# Analysis of CMIP5 AMIP simulations

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# 1 SHORTWAVE DOWNWARD RADIATION FLUX IN AIR

## 1.1 ISCCP

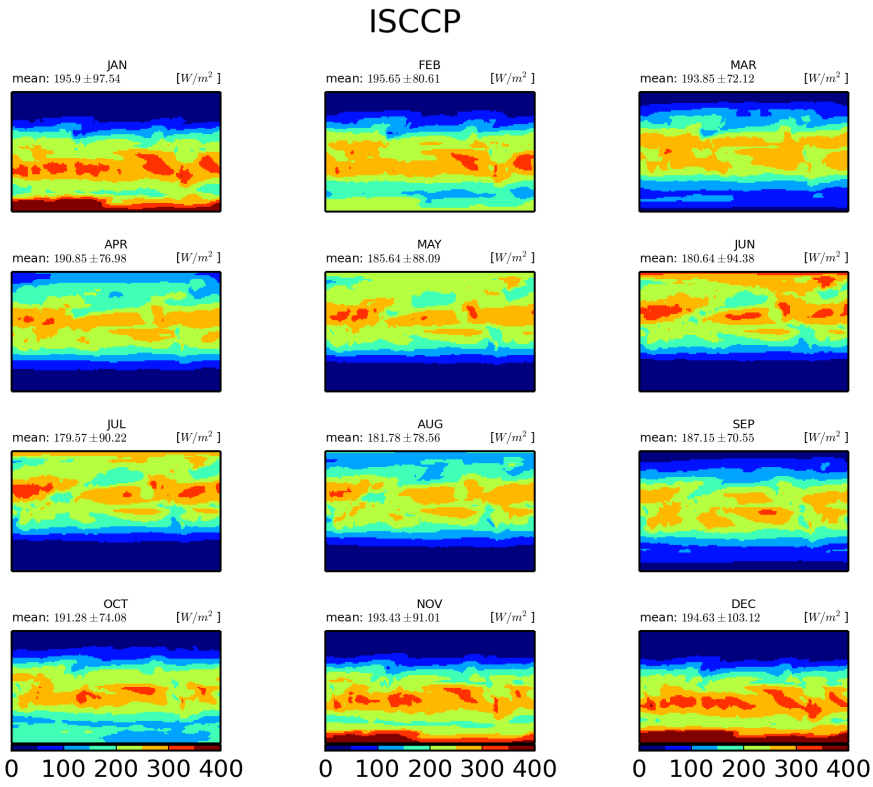



Figure 1: Monthly mean ISCCP

### 1.1.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

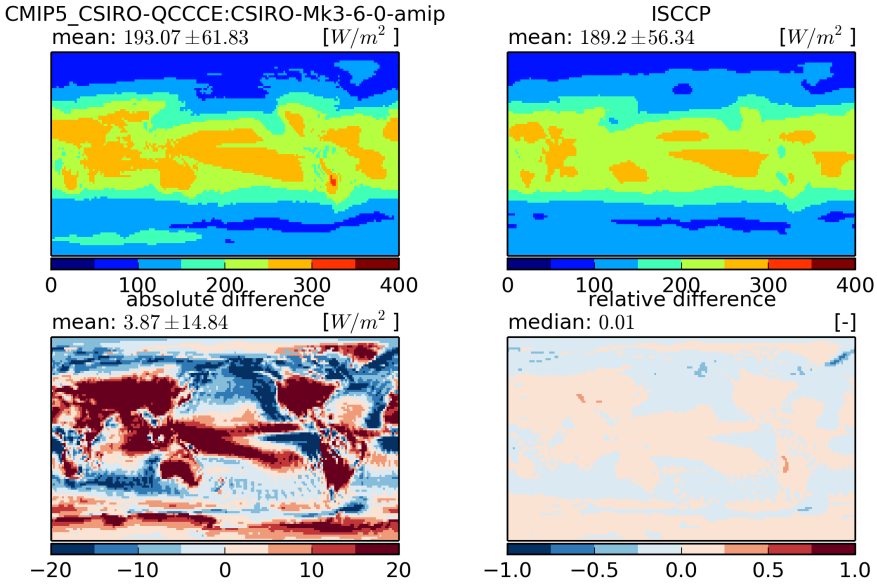



Figure 2: Temporal mean fields (top) and absolute and relative differences (bottom)

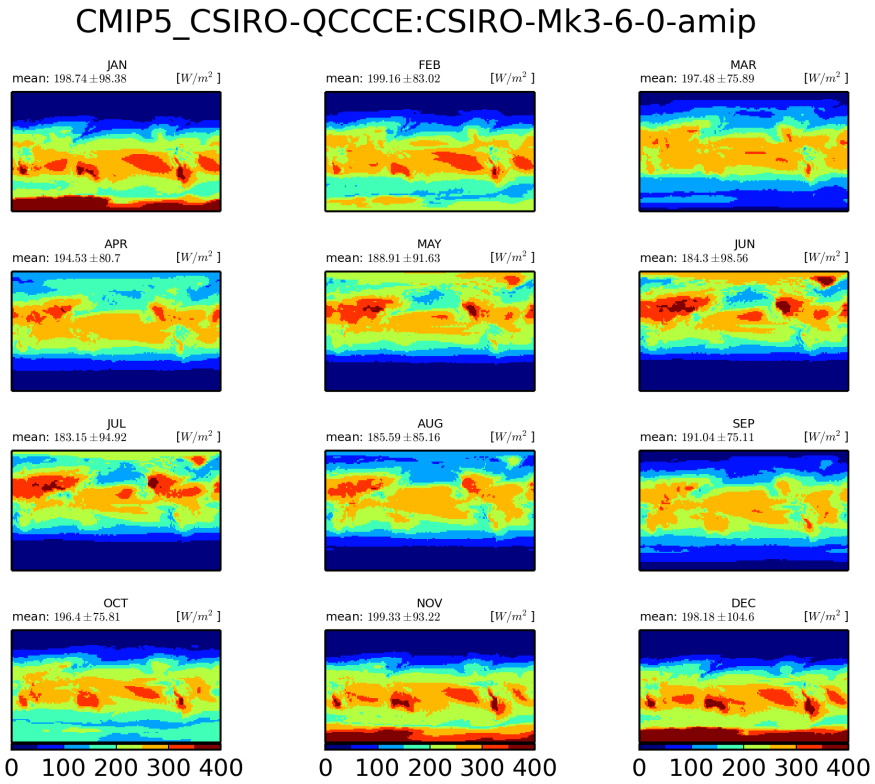



Figure 3: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

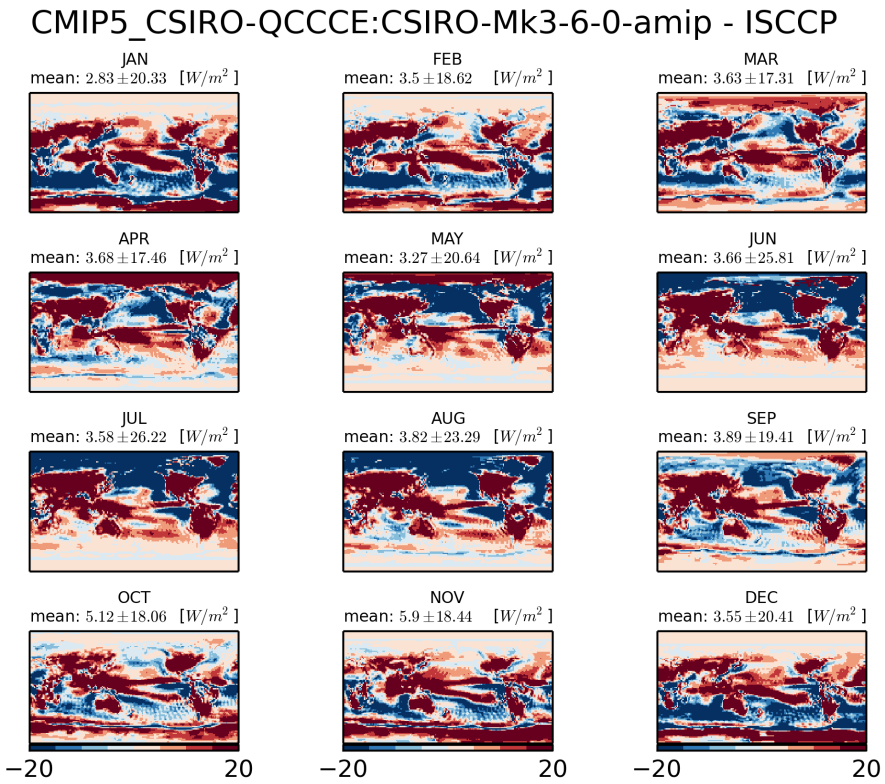



Figure 4: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and ISCCP

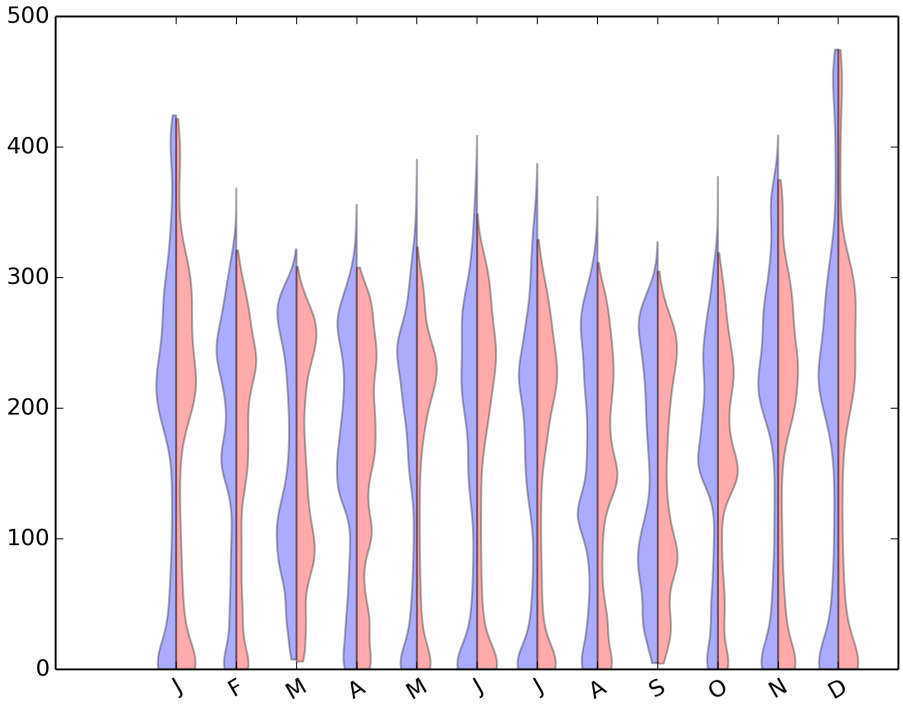



Figure 5: Violin plot for CMIP5-CSIRO-QCCCE:CSIRO-MK3-6-0-AMIP

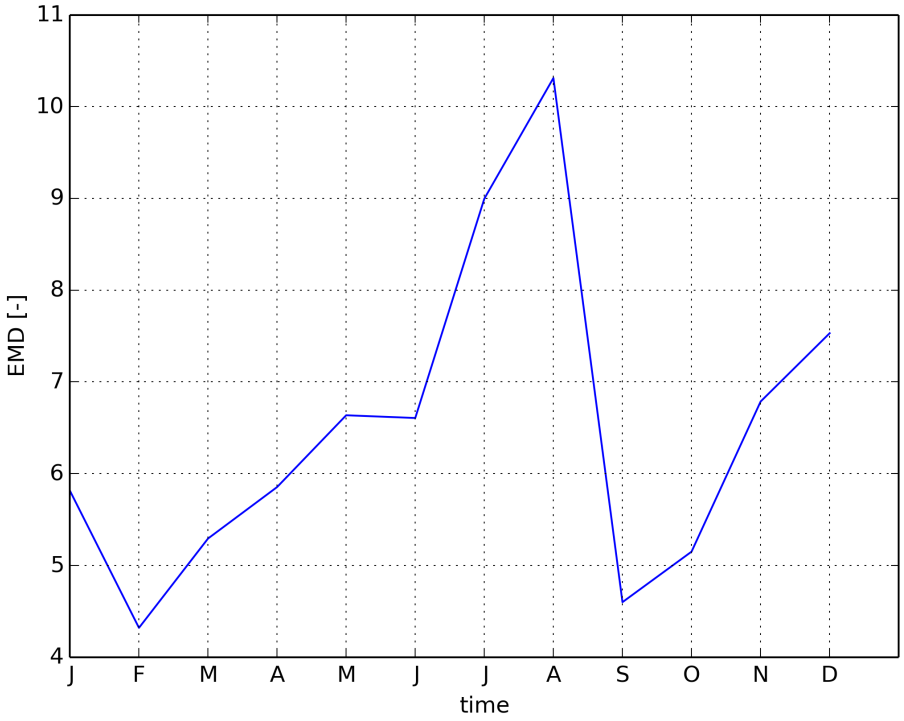



Figure 6: Timeseries of EMD

### 1.1.2 CMIP5 CCCma:CanAM4-amip

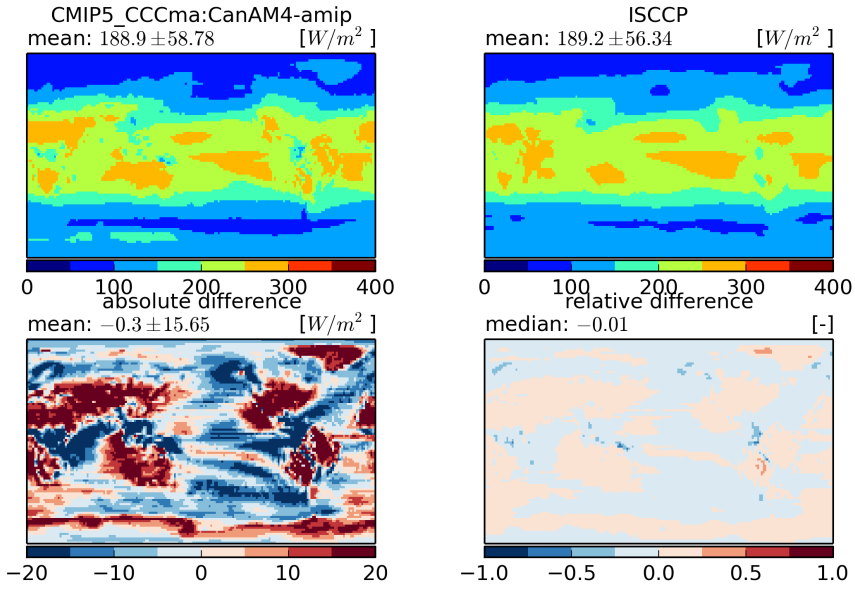



Figure 7: Temporal mean fields (top) and absolute and relative differences (bottom)

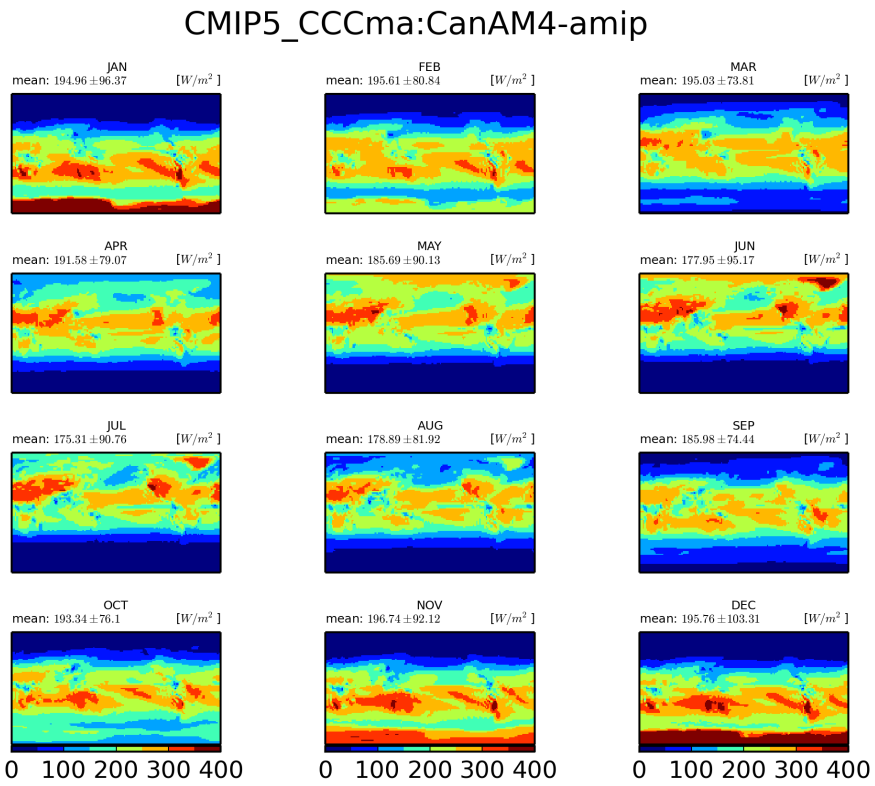



Figure 8: Monthly mean climatology for CCCma:CanAM4

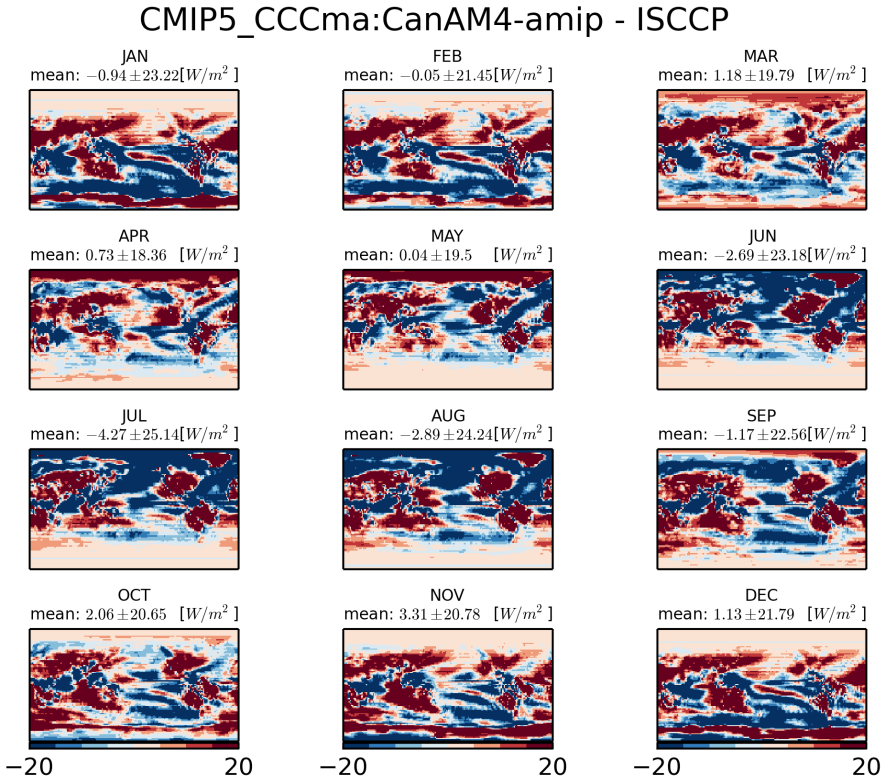



Figure 9: Monthly mean climatology of difference between CCCMA:CANAM4 and ISCCP

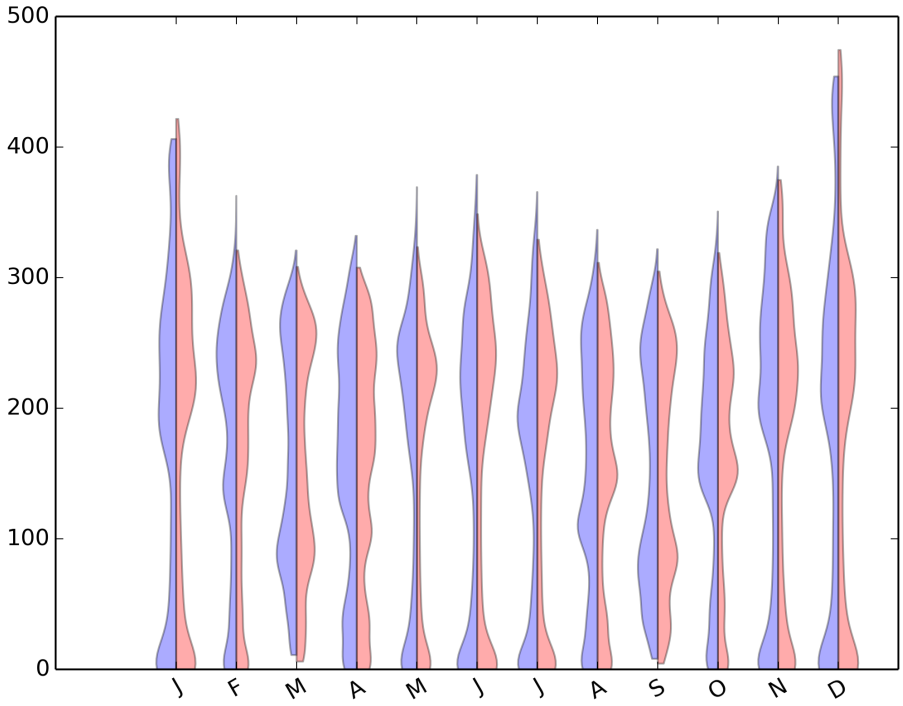



Figure 10: Violin plot for CMIP5-CCCMA:CANAM4-AMIP

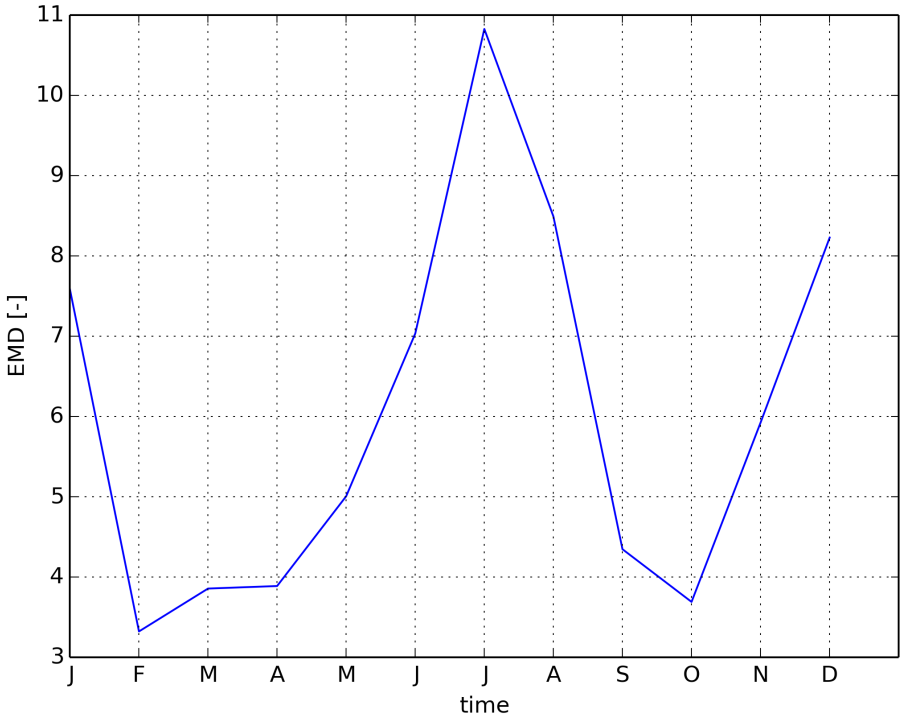



Figure 11: Timeseries of EMD

### 1.1.3 CMIP5 LASG-CESS:FGOALS-g2-amip

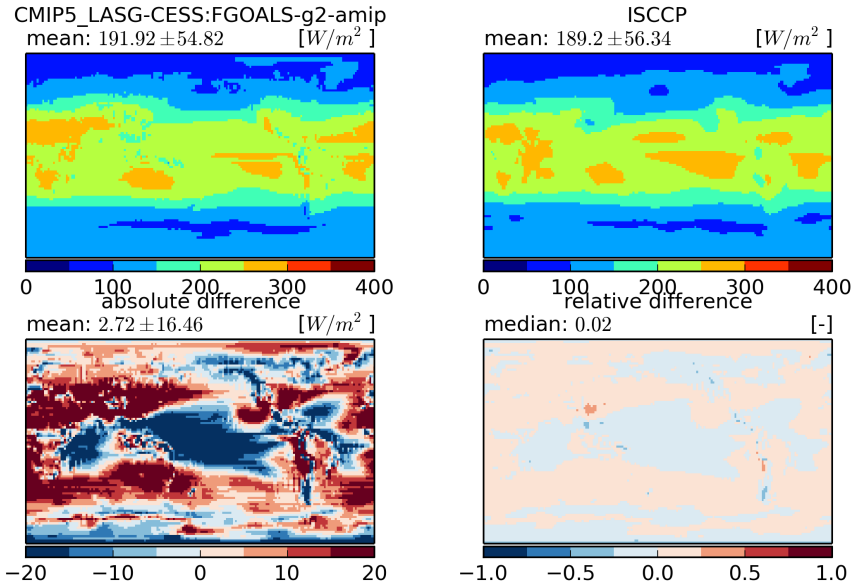



Figure 12: Temporal mean fields (top) and absolute and relative differences (bottom)

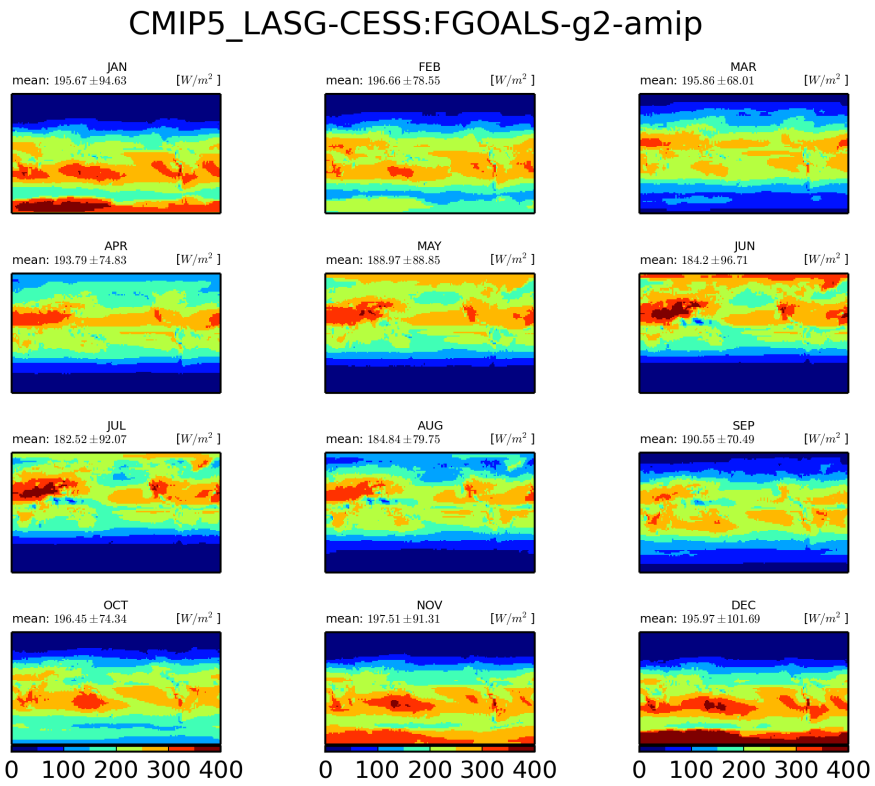



Figure 13: Monthly mean climatology for LASG-CESS:FGOALS-g2

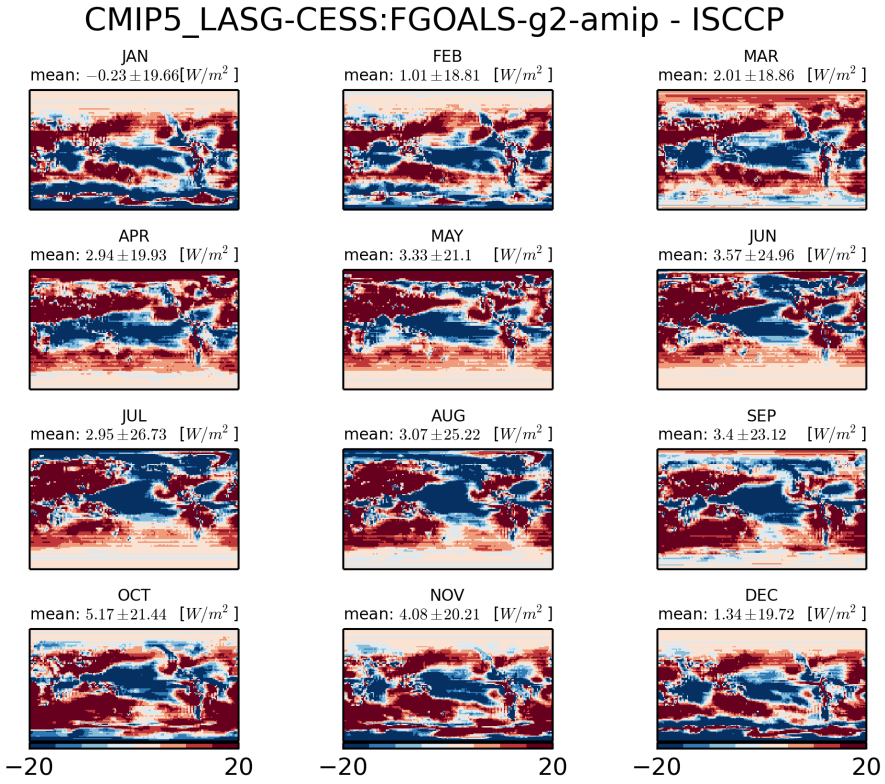



Figure 14: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and ISCCP

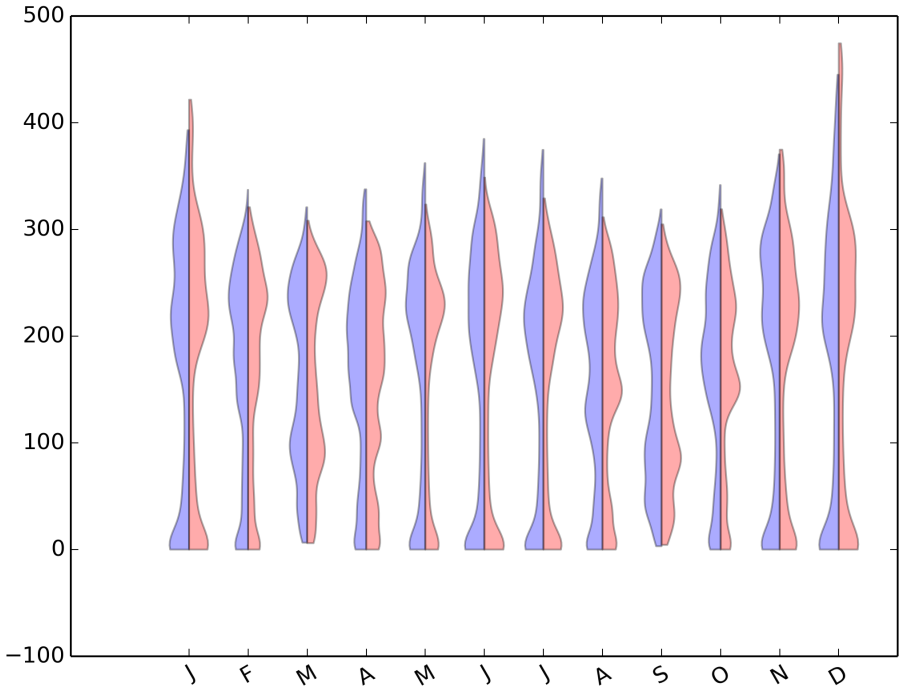



Figure 15: Violin plot for CMIP5-LASG-CESS:FGOALS-G2-AMIP

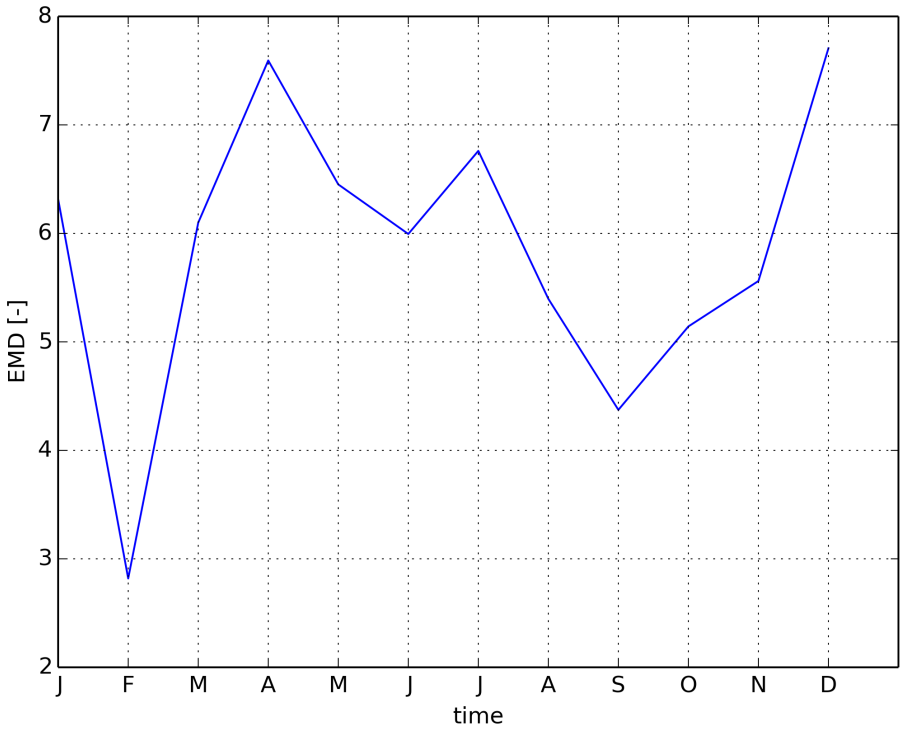



Figure 16: Timeseries of EMD

### 1.1.4 CMIP5 BNU:BNU-ESM-amip

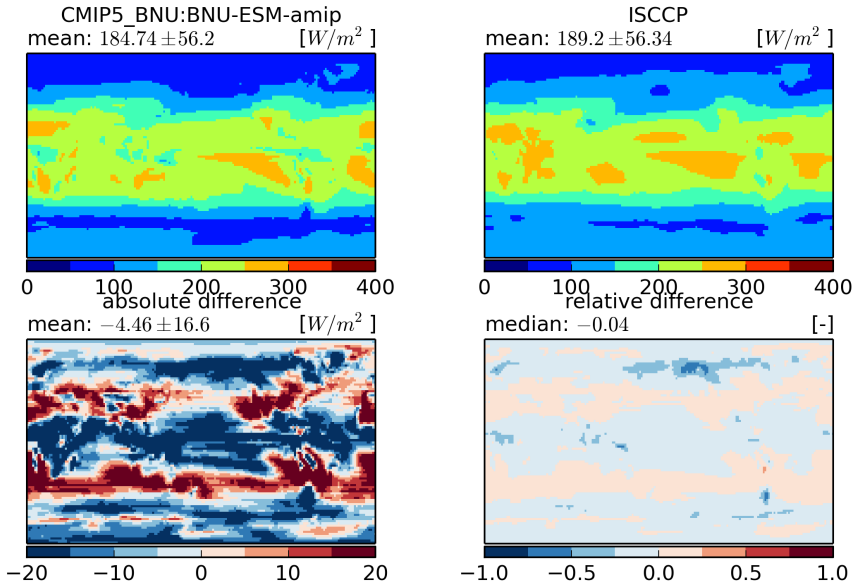



Figure 17: Temporal mean fields (top) and absolute and relative differences (bottom)

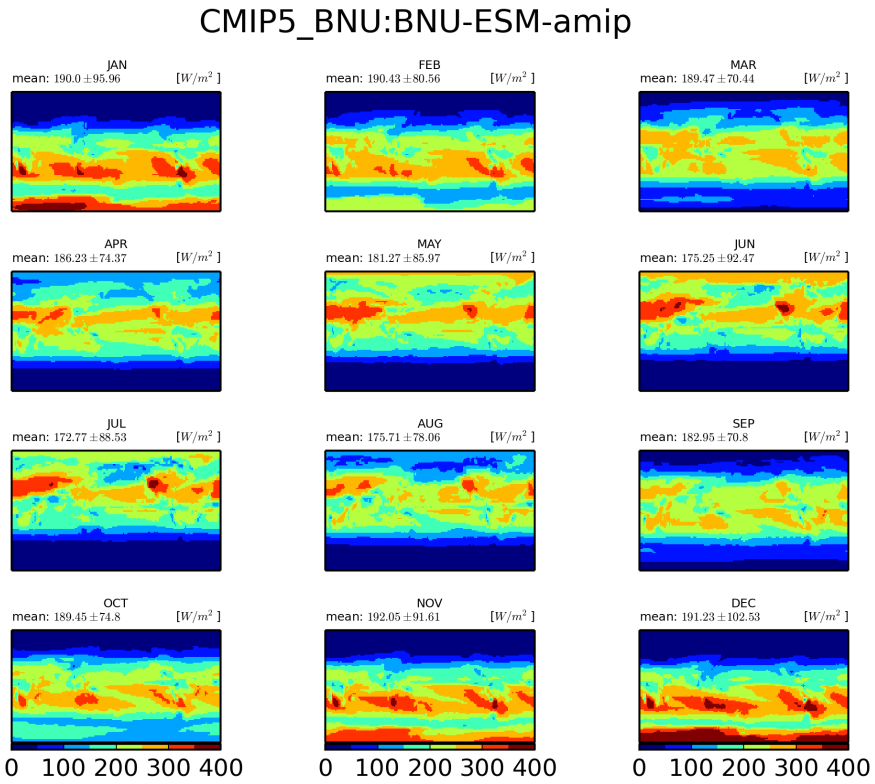



Figure 18: Monthly mean climatology for BNU:BNU-ESM

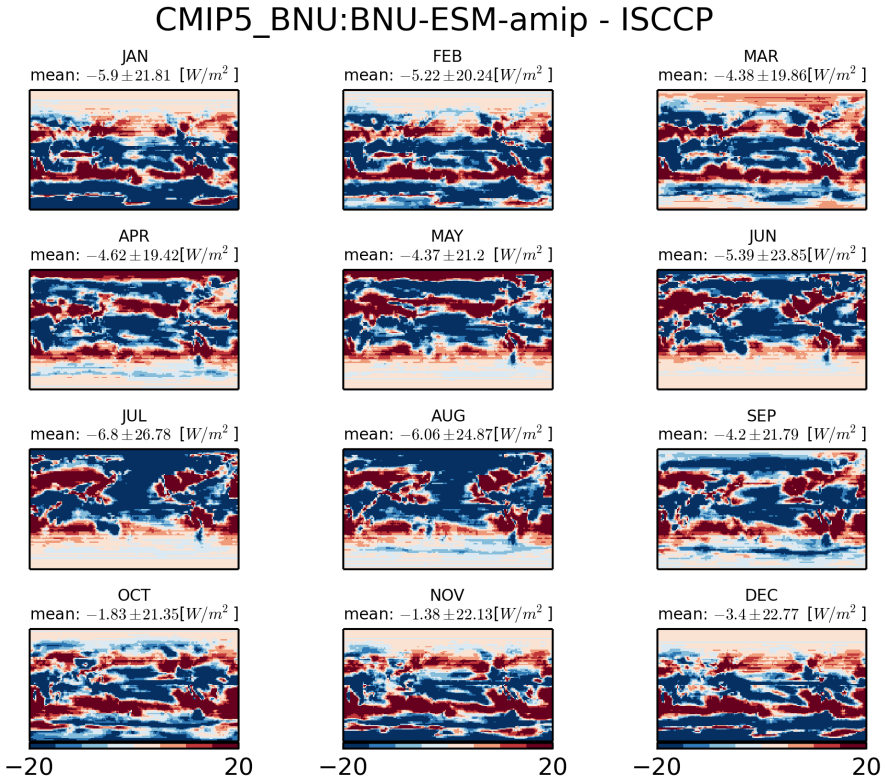



Figure 19: Monthly mean climatology of difference between BNU:BNU-ESM and ISCCP

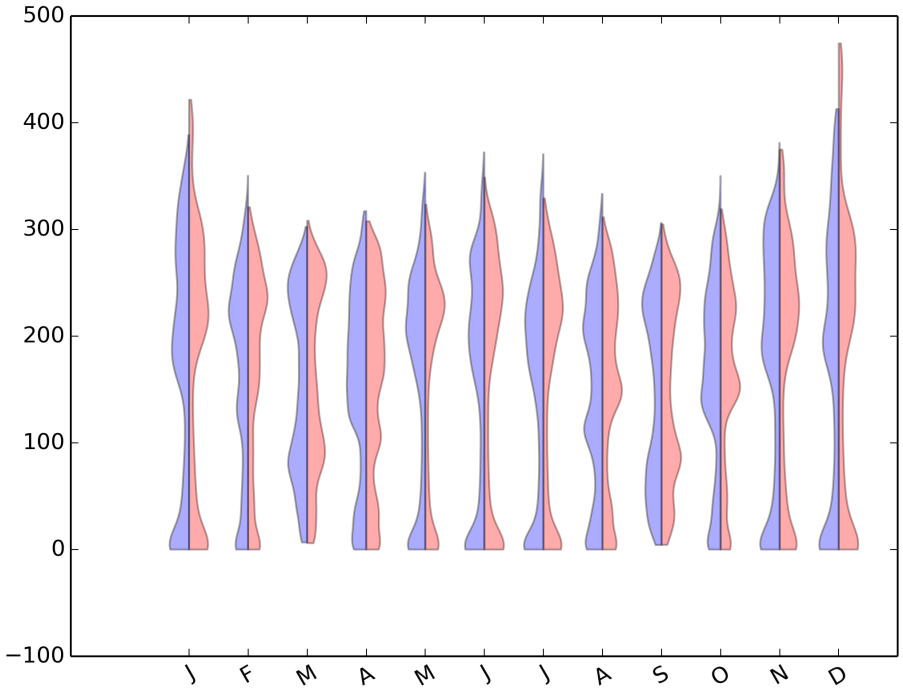



Figure 20: Violin plot for CMIP5-BNU:BNU-ESM-AMIP

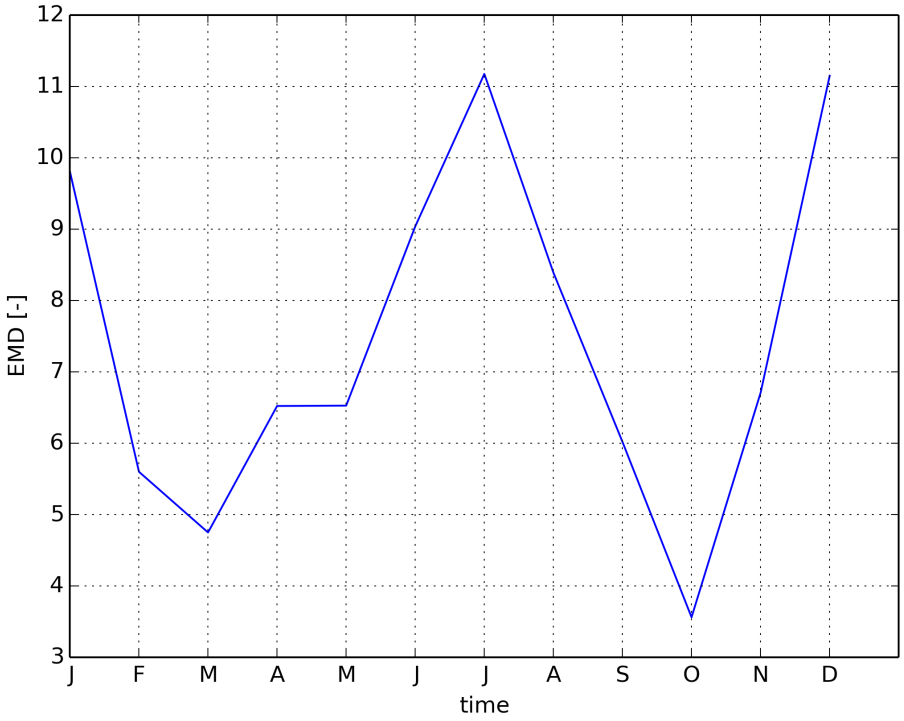



Figure 21: Timeseries of EMD

### 1.1.5 CMIP5 BCC:bcc-csm1-1-amip

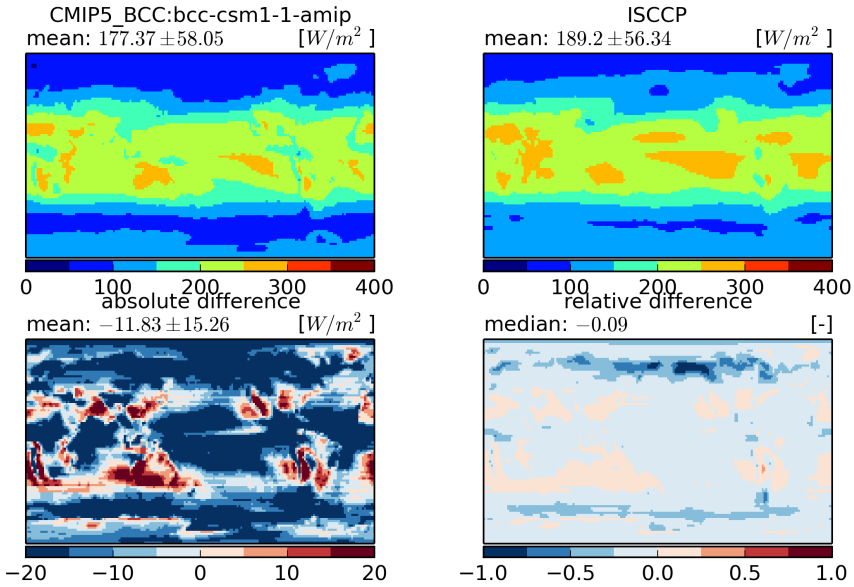



Figure 22: Temporal mean fields (top) and absolute and relative differences (bottom)

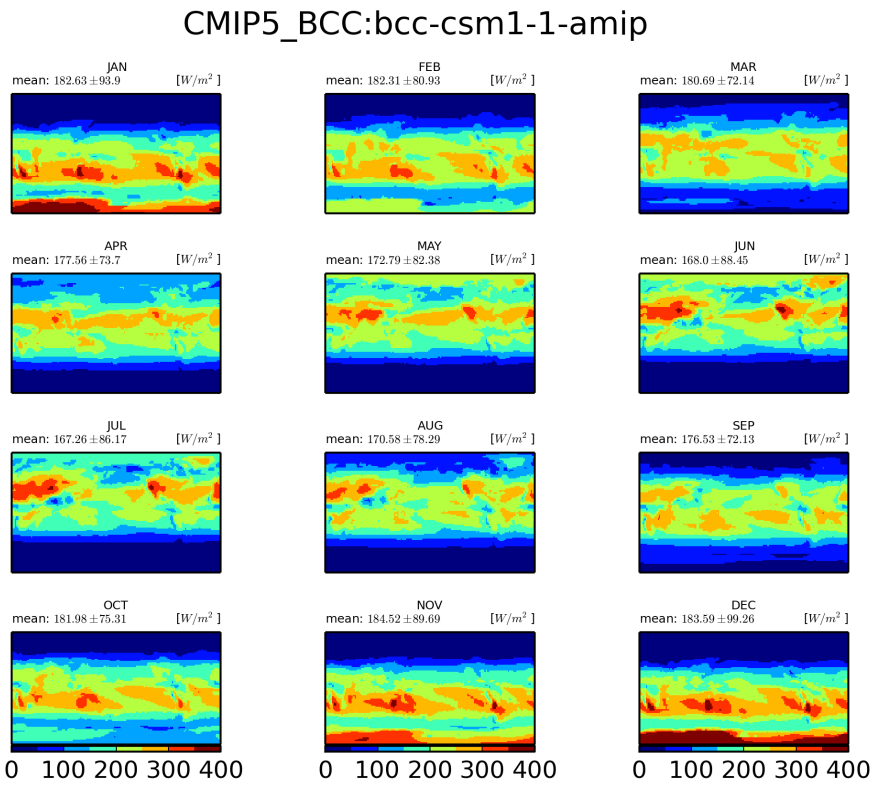



Figure 23: Monthly mean climatology for BCC:bcc-csm1-1

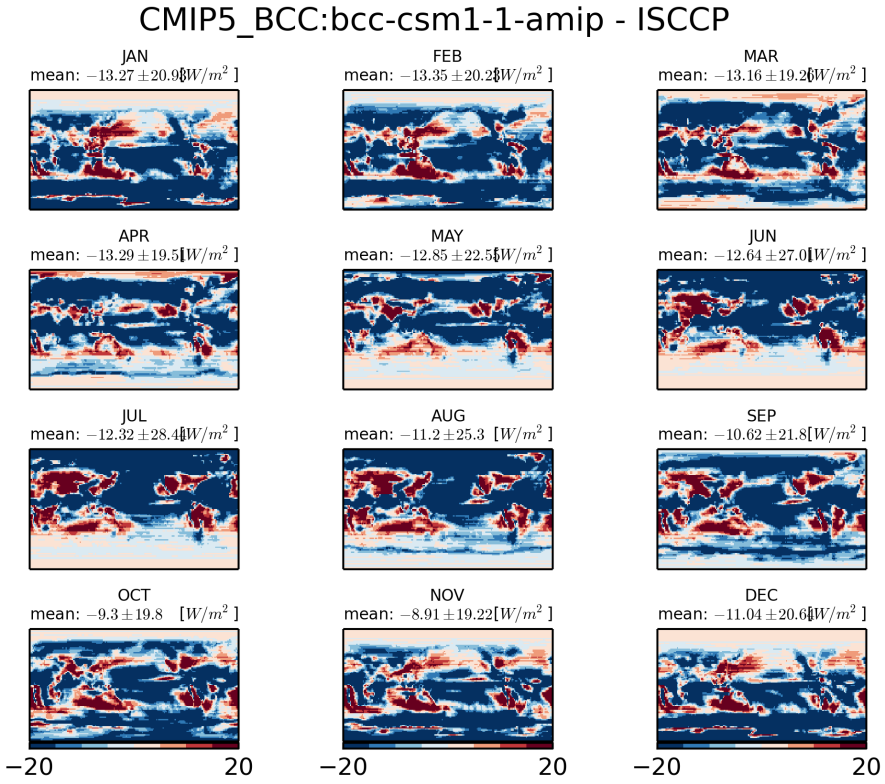



Figure 24: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and ISCCP

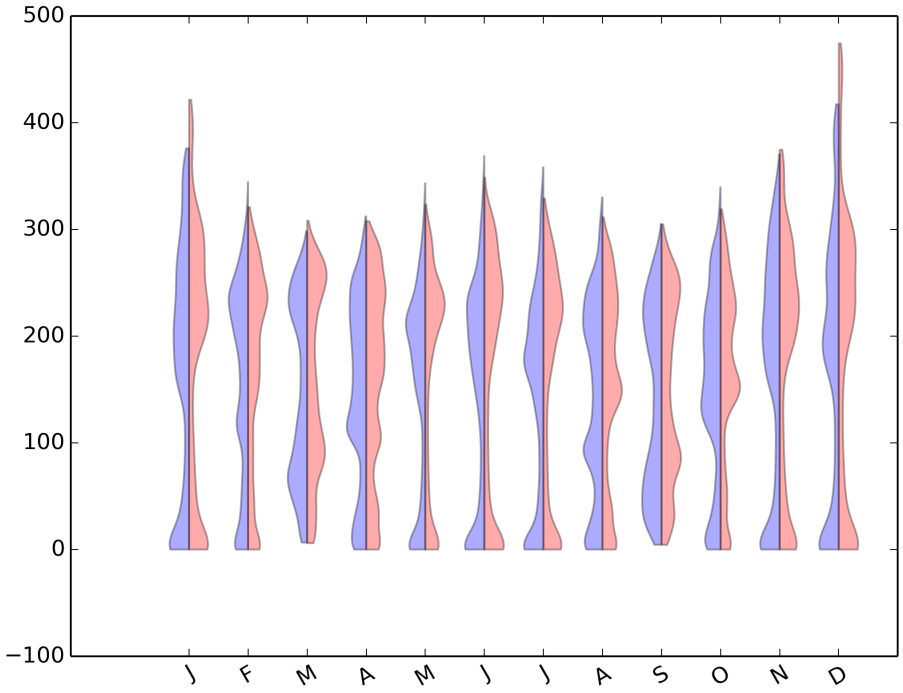



Figure 25: Violin plot for CMIP5-BCC:BCC-CSM1-1-AMIP

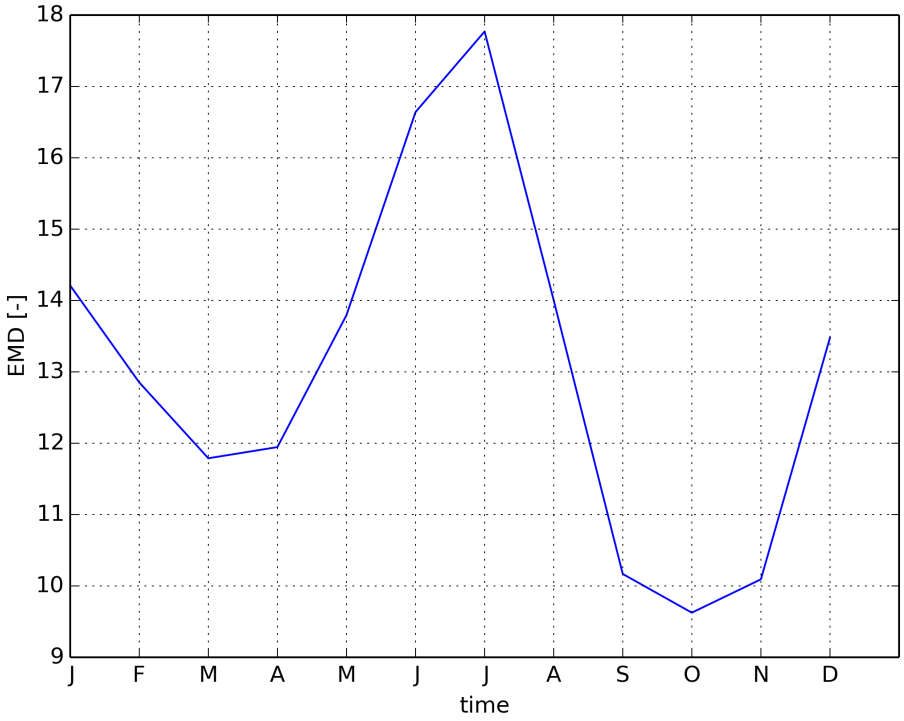



Figure 26: Timeseries of EMD

### 1.1.6 CMIP5 BCC:bcc-csm1-1-m-amip

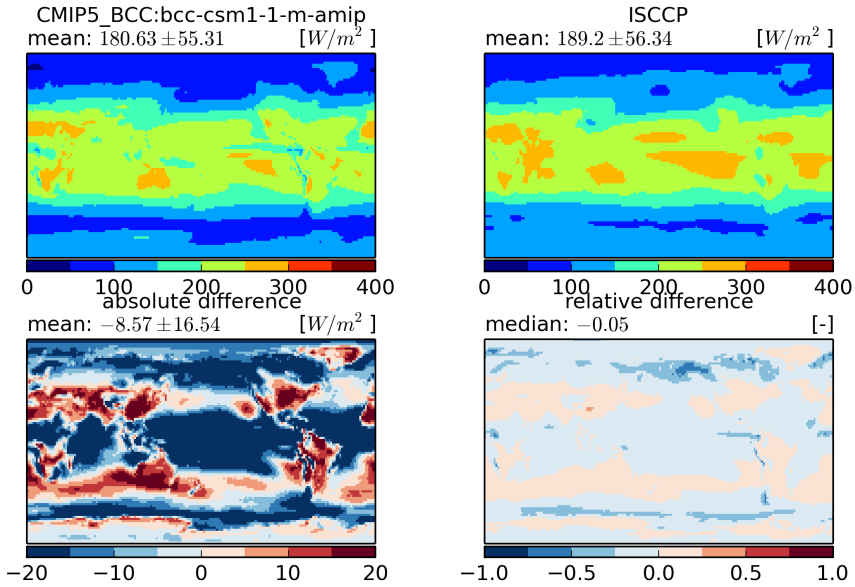



Figure 27: Temporal mean fields (top) and absolute and relative differences (bottom)

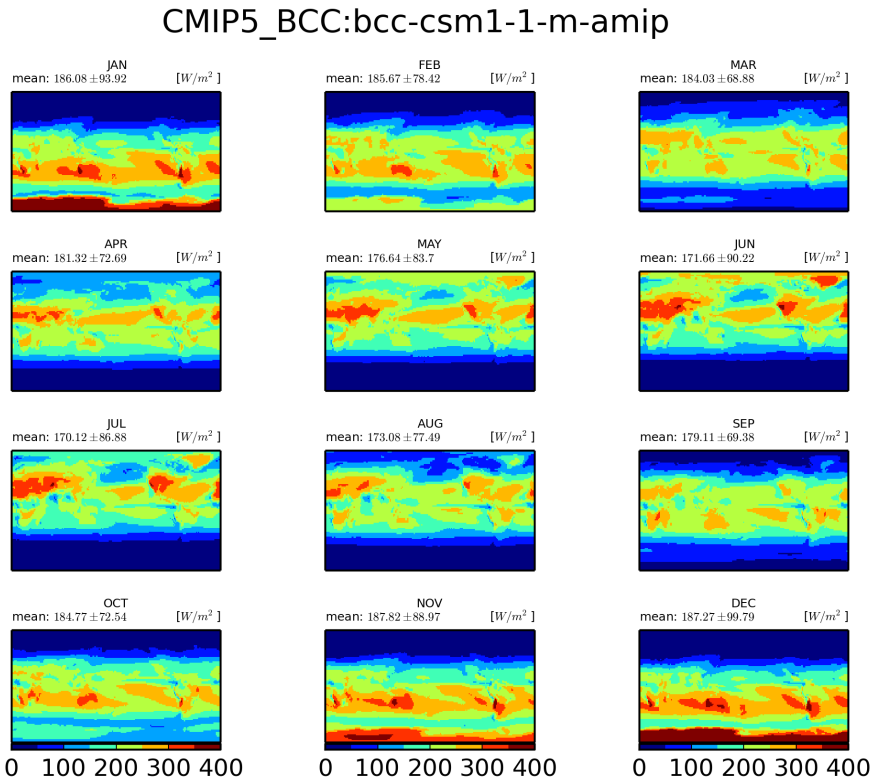



Figure 28: Monthly mean climatology for BCC:bcc-csm1-1-m

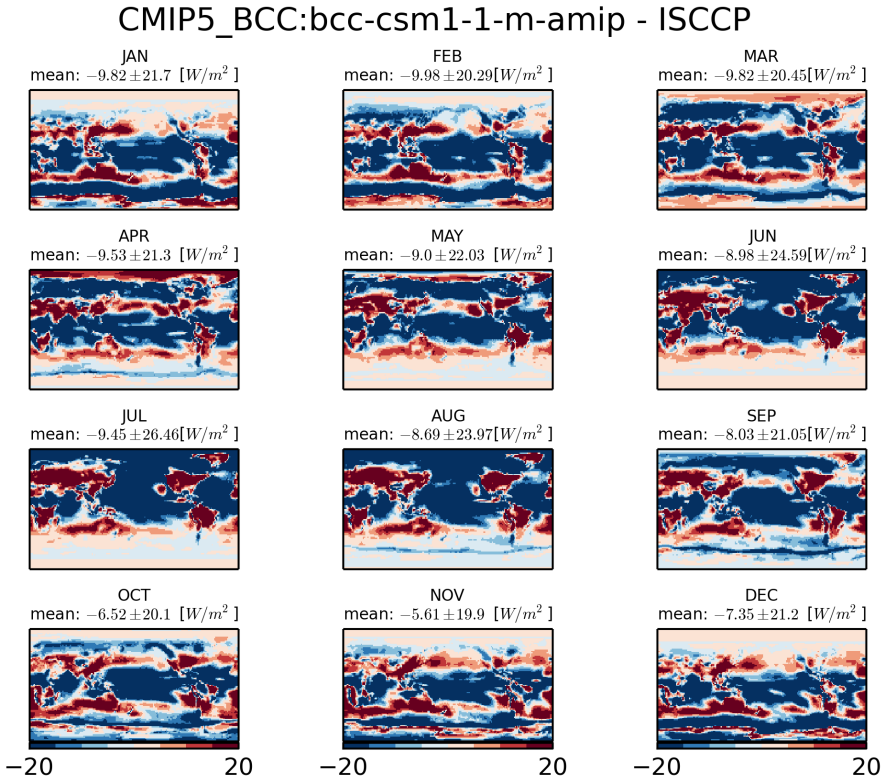



Figure 29: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and ISCCP

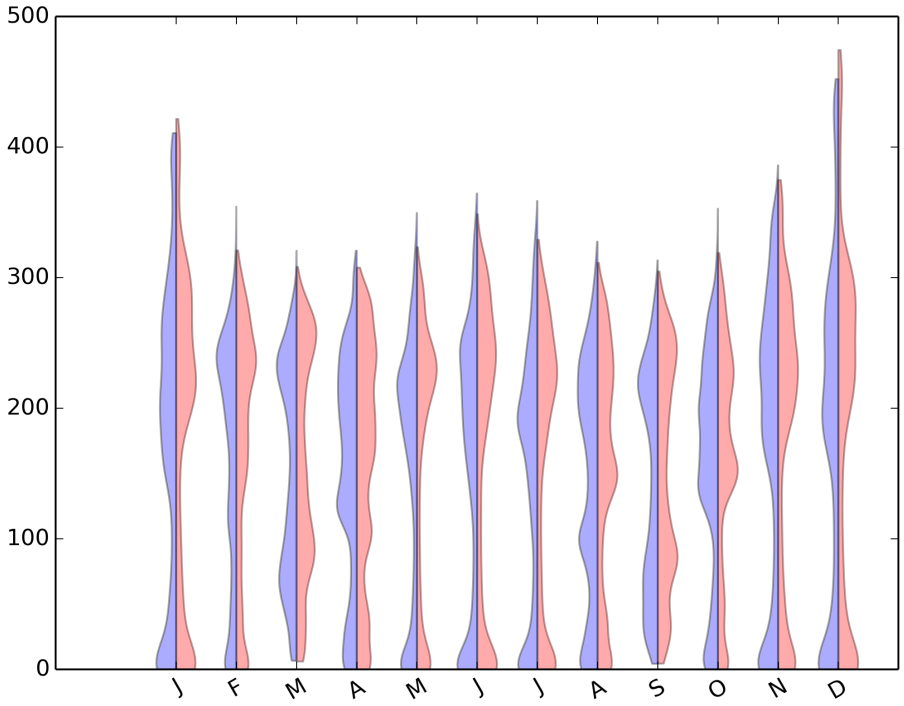



Figure 30: Violin plot for CMIP5-BCC:BCC-CSM1-1-M-AMIP

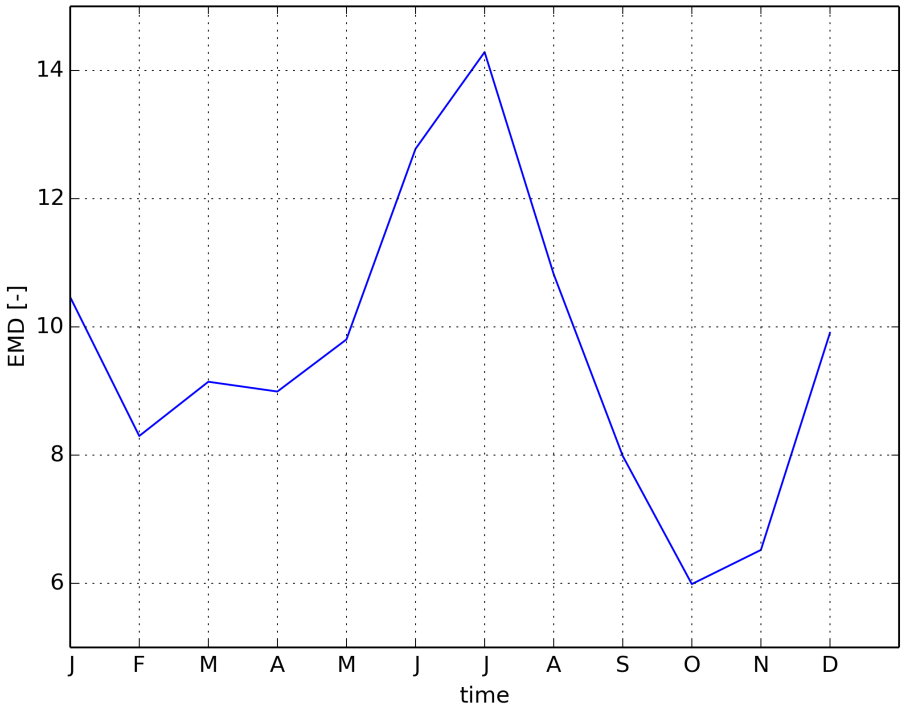



Figure 31: Timeseries of EMD

### 1.1.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

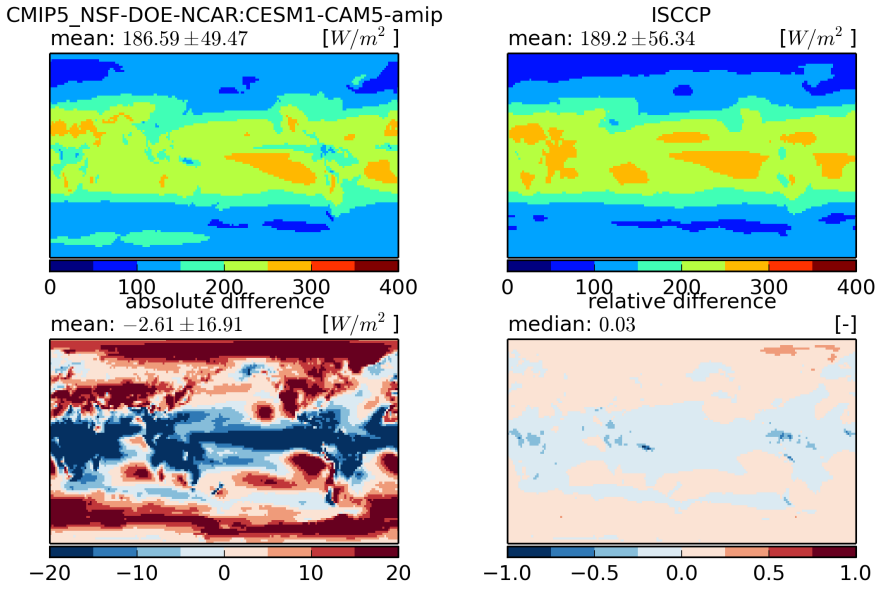



Figure 32: Temporal mean fields (top) and absolute and relative differences (bottom)

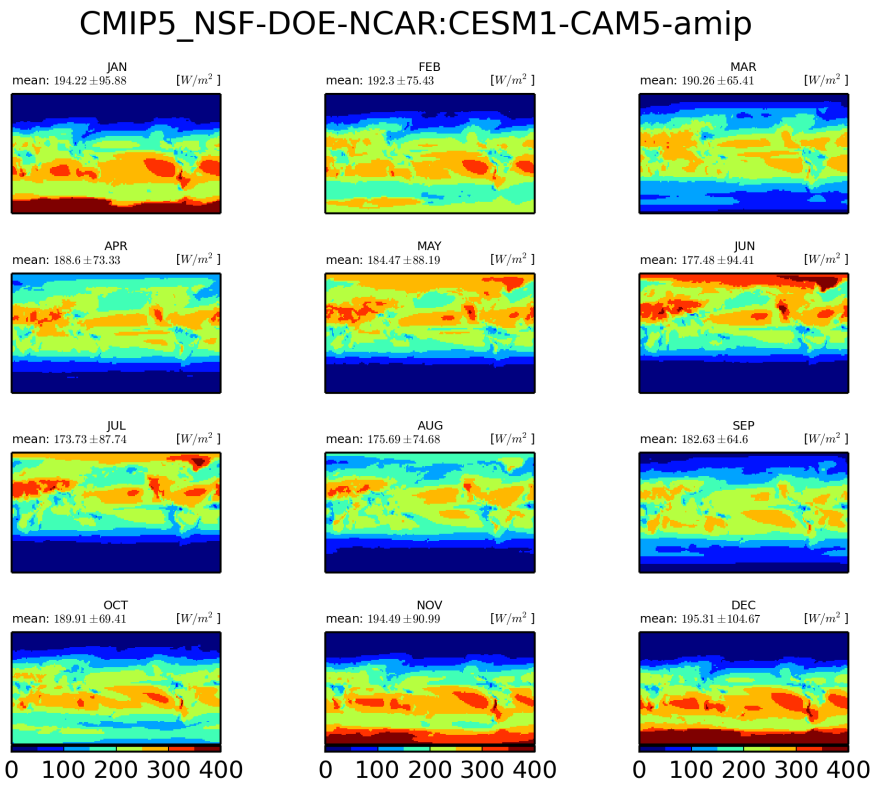



Figure 33: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

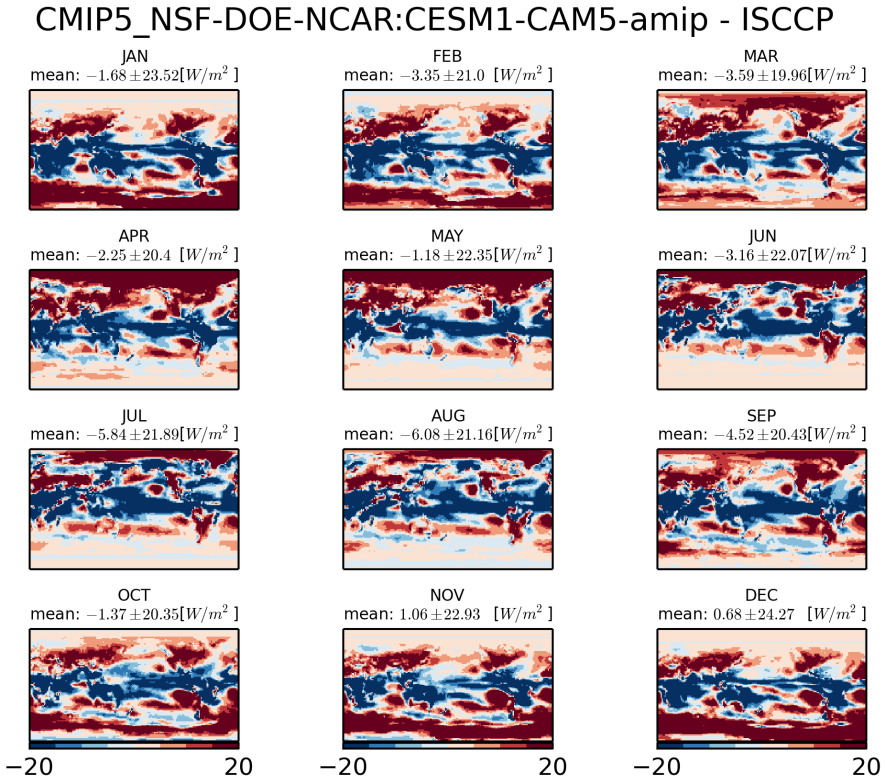



Figure 34: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and ISCCP

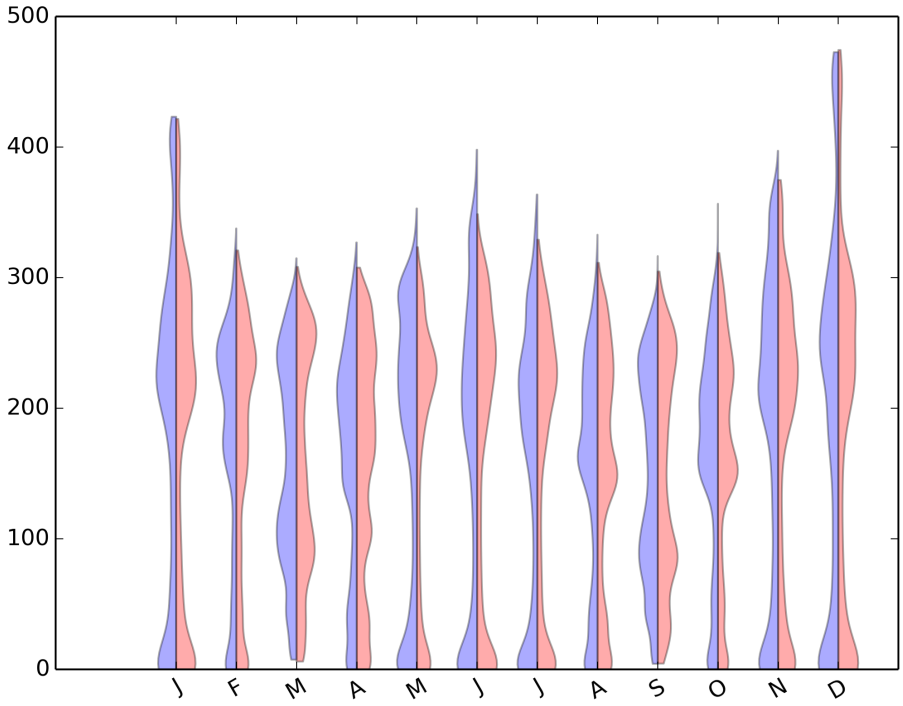



Figure 35: Violin plot for CMIP5-NSF-DOE-NCAR:CESM1-CAM5-AMIP

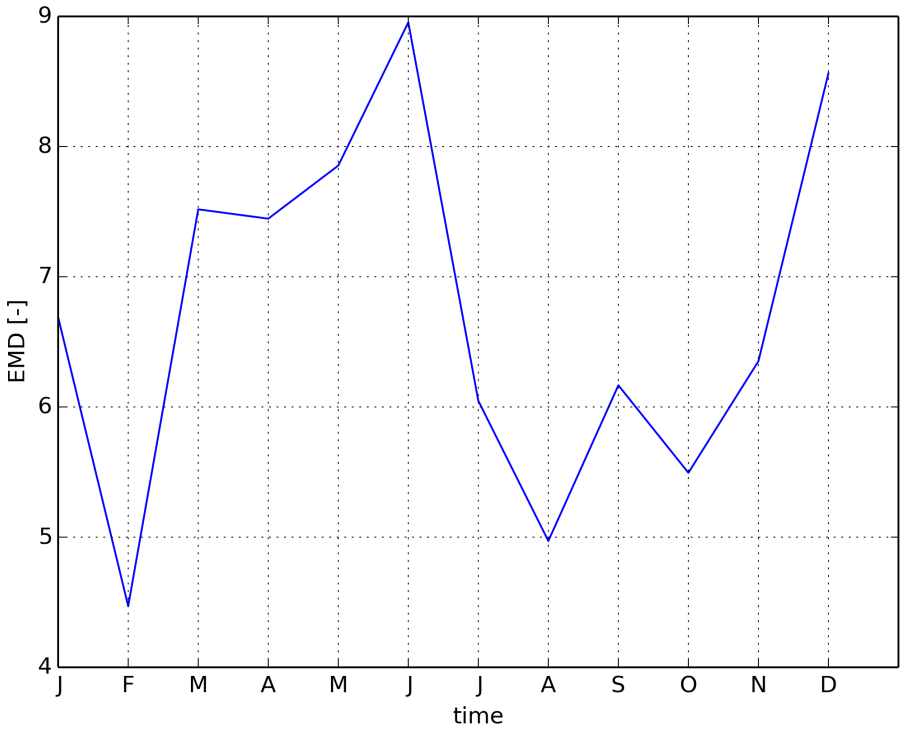



Figure 36: Timeseries of EMD

### 1.1.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

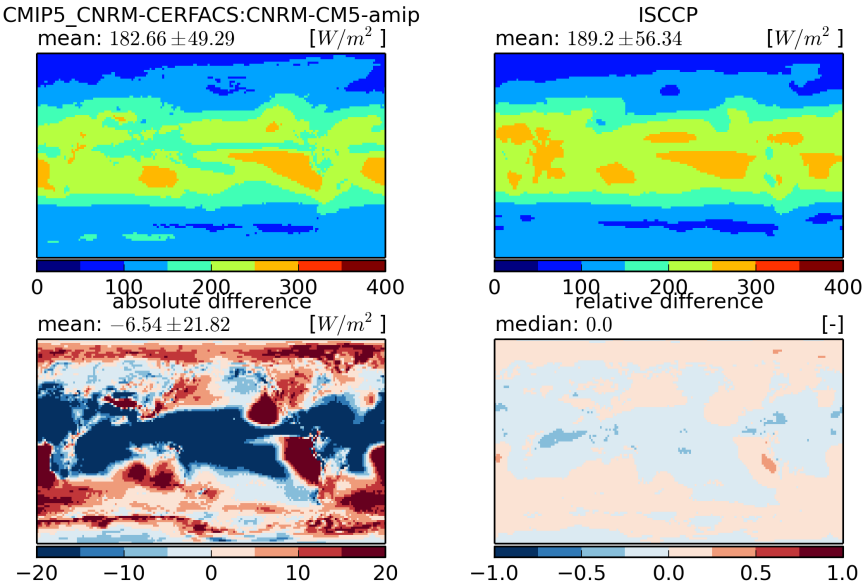



Figure 37: Temporal mean fields (top) and absolute and relative differences (bottom)

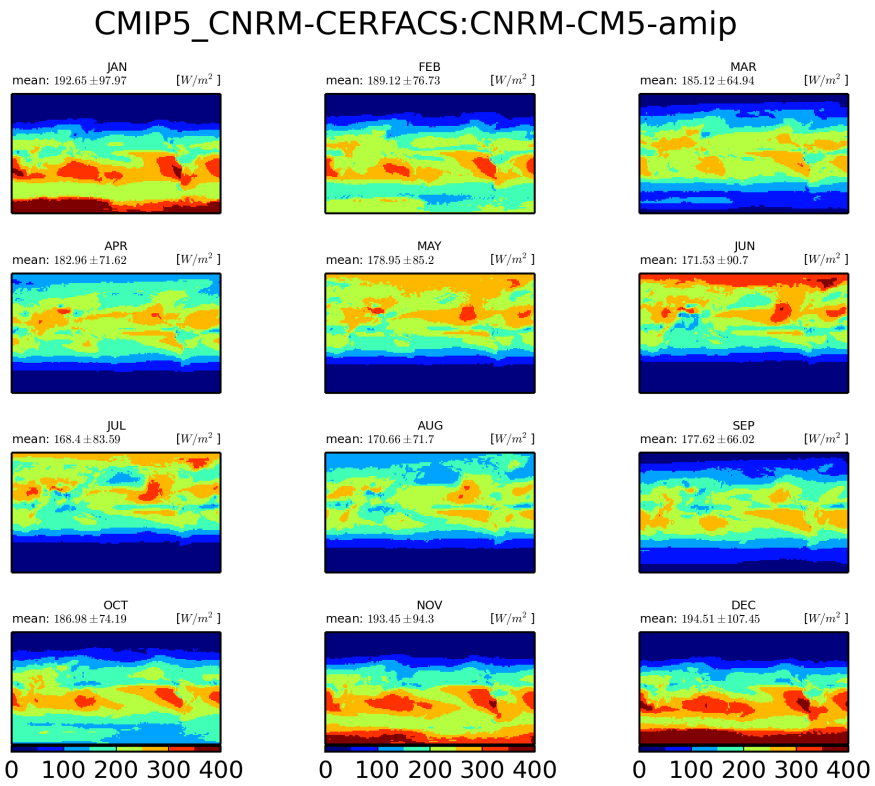



Figure 38: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

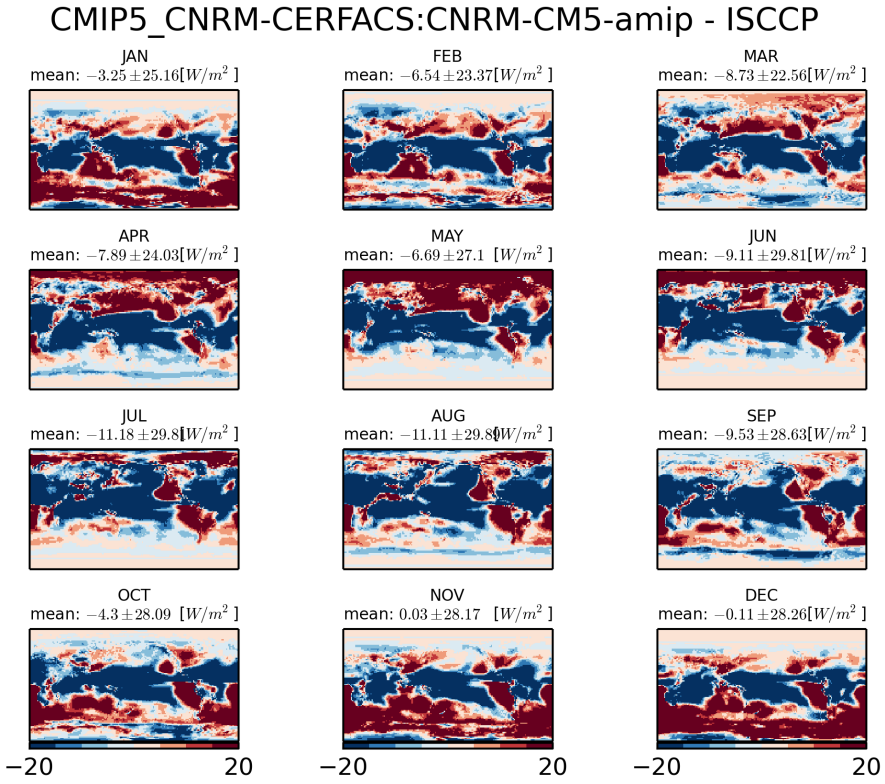



Figure 39: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and ISCCP

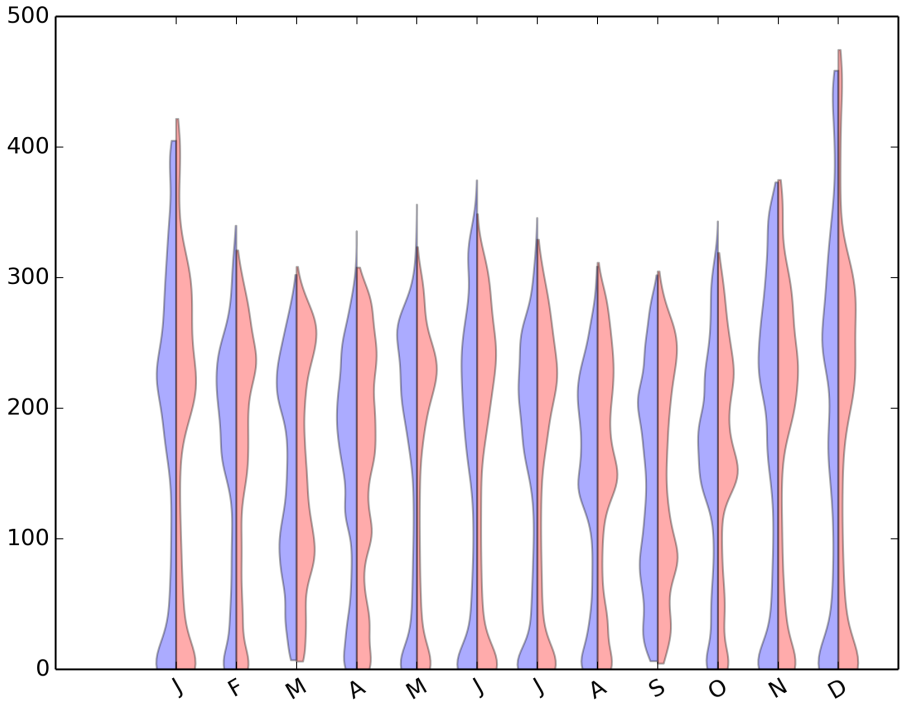



Figure 40: Violin plot for CMIP5-CNRM-CERFACS:CNRM-CM5-AMIP

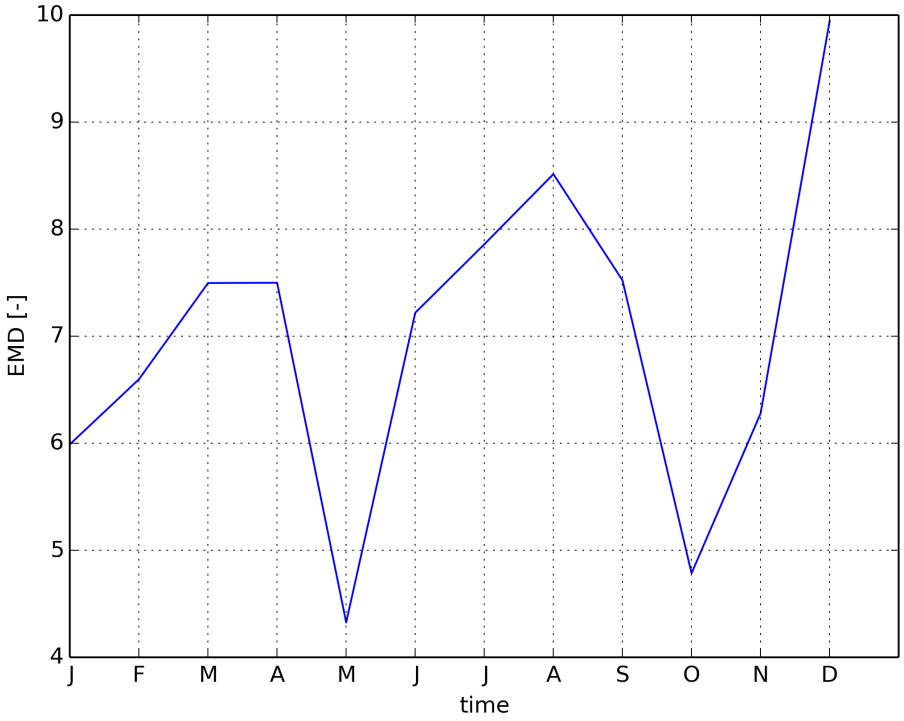



Figure 41: Timeseries of EMD

### 1.1.9 CMIP5 MRI:MRI-CGCM3-amip

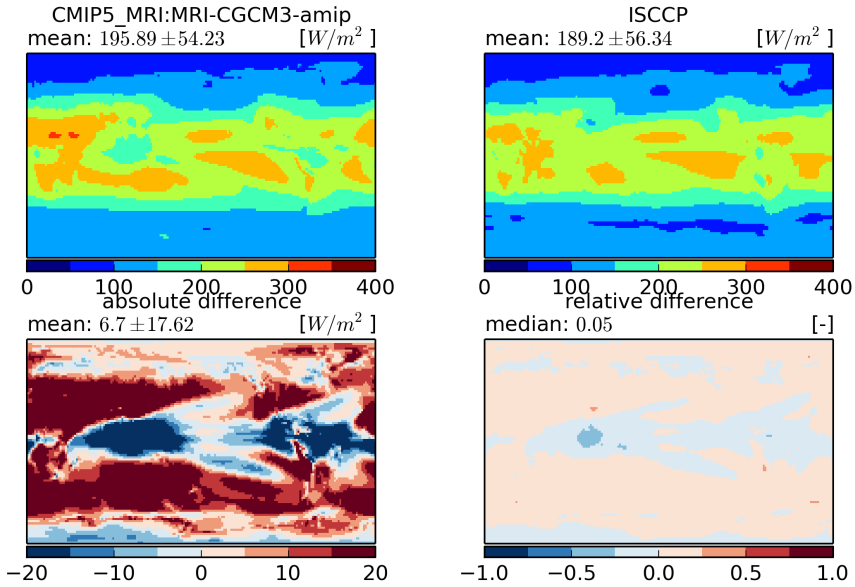



Figure 42: Temporal mean fields (top) and absolute and relative differences (bottom)

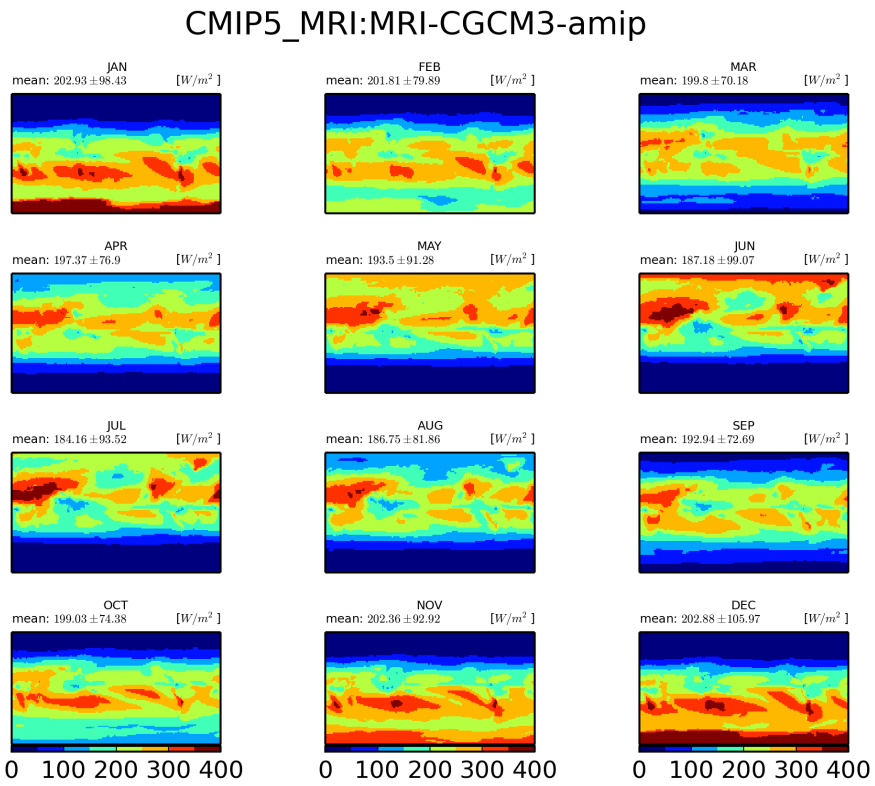



Figure 43: Monthly mean climatology for MRI:MRI-CGCM3

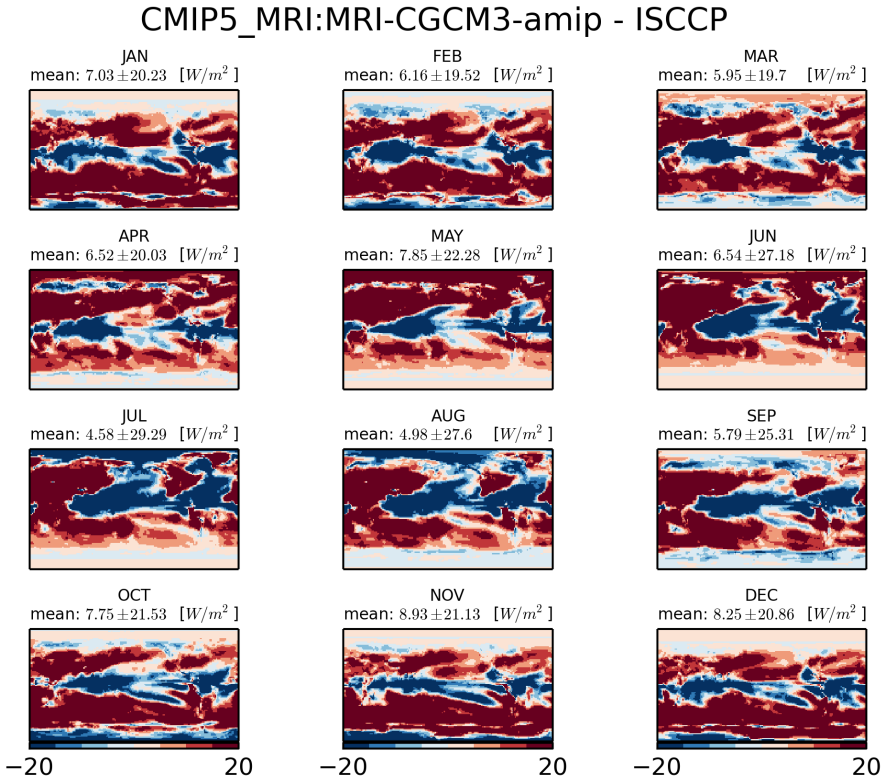



Figure 44: Monthly mean climatology of difference between MRI:MRI-CGCM3 and ISCCP

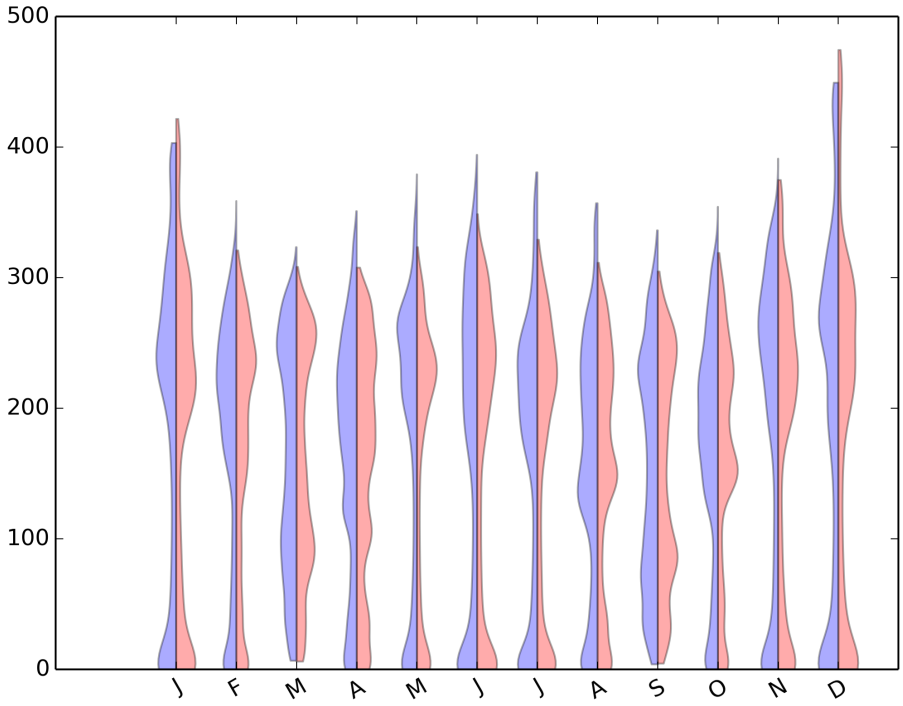



Figure 45: Violin plot for CMIP5-MRI:MRI-CGCM3-AMIP

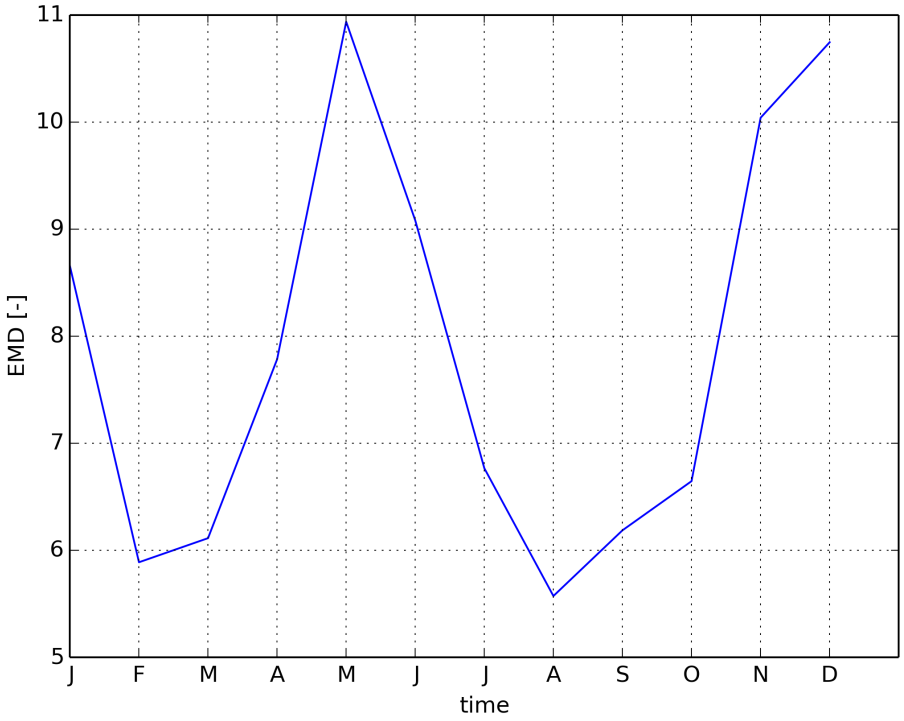



Figure 46: Timeseries of EMD

### 1.1.10 CMIP5 NASA-GISS:GISS-E2-R-amip

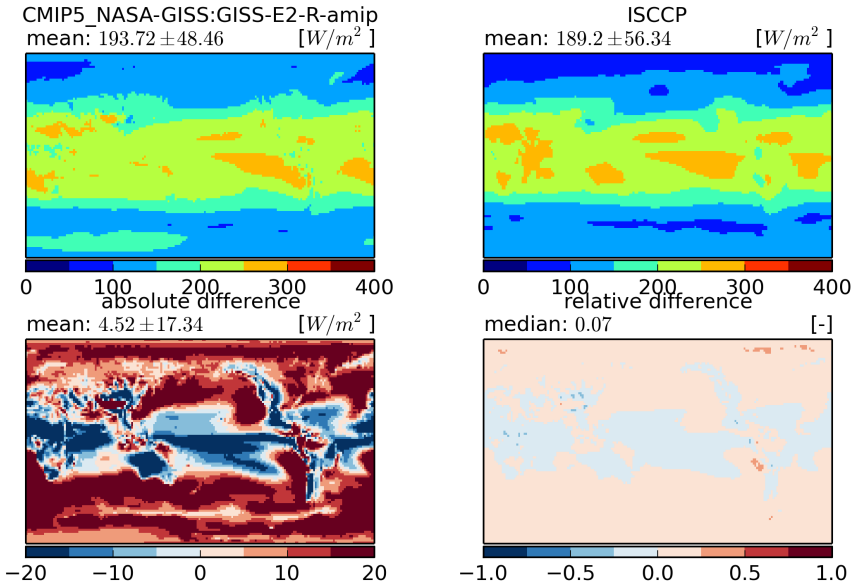



Figure 47: Temporal mean fields (top) and absolute and relative differences (bottom)

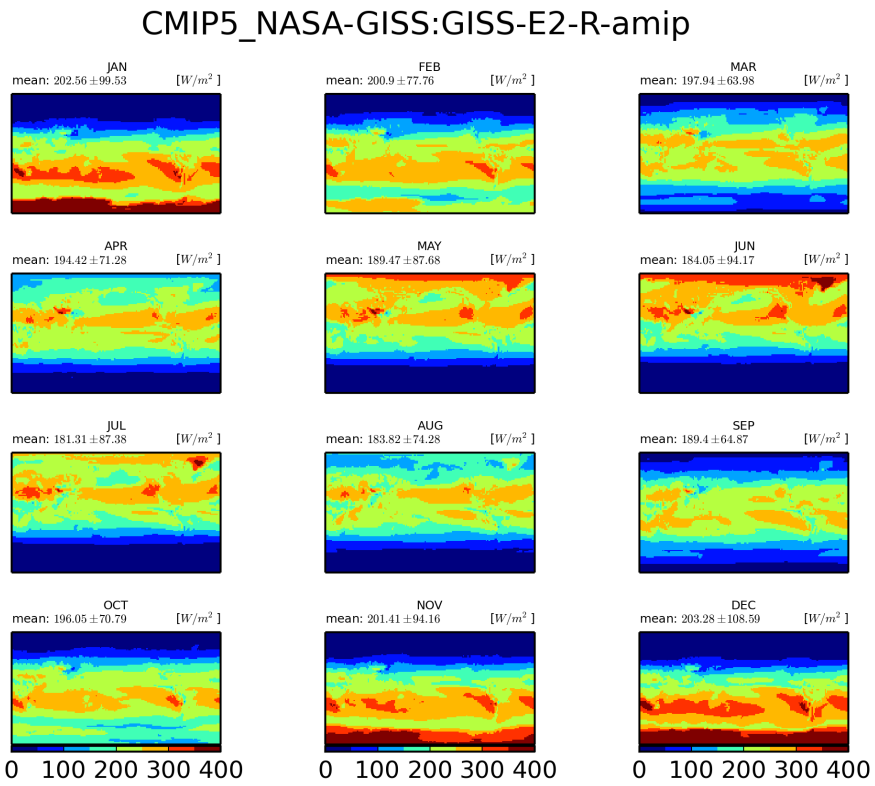



Figure 48: Monthly mean climatology for NASA-GISS:GISS-E2-R

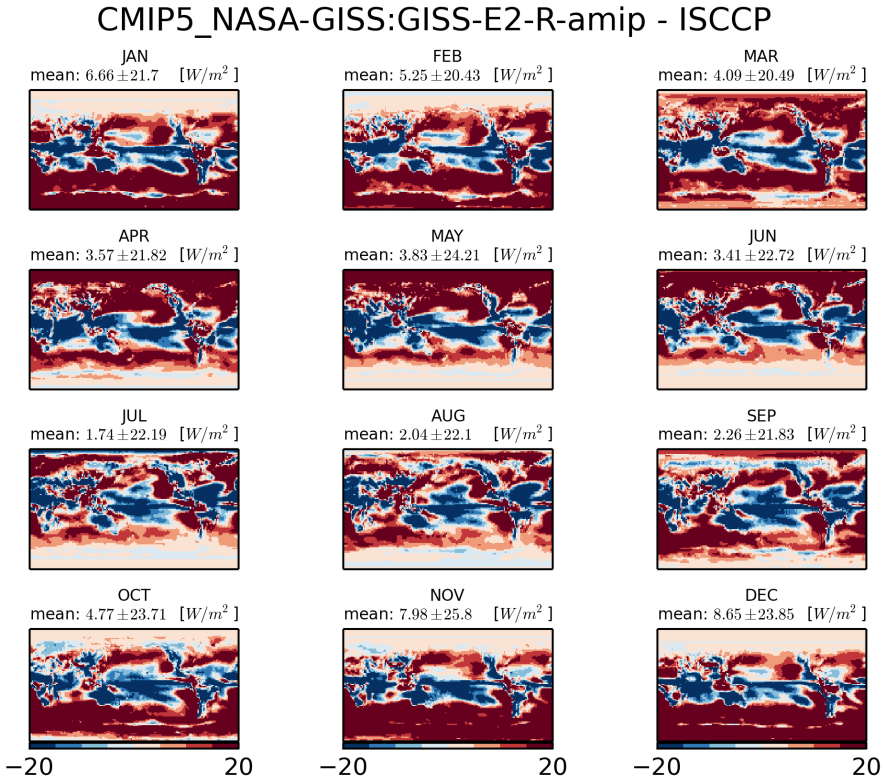



Figure 49: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and ISCCP

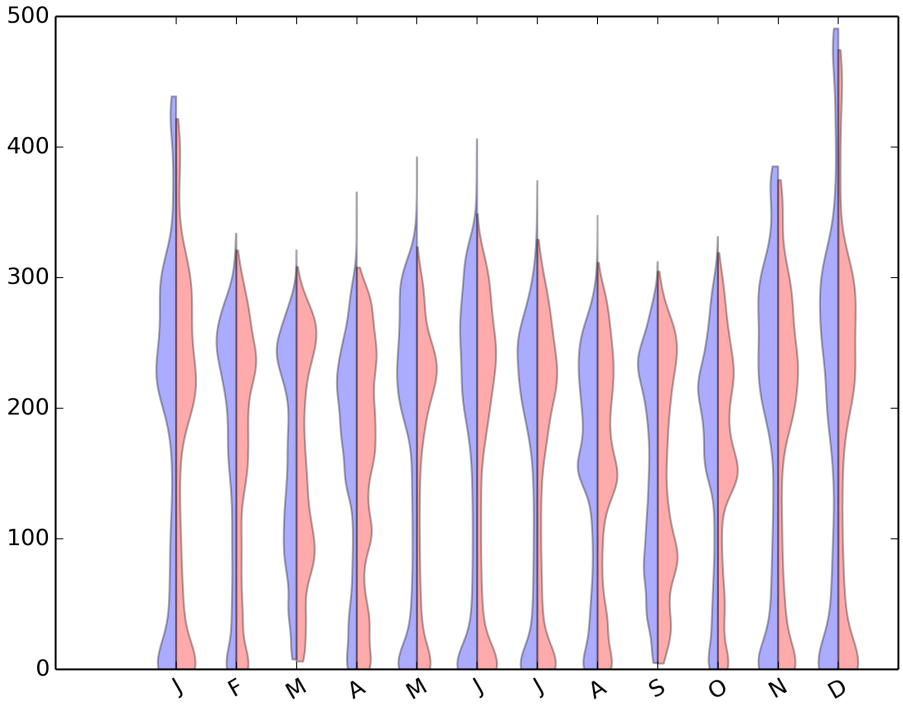



Figure 50: Violin plot for CMIP5-NASA-GISS:GISS-E2-R-AMIP

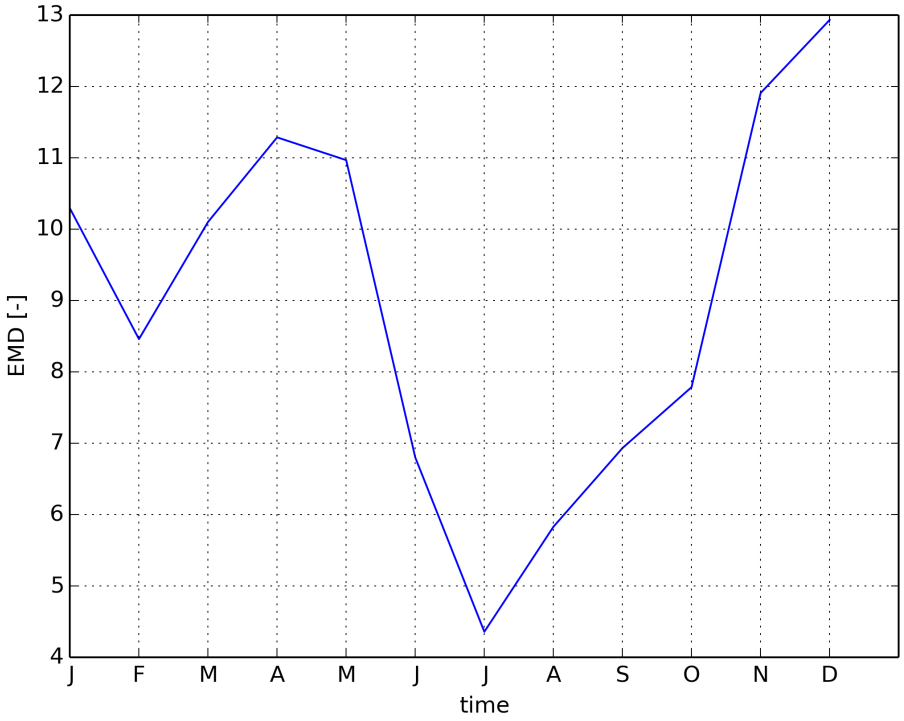



Figure 51: Timeseries of EMD

### 1.1.11 CMIP5 MIROC:MIROC5-amip

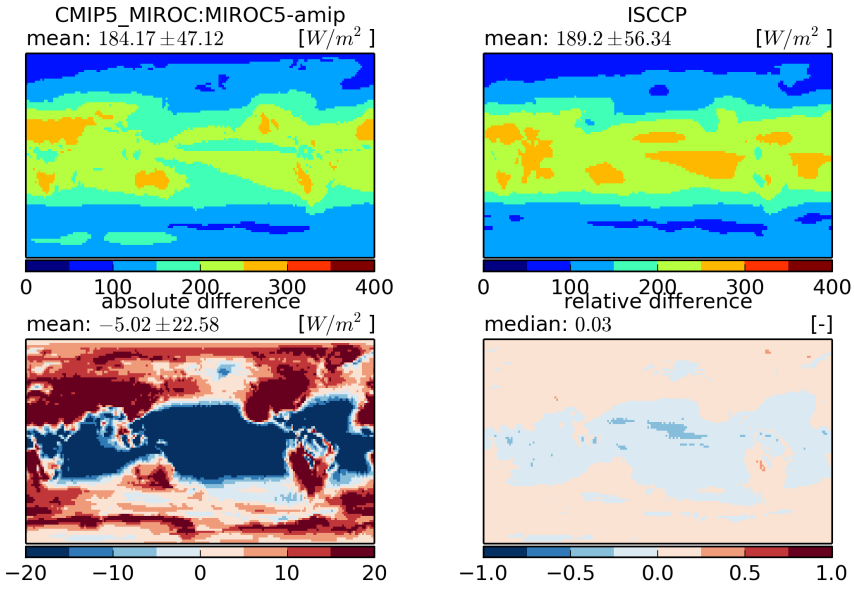



Figure 52: Temporal mean fields (top) and absolute and relative differences (bottom)

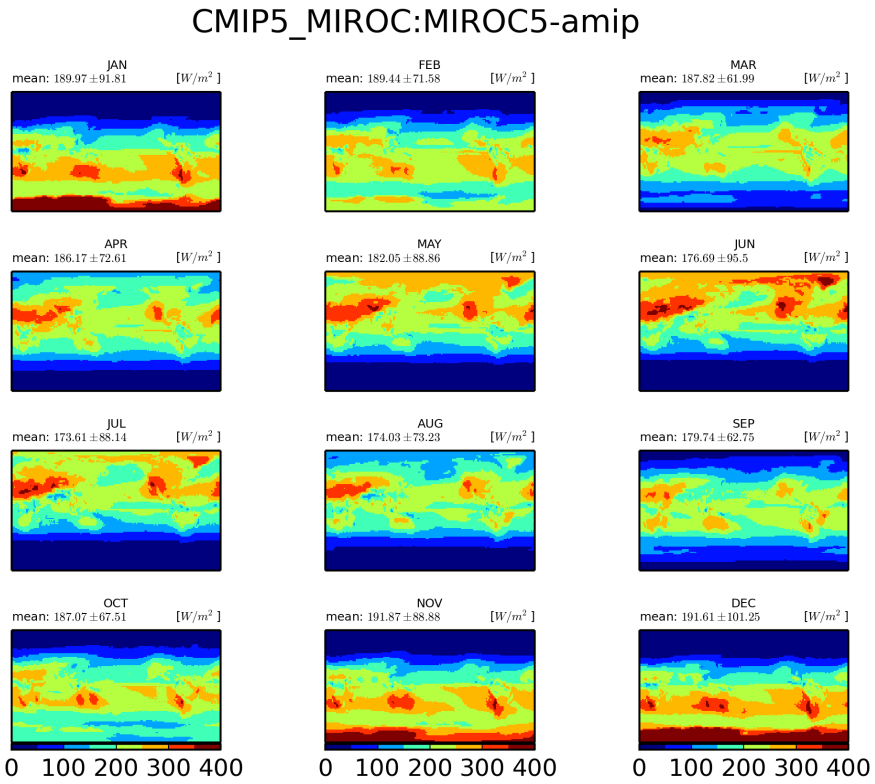



Figure 53: Monthly mean climatology for MIROC:MIROC5

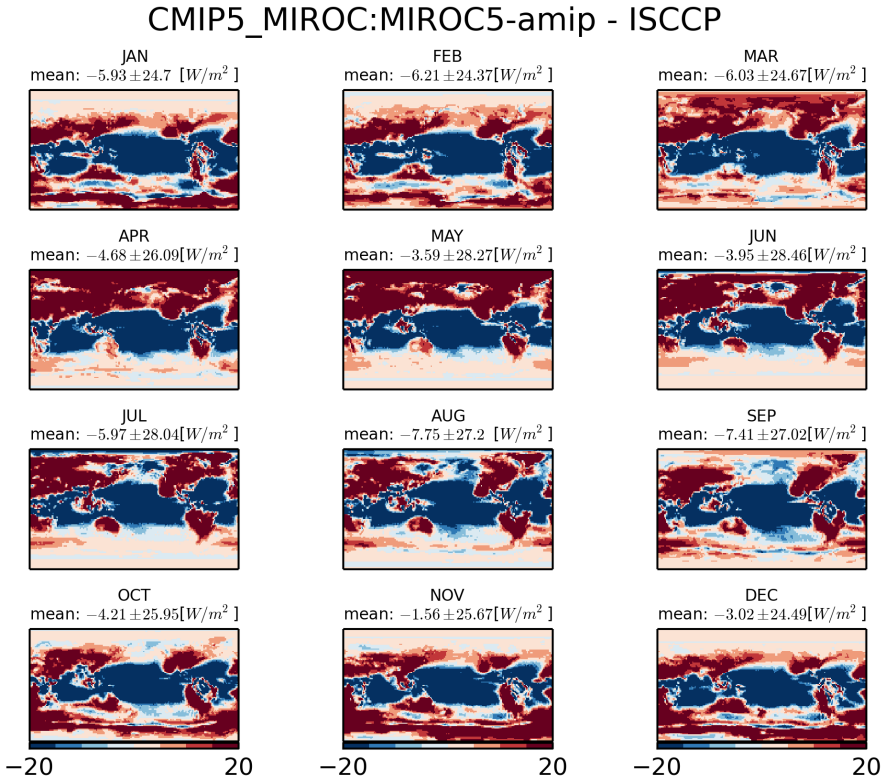



Figure 54: Monthly mean climatology of difference between MIROC:MIROC5 and ISCCP

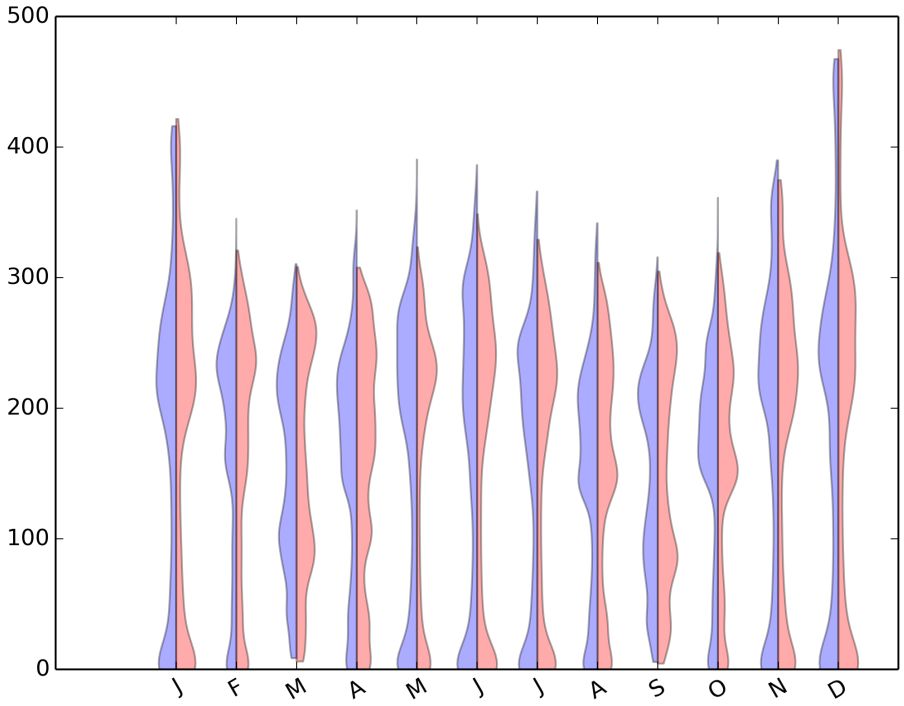



Figure 55: Violin plot for CMIP5-MIROC:MIROC5-AMIP

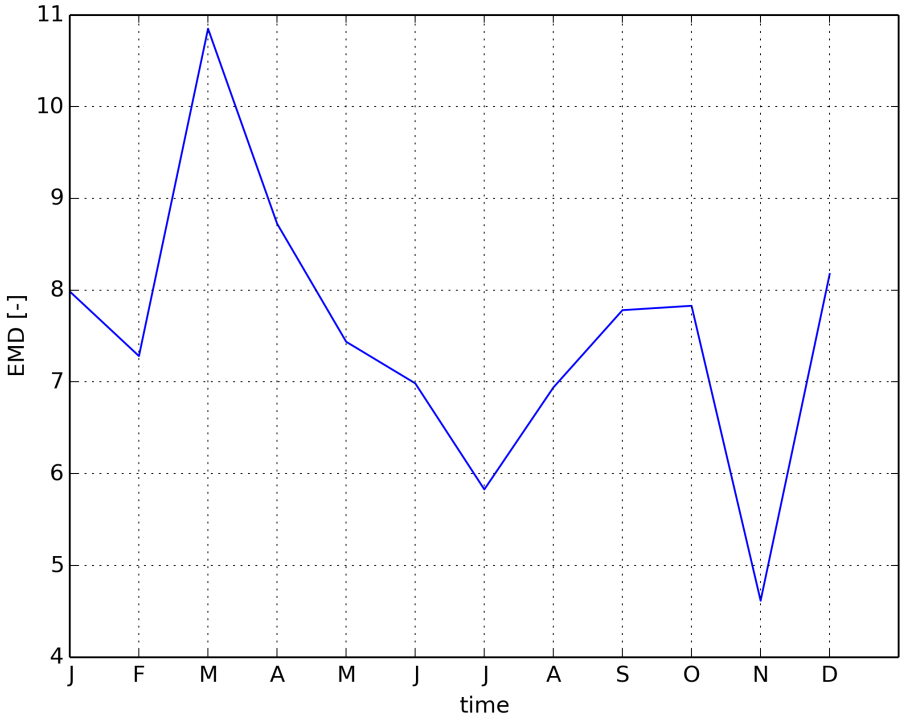



Figure 56: Timeseries of EMD

### 1.1.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

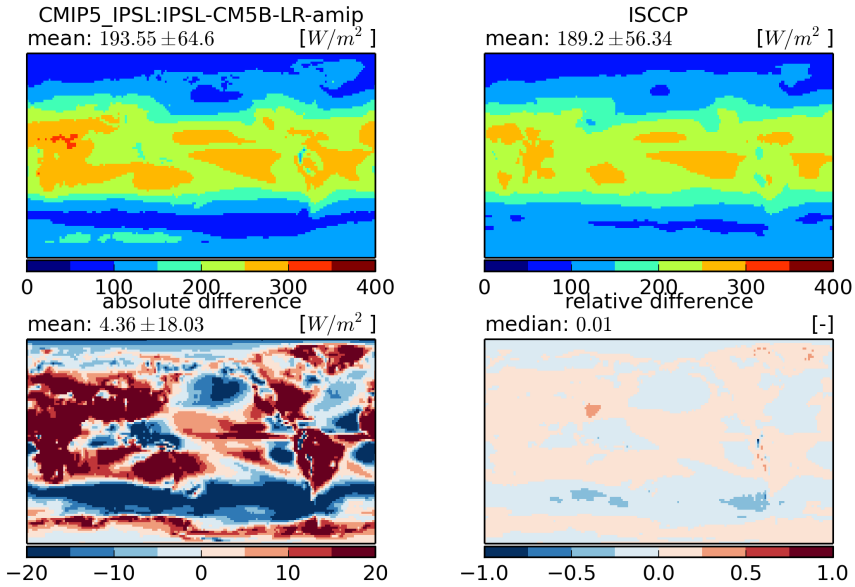



Figure 57: Temporal mean fields (top) and absolute and relative differences (bottom)

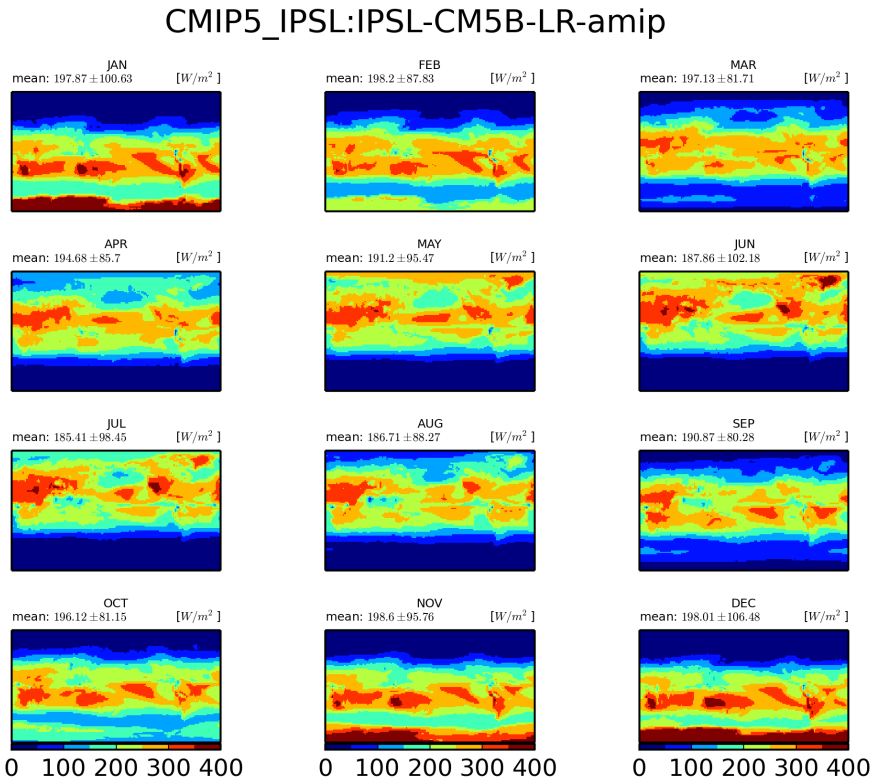



Figure 58: Monthly mean climatology for IPSL:IPSL-CM5B-LR

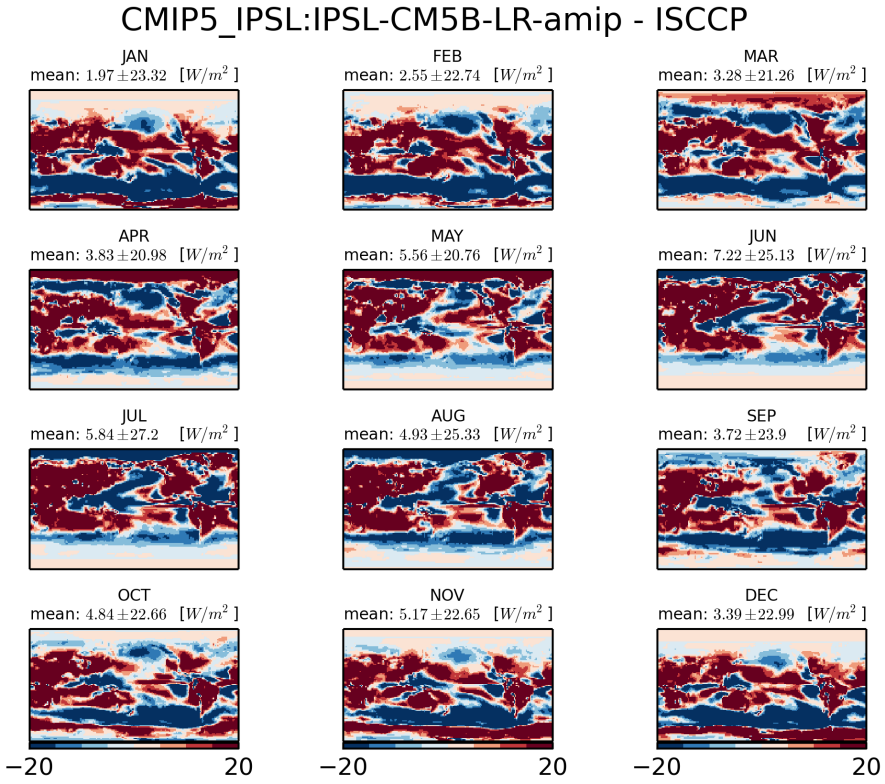



Figure 59: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and ISCCP

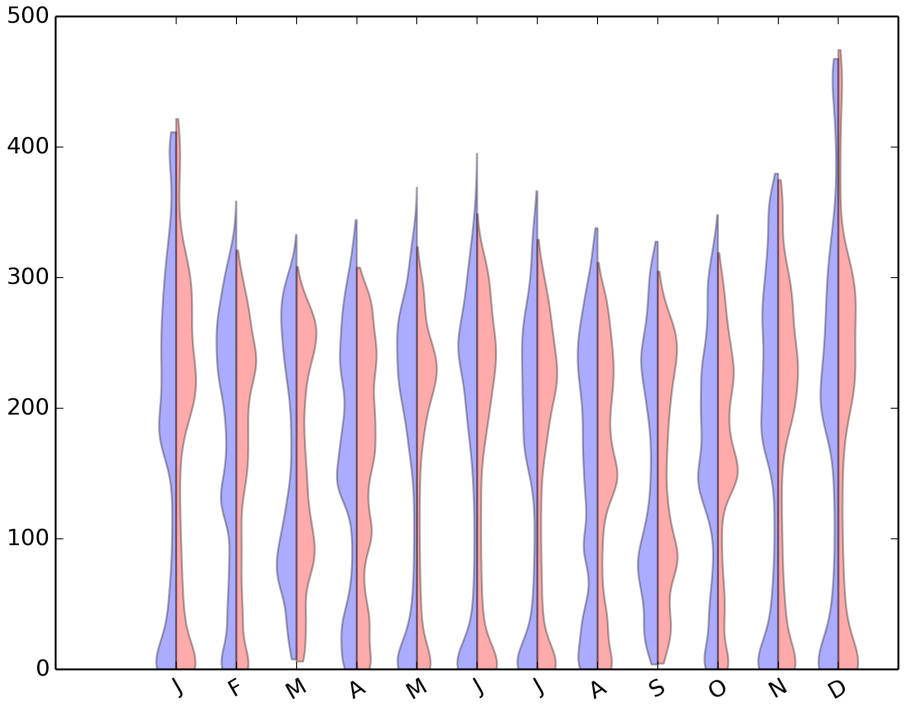



Figure 60: Violin plot for CMIP5-IPSL:IPSL-CM5B-LR-AMIP

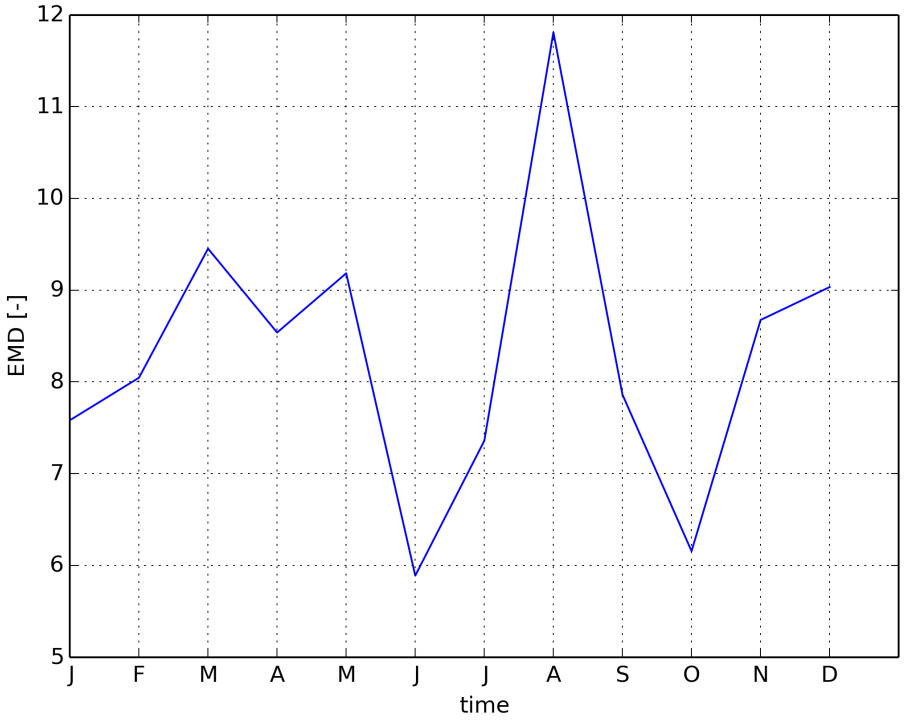



Figure 61: Timeseries of EMD

### 1.1.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

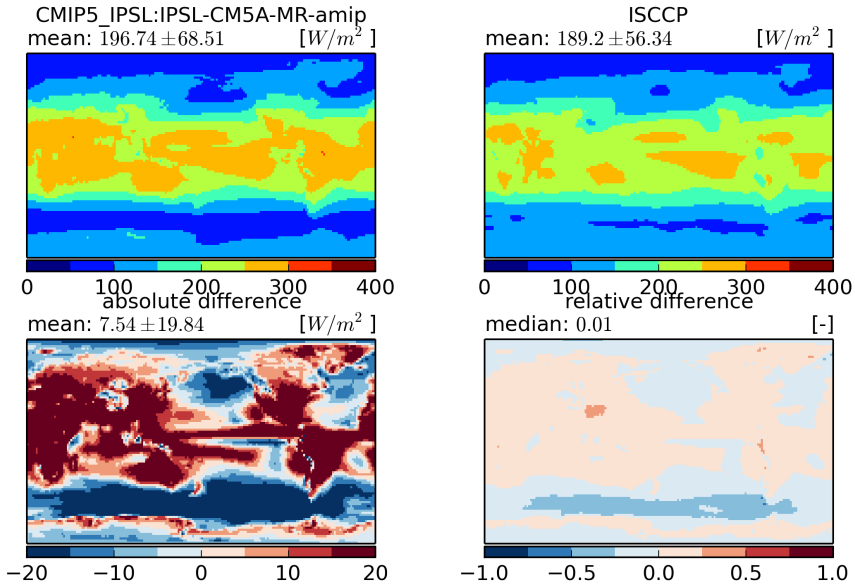



Figure 62: Temporal mean fields (top) and absolute and relative differences (bottom)

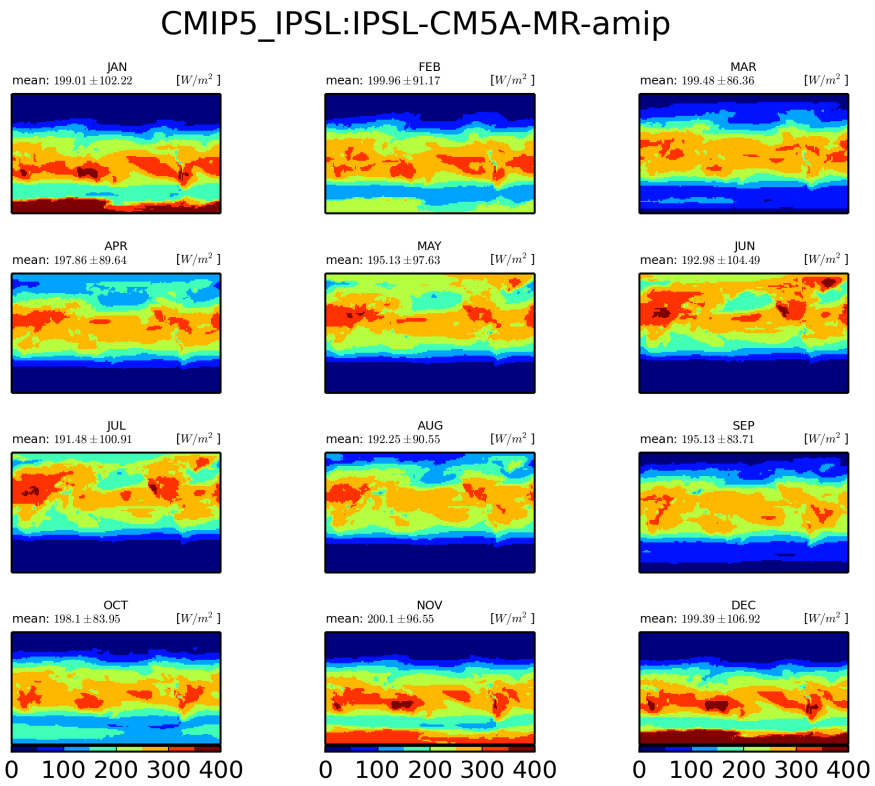



Figure 63: Monthly mean climatology for IPSL:IPSL-CM5A-MR

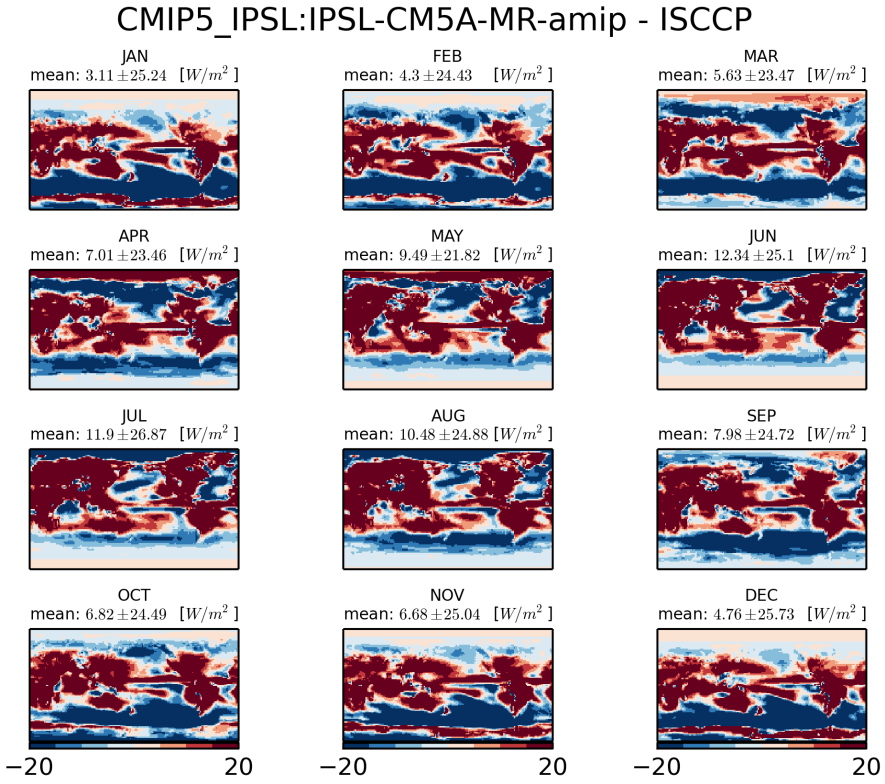



Figure 64: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and ISCCP

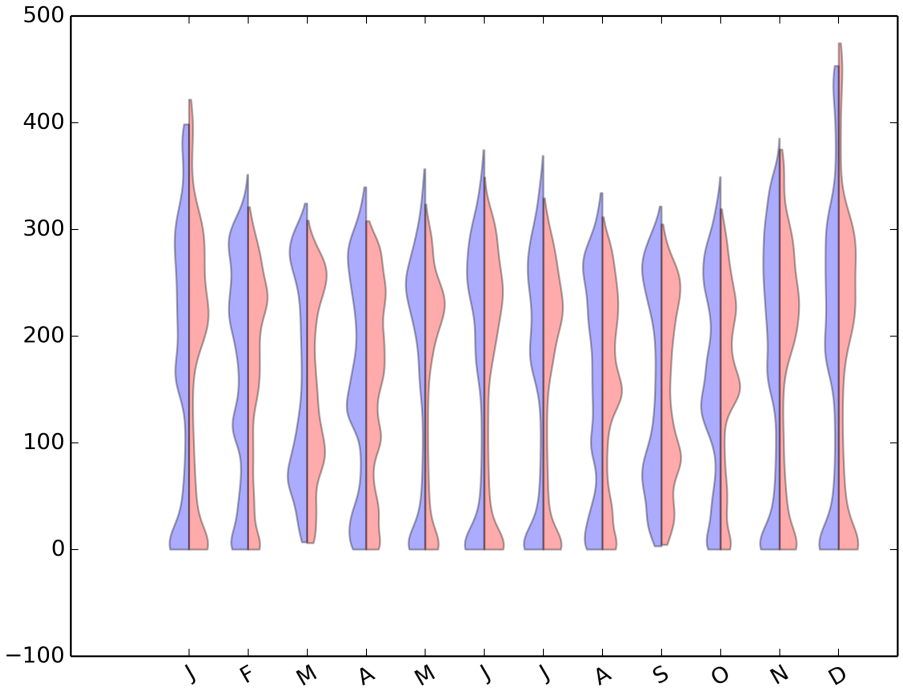



Figure 65: Violin plot for CMIP5-IPSL:IPSL-CM5A-MR-AMIP

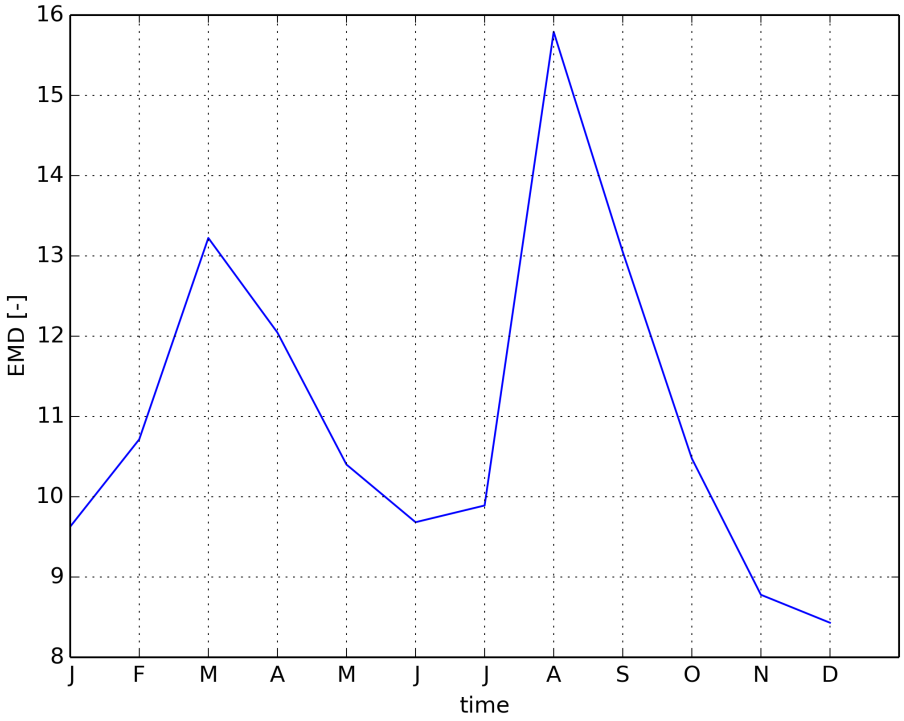



Figure 66: Timeseries of EMD

### 1.1.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

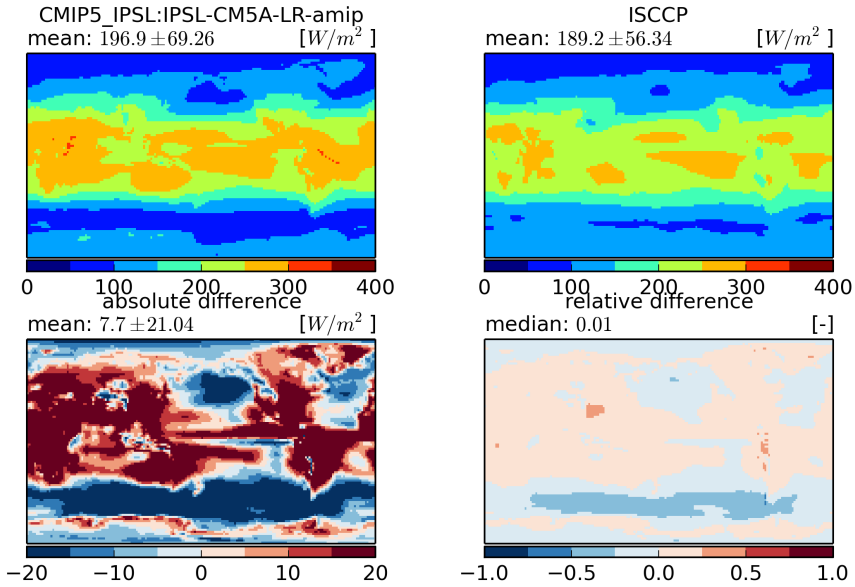



Figure 67: Temporal mean fields (top) and absolute and relative differences (bottom)

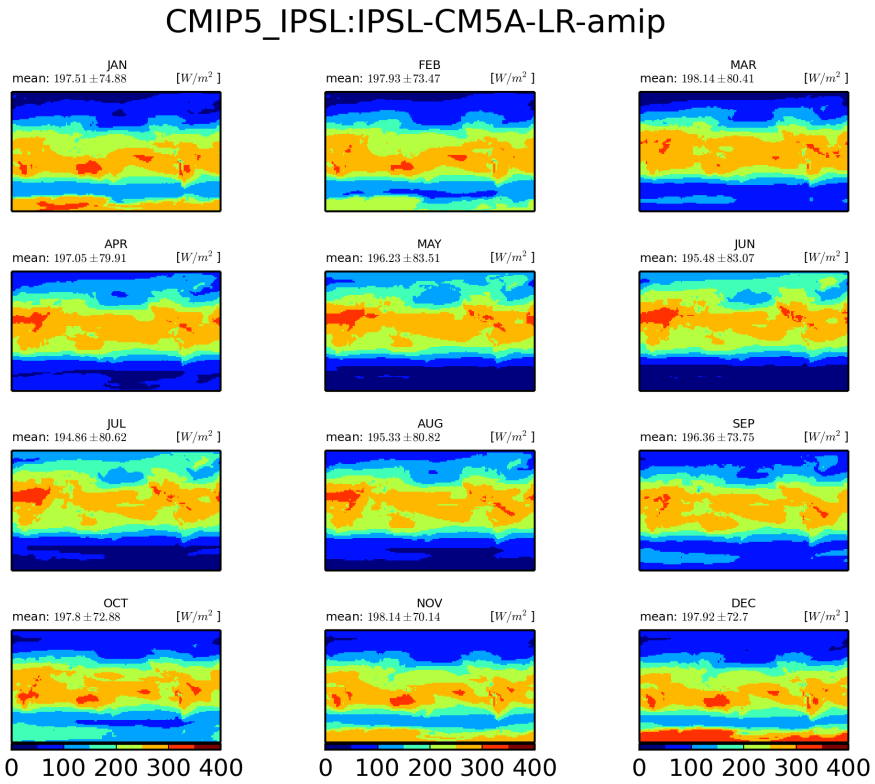



Figure 68: Monthly mean climatology for IPSL:IPSL-CM5A-LR

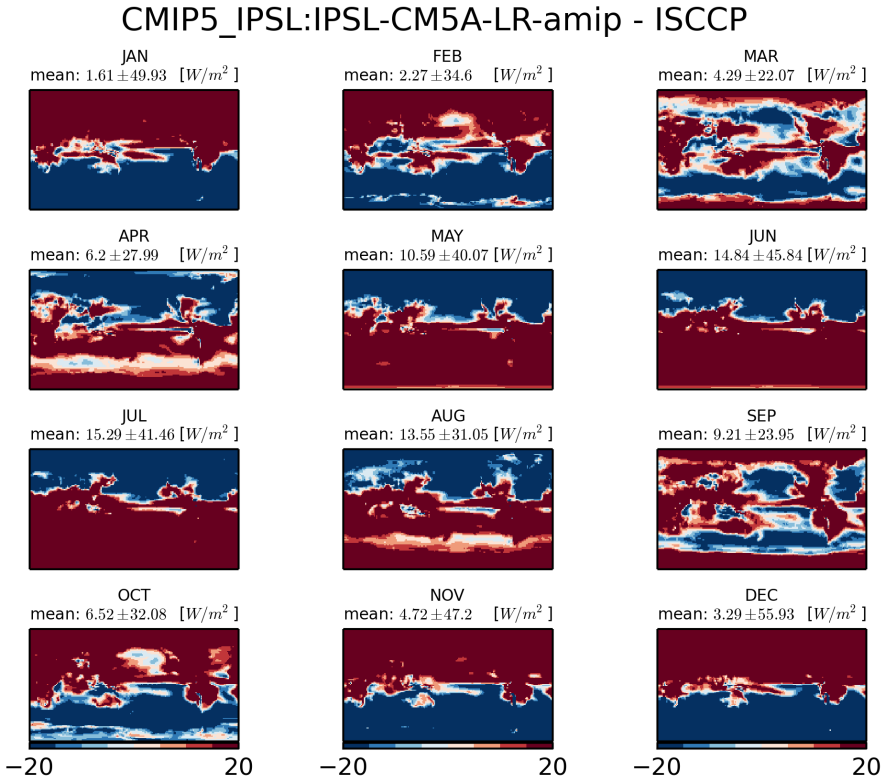



Figure 69: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and ISCCP

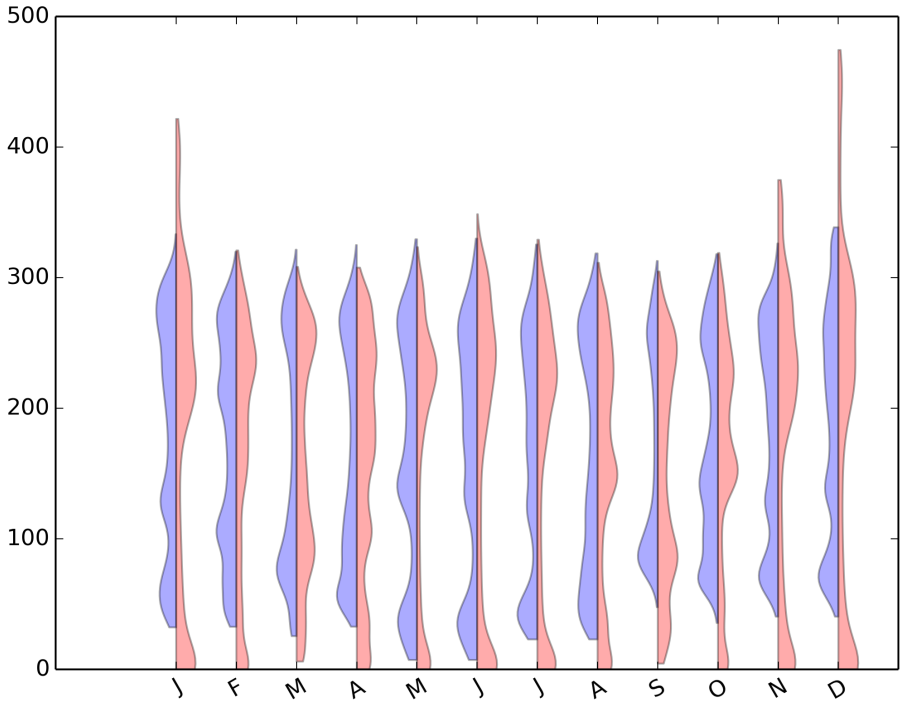



Figure 70: Violin plot for CMIP5-IPSL:IPSL-CM5A-LR-AMIP

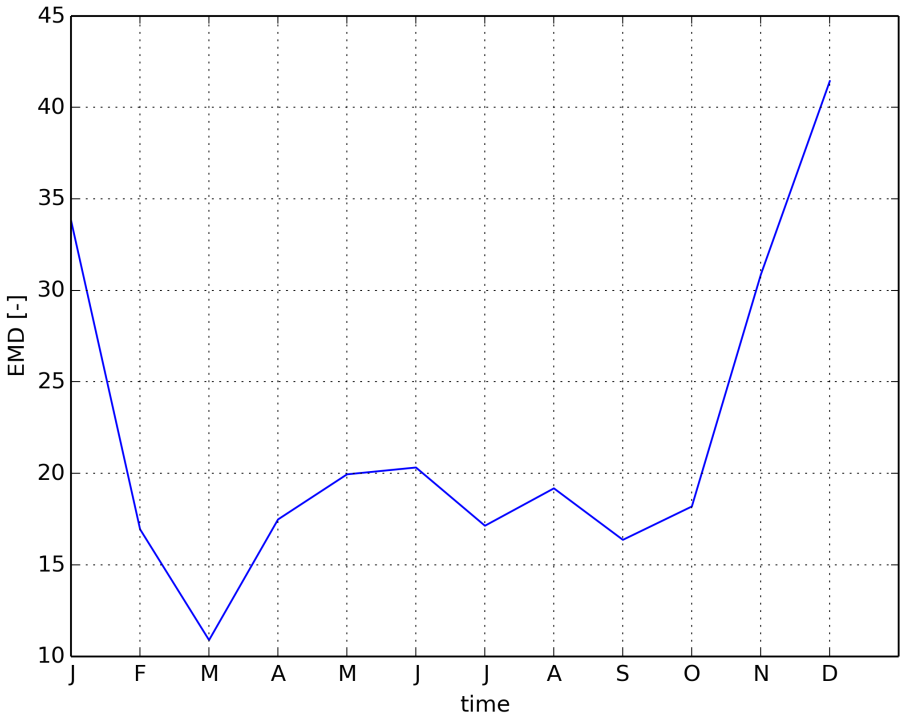



Figure 71: Timeseries of EMD

### 1.1.15 CMIP5 MOHC:HadGEM2-A-amip

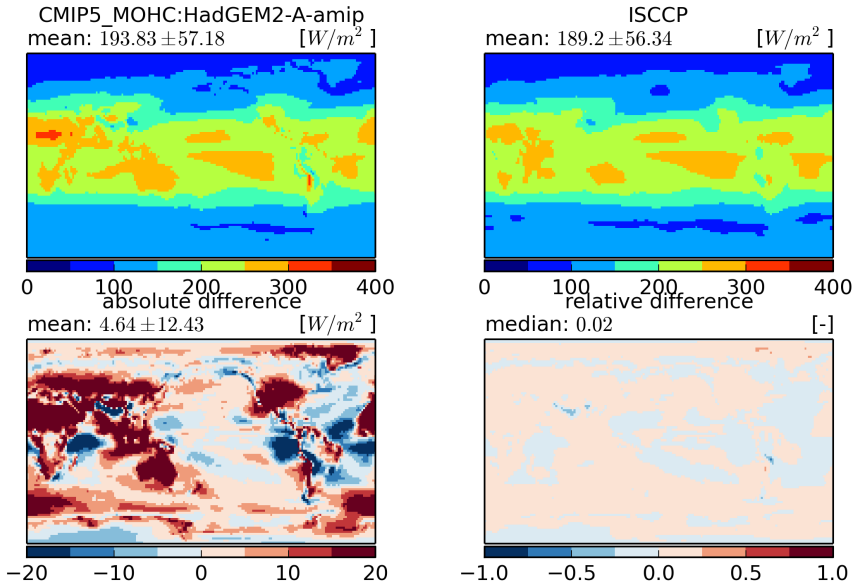



Figure 72: Temporal mean fields (top) and absolute and relative differences (bottom)

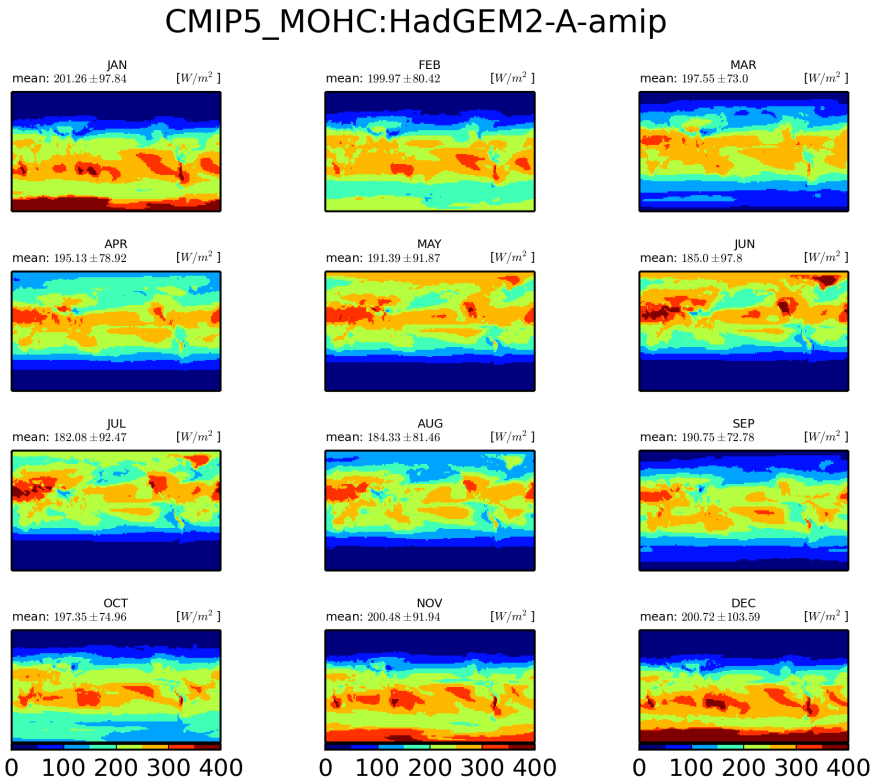



Figure 73: Monthly mean climatology for MOHC:HadGEM2-A

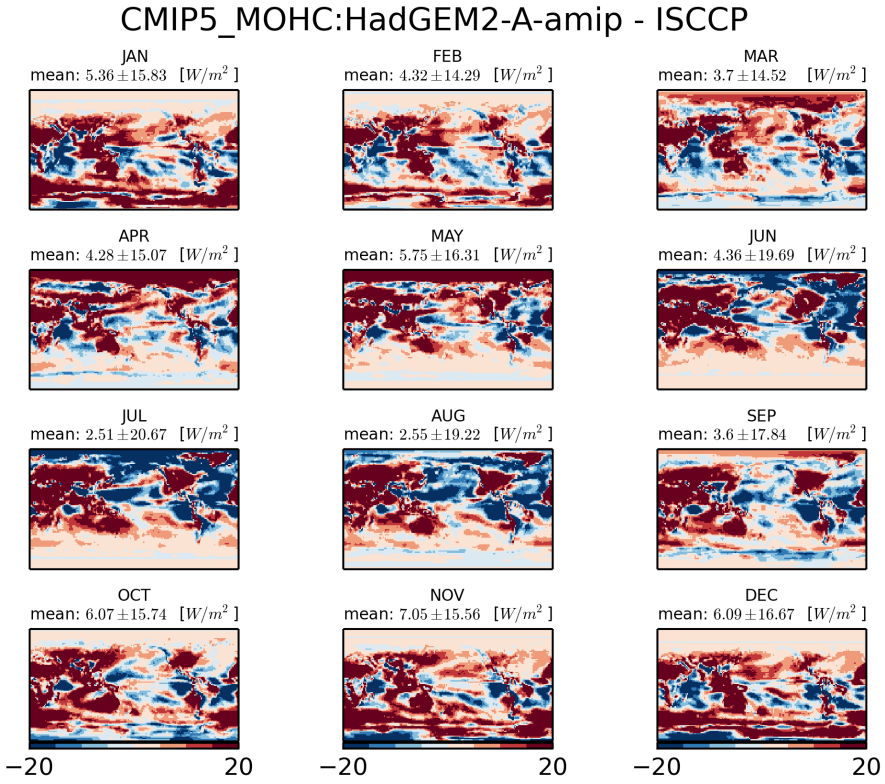



Figure 74: Monthly mean climatology of difference between MOHC:HADGEM2-A and ISCCP

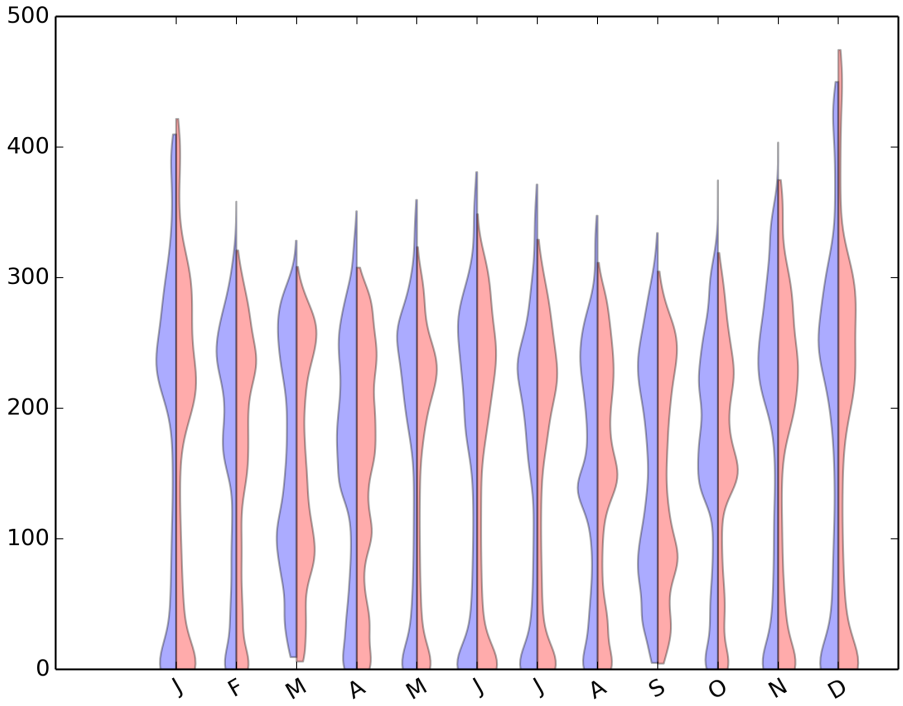



Figure 75: Violin plot for CMIP5-MOHC:HADGEM2-A-AMIP

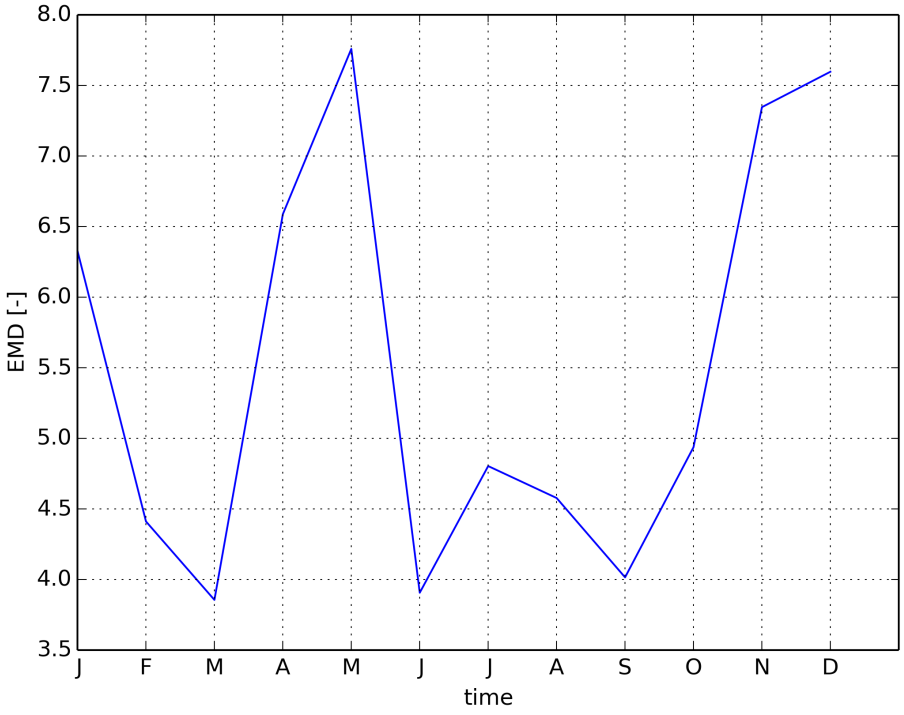



Figure 76: Timeseries of EMD

### 1.1.16 CMIP5 LASG-IAP:FGOALS-s2-amip

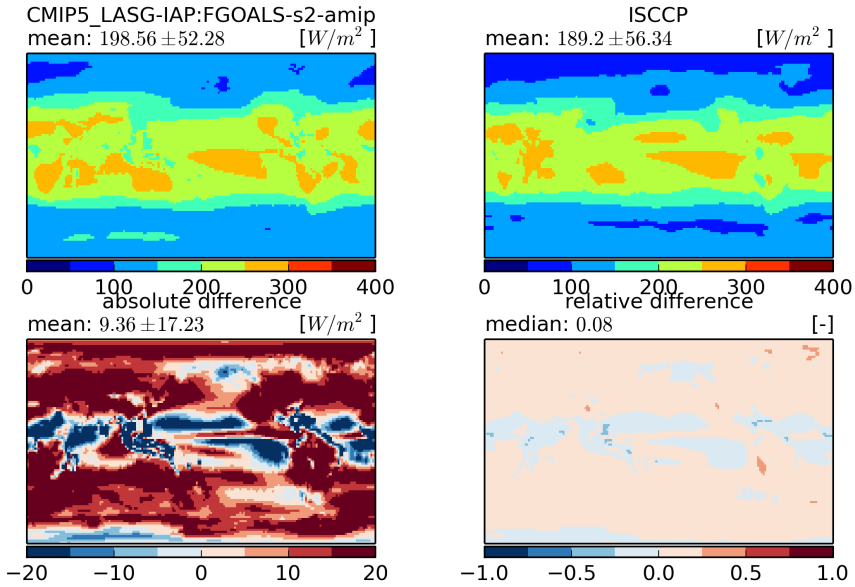



Figure 77: Temporal mean fields (top) and absolute and relative differences (bottom)

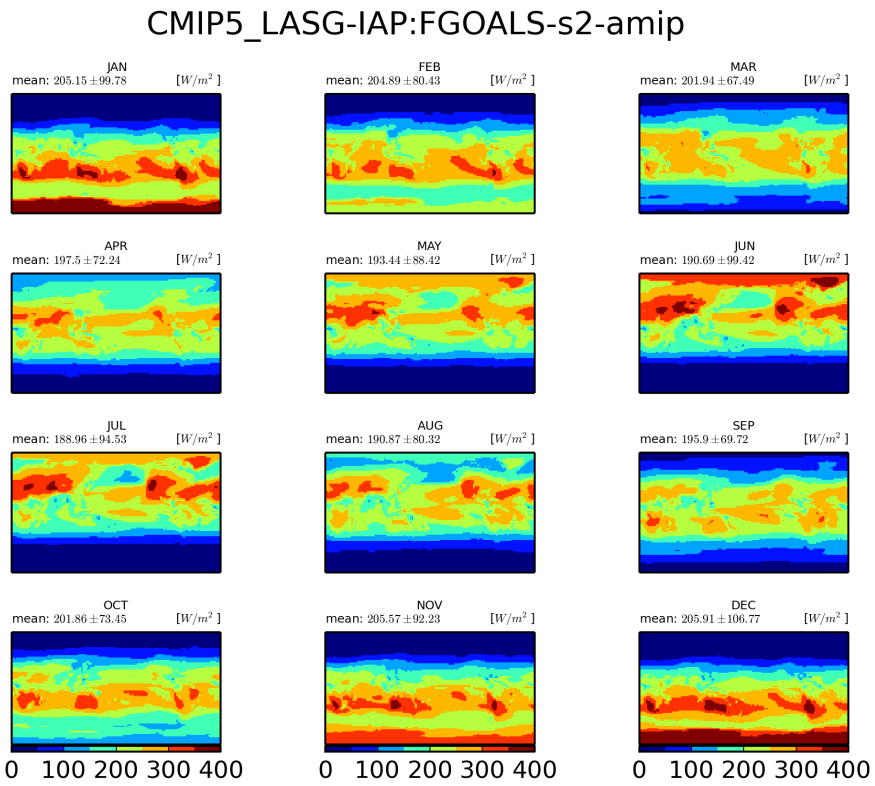



Figure 78: Monthly mean climatology for LASG-IAP:FGOALS-s2

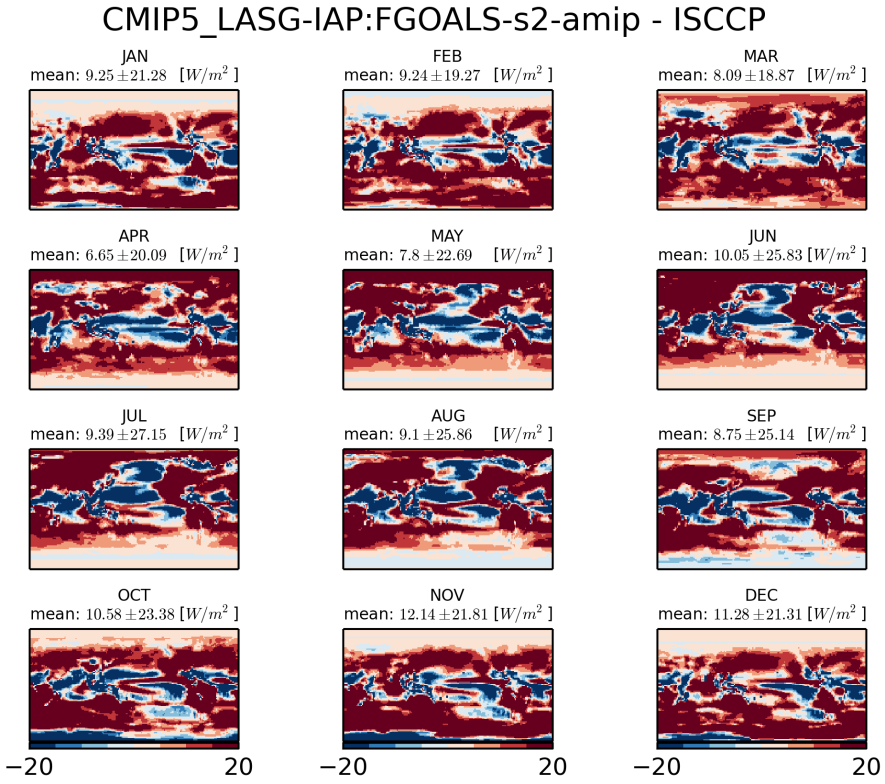



Figure 79: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and ISCCP

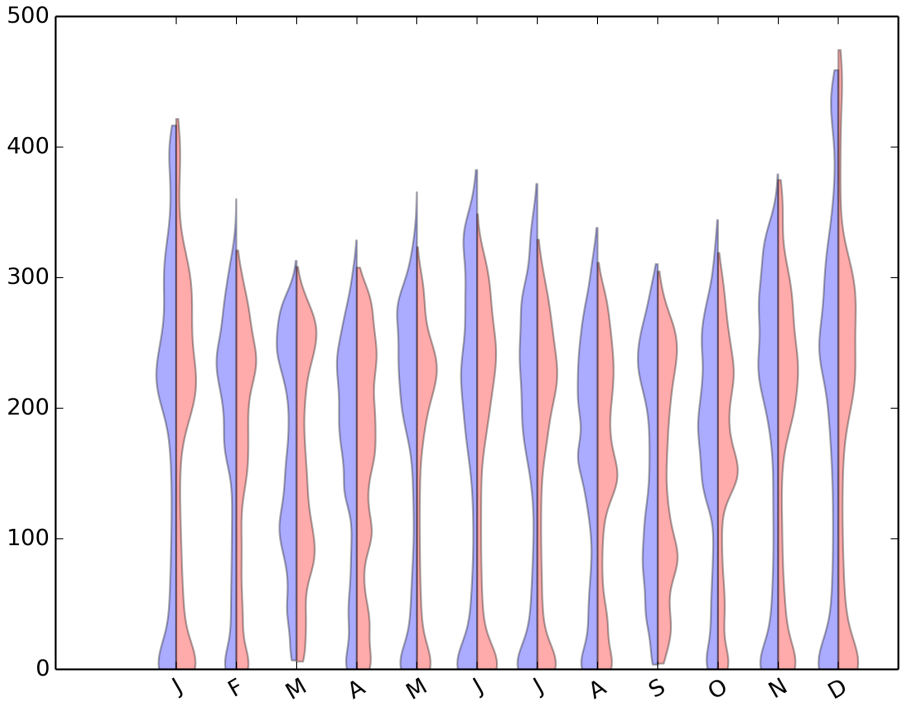



Figure 80: Violin plot for CMIP5-LASG-IAP:FGOALS-S2-AMIP

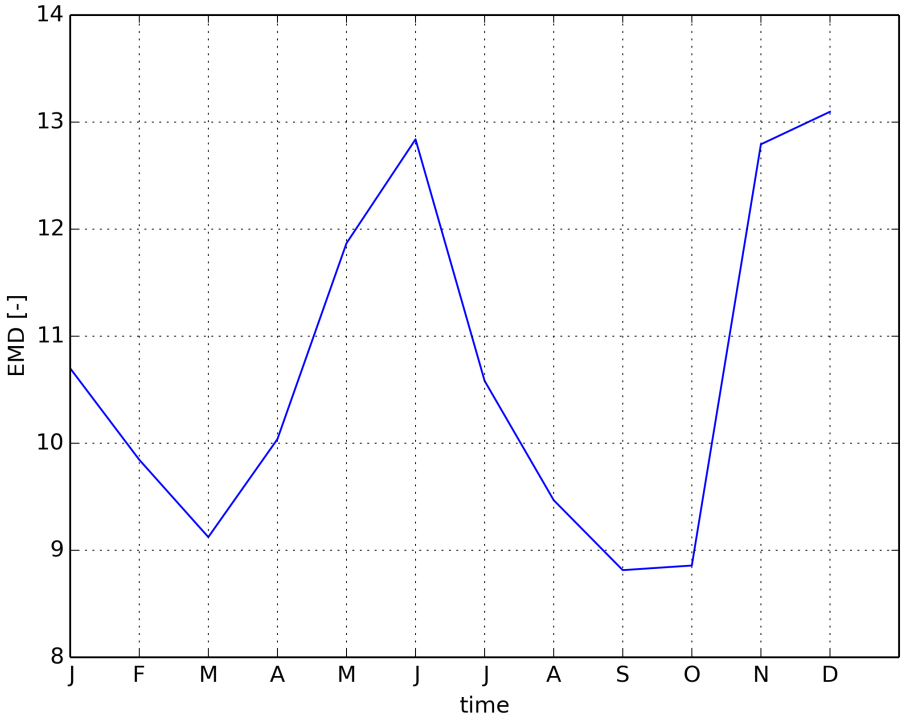



Figure 81: Timeseries of EMD

### 1.1.17 CMIP5 CMCC:CMCC-CM-amip

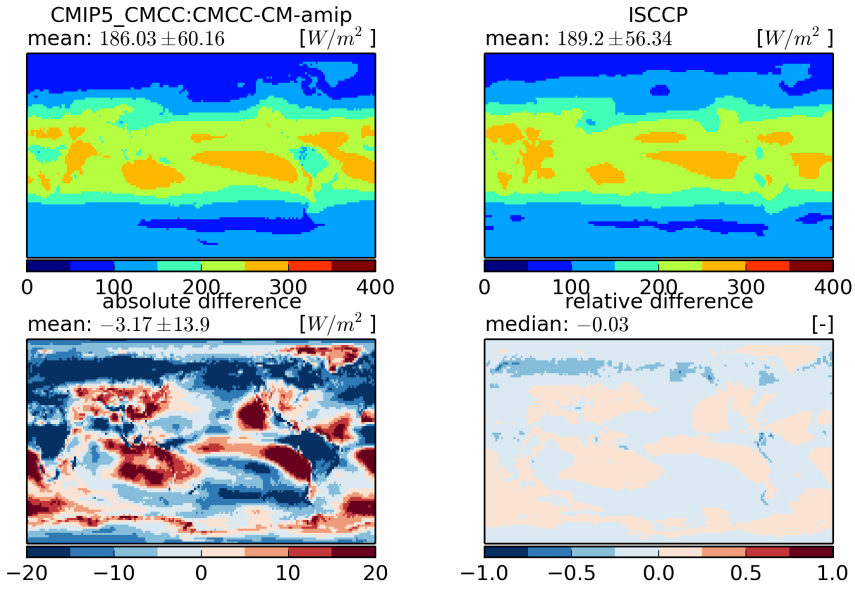



Figure 82: Temporal mean fields (top) and absolute and relative differences (bottom)

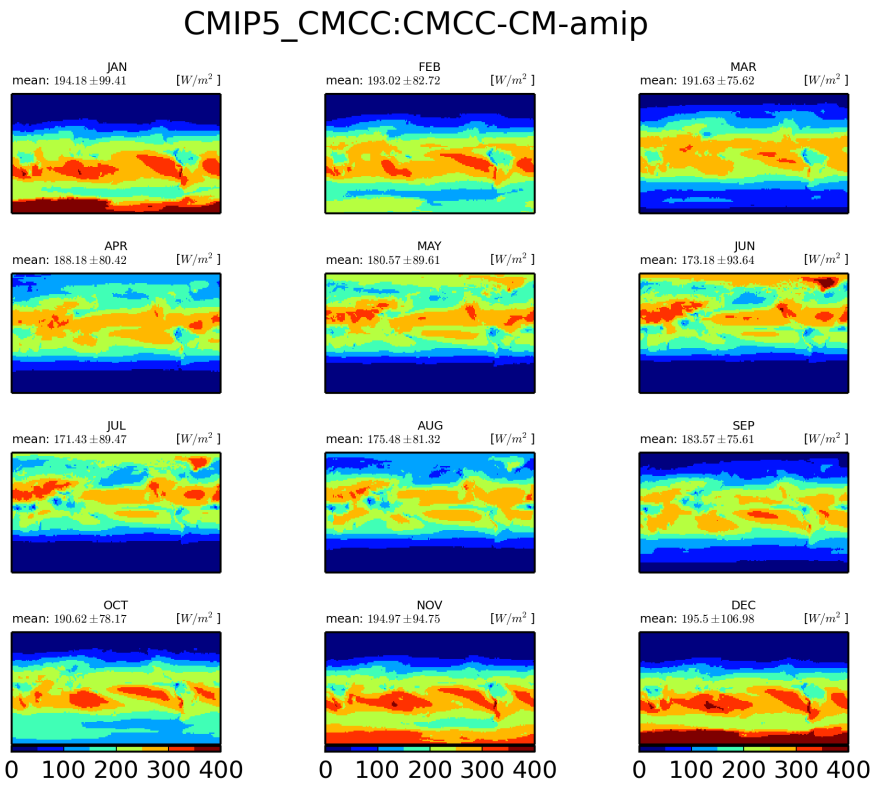



Figure 83: Monthly mean climatology for CMCC:CMCC-CM

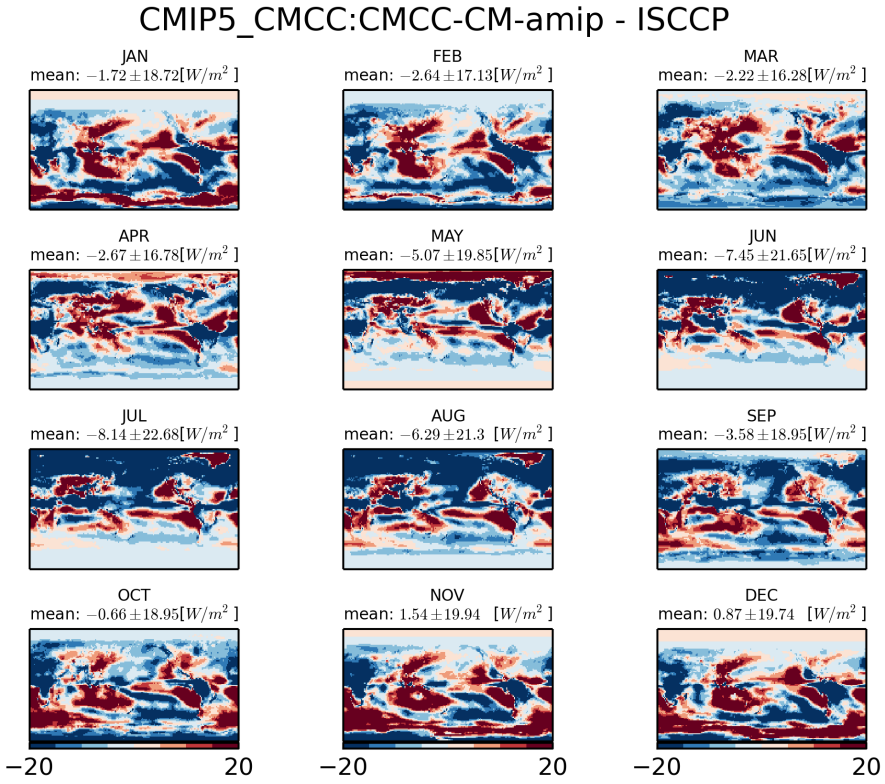



Figure 84: Monthly mean climatology of difference between CMCC:CMCC-CM and ISCCP

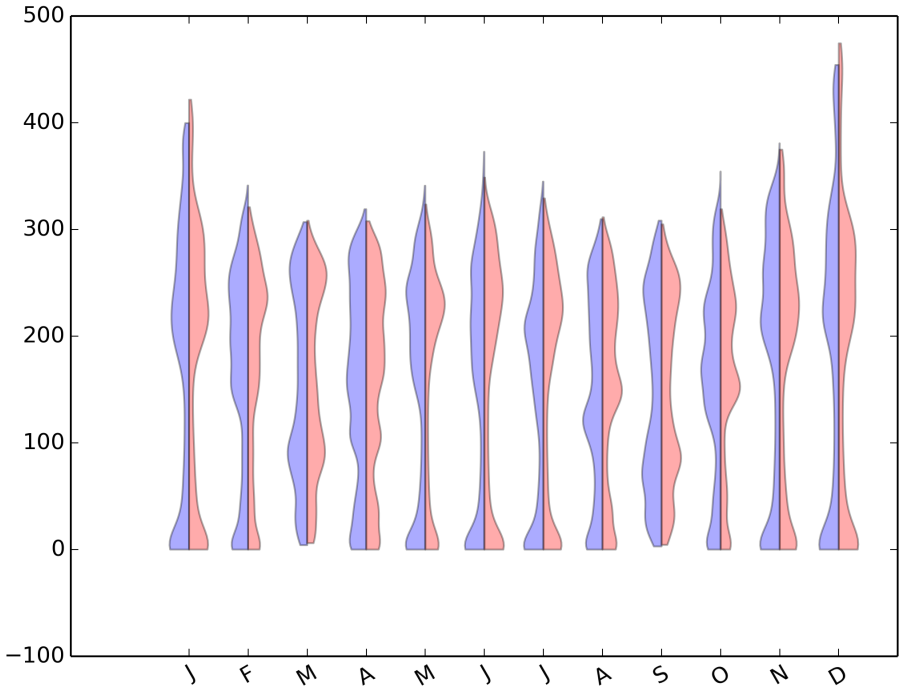



Figure 85: Violin plot for CMIP5-CMCC:CMCC-CM-AMIP

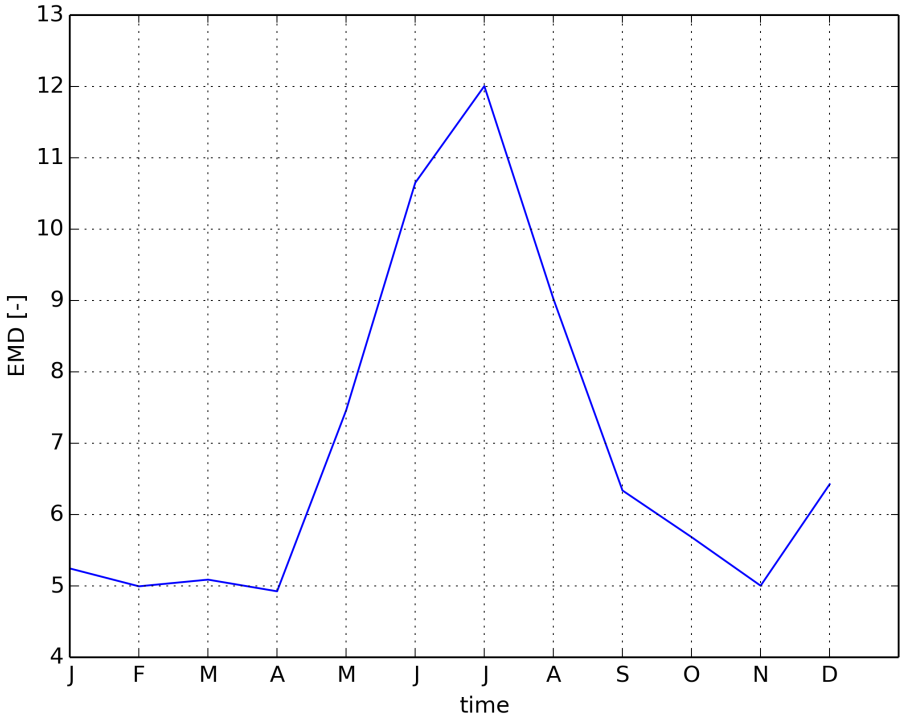



Figure 86: Timeseries of EMD

### 1.1.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

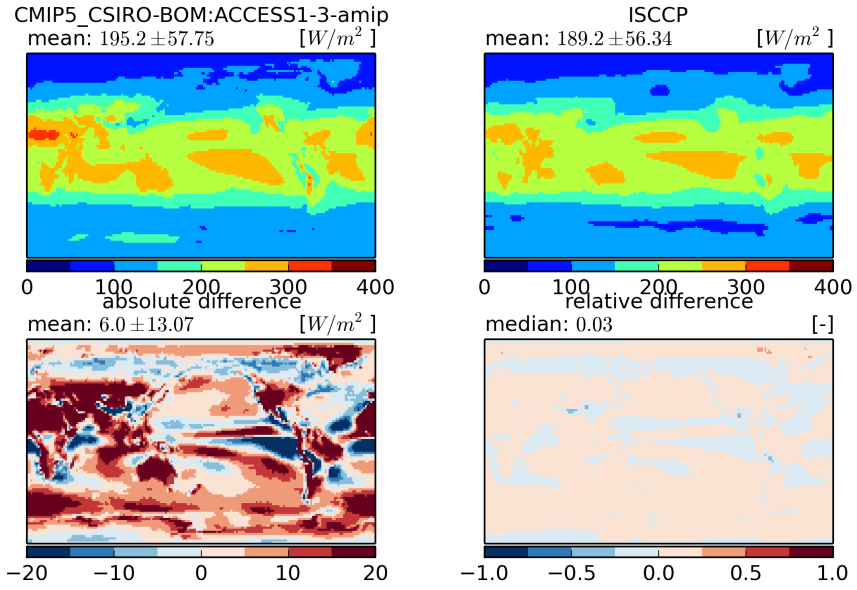



Figure 87: Temporal mean fields (top) and absolute and relative differences (bottom)

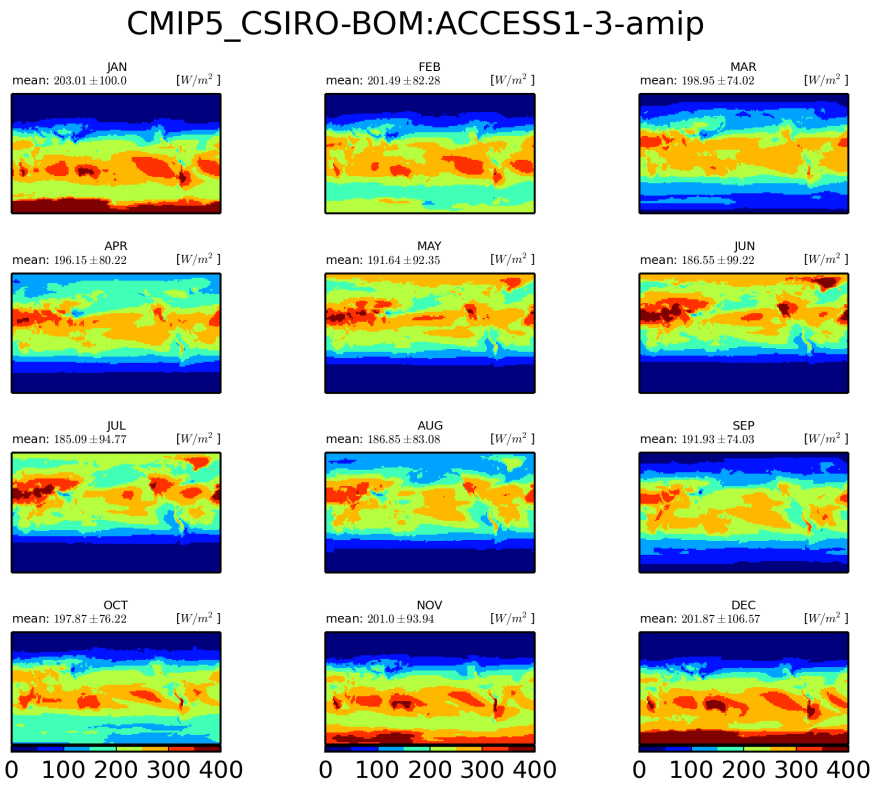



Figure 88: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

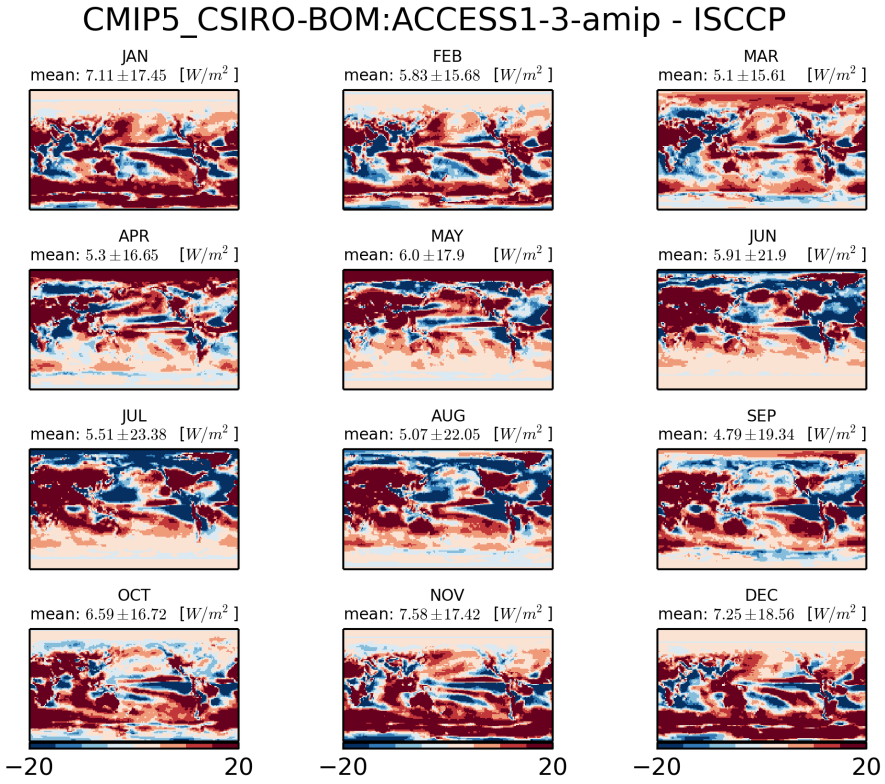



Figure 89: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and ISCCP

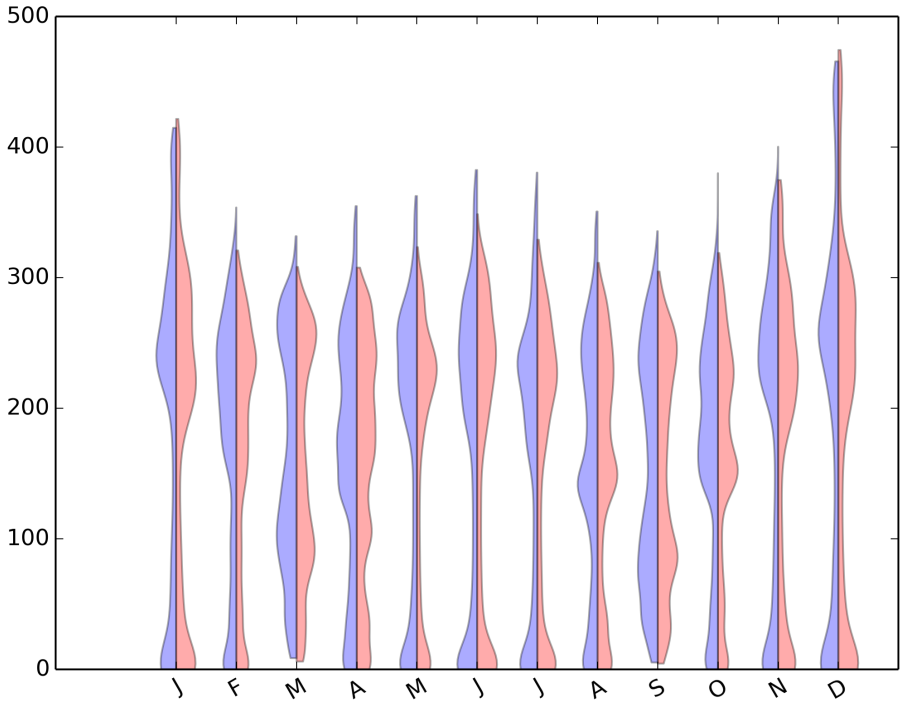



Figure 90: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-3-AMIP

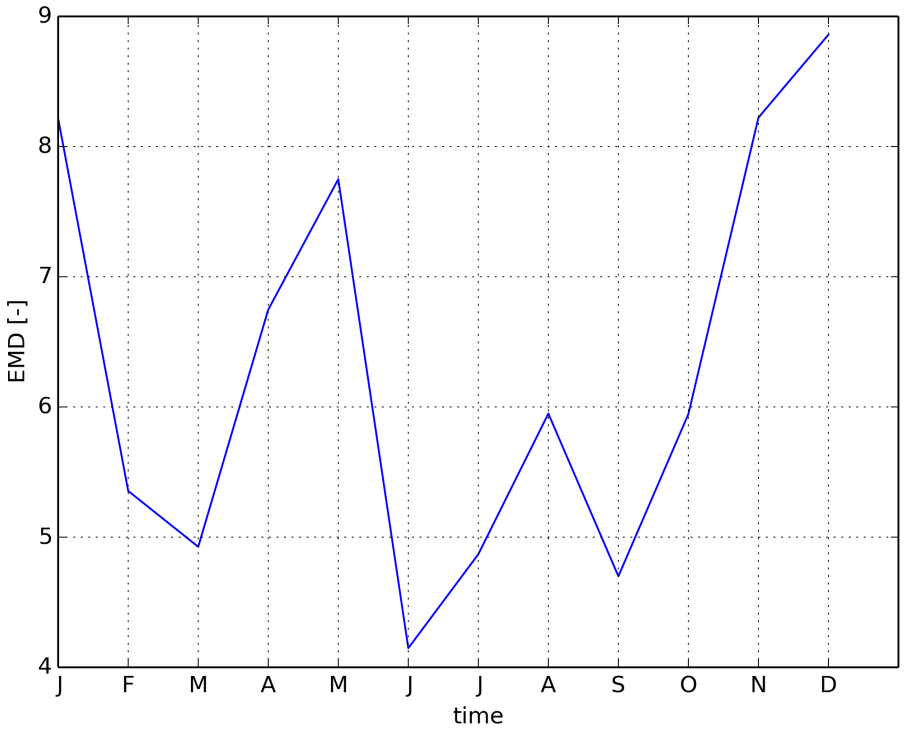



Figure 91: Timeseries of EMD

### 1.1.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

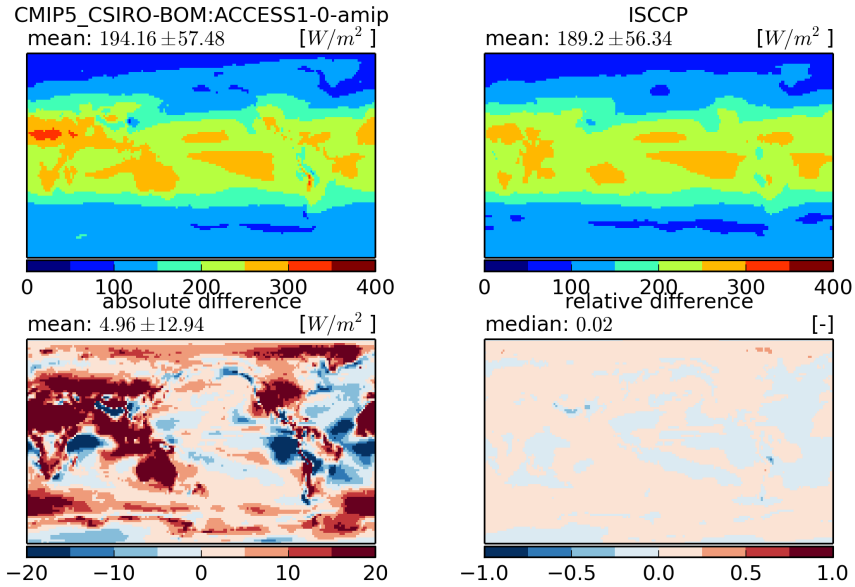



Figure 92: Temporal mean fields (top) and absolute and relative differences (bottom)

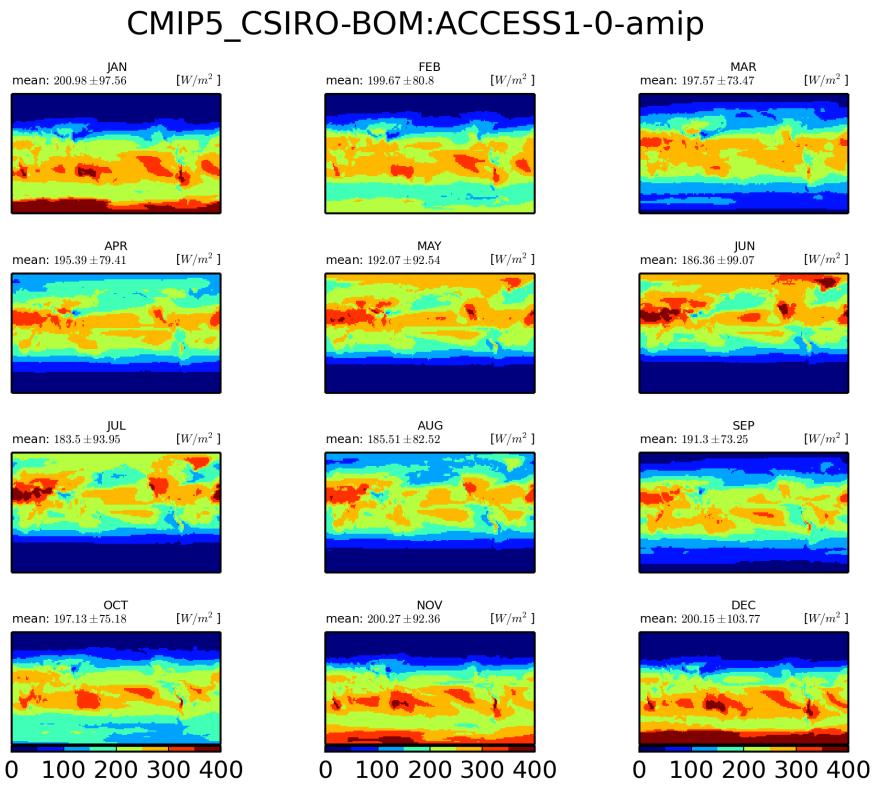



Figure 93: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

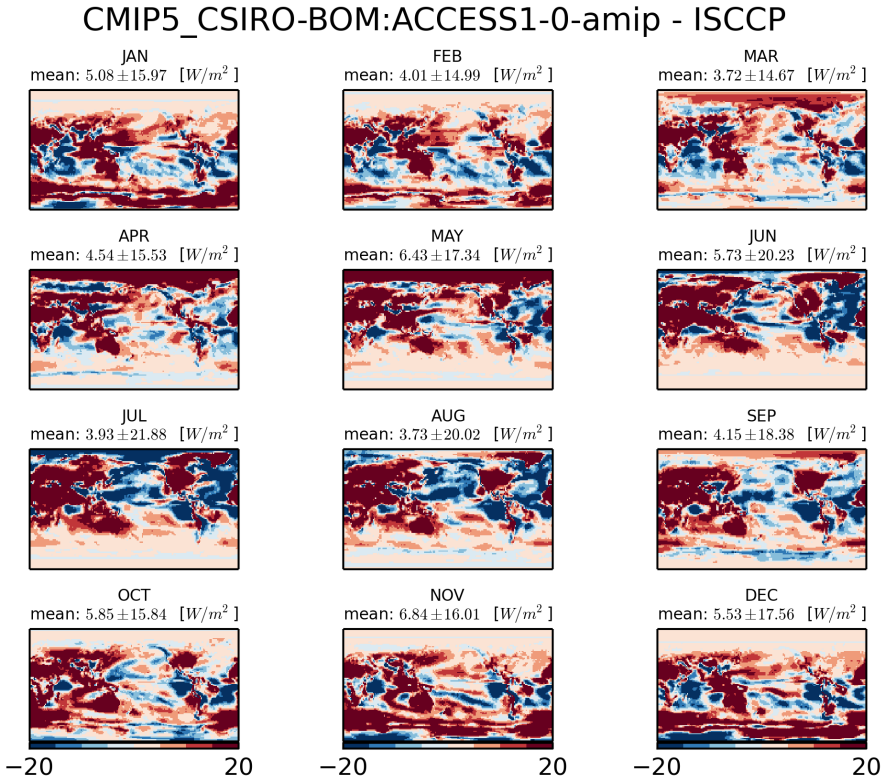



Figure 94: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and ISCCP

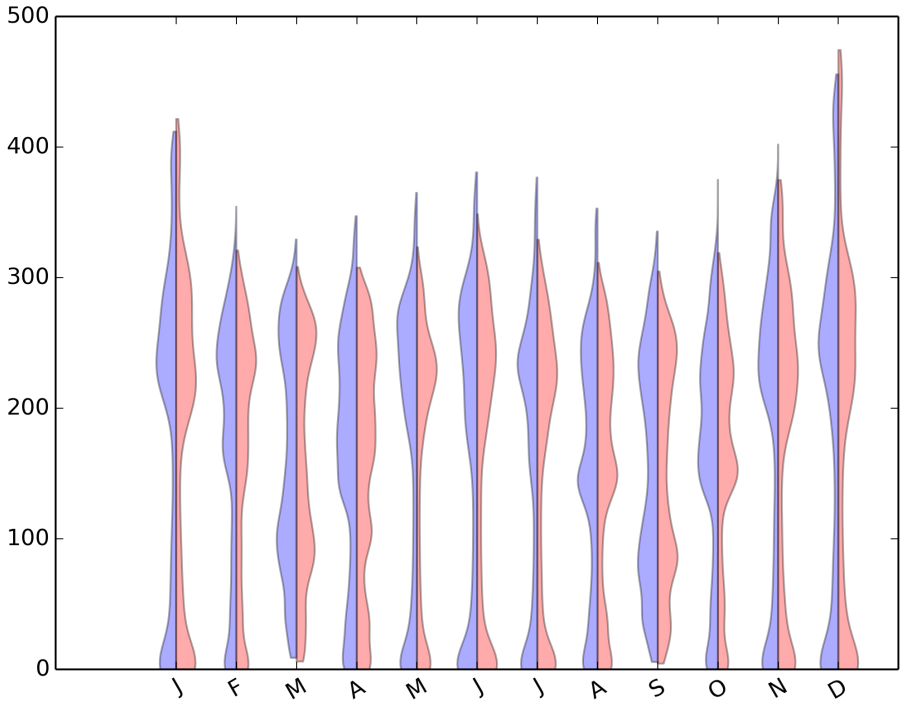



Figure 95: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-0-AMIP

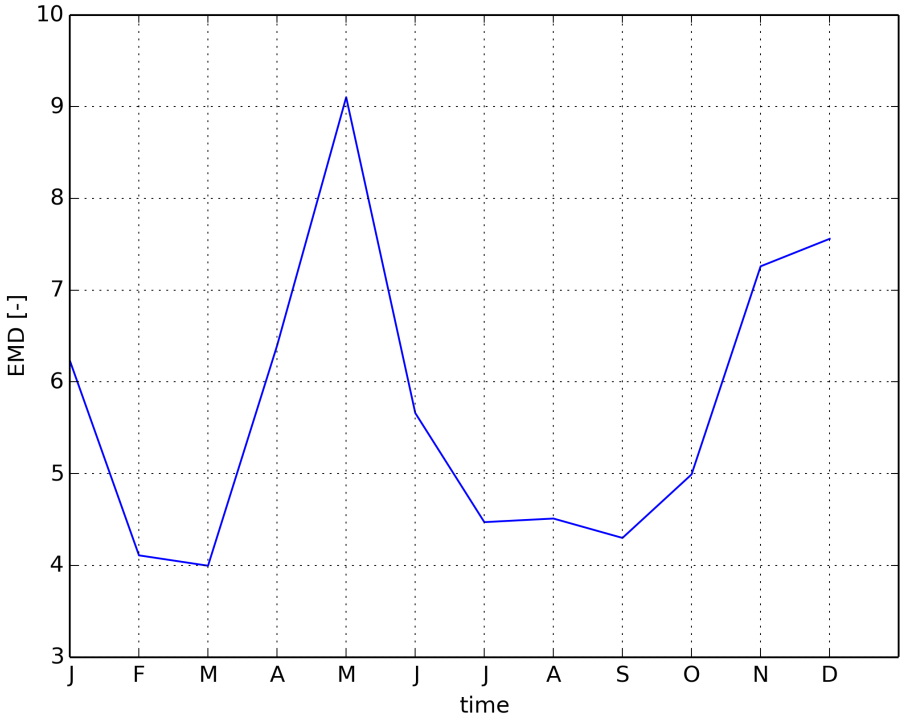



Figure 96: Timeseries of EMD

### 1.1.20 CMIP5 INM:inmcm4-amip

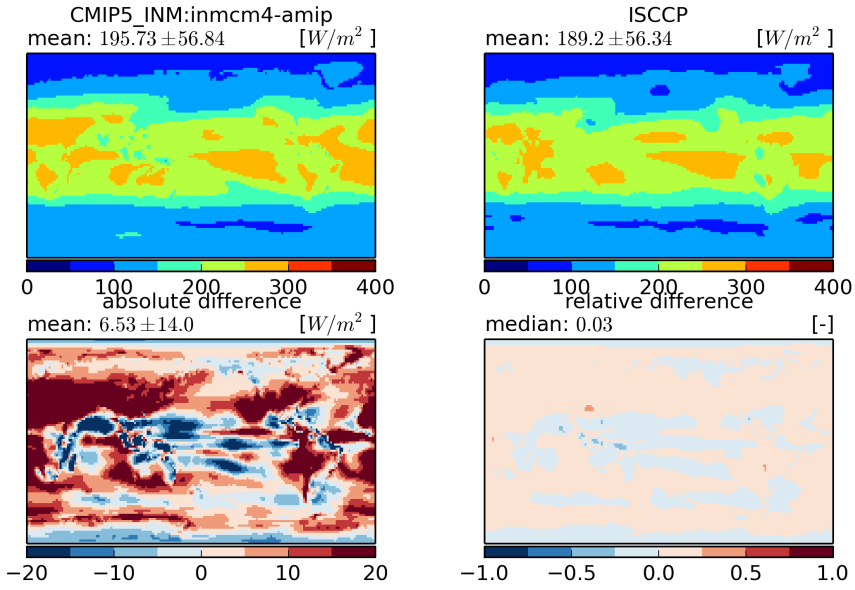



Figure 97: Temporal mean fields (top) and absolute and relative differences (bottom)

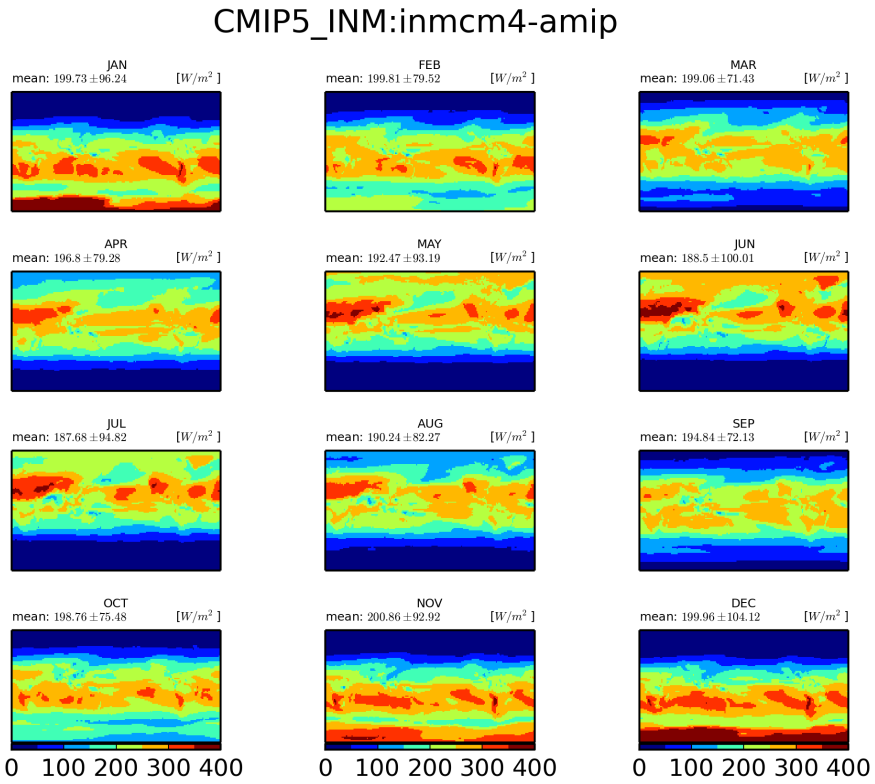



Figure 98: Monthly mean climatology for INM:inmcm4

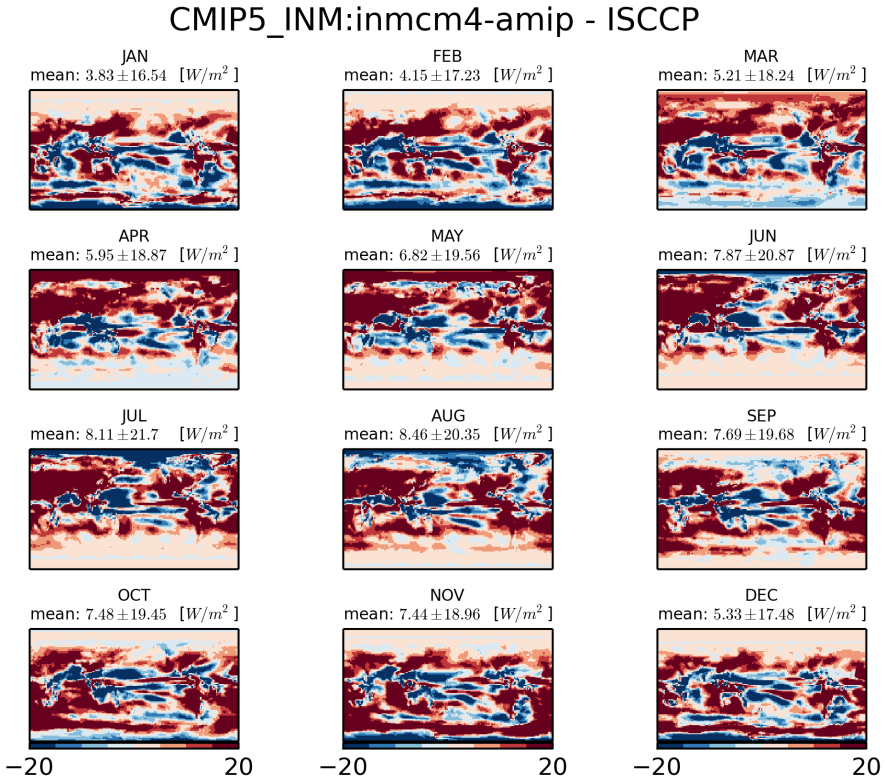



Figure 99: Monthly mean climatology of difference between INM:INMCM4 and ISCCP

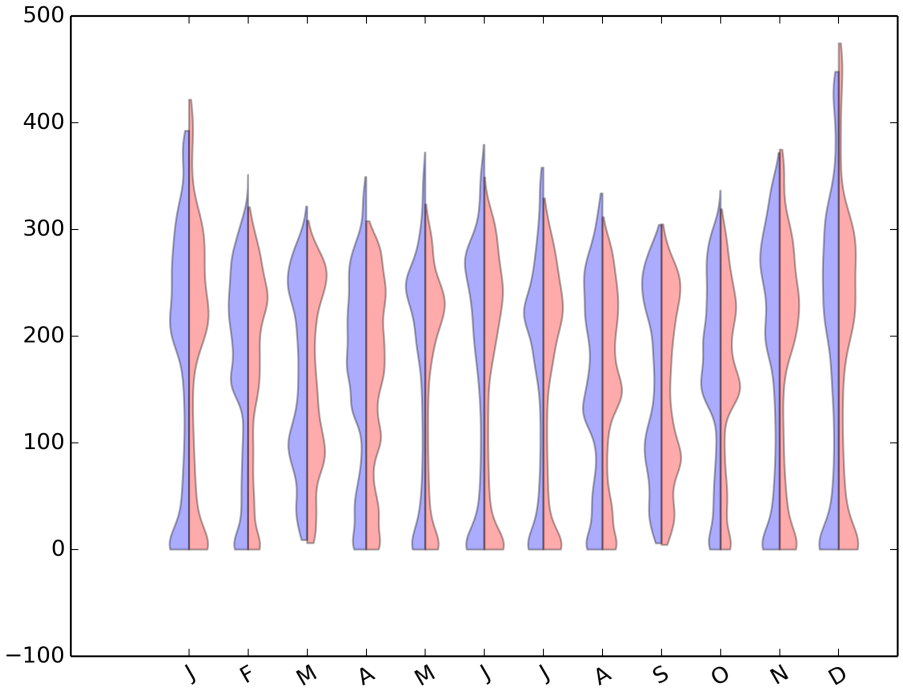



Figure 100: Violin plot for CMIP5-INM:INMCM4-AMIP

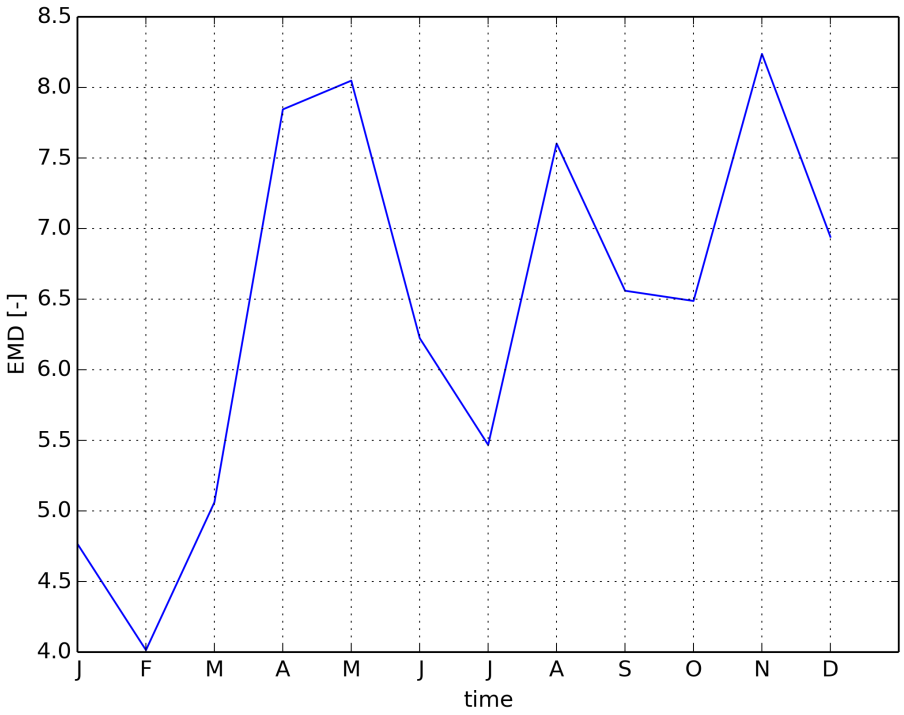



Figure 101: Timeseries of EMD

### 1.1.21 CMIP5 MPI-M:MPI-ESM-LR-amip

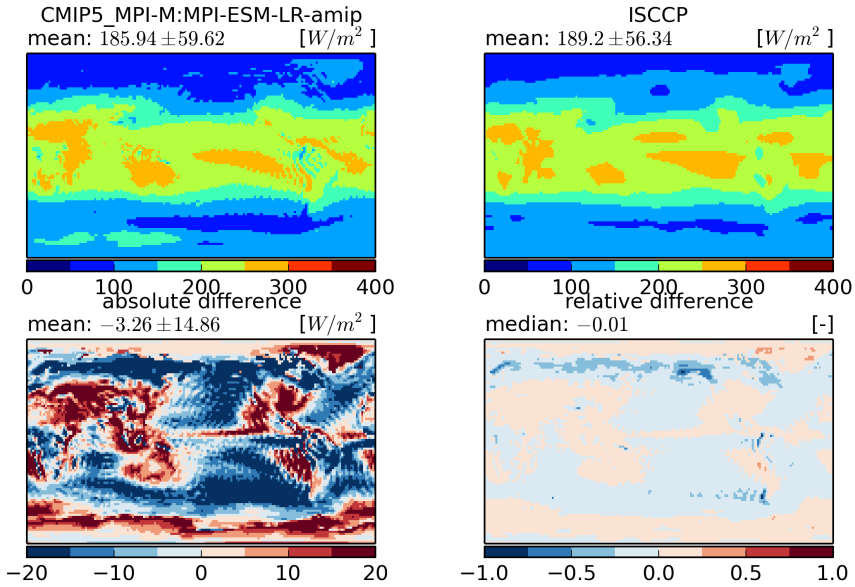



Figure 102: Temporal mean fields (top) and absolute and relative differences (bottom)

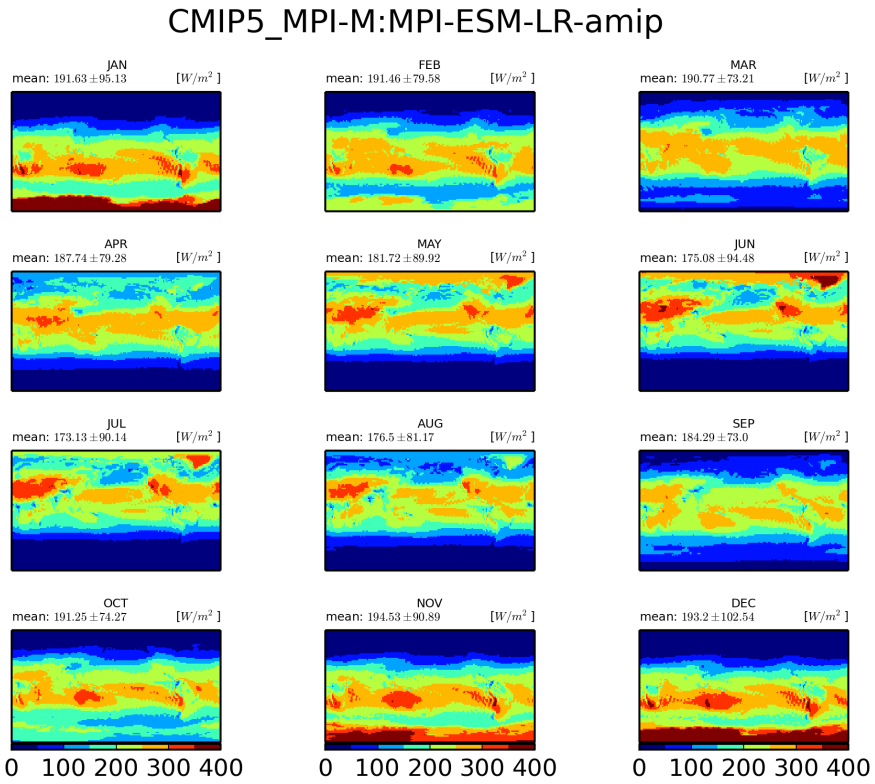



Figure 103: Monthly mean climatology for MPI-M:MPI-ESM-LR

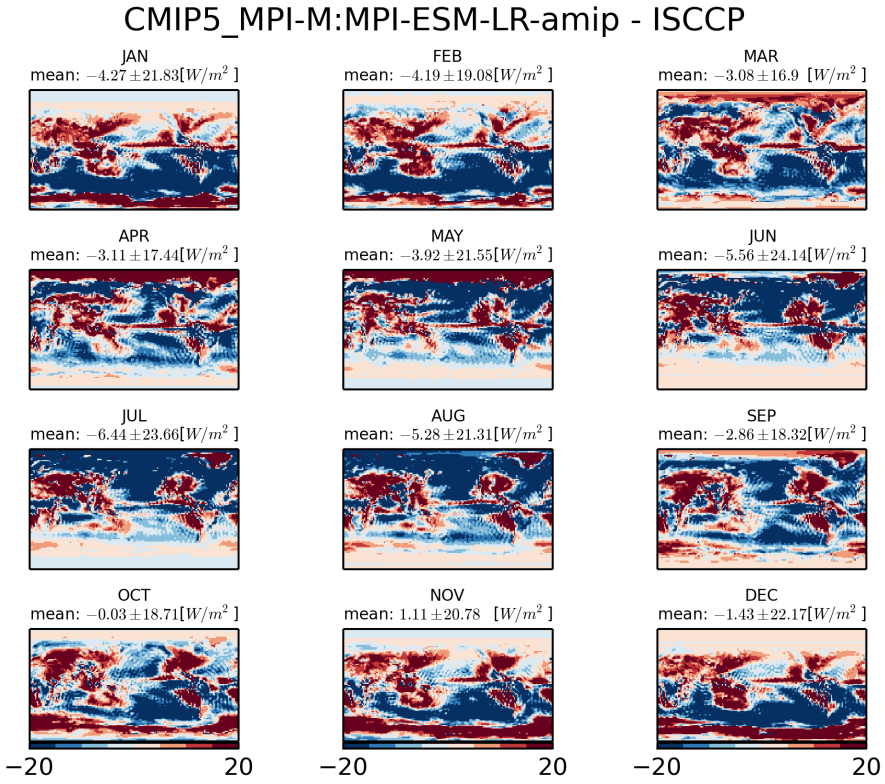



Figure 104: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and ISCCP

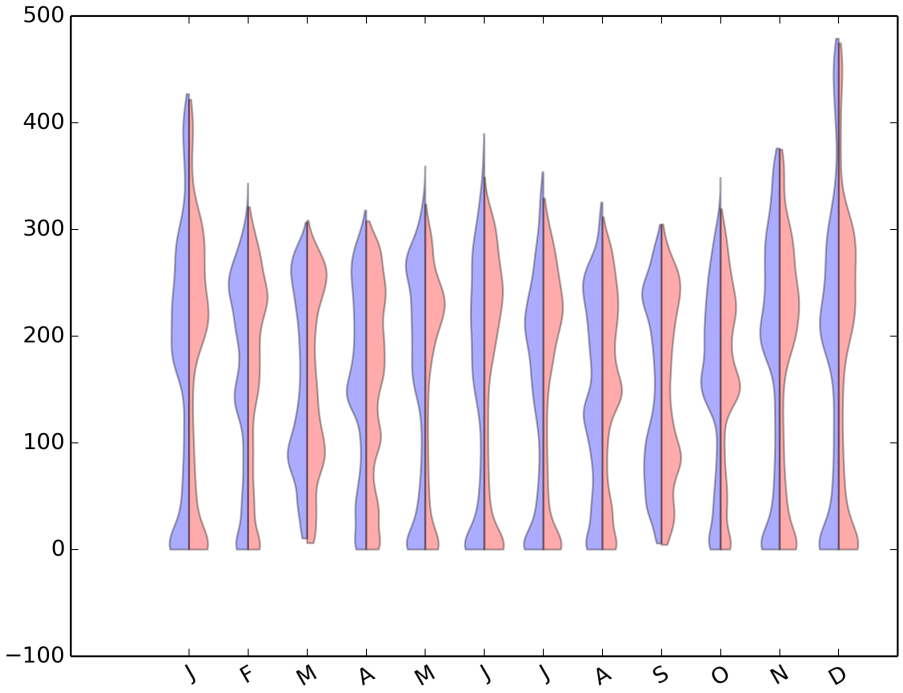



Figure 105: Violin plot for CMIP5-MPI-M:MPI-ESM-LR-AMIP

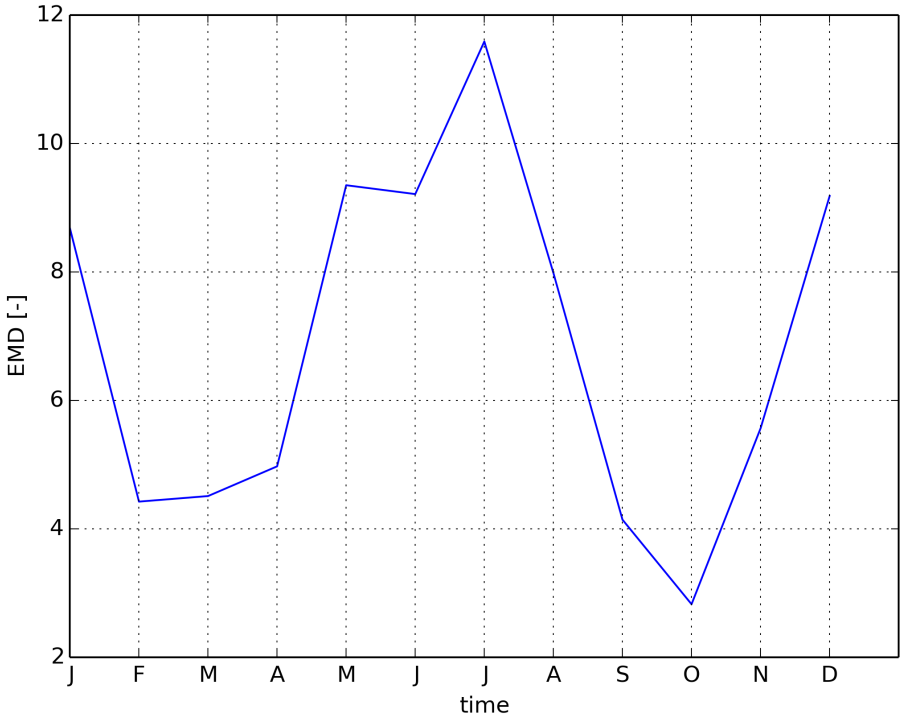



Figure 106: Timeseries of EMD

### 1.1.22 CMIP5 MPI-M:MPI-ESM-MR-amip

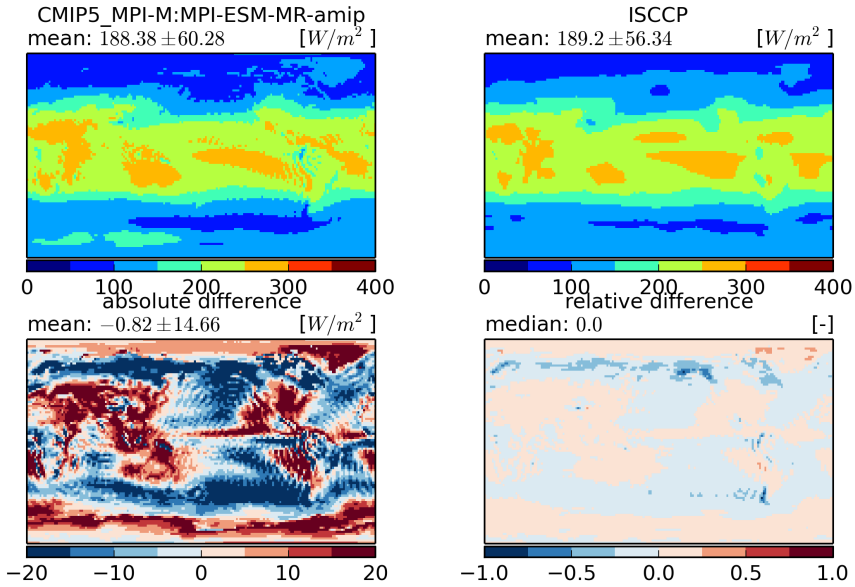



Figure 107: Temporal mean fields (top) and absolute and relative differences (bottom)

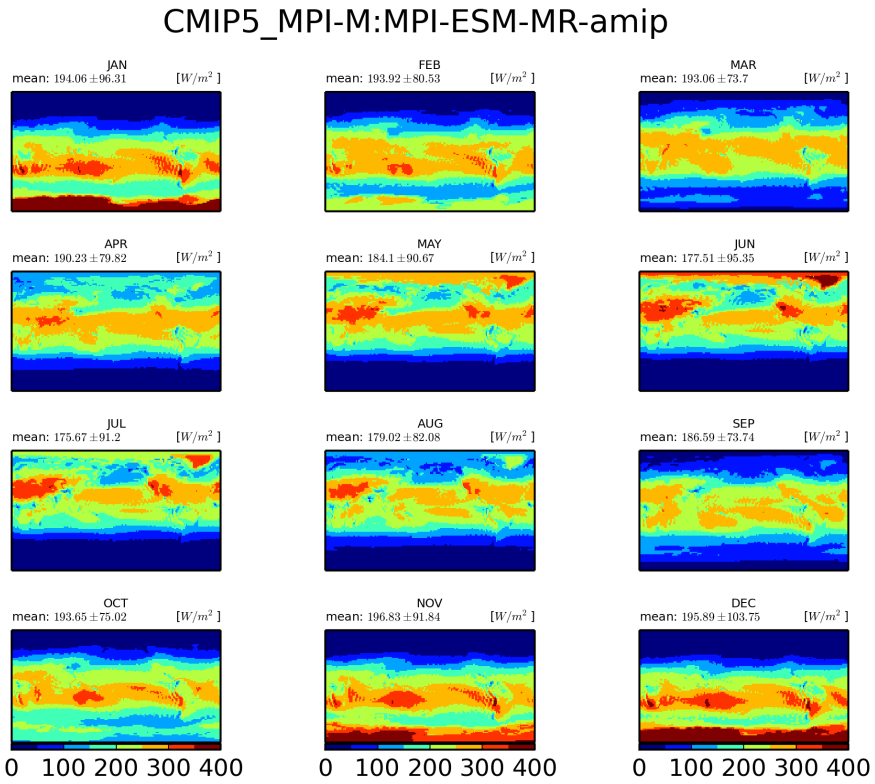



Figure 108: Monthly mean climatology for MPI-M:MPI-ESM-MR

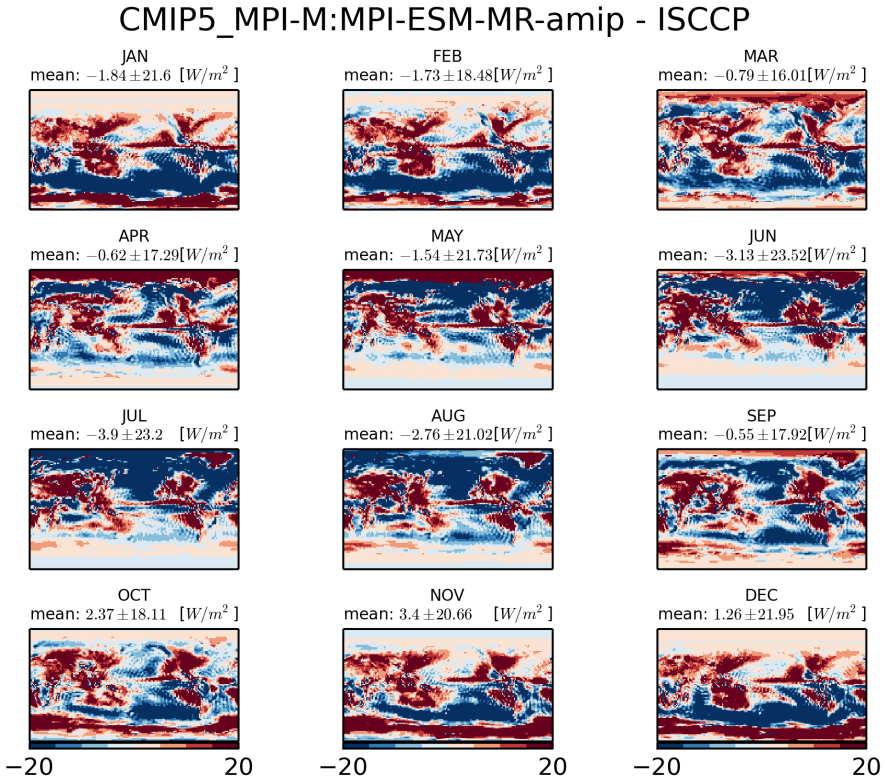



Figure 109: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and ISCCP

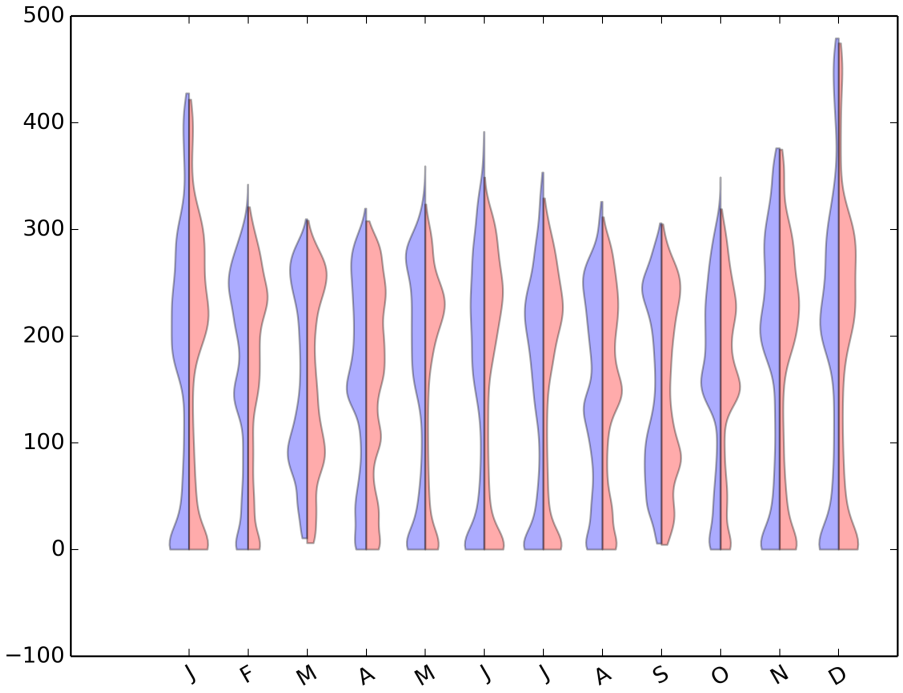



Figure 110: Violin plot for CMIP5-MPI-M:MPI-ESM-MR-AMIP

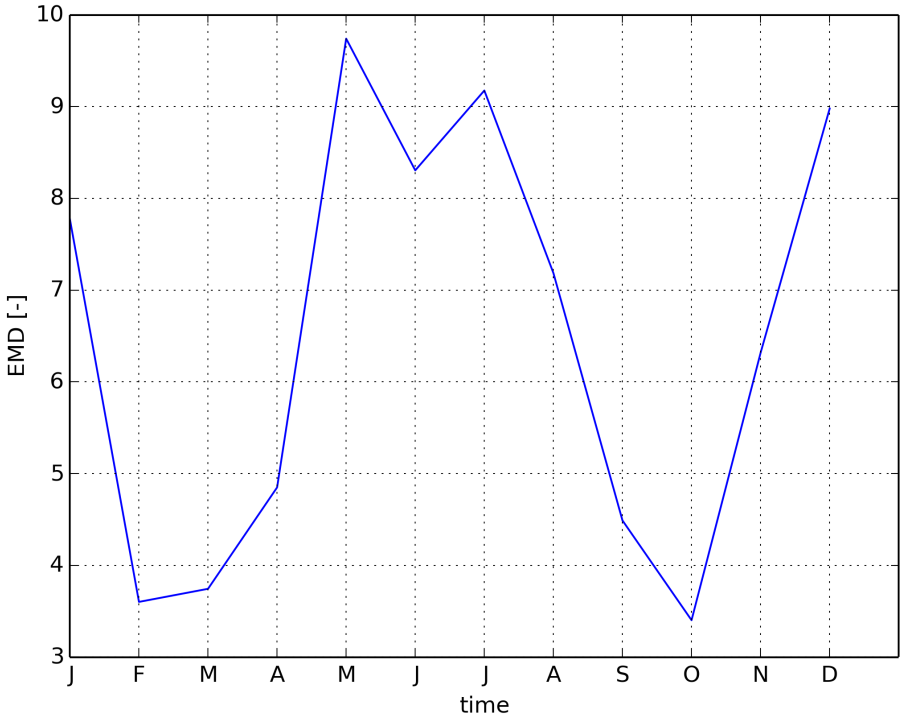



Figure 111: Timeseries of EMD

### 1.1.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

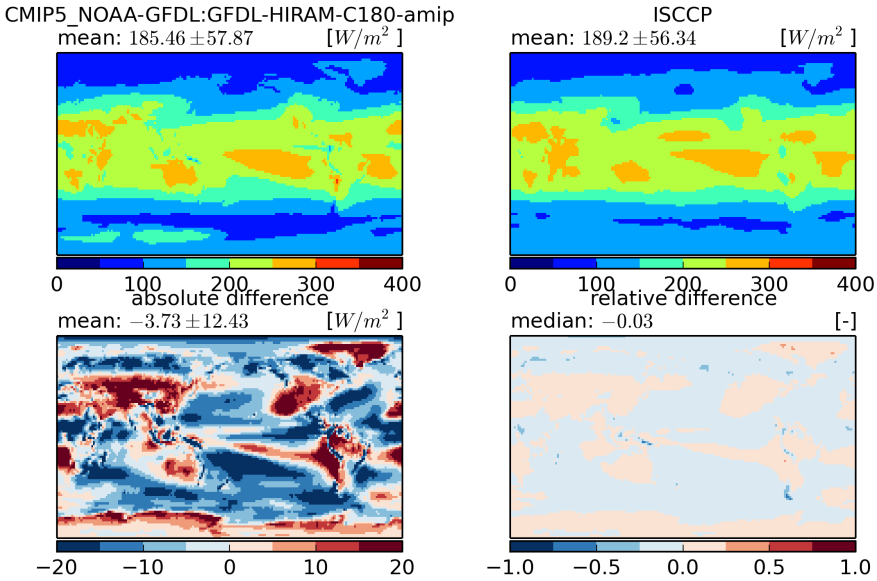



Figure 112: Temporal mean fields (top) and absolute and relative differences (bottom)

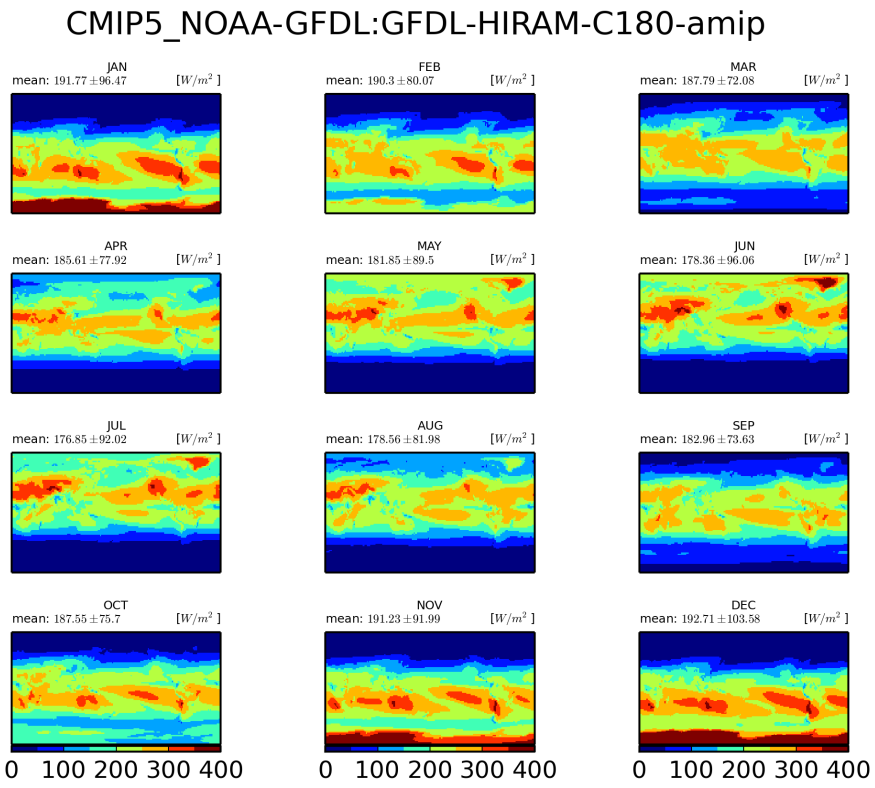



Figure 113: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

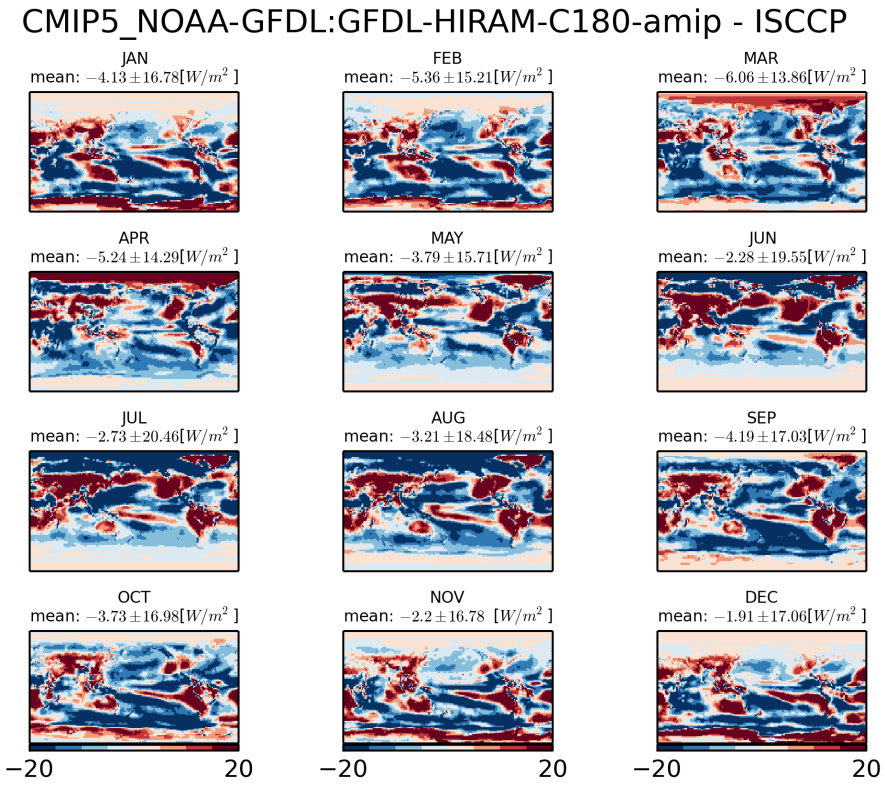



Figure 114: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and ISCCP

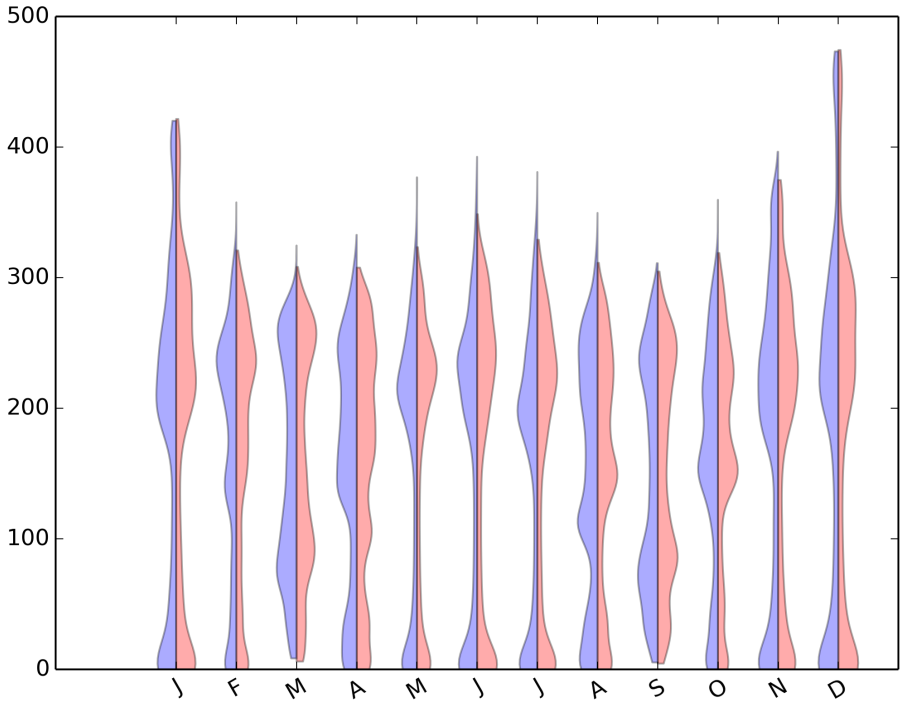



Figure 115: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-AMIP

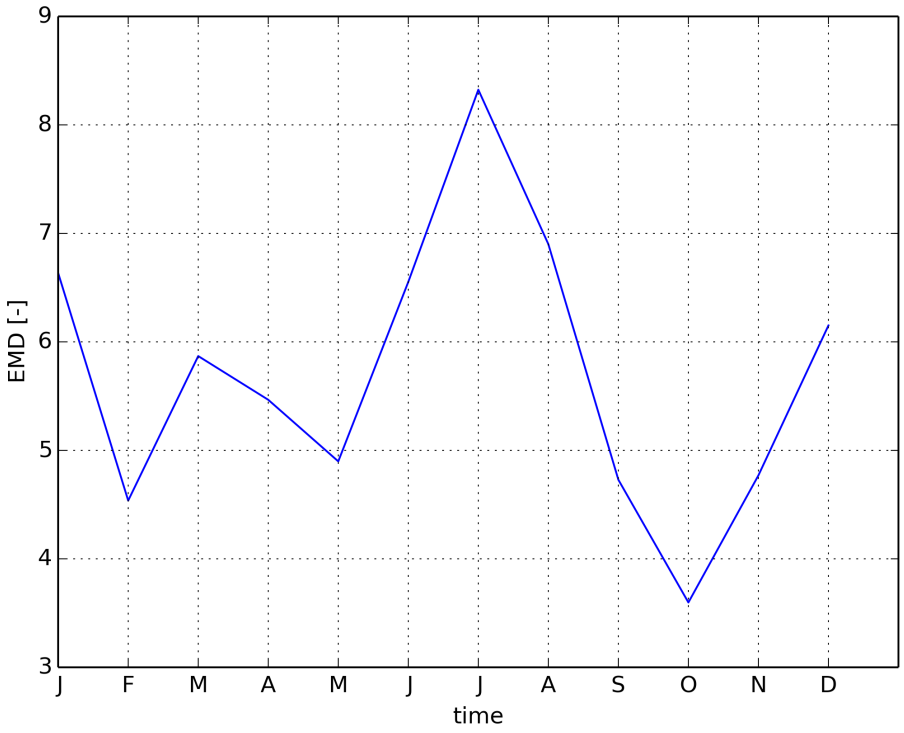



Figure 116: Timeseries of EMD

### 1.1.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

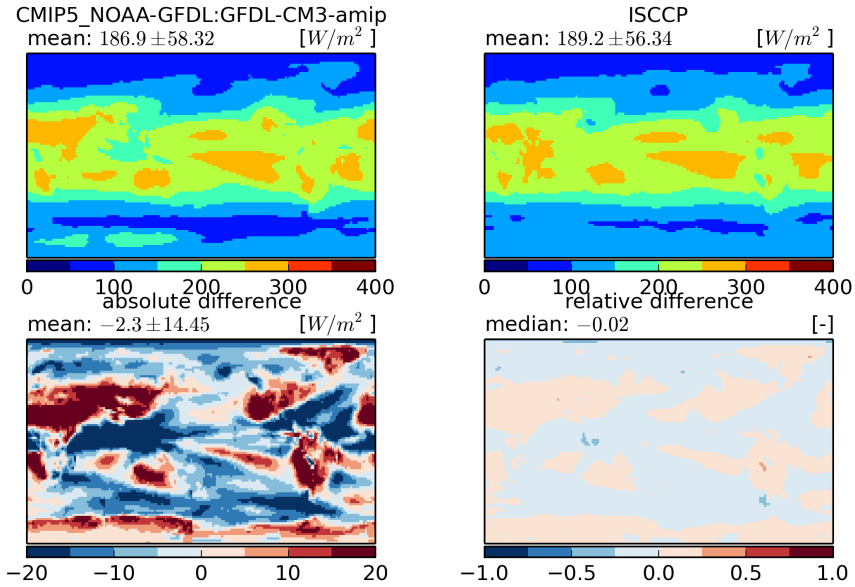



Figure 117: Temporal mean fields (top) and absolute and relative differences (bottom)

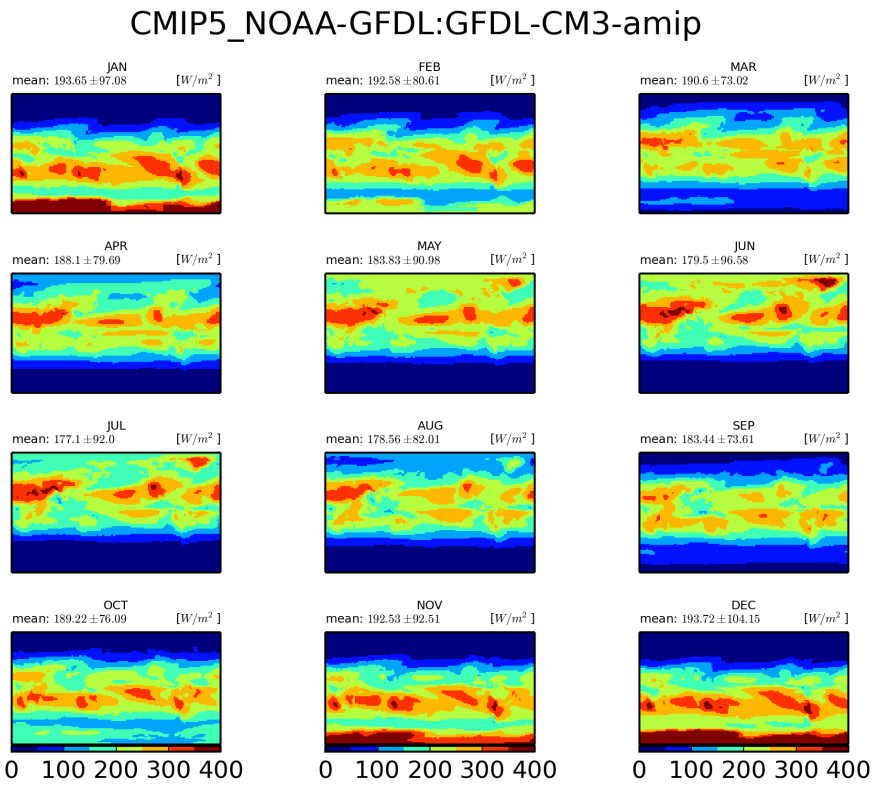



Figure 118: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

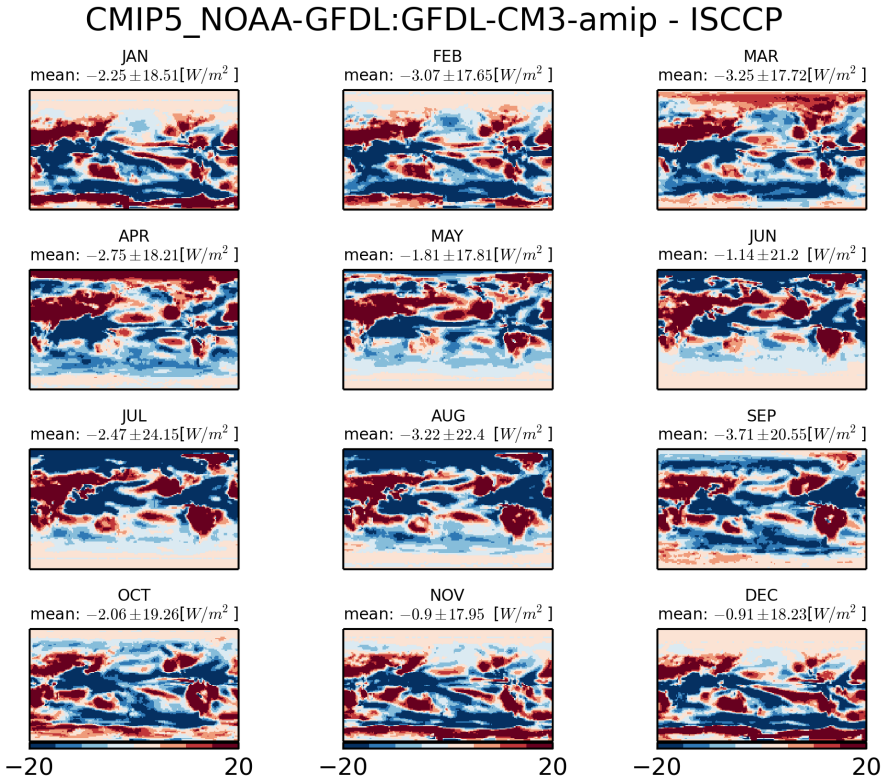



Figure 119: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and ISCCP

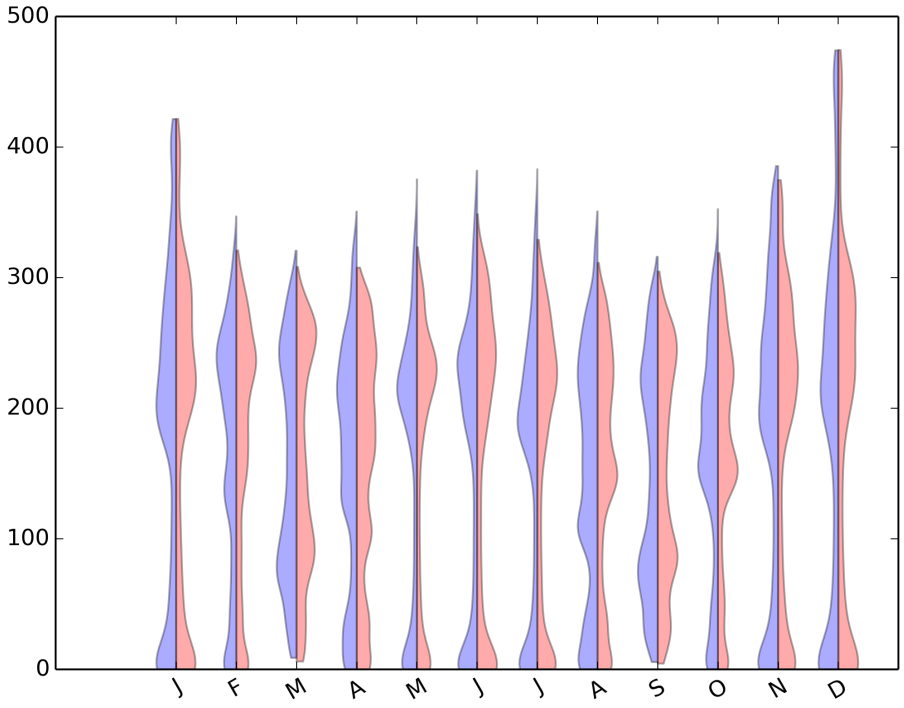



Figure 120: Violin plot for CMIP5-NOAA-GFDL:GFDL-CM3-AMIP

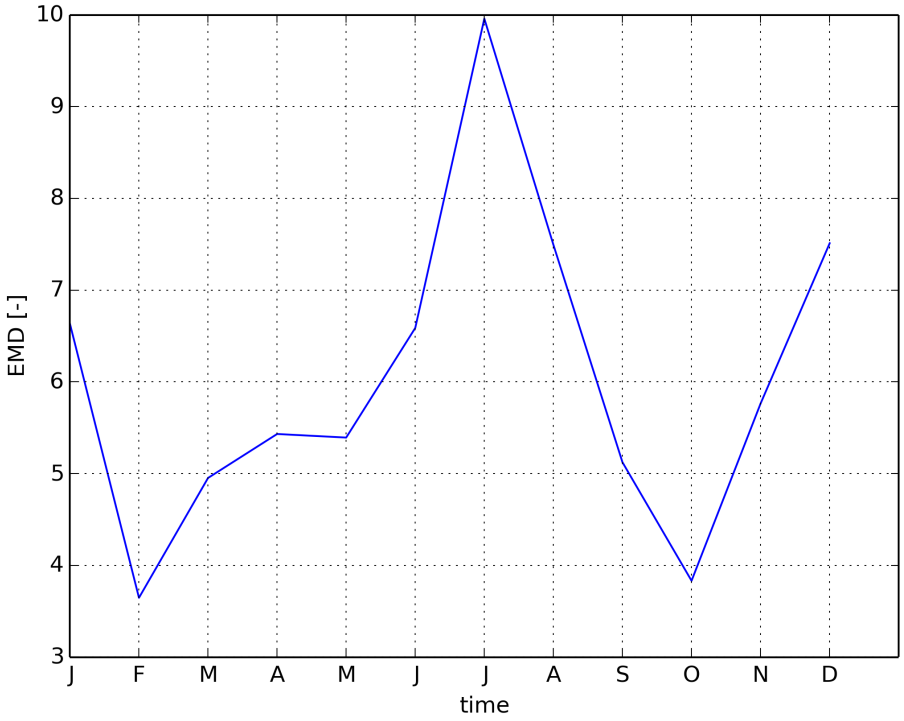



Figure 121: Timeseries of EMD

### 1.1.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

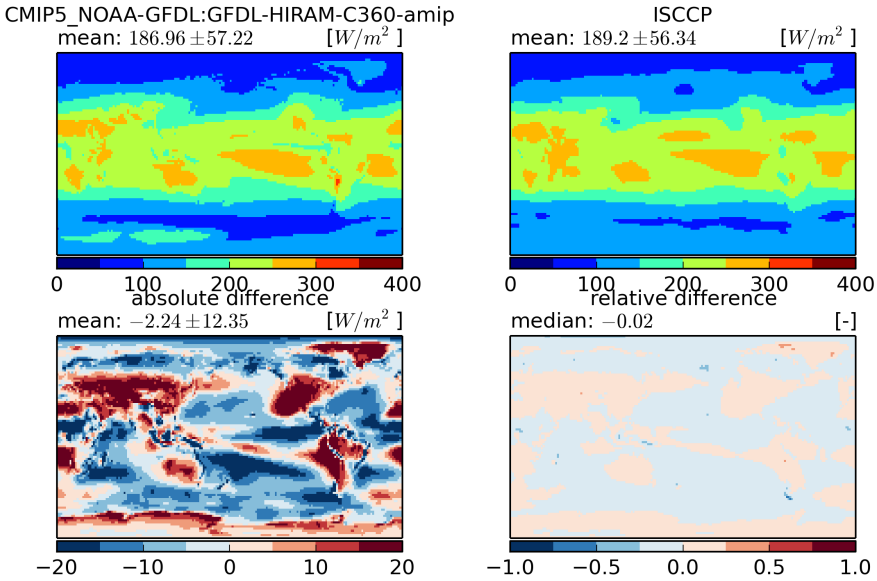



Figure 122: Temporal mean fields (top) and absolute and relative differences (bottom)

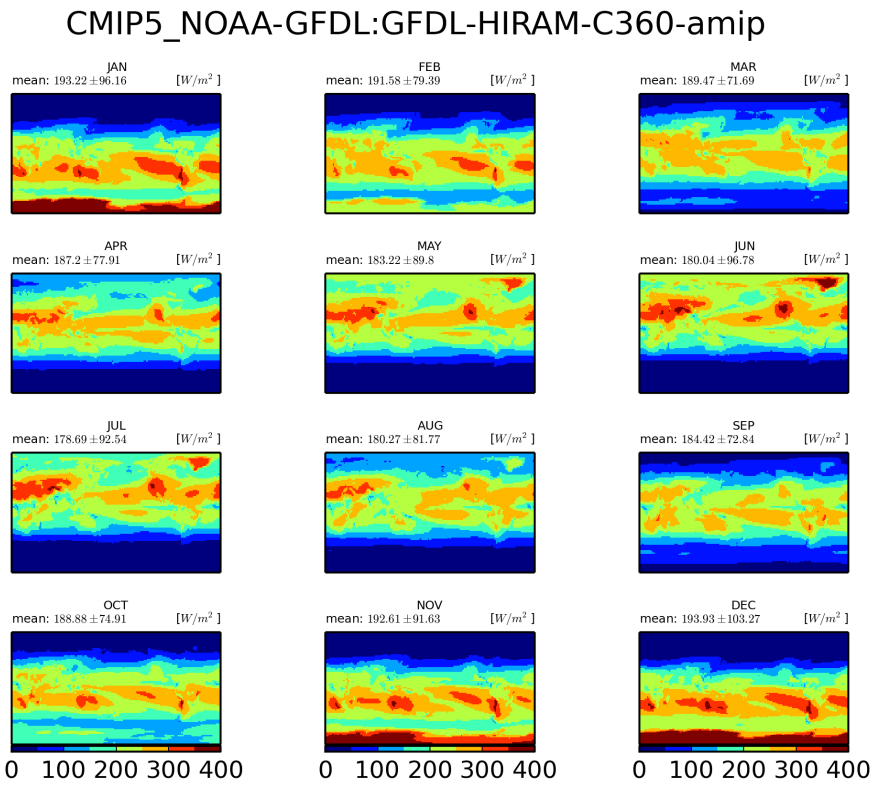



Figure 123: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

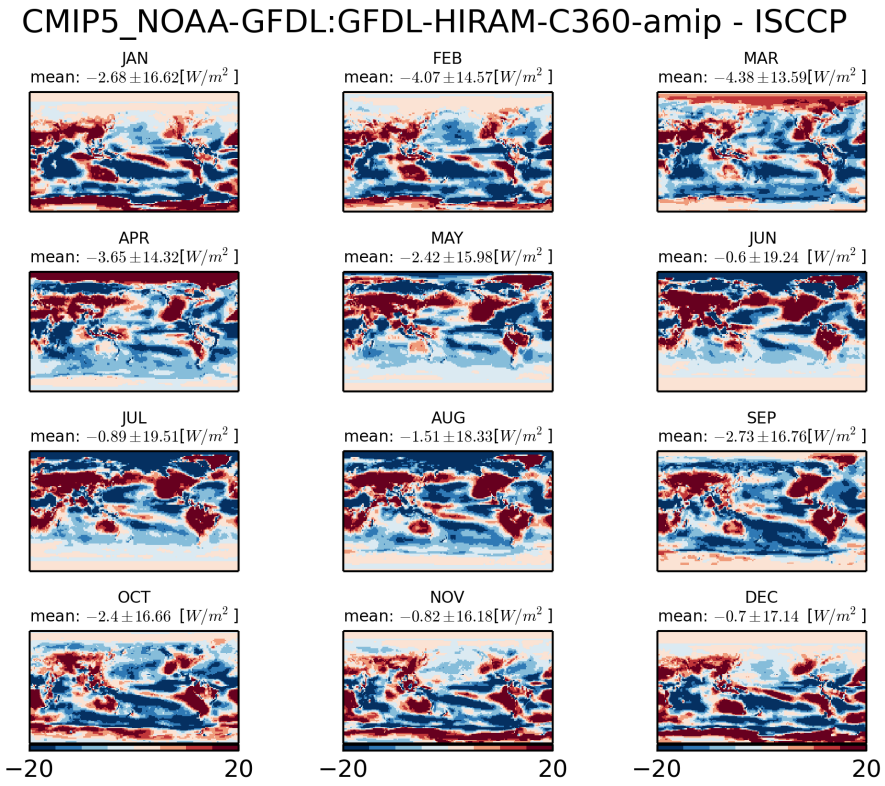



Figure 124: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and ISCCP

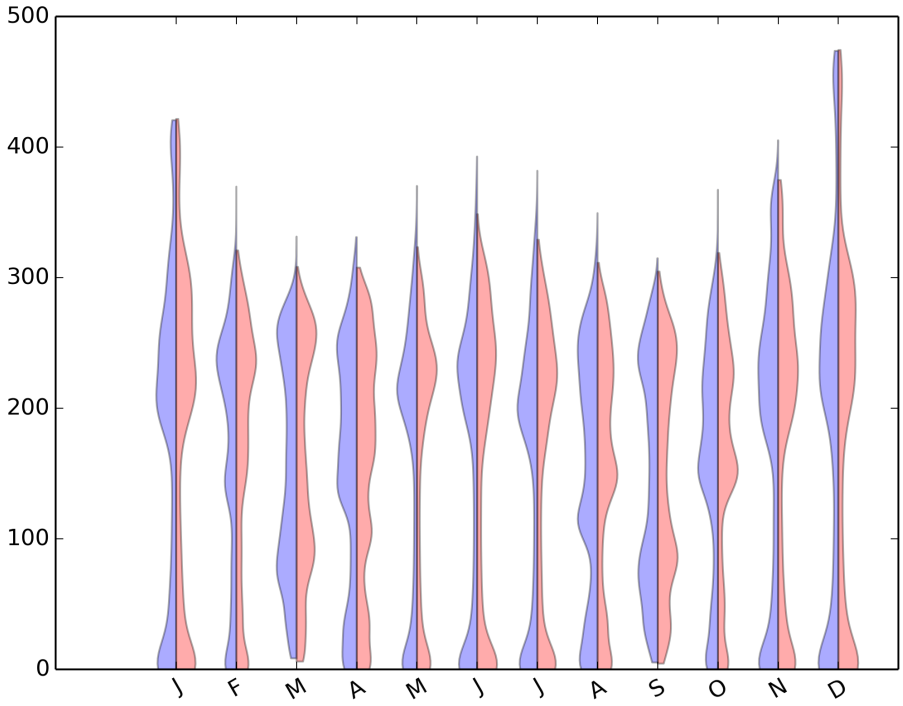



Figure 125: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-AMIP

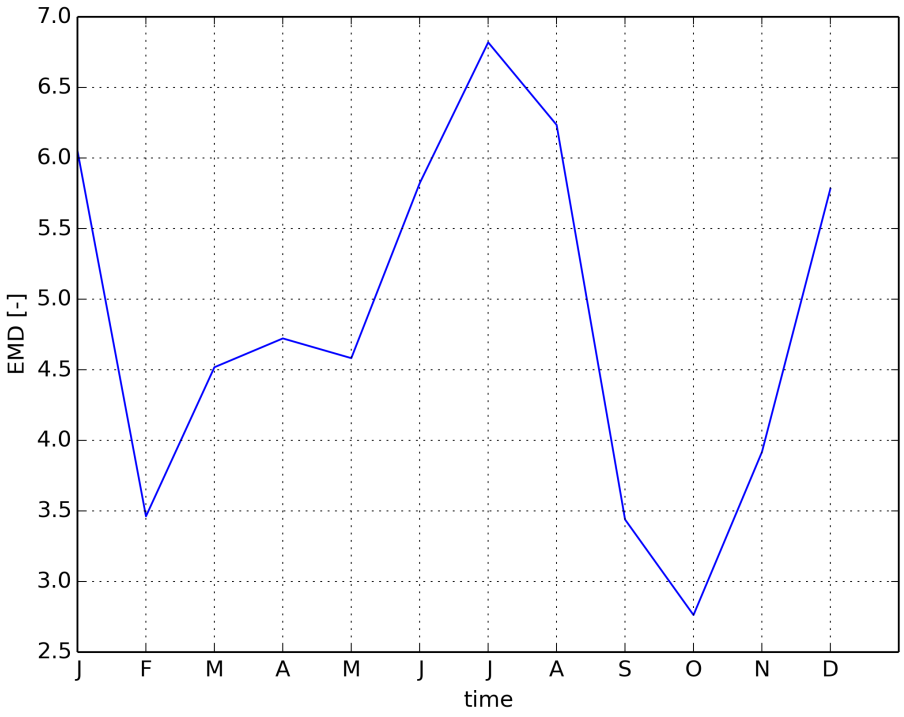



Figure 126: Timeseries of EMD

### 1.1.26 CMIP5 NCAR:CCSM4-amip

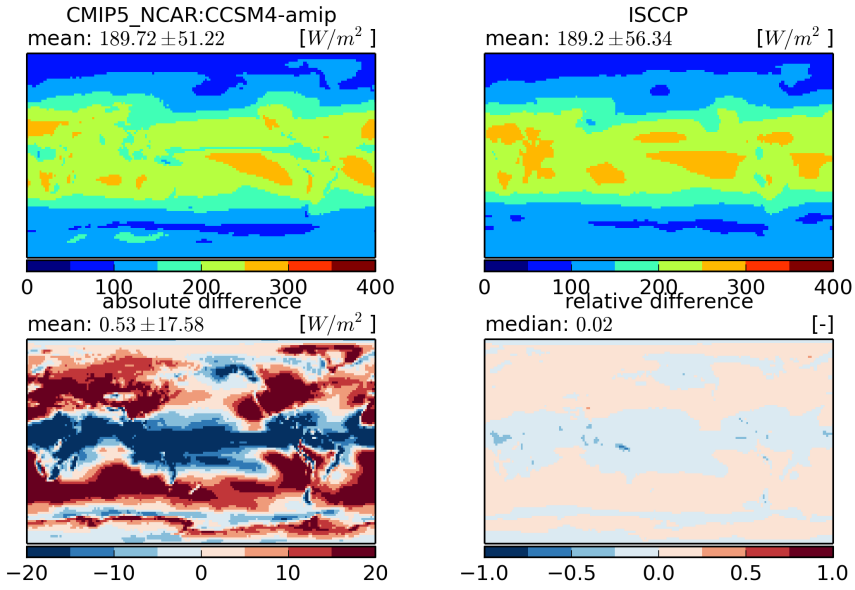



Figure 127: Temporal mean fields (top) and absolute and relative differences (bottom)

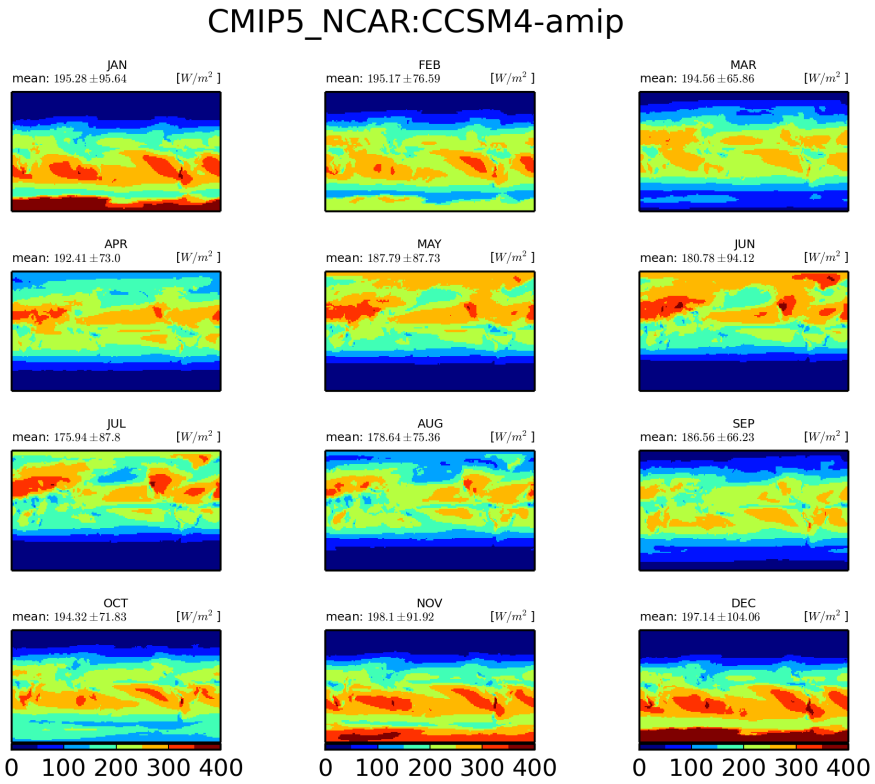



Figure 128: Monthly mean climatology for NCAR:CCSM4

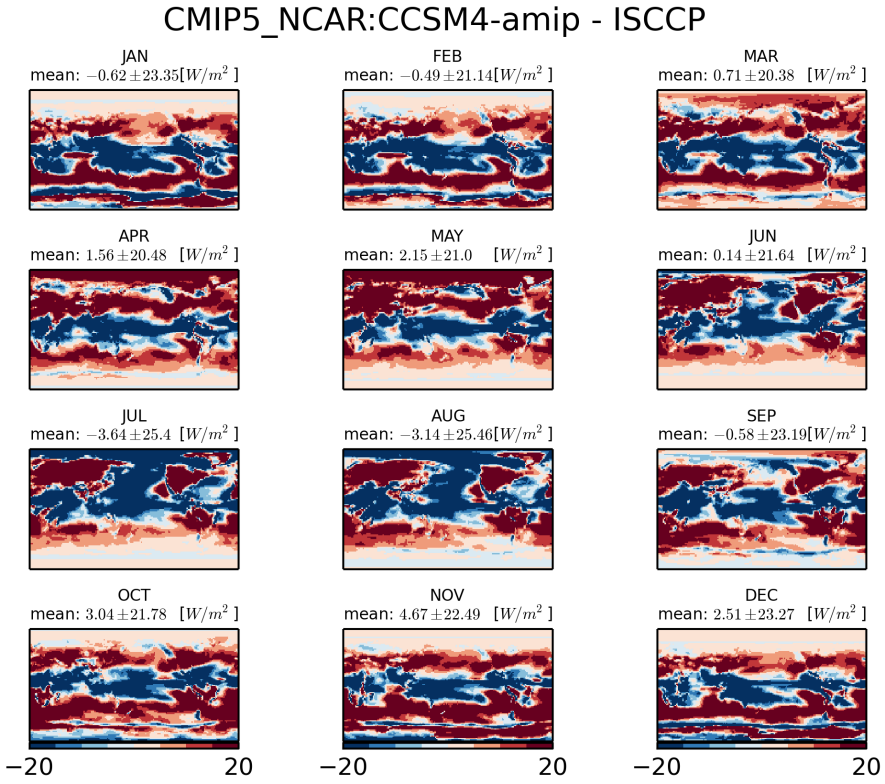



Figure 129: Monthly mean climatology of difference between NCAR:CCSM4 and ISCCP

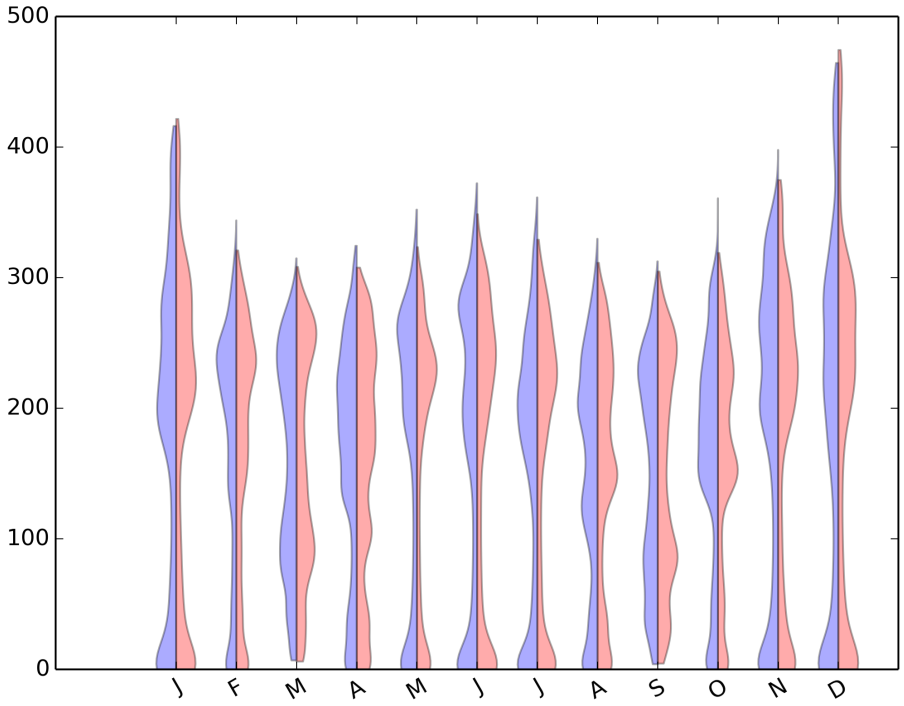



Figure 130: Violin plot for CMIP5-NCAR:CCSM4-AMIP

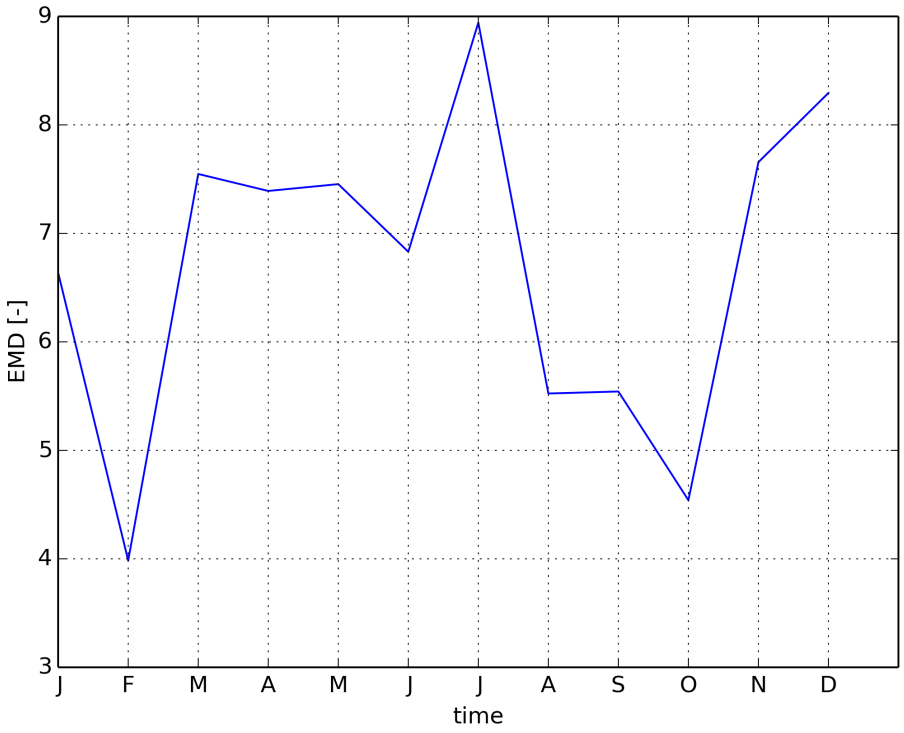



Figure 131: Timeseries of EMD

### 1.1.27 CMIP5 NCC:NorESM1-M-amip

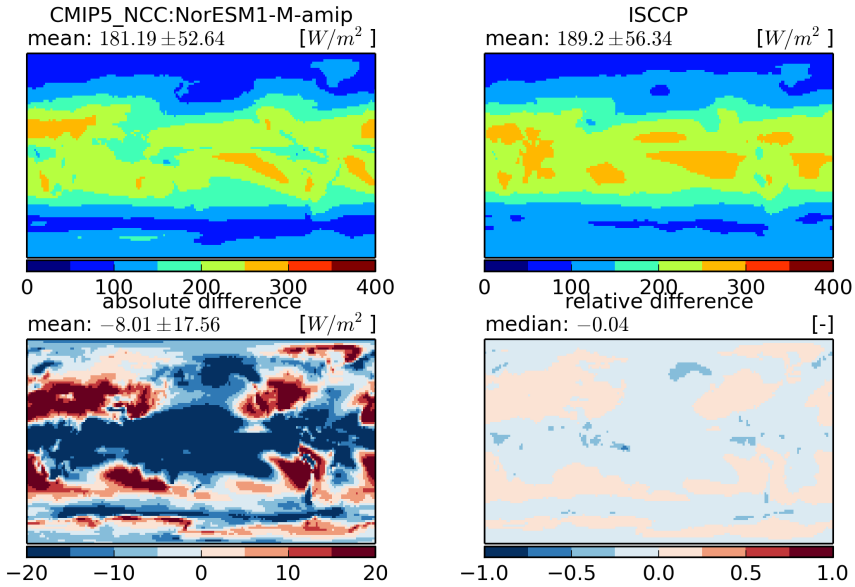



Figure 132: Temporal mean fields (top) and absolute and relative differences (bottom)

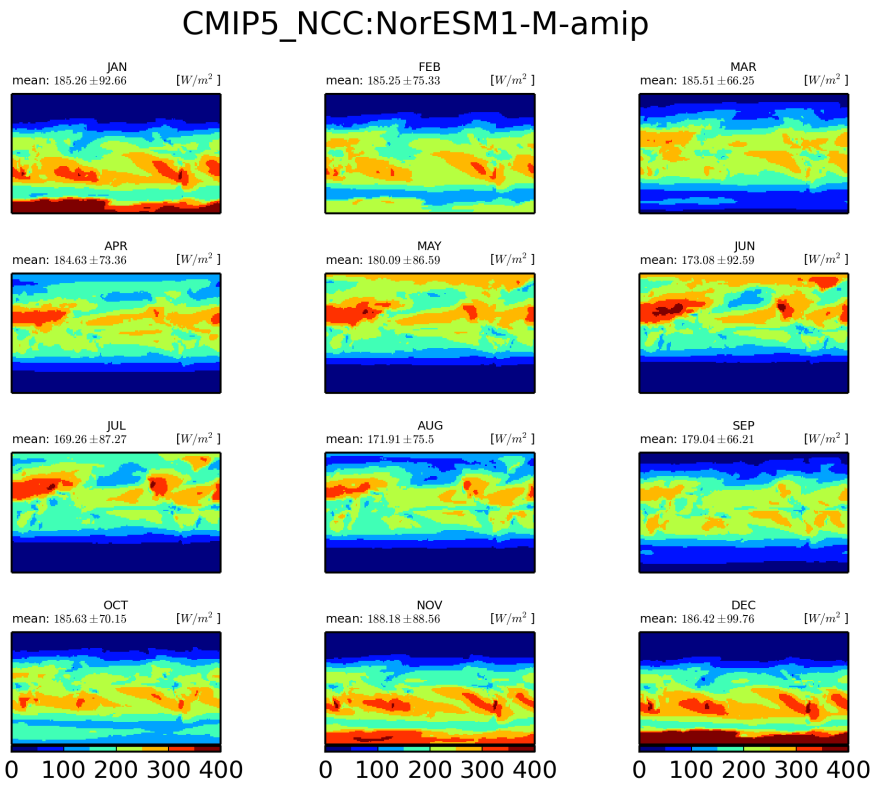



Figure 133: Monthly mean climatology for NCC:NorESM1-M

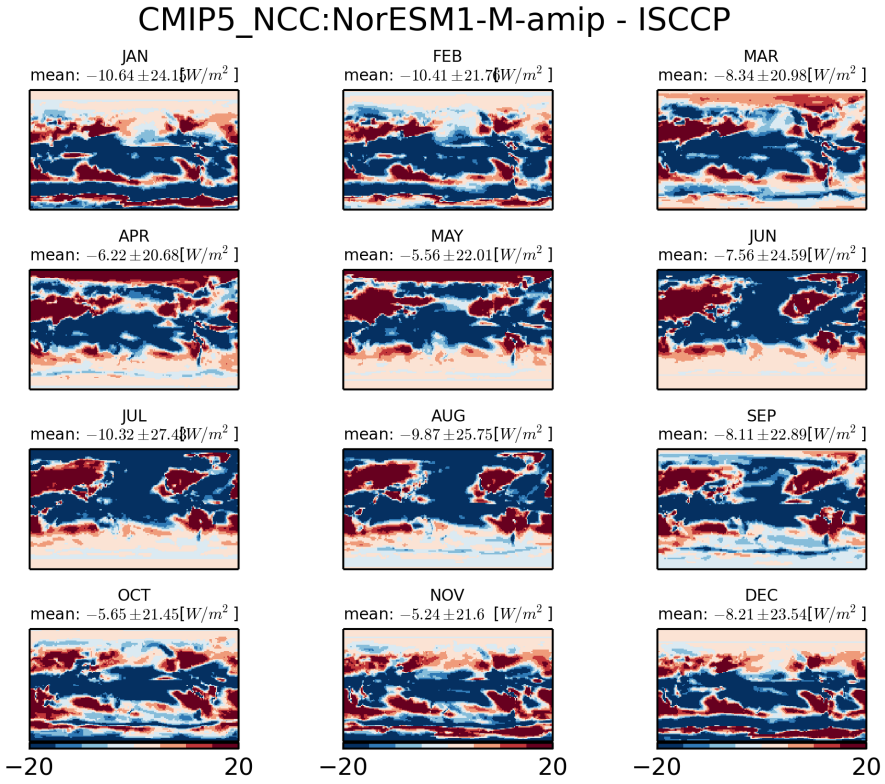



Figure 134: Monthly mean climatology of difference between NCC:NORESM1-M and ISCCP

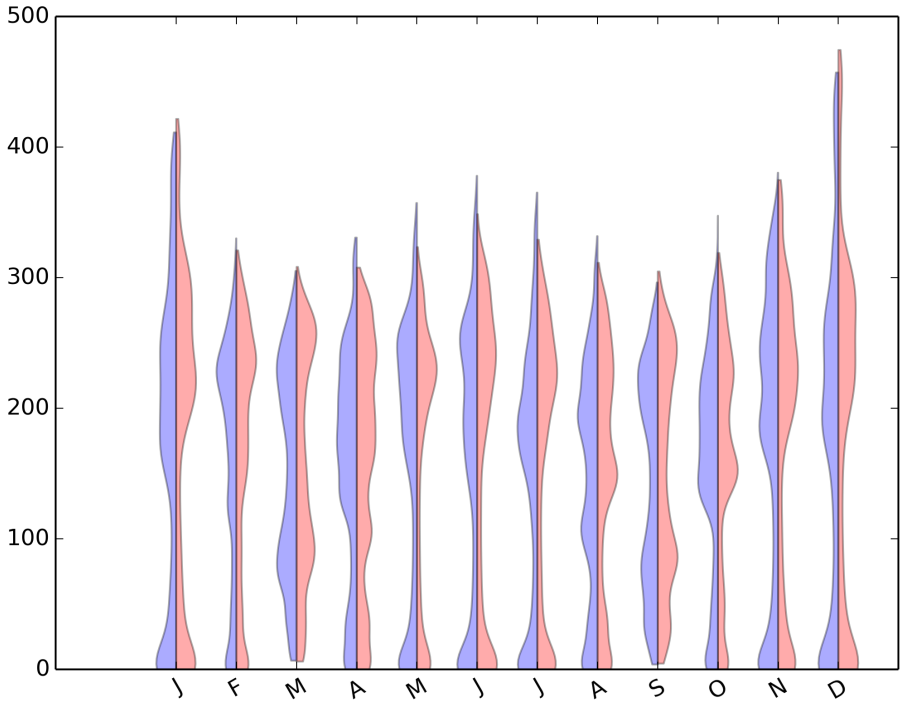



Figure 135: Violin plot for CMIP5-NCC:NORESM1-M-AMIP

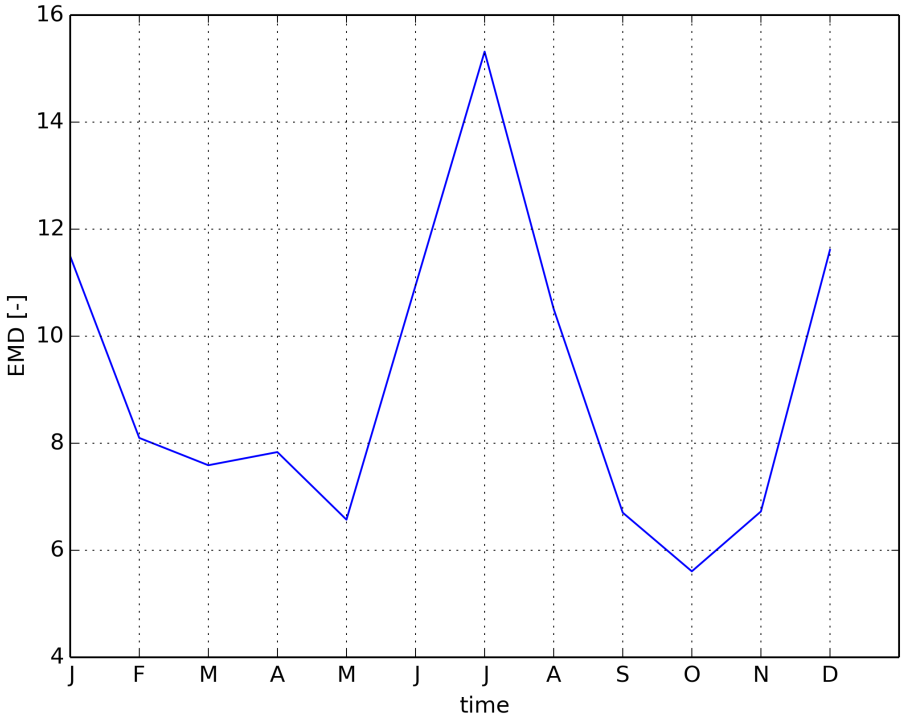



Figure 136: Timeseries of EMD

### 1.1.28 CMIP3 iap fgoals1 0 g-amip

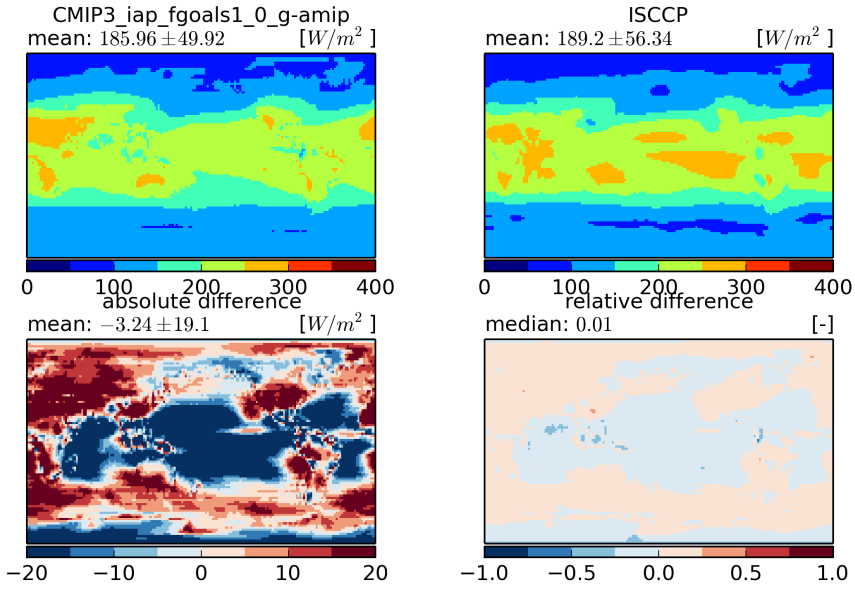



Figure 137: Temporal mean fields (top) and absolute and relative differences (bottom)

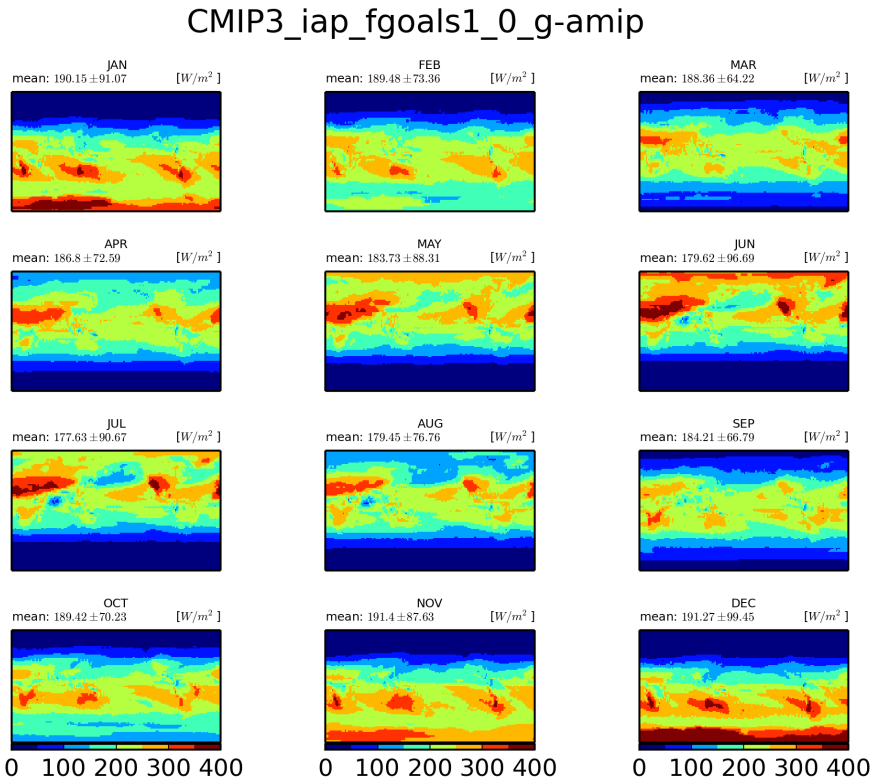



Figure 138: Monthly mean climatology for iap-fgoals1-0-g

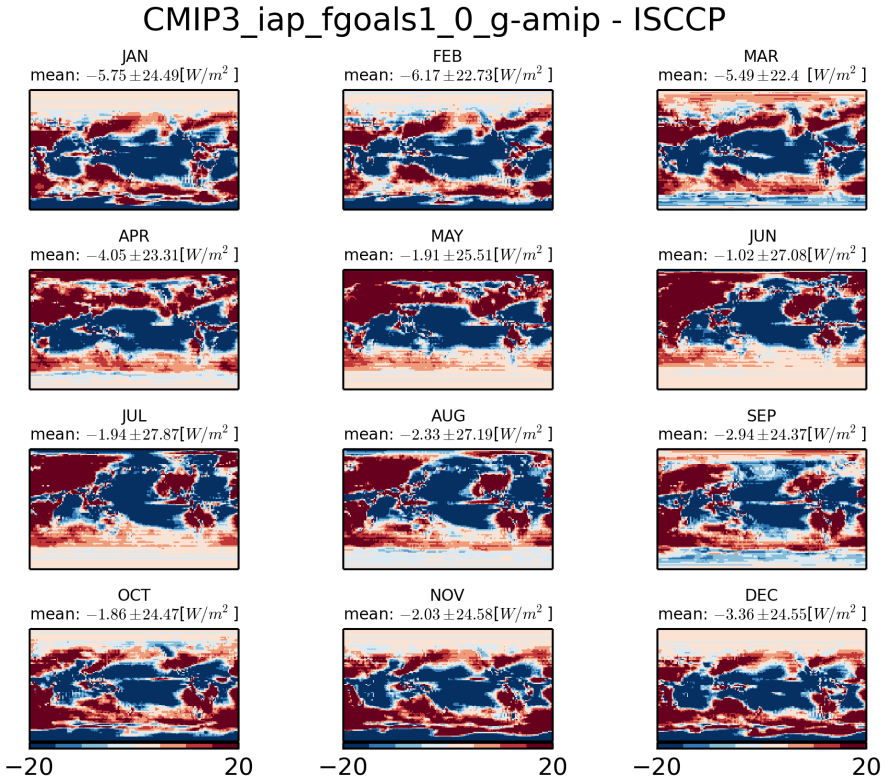



Figure 139: Monthly mean climatology of difference between IAP-FGOALS1-0-G and ISCCP

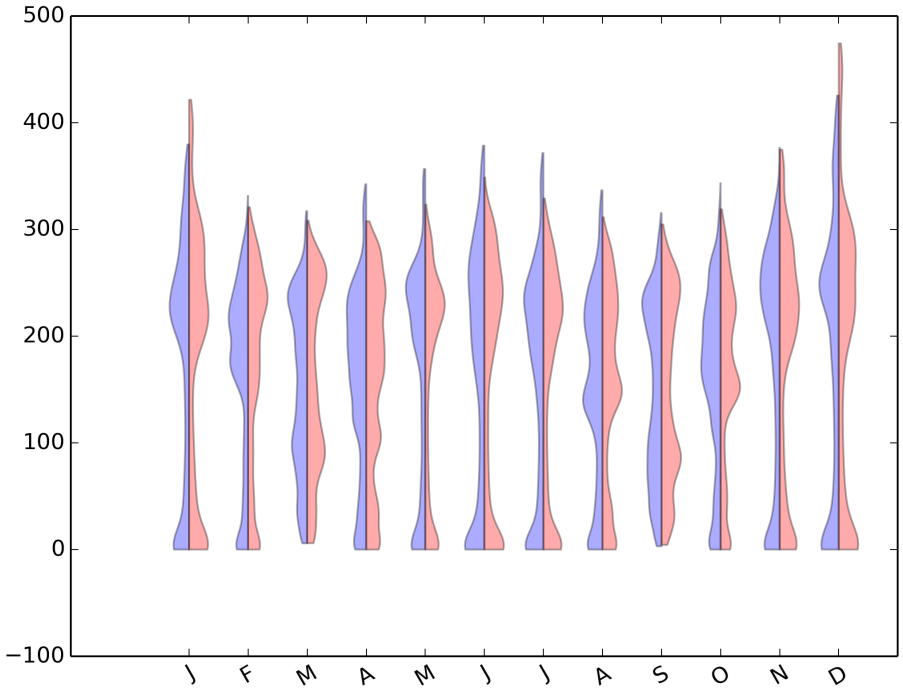



Figure 140: Violin plot for CMIP3-IAP-FGOALS1-0-G-AMIP

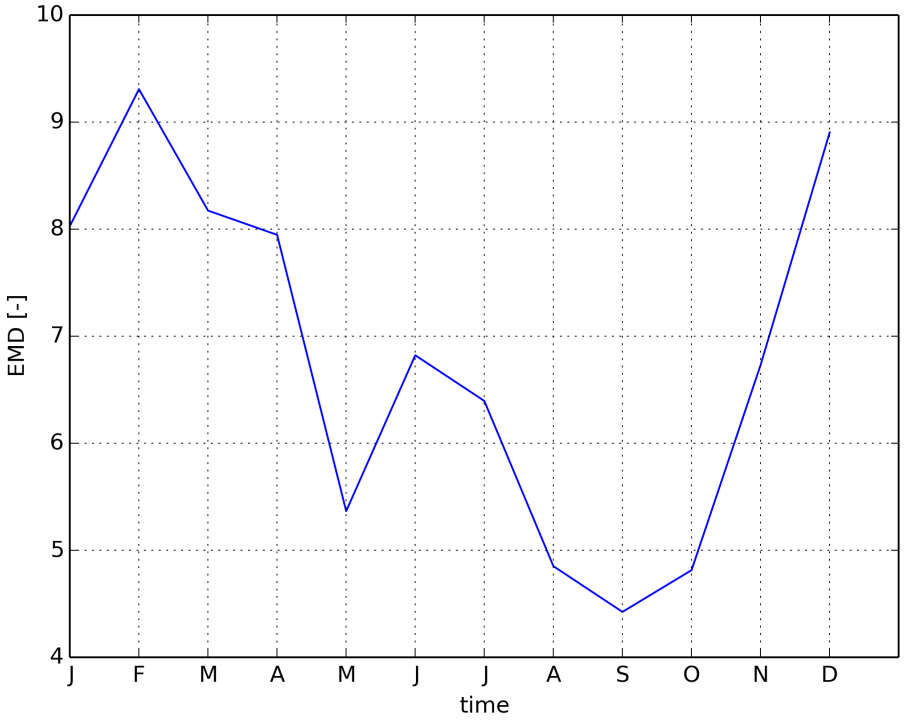



Figure 141: Timeseries of EMD

### 1.1.29 CMIP3 inmcm3 0-amip

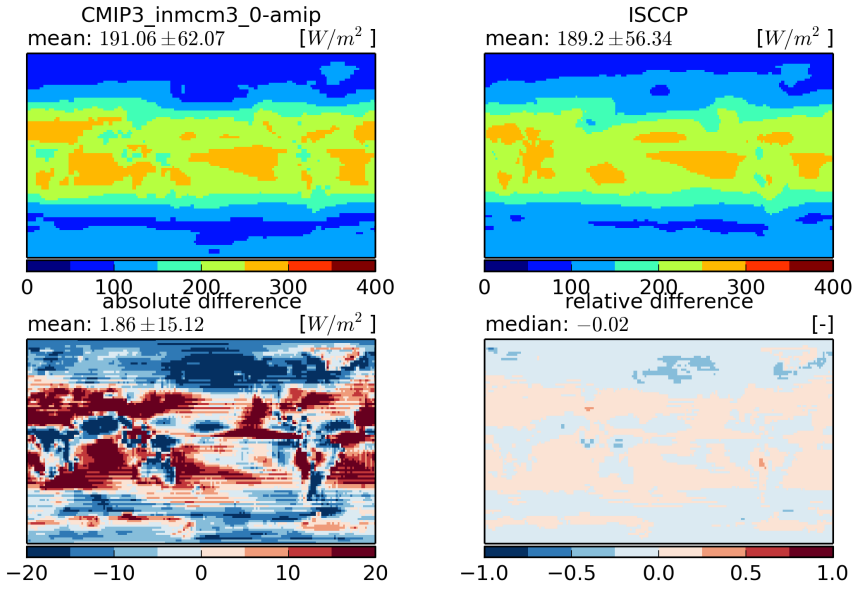



Figure 142: Temporal mean fields (top) and absolute and relative differences (bottom)

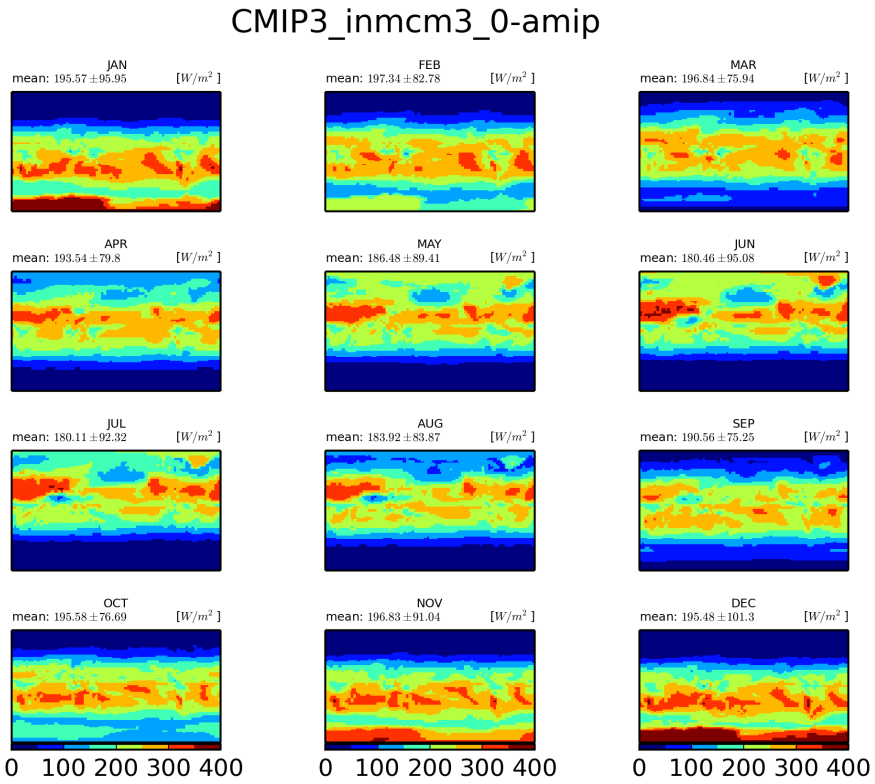



Figure 143: Monthly mean climatology for inmcm3-0

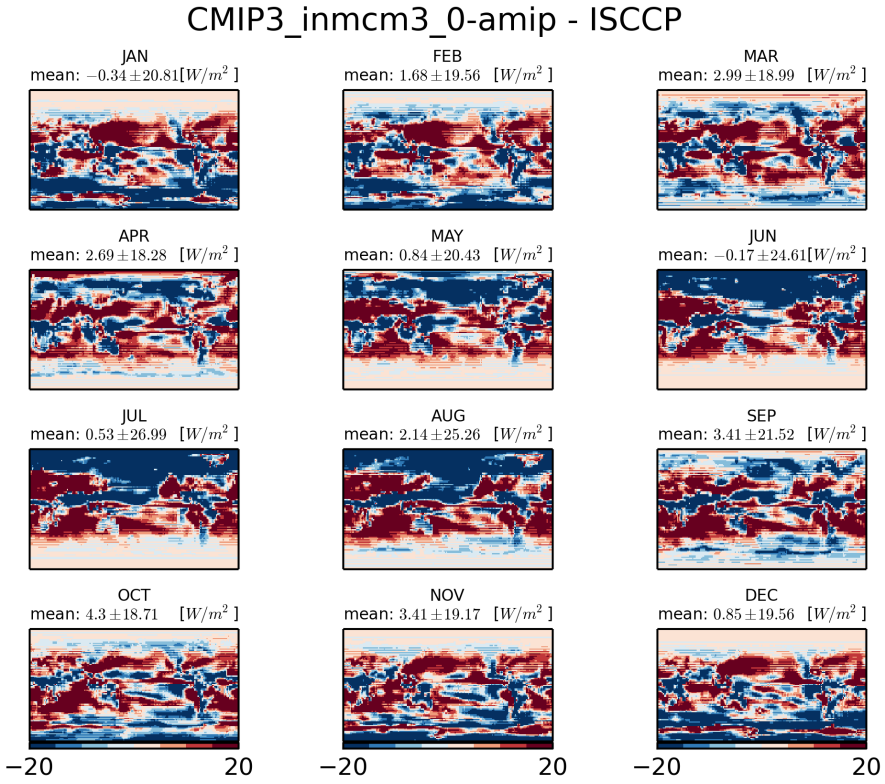



Figure 144: Monthly mean climatology of difference between INMCM3-0 and ISCCP

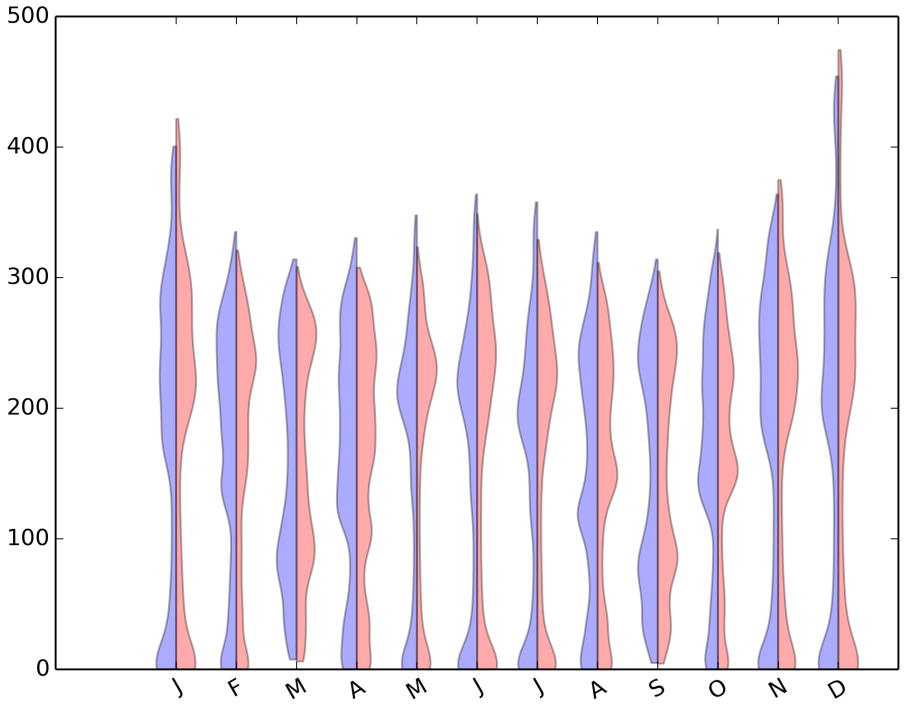



Figure 145: Violin plot for CMIP3-INMCM3-0-AMIP

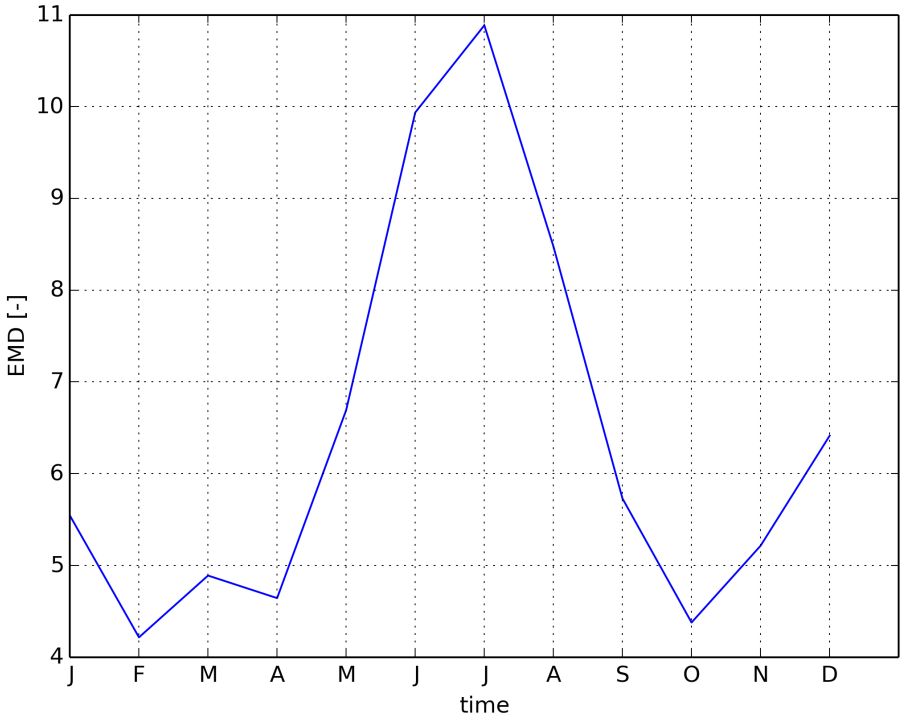



Figure 146: Timeseries of EMD

### 1.1.30 CMIP3 ipsl cm4-amip

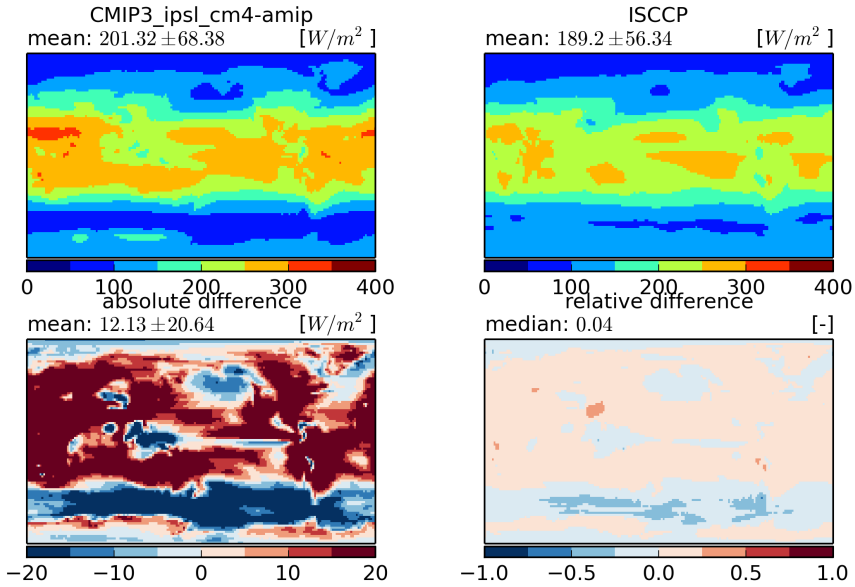



Figure 147: Temporal mean fields (top) and absolute and relative differences (bottom)

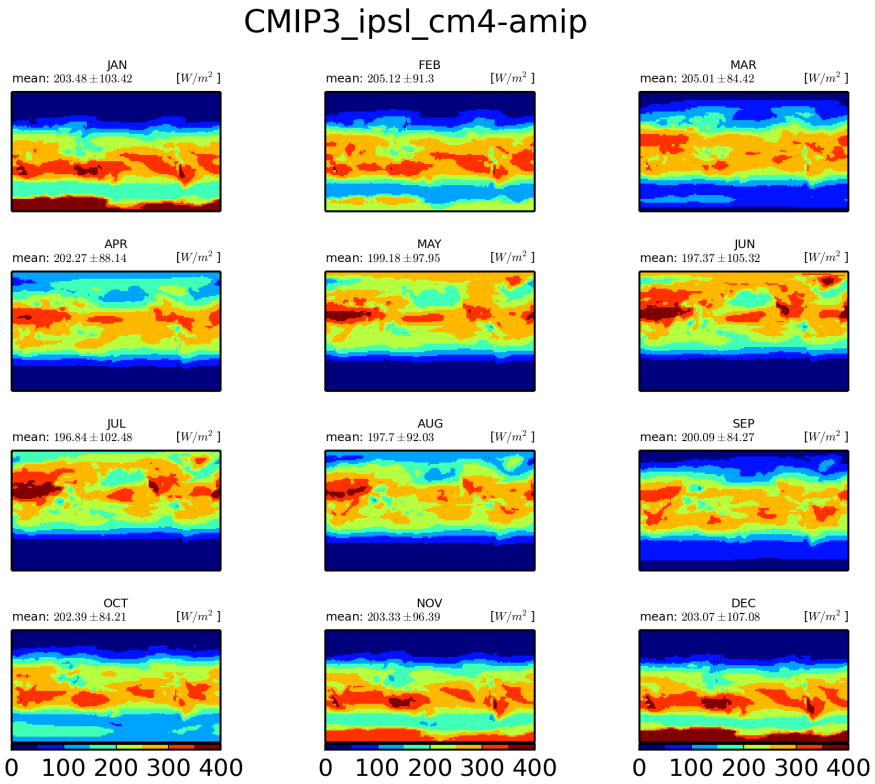



Figure 148: Monthly mean climatology for ipsl-cm4

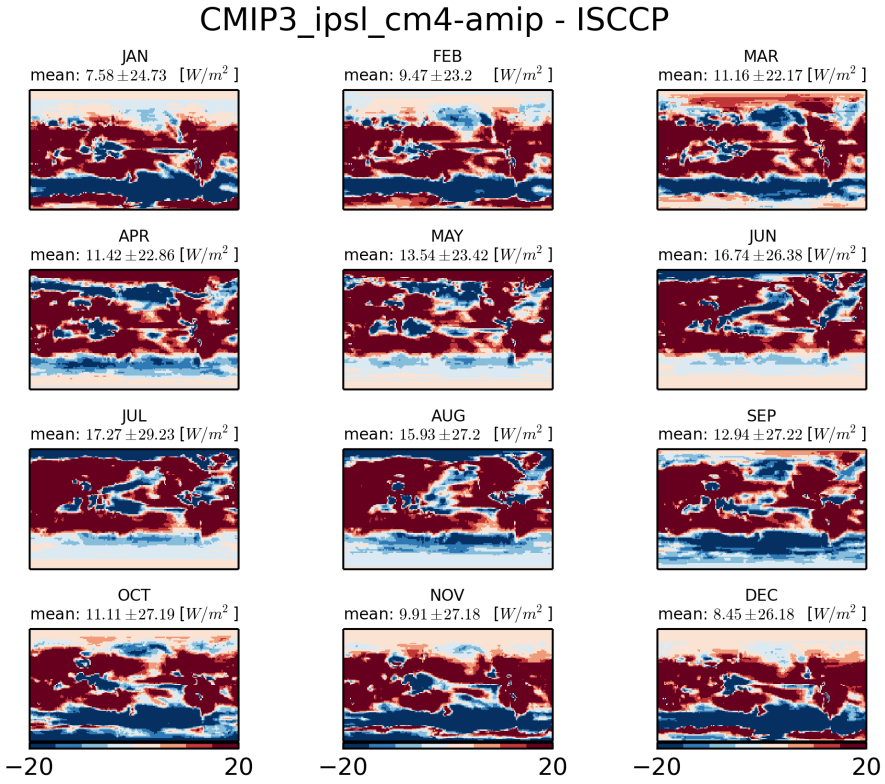



Figure 149: Monthly mean climatology of difference between IPSL-CM4 and ISCCP

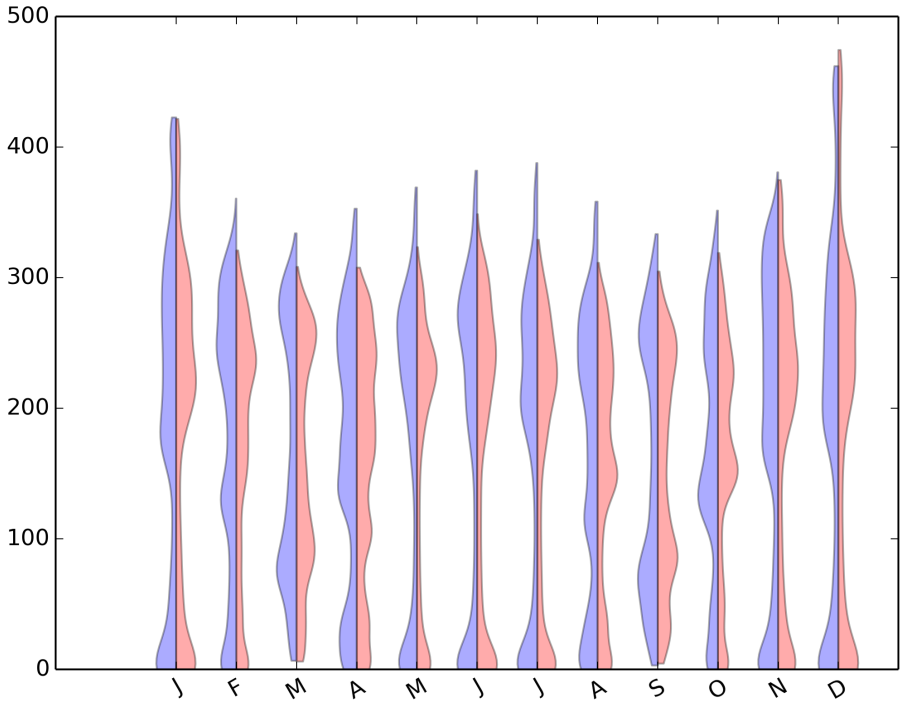



Figure 150: Violin plot for CMIP3-IPSL-CM4-AMIP

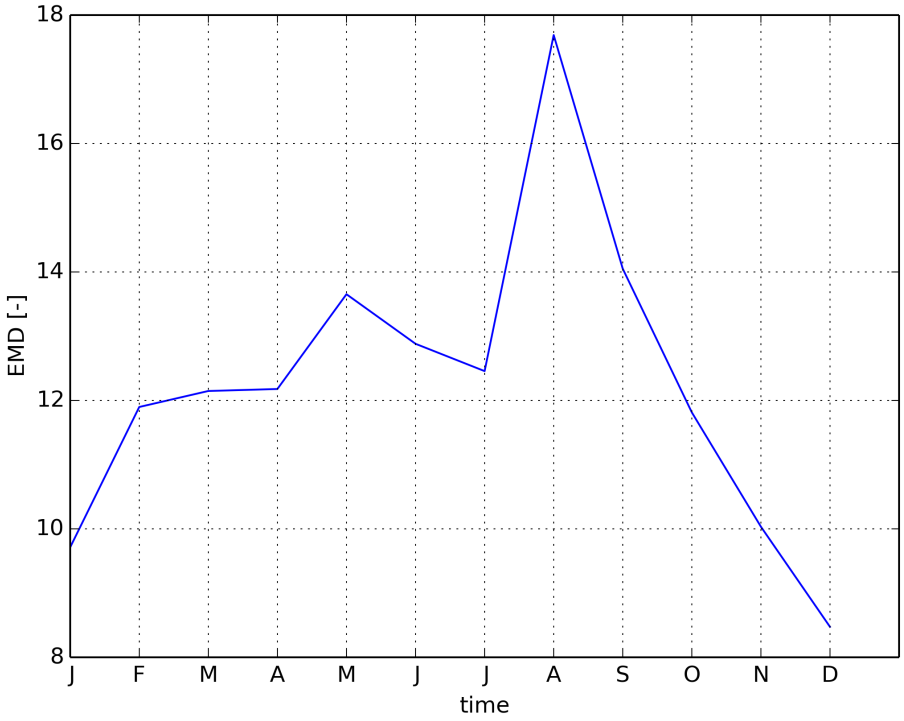



Figure 151: Timeseries of EMD

### 1.1.31 CMIP3 miroc3 2 hires-amip

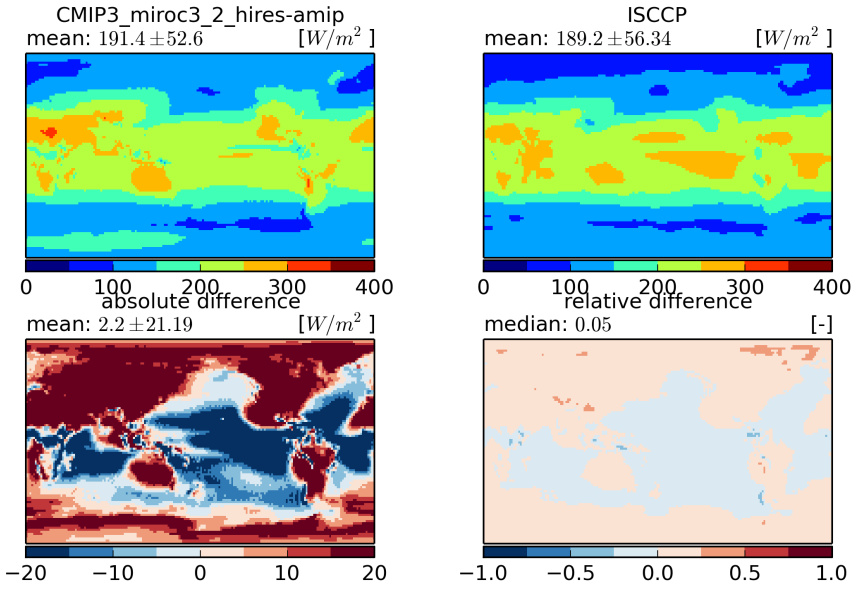



Figure 152: Temporal mean fields (top) and absolute and relative differences (bottom)

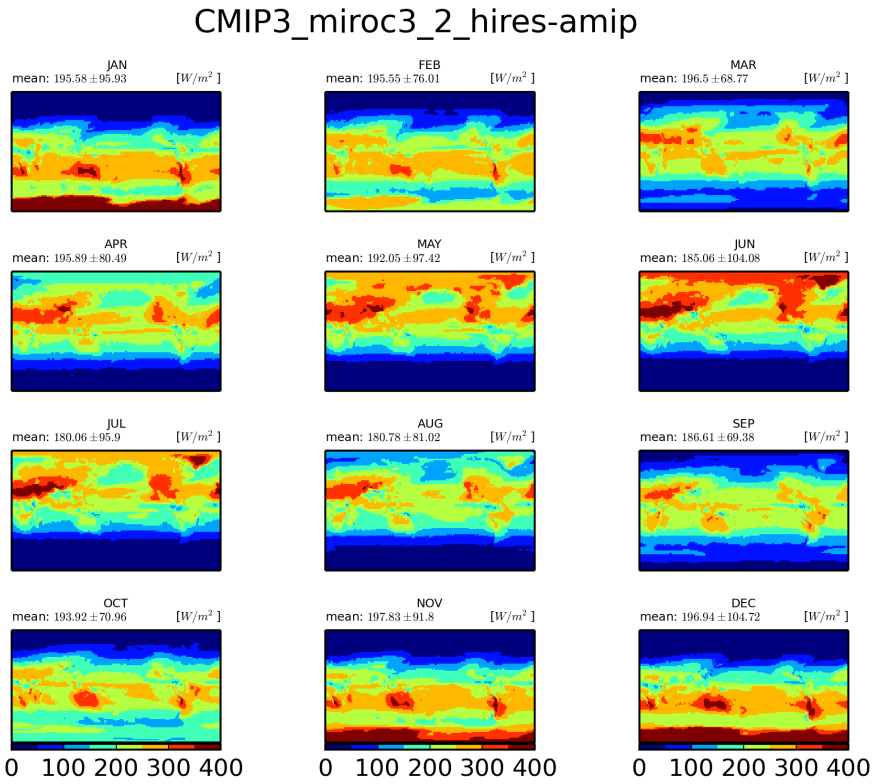



Figure 153: Monthly mean climatology for miroc3-2-hires

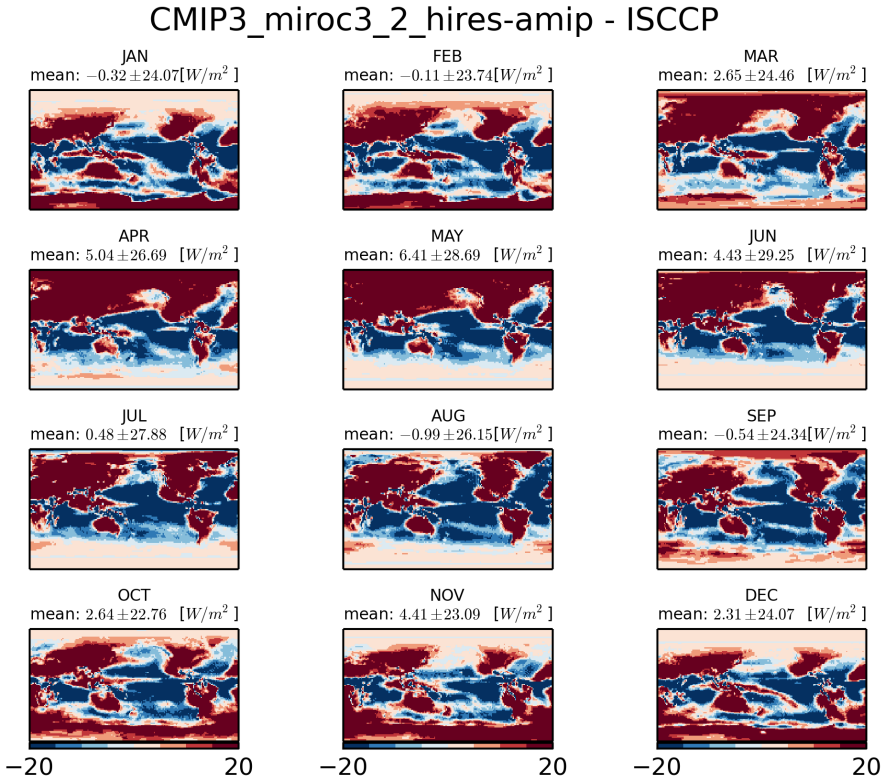



Figure 154: Monthly mean climatology of difference between MIROC3-2-HIRES and ISCCP

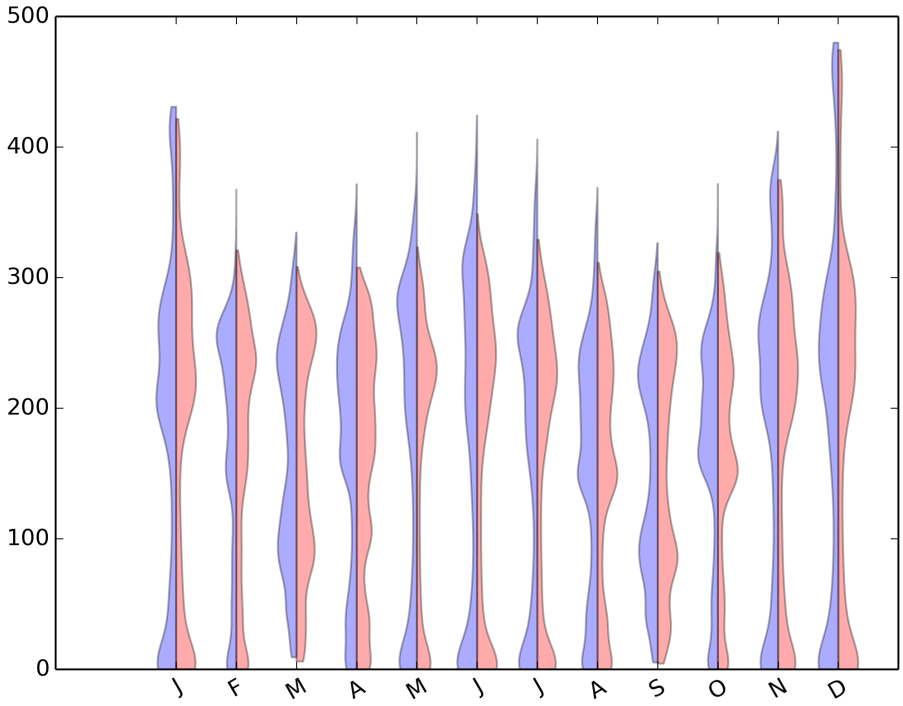



Figure 155: Violin plot for CMIP3-MIROC3-2-HIRES-AMIP

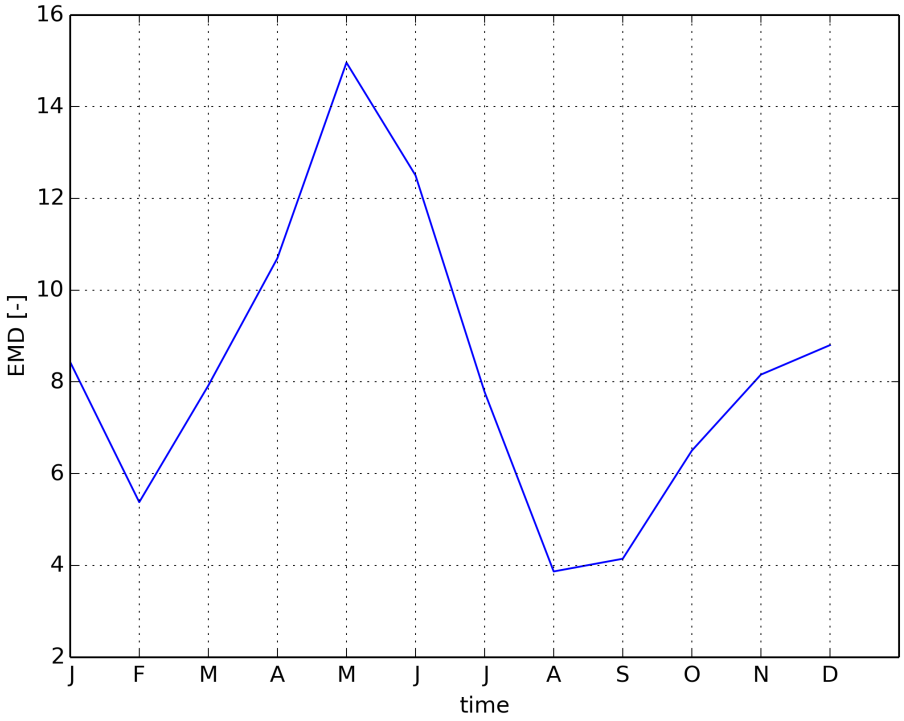



Figure 156: Timeseries of EMD

### 1.1.32 CMIP3 miroc3 2 medres-amip

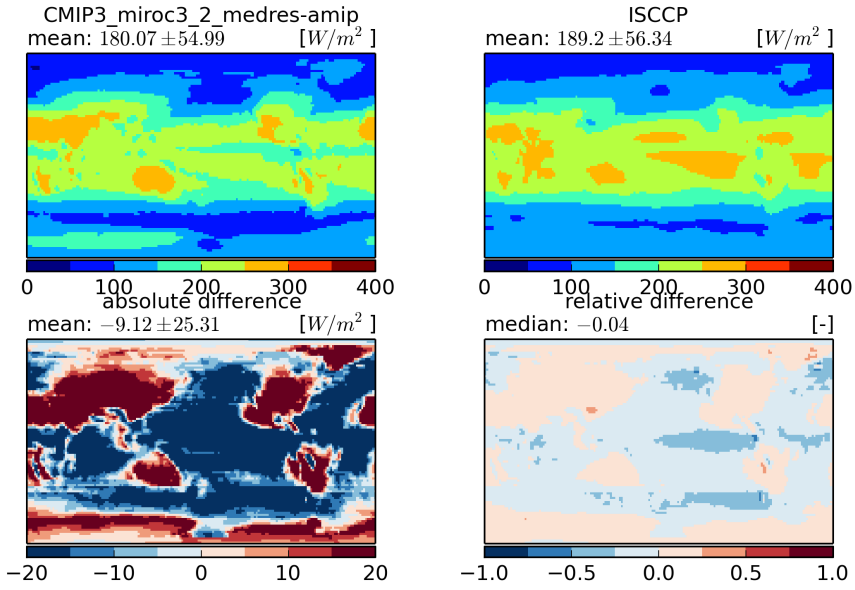



Figure 157: Temporal mean fields (top) and absolute and relative differences (bottom)

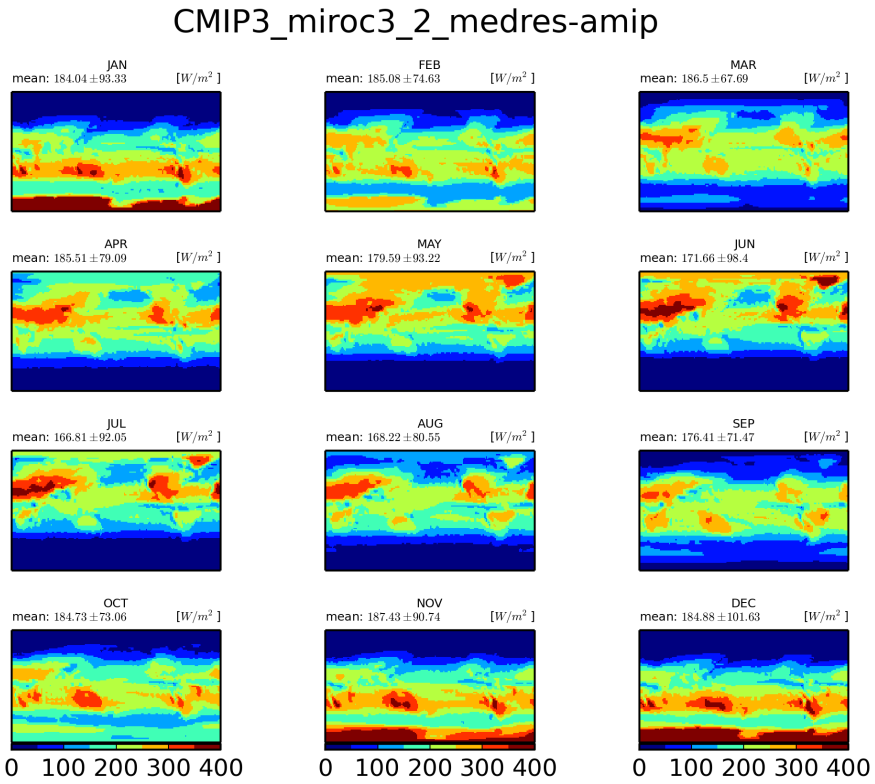



Figure 158: Monthly mean climatology for miroc3-2-medres

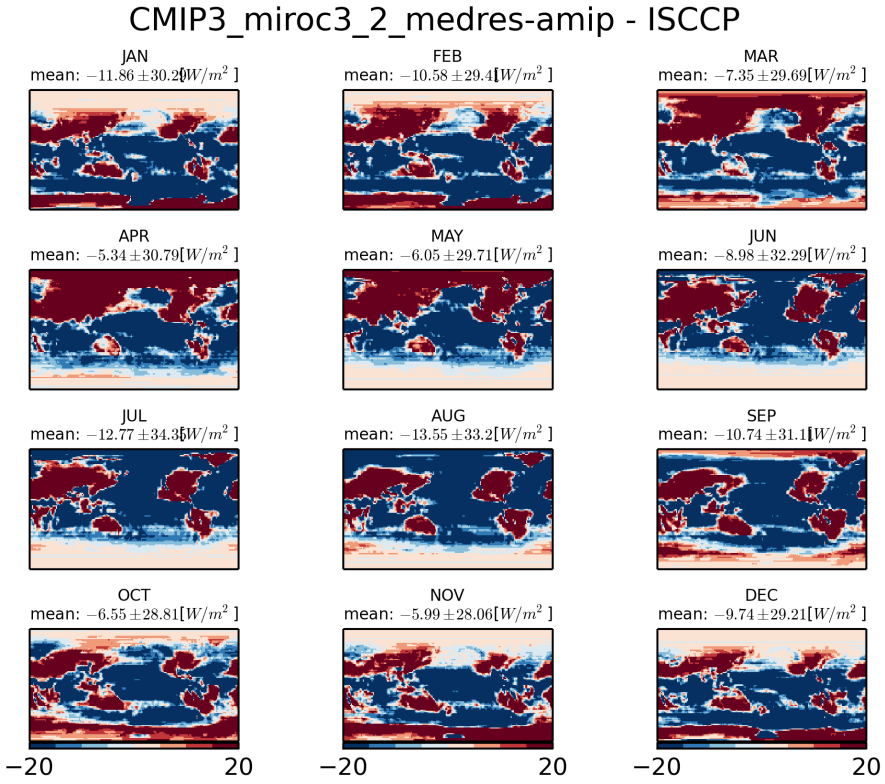



Figure 159: Monthly mean climatology of difference between MIROC3-2-MEDRES and ISCCP

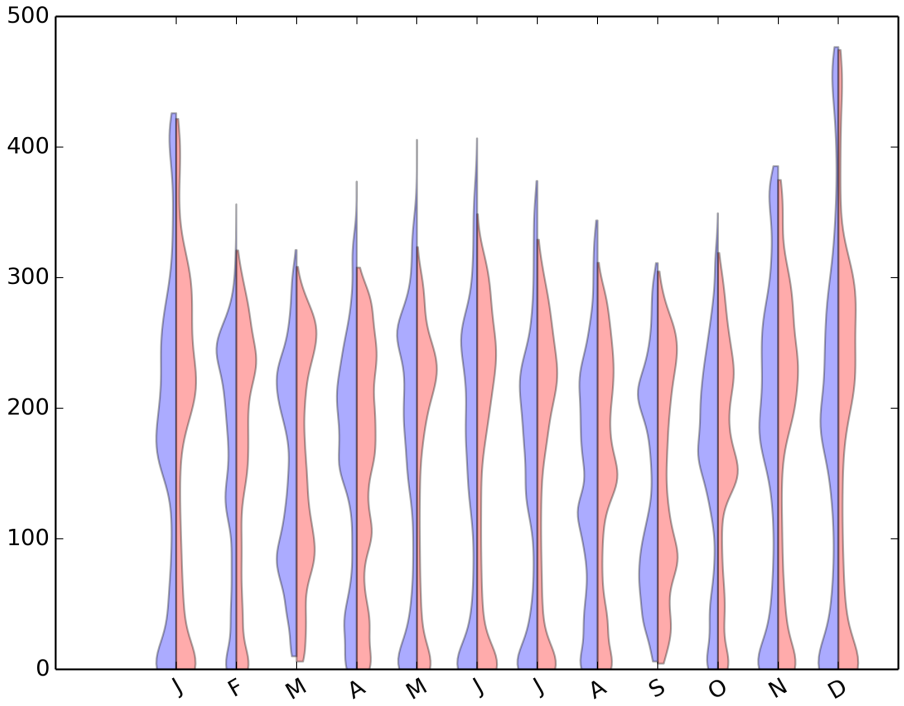



Figure 160: Violin plot for CMIP3-MIROC3-2-MEDRES-AMIP

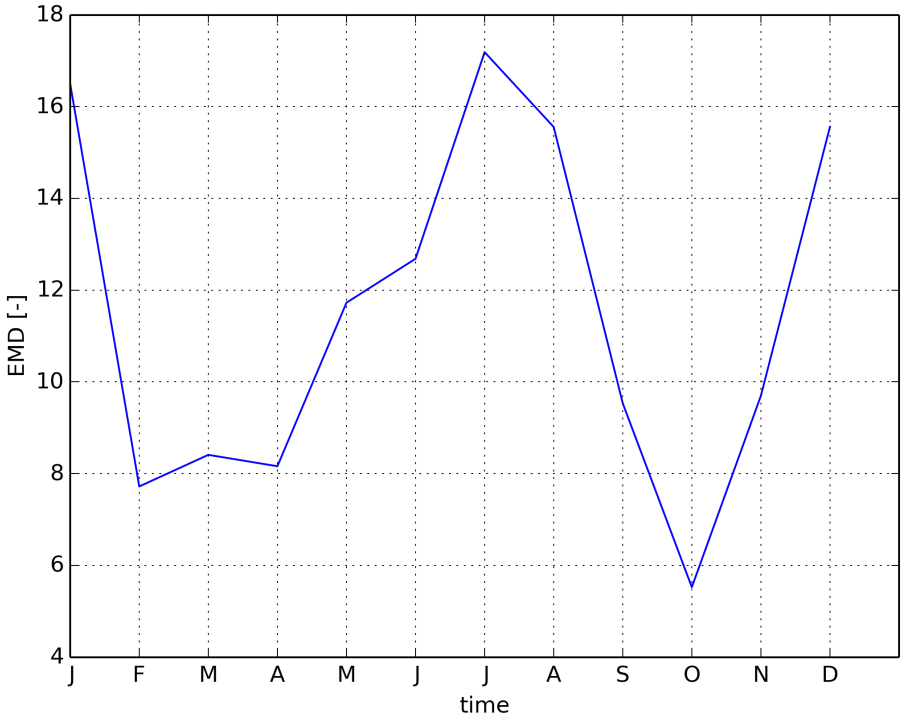



Figure 161: Timeseries of EMD

### 1.1.33 CMIP3 mpi echam5-amip

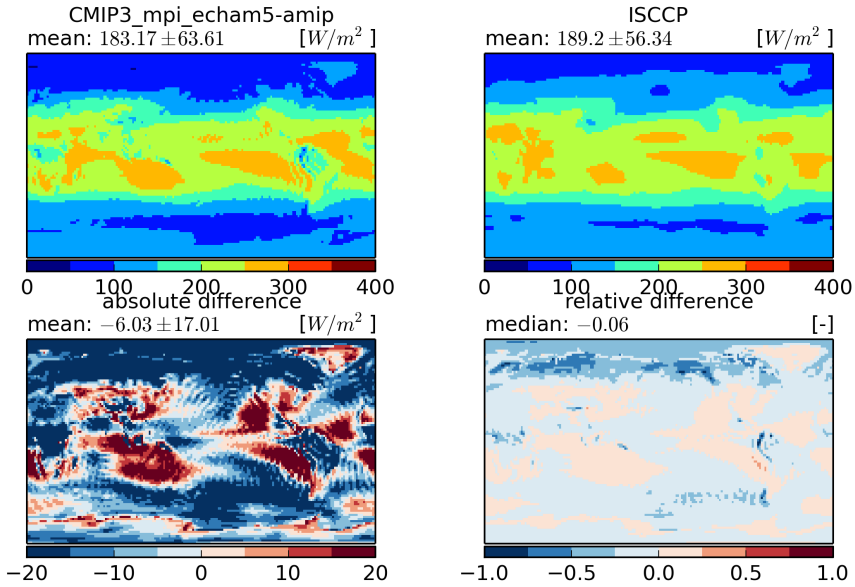



Figure 162: Temporal mean fields (top) and absolute and relative differences (bottom)

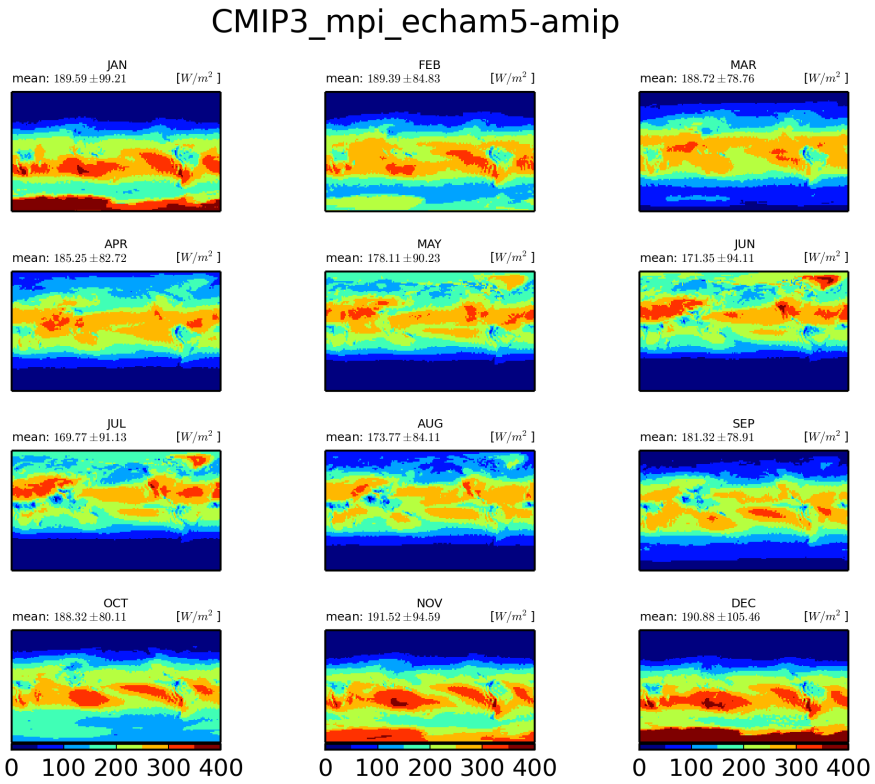



Figure 163: Monthly mean climatology for mpi-echam5

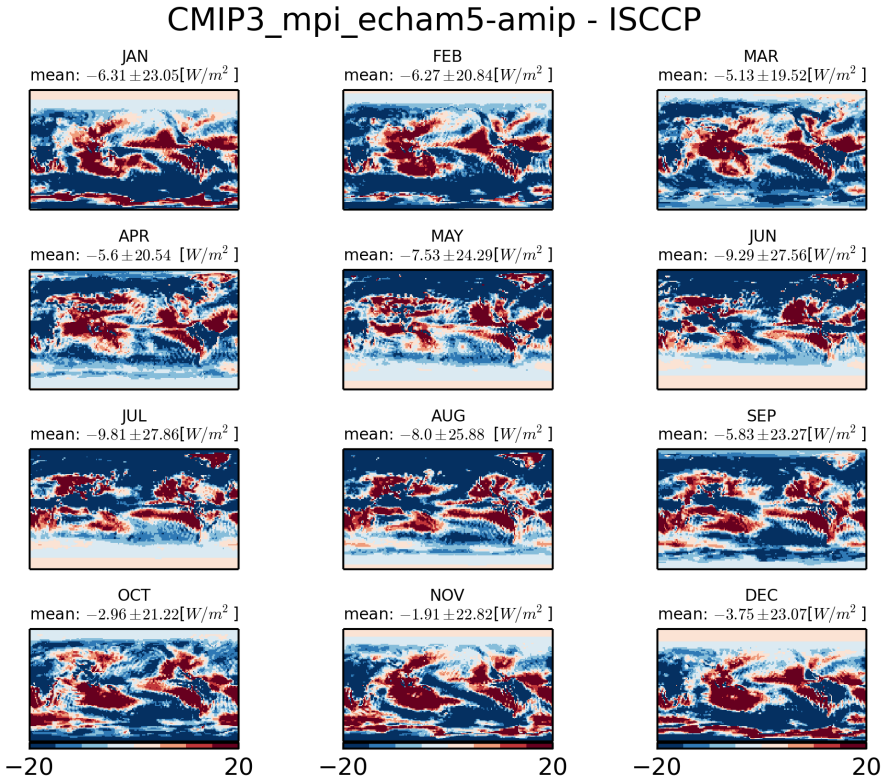



Figure 164: Monthly mean climatology of difference between MPI-ECHAM5 and ISCCP

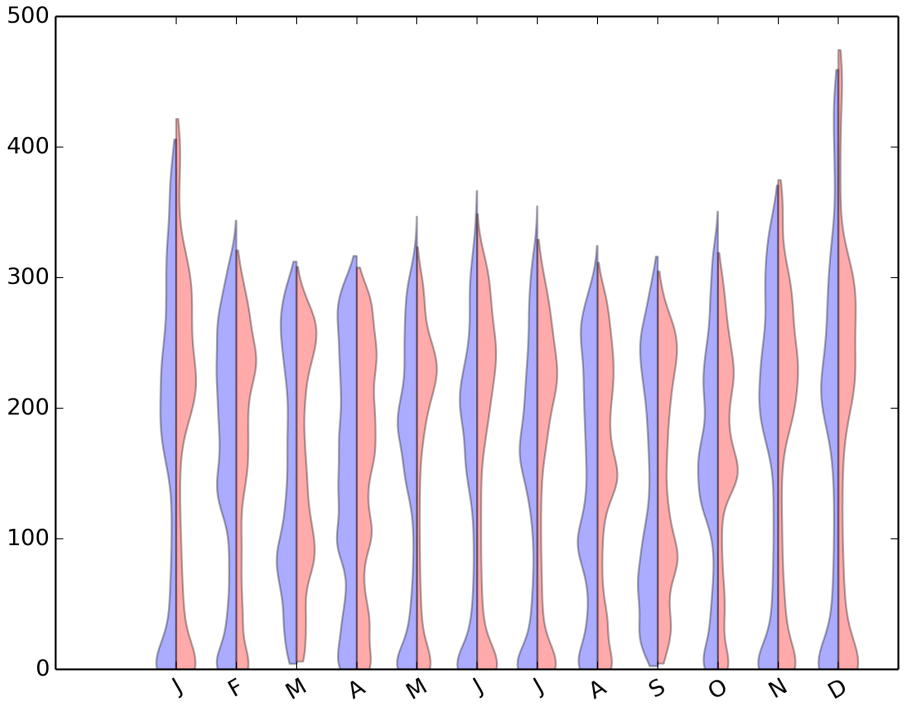



Figure 165: Violin plot for CMIP3-MPI-ECHAM5-AMIP

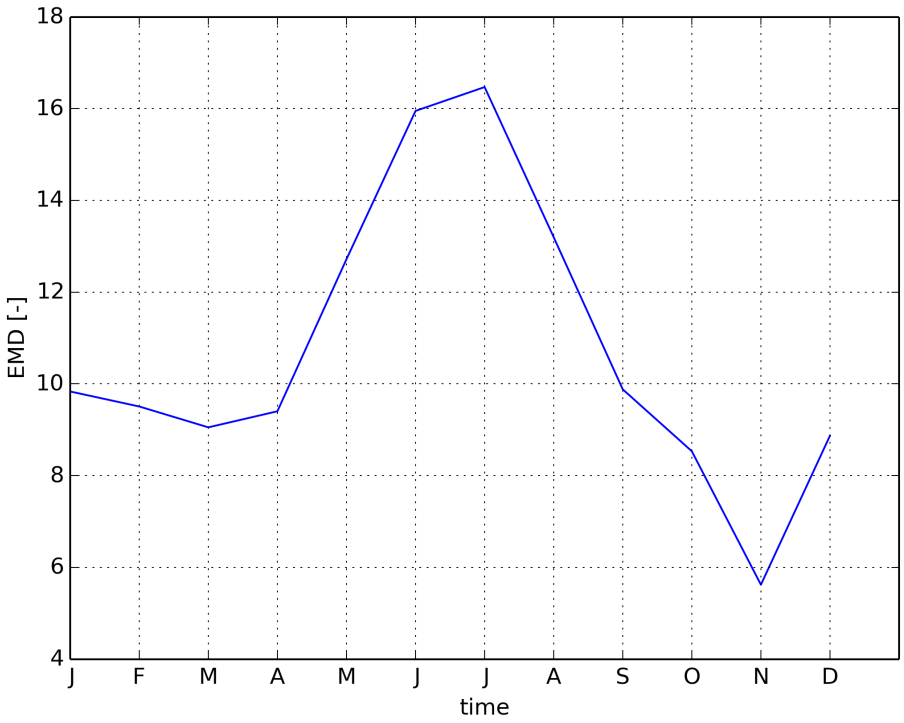



Figure 166: Timeseries of EMD

### 1.1.34 CMIP3 ncar ccsm3 0-amip

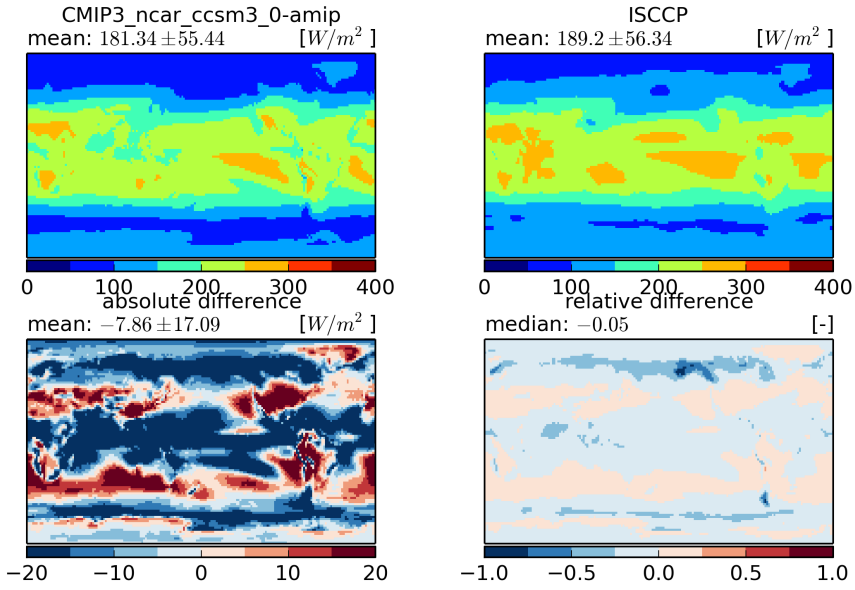



Figure 167: Temporal mean fields (top) and absolute and relative differences (bottom)

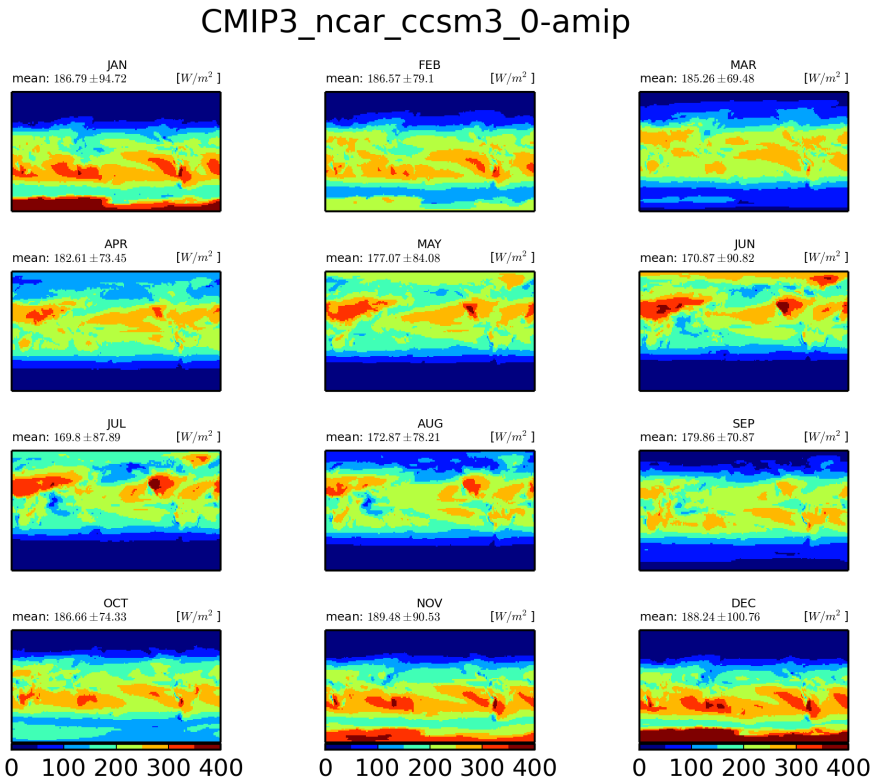



Figure 168: Monthly mean climatology for ncar-ccsm3-0

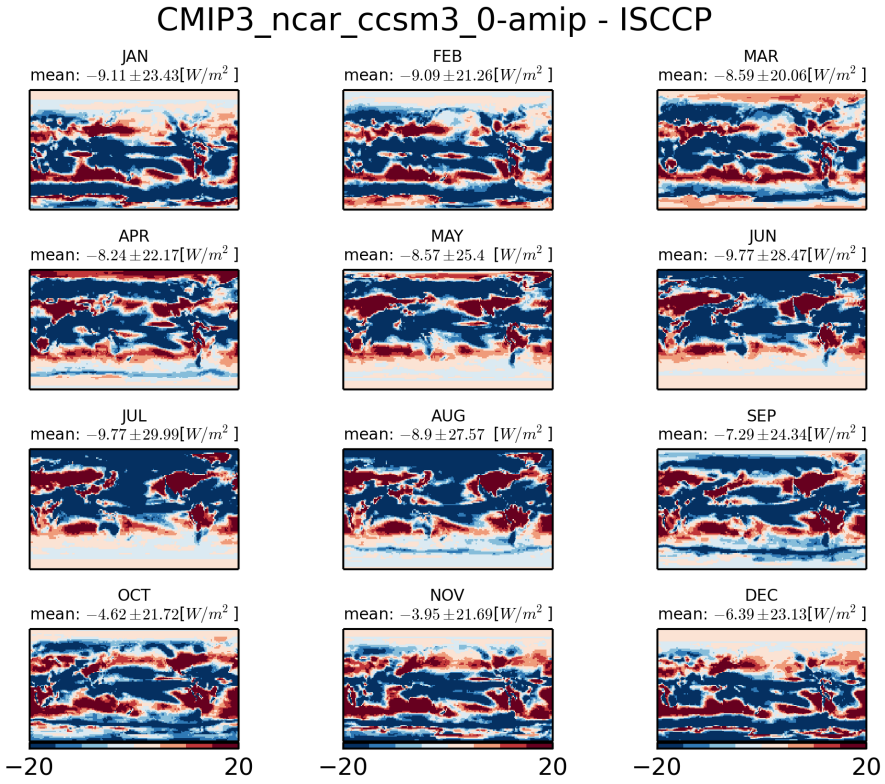



Figure 169: Monthly mean climatology of difference between NCAR-CCSM3-0 and ISCCP

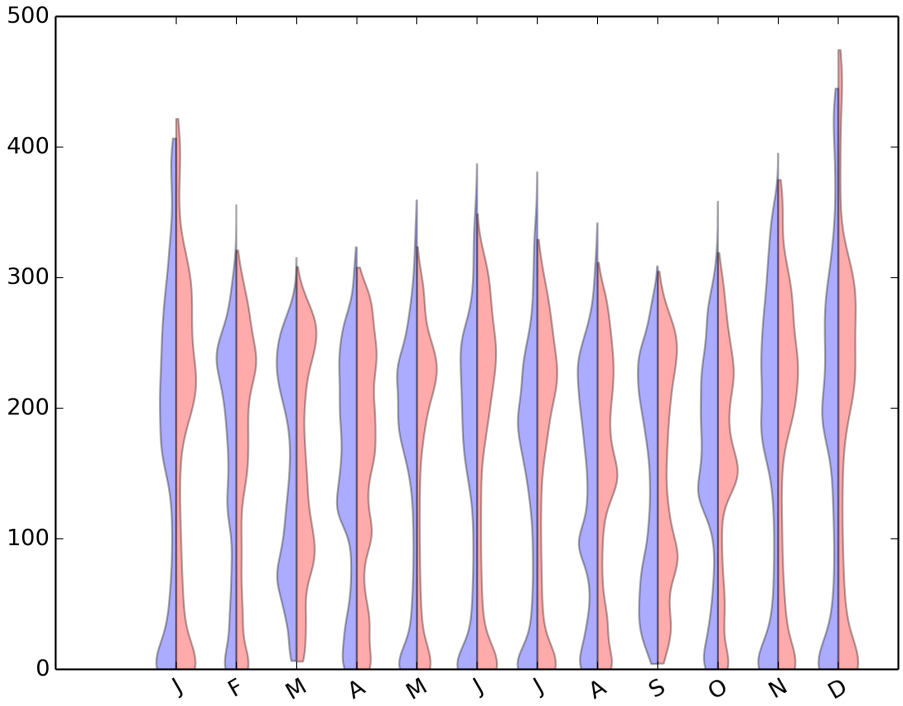



Figure 170: Violin plot for CMIP3-NCAR-CCSM3-0-AMIP

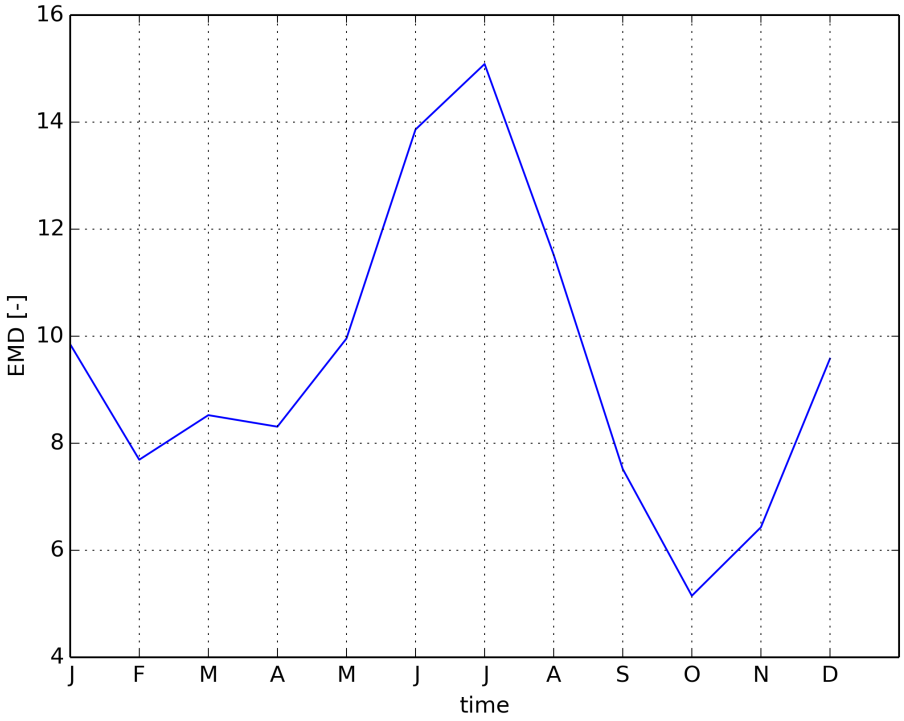



Figure 171: Timeseries of EMD

### 1.1.35 CMIP3 ncar pcm1-amip

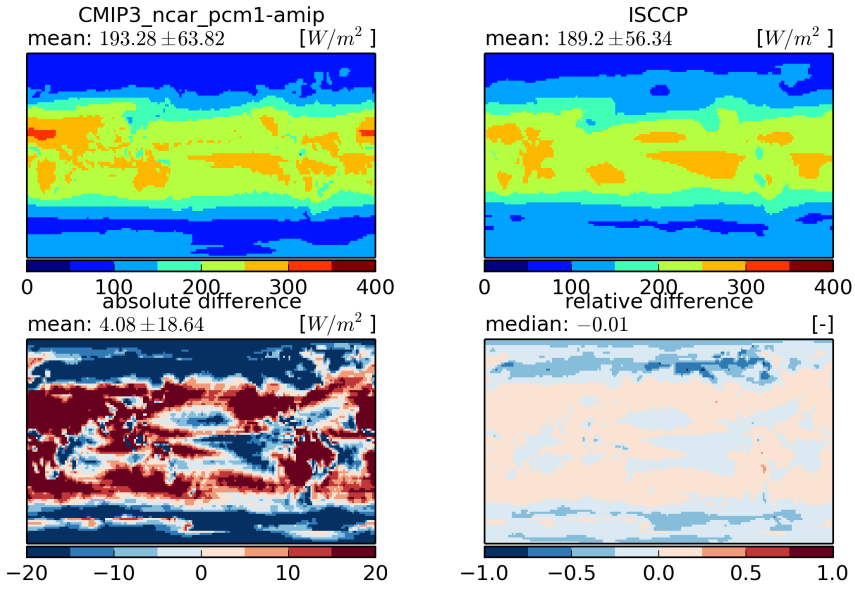



Figure 172: Temporal mean fields (top) and absolute and relative differences (bottom)

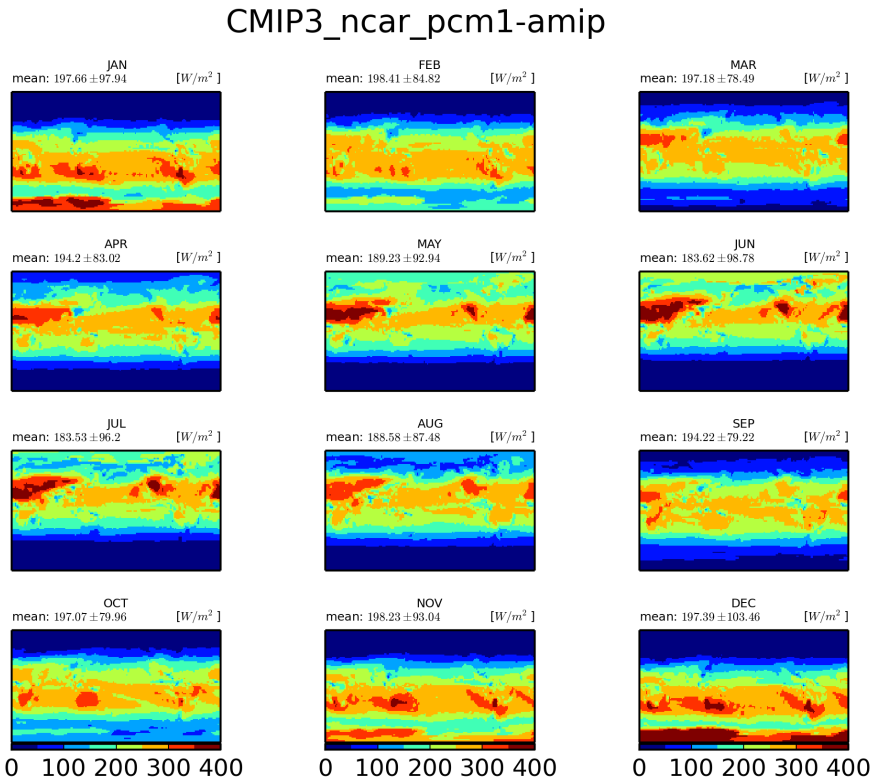



Figure 173: Monthly mean climatology for ncar-pcm1

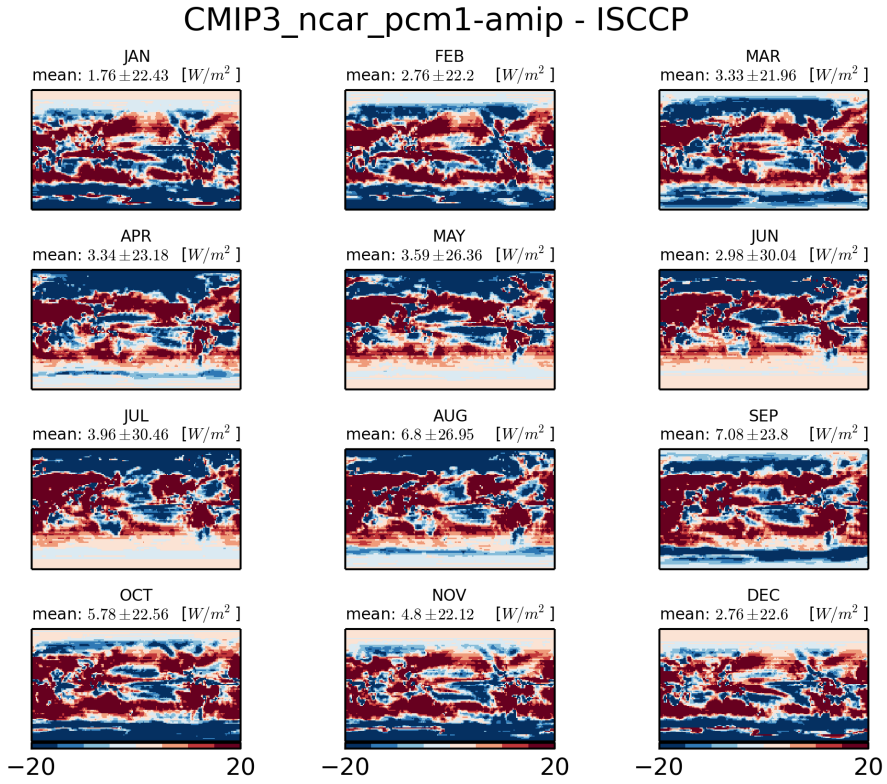



Figure 174: Monthly mean climatology of difference between NCAR-PCM1 and ISCCP

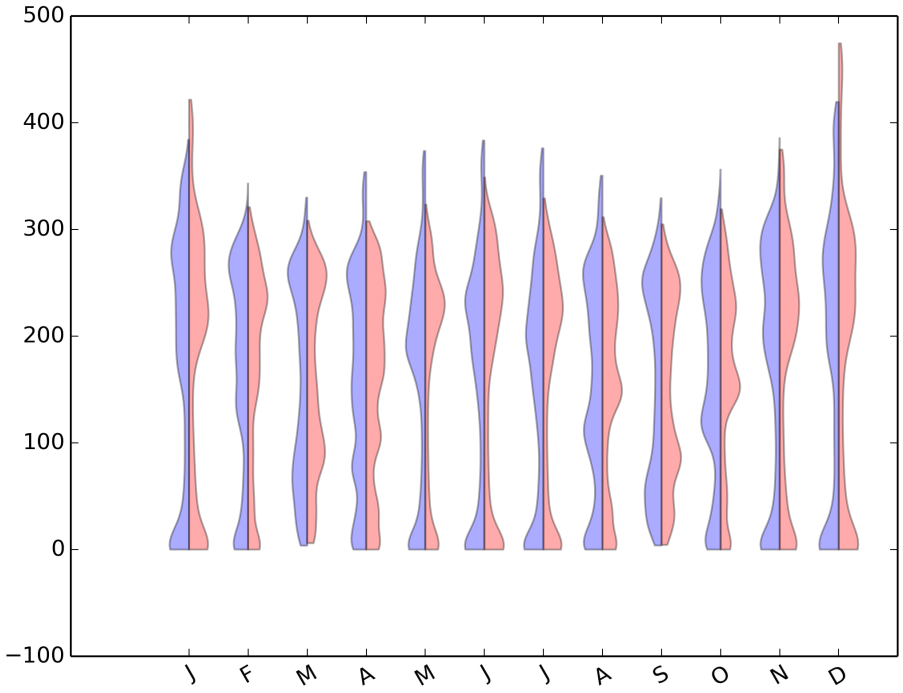



Figure 175: Violin plot for CMIP3-NCAR-PCM1-AMIP

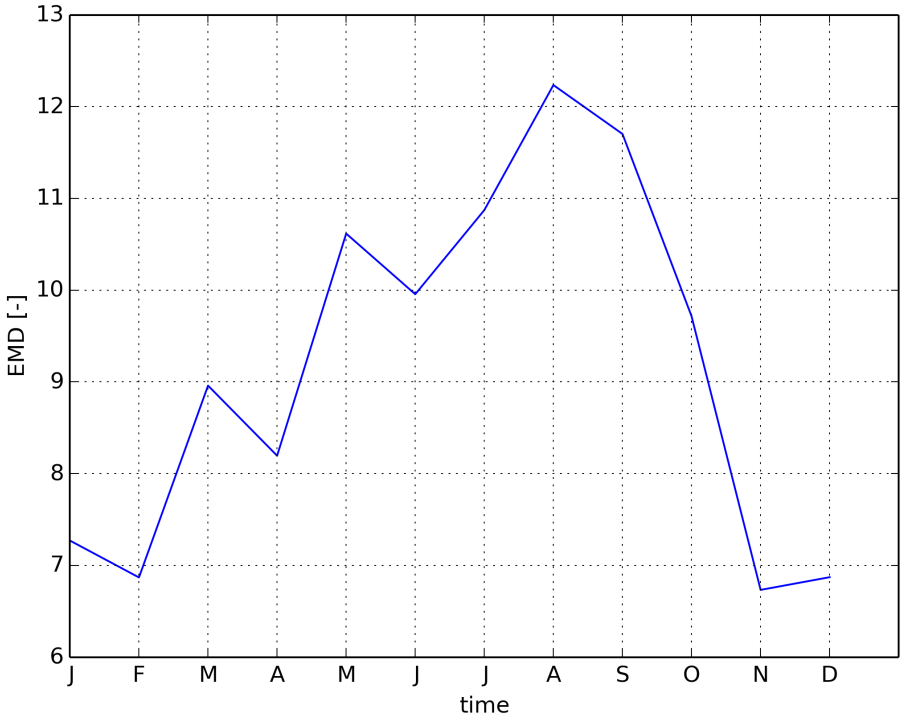



Figure 176: Timeseries of EMD

### 1.1.36 CMIP3 ukmo hadgem1-amip

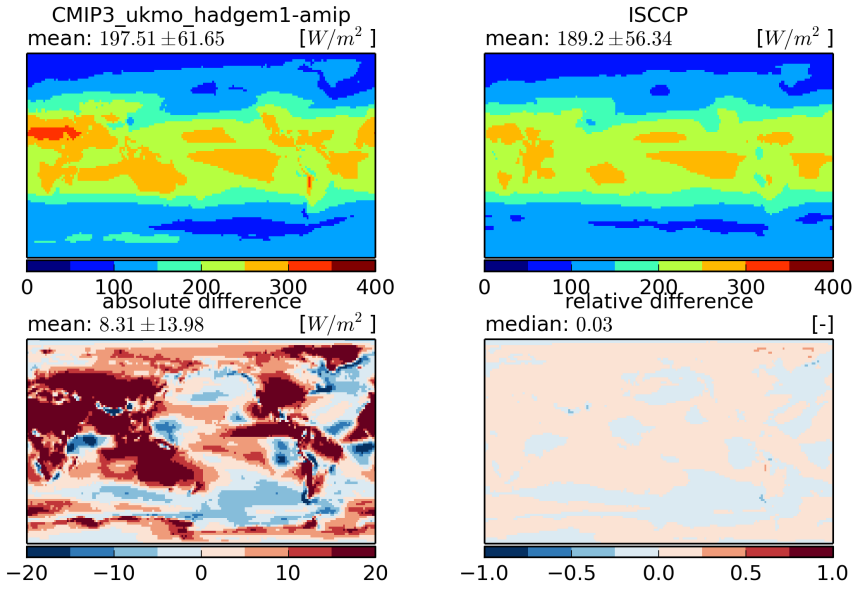



Figure 177: Temporal mean fields (top) and absolute and relative differences (bottom)

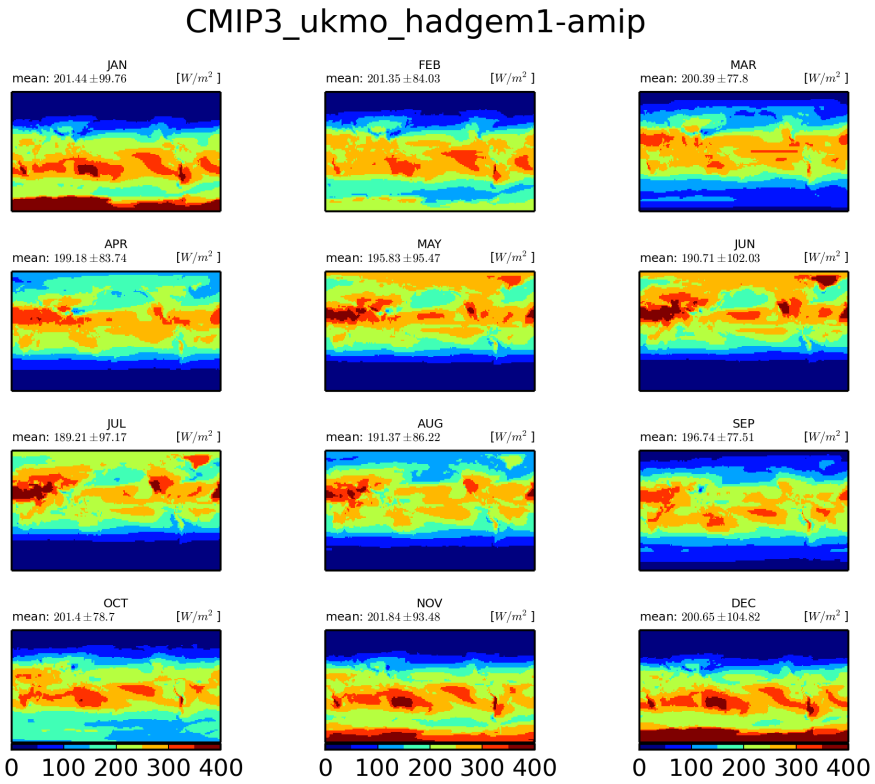



Figure 178: Monthly mean climatology for ukmo-hadgem1

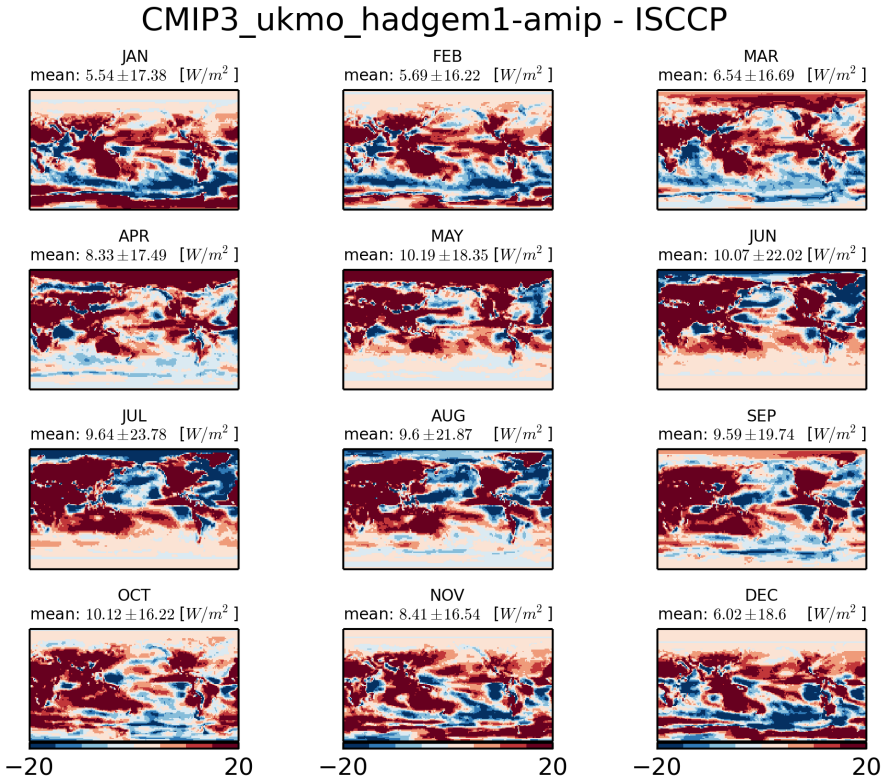



Figure 179: Monthly mean climatology of difference between UKMO-HADGEM1 and ISCCP

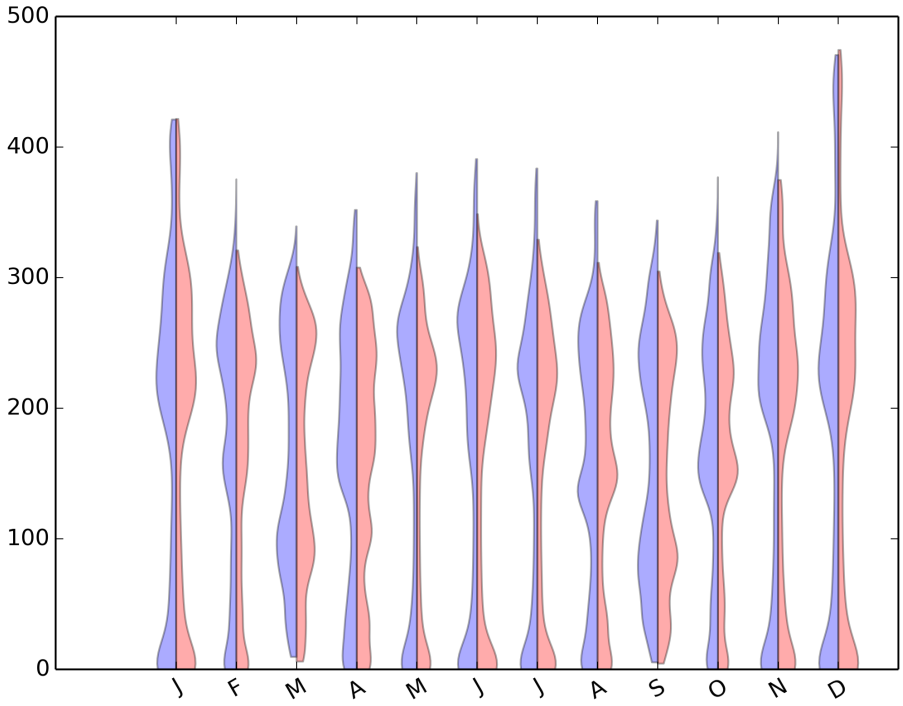



Figure 180: Violin plot for CMIP3-UKMO-HADGEM1-AMIP

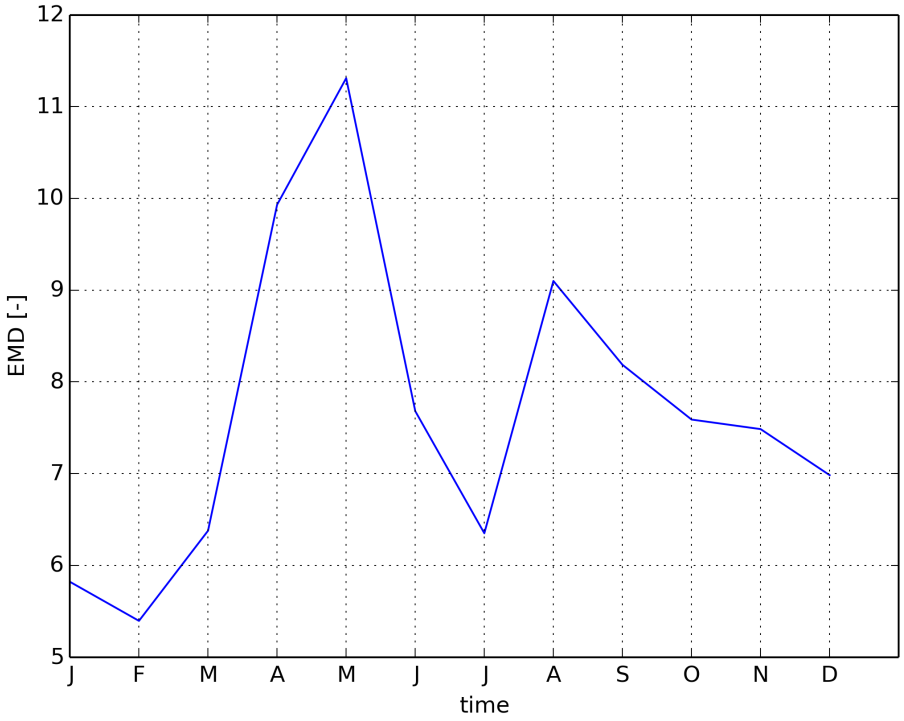



Figure 181: Timeseries of EMD

### 1.1.37 model mean

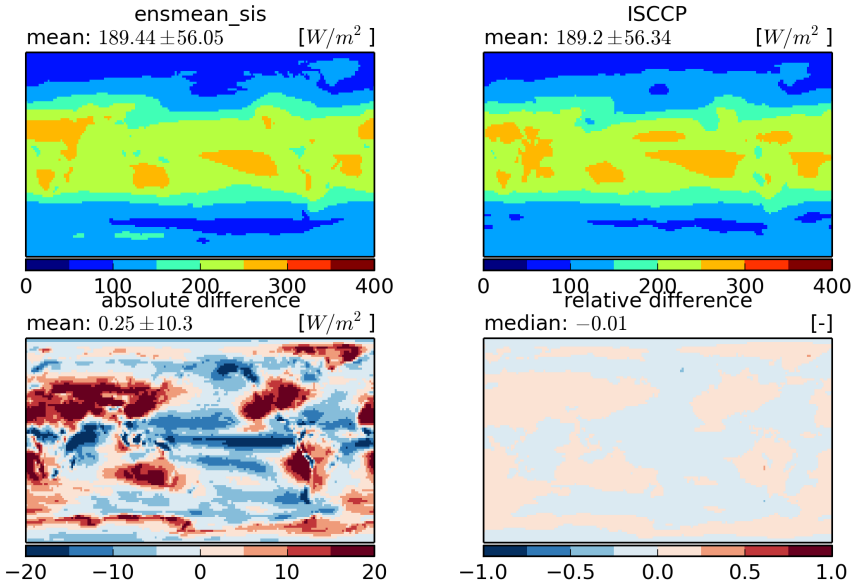



Figure 182: Temporal mean fields (top) and absolute and relative differences (bottom)

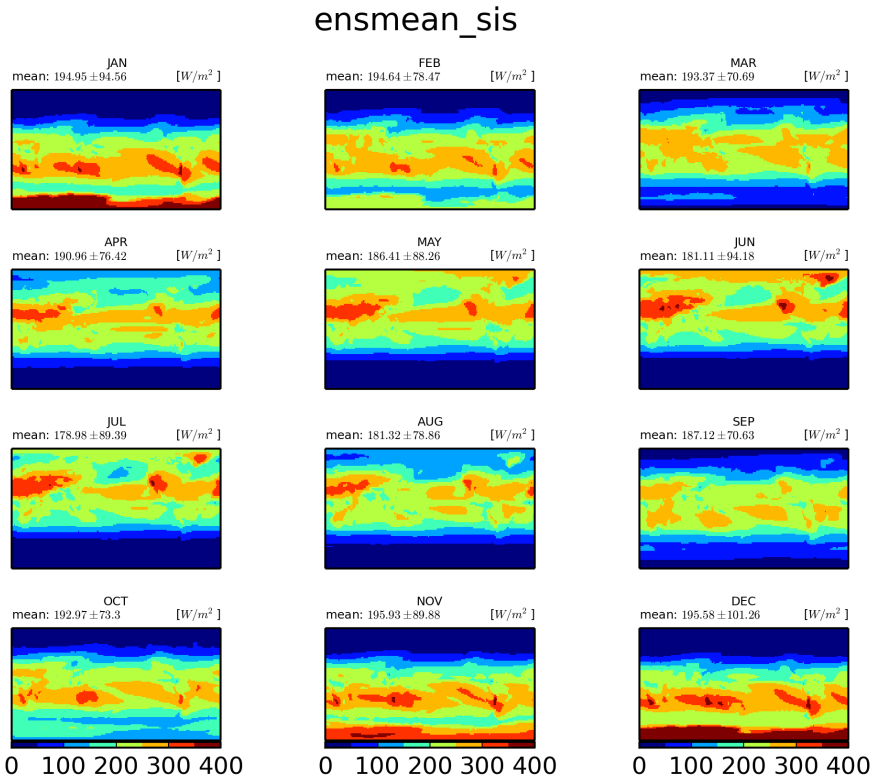



Figure 183: Monthly mean climatology for mean-model

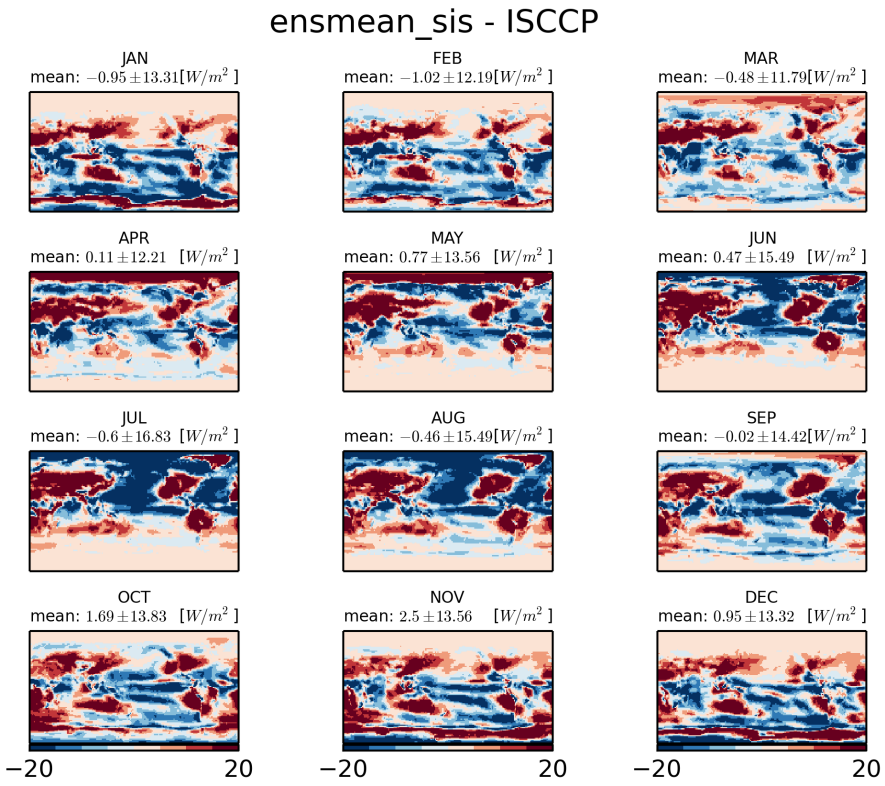



Figure 184: Monthly mean climatology of difference between MEAN-MODEL and ISCCP

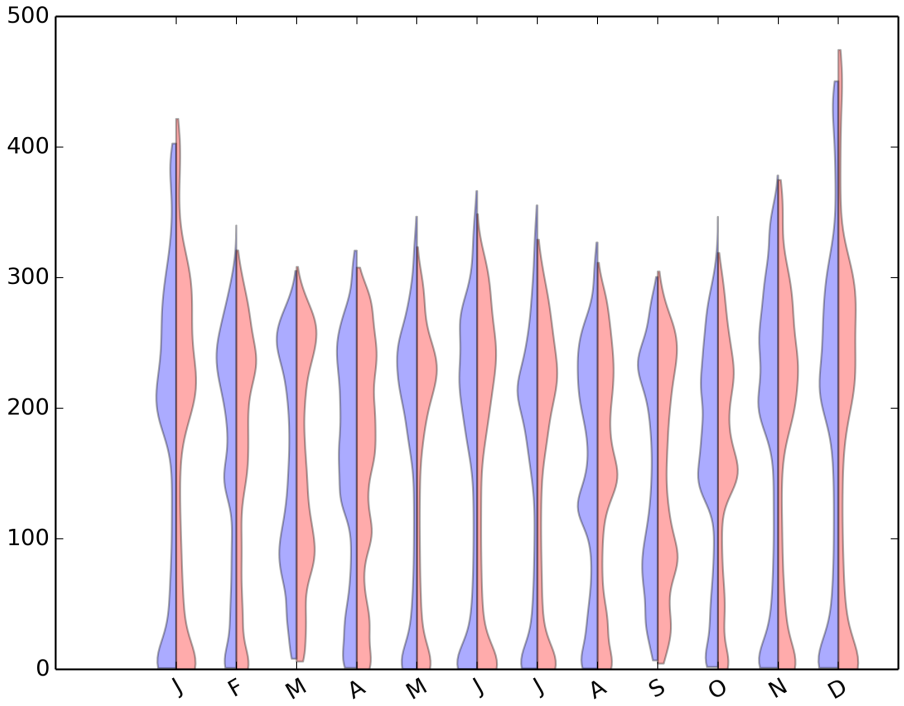



Figure 185: Violin plot for ENSMEAN-SIS

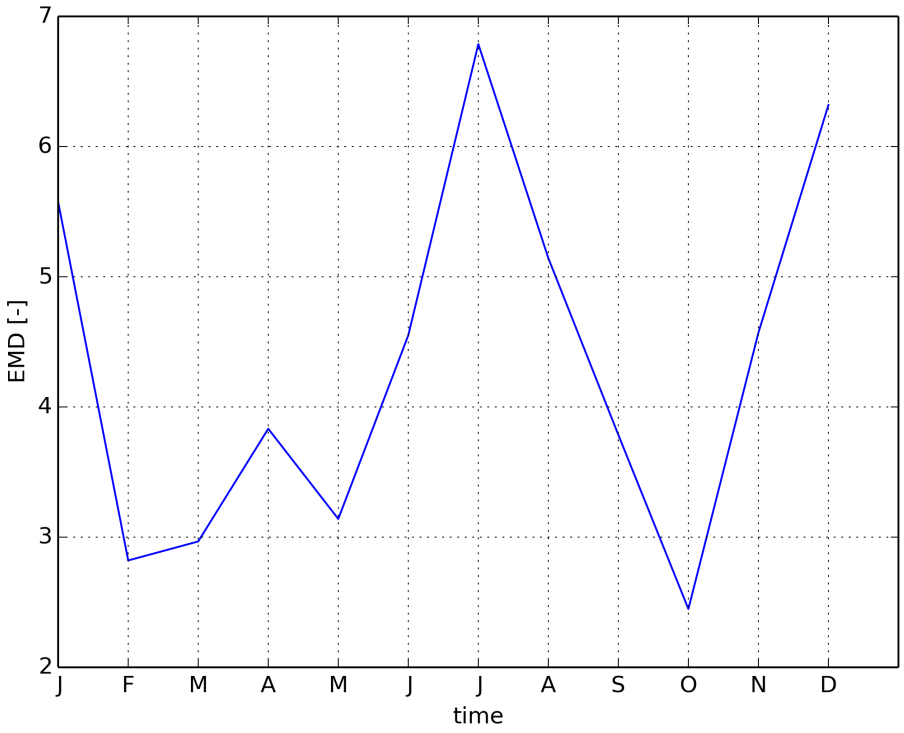



Figure 186: Timeseries of EMD

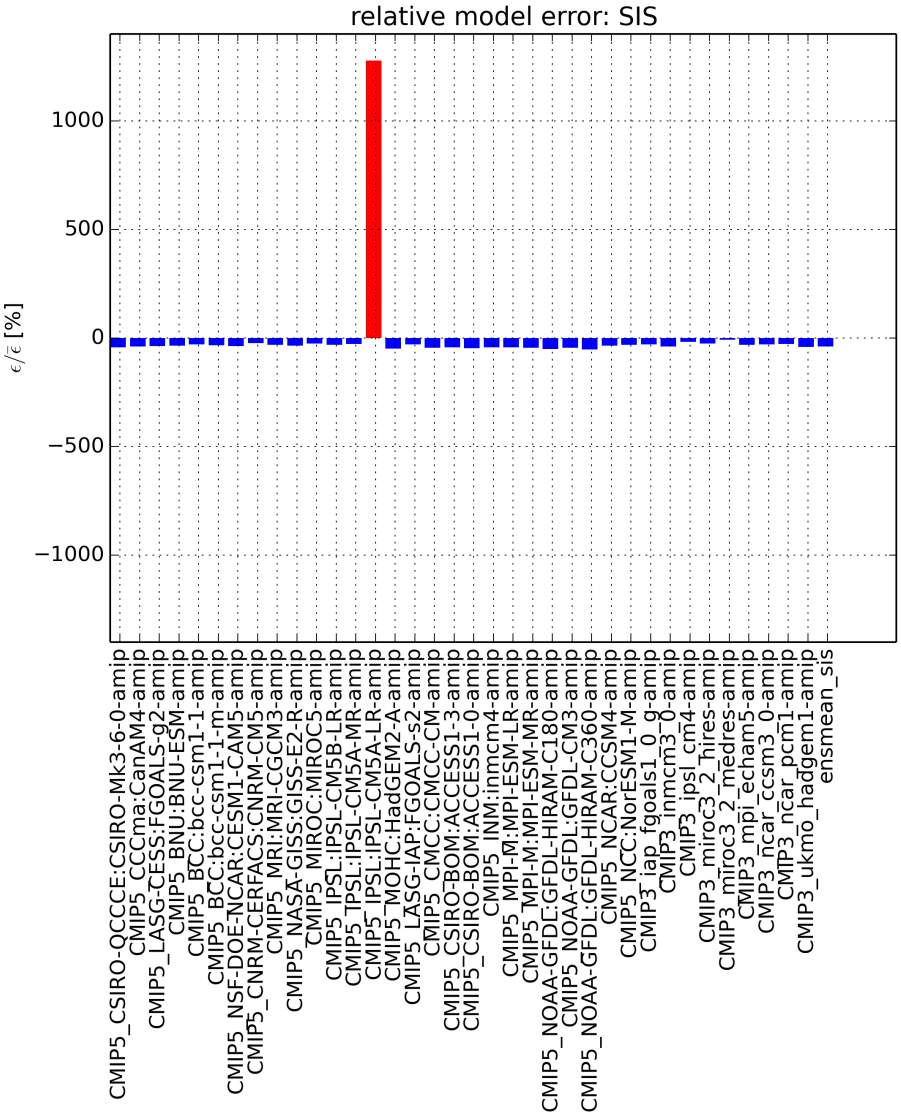



Figure 187: Relative model performance for SIS

## 1.2 CLARA

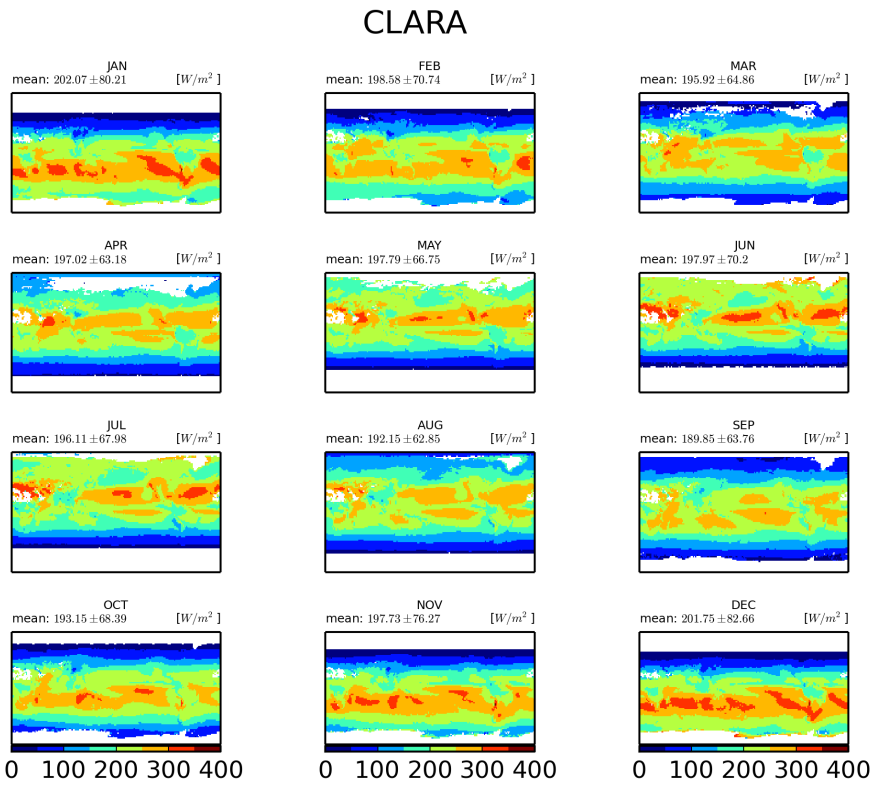



Figure 188: Monthly mean CLARA

### 1.2.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

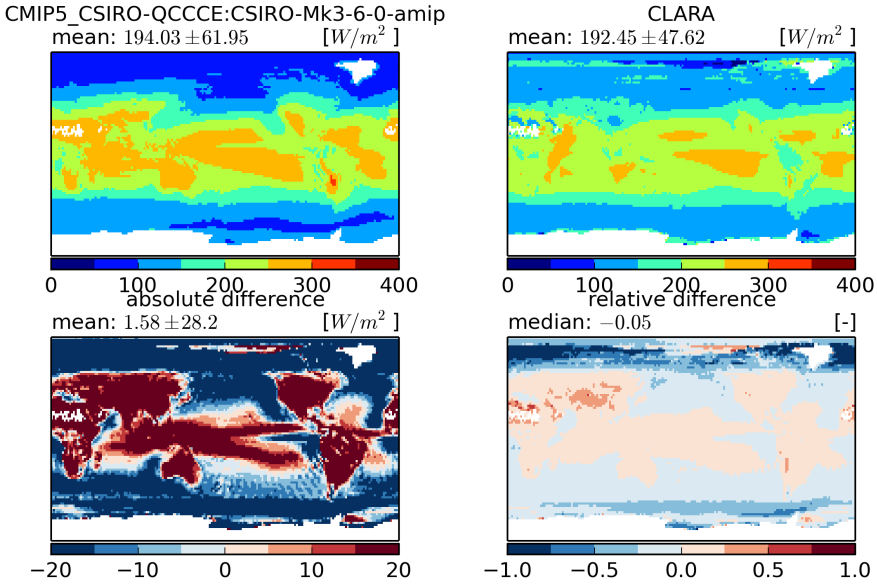



Figure 189: Temporal mean fields (top) and absolute and relative differences (bottom)

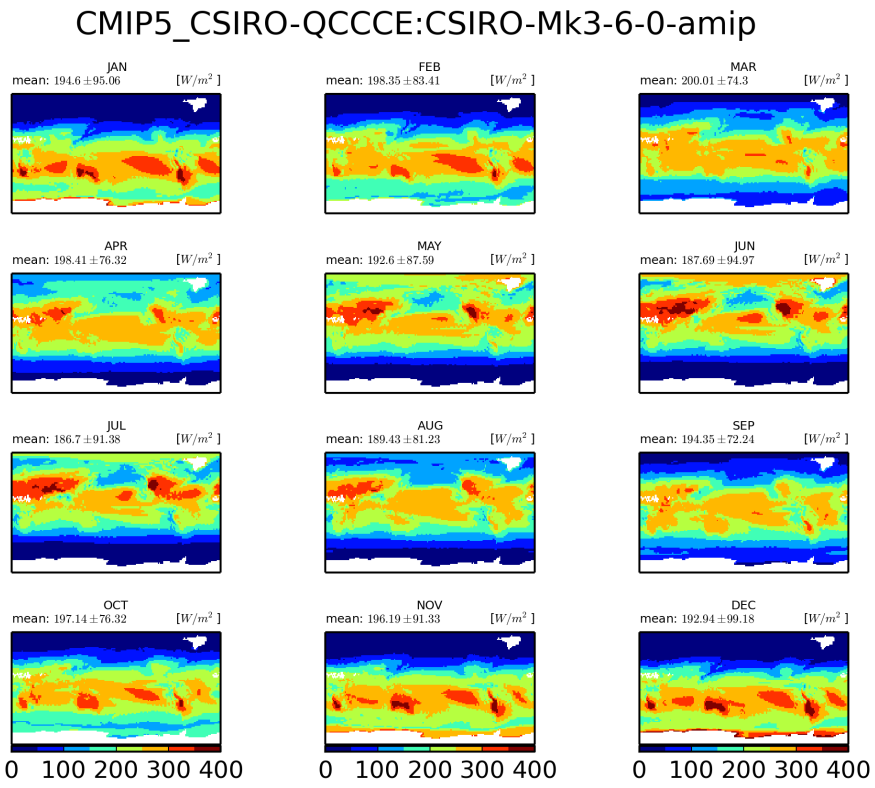



Figure 190: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

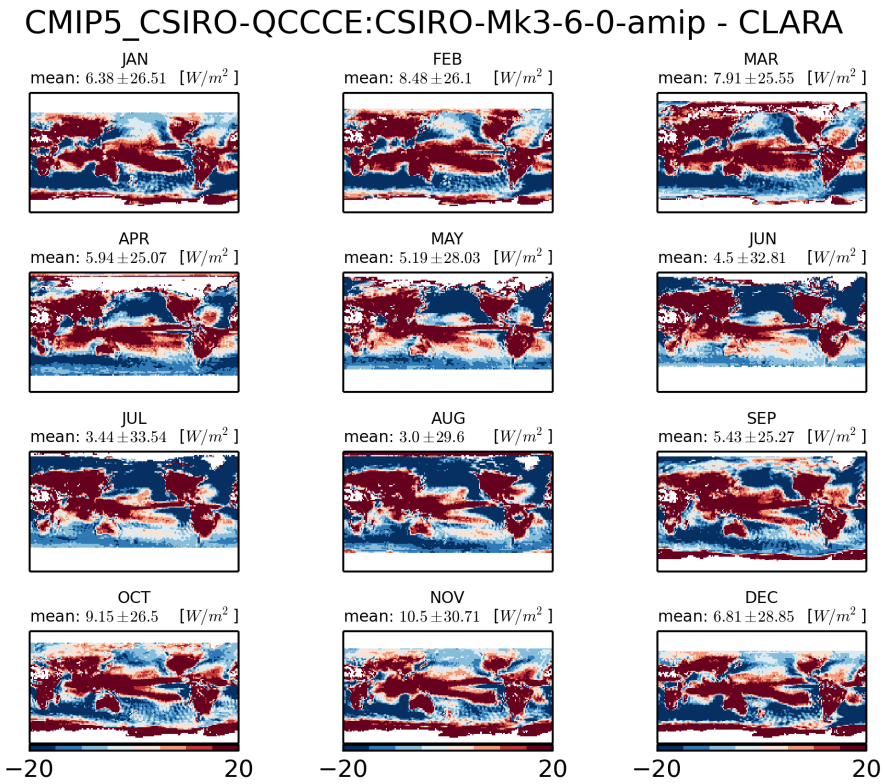



Figure 191: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and CLARA

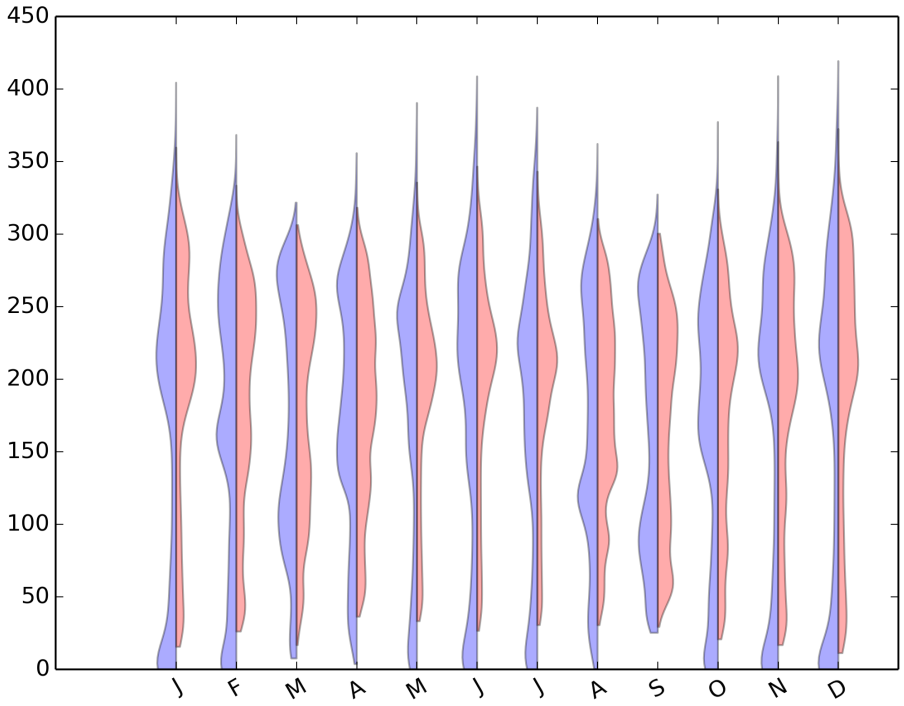



Figure 192: Violin plot for CMIP5-CSIRO-QCCCE:CSIRO-MK3-6-0-AMIP

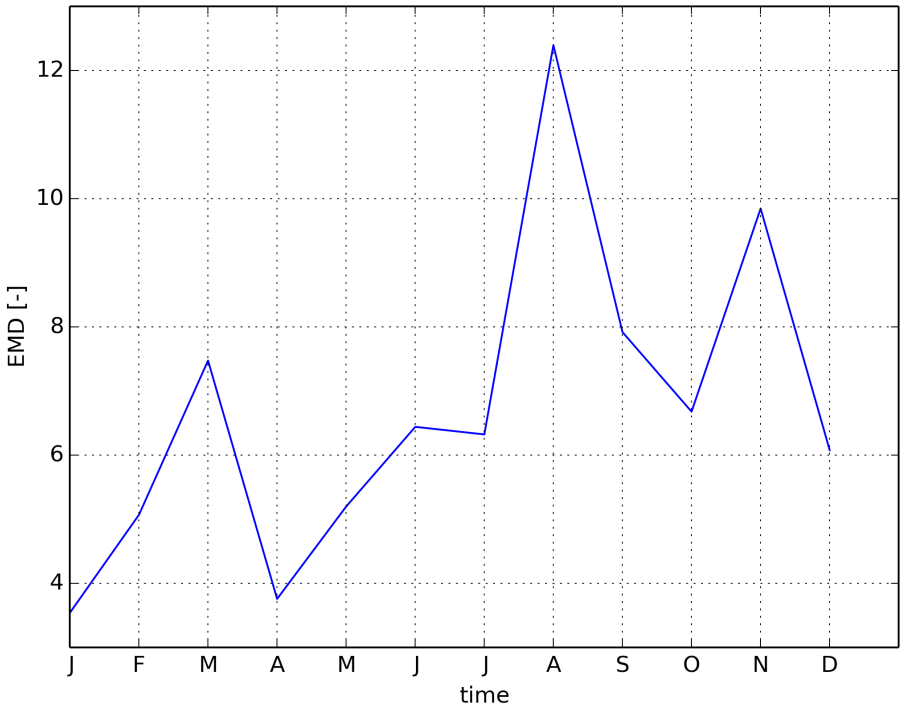



Figure 193: Timeseries of EMD

### 1.2.2 CMIP5 CCCma:CanAM4-amip

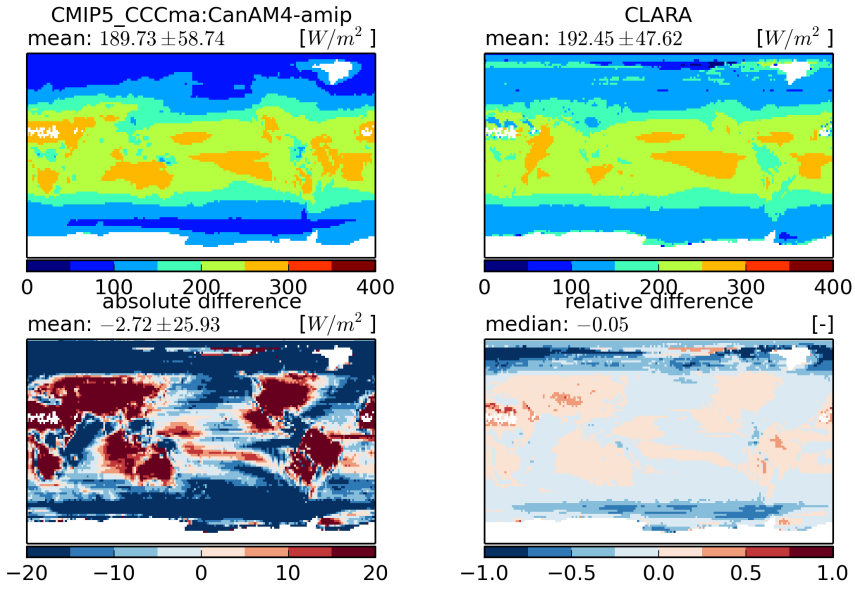



Figure 194: Temporal mean fields (top) and absolute and relative differences (bottom)

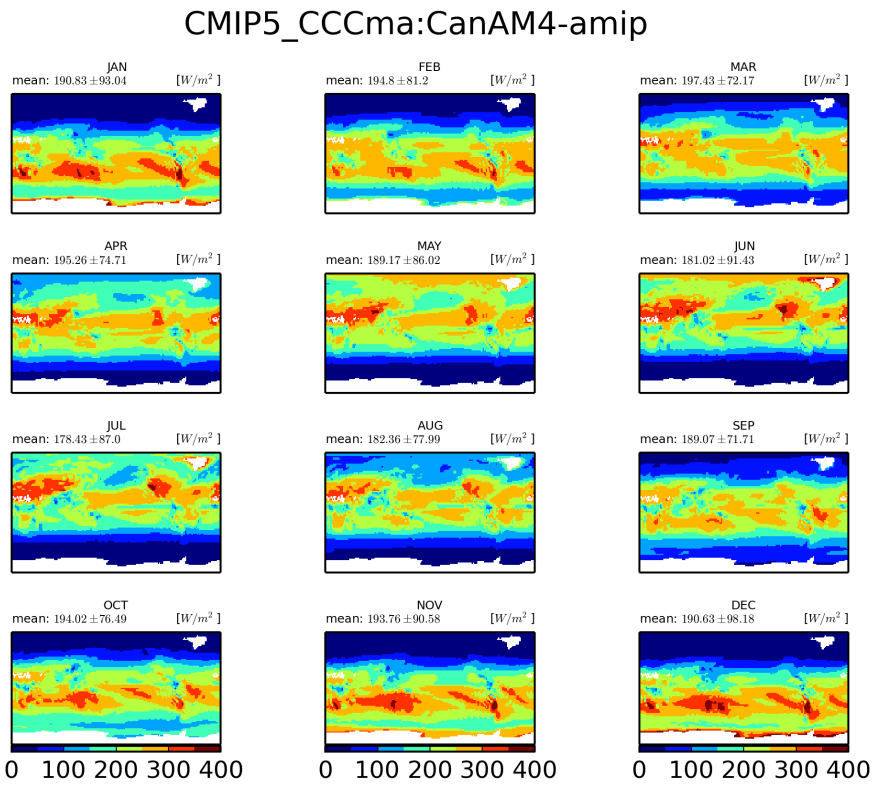



Figure 195: Monthly mean climatology for CCCma:CanAM4

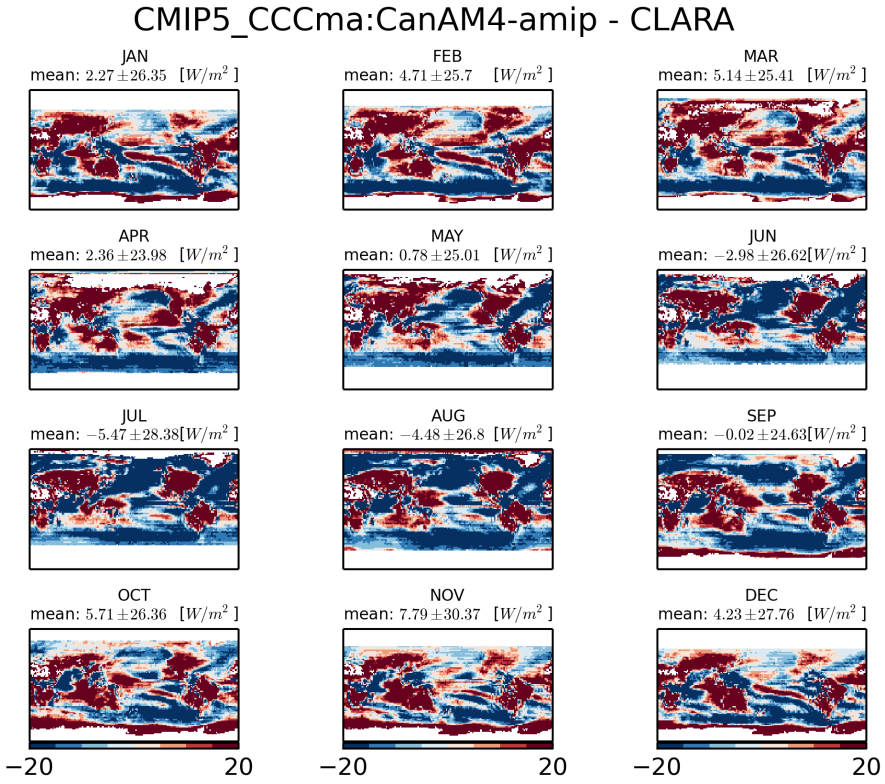



Figure 196: Monthly mean climatology of difference between CCCMA:CANAM4 and CLARA

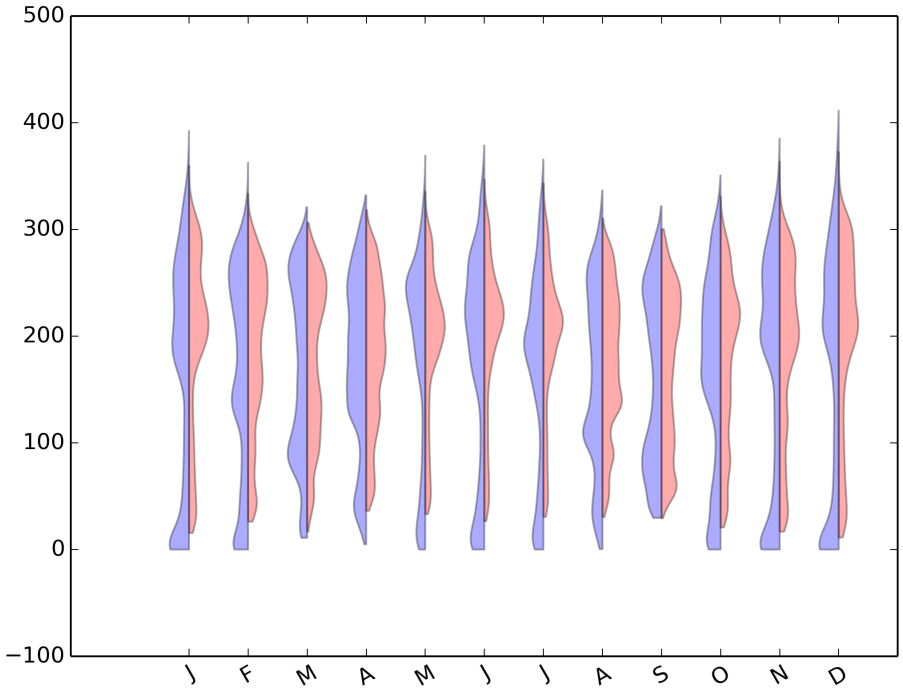



Figure 197: Violin plot for CMIP5-CCCMA:CANAM4-AMIP

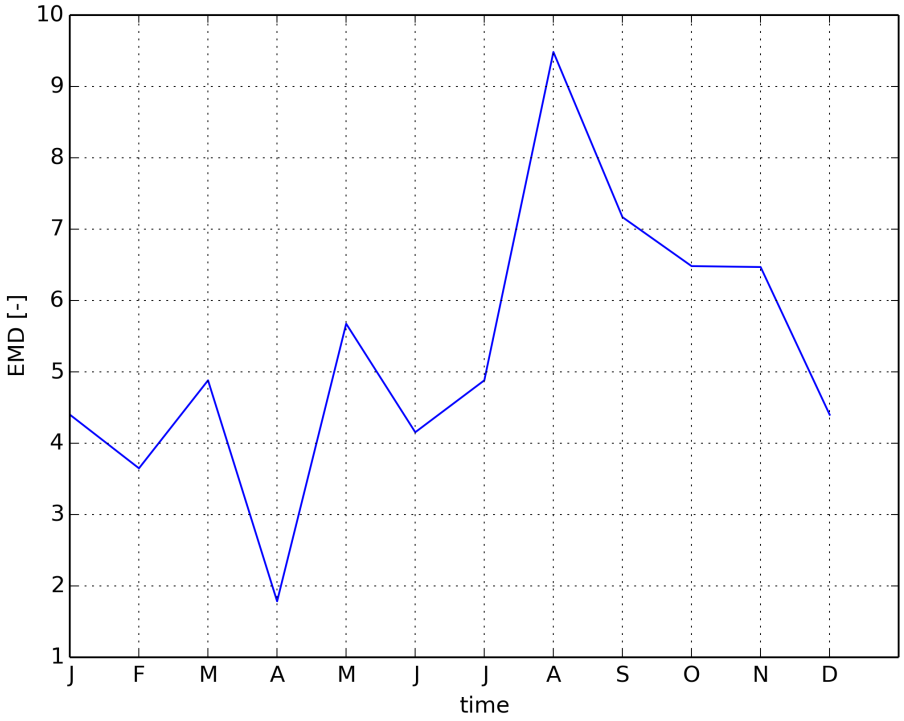



Figure 198: Timeseries of EMD

### 1.2.3 CMIP5 LASG-CESS:FGOALS-g2-amip

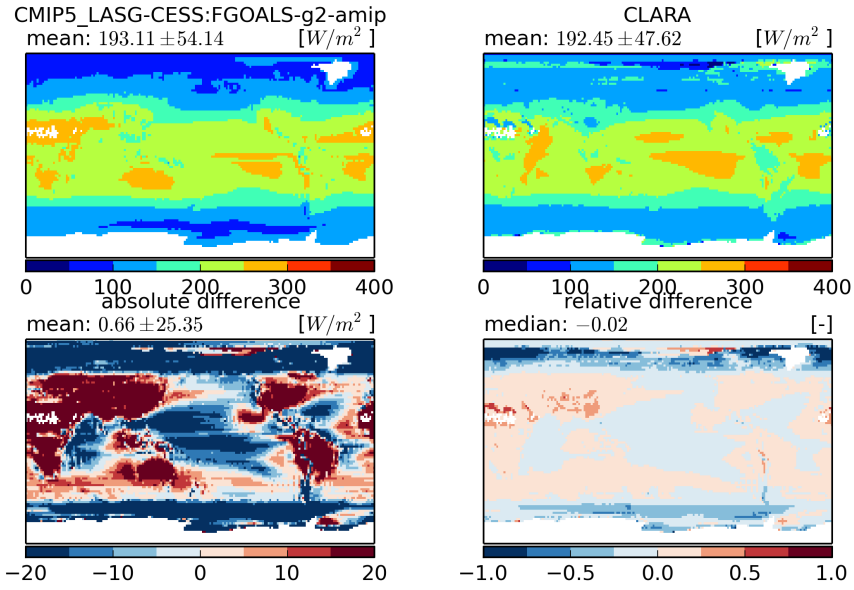



Figure 199: Temporal mean fields (top) and absolute and relative differences (bottom)

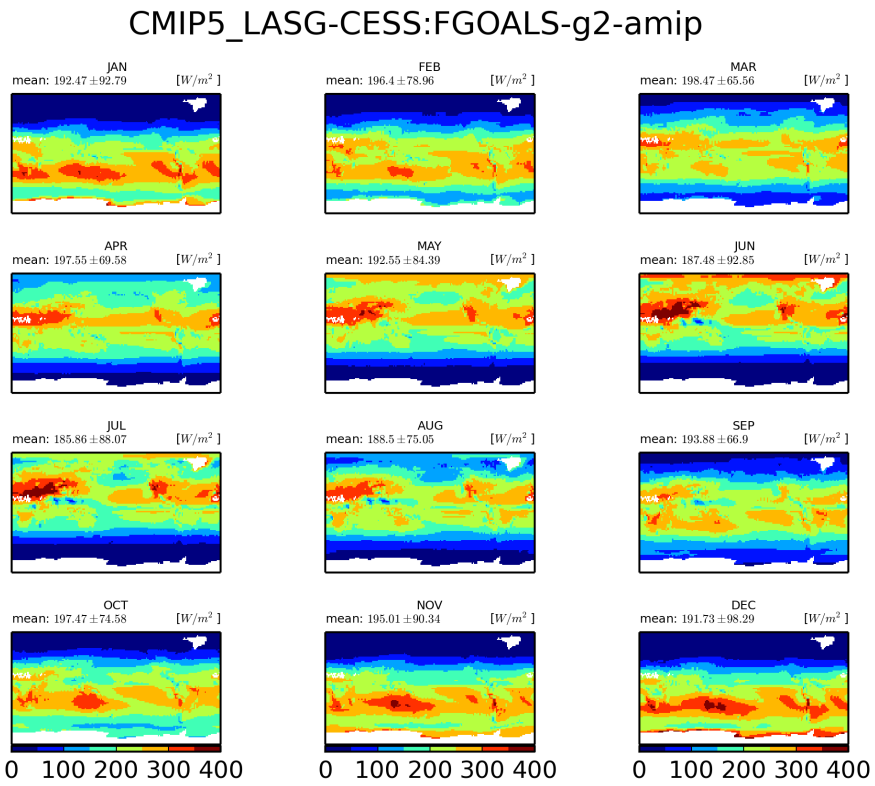



Figure 200: Monthly mean climatology for LASG-CESS:FGOALS-g2

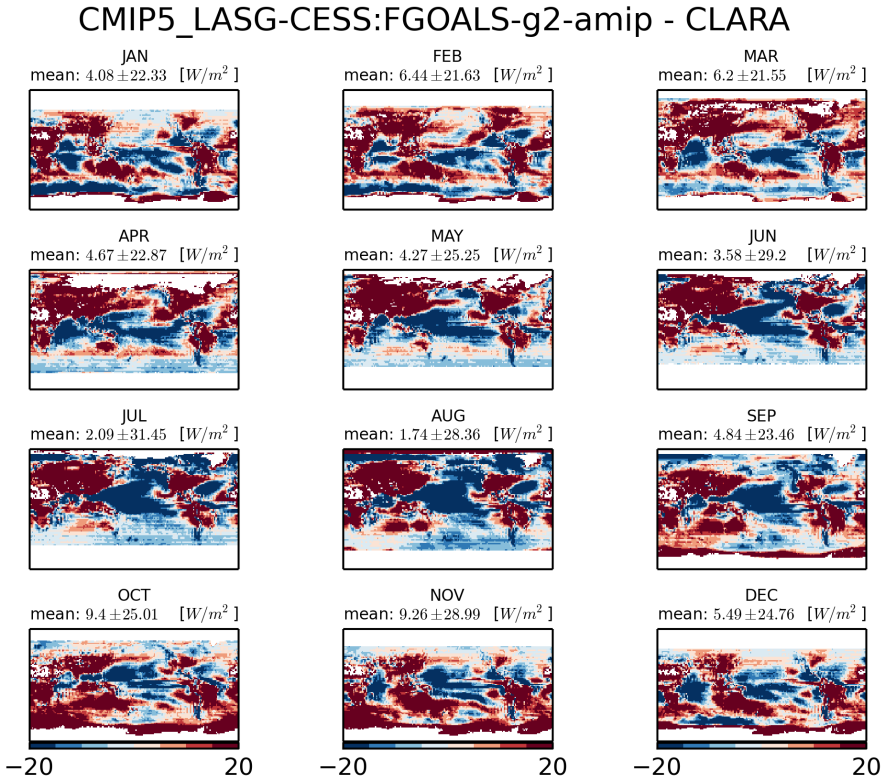



Figure 201: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and CLARA

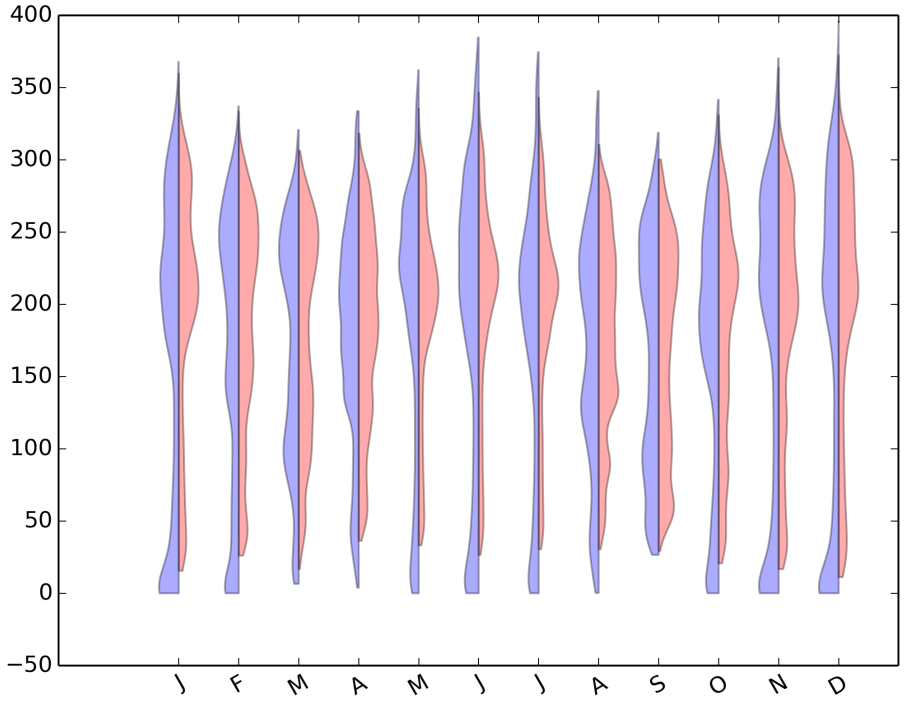



Figure 202: Violin plot for CMIP5-LASG-CESS:FGOALS-G2-AMIP

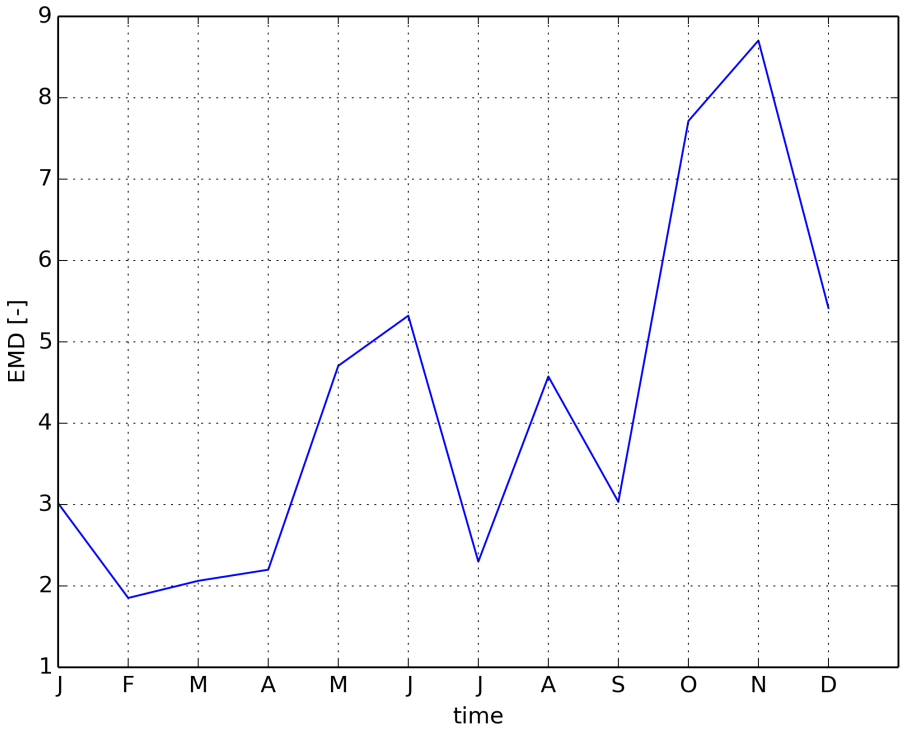



Figure 203: Timeseries of EMD

### 1.2.4 CMIP5 BNU:BNU-ESM-amip

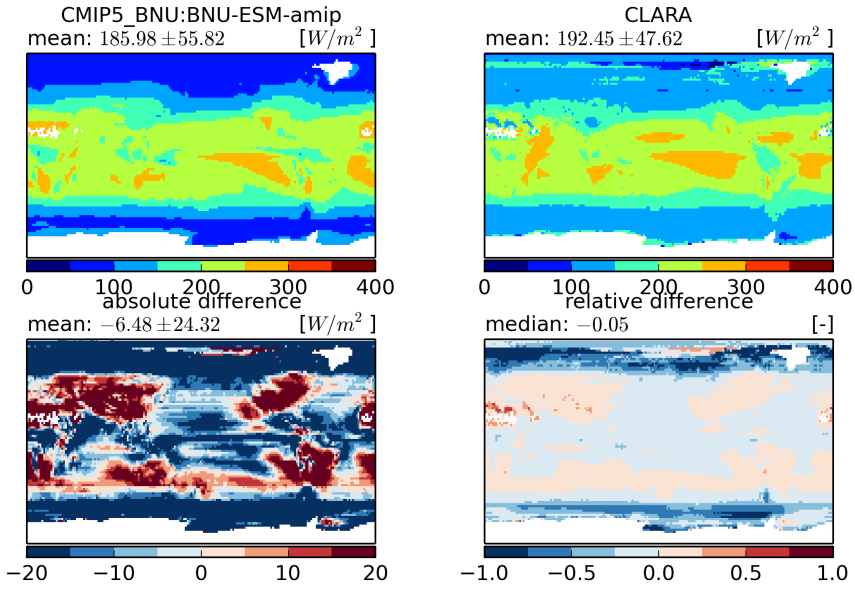



Figure 204: Temporal mean fields (top) and absolute and relative differences (bottom)

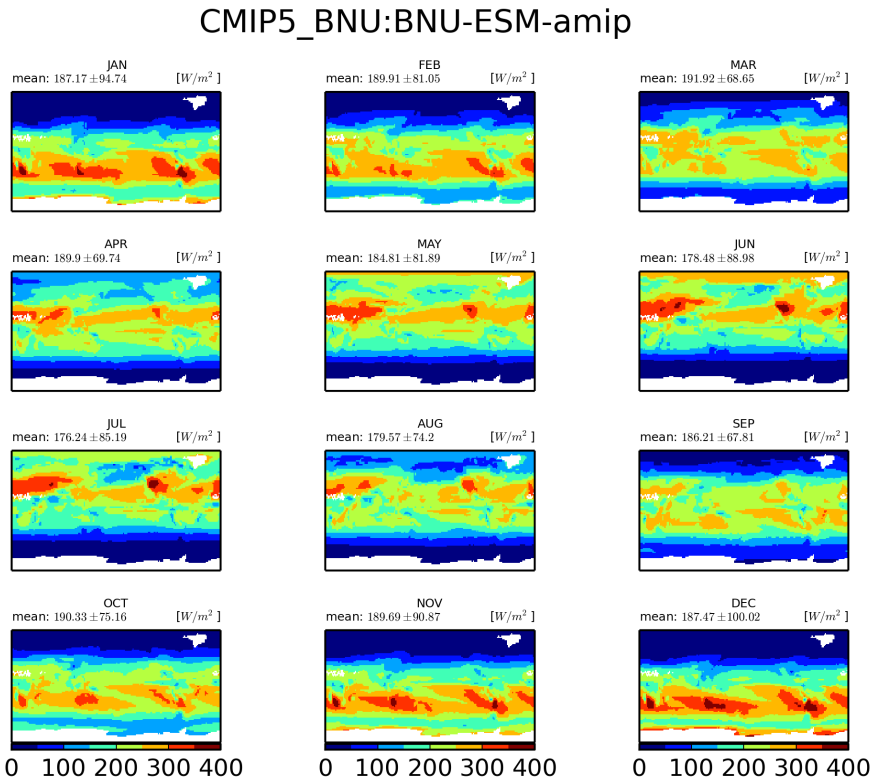



Figure 205: Monthly mean climatology for BNU:BNU-ESM

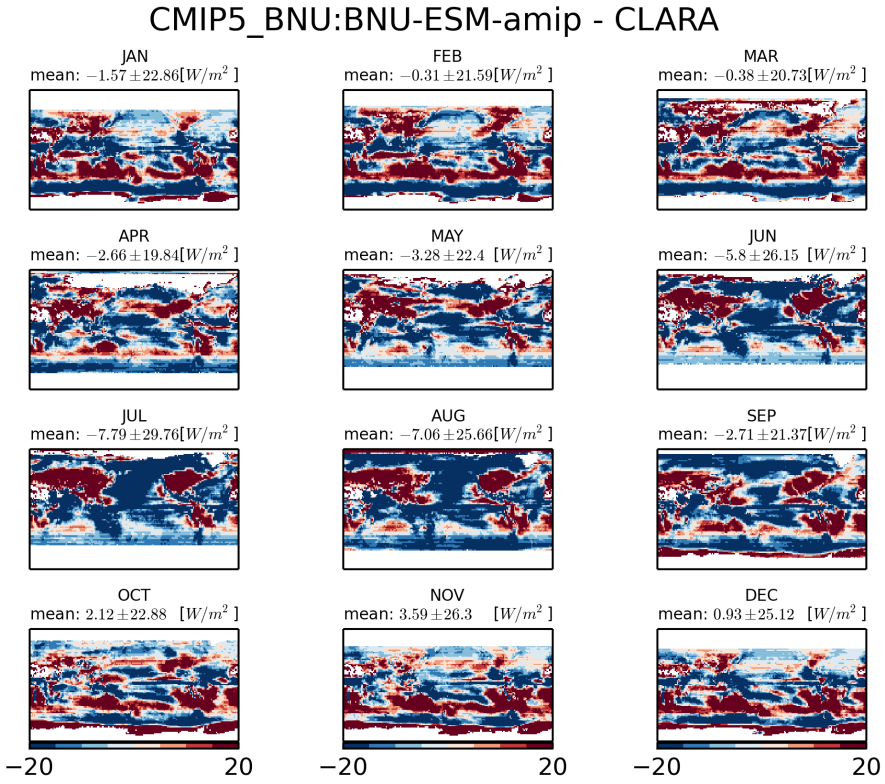



Figure 206: Monthly mean climatology of difference between BNU:BNU-ESM and CLARA

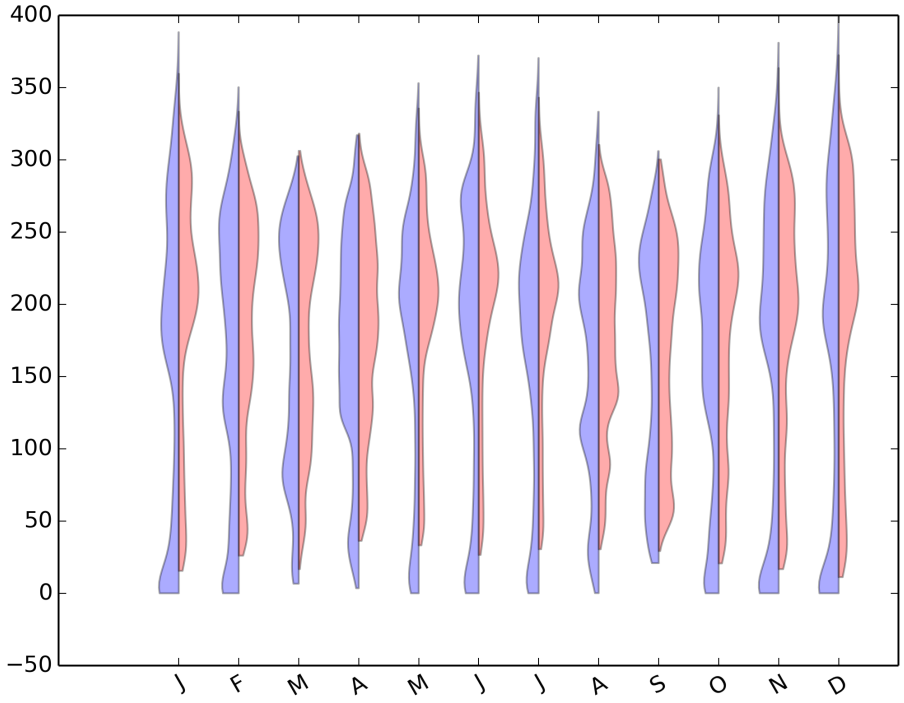



Figure 207: Violin plot for CMIP5-BNU:BNU-ESM-AMIP

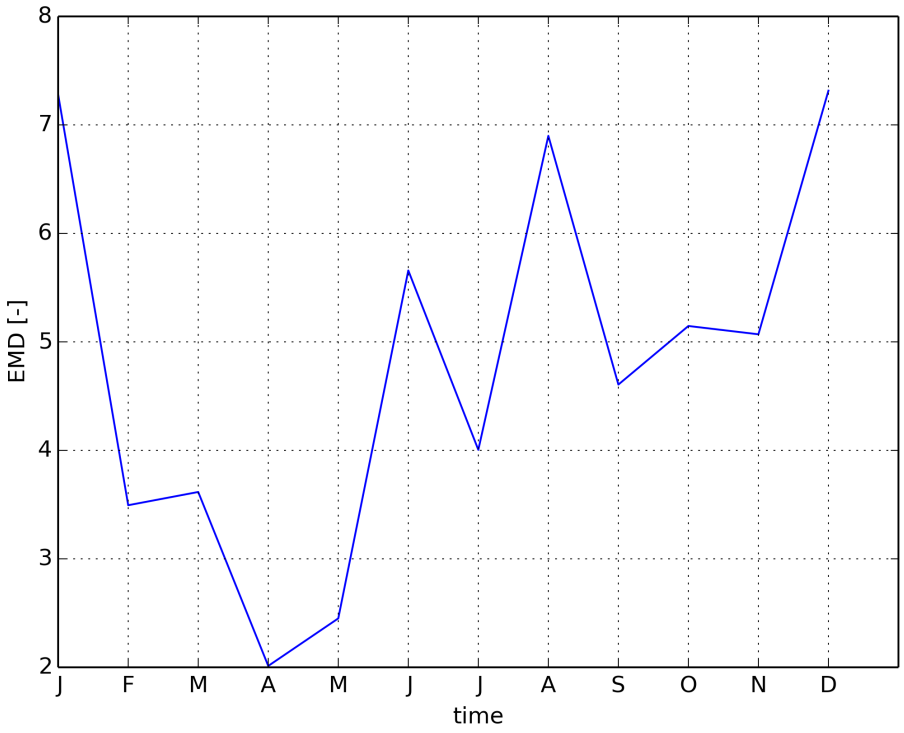



Figure 208: Timeseries of EMD

### 1.2.5 CMIP5 BCC:bcc-csm1-1-amip

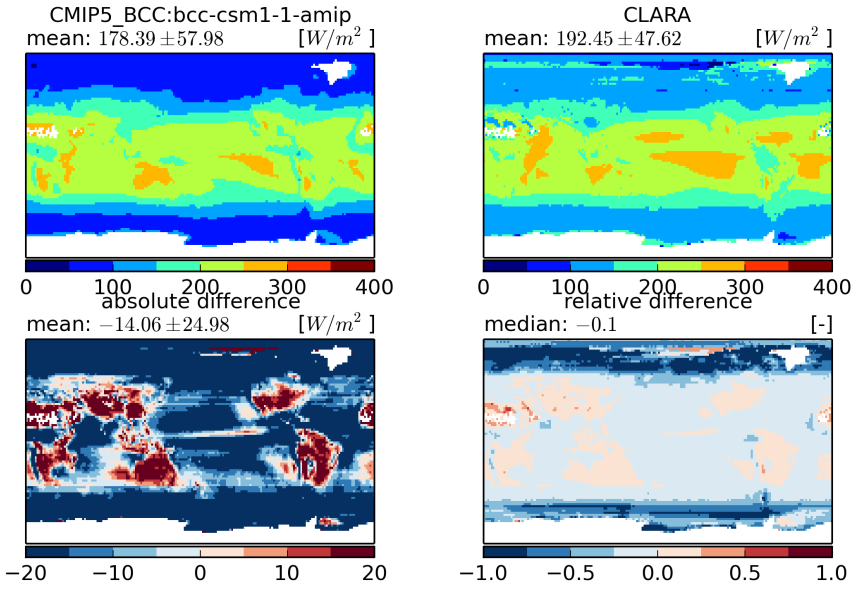



Figure 209: Temporal mean fields (top) and absolute and relative differences (bottom)

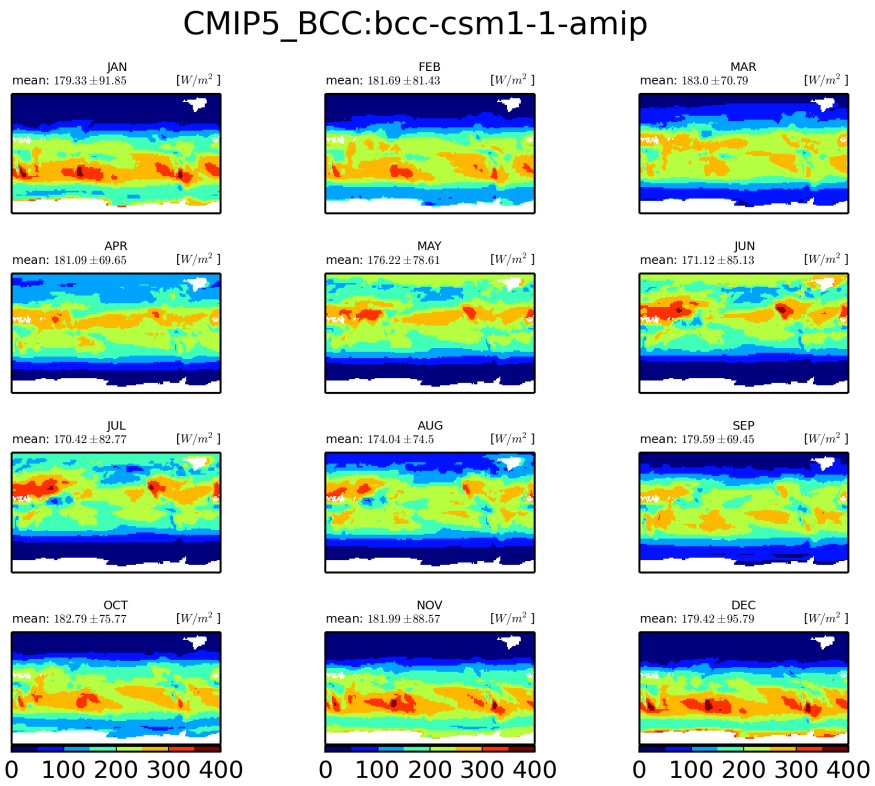



Figure 210: Monthly mean climatology for BCC:bcc-csm1-1

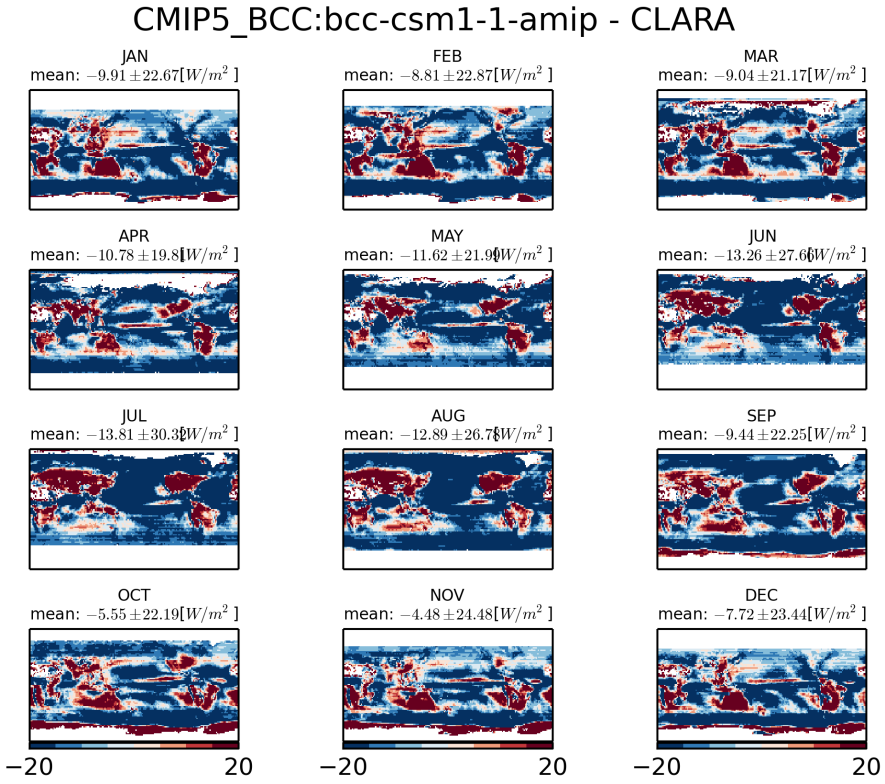



Figure 211: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and CLARA

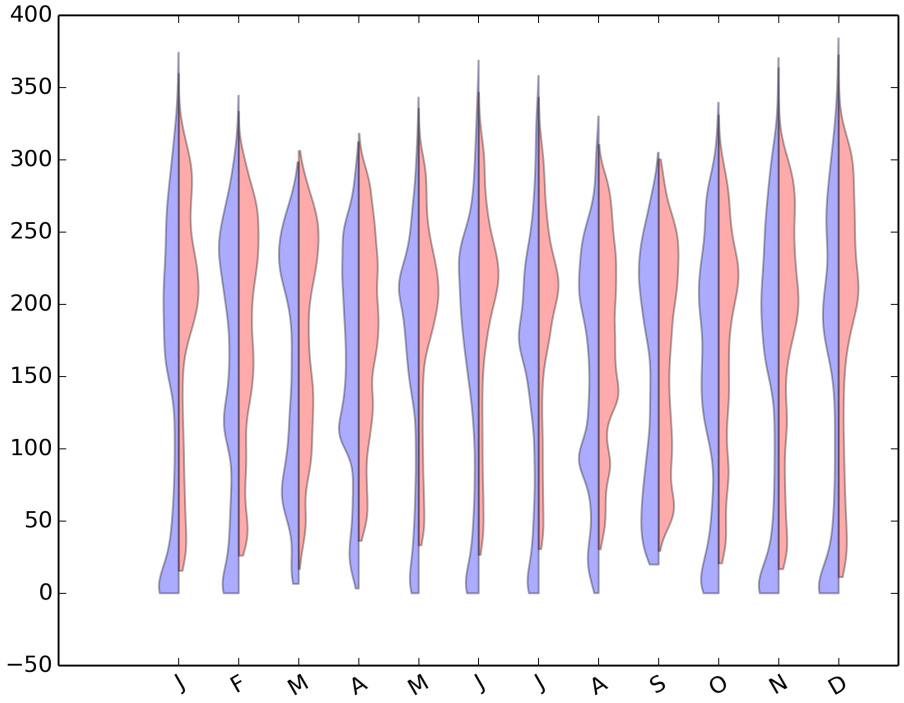



Figure 212: Violin plot for CMIP5-BCC:BCC-CSM1-1-AMIP

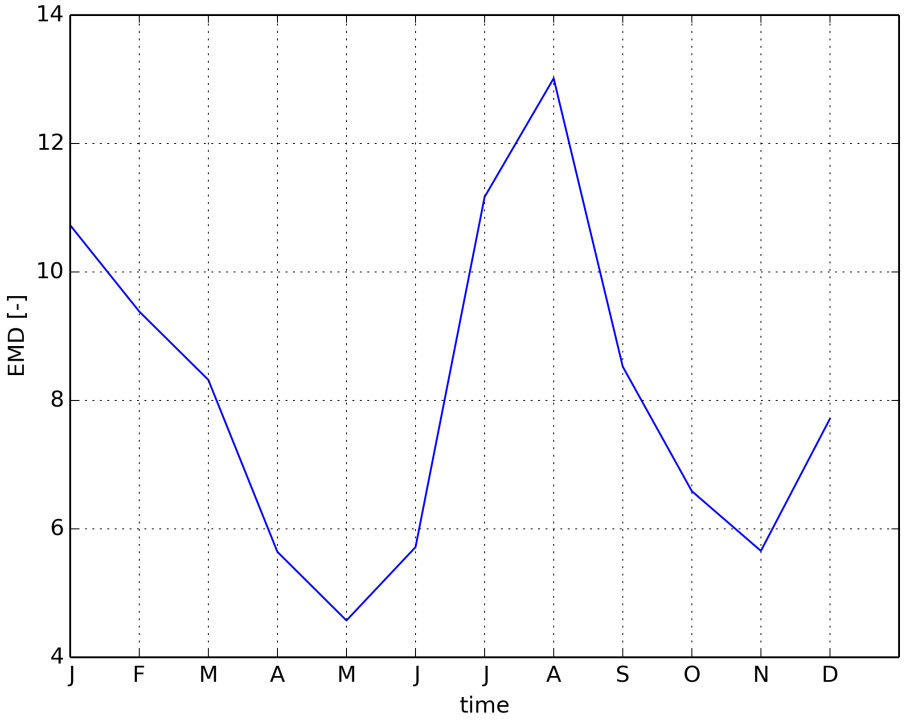



Figure 213: Timeseries of EMD

### 1.2.6 CMIP5 BCC:bcc-csm1-1-m-amip

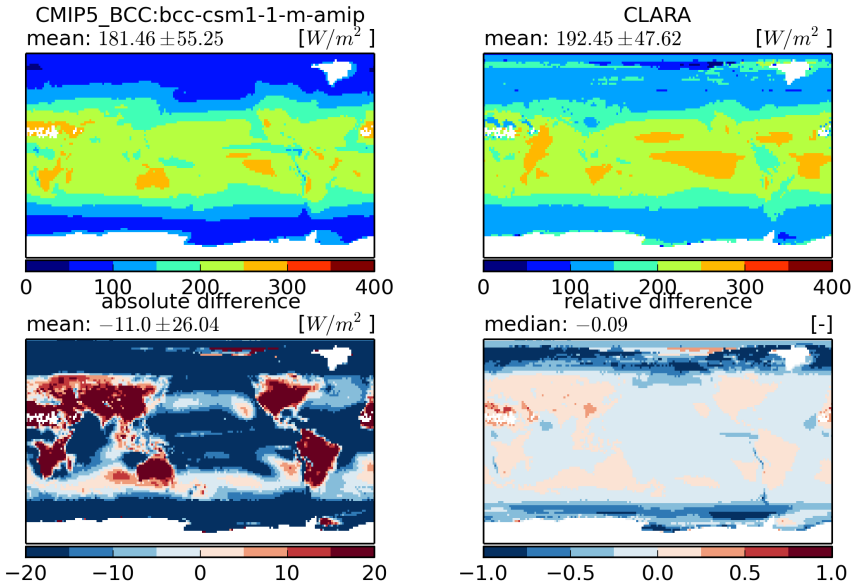



Figure 214: Temporal mean fields (top) and absolute and relative differences (bottom)

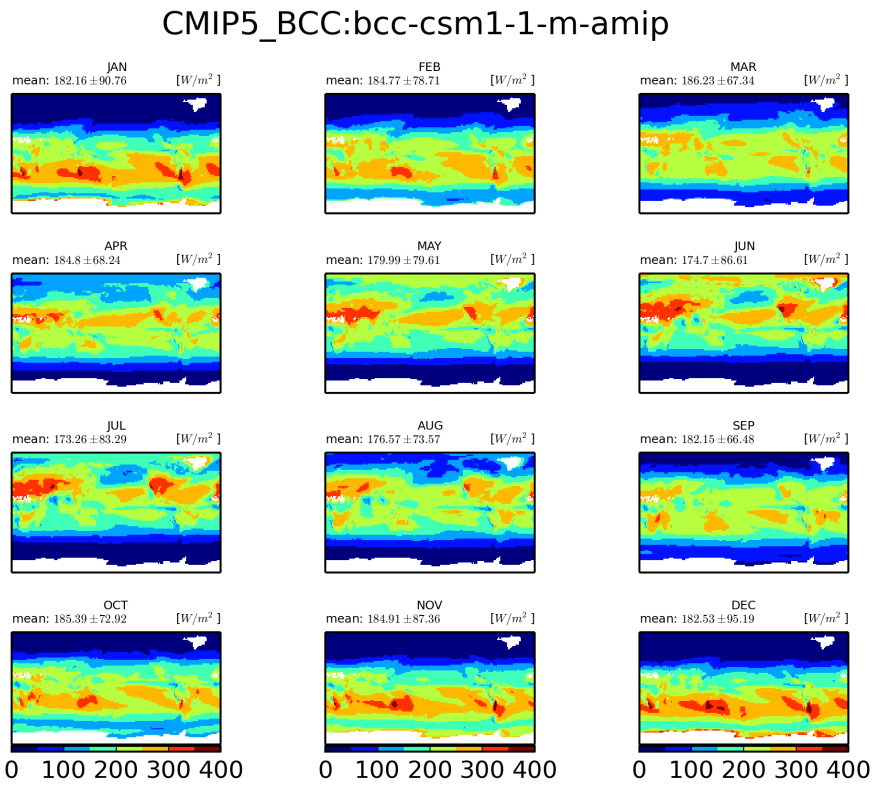



Figure 215: Monthly mean climatology for BCC:bcc-csm1-1-m

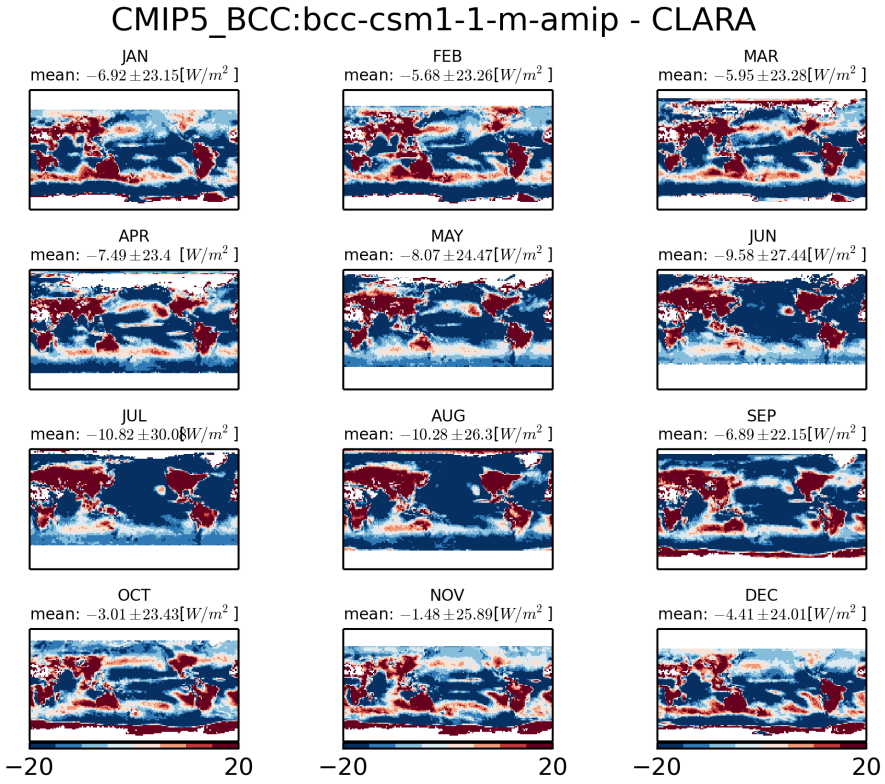



Figure 216: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and CLARA

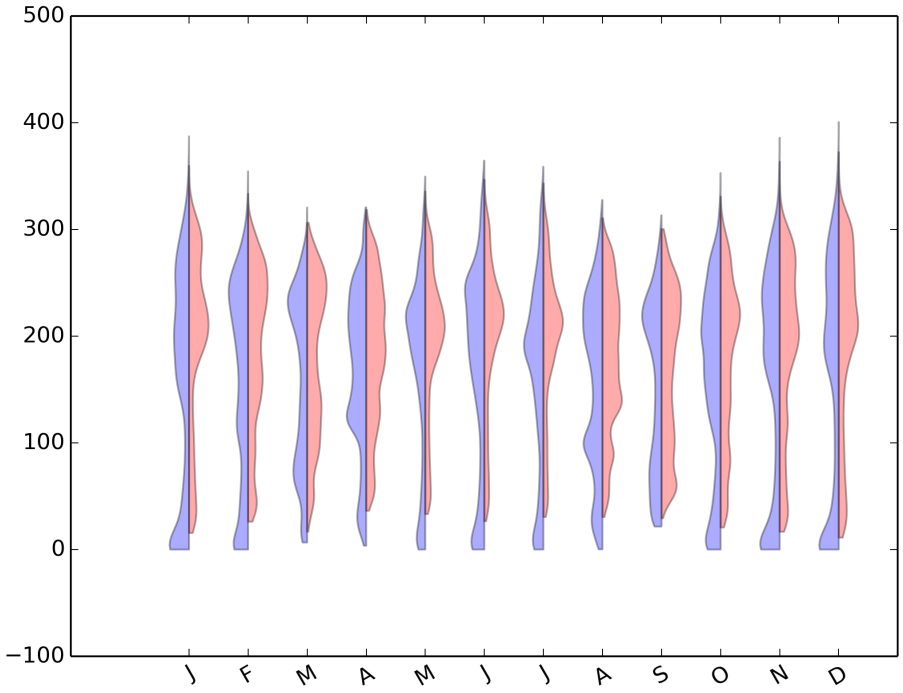



Figure 217: Violin plot for CMIP5-BCC:BCC-CSM1-1-M-AMIP

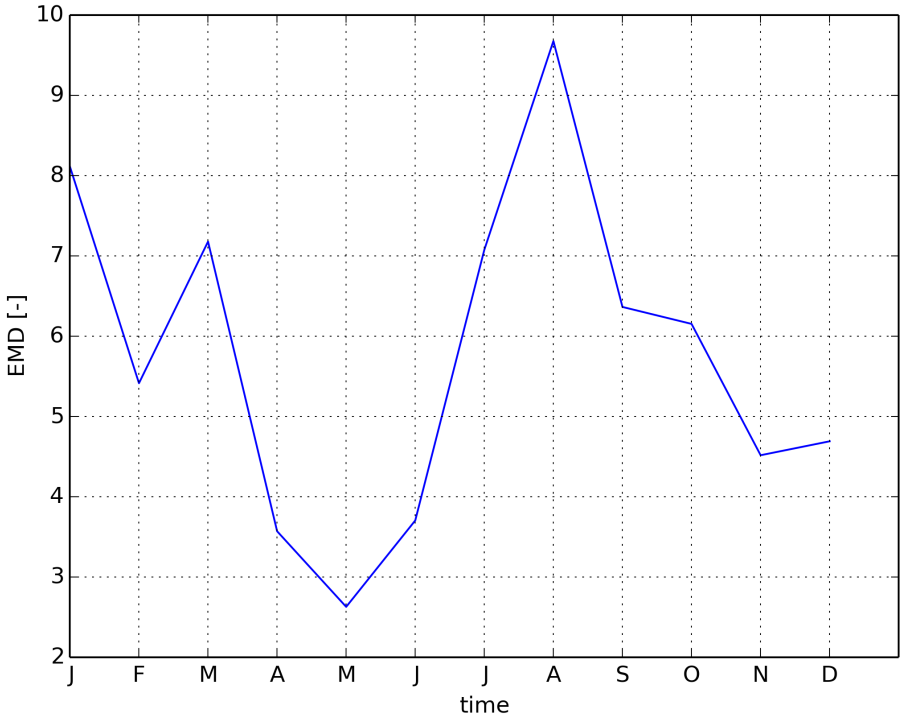



Figure 218: Timeseries of EMD

### 1.2.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

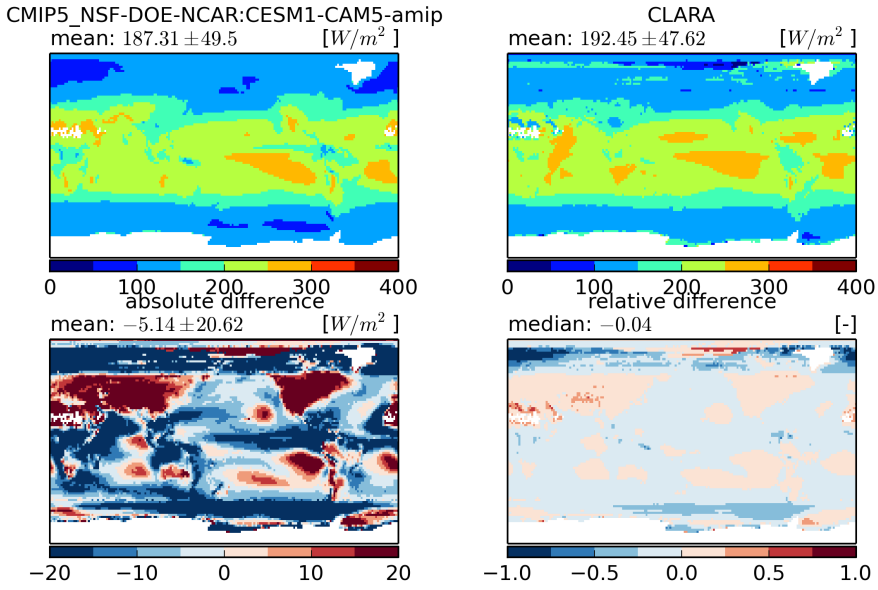



Figure 219: Temporal mean fields (top) and absolute and relative differences (bottom)

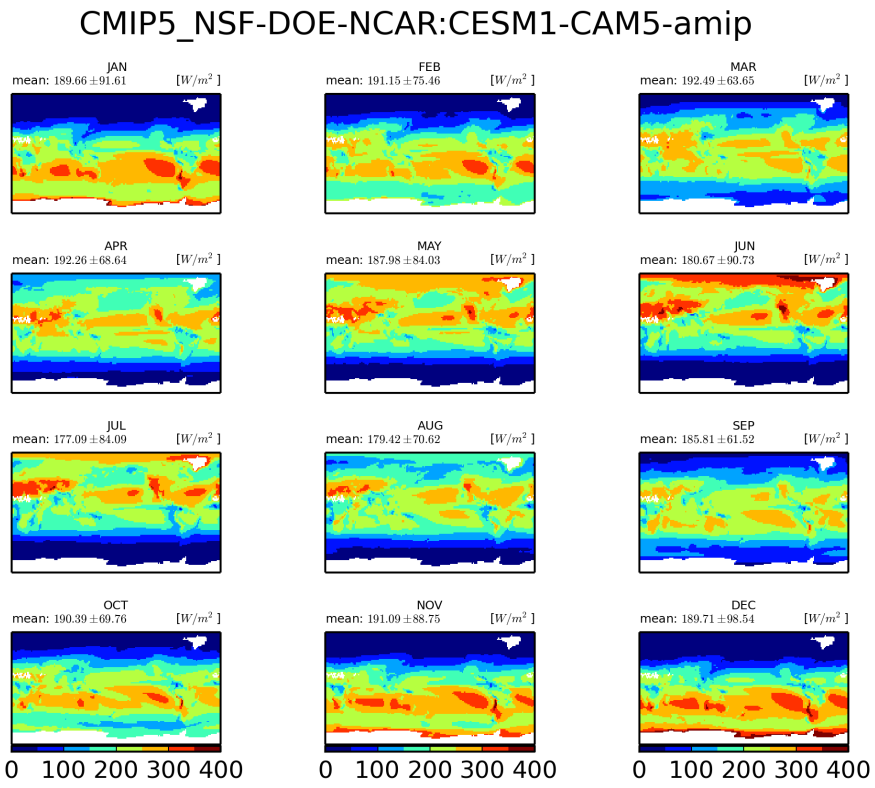



Figure 220: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

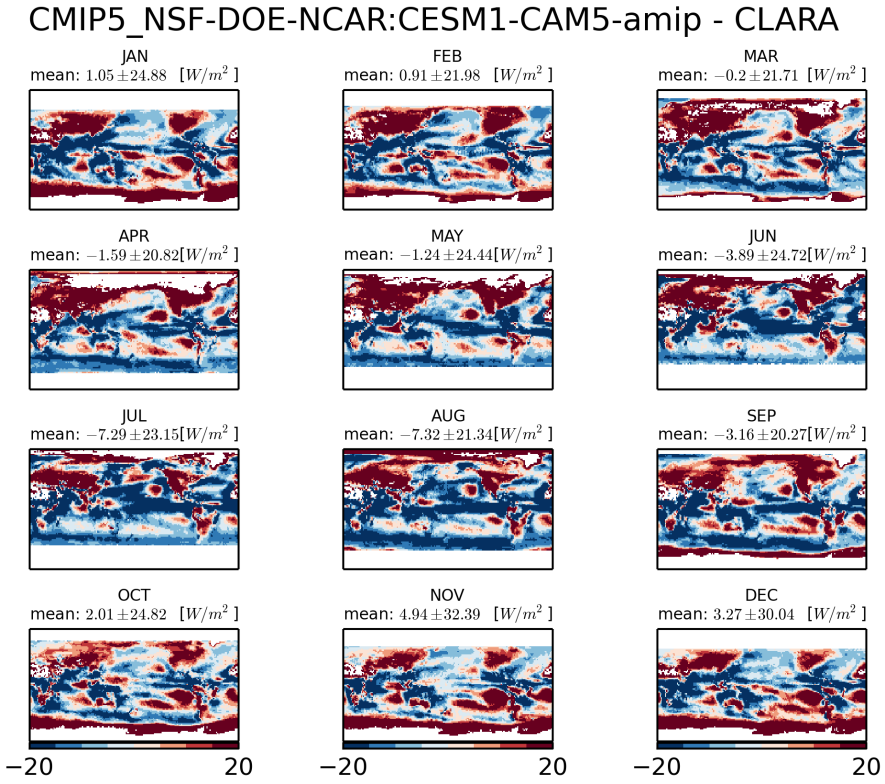



Figure 221: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and CLARA

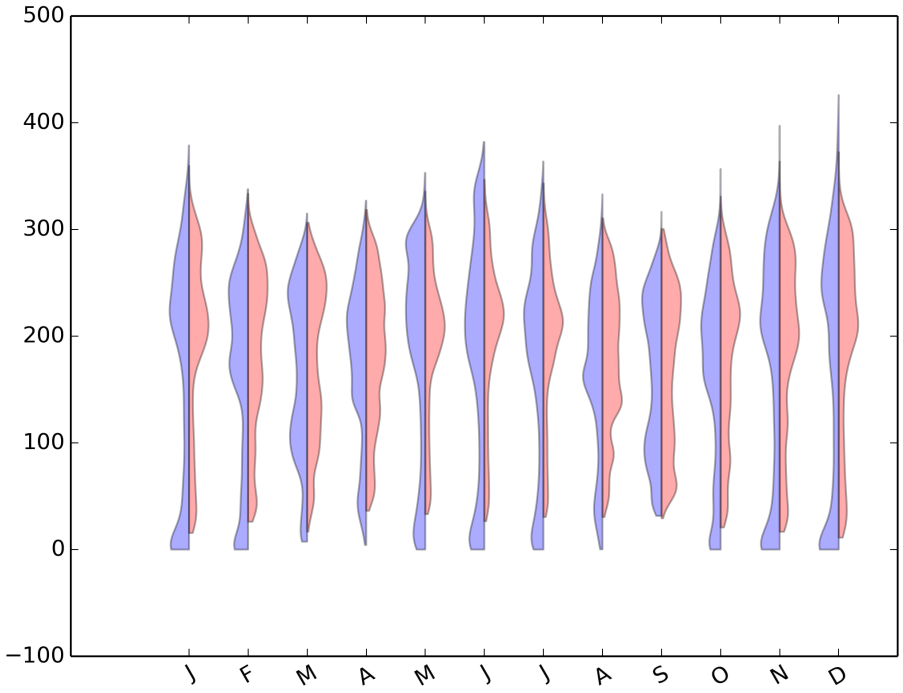



Figure 222: Violin plot for CMIP5-NSF-DOE-NCAR:CESM1-CAM5-AMIP

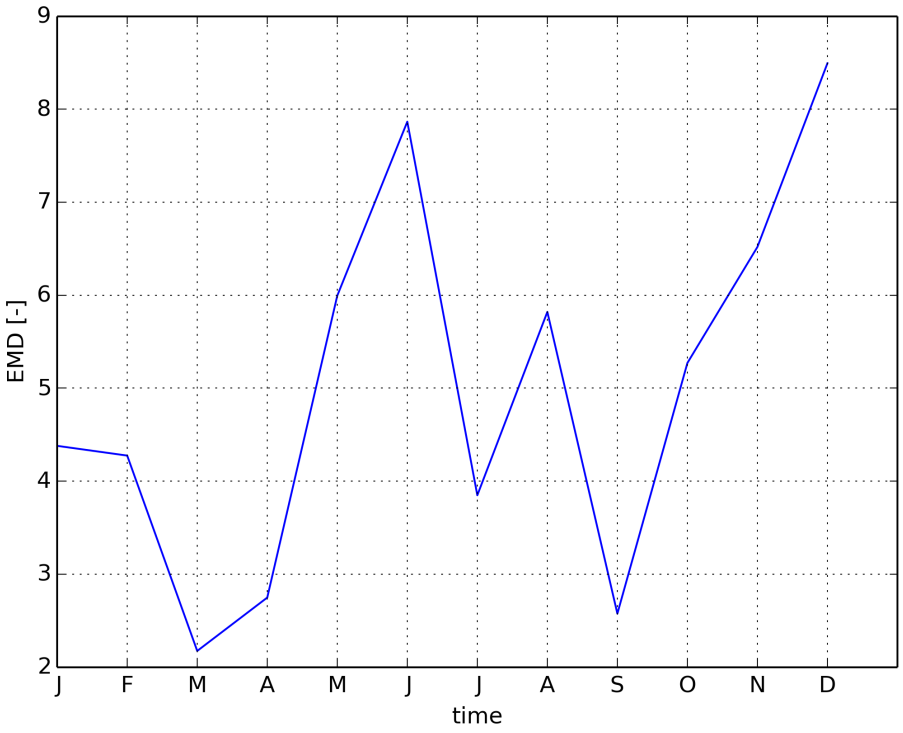



Figure 223: Timeseries of EMD

### 1.2.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

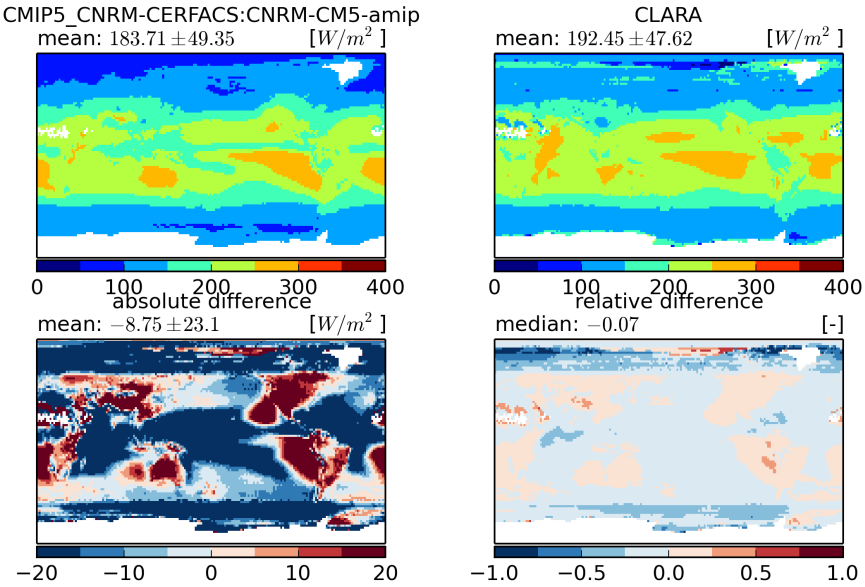



Figure 224: Temporal mean fields (top) and absolute and relative differences (bottom)

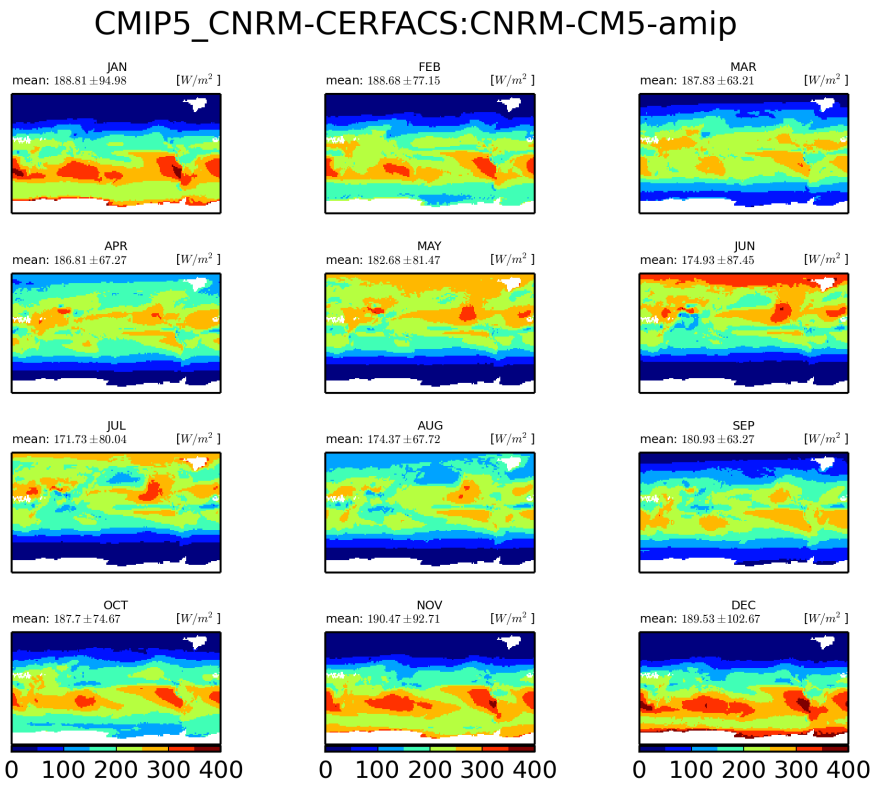



Figure 225: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

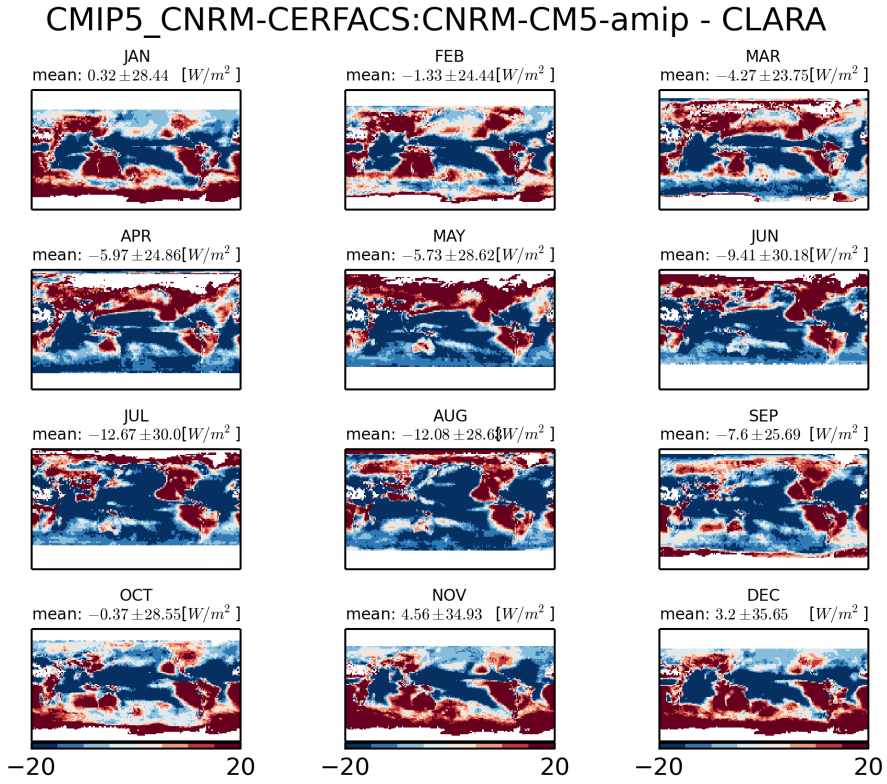



Figure 226: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and CLARA

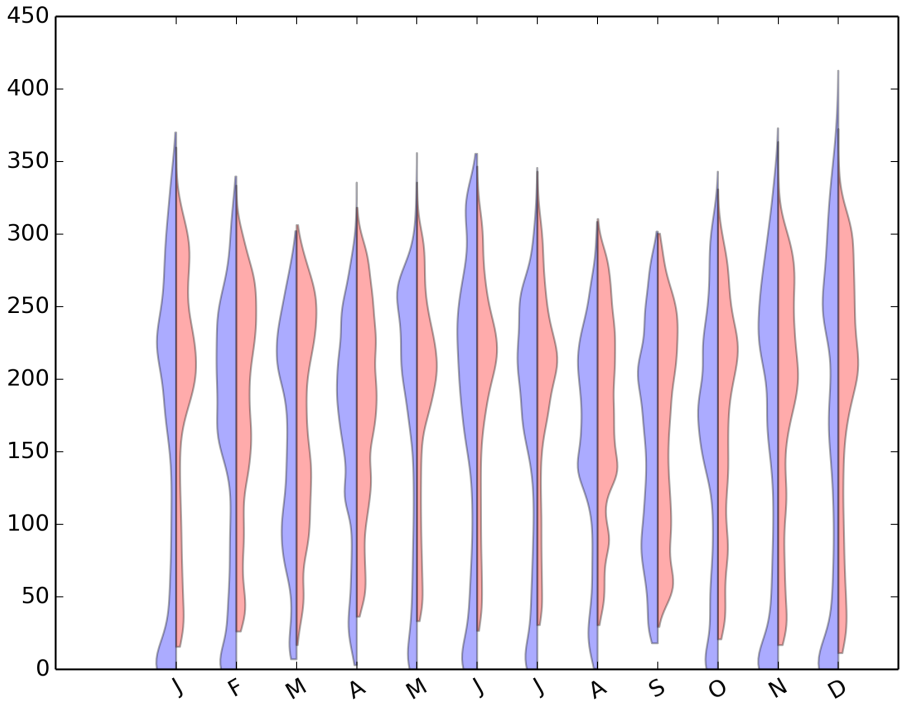



Figure 227: Violin plot for CMIP5-CNRM-CERFACS:CNRM-CM5-AMIP

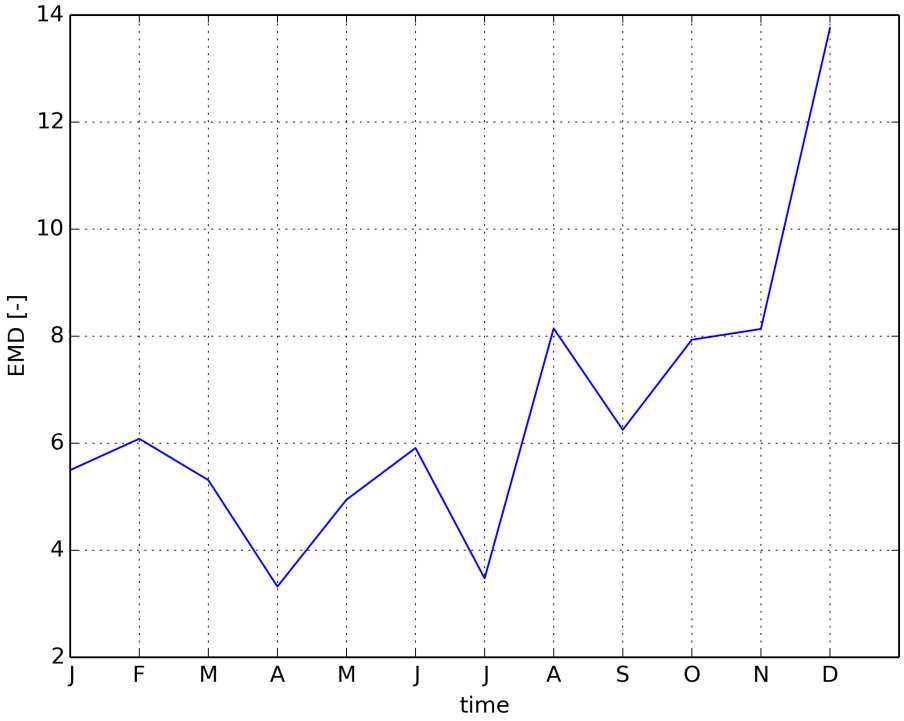



Figure 228: Timeseries of EMD

### 1.2.9 CMIP5 MRI:MRI-CGCM3-amip

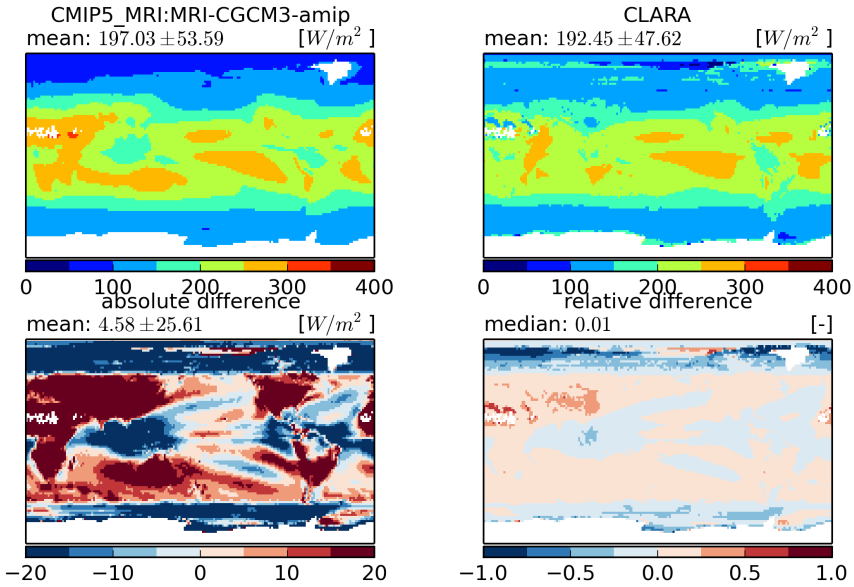



Figure 229: Temporal mean fields (top) and absolute and relative differences (bottom)

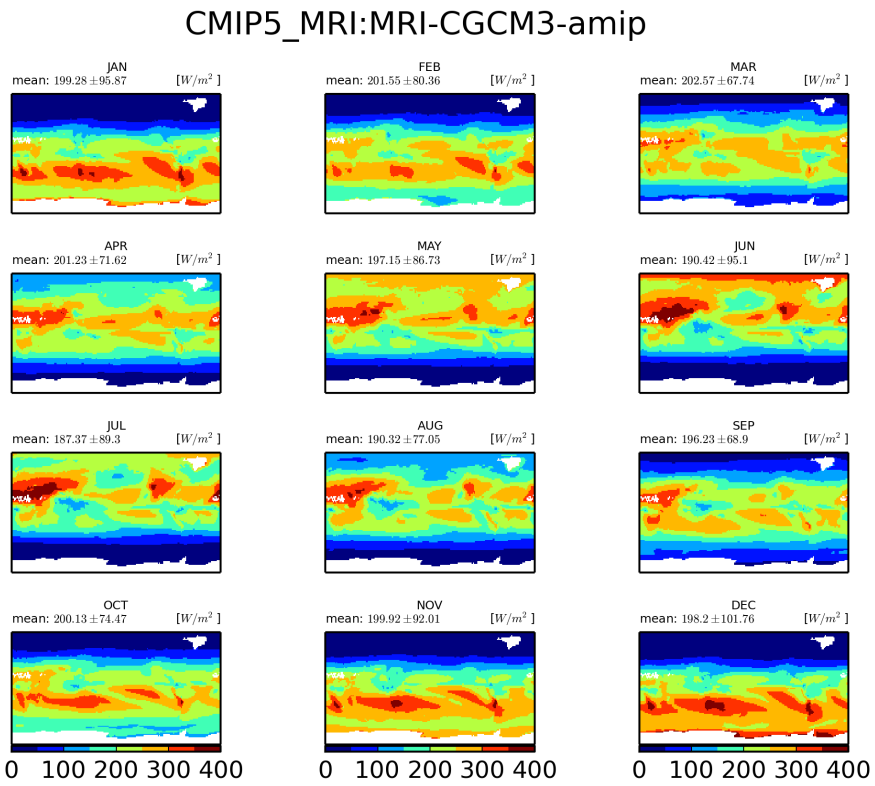



Figure 230: Monthly mean climatology for MRI:MRI-CGCM3

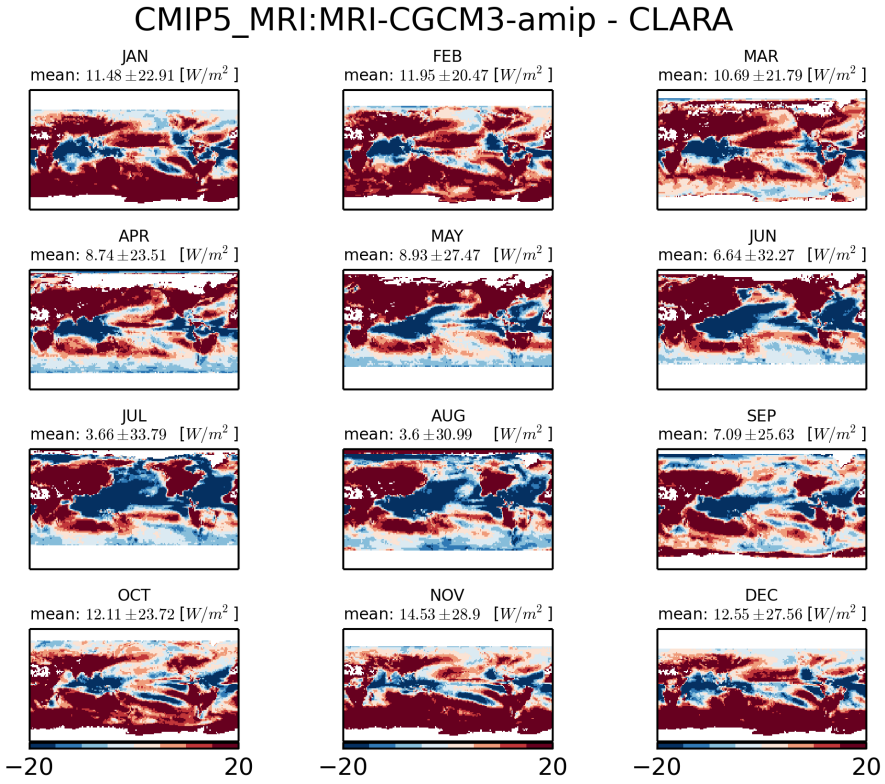



Figure 231: Monthly mean climatology of difference between MRI:MRI-CGCM3 and CLARA

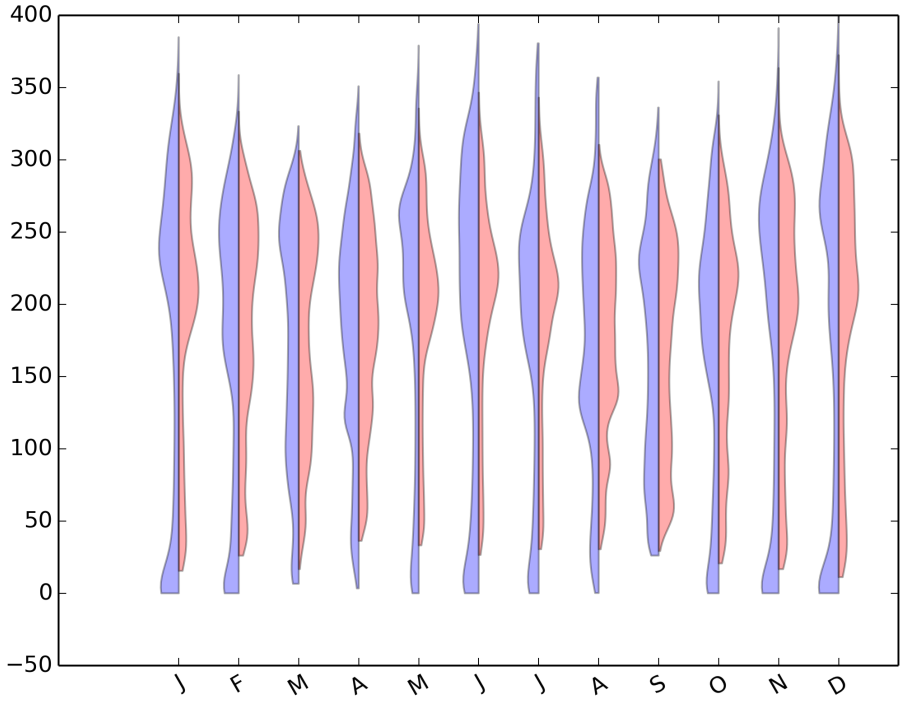



Figure 232: Violin plot for CMIP5-MRI:MRI-CGCM3-AMIP

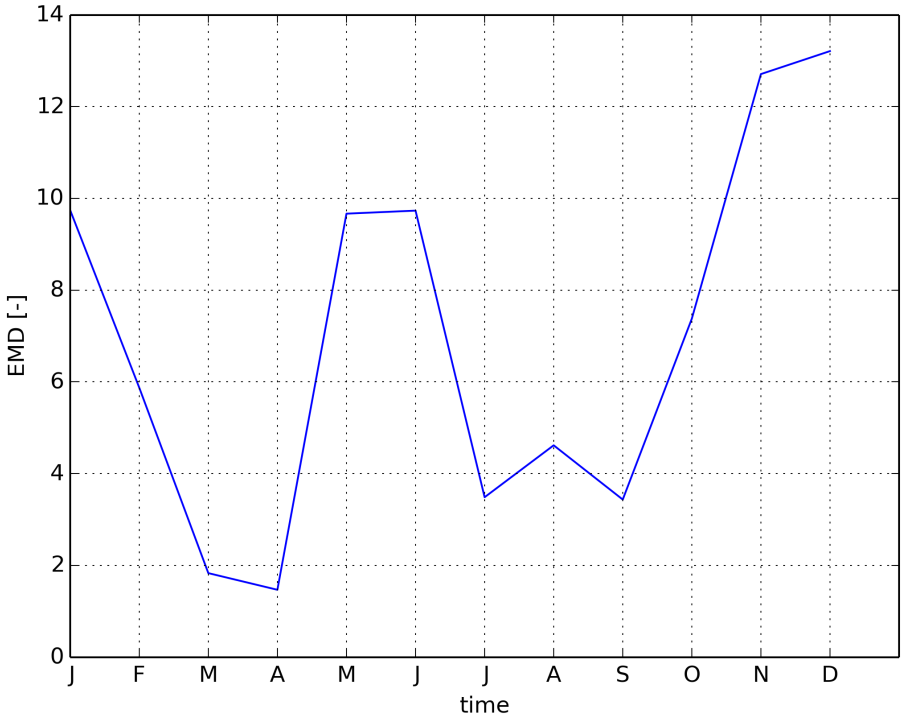



Figure 233: Timeseries of EMD

### 1.2.10 CMIP5 NASA-GISS:GISS-E2-R-amip

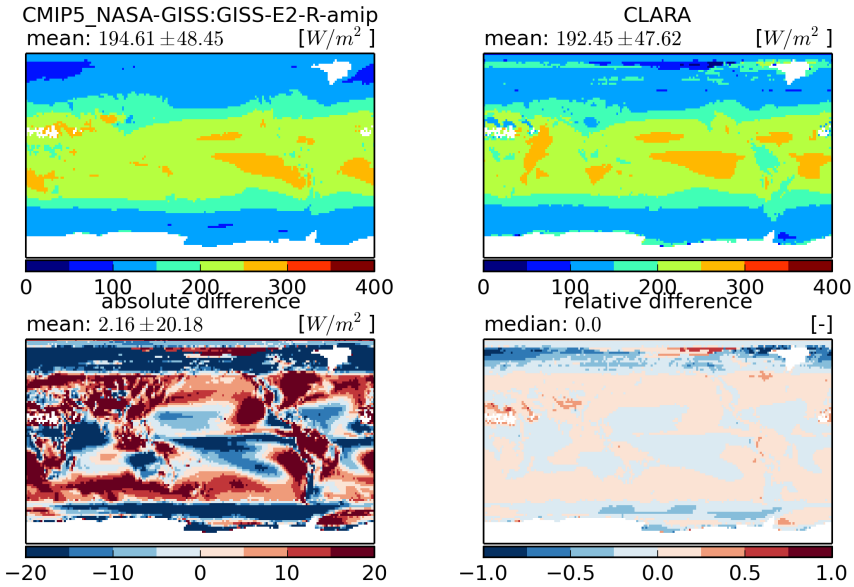



Figure 234: Temporal mean fields (top) and absolute and relative differences (bottom)

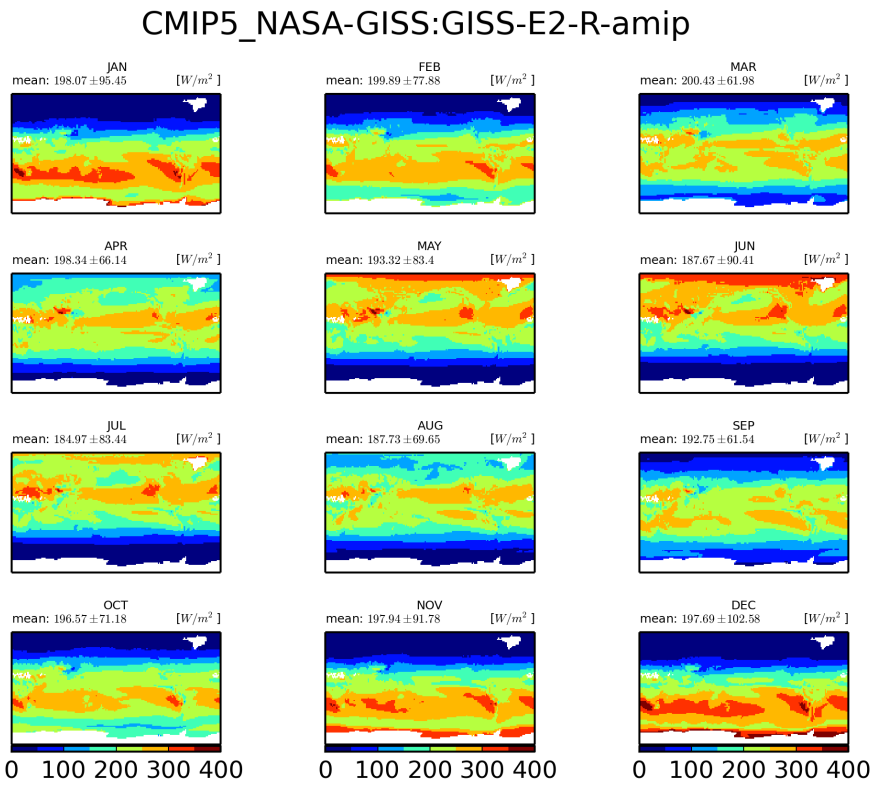



Figure 235: Monthly mean climatology for NASA-GISS:GISS-E2-R

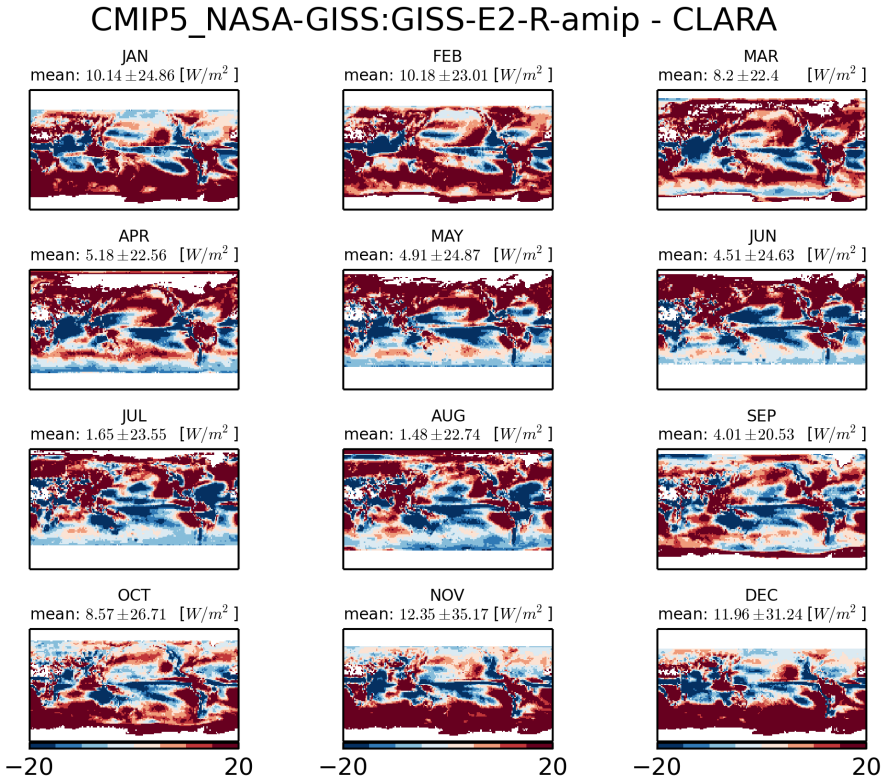



Figure 236: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and CLARA

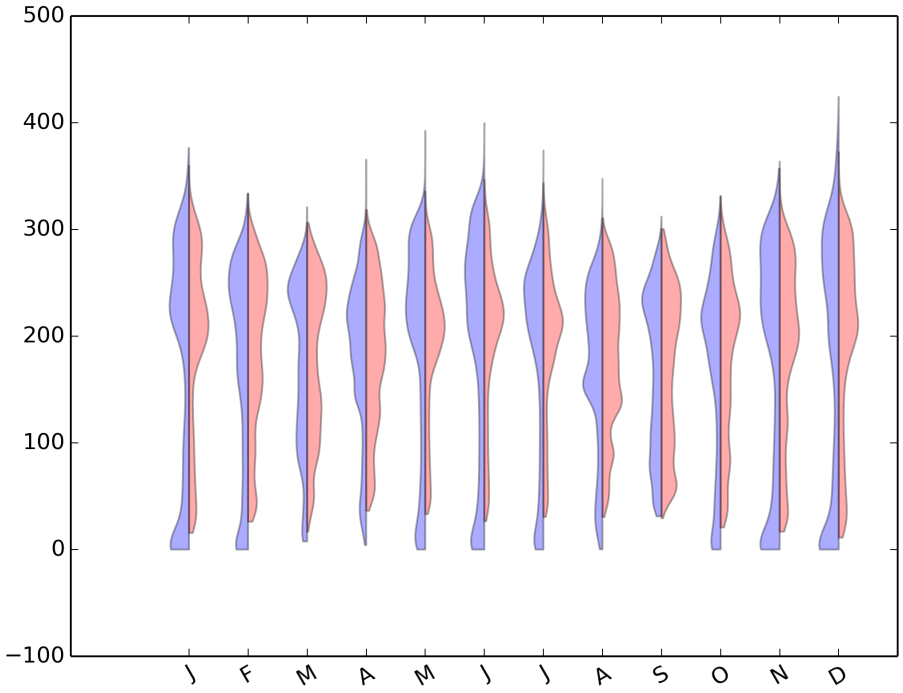



Figure 237: Violin plot for CMIP5-NASA-GISS:GISS-E2-R-AMIP

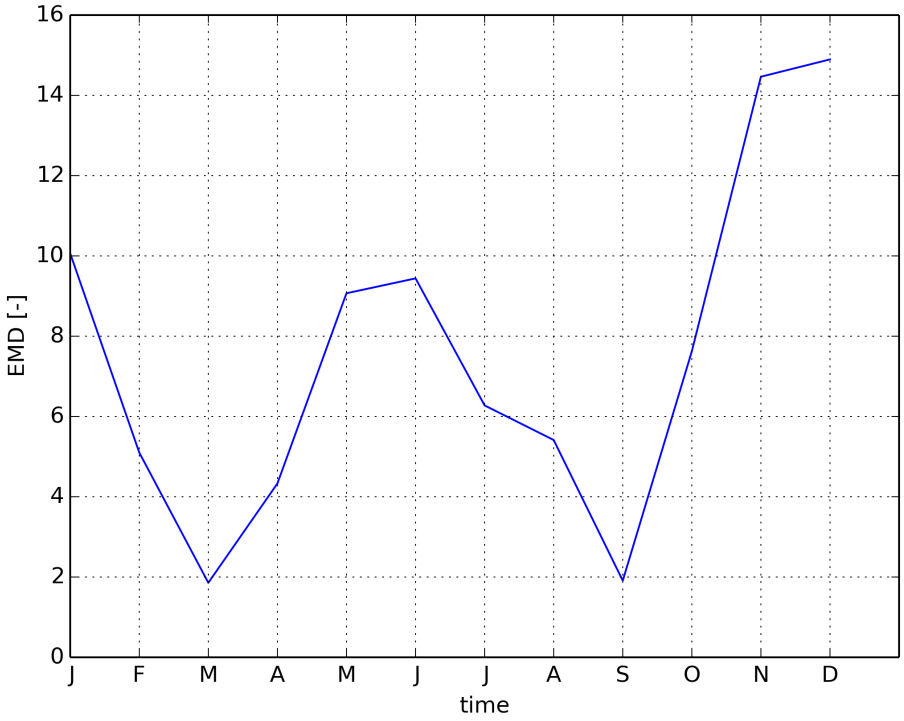



Figure 238: Timeseries of EMD

### 1.2.11 CMIP5 MIROC:MIROC5-amip

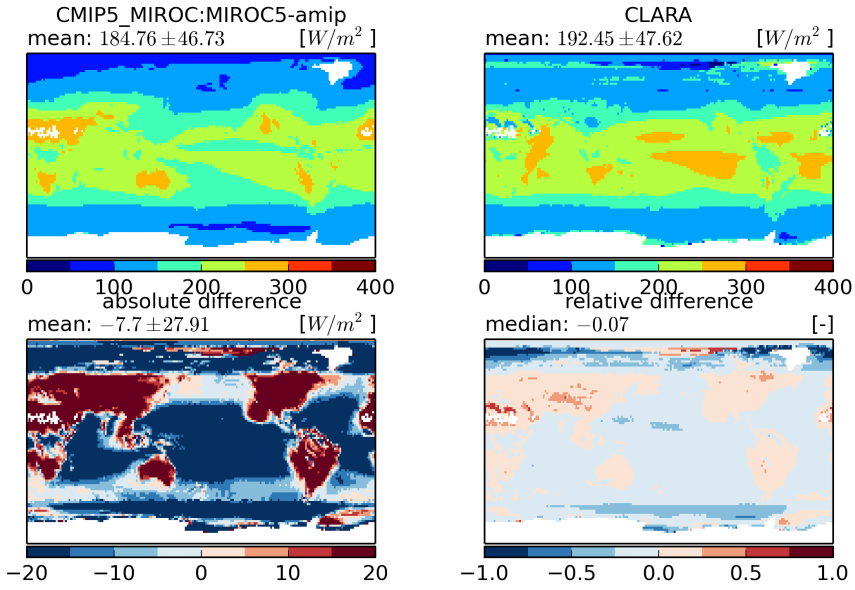



Figure 239: Temporal mean fields (top) and absolute and relative differences (bottom)

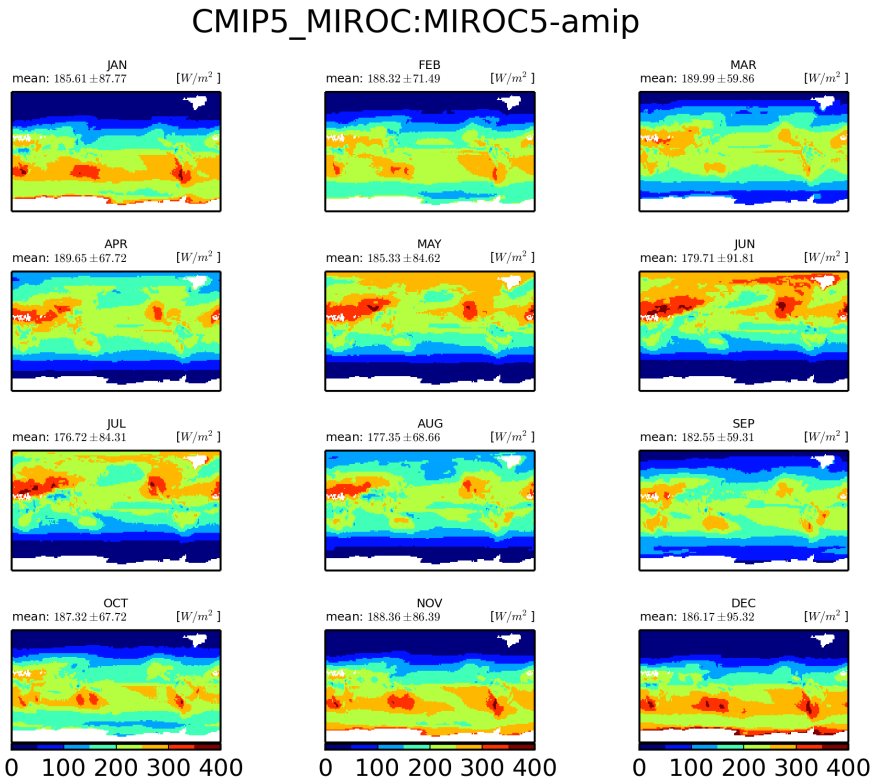



Figure 240: Monthly mean climatology for MIROC:MIROC5

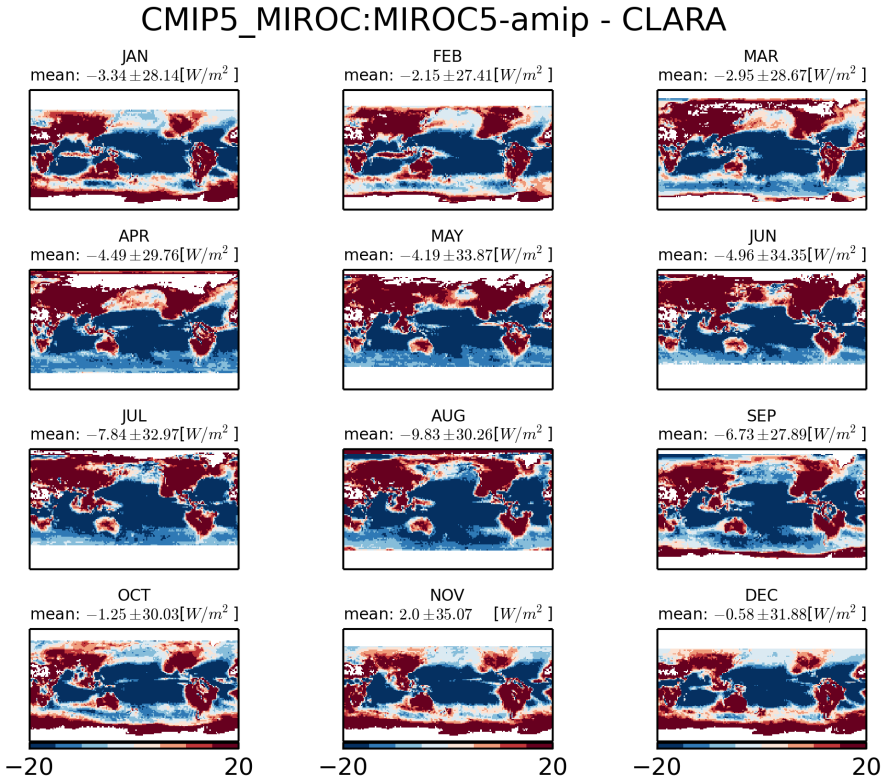



Figure 241: Monthly mean climatology of difference between MIROC:MIROC5 and CLARA

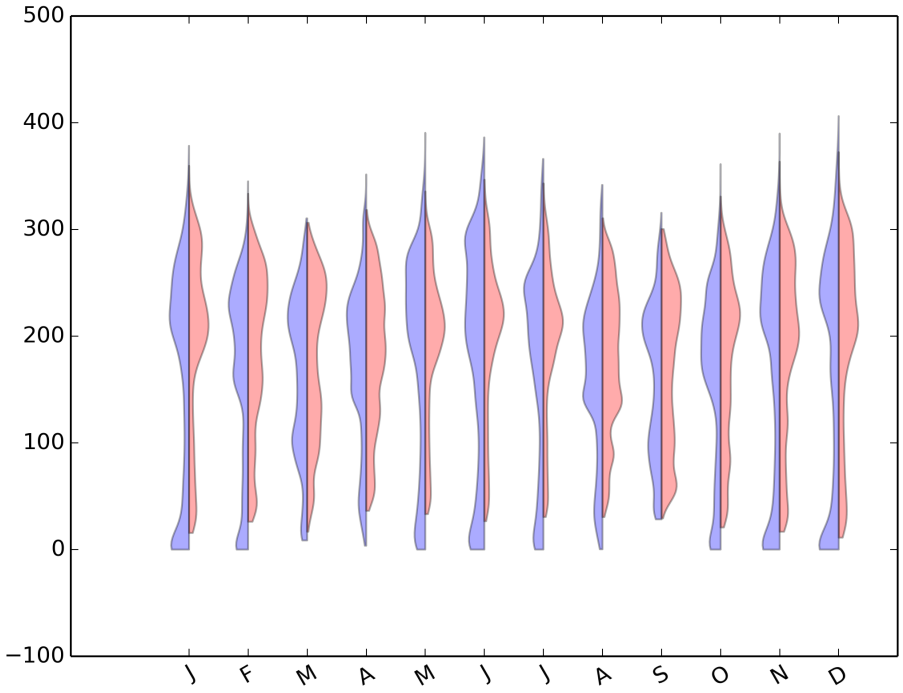



Figure 242: Violin plot for CMIP5-MIROC:MIROC5-AMIP

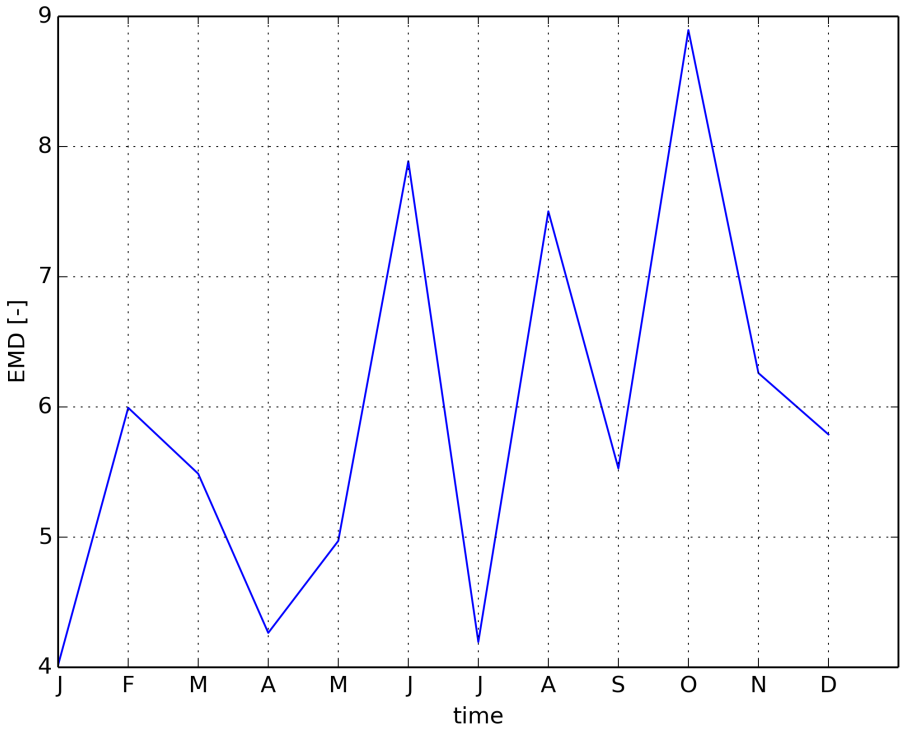



Figure 243: Timeseries of EMD

### 1.2.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

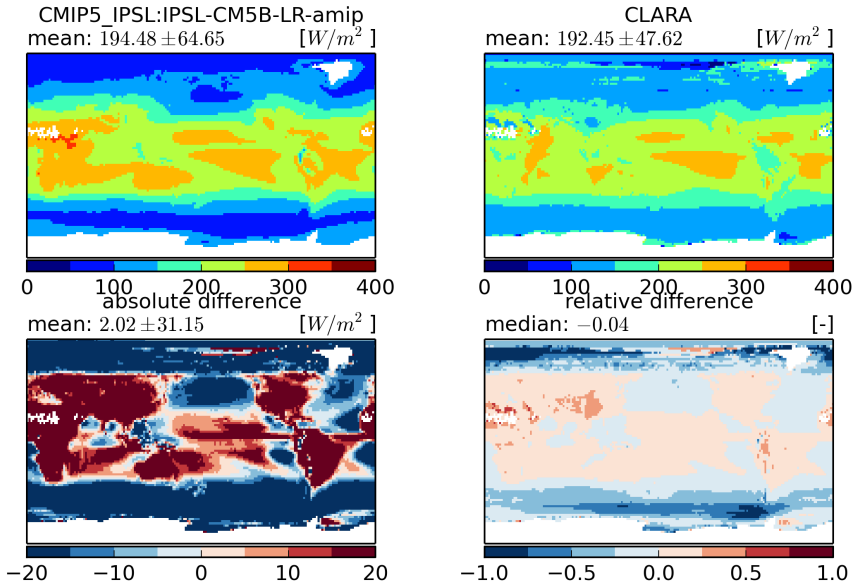



Figure 244: Temporal mean fields (top) and absolute and relative differences (bottom)

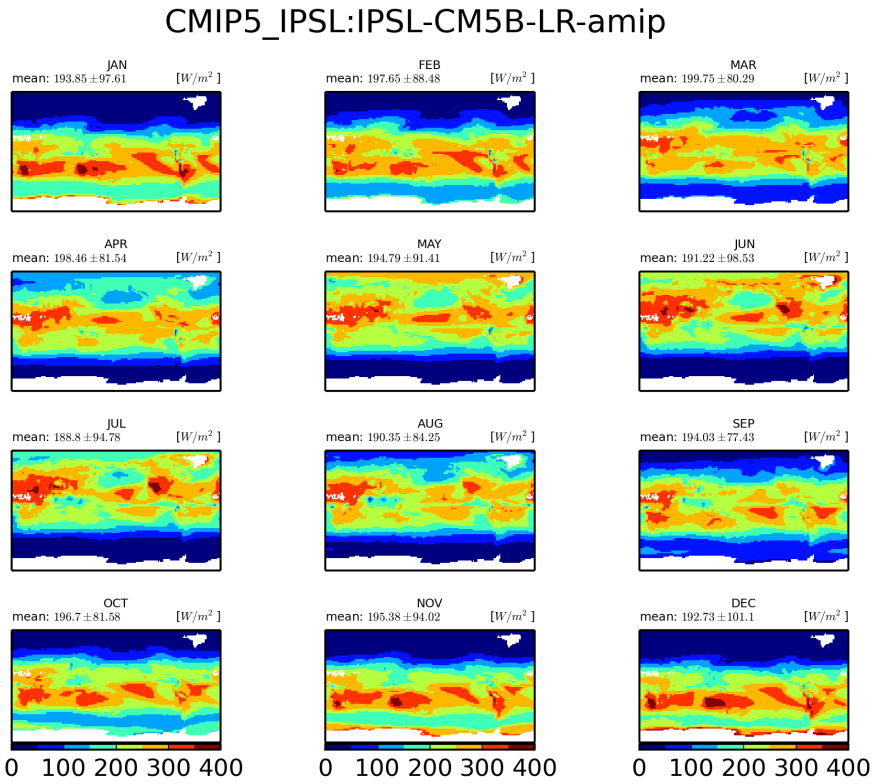



Figure 245: Monthly mean climatology for IPSL:IPSL-CM5B-LR

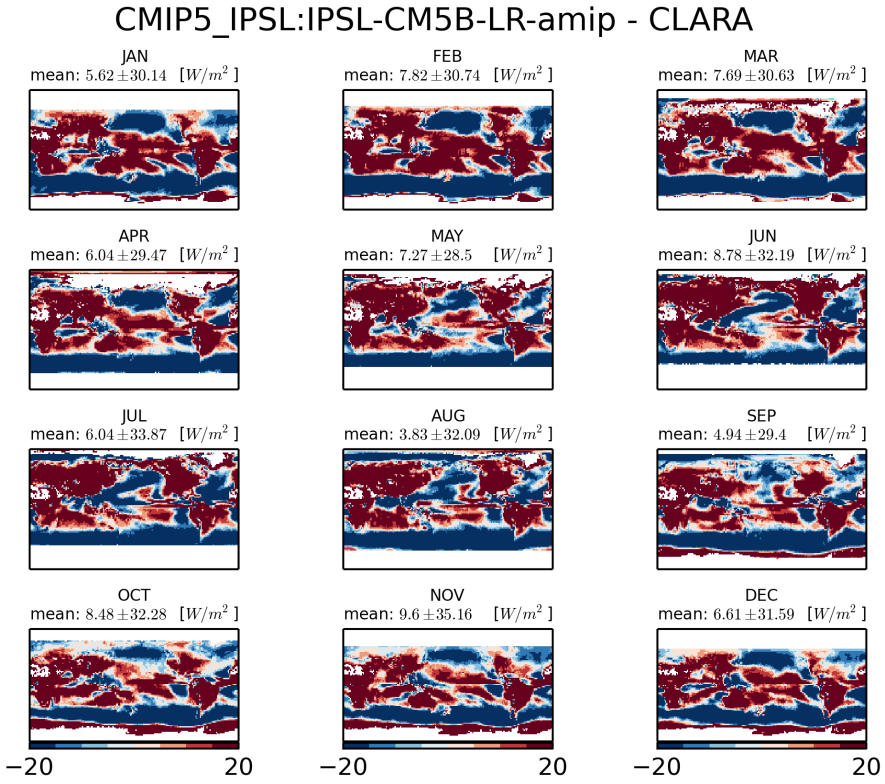



Figure 246: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and CLARA

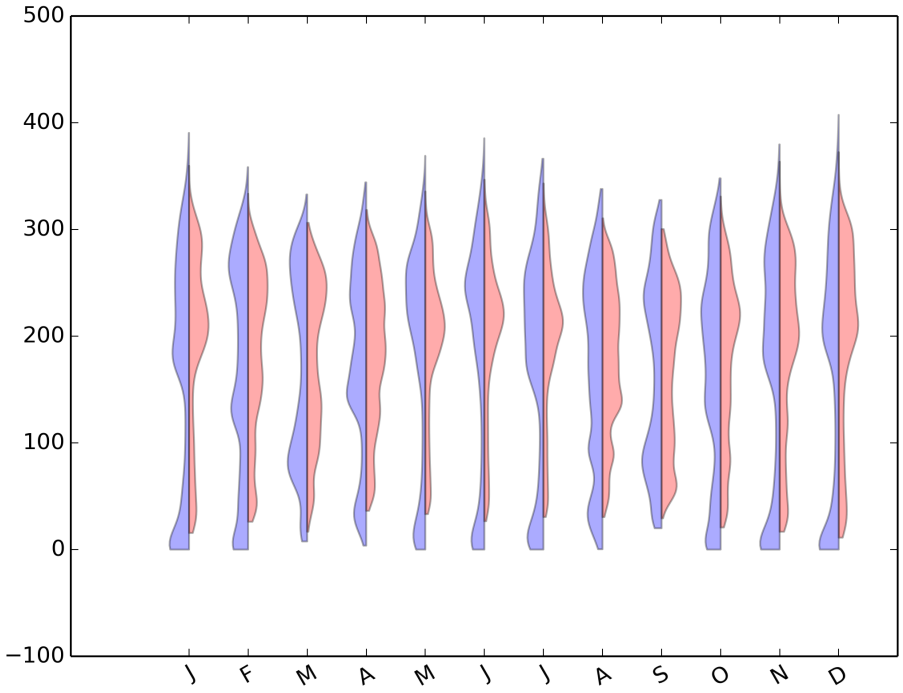



Figure 247: Violin plot for CMIP5-IPSL:IPSL-CM5B-LR-AMIP

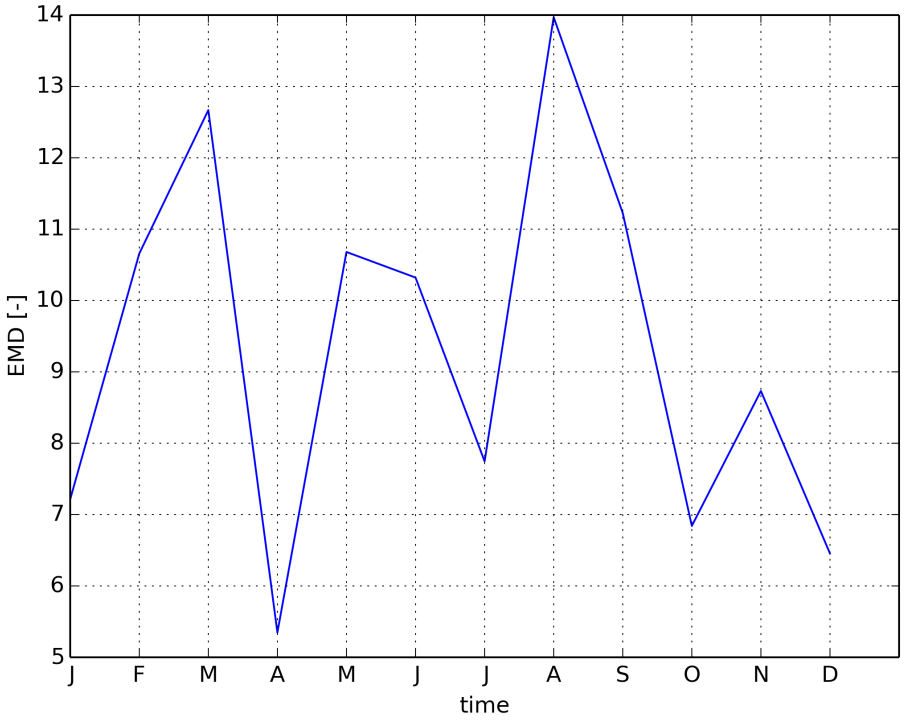



Figure 248: Timeseries of EMD

### 1.2.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

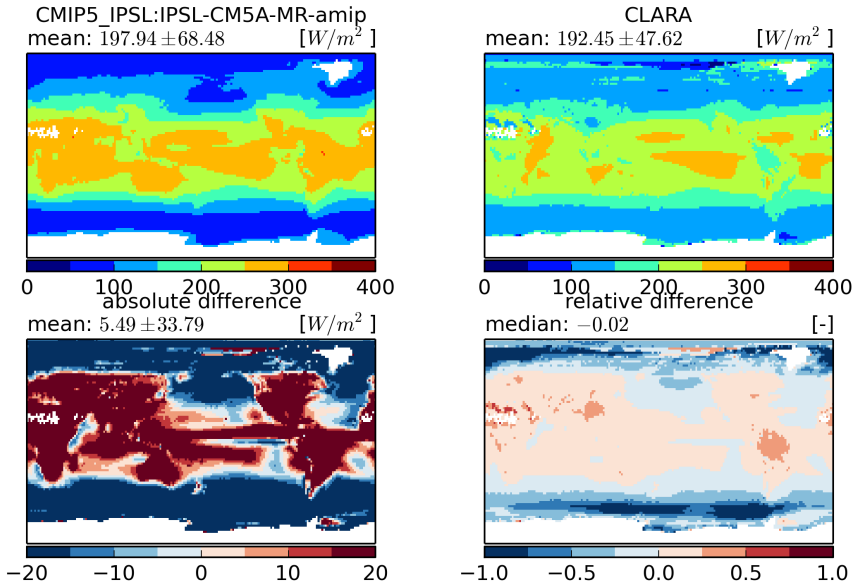



Figure 249: Temporal mean fields (top) and absolute and relative differences (bottom)

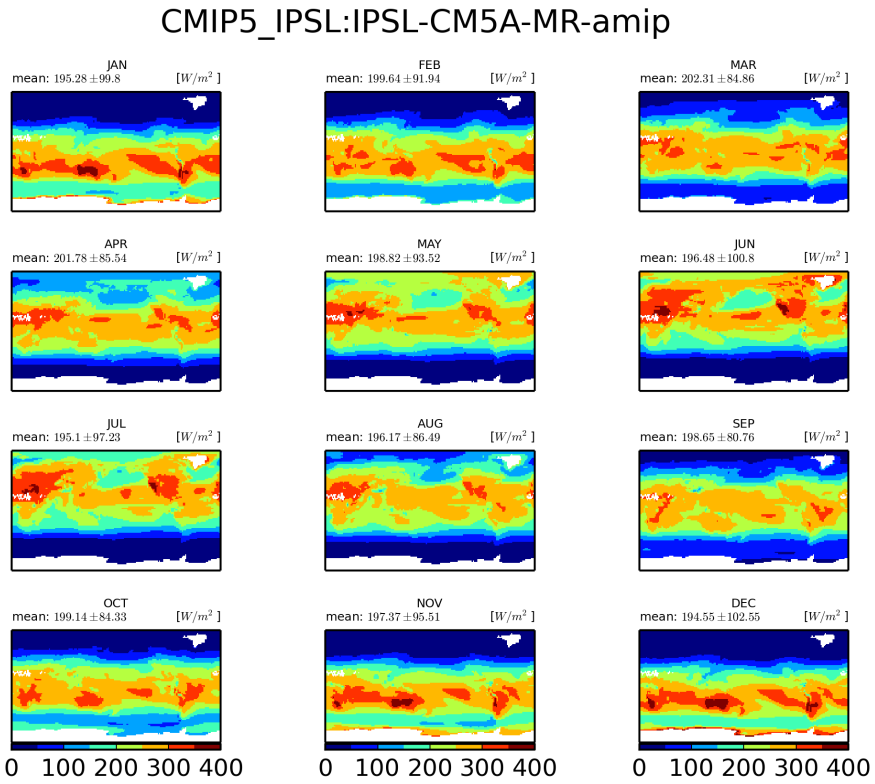



Figure 250: Monthly mean climatology for IPSL:IPSL-CM5A-MR

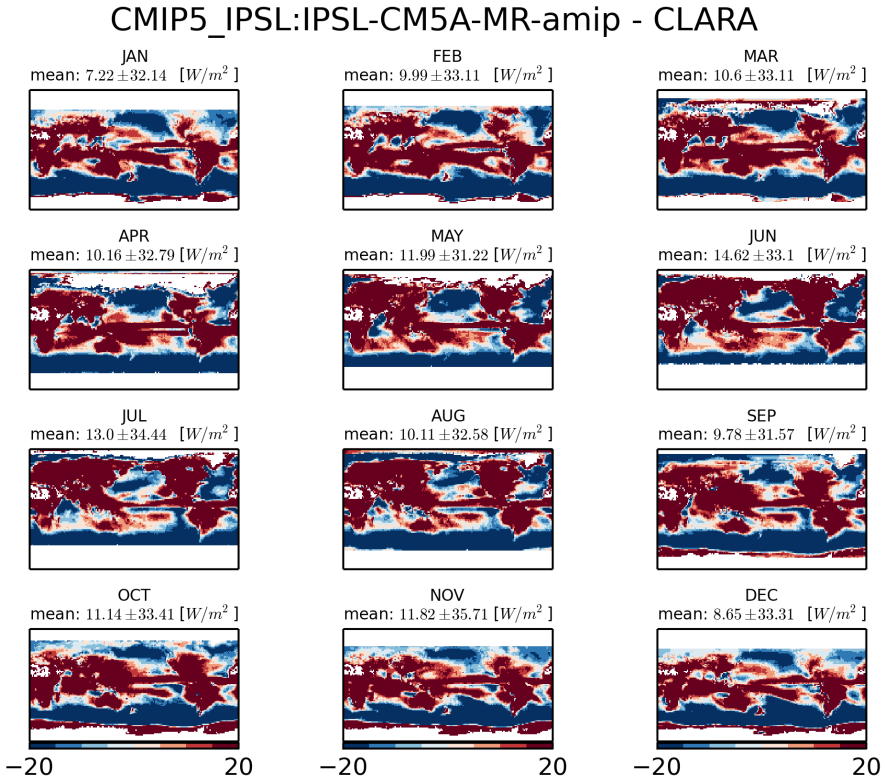



Figure 251: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and CLARA

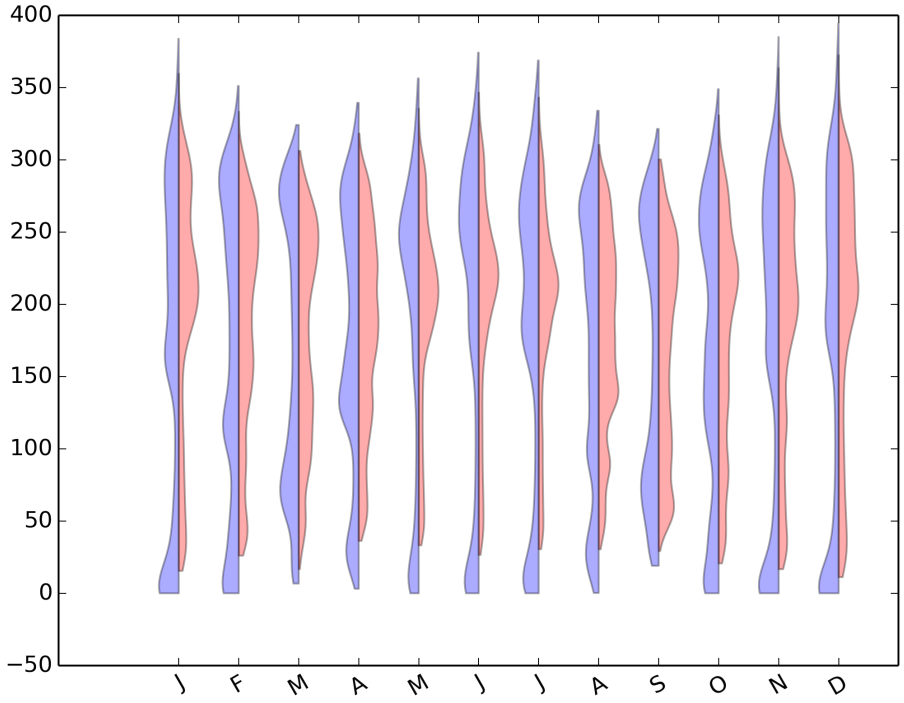



Figure 252: Violin plot for CMIP5-IPSL:IPSL-CM5A-MR-AMIP

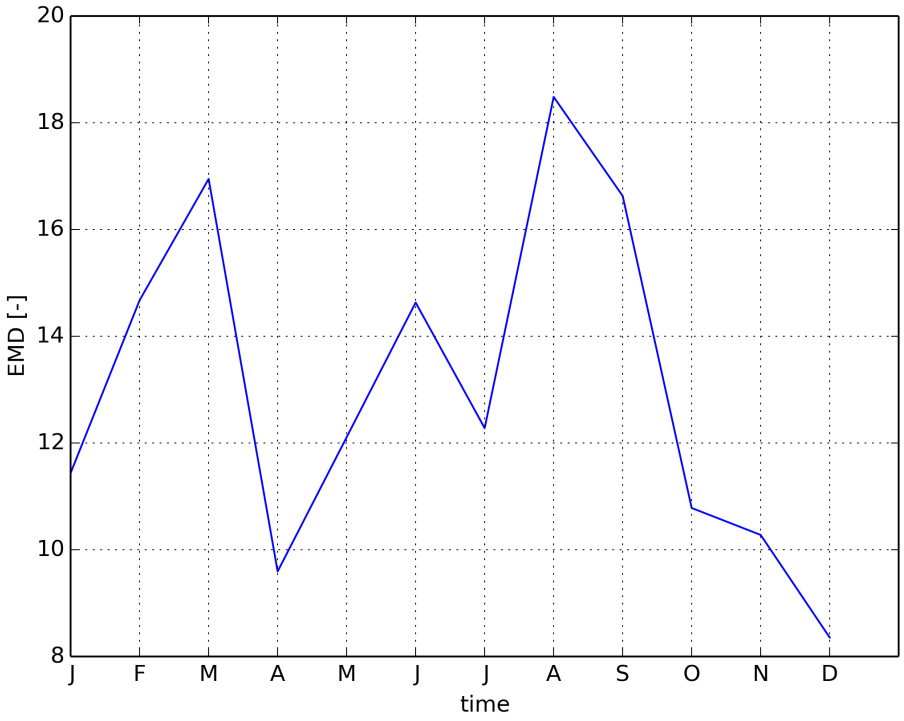



Figure 253: Timeseries of EMD

### 1.2.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

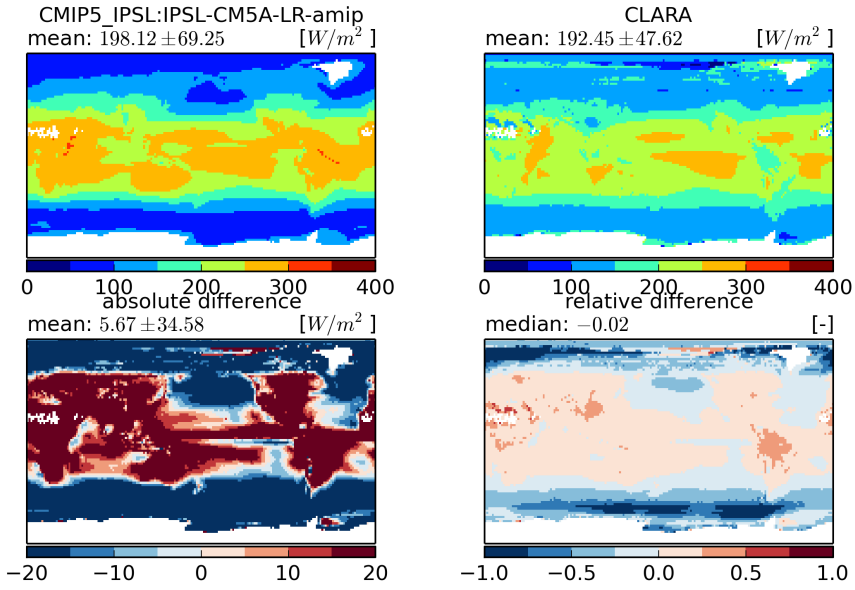



Figure 254: Temporal mean fields (top) and absolute and relative differences (bottom)

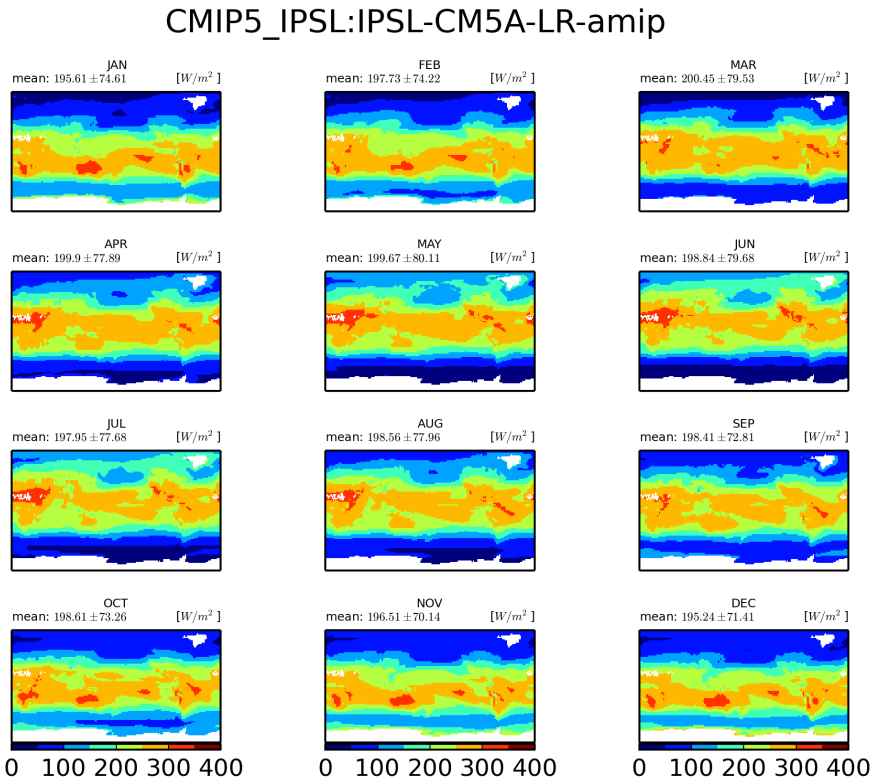



Figure 255: Monthly mean climatology for IPSL:IPSL-CM5A-LR

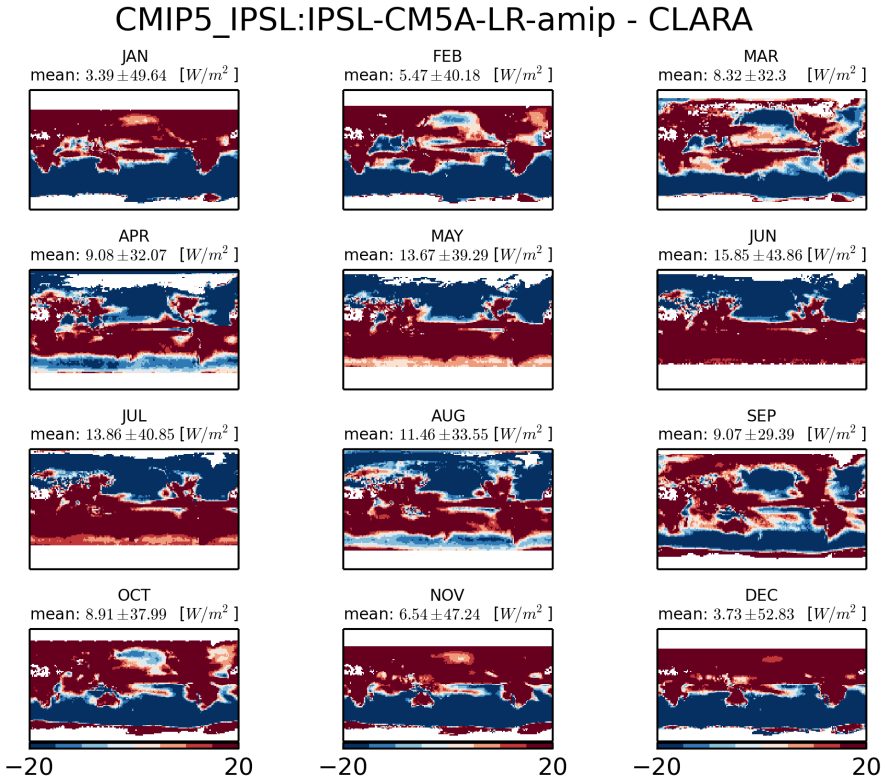



Figure 256: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and CLARA

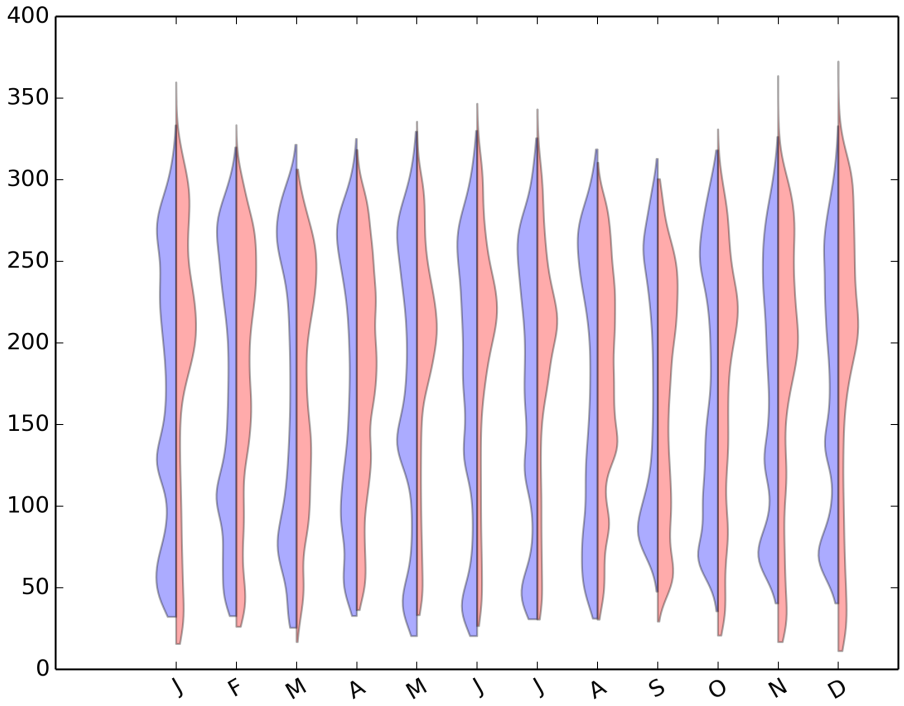



Figure 257: Violin plot for CMIP5-IPSL:IPSL-CM5A-LR-AMIP

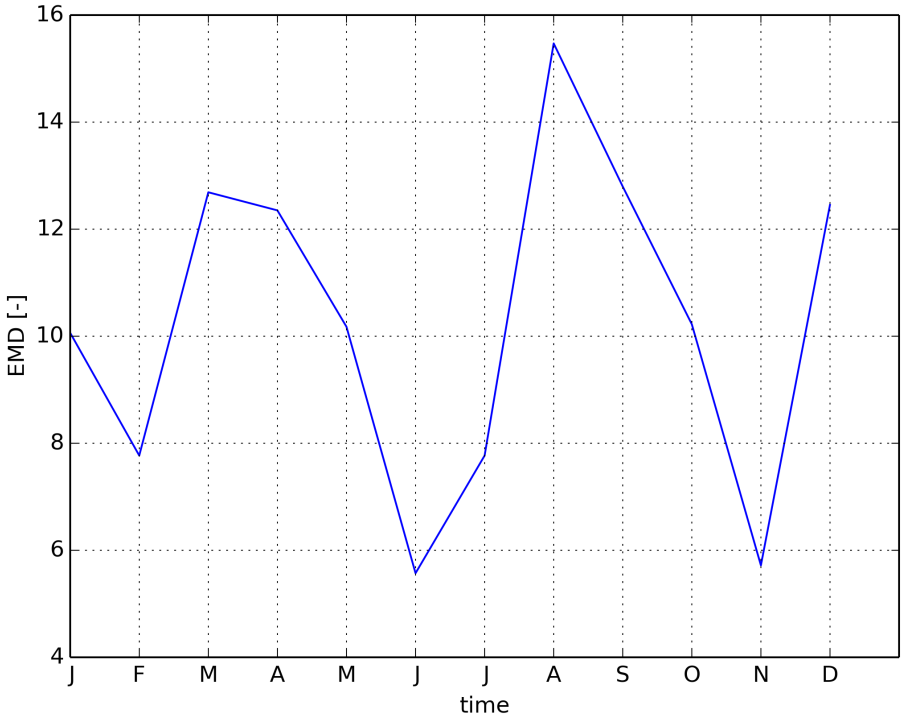



Figure 258: Timeseries of EMD

### 1.2.15 CMIP5 MOHC:HadGEM2-A-amip

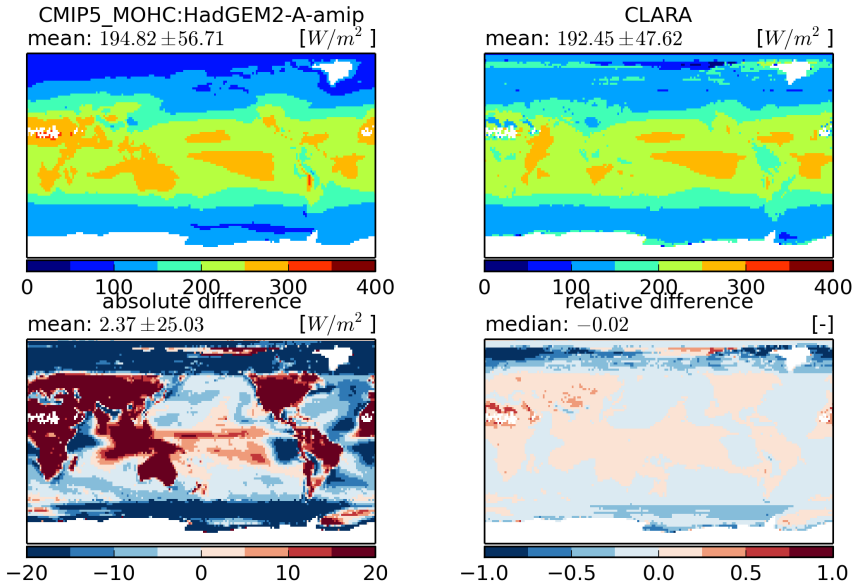



Figure 259: Temporal mean fields (top) and absolute and relative differences (bottom)

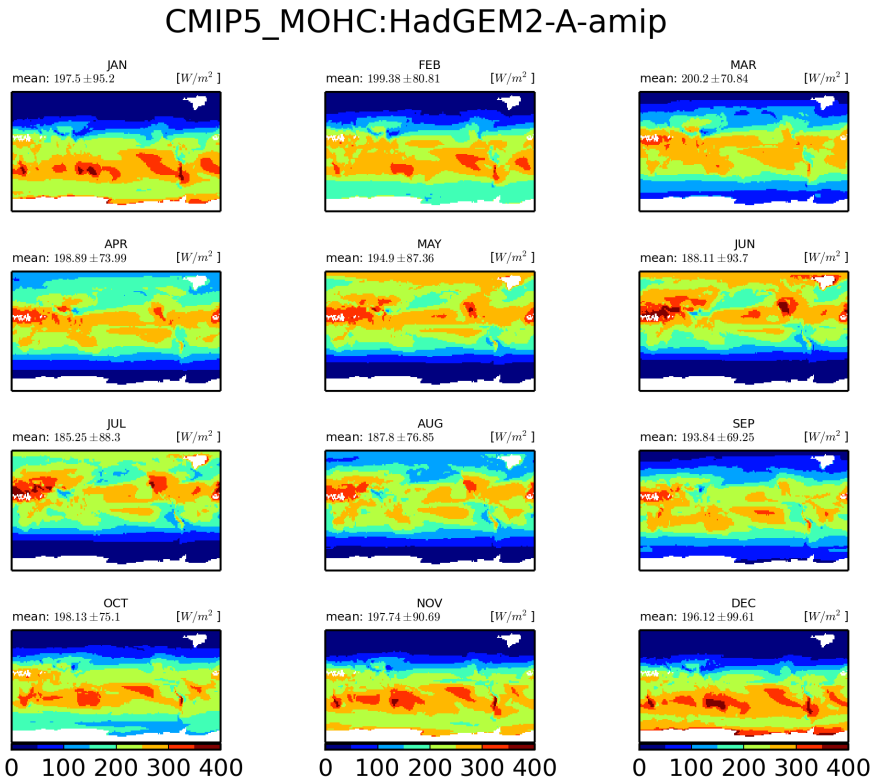



Figure 260: Monthly mean climatology for MOHC:HadGEM2-A

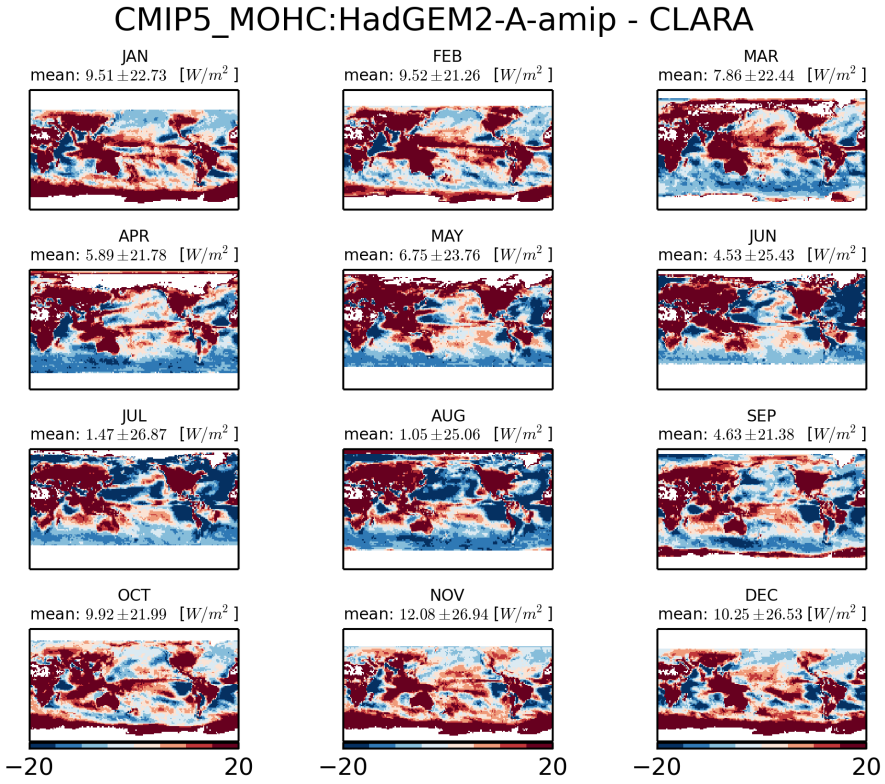



Figure 261: Monthly mean climatology of difference between MOHC:HADGEM2-A and CLARA

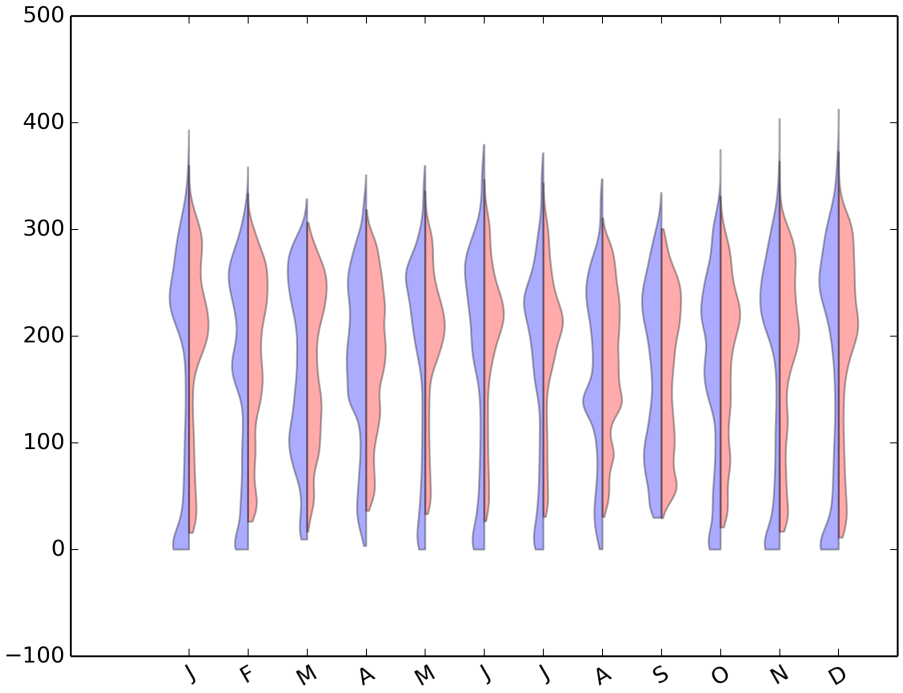



Figure 262: Violin plot for CMIP5-MOHC:HADGEM2-A-AMIP

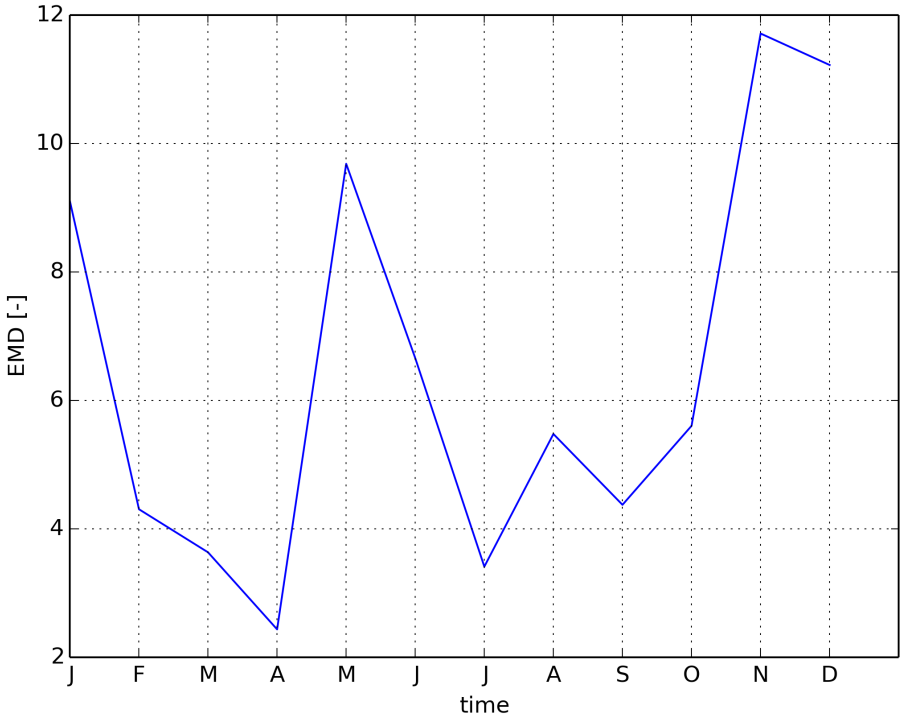



Figure 263: Timeseries of EMD

### 1.2.16 CMIP5 LASG-IAP:FGOALS-s2-amip

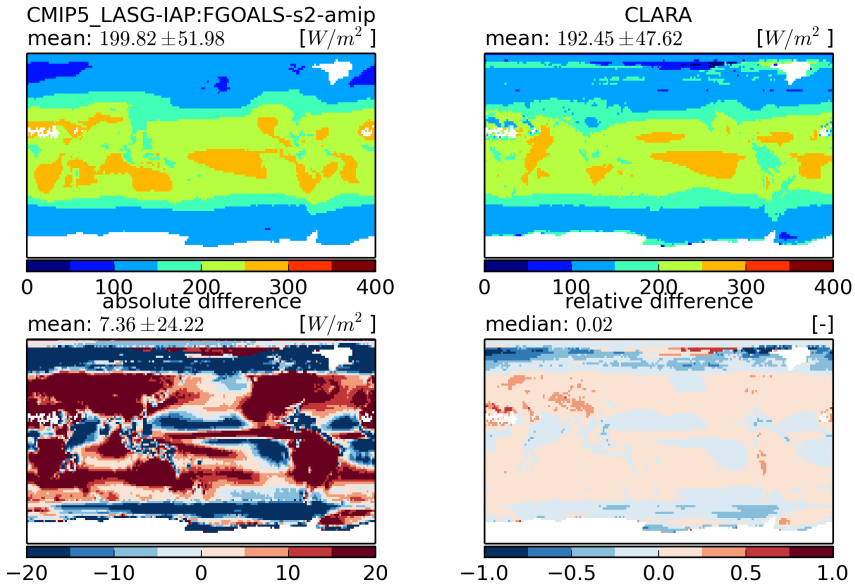



Figure 264: Temporal mean fields (top) and absolute and relative differences (bottom)

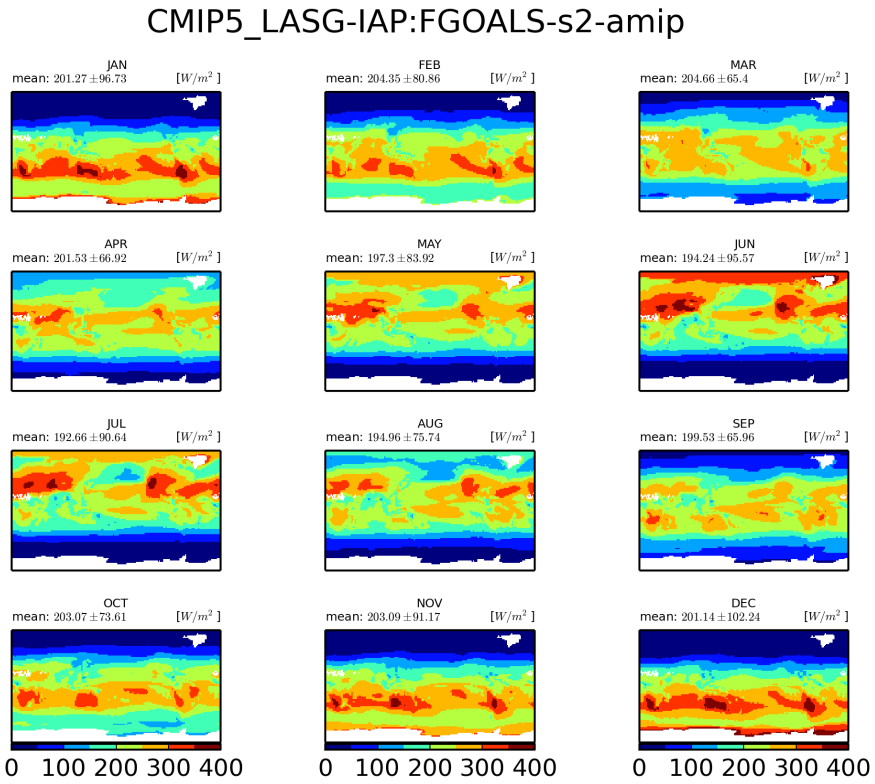



Figure 265: Monthly mean climatology for LASG-IAP:FGOALS-s2

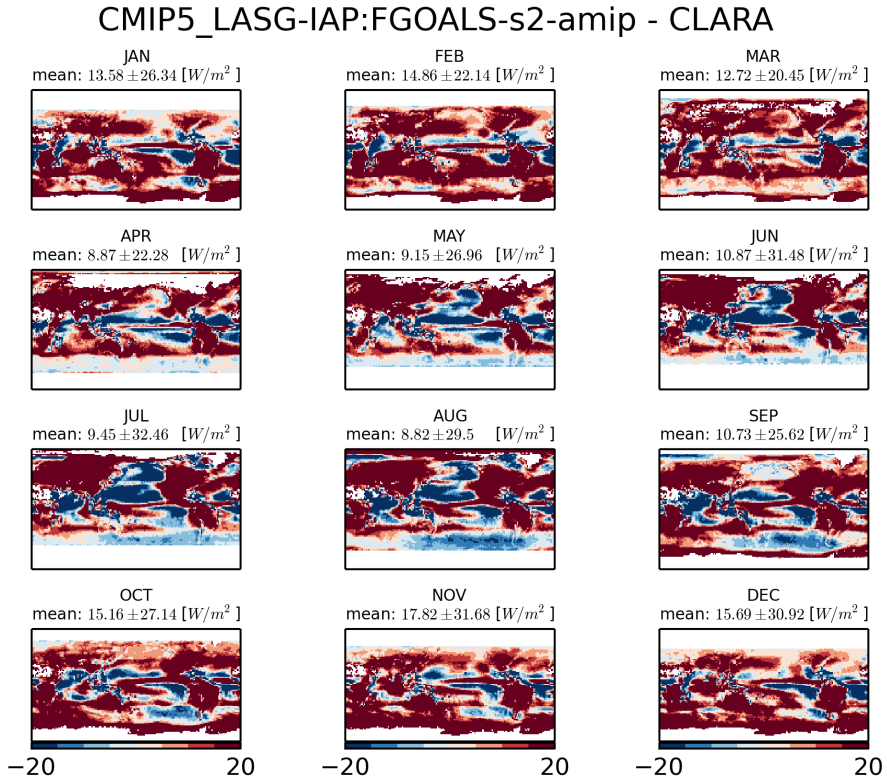



Figure 266: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and CLARA

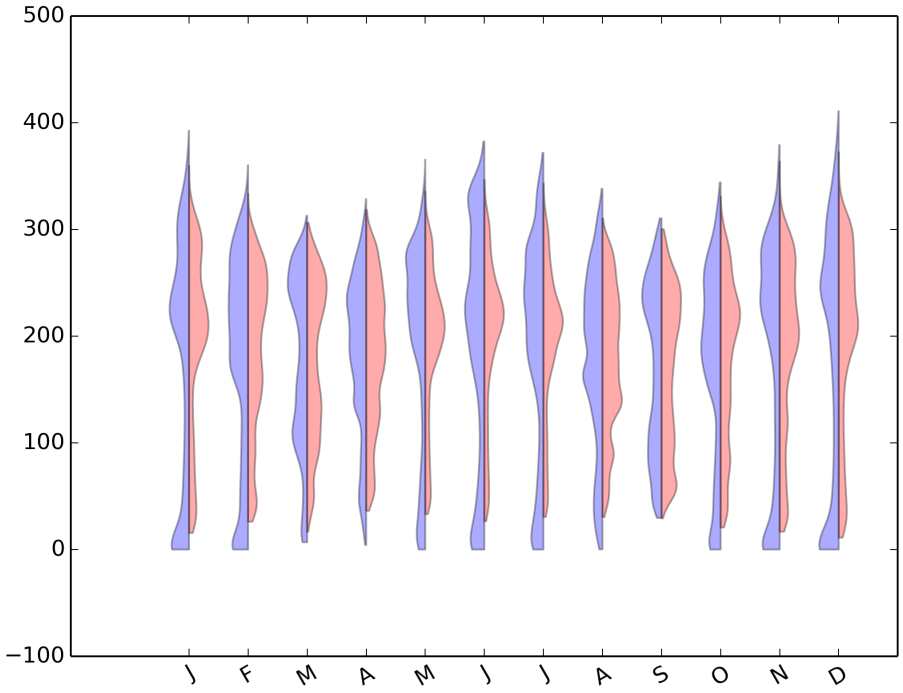



Figure 267: Violin plot for CMIP5-LASG-IAP:FGOALS-S2-AMIP

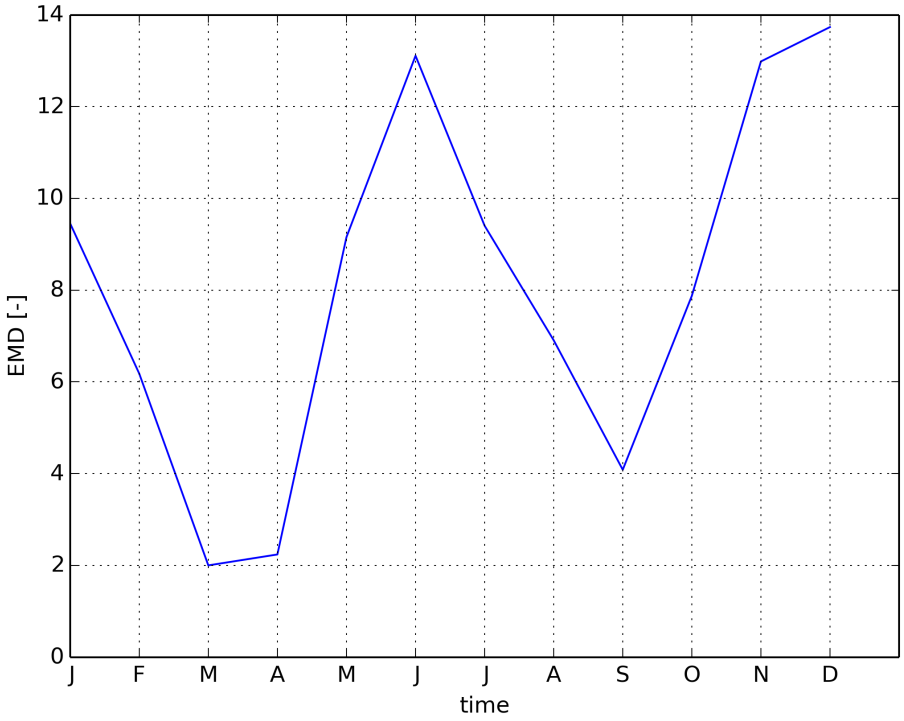



Figure 268: Timeseries of EMD

### 1.2.17 CMIP5 CMCC:CMCC-CM-amip

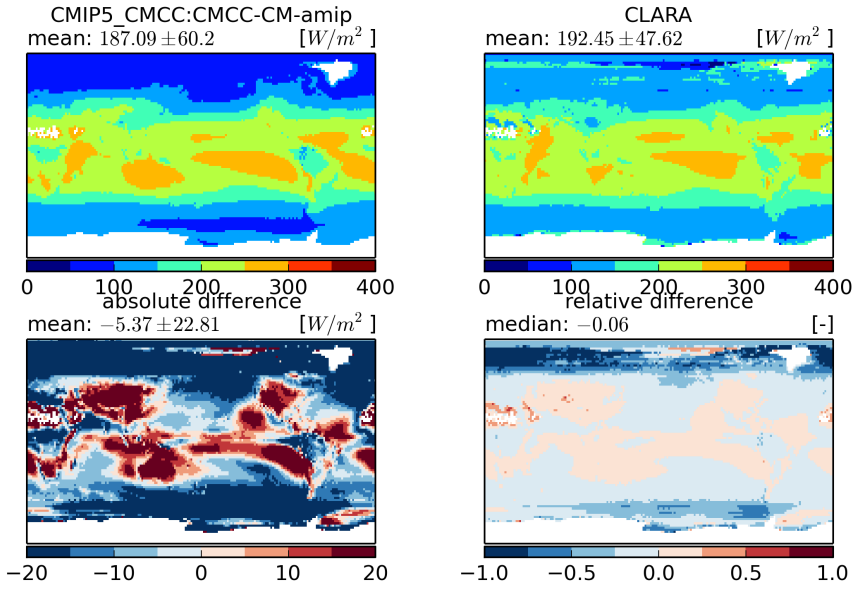



Figure 269: Temporal mean fields (top) and absolute and relative differences (bottom)

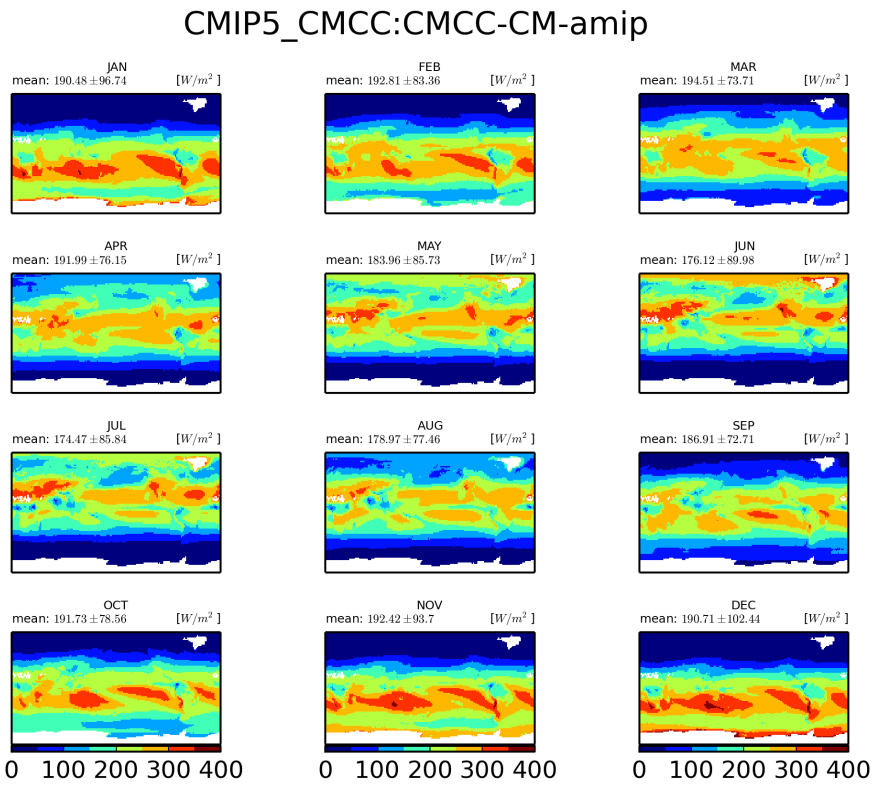



Figure 270: Monthly mean climatology for CMCC:CMCC-CM

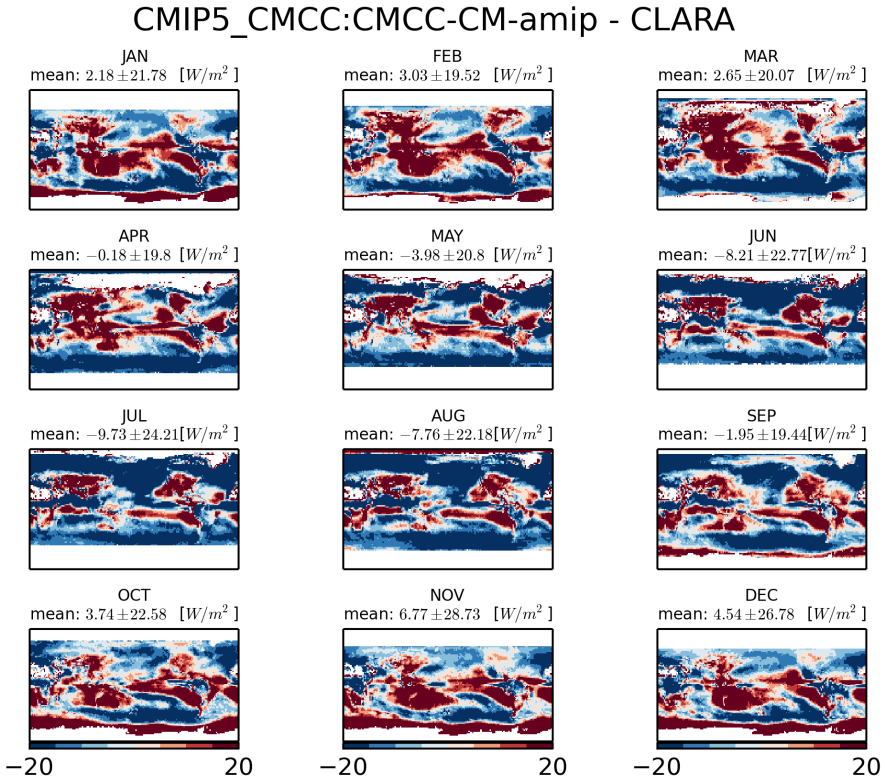



Figure 271: Monthly mean climatology of difference between CMCC:CMCC-CM and CLARA

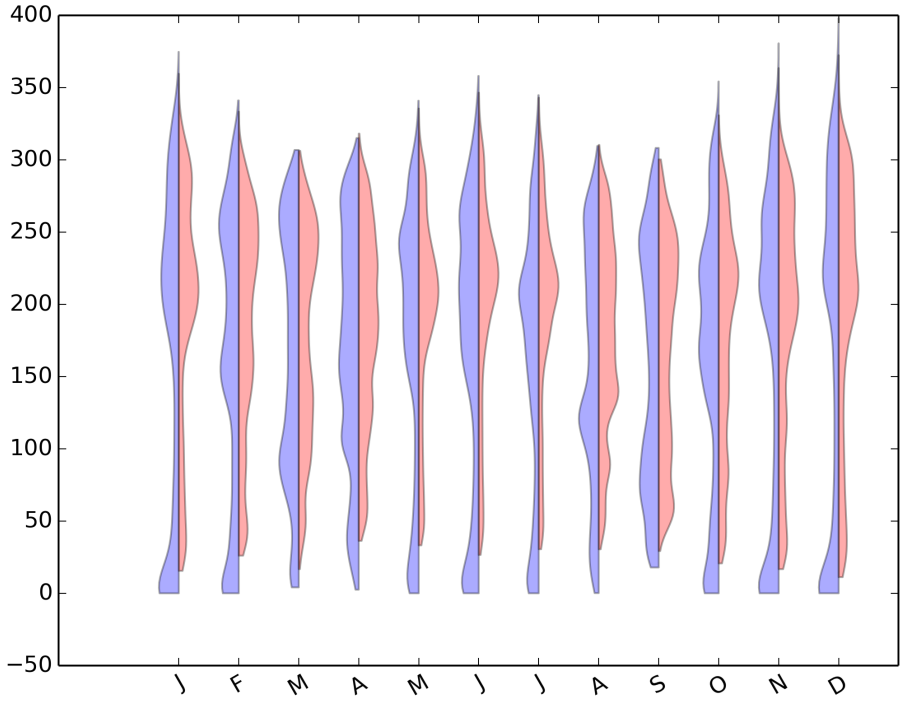



Figure 272: Violin plot for CMIP5-CMCC:CMCC-CM-AMIP

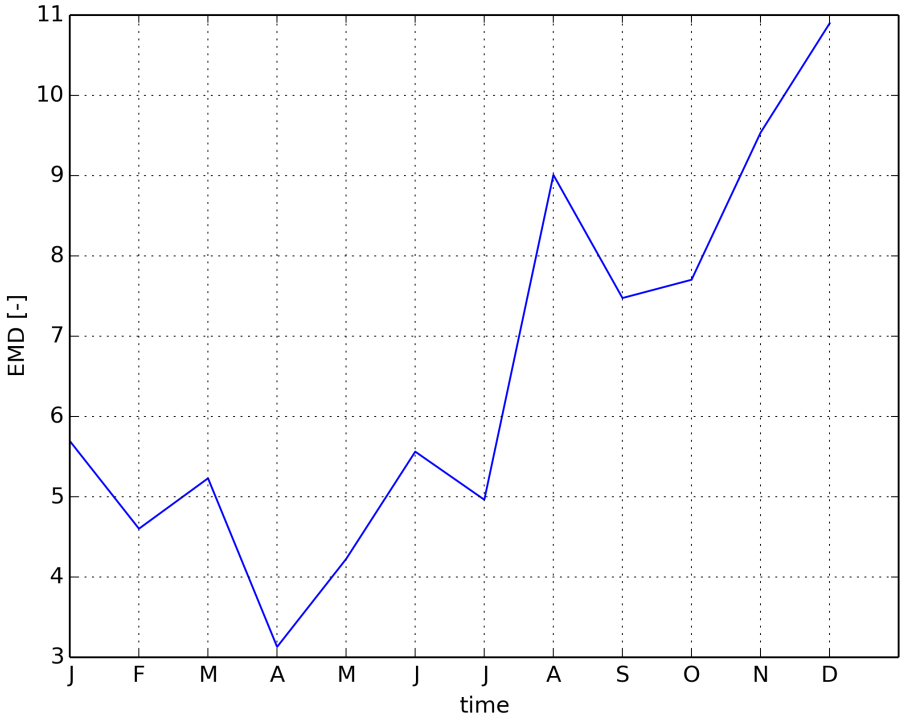



Figure 273: Timeseries of EMD

### 1.2.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

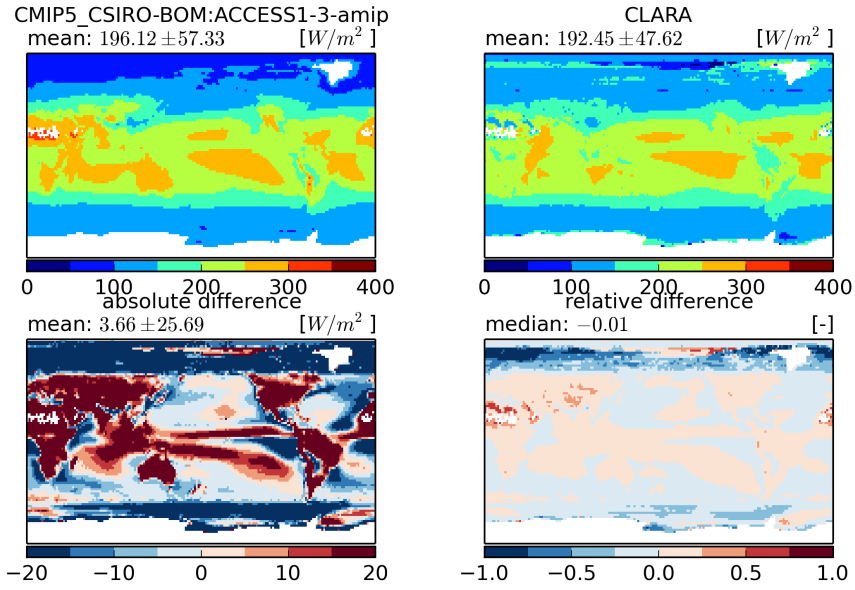



Figure 274: Temporal mean fields (top) and absolute and relative differences (bottom)

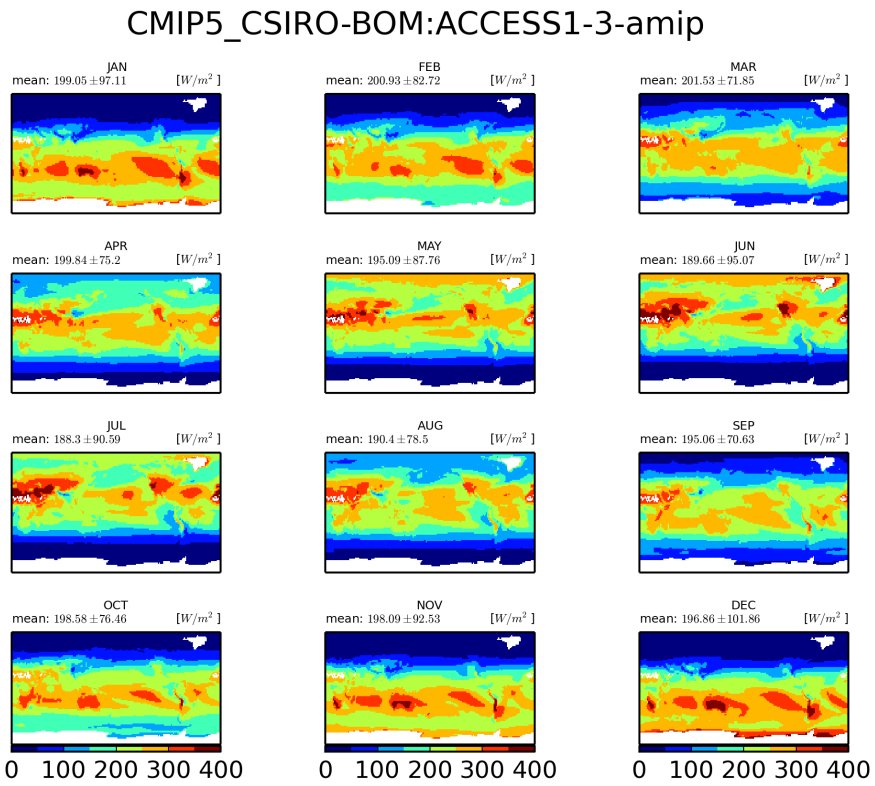



Figure 275: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

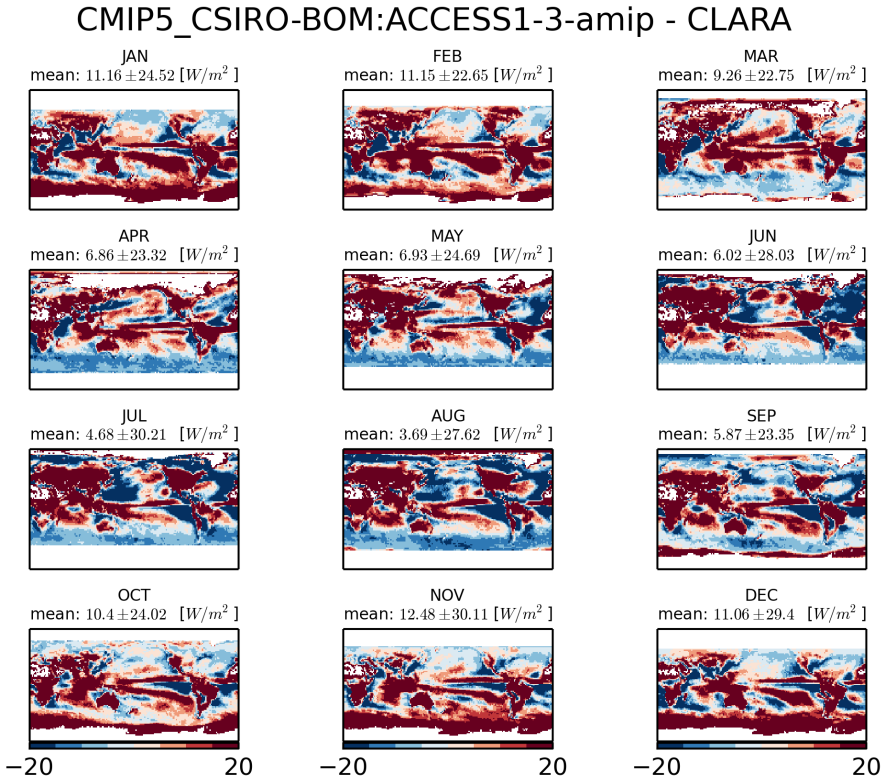



Figure 276: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and CLARA

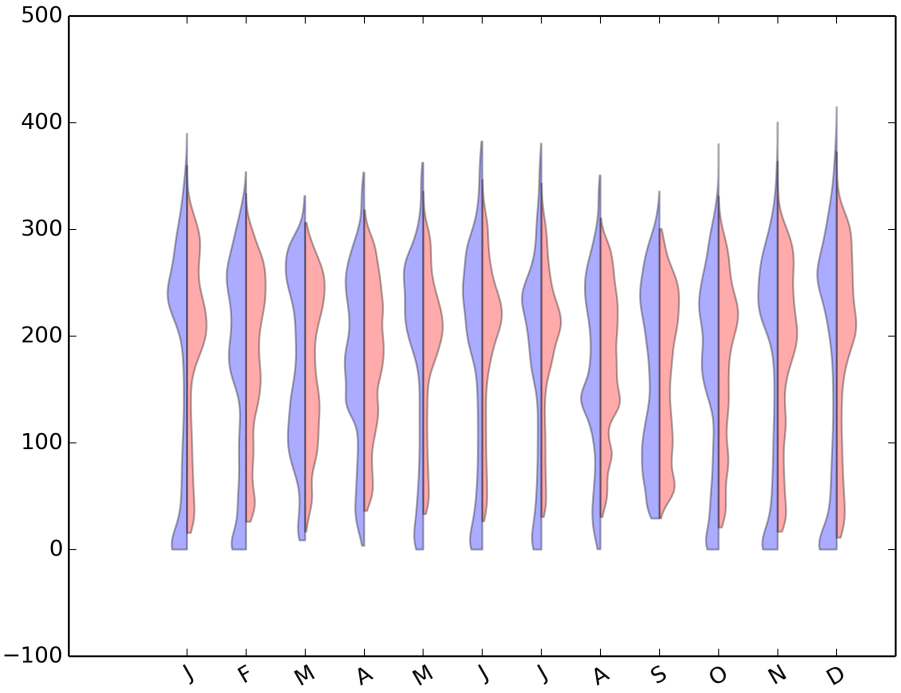



Figure 277: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-3-AMIP

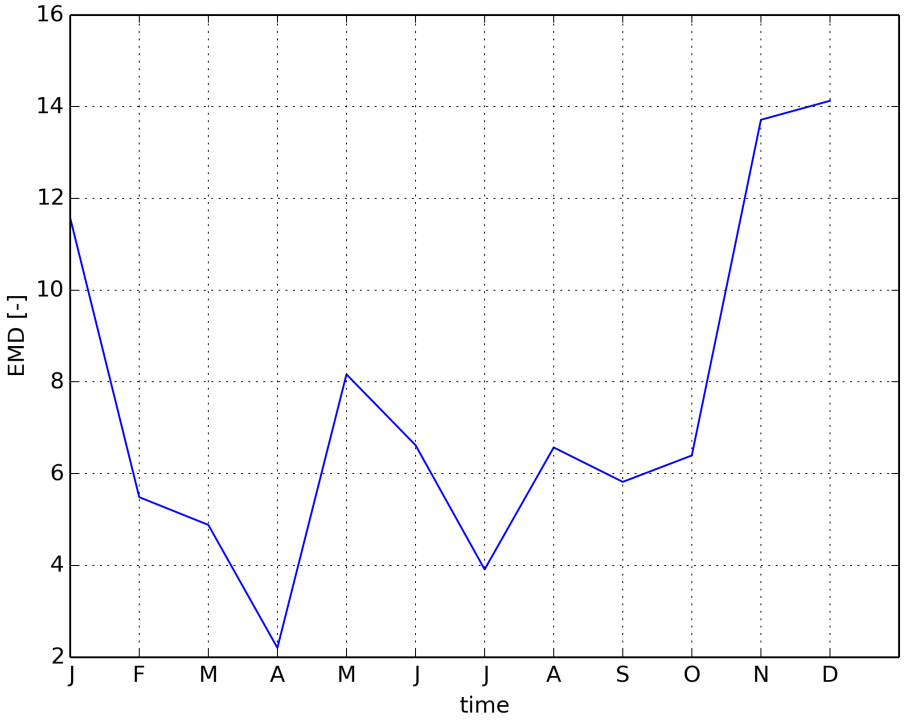



Figure 278: Timeseries of EMD

### 1.2.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

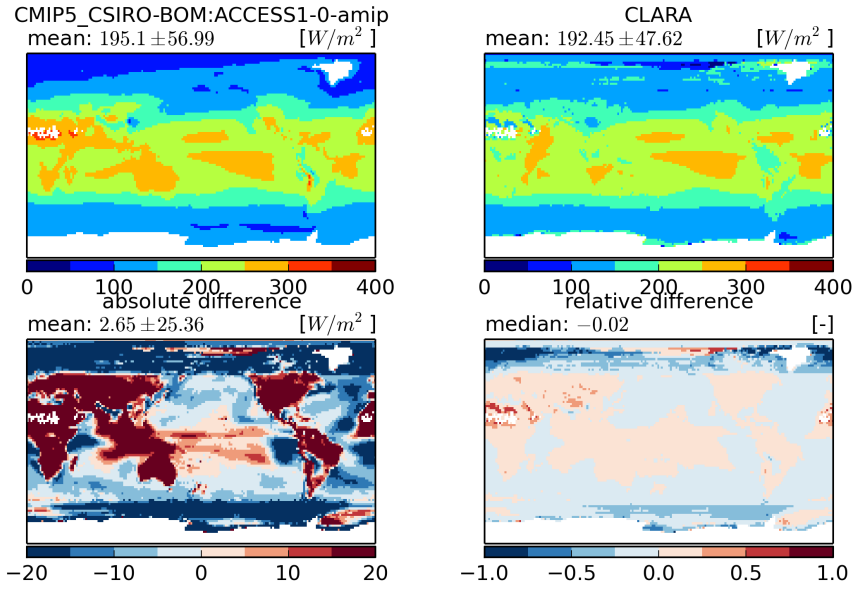



Figure 279: Temporal mean fields (top) and absolute and relative differences (bottom)

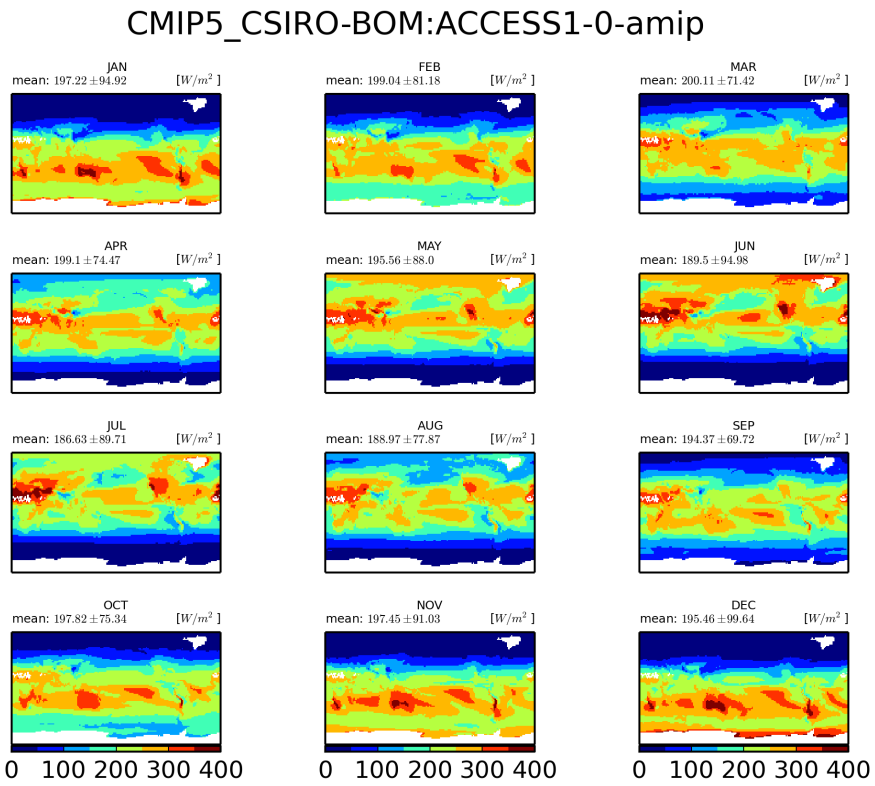



Figure 280: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

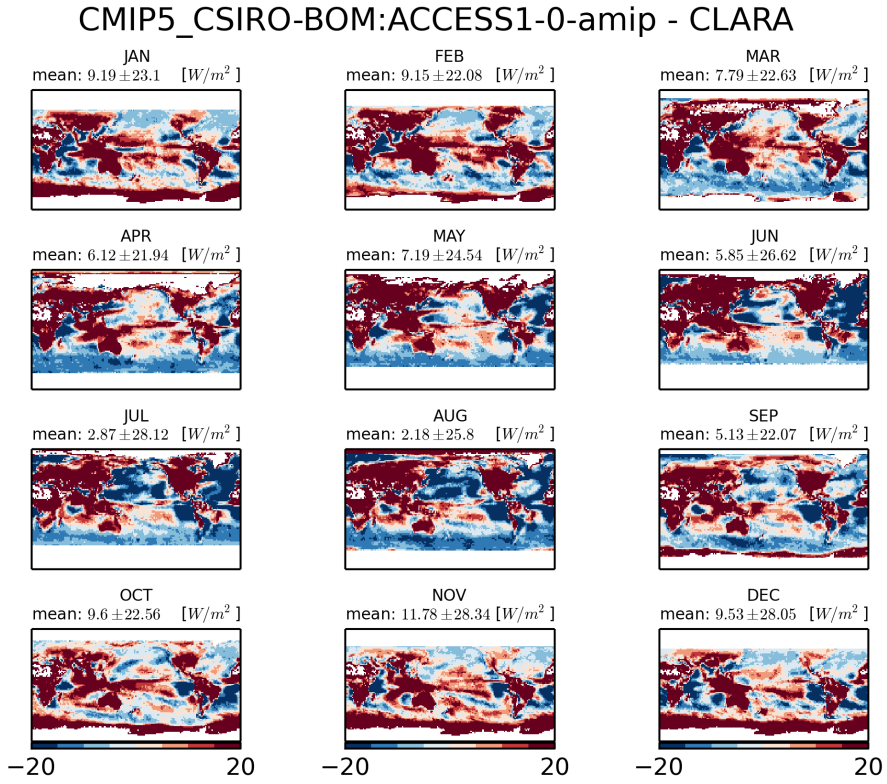



Figure 281: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and CLARA

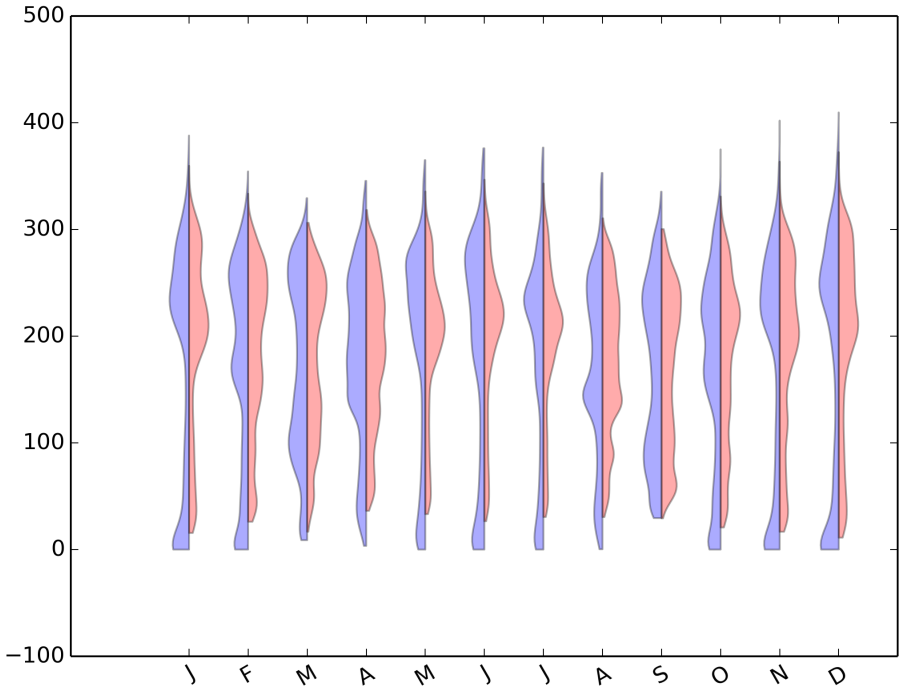



Figure 282: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-0-AMIP

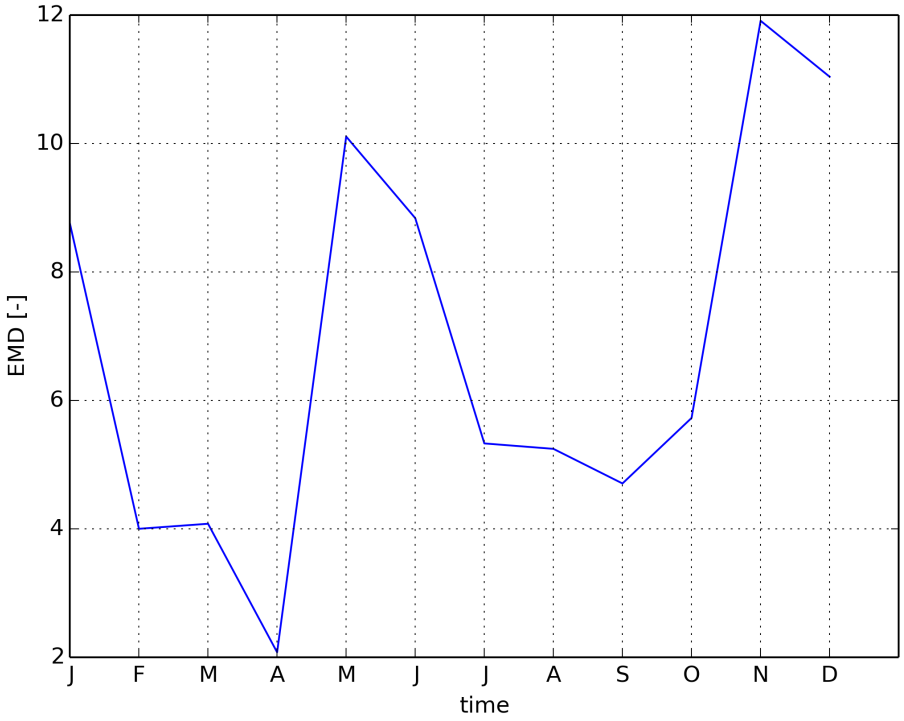



Figure 283: Timeseries of EMD

### 1.2.20 CMIP5 INM:inmcm4-amip

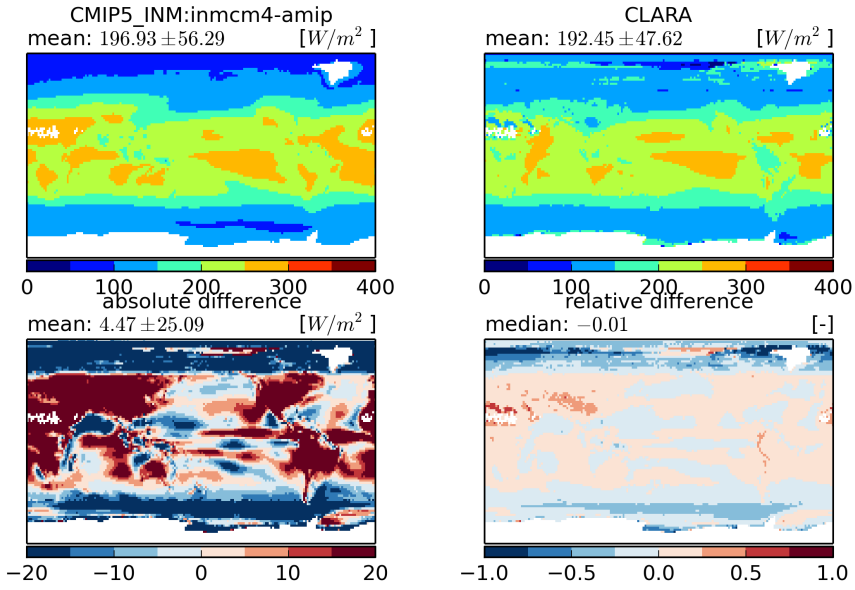



Figure 284: Temporal mean fields (top) and absolute and relative differences (bottom)

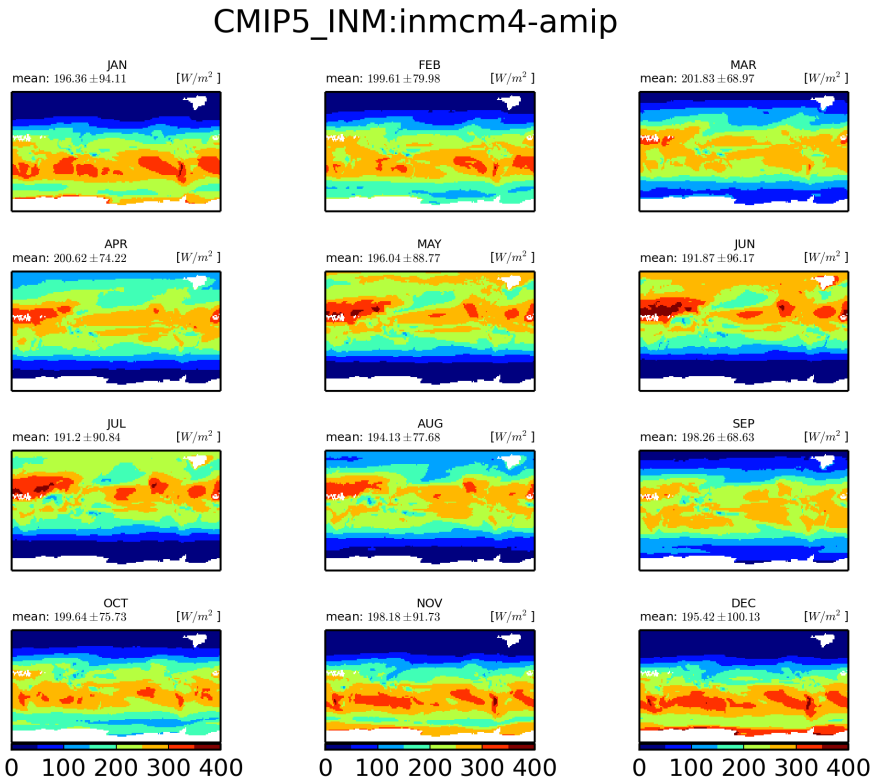



Figure 285: Monthly mean climatology for INM:inmcm4

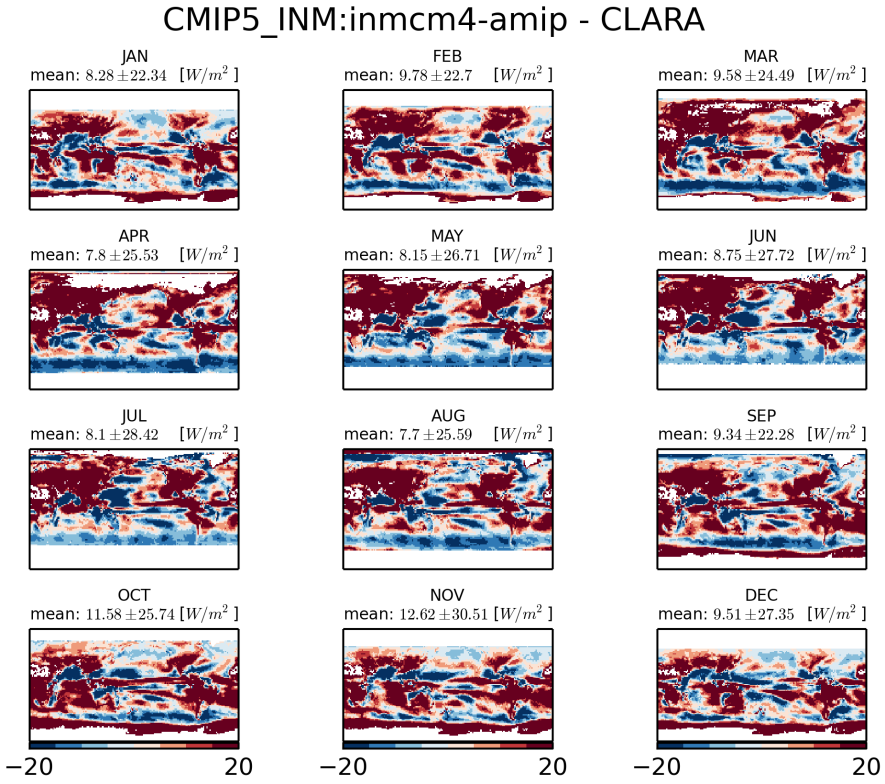



Figure 286: Monthly mean climatology of difference between INM:INMCM4 and CLARA

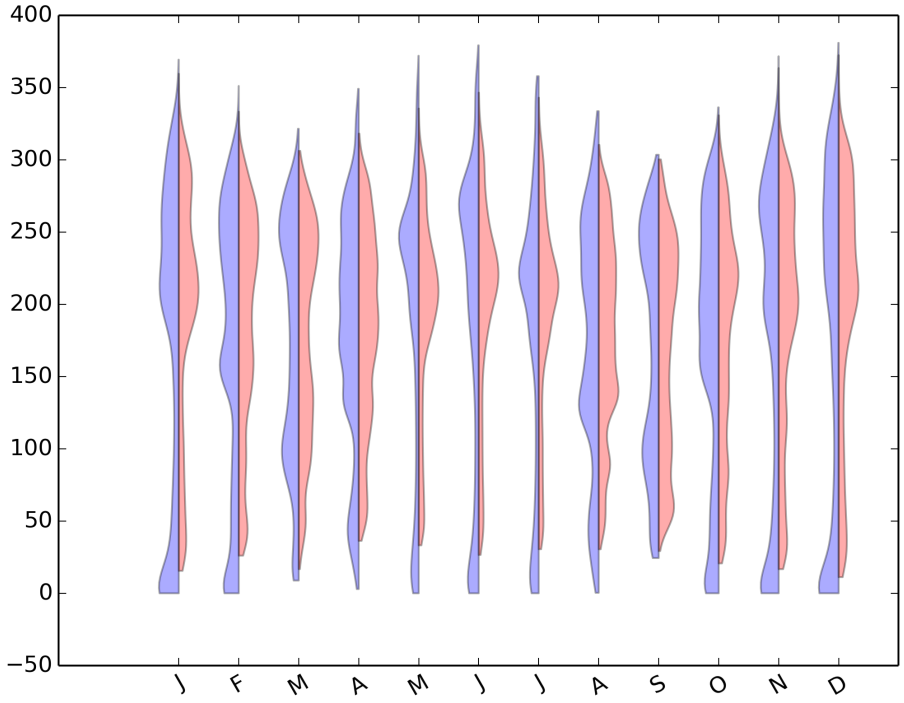



Figure 287: Violin plot for CMIP5-INM:INMCM4-AMIP

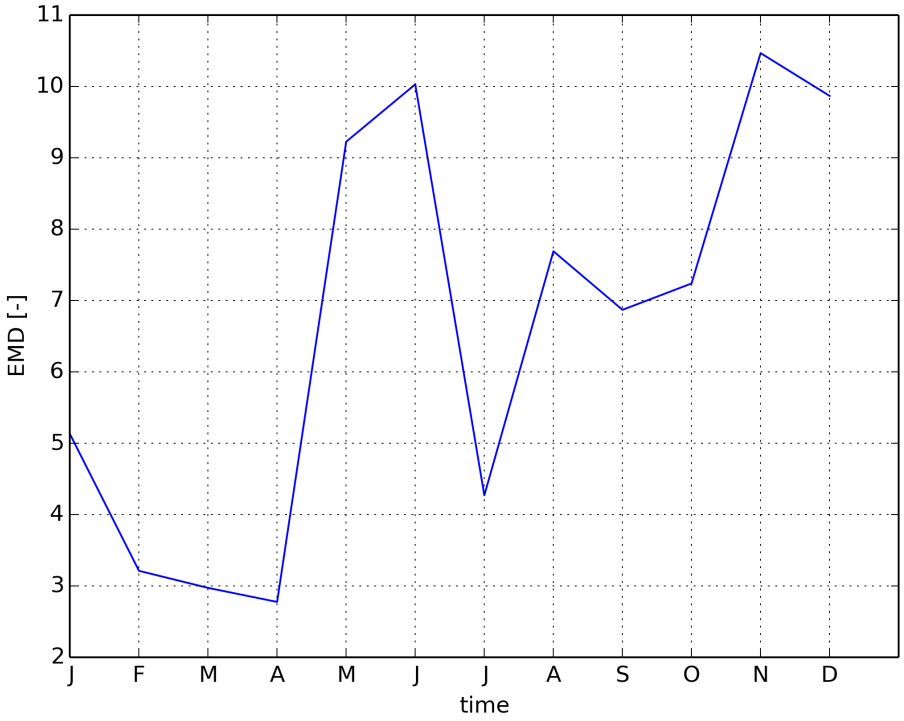



Figure 288: Timeseries of EMD

### 1.2.21 CMIP5 MPI-M:MPI-ESM-LR-amip

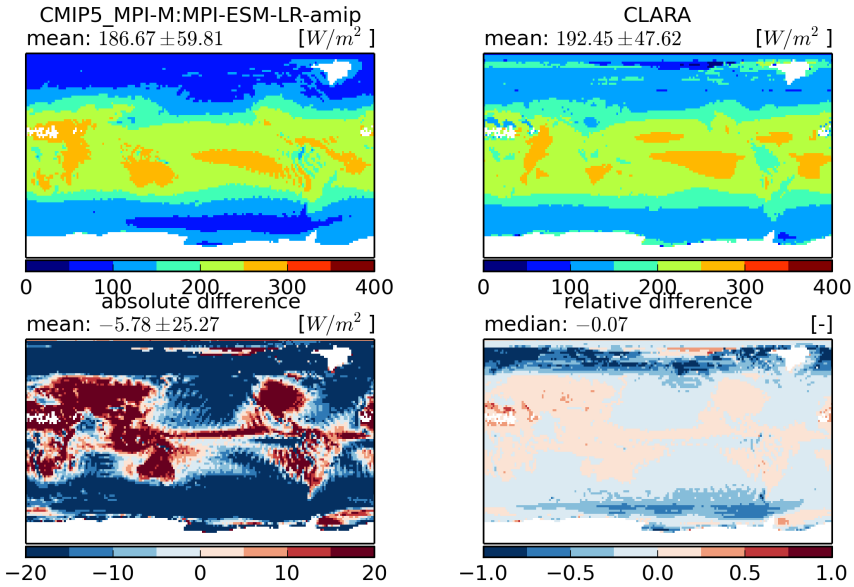



Figure 289: Temporal mean fields (top) and absolute and relative differences (bottom)

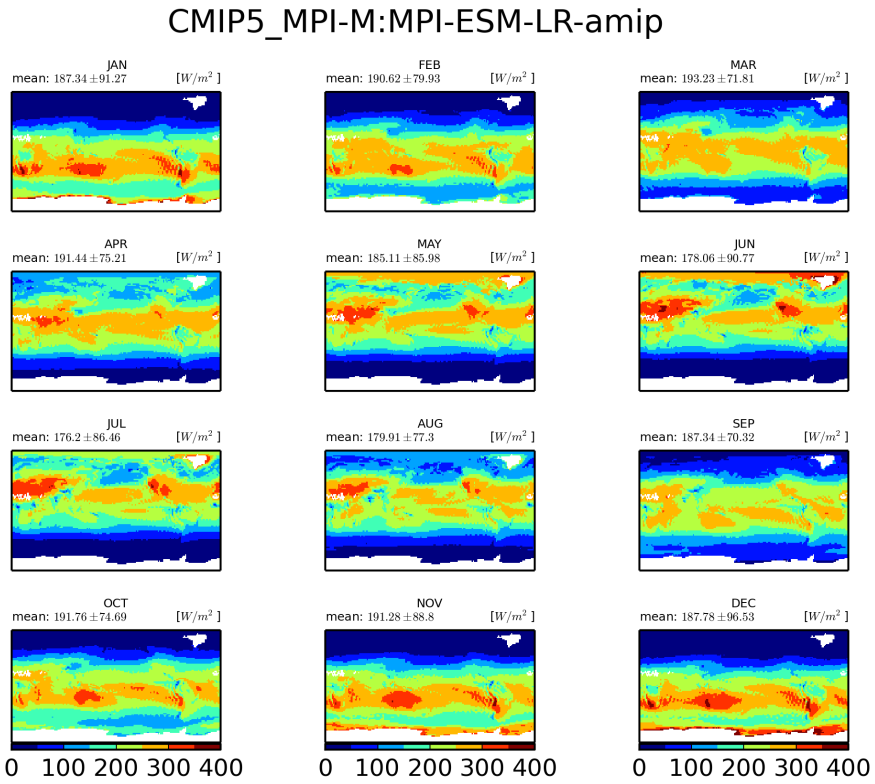



Figure 290: Monthly mean climatology for MPI-M:MPI-ESM-LR

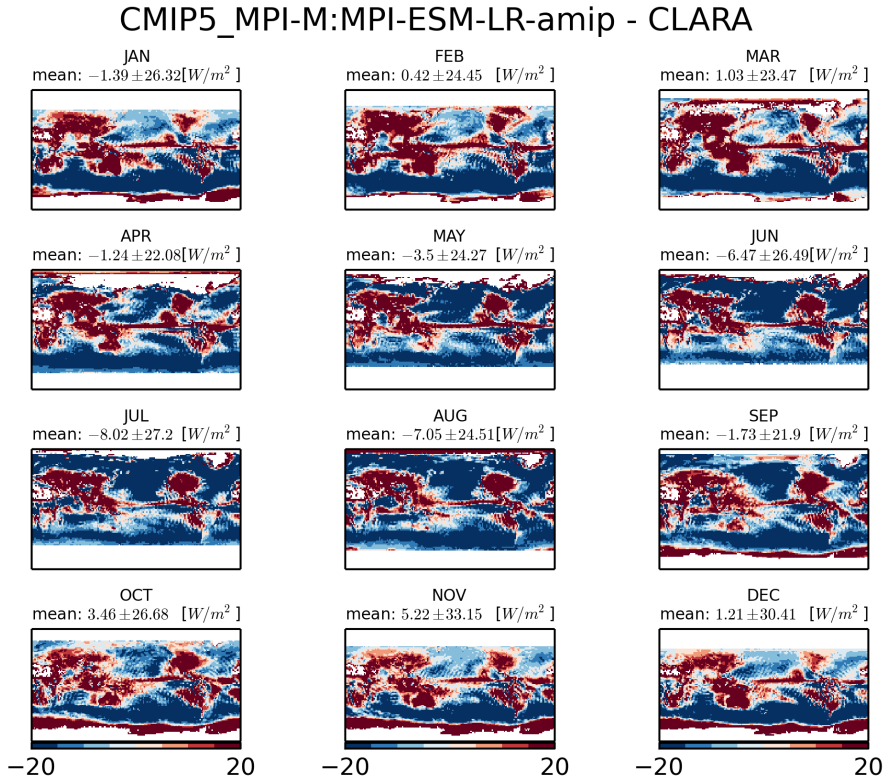



Figure 291: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and CLARA

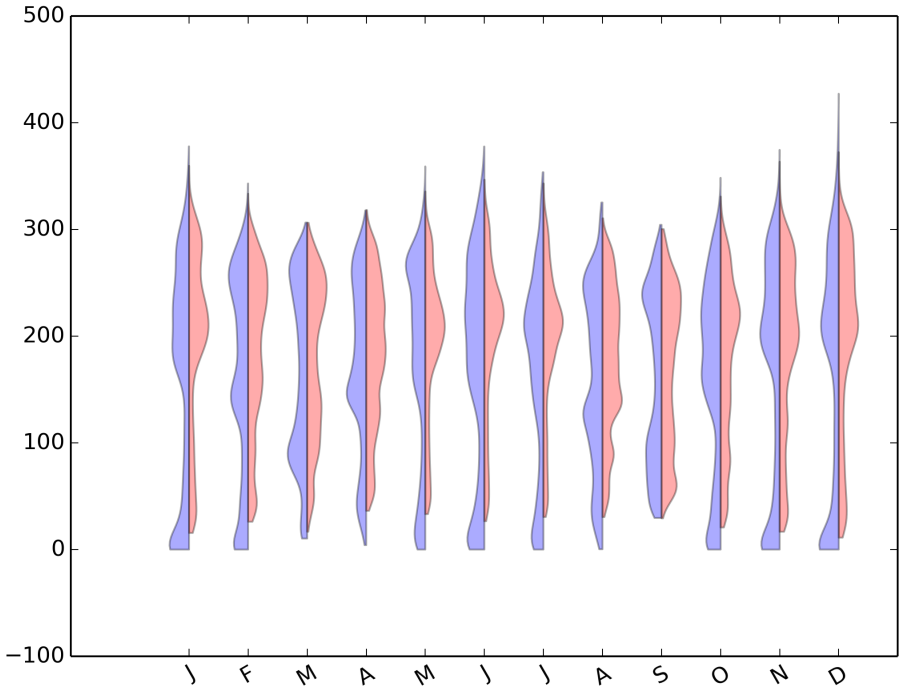



Figure 292: Violin plot for CMIP5-MPI-M:MPI-ESM-LR-AMIP

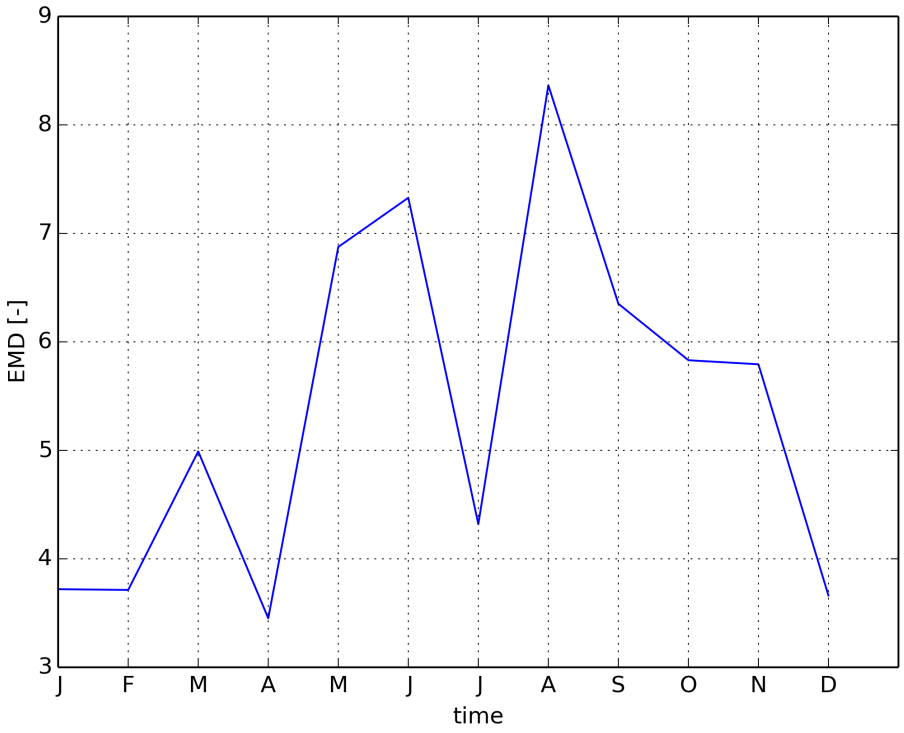



Figure 293: Timeseries of EMD

### 1.2.22 CMIP5 MPI-M:MPI-ESM-MR-amip

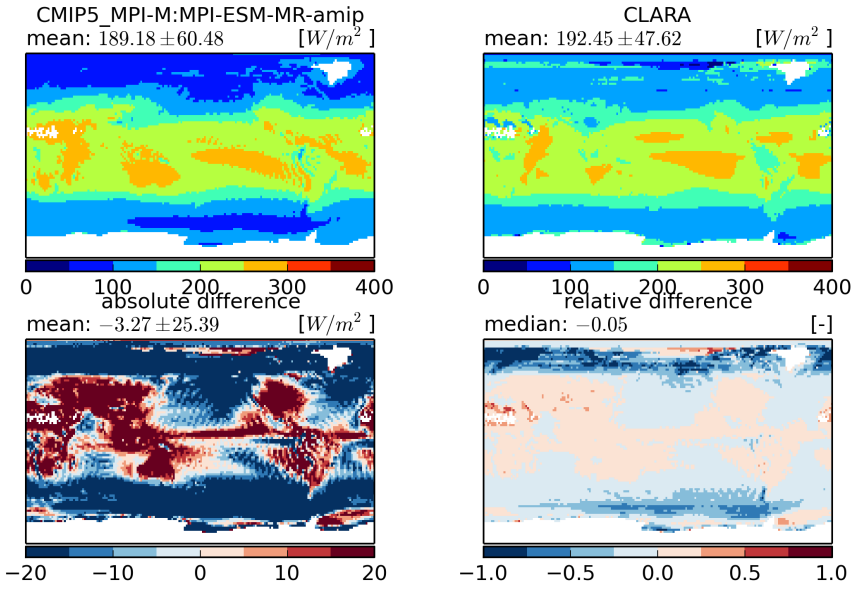



Figure 294: Temporal mean fields (top) and absolute and relative differences (bottom)

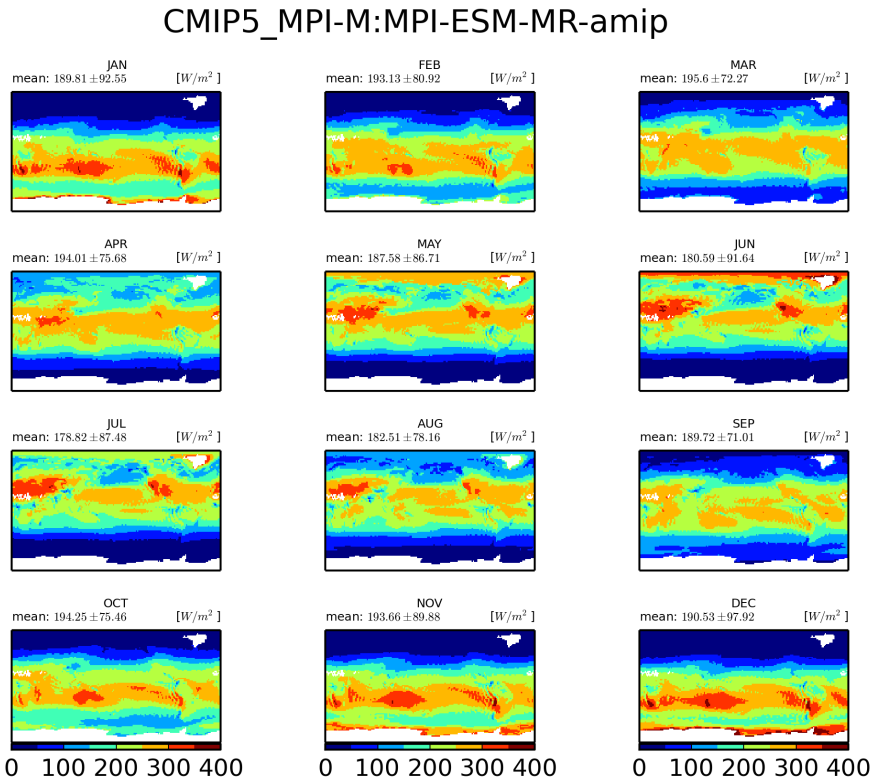



Figure 295: Monthly mean climatology for MPI-M:MPI-ESM-MR

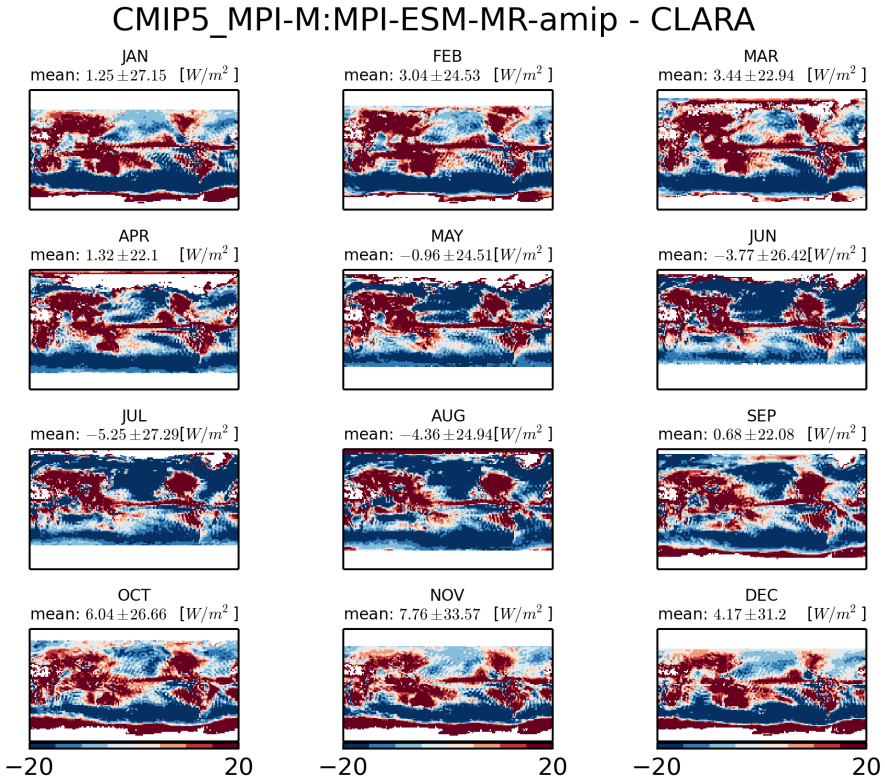



Figure 296: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and CLARA

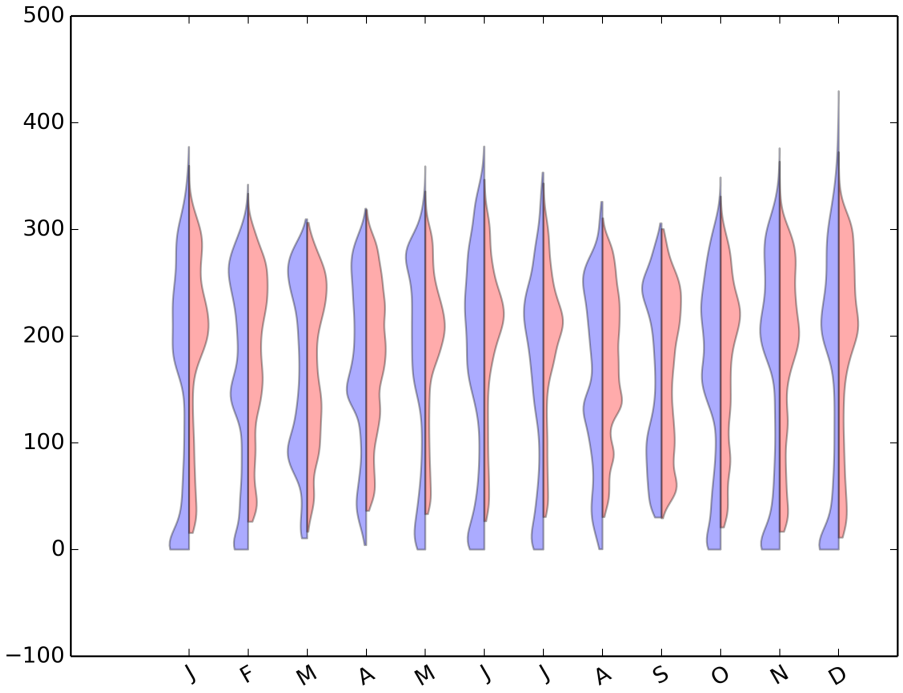



Figure 297: Violin plot for CMIP5-MPI-M:MPI-ESM-MR-AMIP

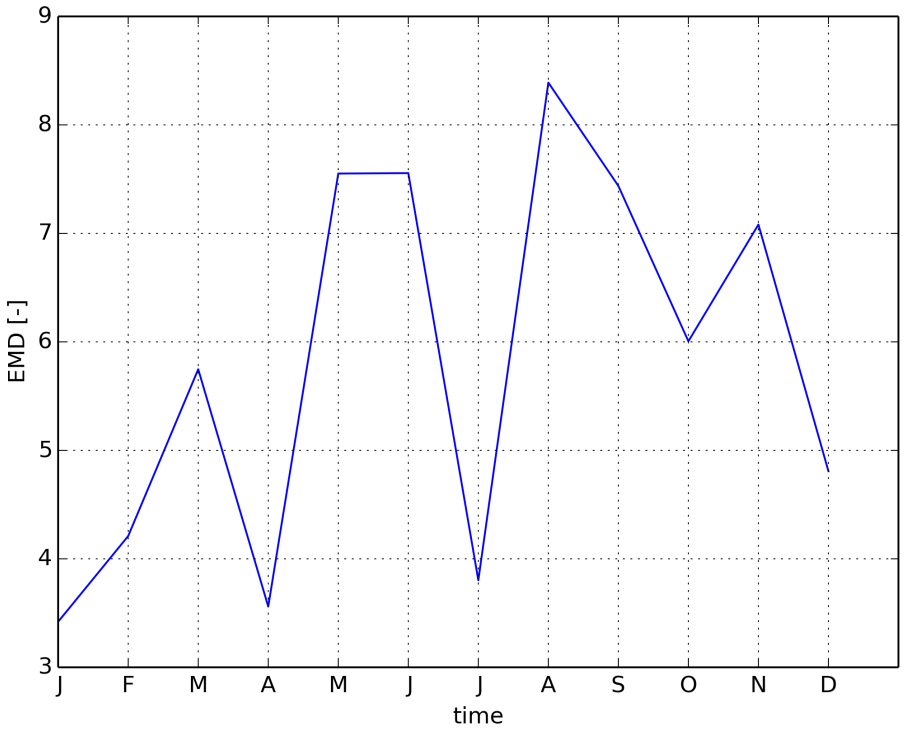



Figure 298: Timeseries of EMD

### 1.2.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

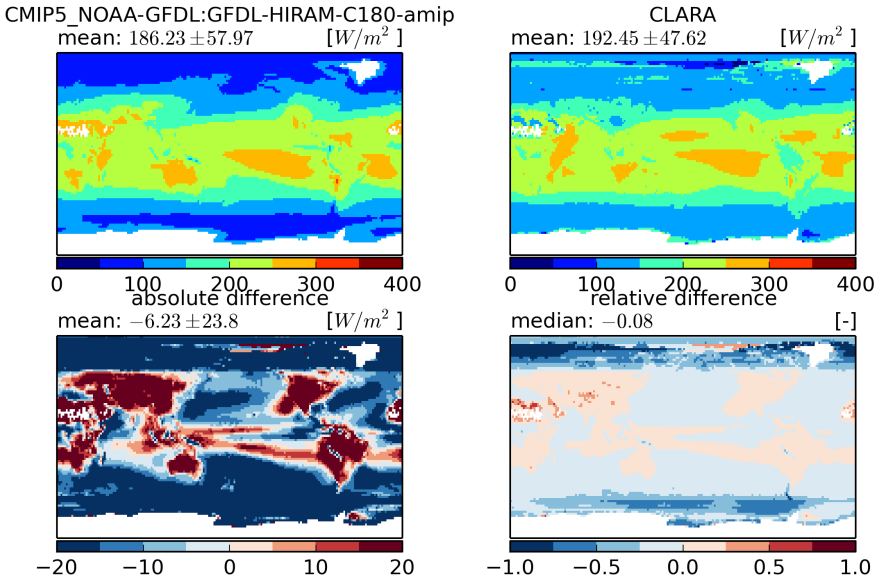



Figure 299: Temporal mean fields (top) and absolute and relative differences (bottom)

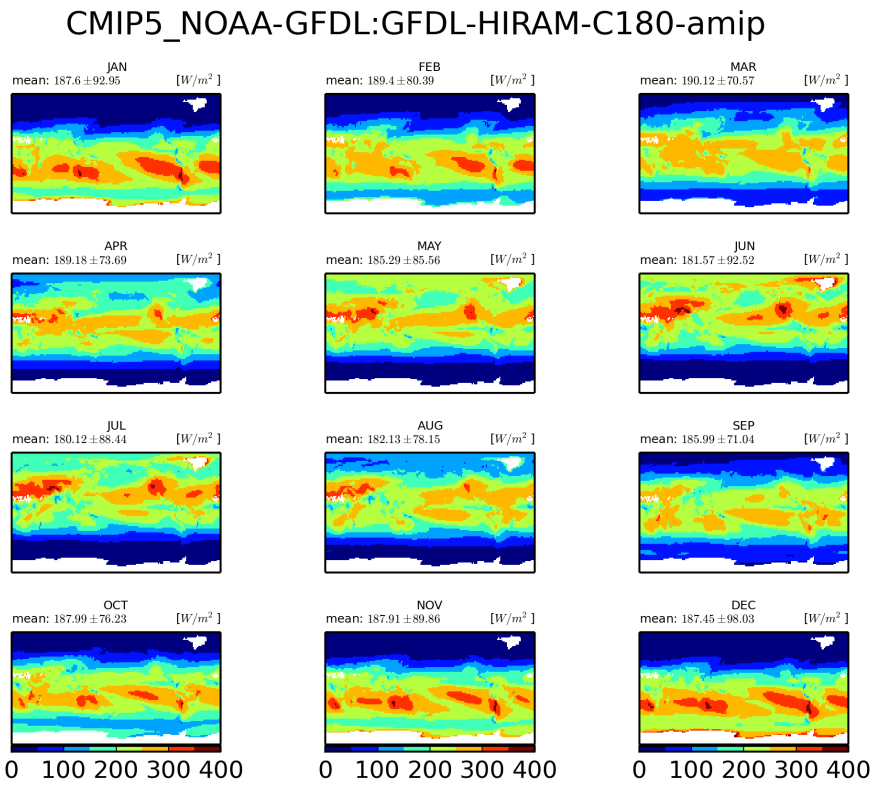



Figure 300: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

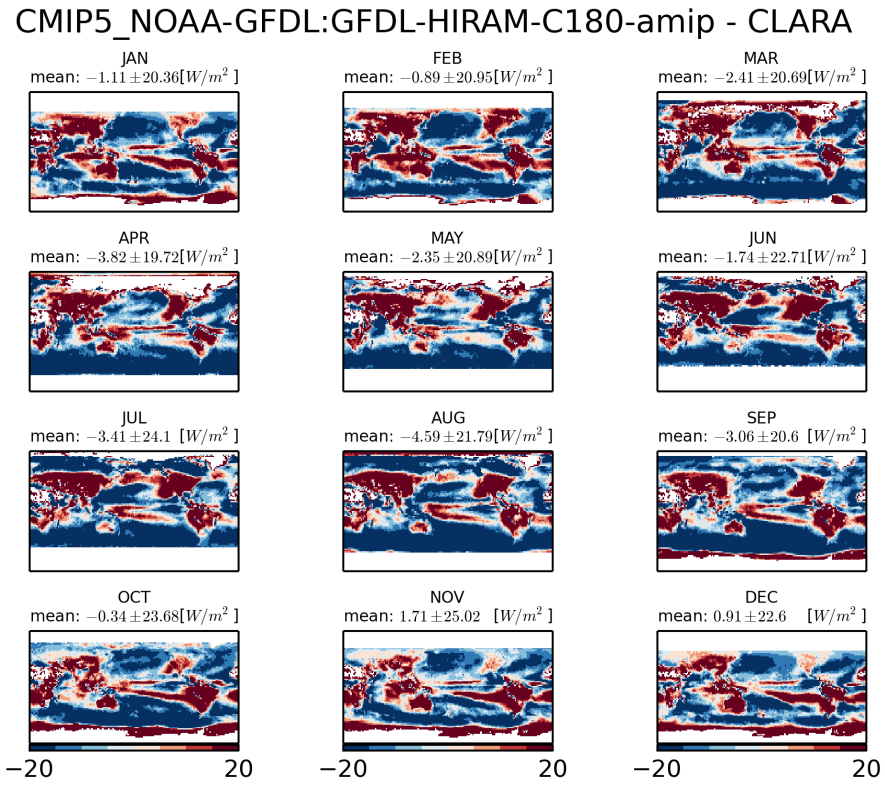



Figure 301: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and CLARA

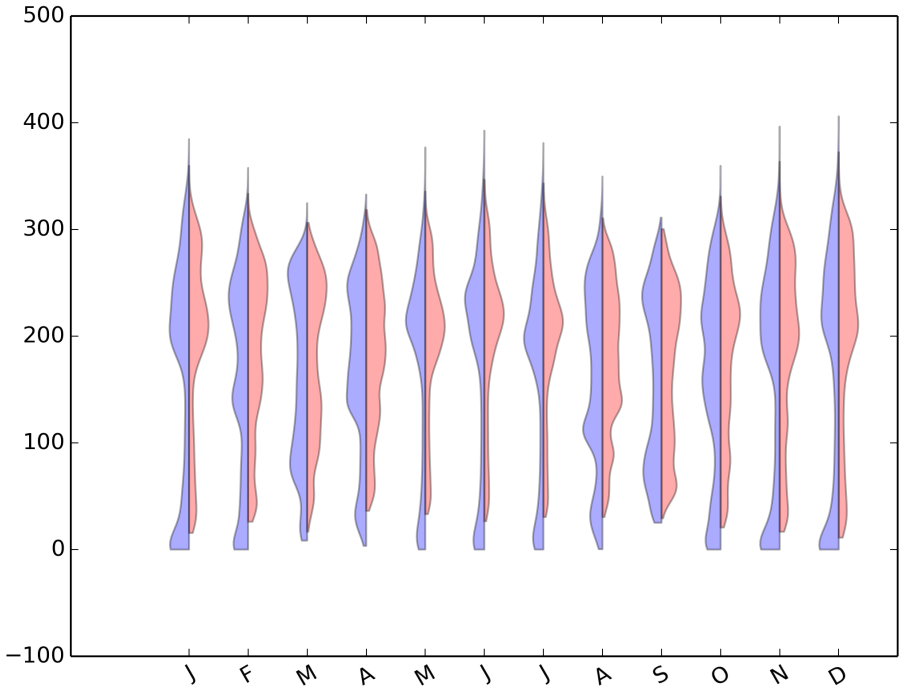



Figure 302: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-AMIP

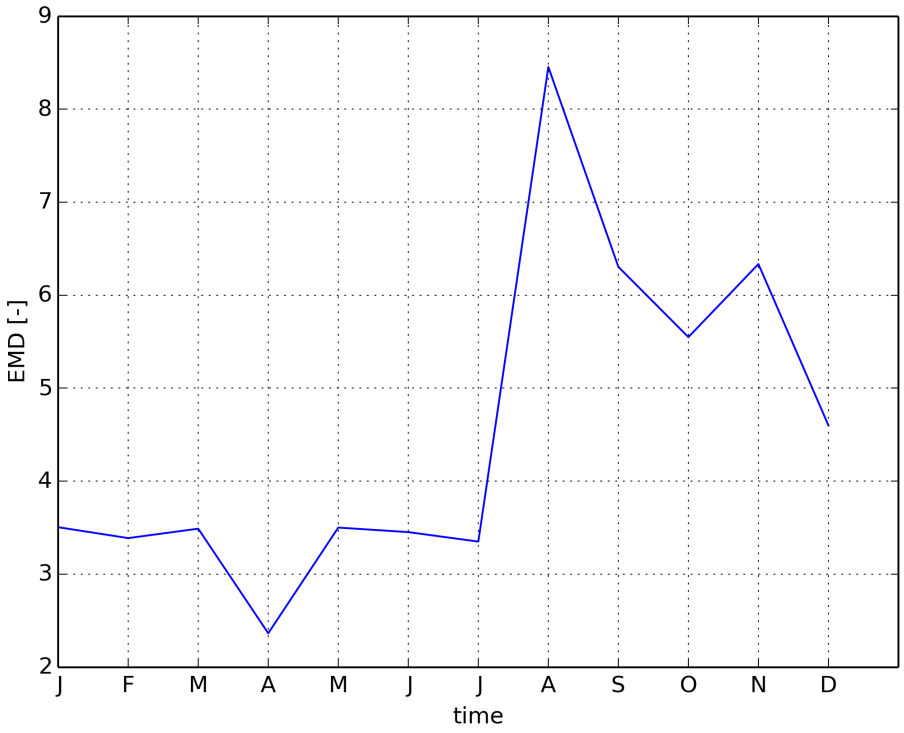



Figure 303: Timeseries of EMD

### 1.2.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

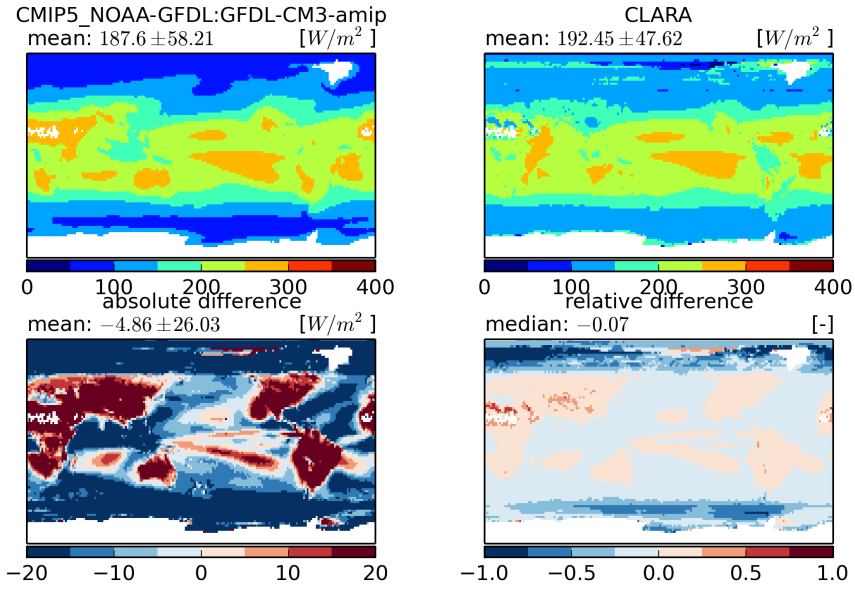



Figure 304: Temporal mean fields (top) and absolute and relative differences (bottom)

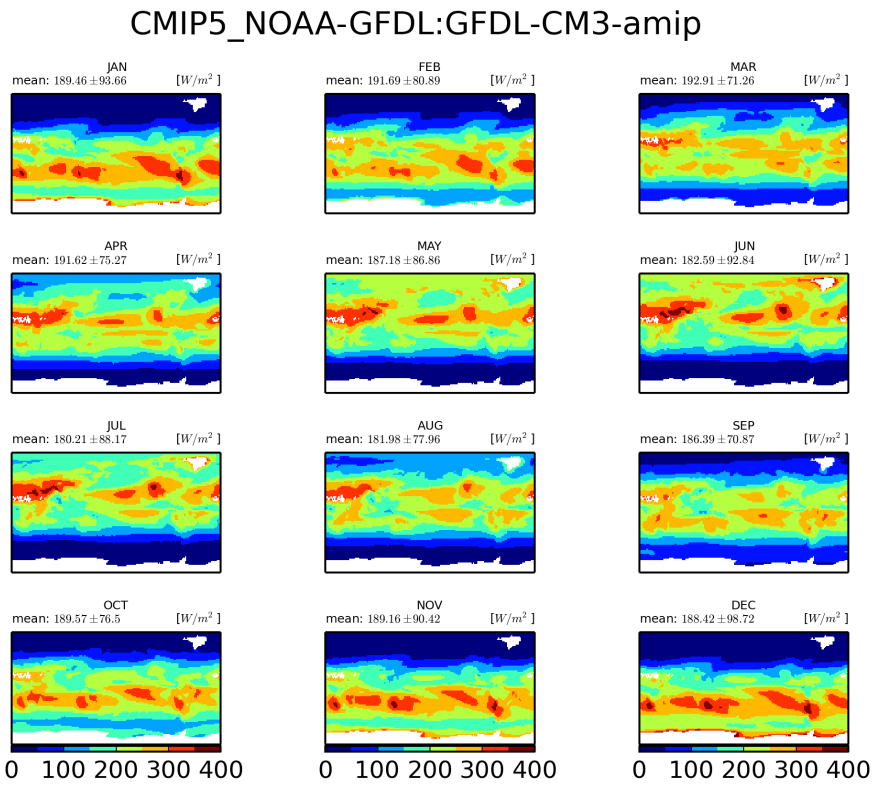



Figure 305: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

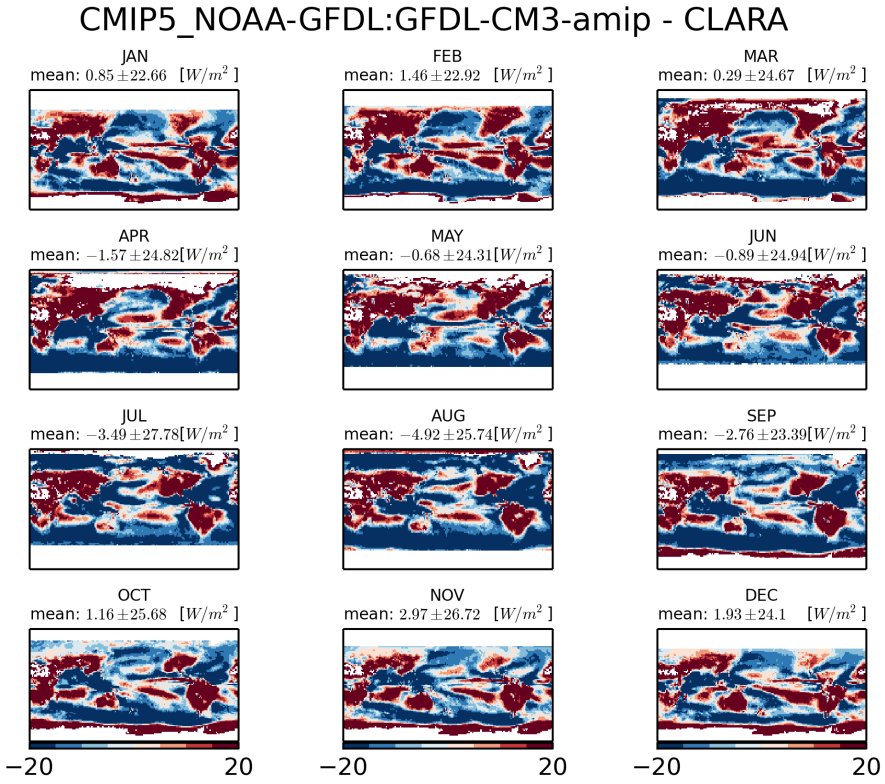



Figure 306: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and CLARA

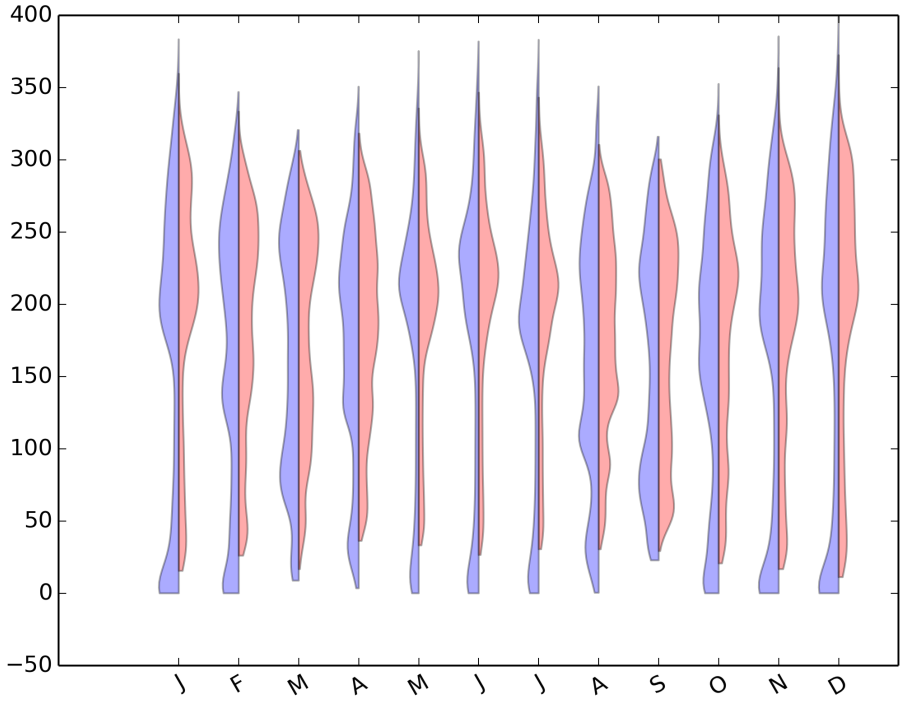



Figure 307: Violin plot for CMIP5-NOAA-GFDL:GFDL-CM3-AMIP

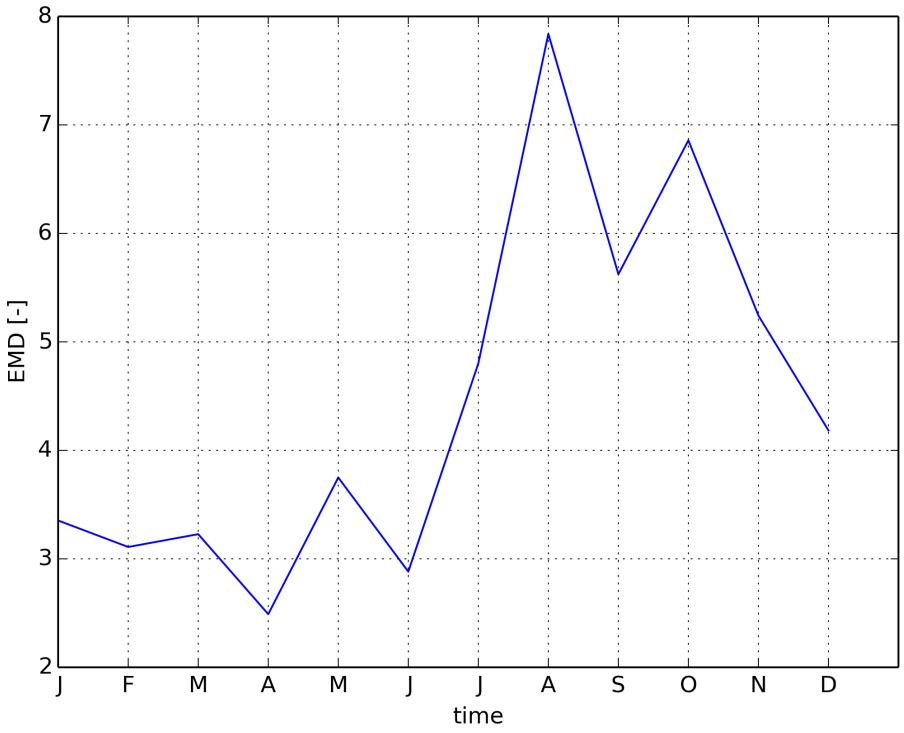



Figure 308: Timeseries of EMD

### 1.2.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

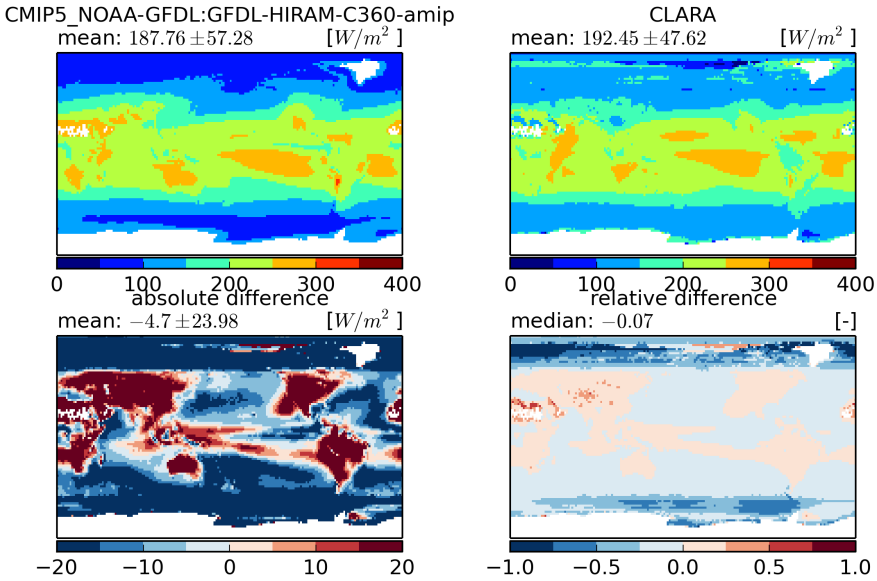



Figure 309: Temporal mean fields (top) and absolute and relative differences (bottom)

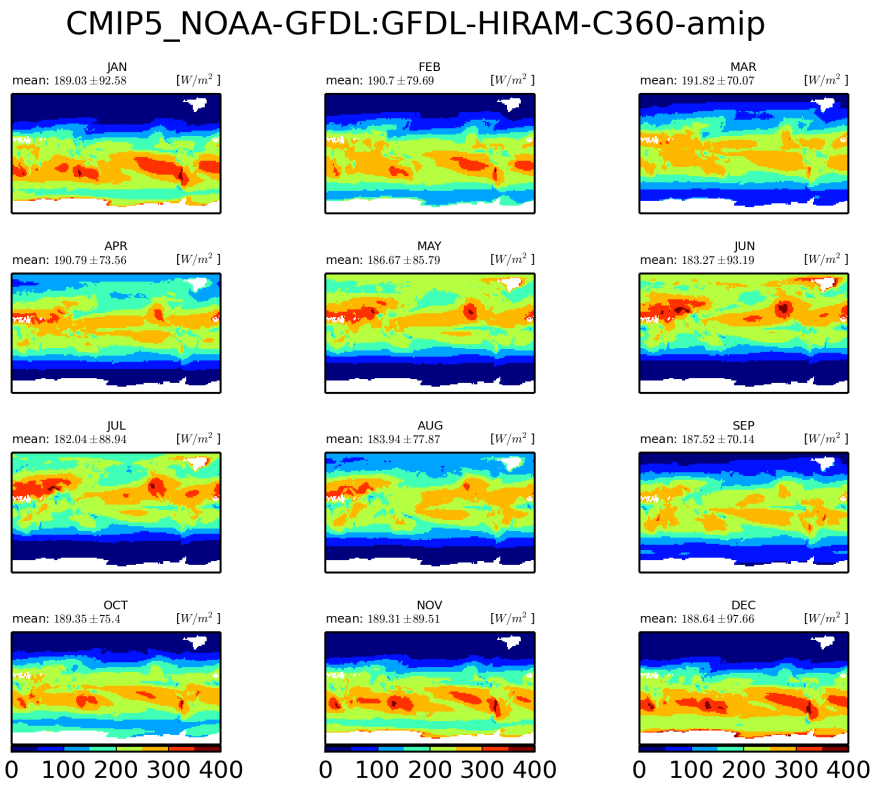



Figure 310: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

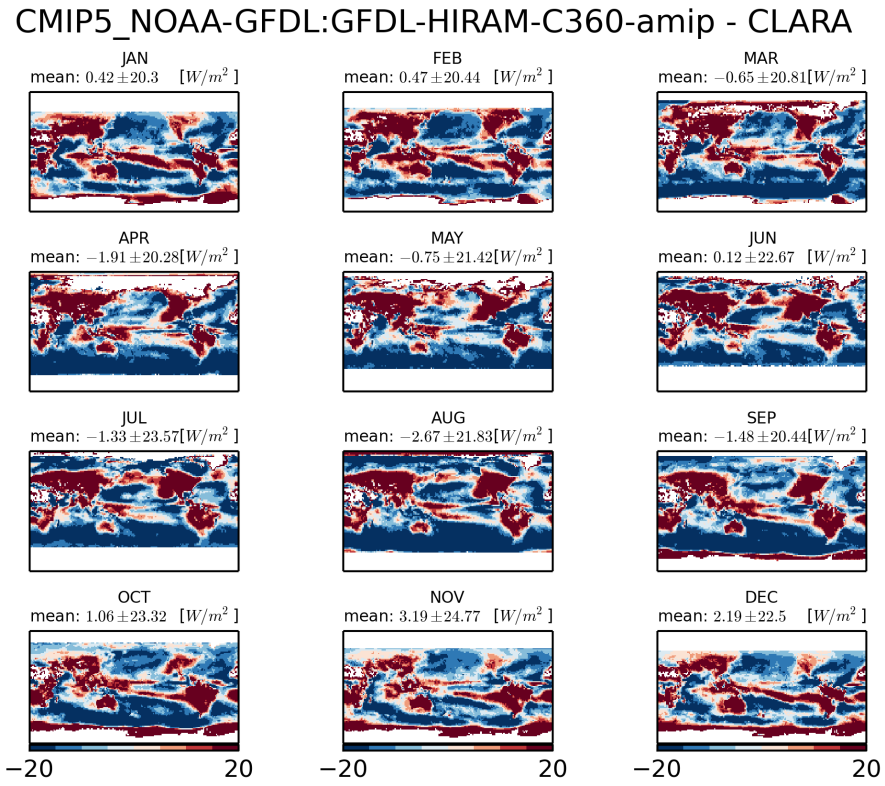



Figure 311: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and CLARA

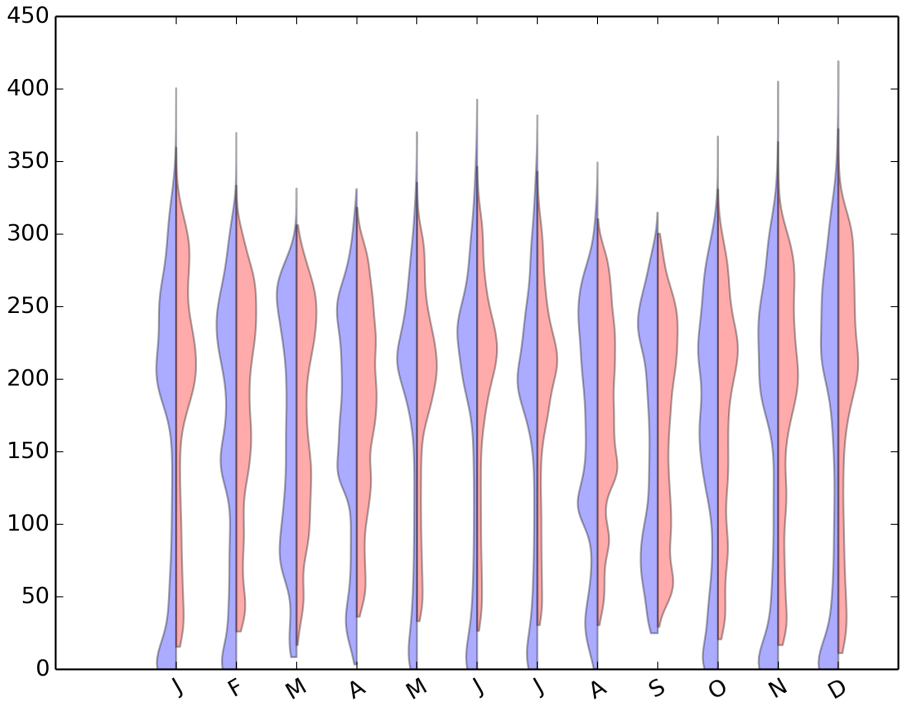



Figure 312: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-AMIP

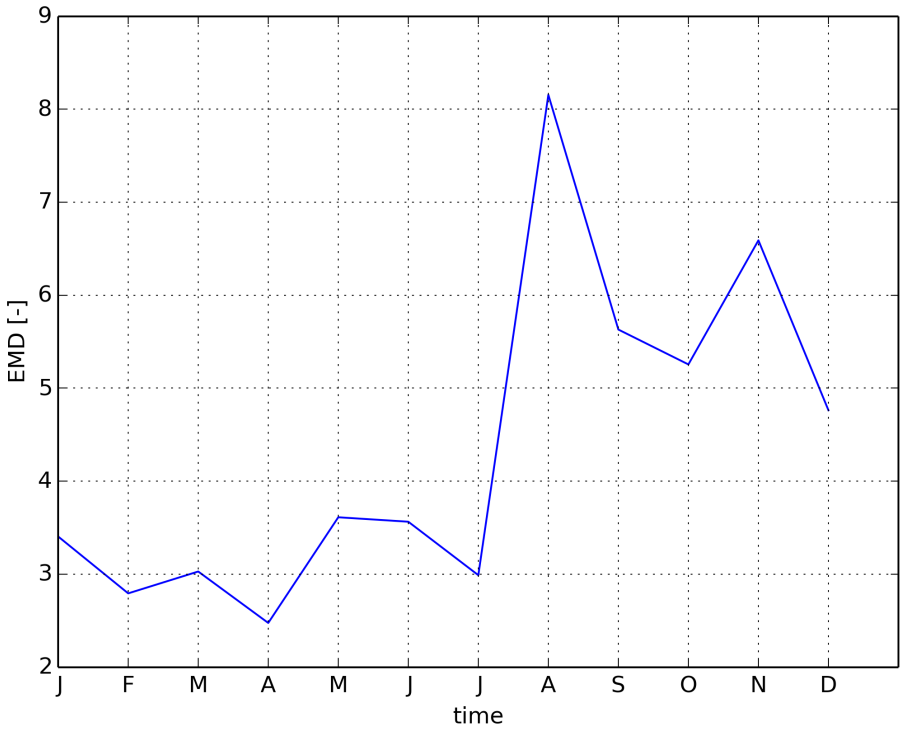



Figure 313: Timeseries of EMD

### 1.2.26 CMIP5 NCAR:CCSM4-amip

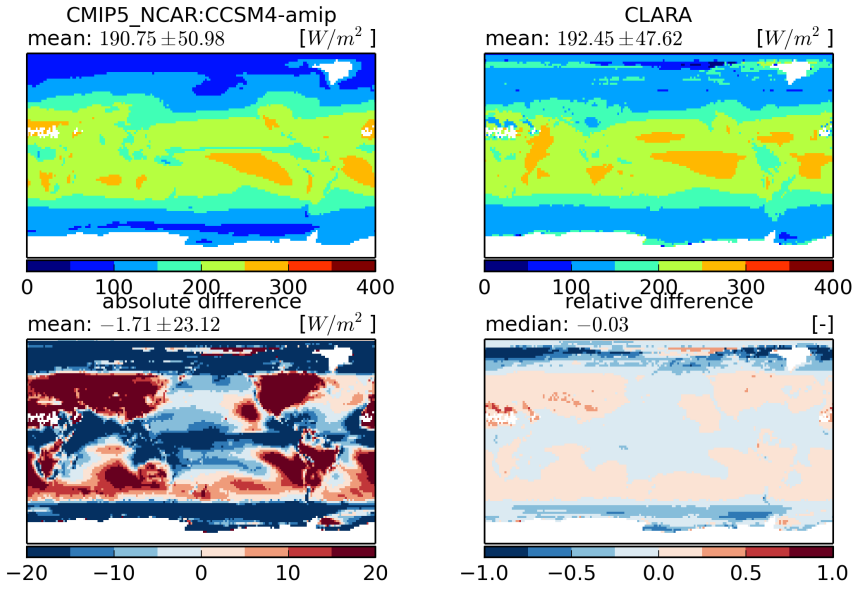



Figure 314: Temporal mean fields (top) and absolute and relative differences (bottom)

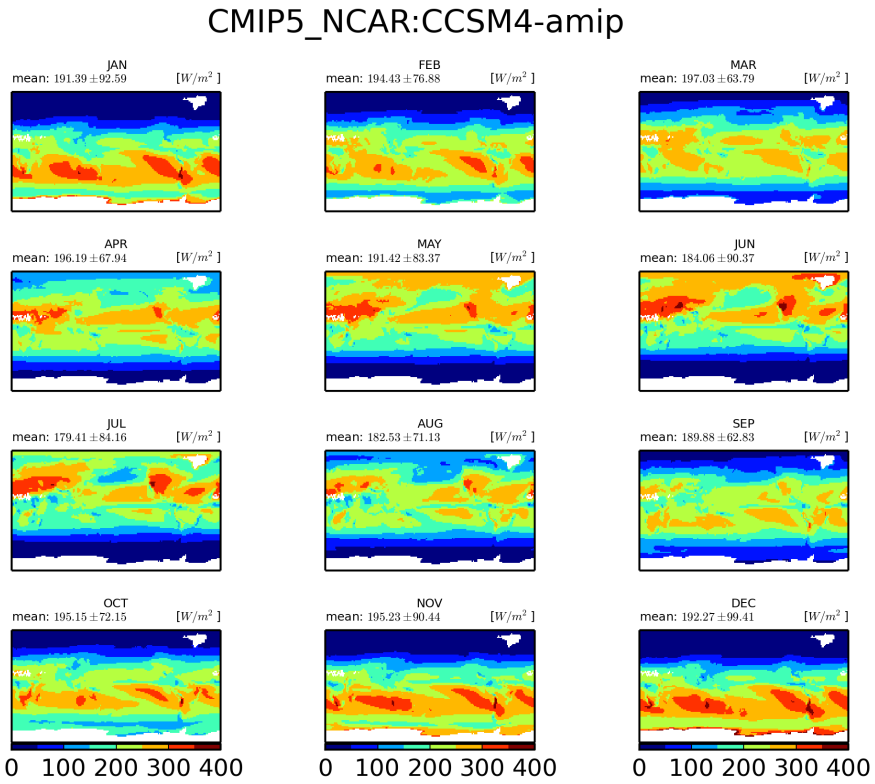



Figure 315: Monthly mean climatology for NCAR:CCSM4

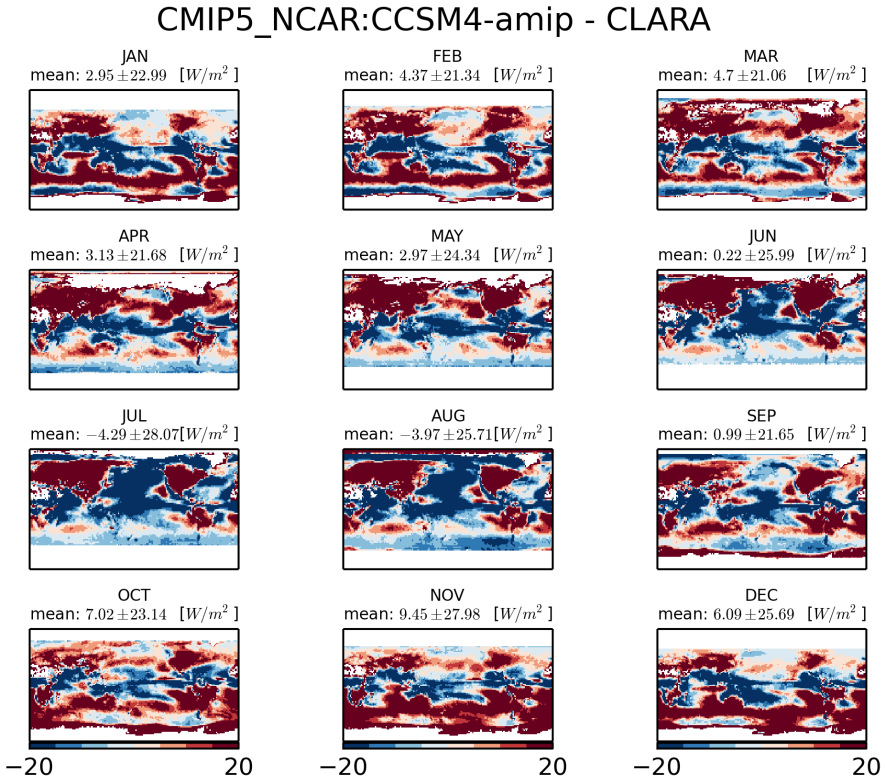



Figure 316: Monthly mean climatology of difference between NCAR:CCSM4 and CLARA

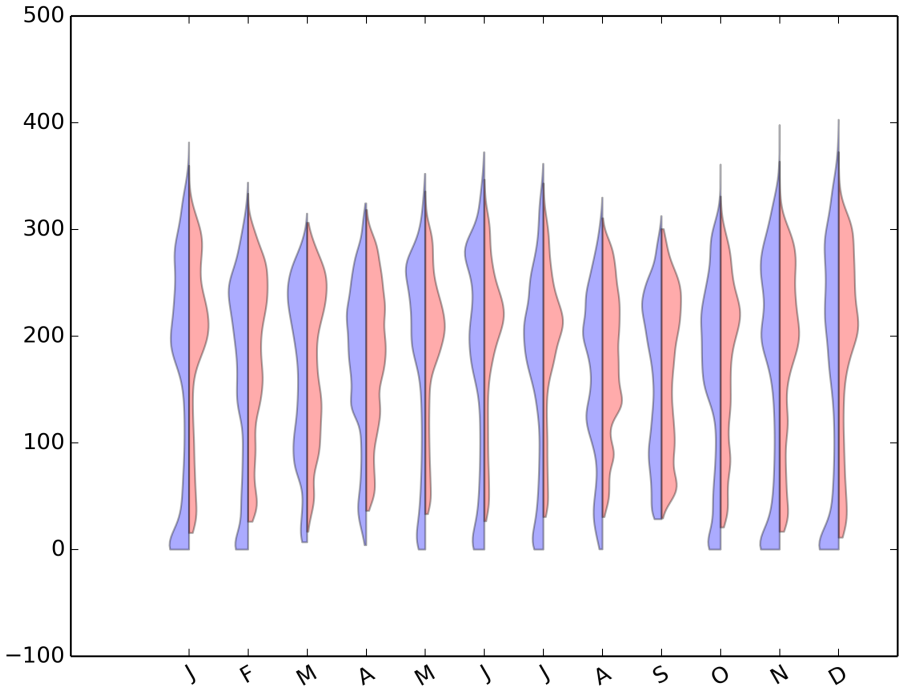



Figure 317: Violin plot for CMIP5-NCAR:CCSM4-AMIP

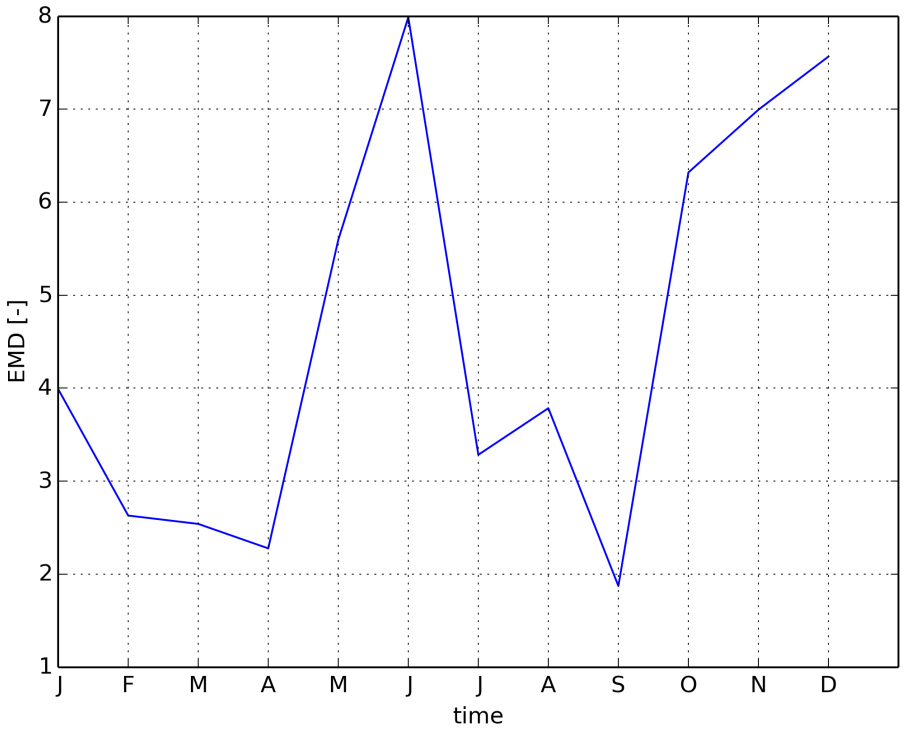



Figure 318: Timeseries of EMD

### 1.2.27 CMIP5 NCC:NorESM1-M-amip

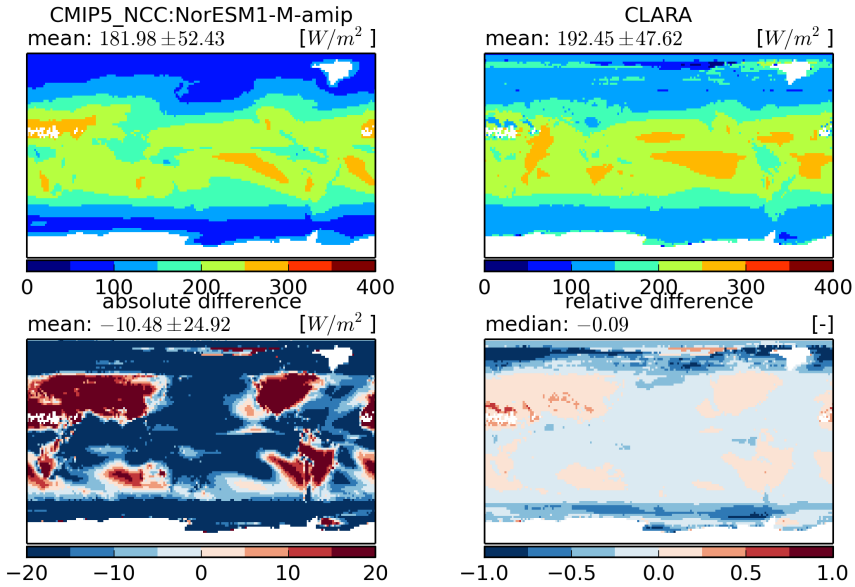



Figure 319: Temporal mean fields (top) and absolute and relative differences (bottom)

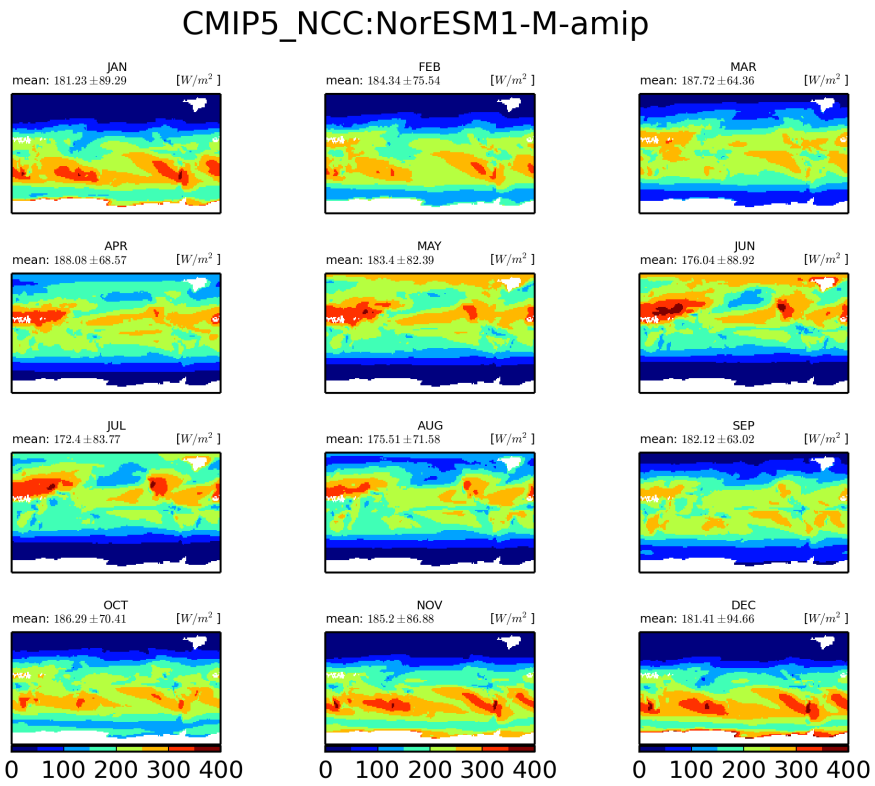



Figure 320: Monthly mean climatology for NCC:NorESM1-M

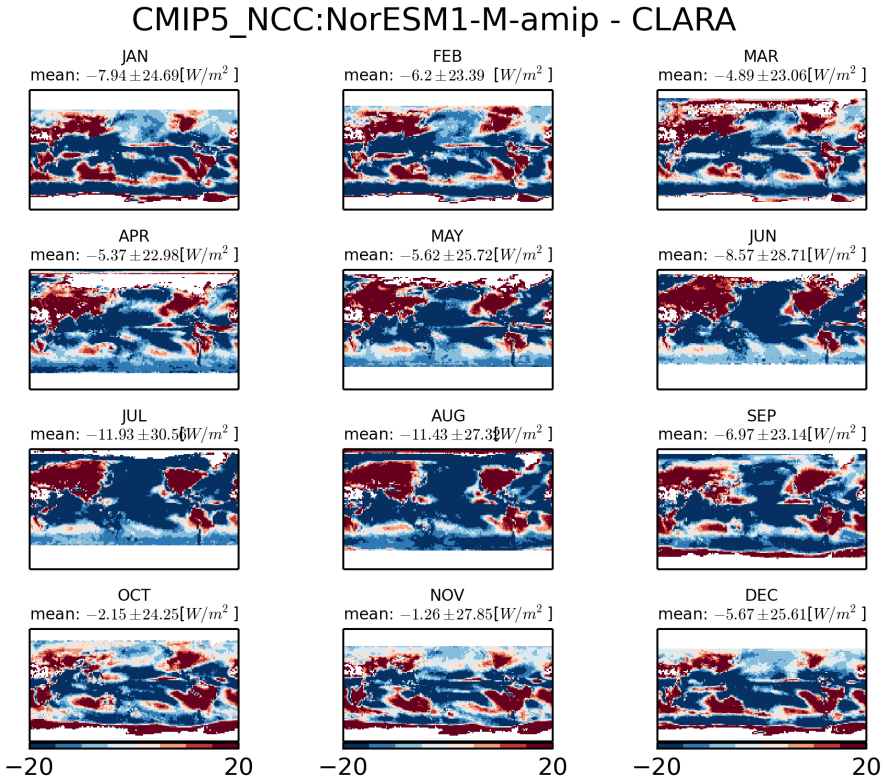



Figure 321: Monthly mean climatology of difference between NCC:NORESM1-M and CLARA

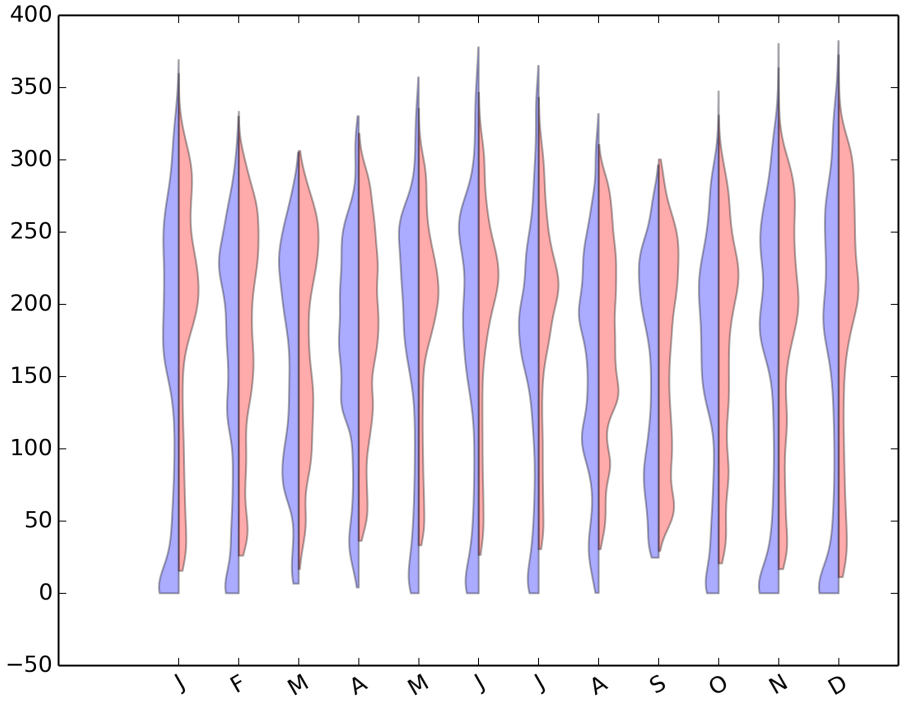



Figure 322: Violin plot for CMIP5-NCC:NORESM1-M-AMIP

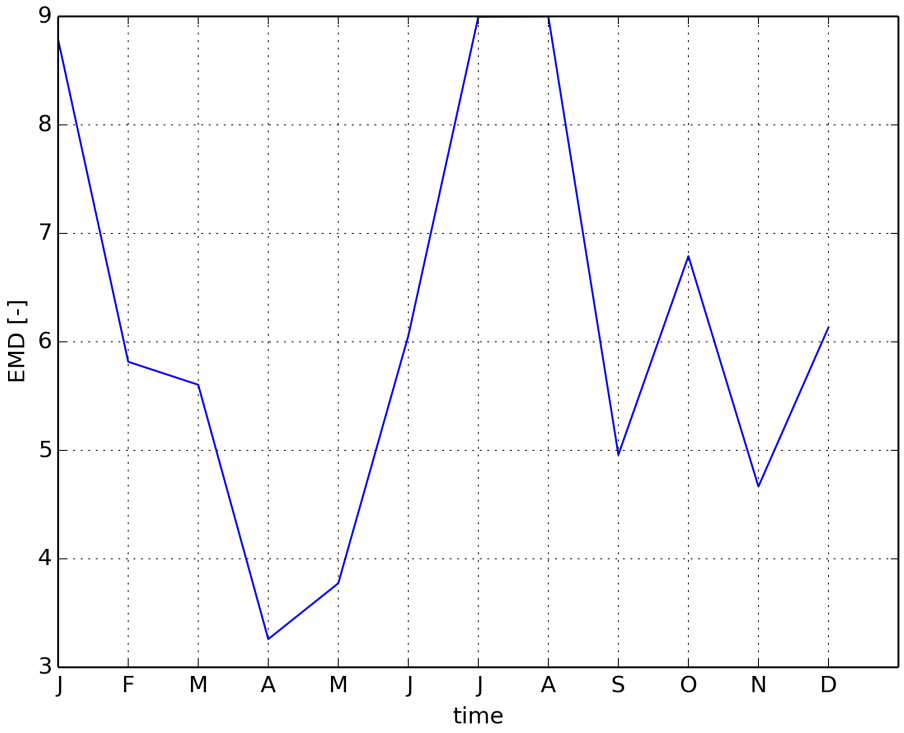



Figure 323: Timeseries of EMD

### 1.2.28 CMIP3 iap fgoals1 0 g-amip

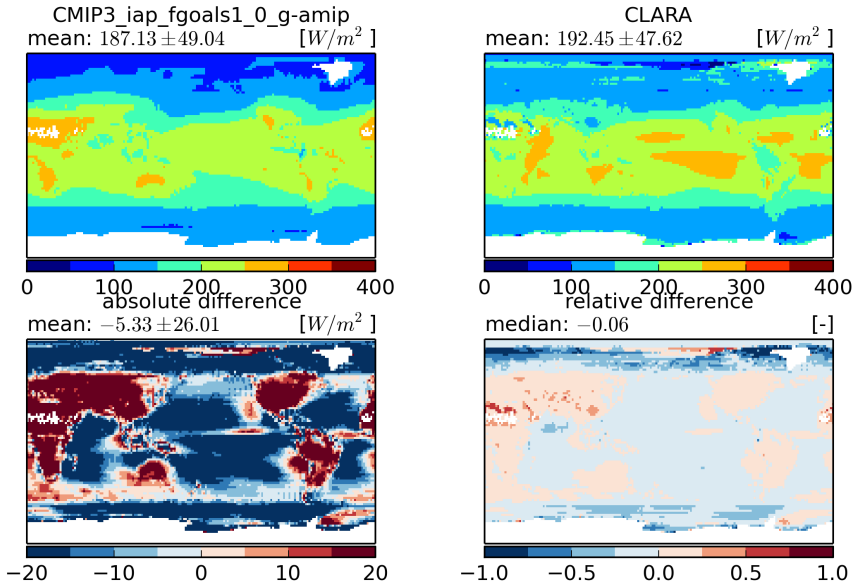



Figure 324: Temporal mean fields (top) and absolute and relative differences (bottom)

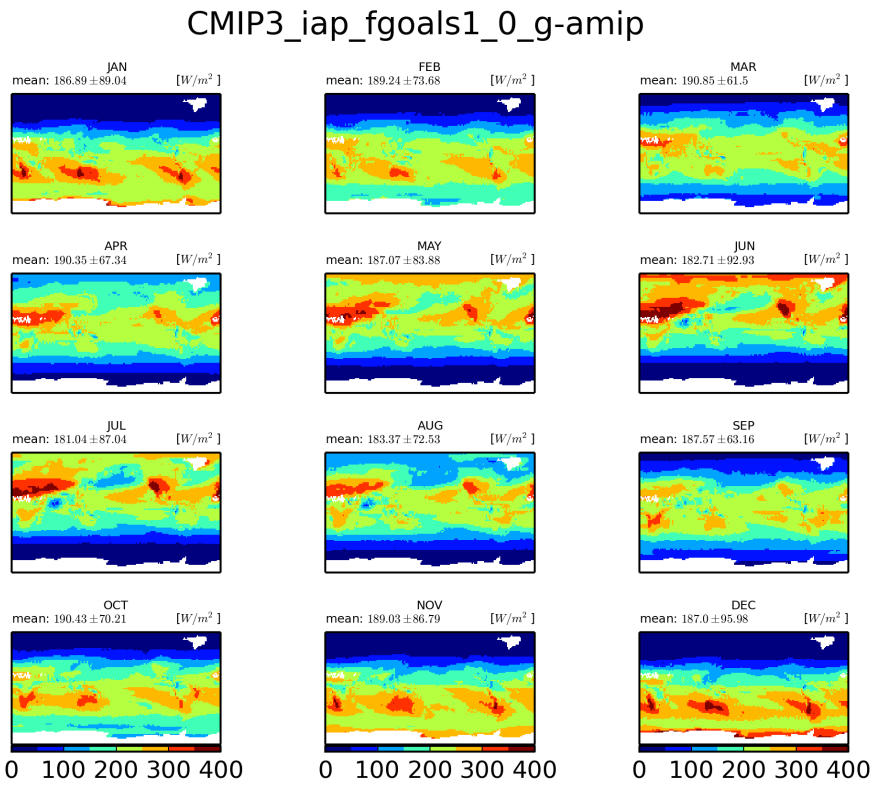



Figure 325: Monthly mean climatology for iap-fgoals1-0-g

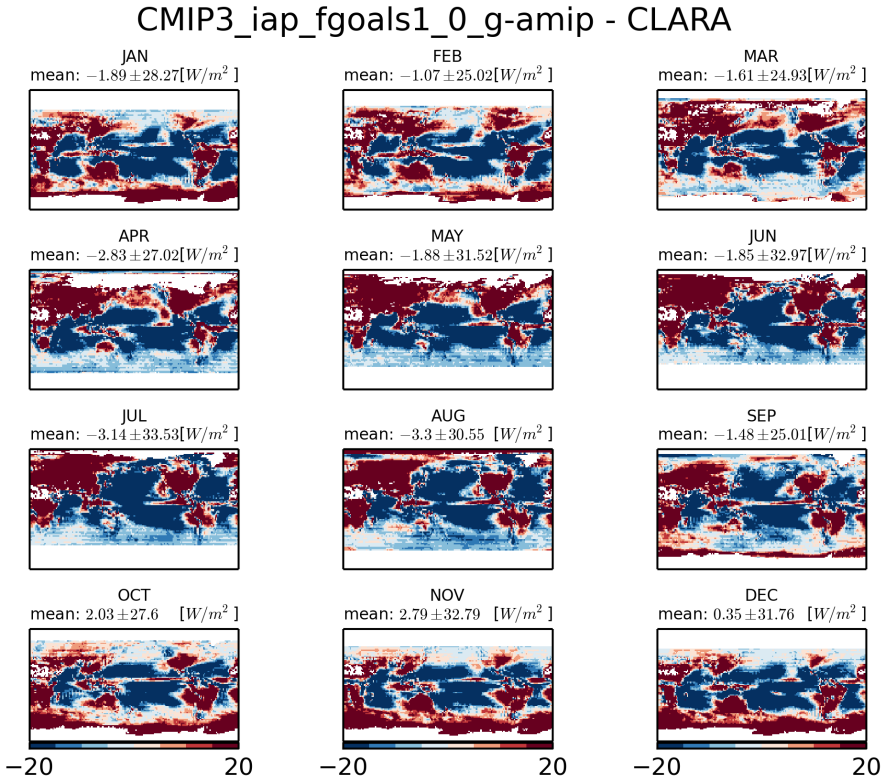



Figure 326: Monthly mean climatology of difference between IAP-FGOALS1-0-G and CLARA

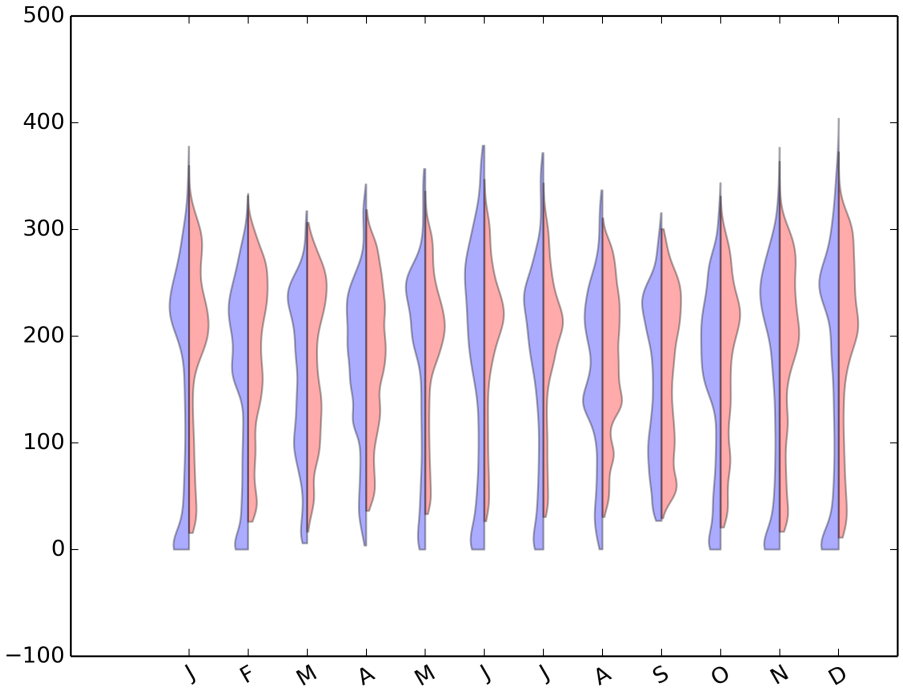



Figure 327: Violin plot for CMIP3-IAP-FGOALS1-0-G-AMIP

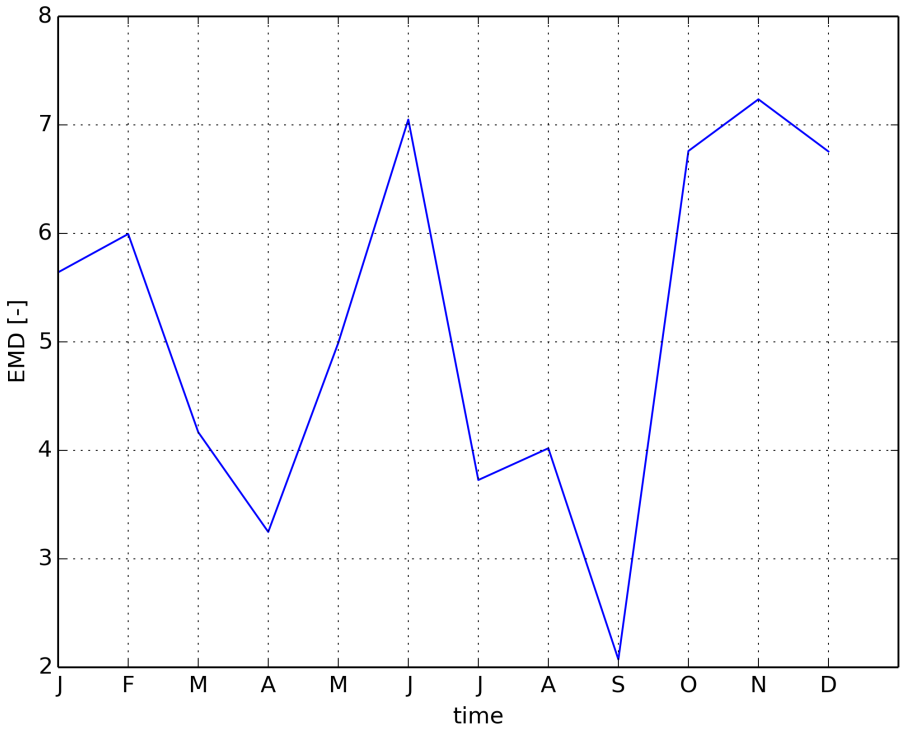



Figure 328: Timeseries of EMD

### 1.2.29 CMIP3 inmcm3 0-amip

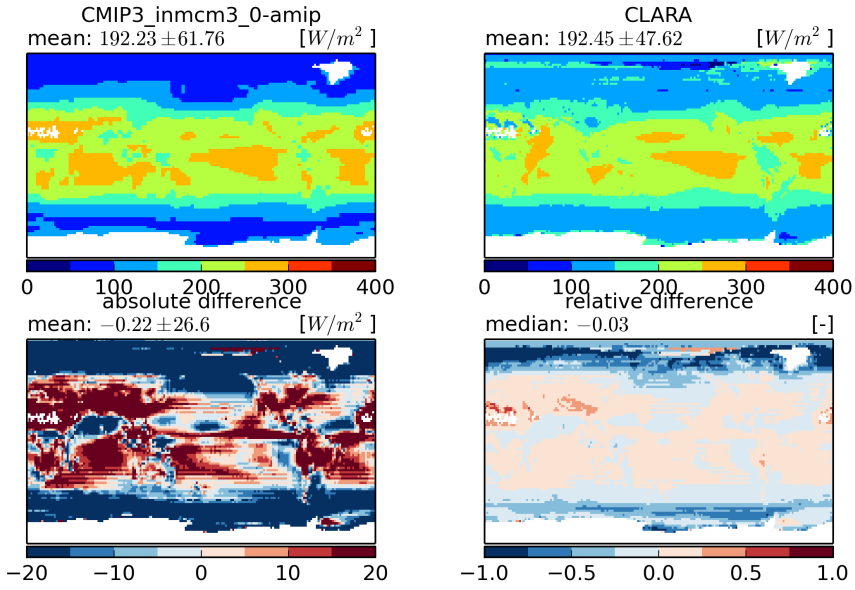



Figure 329: Temporal mean fields (top) and absolute and relative differences (bottom)

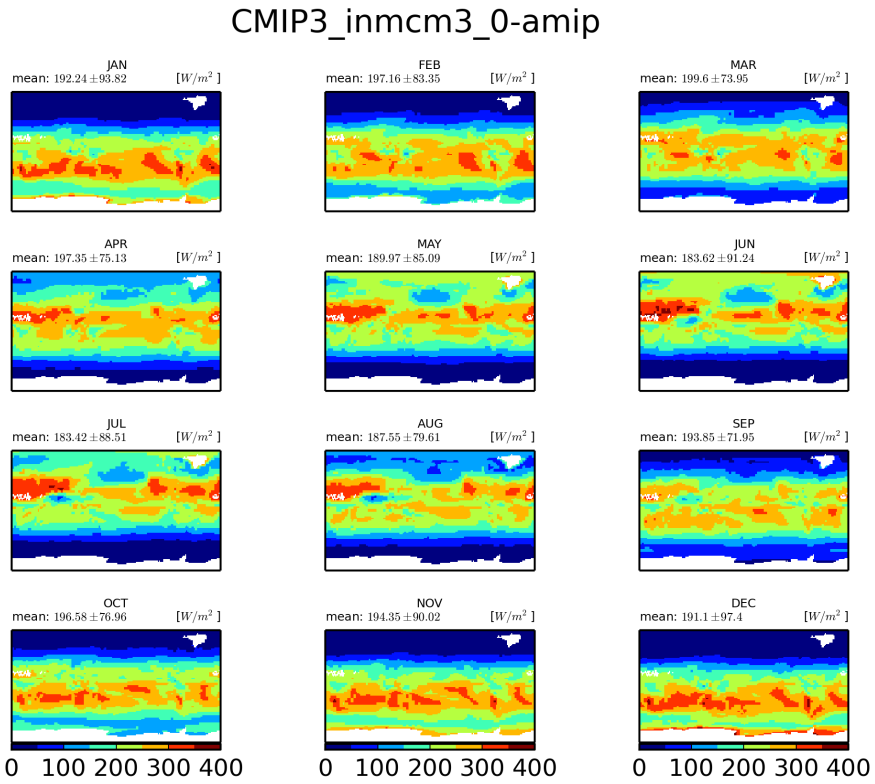



Figure 330: Monthly mean climatology for inmcm3-0

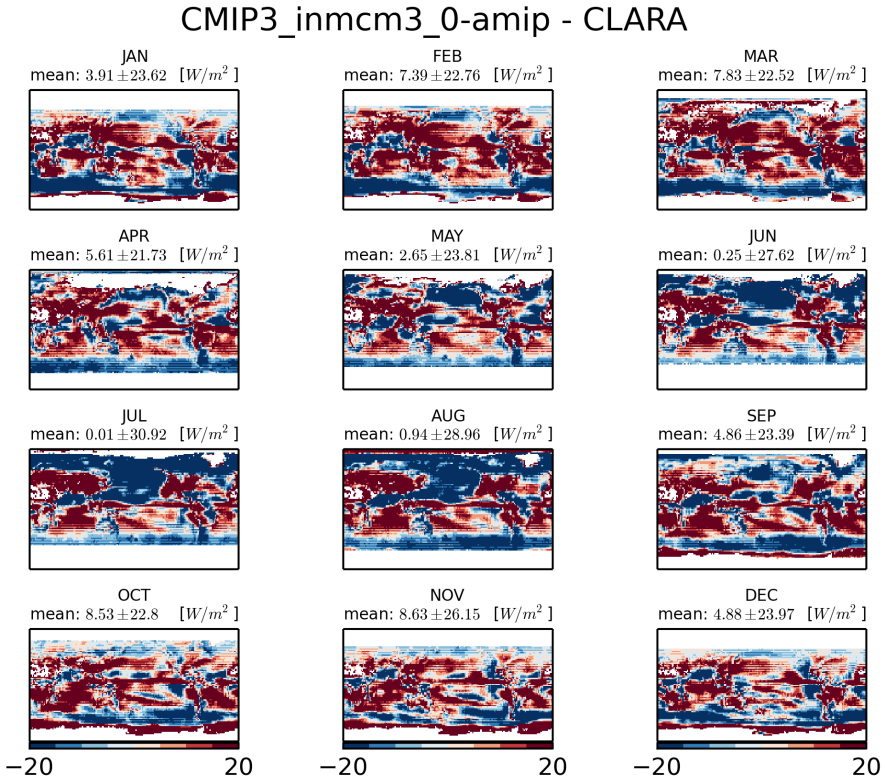



Figure 331: Monthly mean climatology of difference between INMCM3-0 and CLARA

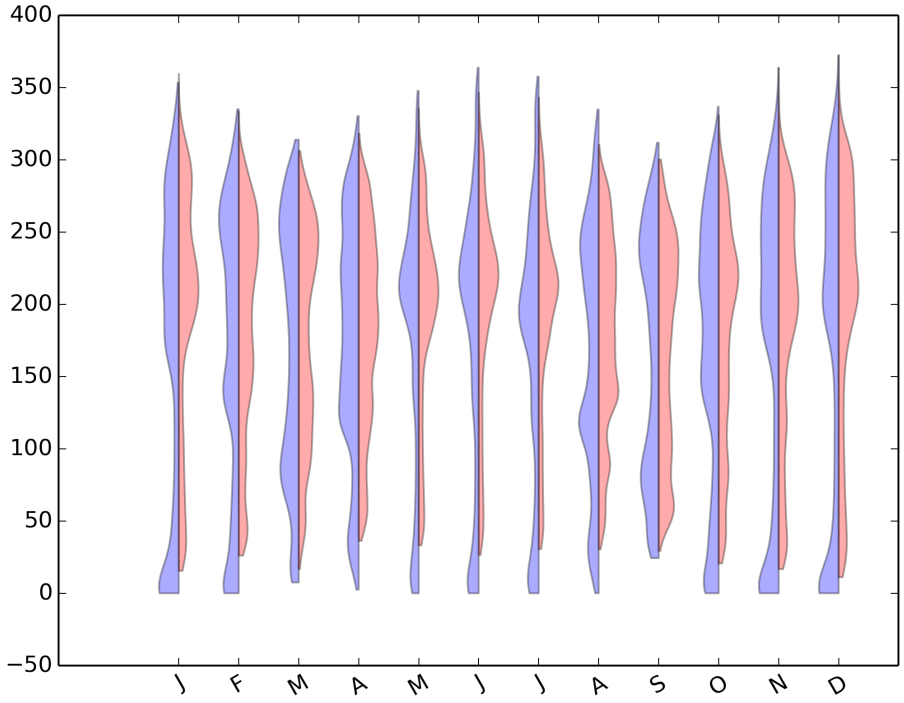



Figure 332: Violin plot for CMIP3-INMCM3-0-AMIP

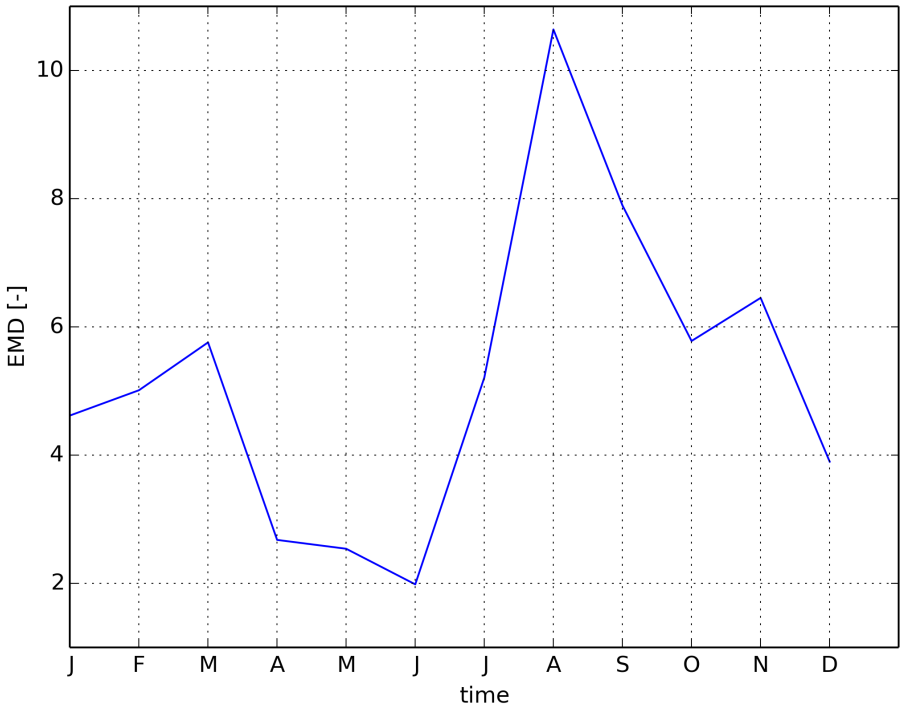



Figure 333: Timeseries of EMD

### 1.2.30 CMIP3 ipsl cm4-amip

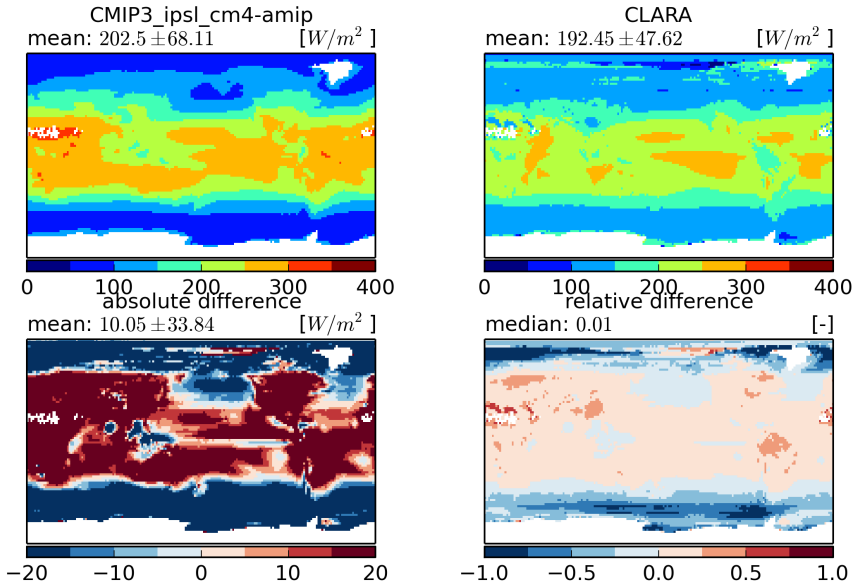



Figure 334: Temporal mean fields (top) and absolute and relative differences (bottom)

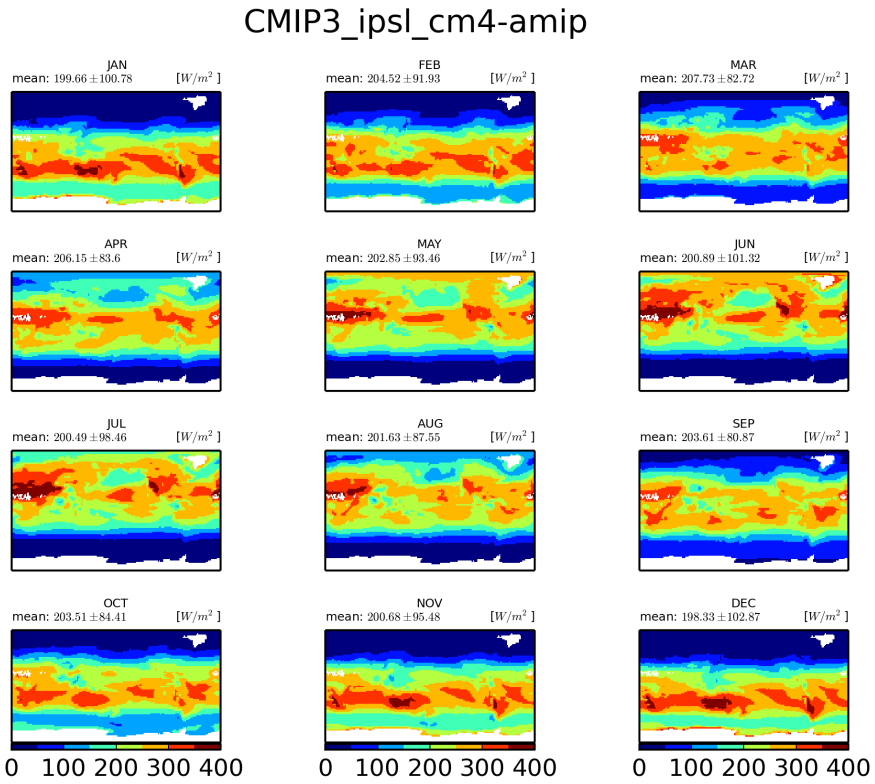



Figure 335: Monthly mean climatology for ipsl-cm4

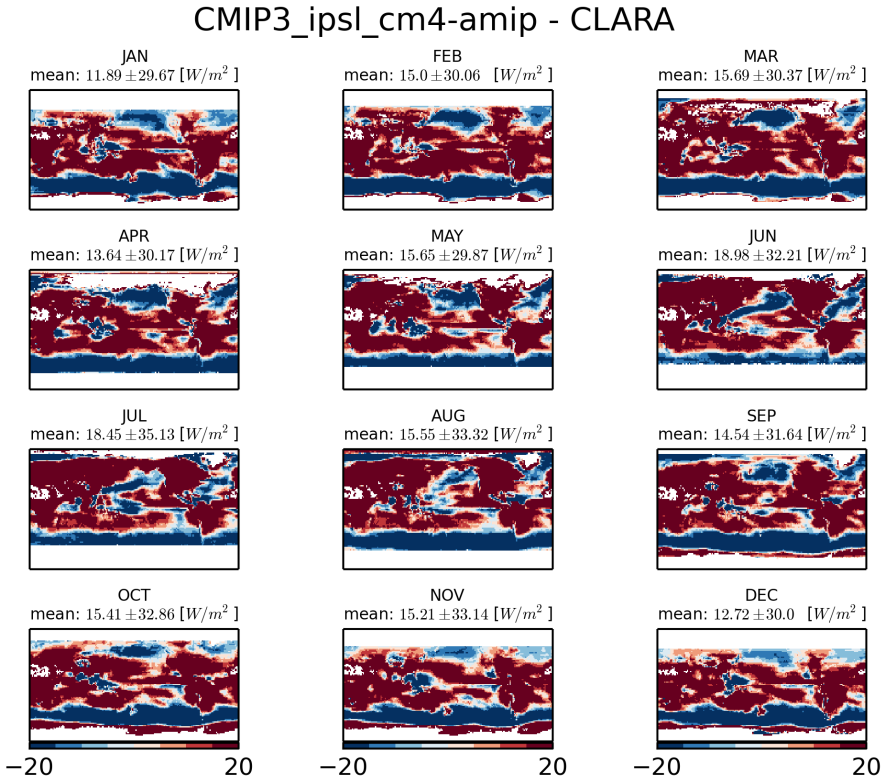



Figure 336: Monthly mean climatology of difference between IPSL-CM4 and CLARA

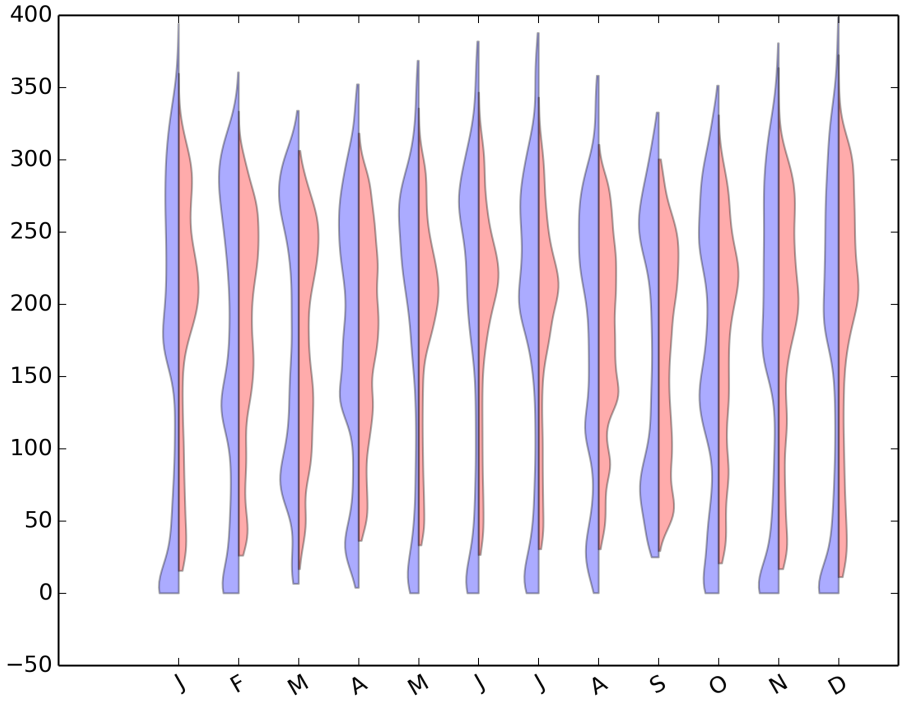



Figure 337: Violin plot for CMIP3-IPSL-CM4-AMIP

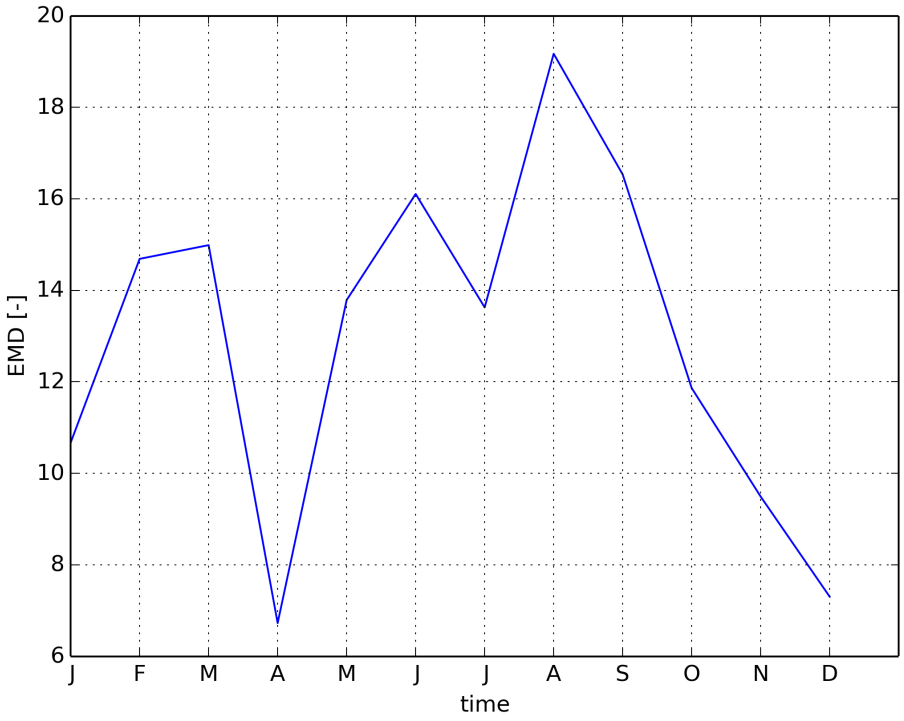



Figure 338: Timeseries of EMD

### 1.2.31 CMIP3 miroc3 2 hires-amip

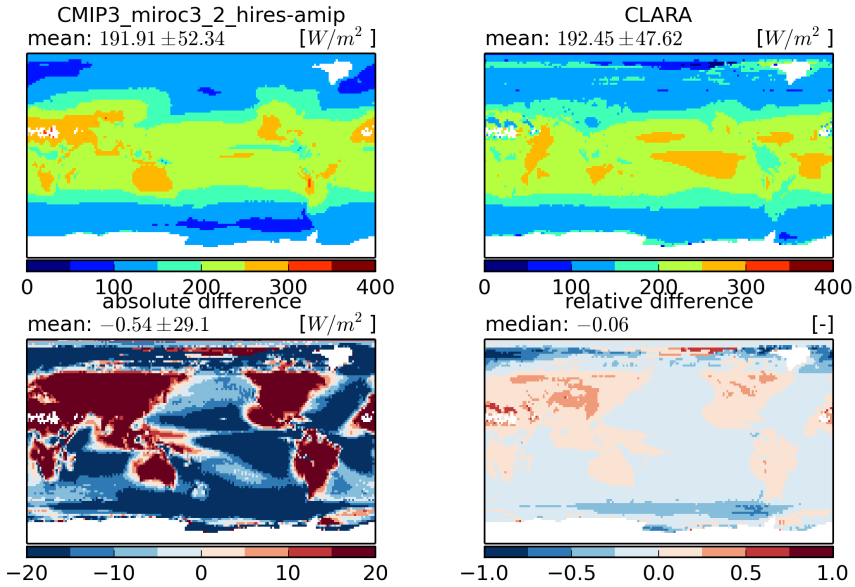



Figure 339: Temporal mean fields (top) and absolute and relative differences (bottom)

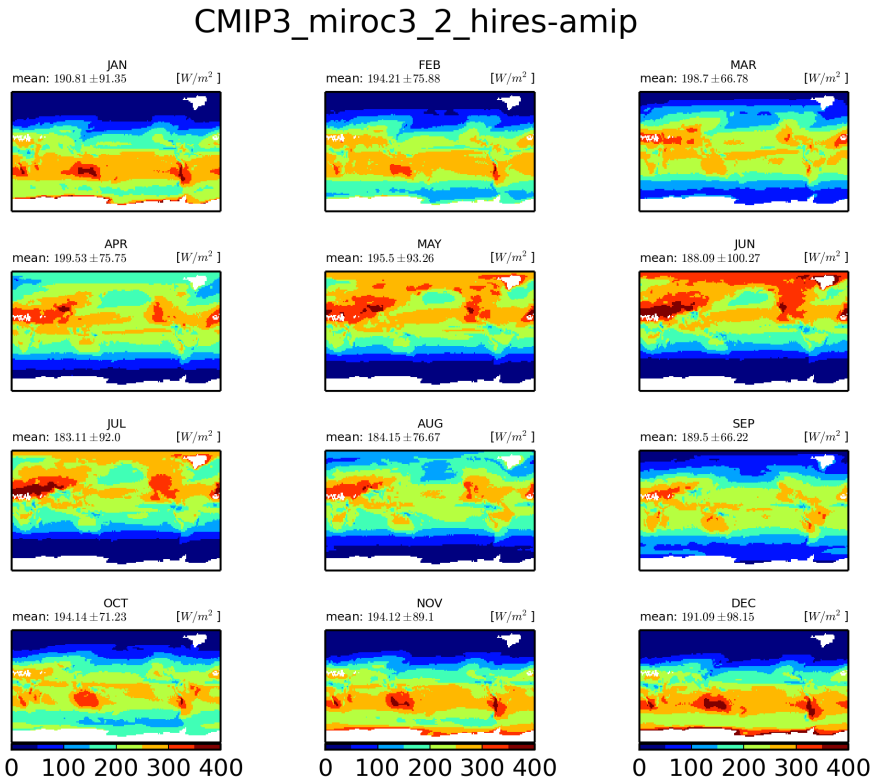



Figure 340: Monthly mean climatology for miroc3-2-hires

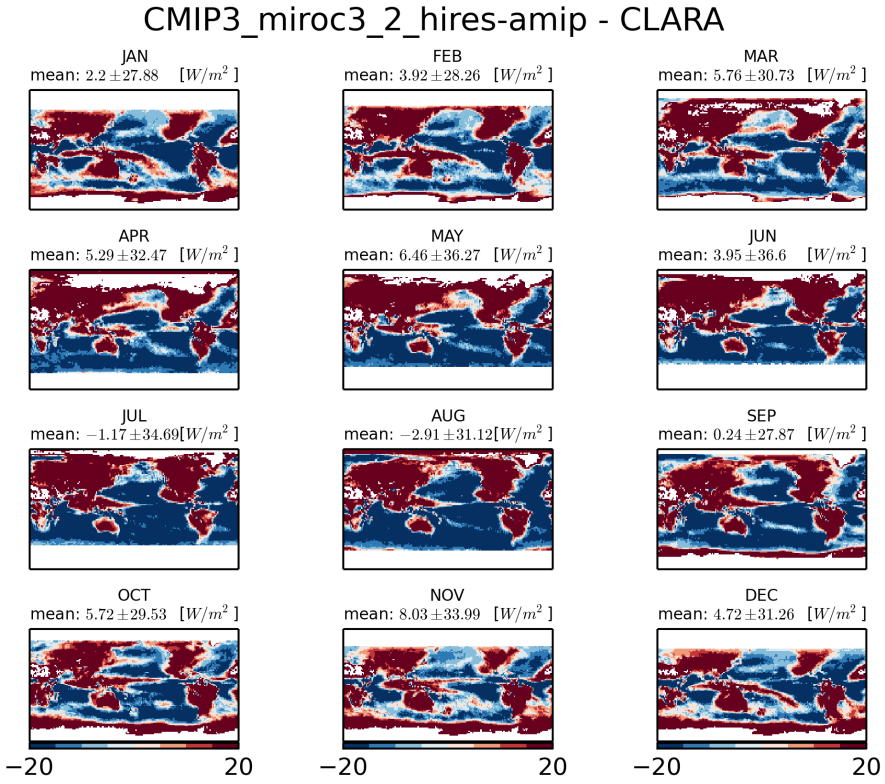



Figure 341: Monthly mean climatology of difference between MIROC3-2-HIRES and CLARA

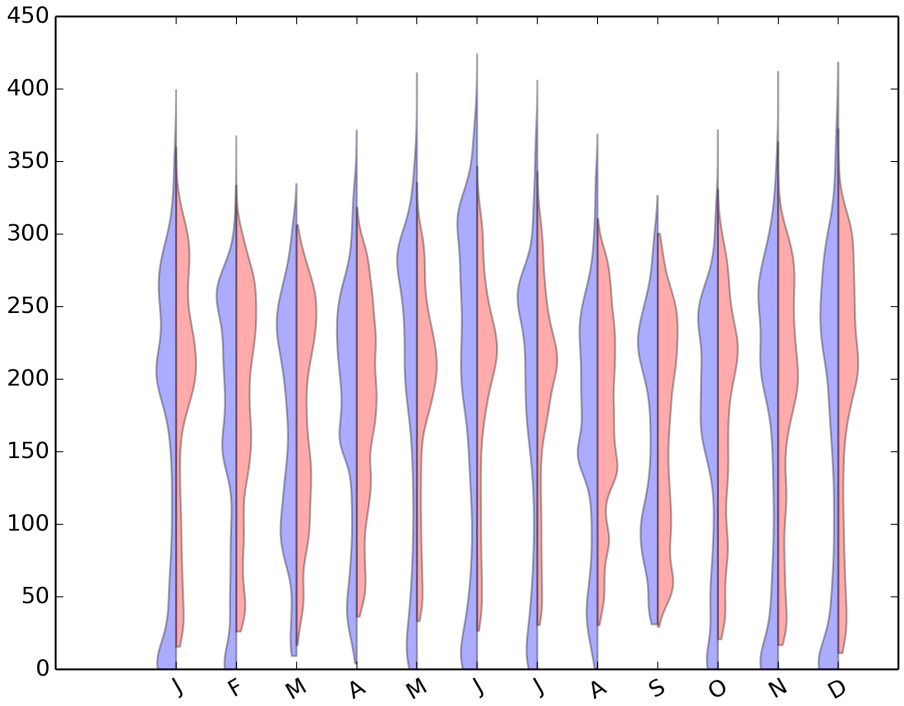



Figure 342: Violin plot for CMIP3-MIROC3-2-HIRES-AMIP

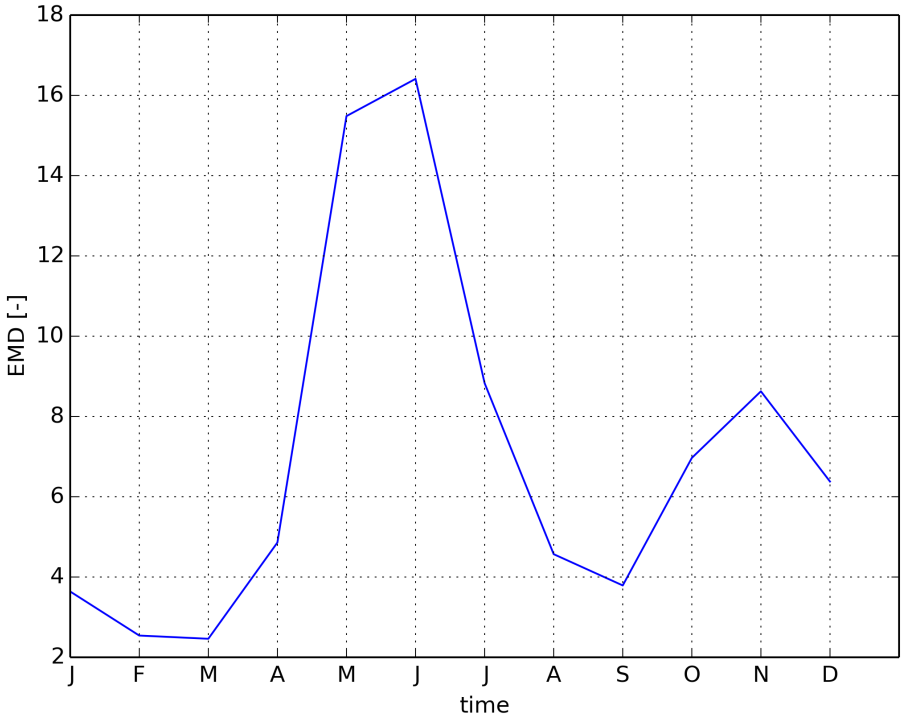



Figure 343: Timeseries of EMD

### 1.2.32 CMIP3 miroc3 2 medres-amip

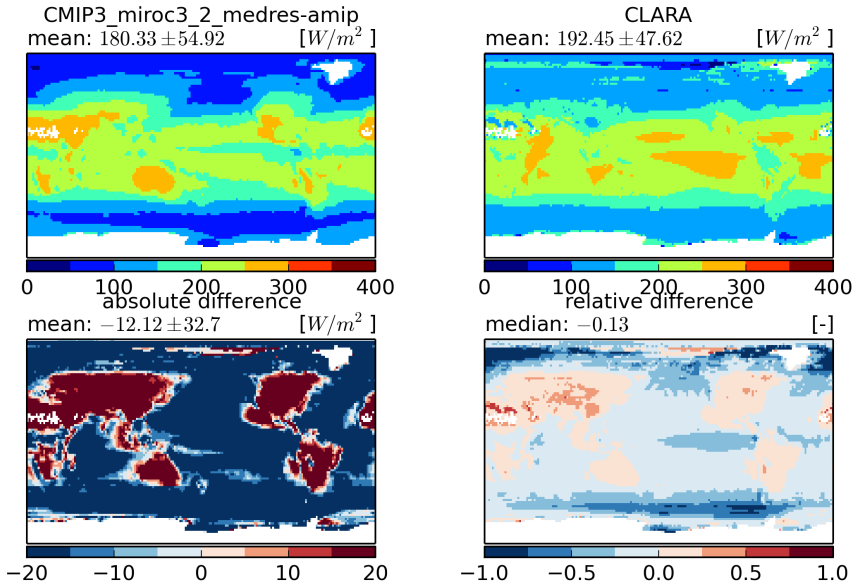



Figure 344: Temporal mean fields (top) and absolute and relative differences (bottom)

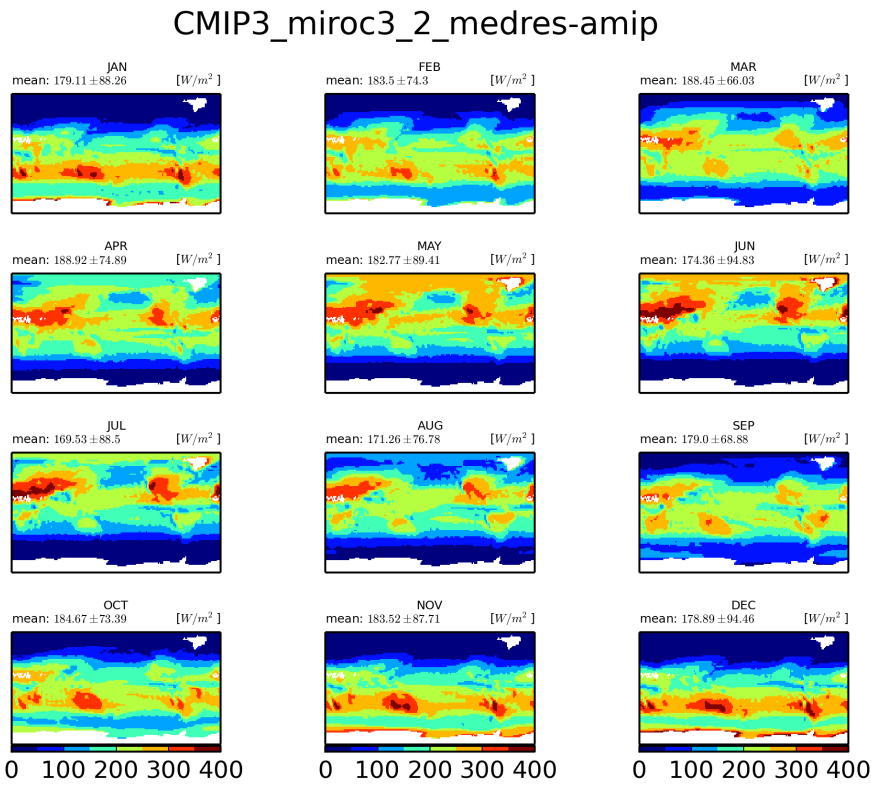



Figure 345: Monthly mean climatology for miroc3-2-medres

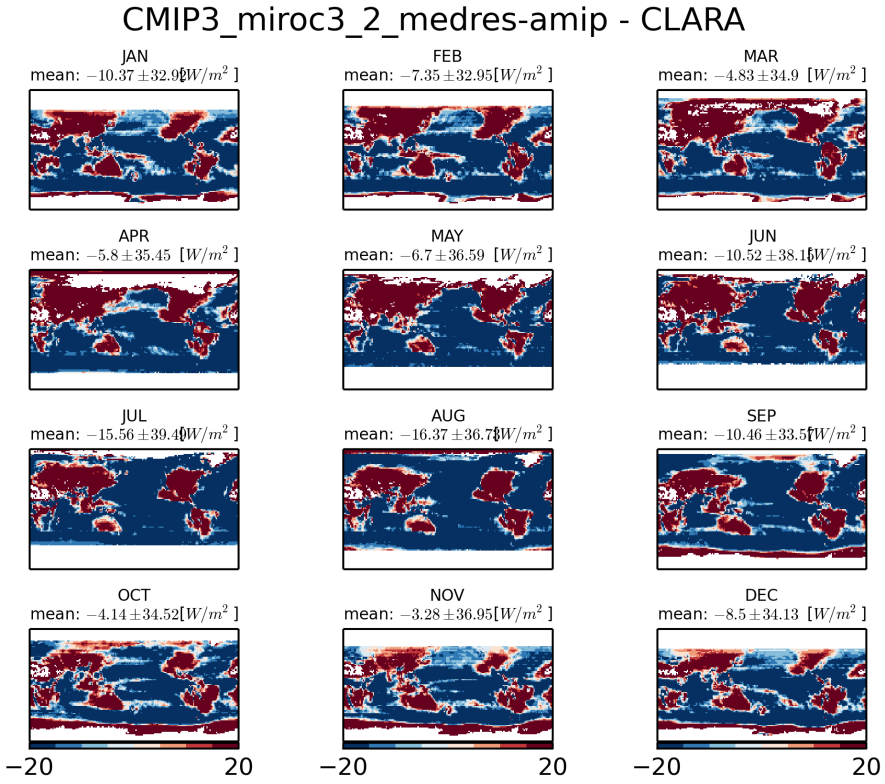



Figure 346: Monthly mean climatology of difference between MIROC3-2-MEDRES and CLARA

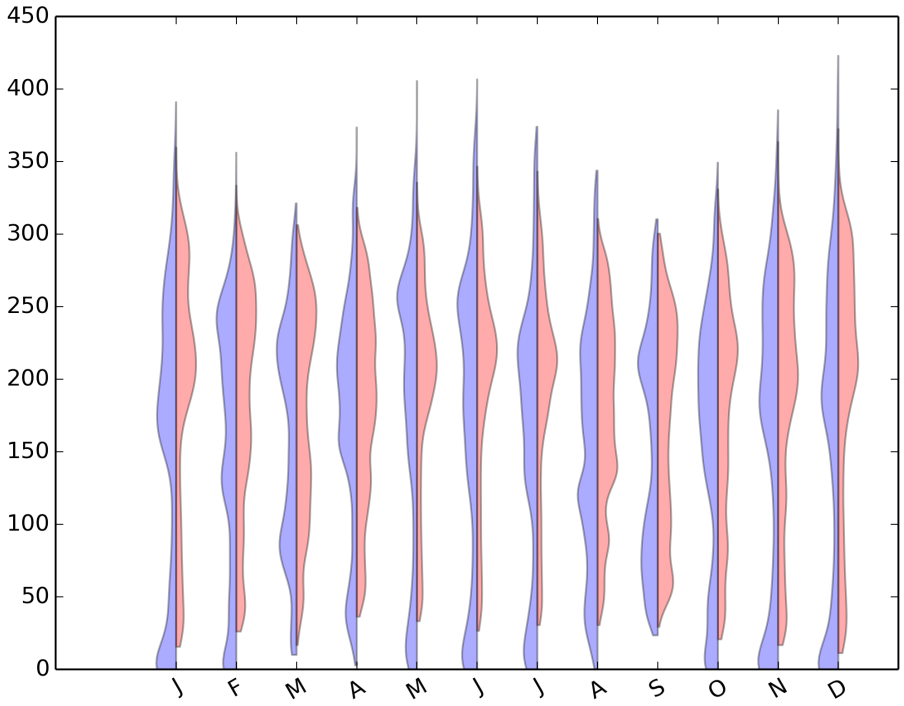



Figure 347: Violin plot for CMIP3-MIROC3-2-MEDRES-AMIP

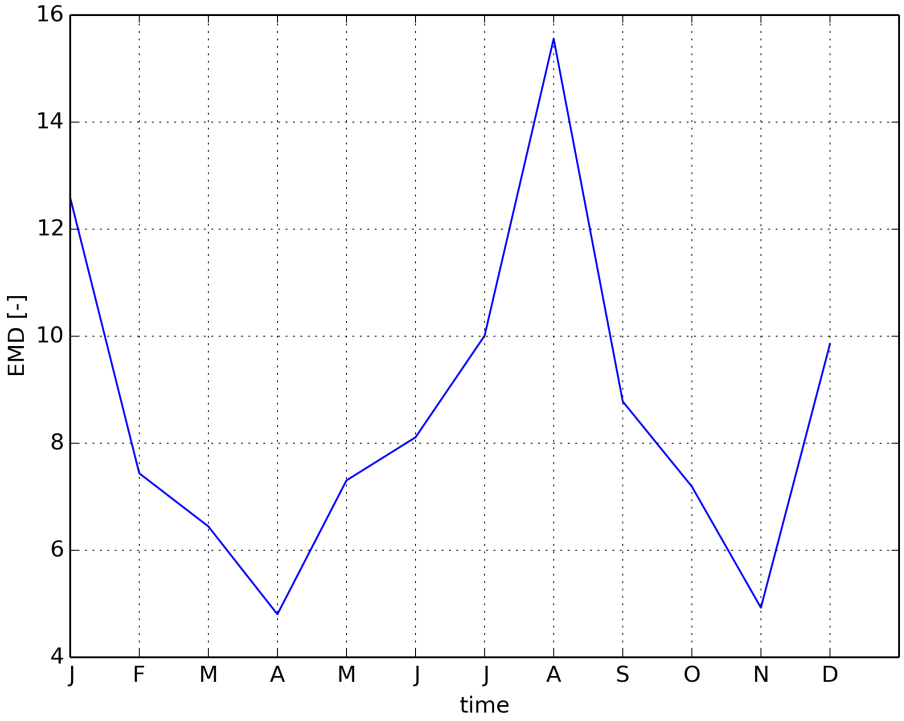



Figure 348: Timeseries of EMD

### 1.2.33 CMIP3 mpi echam5-amip

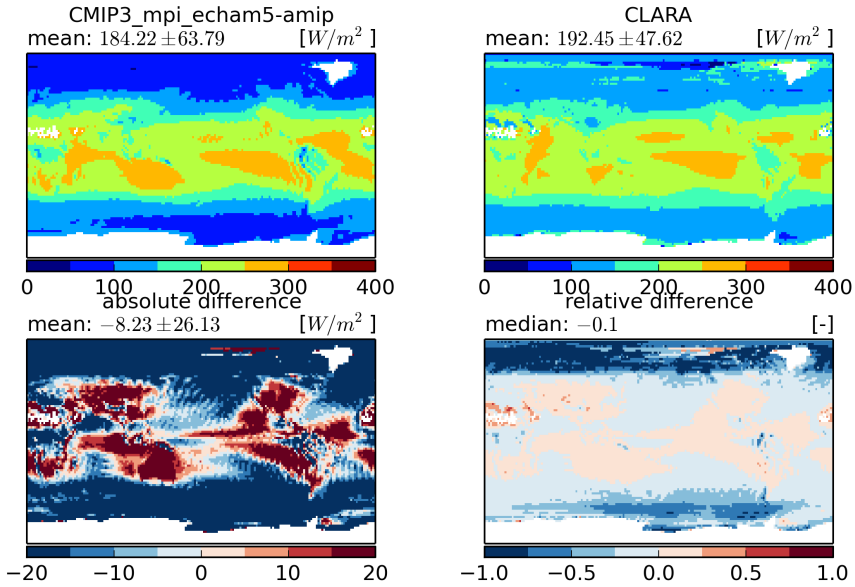



Figure 349: Temporal mean fields (top) and absolute and relative differences (bottom)

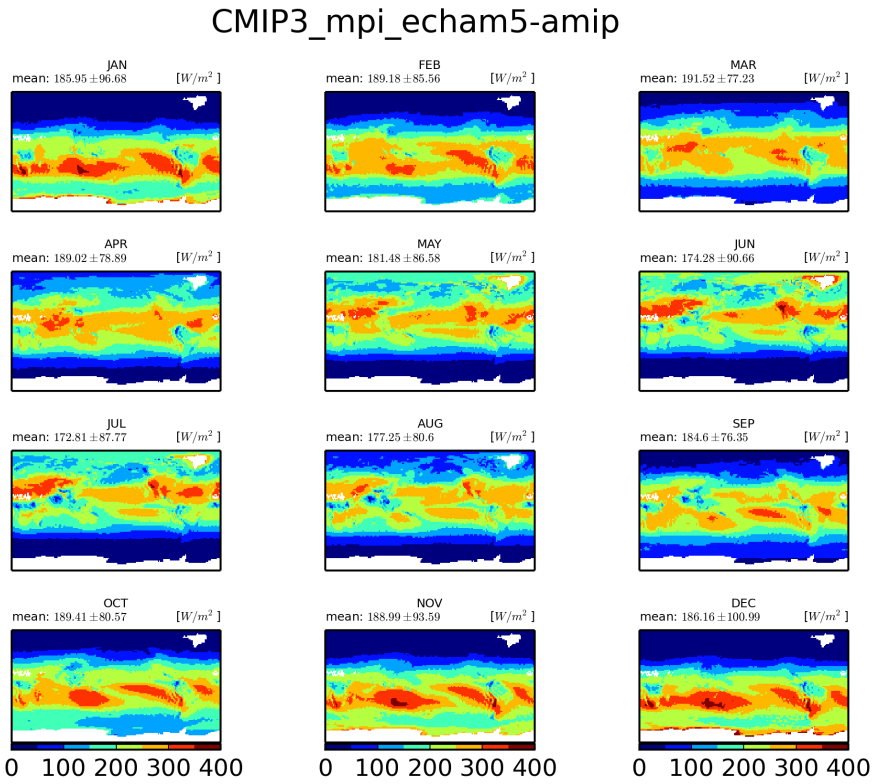



Figure 350: Monthly mean climatology for mpi-echam5

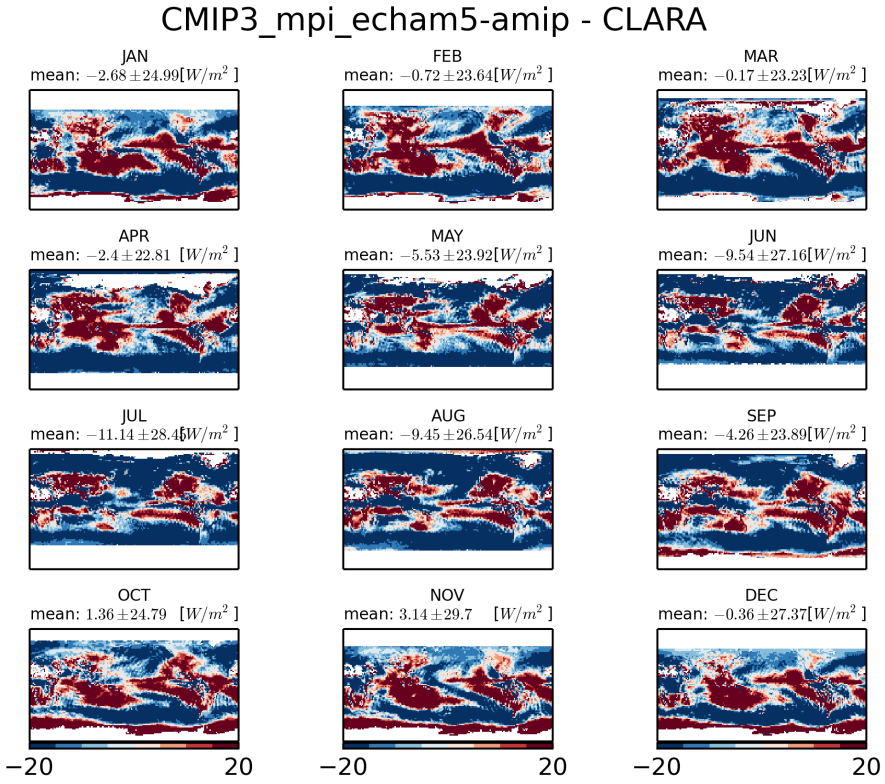



Figure 351: Monthly mean climatology of difference between MPI-ECHAM5 and CLARA

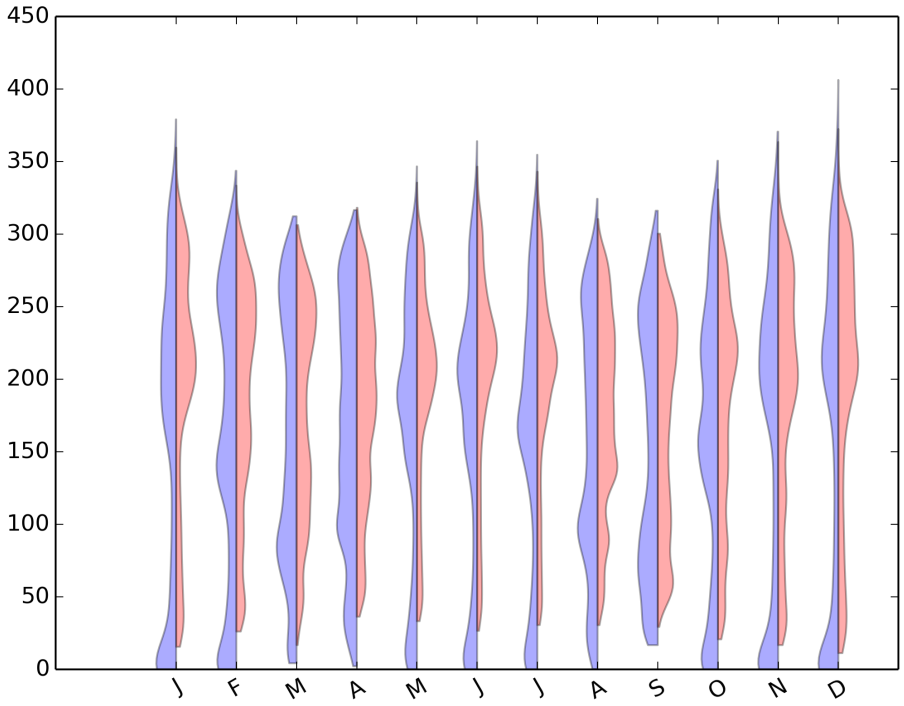



Figure 352: Violin plot for CMIP3-MPI-ECHAM5-AMIP

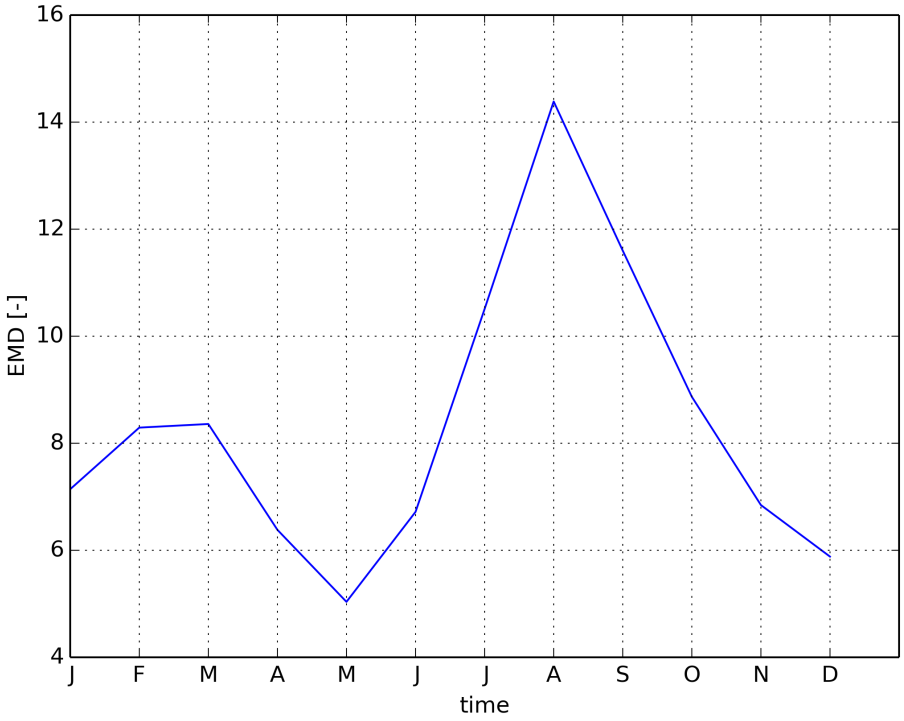



Figure 353: Timeseries of EMD

### 1.2.34 CMIP3 ncar ccsm3 0-amip

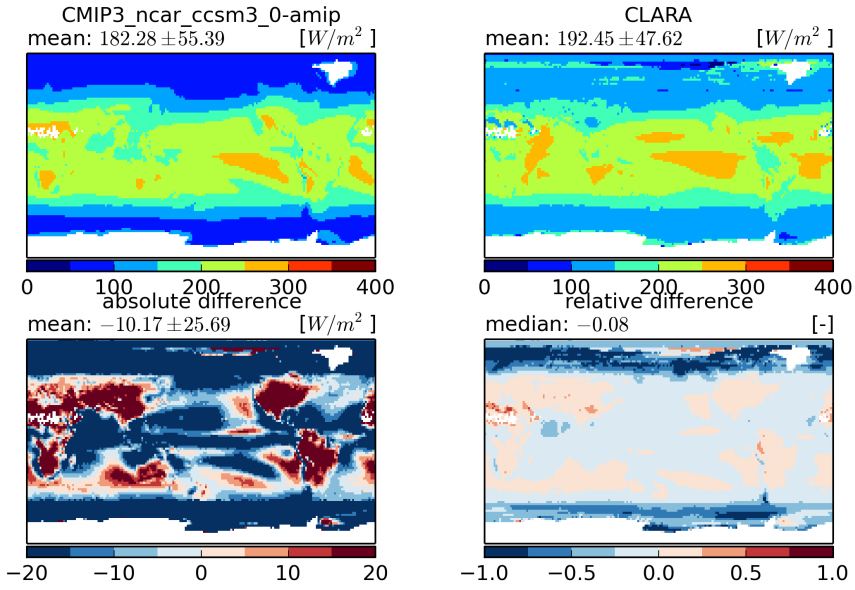



Figure 354: Temporal mean fields (top) and absolute and relative differences (bottom)

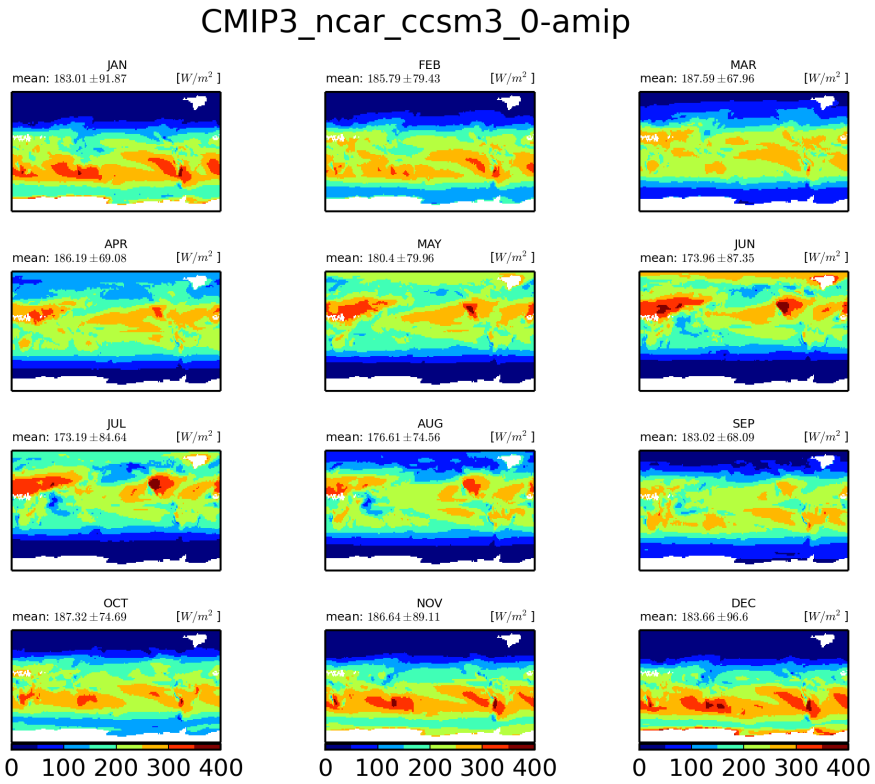



Figure 355: Monthly mean climatology for ncar-ccsm3-0

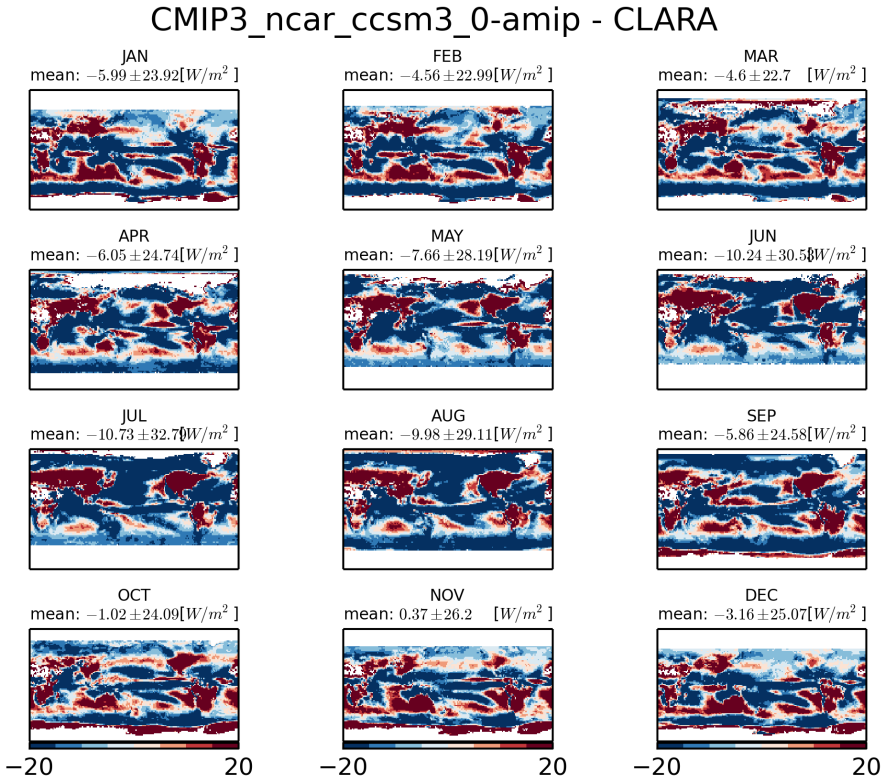



Figure 356: Monthly mean climatology of difference between NCAR-CCSM3-0 and CLARA

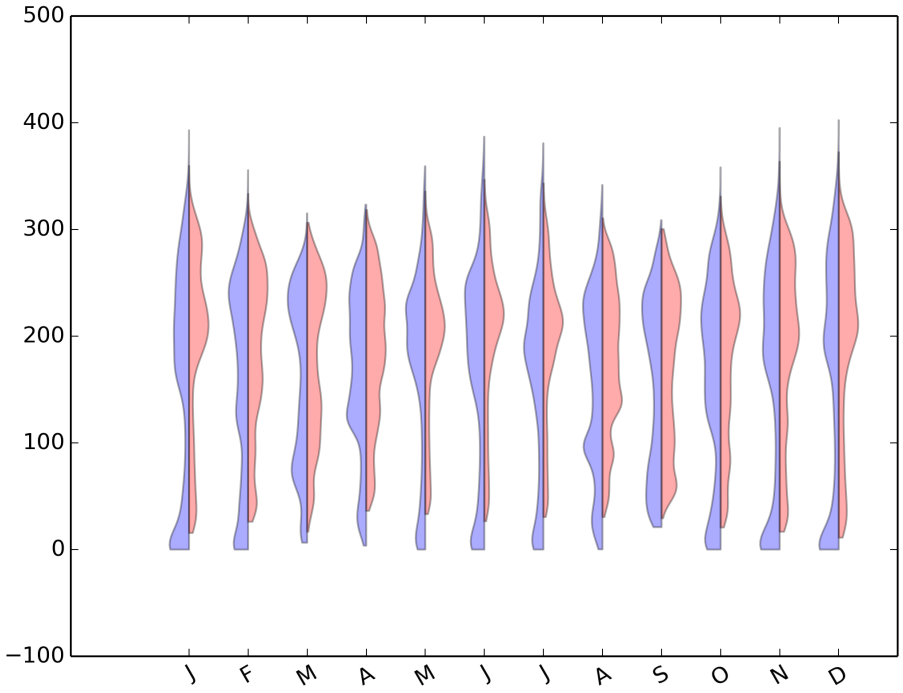



Figure 357: Violin plot for CMIP3-NCAR-CCSM3-0-AMIP

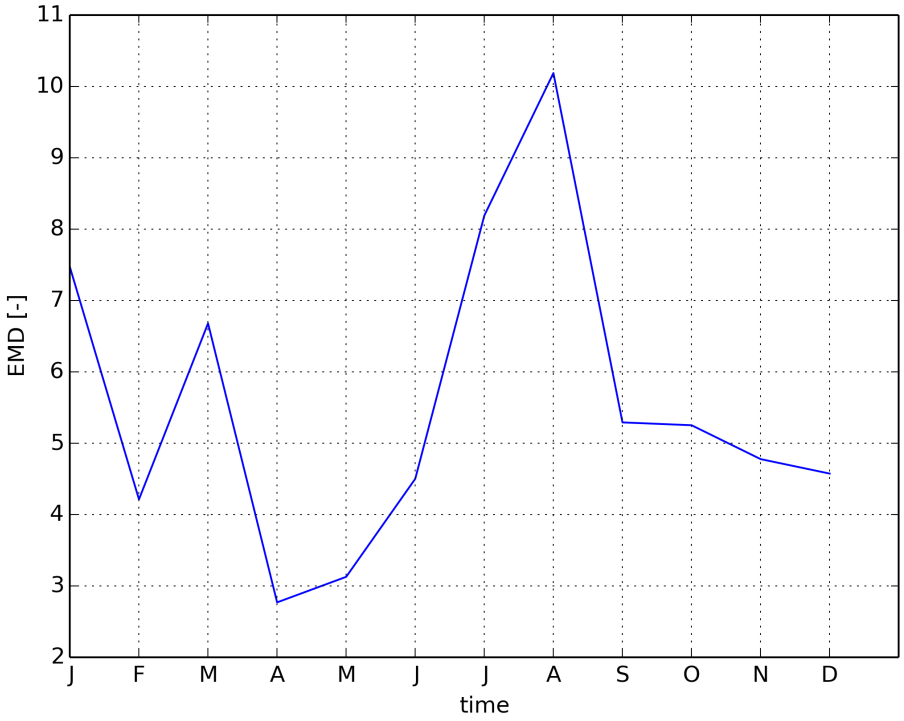



Figure 358: Timeseries of EMD

### 1.2.35 CMIP3 ncar pcm1-amip

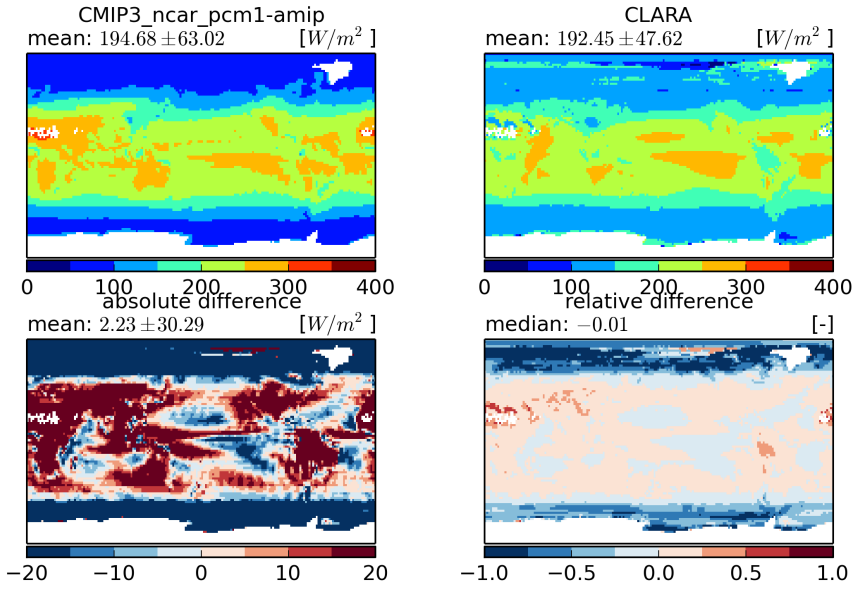



Figure 359: Temporal mean fields (top) and absolute and relative differences (bottom)

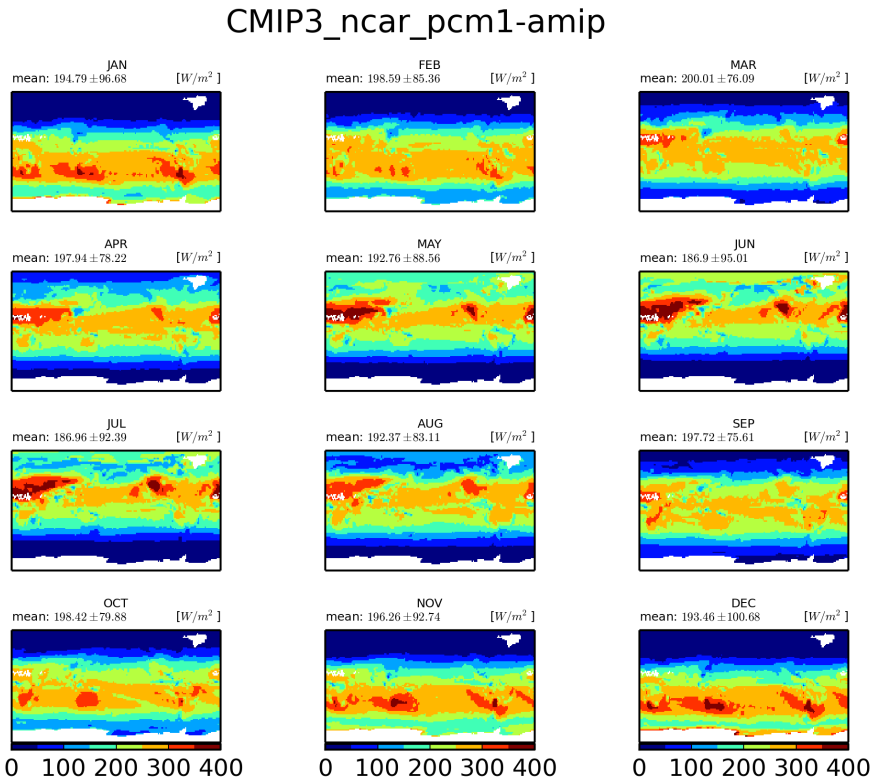



Figure 360: Monthly mean climatology for ncar-pcm1

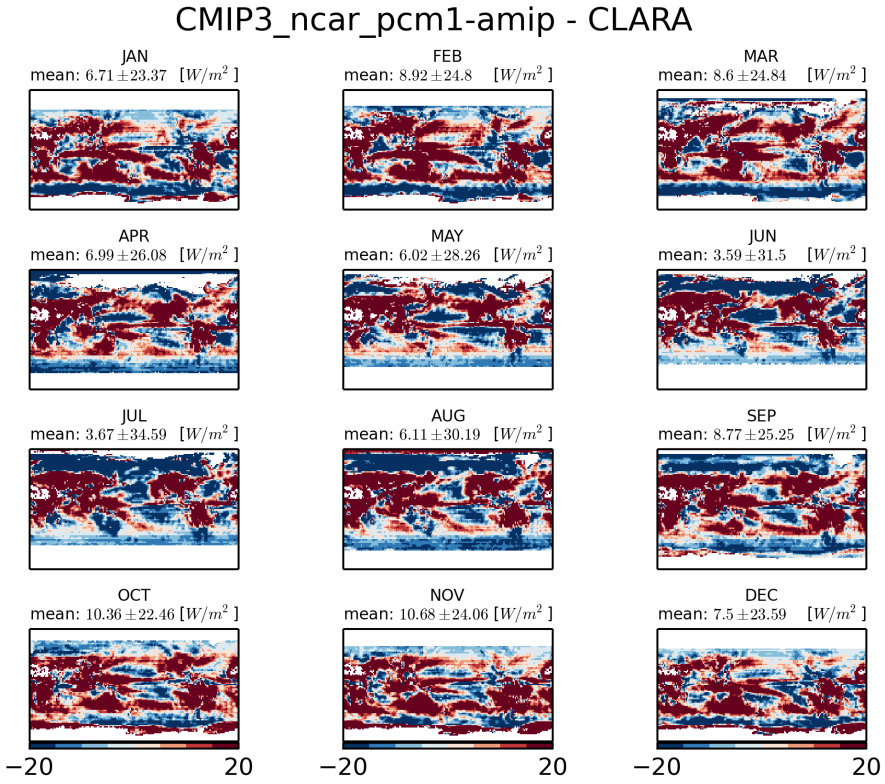



Figure 361: Monthly mean climatology of difference between NCAR-PCM1 and CLARA

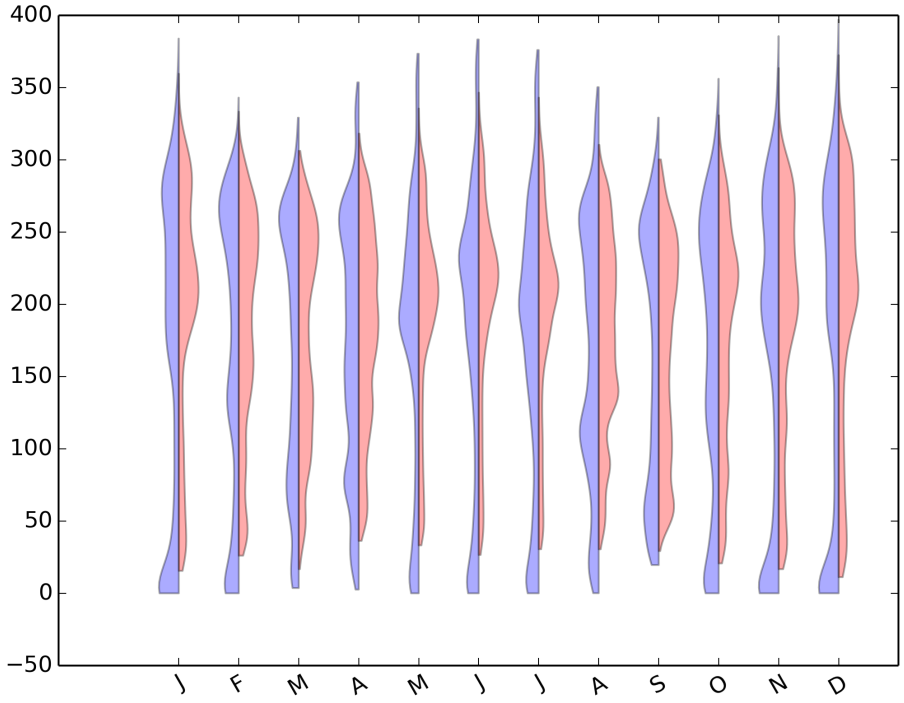



Figure 362: Violin plot for CMIP3-NCAR-PCM1-AMIP

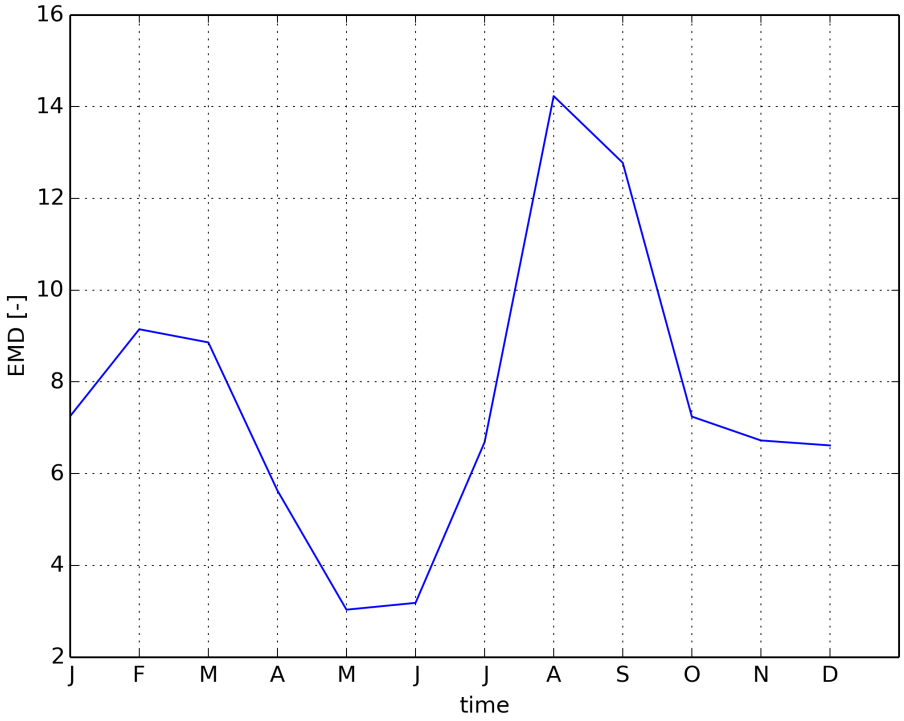



Figure 363: Timeseries of EMD

### 1.2.36 CMIP3 ukmo hadgem1-amip

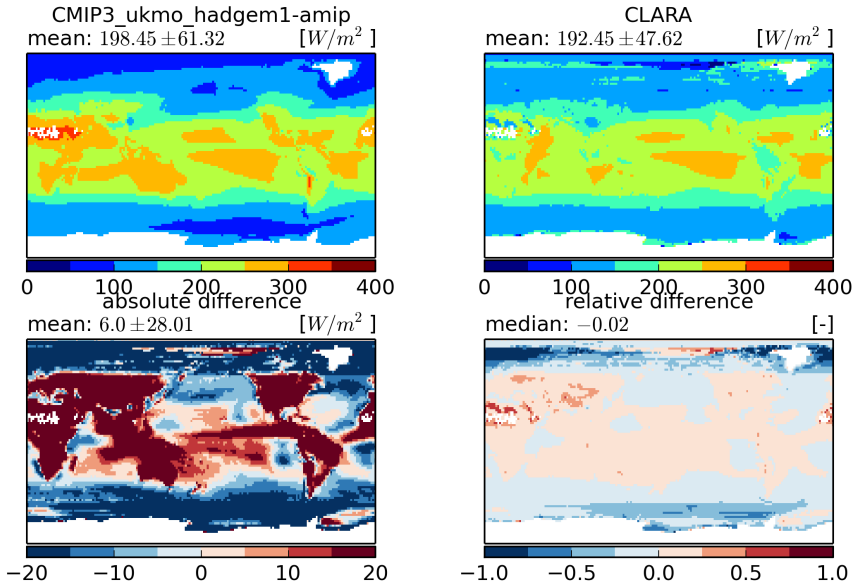



Figure 364: Temporal mean fields (top) and absolute and relative differences (bottom)

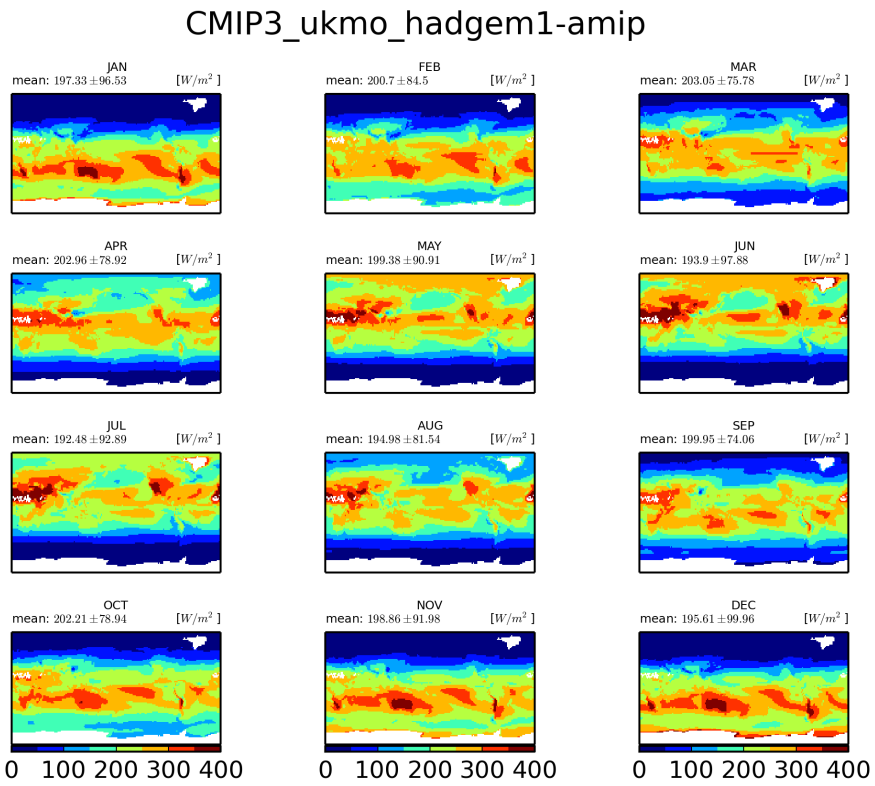



Figure 365: Monthly mean climatology for ukmo-hadgem1

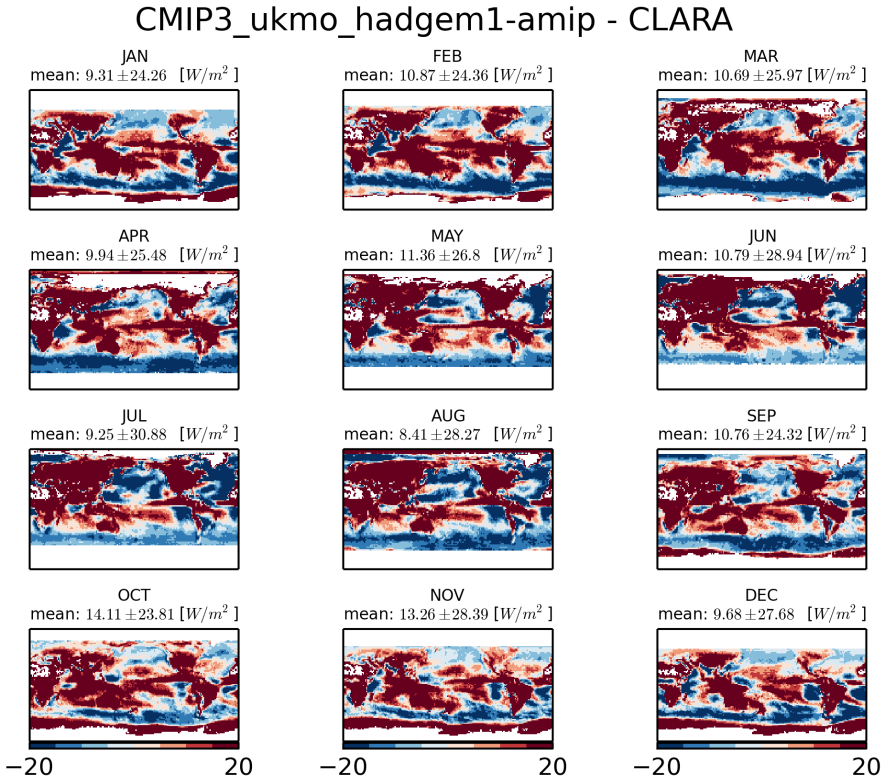



Figure 366: Monthly mean climatology of difference between UKMO-HADGEM1 and CLARA

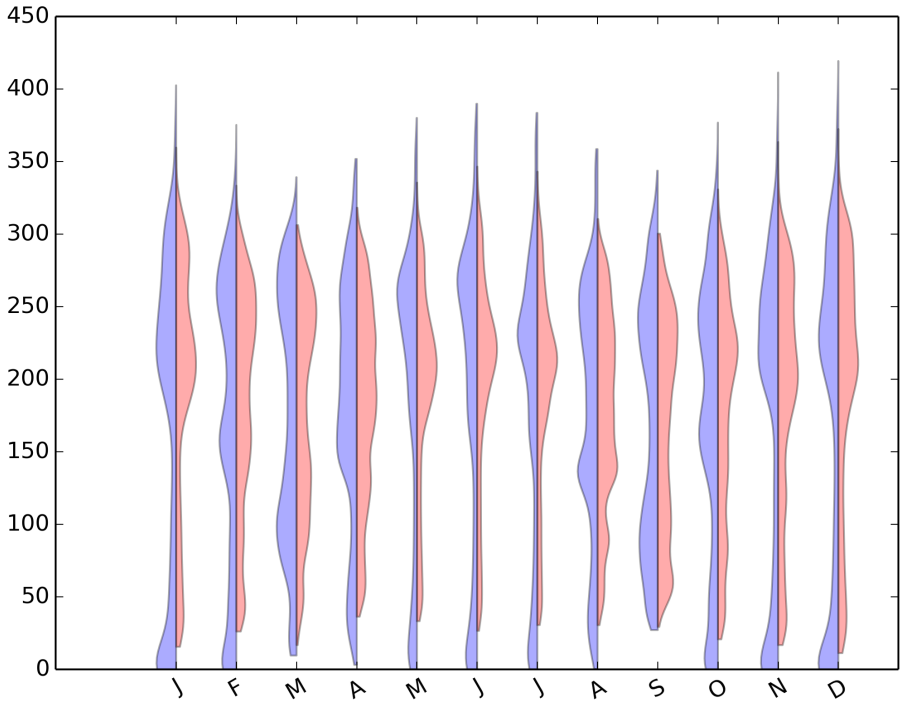



Figure 367: Violin plot for CMIP3-UKMO-HADGEM1-AMIP

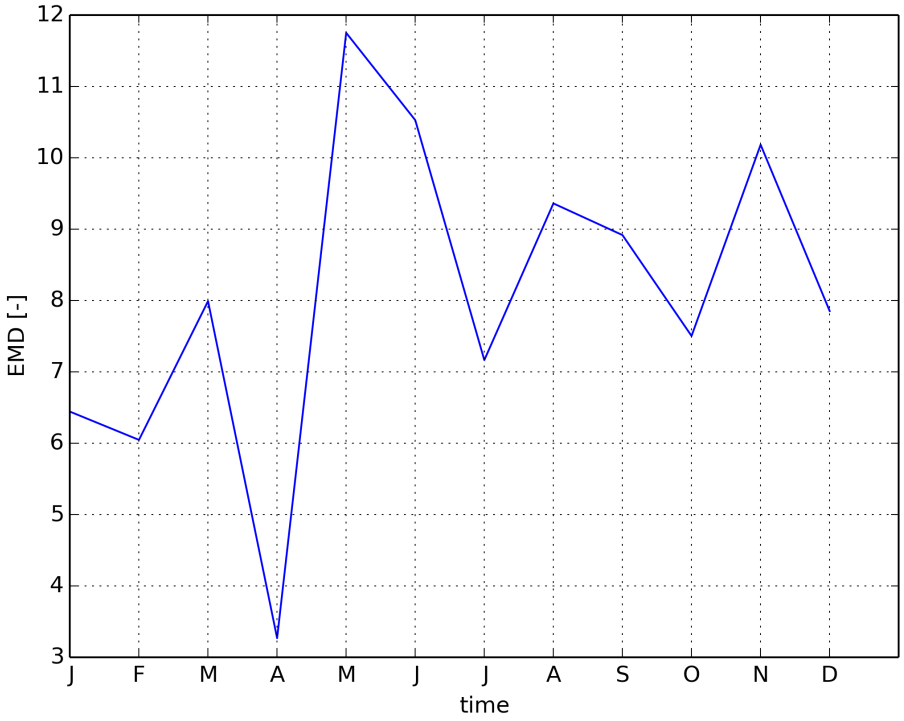



Figure 368: Timeseries of EMD

### 1.2.37 model mean

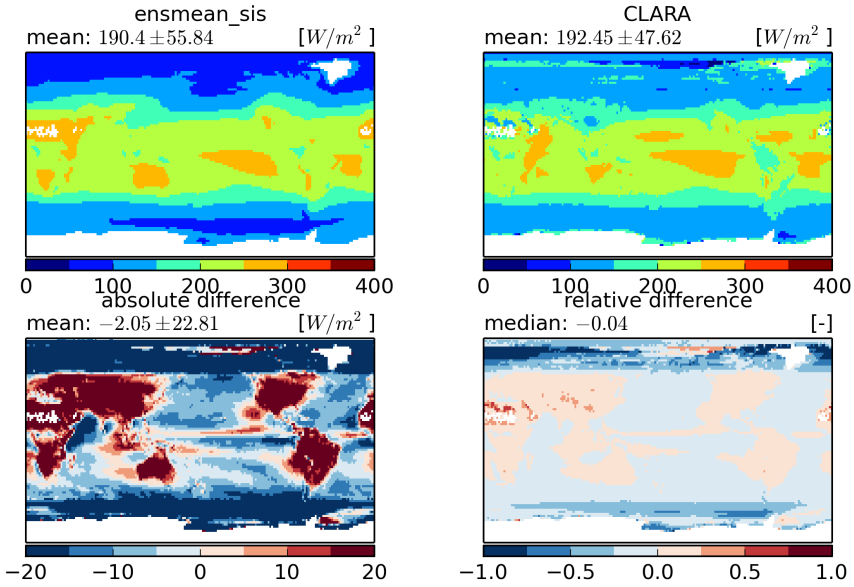



Figure 369: Temporal mean fields (top) and absolute and relative differences (bottom)

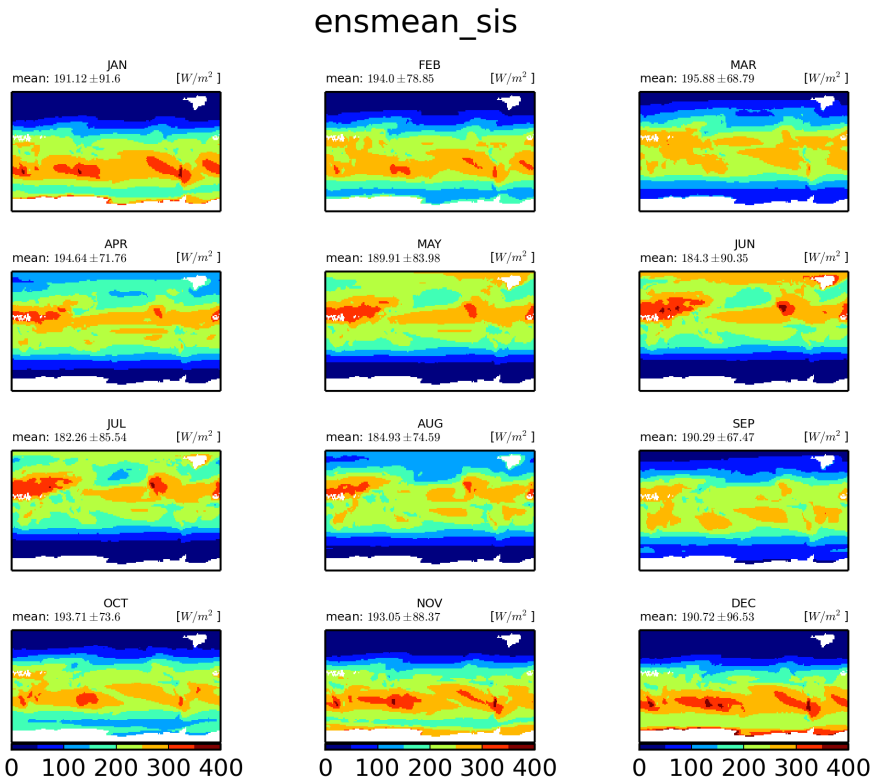



Figure 370: Monthly mean climatology for mean-model

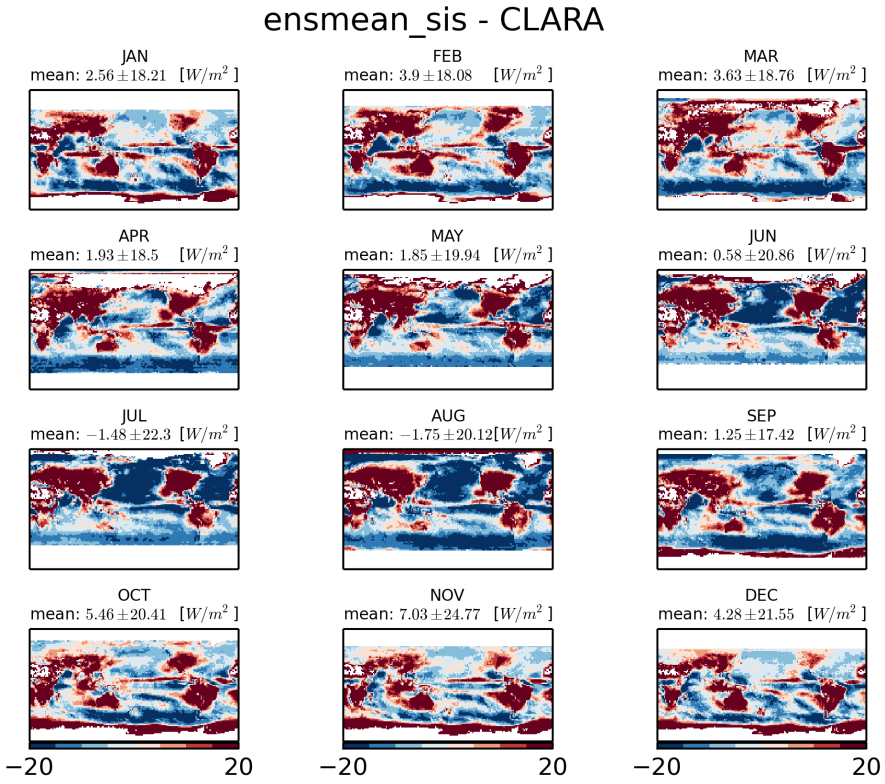



Figure 371: Monthly mean climatology of difference between MEAN-MODEL and CLARA

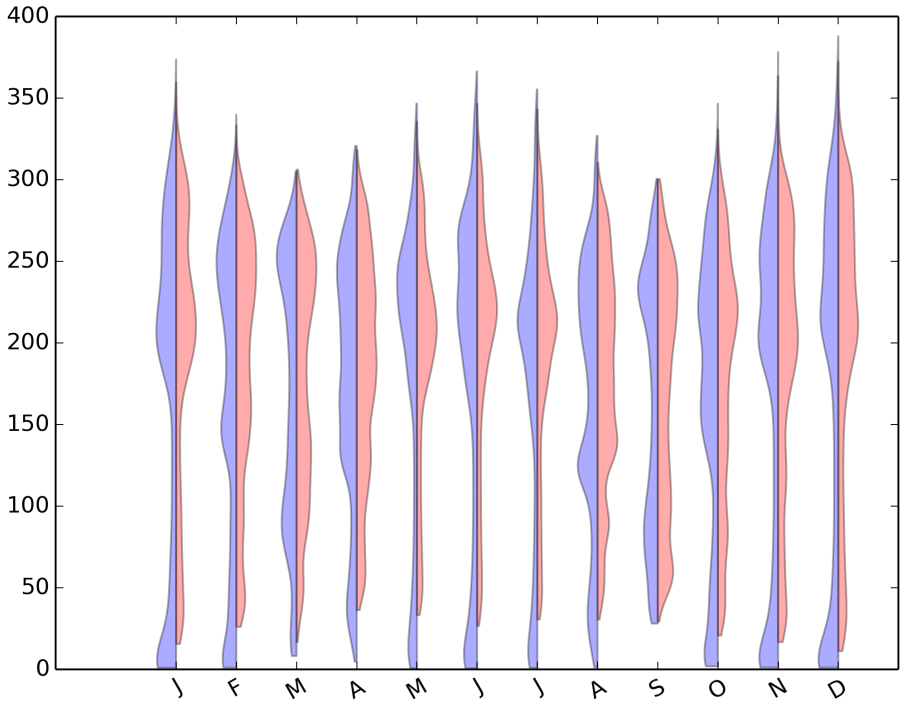



Figure 372: Violin plot for ENSMEAN-SIS

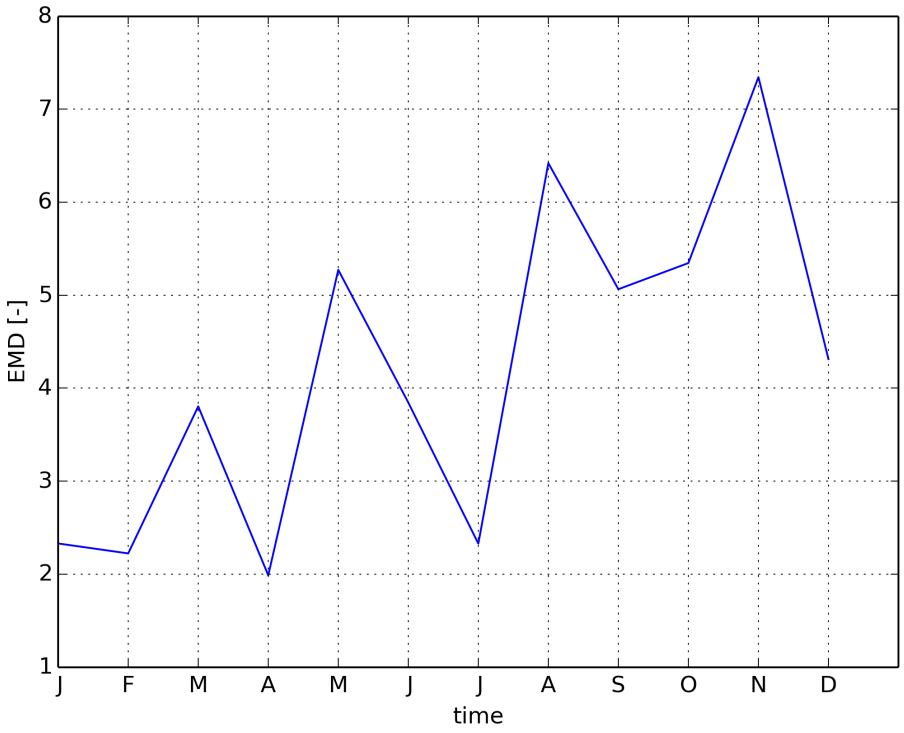



Figure 373: Timeseries of EMD

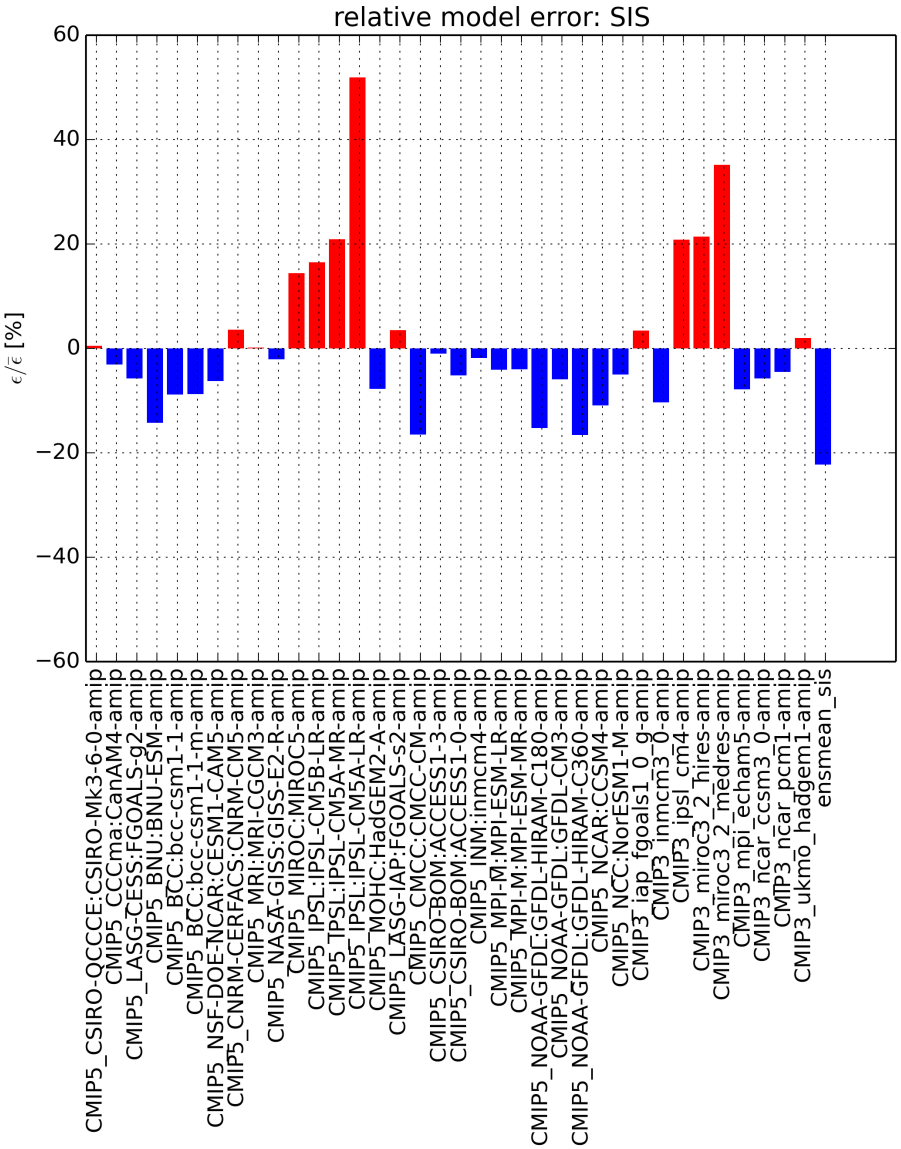



Figure 374: Relative model performance for SIS

## 1.3 CERES2.7

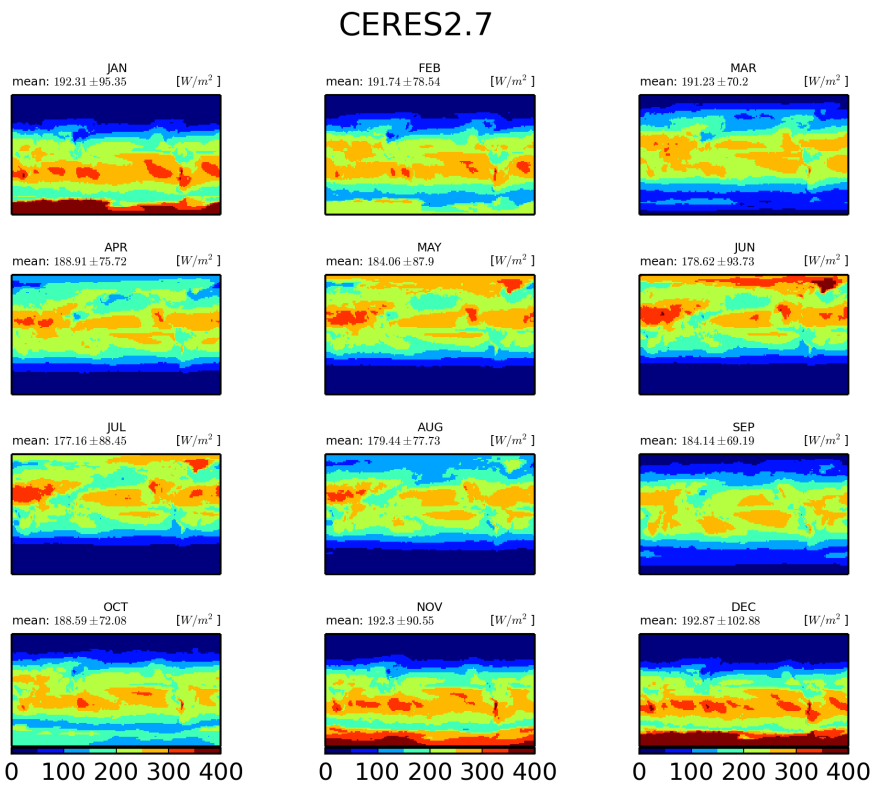



Figure 375: Monthly mean CERES2.7

### 1.3.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

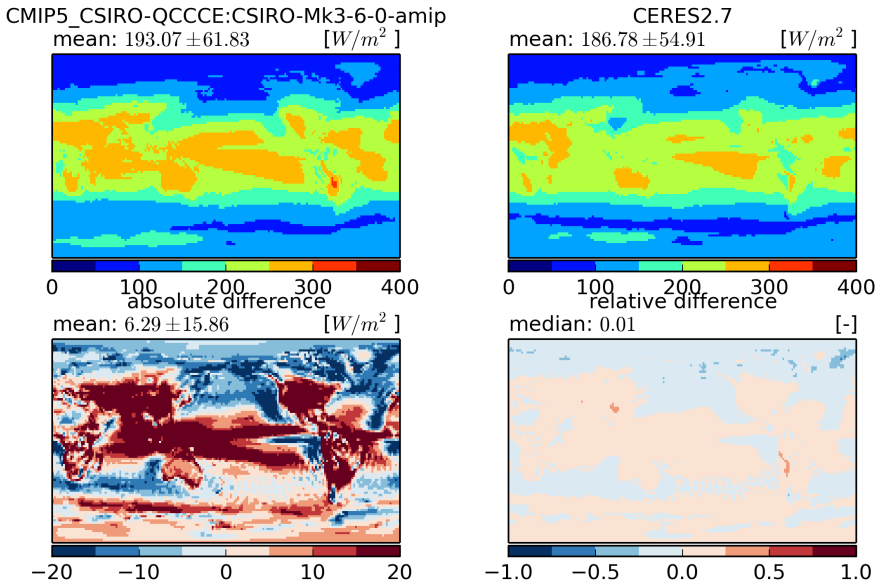



Figure 376: Temporal mean fields (top) and absolute and relative differences (bottom)

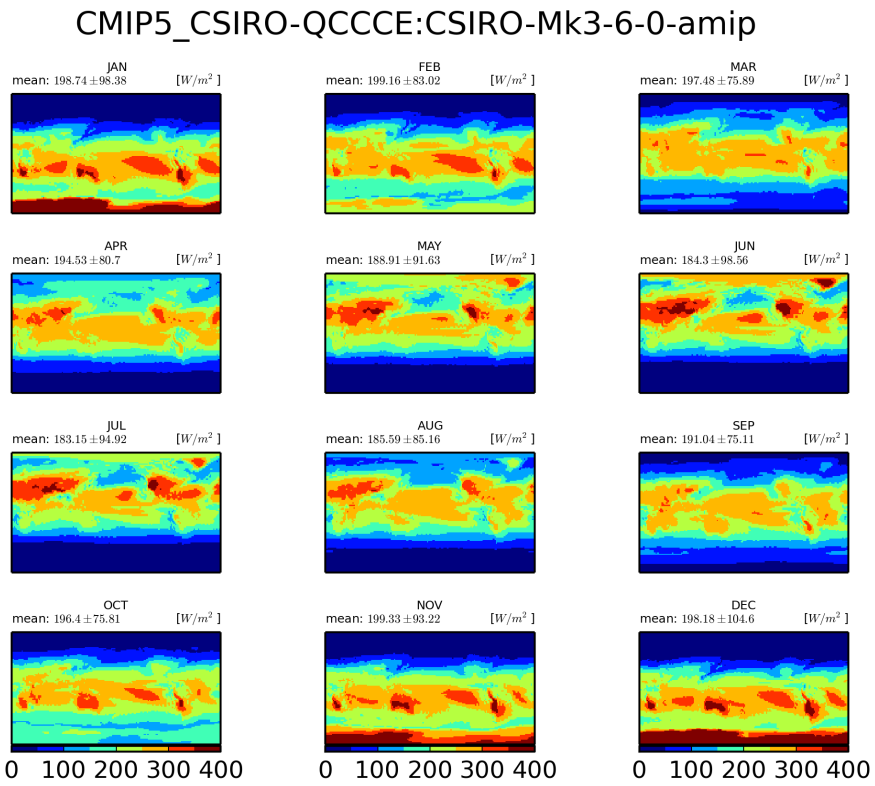



Figure 377: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

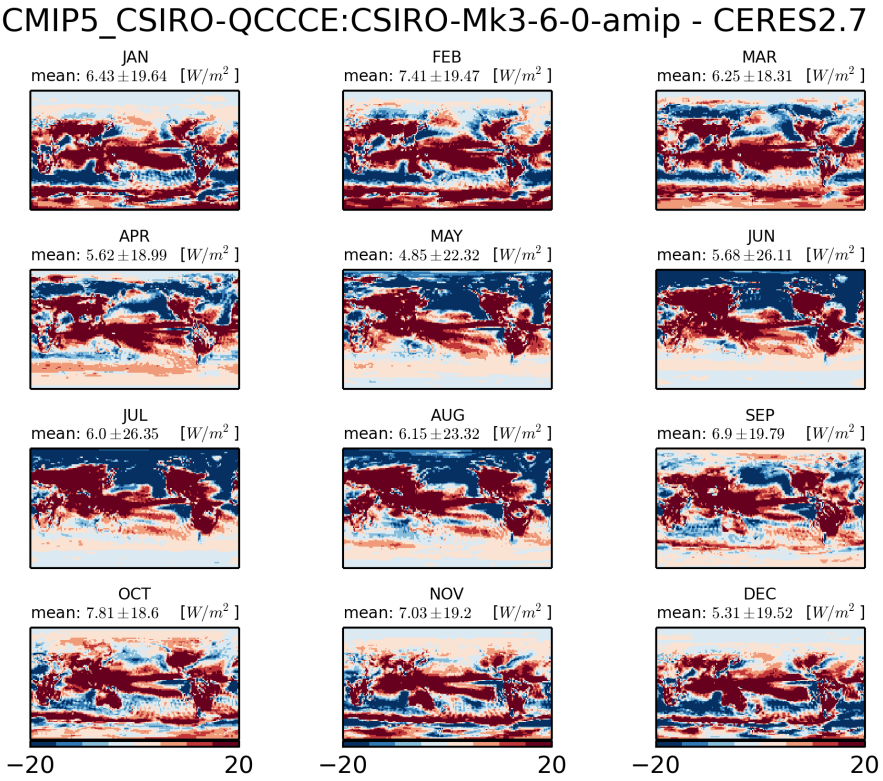



Figure 378: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and CERES2.7

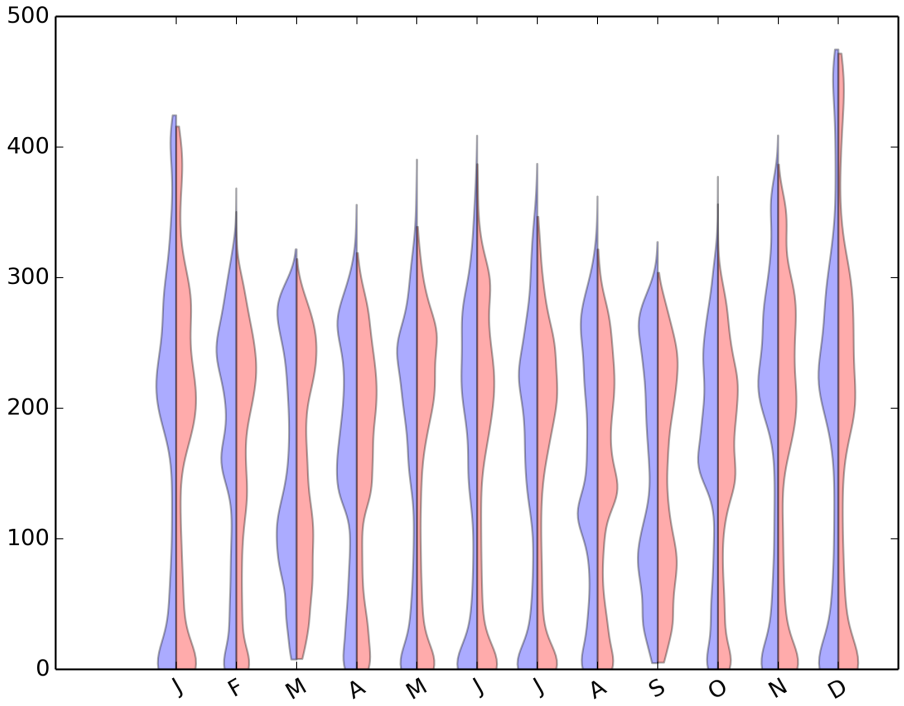



Figure 379: Violin plot for CMIP5-CSIRO-QCCCE:CSIRO-MK3-6-0-AMIP

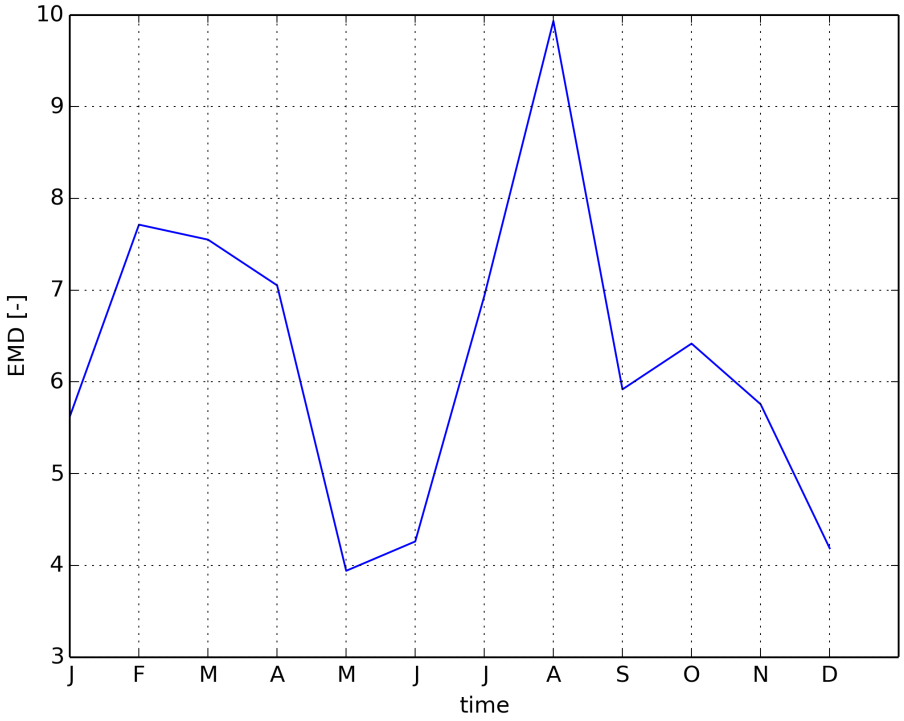



Figure 380: Timeseries of EMD

### 1.3.2 CMIP5 CCCma:CanAM4-amip

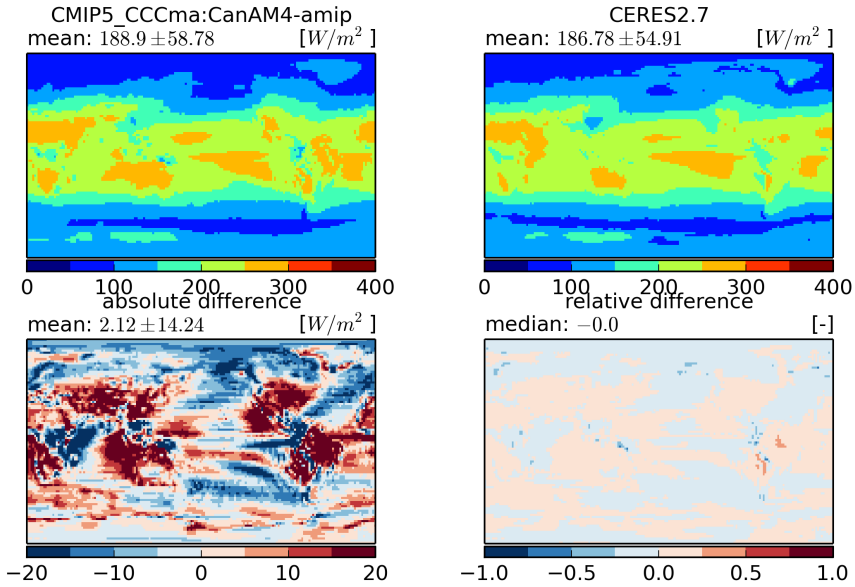



Figure 381: Temporal mean fields (top) and absolute and relative differences (bottom)

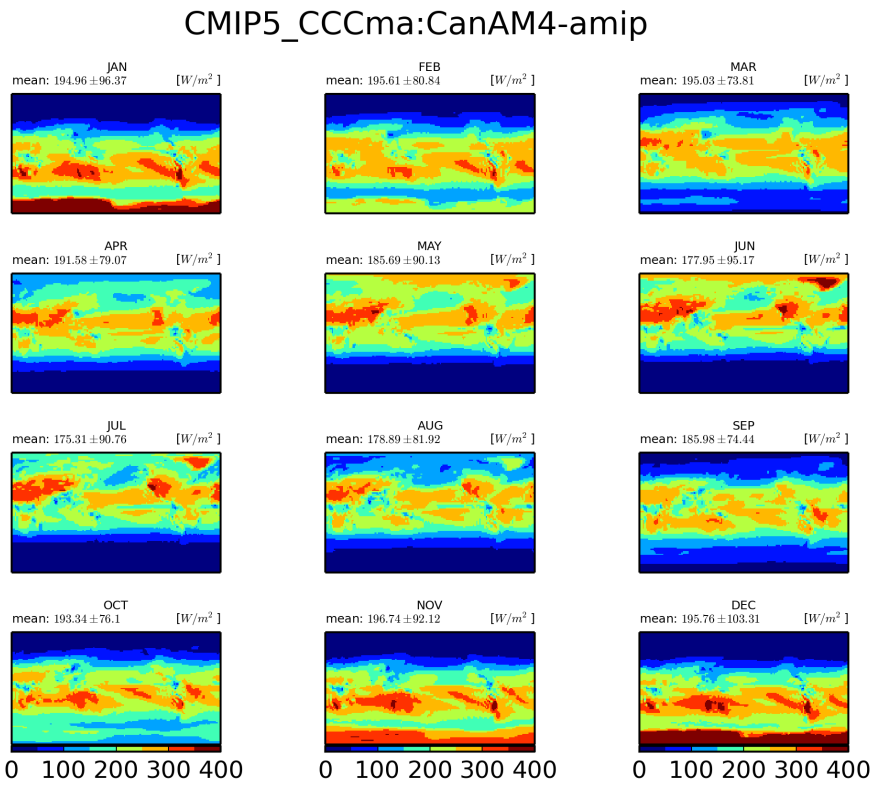



Figure 382: Monthly mean climatology for CCCma:CanAM4

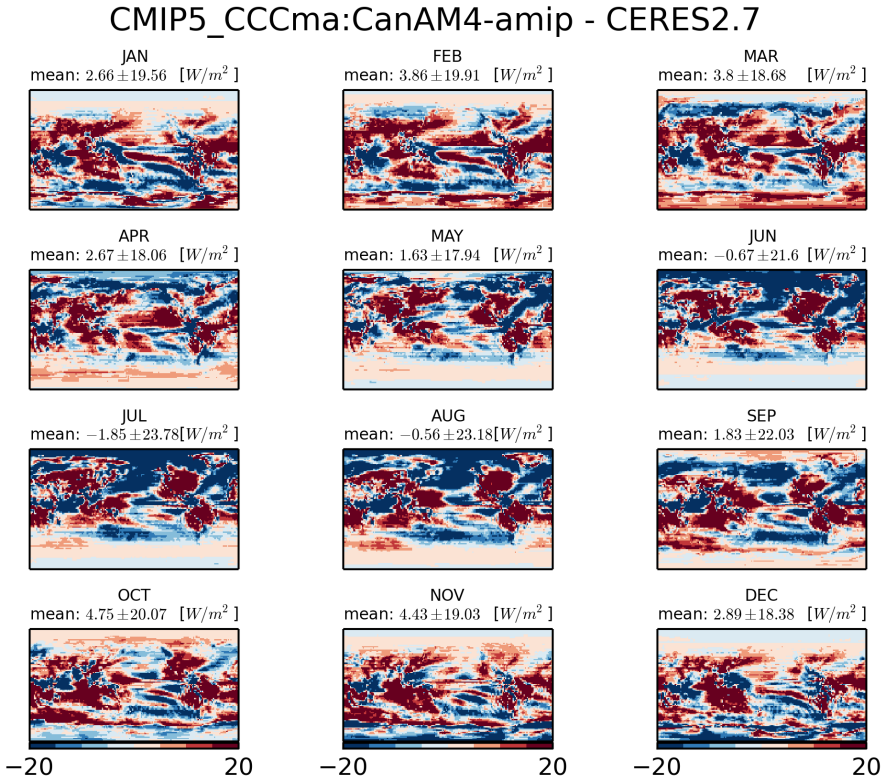



Figure 383: Monthly mean climatology of difference between CCCMA:CANAM4 and CERES2.7

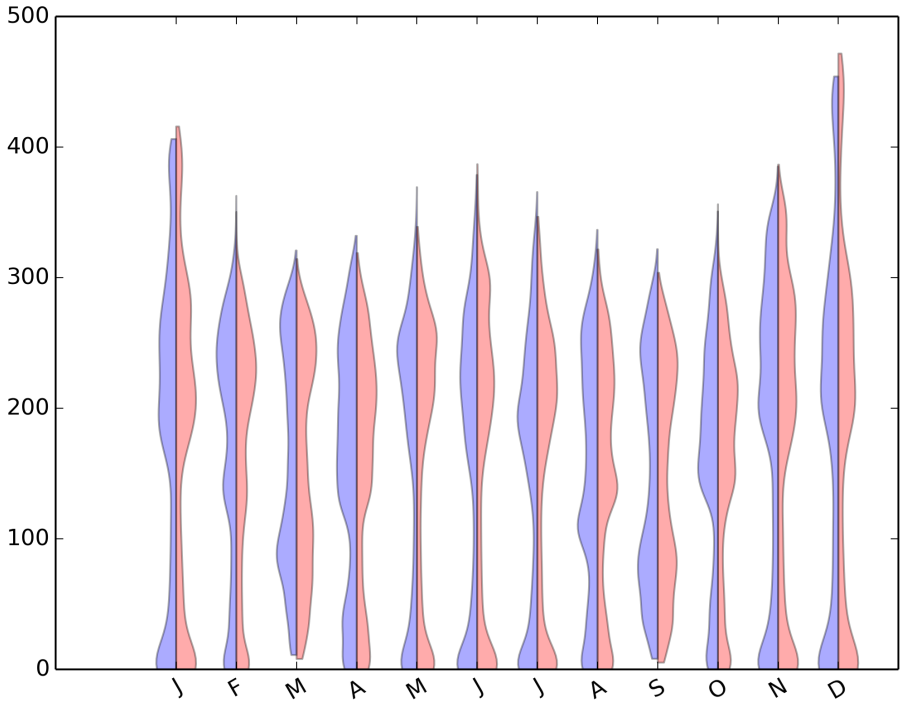



Figure 384: Violin plot for CMIP5-CCCMA:CANAM4-AMIP

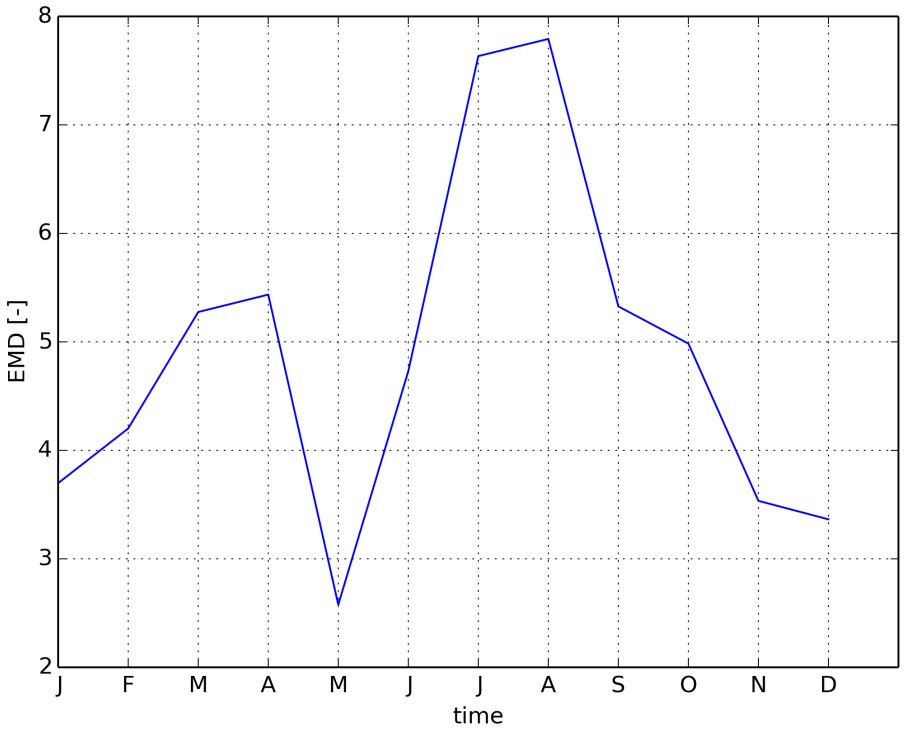



Figure 385: Timeseries of EMD

### 1.3.3 CMIP5 LASG-CESS:FGOALS-g2-amip

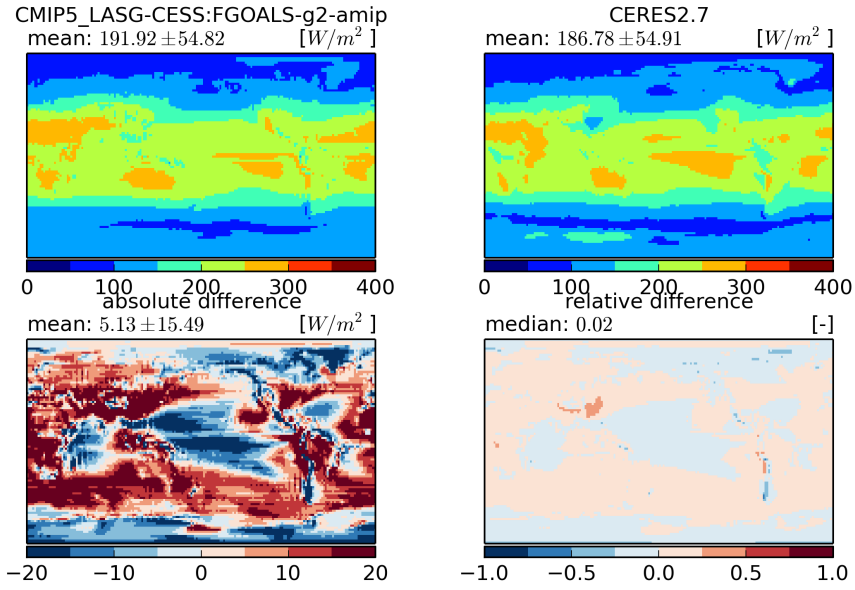



Figure 386: Temporal mean fields (top) and absolute and relative differences (bottom)

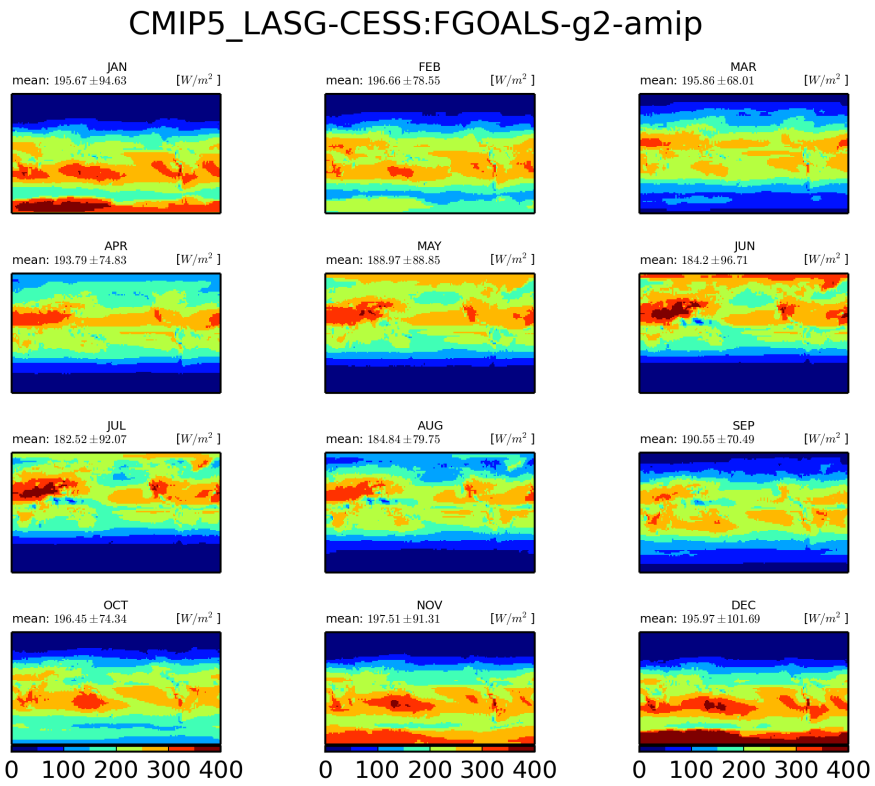



Figure 387: Monthly mean climatology for LASG-CESS:FGOALS-g2

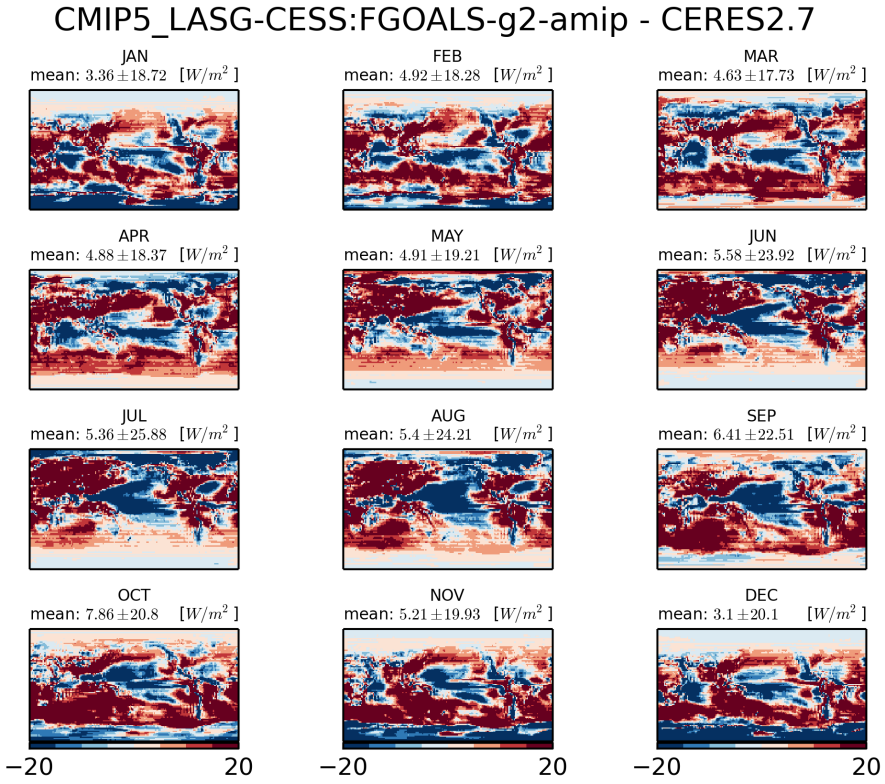



Figure 388: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and CERES2.7

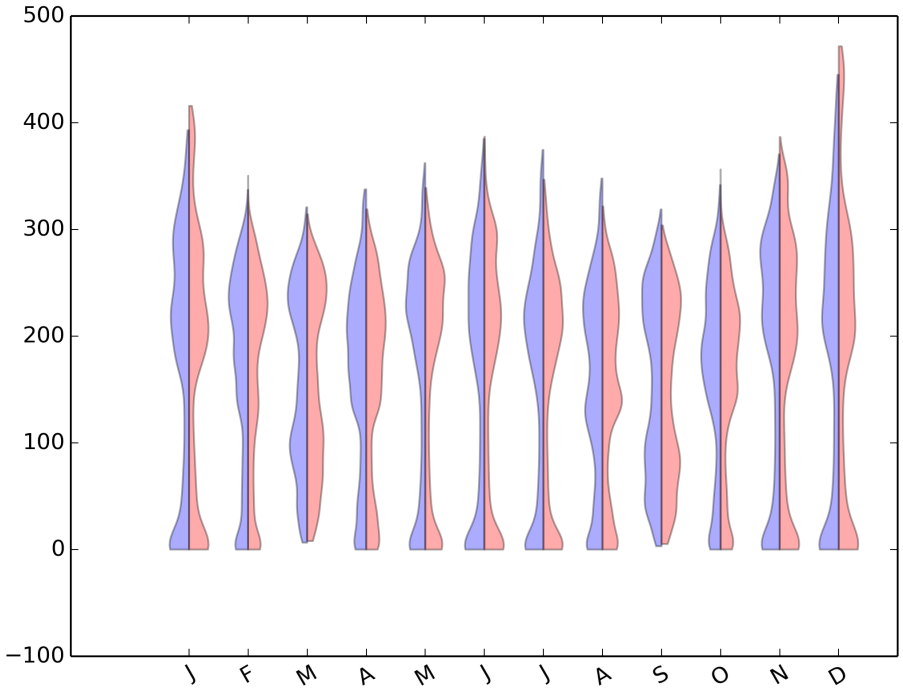



Figure 389: Violin plot for CMIP5-LASG-CESS:FGOALS-G2-AMIP

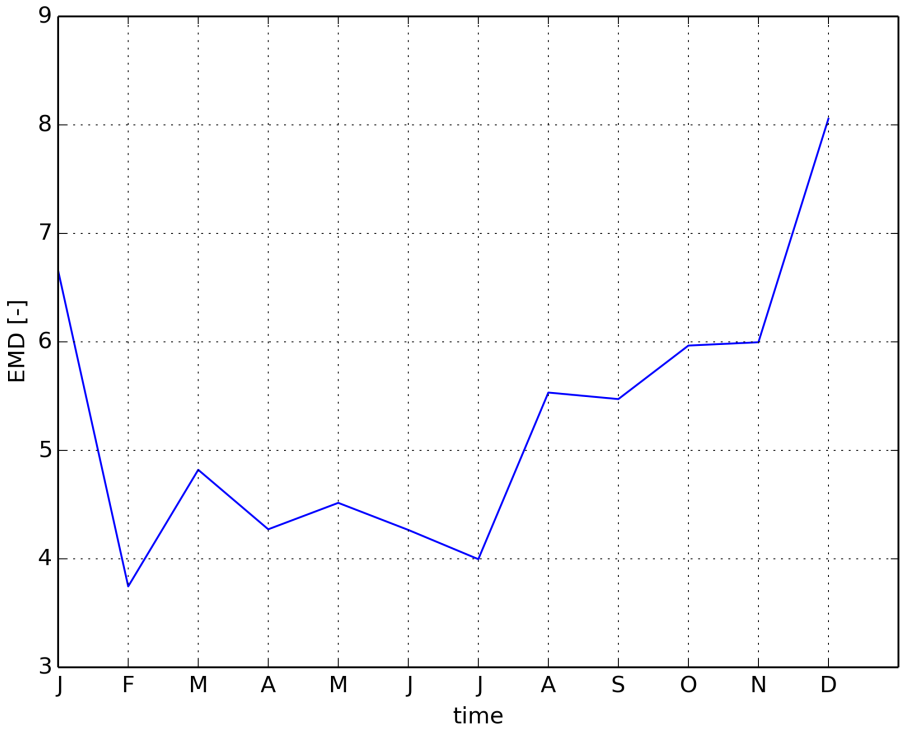



Figure 390: Timeseries of EMD

### 1.3.4 CMIP5 BNU:BNU-ESM-amip

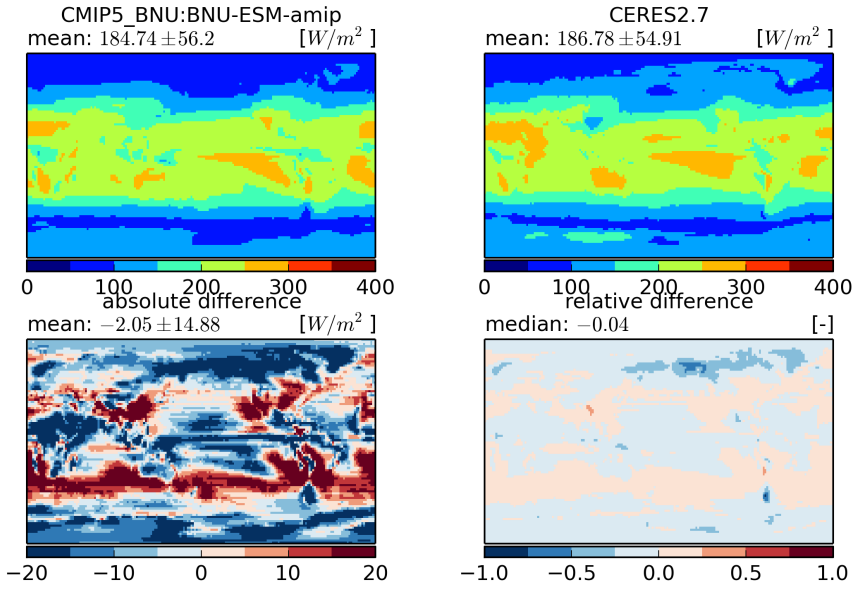



Figure 391: Temporal mean fields (top) and absolute and relative differences (bottom)

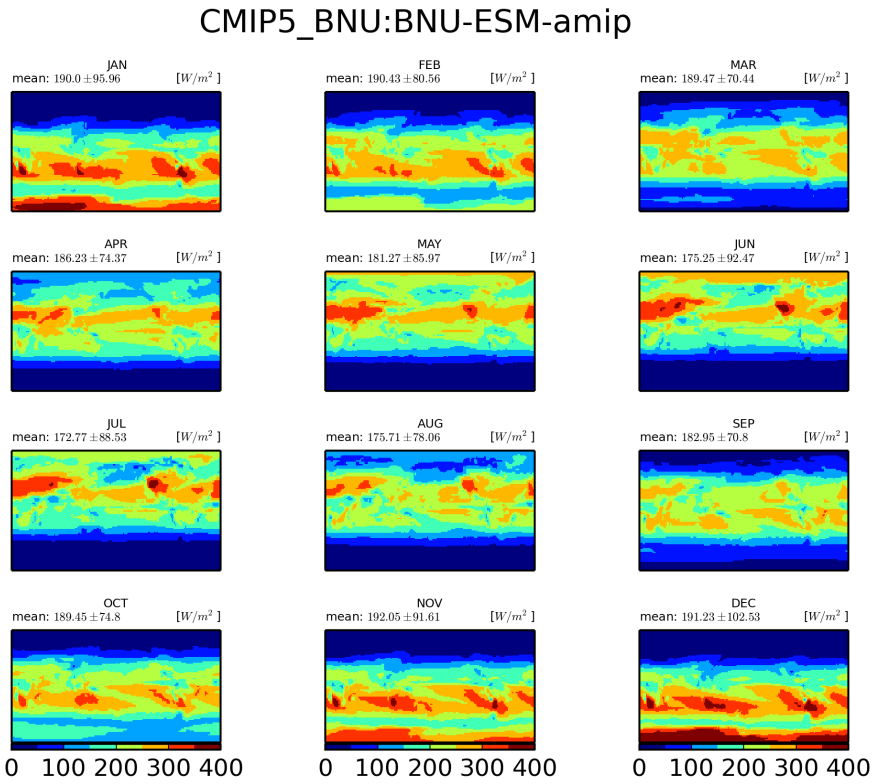



Figure 392: Monthly mean climatology for BNU:BNU-ESM

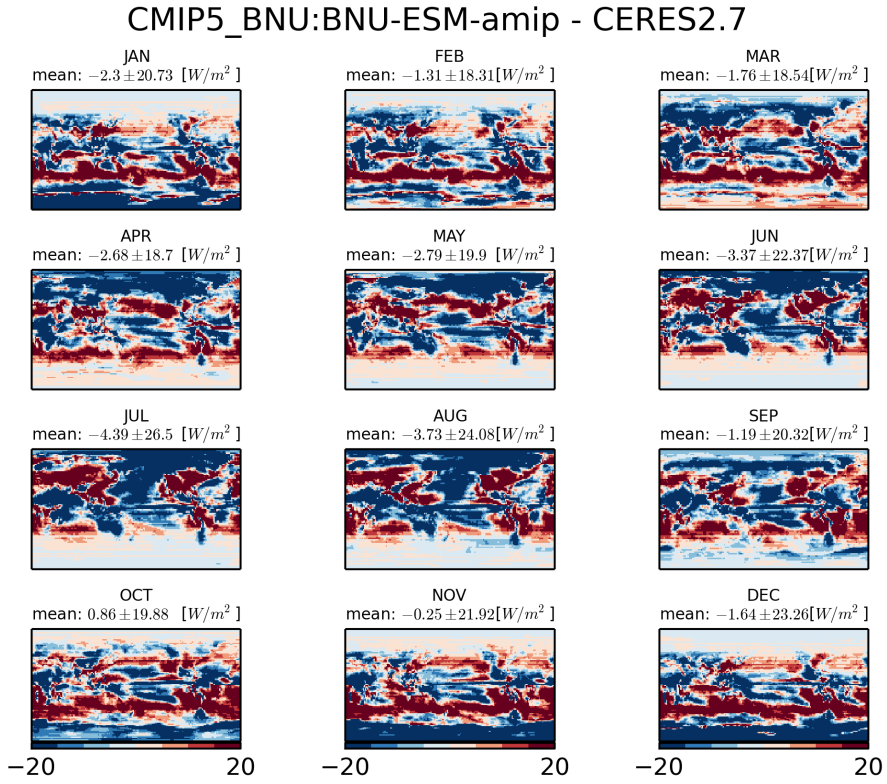



Figure 393: Monthly mean climatology of difference between BNU:BNU-ESM and CERES2.7

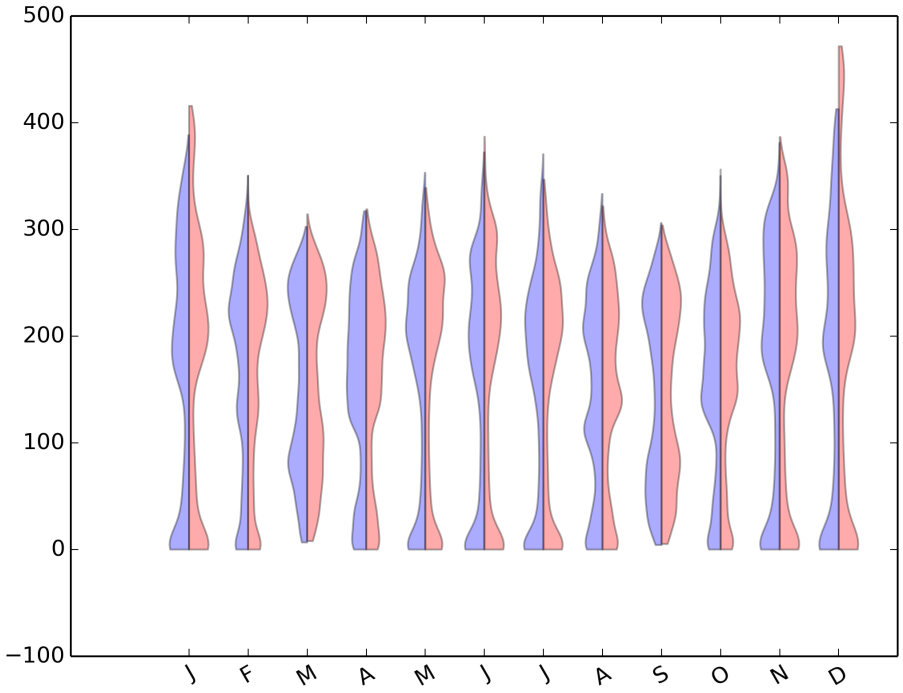



Figure 394: Violin plot for CMIP5-BNU:BNU-ESM-AMIP

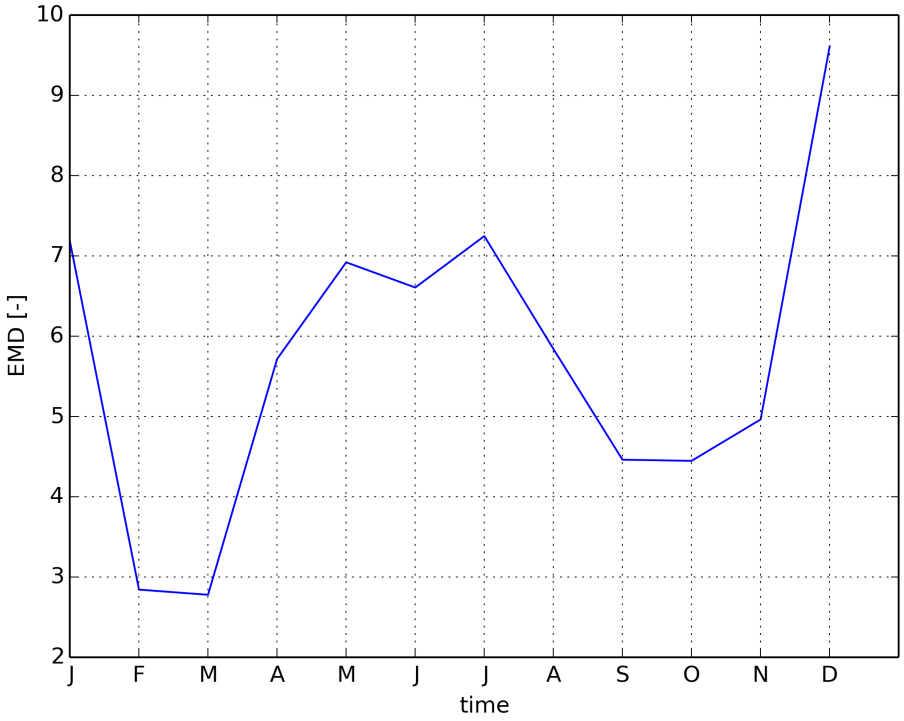



Figure 395: Timeseries of EMD

### 1.3.5 CMIP5 BCC:bcc-csm1-1-amip

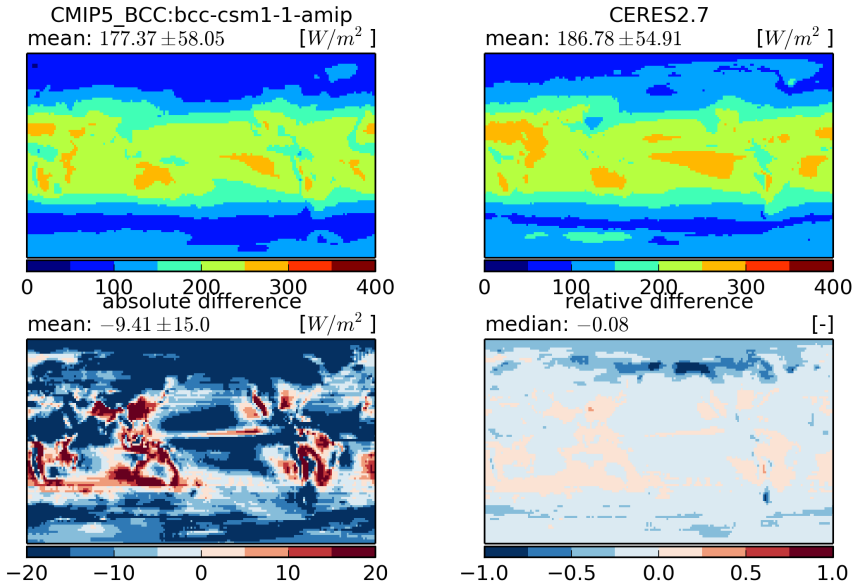



Figure 396: Temporal mean fields (top) and absolute and relative differences (bottom)

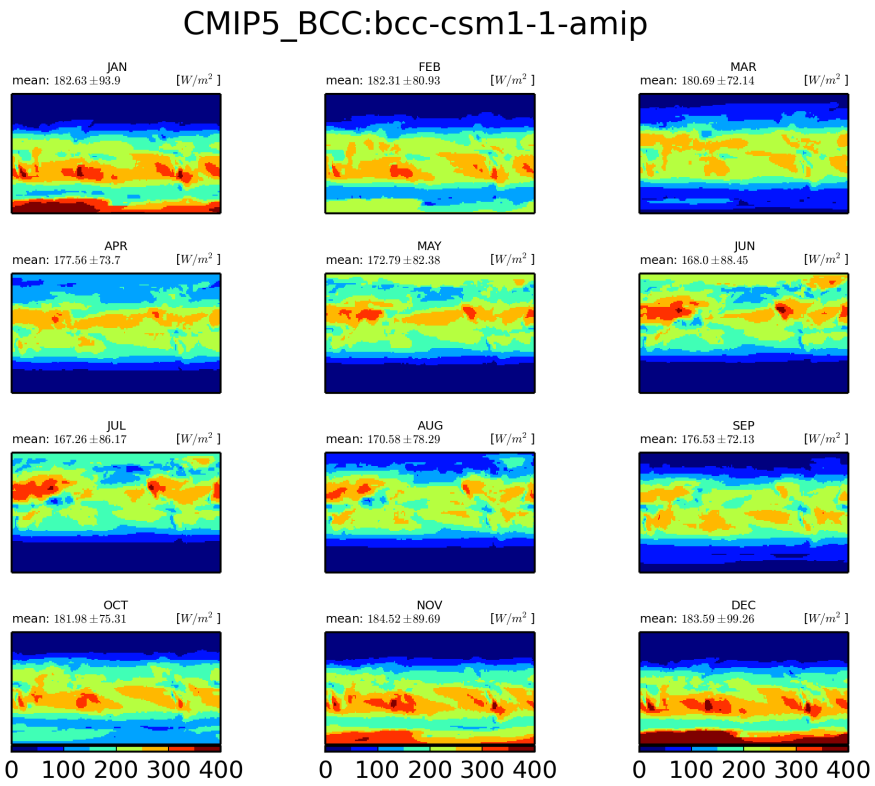



Figure 397: Monthly mean climatology for BCC:bcc-csm1-1

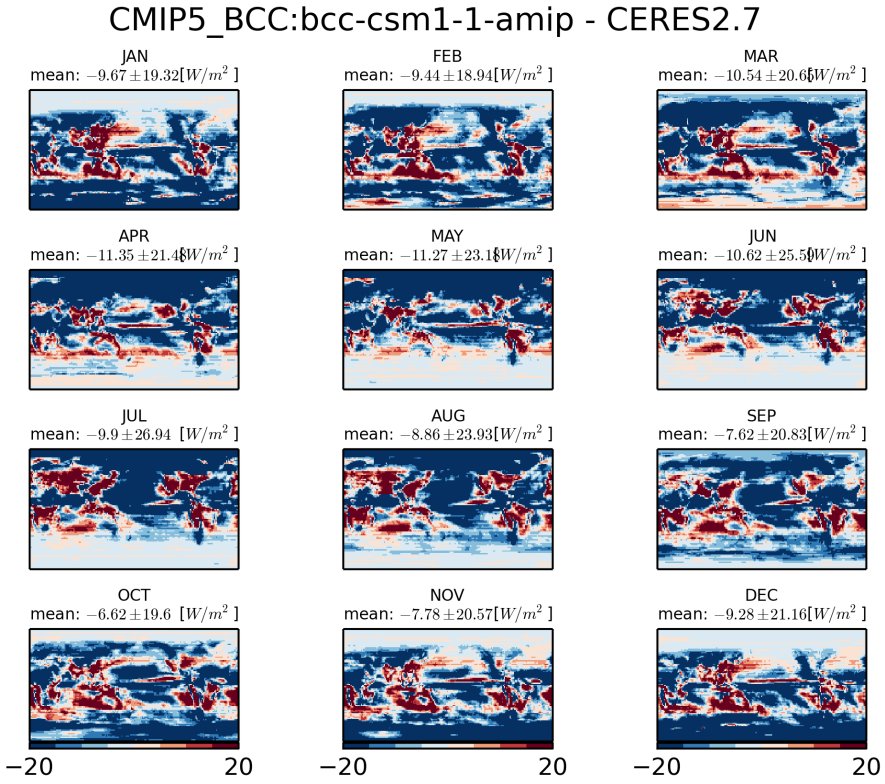



Figure 398: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and CERES2.7

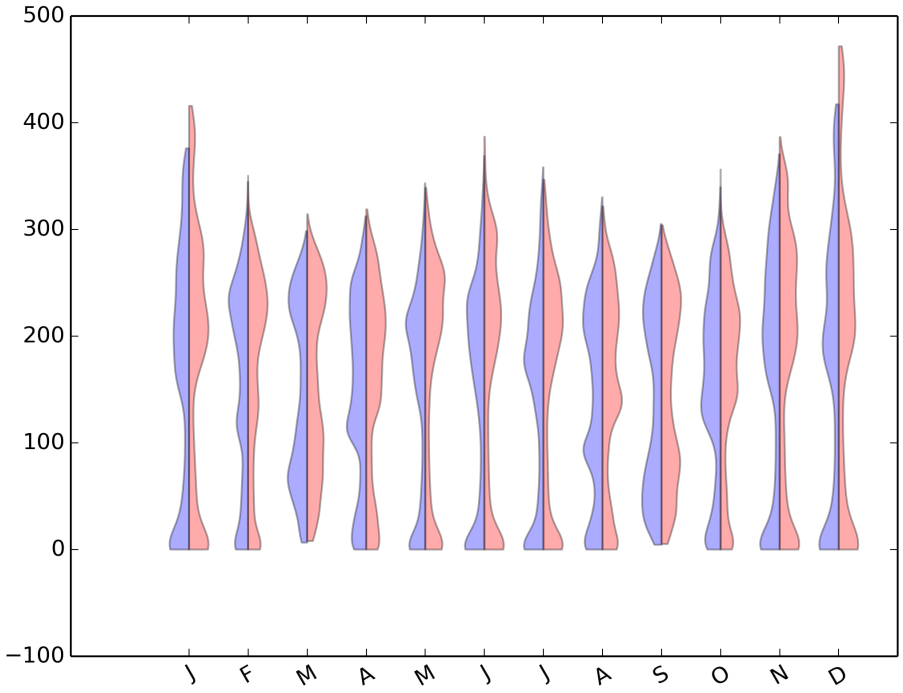



Figure 399: Violin plot for CMIP5-BCC:BCC-CSM1-1-AMIP

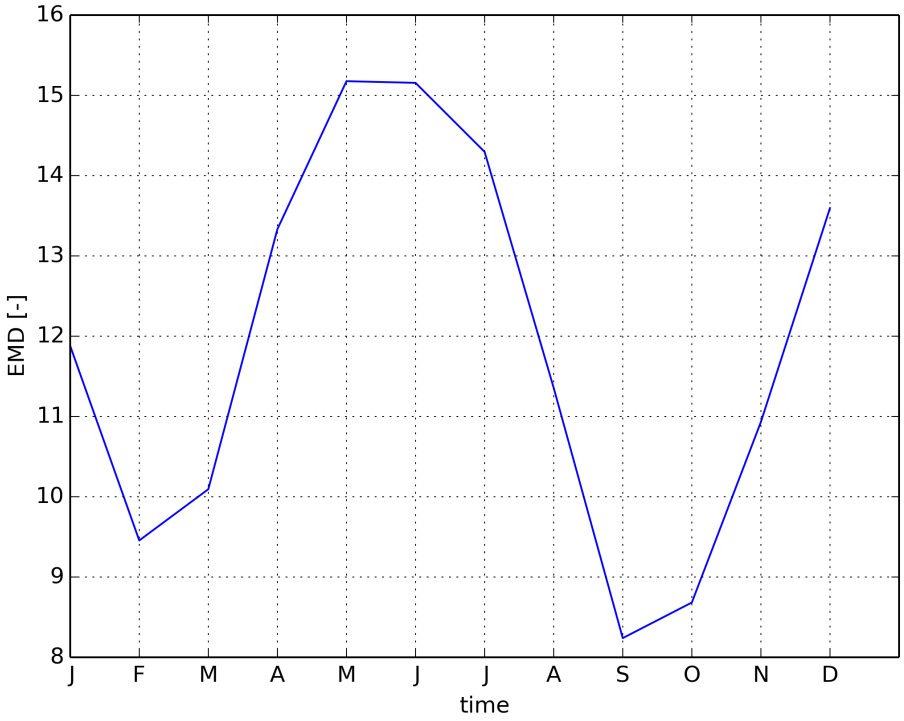



Figure 400: Timeseries of EMD

### 1.3.6 CMIP5 BCC:bcc-csm1-1-m-amip

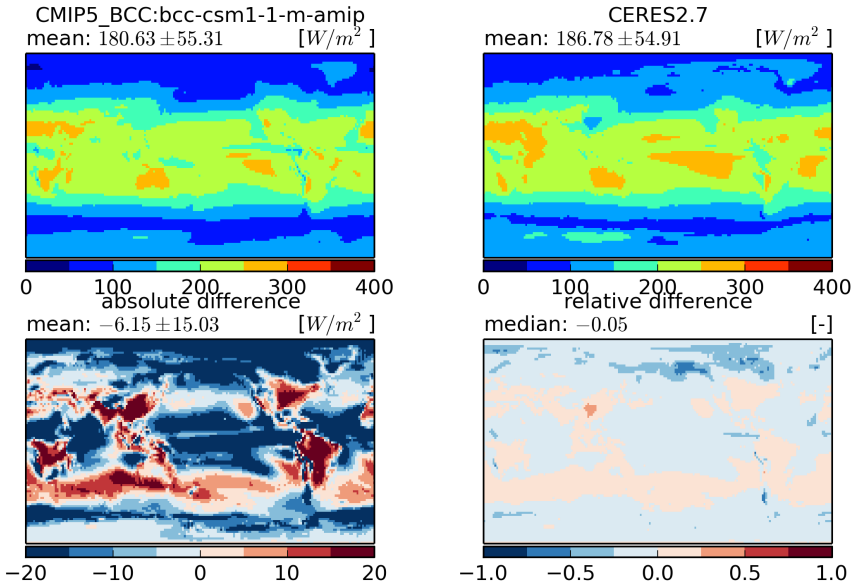



Figure 401: Temporal mean fields (top) and absolute and relative differences (bottom)

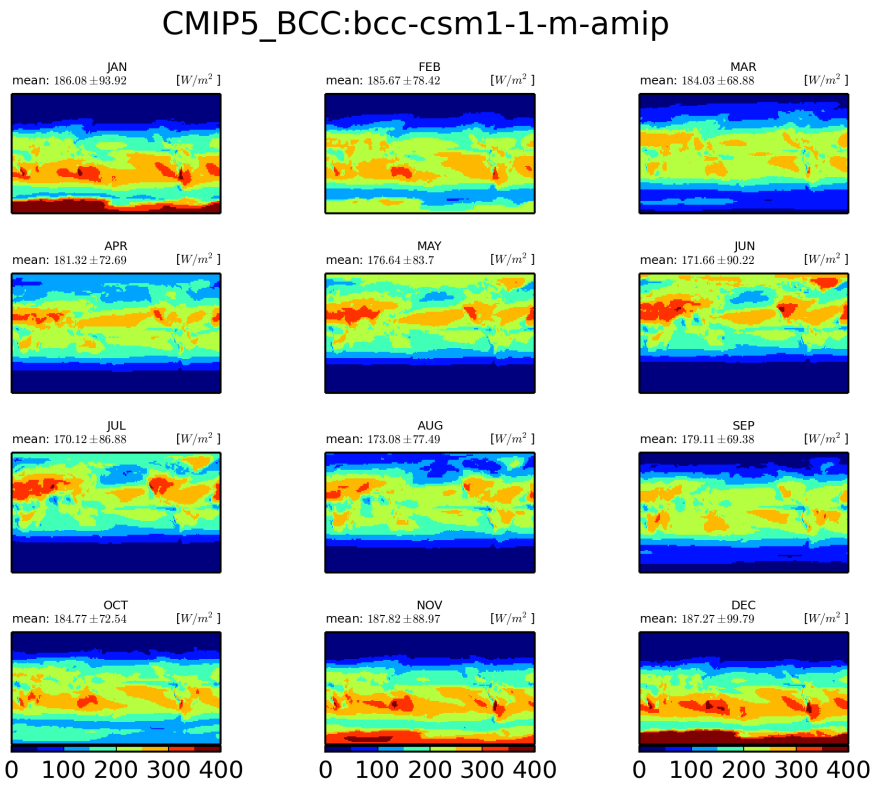



Figure 402: Monthly mean climatology for BCC:bcc-csm1-1-m

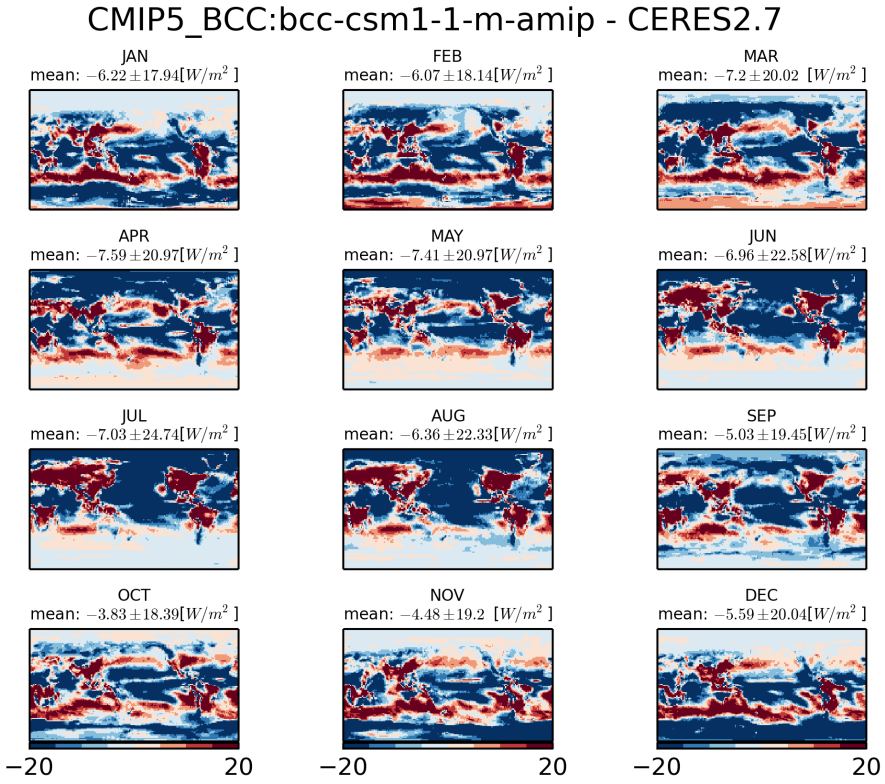



Figure 403: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and CERES2.7

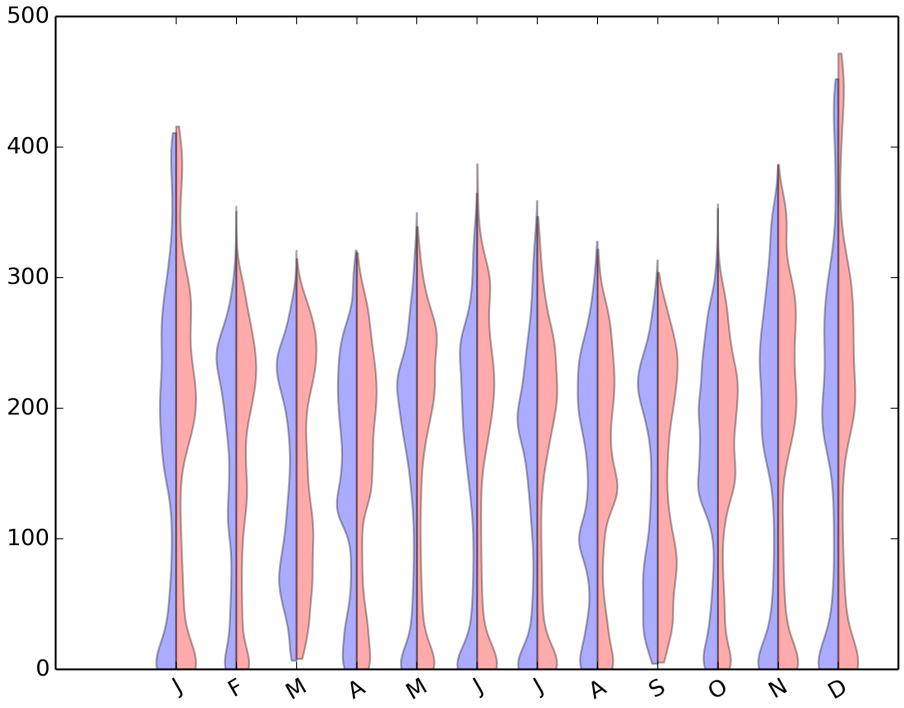



Figure 404: Violin plot for CMIP5-BCC:BCC-CSM1-1-M-AMIP

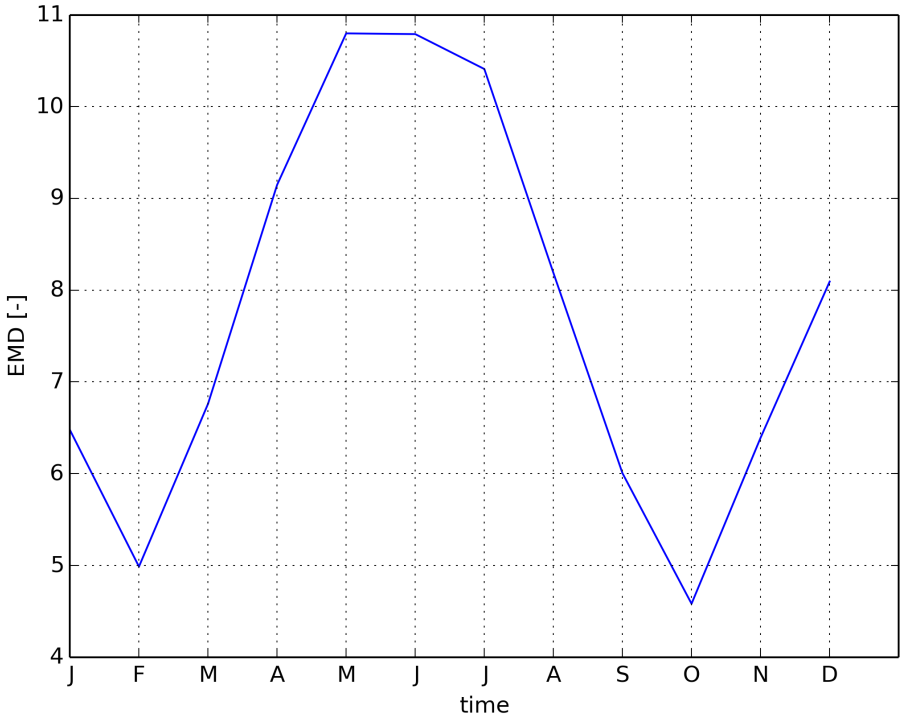



Figure 405: Timeseries of EMD

### 1.3.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

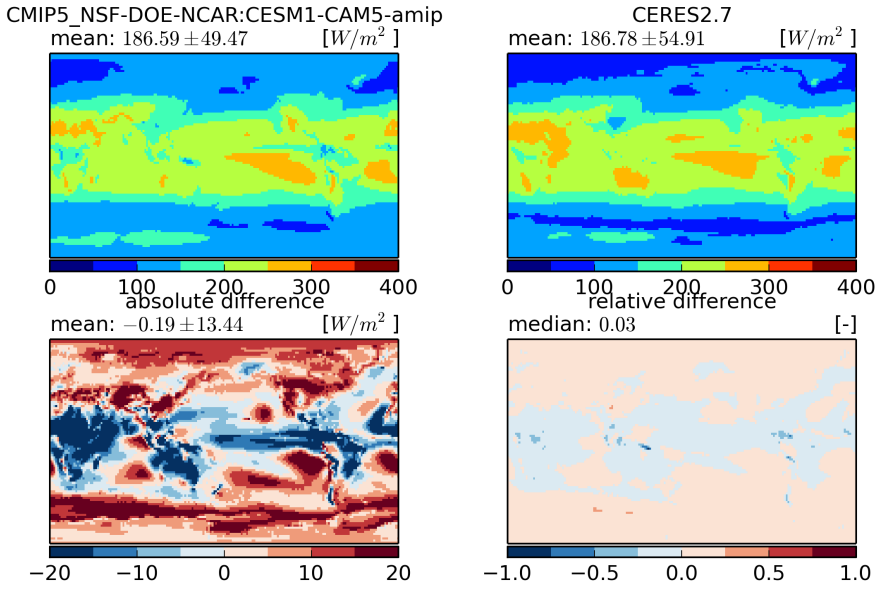



Figure 406: Temporal mean fields (top) and absolute and relative differences (bottom)

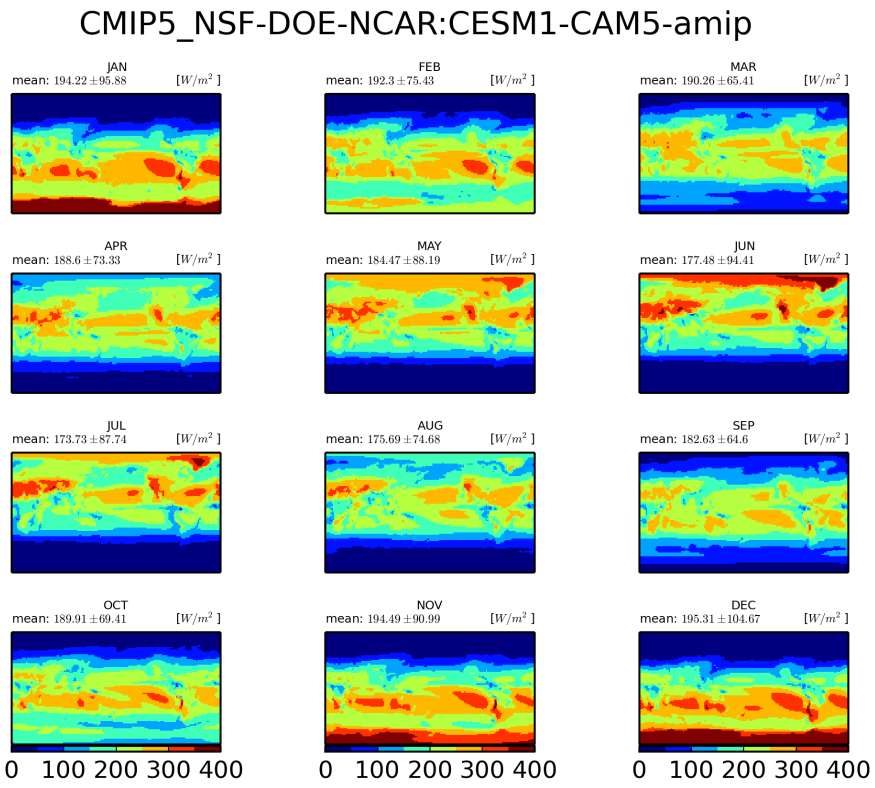



Figure 407: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

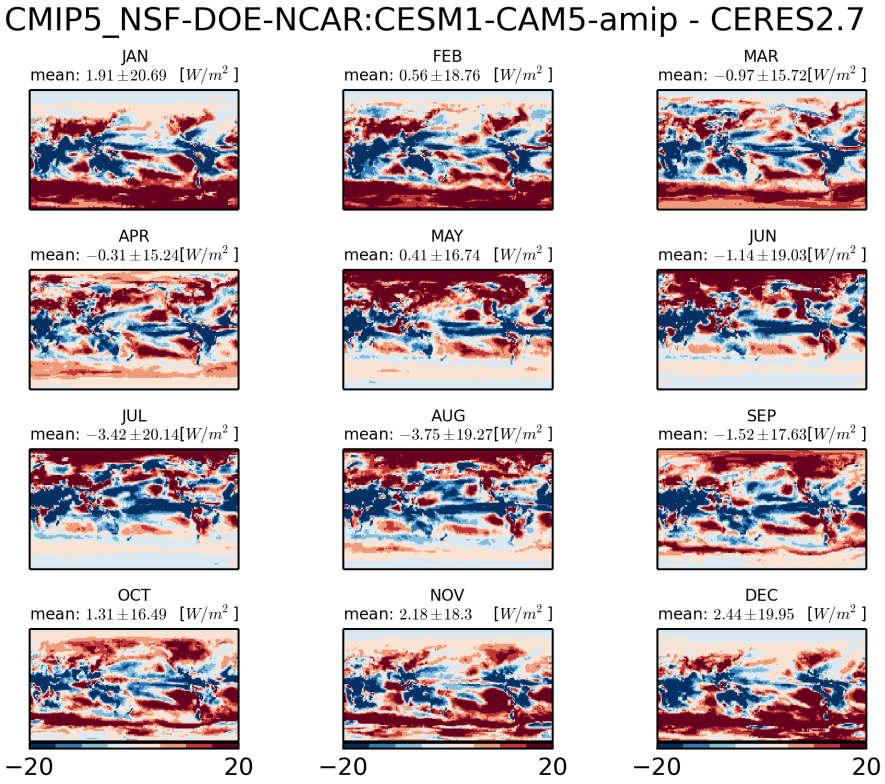



Figure 408: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and CERES2.7

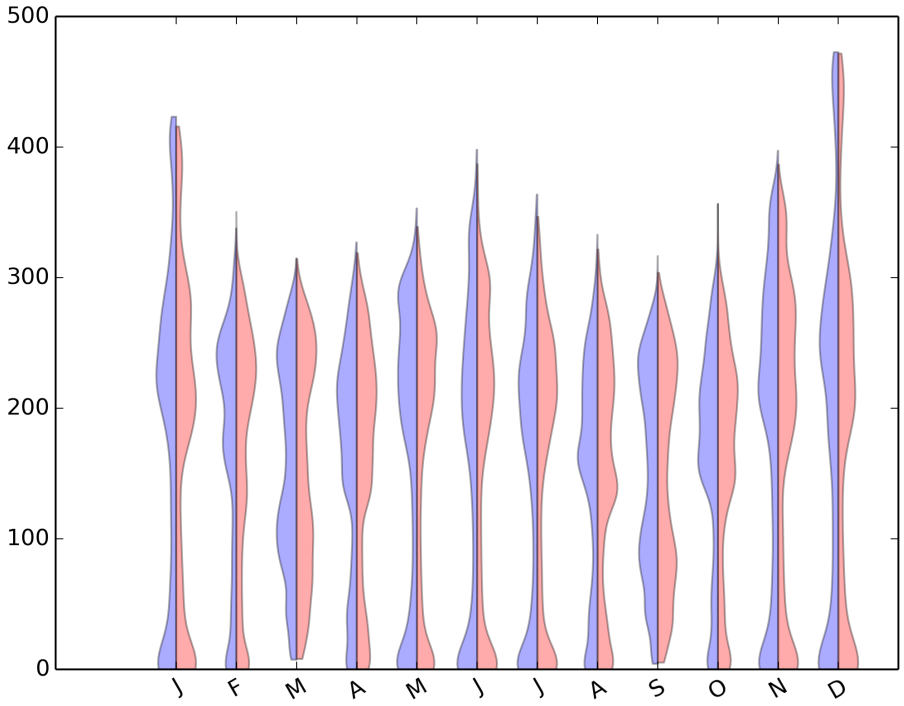



Figure 409: Violin plot for CMIP5-NSF-DOE-NCAR:CESM1-CAM5-AMIP

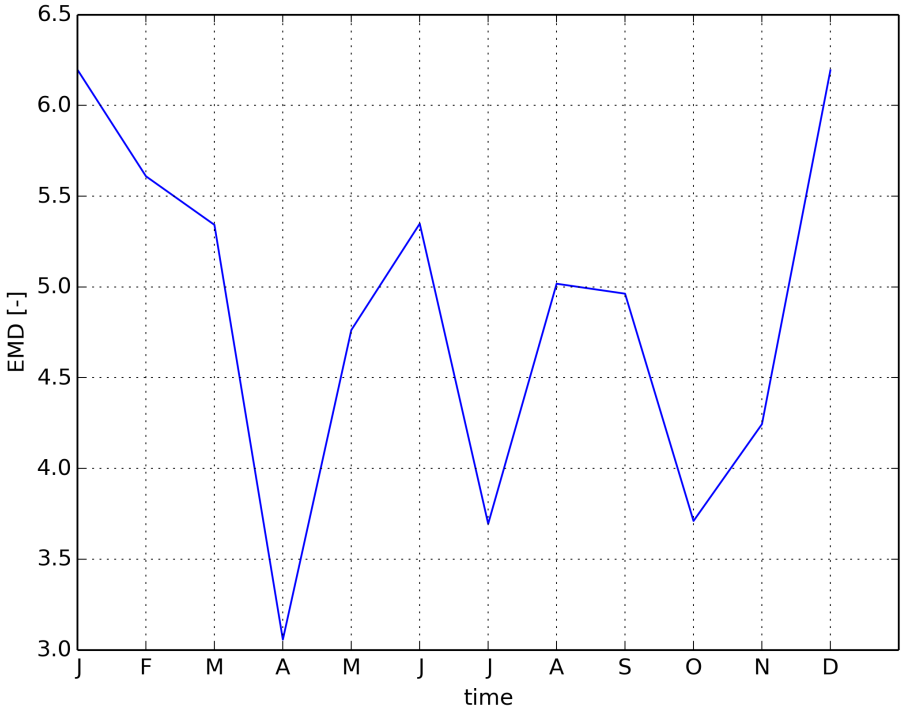



Figure 410: Timeseries of EMD

### 1.3.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

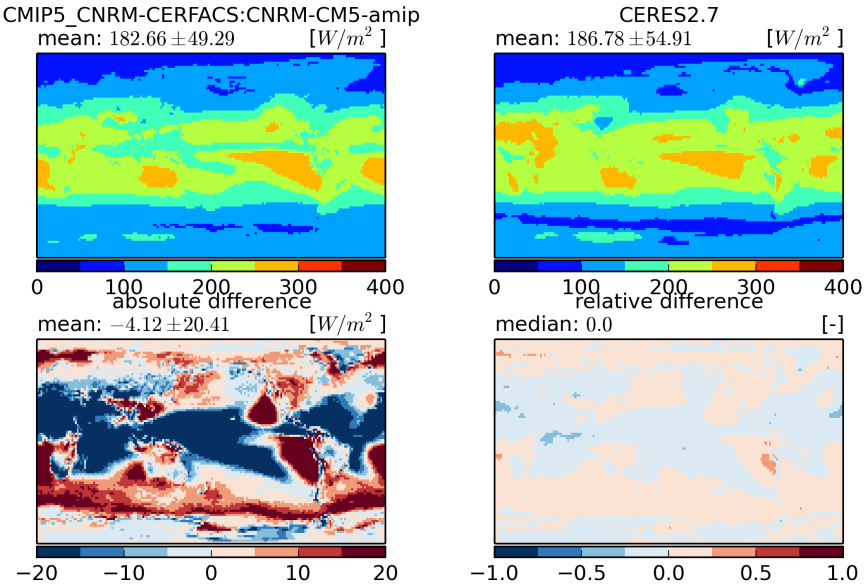



Figure 411: Temporal mean fields (top) and absolute and relative differences (bottom)

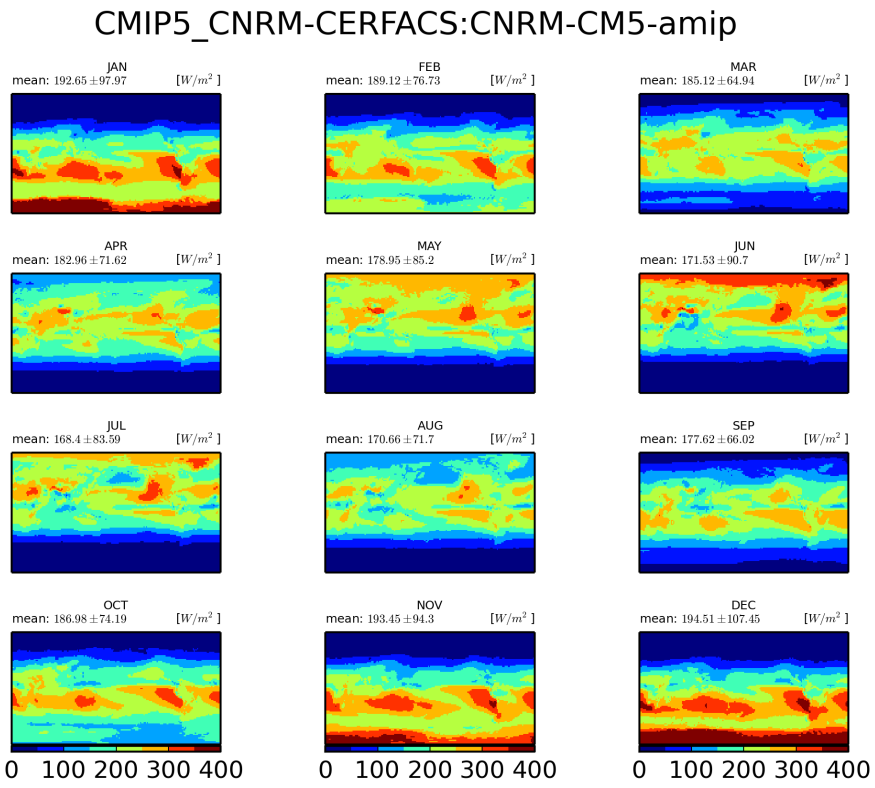



Figure 412: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

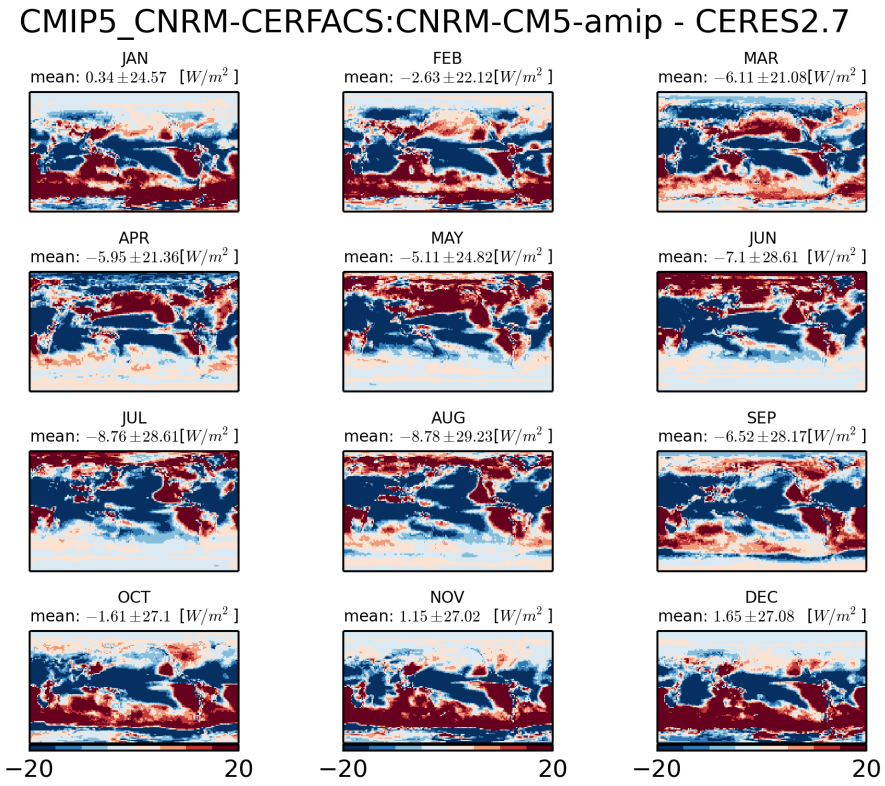



Figure 413: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and CERES2.7

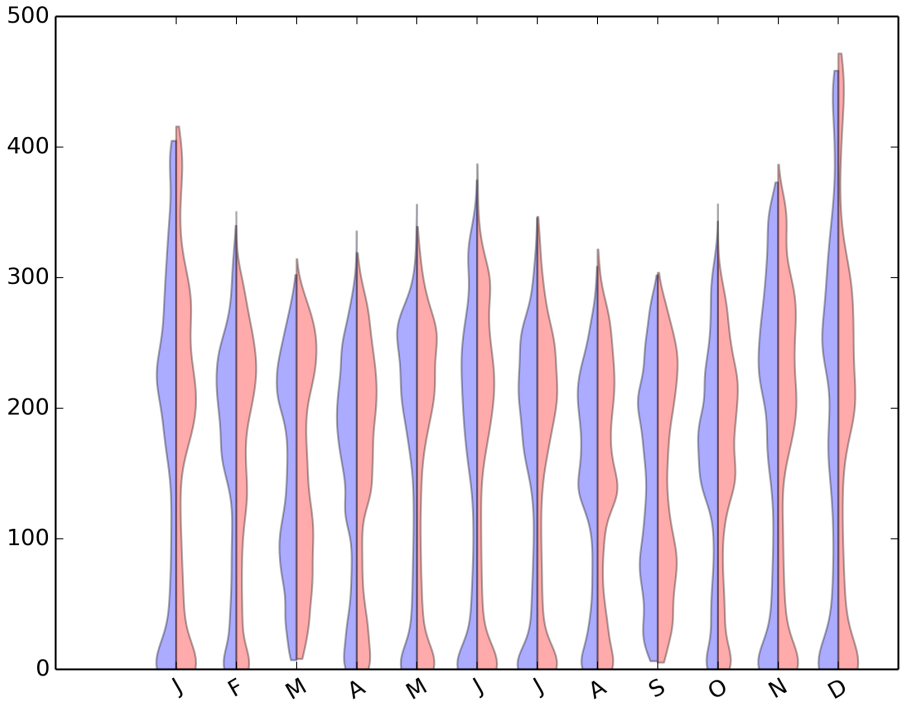



Figure 414: Violin plot for CMIP5-CNRM-CERFACS:CNRM-CM5-AMIP

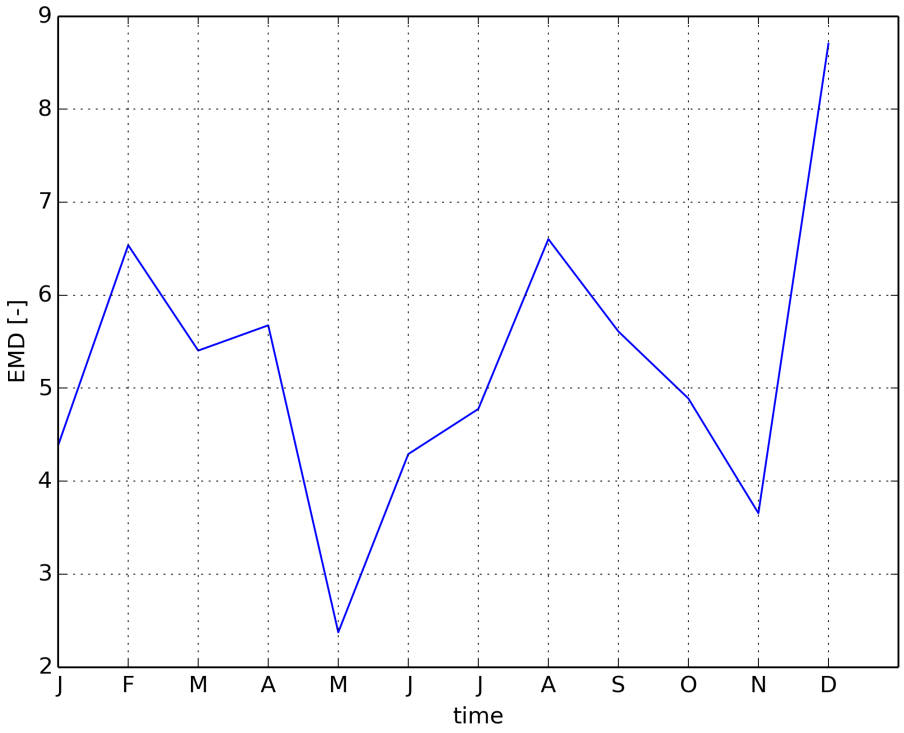



Figure 415: Timeseries of EMD

### 1.3.9 CMIP5 MRI:MRI-CGCM3-amip

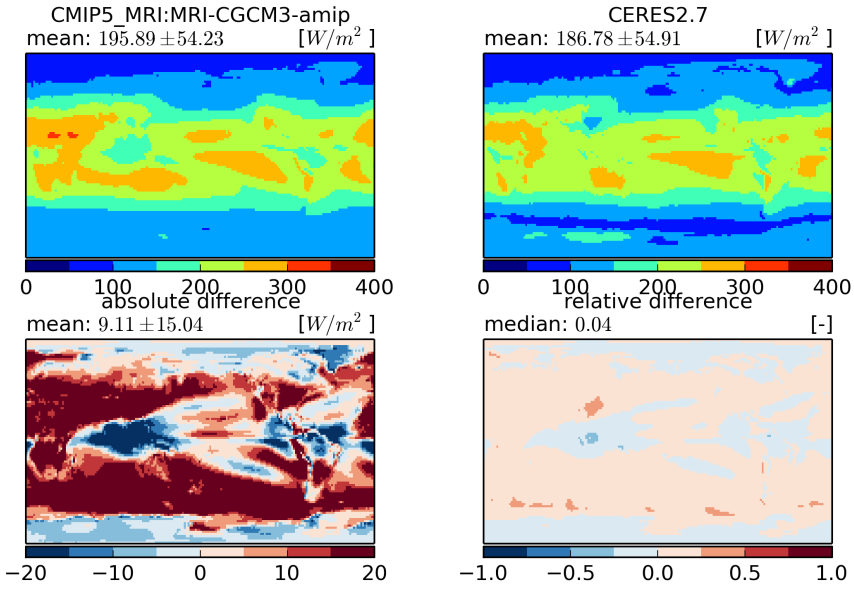



Figure 416: Temporal mean fields (top) and absolute and relative differences (bottom)

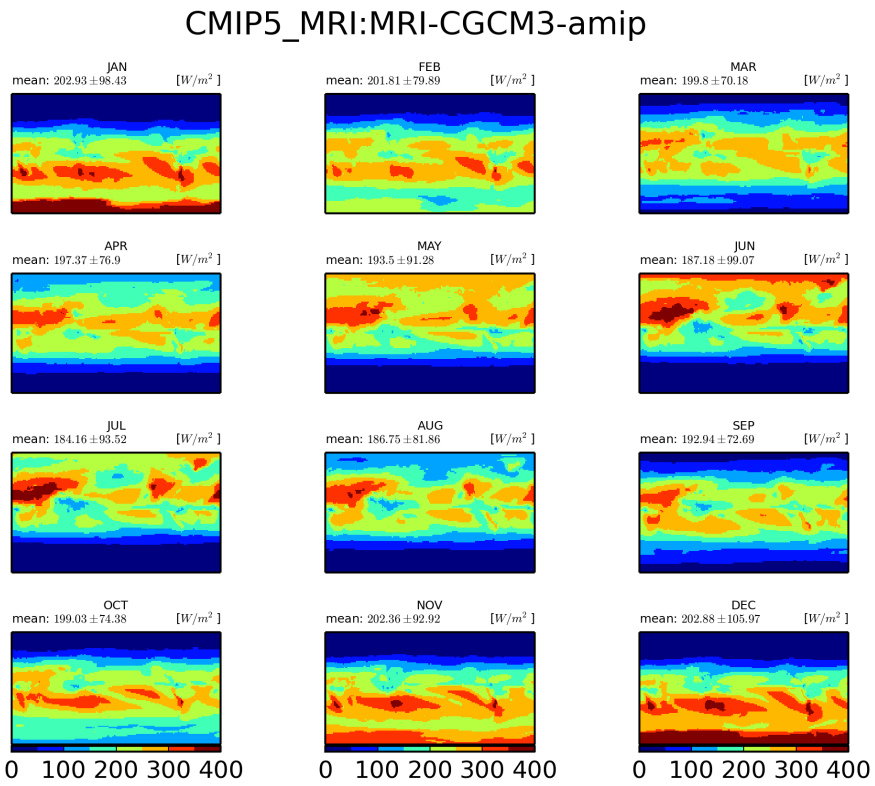



Figure 417: Monthly mean climatology for MRI:MRI-CGCM3

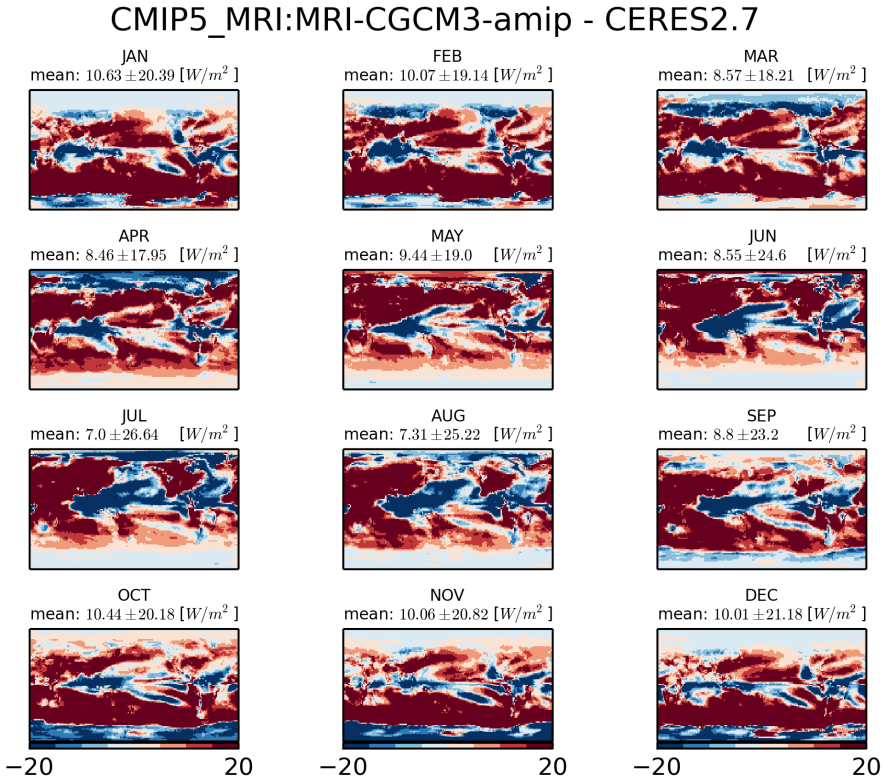



Figure 418: Monthly mean climatology of difference between MRI:MRI-CGCM3 and CERES2.7

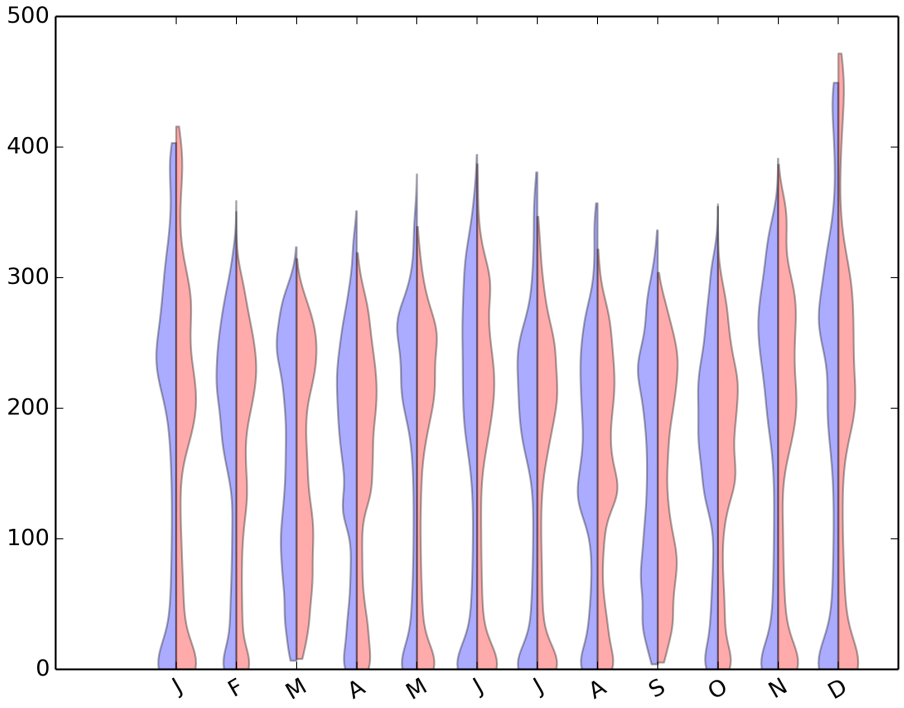



Figure 419: Violin plot for CMIP5-MRI:MRI-CGCM3-AMIP

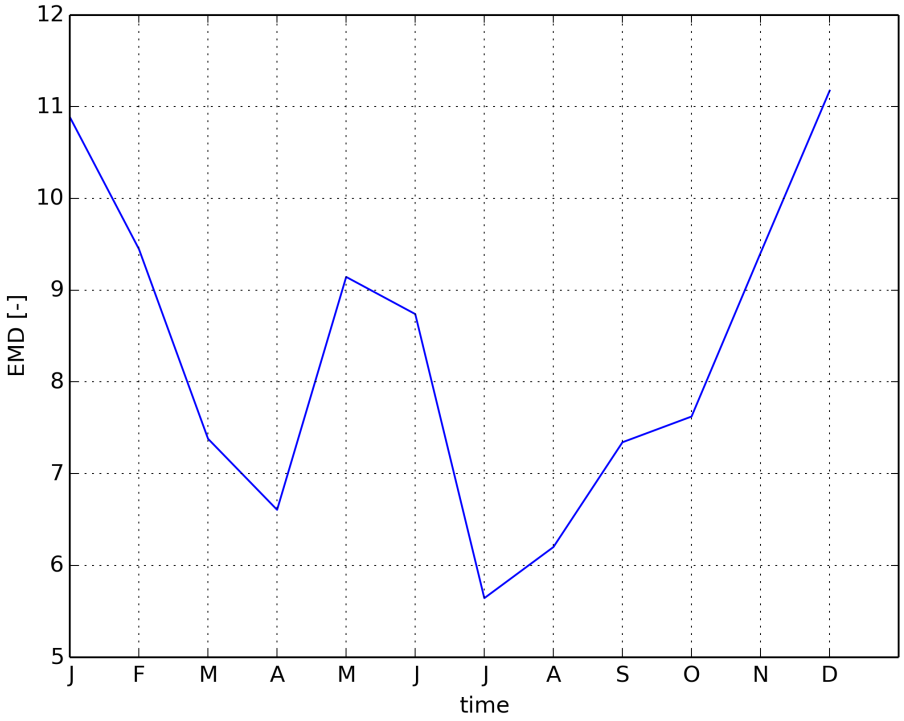



Figure 420: Timeseries of EMD

### 1.3.10 CMIP5 NASA-GISS:GISS-E2-R-amip

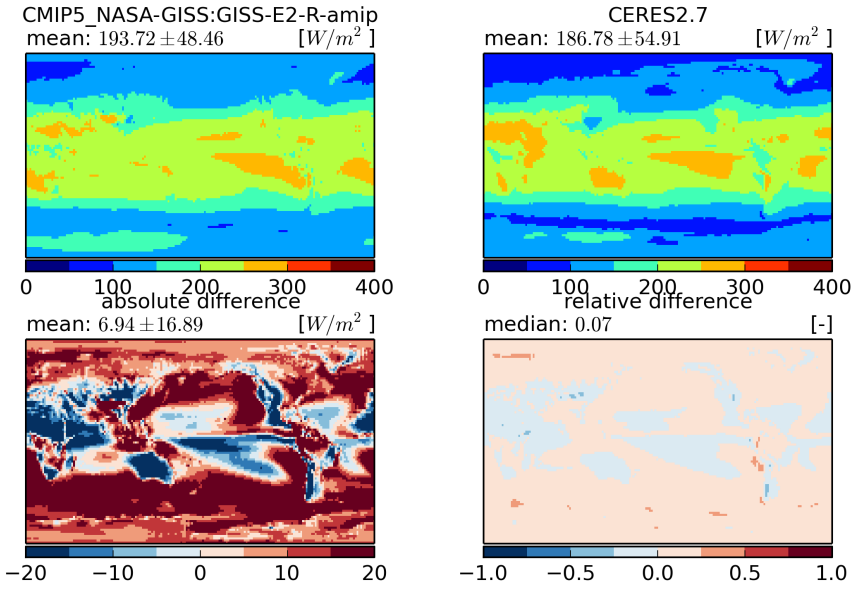



Figure 421: Temporal mean fields (top) and absolute and relative differences (bottom)

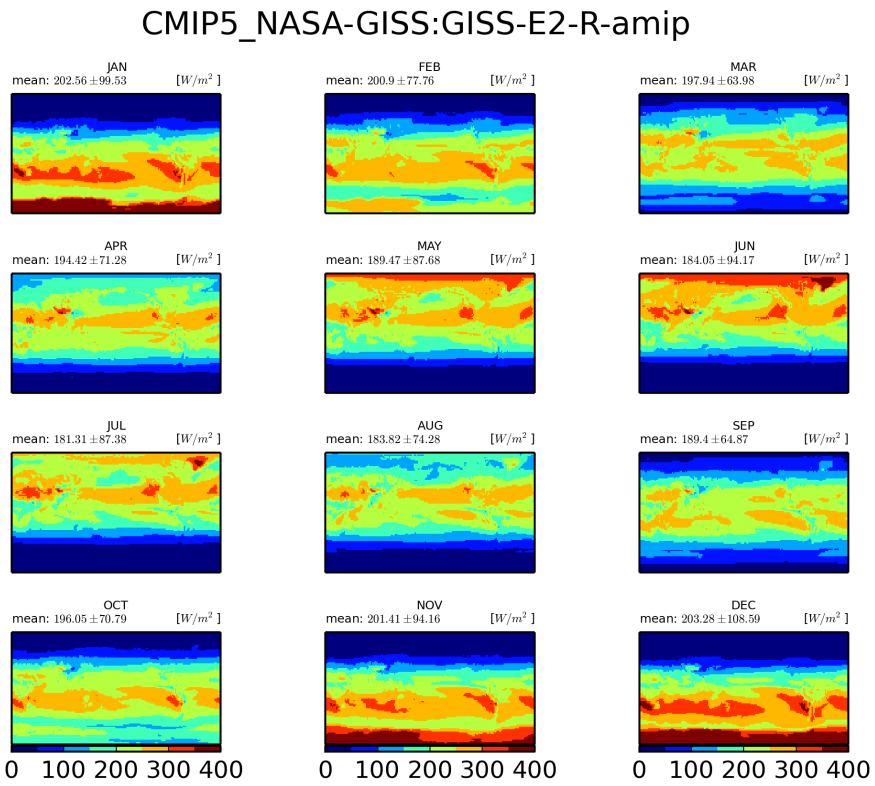



Figure 422: Monthly mean climatology for NASA-GISS:GISS-E2-R

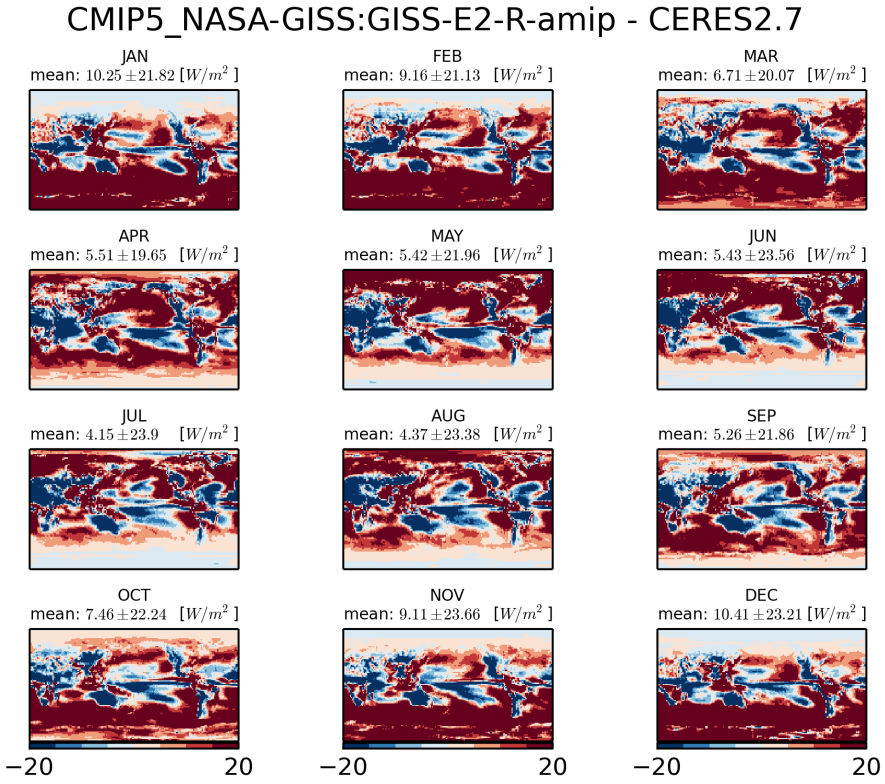



Figure 423: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and CERES2.7

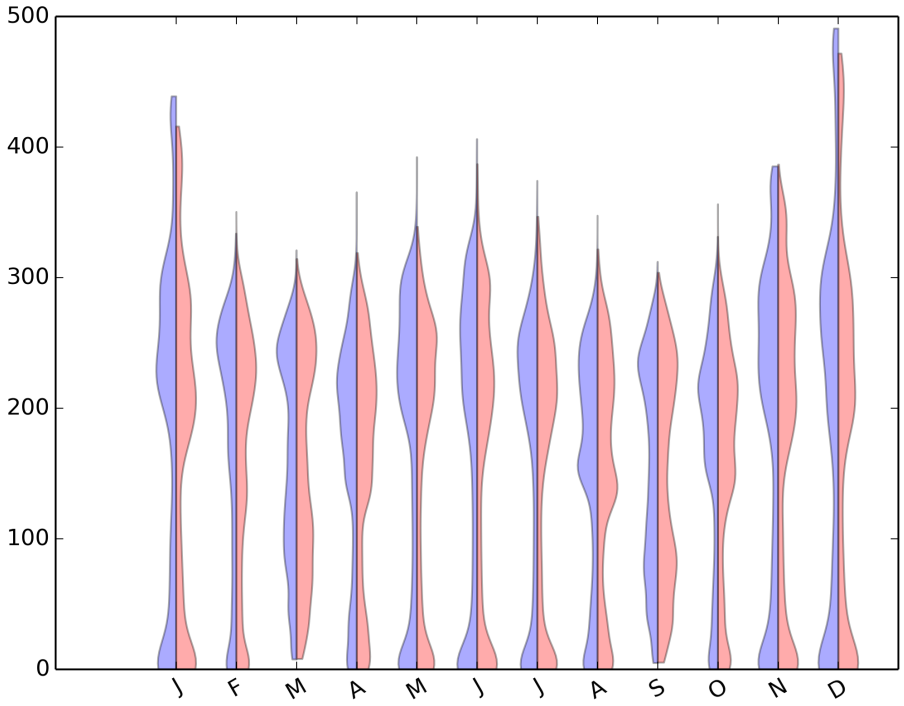



Figure 424: Violin plot for CMIP5-NASA-GISS:GISS-E2-R-AMIP

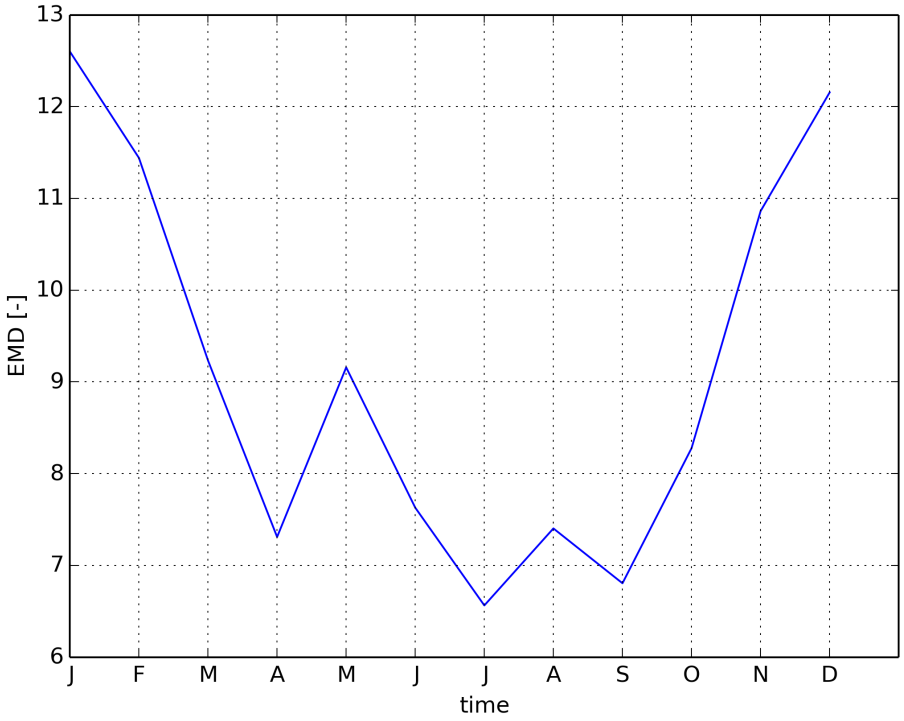



Figure 425: Timeseries of EMD

### 1.3.11 CMIP5 MIROC:MIROC5-amip

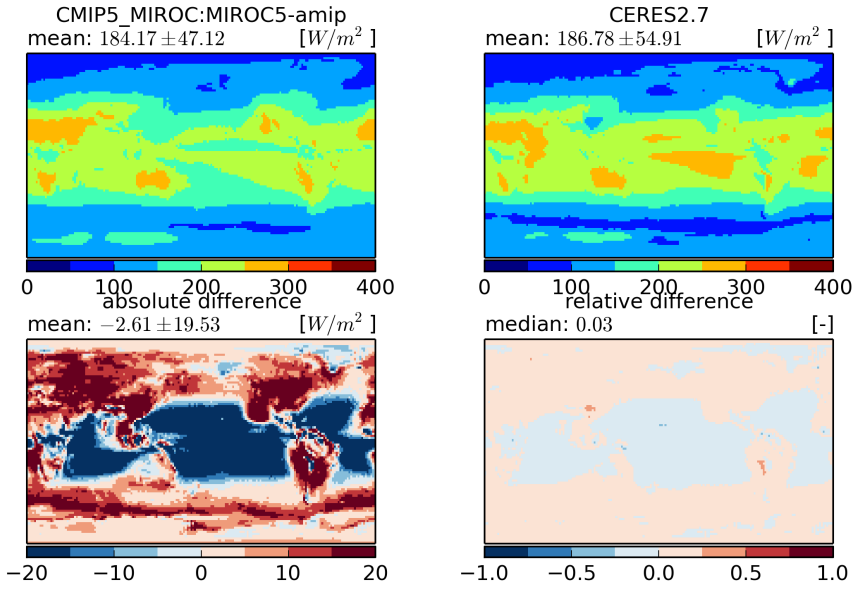



Figure 426: Temporal mean fields (top) and absolute and relative differences (bottom)

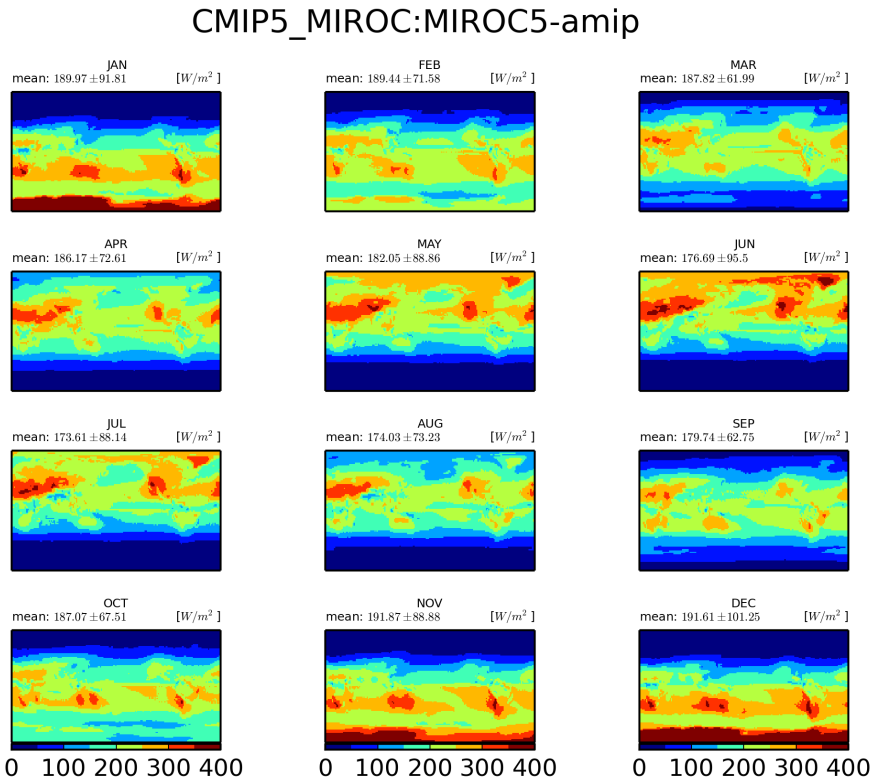



Figure 427: Monthly mean climatology for MIROC:MIROC5

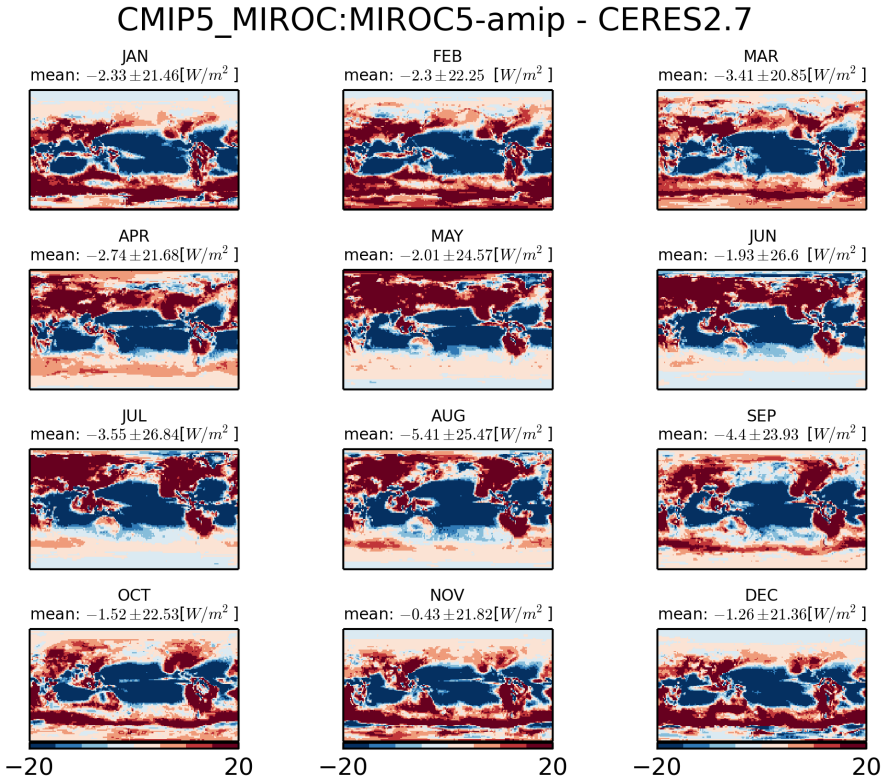



Figure 428: Monthly mean climatology of difference between MIROC:MIROC5 and CERES2.7

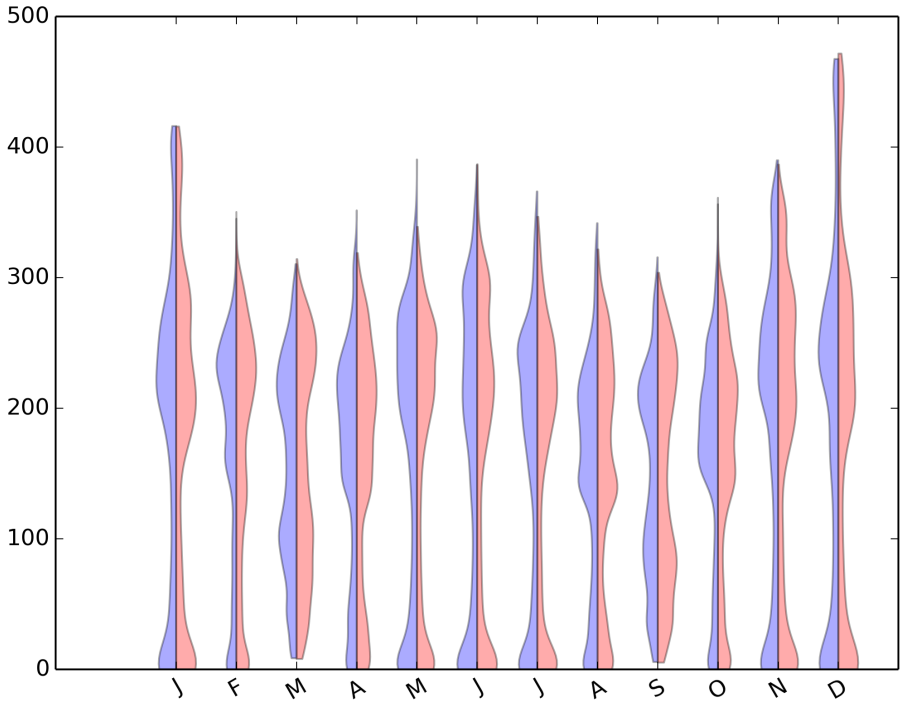



Figure 429: Violin plot for CMIP5-MIROC:MIROC5-AMIP

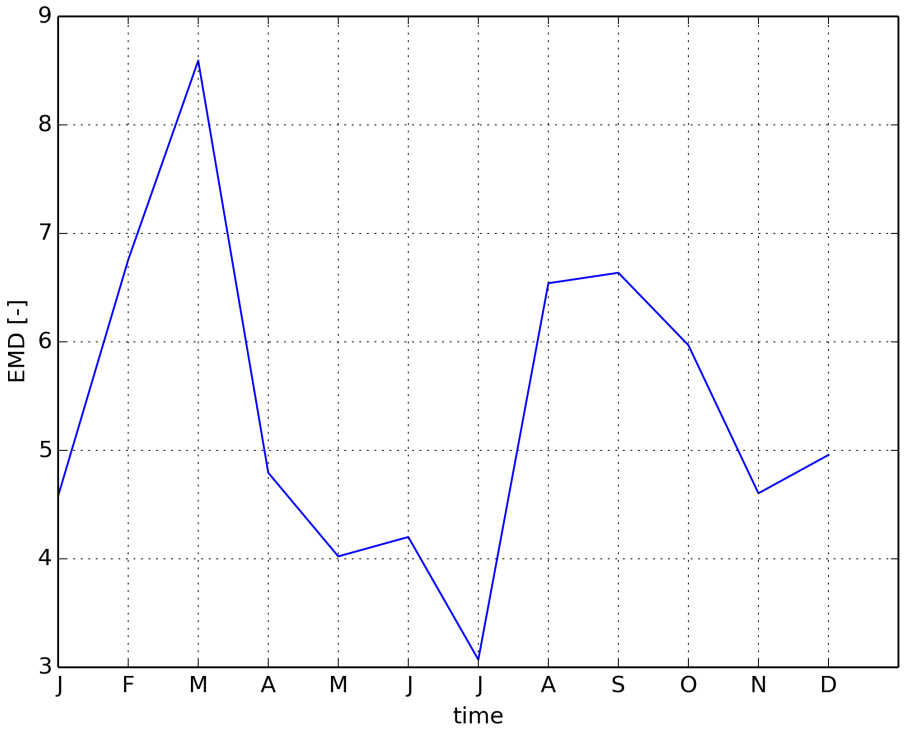



Figure 430: Timeseries of EMD

### 1.3.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

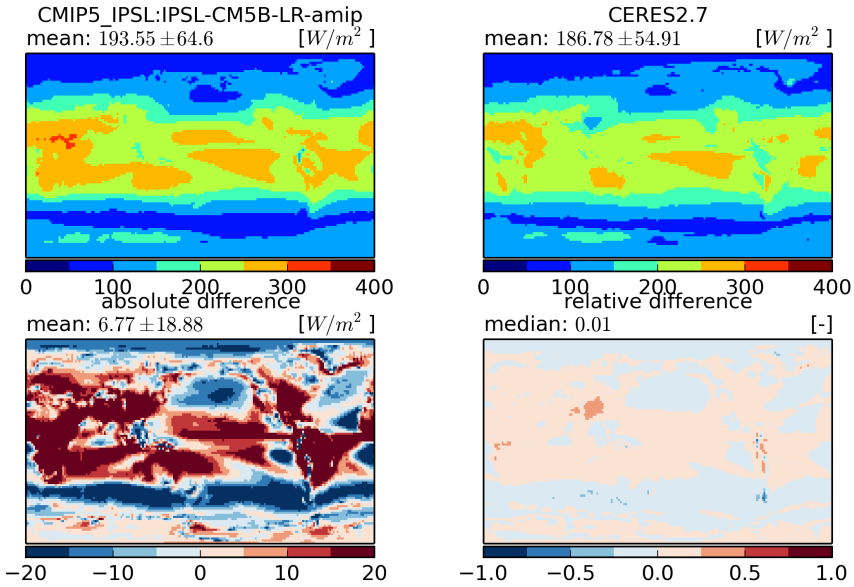



Figure 431: Temporal mean fields (top) and absolute and relative differences (bottom)

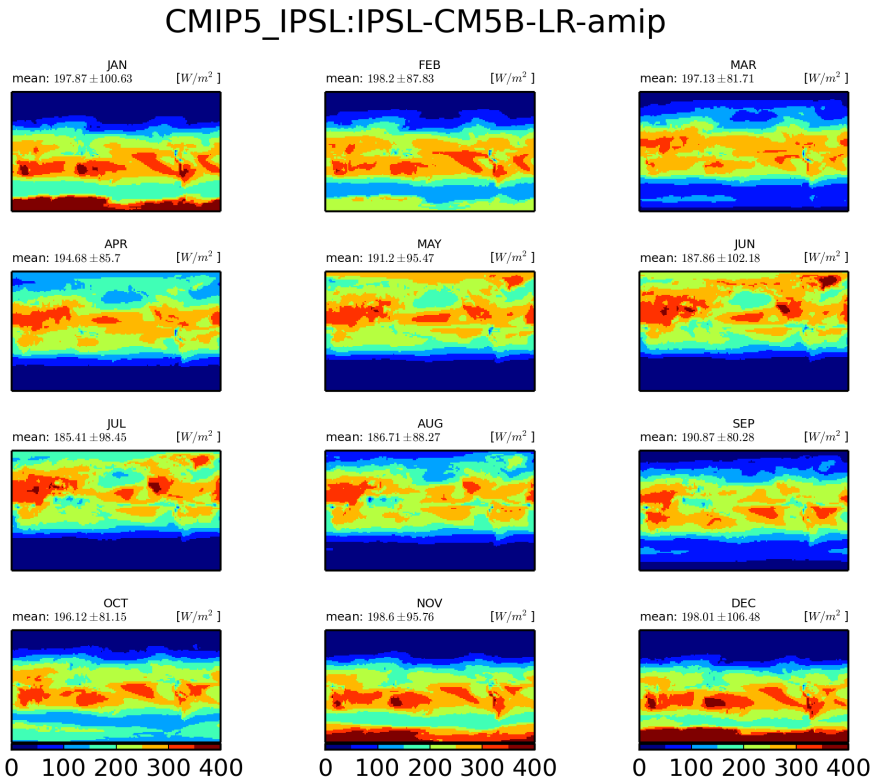



Figure 432: Monthly mean climatology for IPSL:IPSL-CM5B-LR

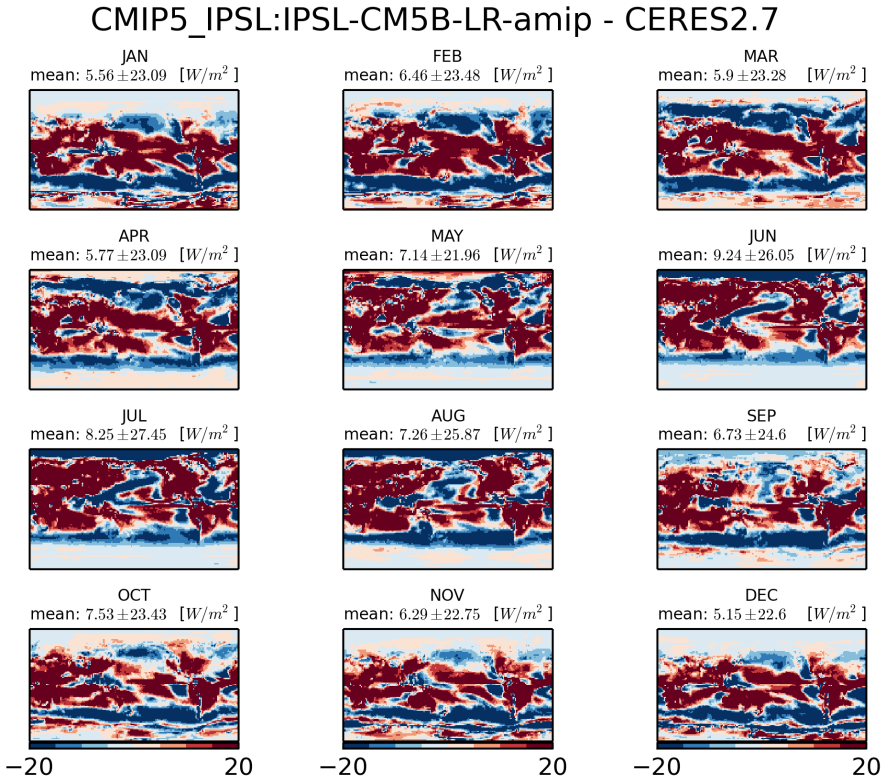



Figure 433: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and CERES2.7

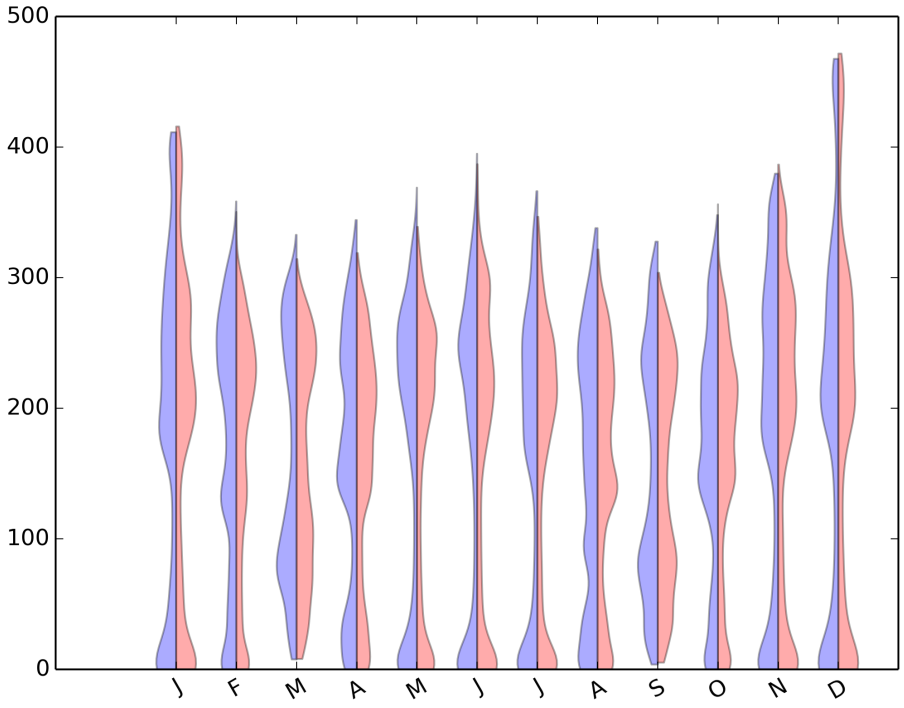



Figure 434: Violin plot for CMIP5-IPSL:IPSL-CM5B-LR-AMIP

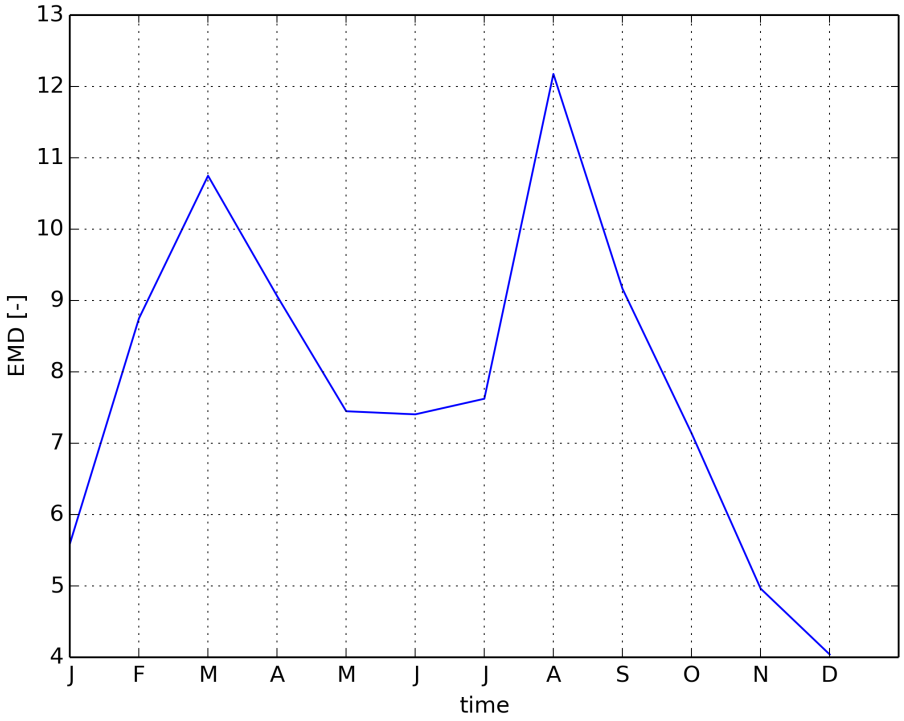



Figure 435: Timeseries of EMD

### 1.3.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

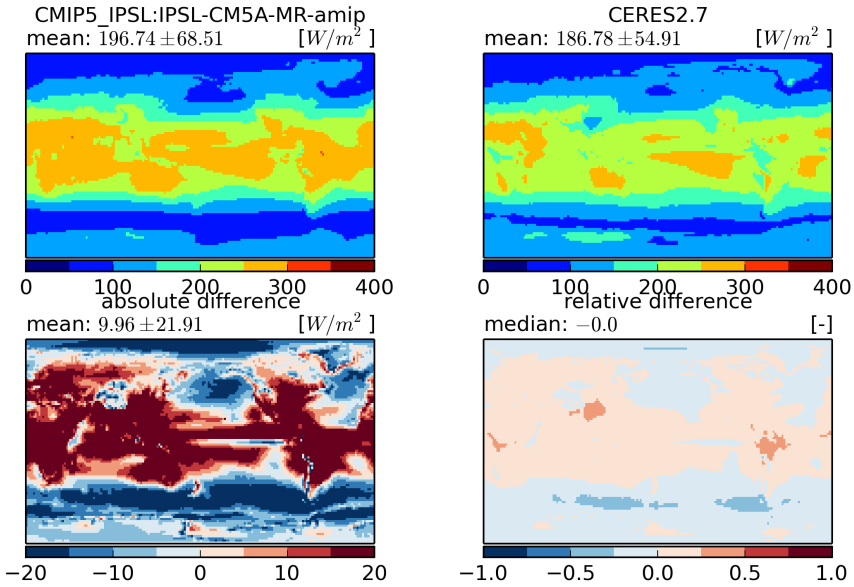



Figure 436: Temporal mean fields (top) and absolute and relative differences (bottom)

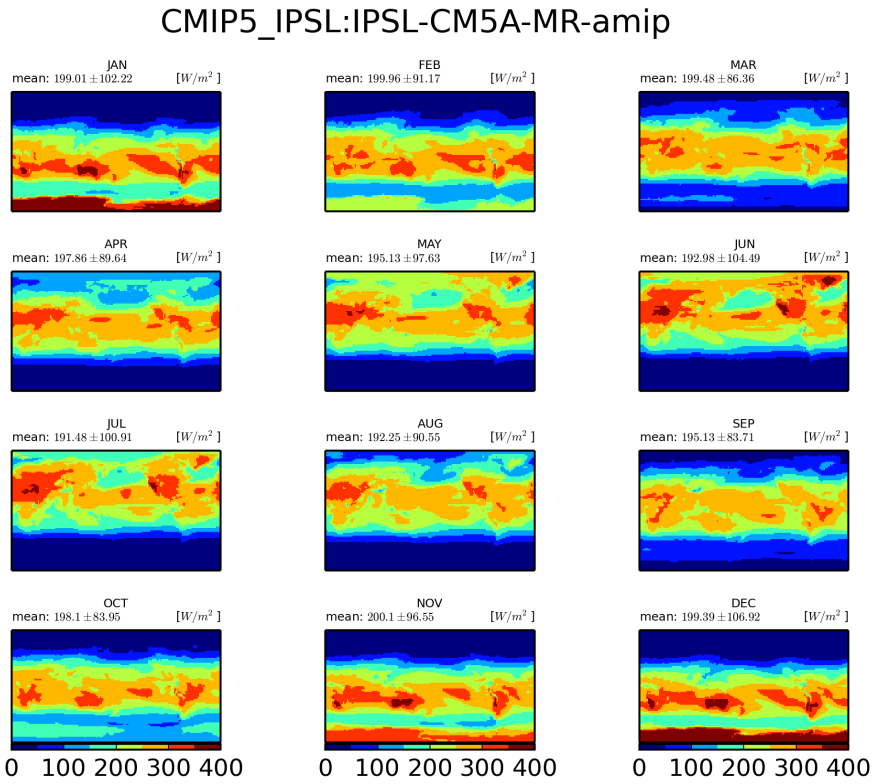



Figure 437: Monthly mean climatology for IPSL:IPSL-CM5A-MR

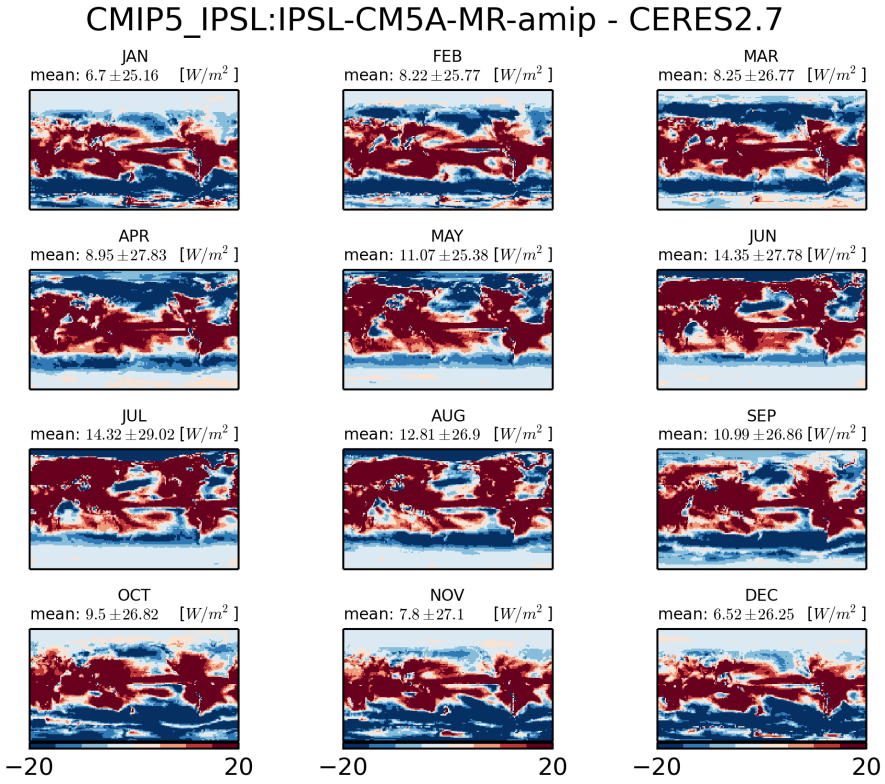



Figure 438: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and CERES2.7

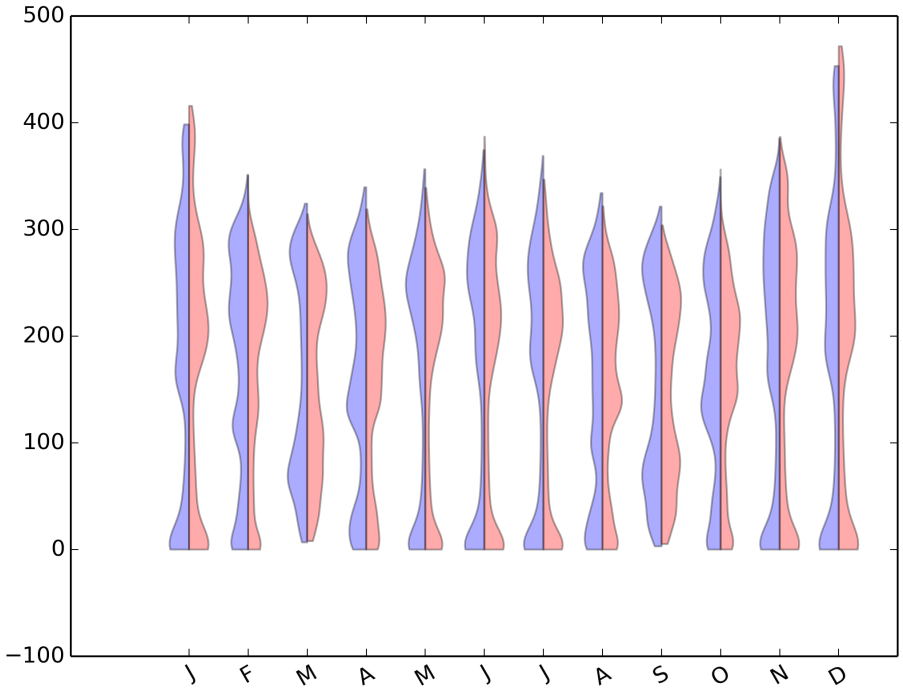



Figure 439: Violin plot for CMIP5-IPSL:IPSL-CM5A-MR-AMIP

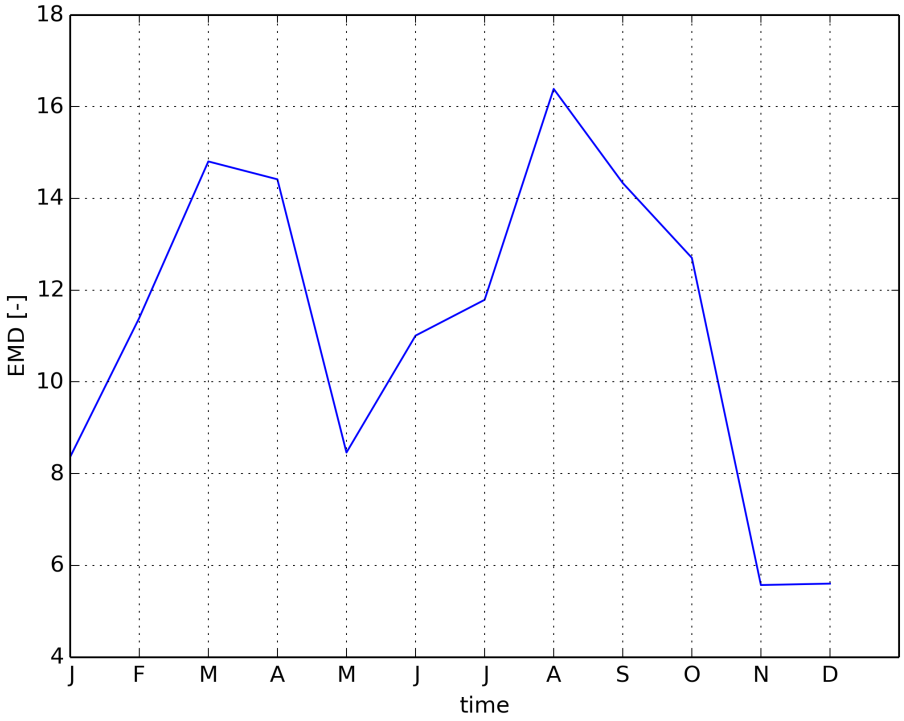



Figure 440: Timeseries of EMD

### 1.3.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

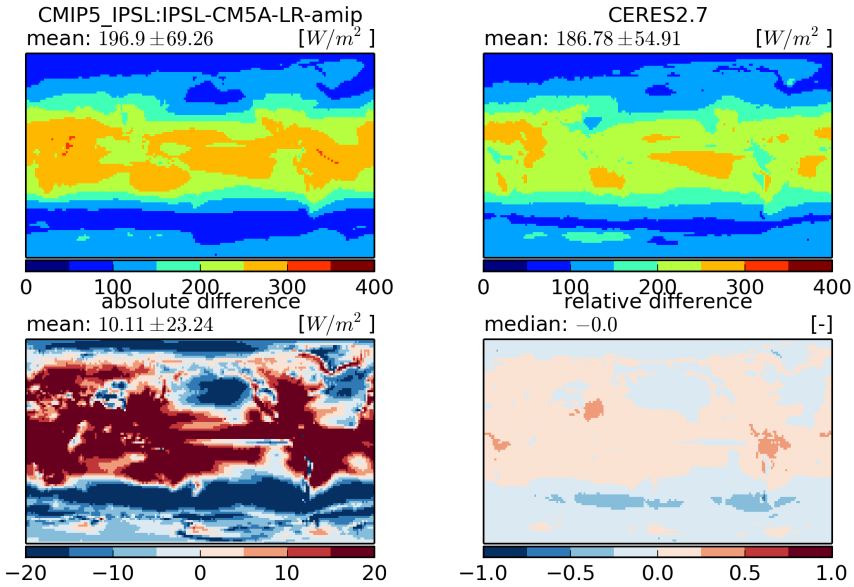



Figure 441: Temporal mean fields (top) and absolute and relative differences (bottom)

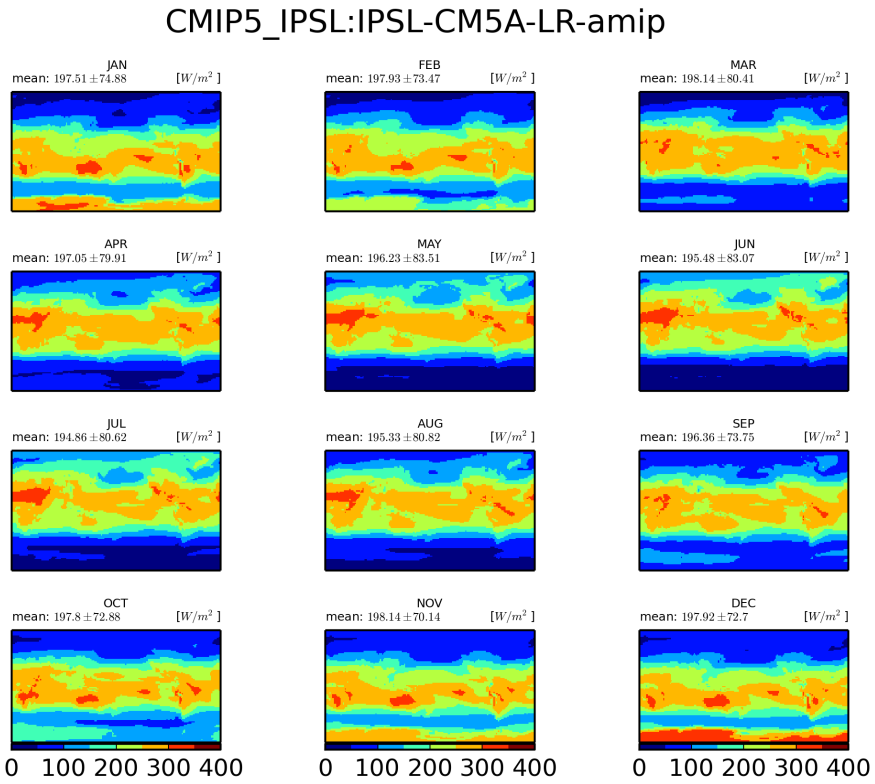



Figure 442: Monthly mean climatology for IPSL:IPSL-CM5A-LR

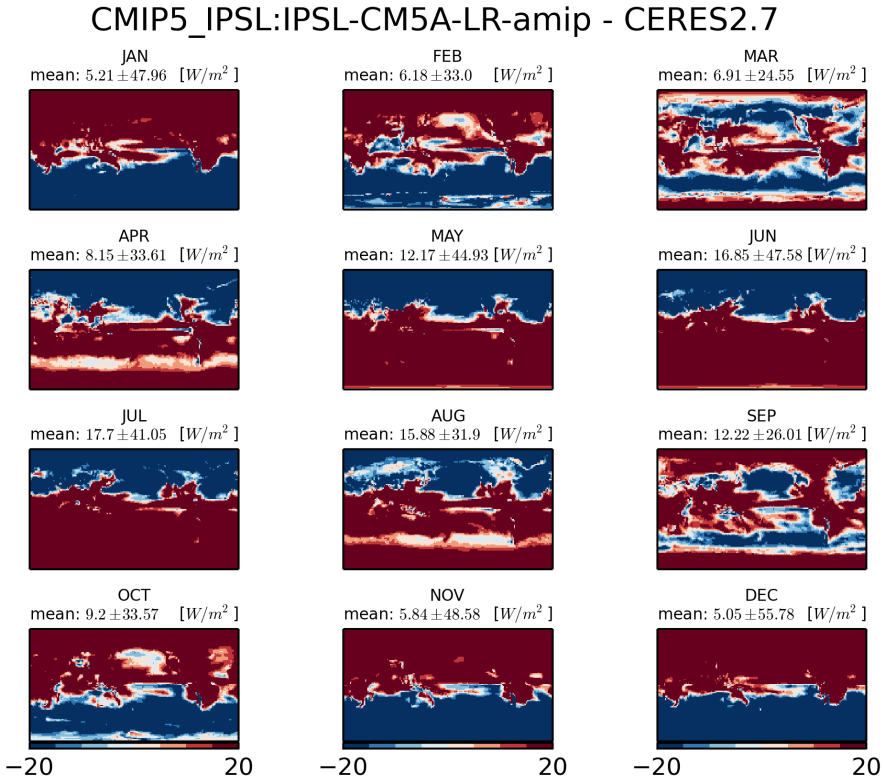



Figure 443: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and CERES2.7

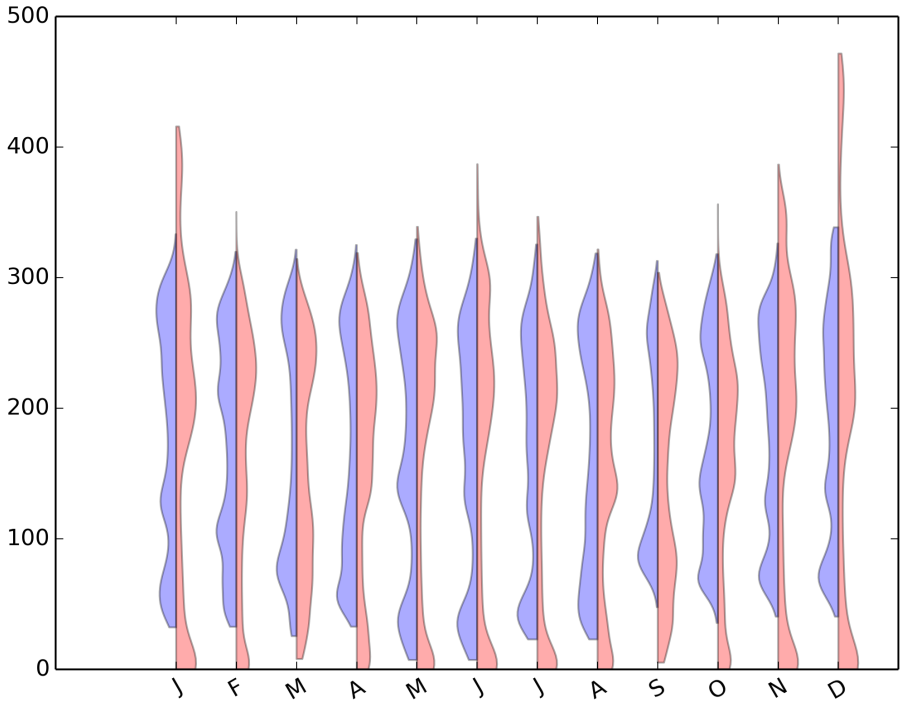



Figure 444: Violin plot for CMIP5-IPSL:IPSL-CM5A-LR-AMIP

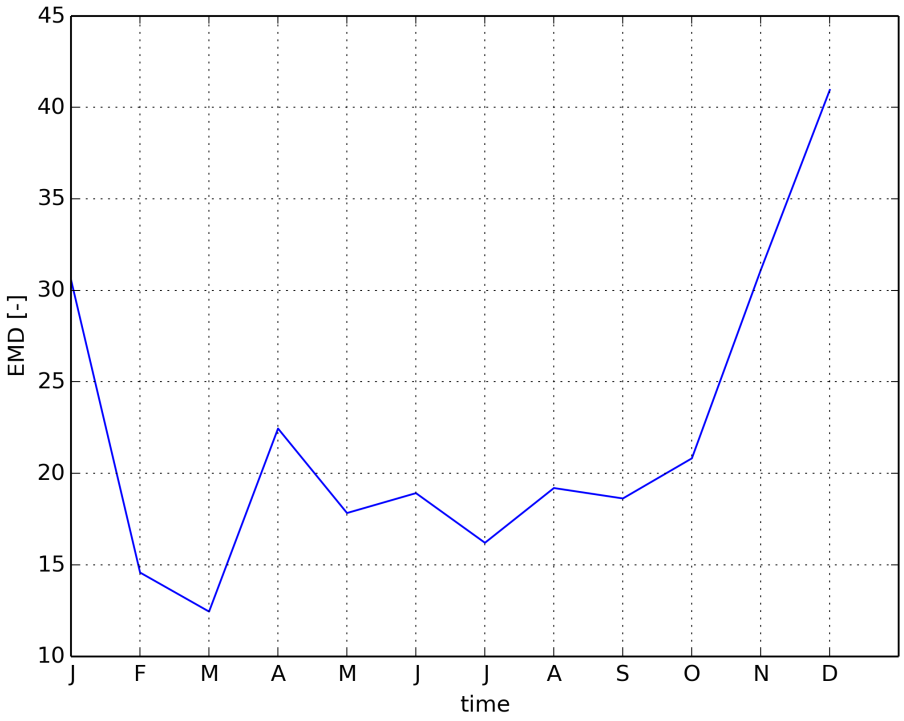



Figure 445: Timeseries of EMD

### 1.3.15 CMIP5 MOHC:HadGEM2-A-amip

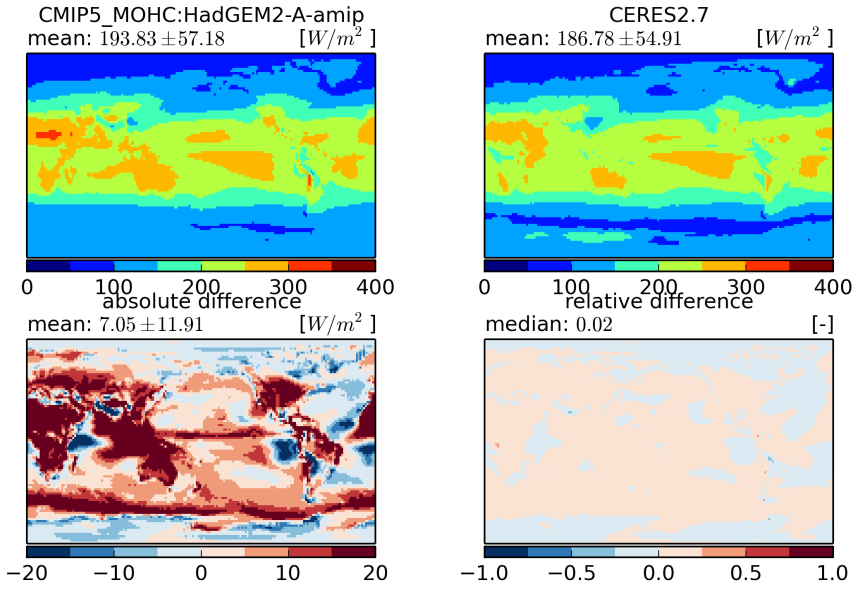



Figure 446: Temporal mean fields (top) and absolute and relative differences (bottom)

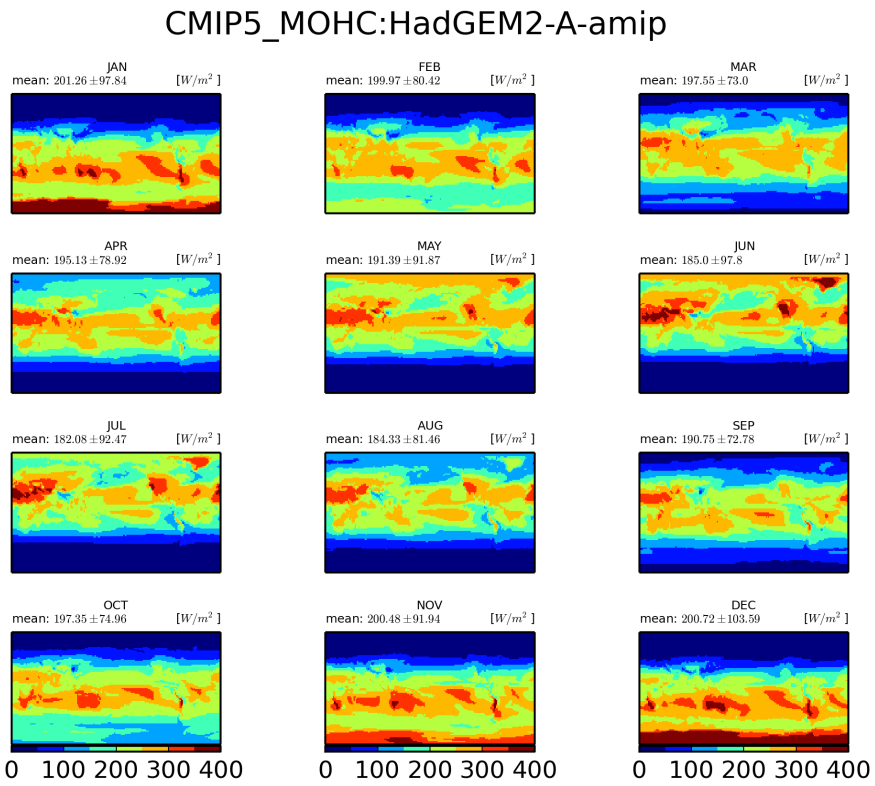



Figure 447: Monthly mean climatology for MOHC:HadGEM2-A

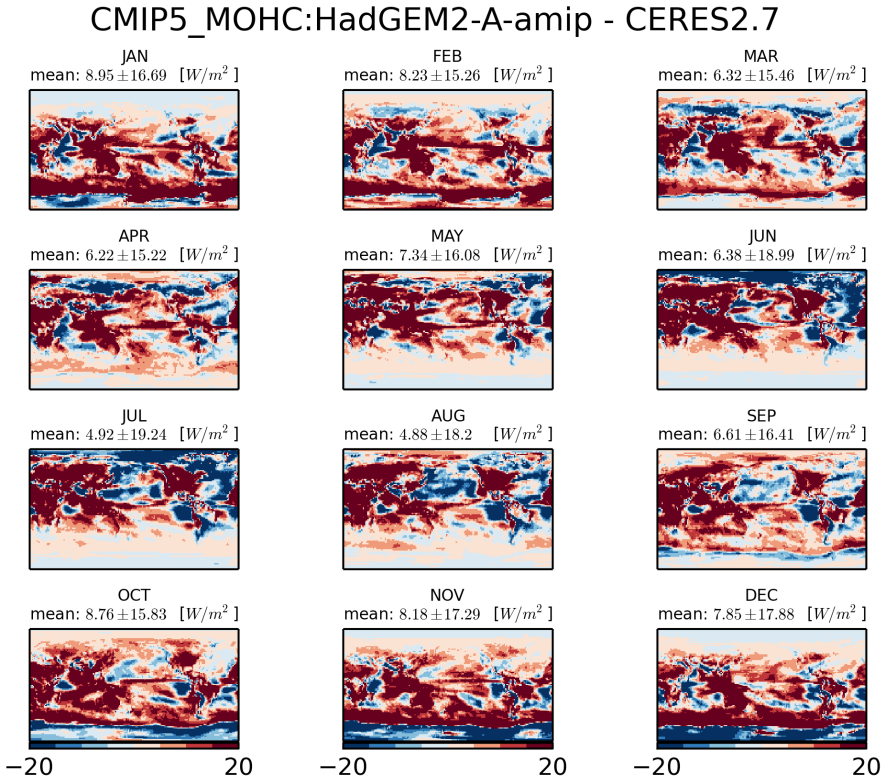



Figure 448: Monthly mean climatology of difference between MOHC:HADGEM2-A and CERES2.7

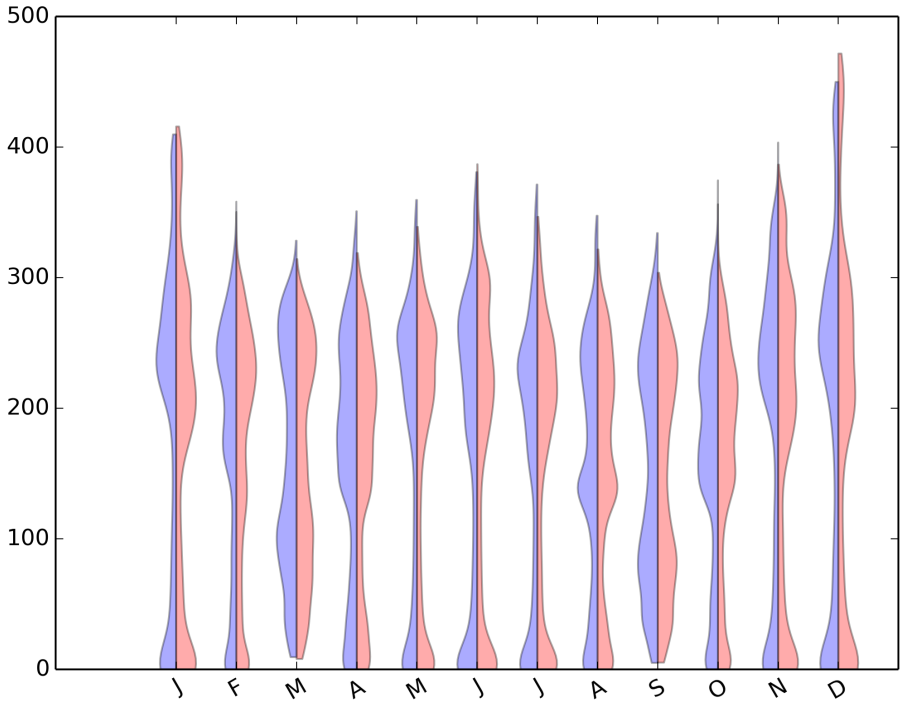



Figure 449: Violin plot for CMIP5-MOHC:HADGEM2-A-AMIP

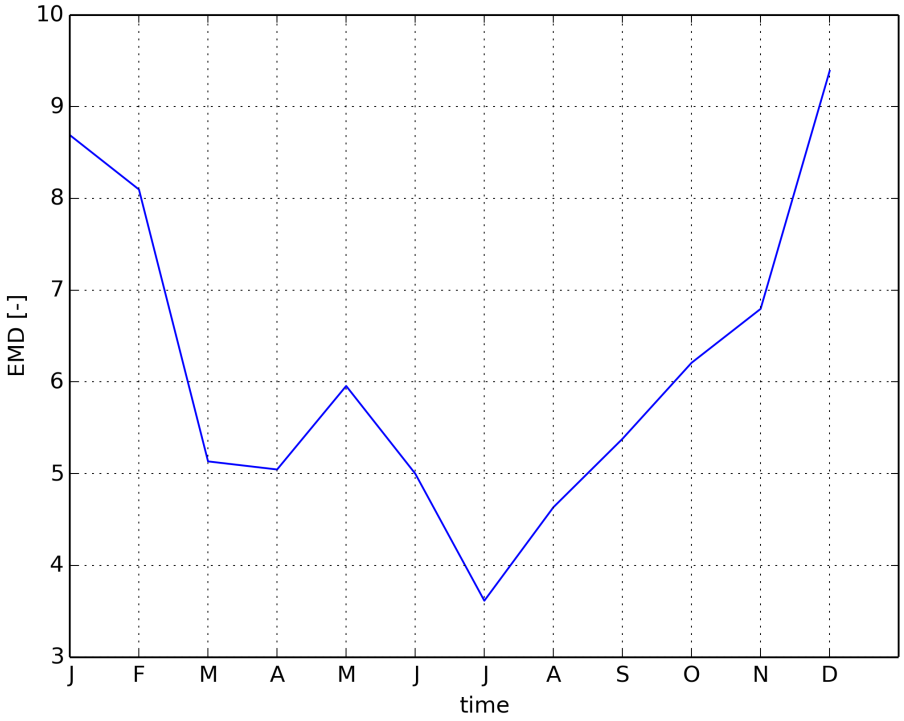



Figure 450: Timeseries of EMD

### 1.3.16 CMIP5 LASG-IAP:FGOALS-s2-amip

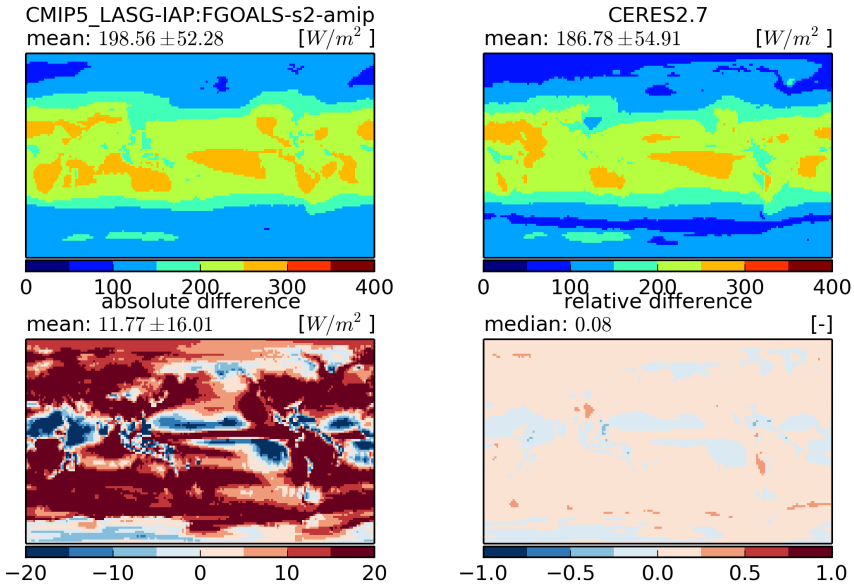



Figure 451: Temporal mean fields (top) and absolute and relative differences (bottom)

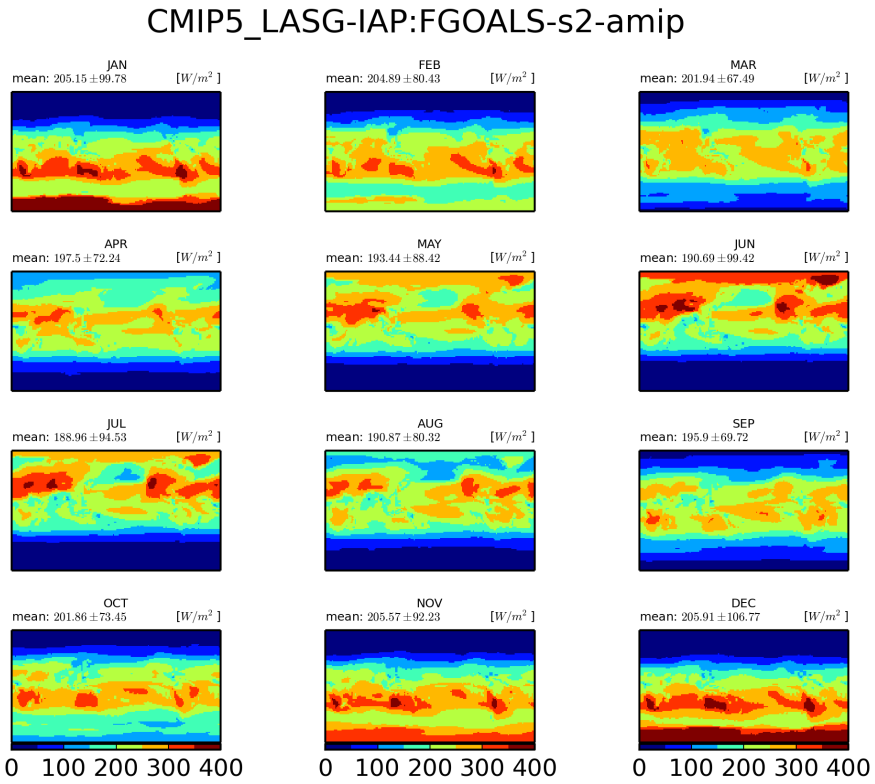



Figure 452: Monthly mean climatology for LASG-IAP:FGOALS-s2

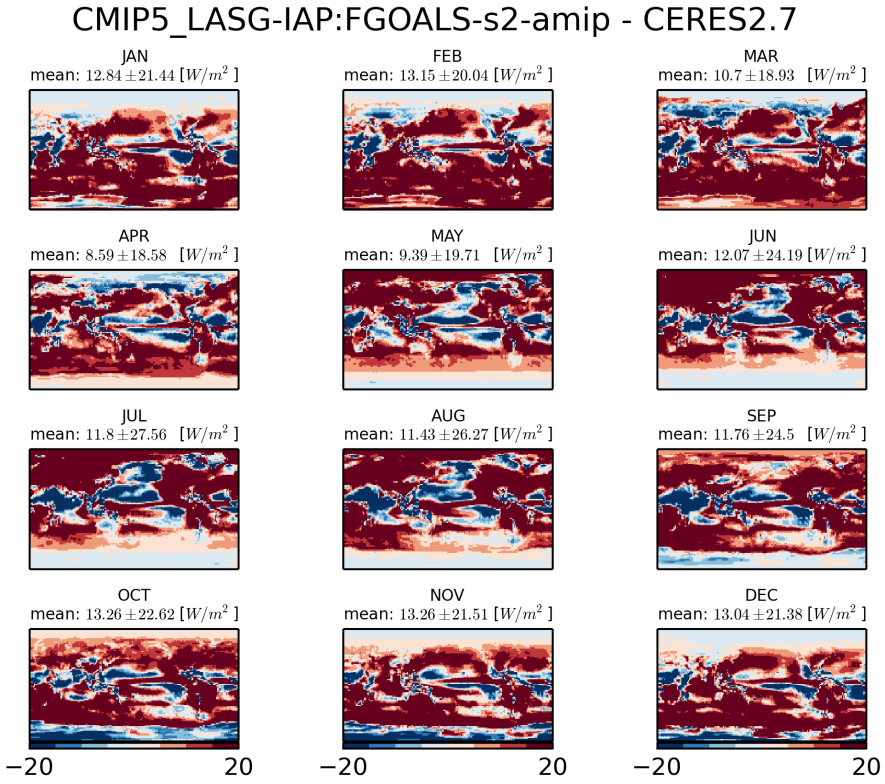



Figure 453: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and CERES2.7

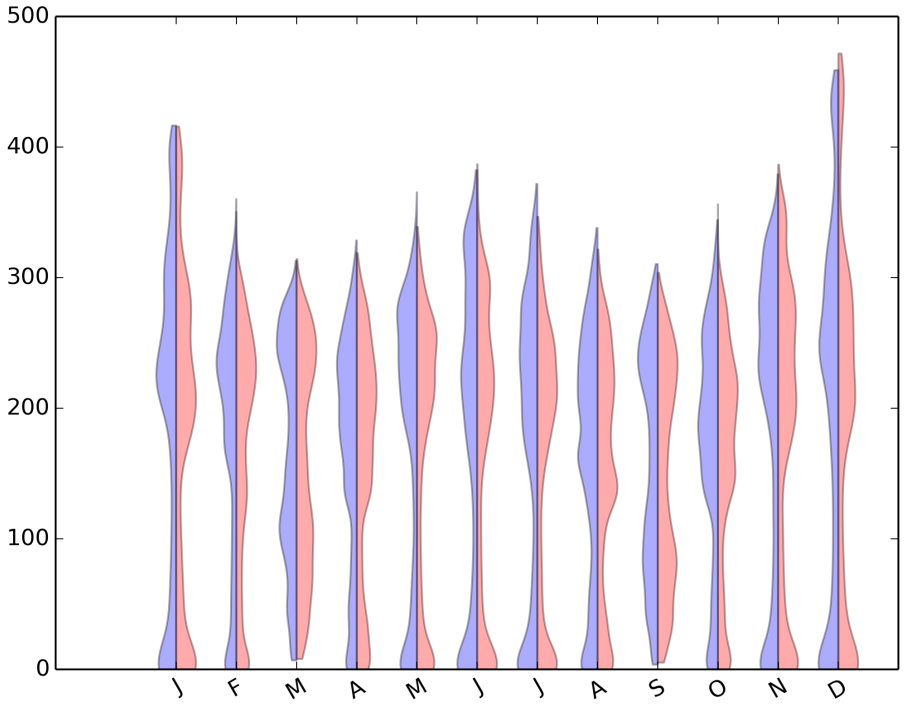



Figure 454: Violin plot for CMIP5-LASG-IAP:FGOALS-S2-AMIP

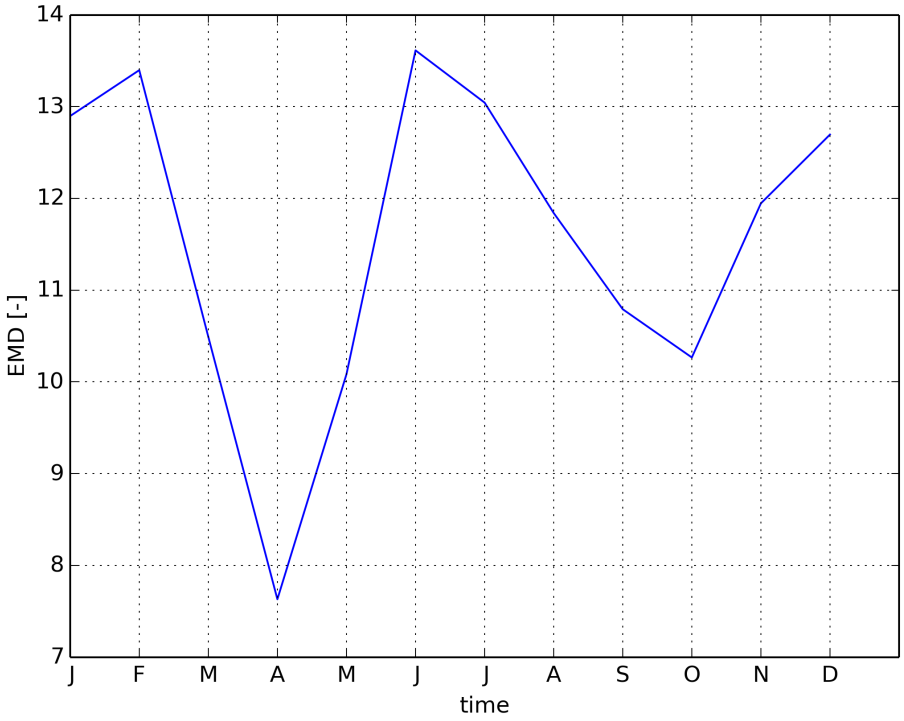



Figure 455: Timeseries of EMD

### 1.3.17 CMIP5 CMCC:CMCC-CM-amip

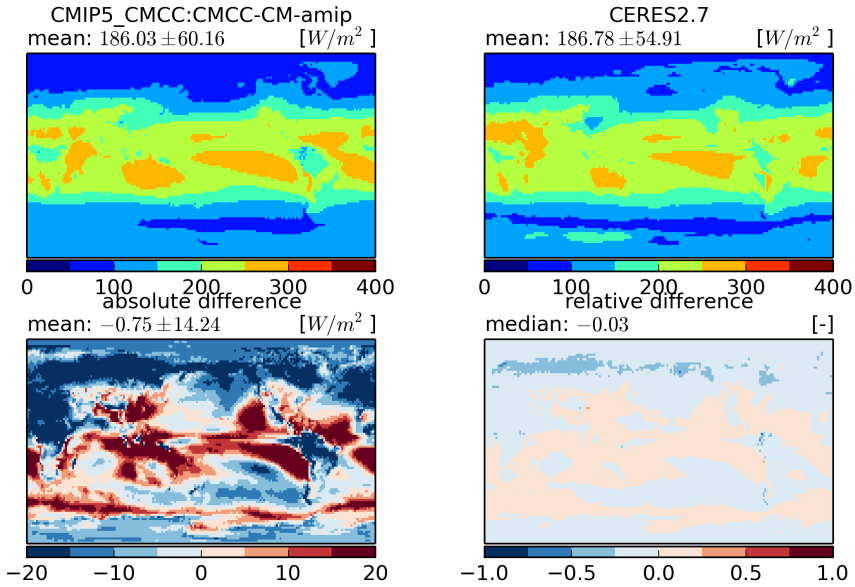



Figure 456: Temporal mean fields (top) and absolute and relative differences (bottom)

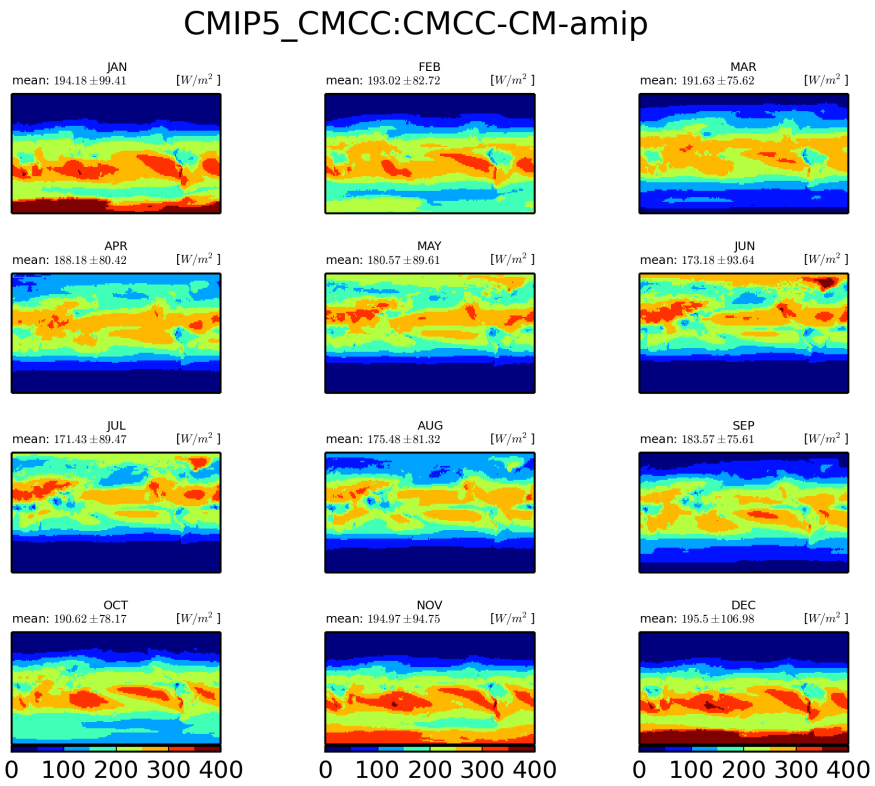



Figure 457: Monthly mean climatology for CMCC:CMCC-CM

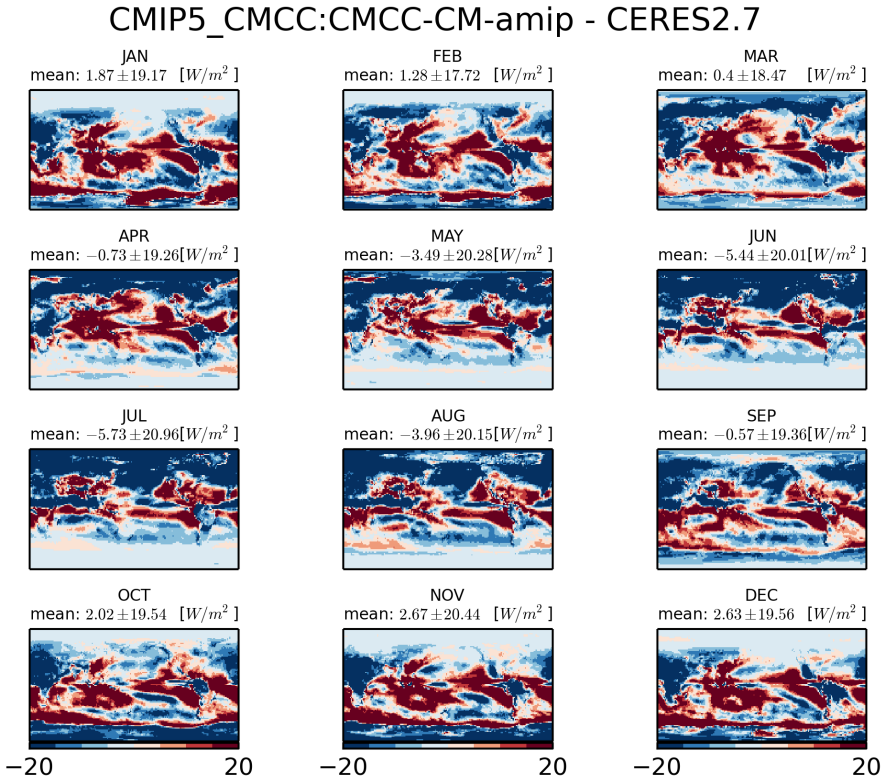



Figure 458: Monthly mean climatology of difference between CMCC:CMCC-CM and CERES2.7

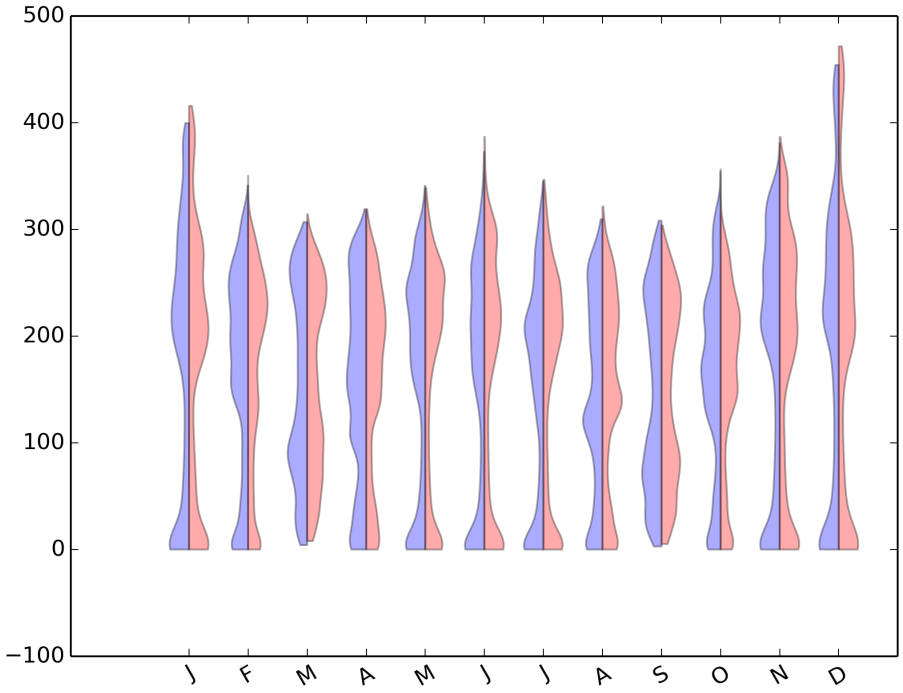



Figure 459: Violin plot for CMIP5-CMCC:CMCC-CM-AMIP

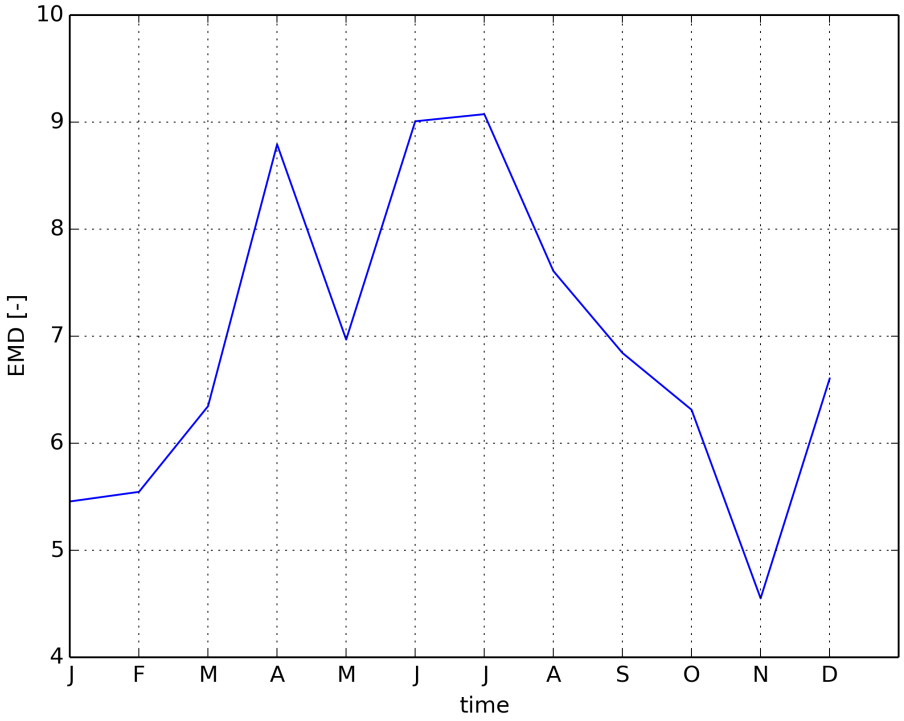



Figure 460: Timeseries of EMD

### 1.3.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

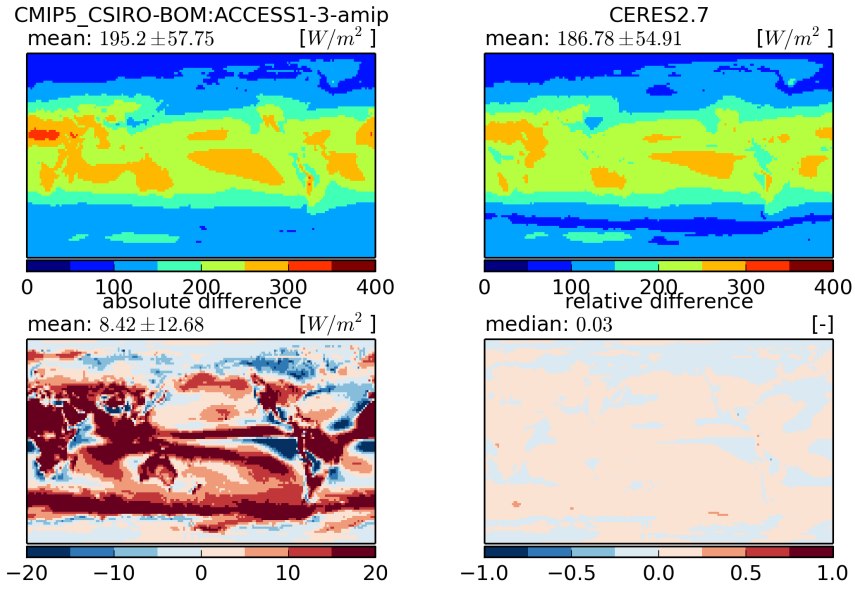



Figure 461: Temporal mean fields (top) and absolute and relative differences (bottom)

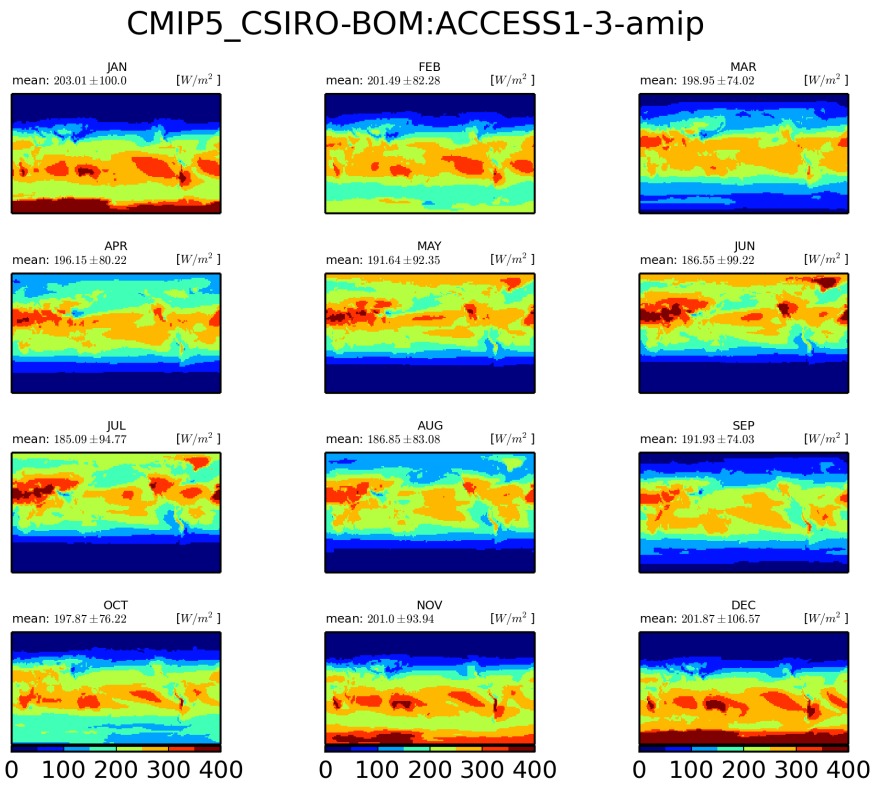



Figure 462: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

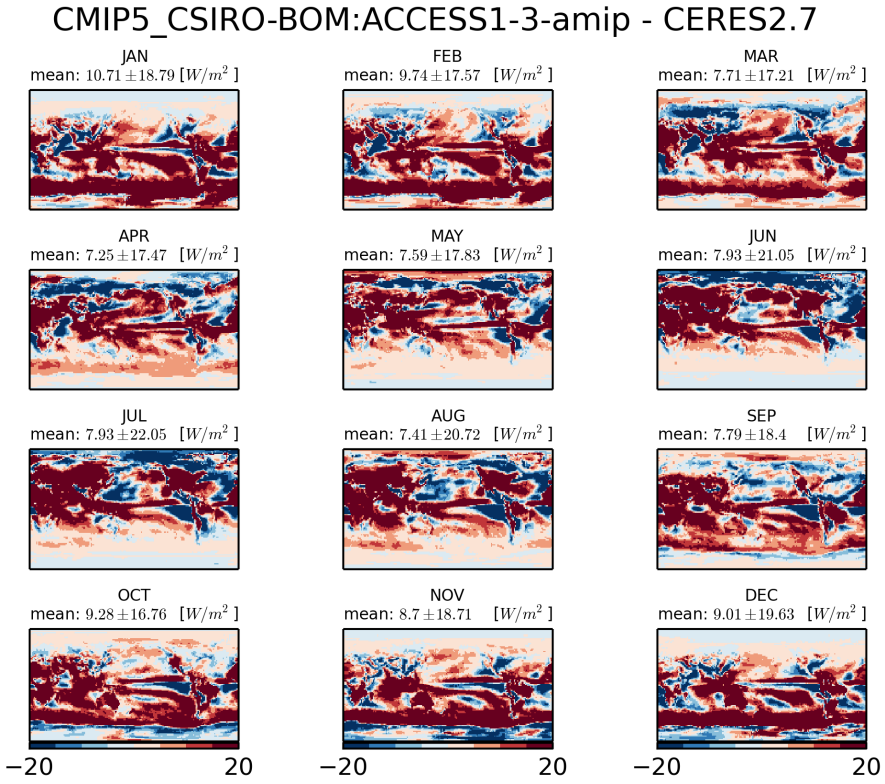



Figure 463: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and CERES2.7

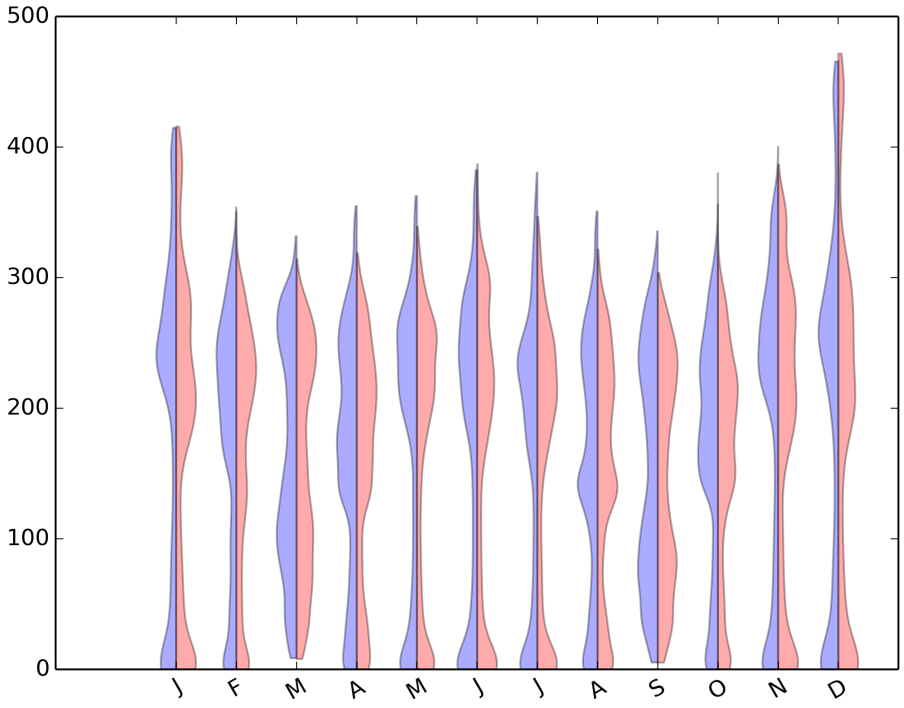



Figure 464: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-3-AMIP

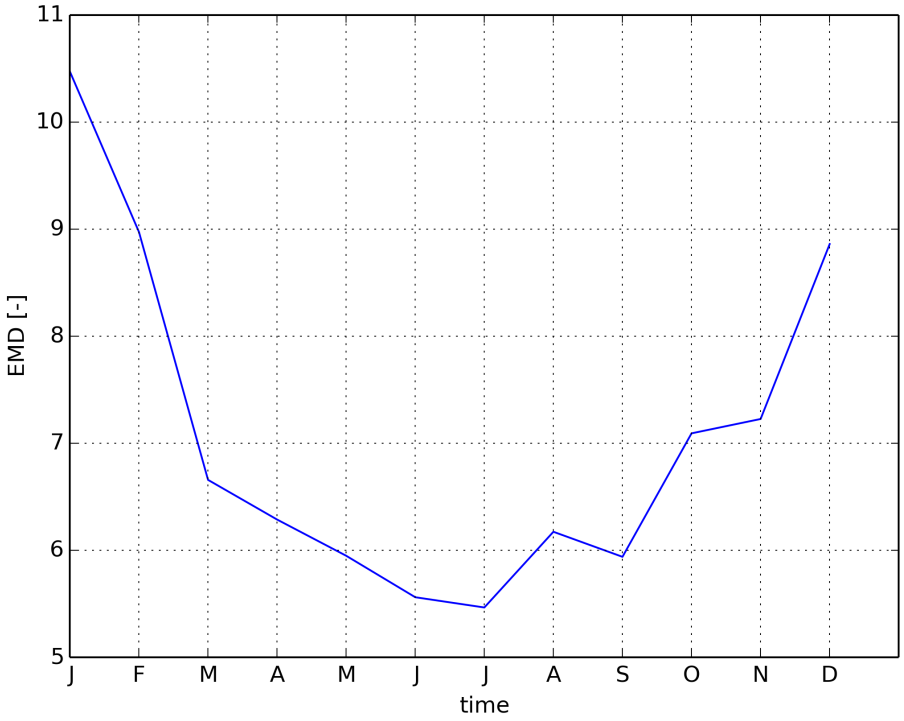



Figure 465: Timeseries of EMD

### 1.3.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

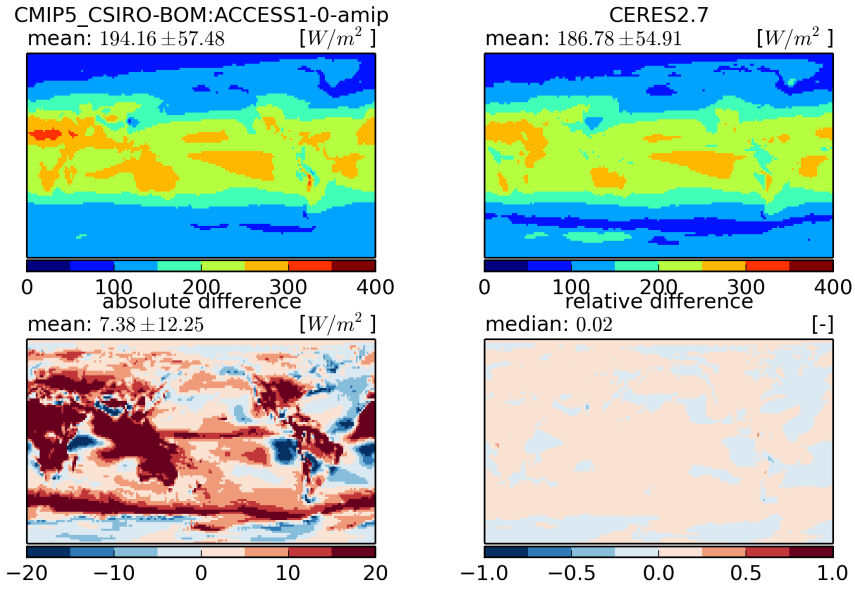



Figure 466: Temporal mean fields (top) and absolute and relative differences (bottom)

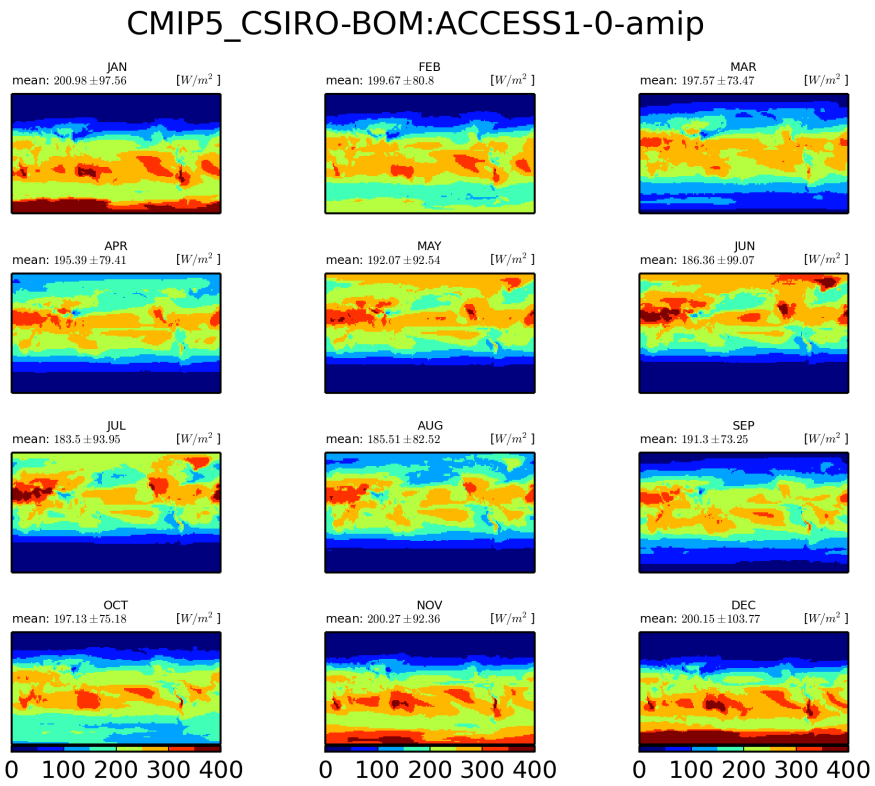



Figure 467: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

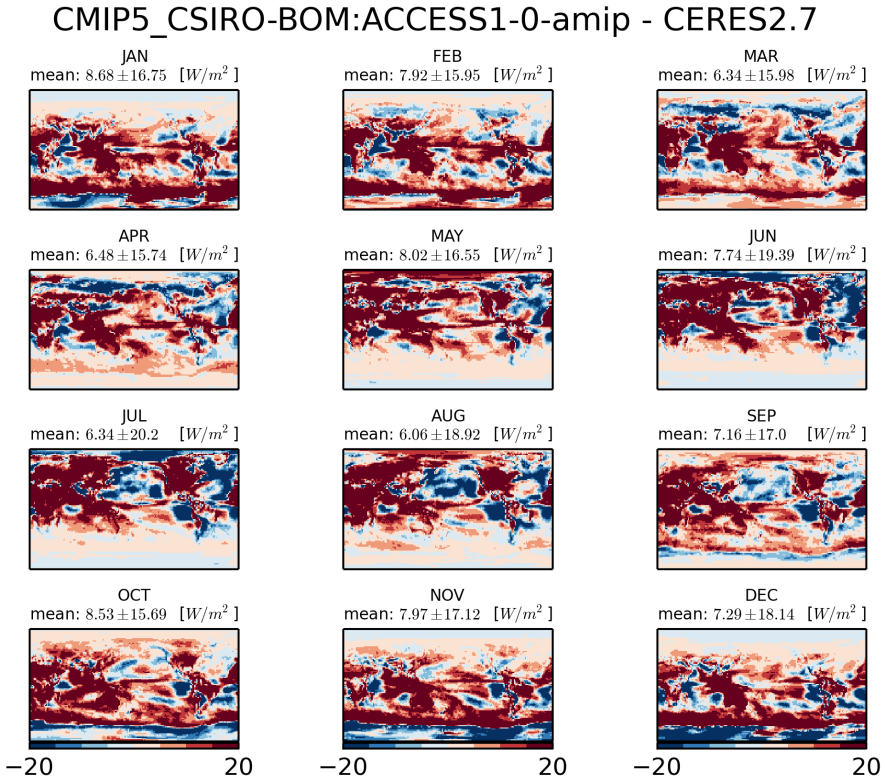



Figure 468: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and CERES2.7

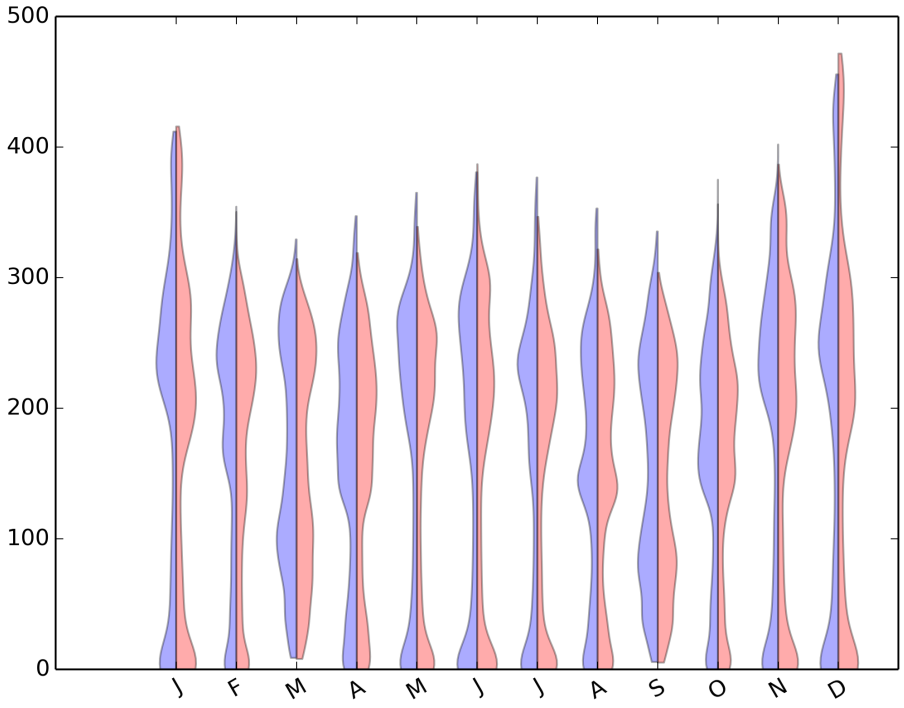



Figure 469: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-0-AMIP

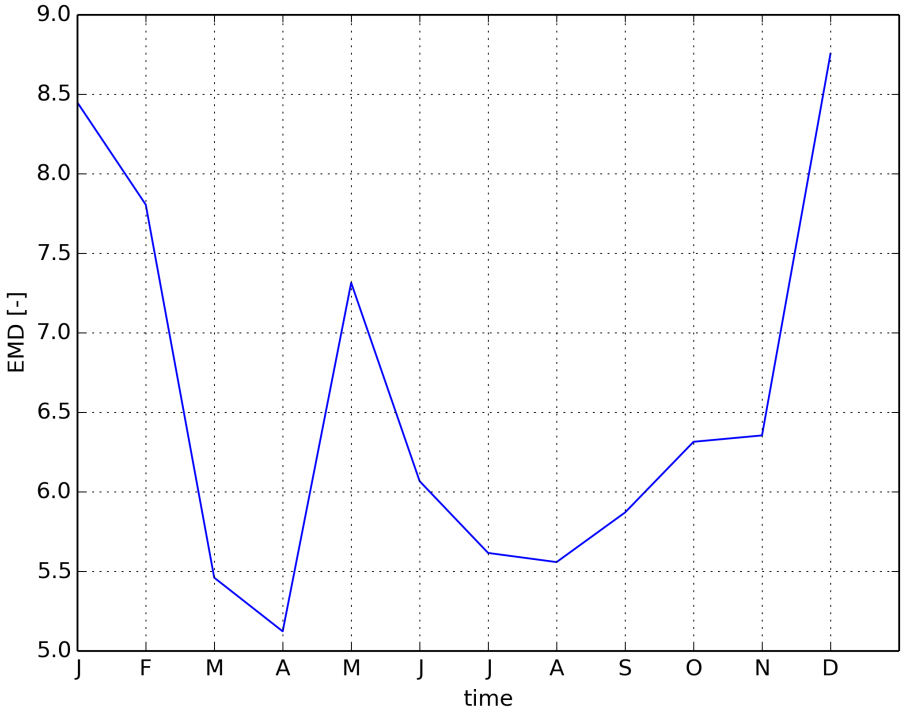



Figure 470: Timeseries of EMD

### 1.3.20 CMIP5 INM:inmcm4-amip

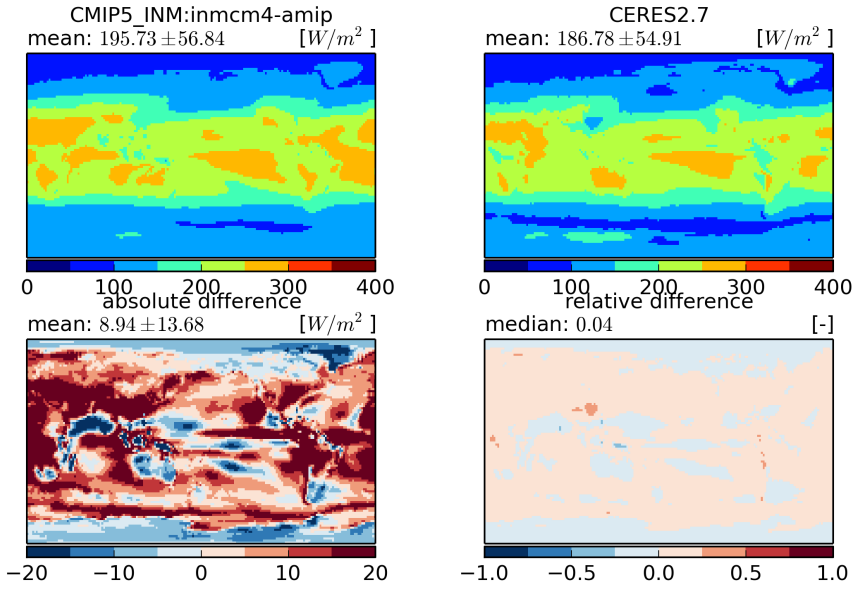



Figure 471: Temporal mean fields (top) and absolute and relative differences (bottom)

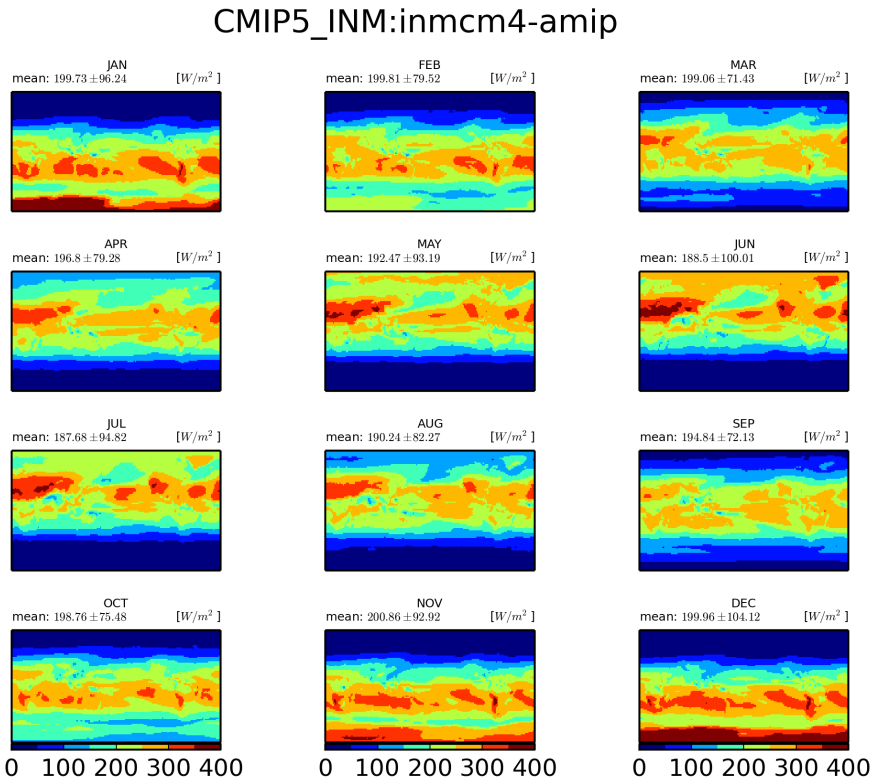



Figure 472: Monthly mean climatology for INM:inmcm4

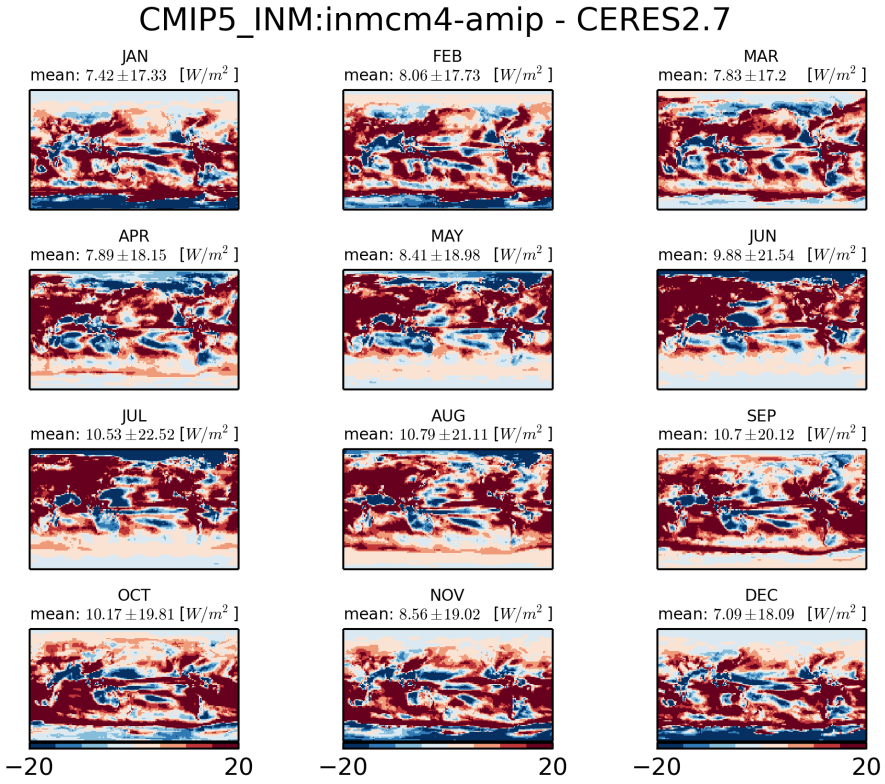



Figure 473: Monthly mean climatology of difference between INM:INMCM4 and CERES2.7

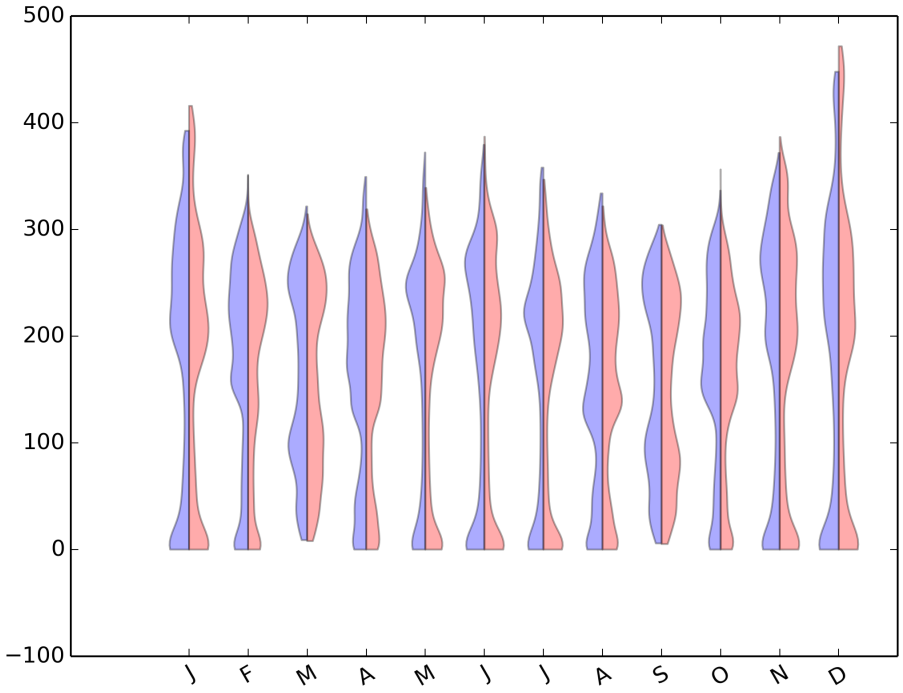



Figure 474: Violin plot for CMIP5-INM:INMCM4-AMIP

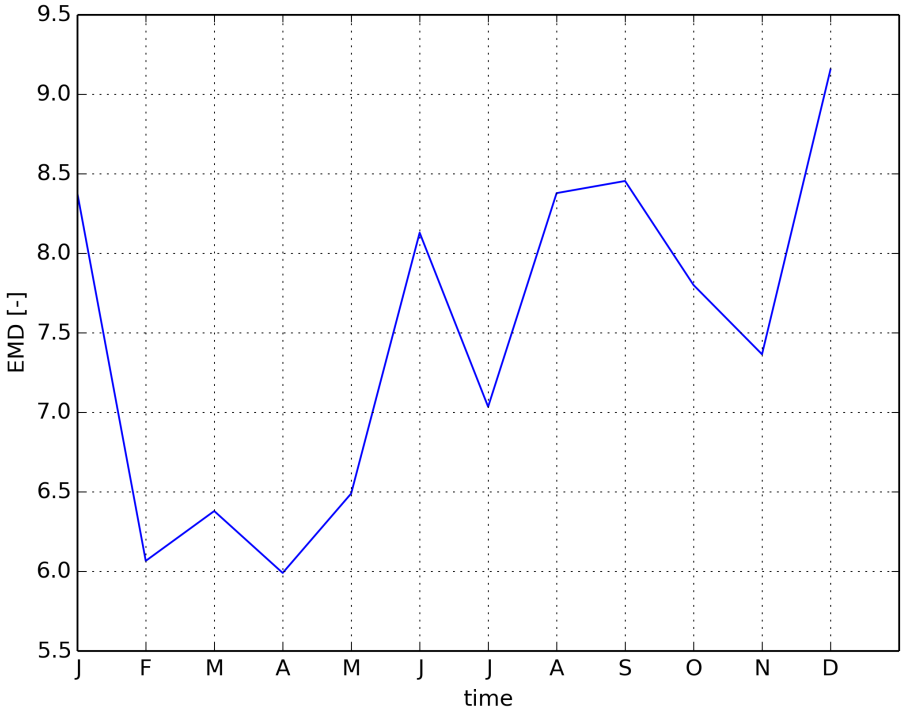



Figure 475: Timeseries of EMD

### 1.3.21 CMIP5 MPI-M:MPI-ESM-LR-amip

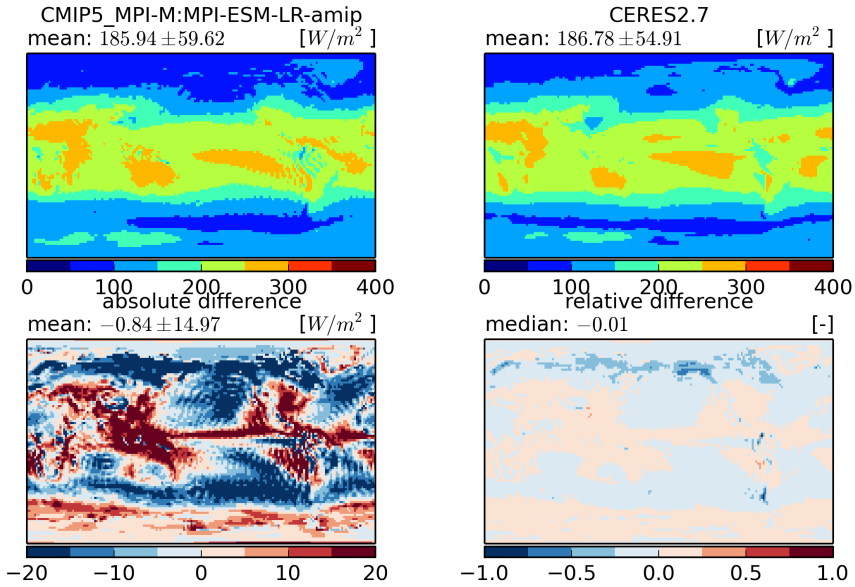



Figure 476: Temporal mean fields (top) and absolute and relative differences (bottom)

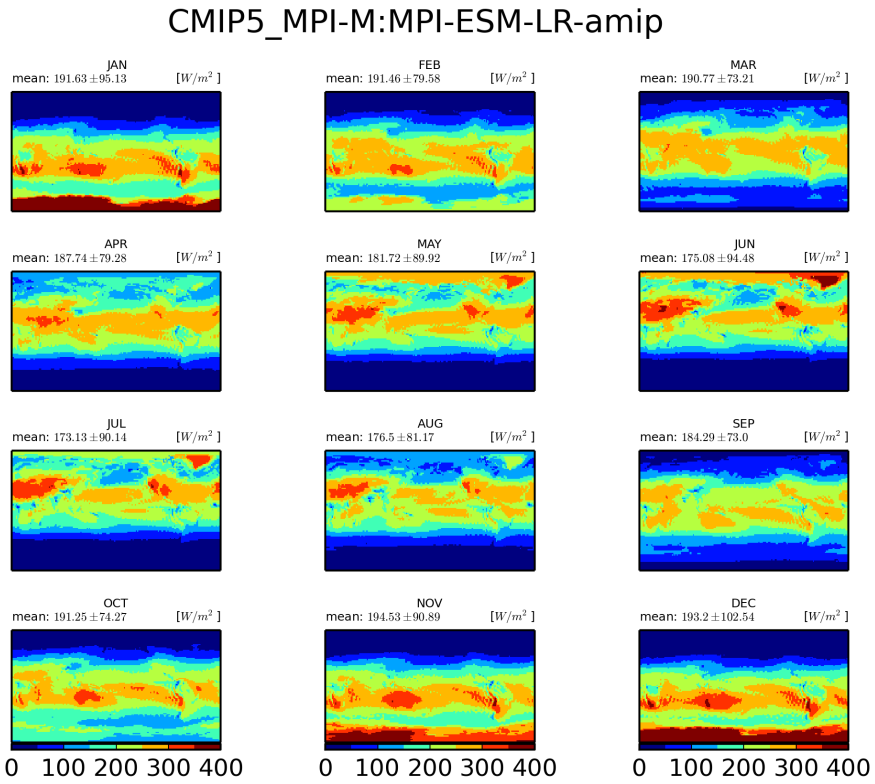



Figure 477: Monthly mean climatology for MPI-M:MPI-ESM-LR

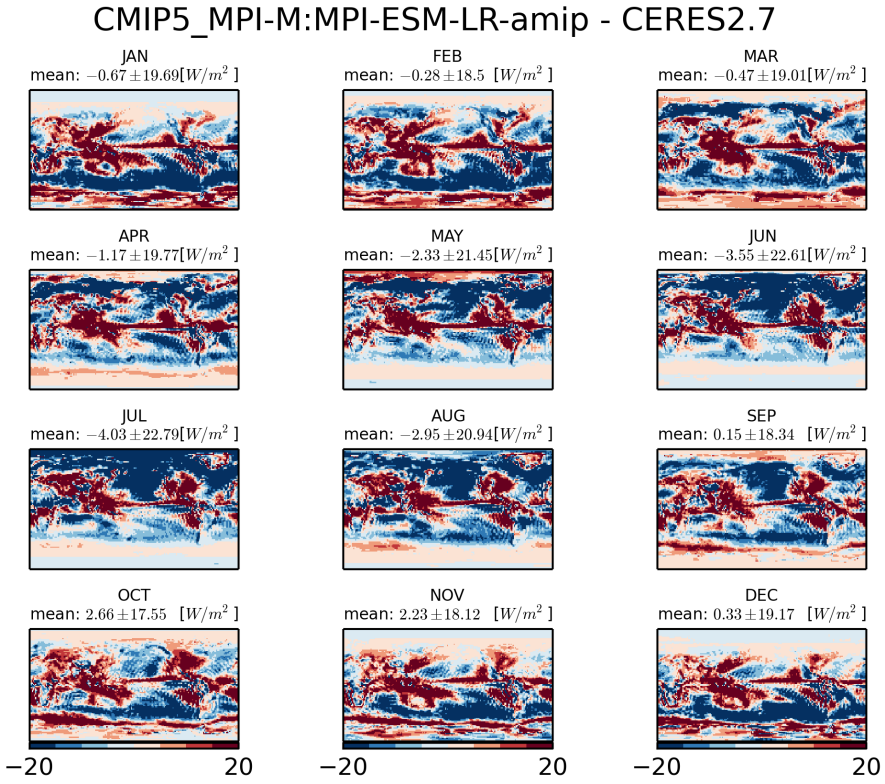



Figure 478: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and CERES2.7

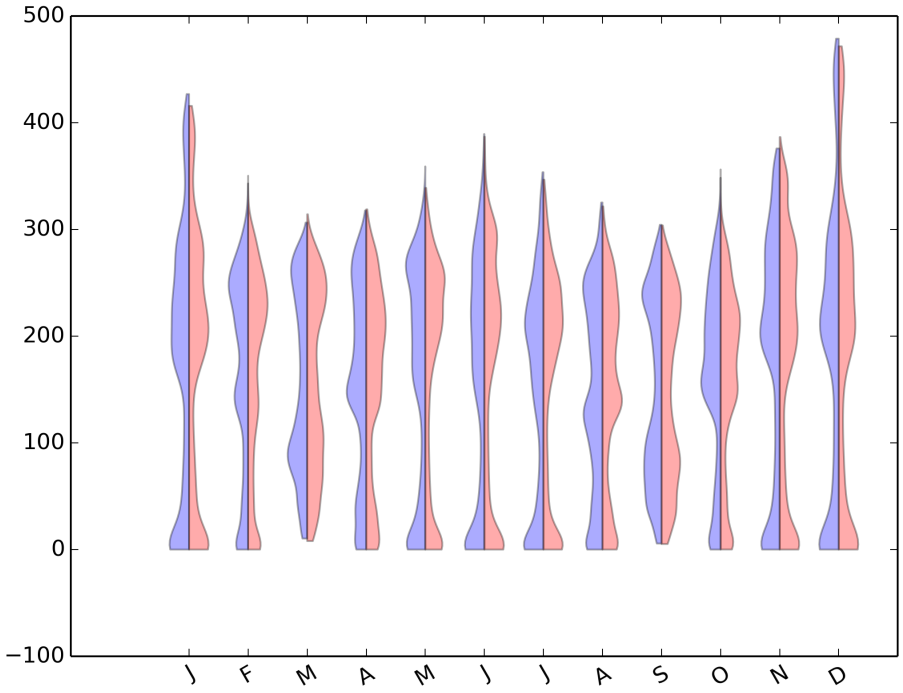



Figure 479: Violin plot for CMIP5-MPI-M:MPI-ESM-LR-AMIP

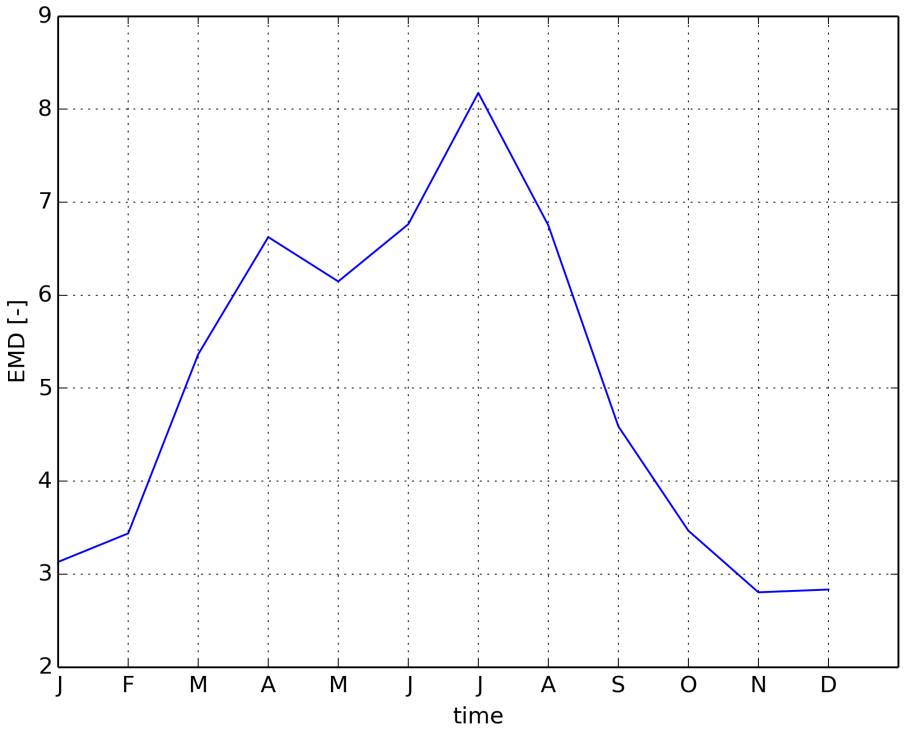



Figure 480: Timeseries of EMD

### 1.3.22 CMIP5 MPI-M:MPI-ESM-MR-amip

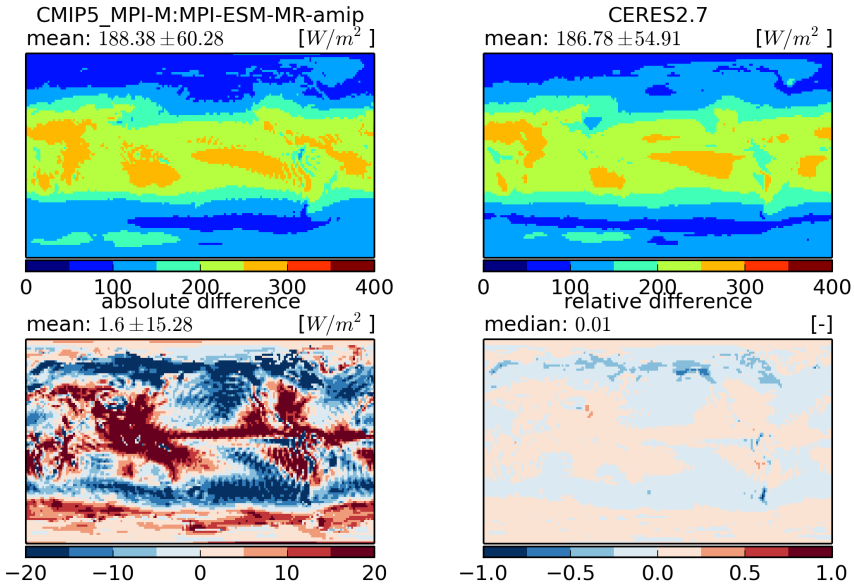



Figure 481: Temporal mean fields (top) and absolute and relative differences (bottom)

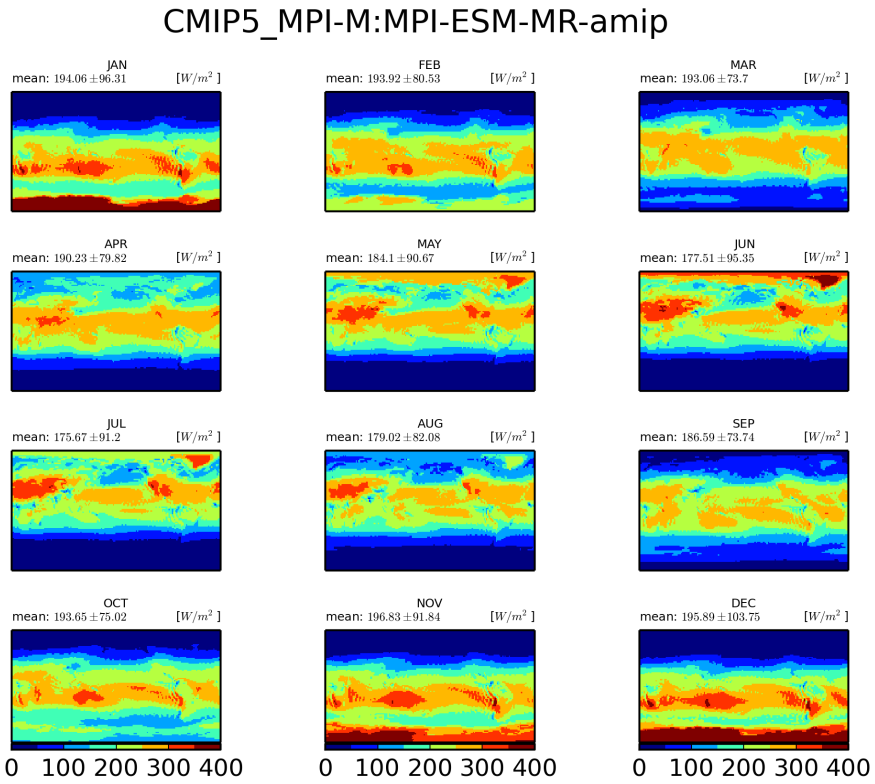



Figure 482: Monthly mean climatology for MPI-M:MPI-ESM-MR

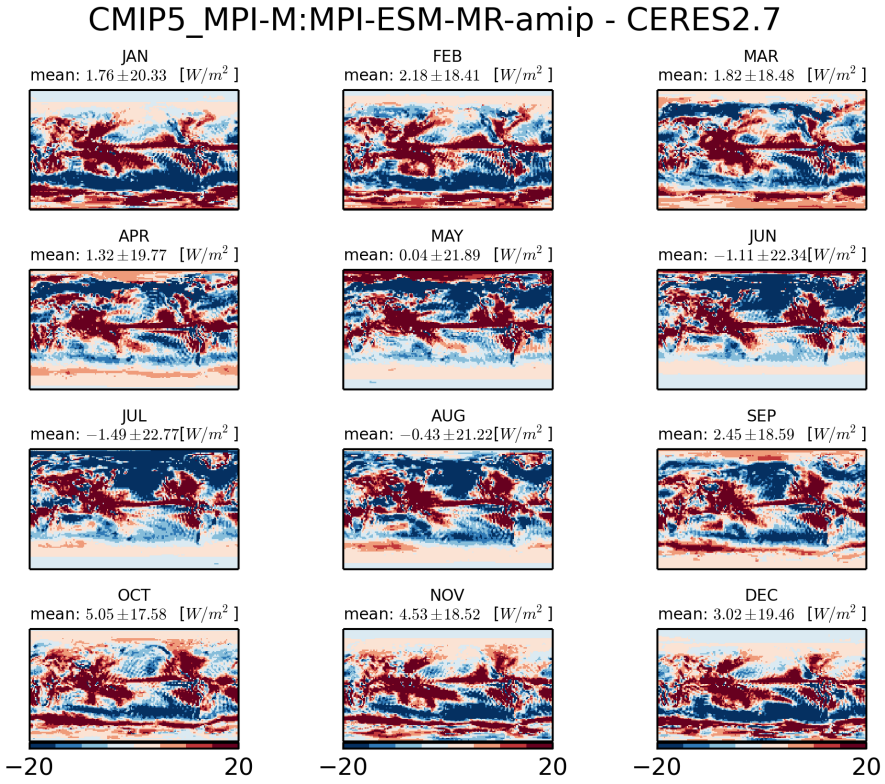



Figure 483: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and CERES2.7

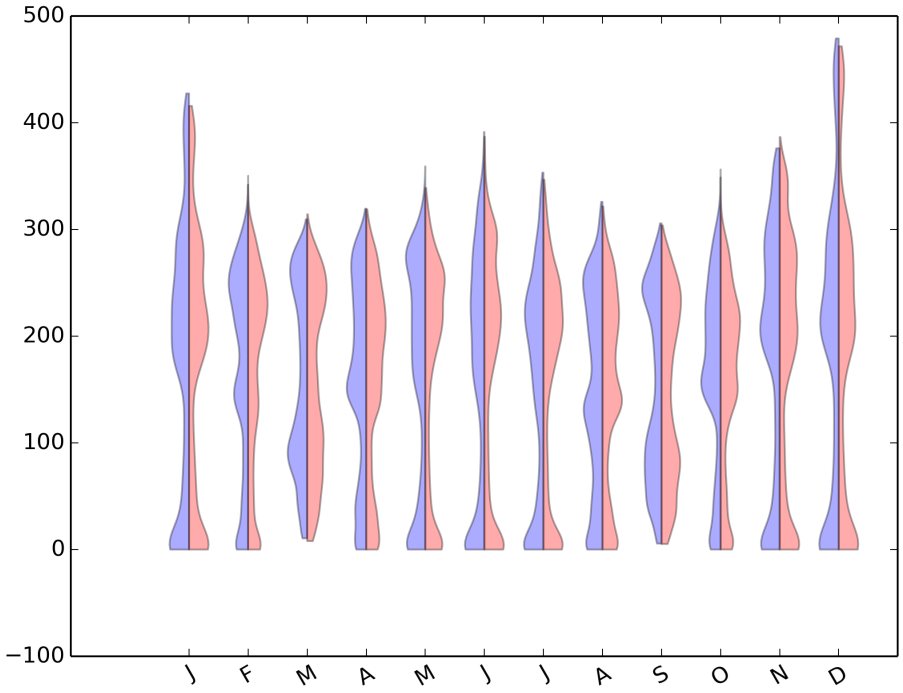



Figure 484: Violin plot for CMIP5-MPI-M:MPI-ESM-MR-AMIP

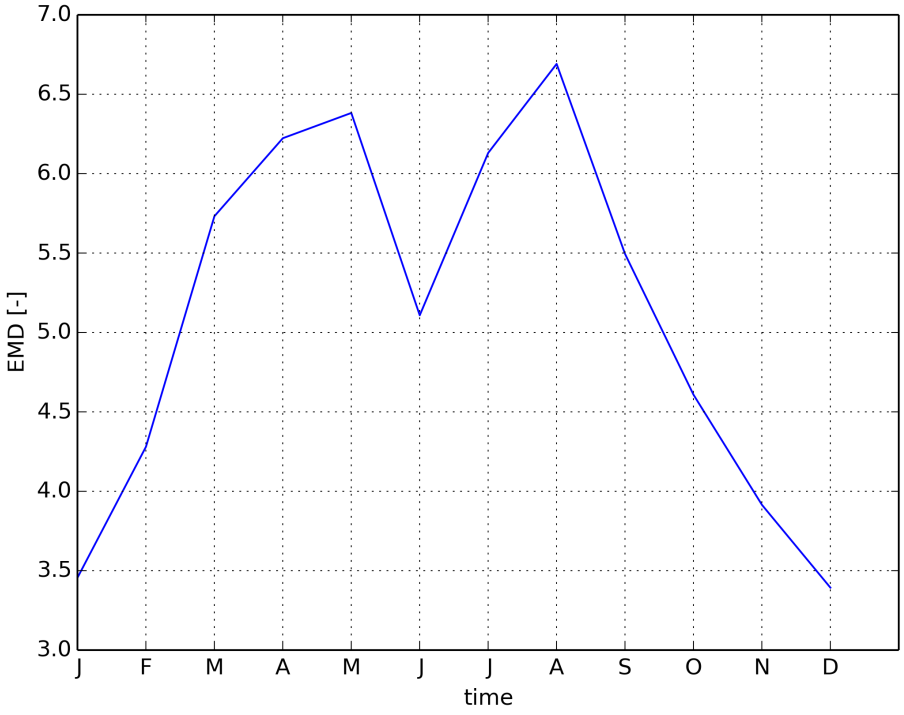



Figure 485: Timeseries of EMD

### 1.3.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

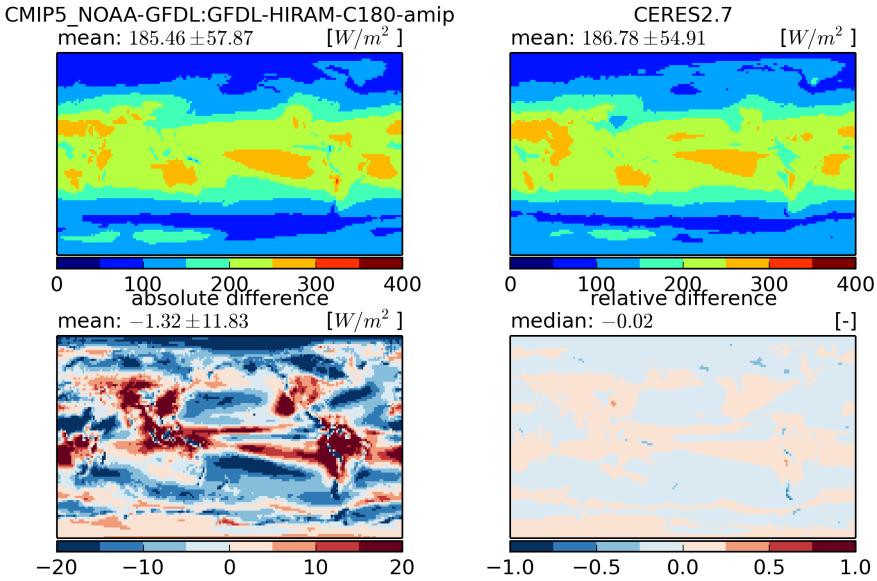



Figure 486: Temporal mean fields (top) and absolute and relative differences (bottom)

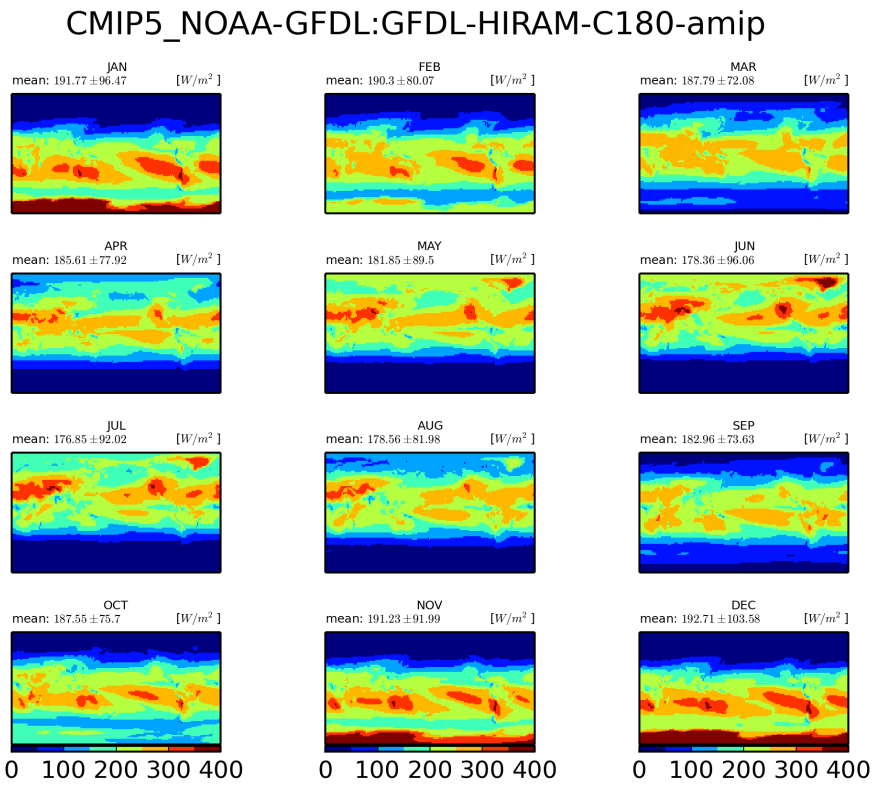



Figure 487: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

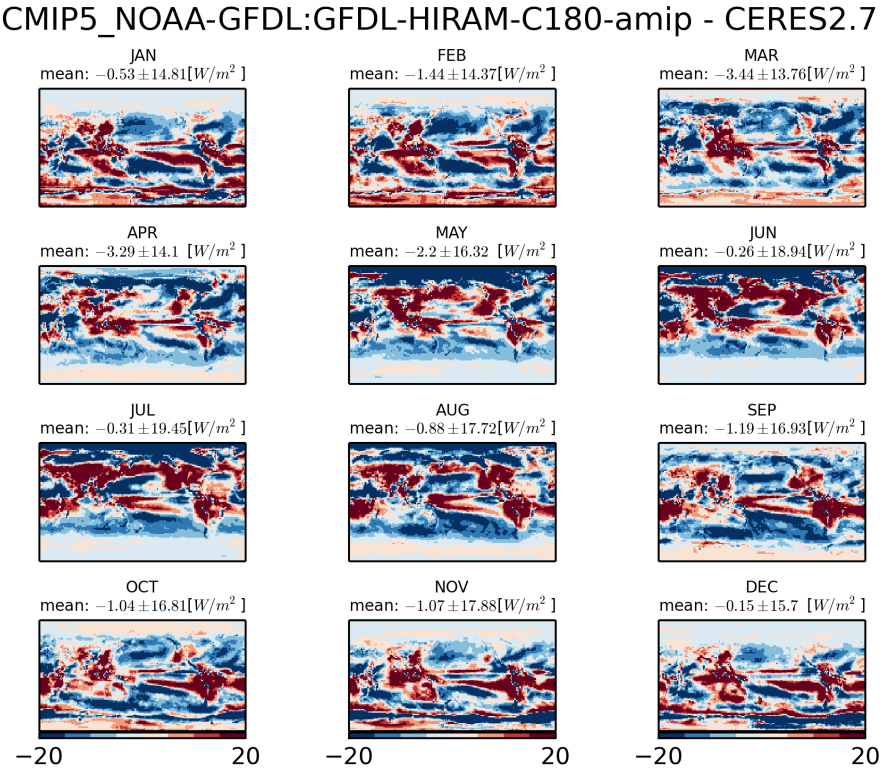



Figure 488: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and CERES2.7

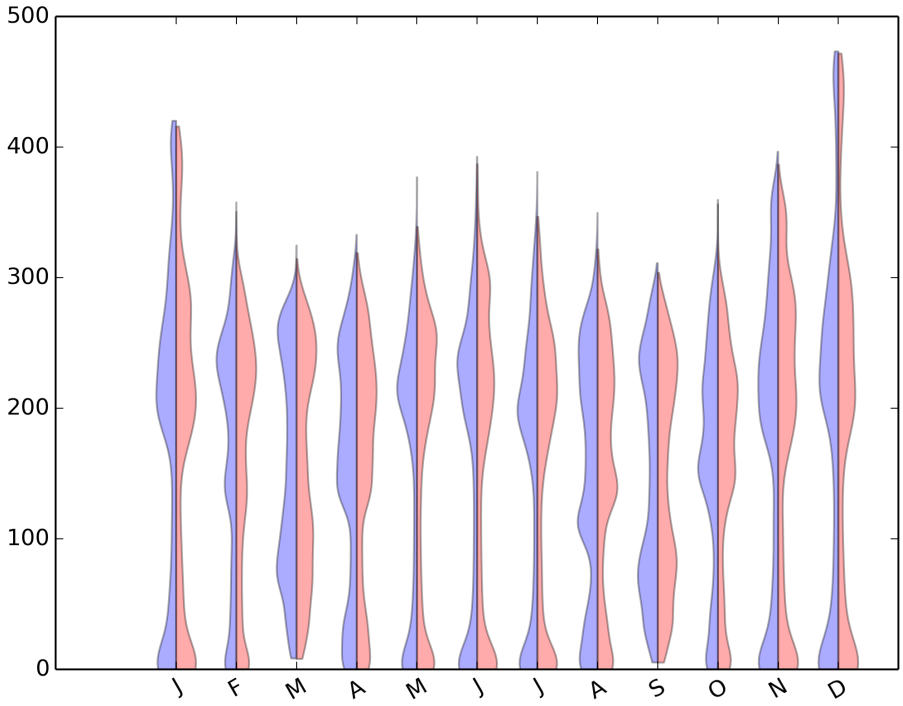



Figure 489: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-AMIP

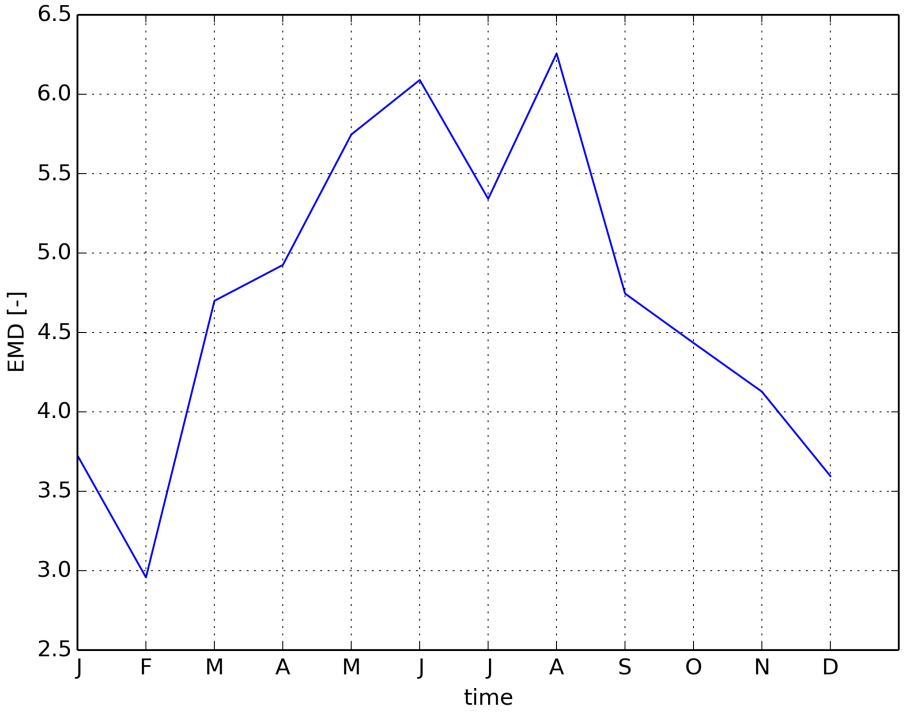



Figure 490: Timeseries of EMD

### 1.3.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

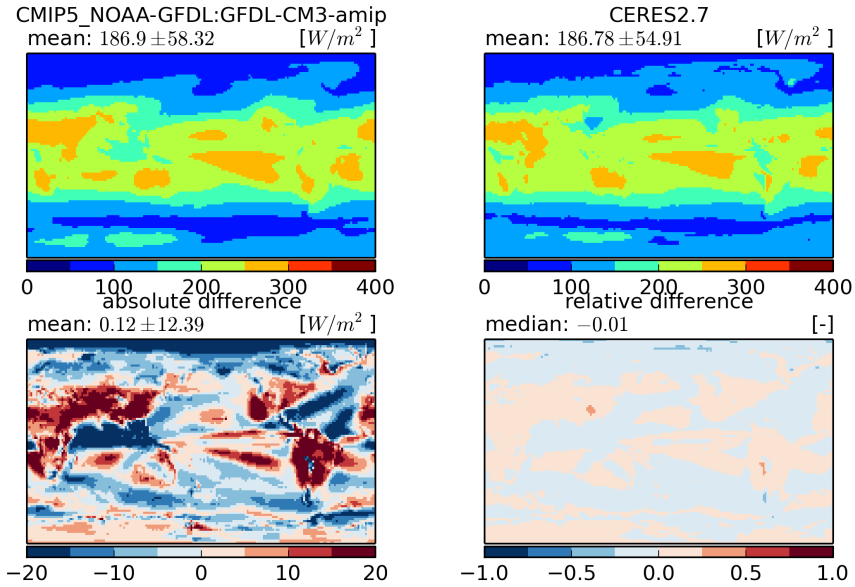



Figure 491: Temporal mean fields (top) and absolute and relative differences (bottom)

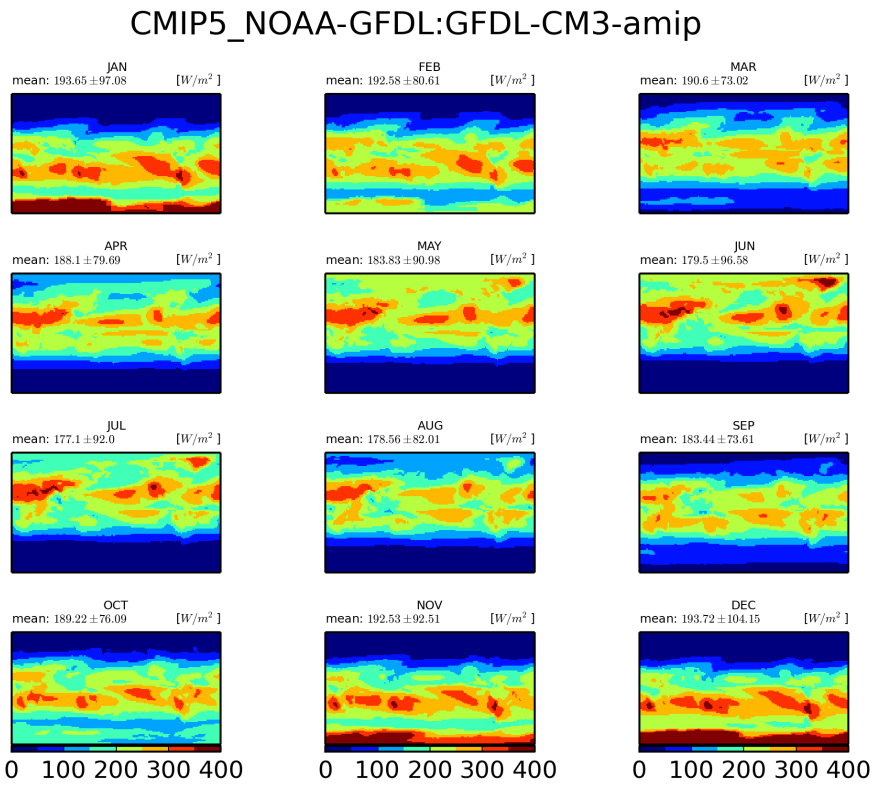



Figure 492: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

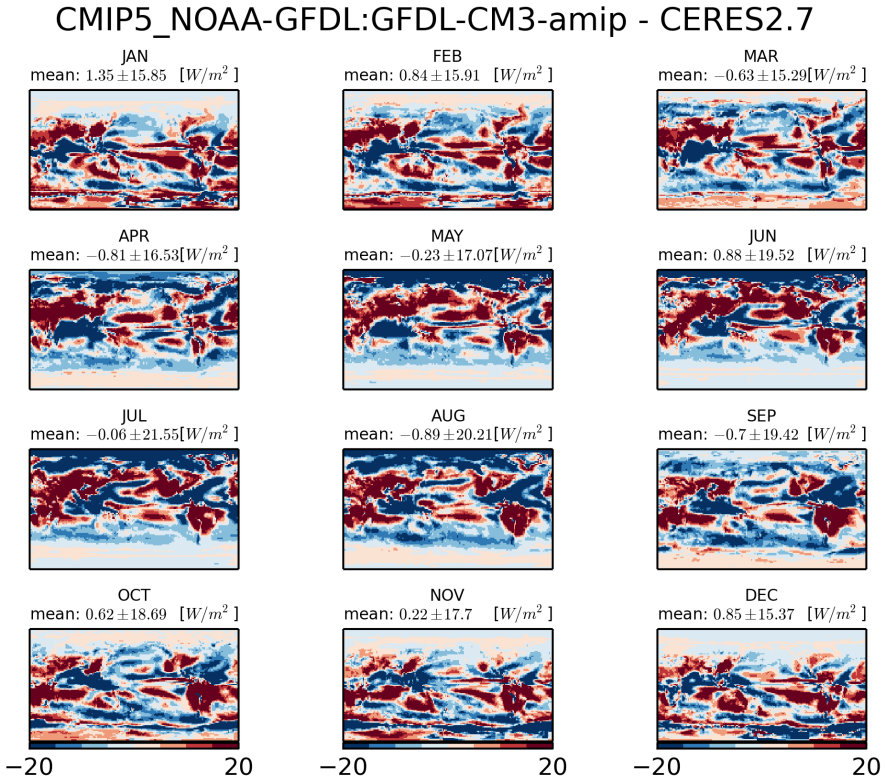



Figure 493: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and CERES2.7

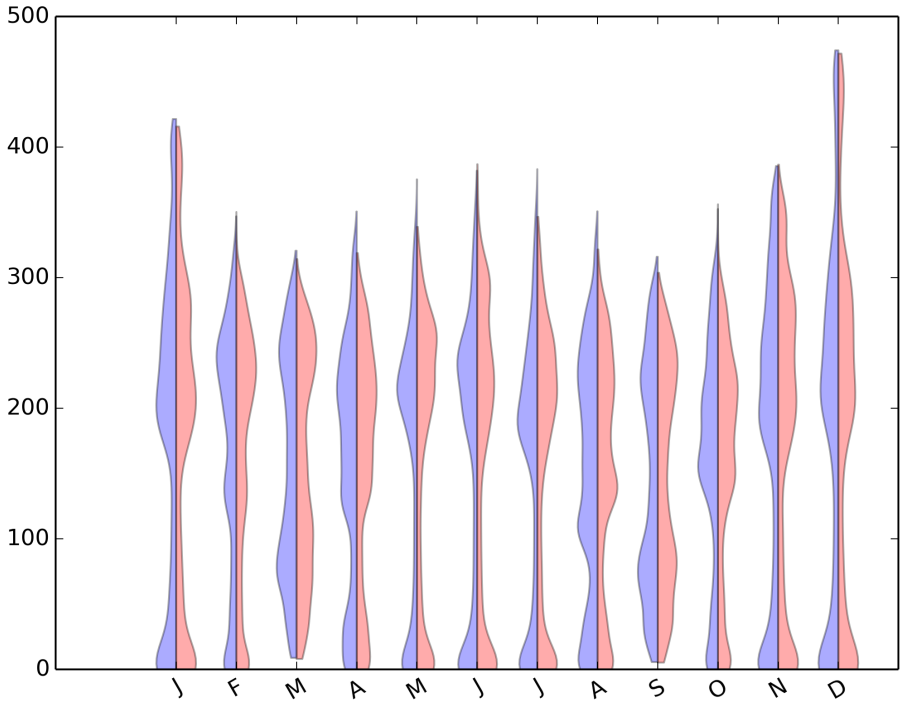



Figure 494: Violin plot for CMIP5-NOAA-GFDL:GFDL-CM3-AMIP

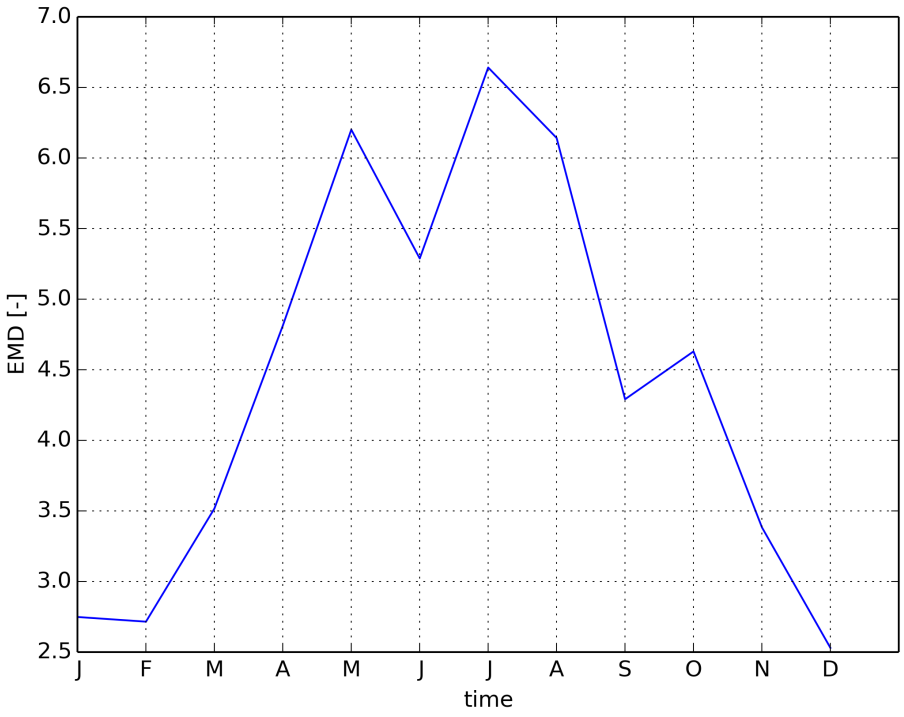



Figure 495: Timeseries of EMD

### 1.3.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

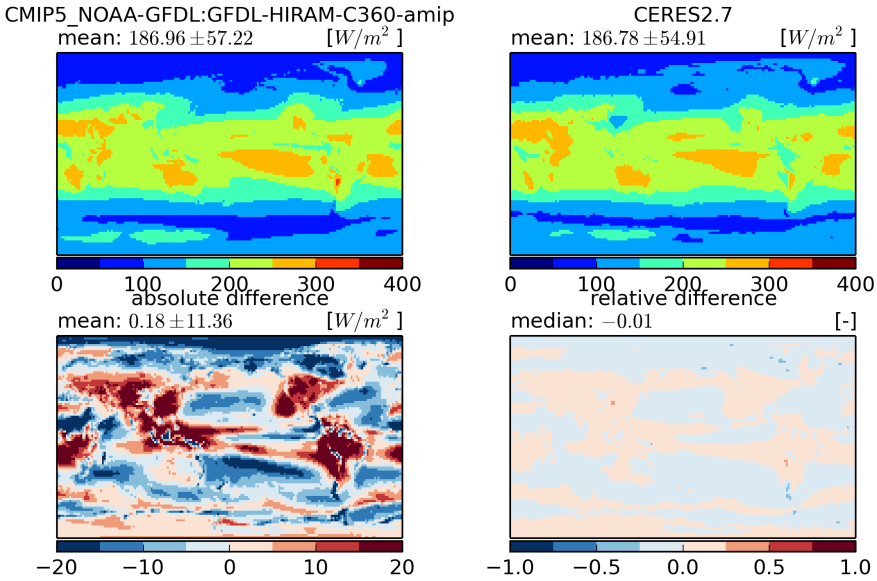



Figure 496: Temporal mean fields (top) and absolute and relative differences (bottom)

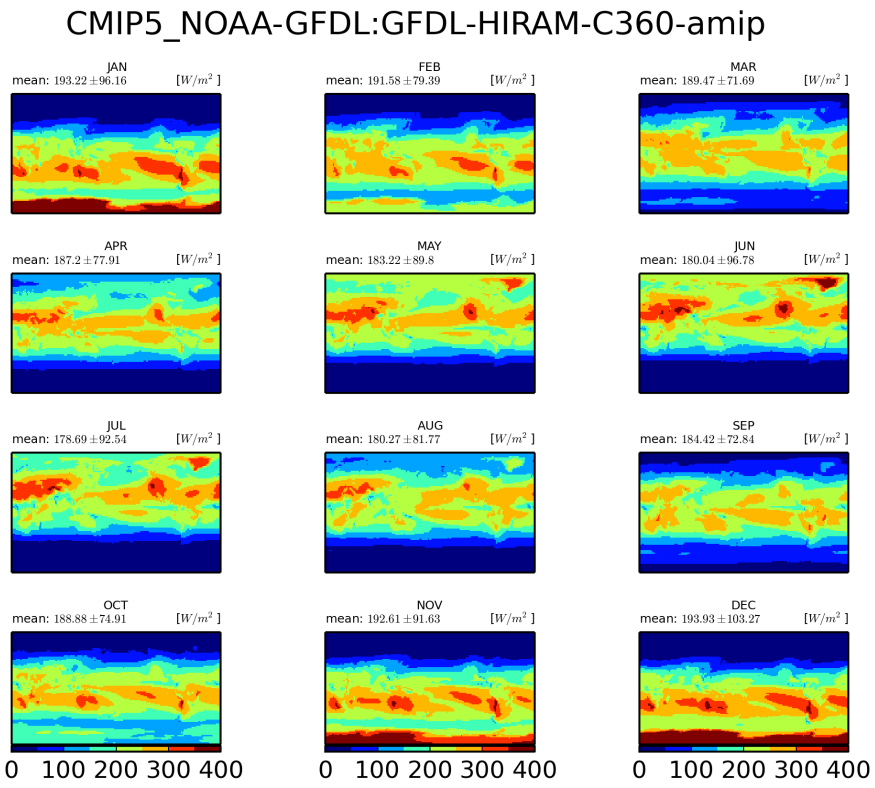



Figure 497: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

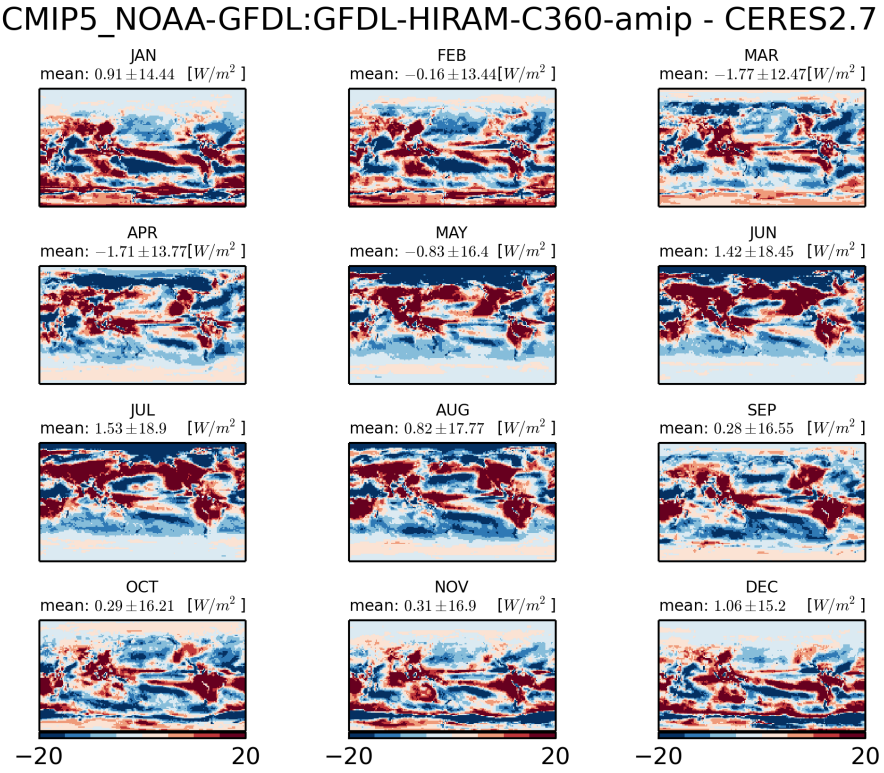



Figure 498: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and CERES2.7

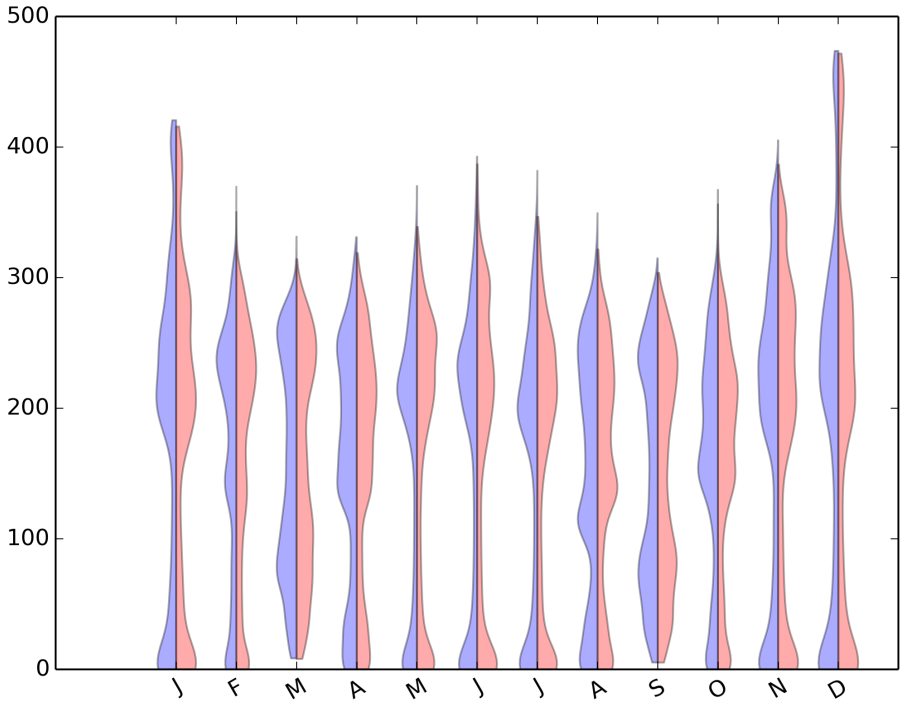



Figure 499: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-AMIP

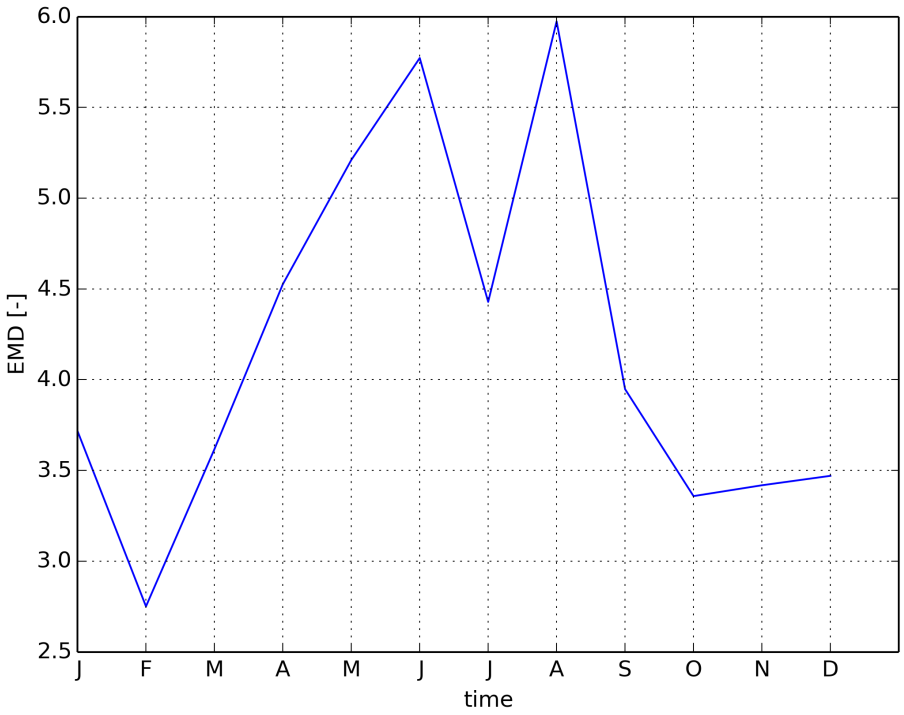



Figure 500: Timeseries of EMD

### 1.3.26 CMIP5 NCAR:CCSM4-amip

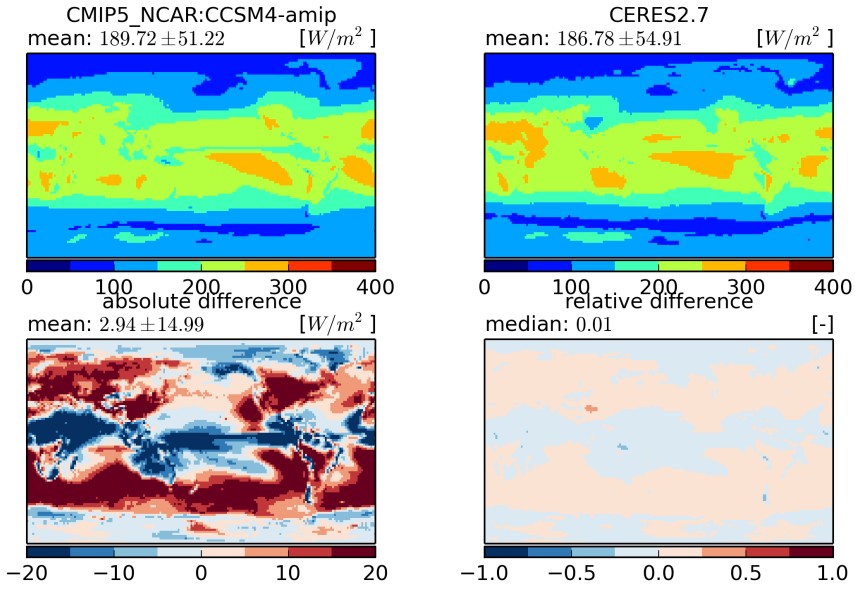



Figure 501: Temporal mean fields (top) and absolute and relative differences (bottom)

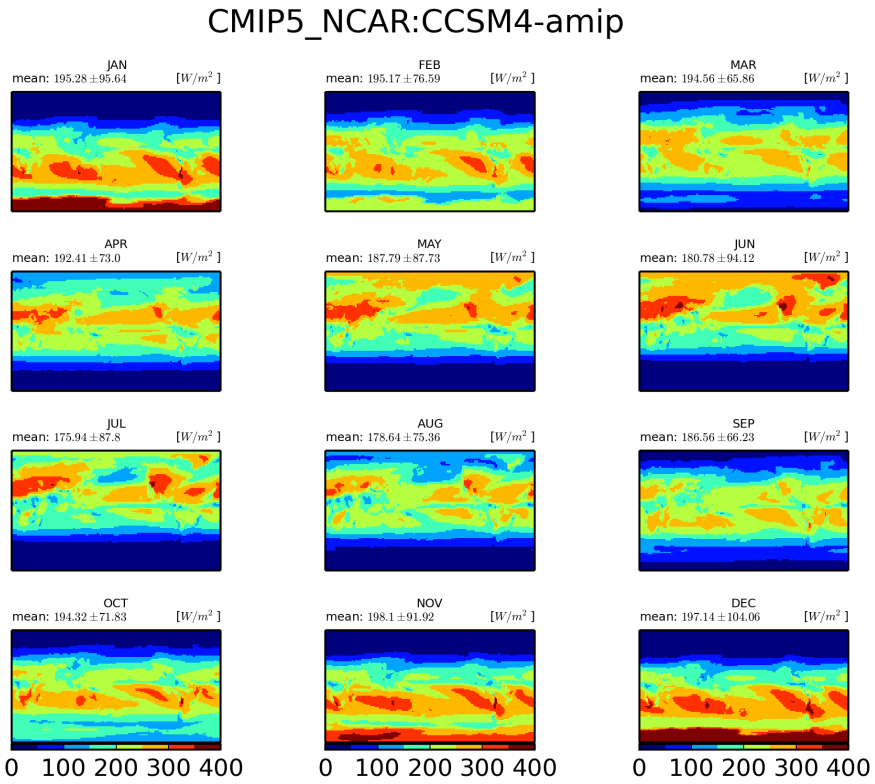



Figure 502: Monthly mean climatology for NCAR:CCSM4

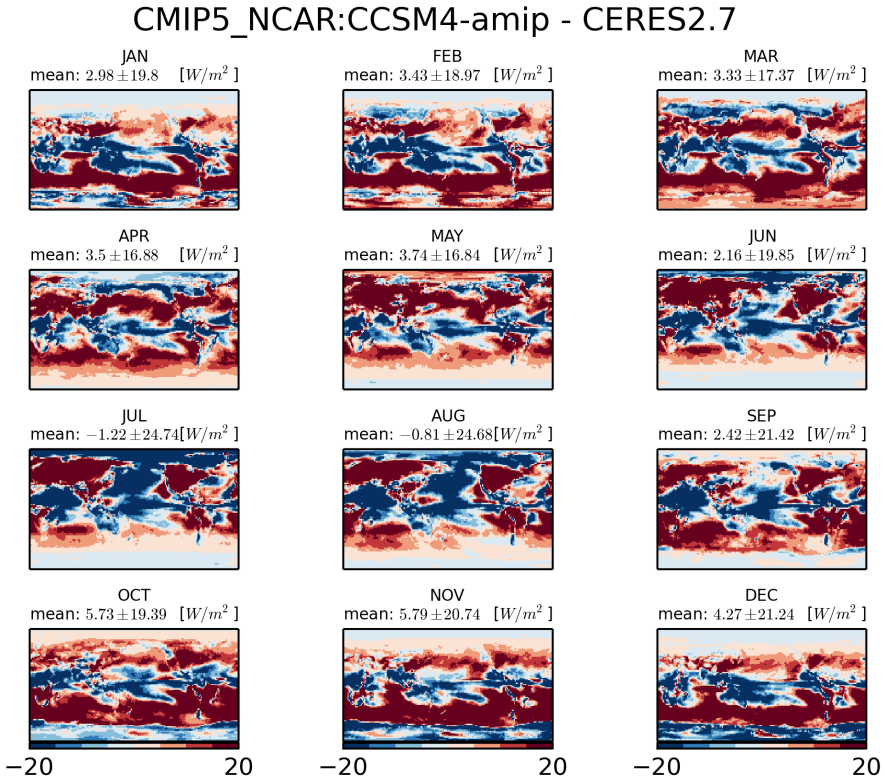



Figure 503: Monthly mean climatology of difference between NCAR:CCSM4 and CERES2.7

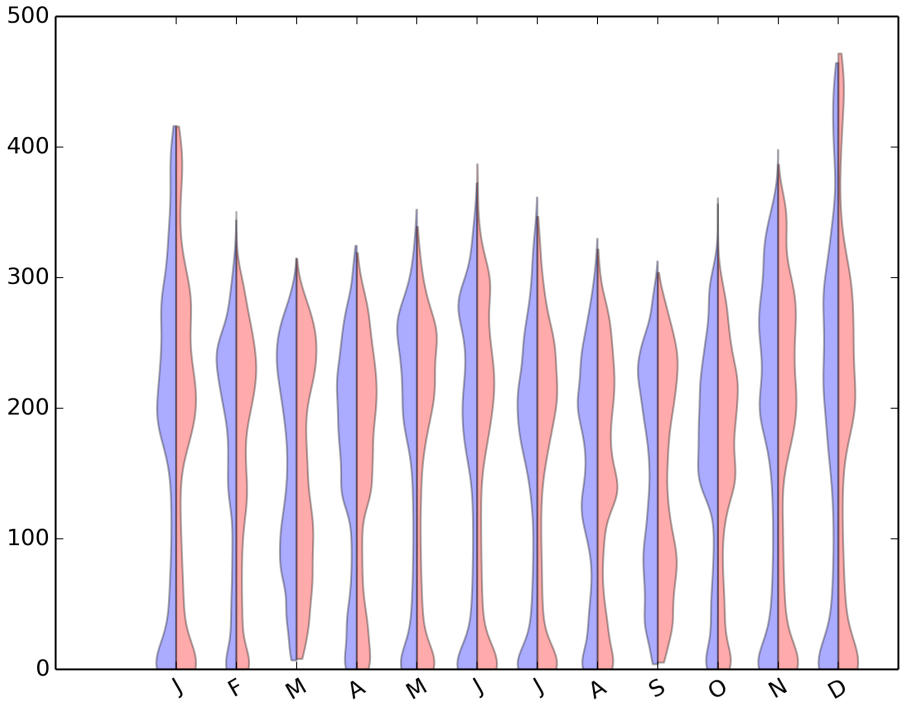



Figure 504: Violin plot for CMIP5-NCAR:CCSM4-AMIP

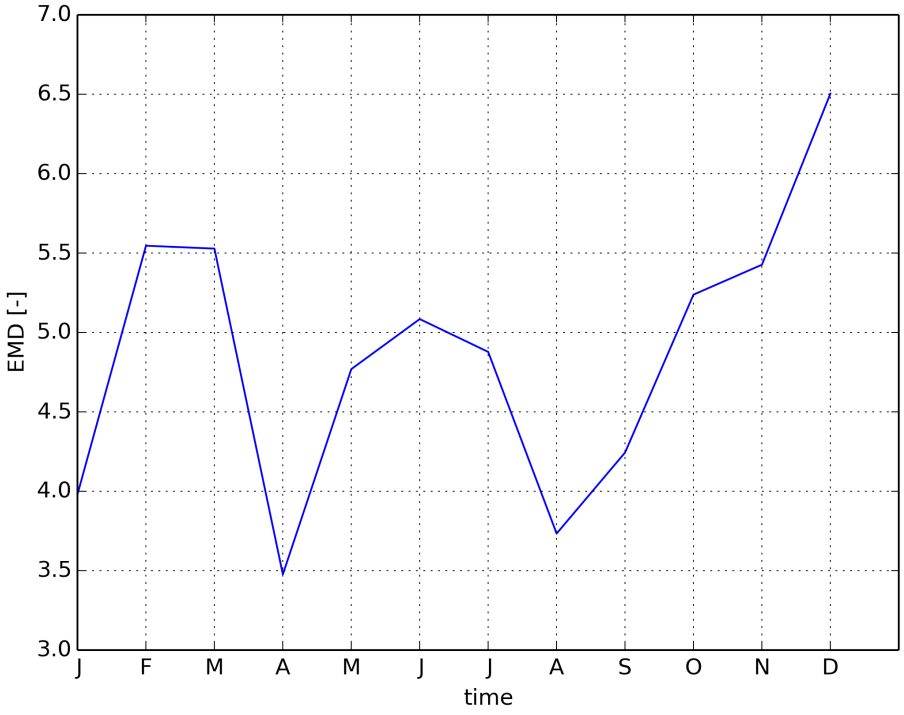



Figure 505: Timeseries of EMD

### 1.3.27 CMIP5 NCC:NorESM1-M-amip

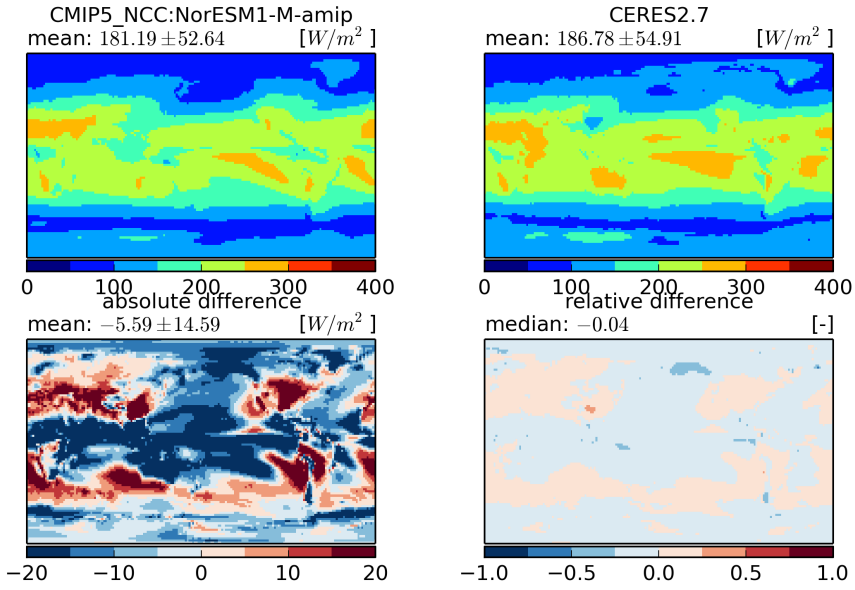



Figure 506: Temporal mean fields (top) and absolute and relative differences (bottom)

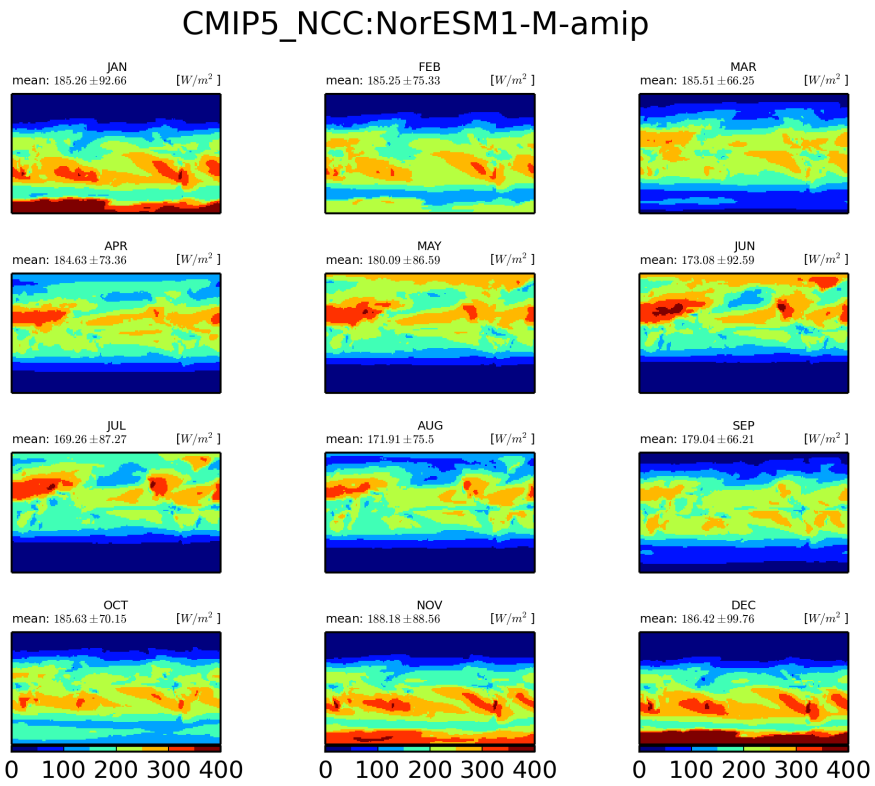



Figure 507: Monthly mean climatology for NCC:NorESM1-M

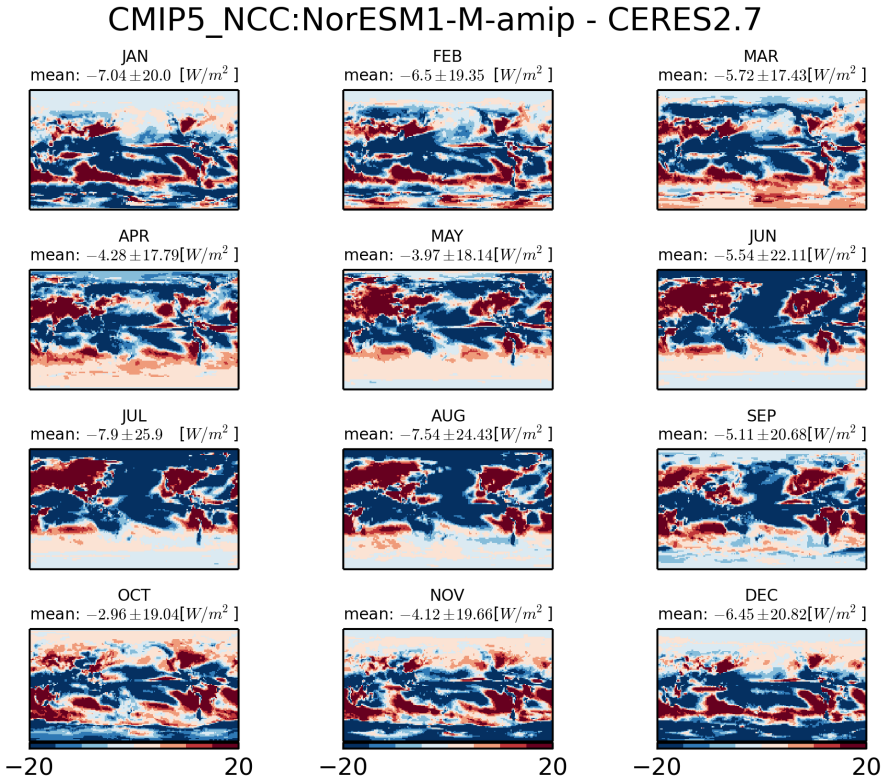



Figure 508: Monthly mean climatology of difference between NCC:NORESM1-M and CERES2.7

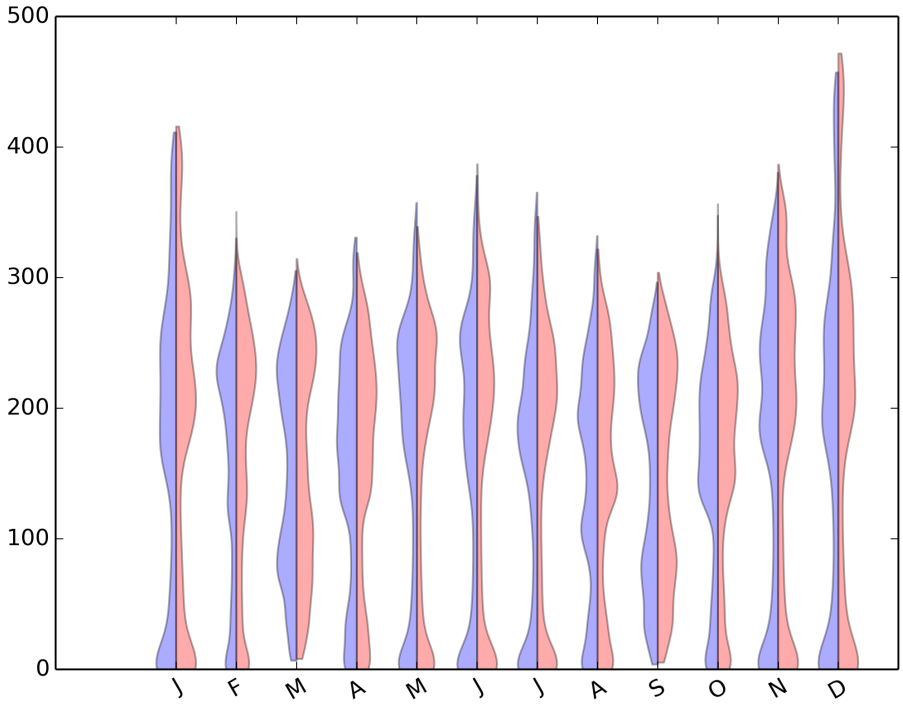



Figure 509: Violin plot for CMIP5-NCC:NORESM1-M-AMIP

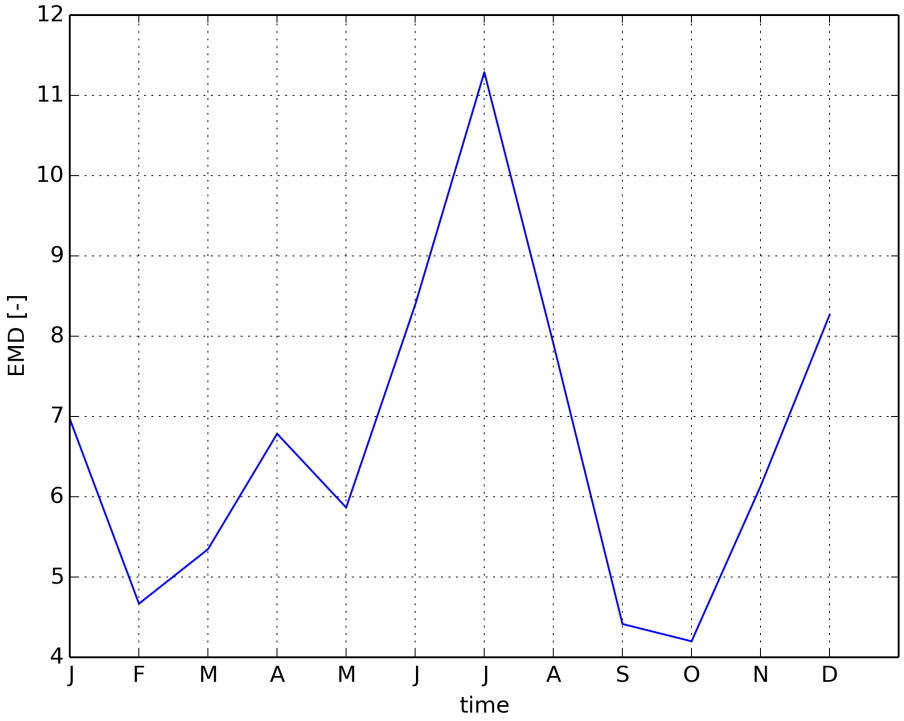



Figure 510: Timeseries of EMD

### 1.3.28 CMIP3 iap fgoals1 0 g-amip

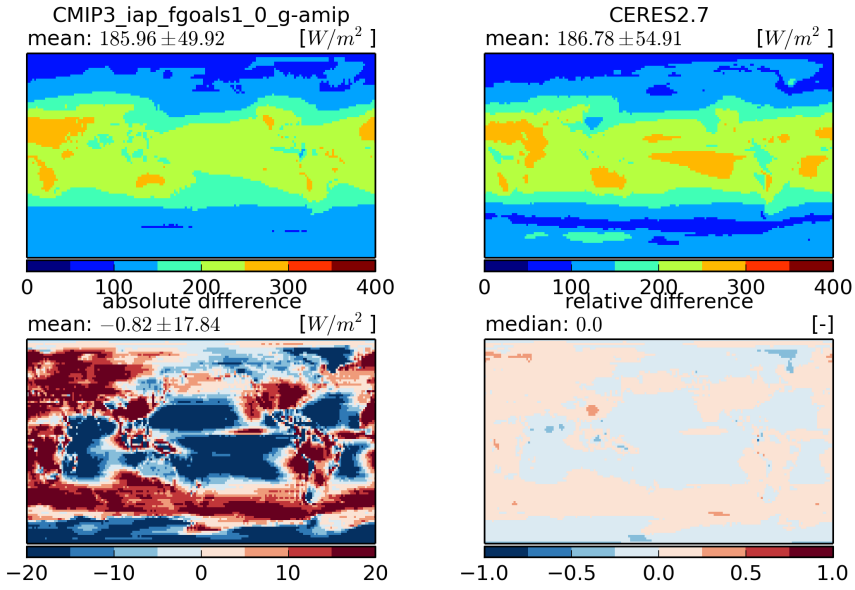



Figure 511: Temporal mean fields (top) and absolute and relative differences (bottom)

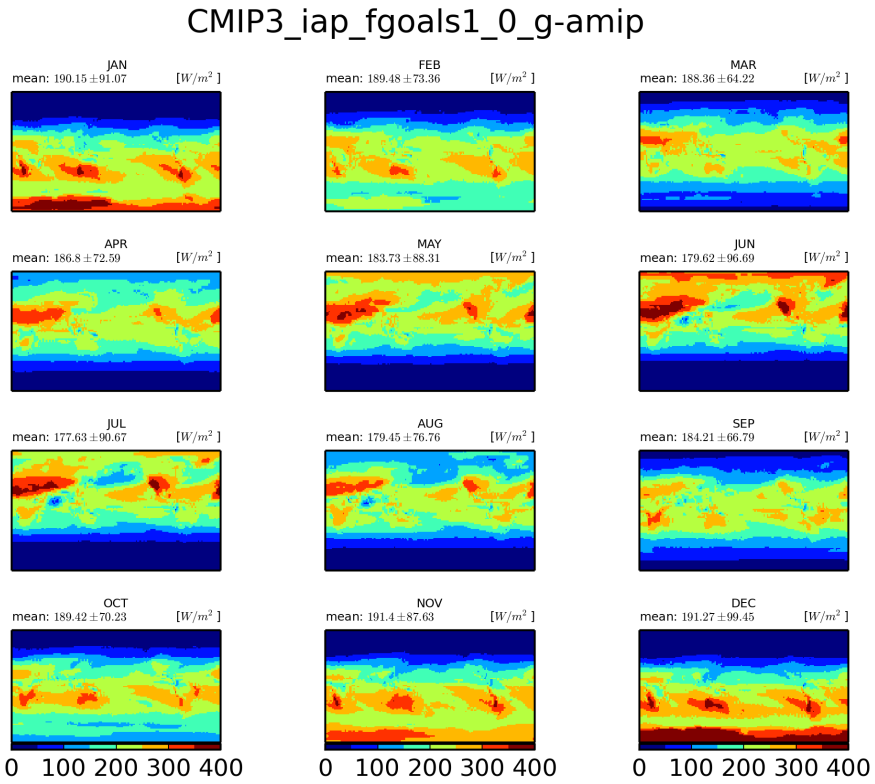



Figure 512: Monthly mean climatology for iap-fgoals1-0-g

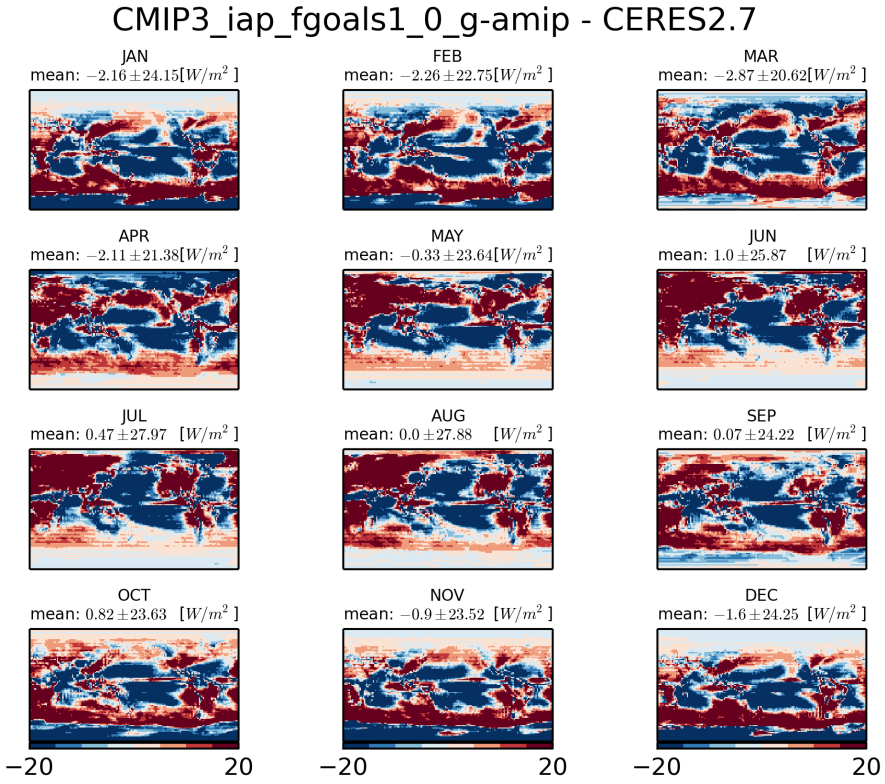



Figure 513: Monthly mean climatology of difference between IAP-FGOALS1-0-G and CERES2.7

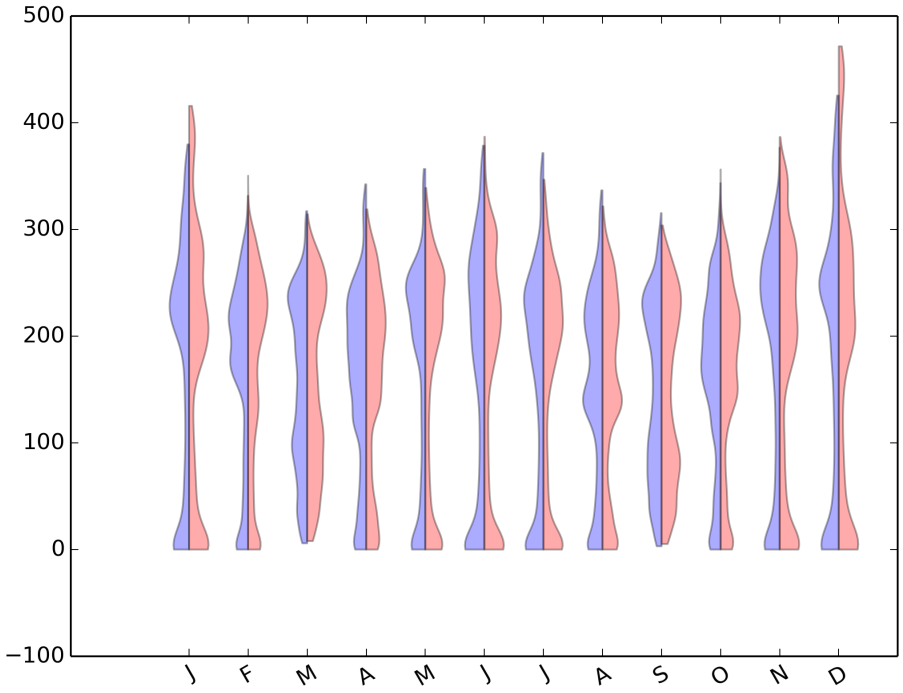



Figure 514: Violin plot for CMIP3-IAP-FGOALS1-0-G-AMIP

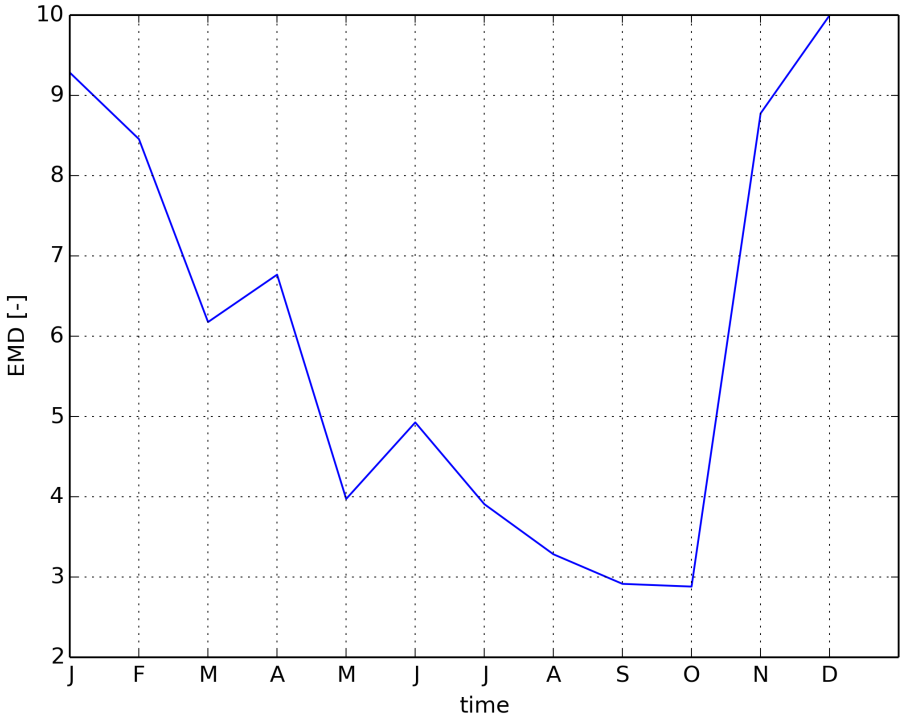



Figure 515: Timeseries of EMD

### 1.3.29 CMIP3 inmcm3 0-amip

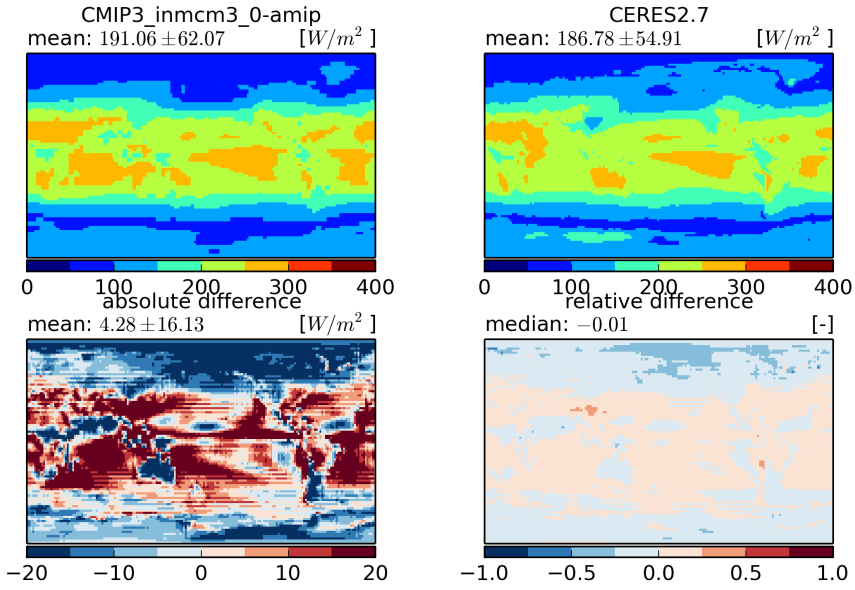



Figure 516: Temporal mean fields (top) and absolute and relative differences (bottom)

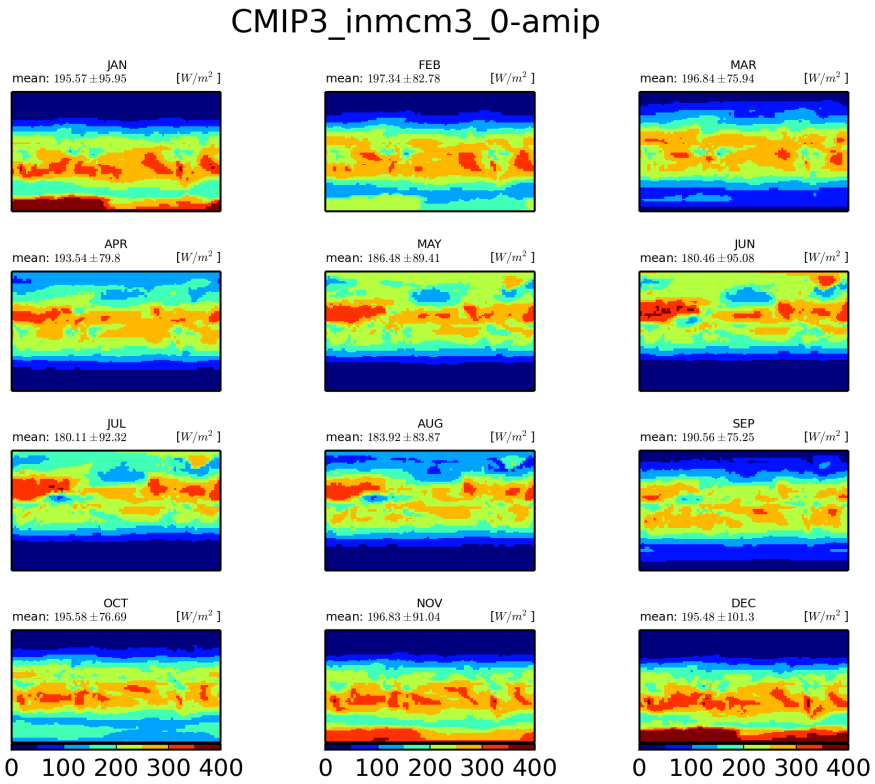



Figure 517: Monthly mean climatology for inmcm3-0

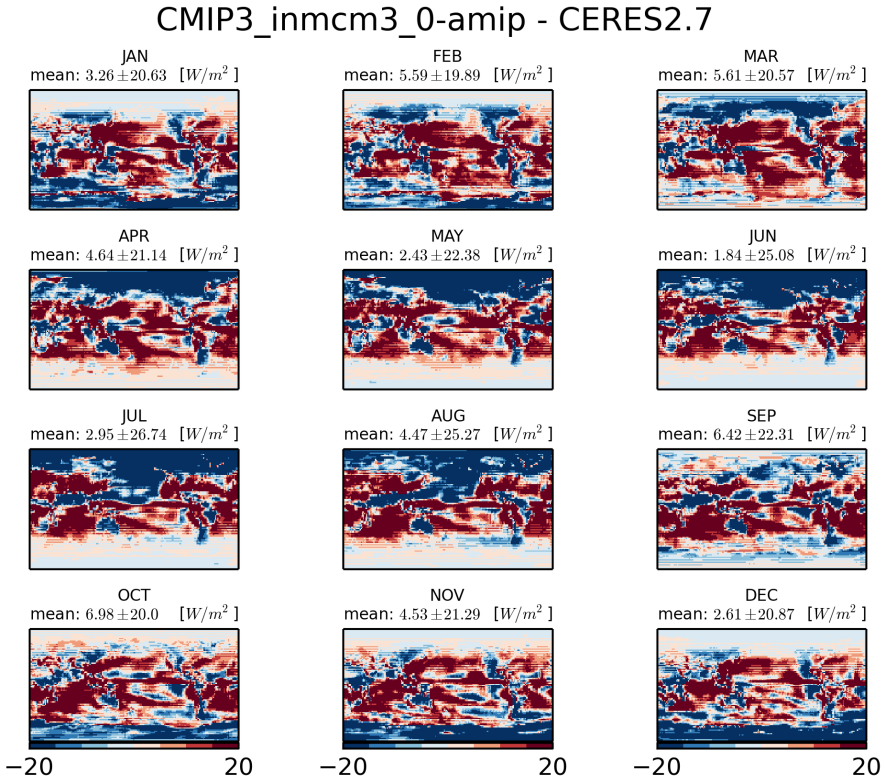



Figure 518: Monthly mean climatology of difference between INMCM3-0 and CERES2.7

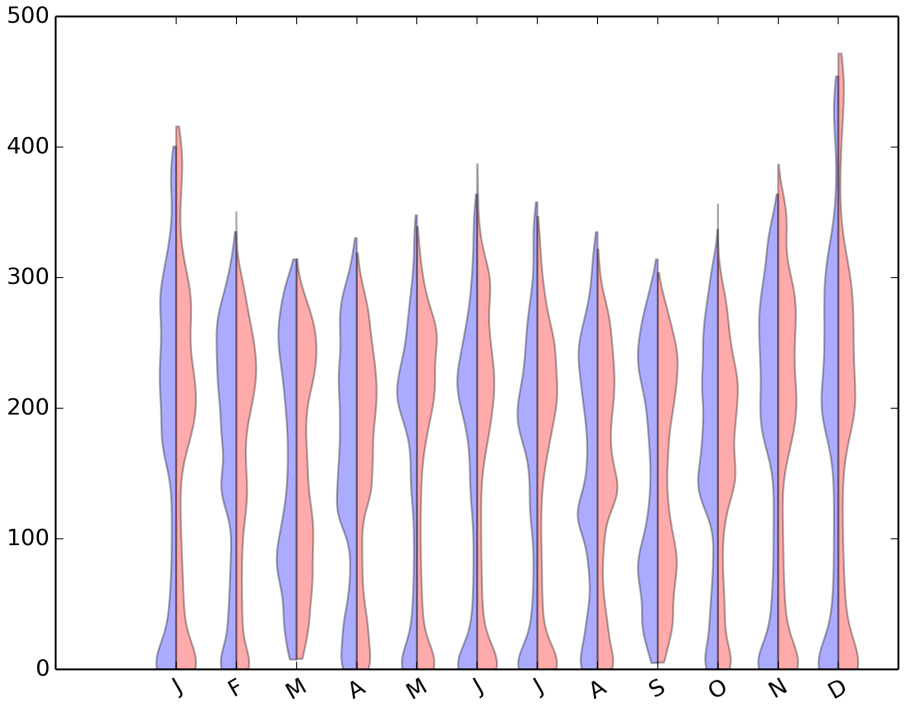



Figure 519: Violin plot for CMIP3-INMCM3-0-AMIP

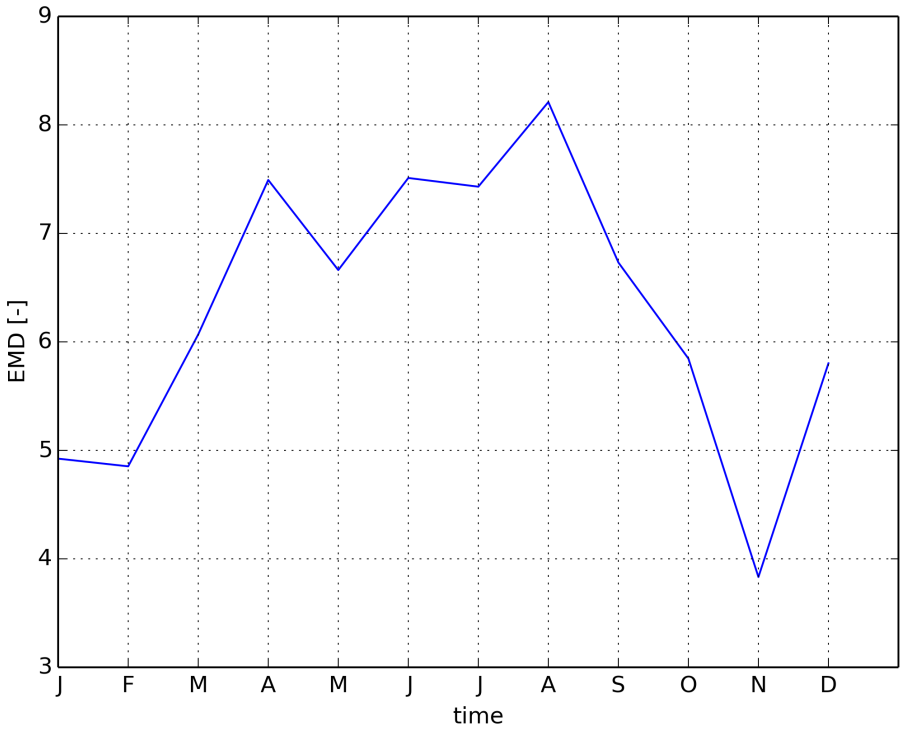



Figure 520: Timeseries of EMD

### 1.3.30 CMIP3 ipsl cm4-amip

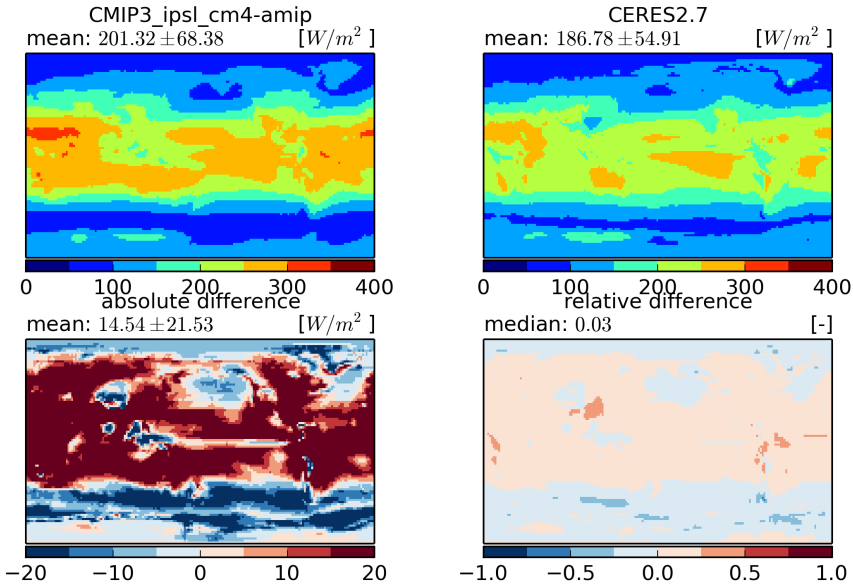



Figure 521: Temporal mean fields (top) and absolute and relative differences (bottom)

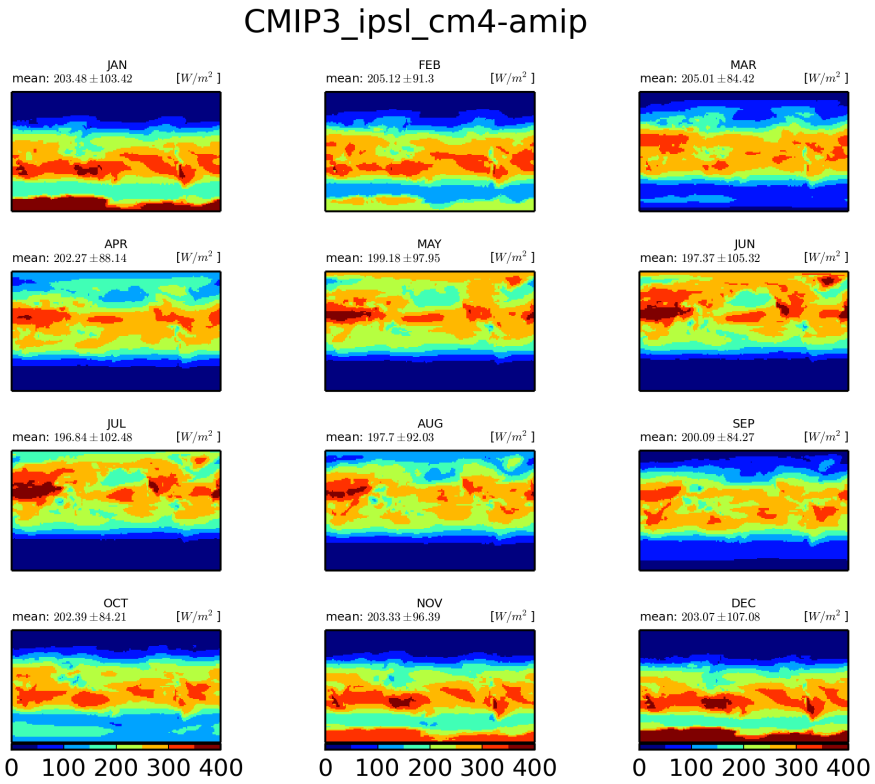



Figure 522: Monthly mean climatology for ipsl-cm4

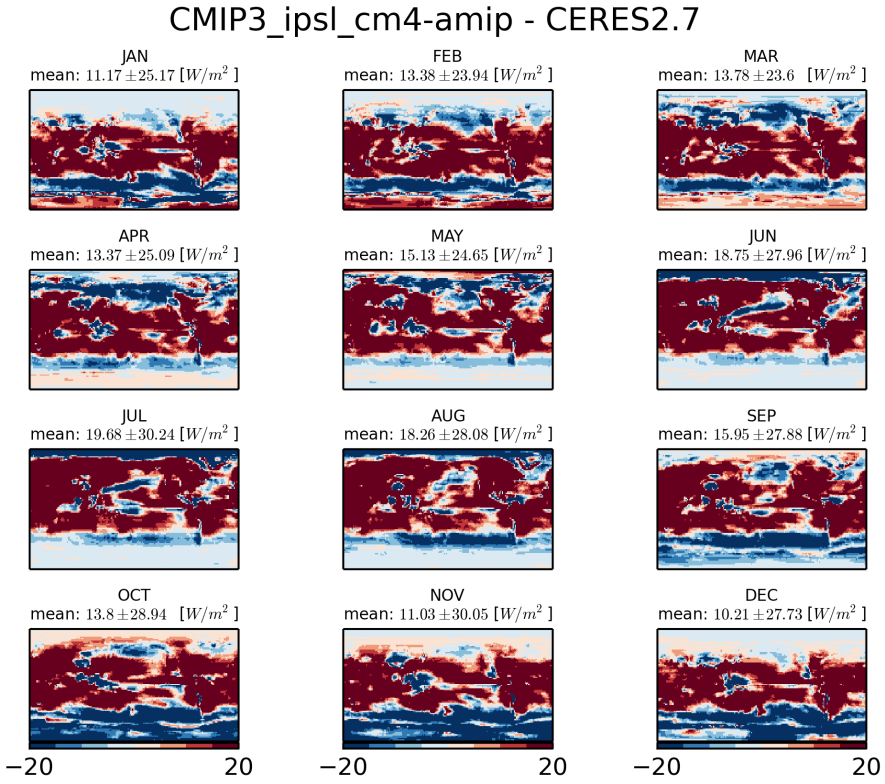



Figure 523: Monthly mean climatology of difference between IPSL-CM4 and CERES2.7

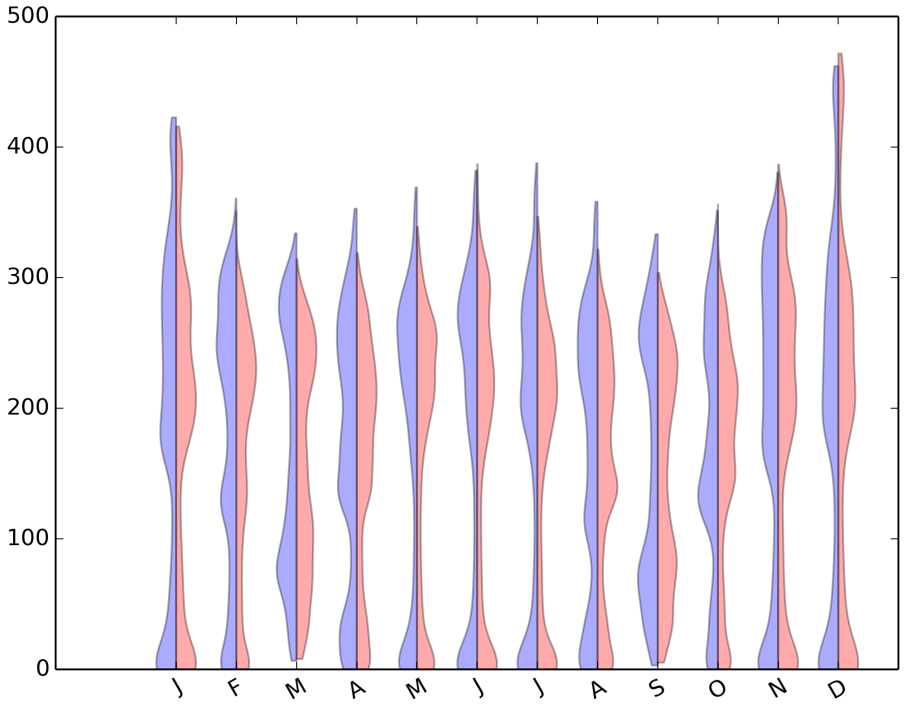



Figure 524: Violin plot for CMIP3-IPSL-CM4-AMIP

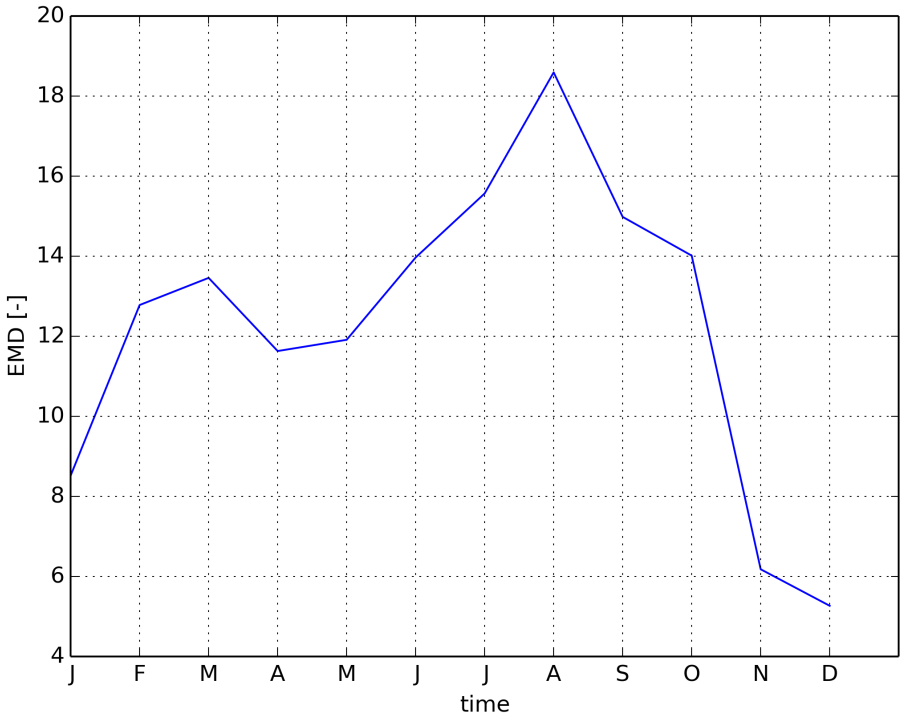



Figure 525: Timeseries of EMD

### 1.3.31 CMIP3 miroc3 2 hires-amip

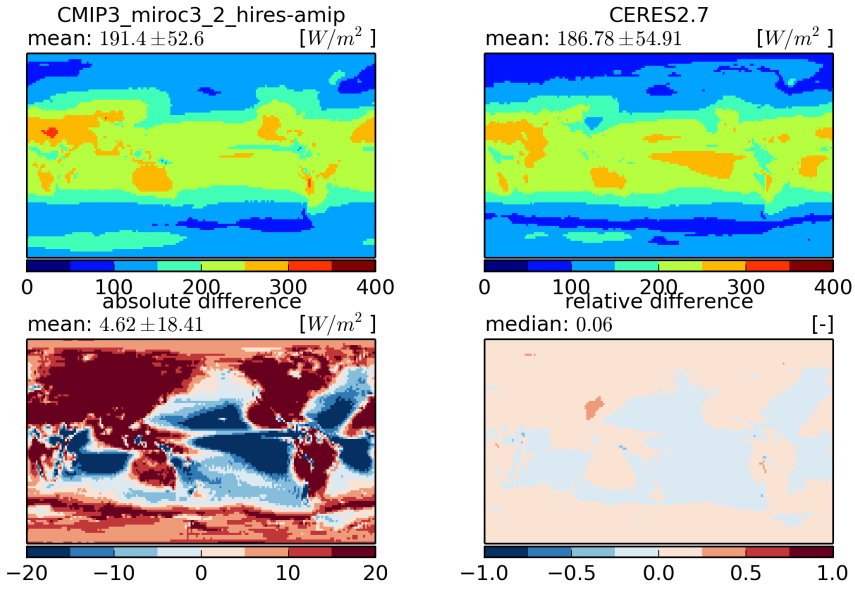



Figure 526: Temporal mean fields (top) and absolute and relative differences (bottom)

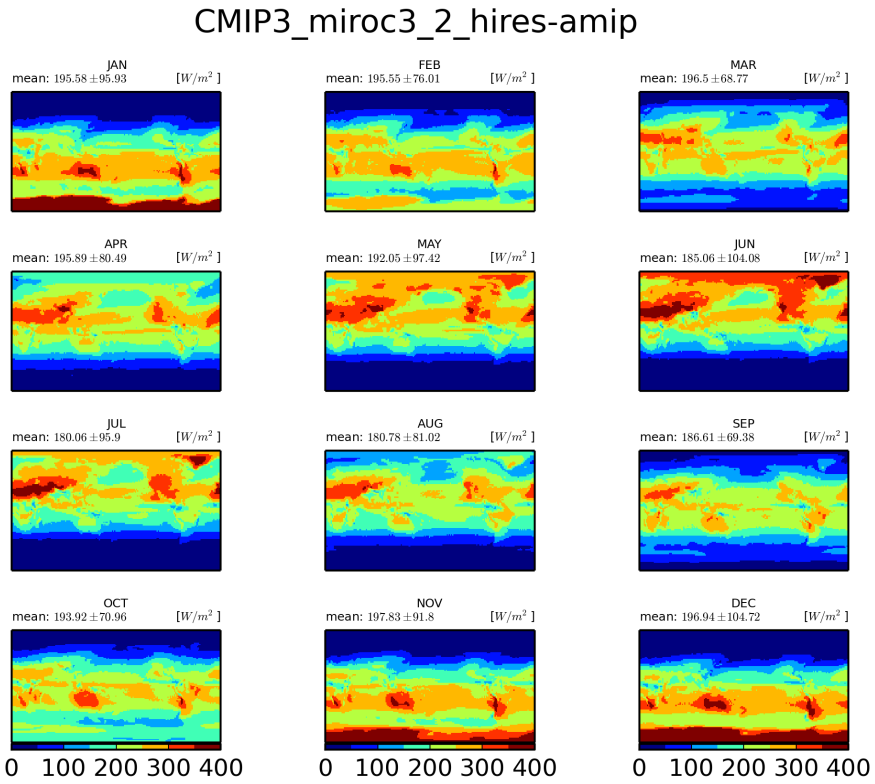



Figure 527: Monthly mean climatology for miroc3-2-hires

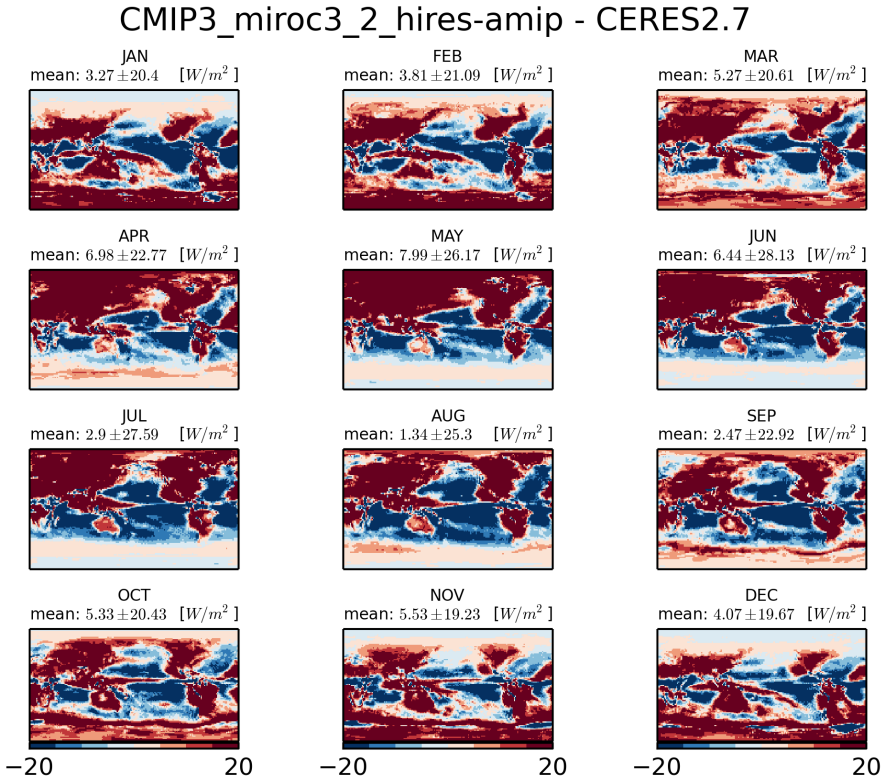



Figure 528: Monthly mean climatology of difference between MIROC3-2-HIRES and CERES2.7

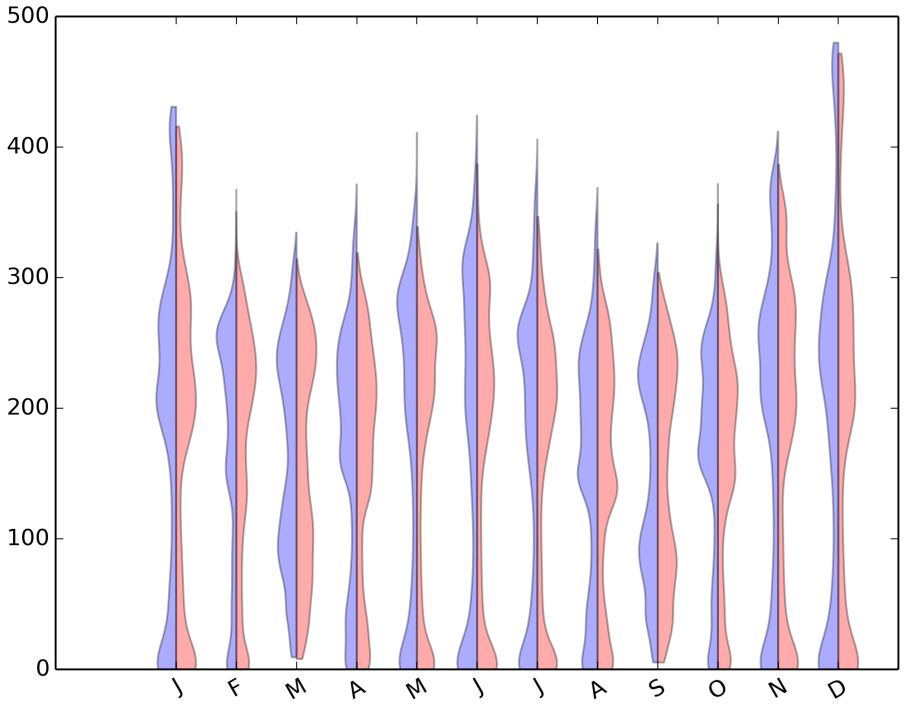



Figure 529: Violin plot for CMIP3-MIROC3-2-HIRES-AMIP

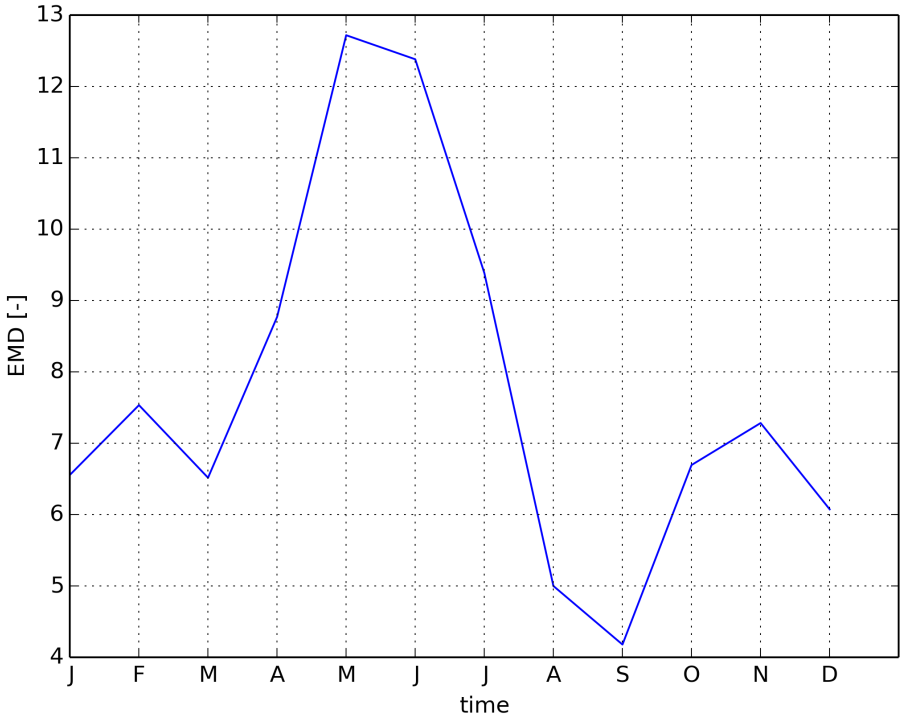



Figure 530: Timeseries of EMD

### 1.3.32 CMIP3 miroc3 2 medres-amip

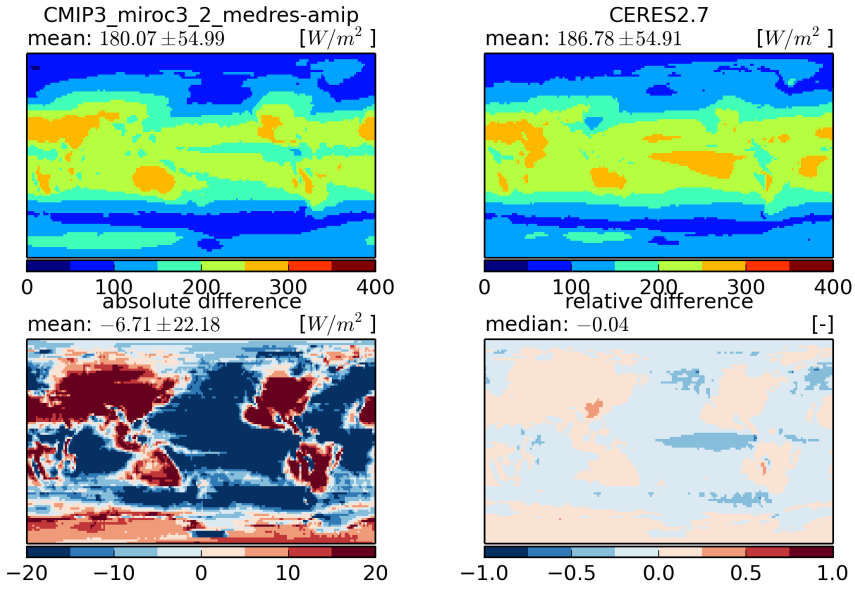



Figure 531: Temporal mean fields (top) and absolute and relative differences (bottom)

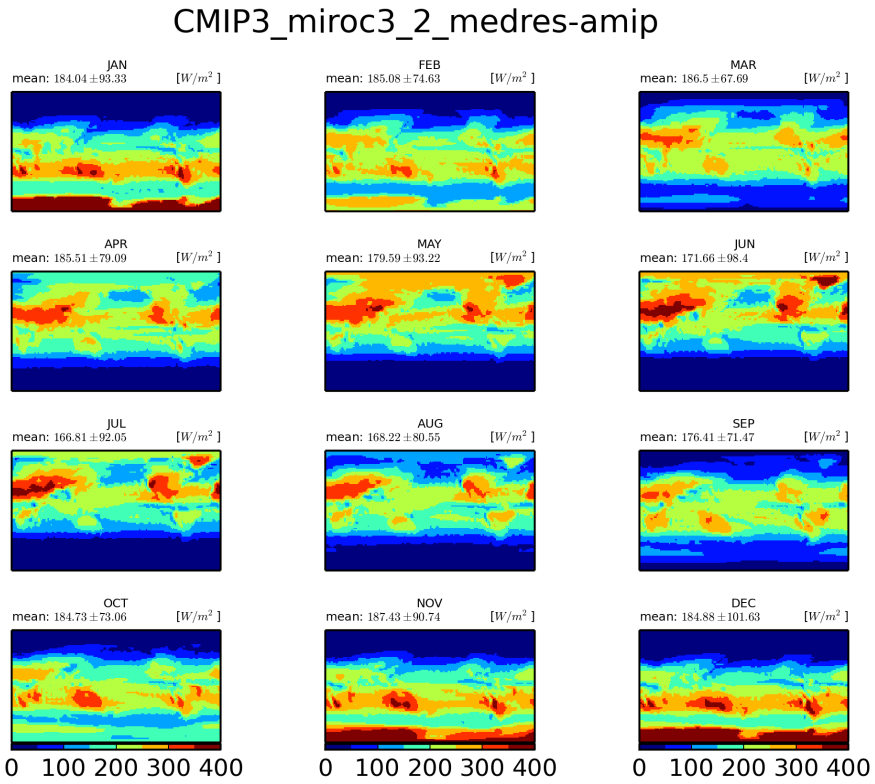



Figure 532: Monthly mean climatology for miroc3-2-medres

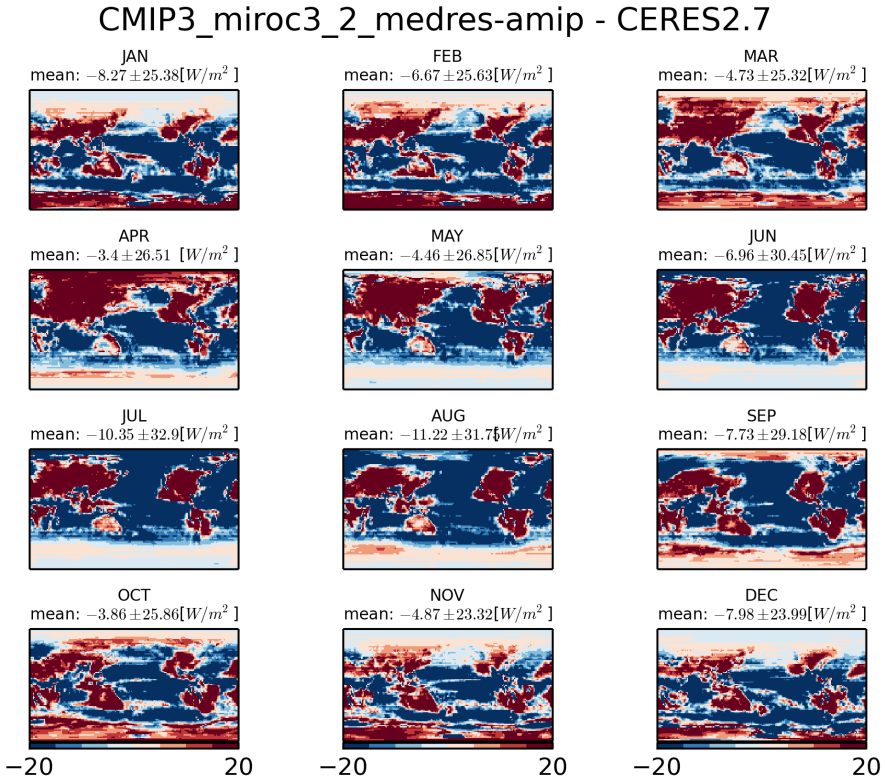



Figure 533: Monthly mean climatology of difference between MIROC3-2-MEDRES and CERES2.7

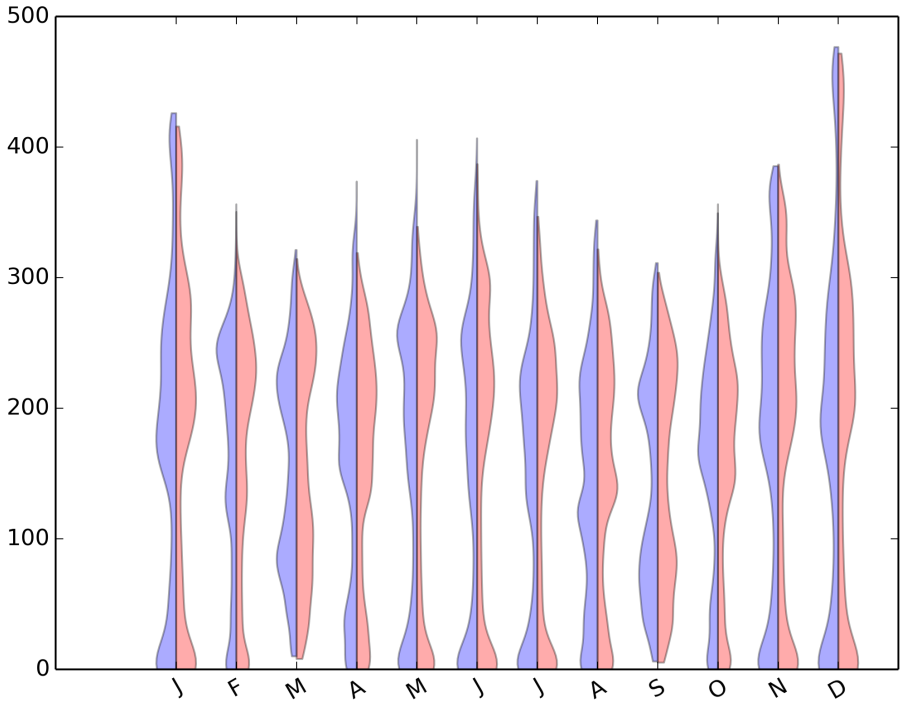



Figure 534: Violin plot for CMIP3-MIROC3-2-MEDRES-AMIP

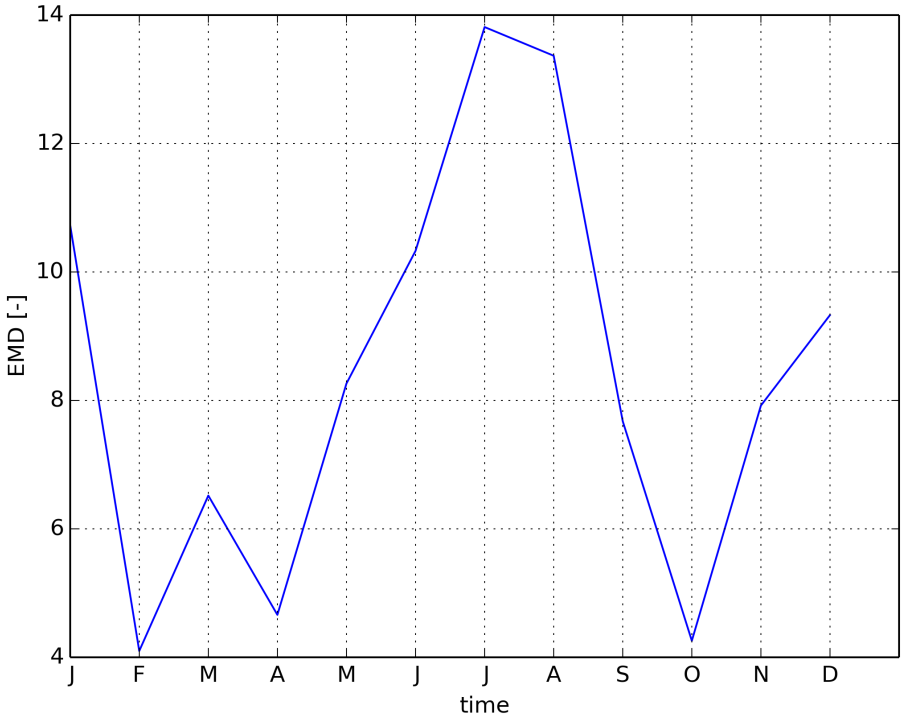



Figure 535: Timeseries of EMD

### 1.3.33 CMIP3 mpi echam5-amip

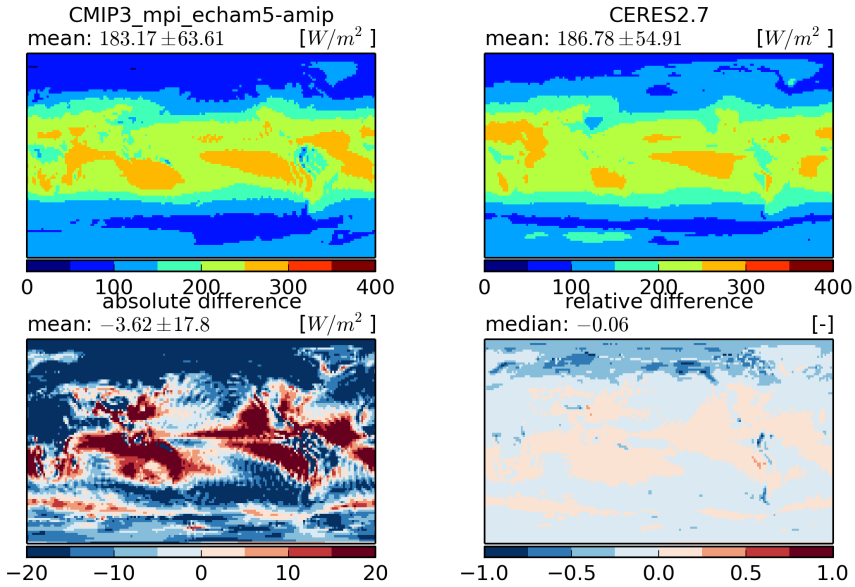



Figure 536: Temporal mean fields (top) and absolute and relative differences (bottom)

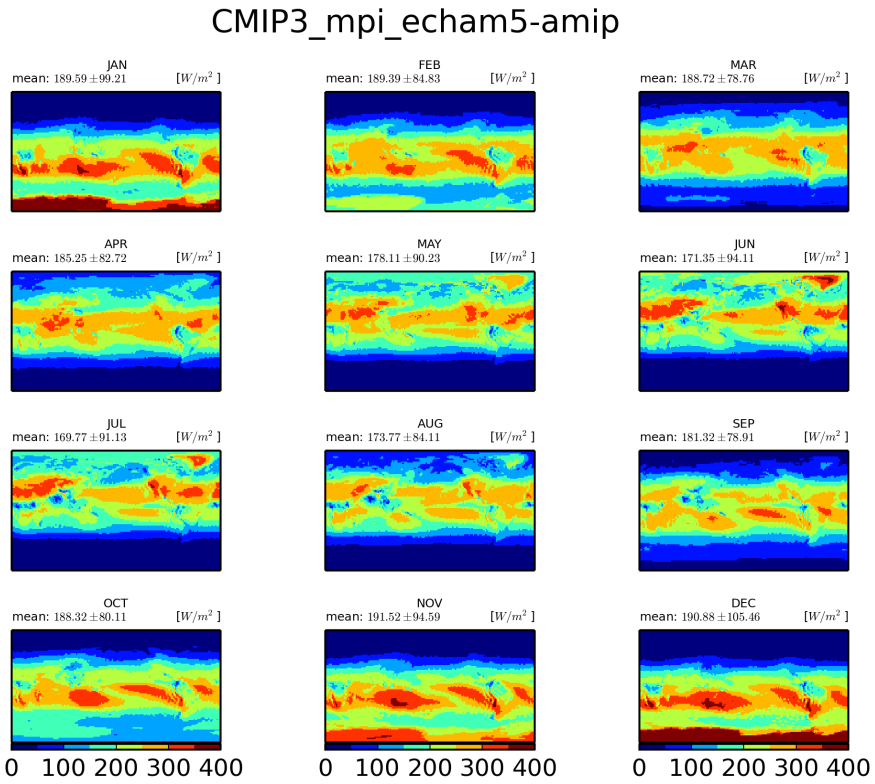



Figure 537: Monthly mean climatology for mpi-echam5

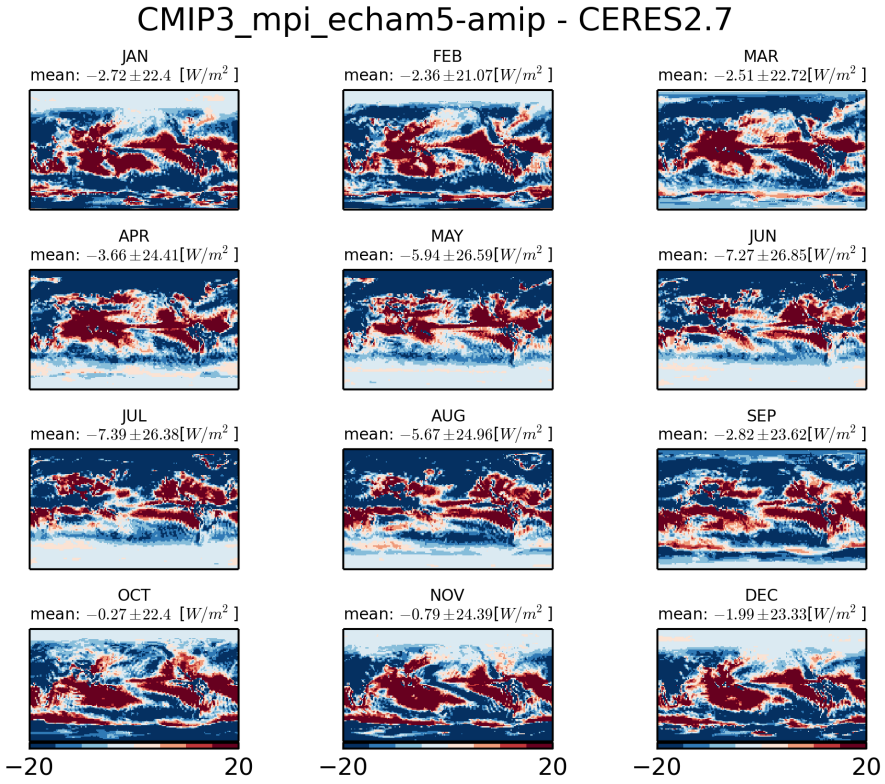



Figure 538: Monthly mean climatology of difference between MPI-ECHAM5 and CERES2.7

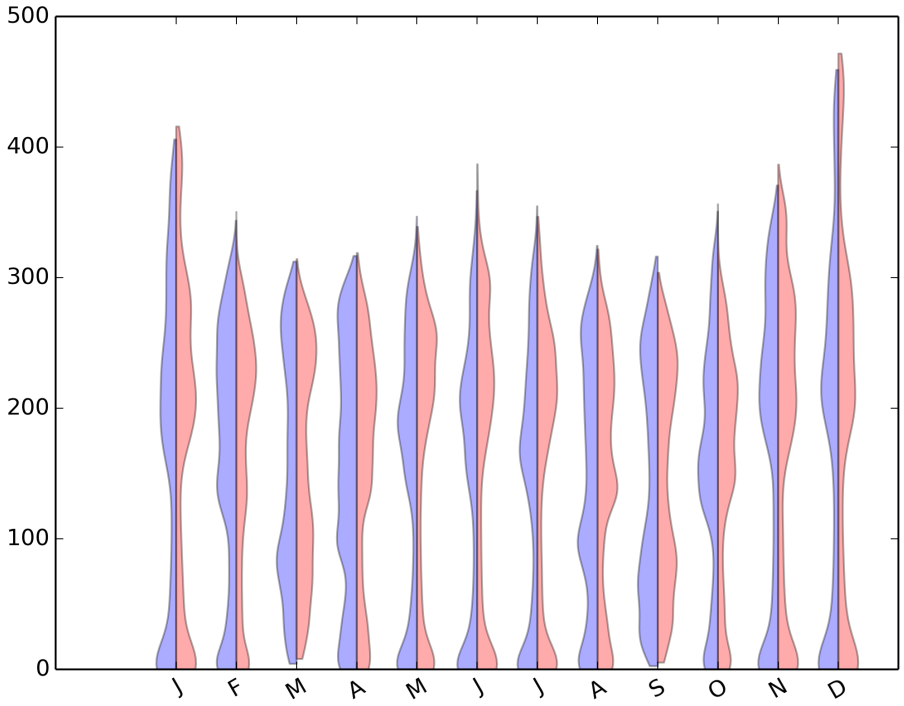



Figure 539: Violin plot for CMIP3-MPI-ECHAM5-AMIP

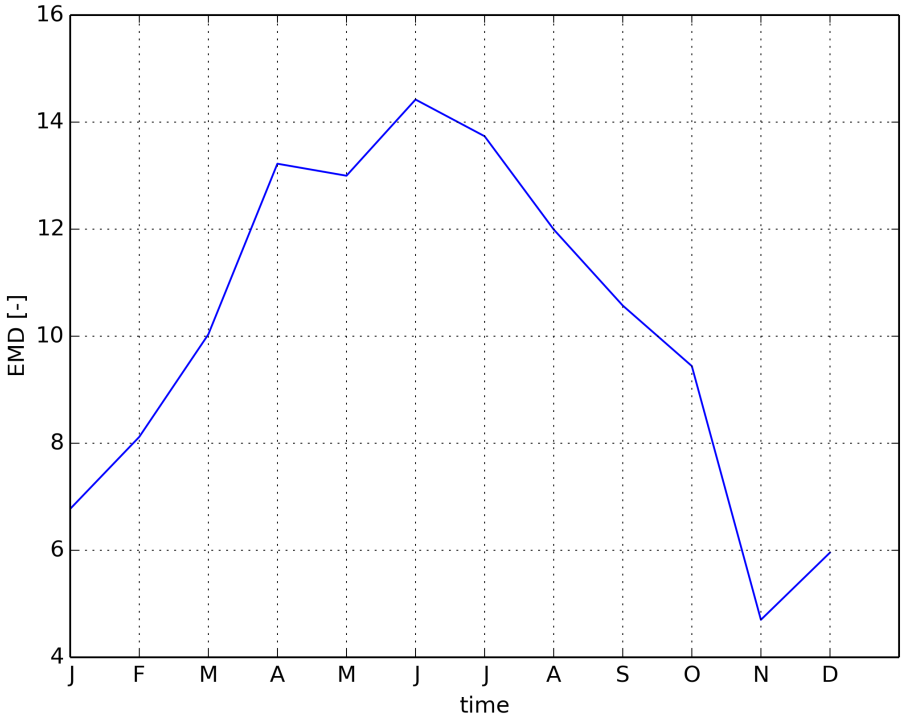



Figure 540: Timeseries of EMD

### 1.3.34 CMIP3 ncar ccsm3 0-amip

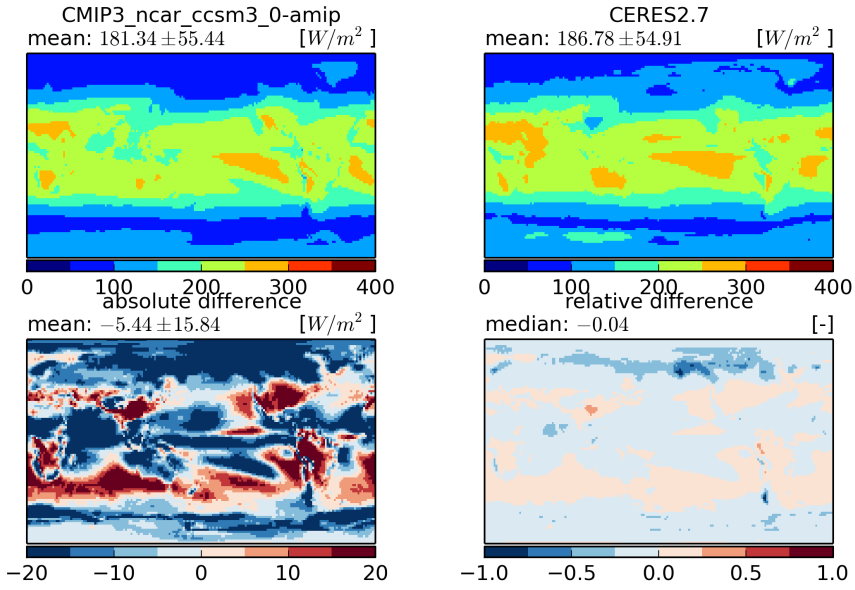



Figure 541: Temporal mean fields (top) and absolute and relative differences (bottom)

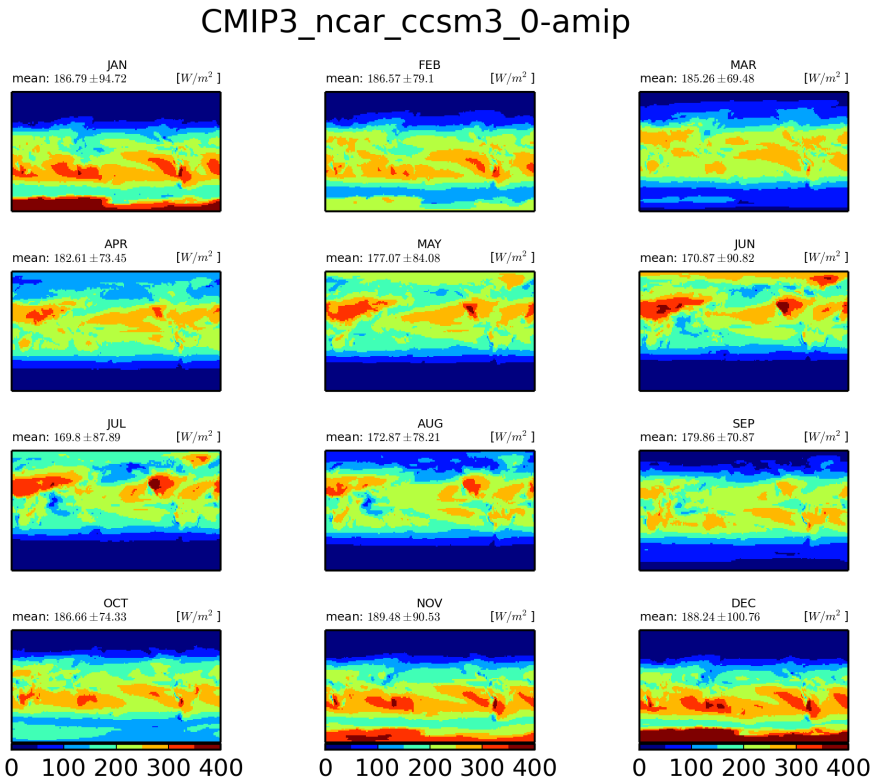



Figure 542: Monthly mean climatology for ncar-ccsm3-0

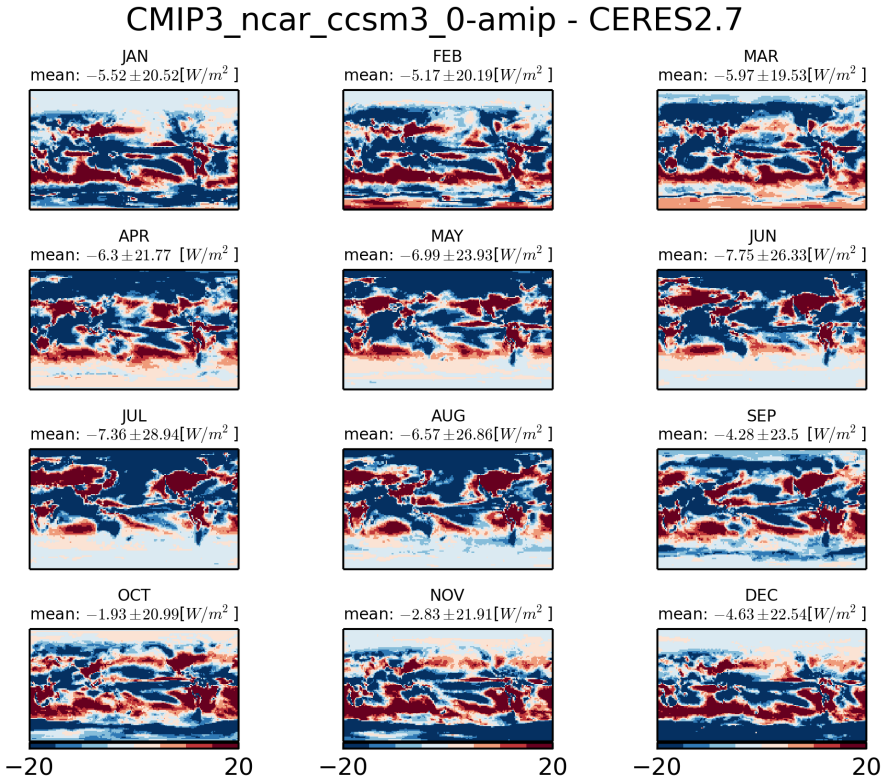



Figure 543: Monthly mean climatology of difference between NCAR-CCSM3-0 and CERES2.7

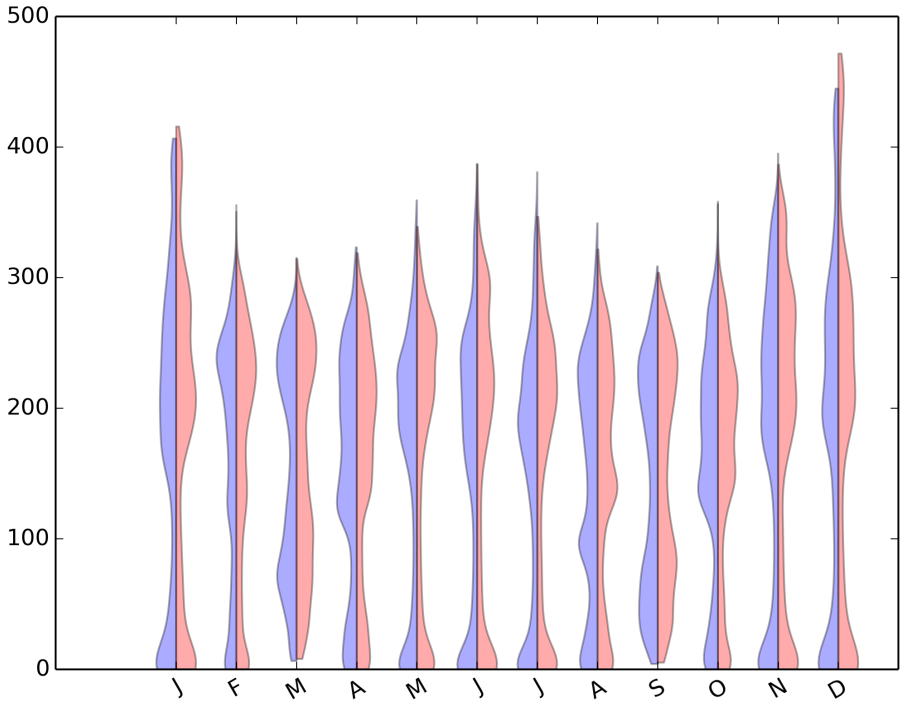



Figure 544: Violin plot for CMIP3-NCAR-CCSM3-0-AMIP

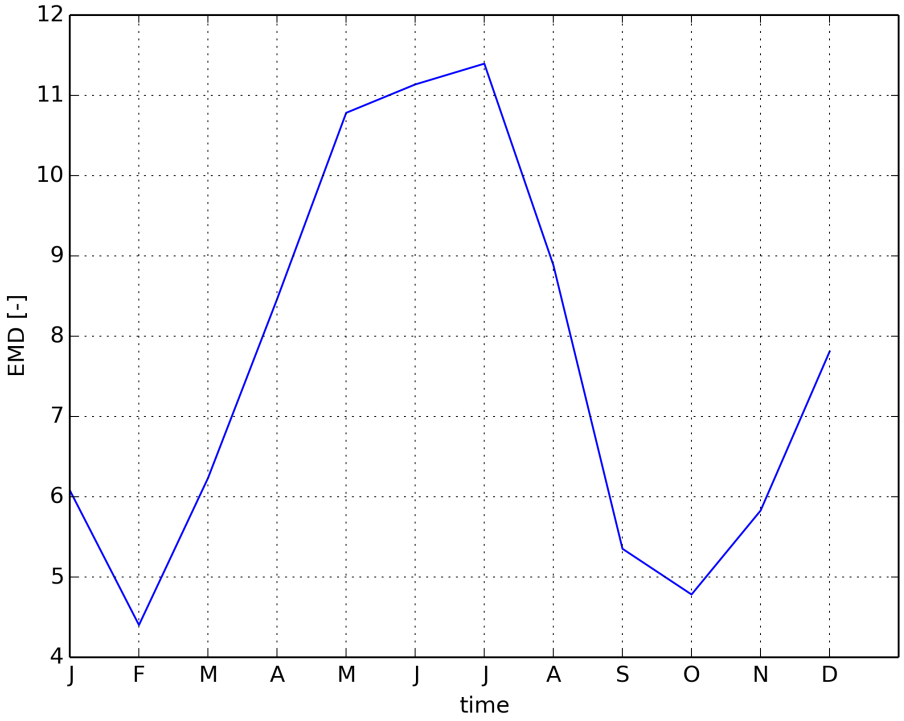



Figure 545: Timeseries of EMD

### 1.3.35 CMIP3 ncar pcm1-amip

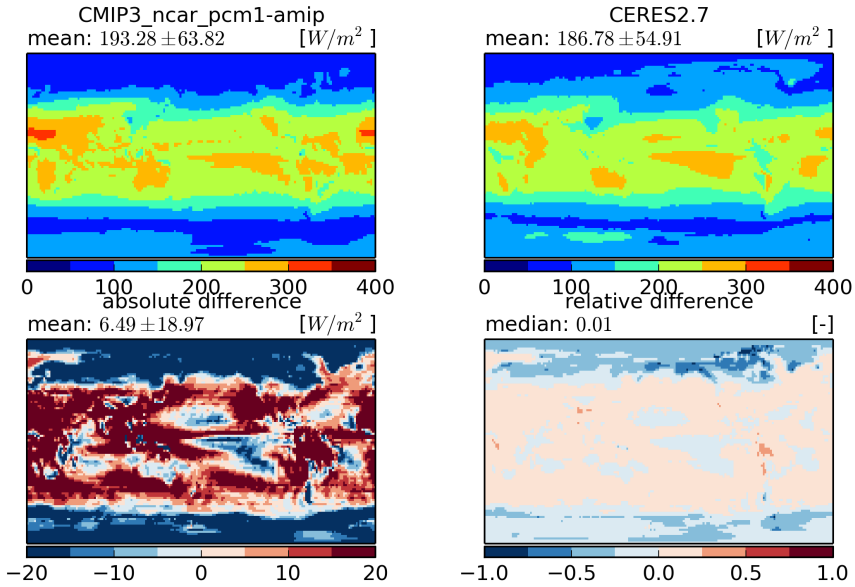



Figure 546: Temporal mean fields (top) and absolute and relative differences (bottom)

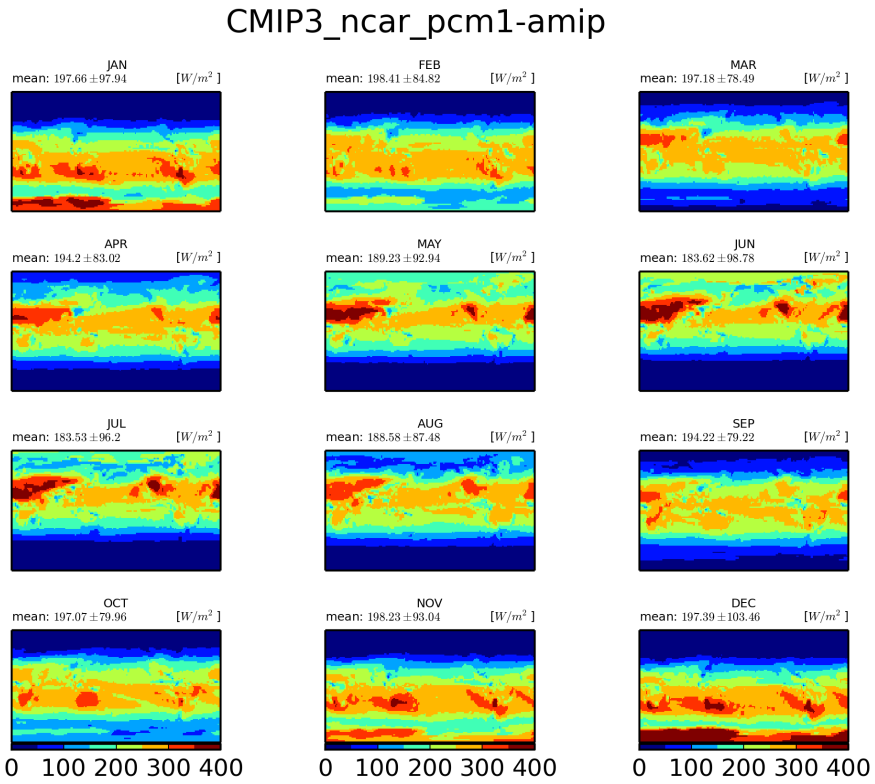



Figure 547: Monthly mean climatology for ncar-pcm1

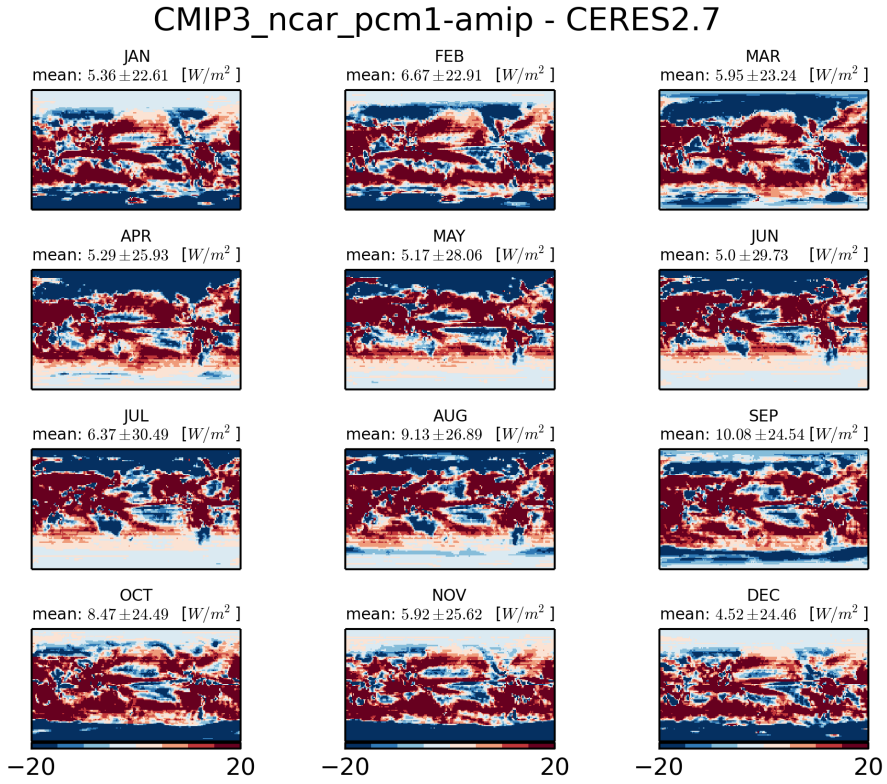



Figure 548: Monthly mean climatology of difference between NCAR-PCM1 and CERES2.7

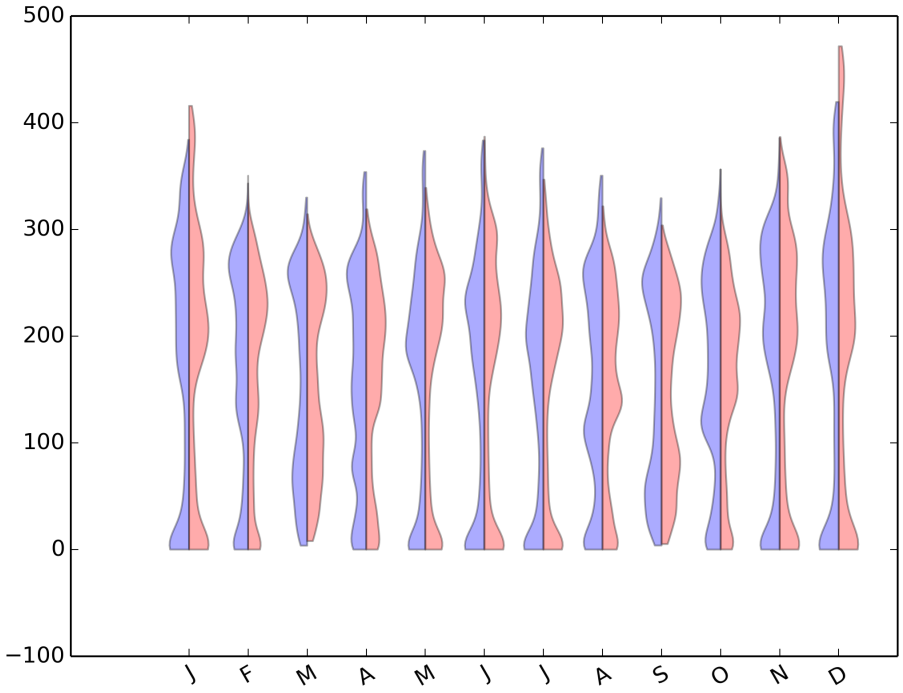



Figure 549: Violin plot for CMIP3-NCAR-PCM1-AMIP

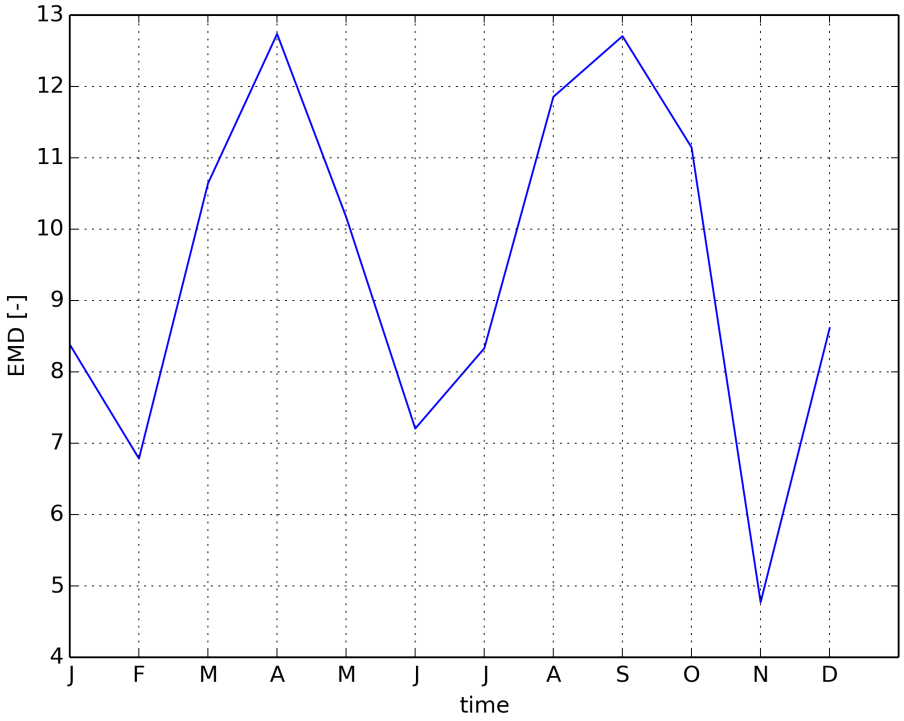



Figure 550: Timeseries of EMD

### 1.3.36 CMIP3 ukmo hadgem1-amip

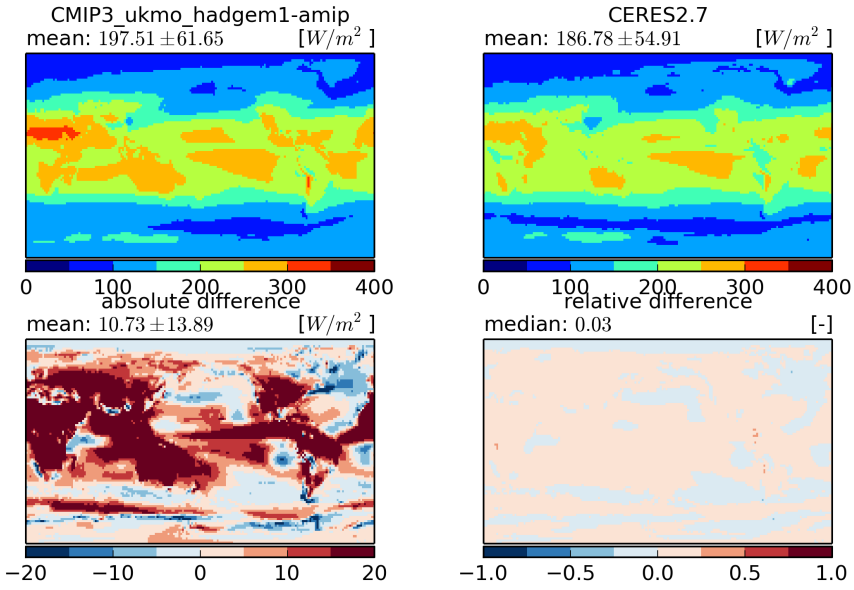



Figure 551: Temporal mean fields (top) and absolute and relative differences (bottom)

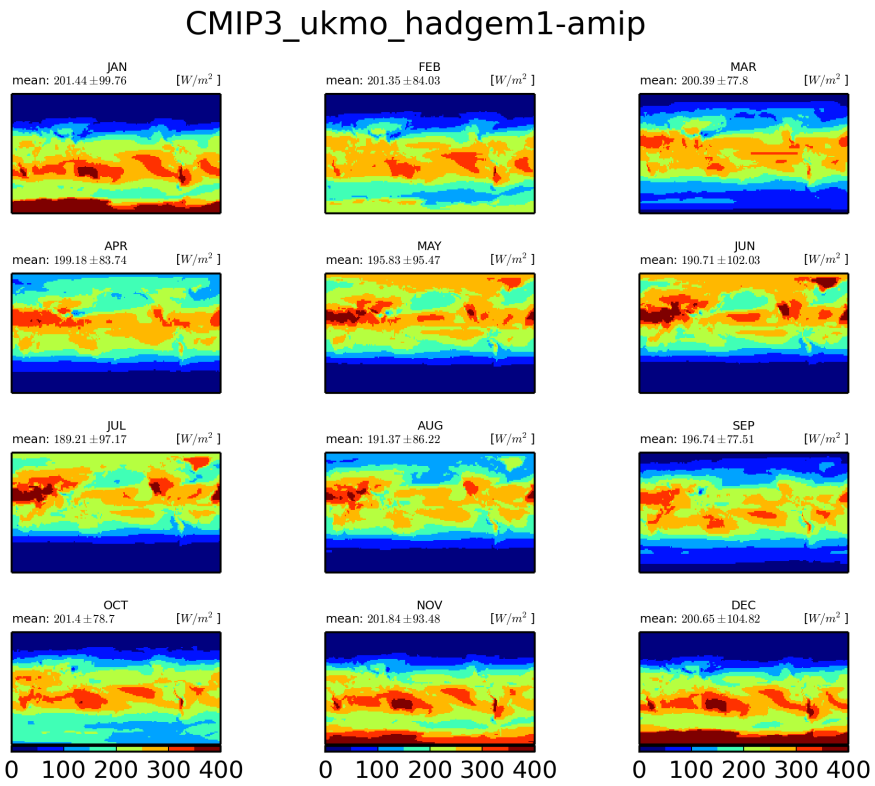



Figure 552: Monthly mean climatology for ukmo-hadgem1

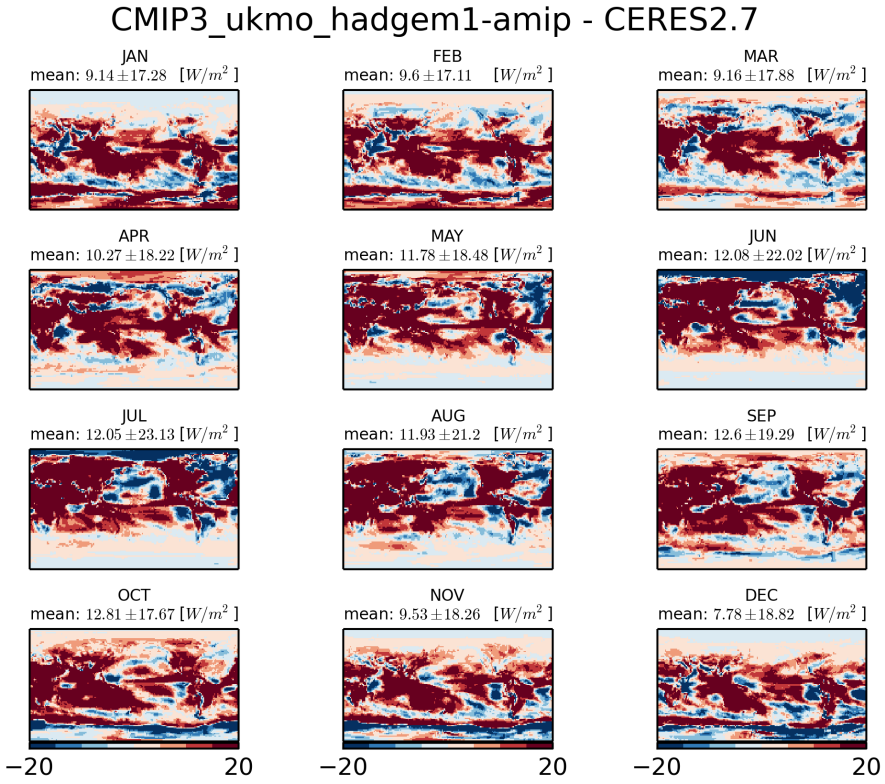



Figure 553: Monthly mean climatology of difference between UKMO-HADGEM1 and CERES2.7

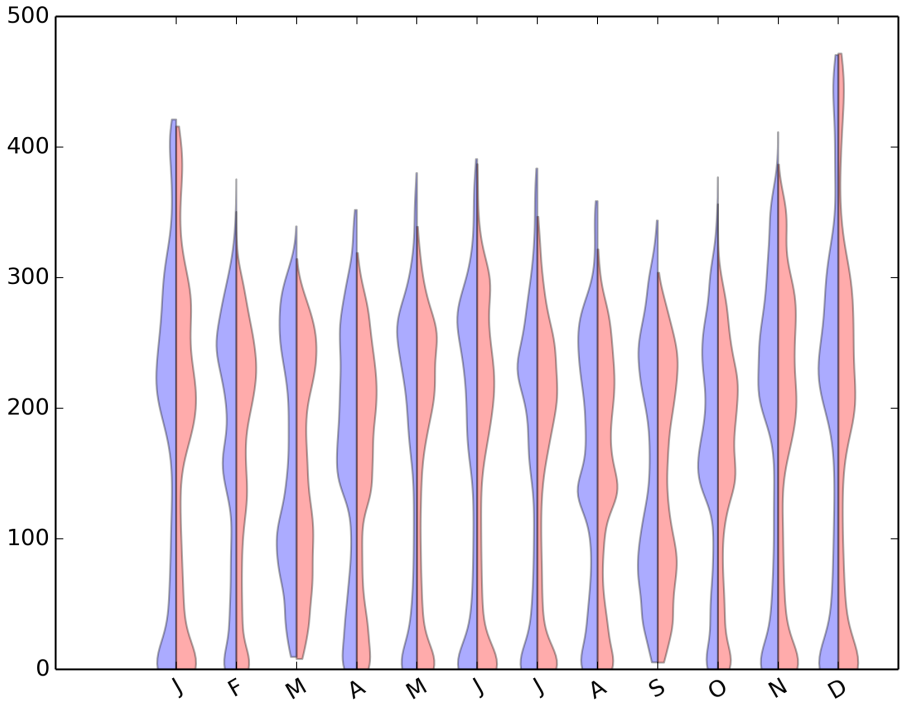



Figure 554: Violin plot for CMIP3-UKMO-HADGEM1-AMIP

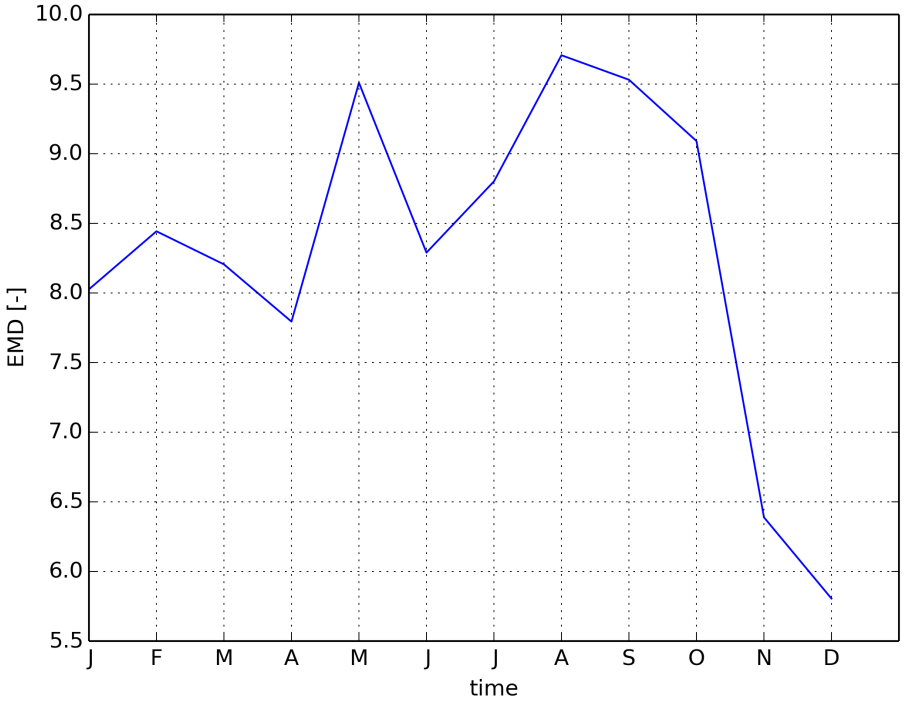



Figure 555: Timeseries of EMD

### 1.3.37 model mean

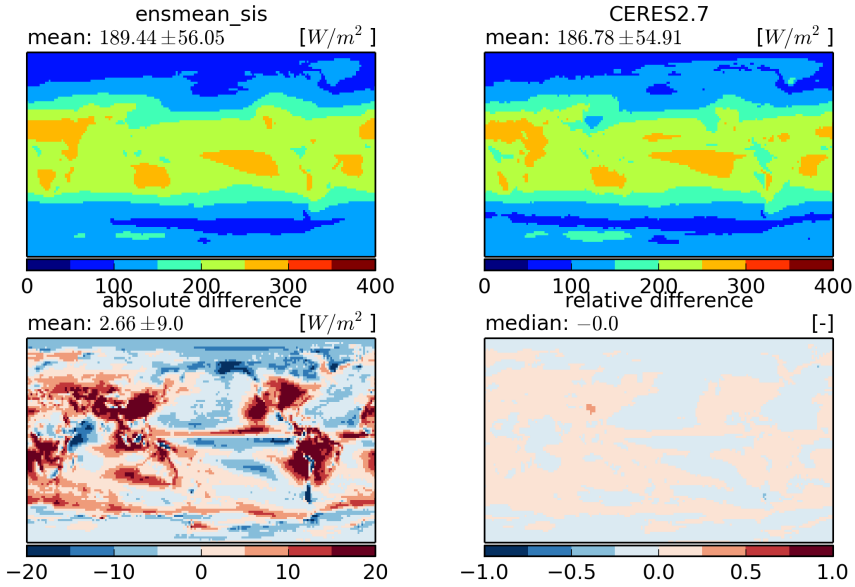



Figure 556: Temporal mean fields (top) and absolute and relative differences (bottom)

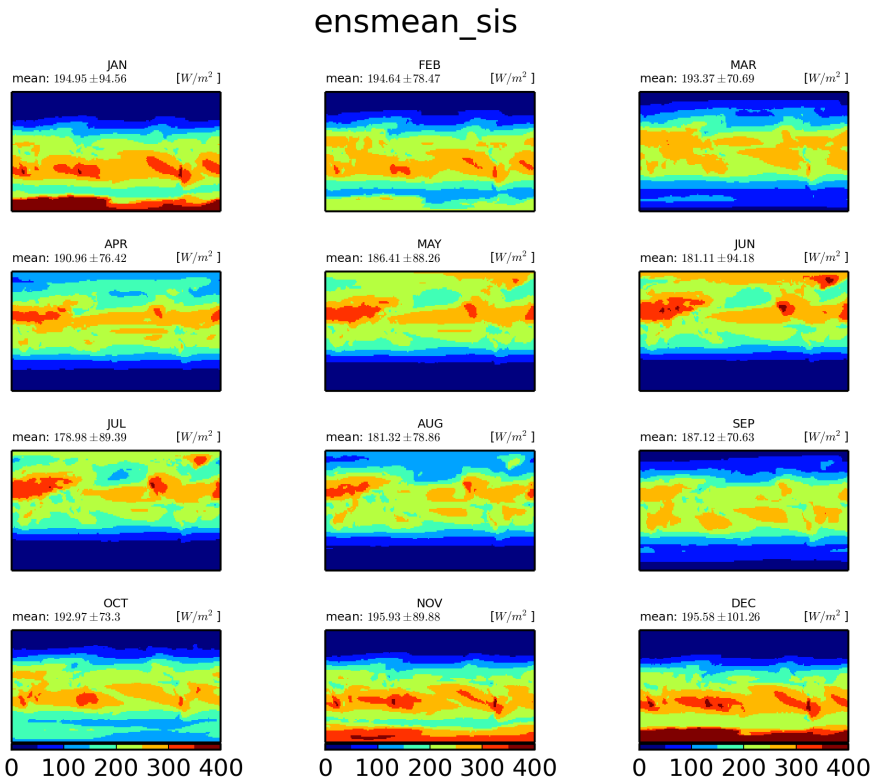



Figure 557: Monthly mean climatology for mean-model

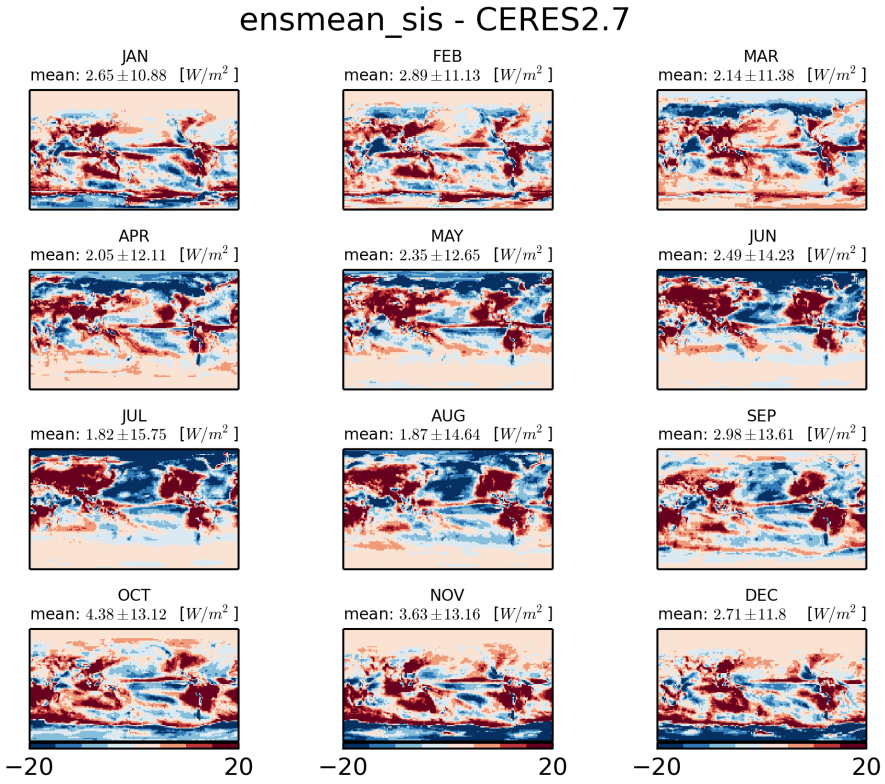



Figure 558: Monthly mean climatology of difference between MEAN-MODEL and CERES2.7

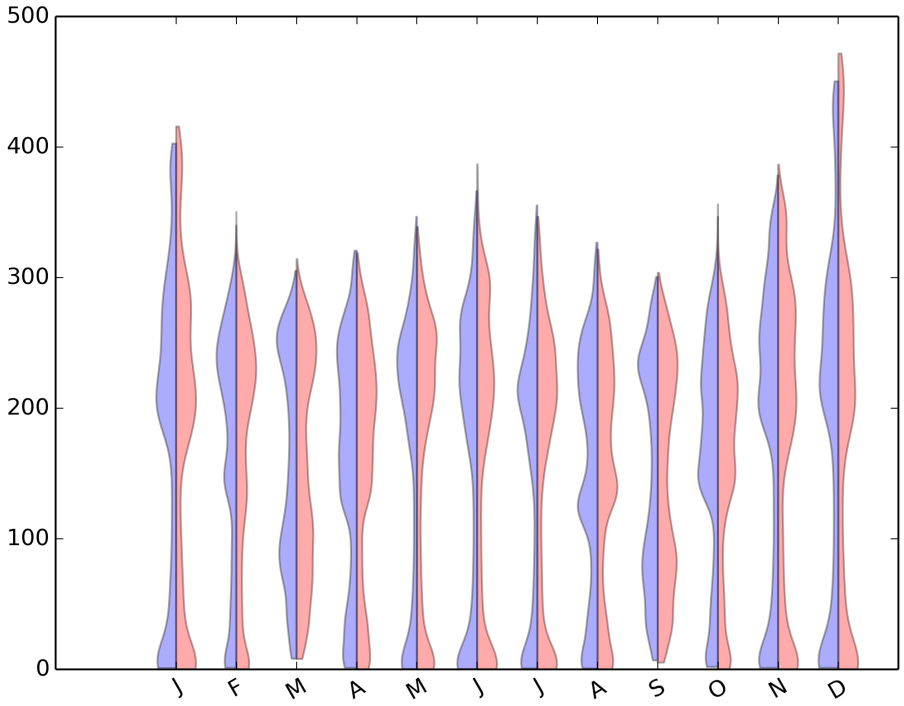



Figure 559: Violin plot for ENSMEAN-SIS

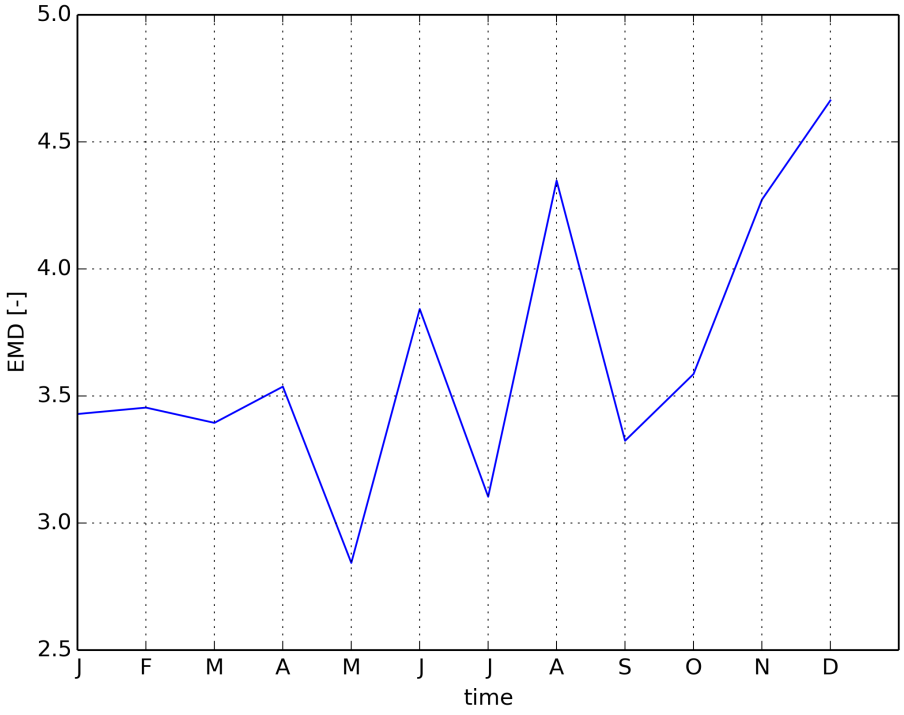



Figure 560: Timeseries of EMD

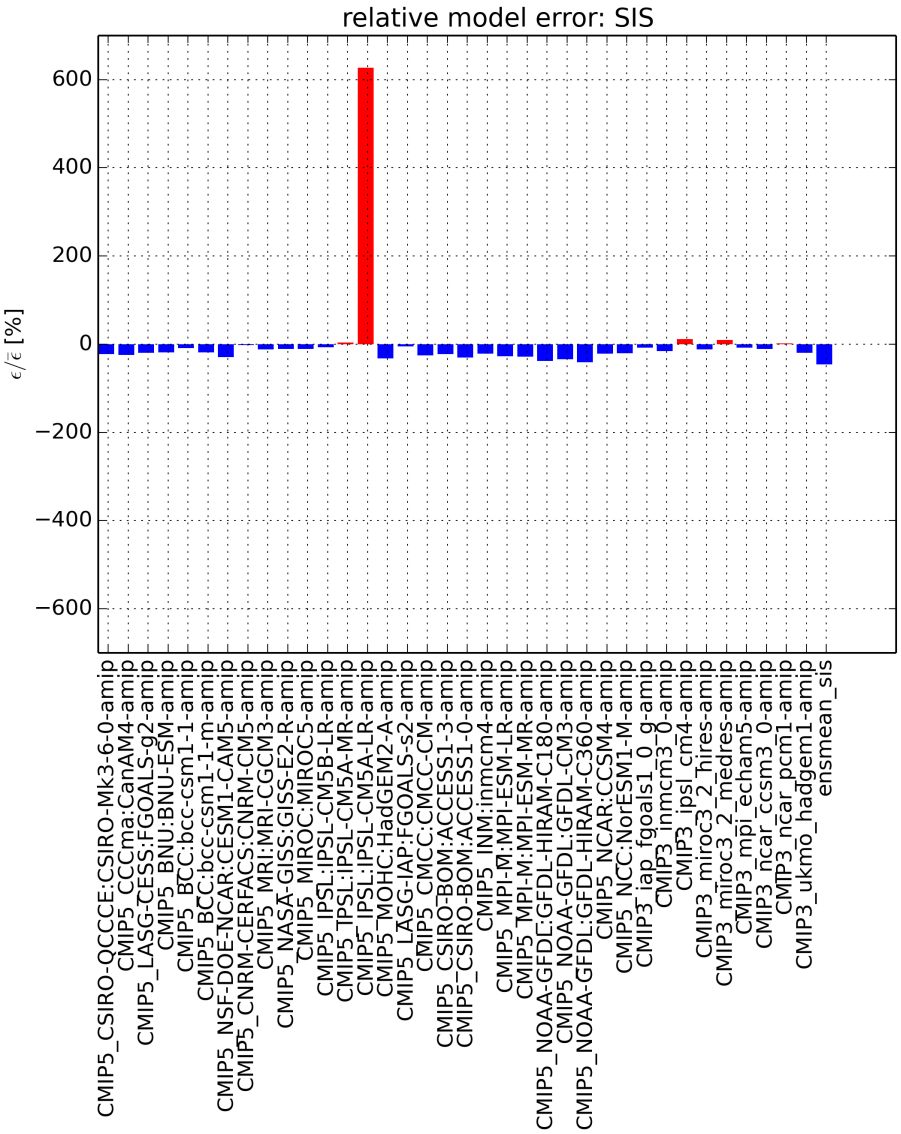



Figure 561: Relative model performance for SIS

## 1.4 SRBv3.0

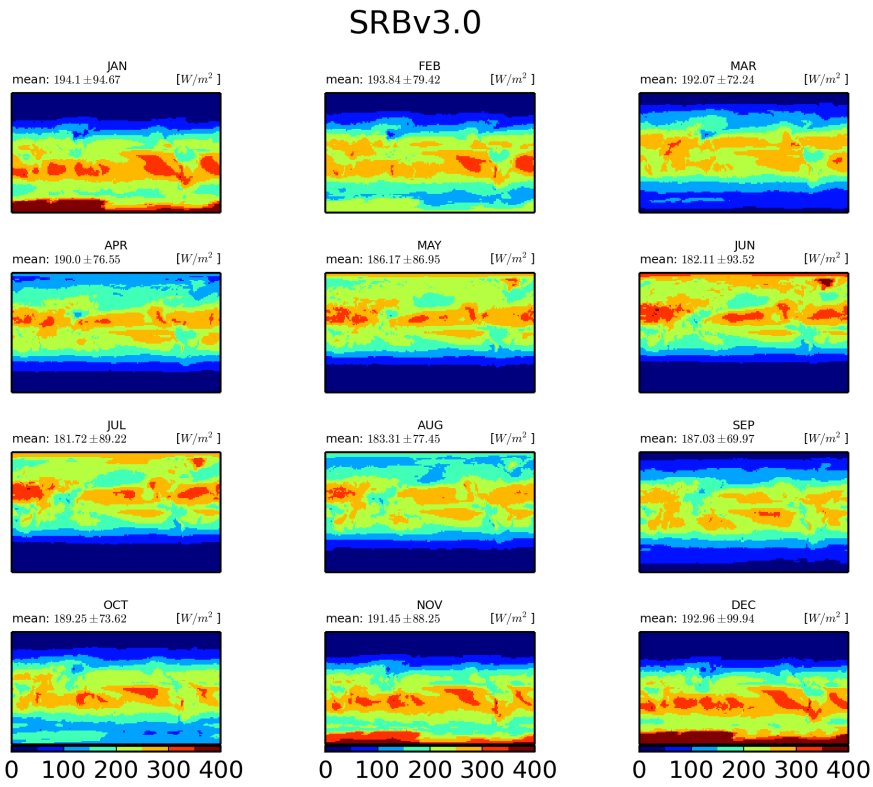



Figure 562: Monthly mean SRBv3.0

### 1.4.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

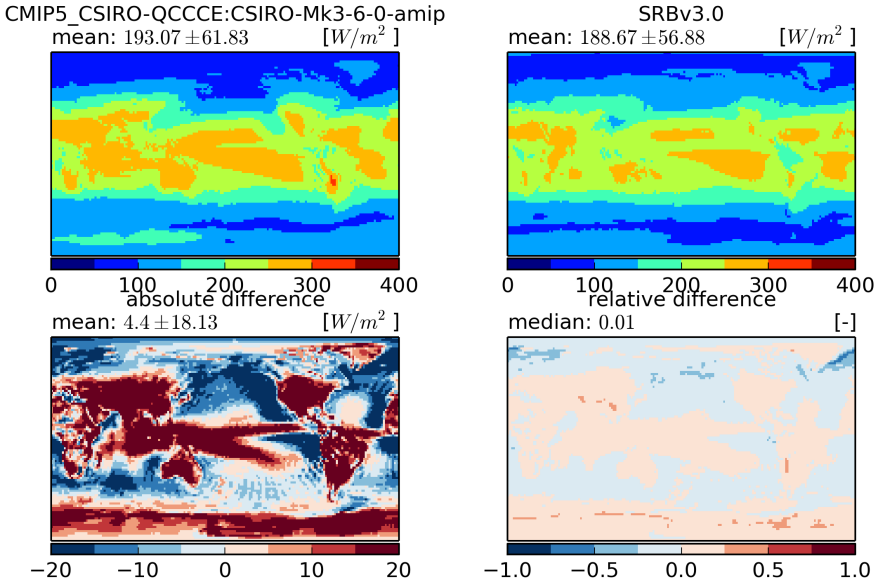



Figure 563: Temporal mean fields (top) and absolute and relative differences (bottom)

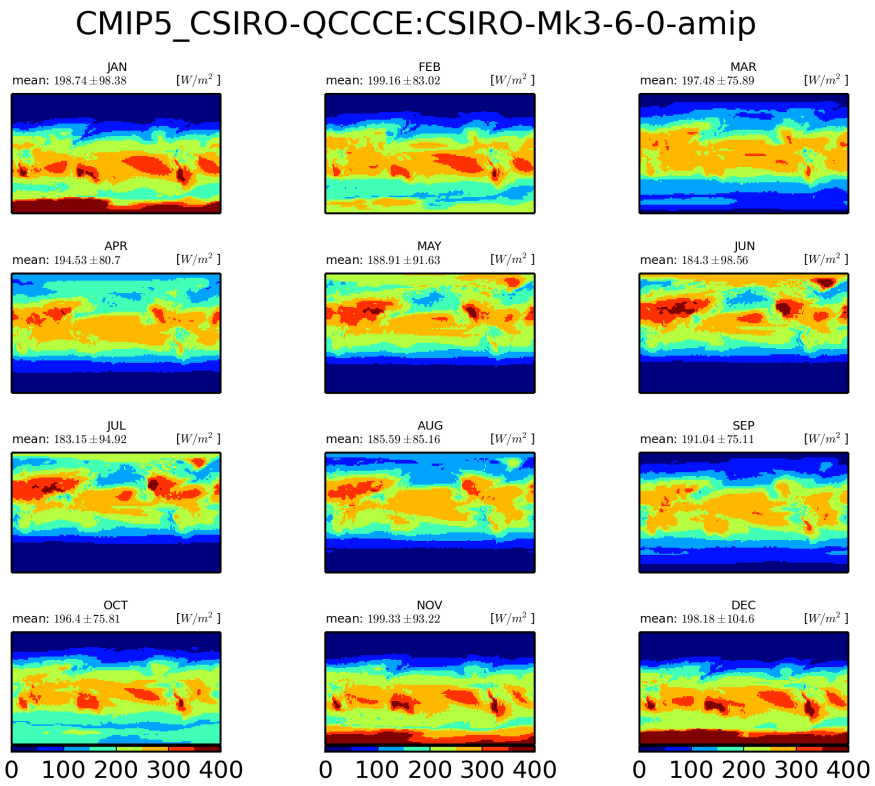



Figure 564: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

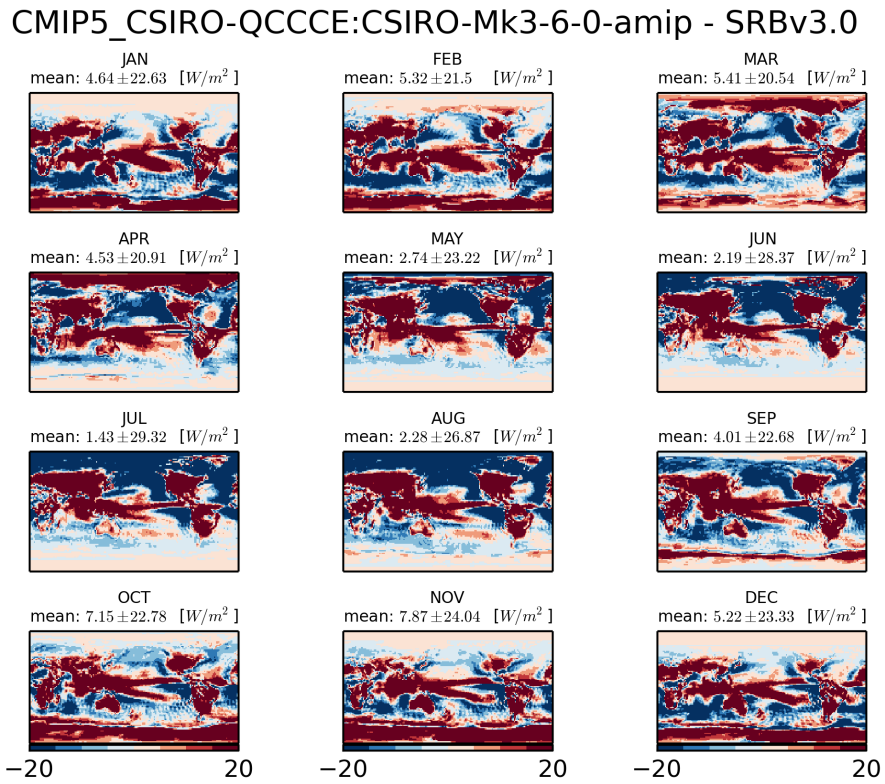



Figure 565: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and SRBV3.0

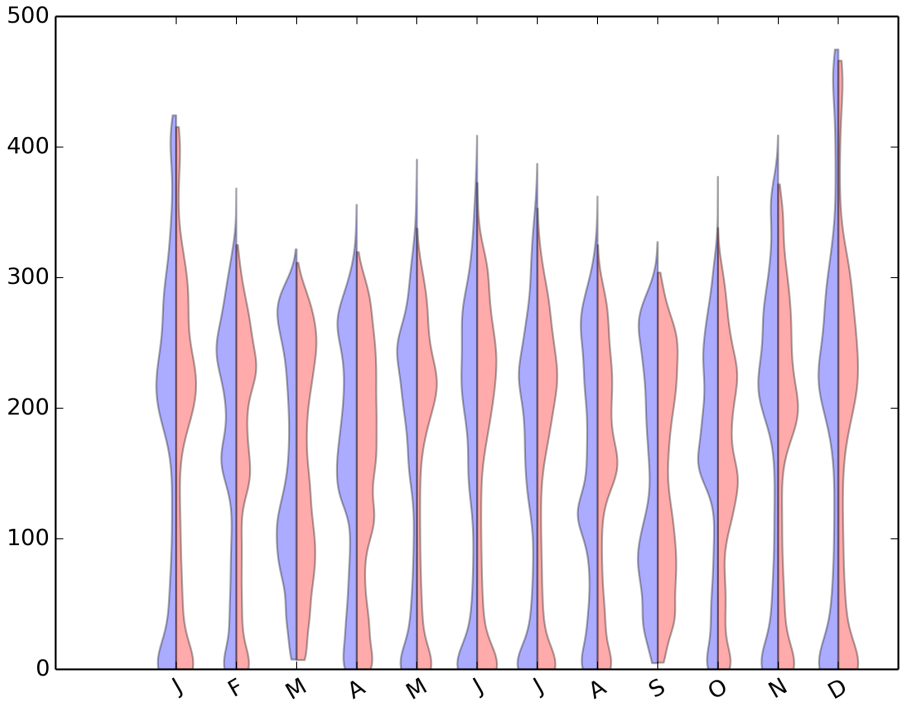



Figure 566: Violin plot for CMIP5-CSIRO-QCCCE:CSIRO-MK3-6-0-AMIP

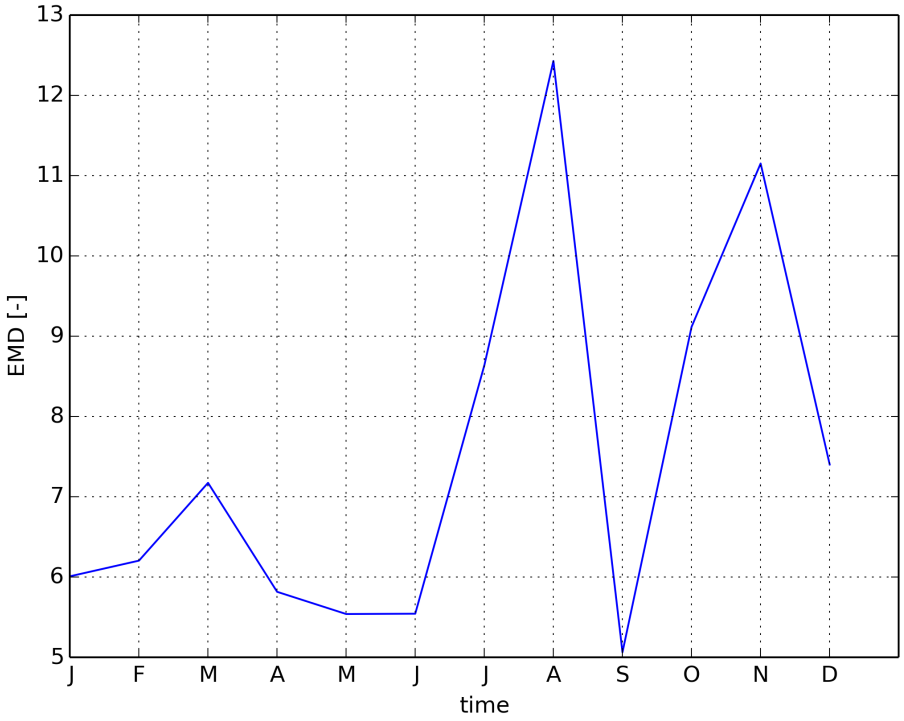



Figure 567: Timeseries of EMD

### 1.4.2 CMIP5 CCCma:CanAM4-amip

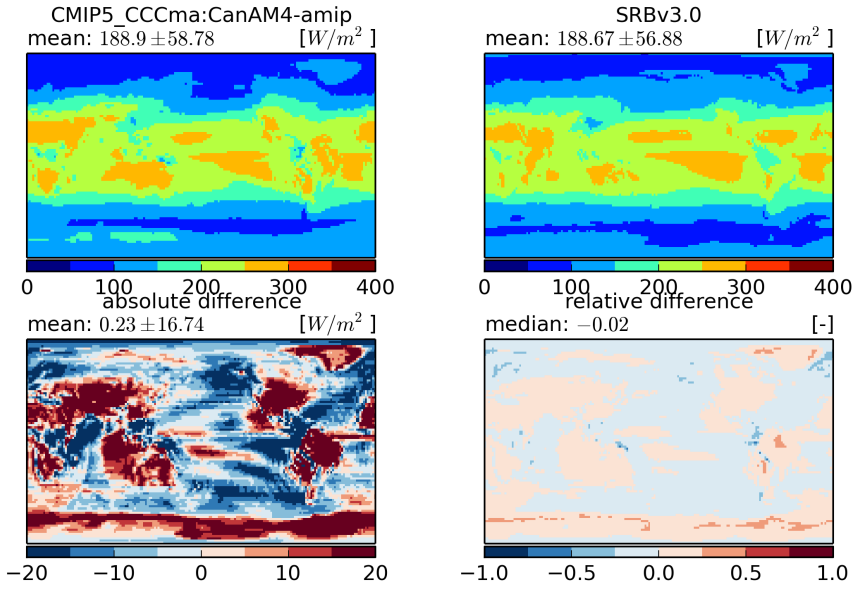



Figure 568: Temporal mean fields (top) and absolute and relative differences (bottom)

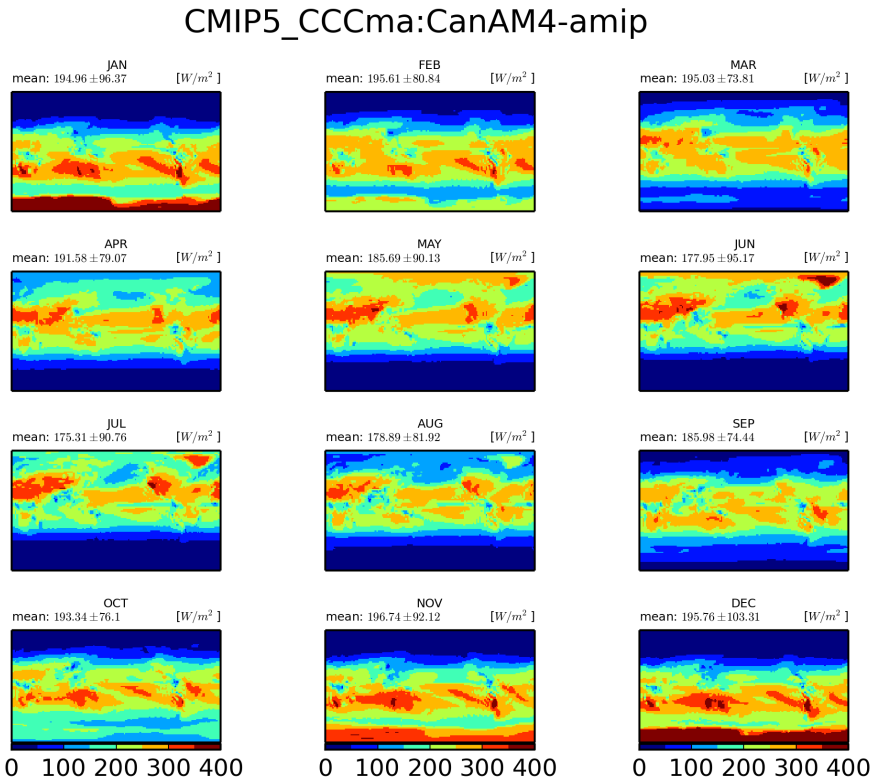



Figure 569: Monthly mean climatology for CCCma:CanAM4

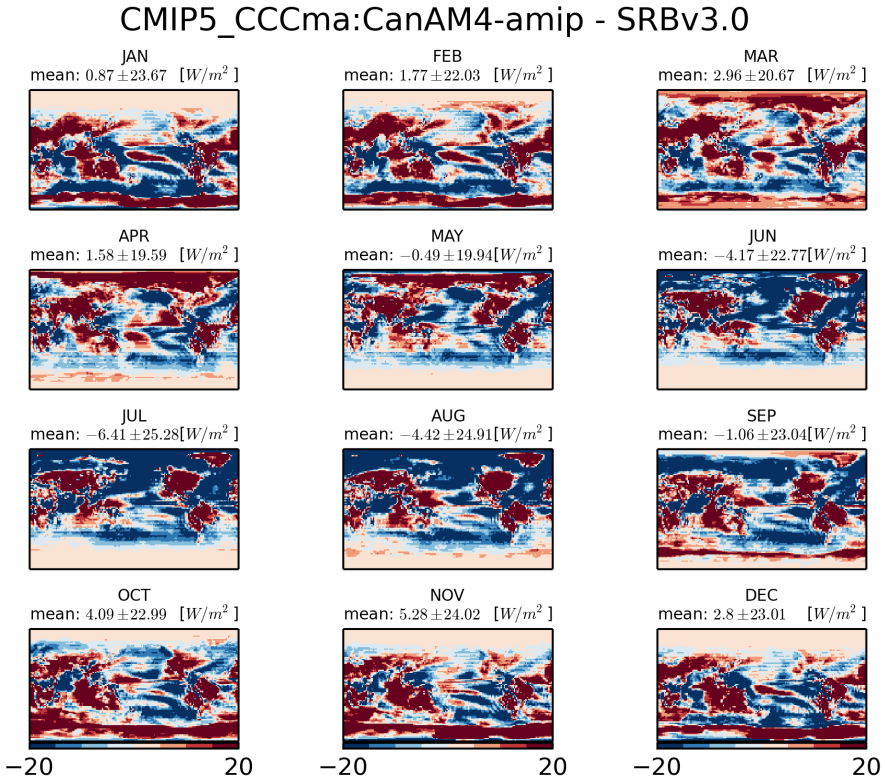



Figure 570: Monthly mean climatology of difference between CCCMA:CANAM4 and SRBV3.0

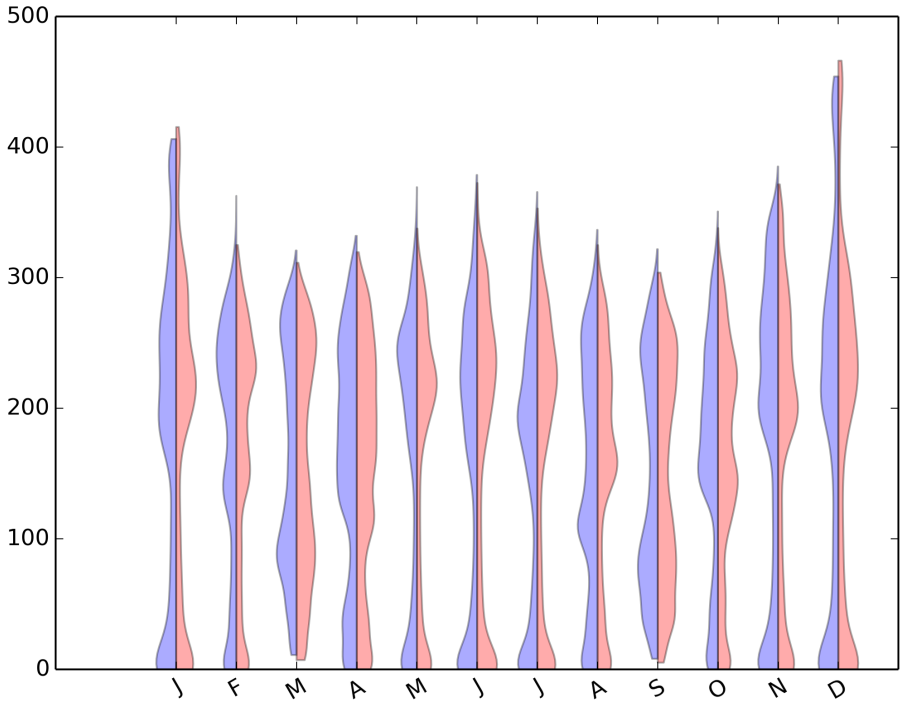



Figure 571: Violin plot for CMIP5-CCCMA:CANAM4-AMIP

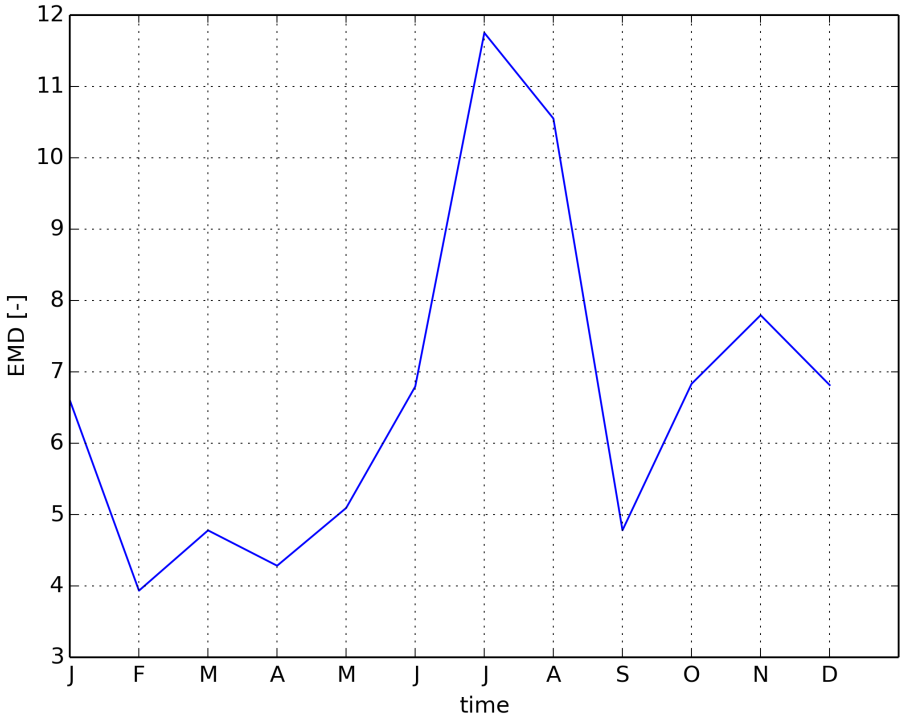



Figure 572: Timeseries of EMD

### 1.4.3 CMIP5 LASG-CESS:FGOALS-g2-amip

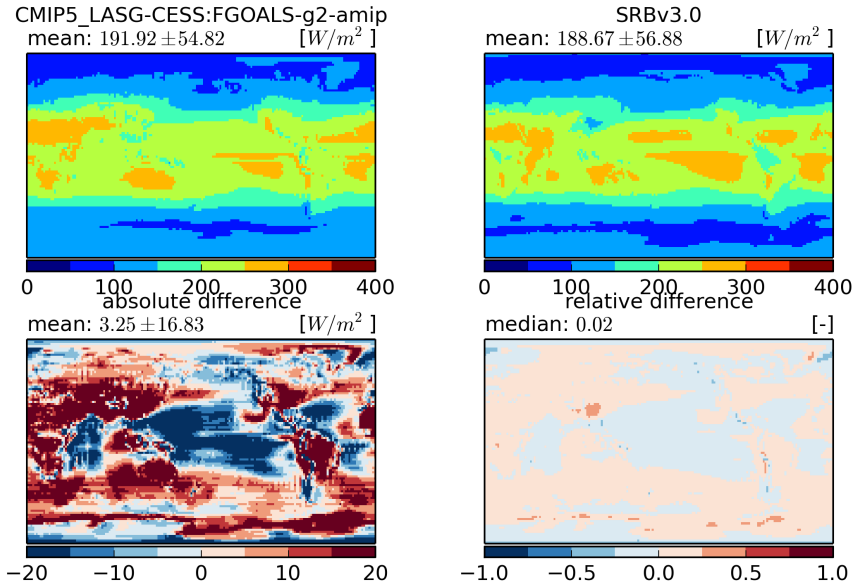



Figure 573: Temporal mean fields (top) and absolute and relative differences (bottom)

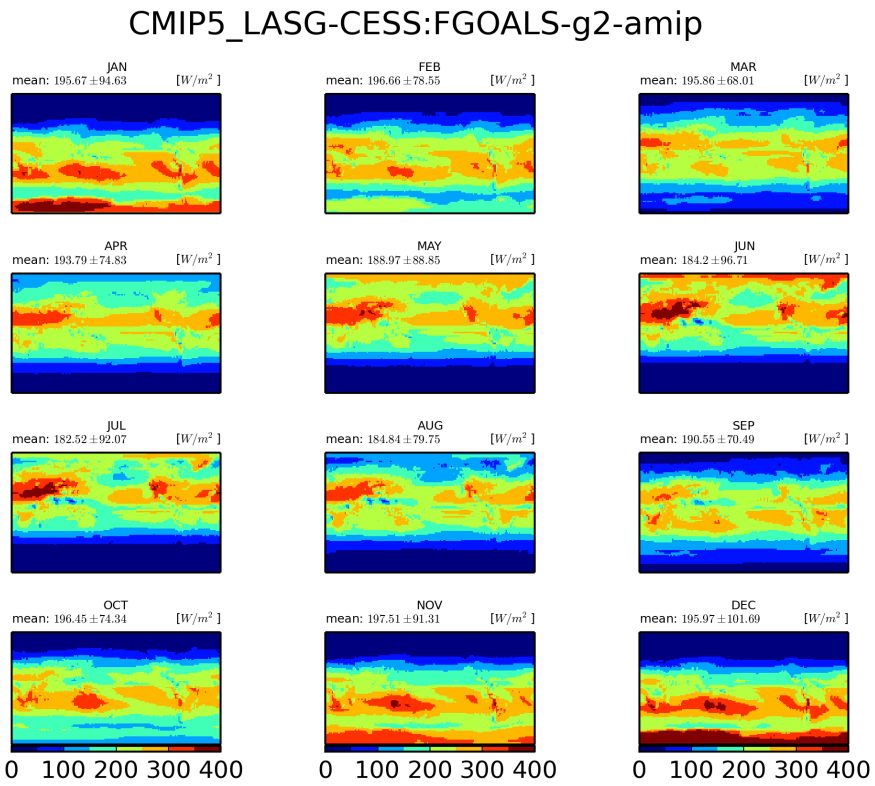



Figure 574: Monthly mean climatology for LASG-CESS:FGOALS-g2

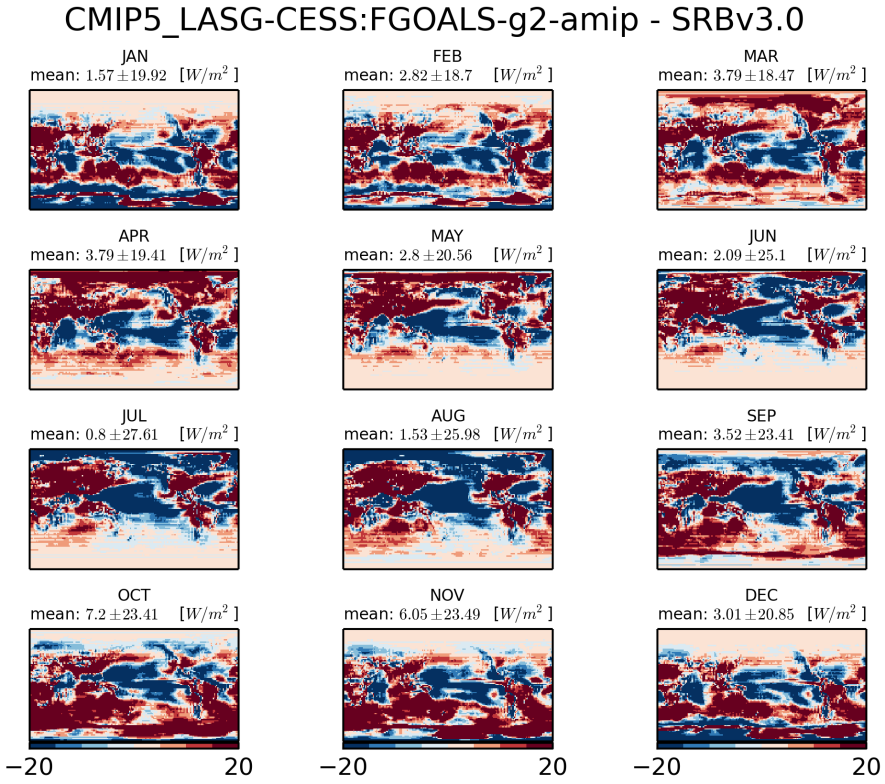



Figure 575: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and SRBV3.0

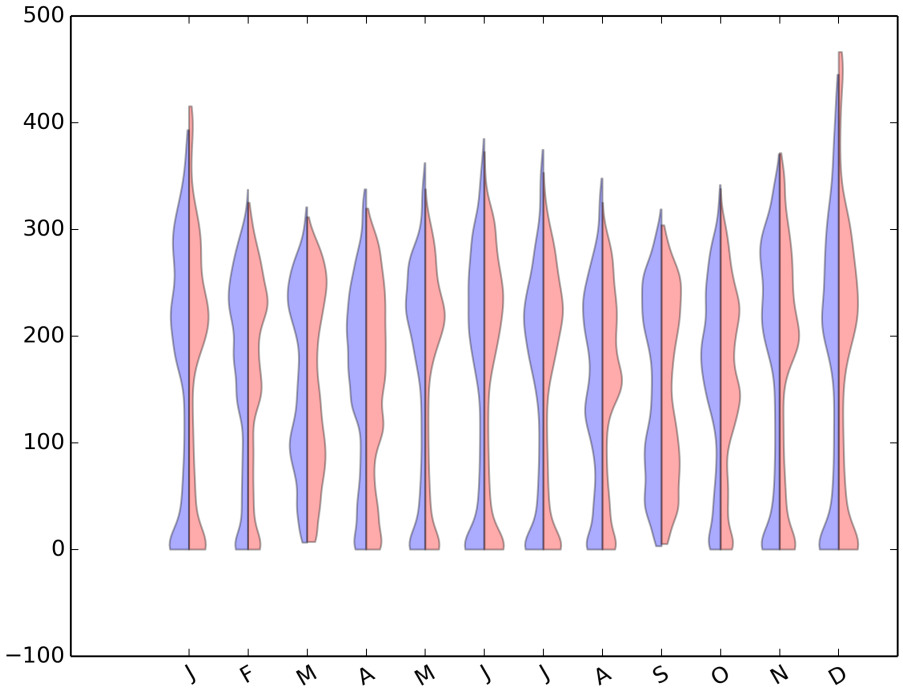



Figure 576: Violin plot for CMIP5-LASG-CESS:FGOALS-G2-AMIP

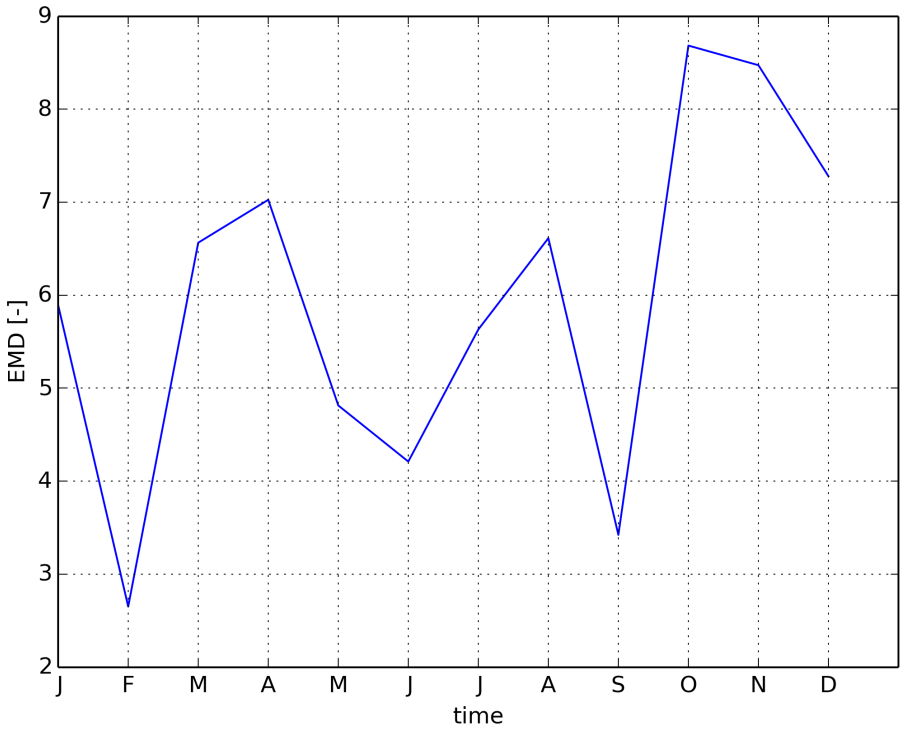



Figure 577: Timeseries of EMD

### 1.4.4 CMIP5 BNU:BNU-ESM-amip

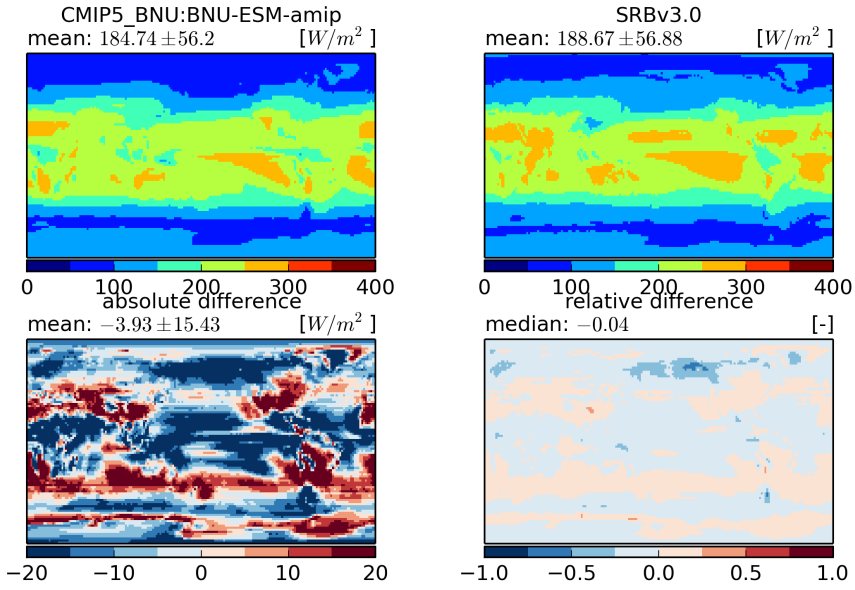



Figure 578: Temporal mean fields (top) and absolute and relative differences (bottom)

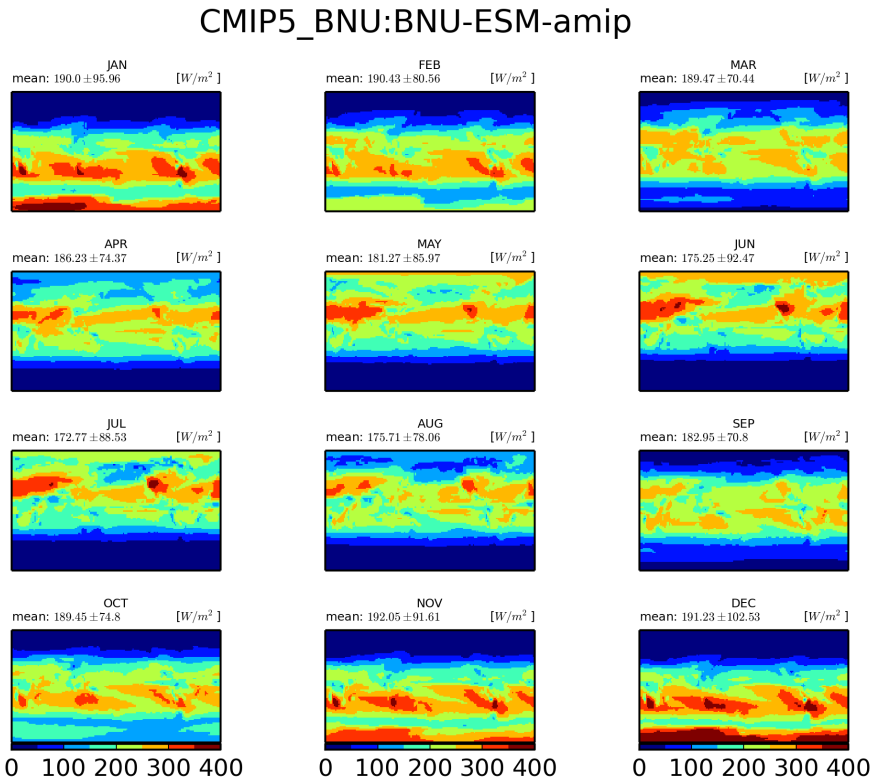



Figure 579: Monthly mean climatology for BNU:BNU-ESM

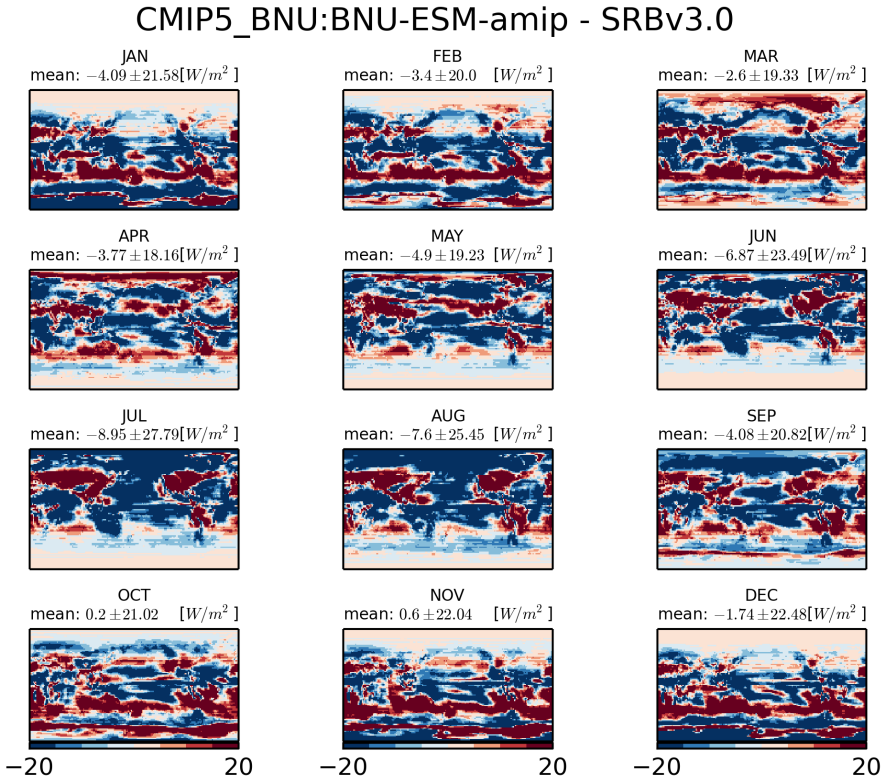



Figure 580: Monthly mean climatology of difference between BNU:BNU-ESM and SRBV3.0

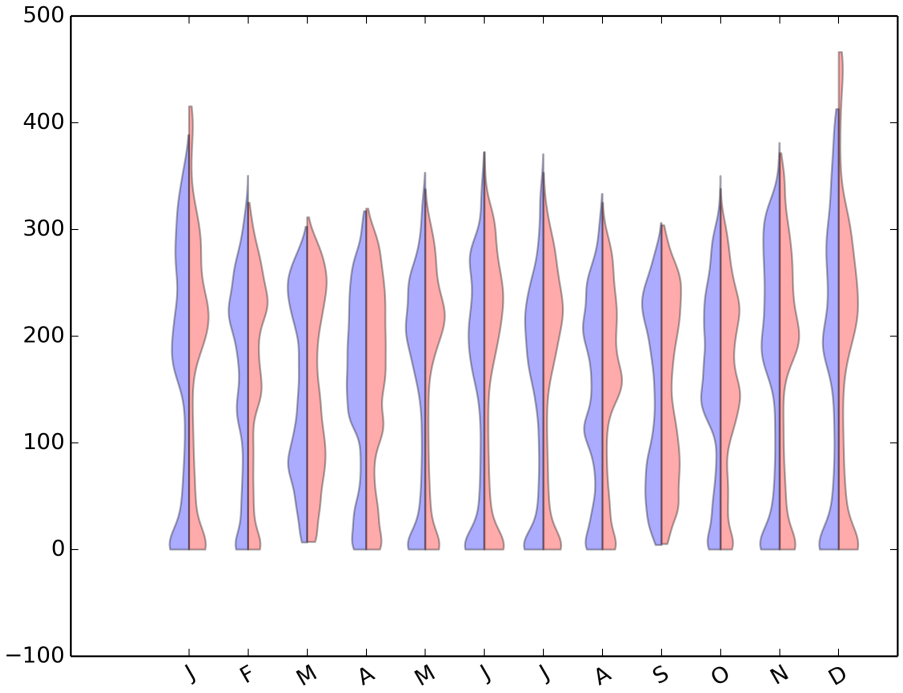



Figure 581: Violin plot for CMIP5-BNU:BNU-ESM-AMIP

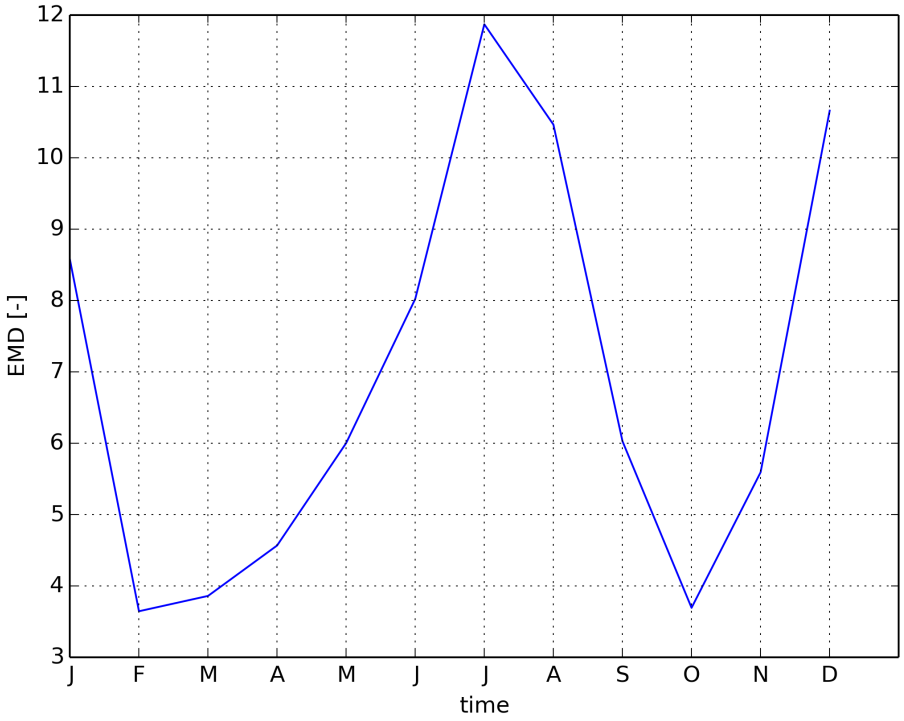



Figure 582: Timeseries of EMD

### 1.4.5 CMIP5 BCC:bcc-csm1-1-amip

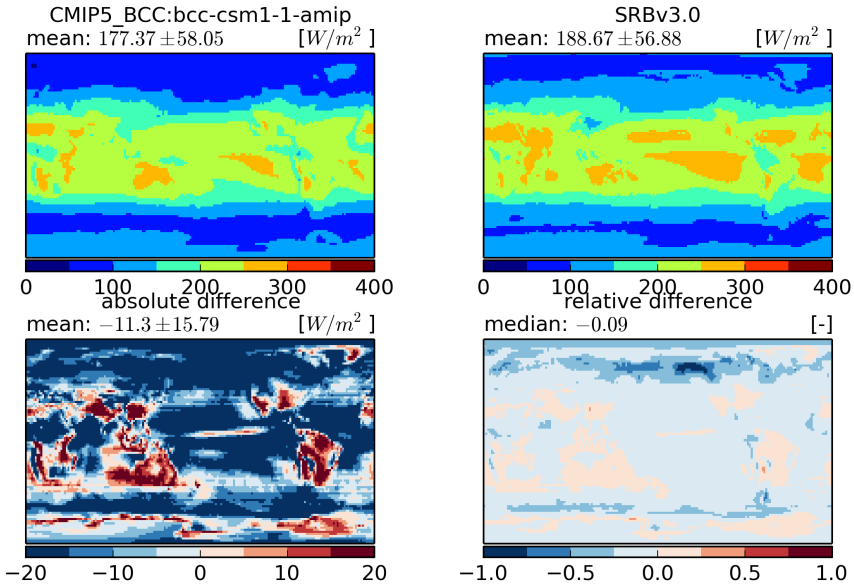



Figure 583: Temporal mean fields (top) and absolute and relative differences (bottom)

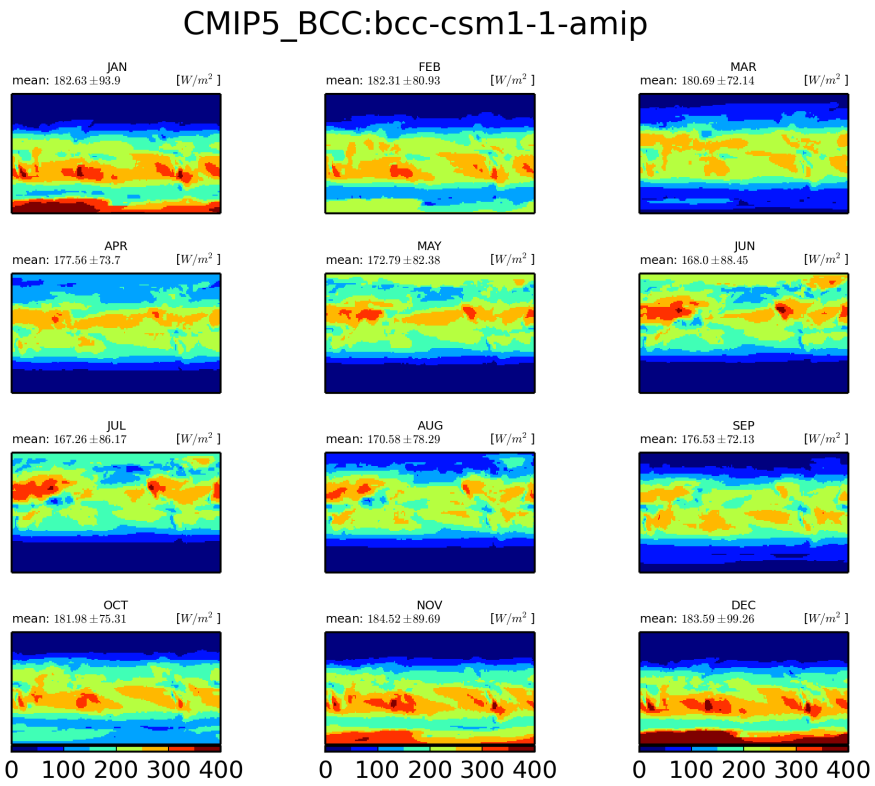



Figure 584: Monthly mean climatology for BCC:bcc-csm1-1

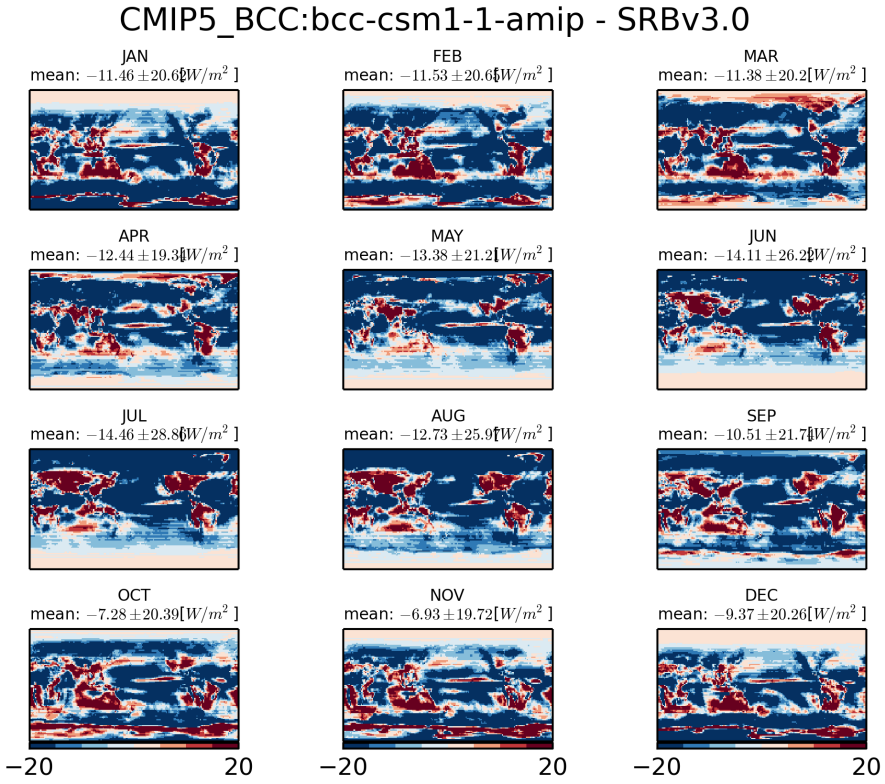



Figure 585: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and SRBV3.0

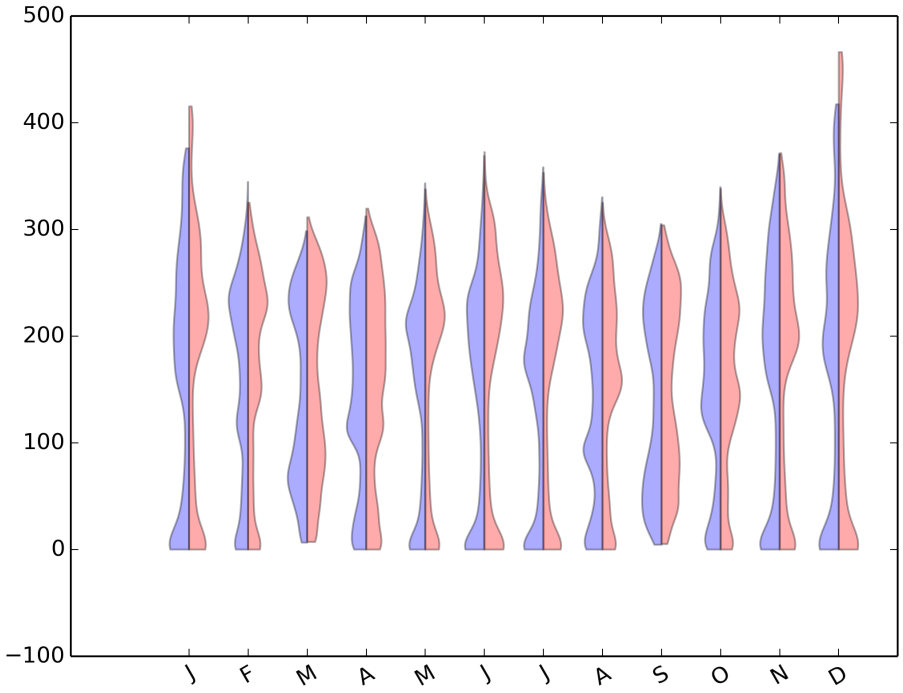



Figure 586: Violin plot for CMIP5-BCC:BCC-CSM1-1-AMIP

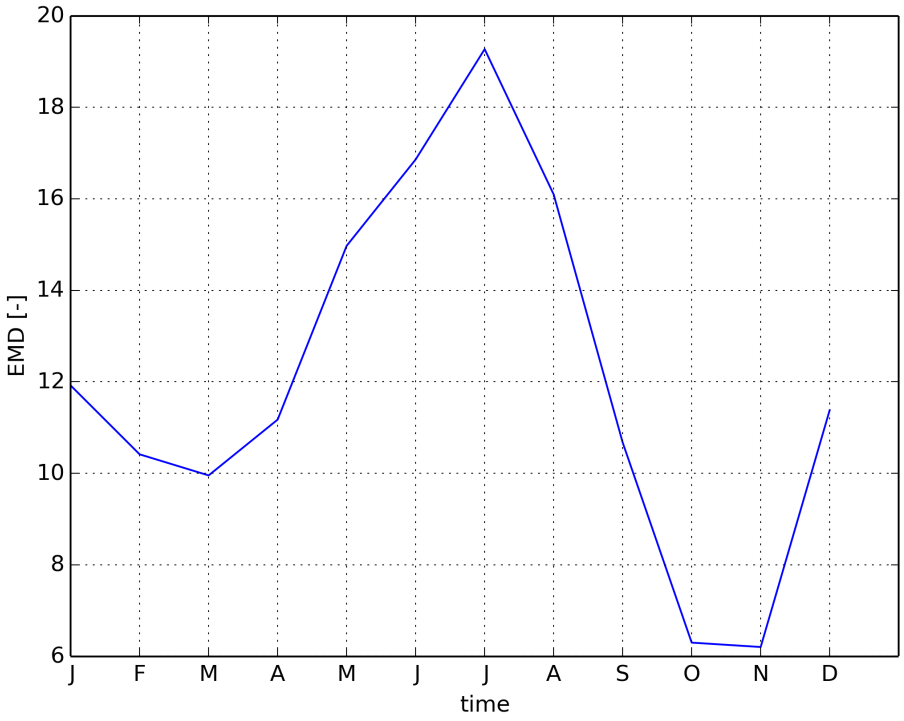



Figure 587: Timeseries of EMD

### 1.4.6 CMIP5 BCC:bcc-csm1-1-m-amip

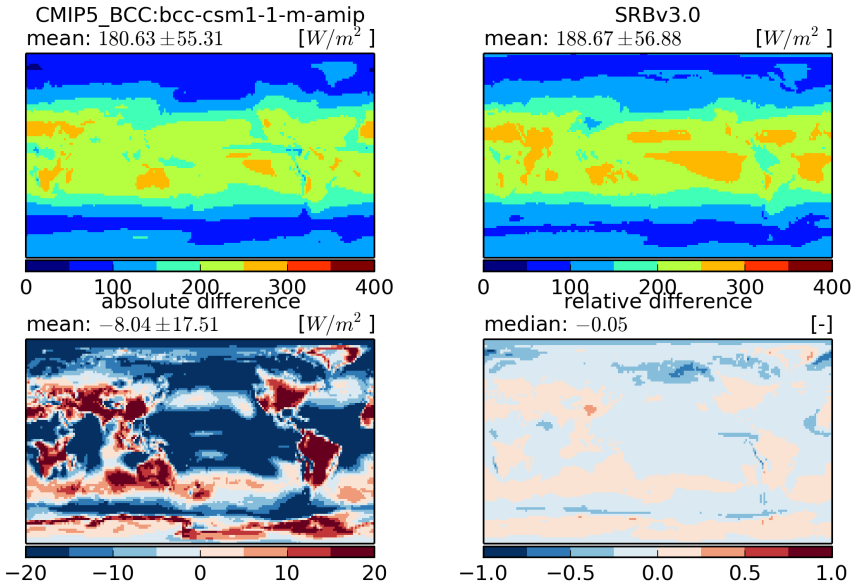



Figure 588: Temporal mean fields (top) and absolute and relative differences (bottom)

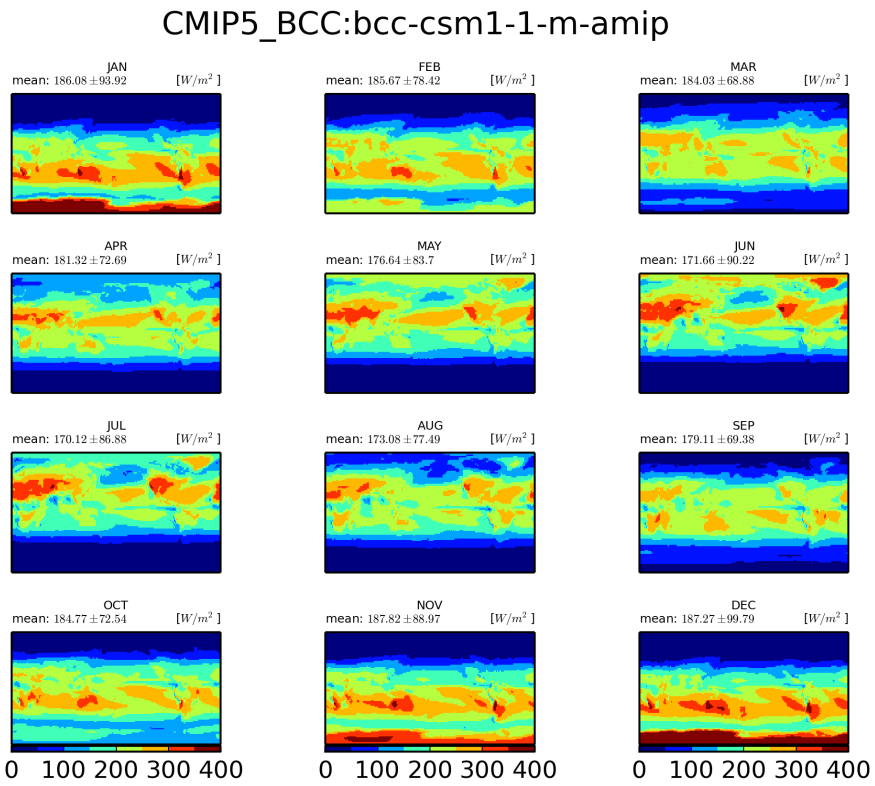



Figure 589: Monthly mean climatology for BCC:bcc-csm1-1-m

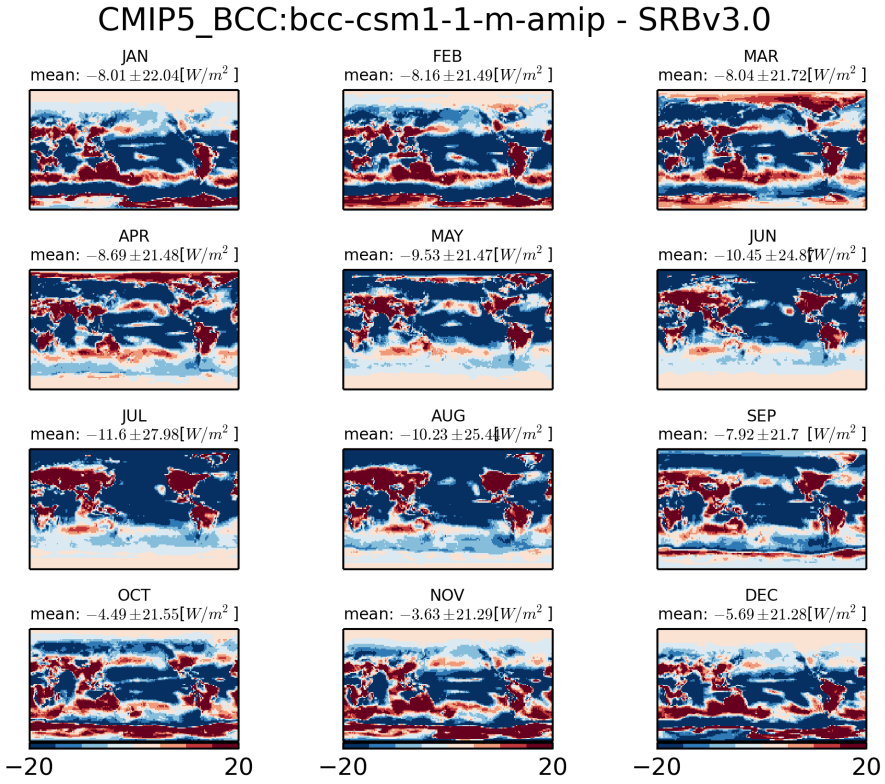



Figure 590: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and SRBV3.0

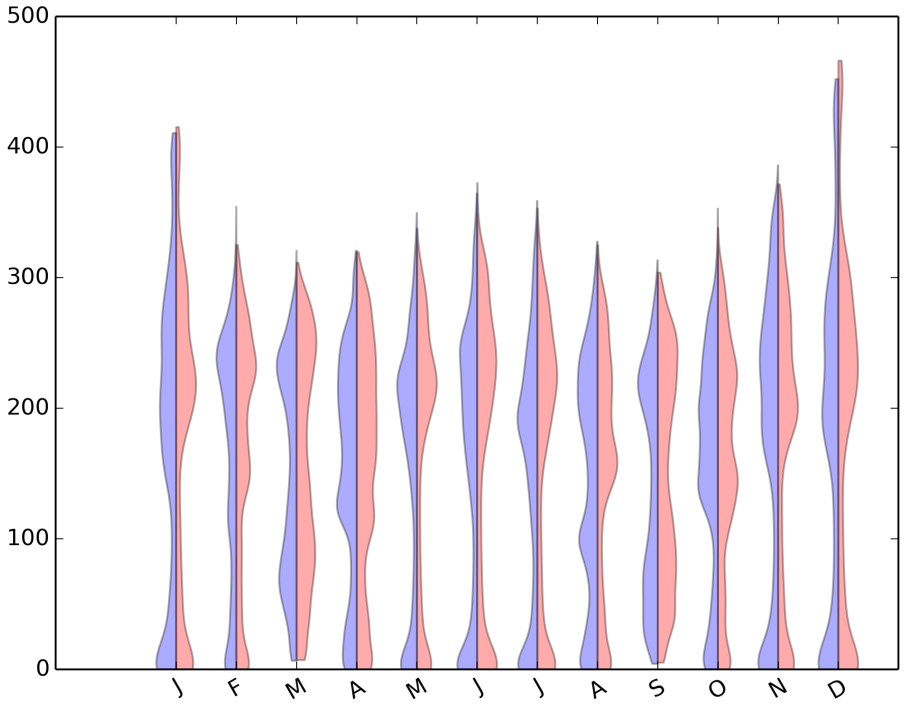



Figure 591: Violin plot for CMIP5-BCC:BCC-CSM1-1-M-AMIP

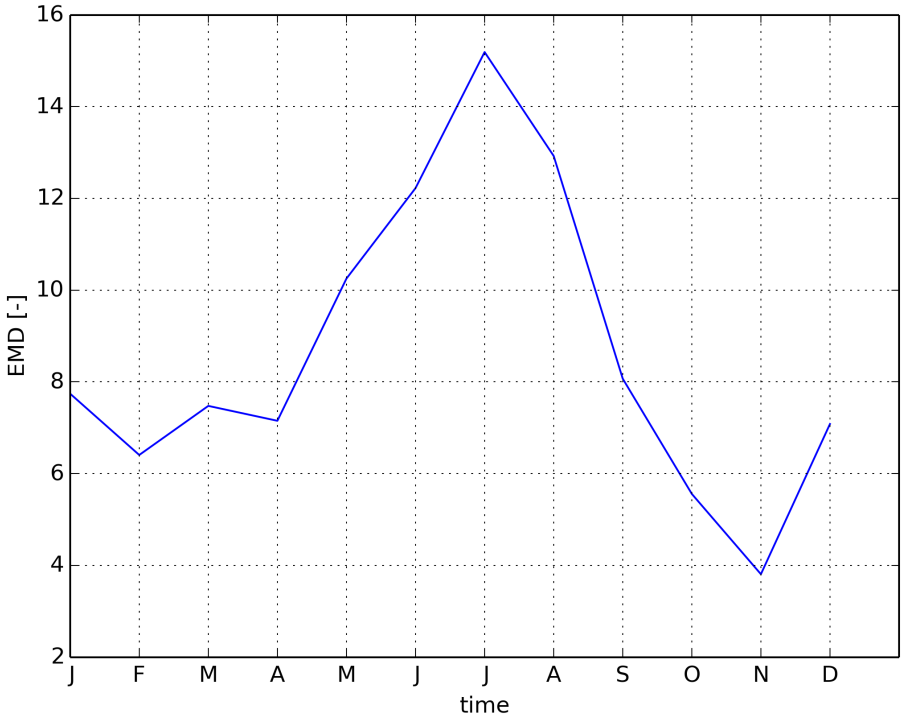



Figure 592: Timeseries of EMD

### 1.4.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

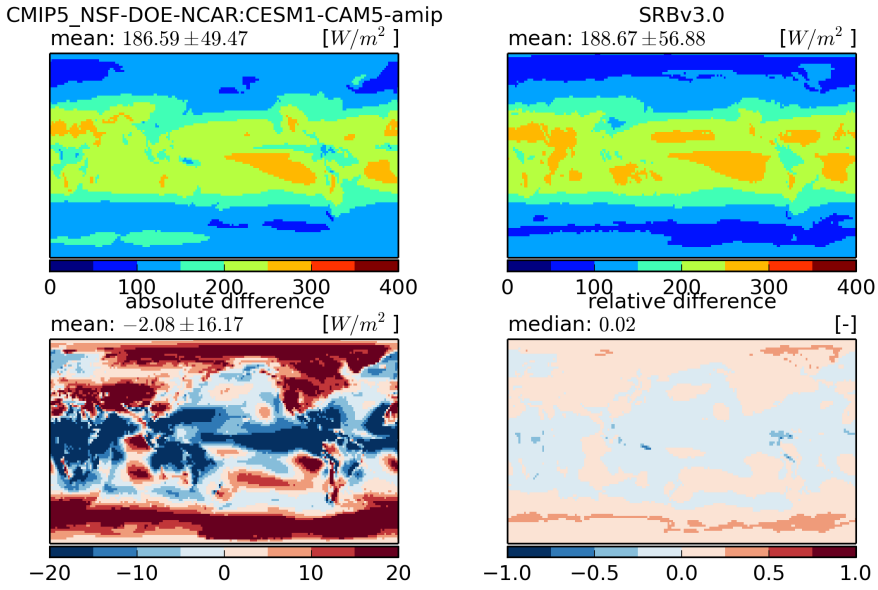



Figure 593: Temporal mean fields (top) and absolute and relative differences (bottom)

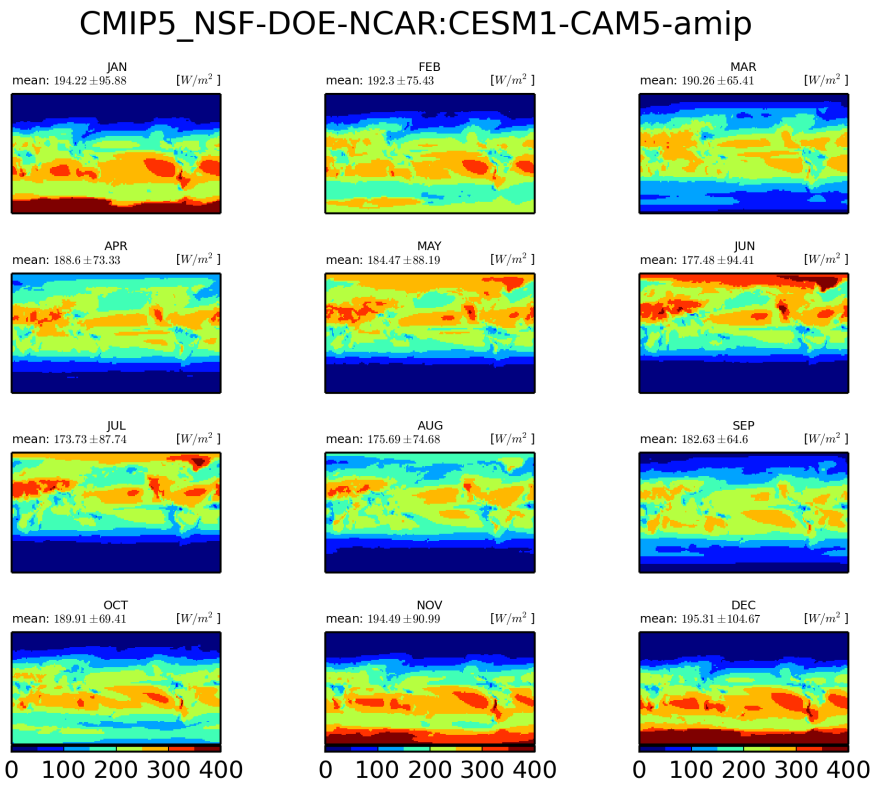



Figure 594: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

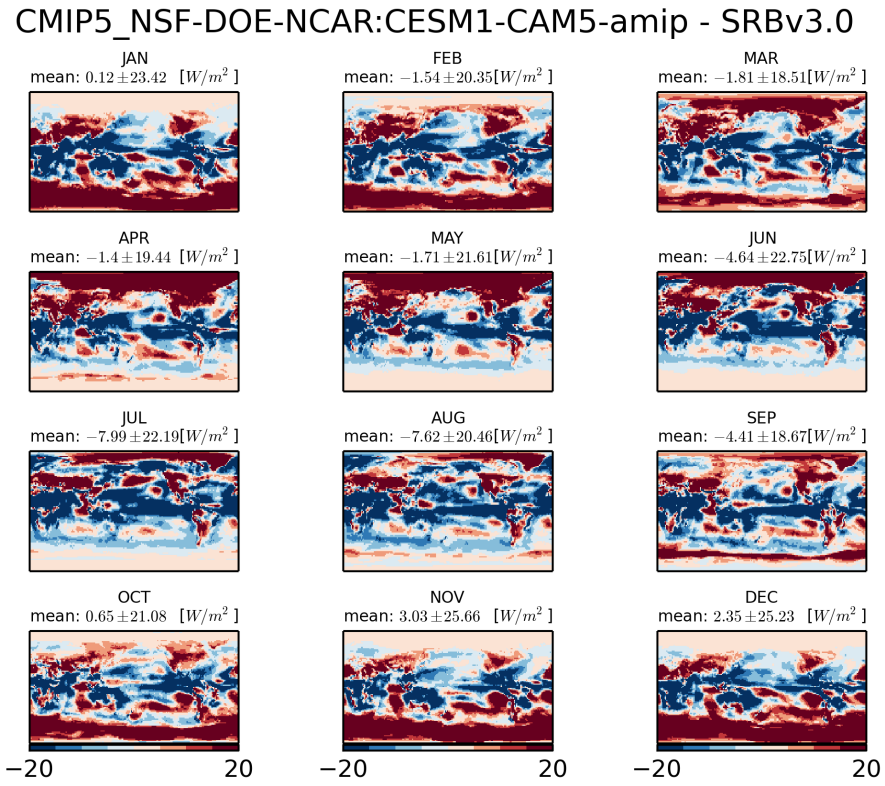



Figure 595: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and SRBV3.0

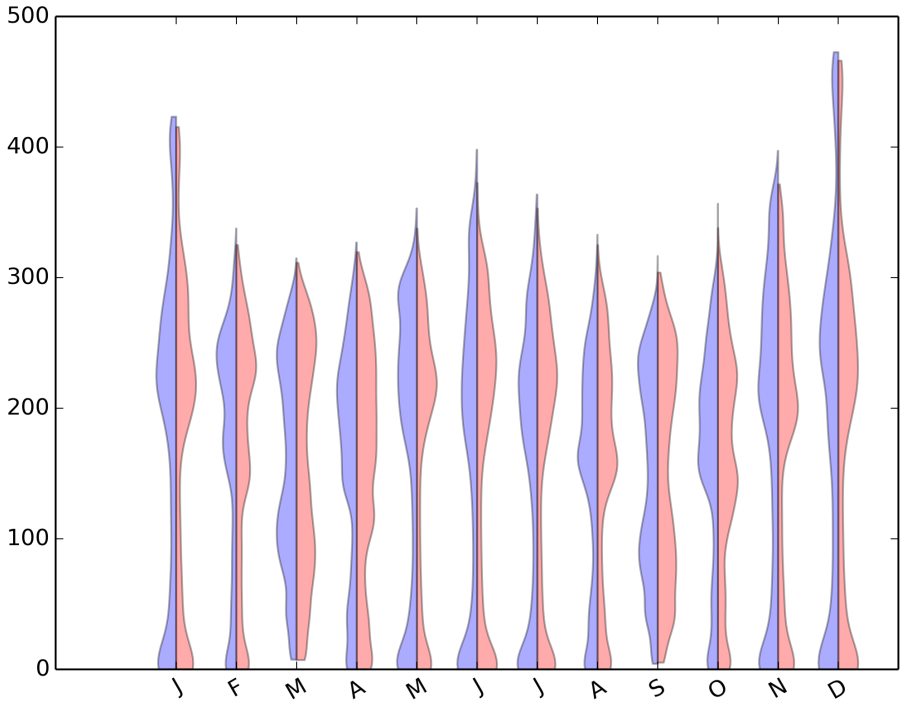



Figure 596: Violin plot for CMIP5-NSF-DOE-NCAR:CESM1-CAM5-AMIP

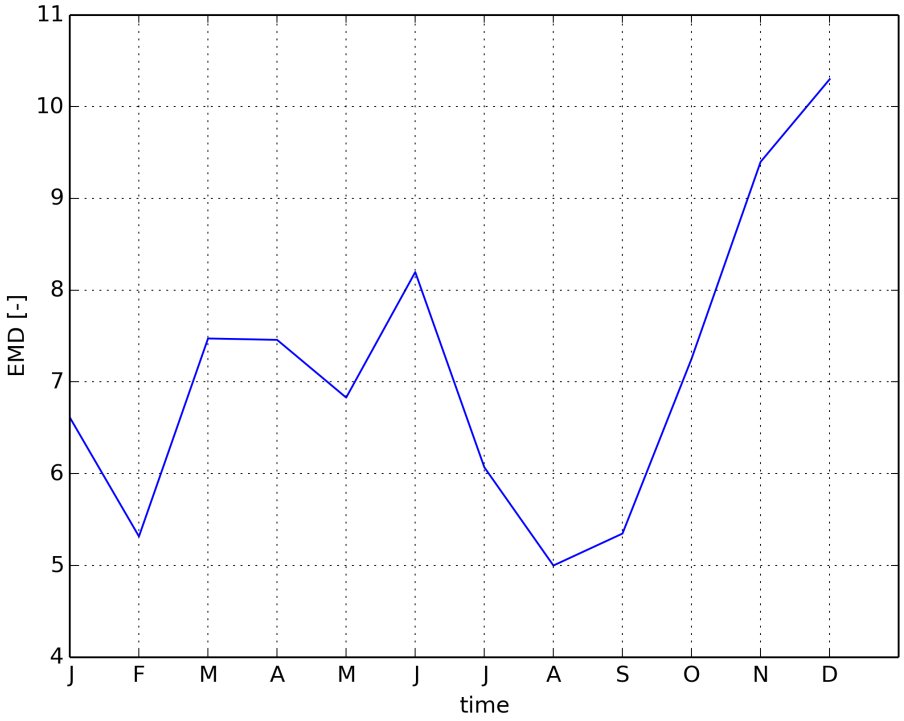



Figure 597: Timeseries of EMD

### 1.4.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

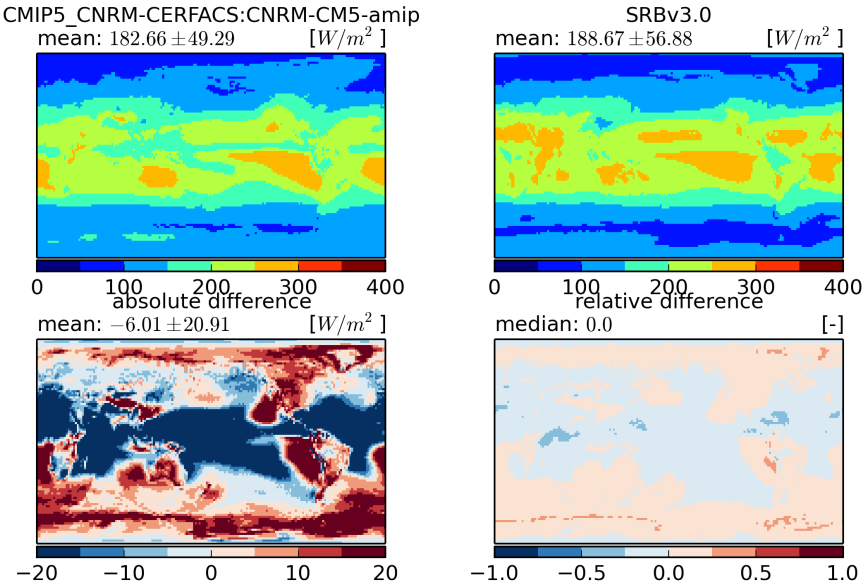



Figure 598: Temporal mean fields (top) and absolute and relative differences (bottom)

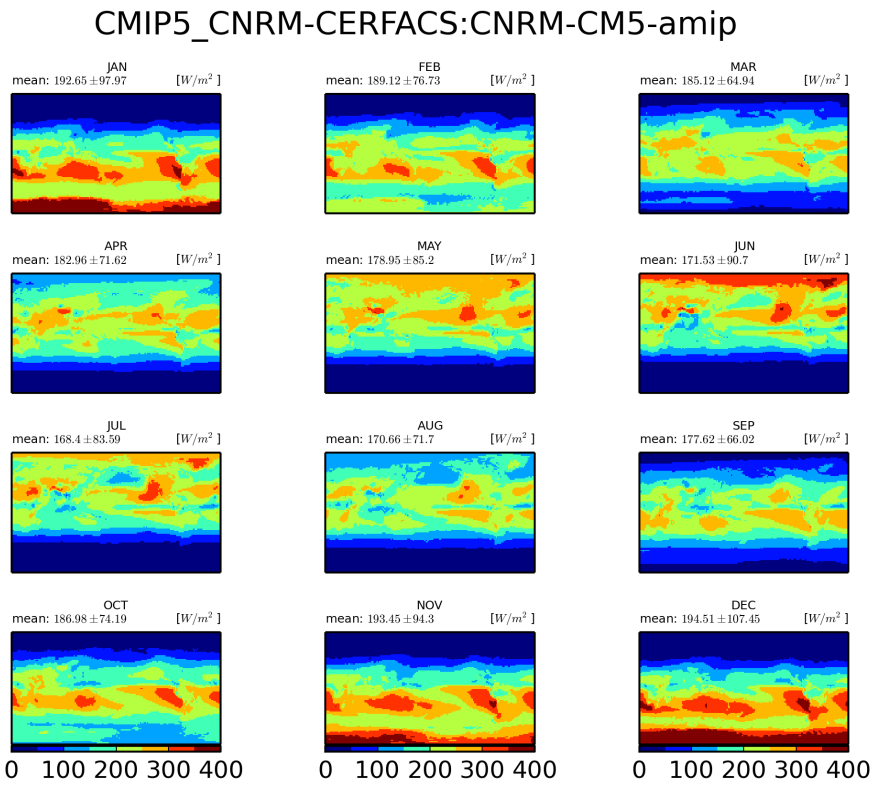



Figure 599: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

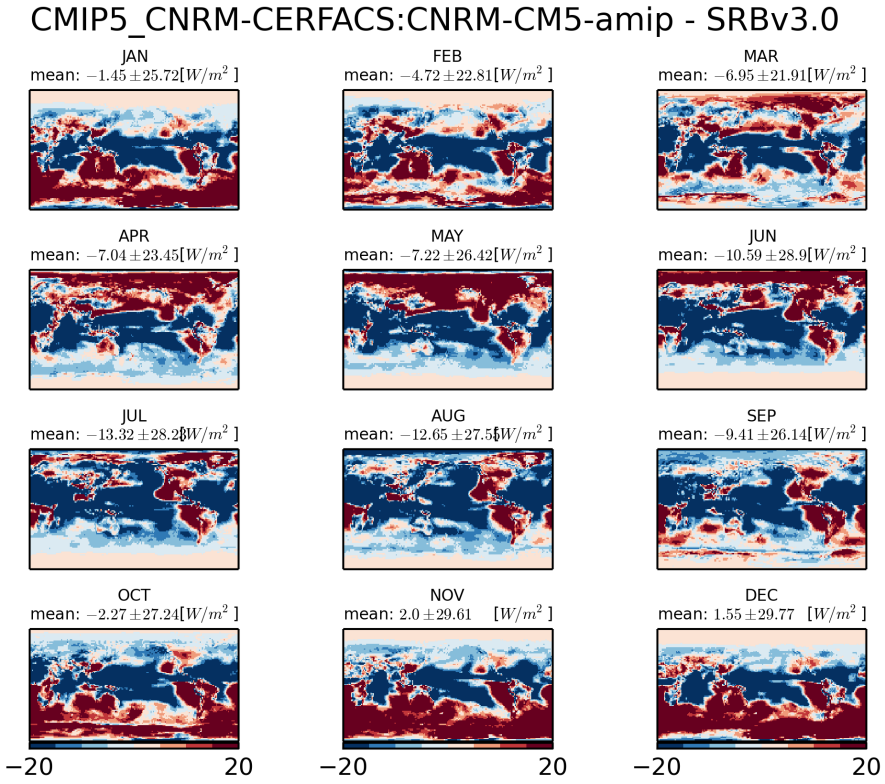



Figure 600: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and SRBV3.0

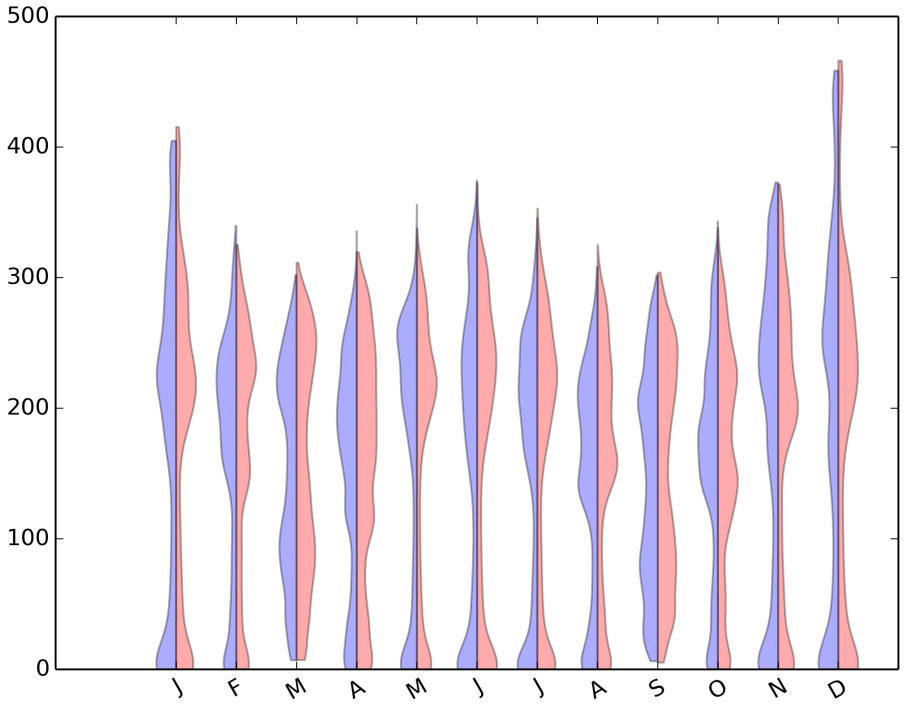



Figure 601: Violin plot for CMIP5-CNRM-CERFACS:CNRM-CM5-AMIP

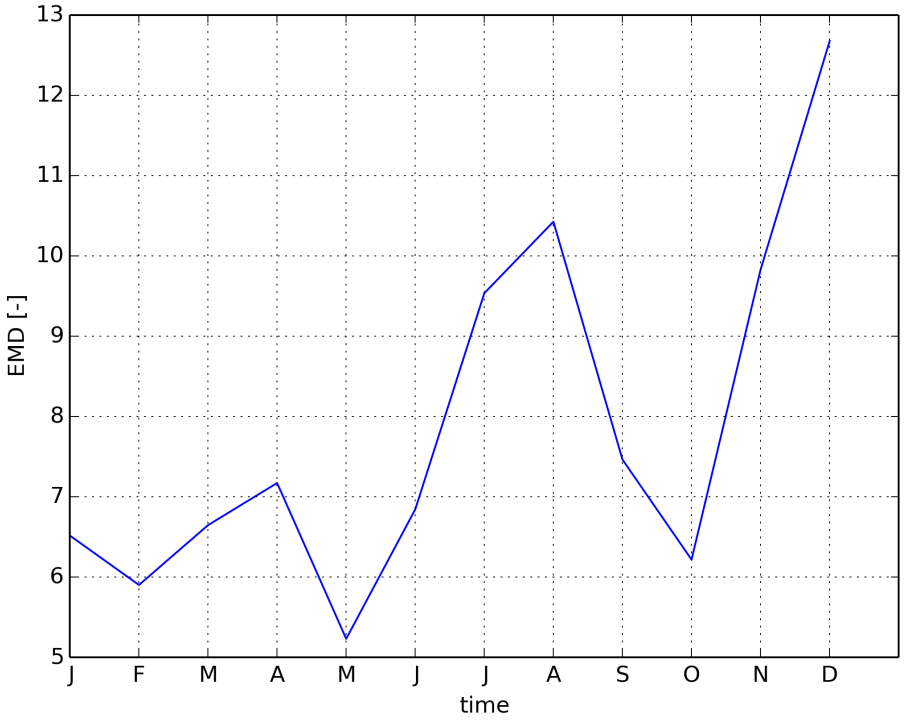



Figure 602: Timeseries of EMD

### 1.4.9 CMIP5 MRI:MRI-CGCM3-amip

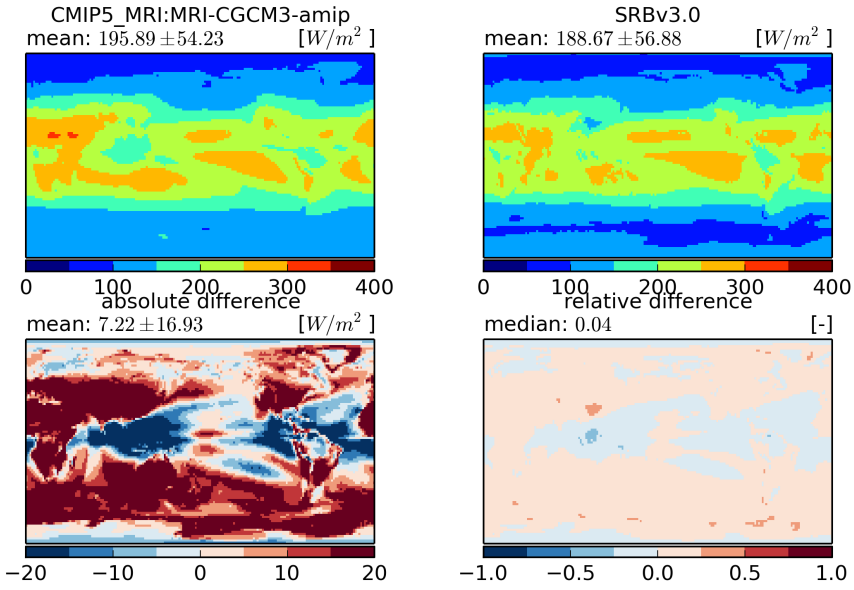



Figure 603: Temporal mean fields (top) and absolute and relative differences (bottom)

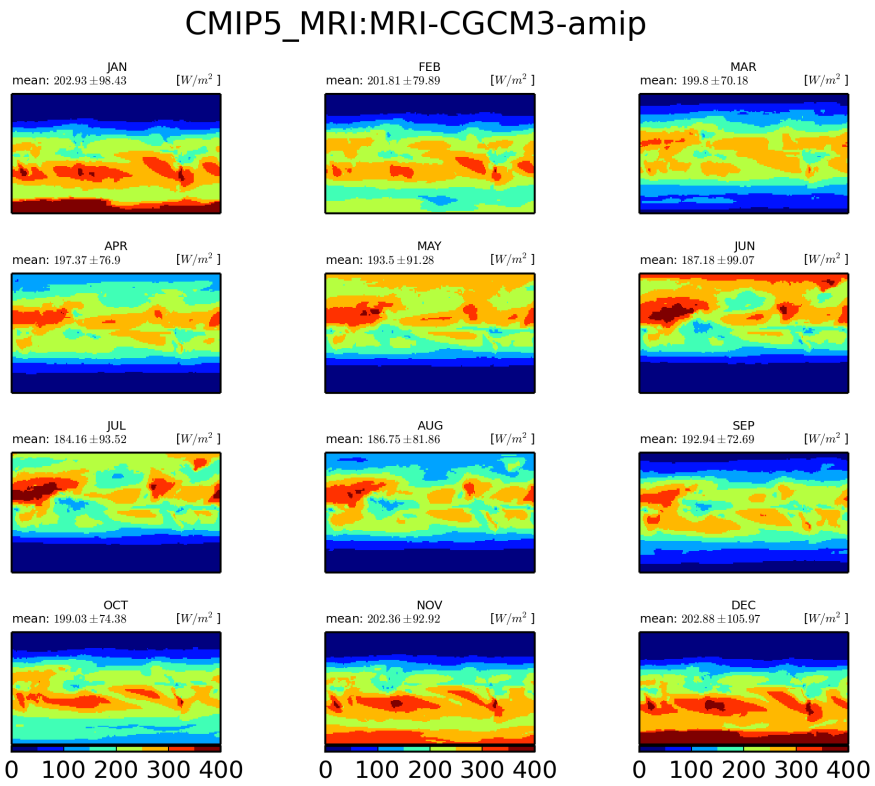



Figure 604: Monthly mean climatology for MRI:MRI-CGCM3

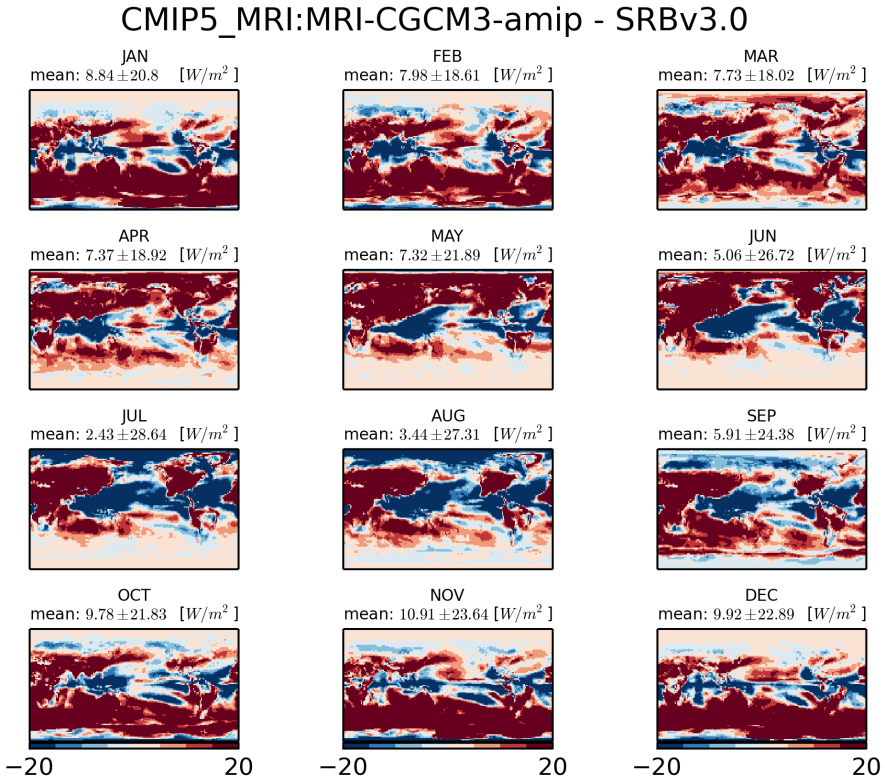



Figure 605: Monthly mean climatology of difference between MRI:MRI-CGCM3 and SRBV3.0

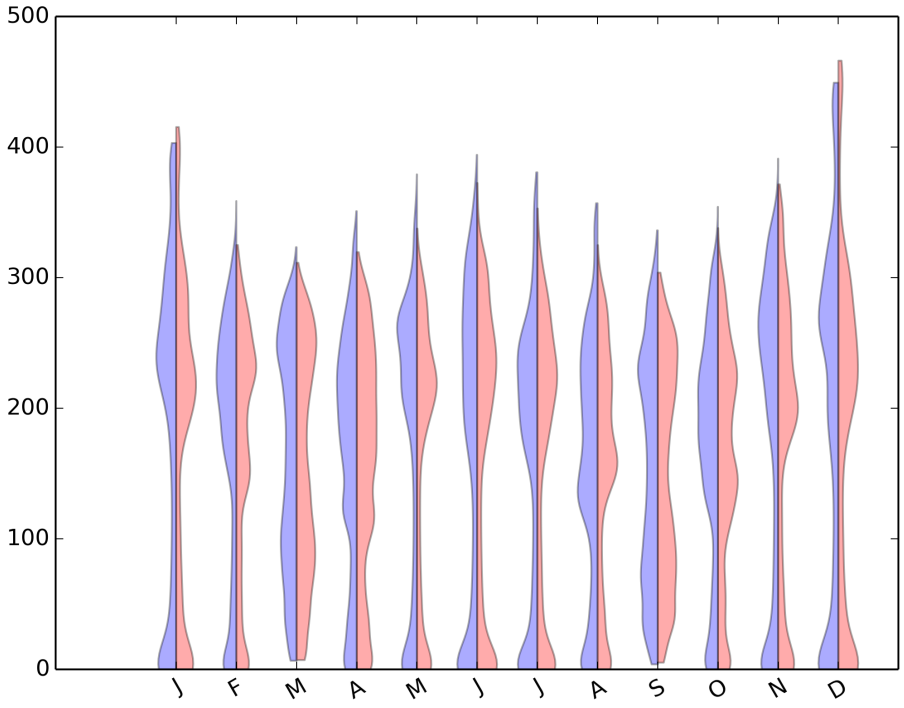



Figure 606: Violin plot for CMIP5-MRI:MRI-CGCM3-AMIP

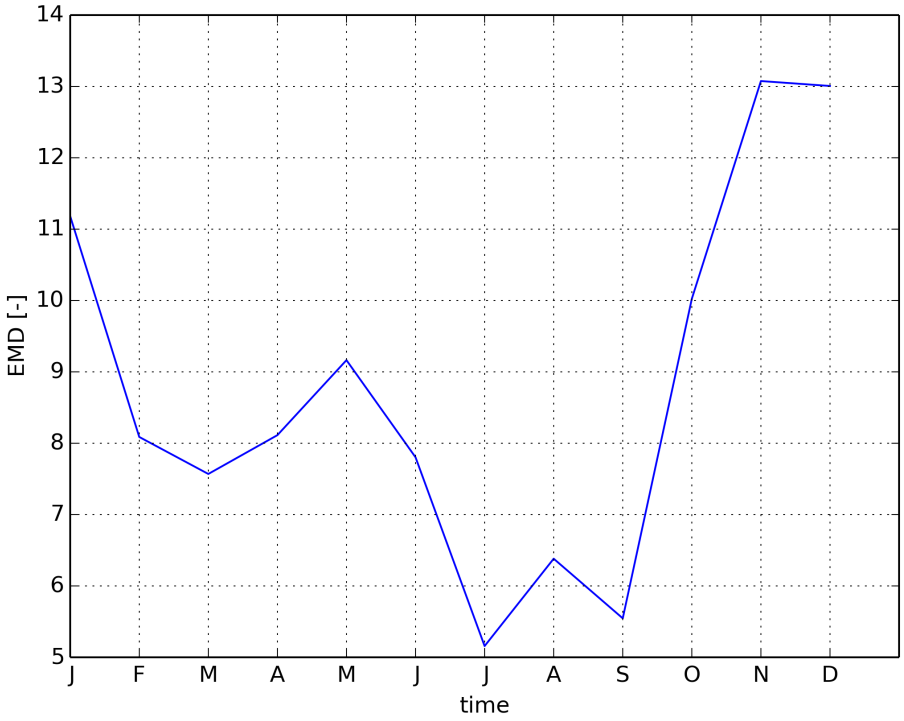



Figure 607: Timeseries of EMD

### 1.4.10 CMIP5 NASA-GISS:GISS-E2-R-amip

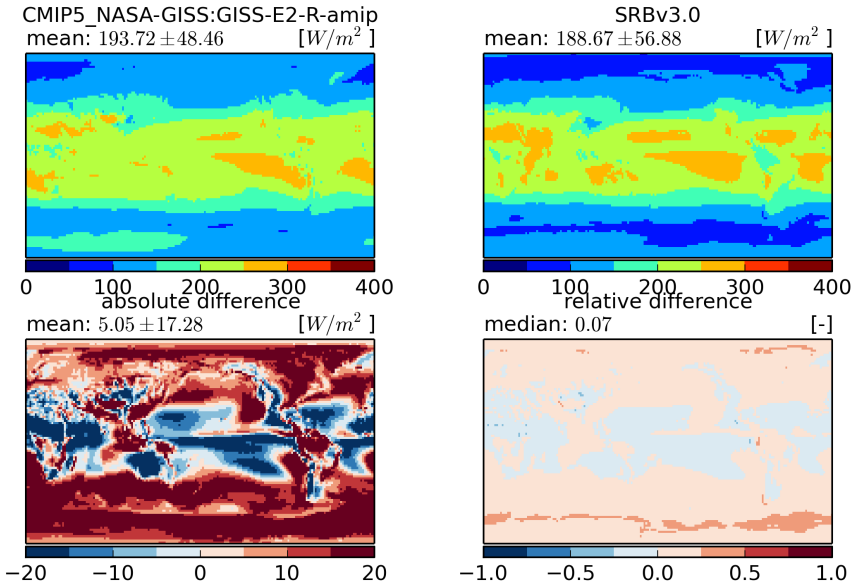



Figure 608: Temporal mean fields (top) and absolute and relative differences (bottom)

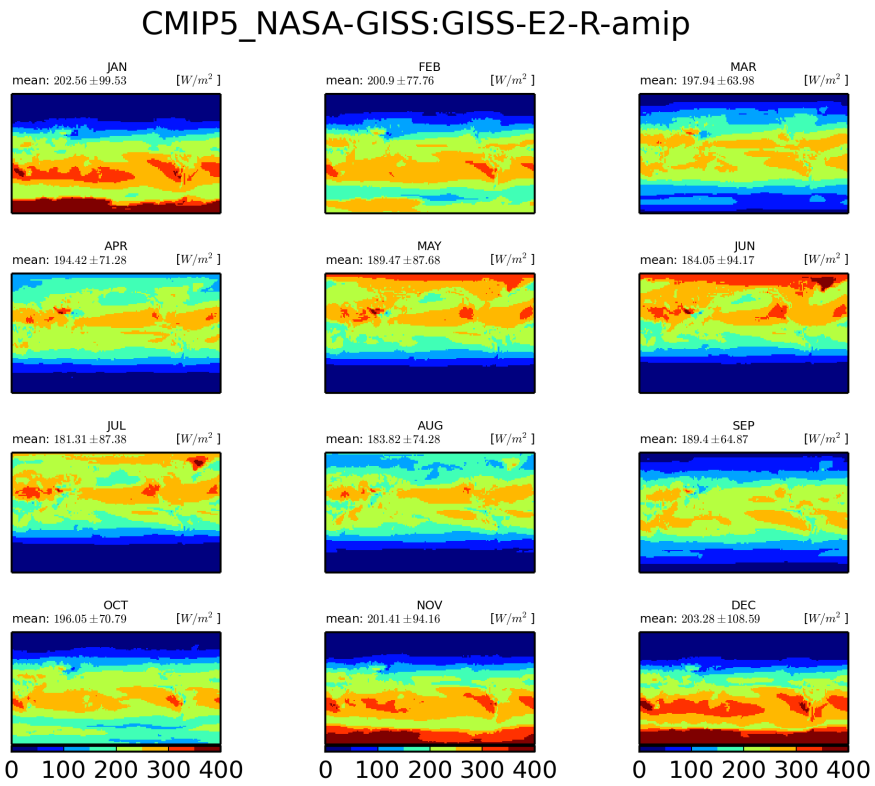



Figure 609: Monthly mean climatology for NASA-GISS:GISS-E2-R

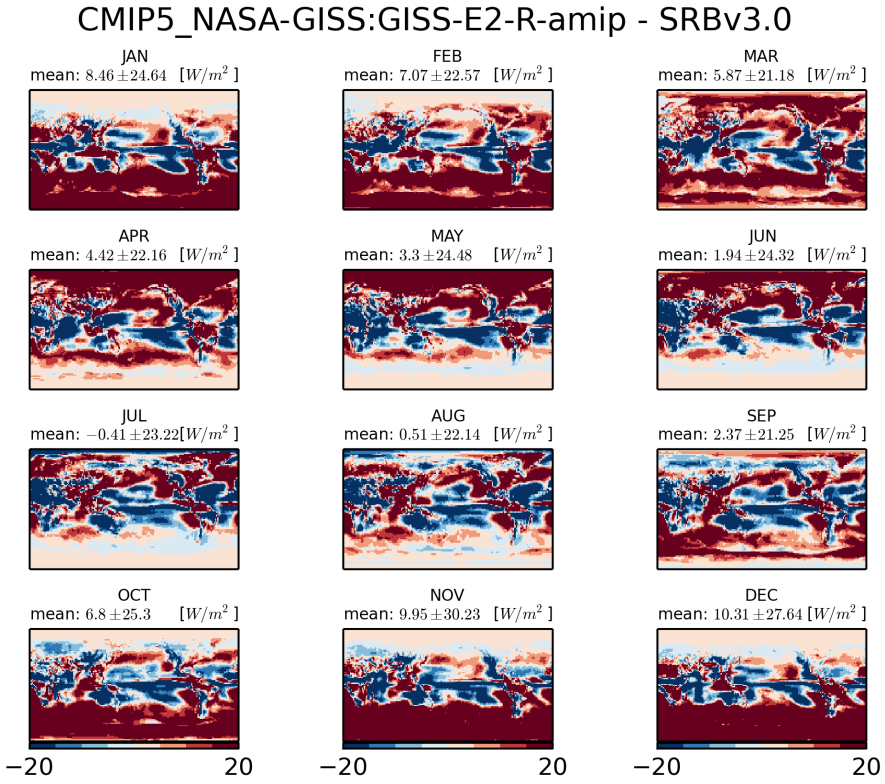



Figure 610: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and SRBV3.0

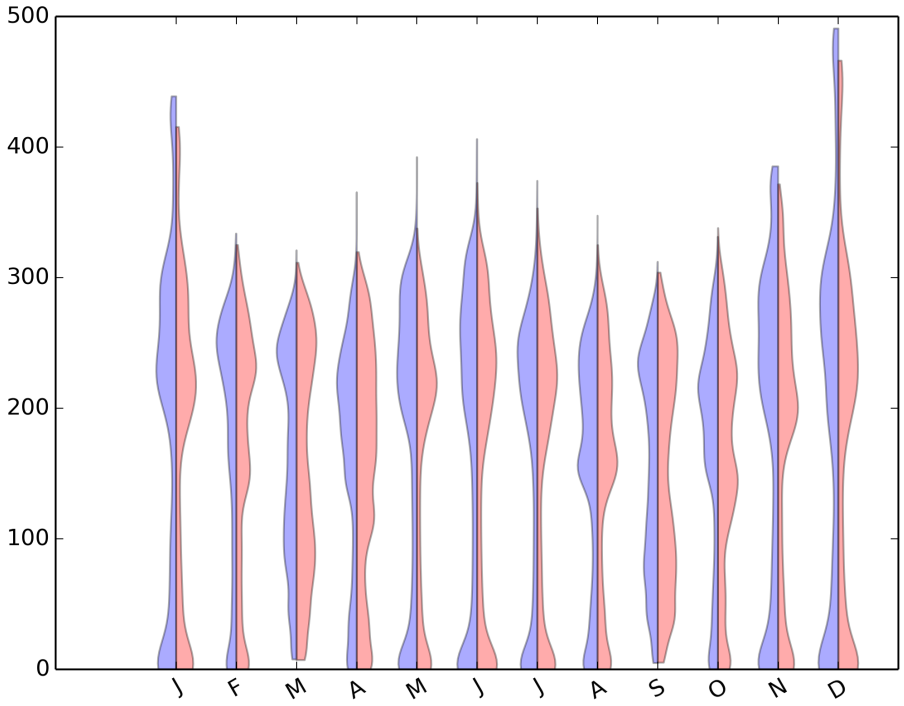



Figure 611: Violin plot for CMIP5-NASA-GISS:GISS-E2-R-AMIP

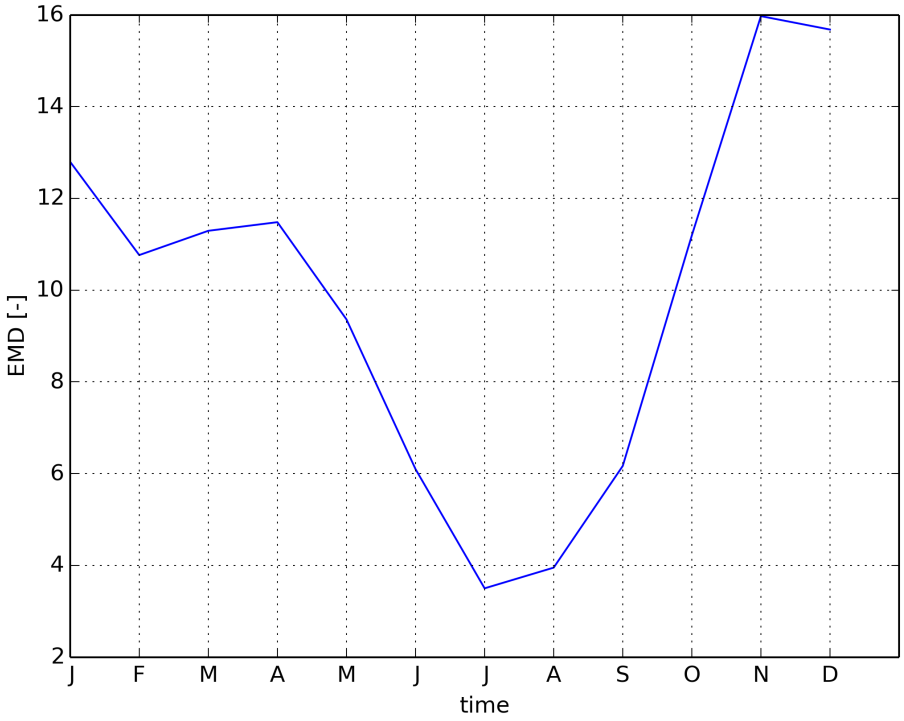



Figure 612: Timeseries of EMD

### 1.4.11 CMIP5 MIROC:MIROC5-amip

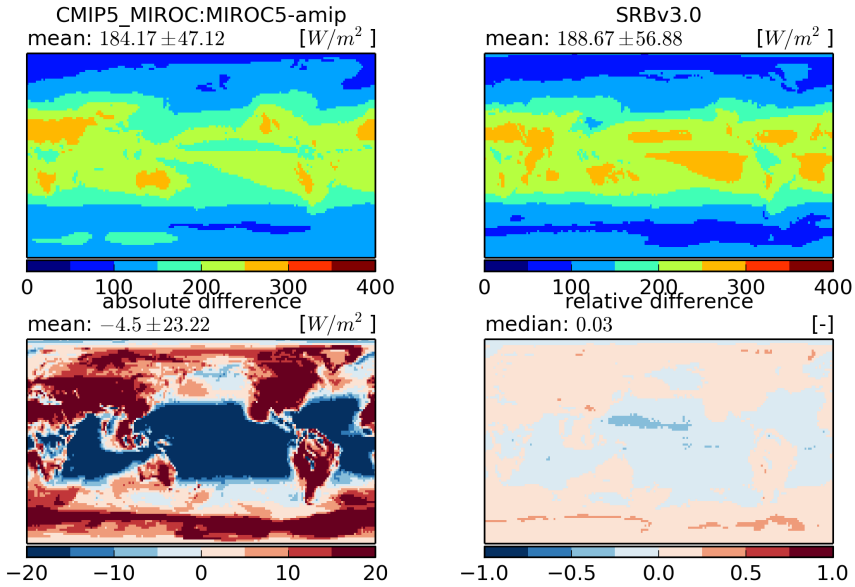



Figure 613: Temporal mean fields (top) and absolute and relative differences (bottom)

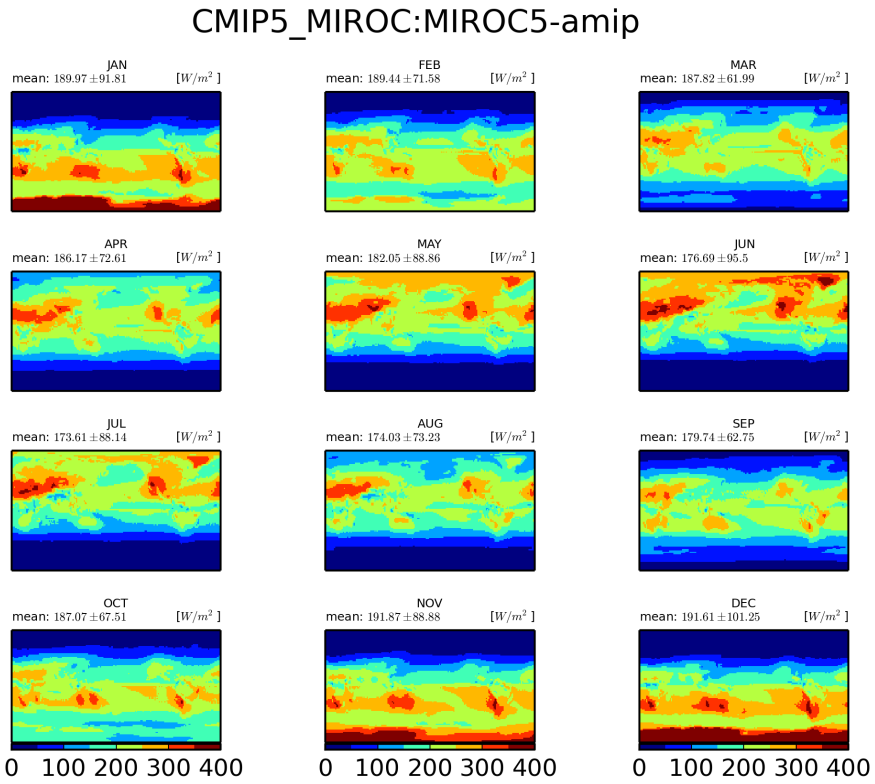



Figure 614: Monthly mean climatology for MIROC:MIROC5

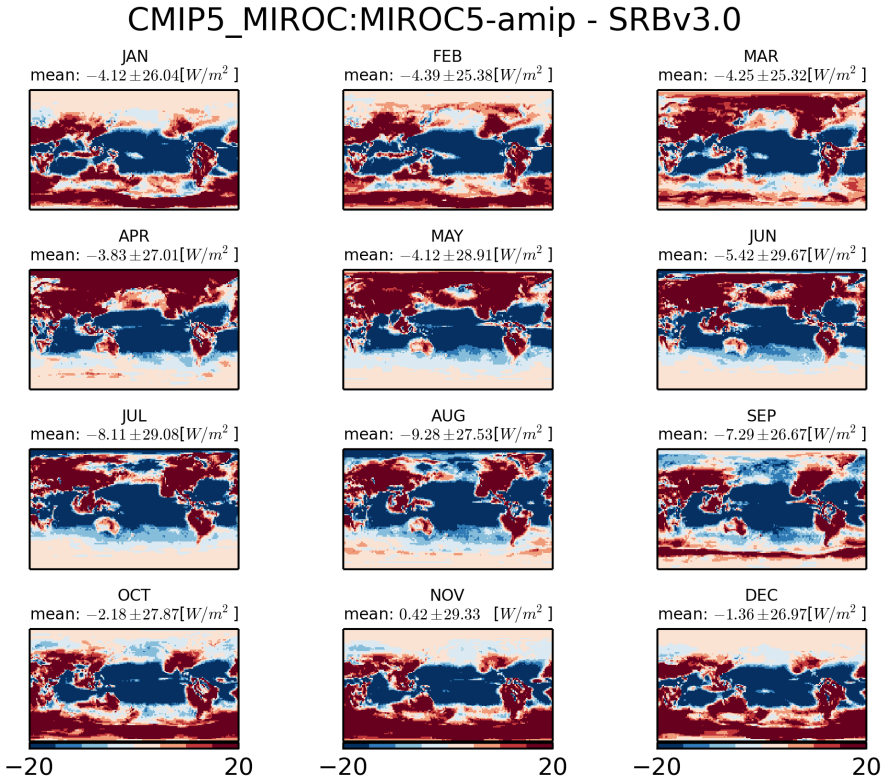



Figure 615: Monthly mean climatology of difference between MIROC:MIROC5 and SRBV3.0

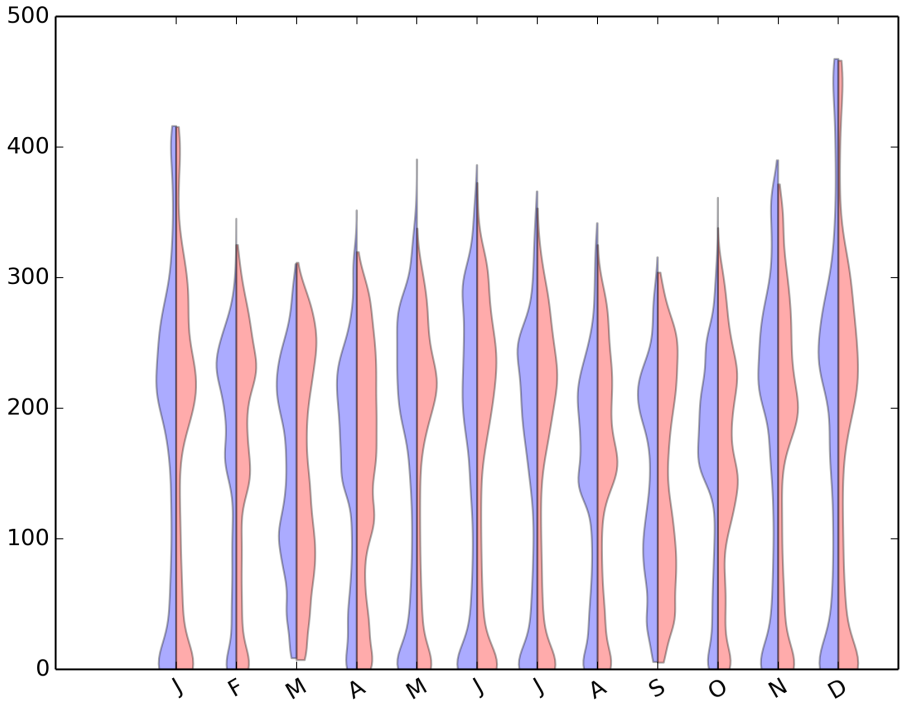



Figure 616: Violin plot for CMIP5-MIROC:MIROC5-AMIP

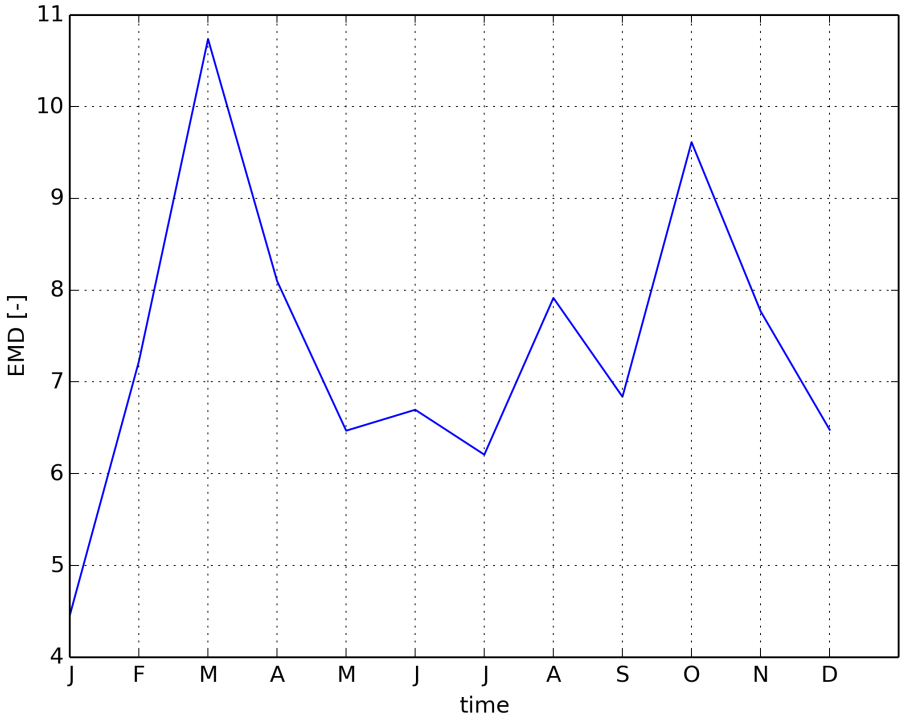



Figure 617: Timeseries of EMD

### 1.4.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

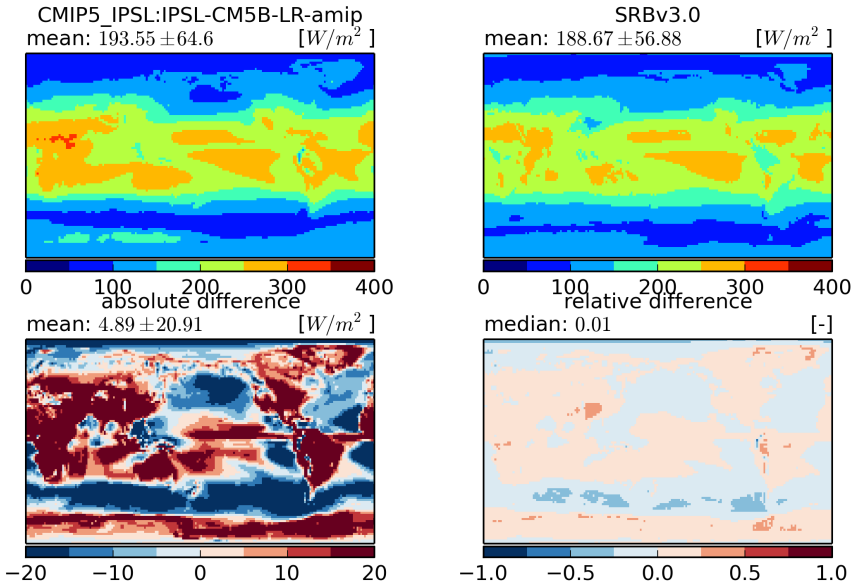



Figure 618: Temporal mean fields (top) and absolute and relative differences (bottom)

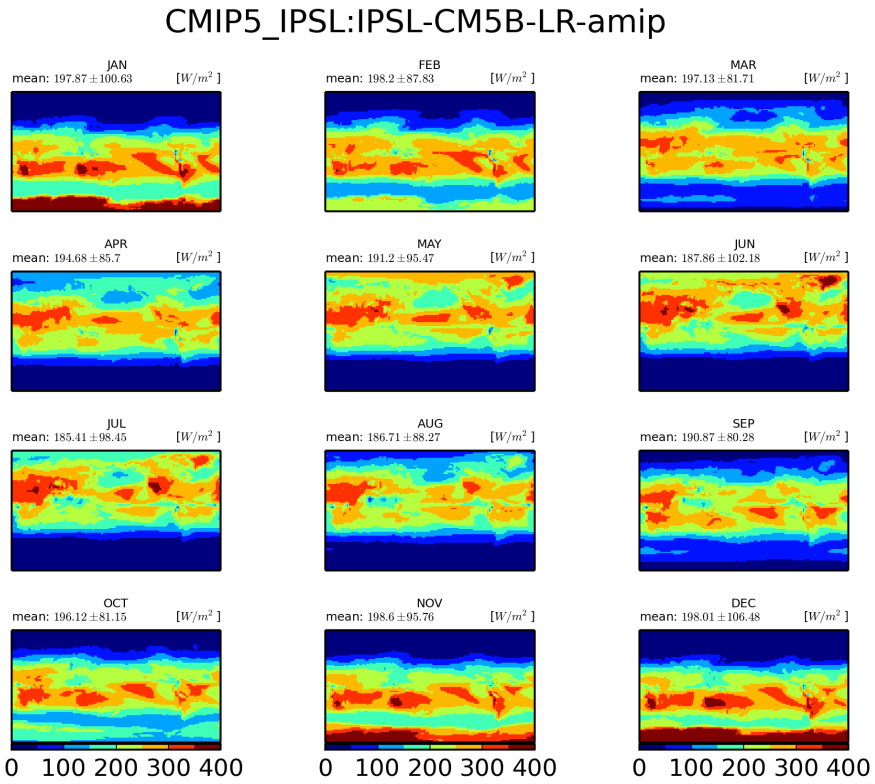



Figure 619: Monthly mean climatology for IPSL:IPSL-CM5B-LR

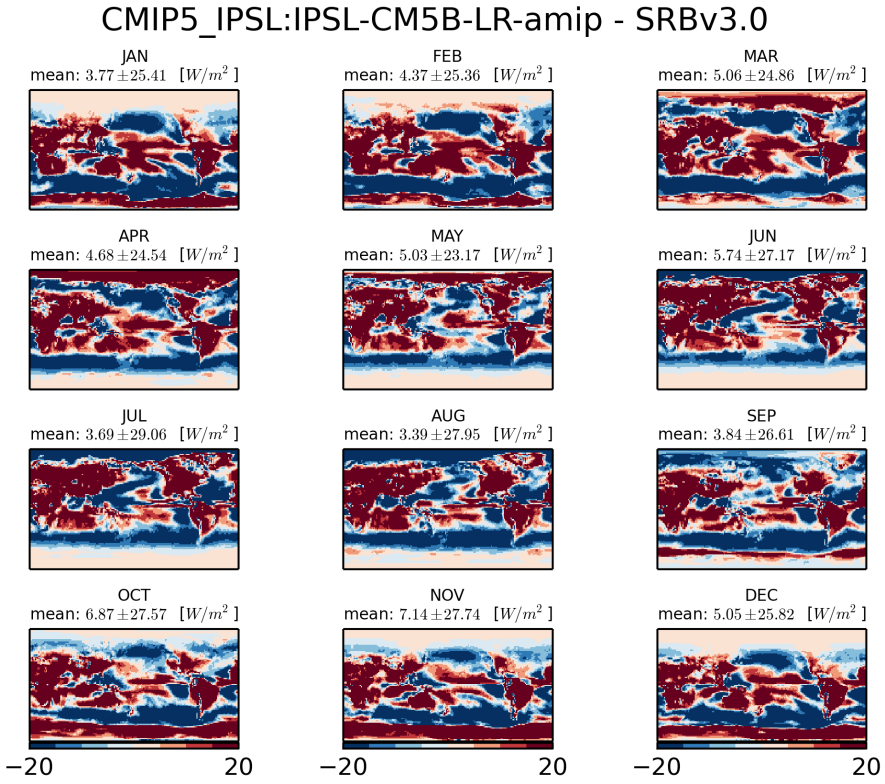



Figure 620: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and SRBV3.0

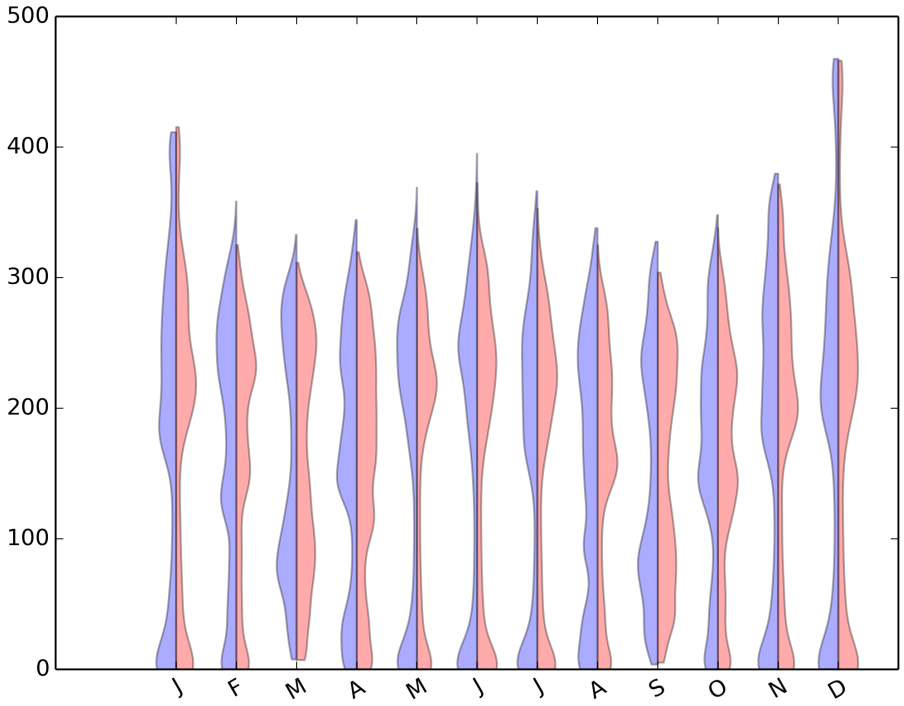



Figure 621: Violin plot for CMIP5-IPSL:IPSL-CM5B-LR-AMIP

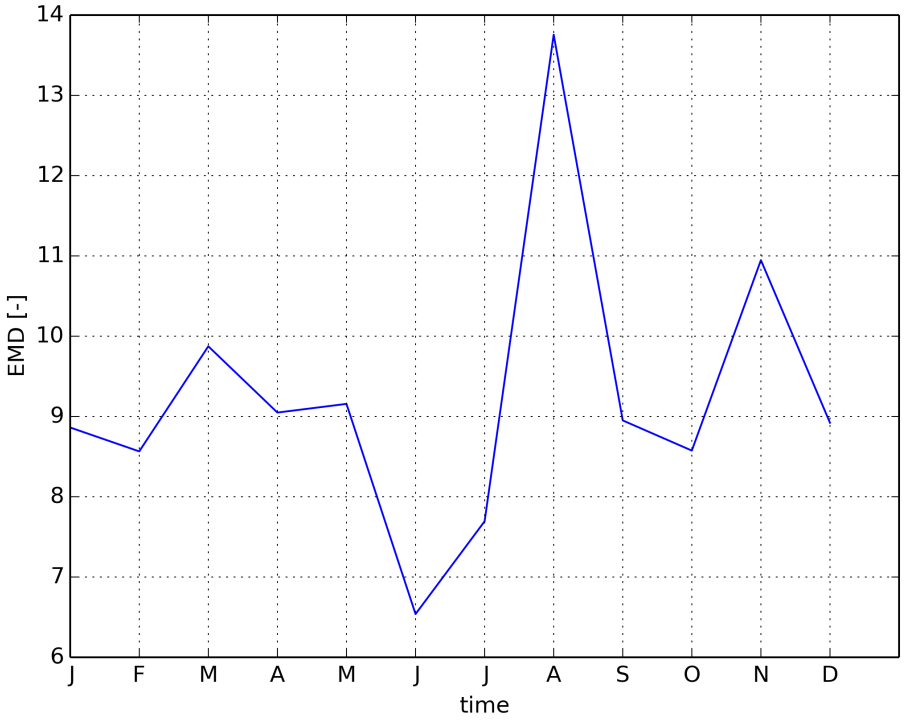



Figure 622: Timeseries of EMD

### 1.4.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

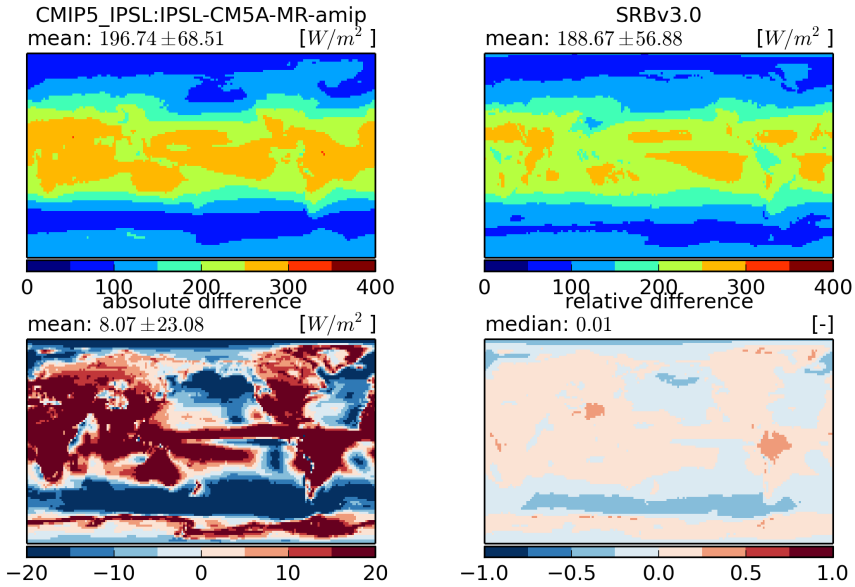



Figure 623: Temporal mean fields (top) and absolute and relative differences (bottom)

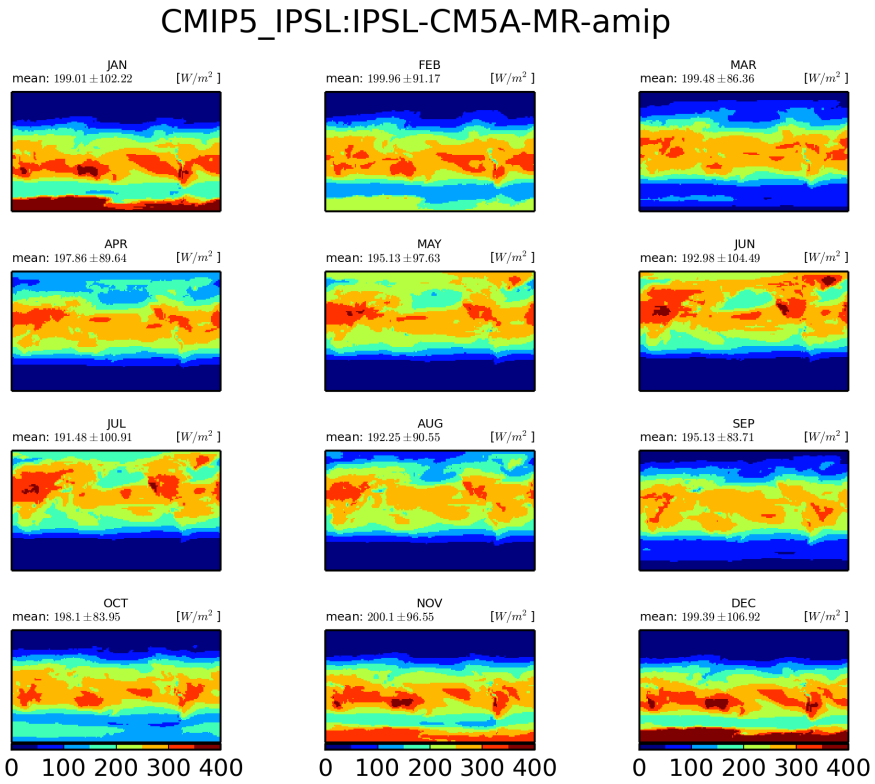



Figure 624: Monthly mean climatology for IPSL:IPSL-CM5A-MR

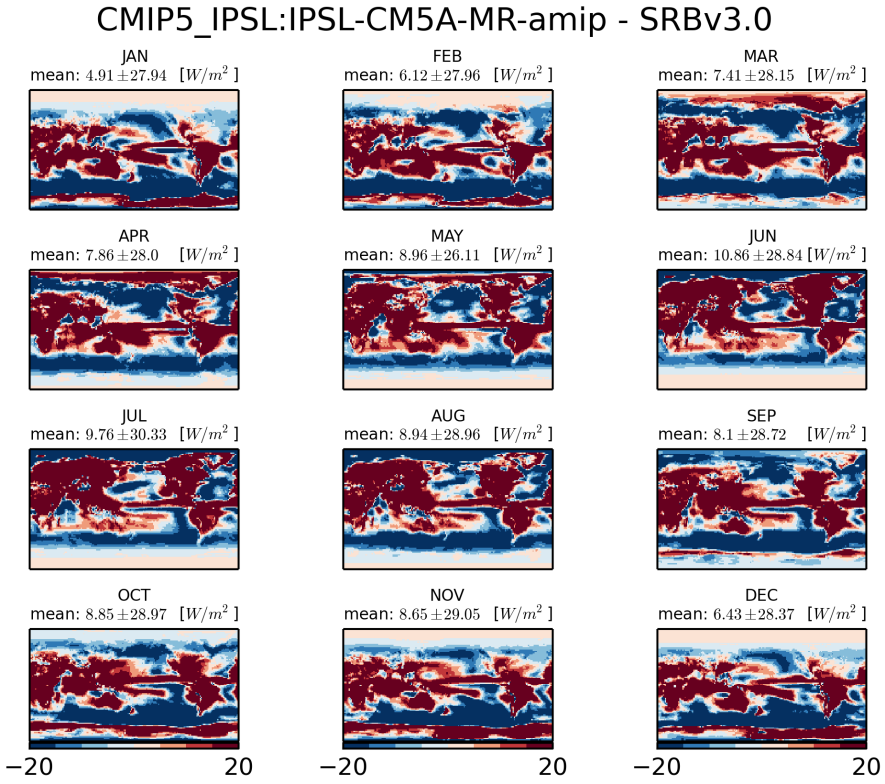



Figure 625: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and SRBV3.0

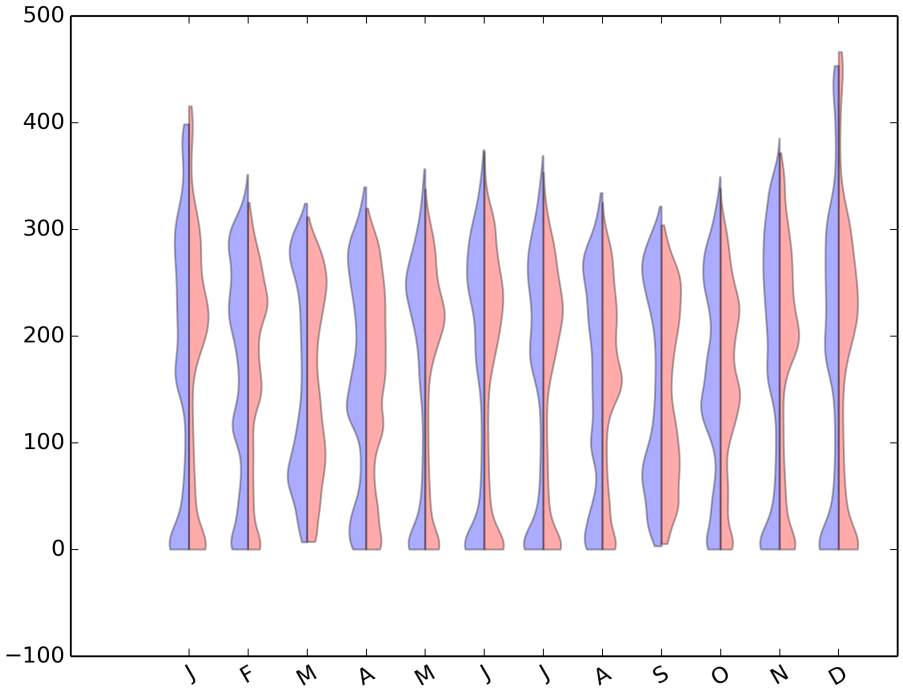



Figure 626: Violin plot for CMIP5-IPSL:IPSL-CM5A-MR-AMIP

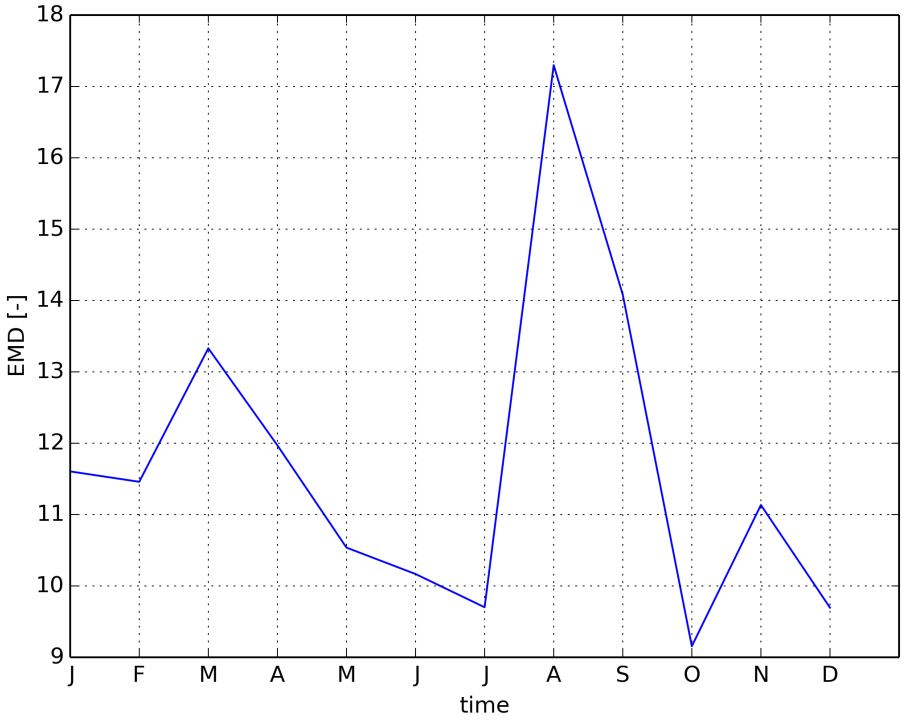



Figure 627: Timeseries of EMD

### 1.4.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

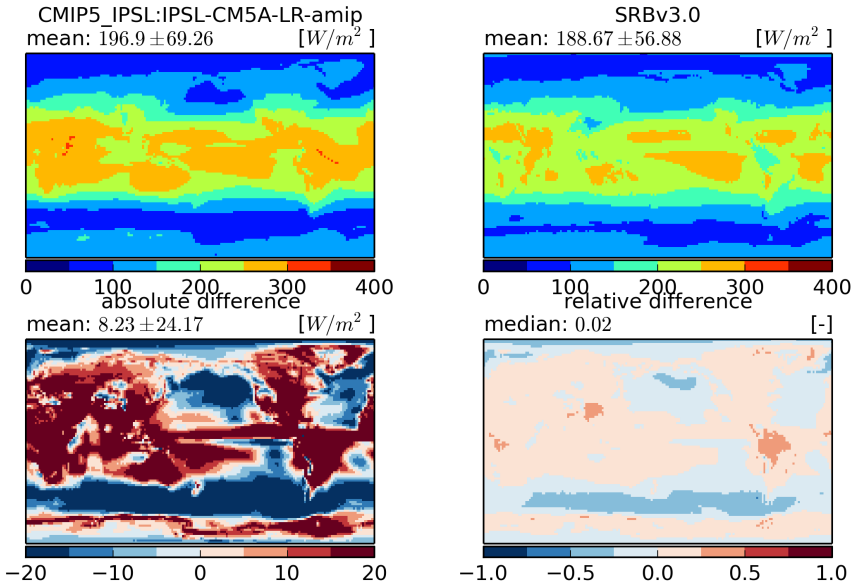



Figure 628: Temporal mean fields (top) and absolute and relative differences (bottom)

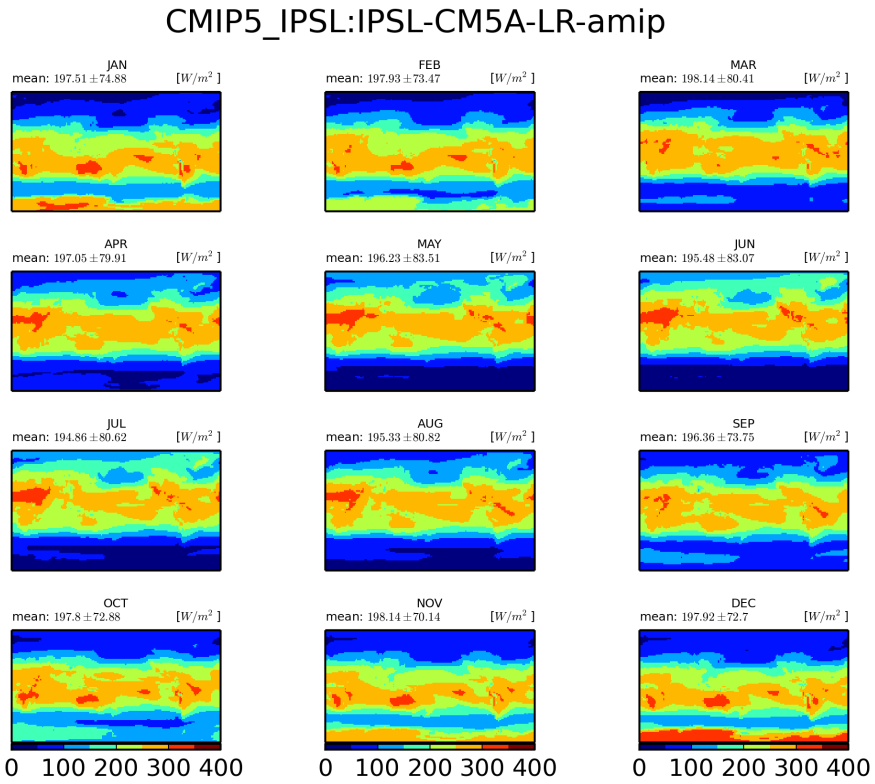



Figure 629: Monthly mean climatology for IPSL:IPSL-CM5A-LR

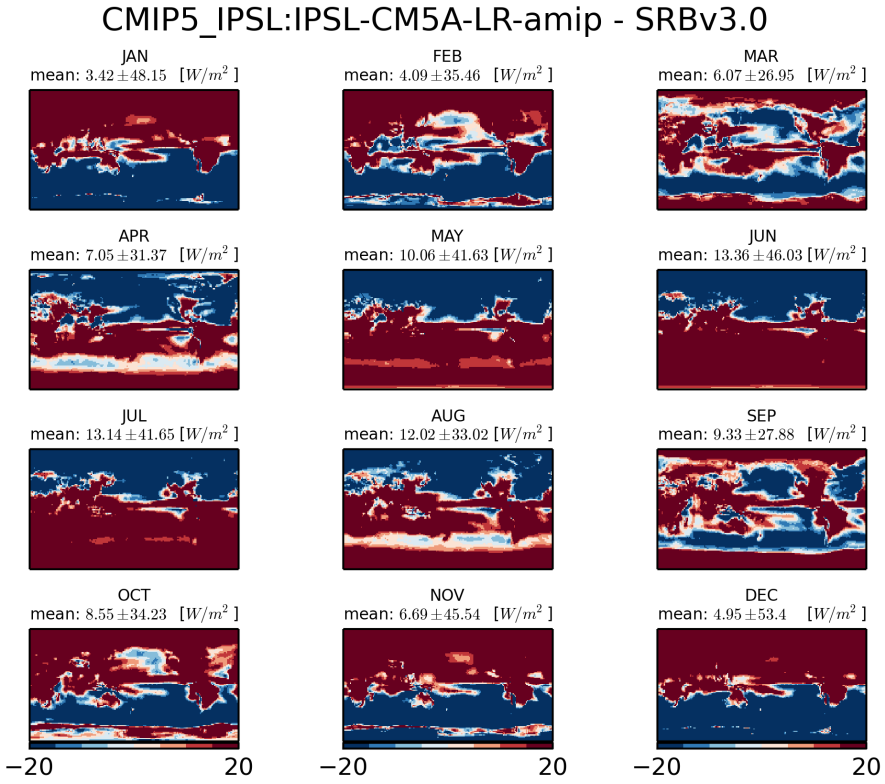



Figure 630: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and SRBV3.0

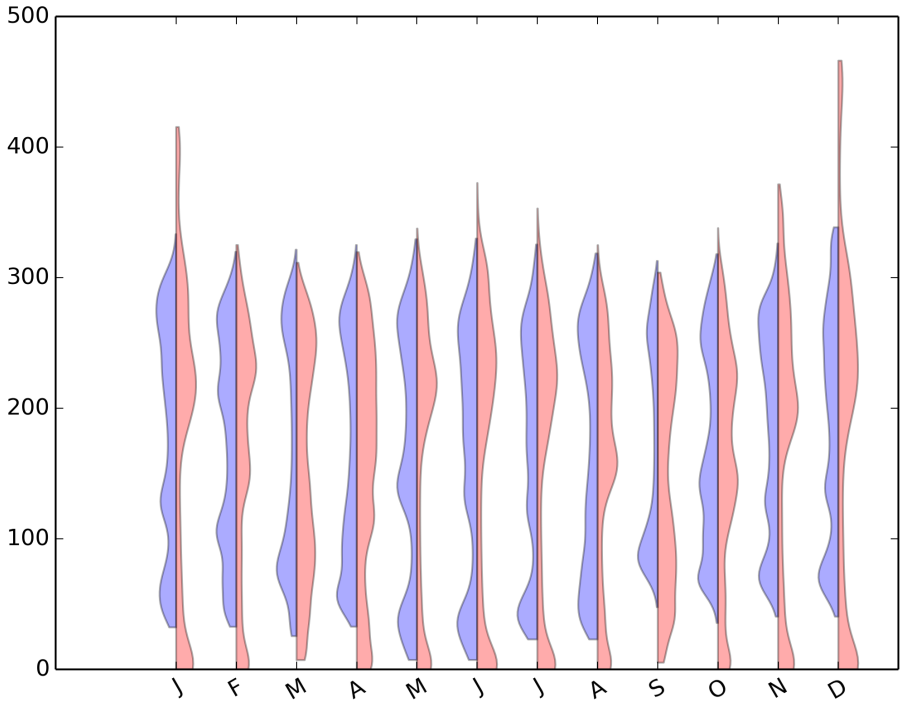



Figure 631: Violin plot for CMIP5-IPSL:IPSL-CM5A-LR-AMIP

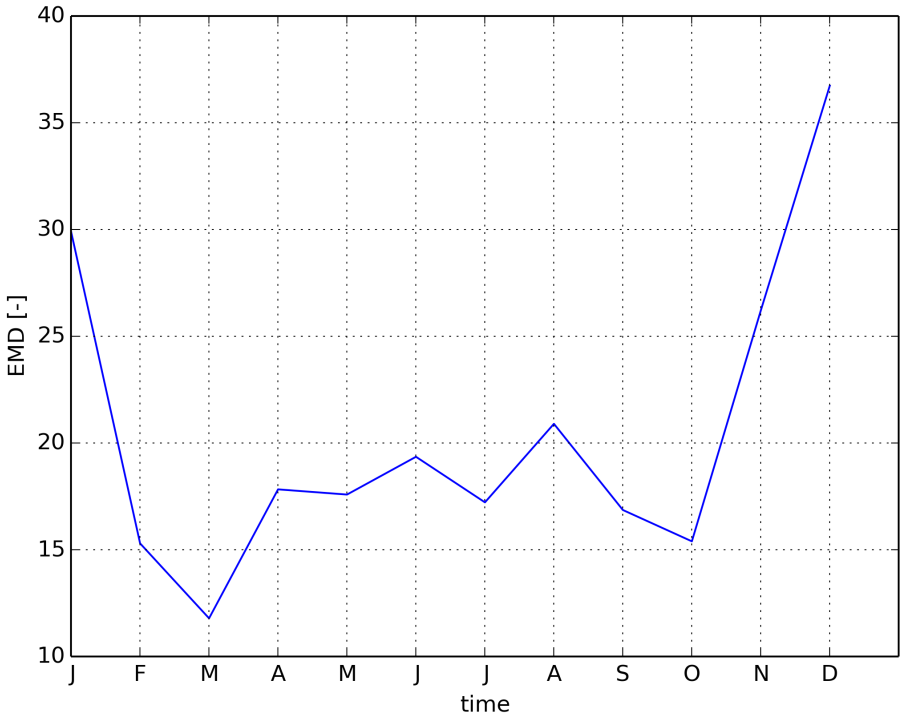



Figure 632: Timeseries of EMD

### 1.4.15 CMIP5 MOHC:HadGEM2-A-amip

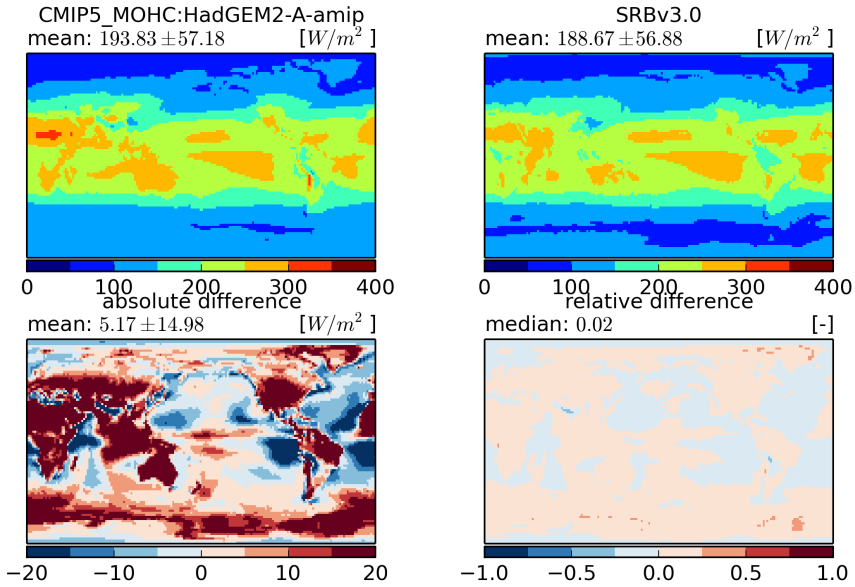



Figure 633: Temporal mean fields (top) and absolute and relative differences (bottom)

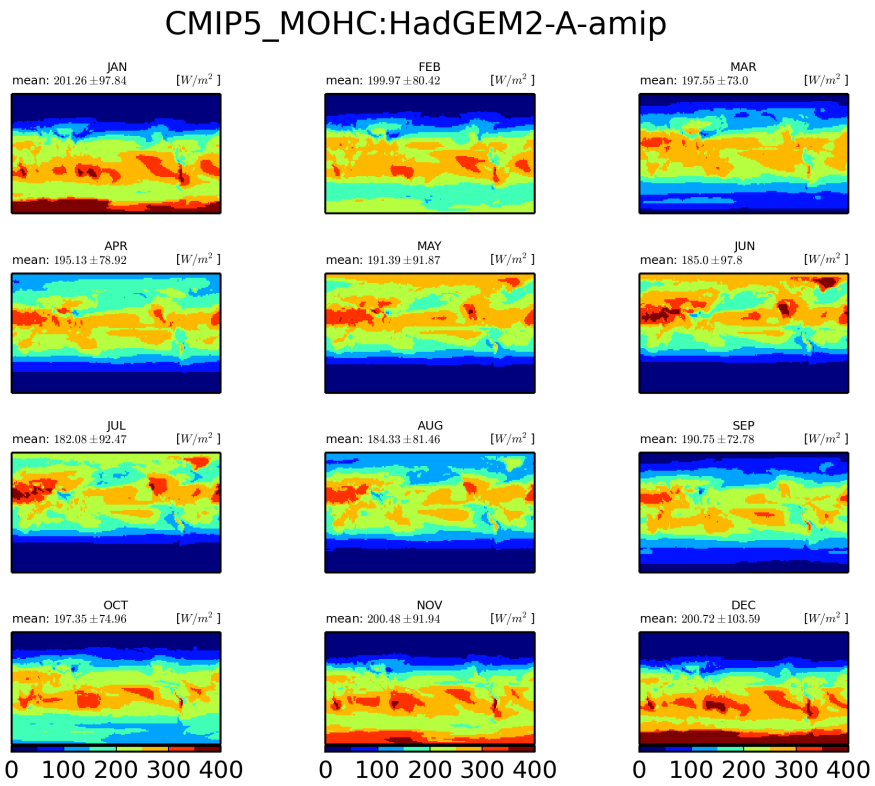



Figure 634: Monthly mean climatology for MOHC:HadGEM2-A

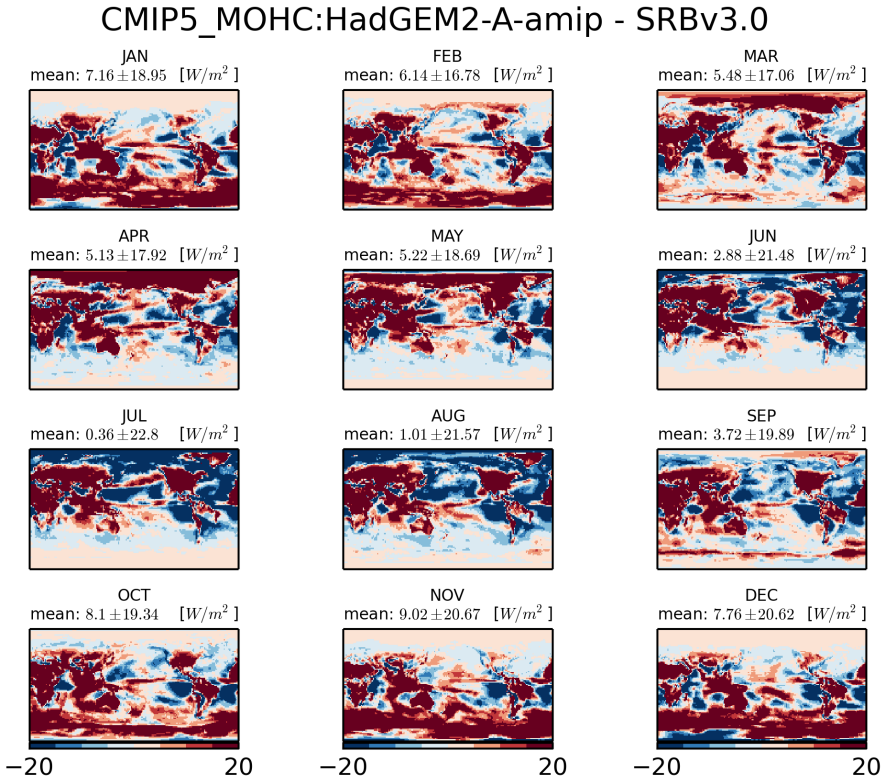



Figure 635: Monthly mean climatology of difference between MOHC:HADGEM2-A and SRBV3.0

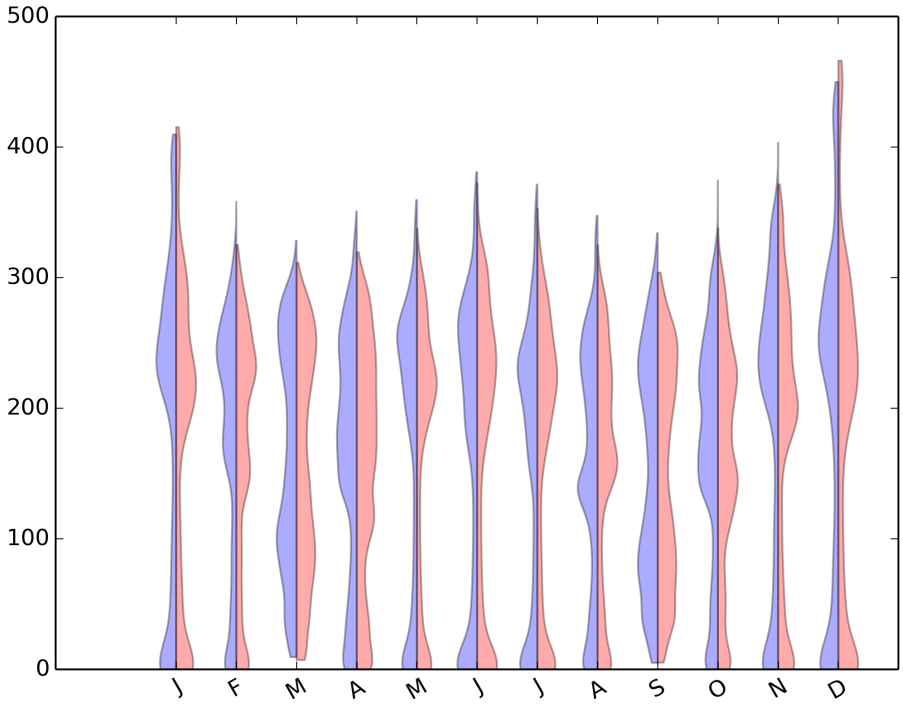



Figure 636: Violin plot for CMIP5-MOHC:HADGEM2-A-AMIP

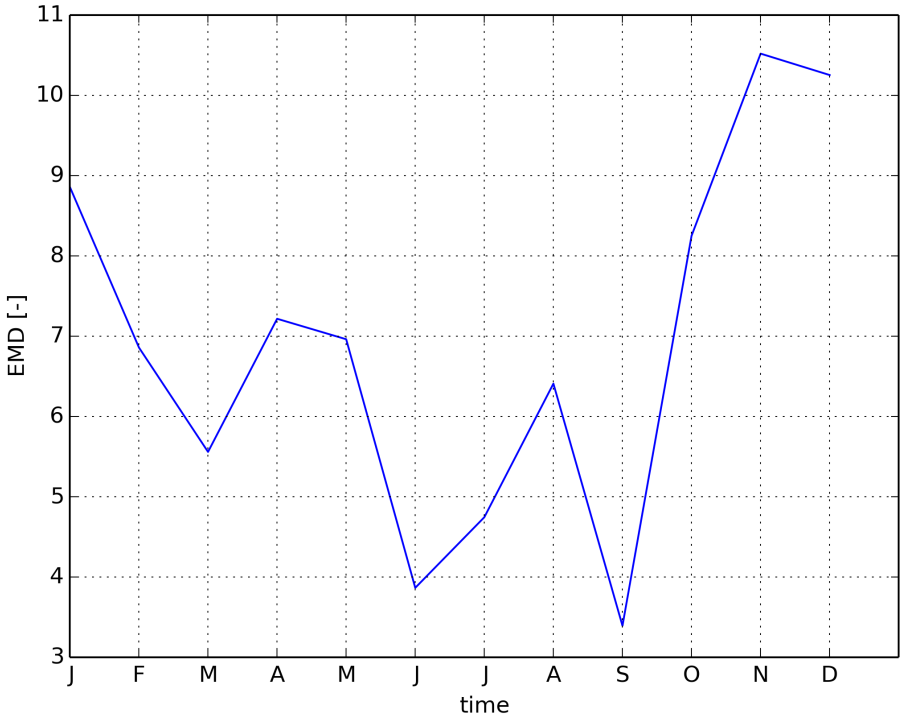



Figure 637: Timeseries of EMD

### 1.4.16 CMIP5 LASG-IAP:FGOALS-s2-amip

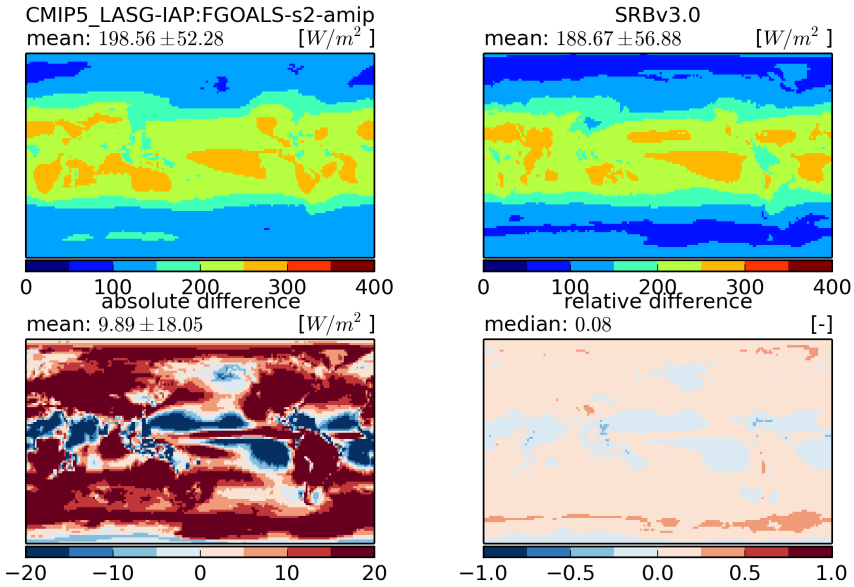



Figure 638: Temporal mean fields (top) and absolute and relative differences (bottom)

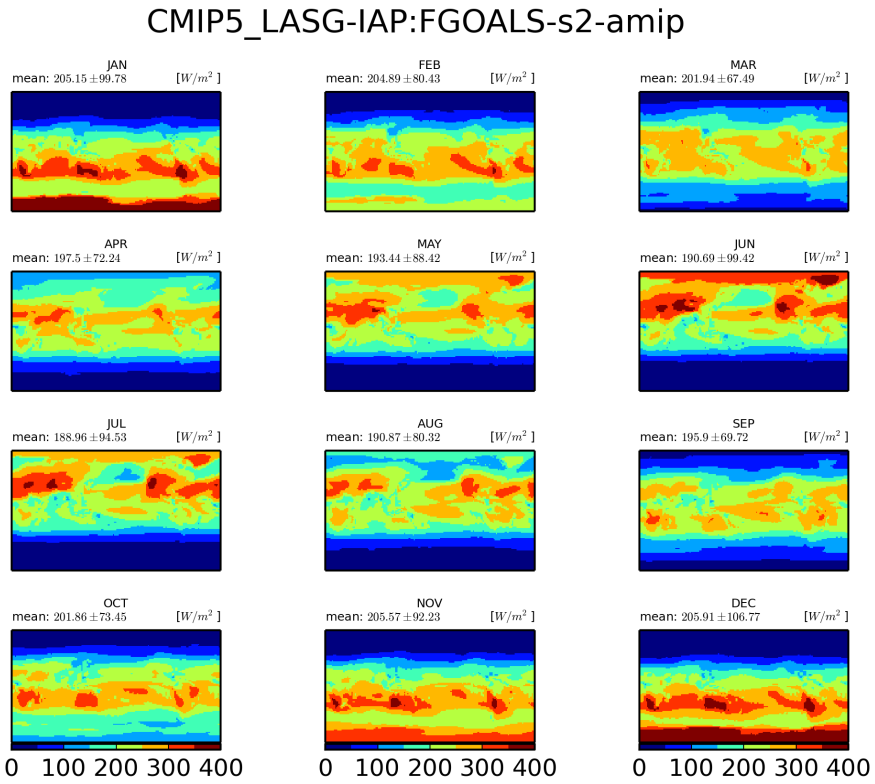



Figure 639: Monthly mean climatology for LASG-IAP:FGOALS-s2

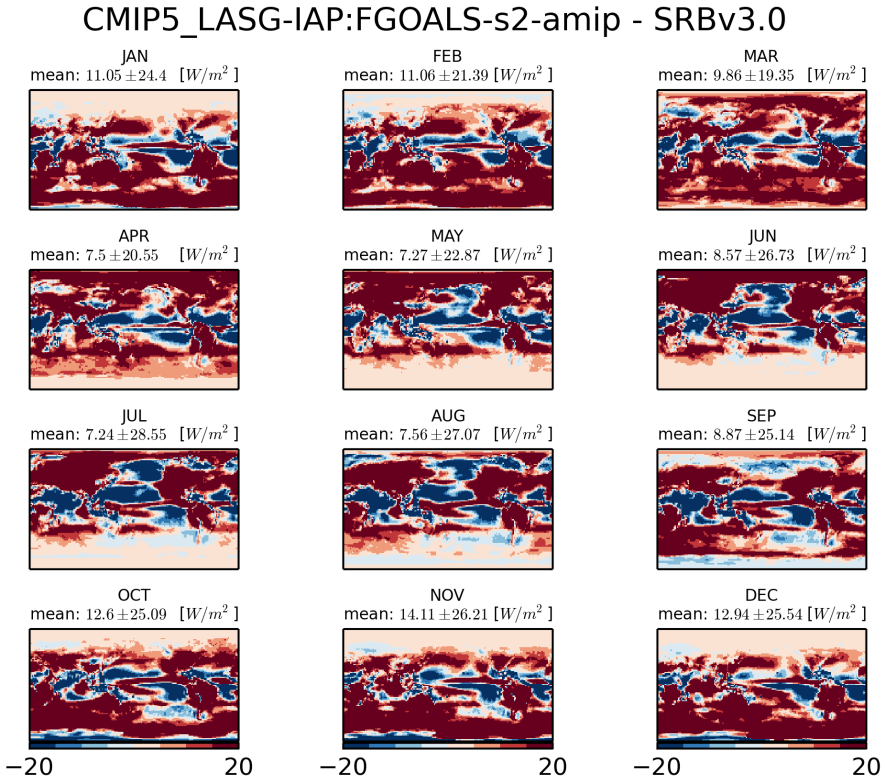



Figure 640: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and SRBV3.0

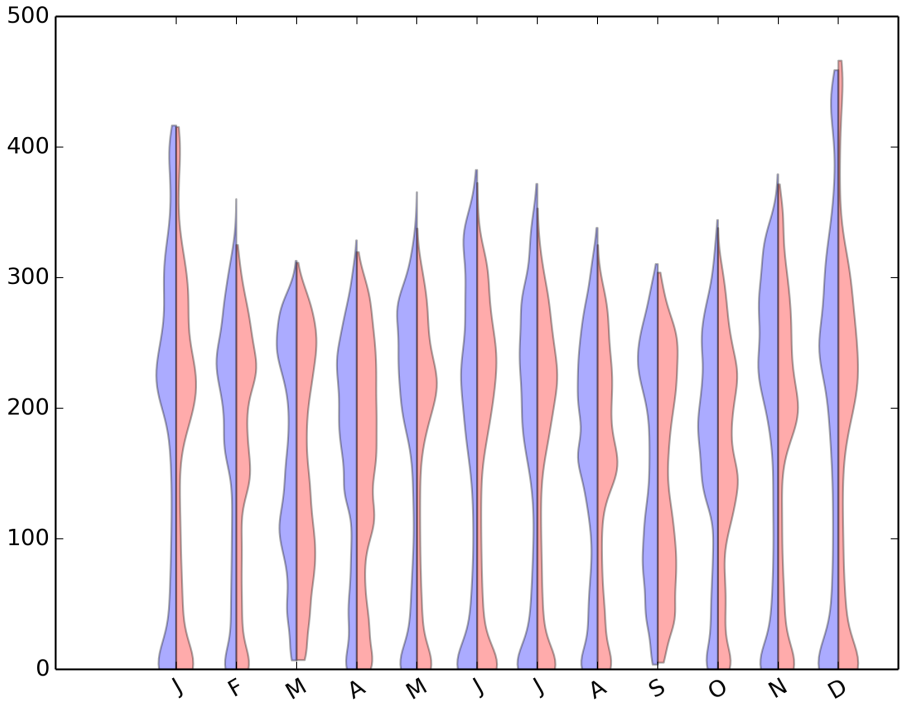



Figure 641: Violin plot for CMIP5-LASG-IAP:FGOALS-S2-AMIP

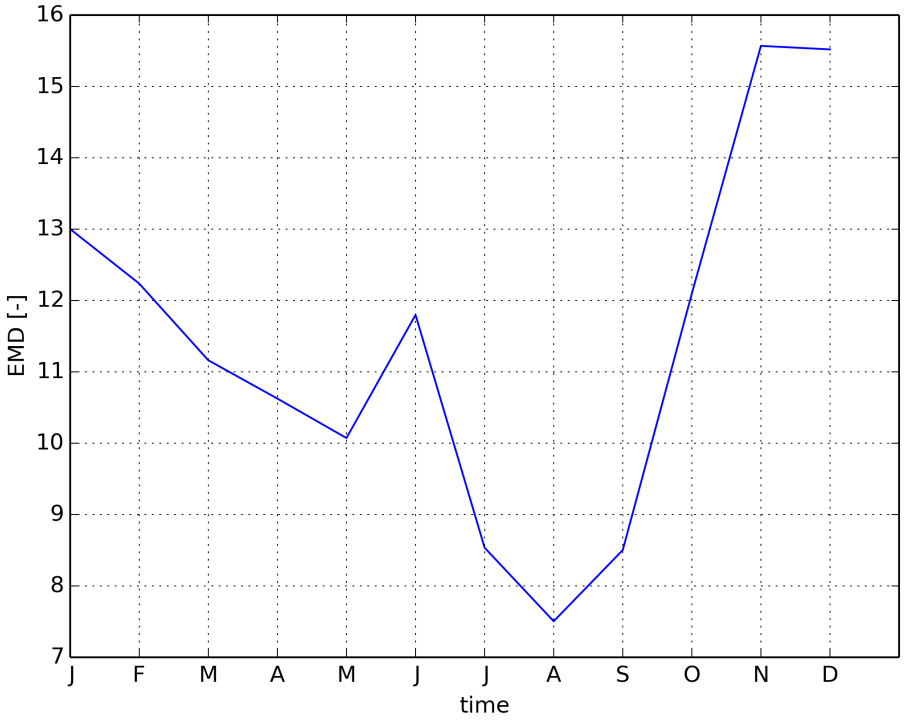



Figure 642: Timeseries of EMD

### 1.4.17 CMIP5 CMCC:CMCC-CM-amip

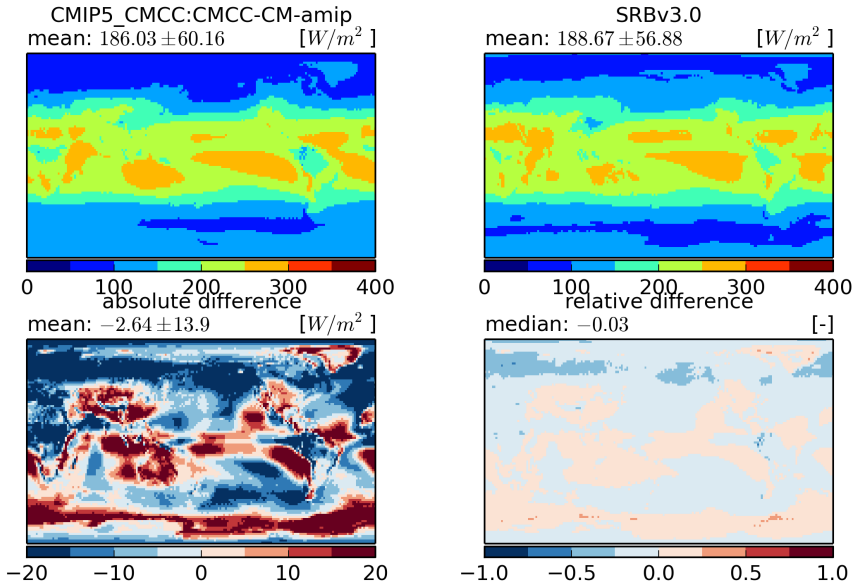



Figure 643: Temporal mean fields (top) and absolute and relative differences (bottom)

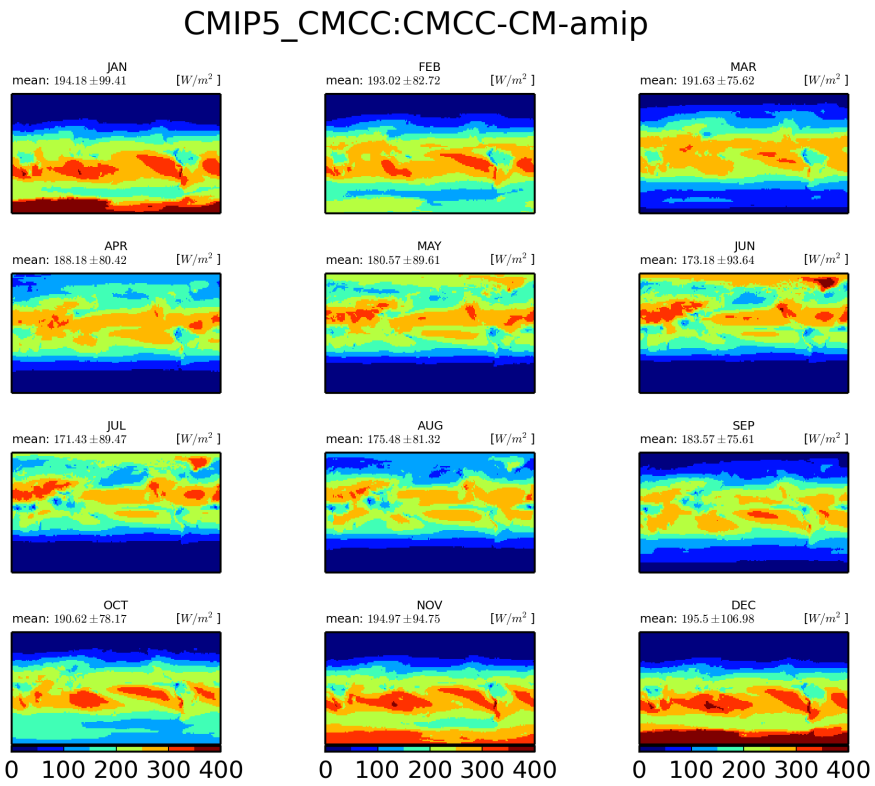



Figure 644: Monthly mean climatology for CMCC:CMCC-CM

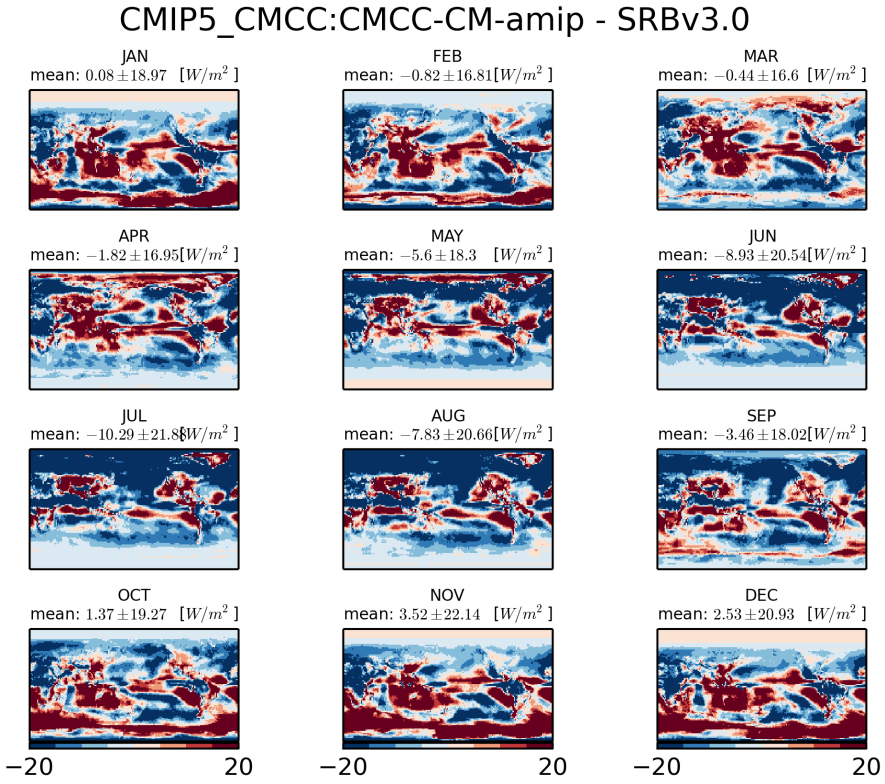



Figure 645: Monthly mean climatology of difference between CMCC:CMCC-CM and SRBV3.0

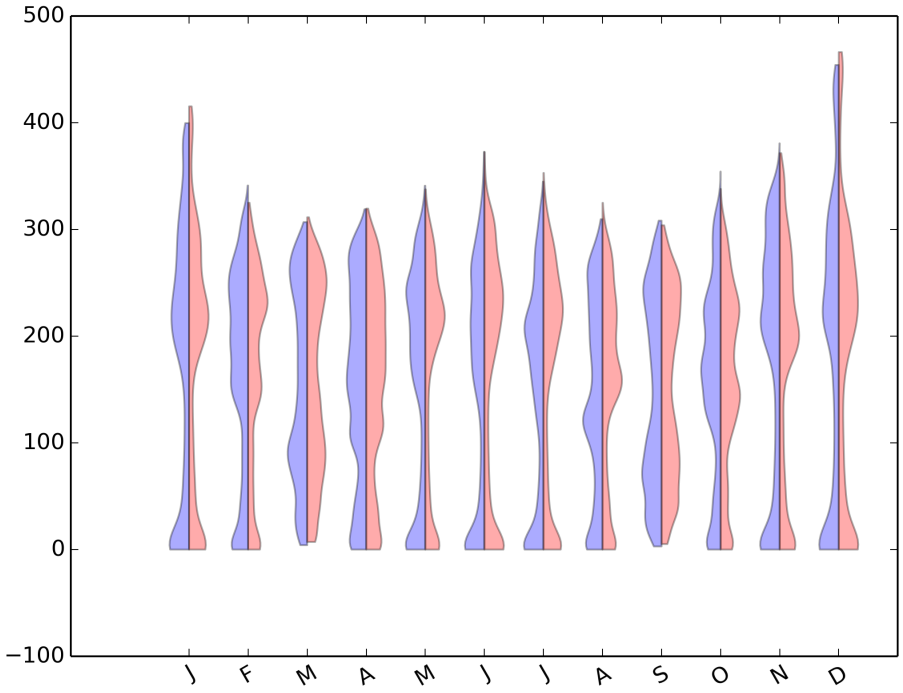



Figure 646: Violin plot for CMIP5-CMCC:CMCC-CM-AMIP

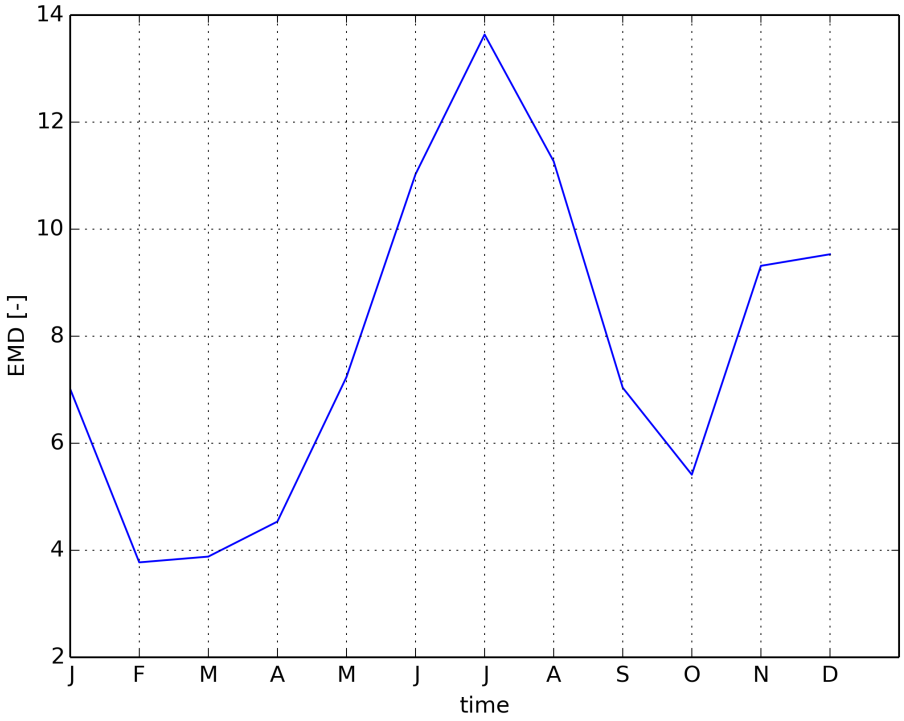



Figure 647: Timeseries of EMD

### 1.4.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

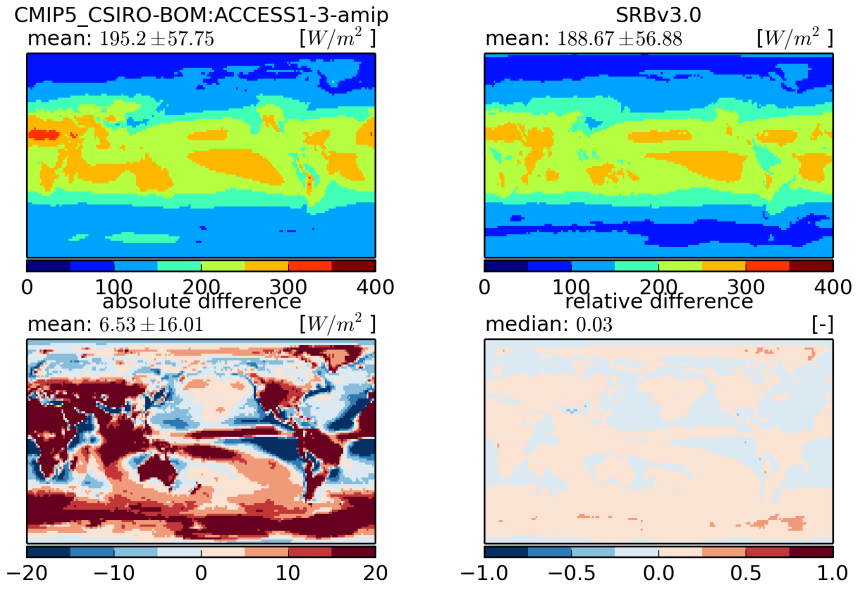



Figure 648: Temporal mean fields (top) and absolute and relative differences (bottom)

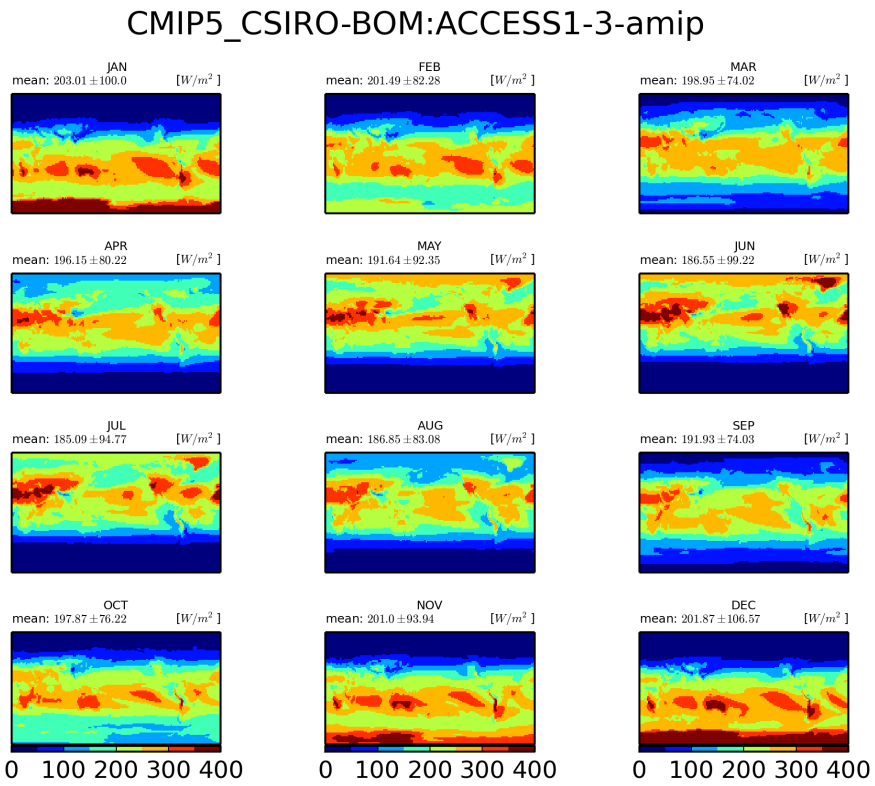



Figure 649: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

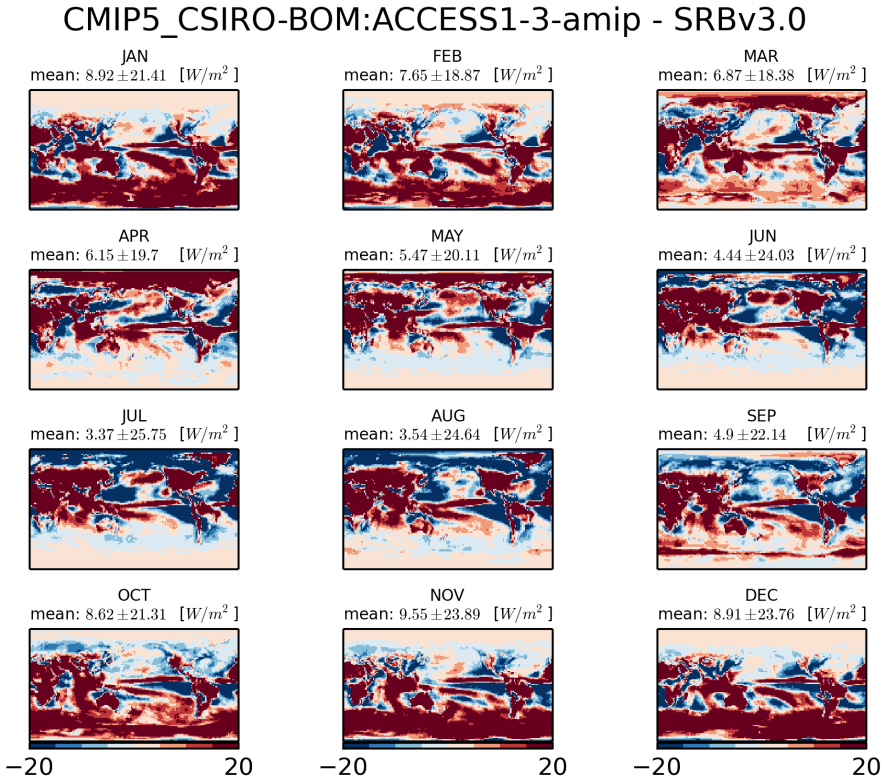



Figure 650: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and SRBV3.0

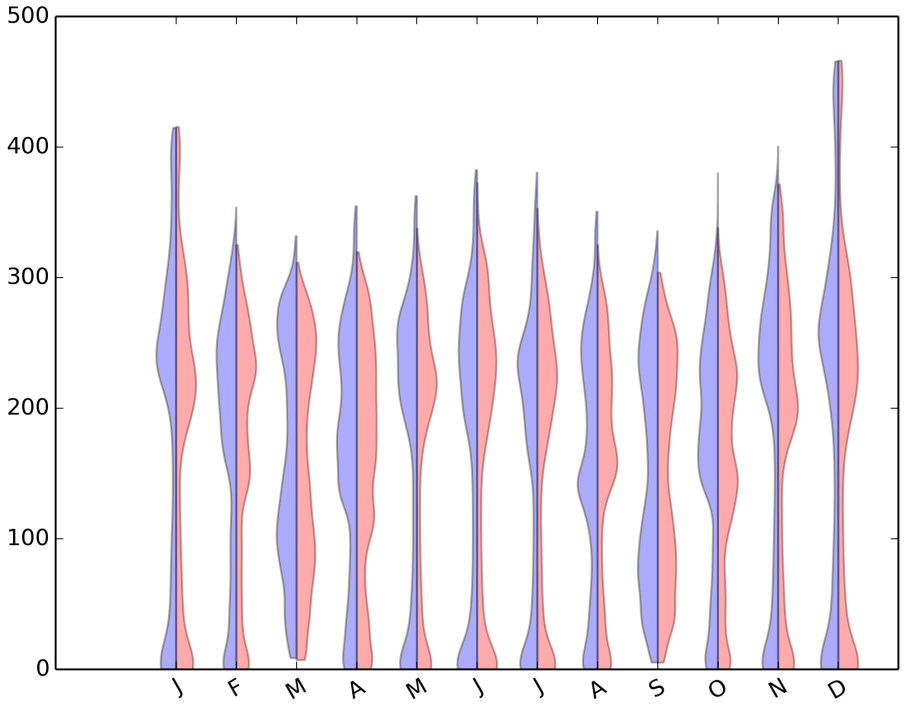



Figure 651: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-3-AMIP

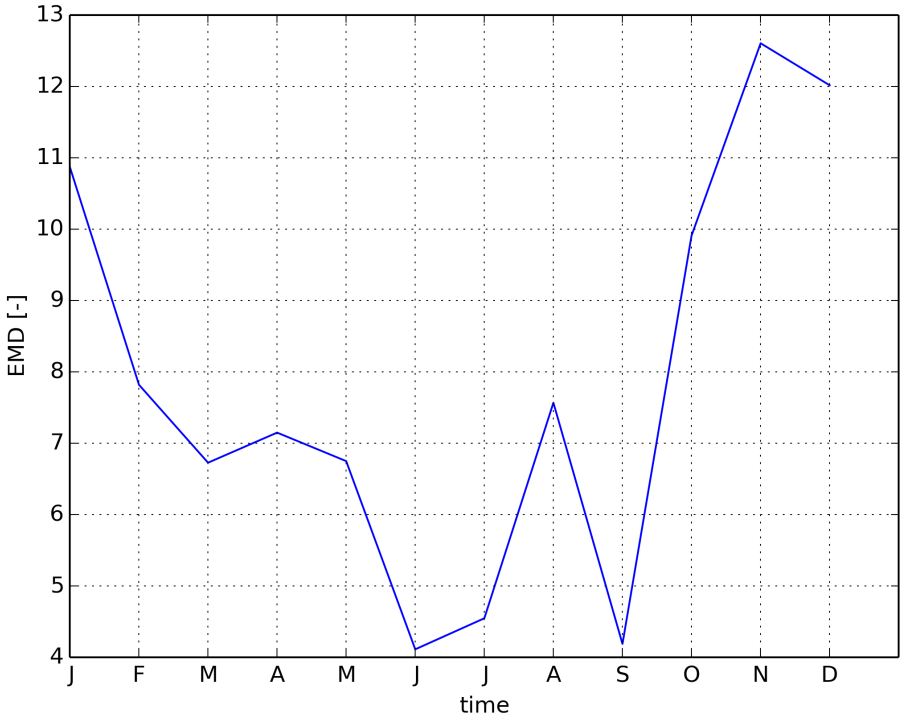



Figure 652: Timeseries of EMD

### 1.4.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

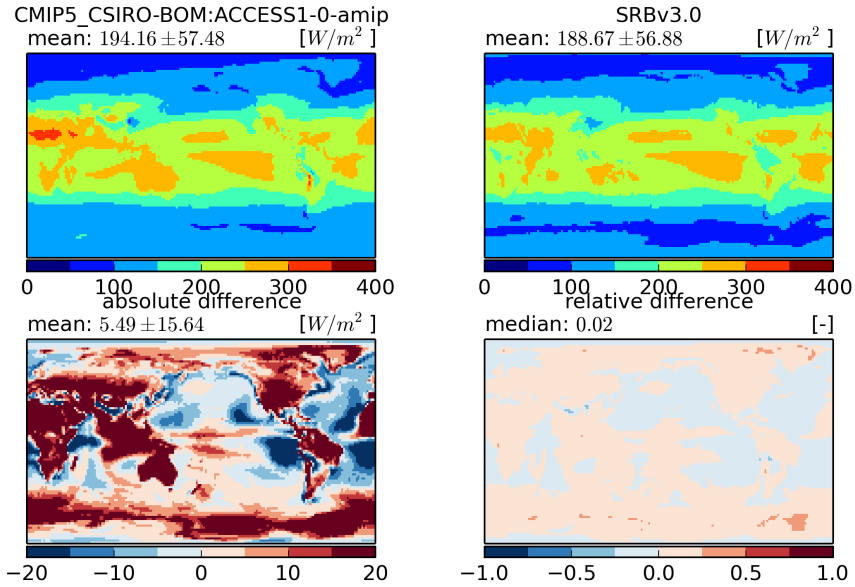



Figure 653: Temporal mean fields (top) and absolute and relative differences (bottom)

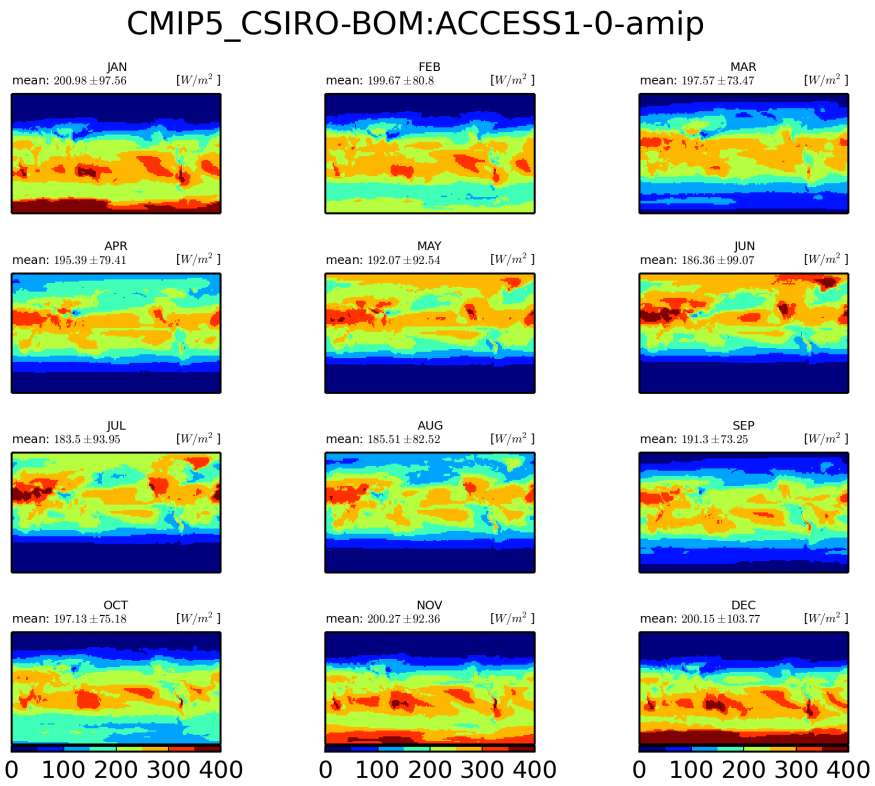



Figure 654: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

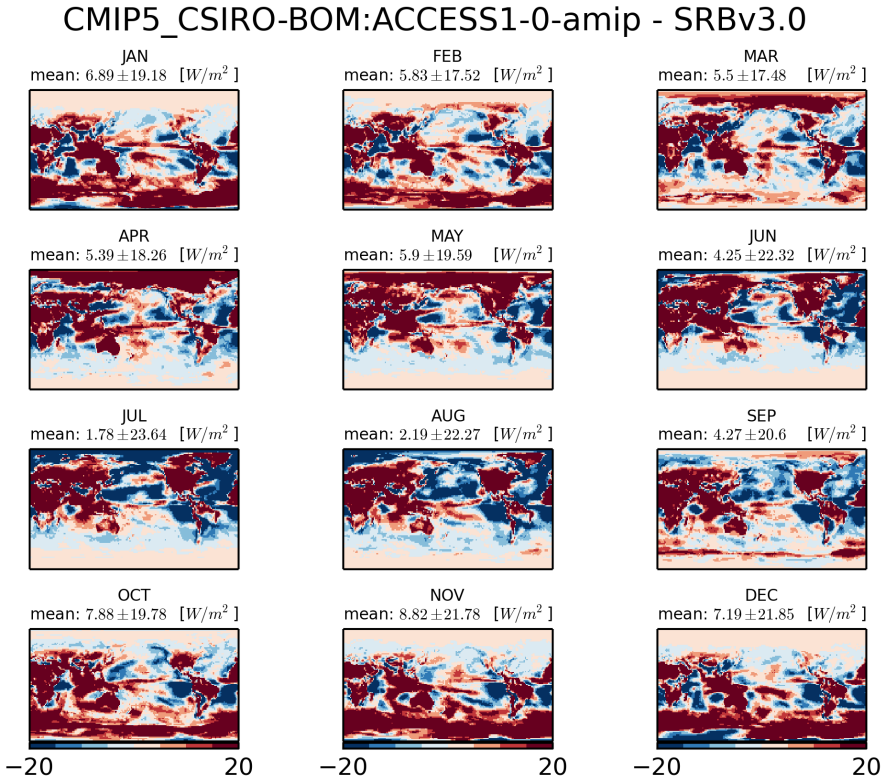



Figure 655: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and SRBV3.0

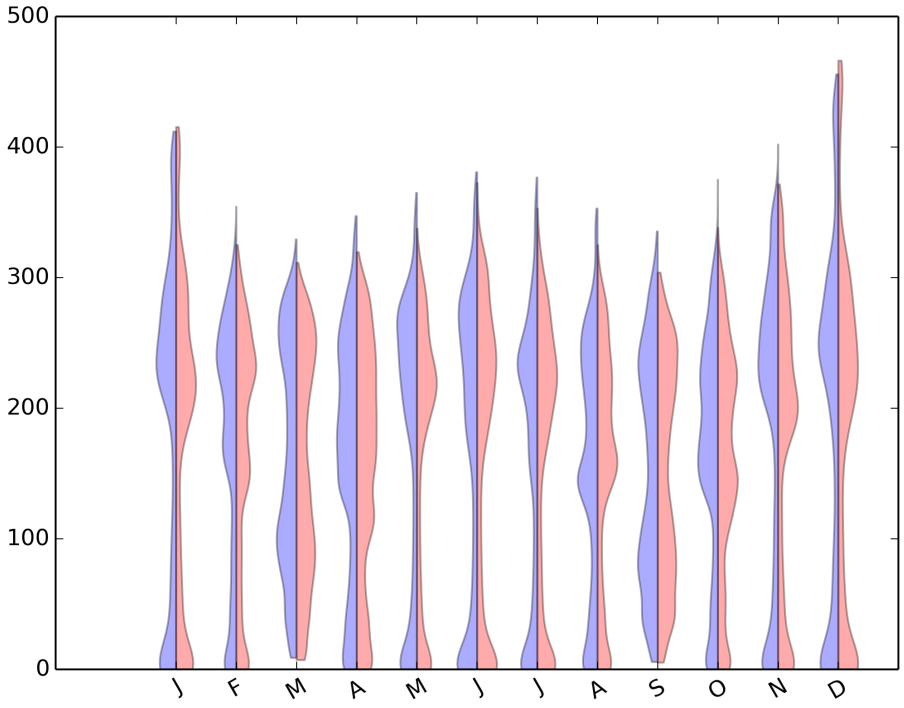



Figure 656: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-0-AMIP

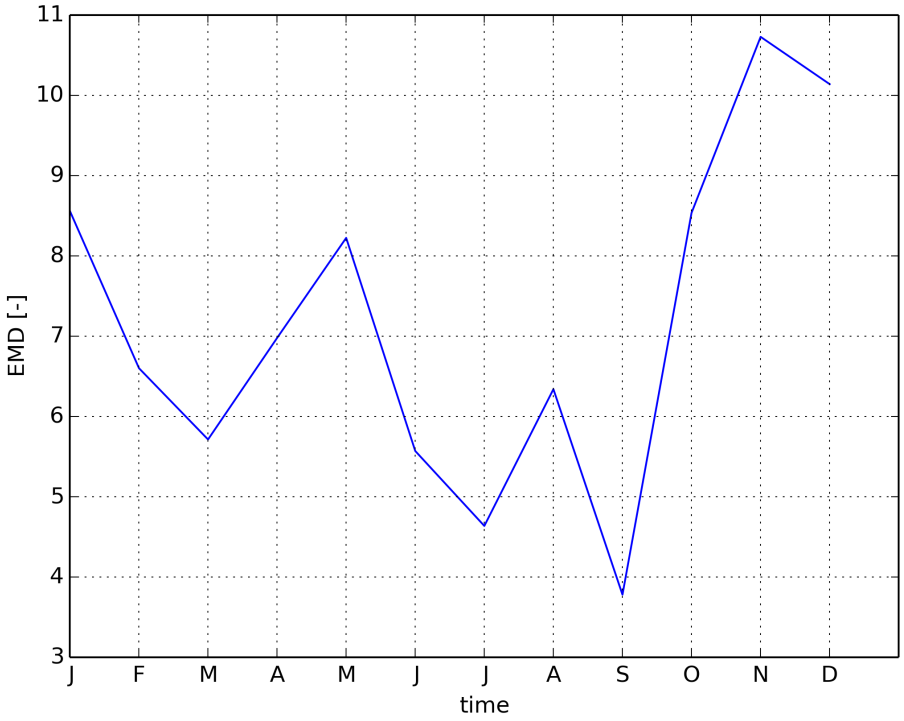



Figure 657: Timeseries of EMD

### 1.4.20 CMIP5 INM:inmcm4-amip

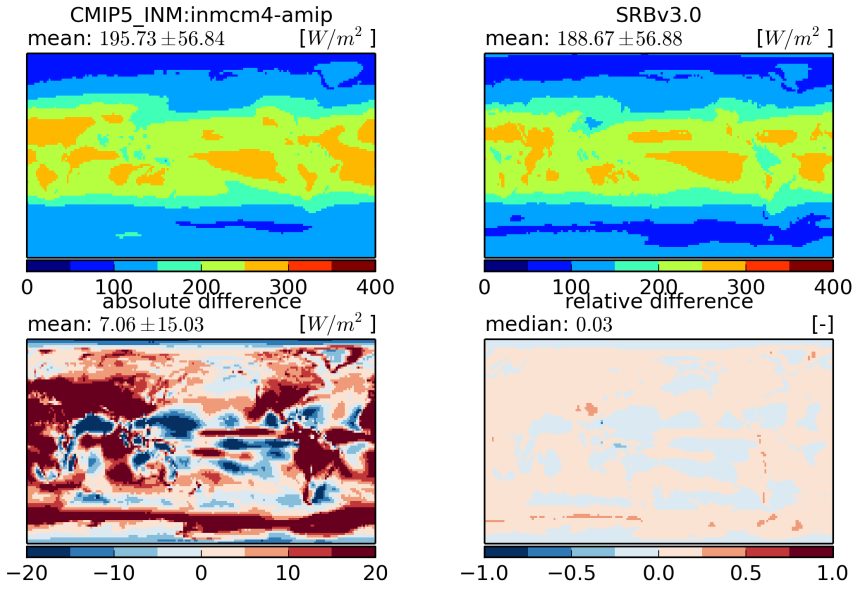



Figure 658: Temporal mean fields (top) and absolute and relative differences (bottom)

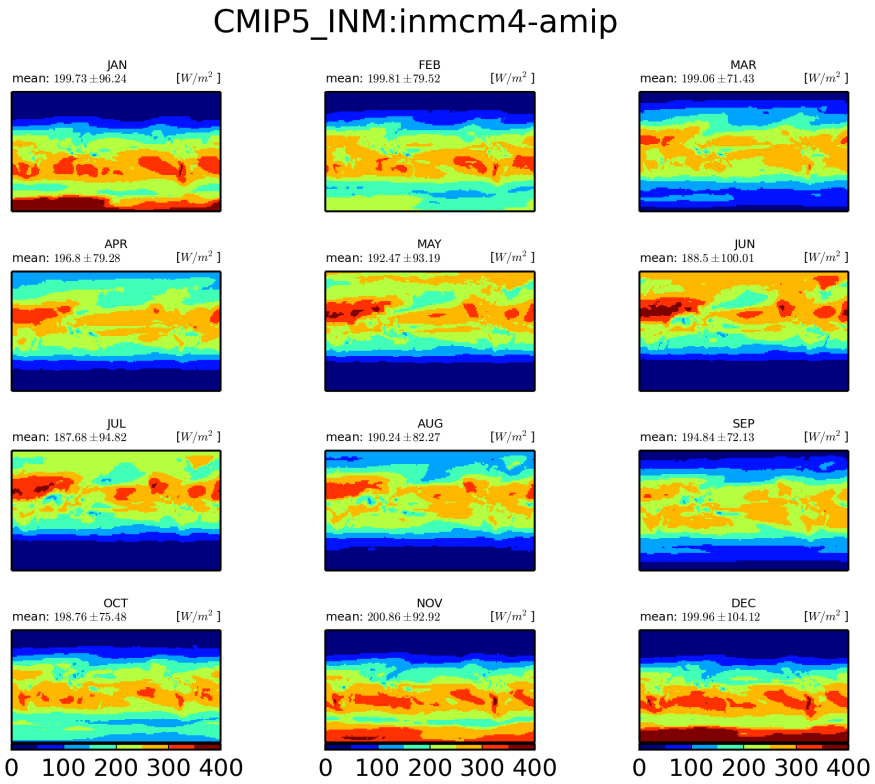



Figure 659: Monthly mean climatology for INM:inmcm4

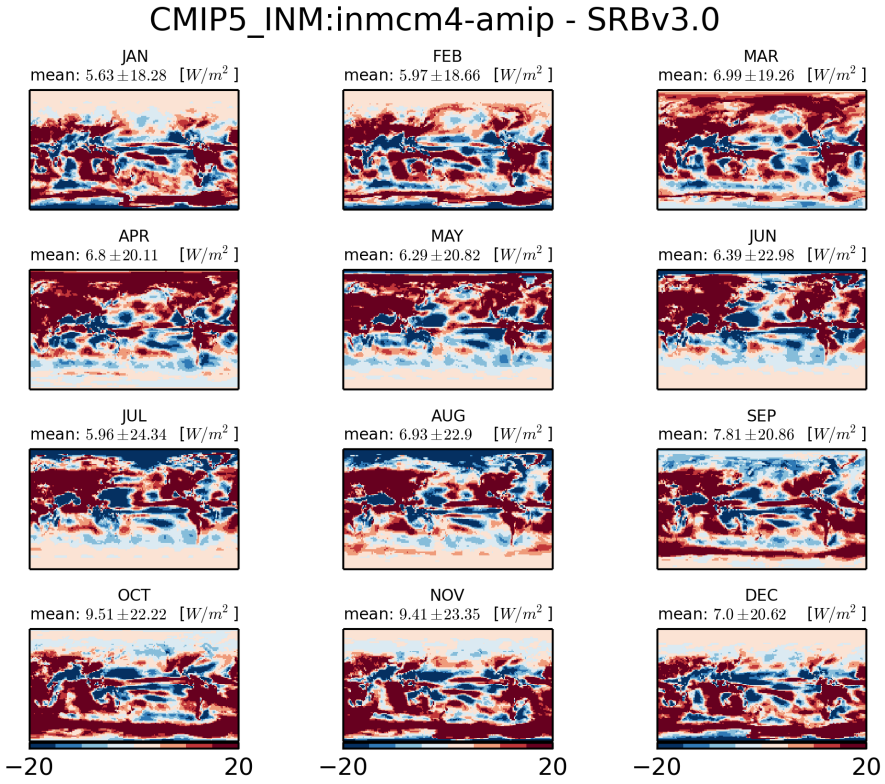



Figure 660: Monthly mean climatology of difference between INM:INMCM4 and SRBV3.0

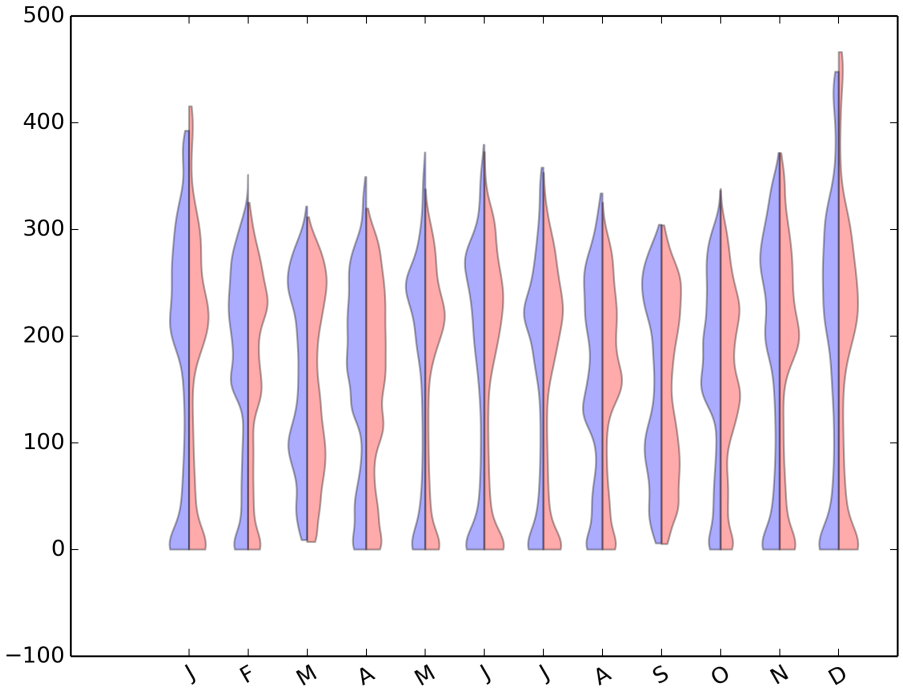



Figure 661: Violin plot for CMIP5-INM:INMCM4-AMIP

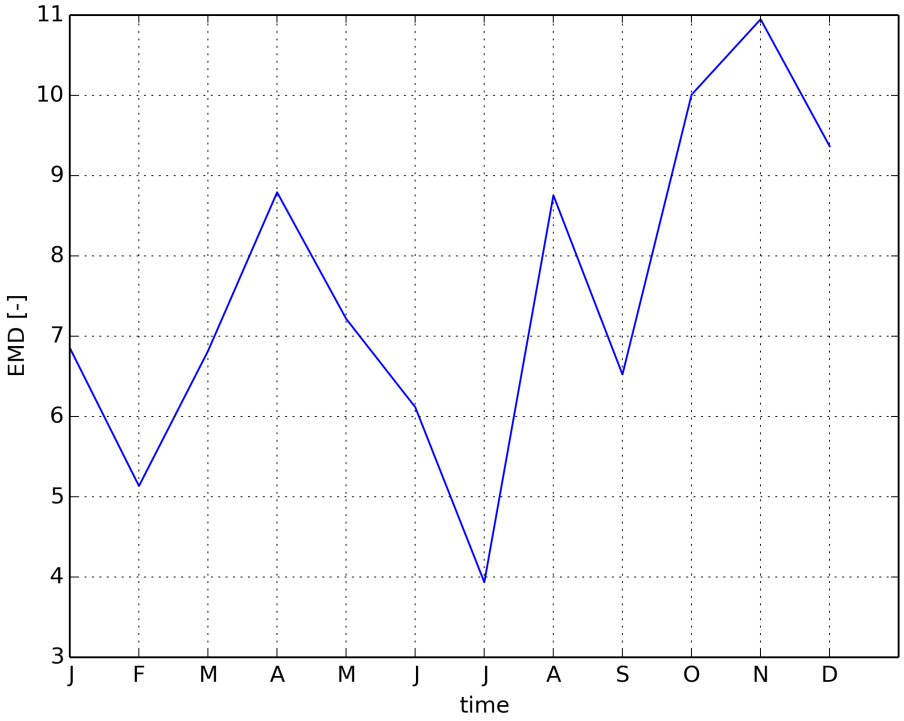



Figure 662: Timeseries of EMD

### 1.4.21 CMIP5 MPI-M:MPI-ESM-LR-amip

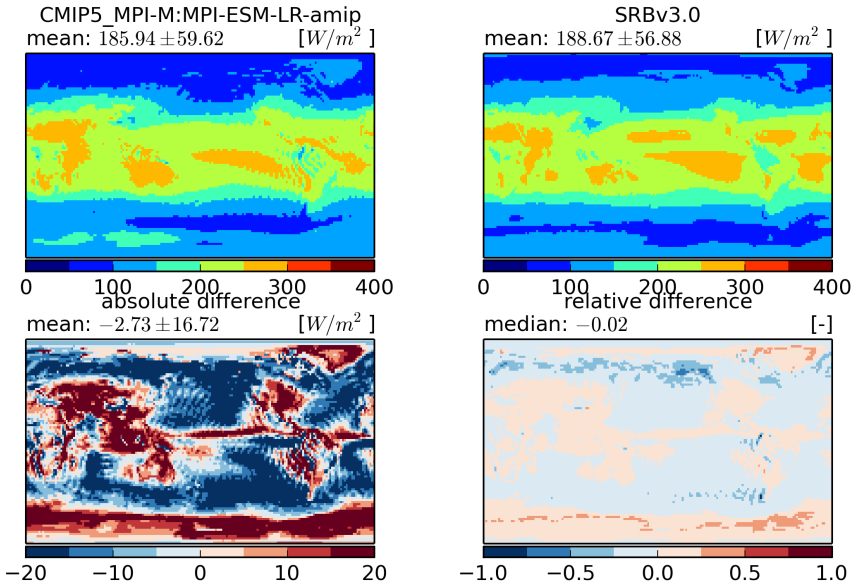



Figure 663: Temporal mean fields (top) and absolute and relative differences (bottom)

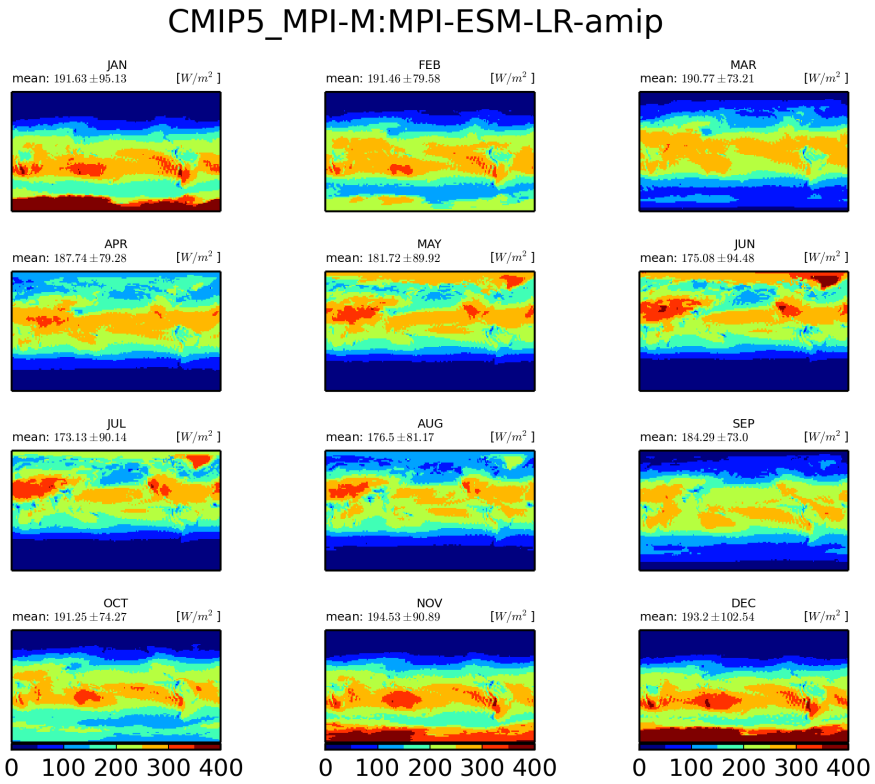



Figure 664: Monthly mean climatology for MPI-M:MPI-ESM-LR

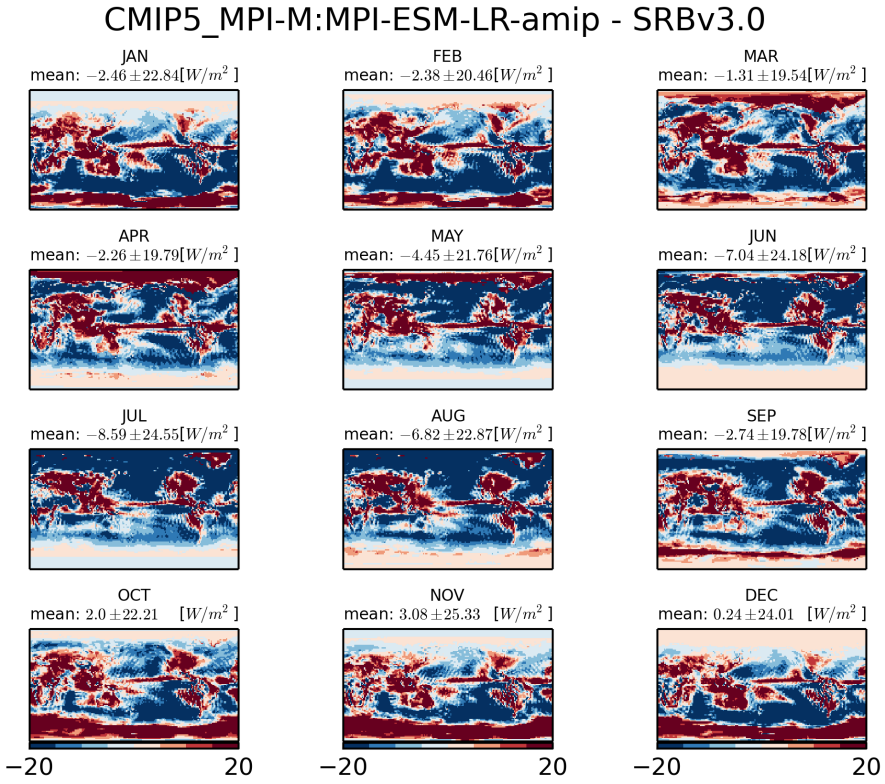



Figure 665: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and SRBV3.0

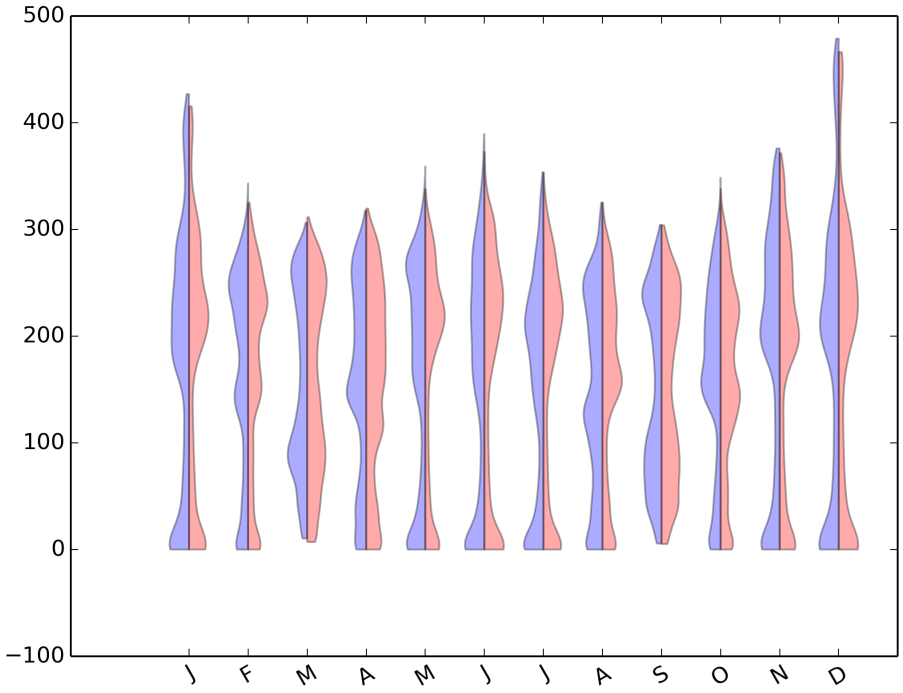



Figure 666: Violin plot for CMIP5-MPI-M:MPI-ESM-LR-AMIP

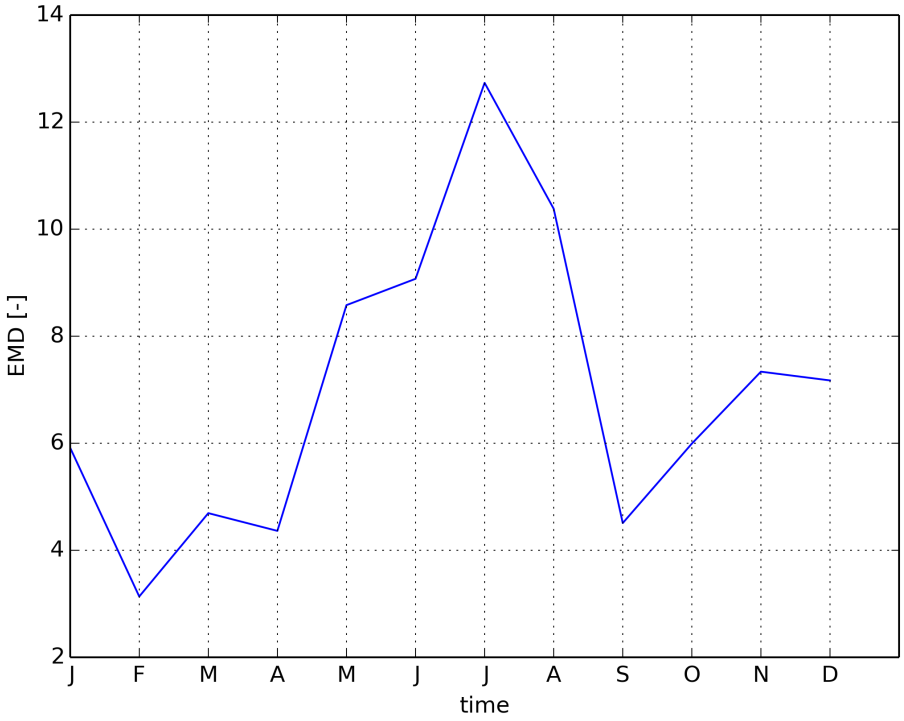



Figure 667: Timeseries of EMD

### 1.4.22 CMIP5 MPI-M:MPI-ESM-MR-amip

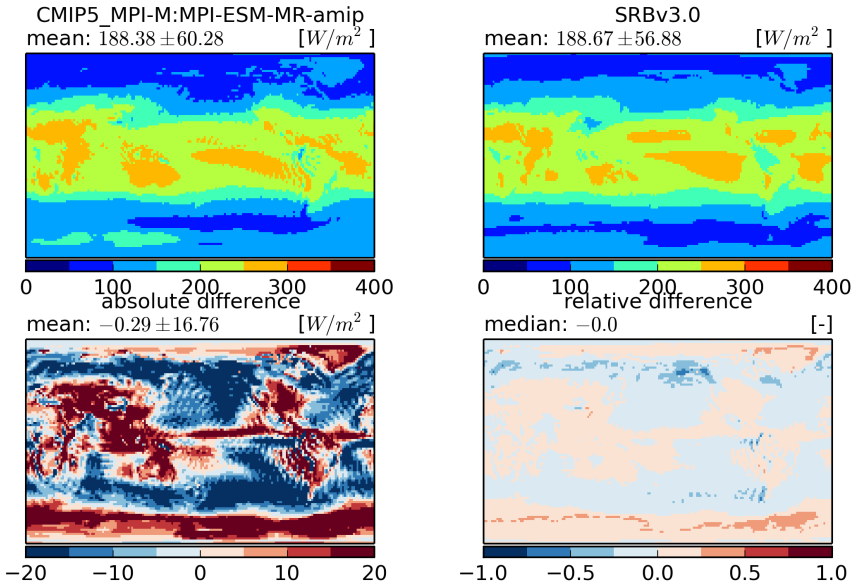



Figure 668: Temporal mean fields (top) and absolute and relative differences (bottom)

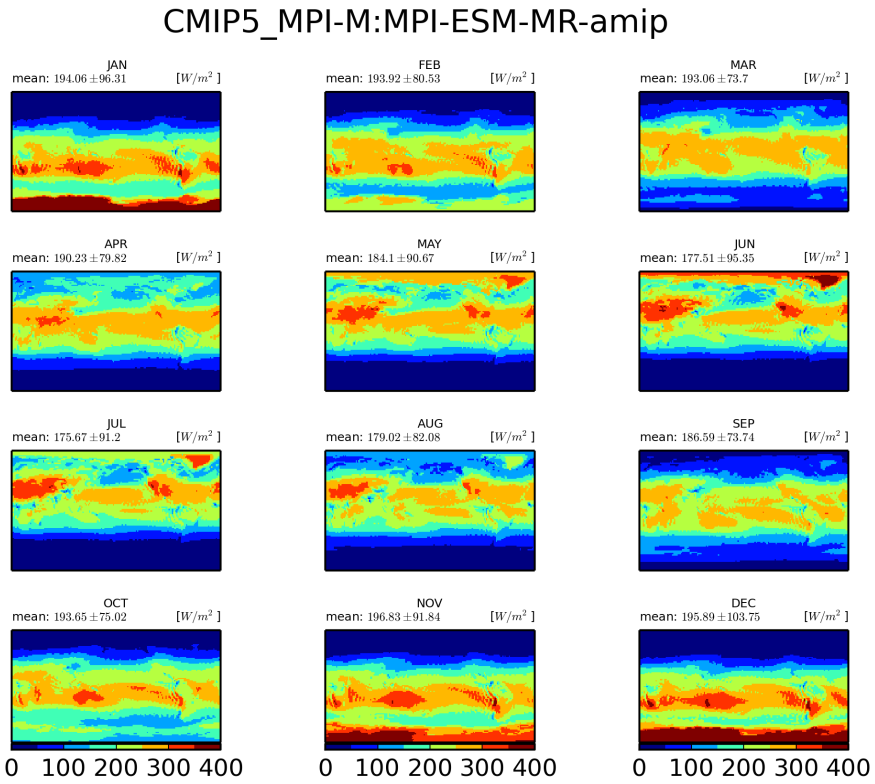



Figure 669: Monthly mean climatology for MPI-M:MPI-ESM-MR

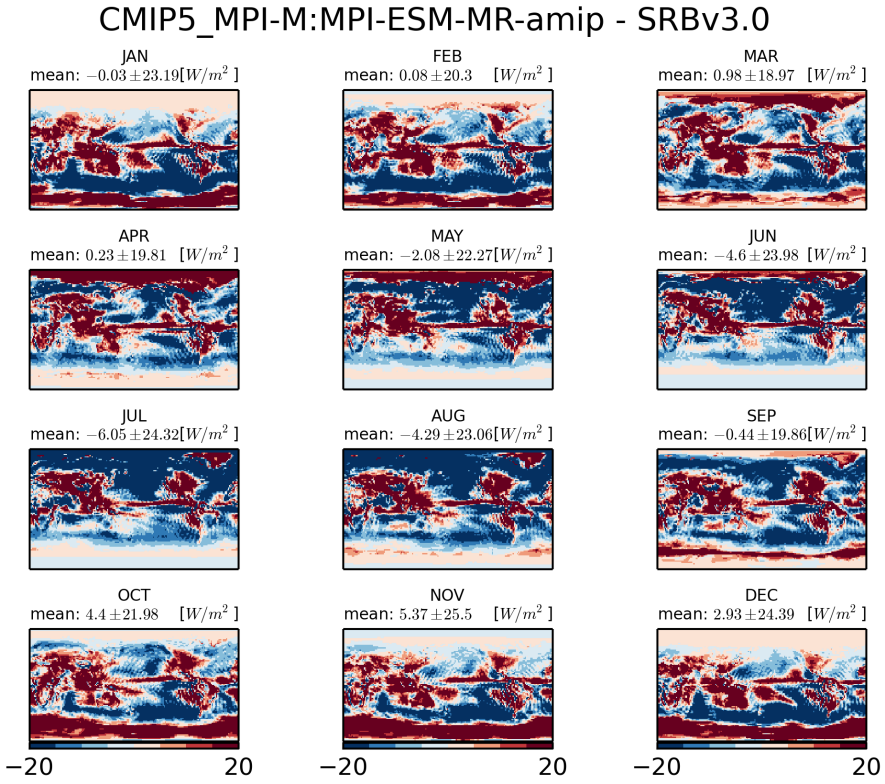



Figure 670: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and SRBV3.0

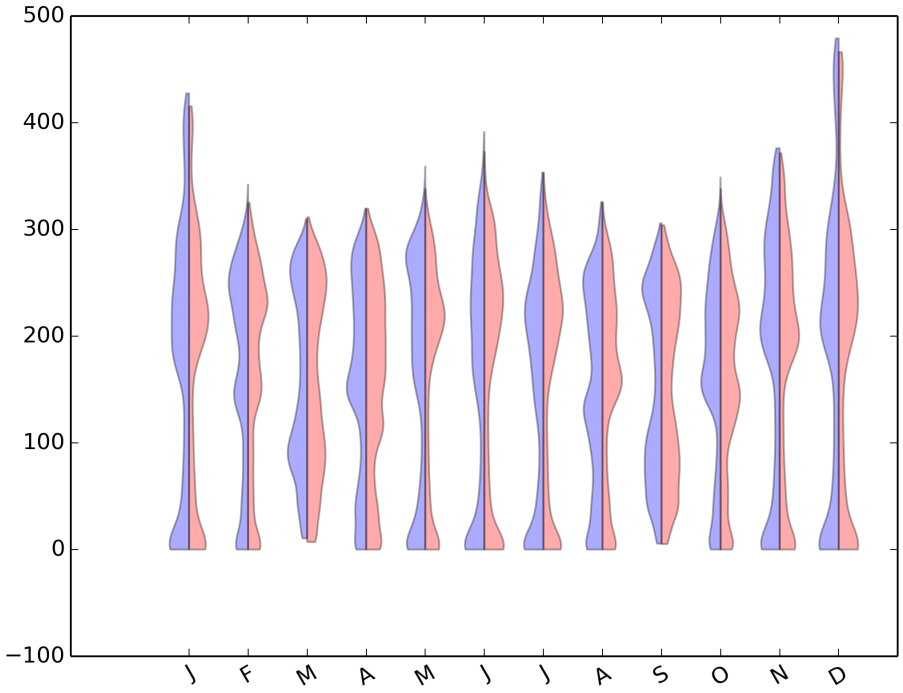



Figure 671: Violin plot for CMIP5-MPI-M:MPI-ESM-MR-AMIP

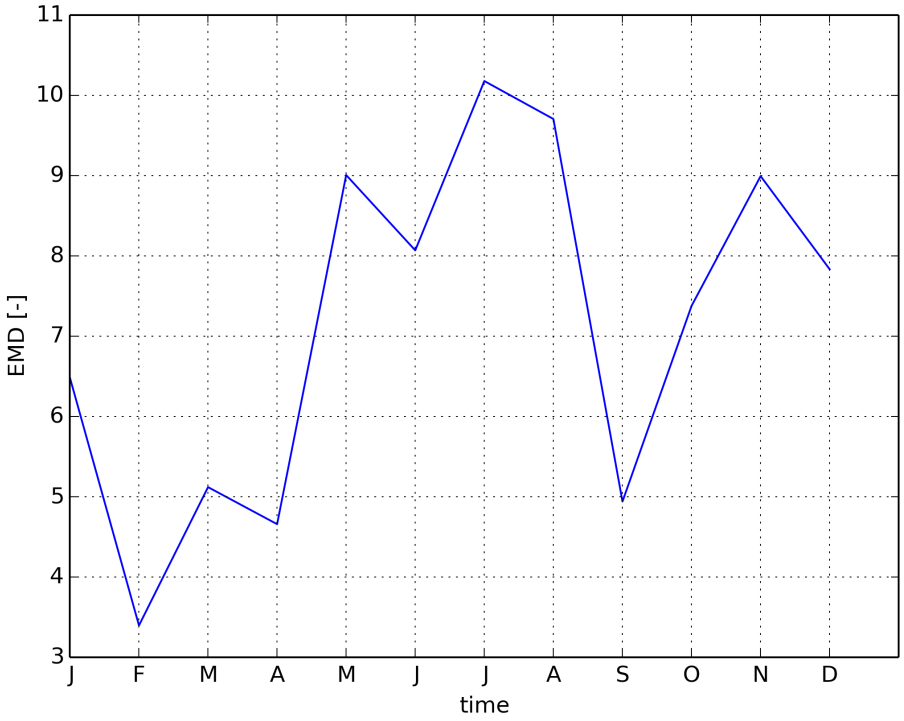



Figure 672: Timeseries of EMD

### 1.4.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

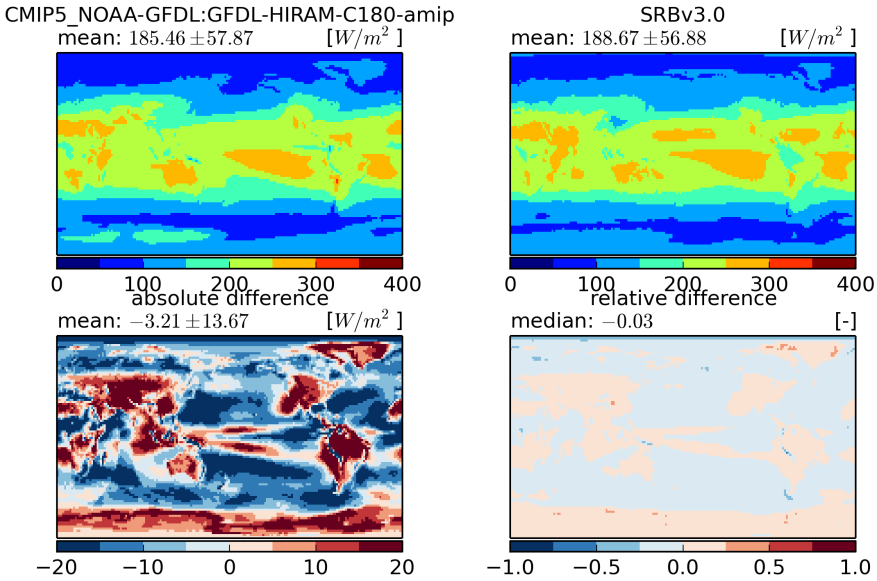



Figure 673: Temporal mean fields (top) and absolute and relative differences (bottom)

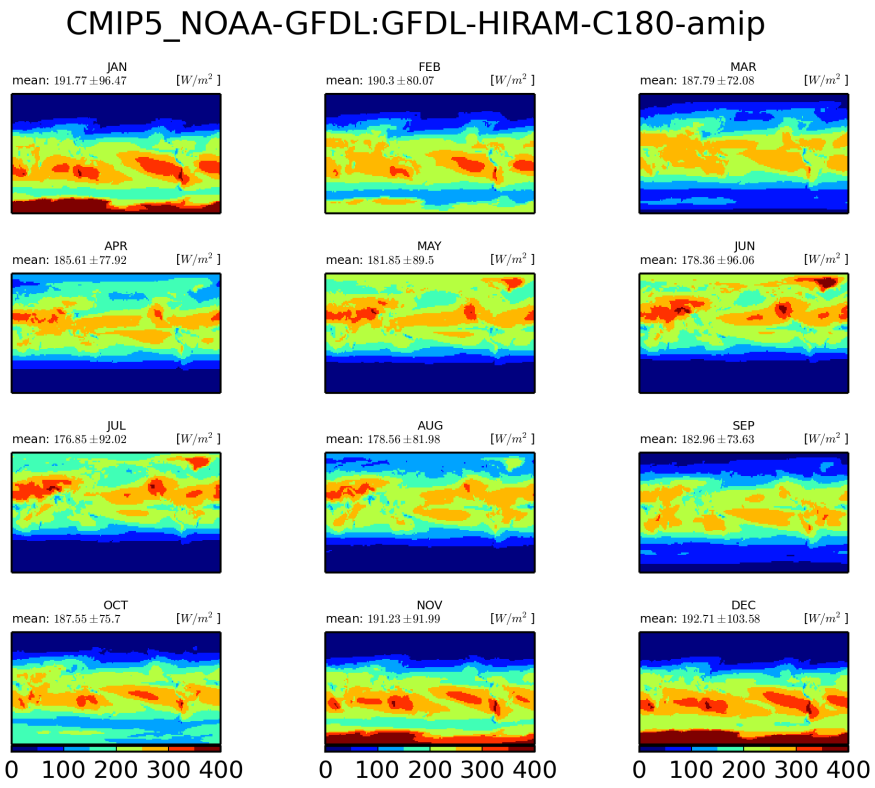



Figure 674: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

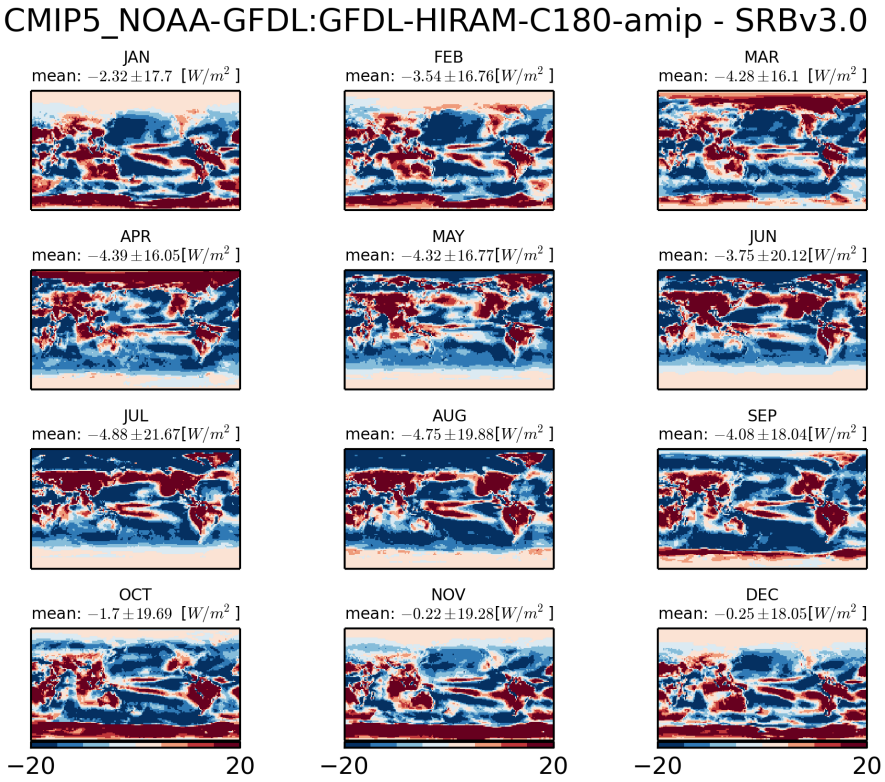



Figure 675: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and SRBV3.0

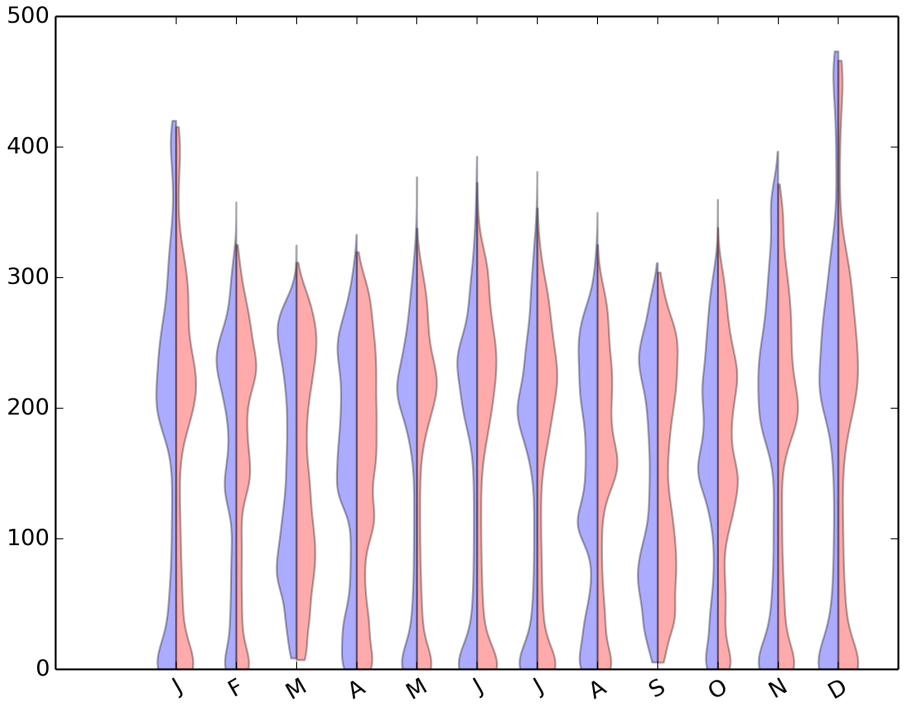



Figure 676: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-AMIP

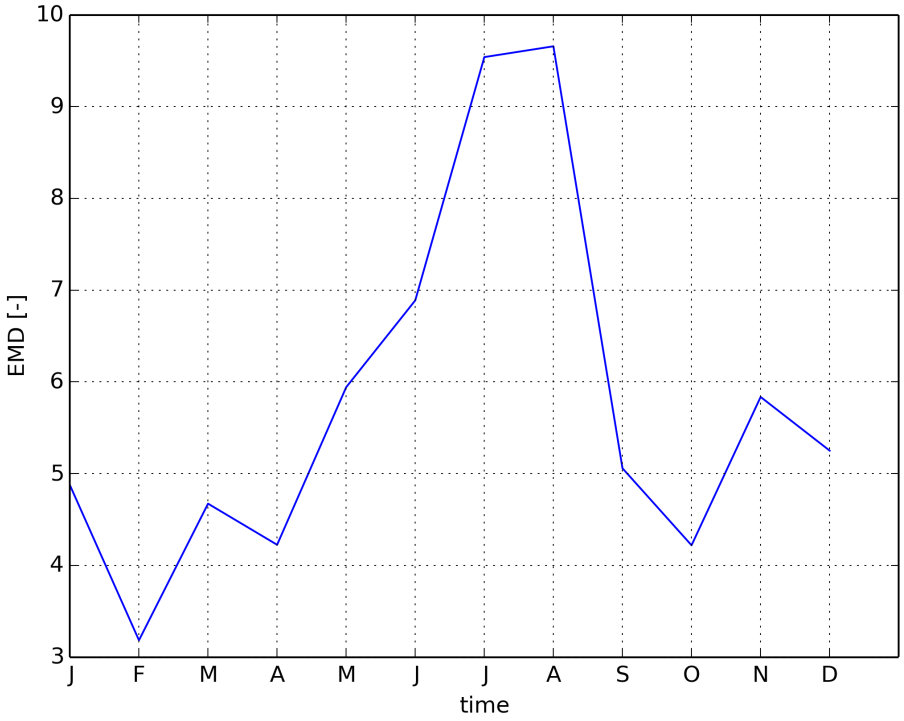



Figure 677: Timeseries of EMD

### 1.4.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

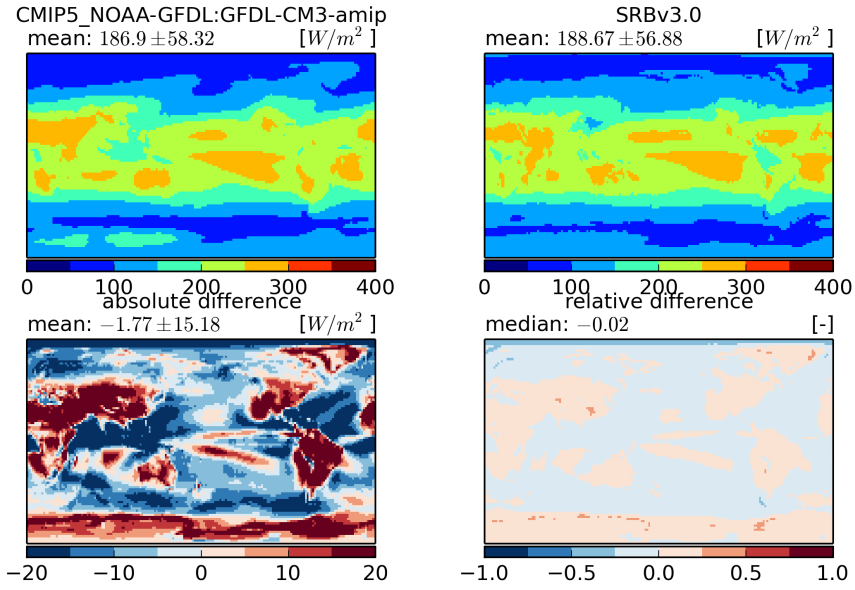



Figure 678: Temporal mean fields (top) and absolute and relative differences (bottom)

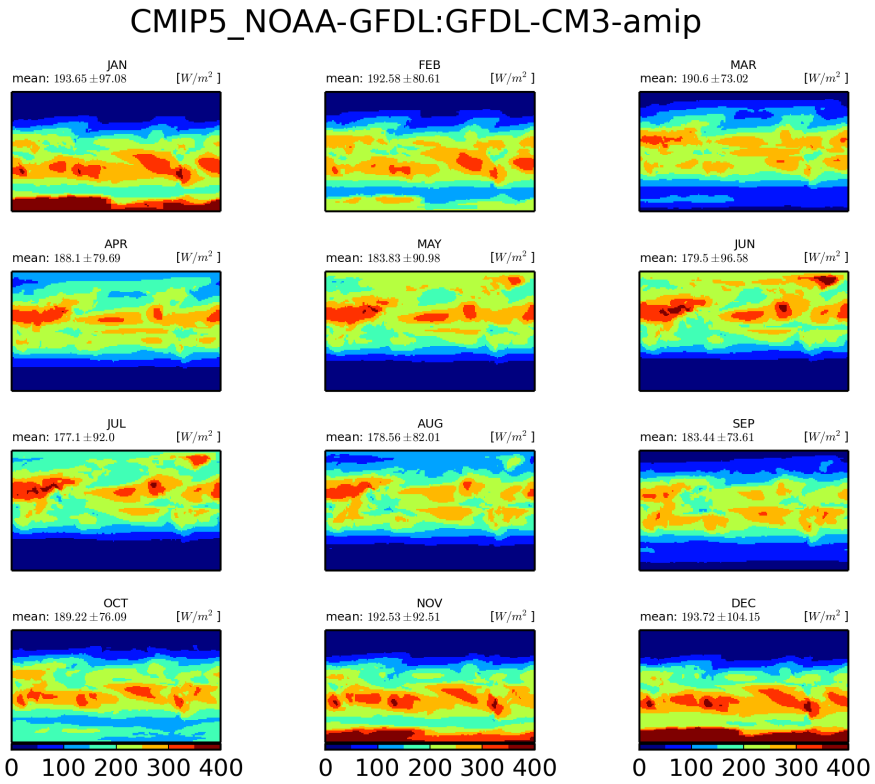



Figure 679: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

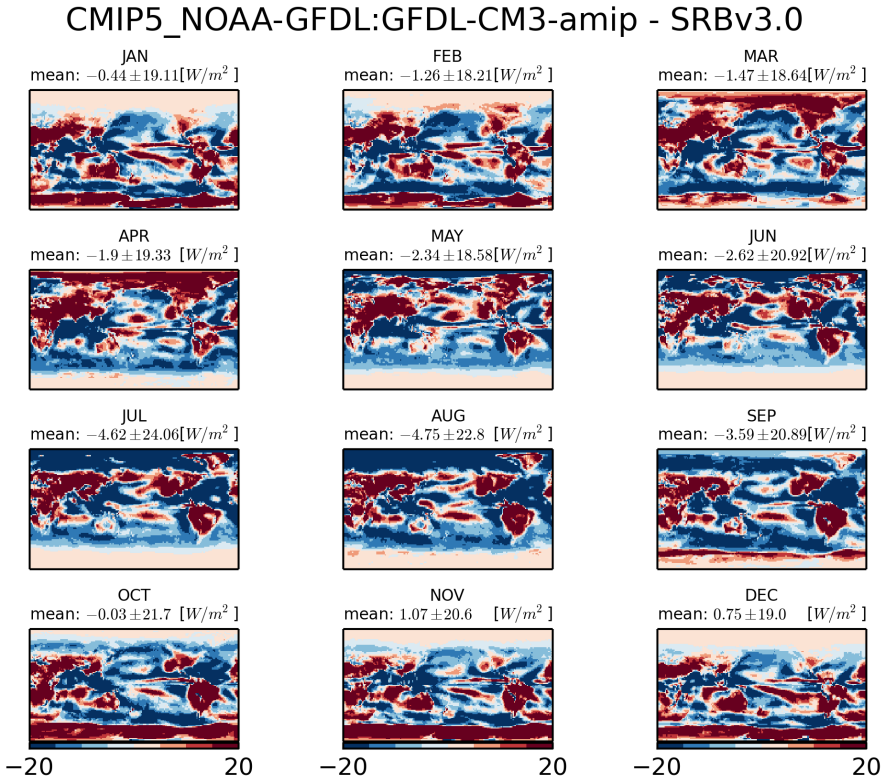



Figure 680: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and SRBV3.0

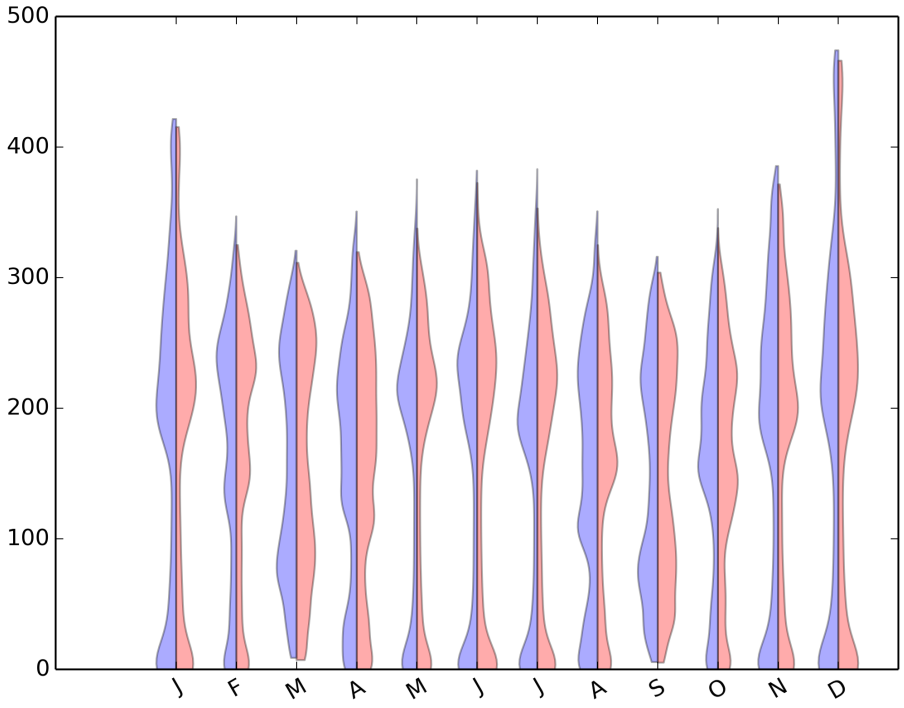



Figure 681: Violin plot for CMIP5-NOAA-GFDL:GFDL-CM3-AMIP

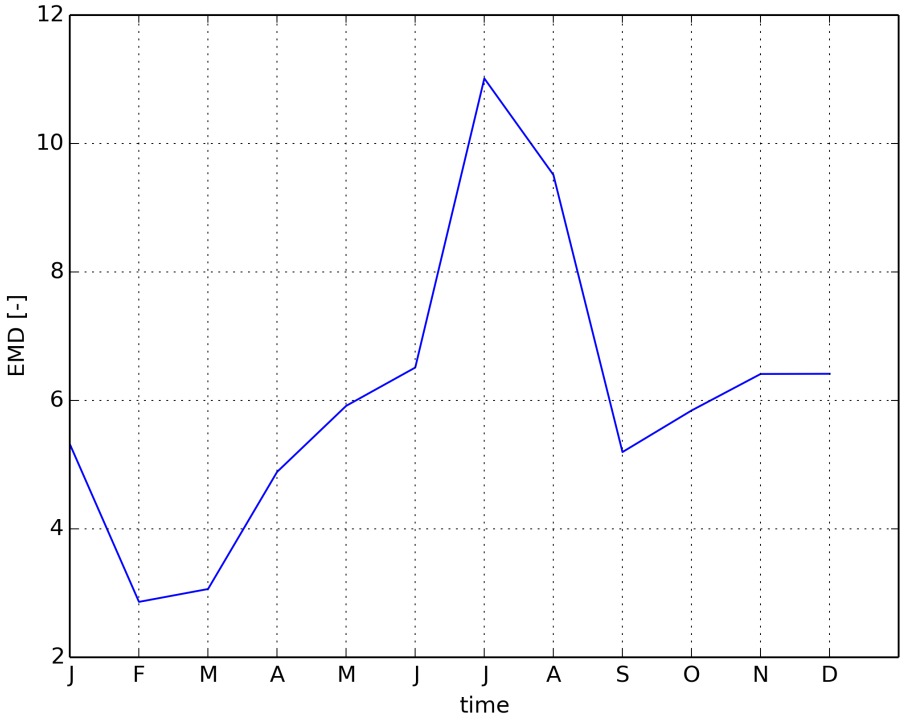



Figure 682: Timeseries of EMD

### 1.4.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

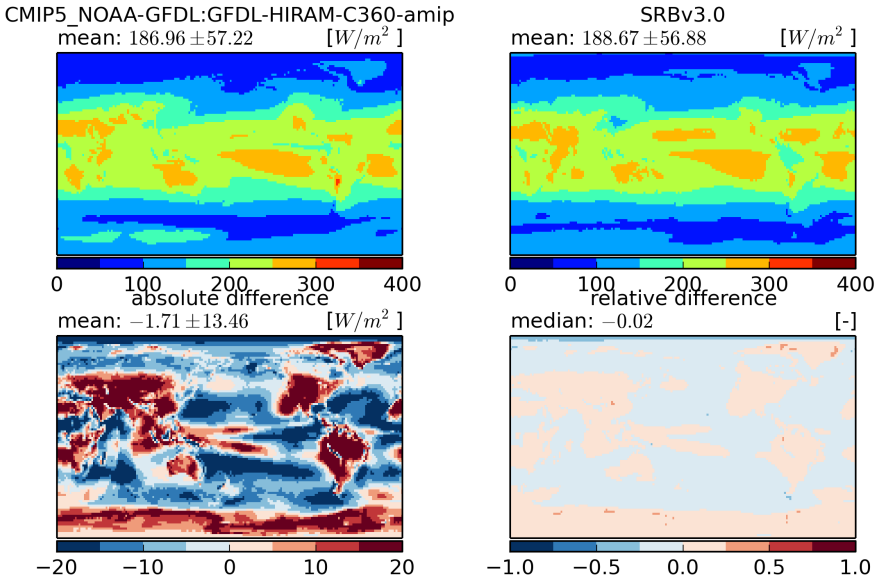



Figure 683: Temporal mean fields (top) and absolute and relative differences (bottom)

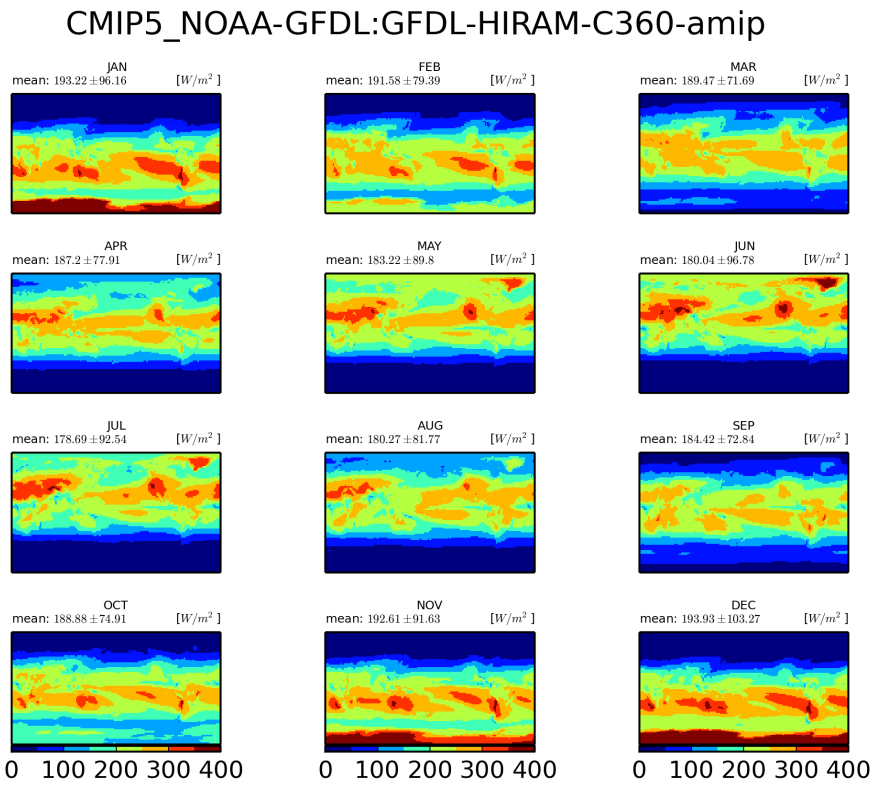



Figure 684: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

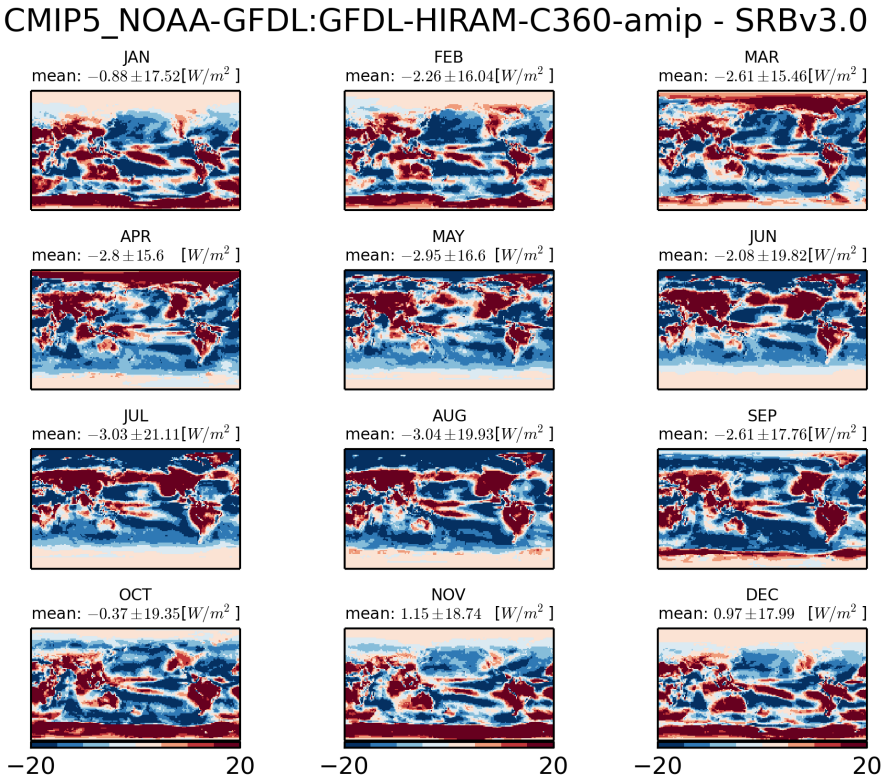



Figure 685: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and SRBV3.0

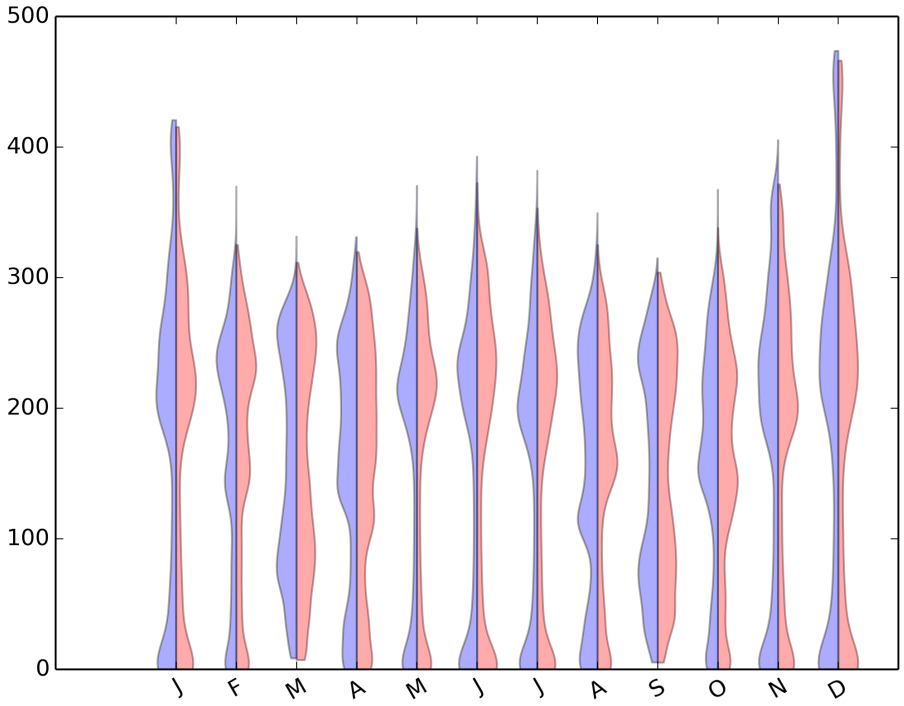



Figure 686: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-AMIP

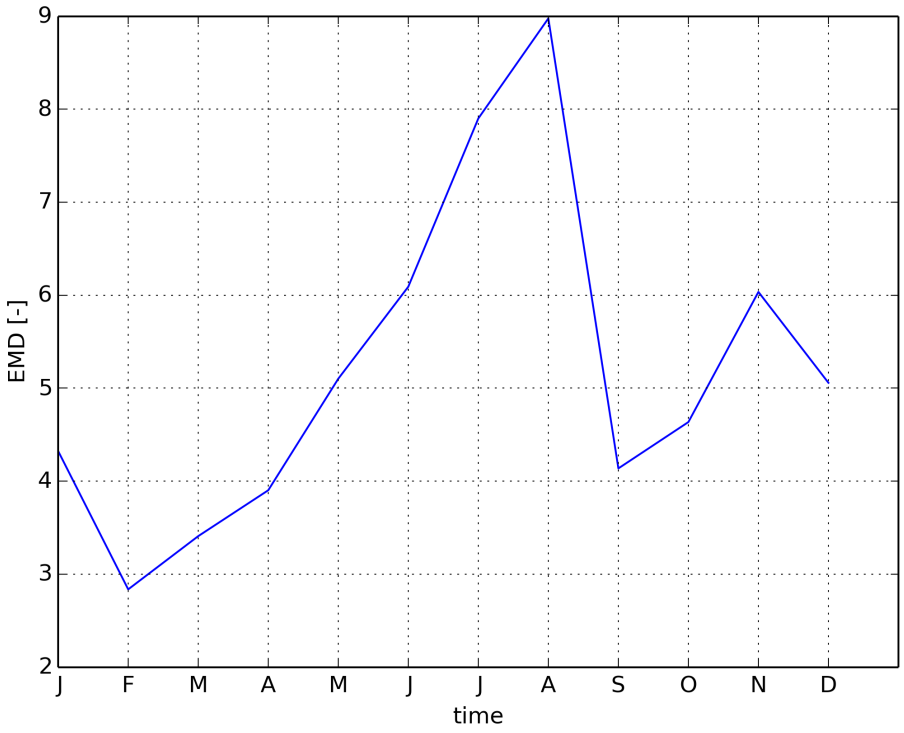



Figure 687: Timeseries of EMD

### 1.4.26 CMIP5 NCAR:CCSM4-amip

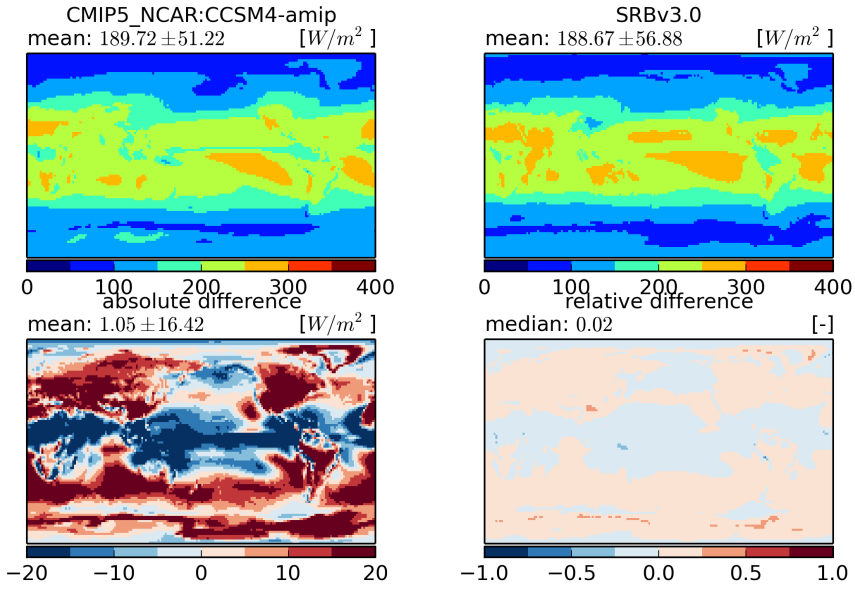



Figure 688: Temporal mean fields (top) and absolute and relative differences (bottom)

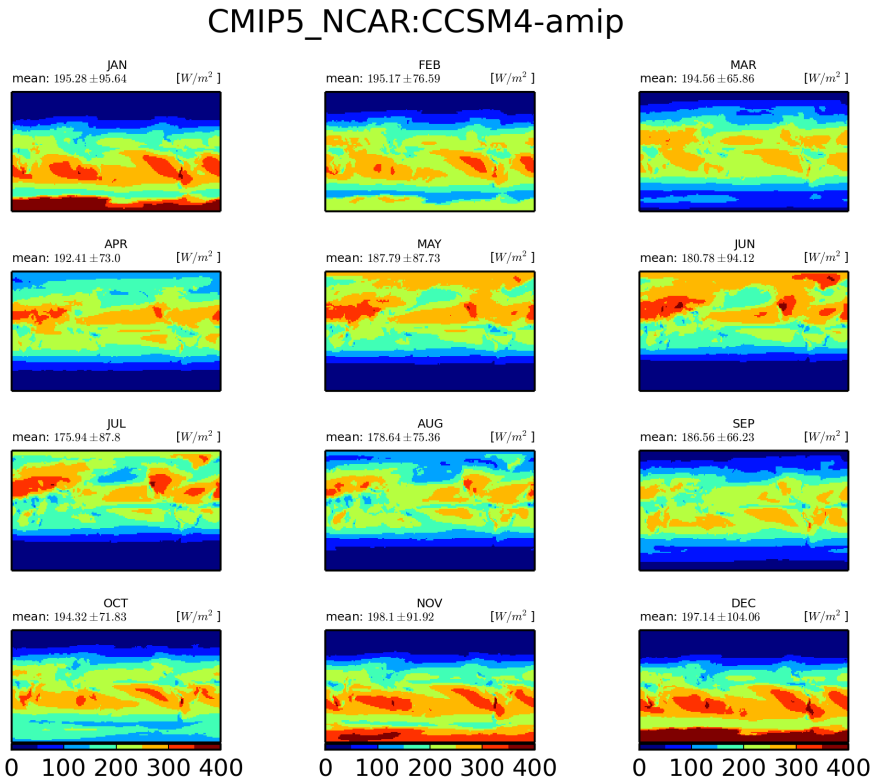



Figure 689: Monthly mean climatology for NCAR:CCSM4

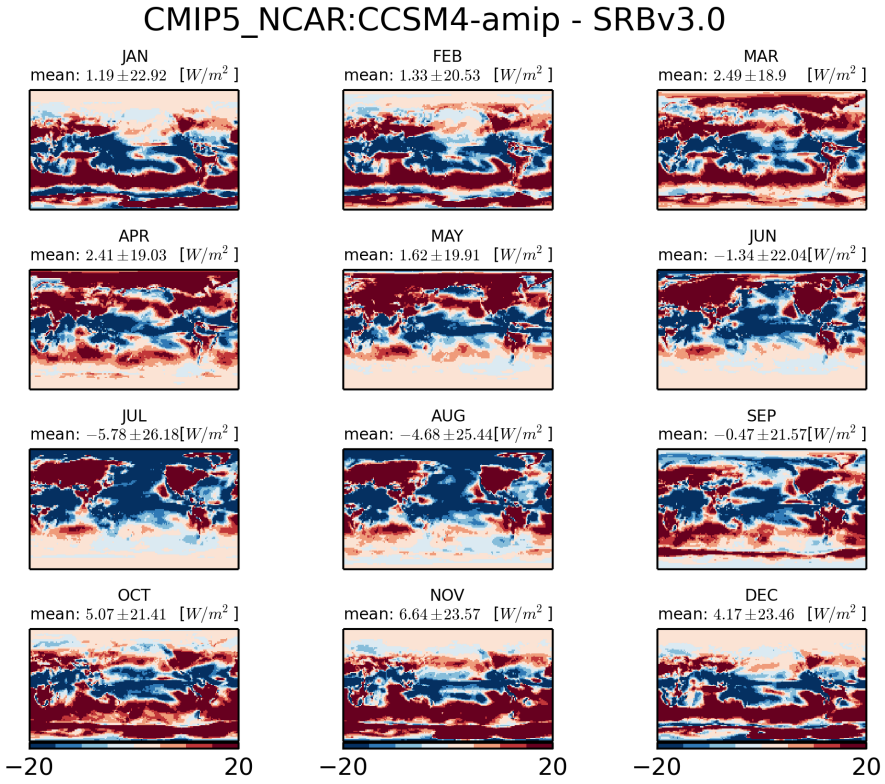



Figure 690: Monthly mean climatology of difference between NCAR:CCSM4 and SRBV3.0

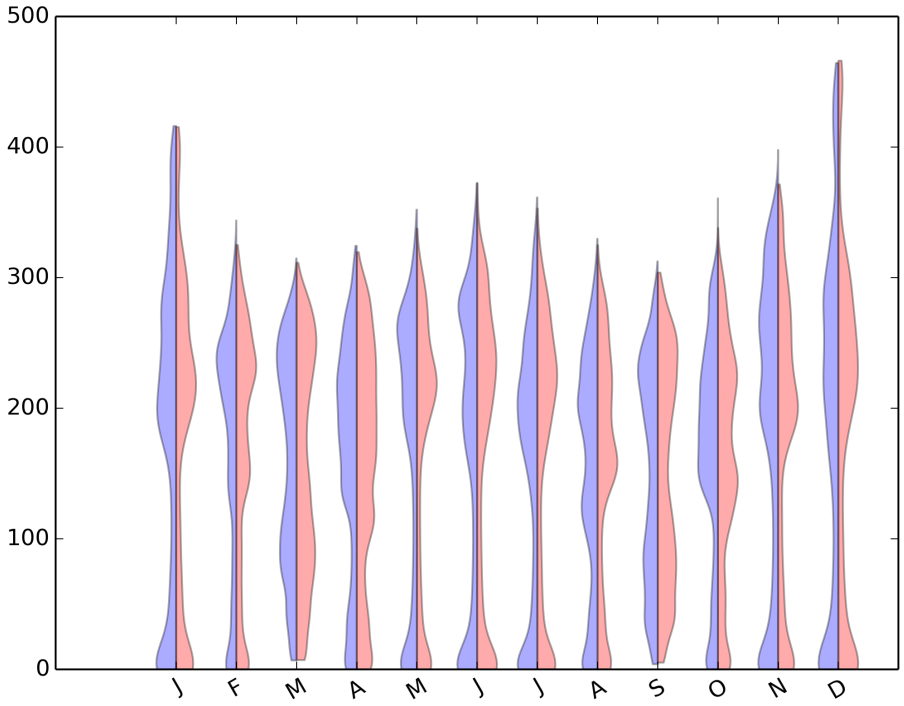



Figure 691: Violin plot for CMIP5-NCAR:CCSM4-AMIP

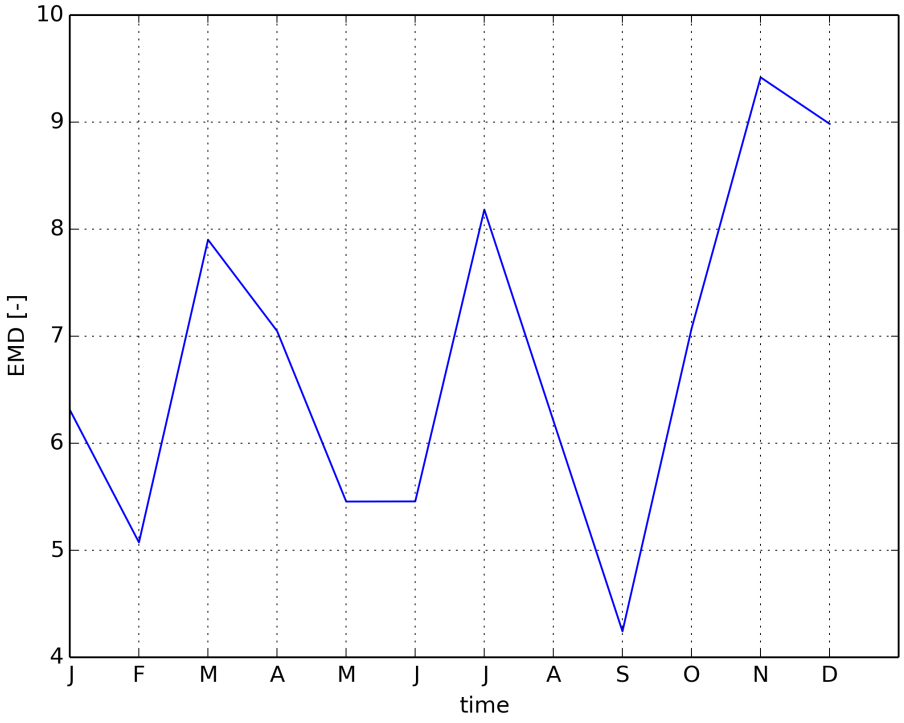



Figure 692: Timeseries of EMD

### 1.4.27 CMIP5 NCC:NorESM1-M-amip

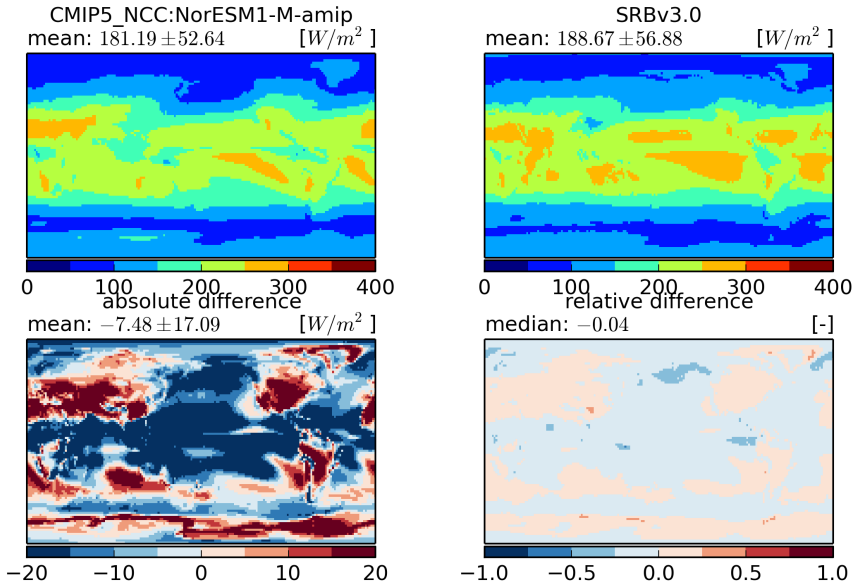



Figure 693: Temporal mean fields (top) and absolute and relative differences (bottom)

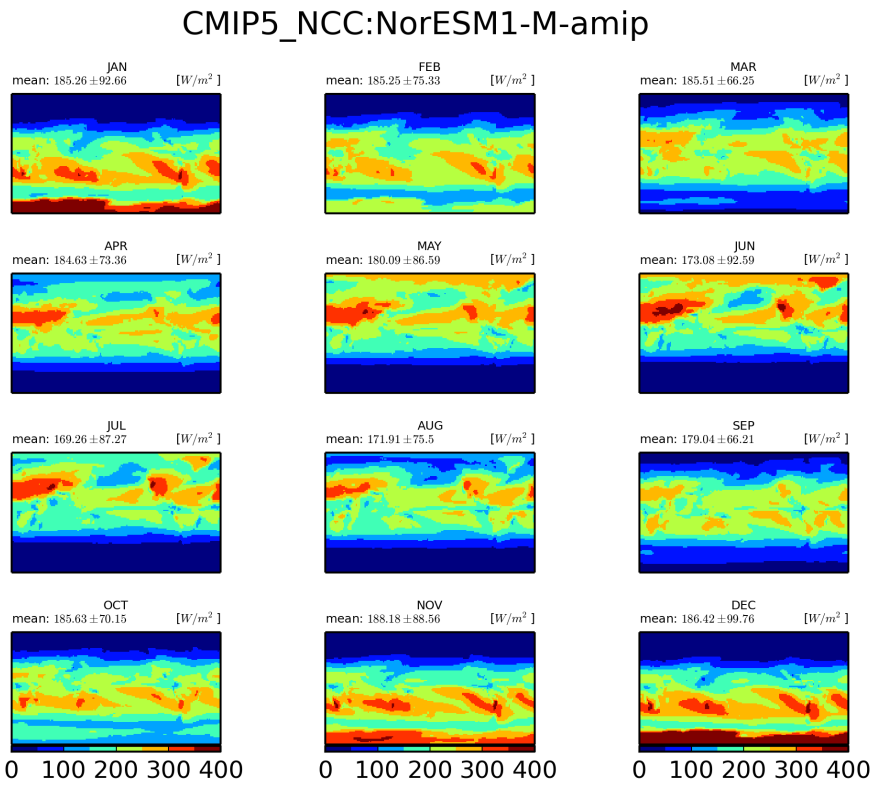



Figure 694: Monthly mean climatology for NCC:NorESM1-M

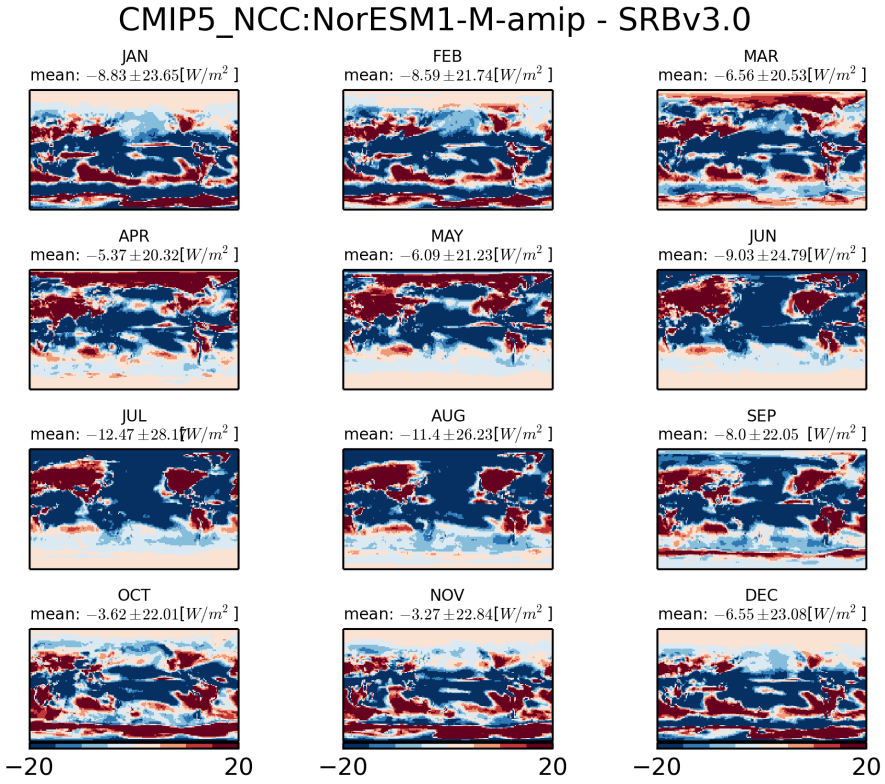



Figure 695: Monthly mean climatology of difference between NCC:NORESM1-M and SRBV3.0

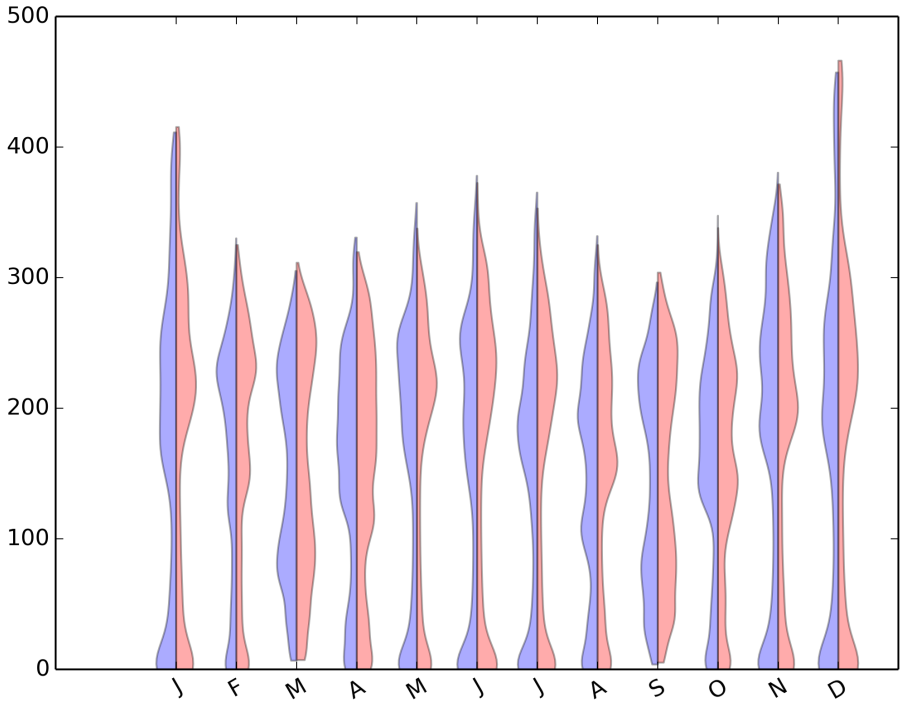



Figure 696: Violin plot for CMIP5-NCC:NORESM1-M-AMIP

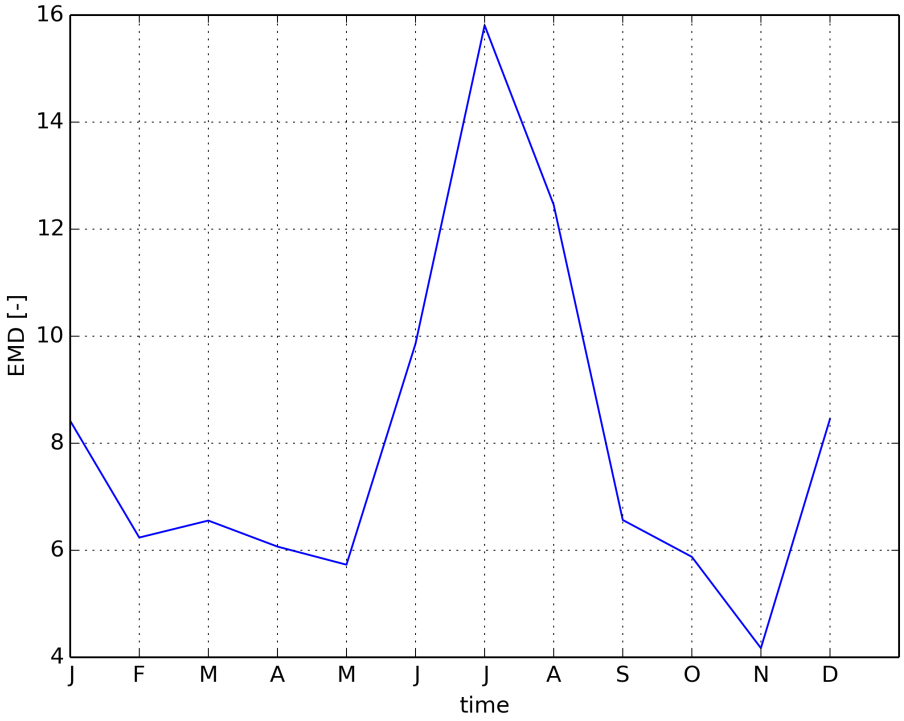



Figure 697: Timeseries of EMD

### 1.4.28 CMIP3 iap fgoals1 0 g-amip

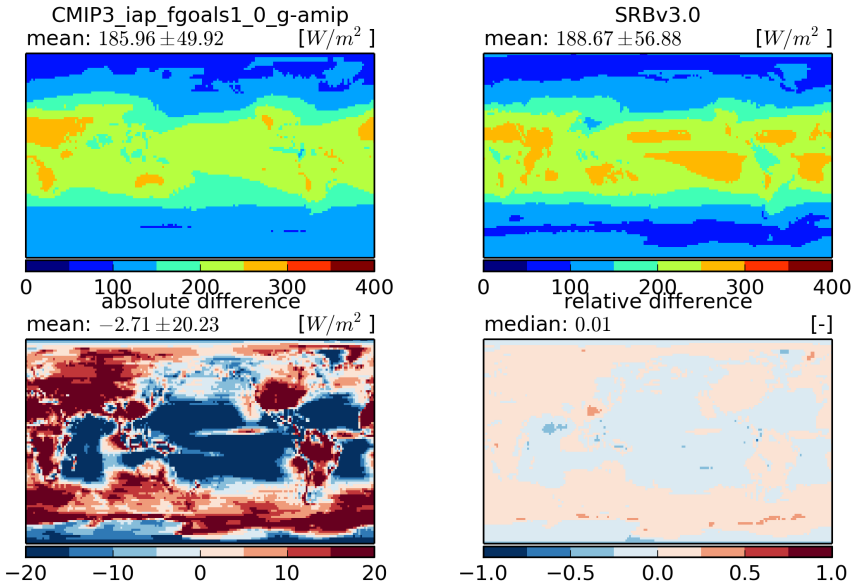



Figure 698: Temporal mean fields (top) and absolute and relative differences (bottom)

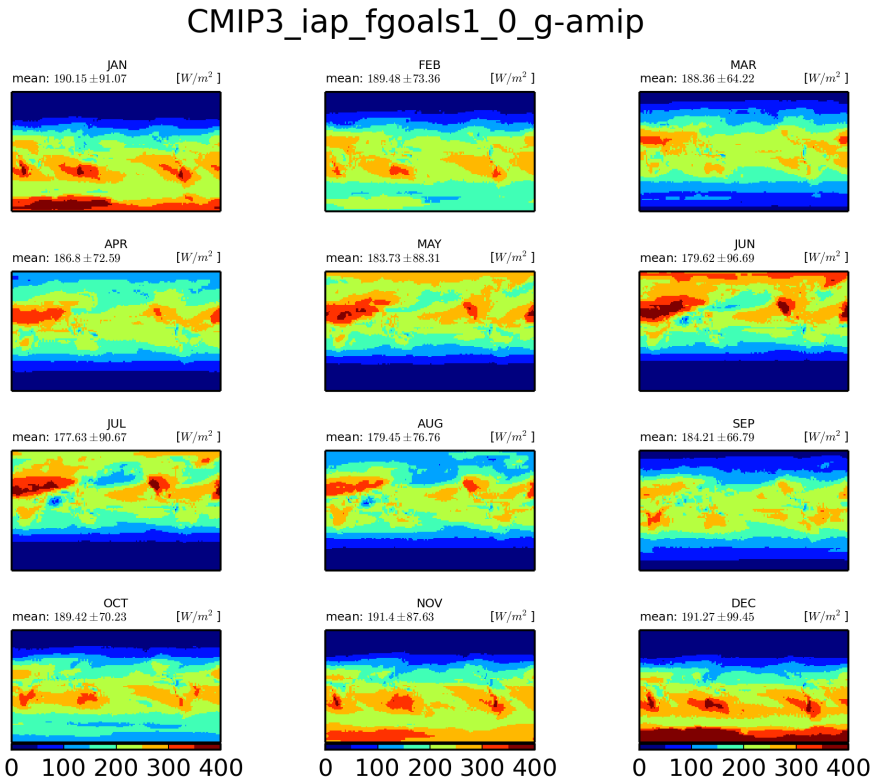



Figure 699: Monthly mean climatology for iap-fgoals1-0-g

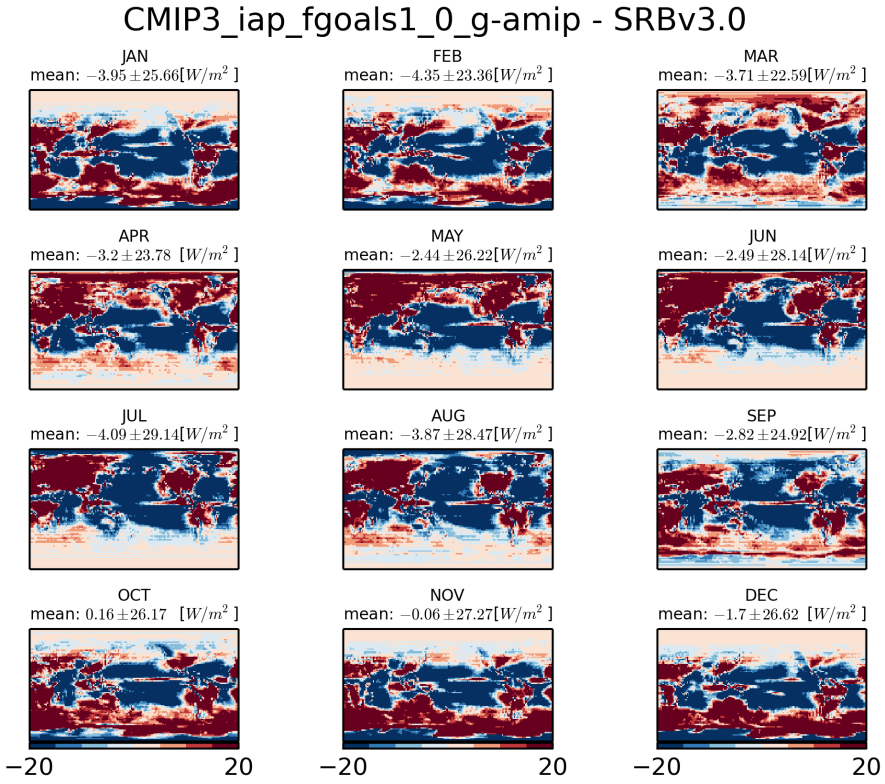



Figure 700: Monthly mean climatology of difference between IAP-FGOALS1-0-G and SRBV3.0

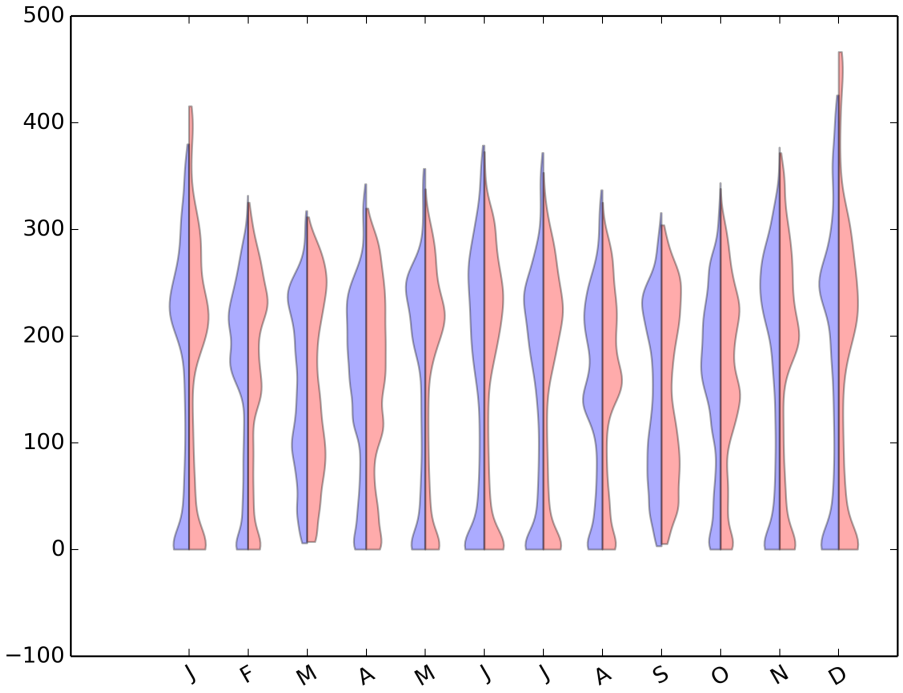



Figure 701: Violin plot for CMIP3-IAP-FGOALS1-0-G-AMIP

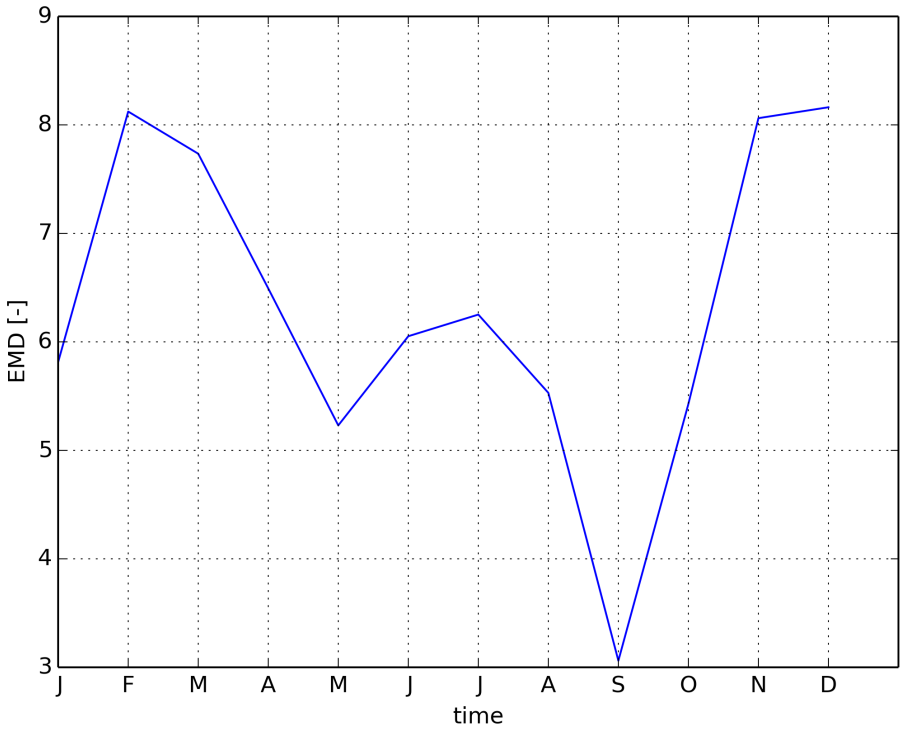



Figure 702: Timeseries of EMD

### 1.4.29 CMIP3 inmcm3 0-amip

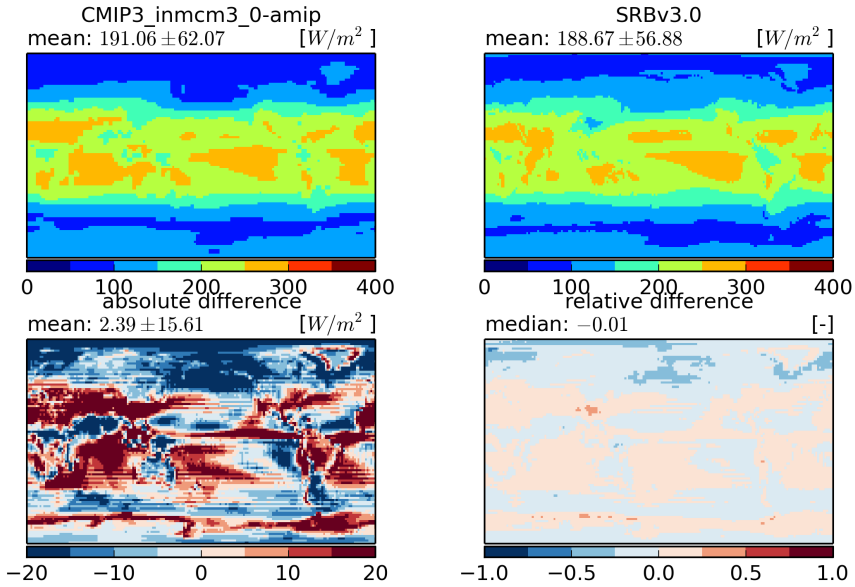



Figure 703: Temporal mean fields (top) and absolute and relative differences (bottom)

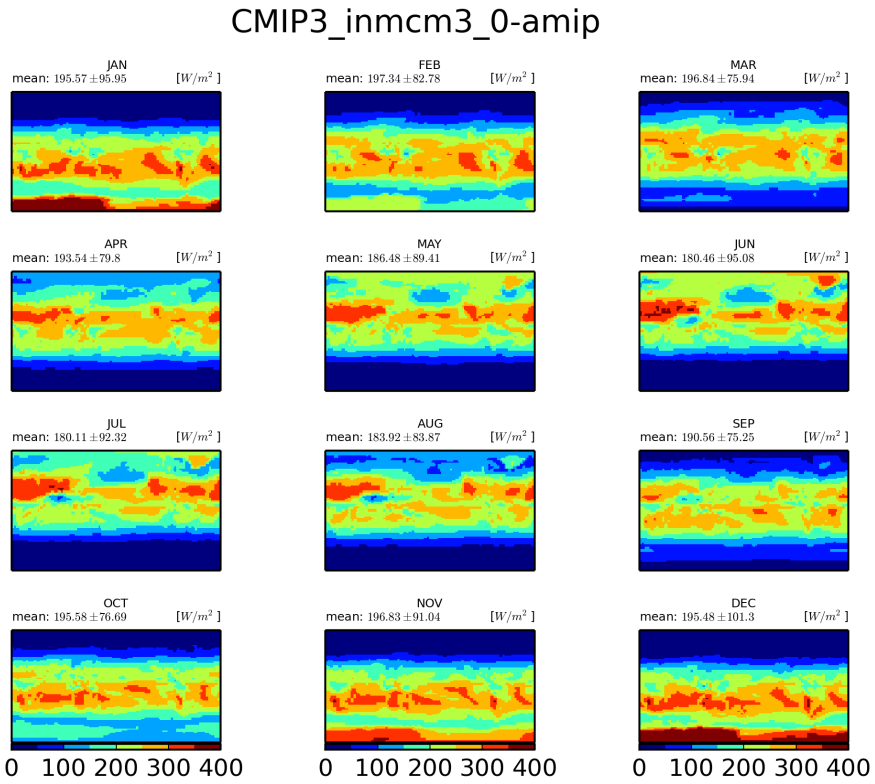



Figure 704: Monthly mean climatology for inmcm3-0

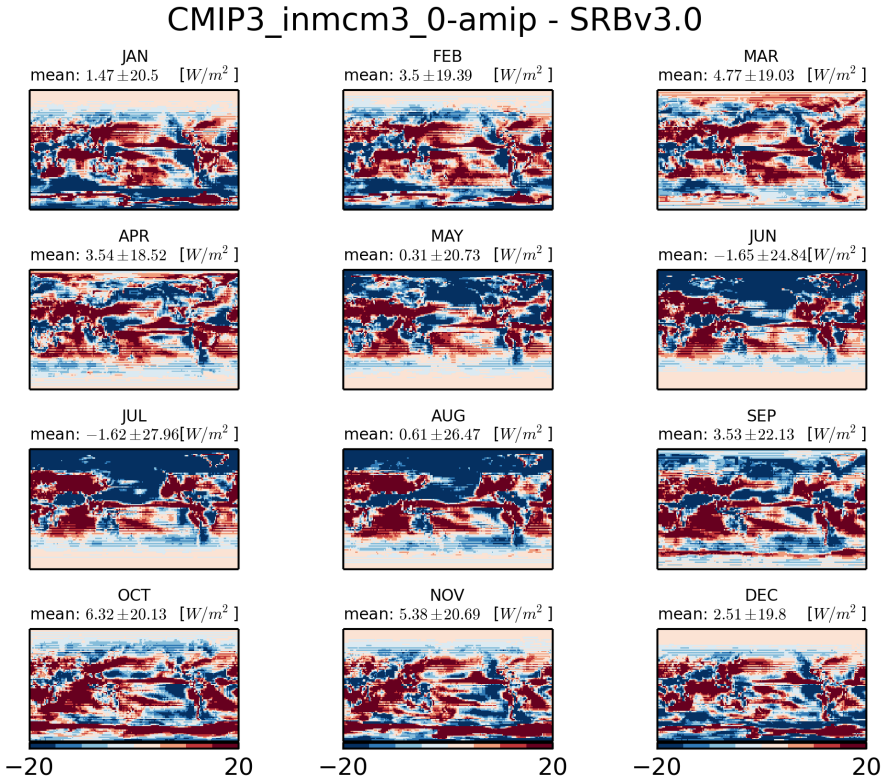



Figure 705: Monthly mean climatology of difference between INMCM3-0 and SRBV3.0

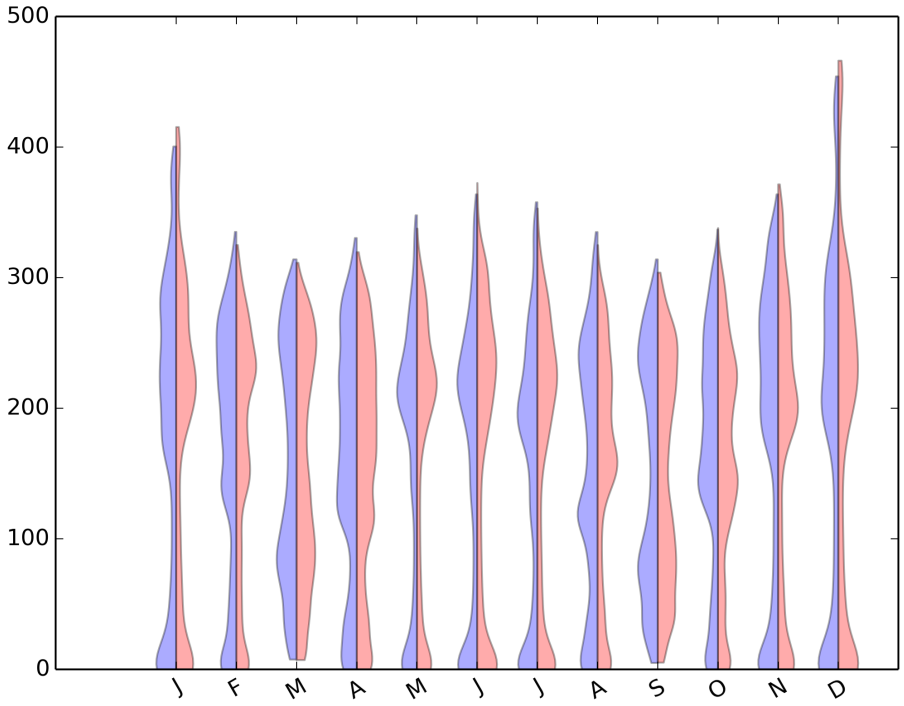



Figure 706: Violin plot for CMIP3-INMCM3-0-AMIP

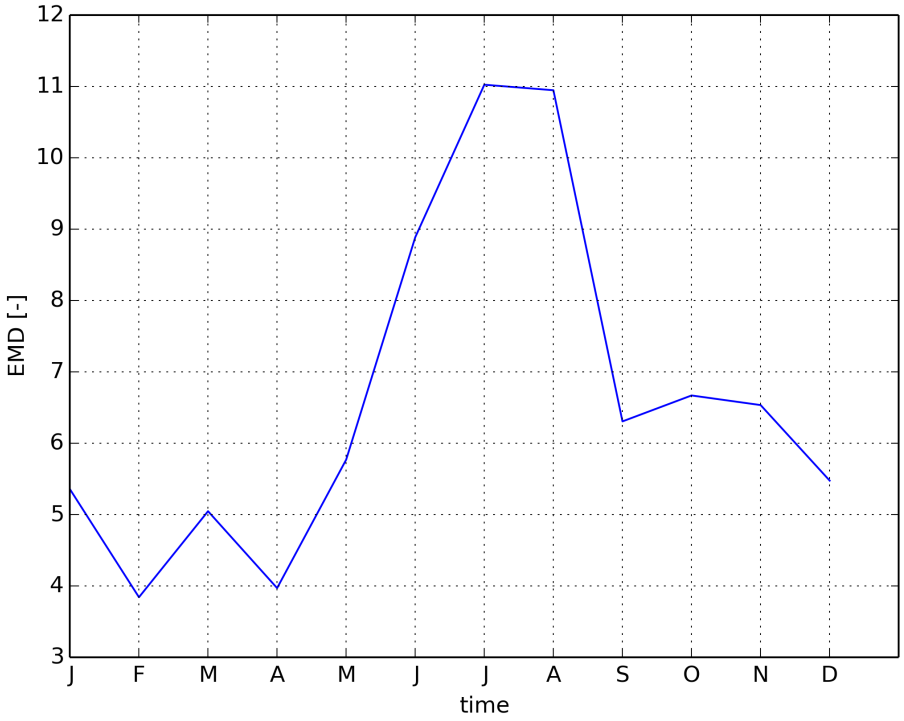



Figure 707: Timeseries of EMD

### 1.4.30 CMIP3 ipsl cm4-amip

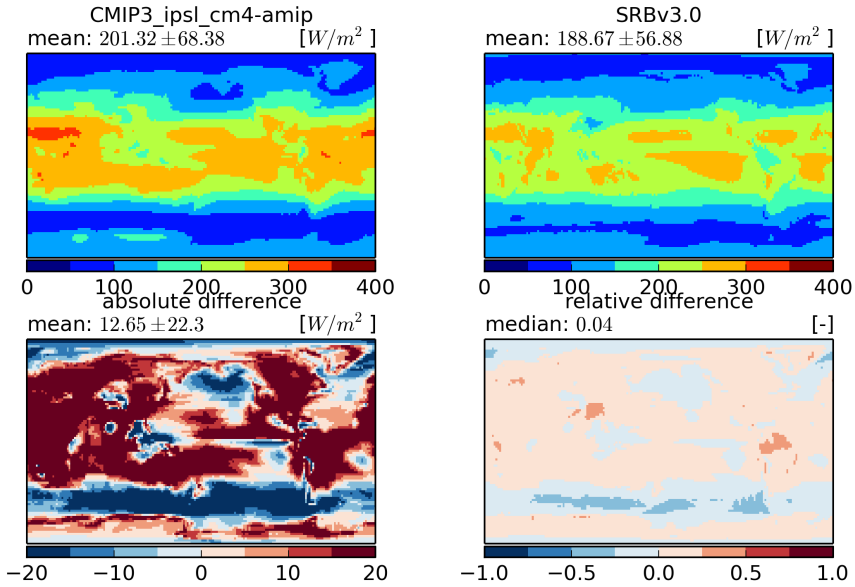



Figure 708: Temporal mean fields (top) and absolute and relative differences (bottom)

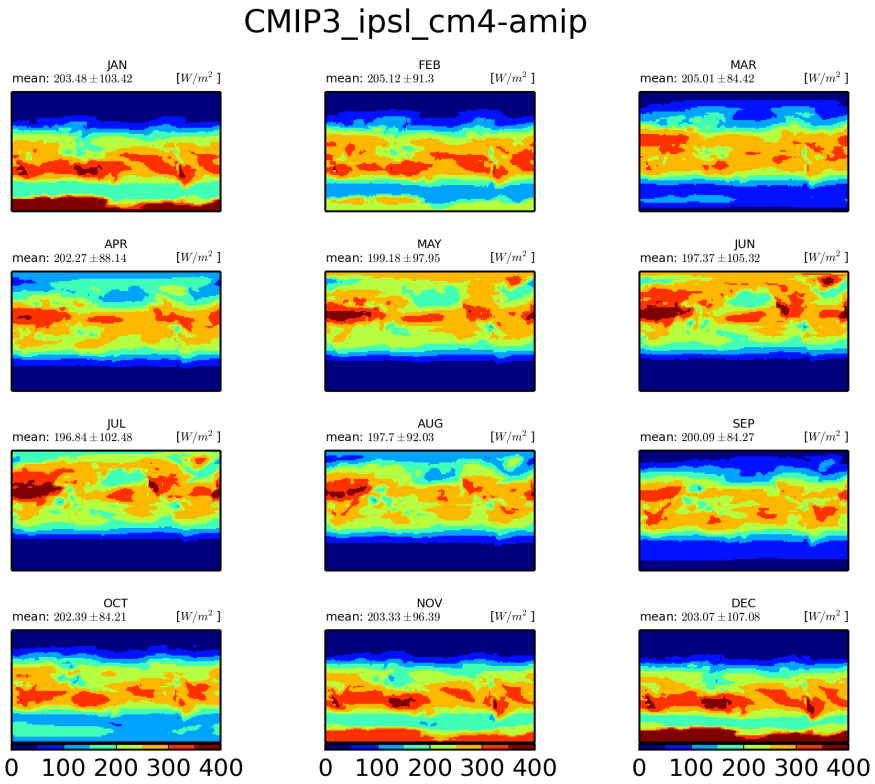



Figure 709: Monthly mean climatology for ipsl-cm4

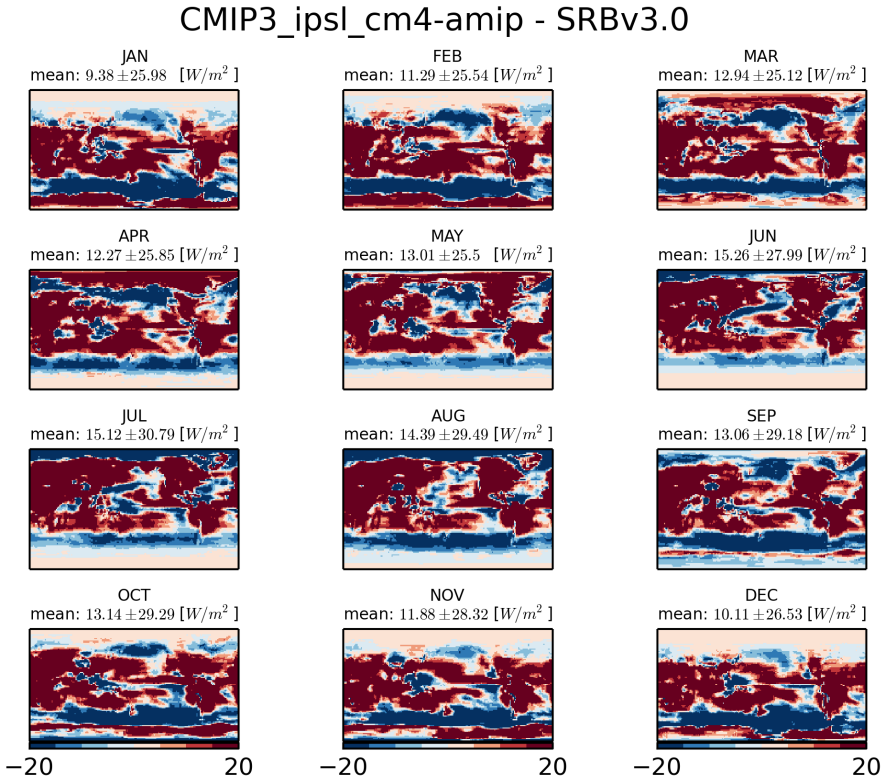



Figure 710: Monthly mean climatology of difference between IPSL-CM4 and SRBV3.0

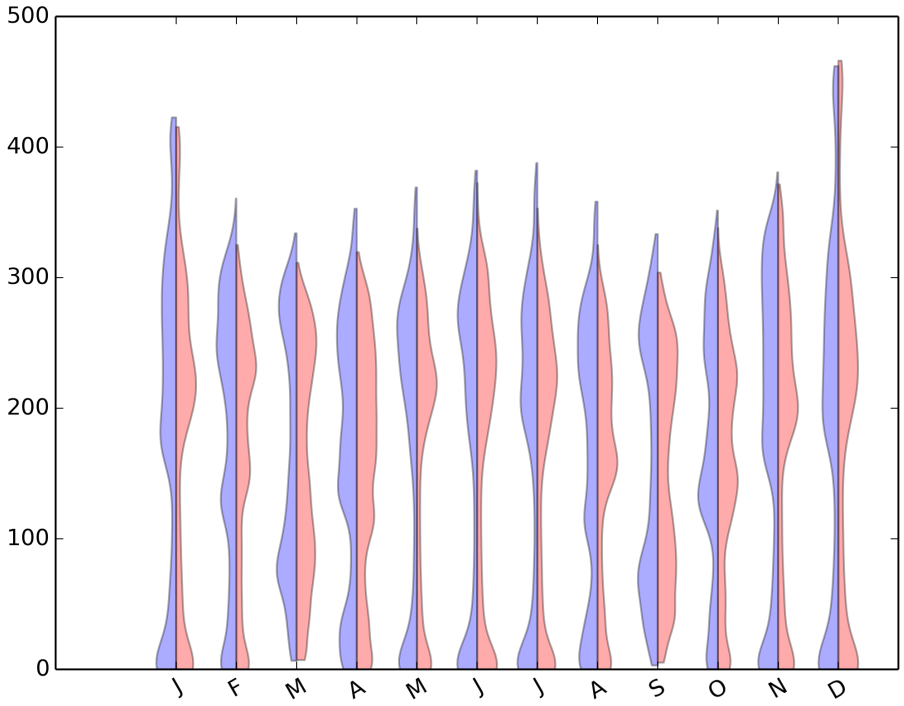



Figure 711: Violin plot for CMIP3-IPSL-CM4-AMIP

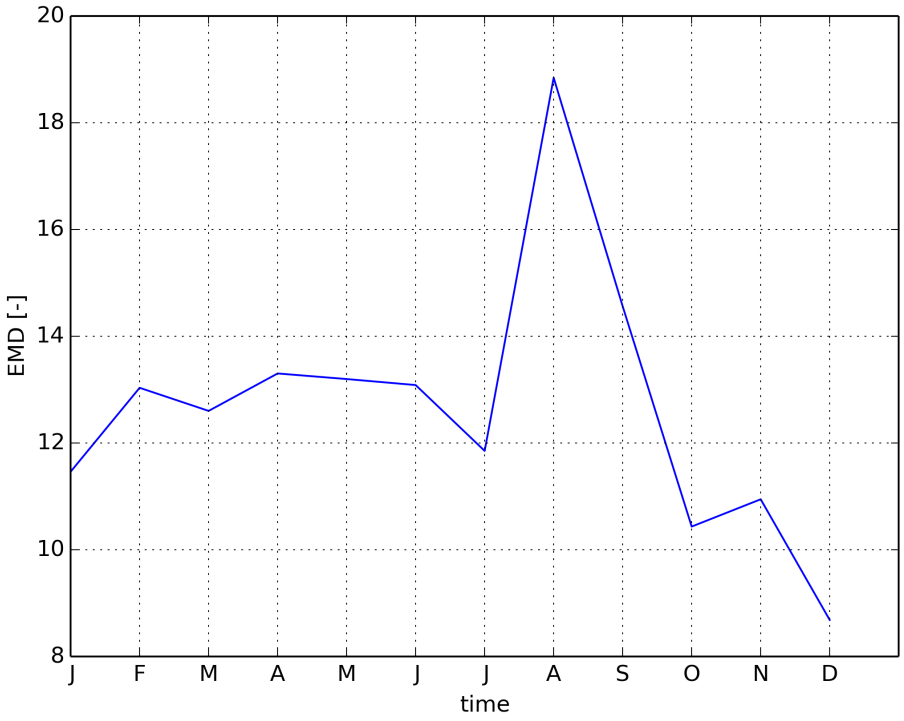



Figure 712: Timeseries of EMD

### 1.4.31 CMIP3 miroc3 2 hires-amip

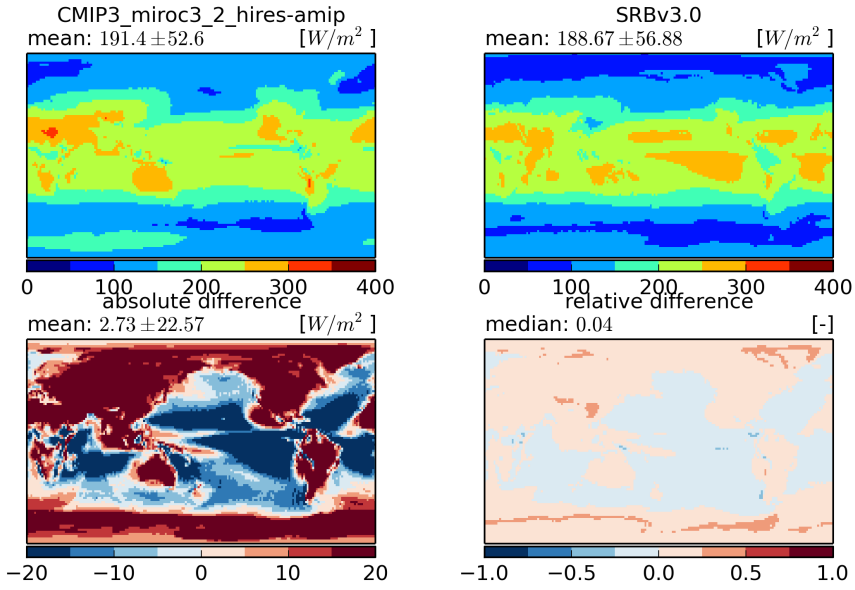



Figure 713: Temporal mean fields (top) and absolute and relative differences (bottom)

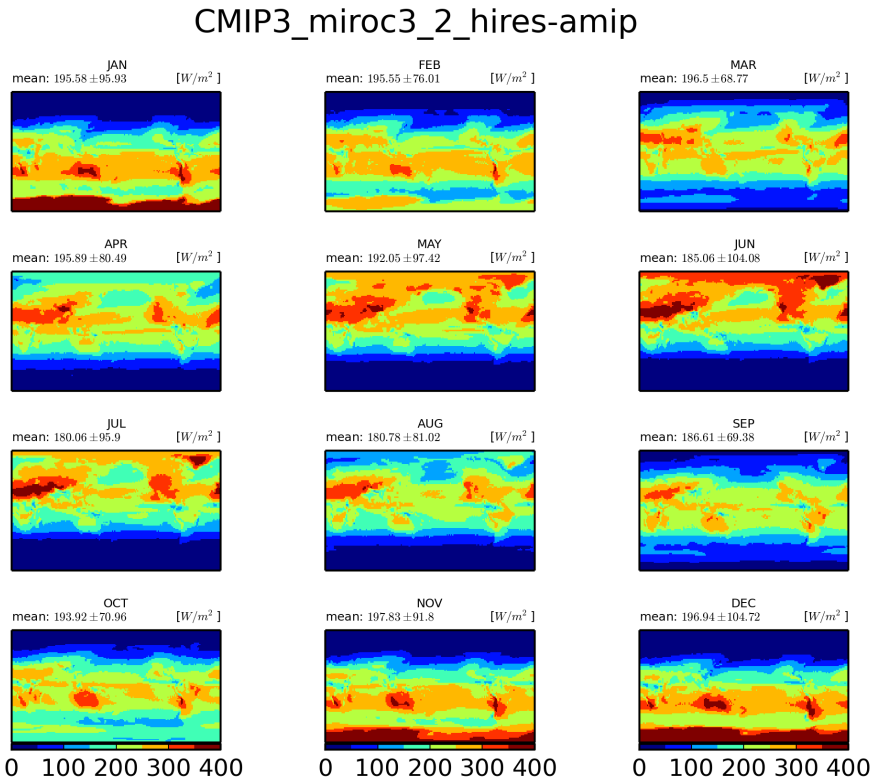



Figure 714: Monthly mean climatology for miroc3-2-hires

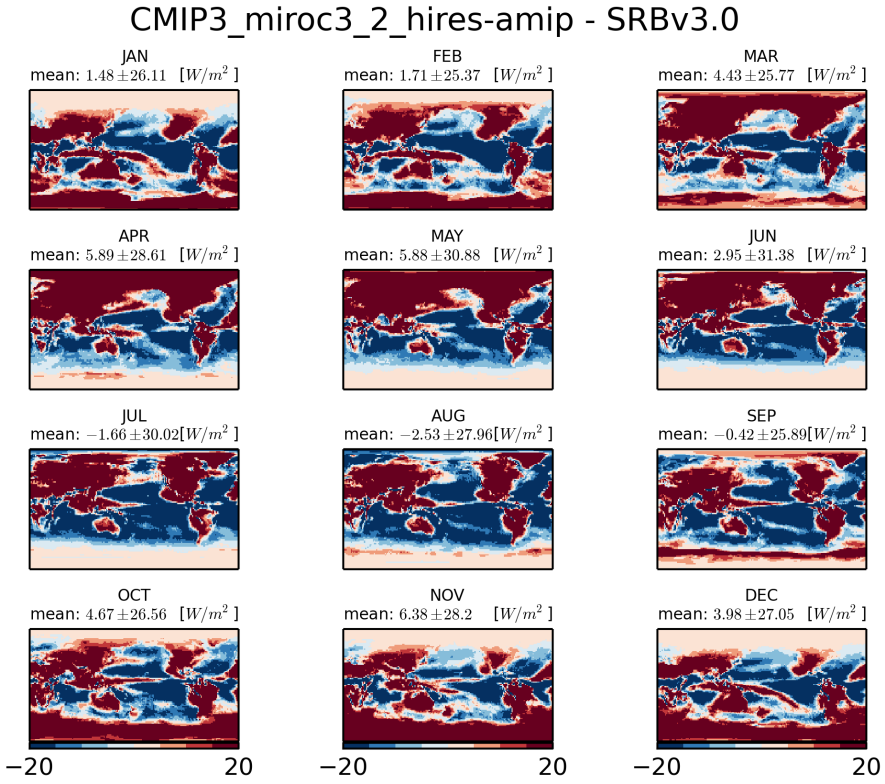



Figure 715: Monthly mean climatology of difference between MIROC3-2-HIRES and SRBV3.0

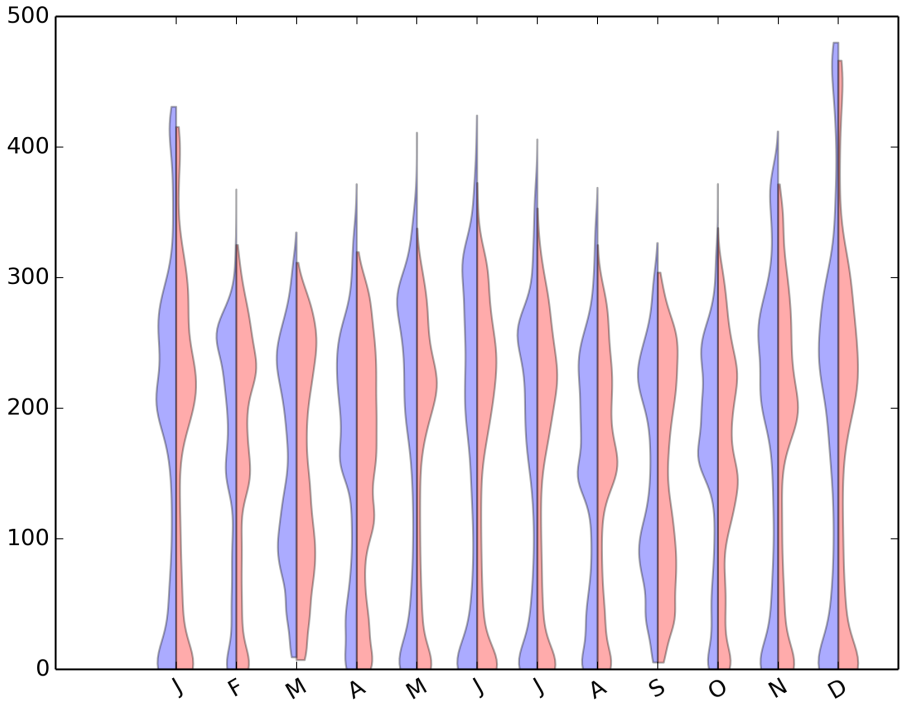



Figure 716: Violin plot for CMIP3-MIROC3-2-HIRES-AMIP

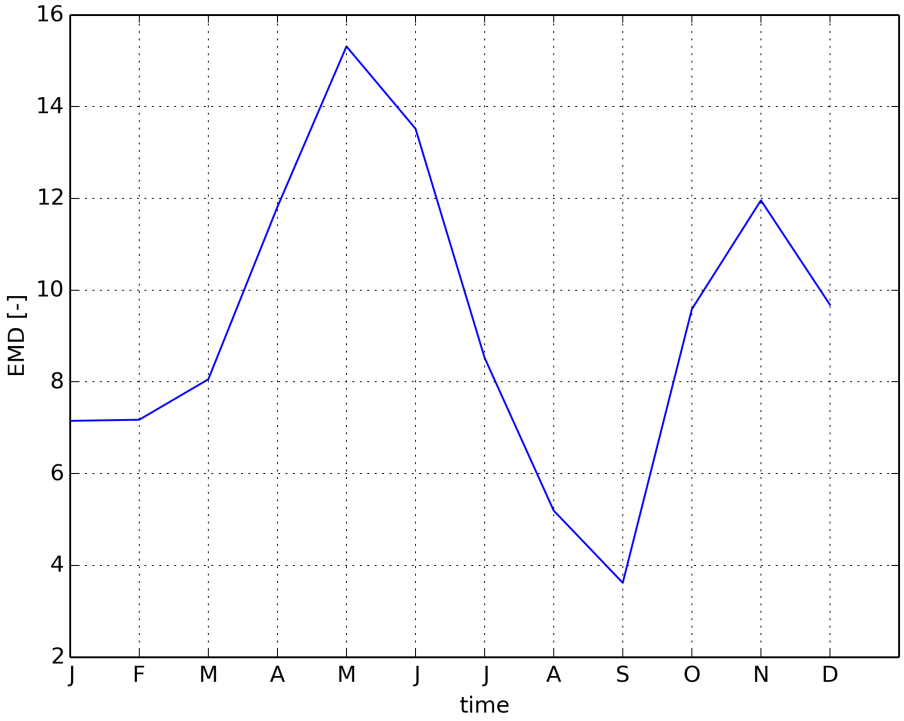



Figure 717: Timeseries of EMD

### 1.4.32 CMIP3 miroc3 2 medres-amip

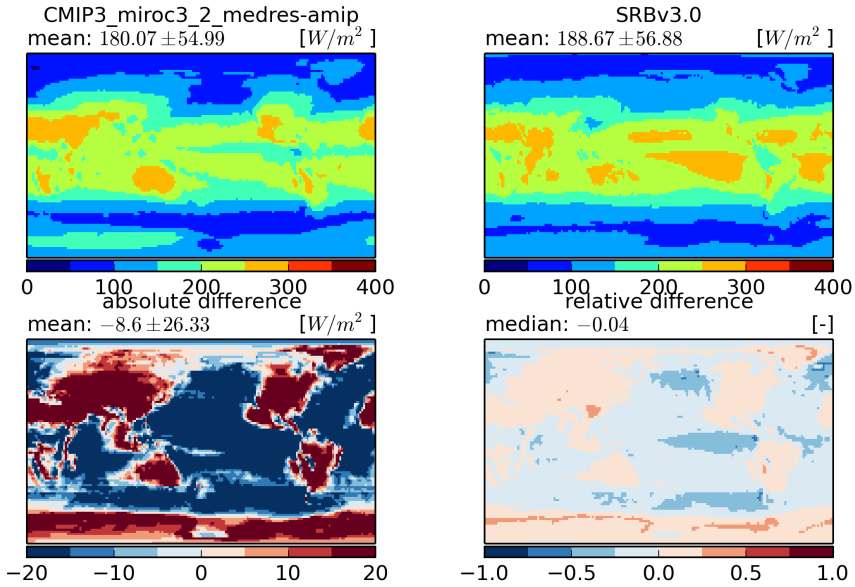



Figure 718: Temporal mean fields (top) and absolute and relative differences (bottom)

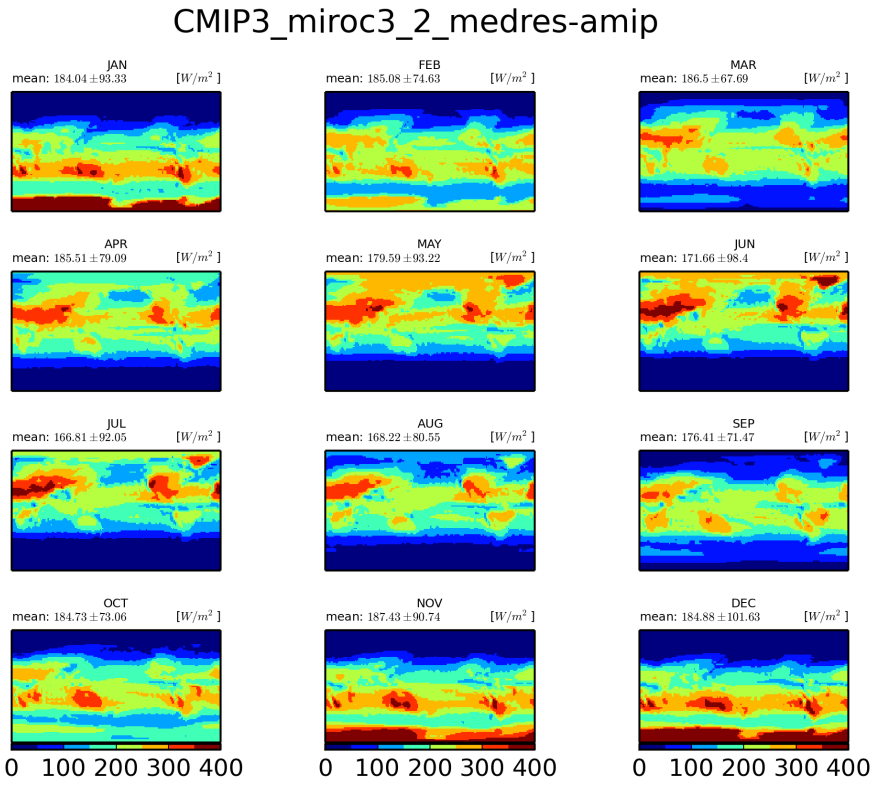



Figure 719: Monthly mean climatology for miroc3-2-medres

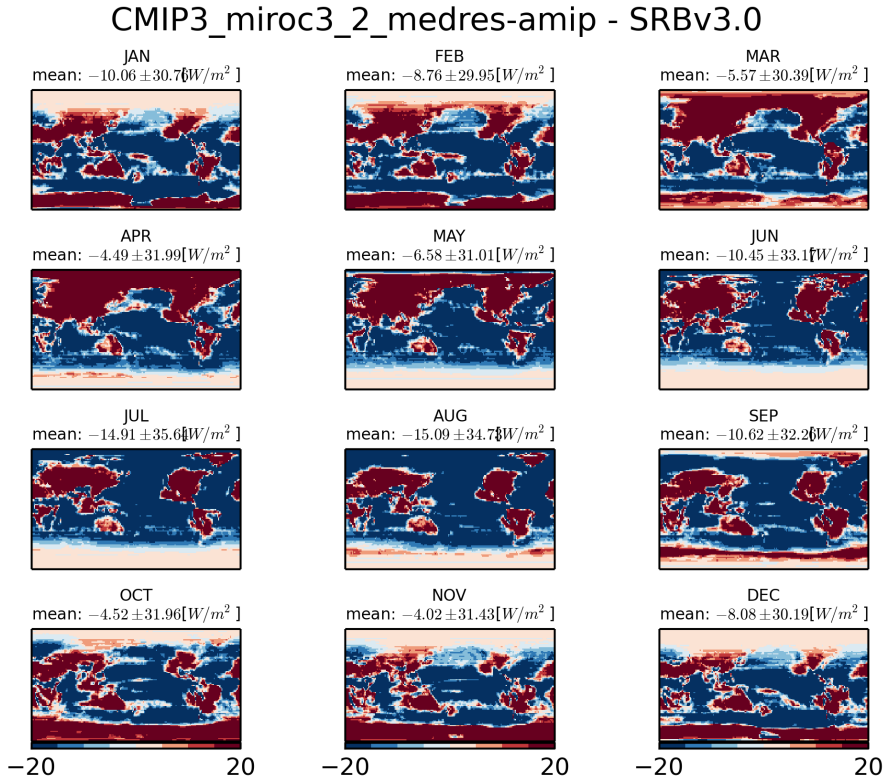



Figure 720: Monthly mean climatology of difference between MIROC3-2-MEDRES and SRBV3.0

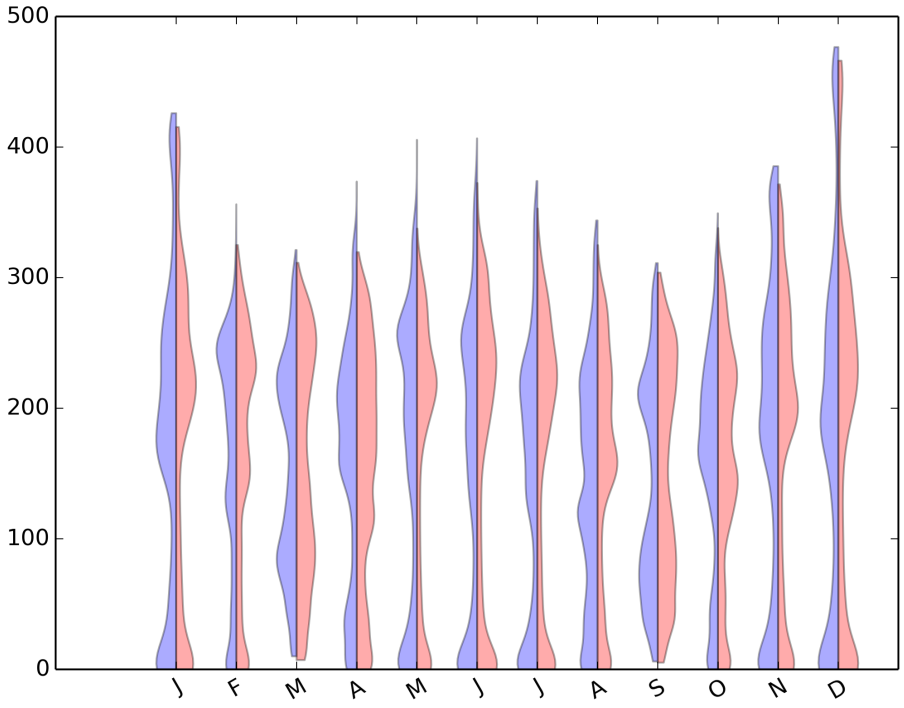



Figure 721: Violin plot for CMIP3-MIROC3-2-MEDRES-AMIP

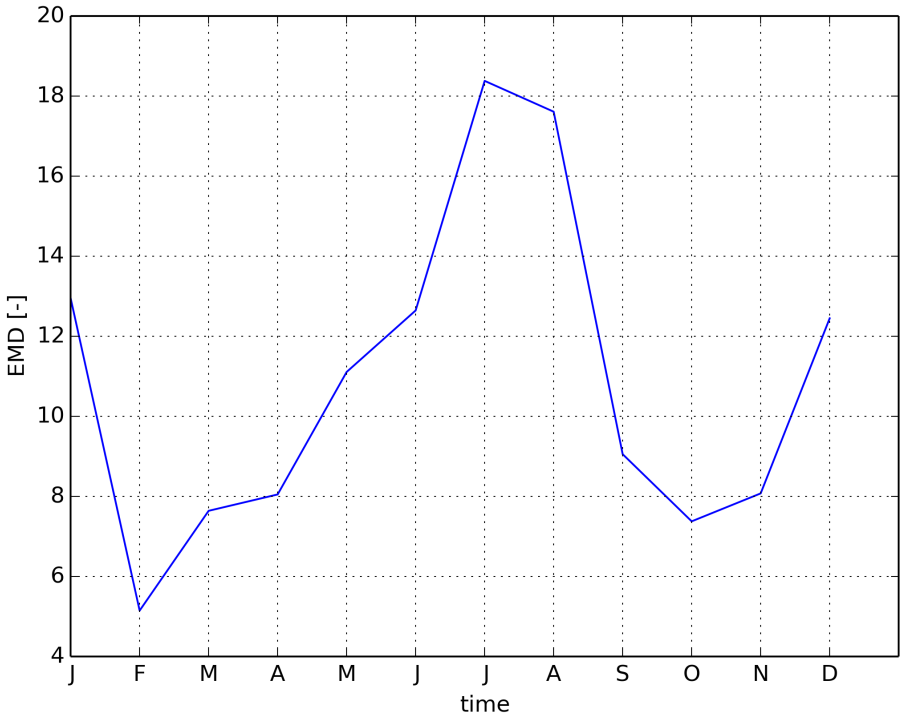



Figure 722: Timeseries of EMD

### 1.4.33 CMIP3 mpi echam5-amip

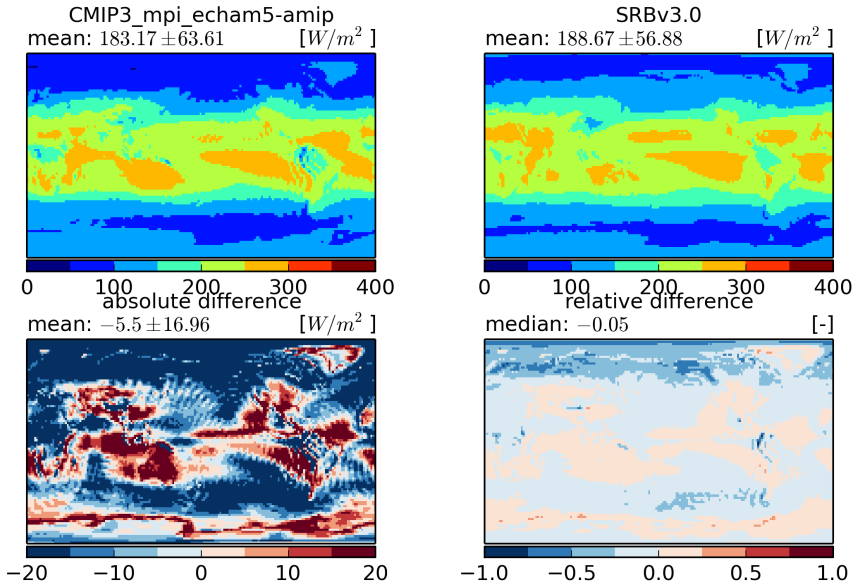



Figure 723: Temporal mean fields (top) and absolute and relative differences (bottom)

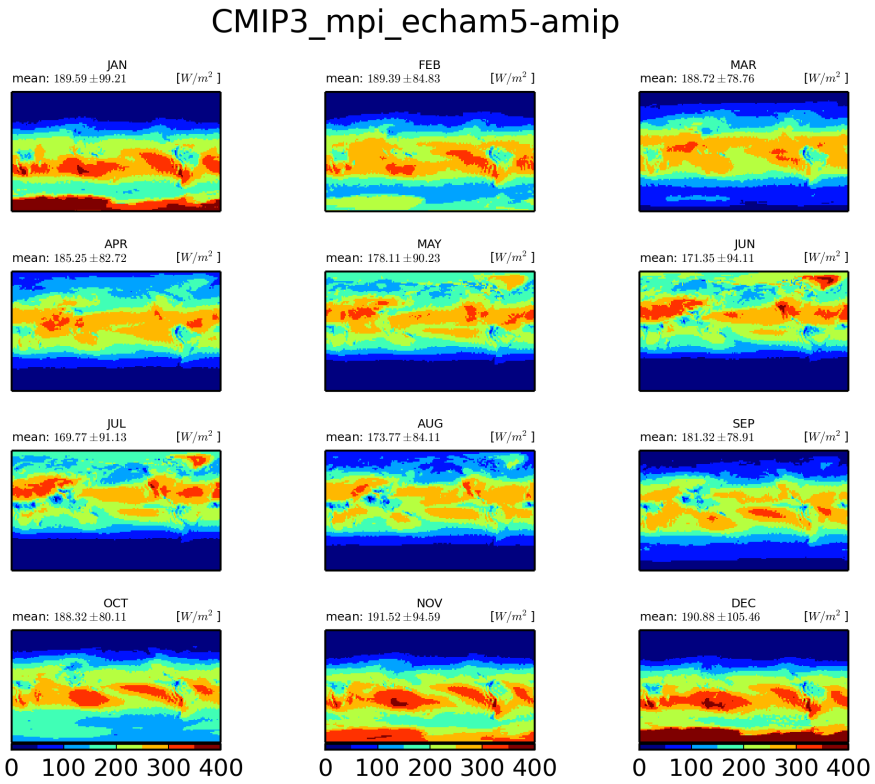



Figure 724: Monthly mean climatology for mpi-echam5

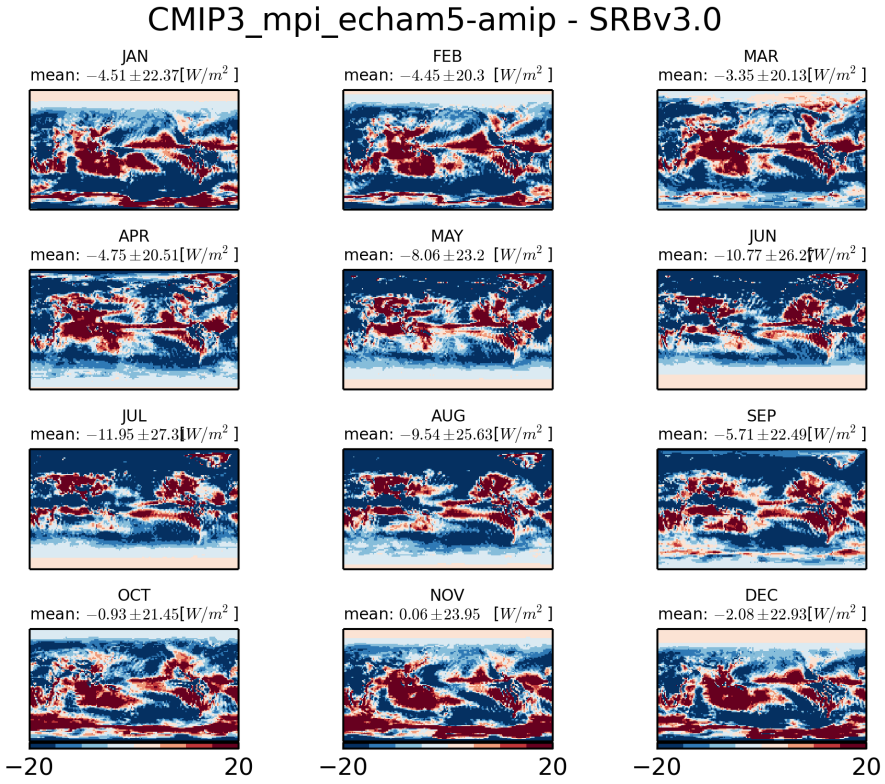



Figure 725: Monthly mean climatology of difference between MPI-ECHAM5 and SRBV3.0

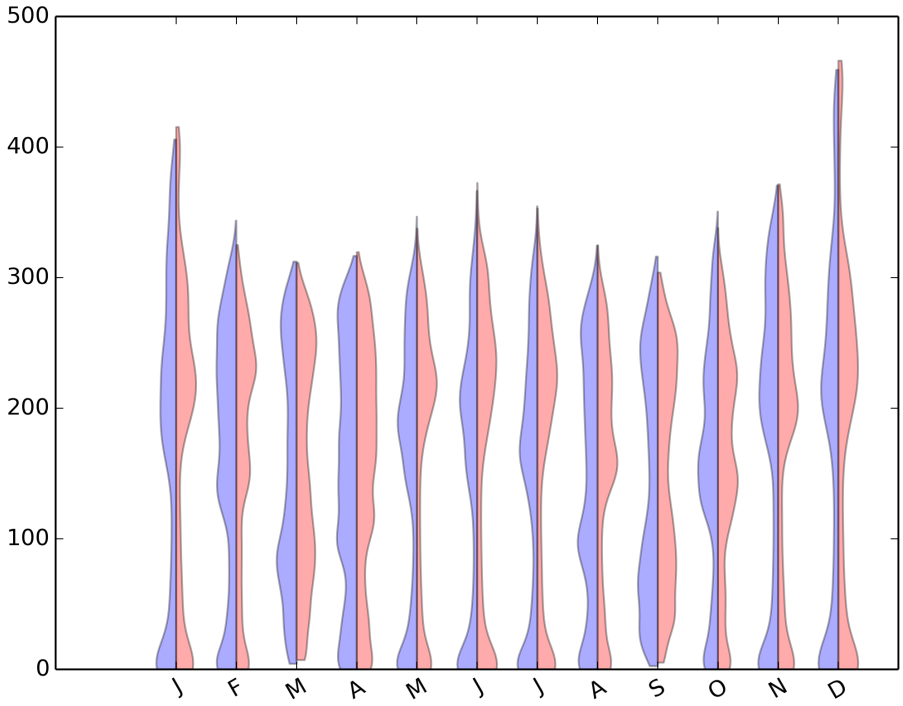



Figure 726: Violin plot for CMIP3-MPI-ECHAM5-AMIP

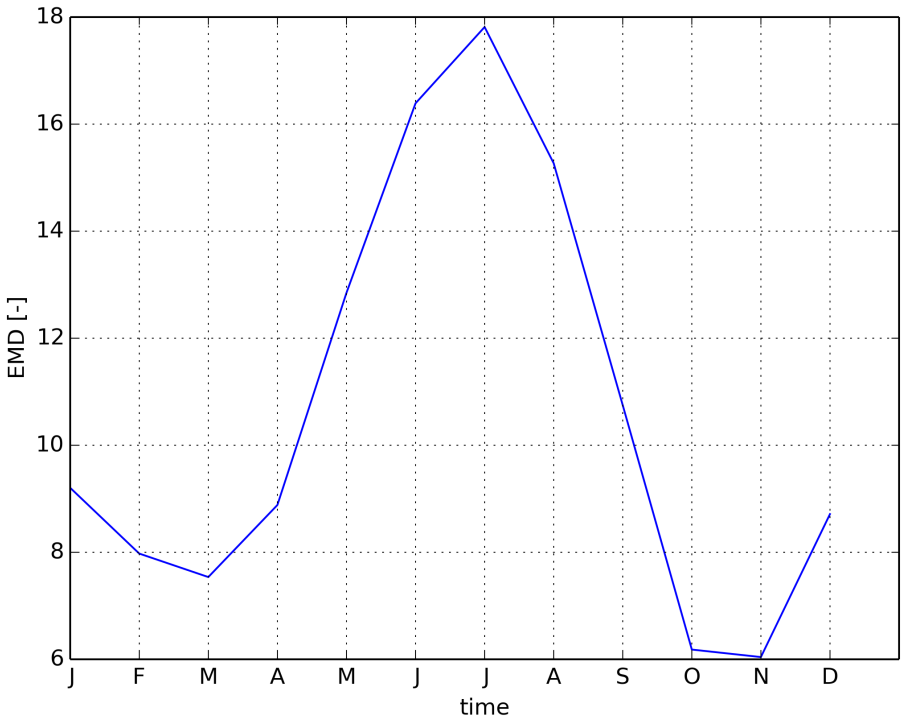



Figure 727: Timeseries of EMD

### 1.4.34 CMIP3 ncar ccsm3 0-amip

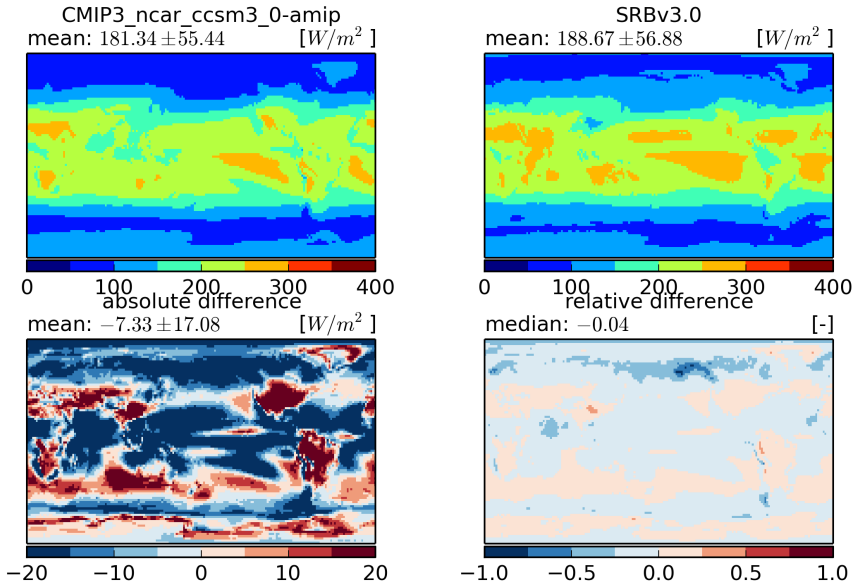



Figure 728: Temporal mean fields (top) and absolute and relative differences (bottom)

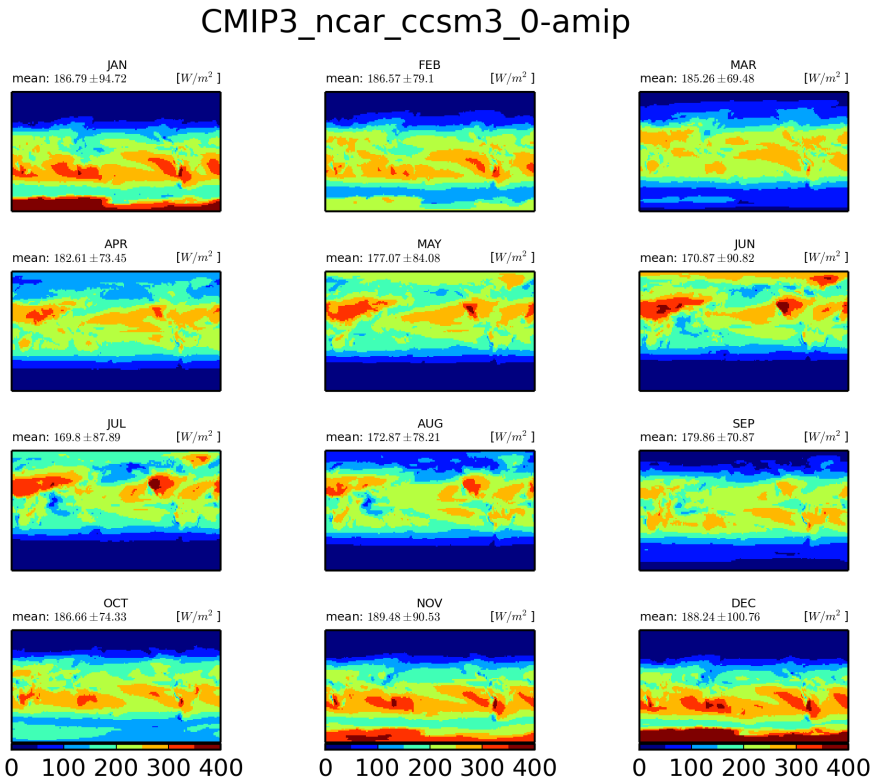



Figure 729: Monthly mean climatology for ncar-ccsm3-0

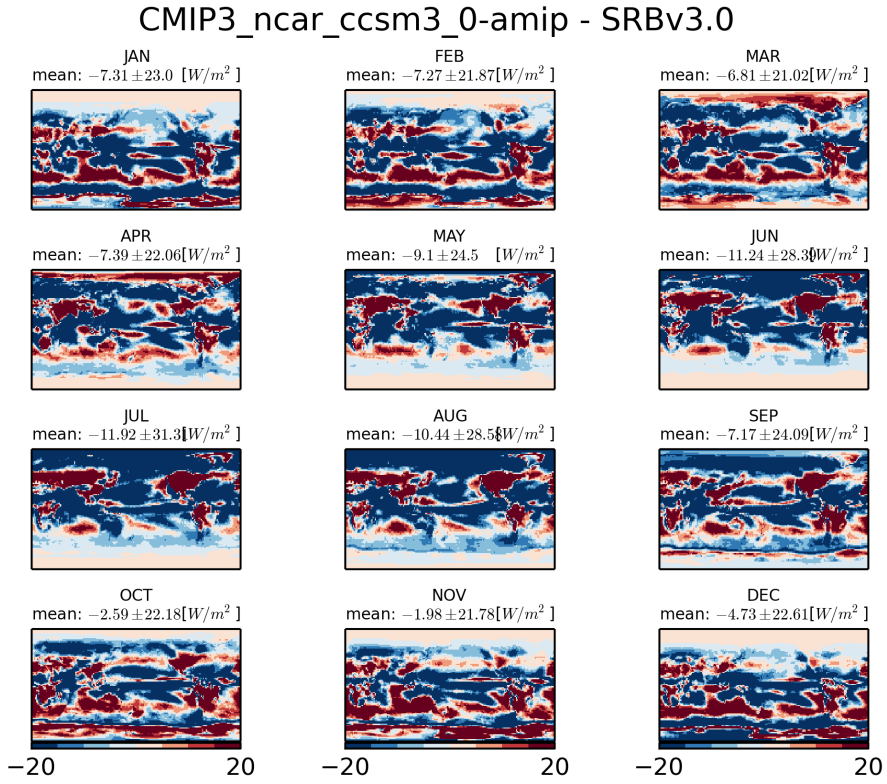



Figure 730: Monthly mean climatology of difference between NCAR-CCSM3-0 and SRBV3.0

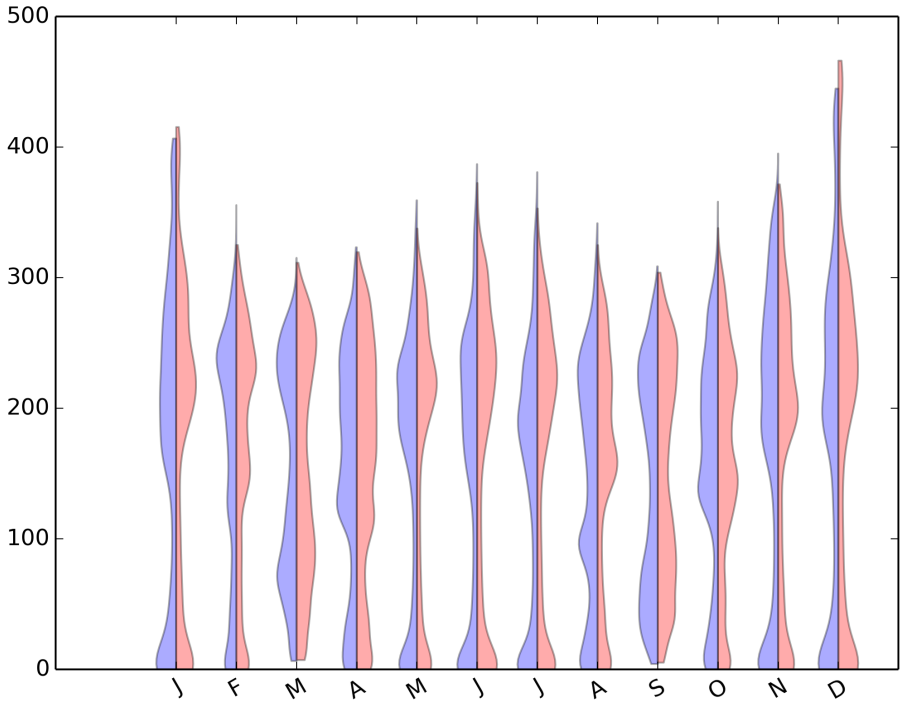



Figure 731: Violin plot for CMIP3-NCAR-CCSM3-0-AMIP

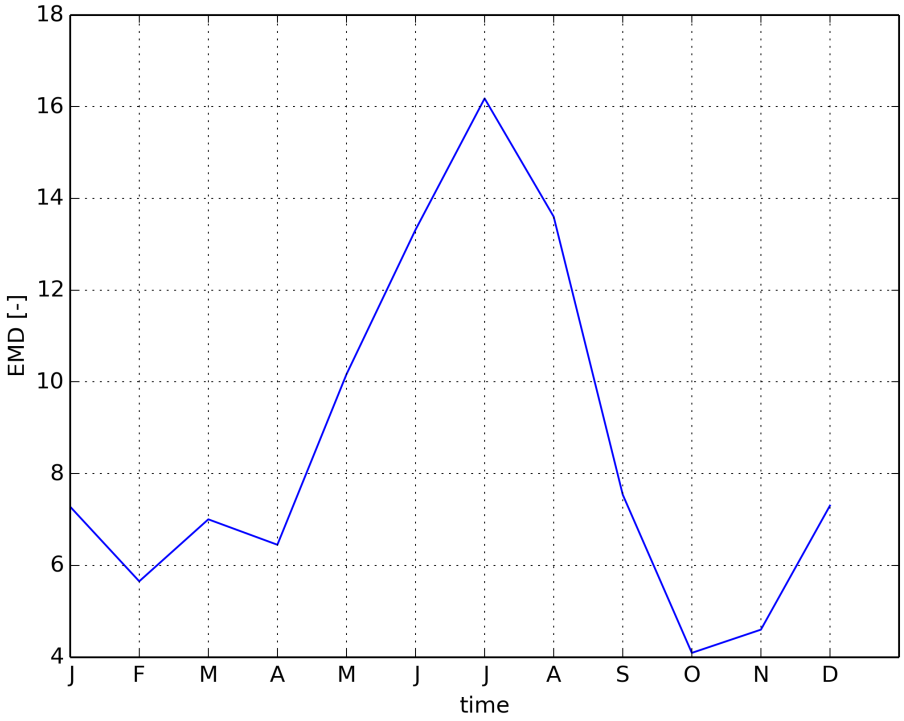



Figure 732: Timeseries of EMD

### 1.4.35 CMIP3 ncar pcm1-amip

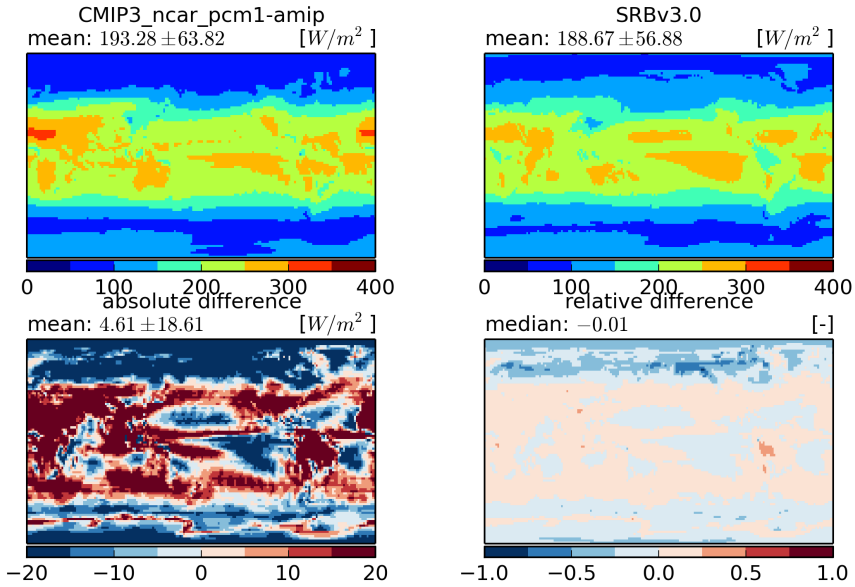



Figure 733: Temporal mean fields (top) and absolute and relative differences (bottom)

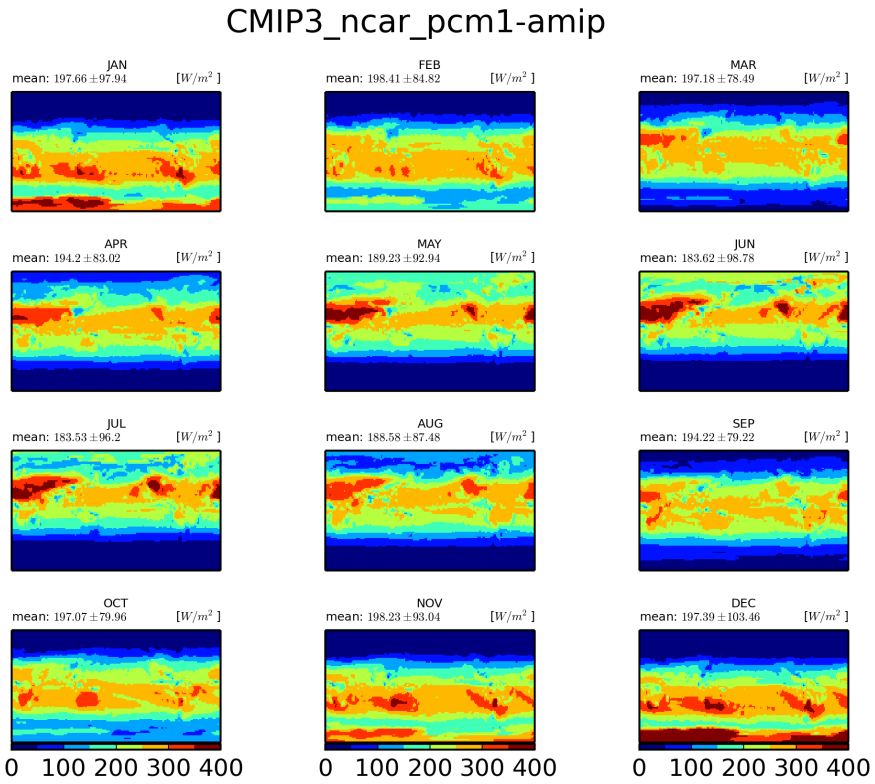



Figure 734: Monthly mean climatology for ncar-pcm1

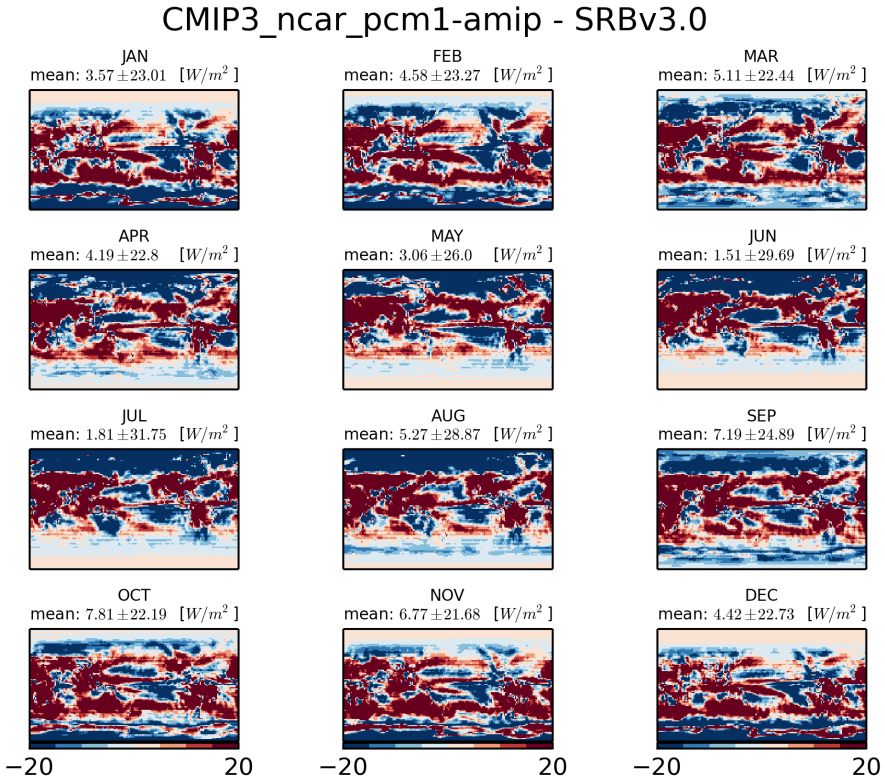



Figure 735: Monthly mean climatology of difference between NCAR-PCM1 and SRBV3.0

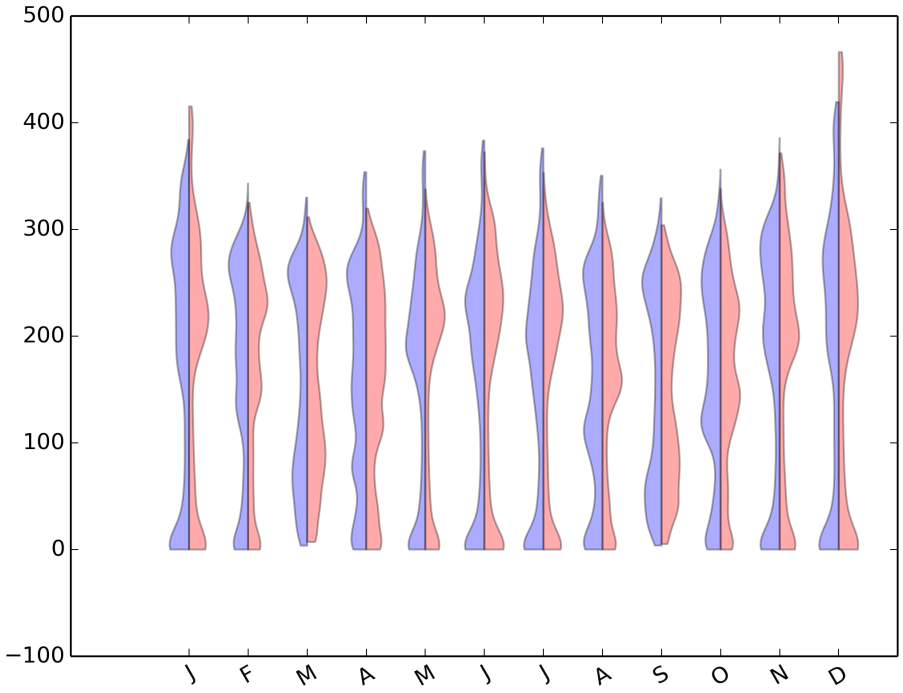



Figure 736: Violin plot for CMIP3-NCAR-PCM1-AMIP

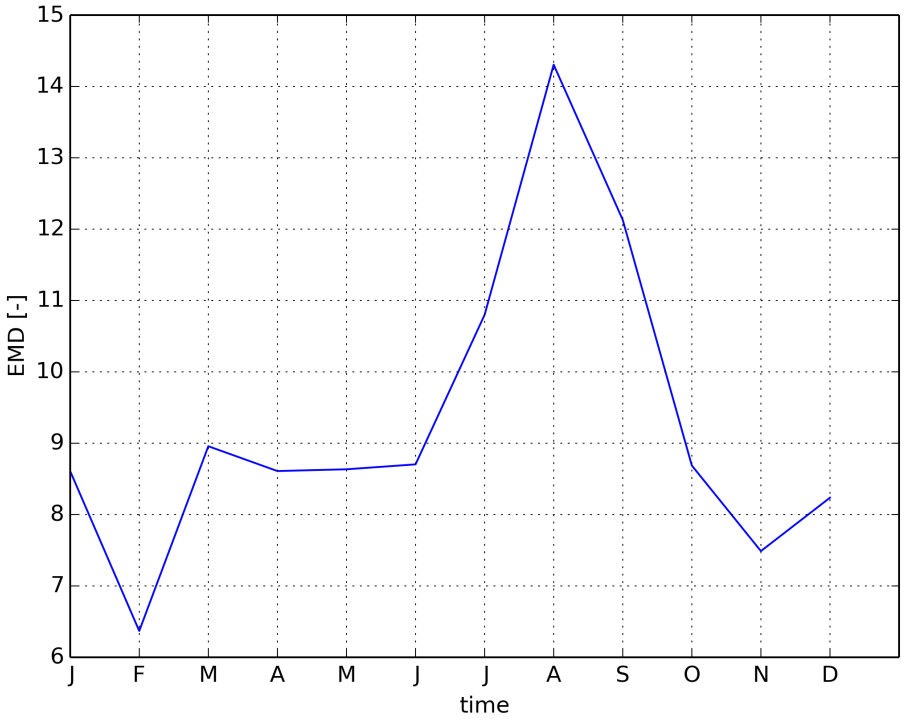



Figure 737: Timeseries of EMD

### 1.4.36 CMIP3 ukmo hadgem1-amip

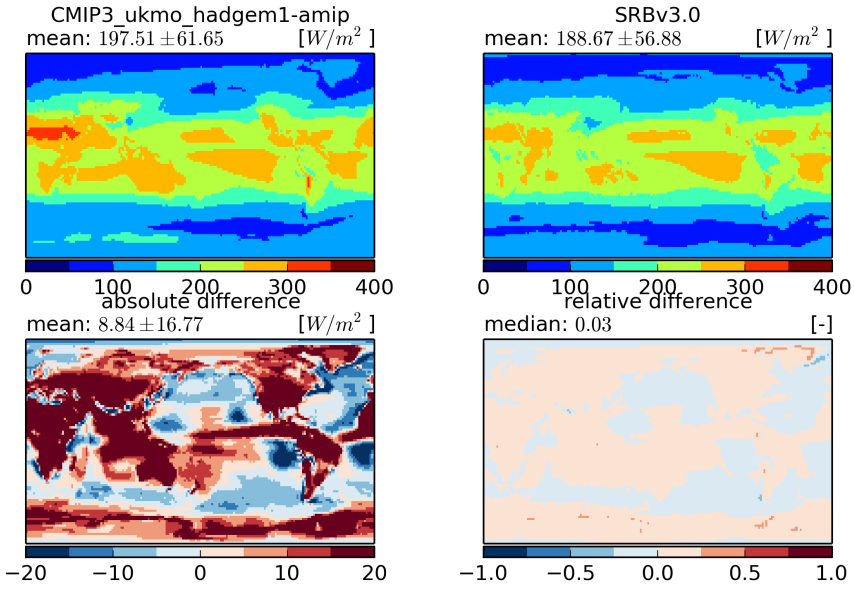



Figure 738: Temporal mean fields (top) and absolute and relative differences (bottom)

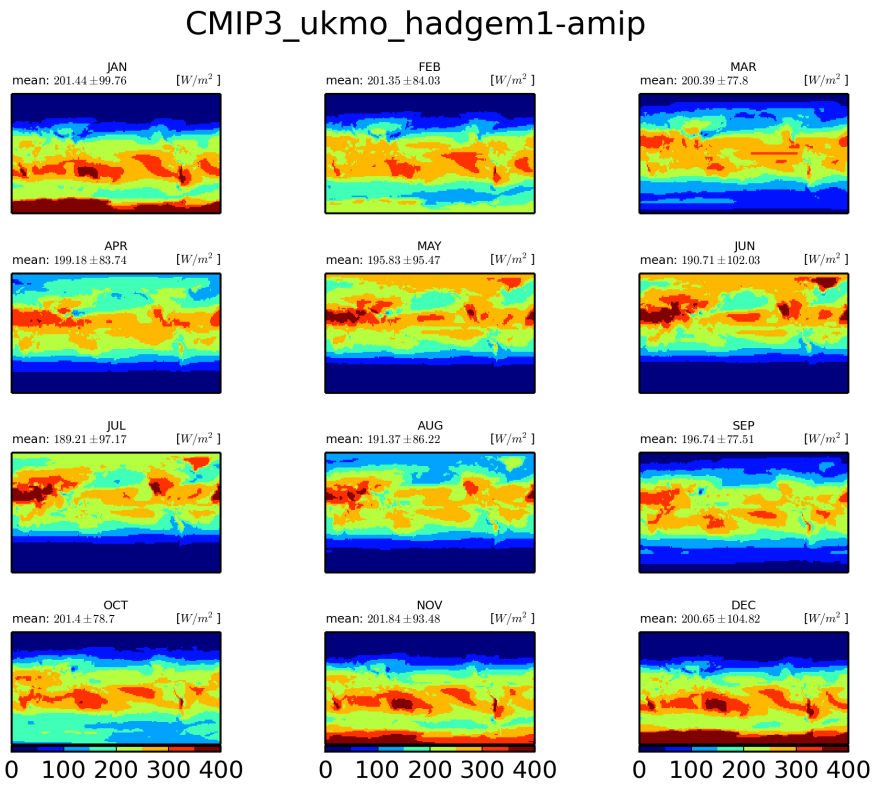



Figure 739: Monthly mean climatology for ukmo-hadgem1

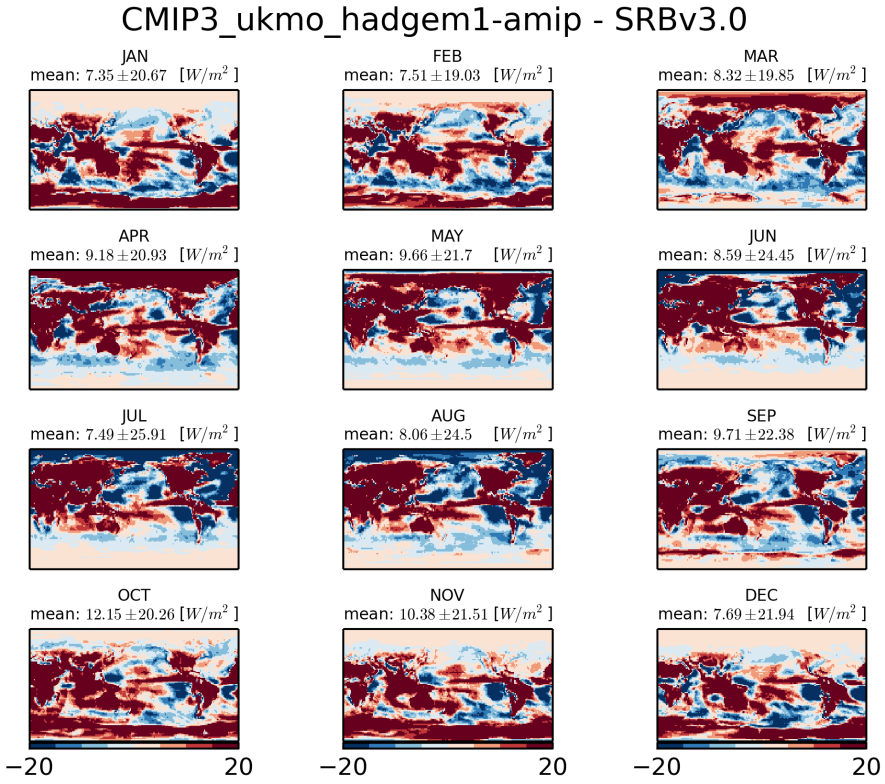



Figure 740: Monthly mean climatology of difference between UKMO-HADGEM1 and SRBV3.0

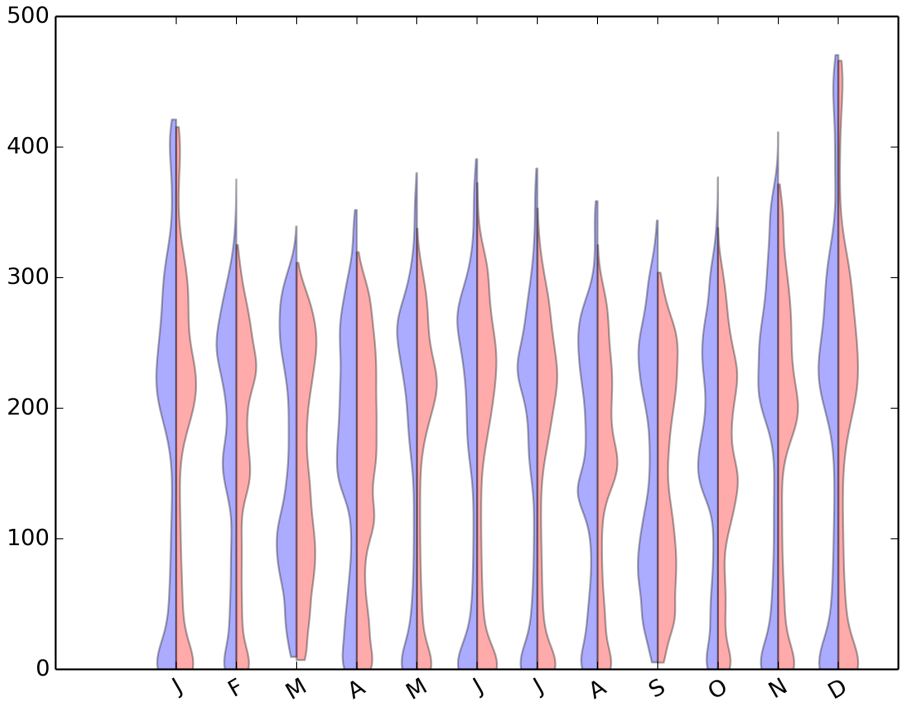



Figure 741: Violin plot for CMIP3-UKMO-HADGEM1-AMIP

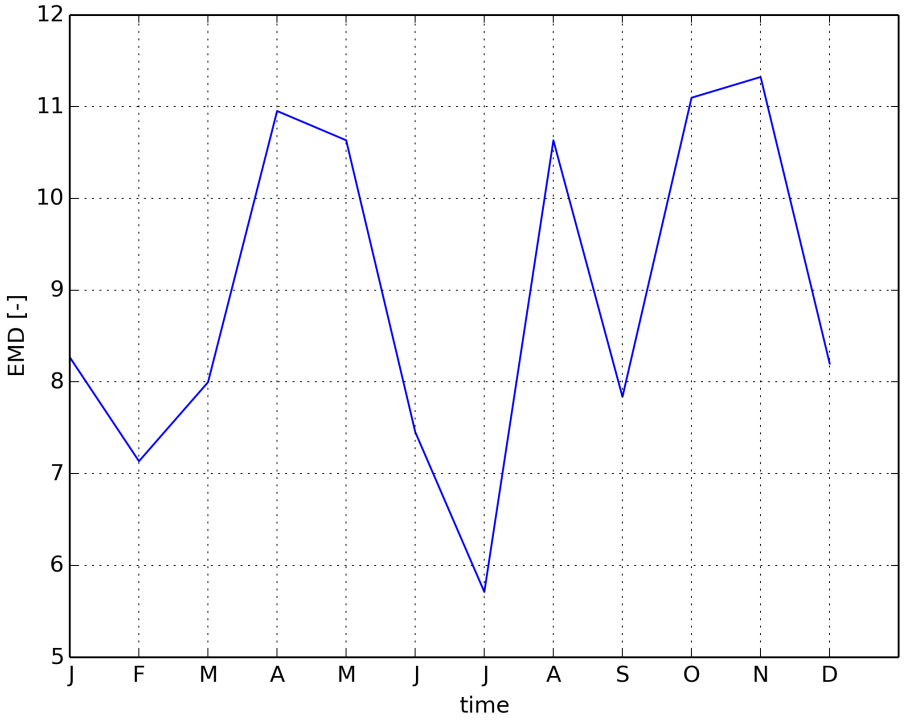



Figure 742: Timeseries of EMD

### 1.4.37 model mean

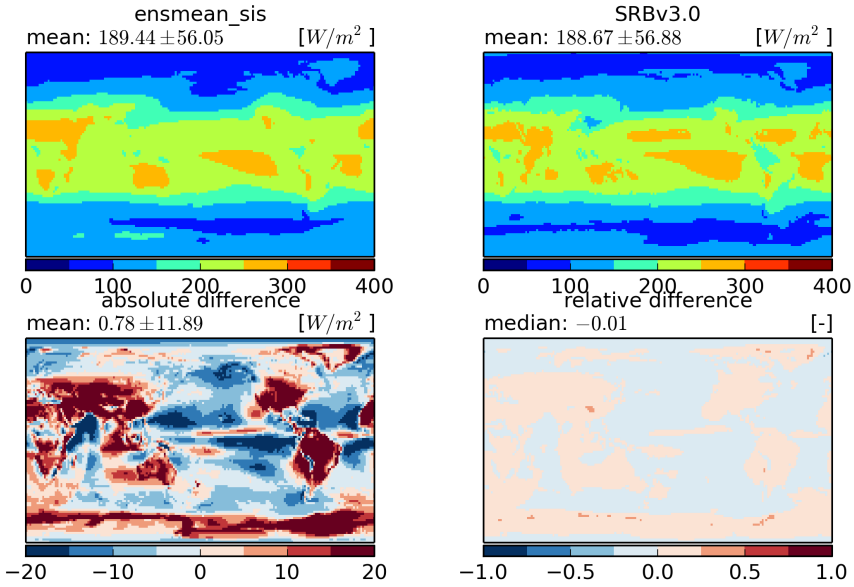



Figure 743: Temporal mean fields (top) and absolute and relative differences (bottom)

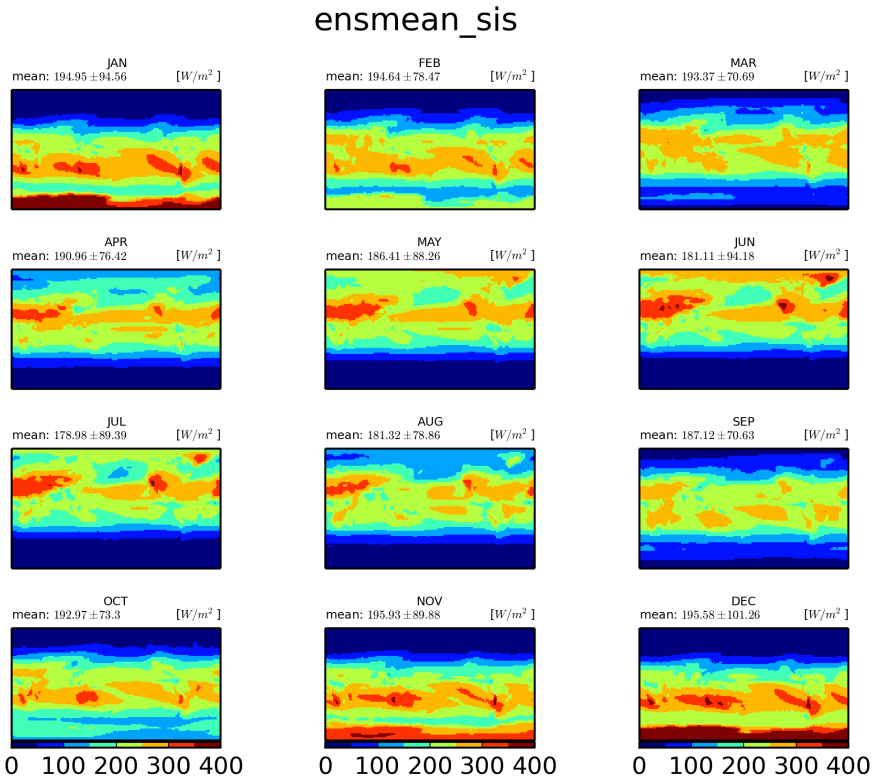



Figure 744: Monthly mean climatology for mean-model

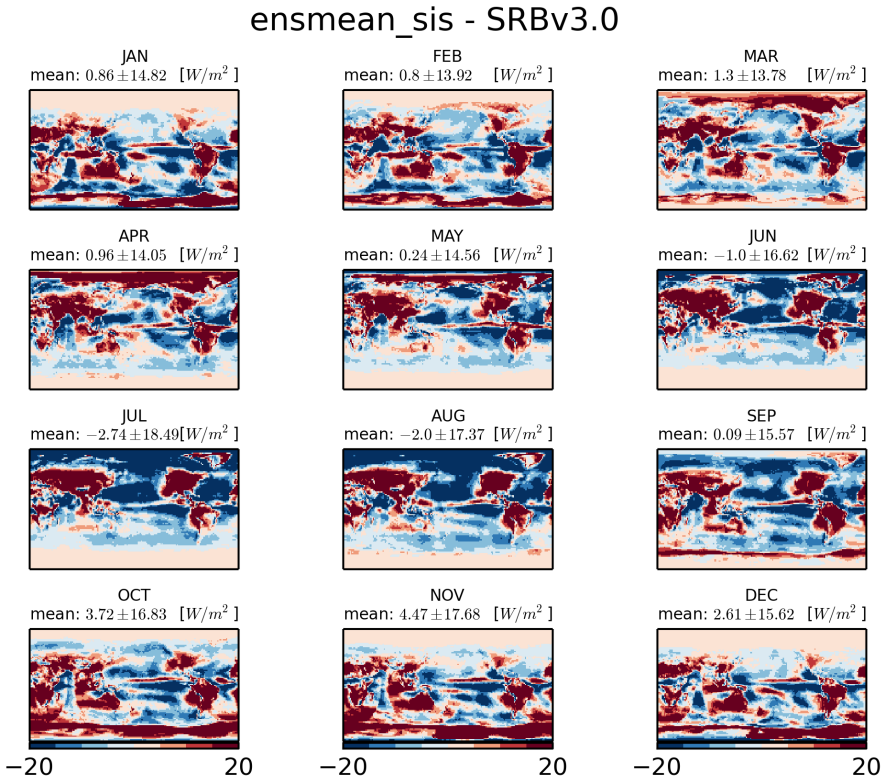



Figure 745: Monthly mean climatology of difference between MEAN-MODEL and SRBV3.0

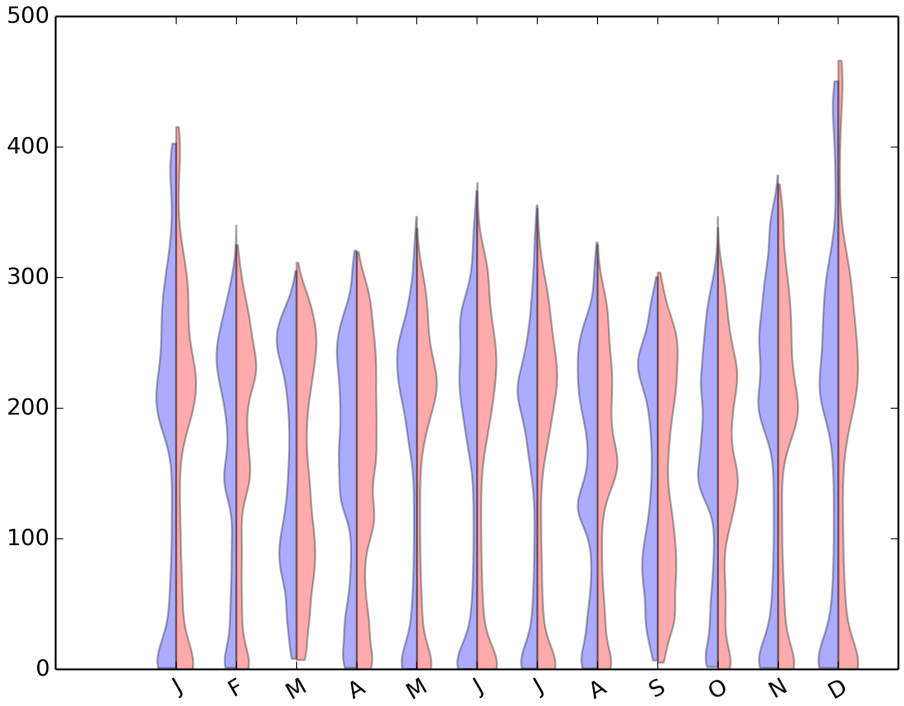



Figure 746: Violin plot for ENSMEAN-SIS

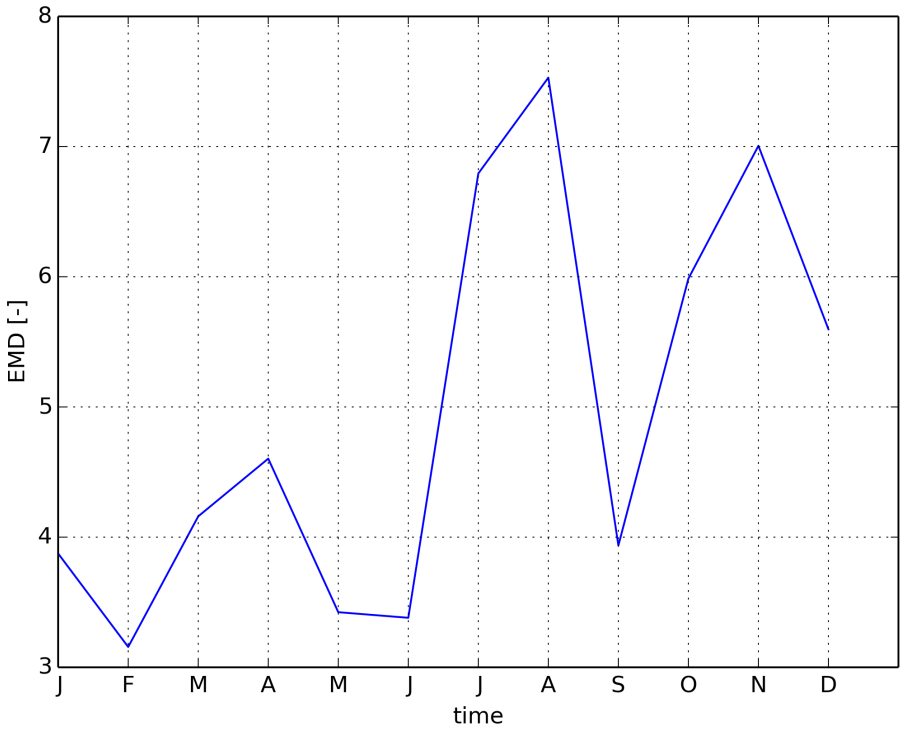



Figure 747: Timeseries of EMD

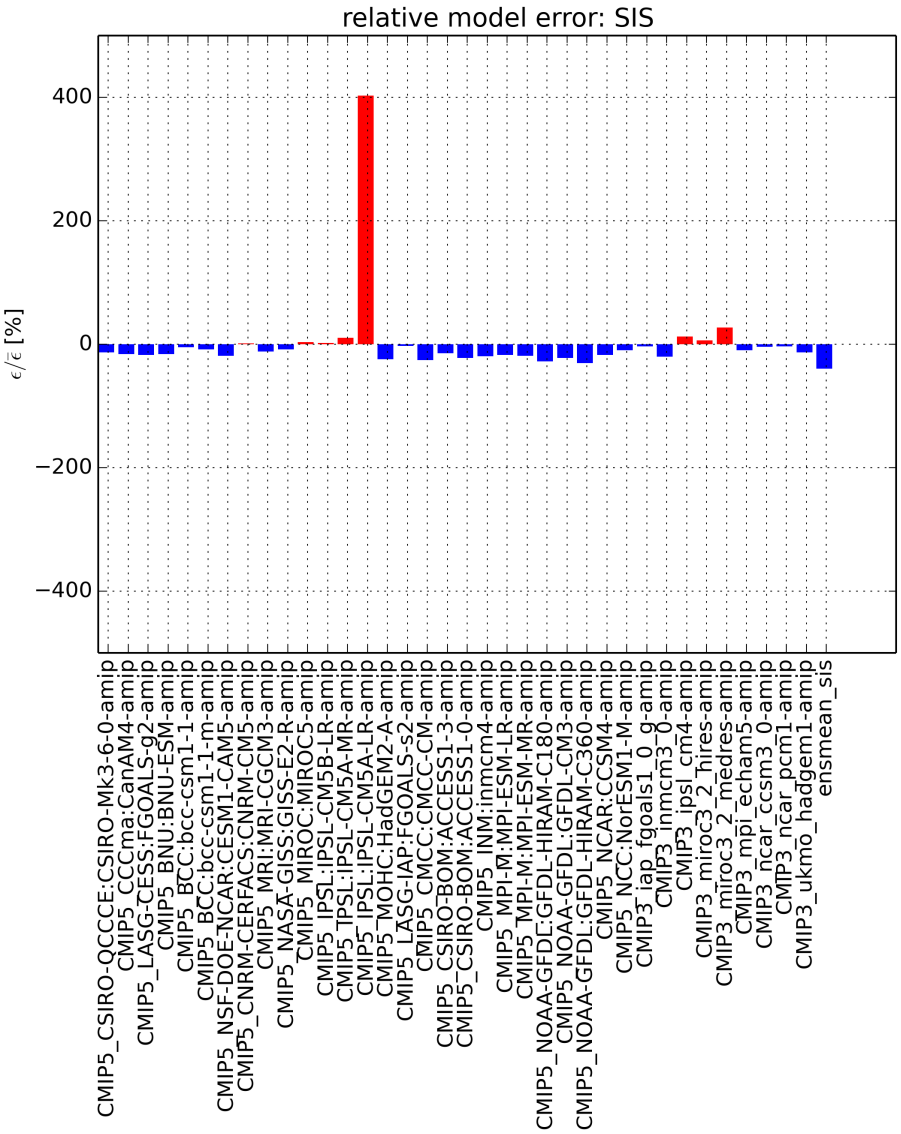



Figure 748: Relative model performance for SIS

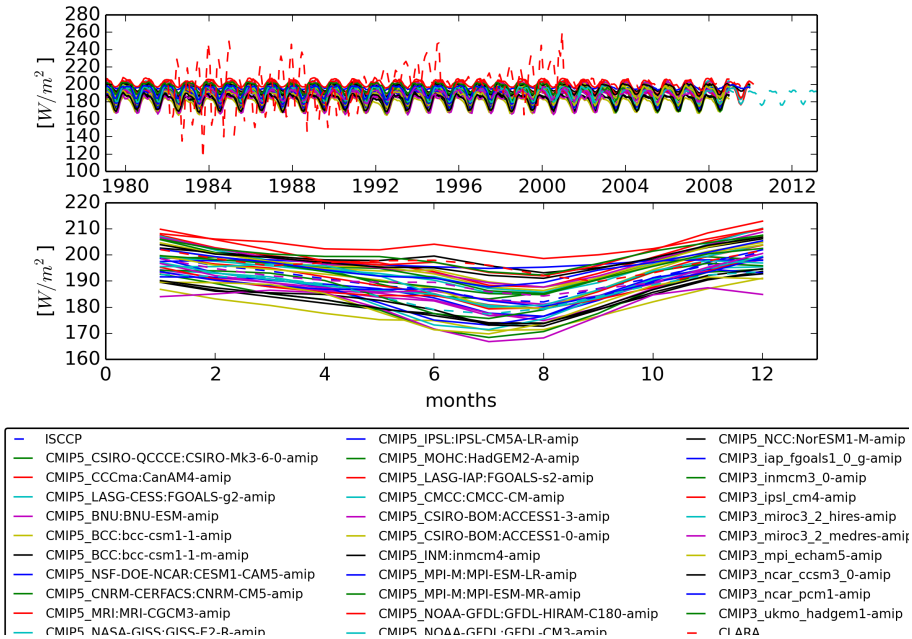



Figure 749: Global means for SHORTWAVE DOWNWARD RADIATION FLUX IN AIR

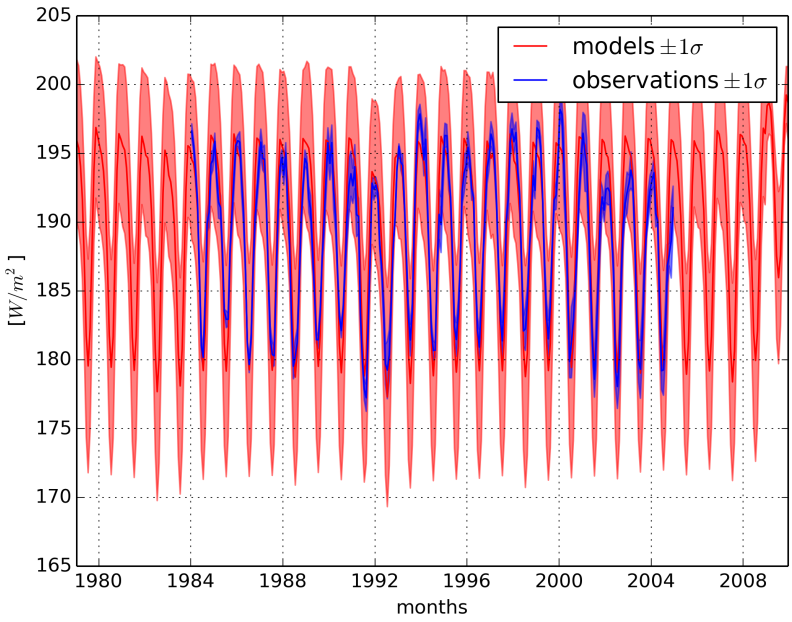



Figure 750: Global means for SHORTWAVE DOWNWARD RADIATION FLUX IN AIR (summary); areas indicate $\pm 1\sigma$ as derived from the ensemble of models or observations

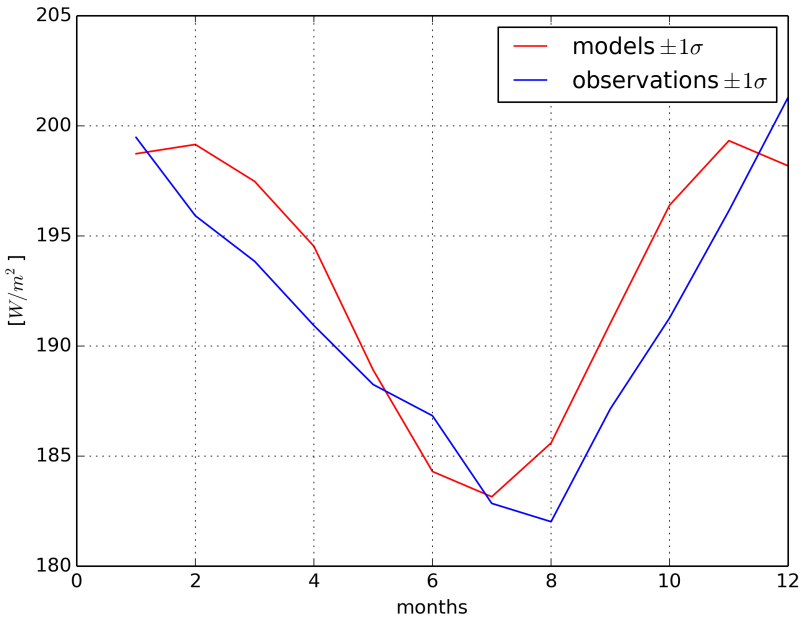



Figure 751: Global means for SHORTWAVE DOWNWARD RADIATION FLUX IN AIR (summary climatology)

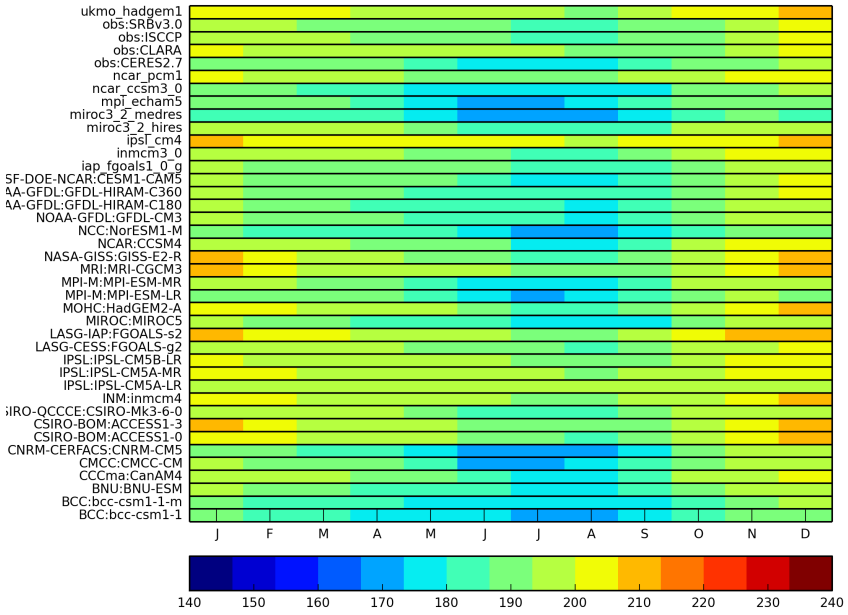



Figure 752: Global means climatology for SHORTWAVE DOWNWARD RADIATION FLUX IN AIR

# 2 SHORTWAVE UPWARD RADIATION FLUX IN AIR

## 2.1 ISCCP

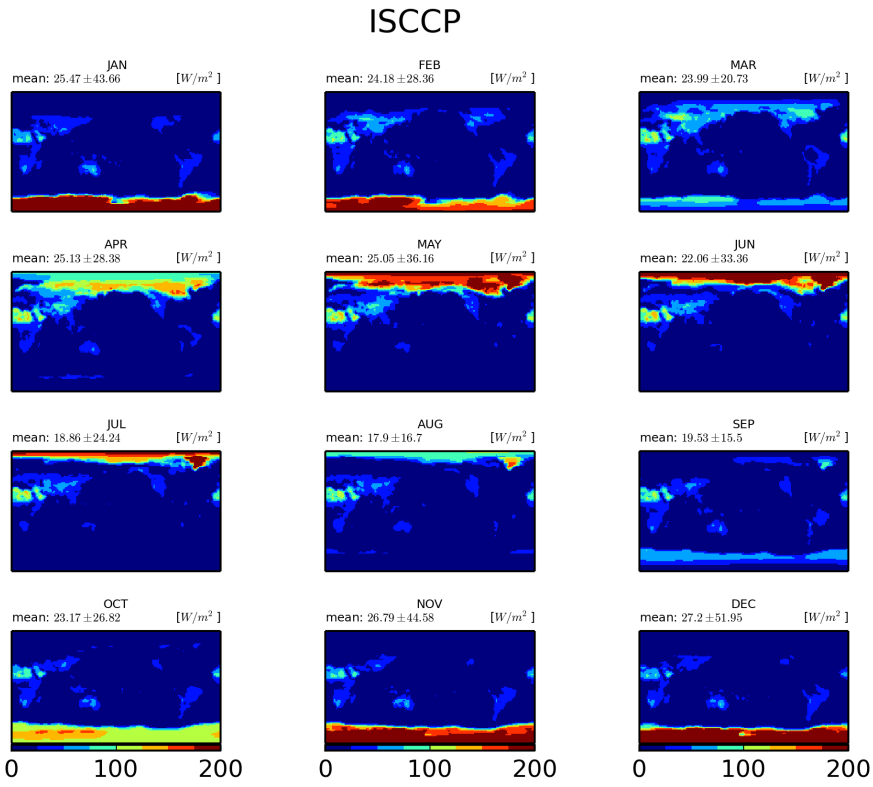



Figure 753: Monthly mean ISCCP

### 2.1.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

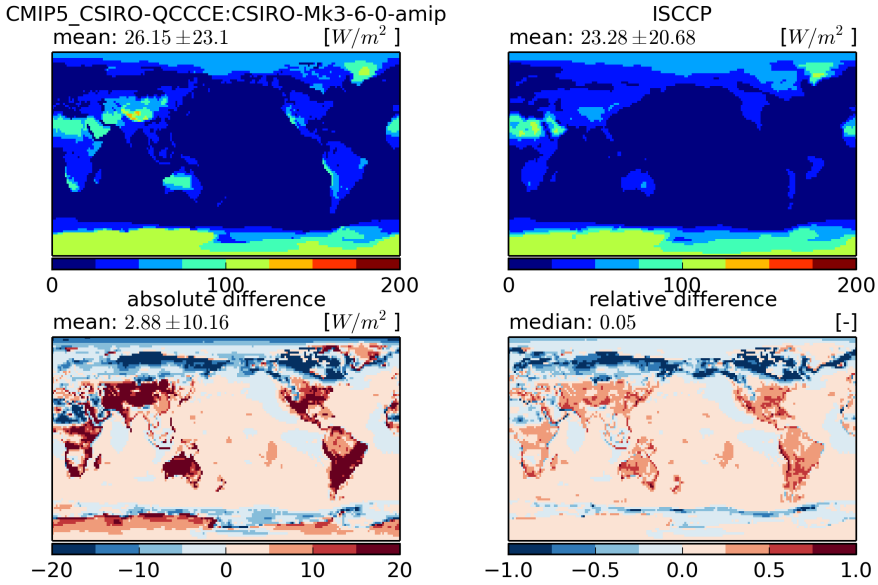



Figure 754: Temporal mean fields (top) and absolute and relative differences (bottom)

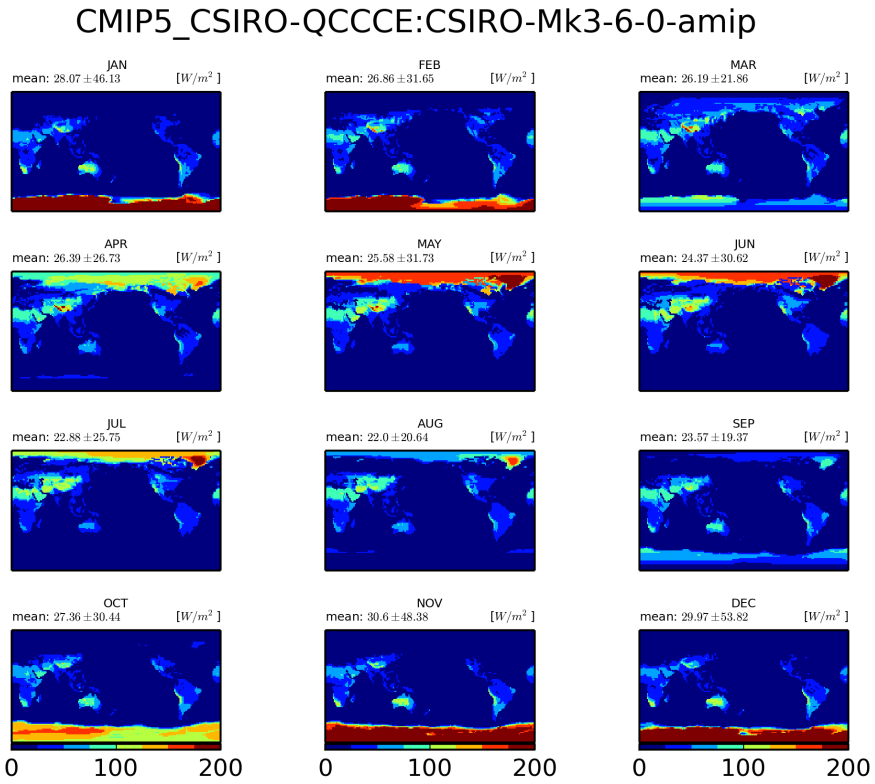



Figure 755: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

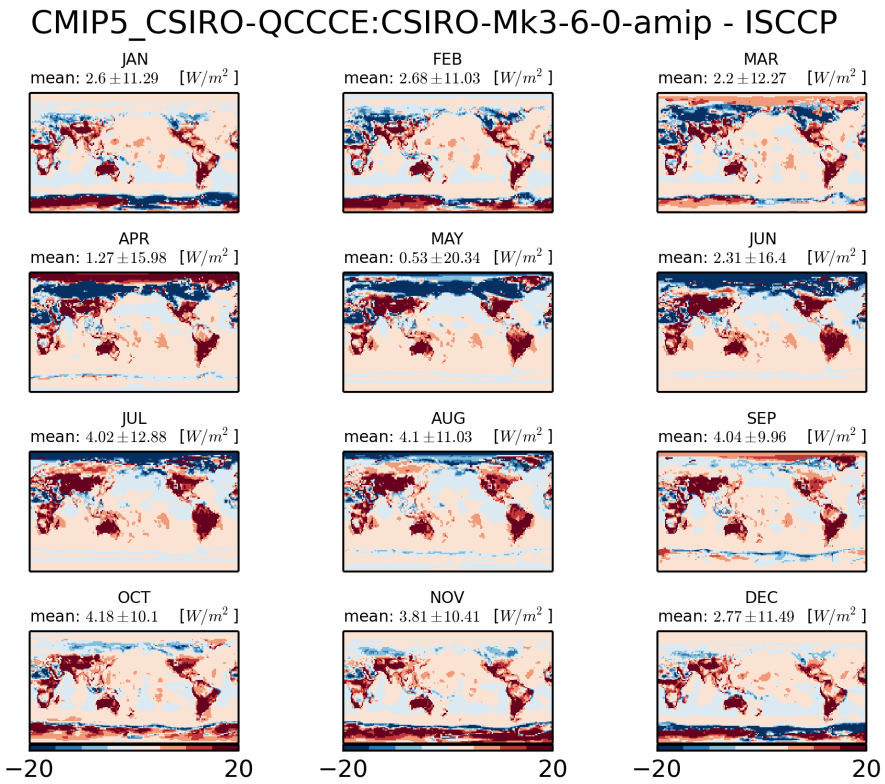



Figure 756: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and ISCCP

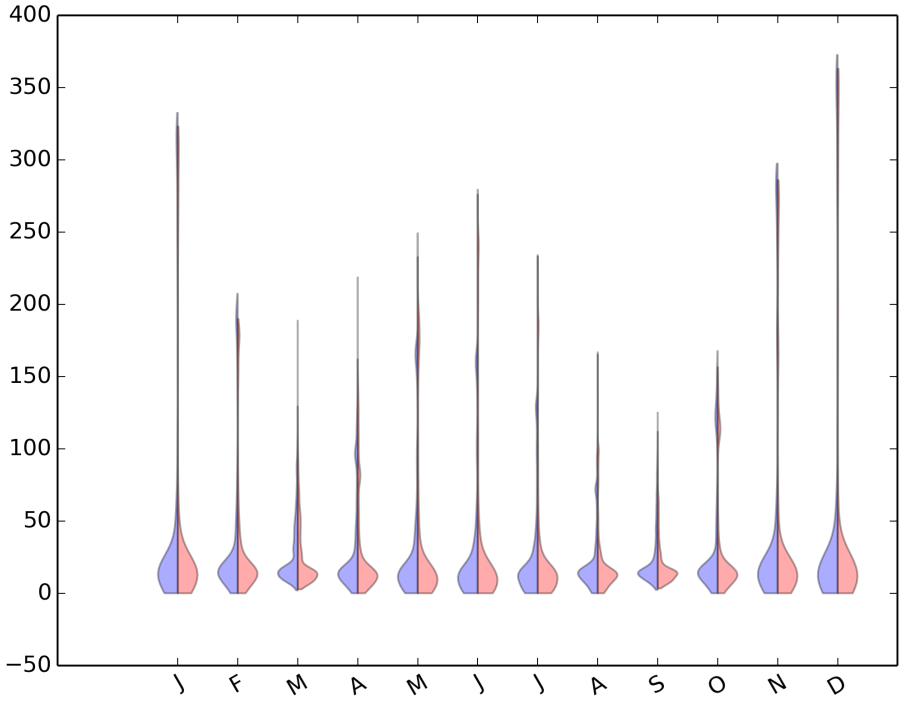



Figure 757: Violin plot for CMIP5-CSIRO-QCCCE:CSIRO-MK3-6-0-AMIP

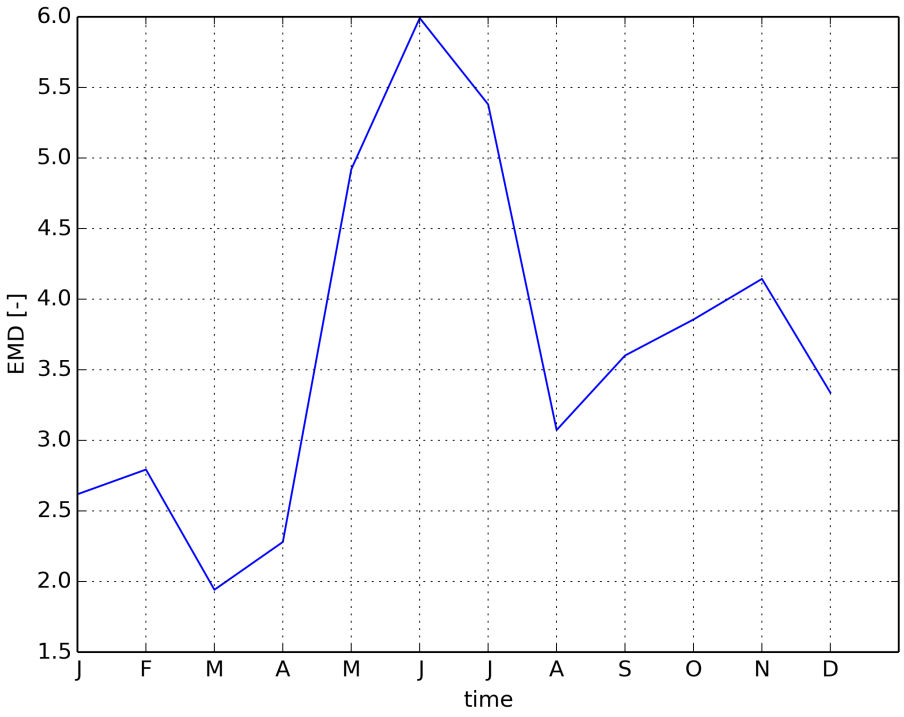



Figure 758: Timeseries of EMD

### 2.1.2 CMIP5 CCCma:CanAM4-amip

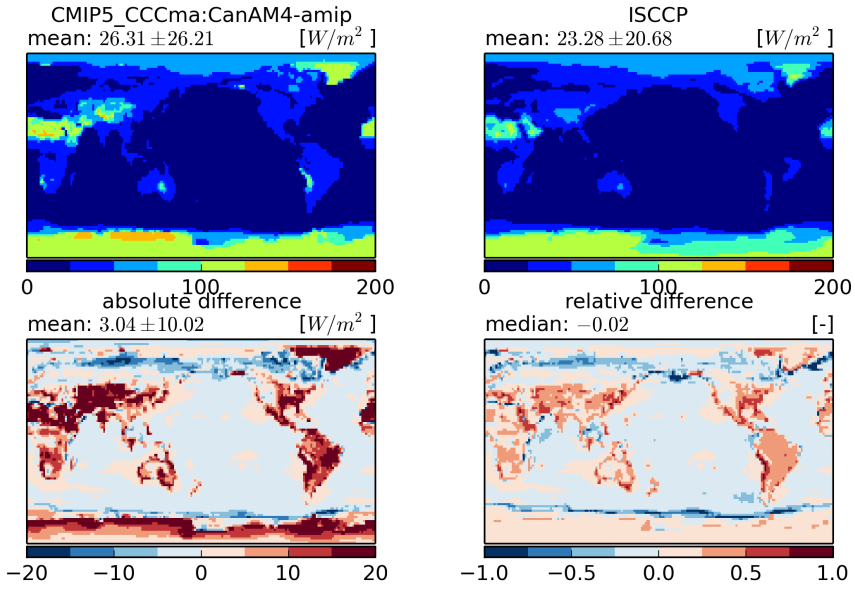



Figure 759: Temporal mean fields (top) and absolute and relative differences (bottom)

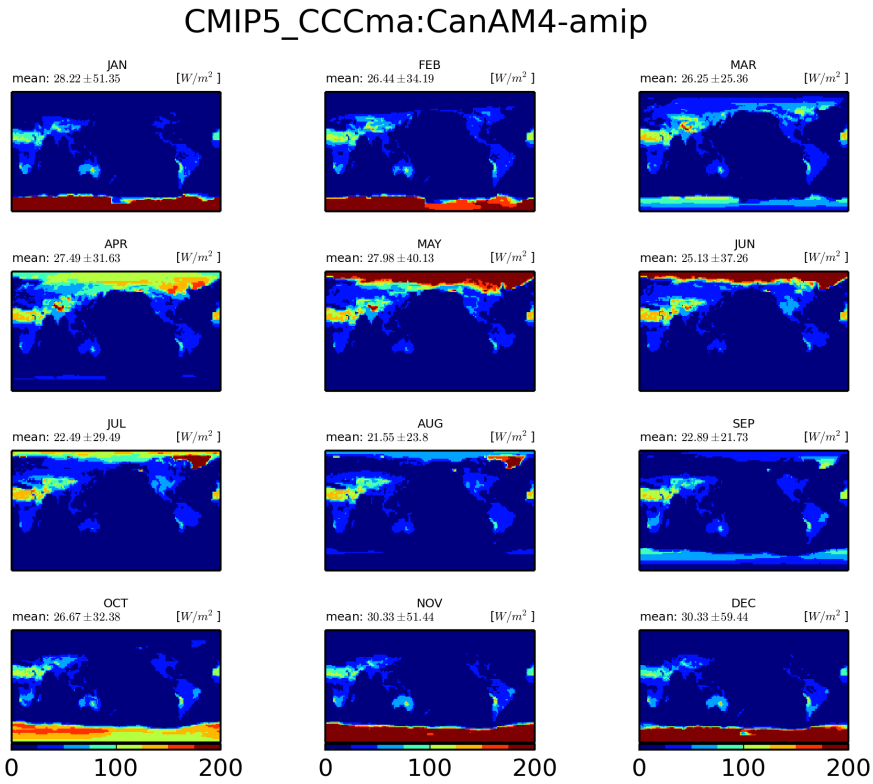



Figure 760: Monthly mean climatology for CCCma:CanAM4

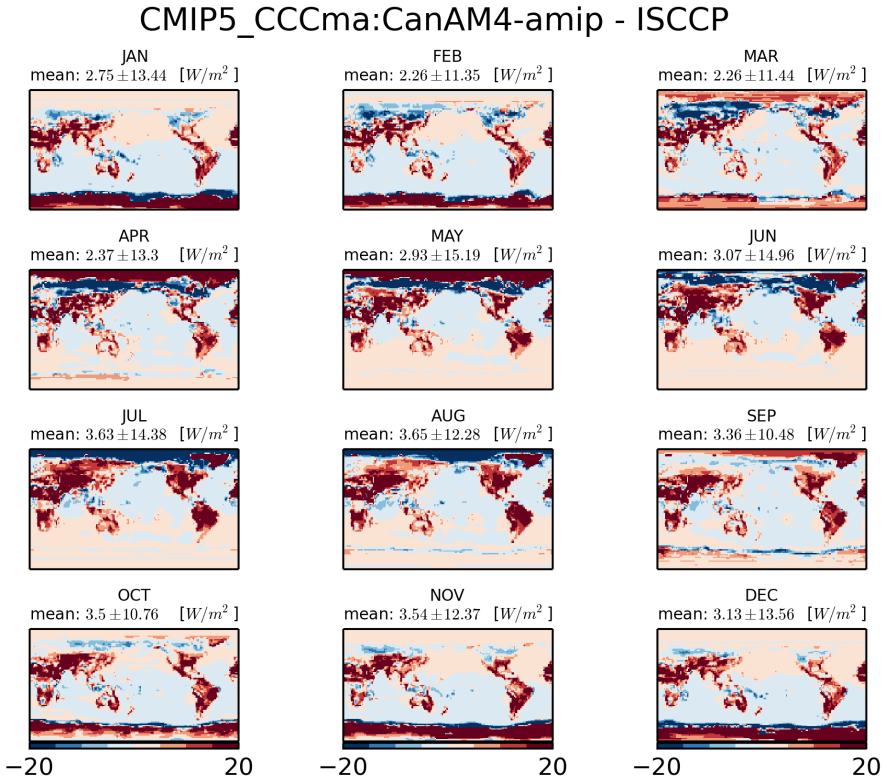



Figure 761: Monthly mean climatology of difference between CCCMA:CANAM4 and ISCCP

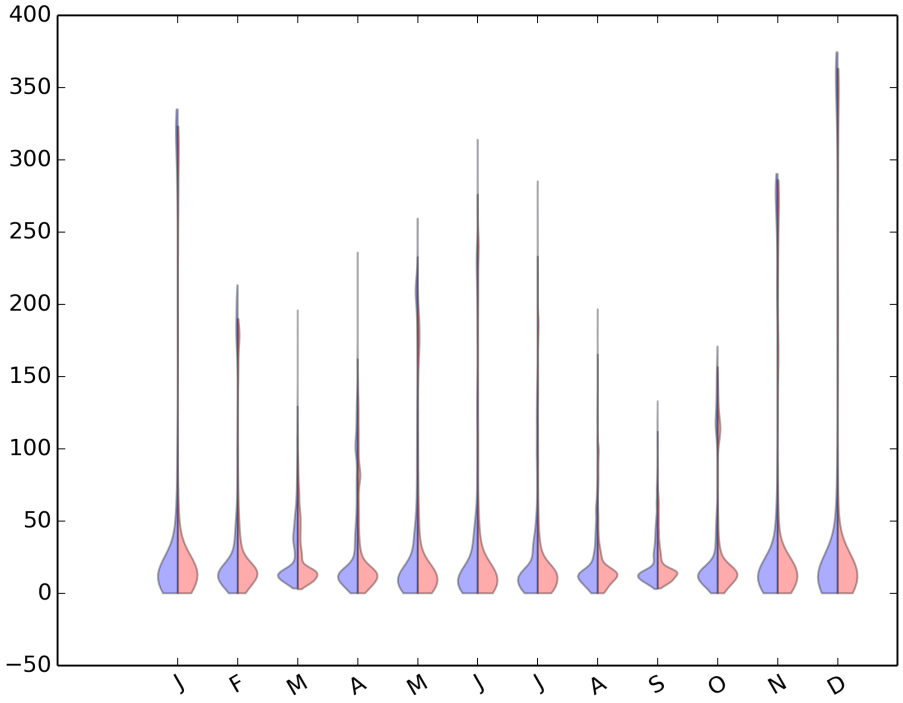



Figure 762: Violin plot for CMIP5-CCCMA:CANAM4-AMIP

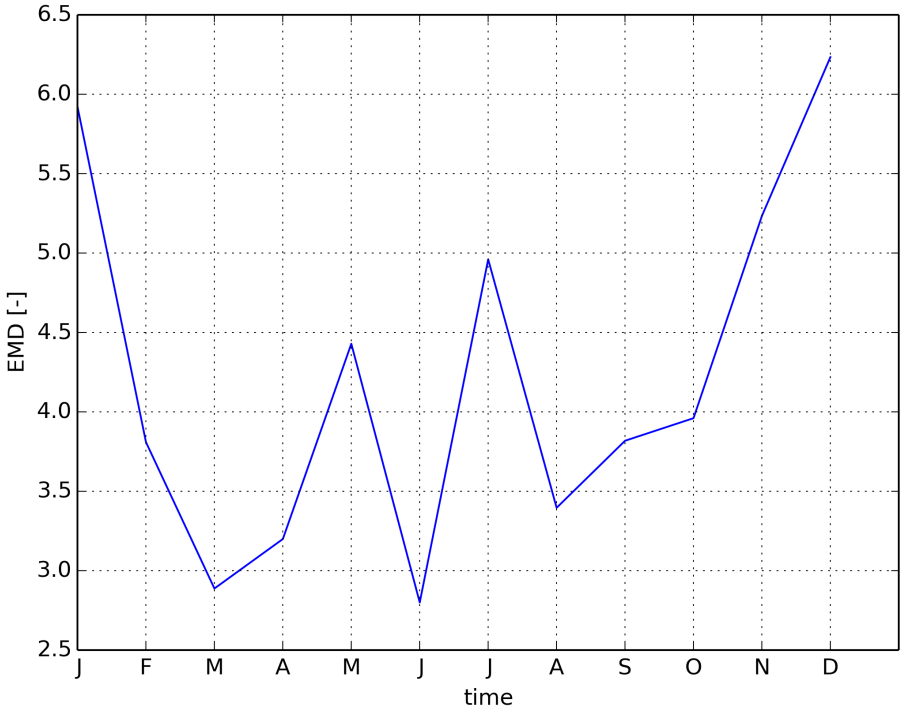



Figure 763: Timeseries of EMD

### 2.1.3 CMIP5 LASG-CESS:FGOALS-g2-amip

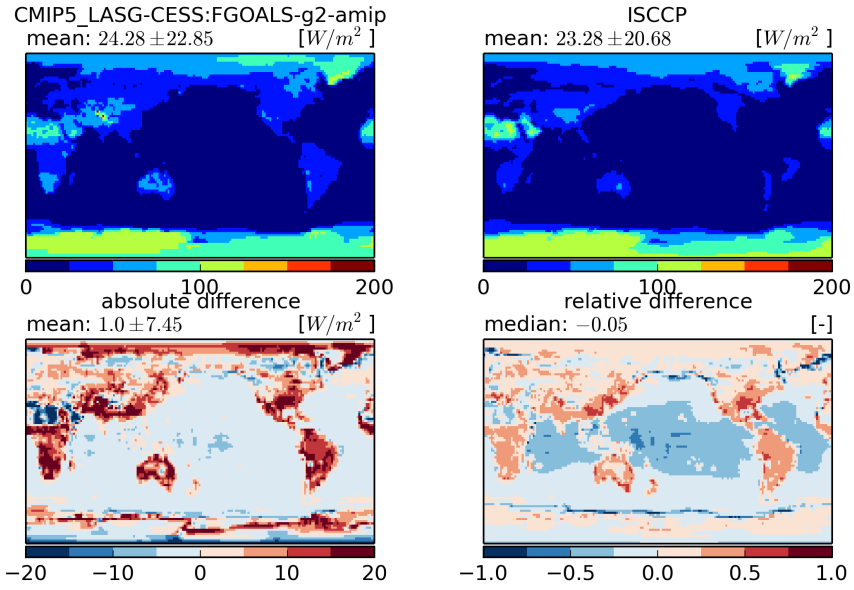



Figure 764: Temporal mean fields (top) and absolute and relative differences (bottom)

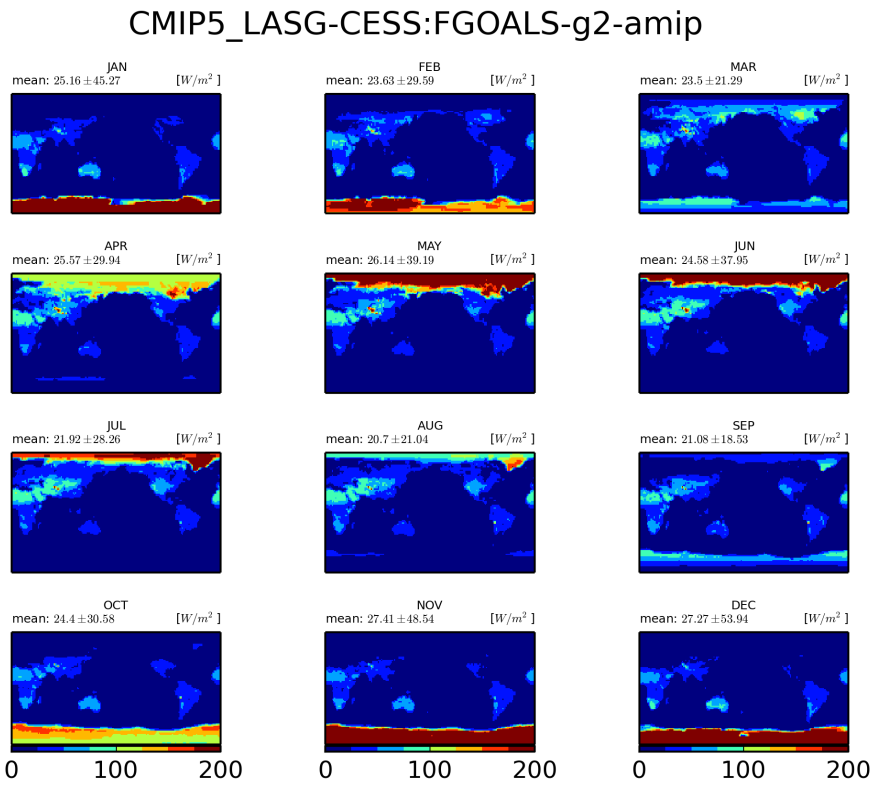



Figure 765: Monthly mean climatology for LASG-CESS:FGOALS-g2

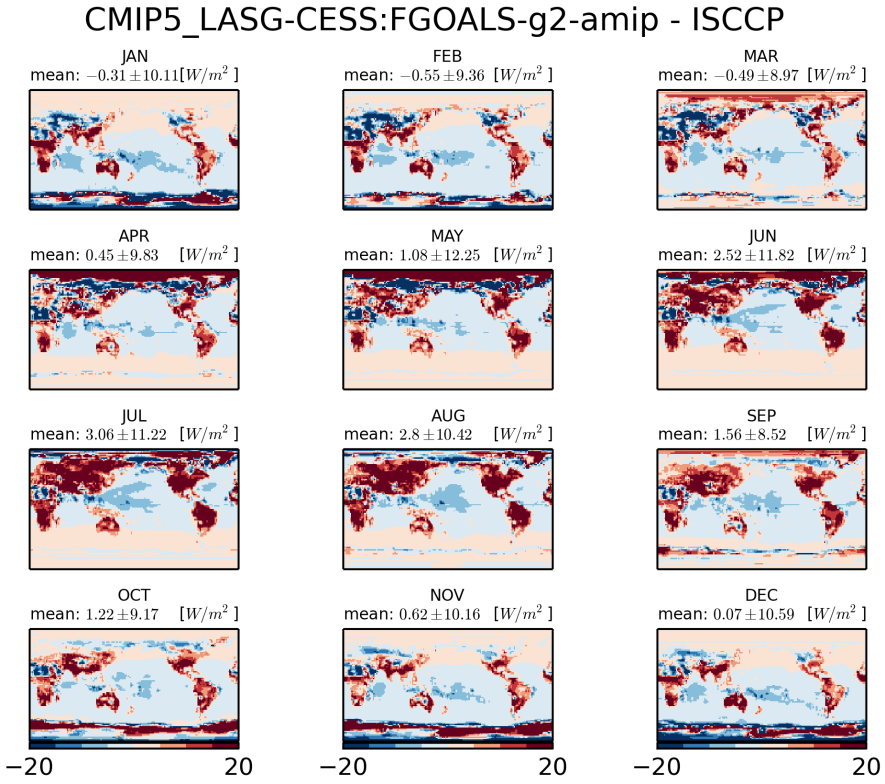



Figure 766: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and ISCCP

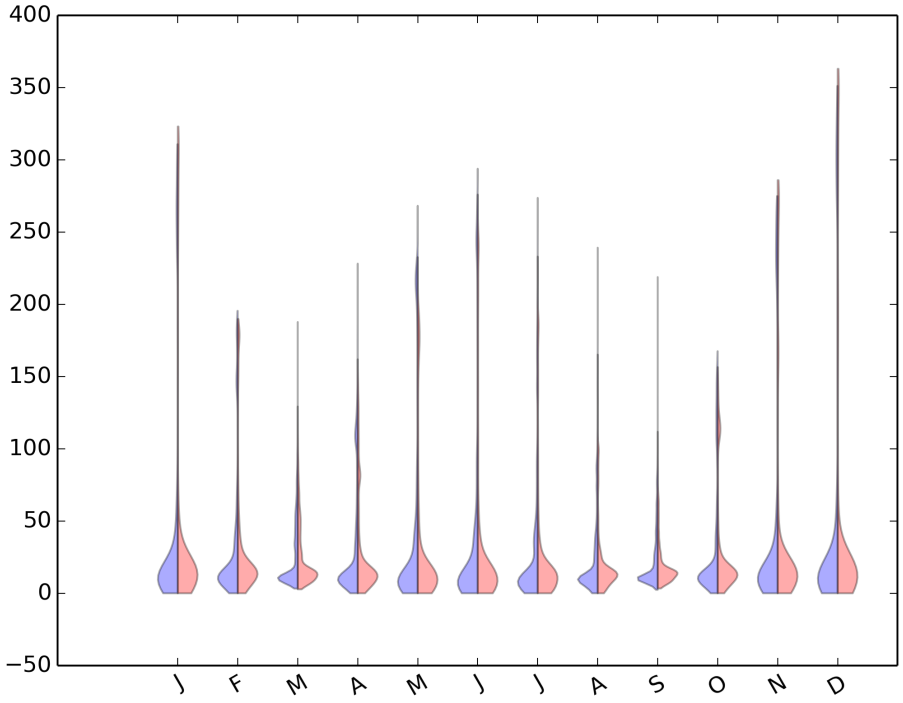



Figure 767: Violin plot for CMIP5-LASG-CESS:FGOALS-G2-AMIP

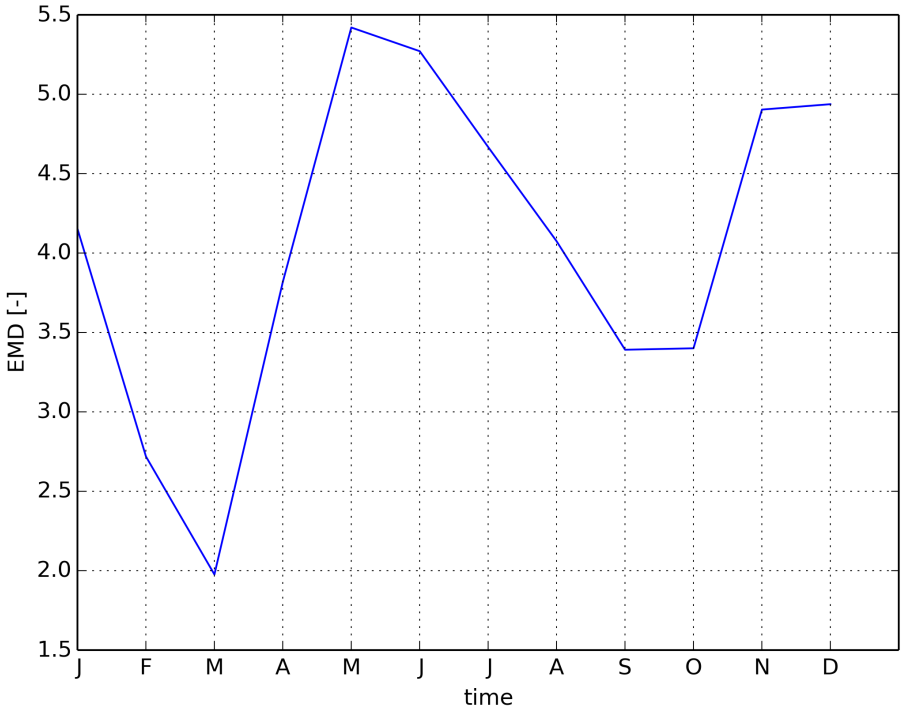



Figure 768: Timeseries of EMD

### 2.1.4 CMIP5 BNU:BNU-ESM-amip

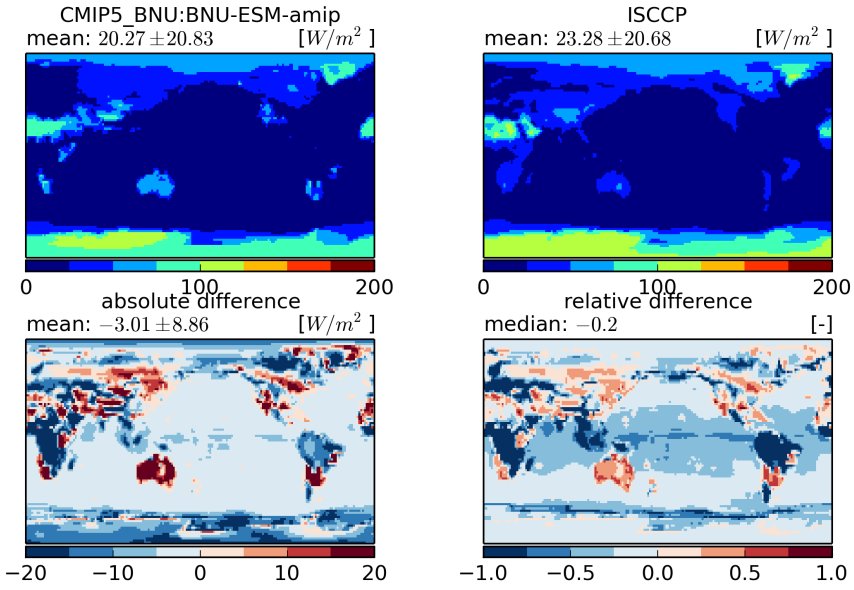



Figure 769: Temporal mean fields (top) and absolute and relative differences (bottom)

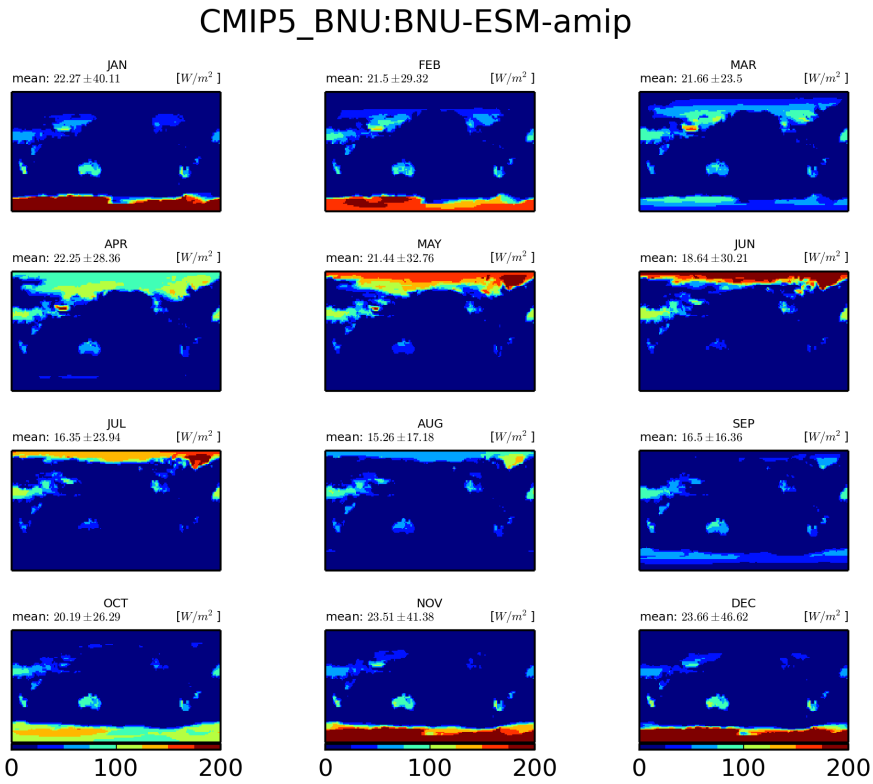



Figure 770: Monthly mean climatology for BNU:BNU-ESM

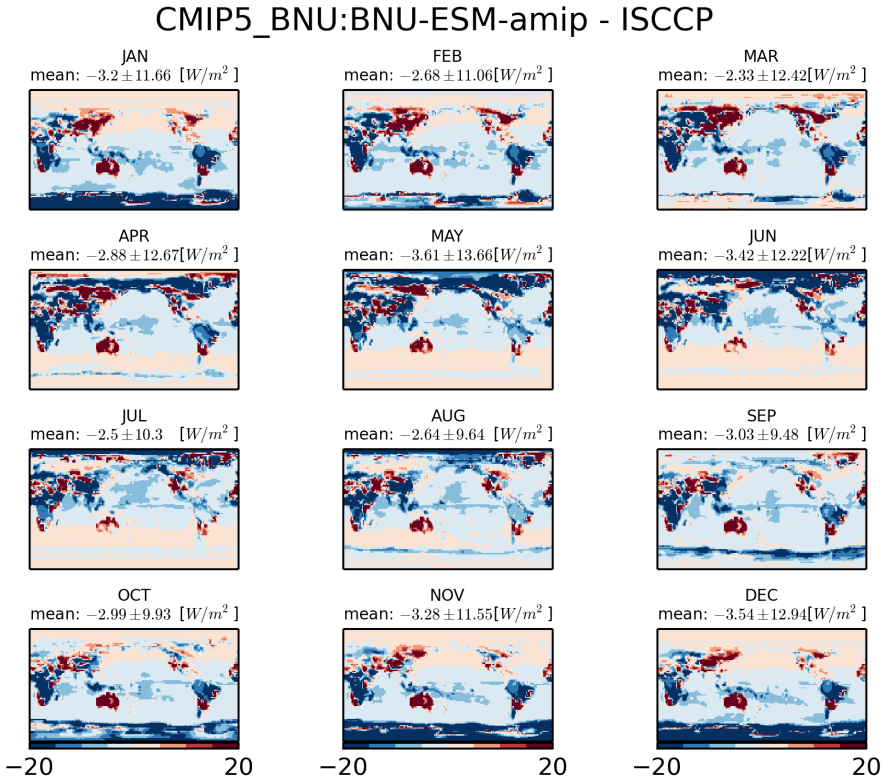



Figure 771: Monthly mean climatology of difference between BNU:BNU-ESM and ISCCP

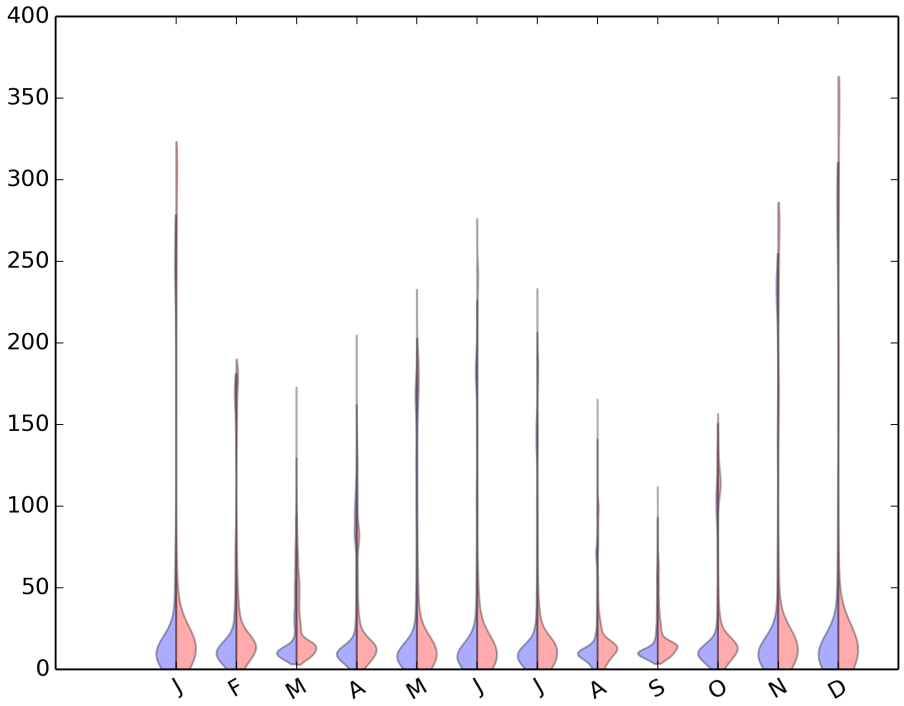



Figure 772: Violin plot for CMIP5-BNU:BNU-ESM-AMIP

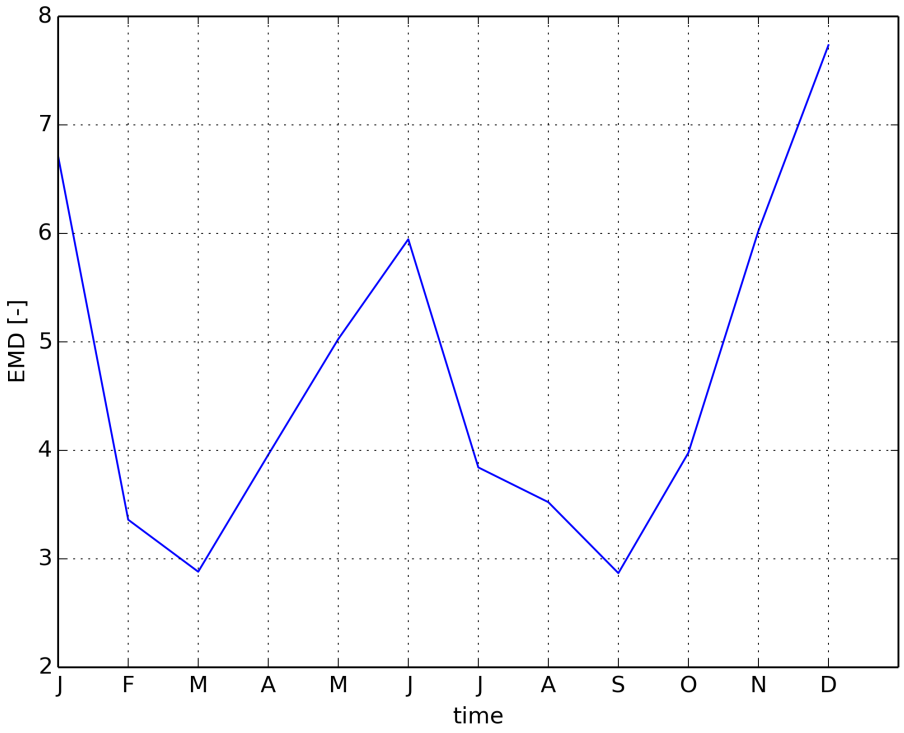



Figure 773: Timeseries of EMD

### 2.1.5 CMIP5 BCC:bcc-csm1-1-amip

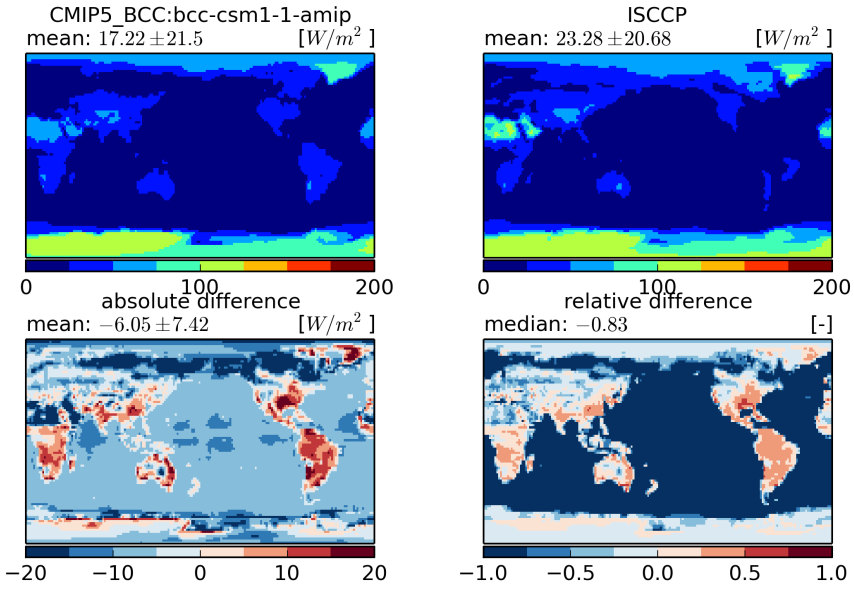



Figure 774: Temporal mean fields (top) and absolute and relative differences (bottom)

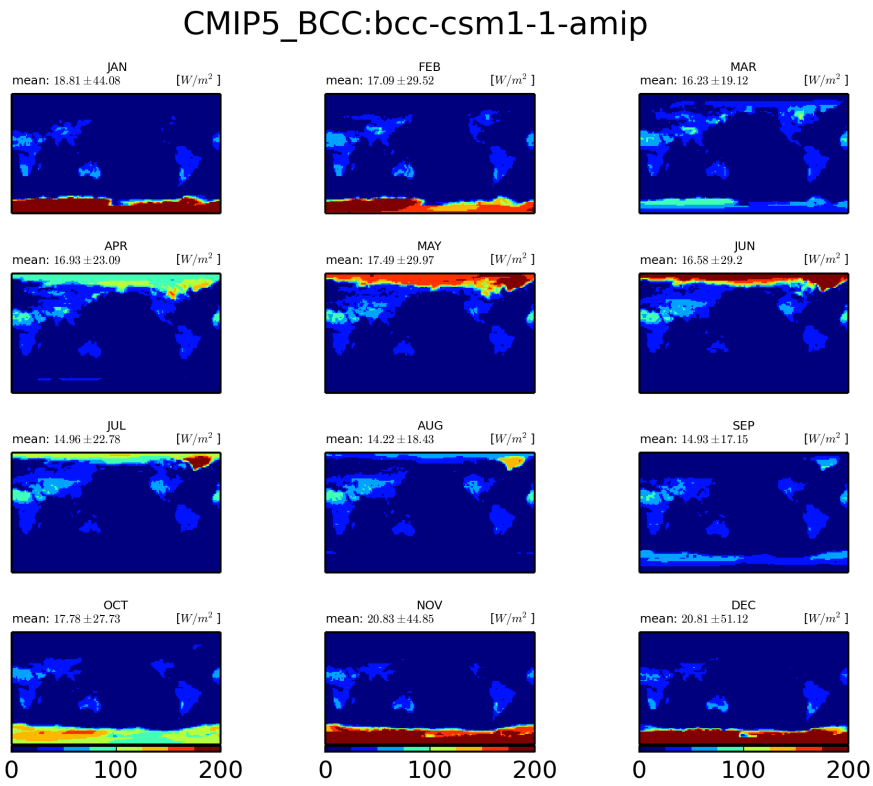



Figure 775: Monthly mean climatology for BCC:bcc-csm1-1

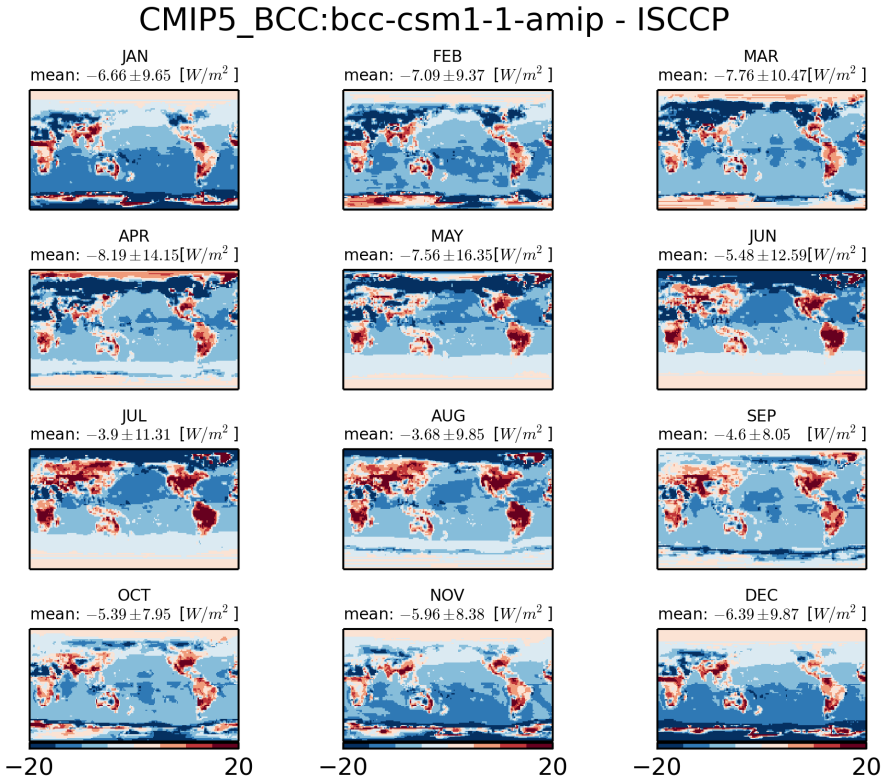



Figure 776: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and ISCCP

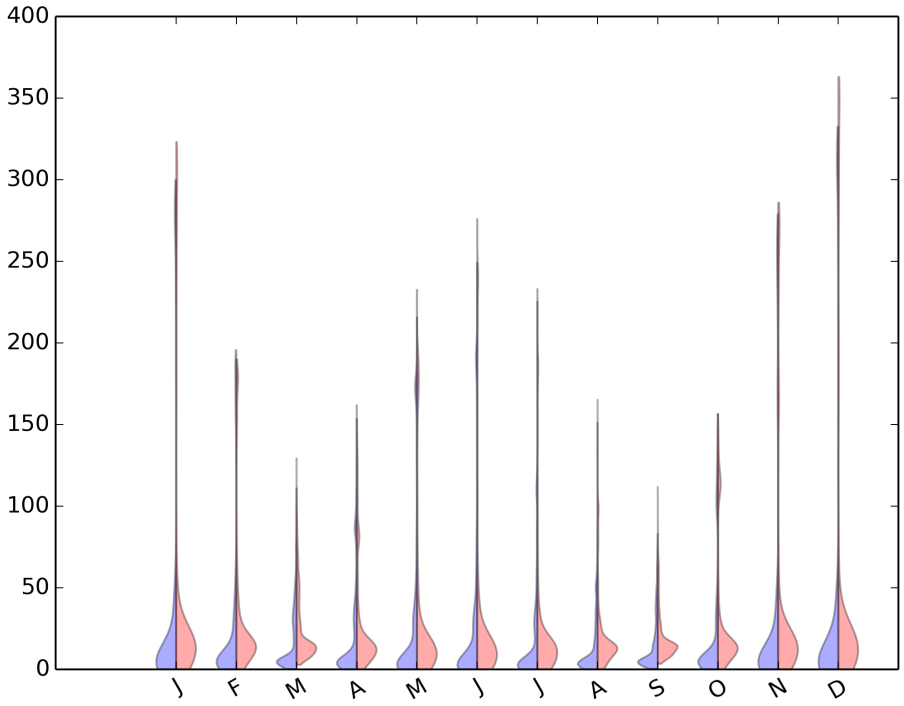



Figure 777: Violin plot for CMIP5-BCC:BCC-CSM1-1-AMIP

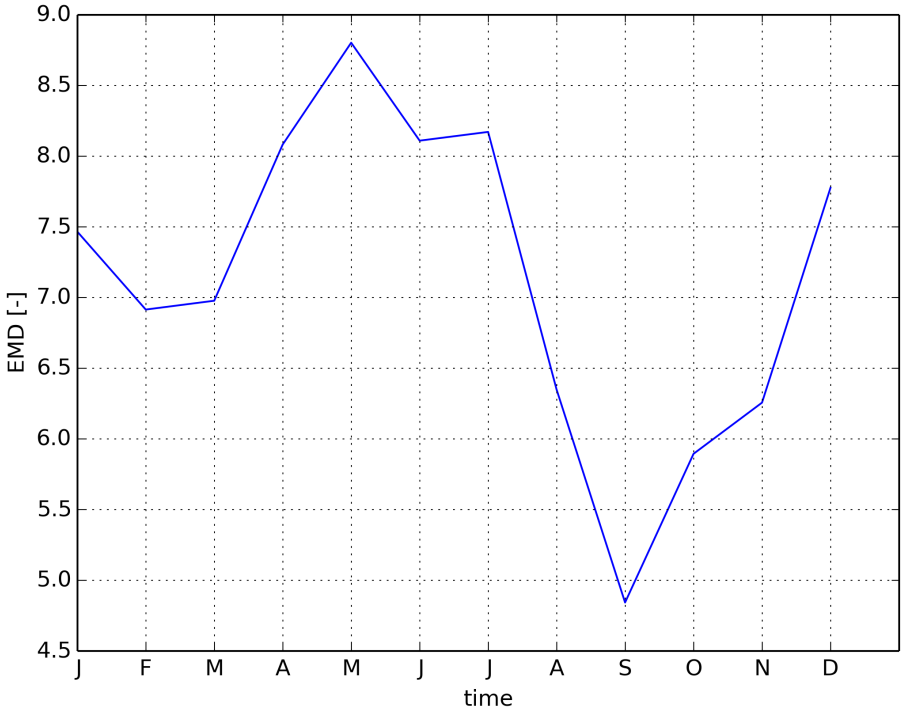



Figure 778: Timeseries of EMD

### 2.1.6 CMIP5 BCC:bcc-csm1-1-m-amip

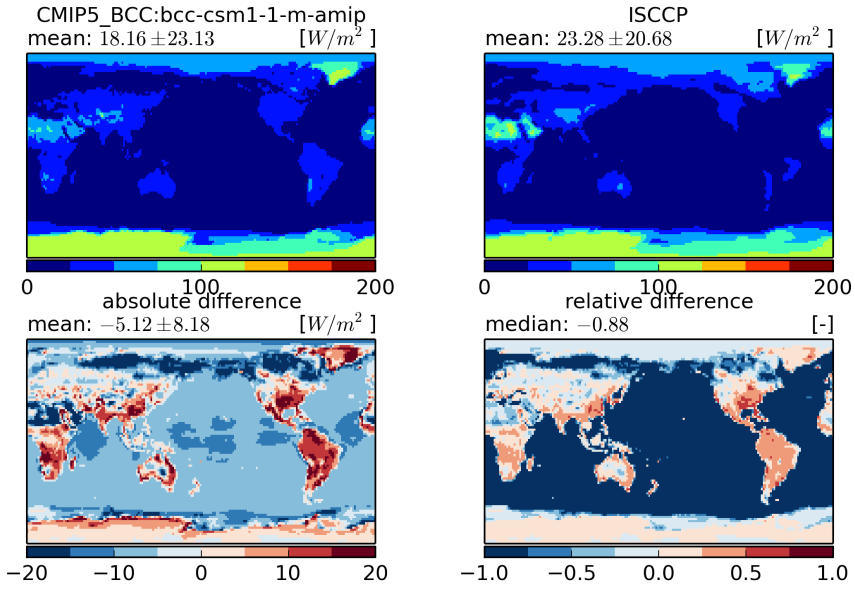



Figure 779: Temporal mean fields (top) and absolute and relative differences (bottom)

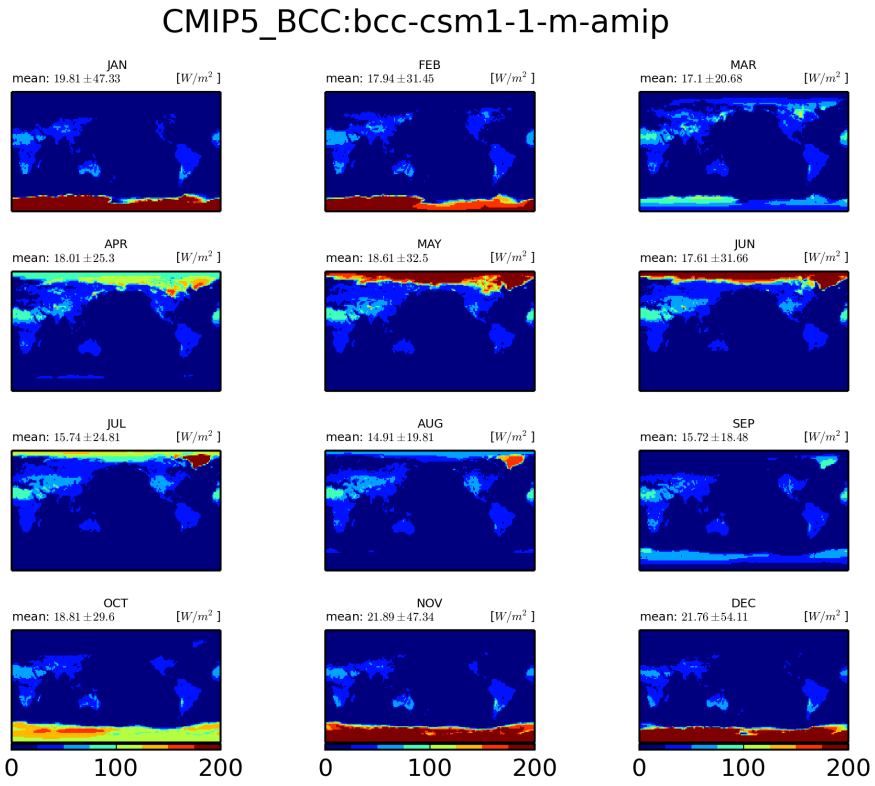



Figure 780: Monthly mean climatology for BCC:bcc-csm1-1-m

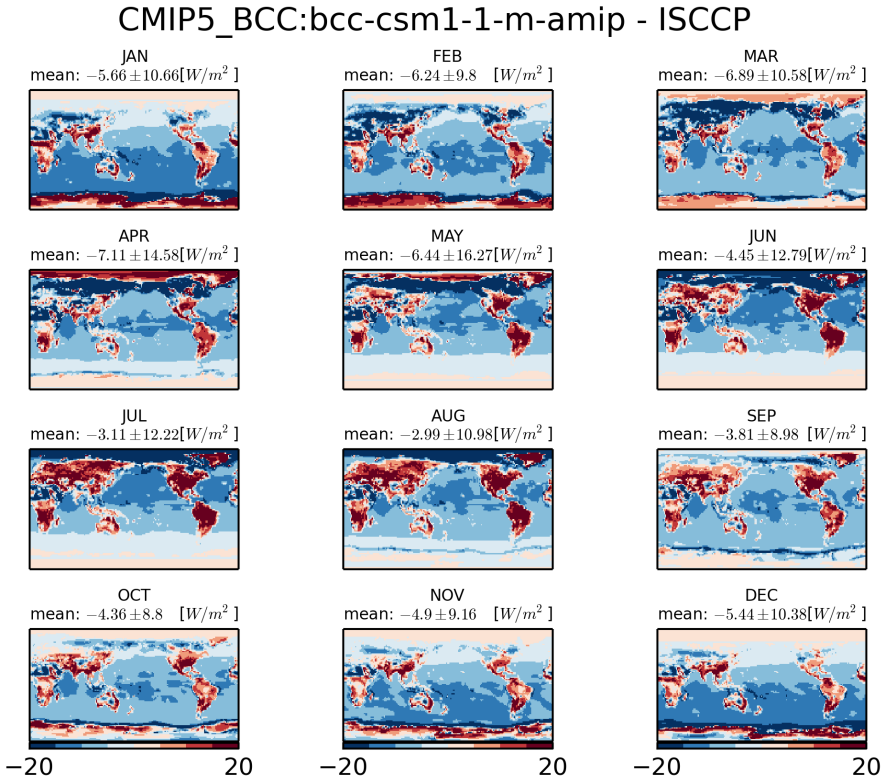



Figure 781: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and ISCCP

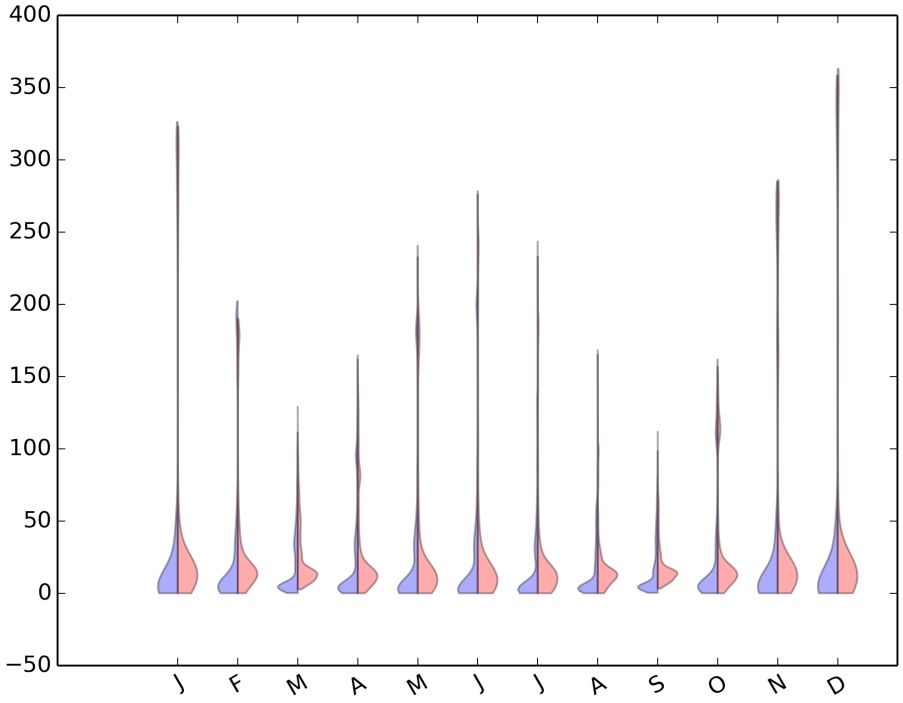



Figure 782: Violin plot for CMIP5-BCC:BCC-CSM1-1-M-AMIP

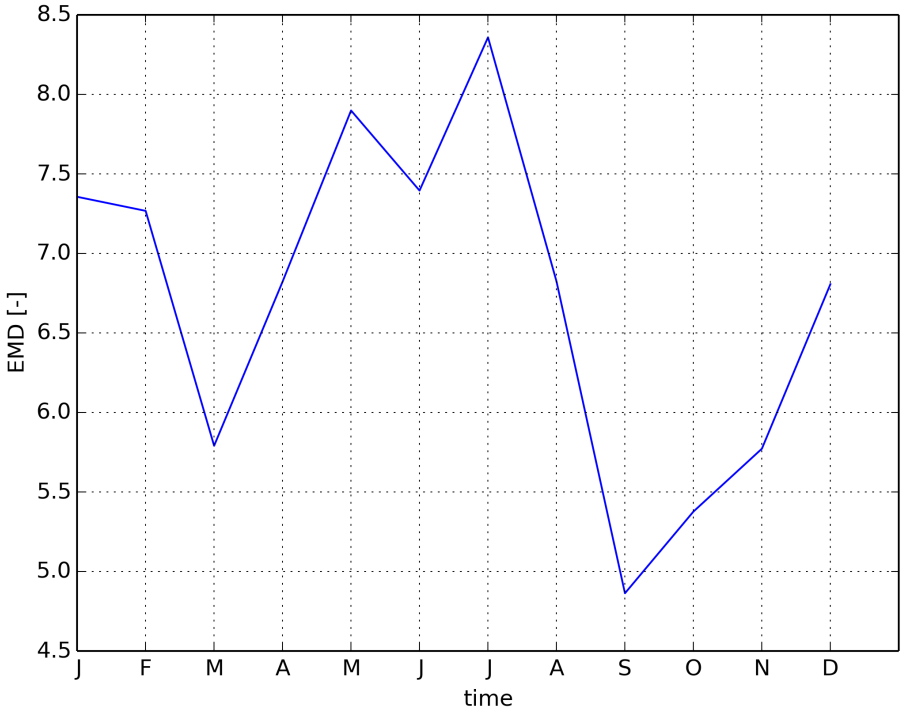



Figure 783: Timeseries of EMD

### 2.1.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

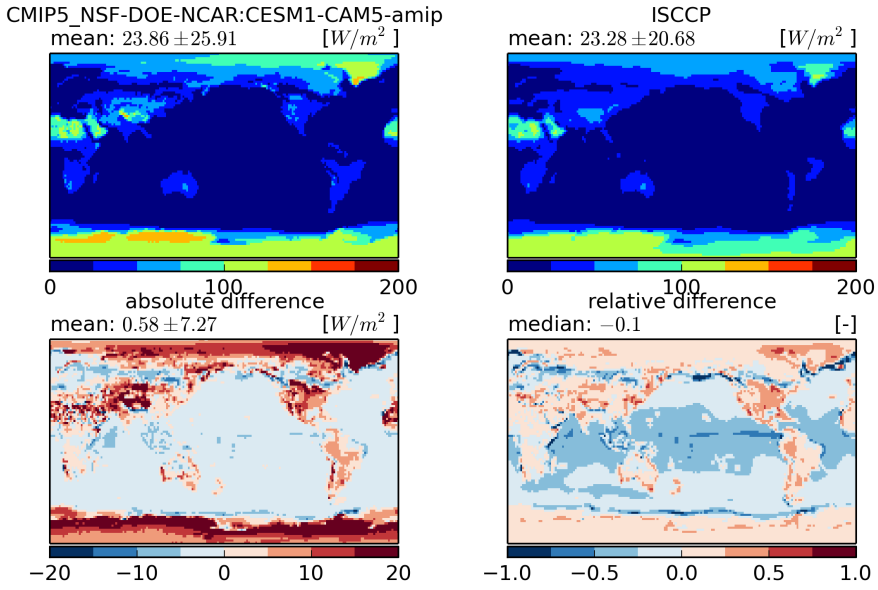



Figure 784: Temporal mean fields (top) and absolute and relative differences (bottom)

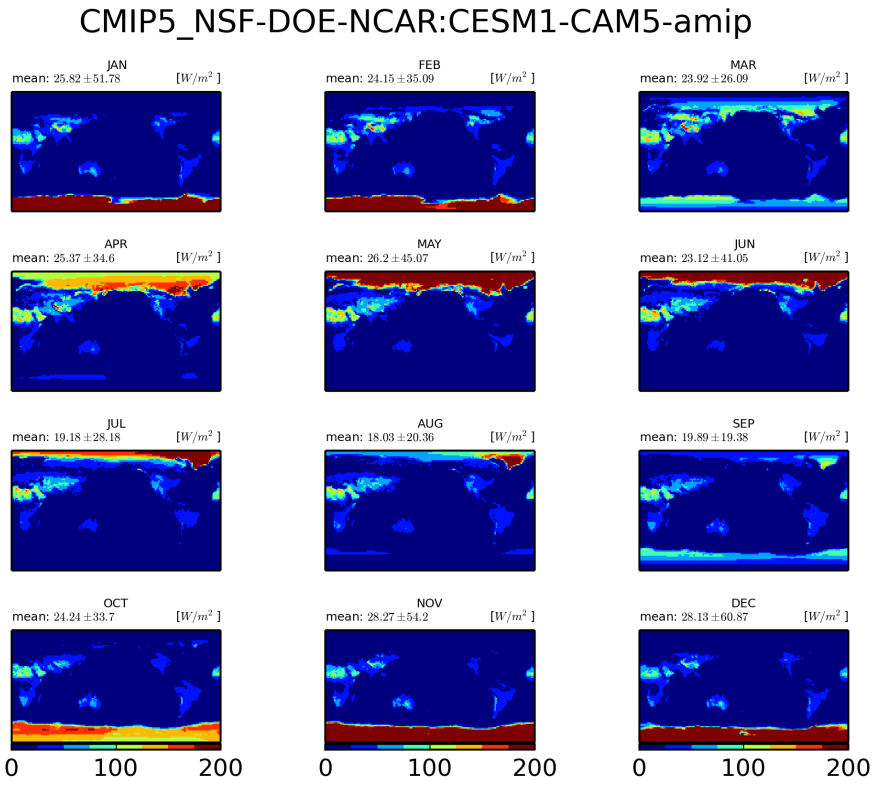



Figure 785: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

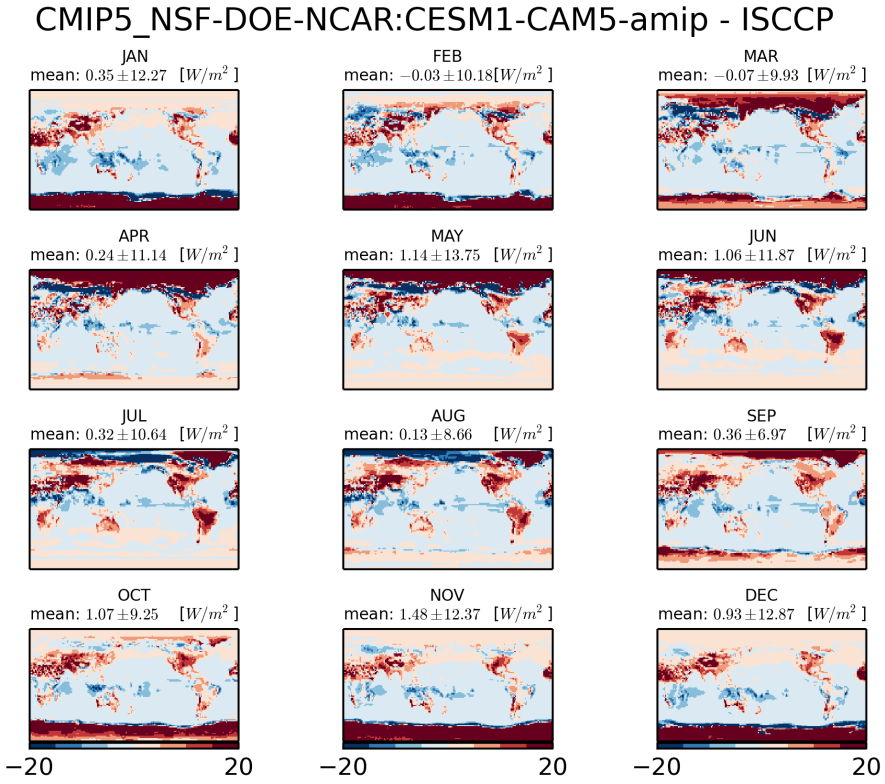



Figure 786: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and ISCCP

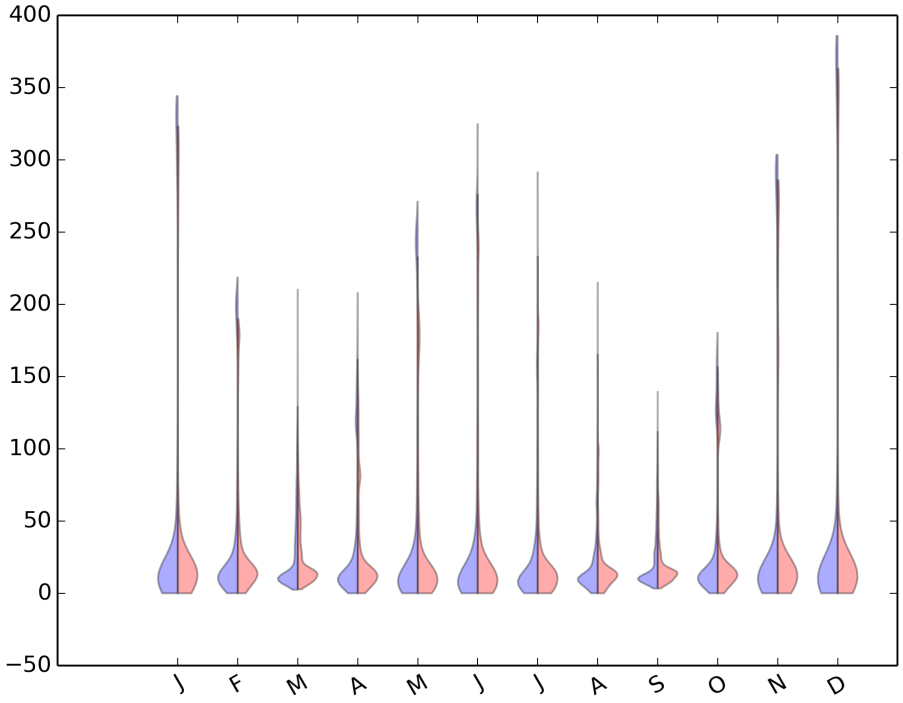



Figure 787: Violin plot for CMIP5-NSF-DOE-NCAR:CESM1-CAM5-AMIP

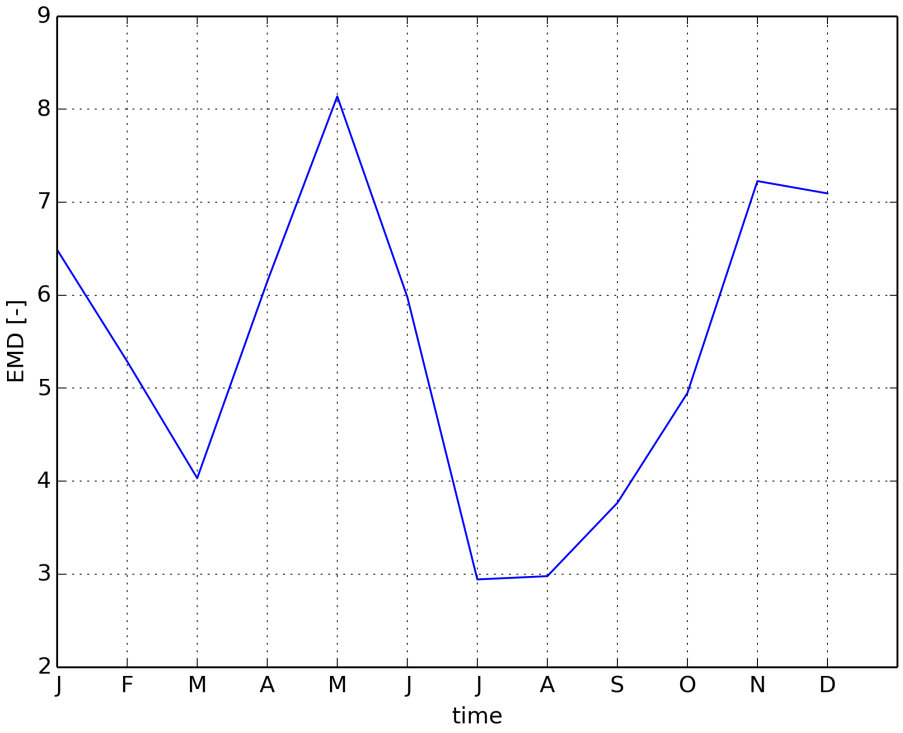



Figure 788: Timeseries of EMD

### 2.1.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

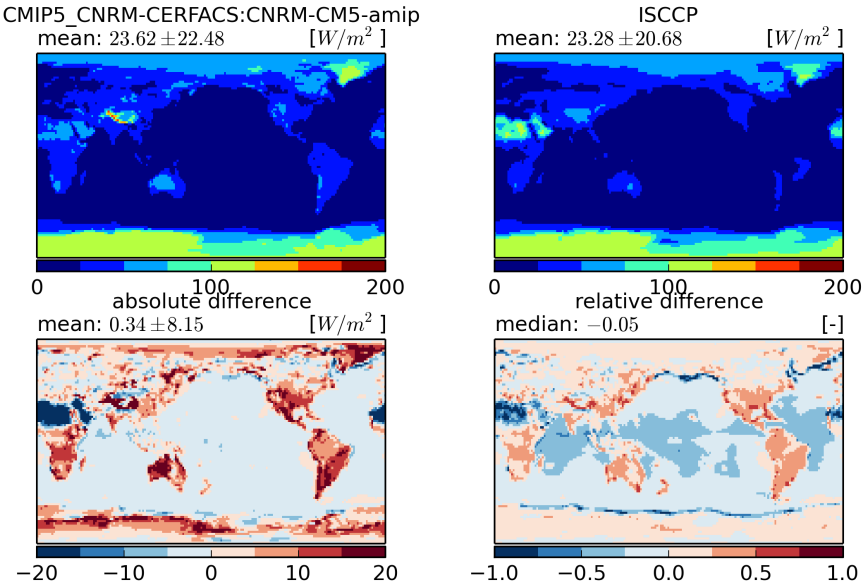



Figure 789: Temporal mean fields (top) and absolute and relative differences (bottom)

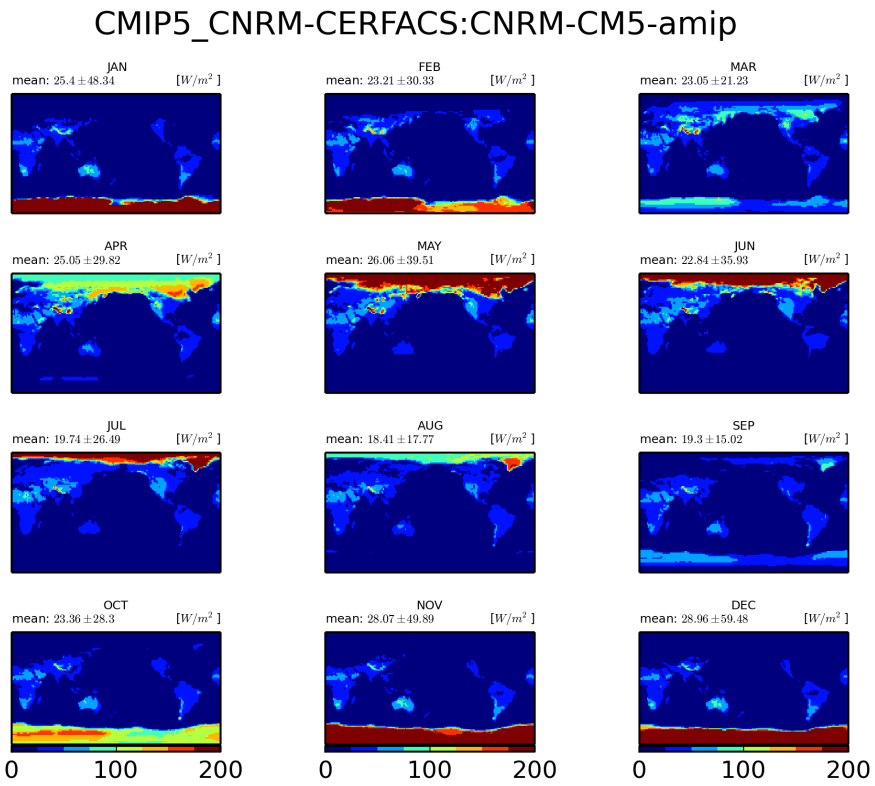



Figure 790: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

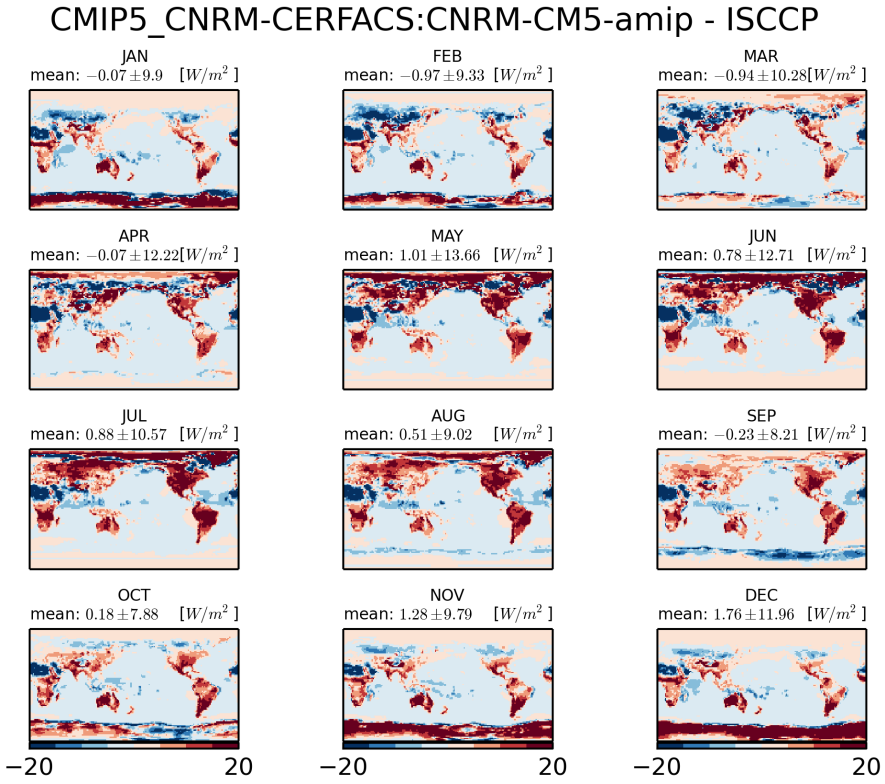



Figure 791: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and ISCCP

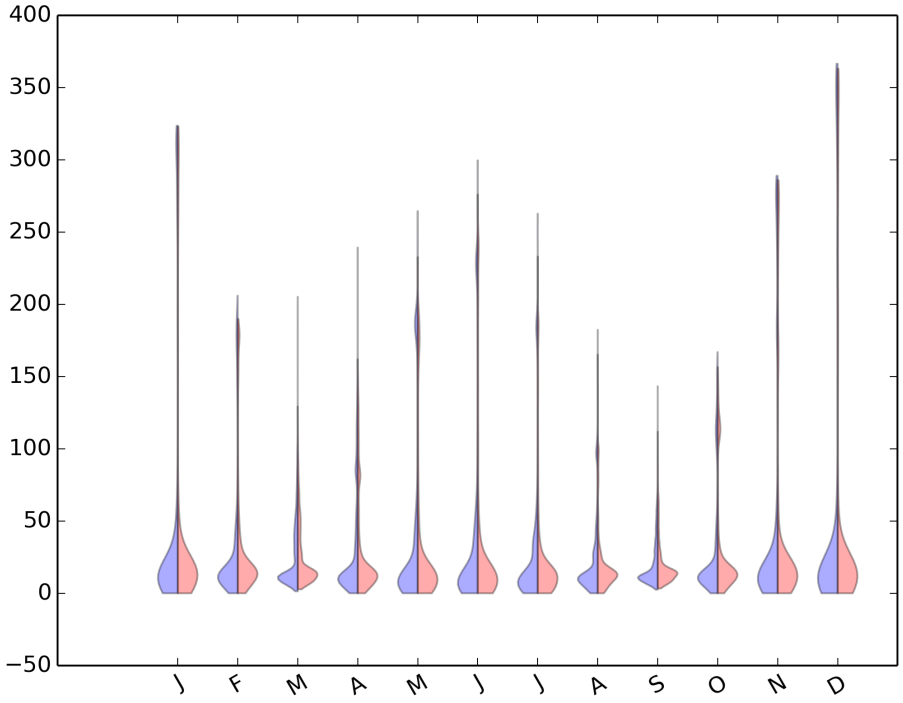



Figure 792: Violin plot for CMIP5-CNRM-CERFACS:CNRM-CM5-AMIP

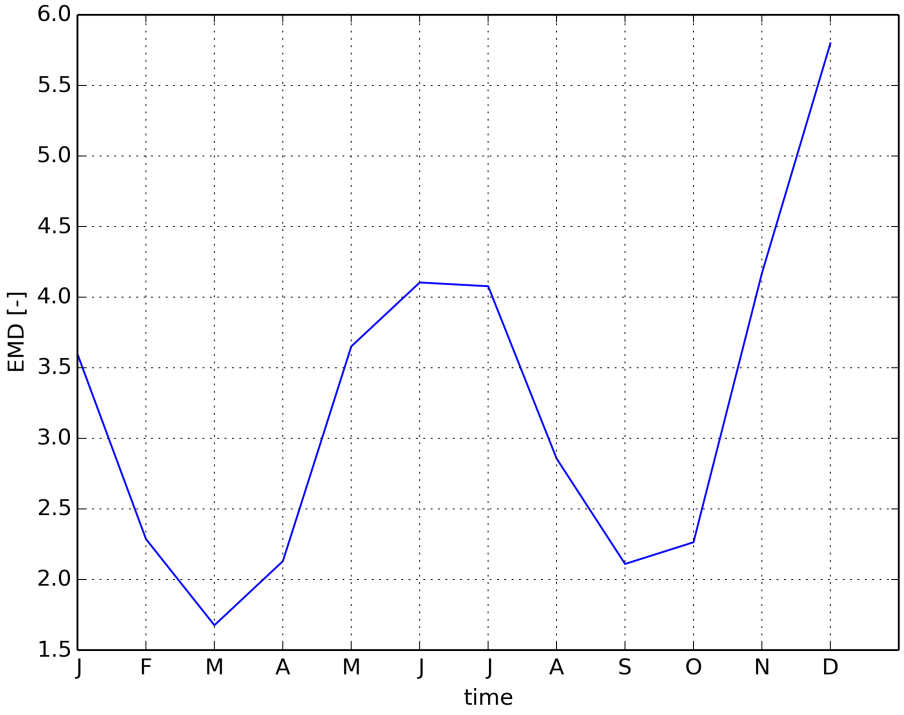



Figure 793: Timeseries of EMD

### 2.1.9 CMIP5 MRI:MRI-CGCM3-amip

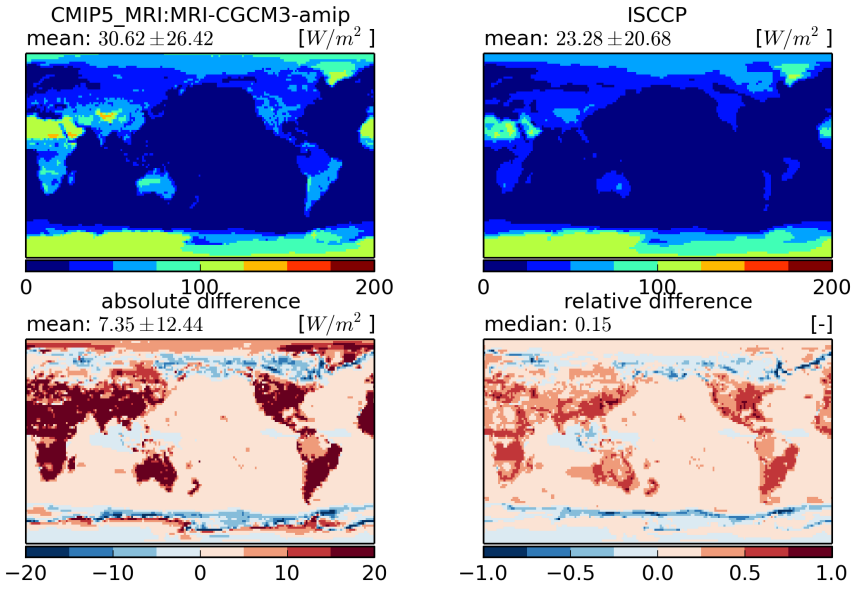



Figure 794: Temporal mean fields (top) and absolute and relative differences (bottom)

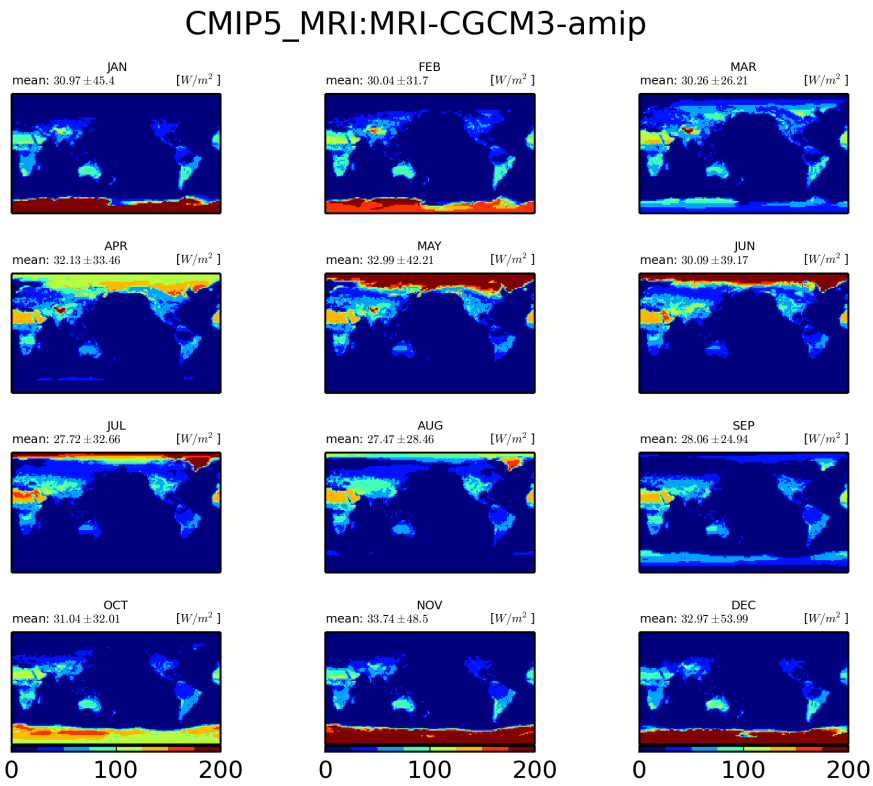



Figure 795: Monthly mean climatology for MRI:MRI-CGCM3

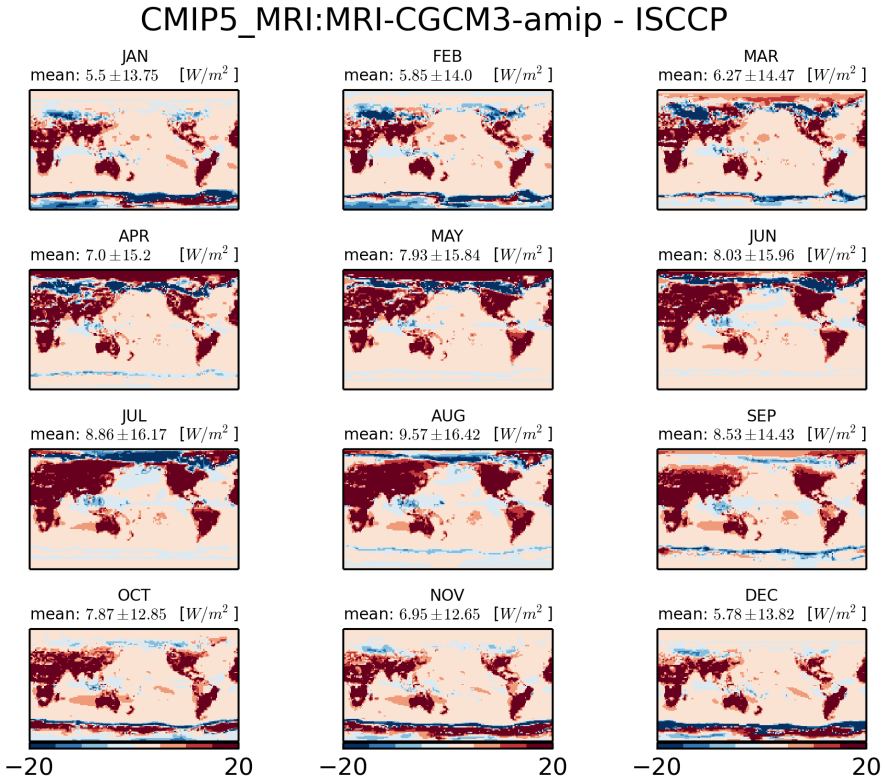



Figure 796: Monthly mean climatology of difference between MRI:MRI-CGCM3 and ISCCP

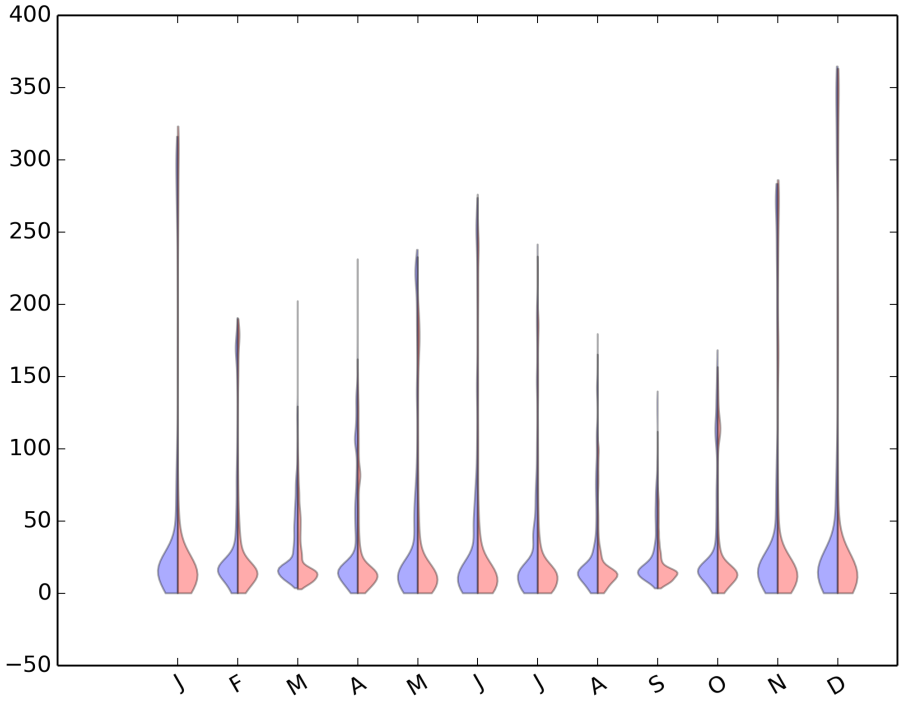



Figure 797: Violin plot for CMIP5-MRI:MRI-CGCM3-AMIP

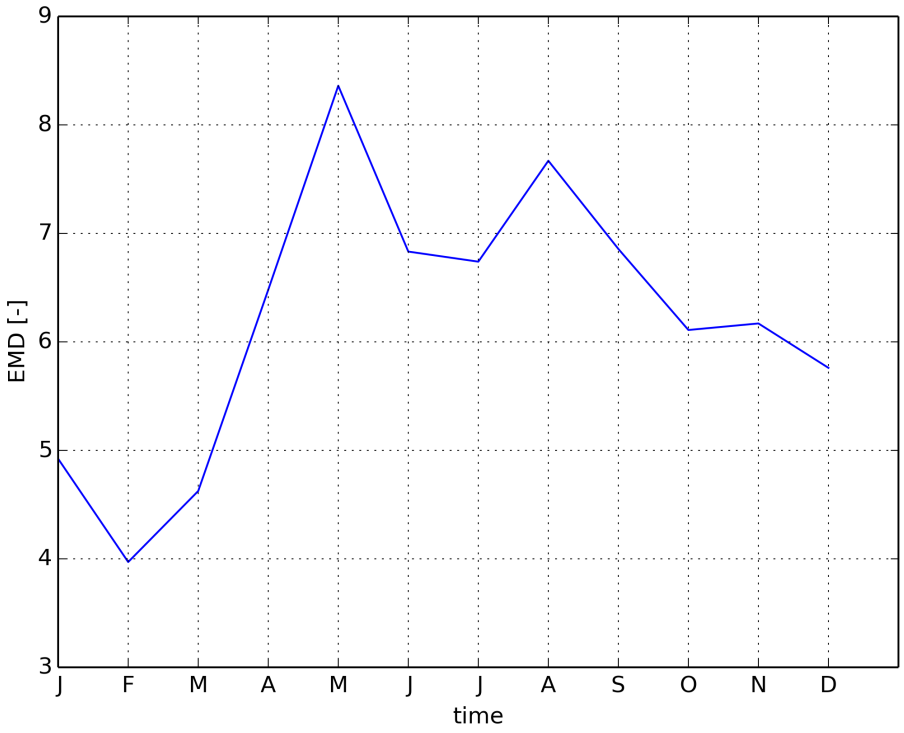



Figure 798: Timeseries of EMD

### 2.1.10 CMIP5 NASA-GISS:GISS-E2-R-amip

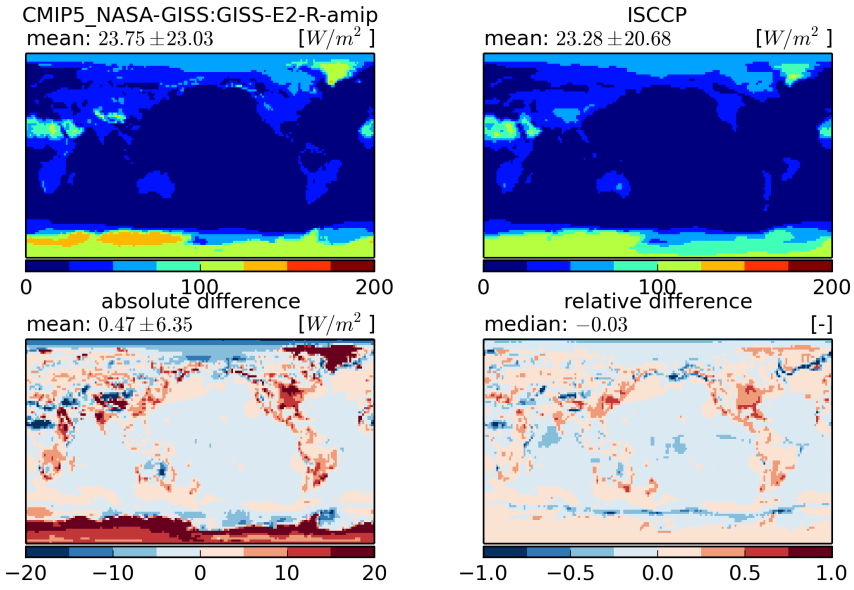



Figure 799: Temporal mean fields (top) and absolute and relative differences (bottom)

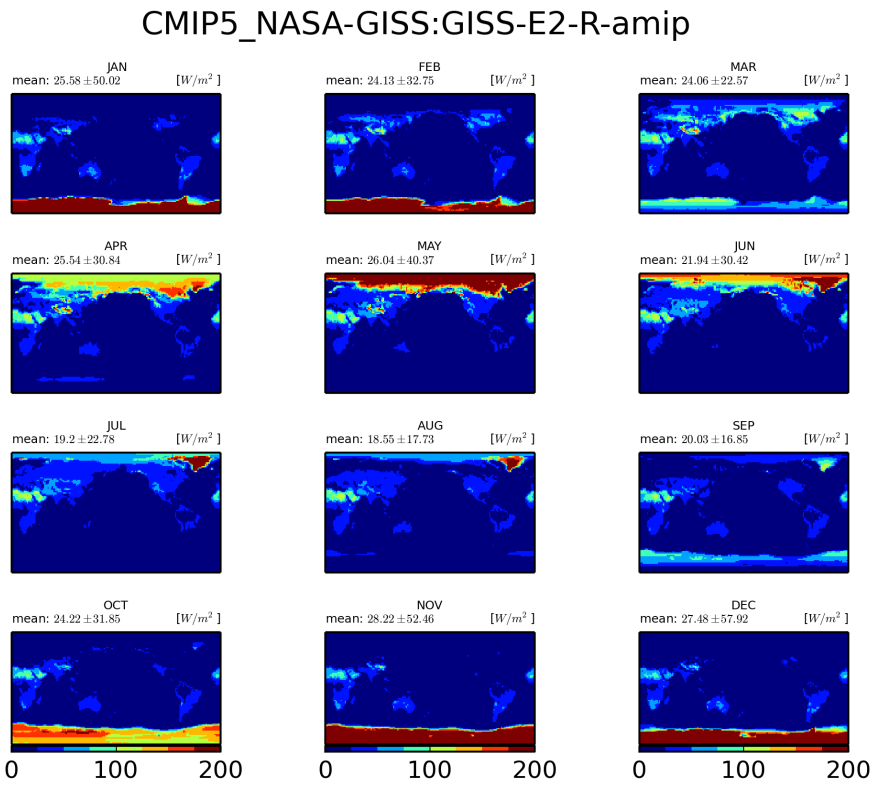



Figure 800: Monthly mean climatology for NASA-GISS:GISS-E2-R

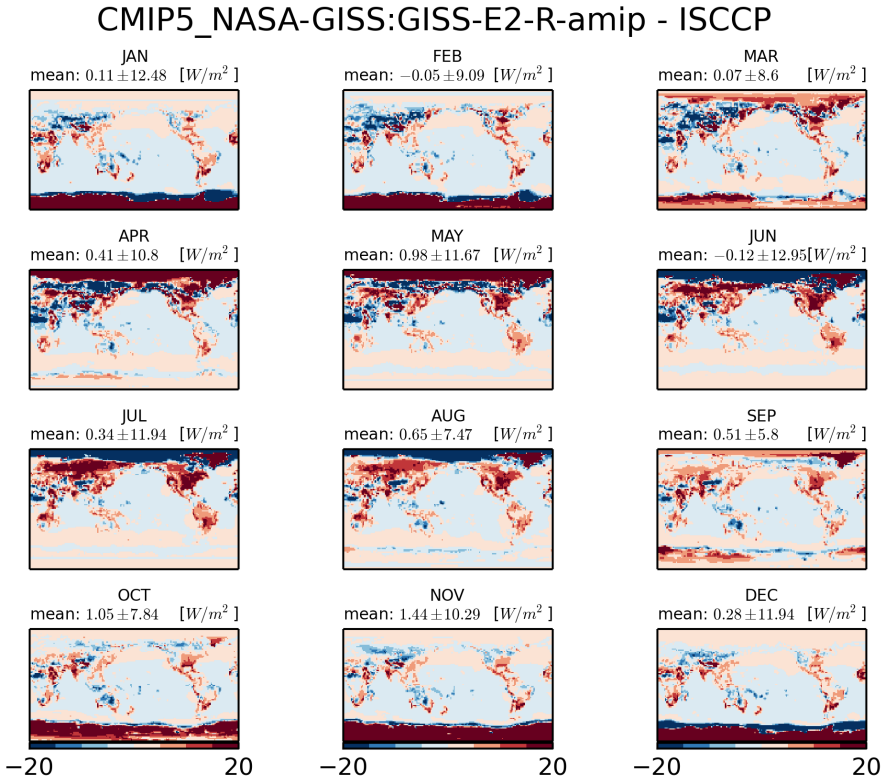



Figure 801: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and ISCCP

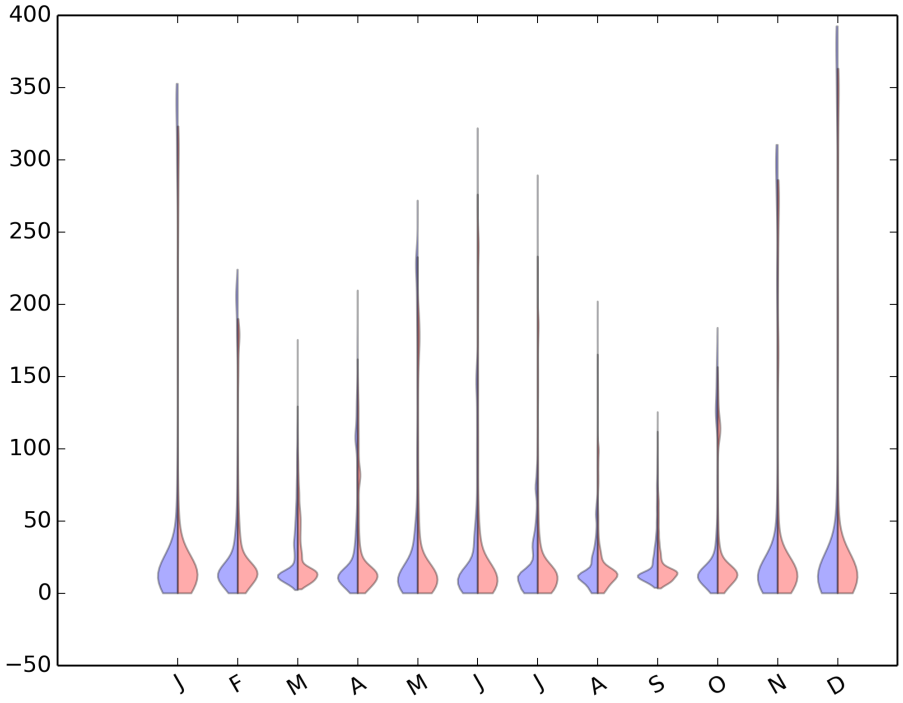



Figure 802: Violin plot for CMIP5-NASA-GISS:GISS-E2-R-AMIP

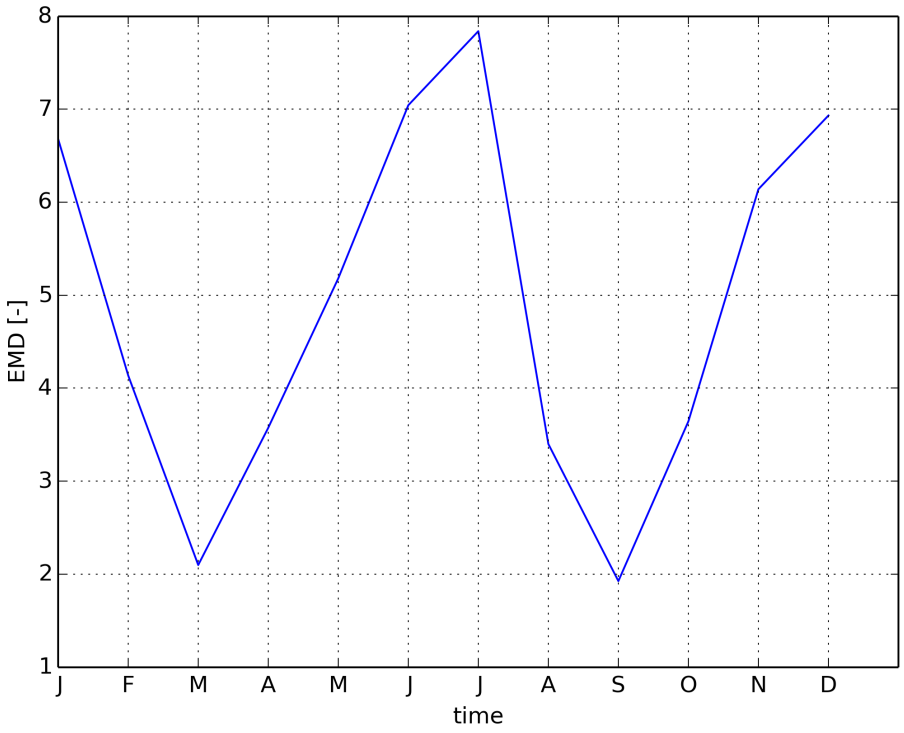



Figure 803: Timeseries of EMD

### 2.1.11 CMIP5 MIROC:MIROC5-amip

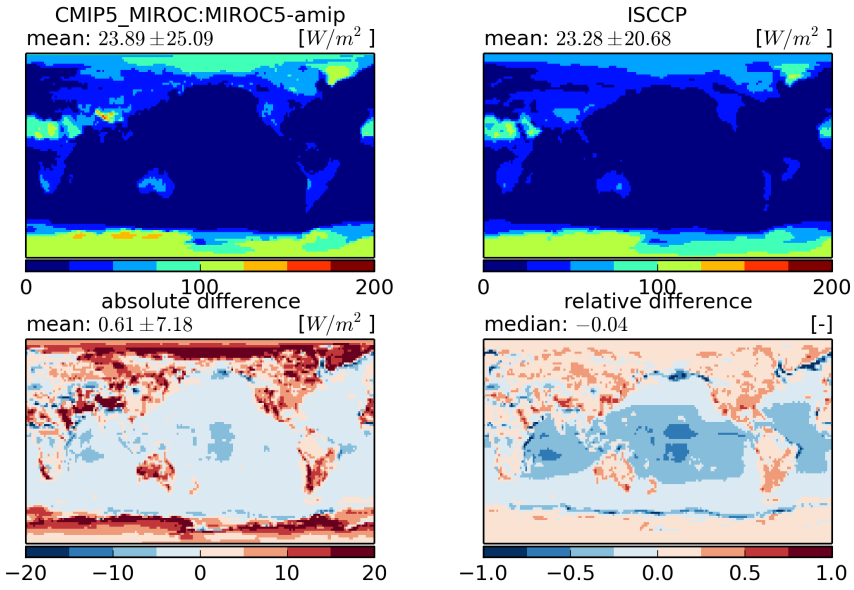



Figure 804: Temporal mean fields (top) and absolute and relative differences (bottom)

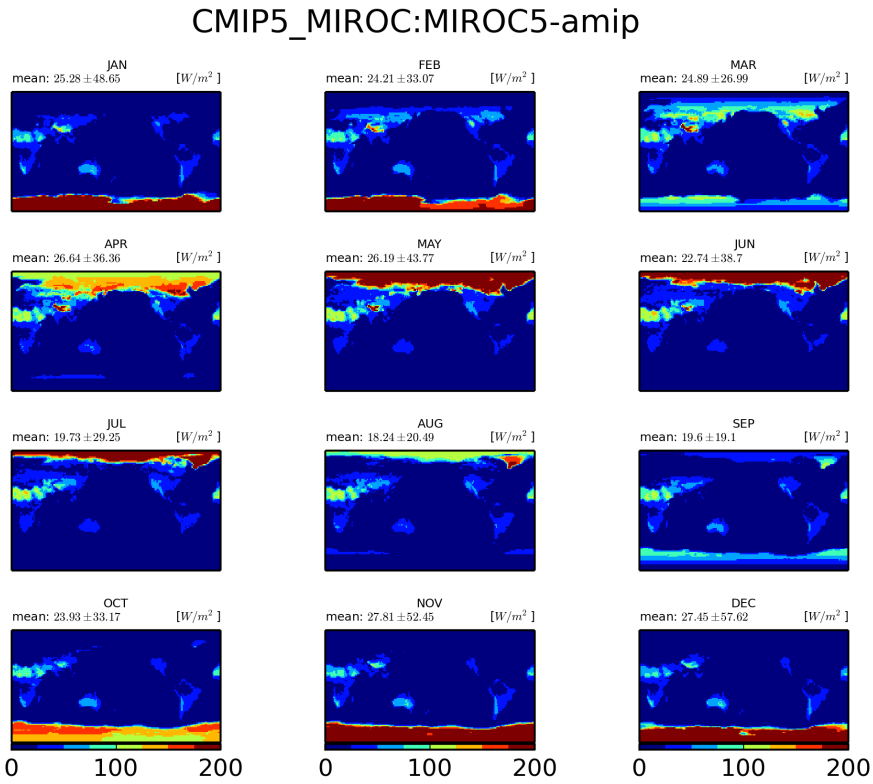



Figure 805: Monthly mean climatology for MIROC:MIROC5

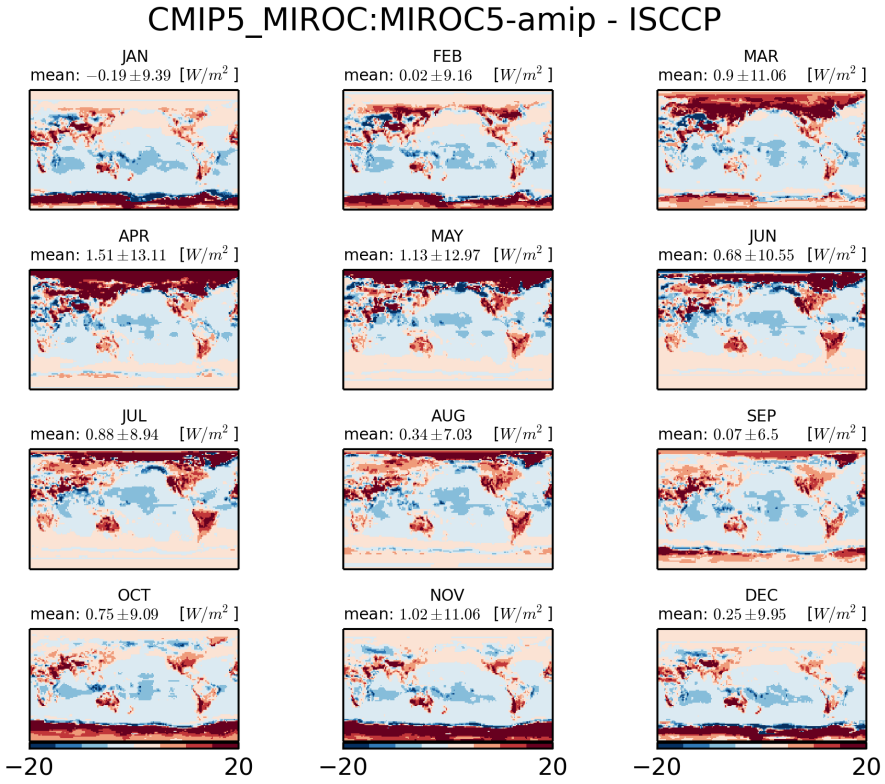



Figure 806: Monthly mean climatology of difference between MIROC:MIROC5 and ISCCP

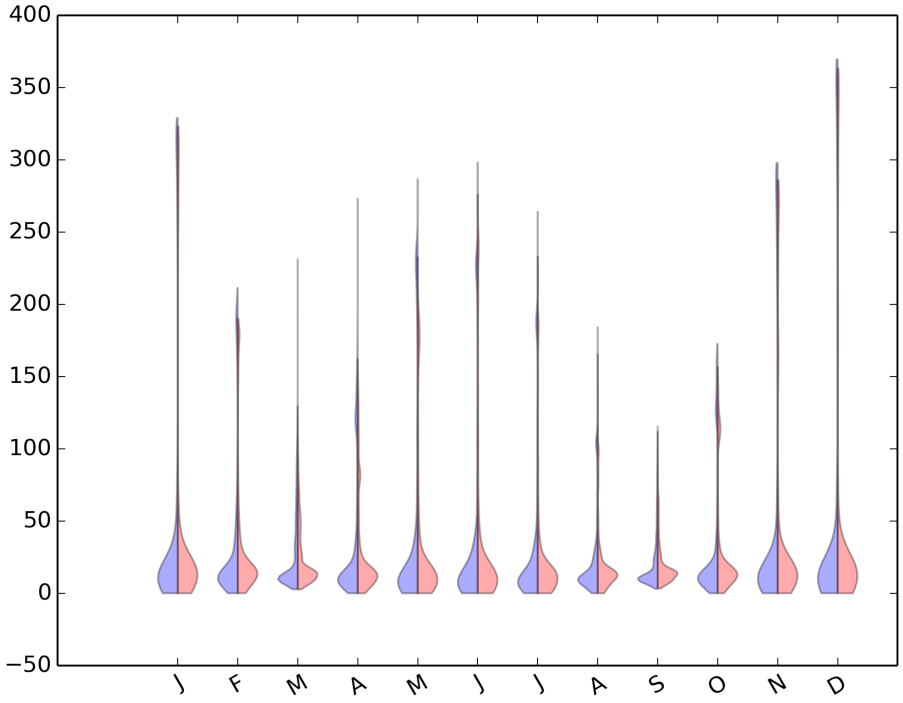



Figure 807: Violin plot for CMIP5-MIROC:MIROC5-AMIP

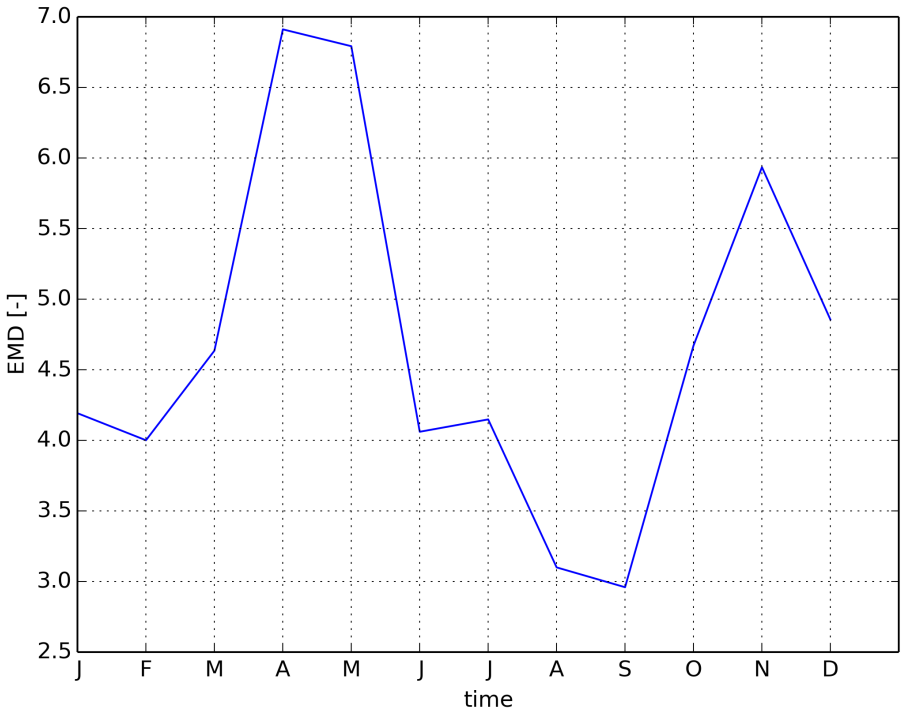



Figure 808: Timeseries of EMD

### 2.1.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

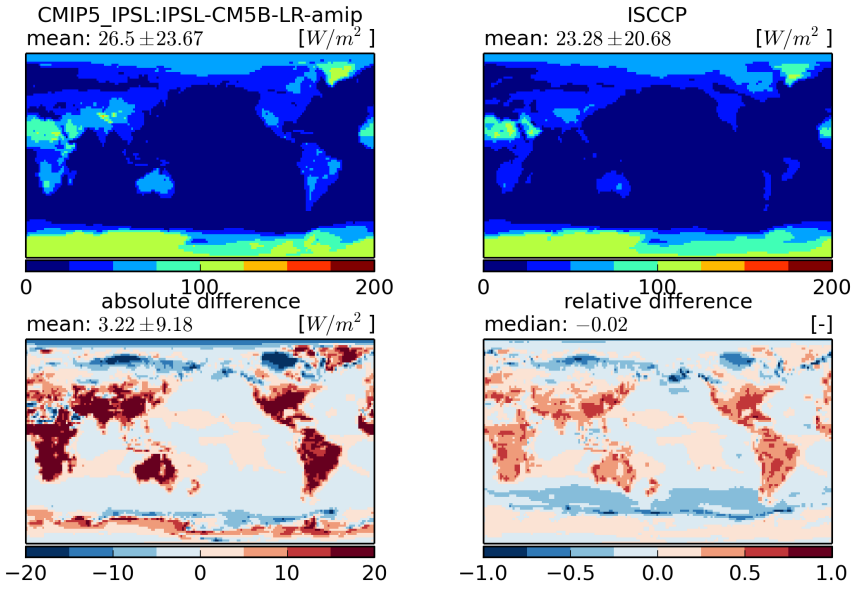



Figure 809: Temporal mean fields (top) and absolute and relative differences (bottom)

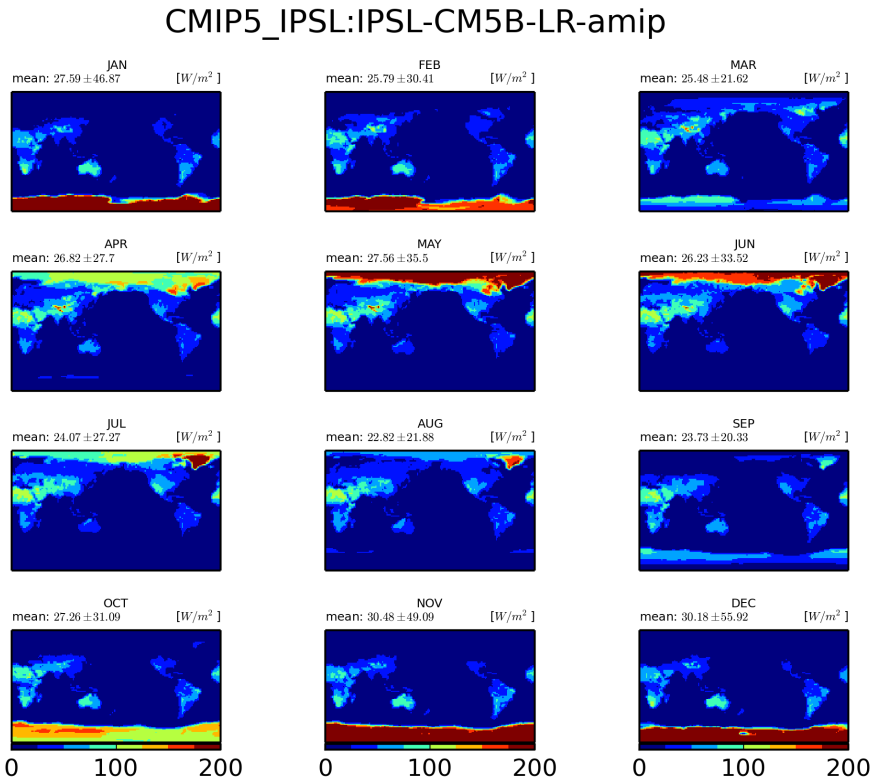



Figure 810: Monthly mean climatology for IPSL:IPSL-CM5B-LR

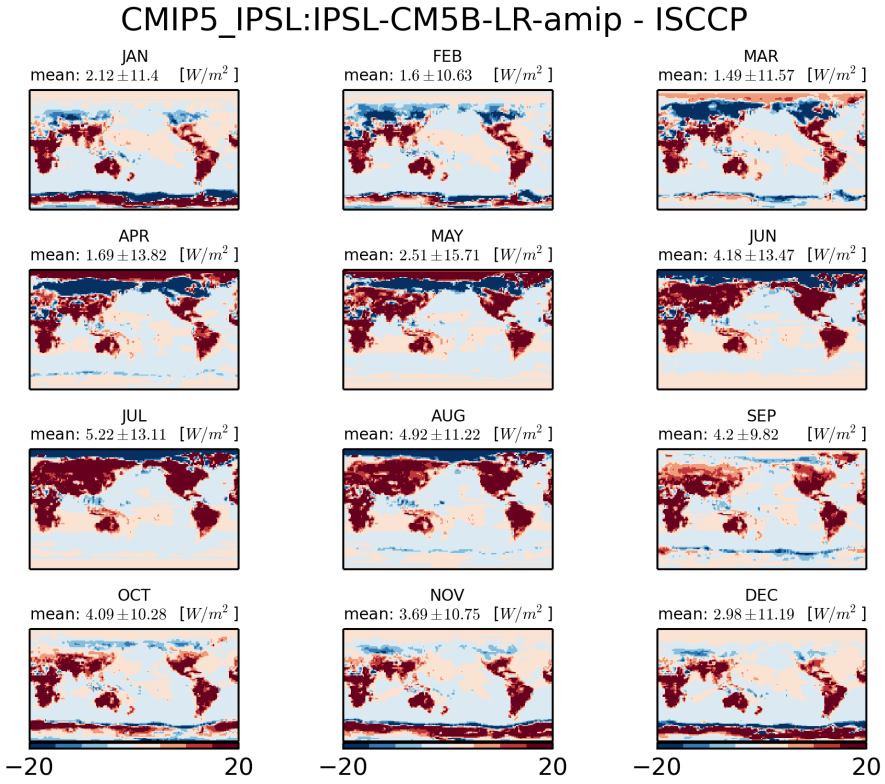



Figure 811: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and ISCCP

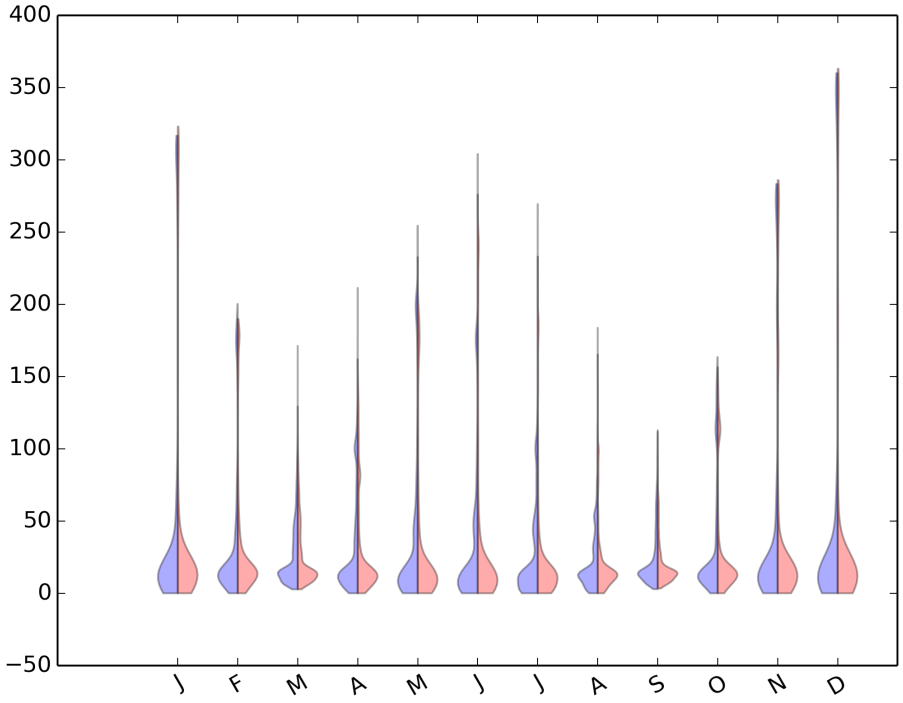



Figure 812: Violin plot for CMIP5-IPSL:IPSL-CM5B-LR-AMIP

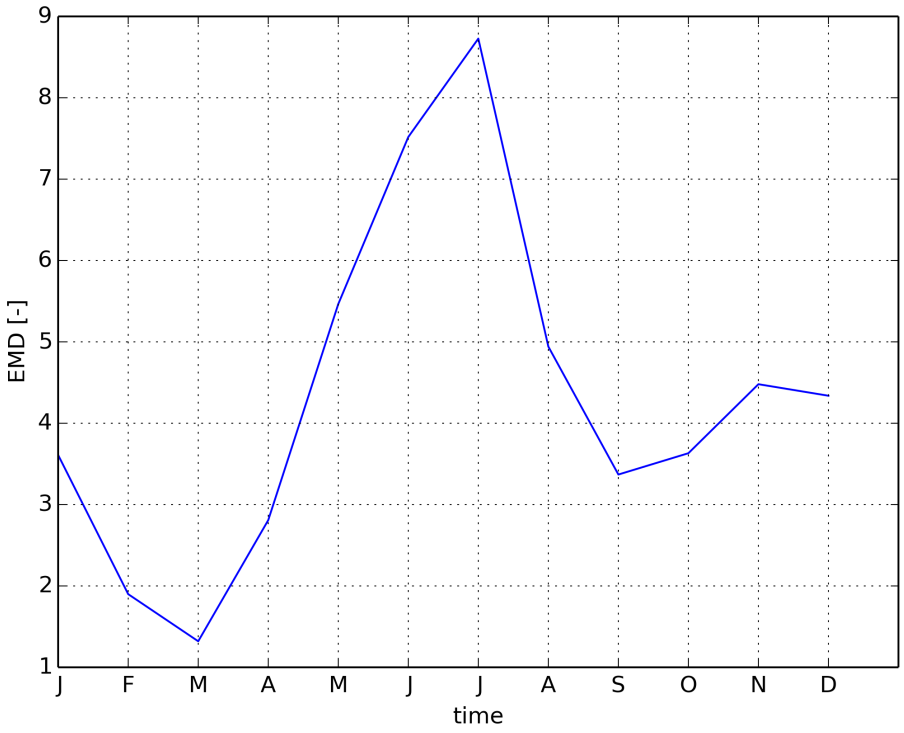



Figure 813: Timeseries of EMD

### 2.1.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

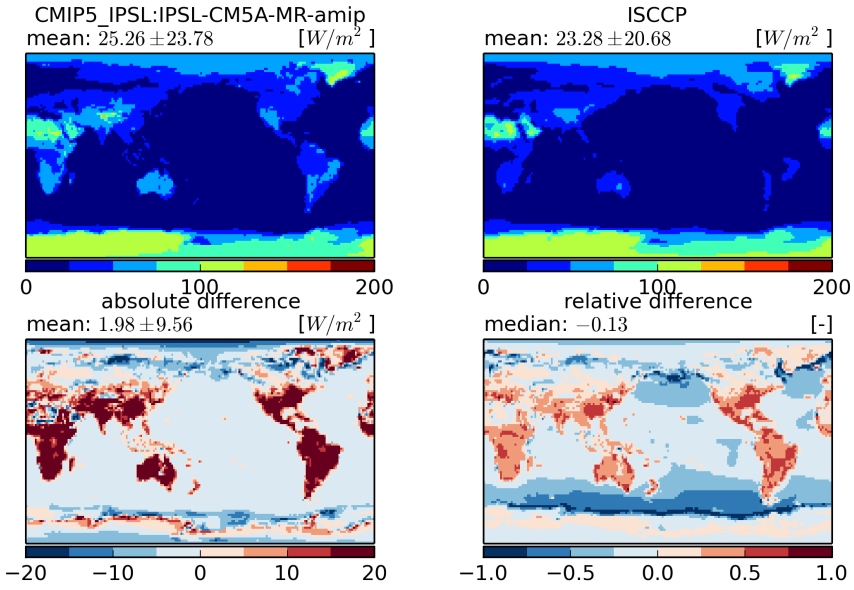



Figure 814: Temporal mean fields (top) and absolute and relative differences (bottom)

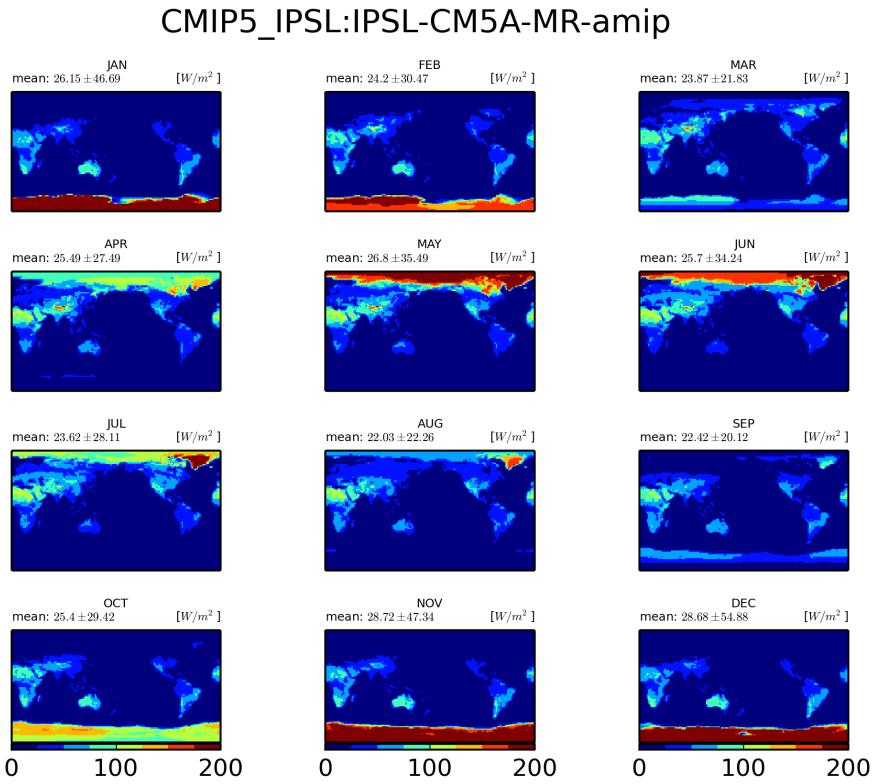



Figure 815: Monthly mean climatology for IPSL:IPSL-CM5A-MR

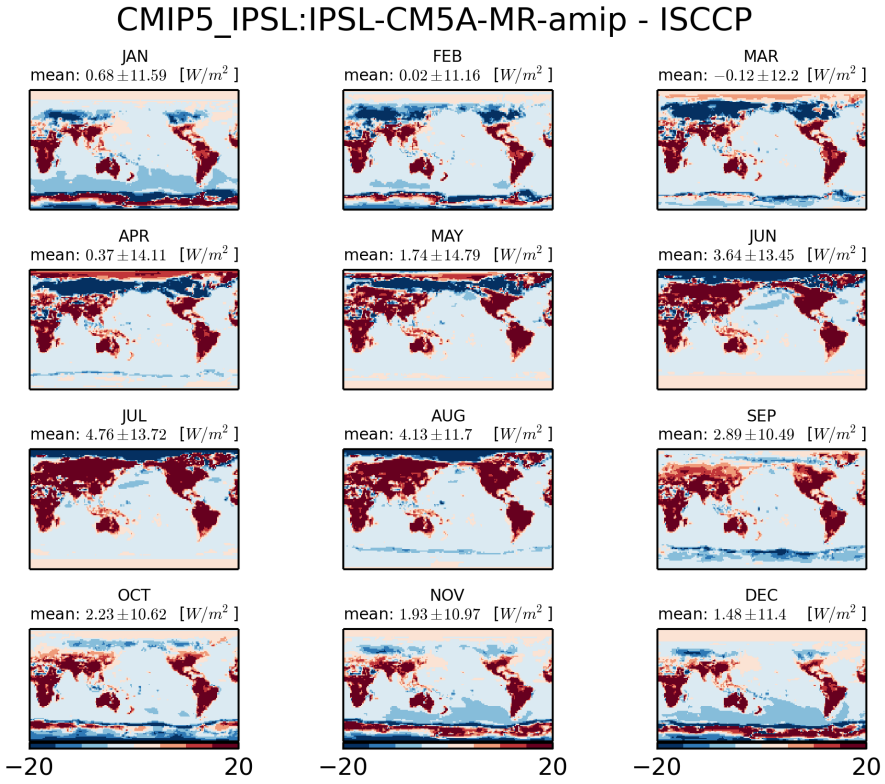



Figure 816: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and ISCCP

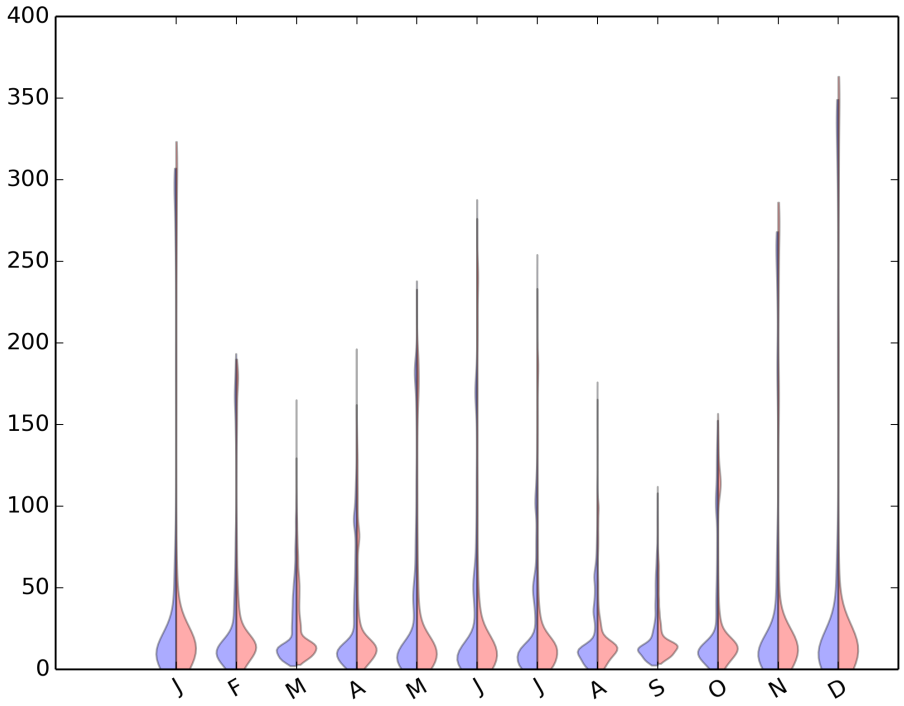



Figure 817: Violin plot for CMIP5-IPSL:IPSL-CM5A-MR-AMIP

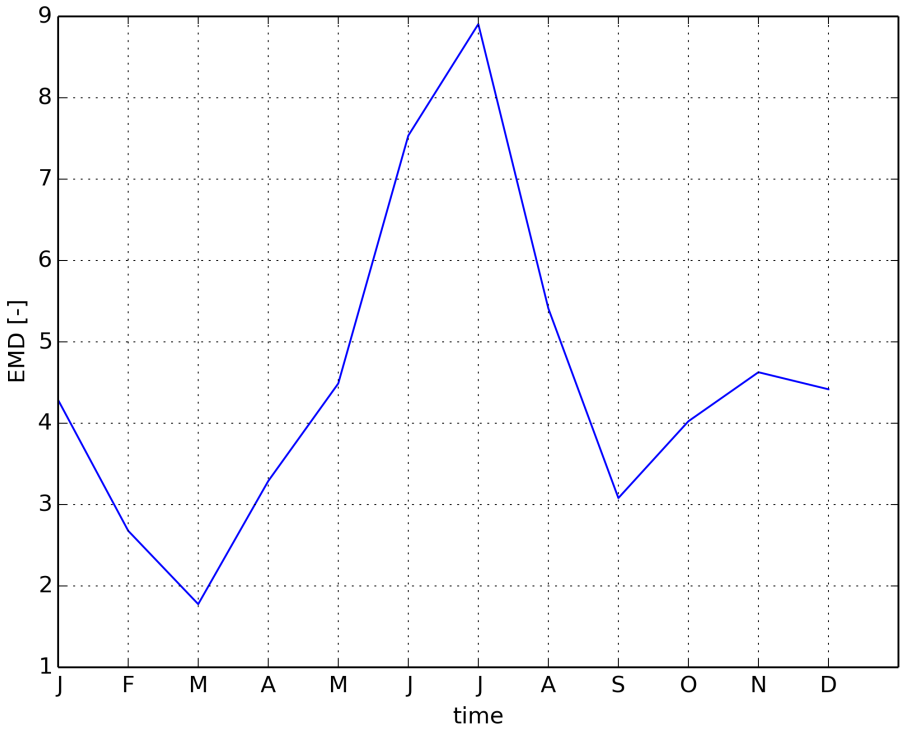



Figure 818: Timeseries of EMD

### 2.1.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

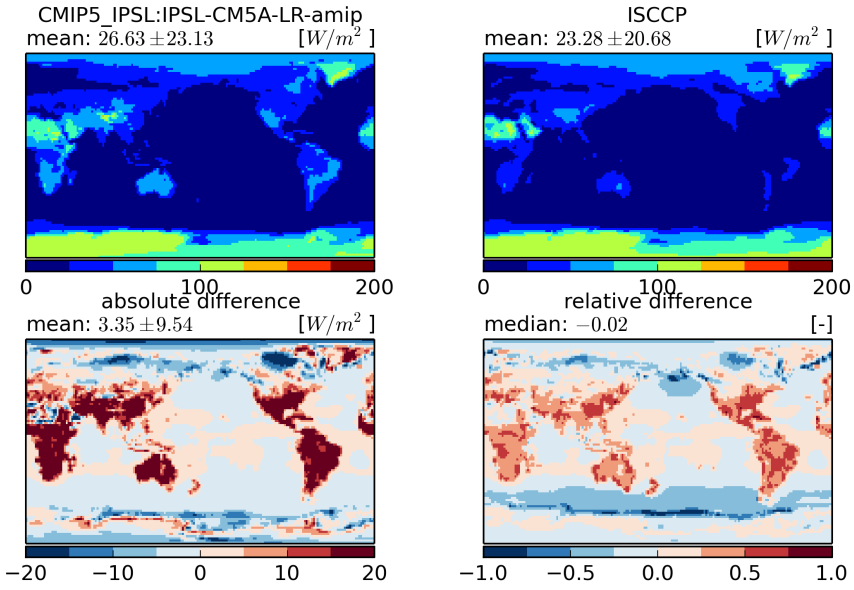



Figure 819: Temporal mean fields (top) and absolute and relative differences (bottom)

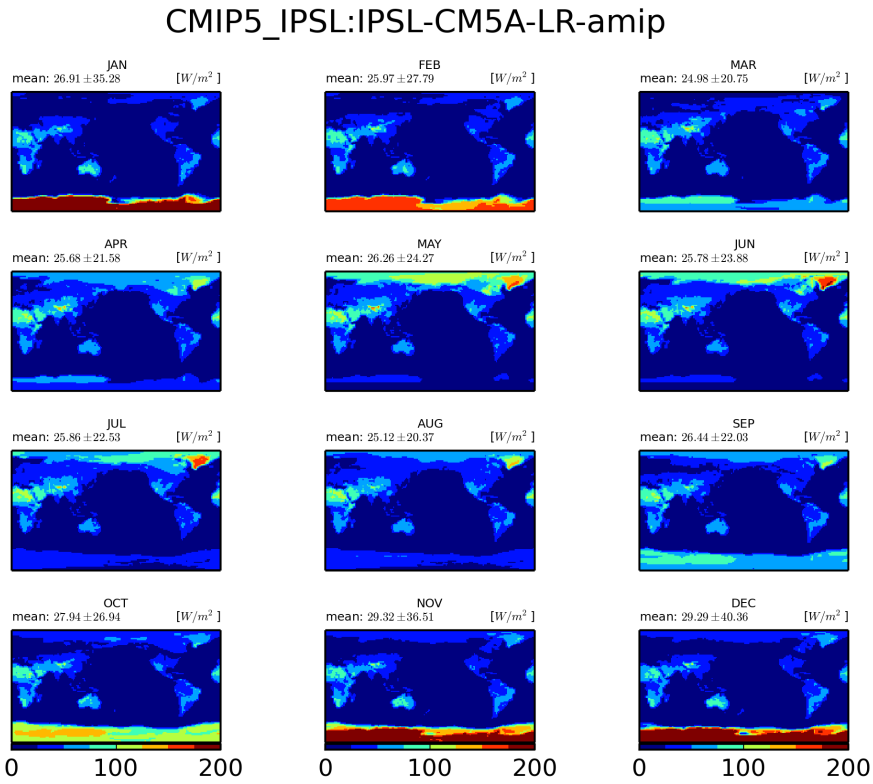



Figure 820: Monthly mean climatology for IPSL:IPSL-CM5A-LR

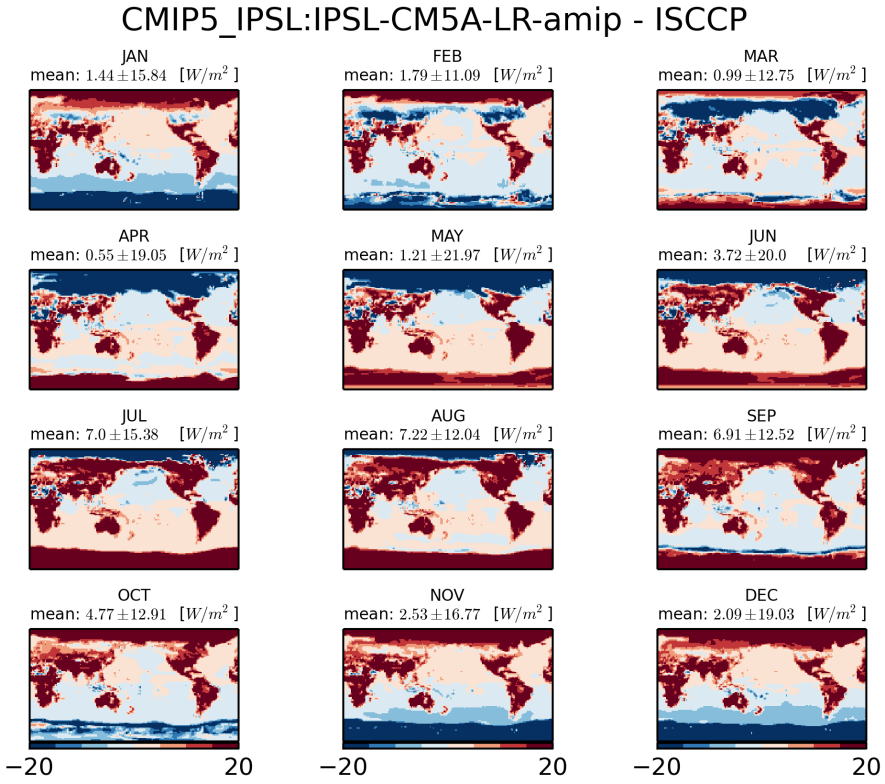



Figure 821: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and ISCCP

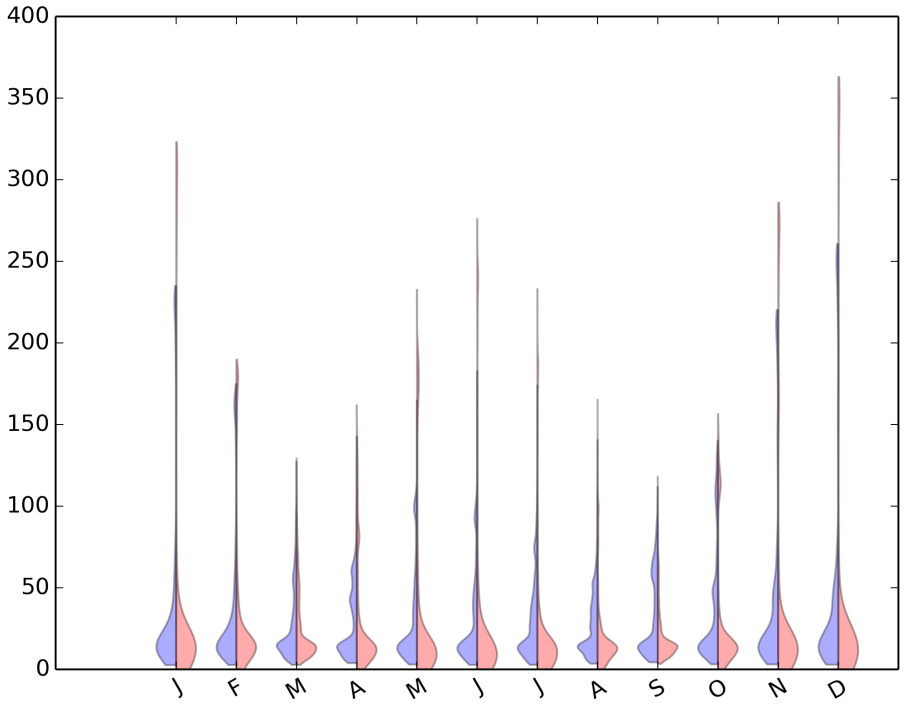



Figure 822: Violin plot for CMIP5-IPSL:IPSL-CM5A-LR-AMIP

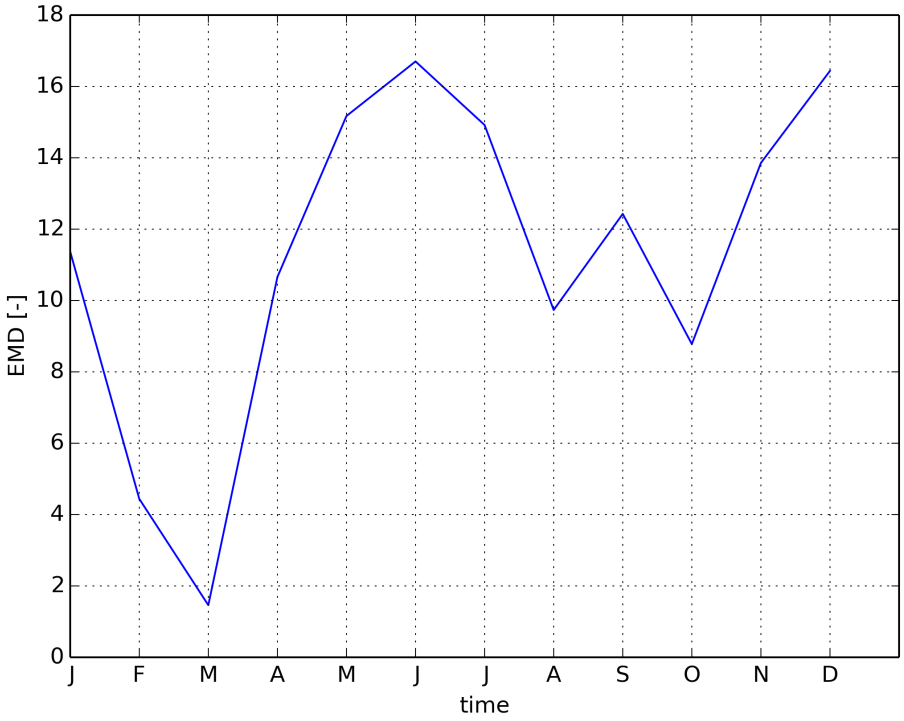



Figure 823: Timeseries of EMD

### 2.1.15 CMIP5 MOHC:HadGEM2-A-amip

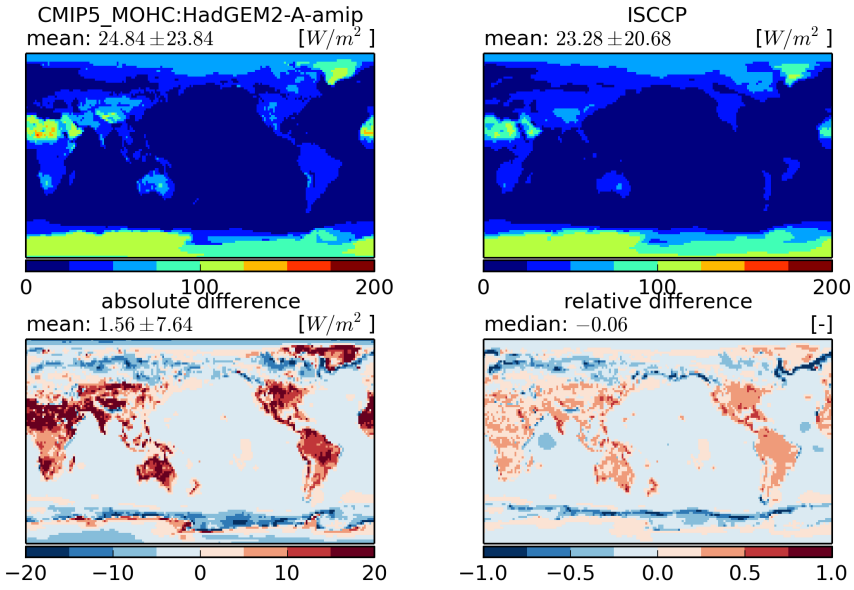



Figure 824: Temporal mean fields (top) and absolute and relative differences (bottom)

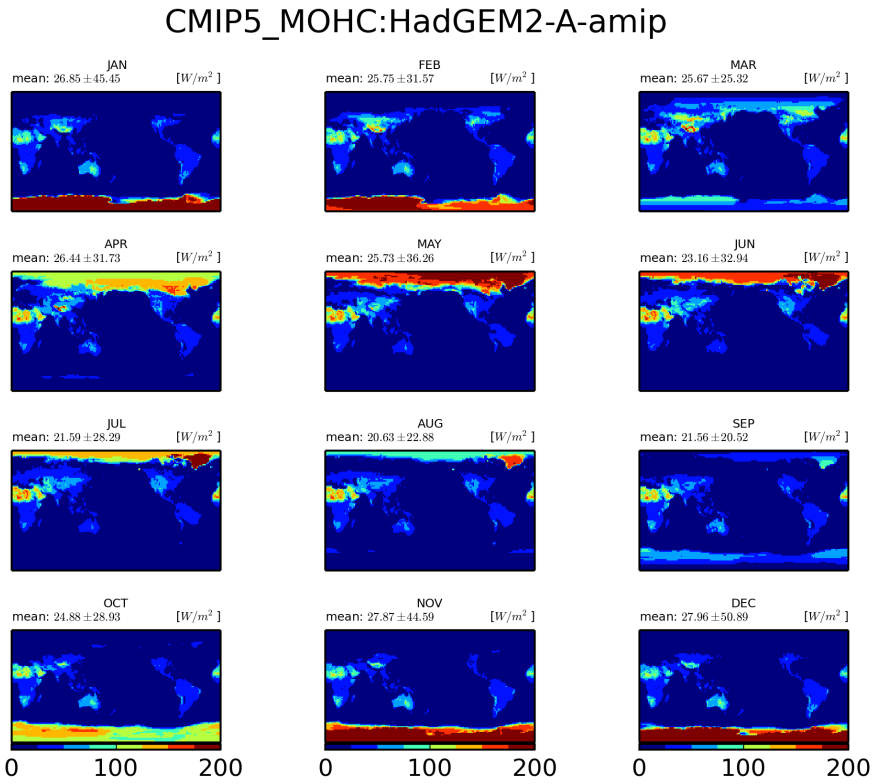



Figure 825: Monthly mean climatology for MOHC:HadGEM2-A

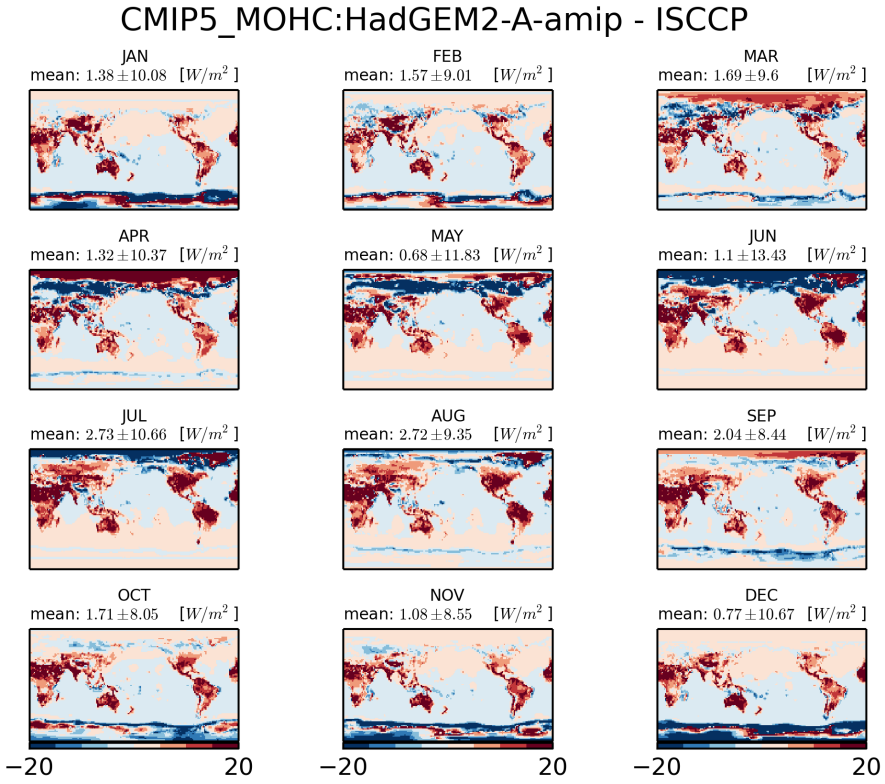



Figure 826: Monthly mean climatology of difference between MOHC:HADGEM2-A and ISCCP

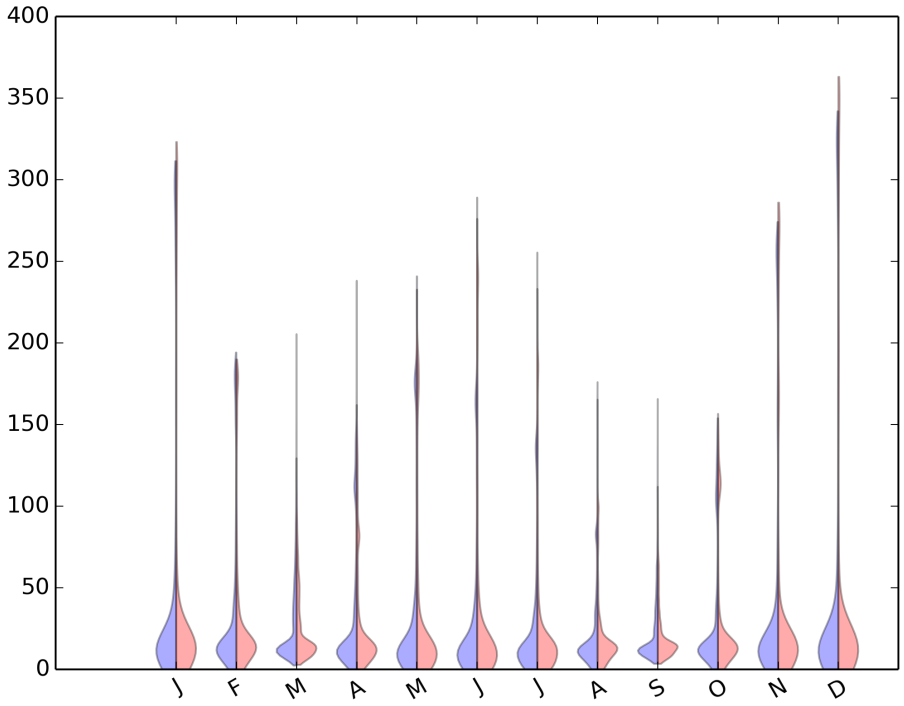



Figure 827: Violin plot for CMIP5-MOHC:HADGEM2-A-AMIP

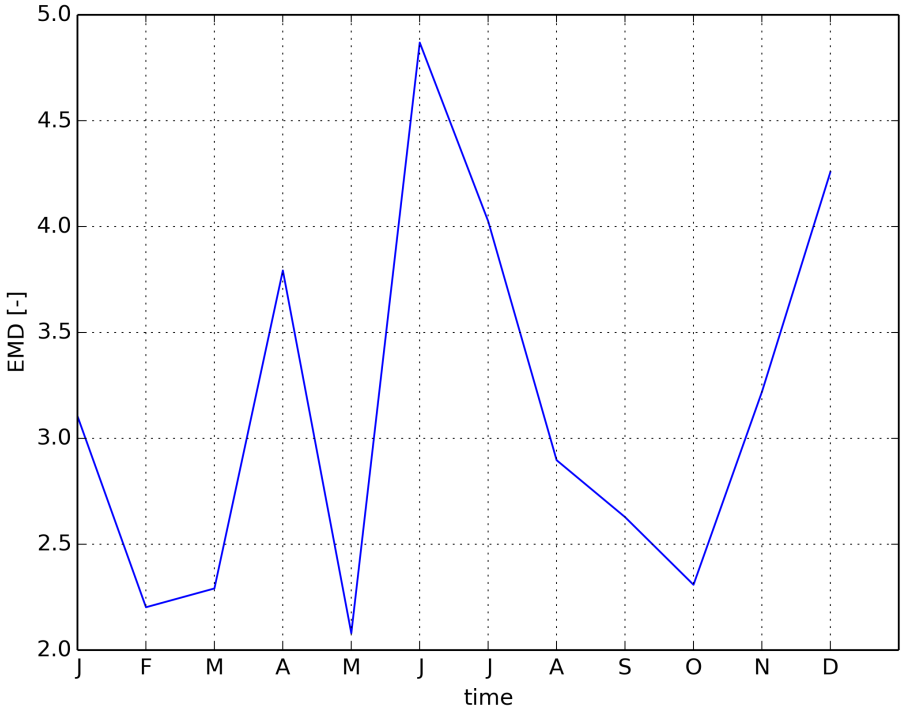



Figure 828: Timeseries of EMD

### 2.1.16 CMIP5 LASG-IAP:FGOALS-s2-amip

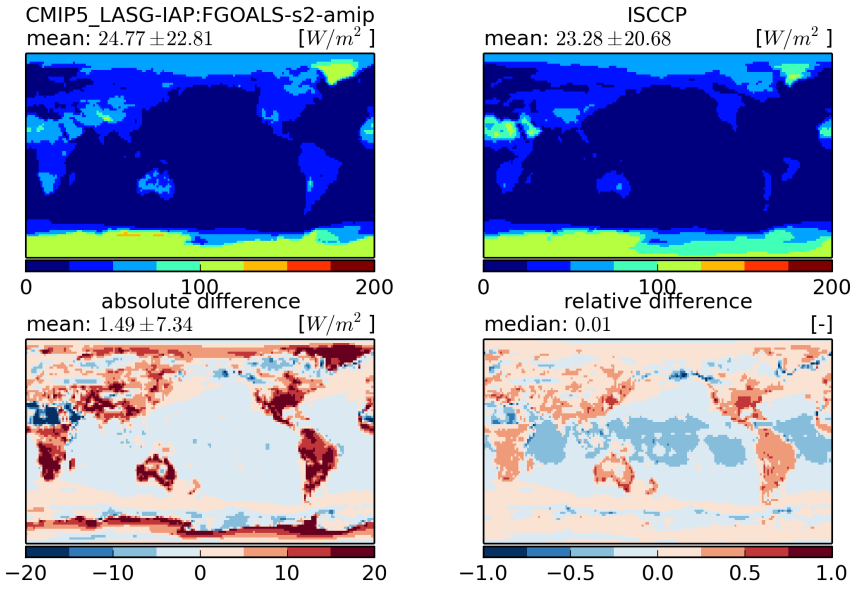



Figure 829: Temporal mean fields (top) and absolute and relative differences (bottom)

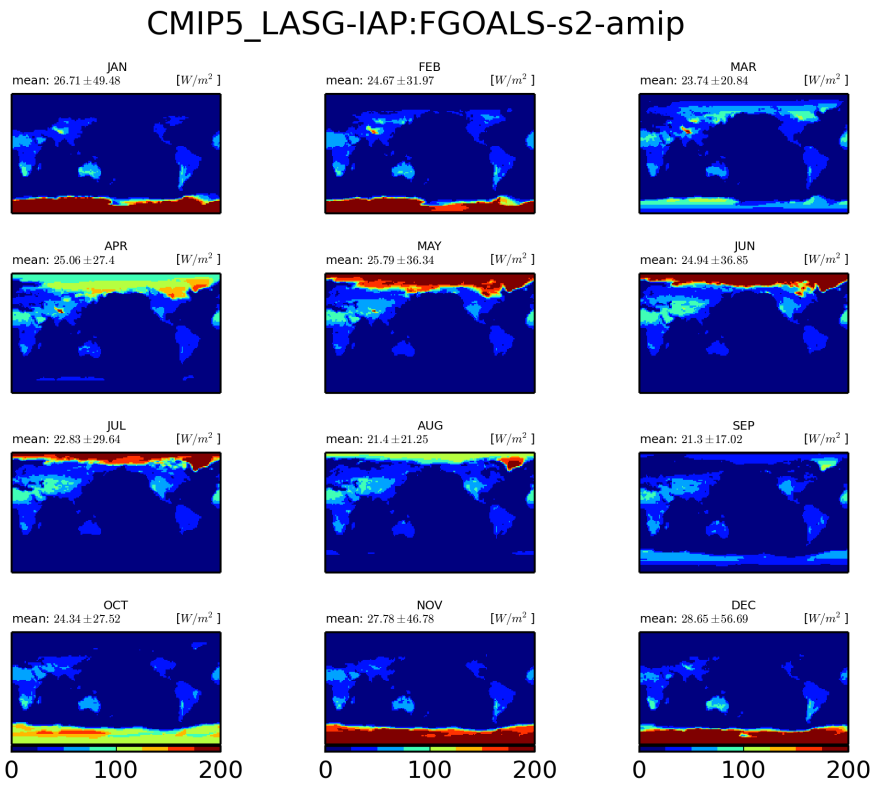



Figure 830: Monthly mean climatology for LASG-IAP:FGOALS-s2

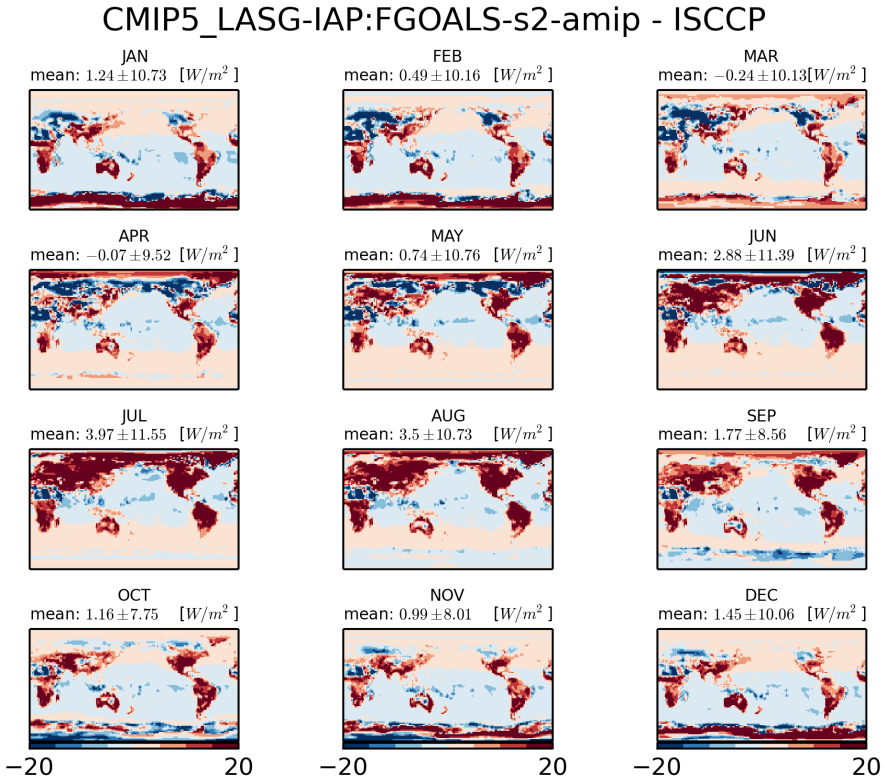



Figure 831: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and ISCCP

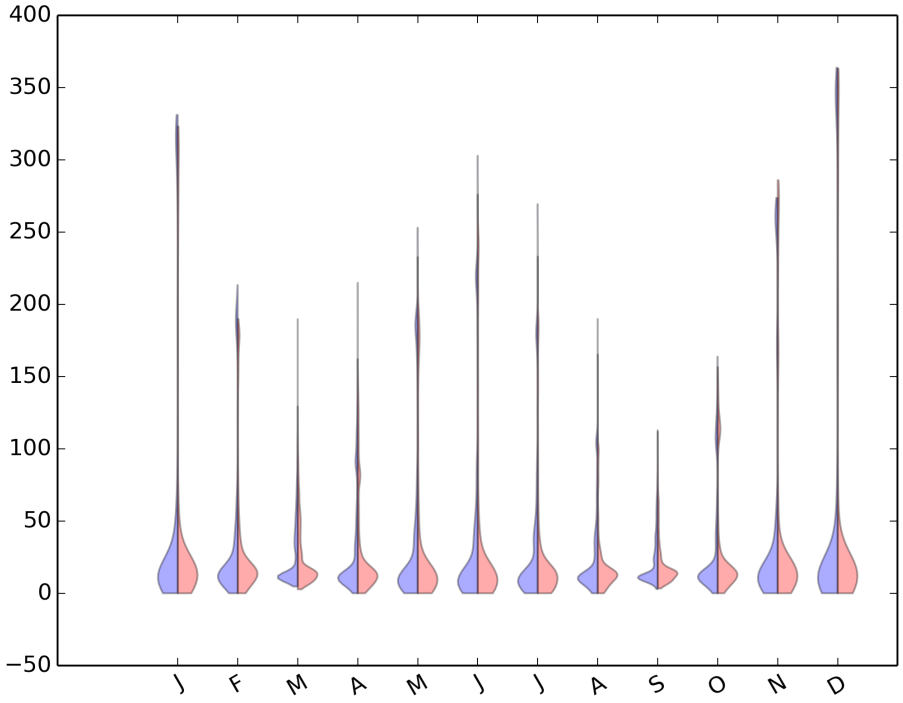



Figure 832: Violin plot for CMIP5-LASG-IAP:FGOALS-S2-AMIP

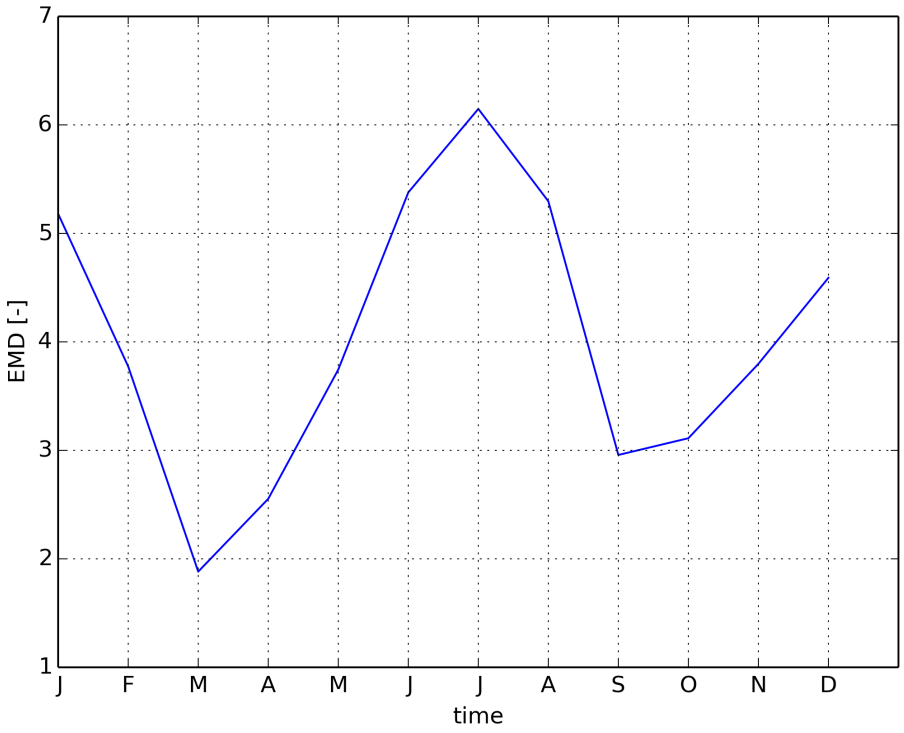



Figure 833: Timeseries of EMD

### 2.1.17 CMIP5 CMCC:CMCC-CM-amip

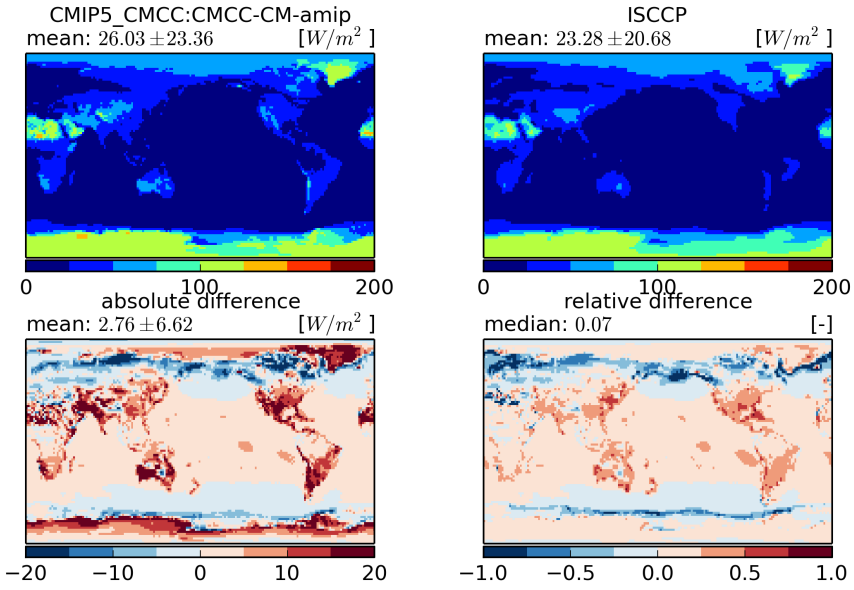



Figure 834: Temporal mean fields (top) and absolute and relative differences (bottom)

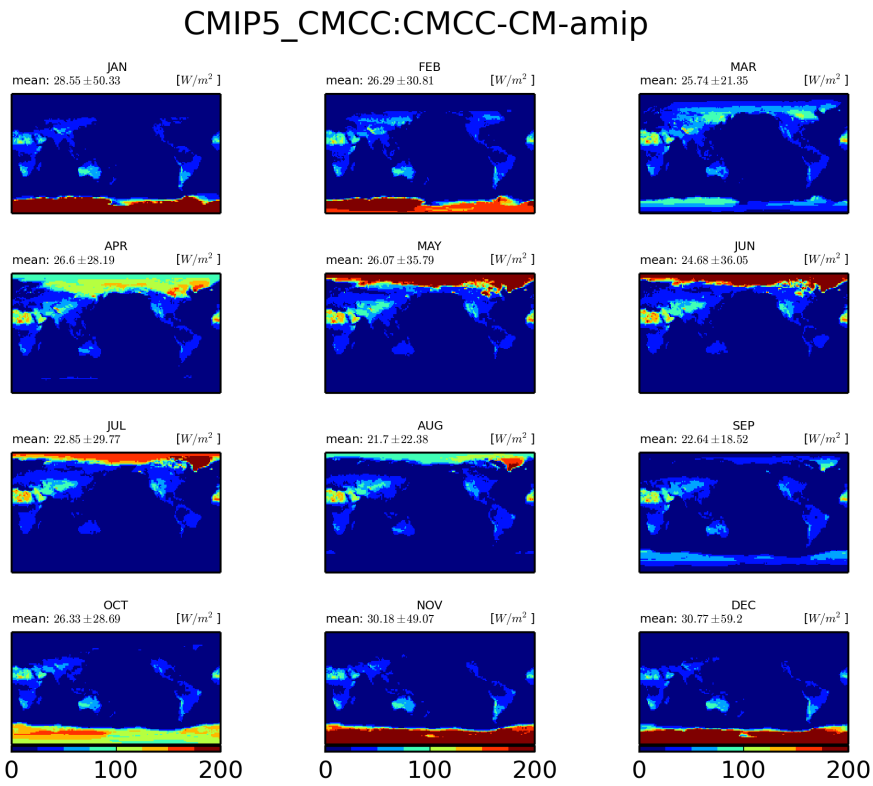



Figure 835: Monthly mean climatology for CMCC:CMCC-CM

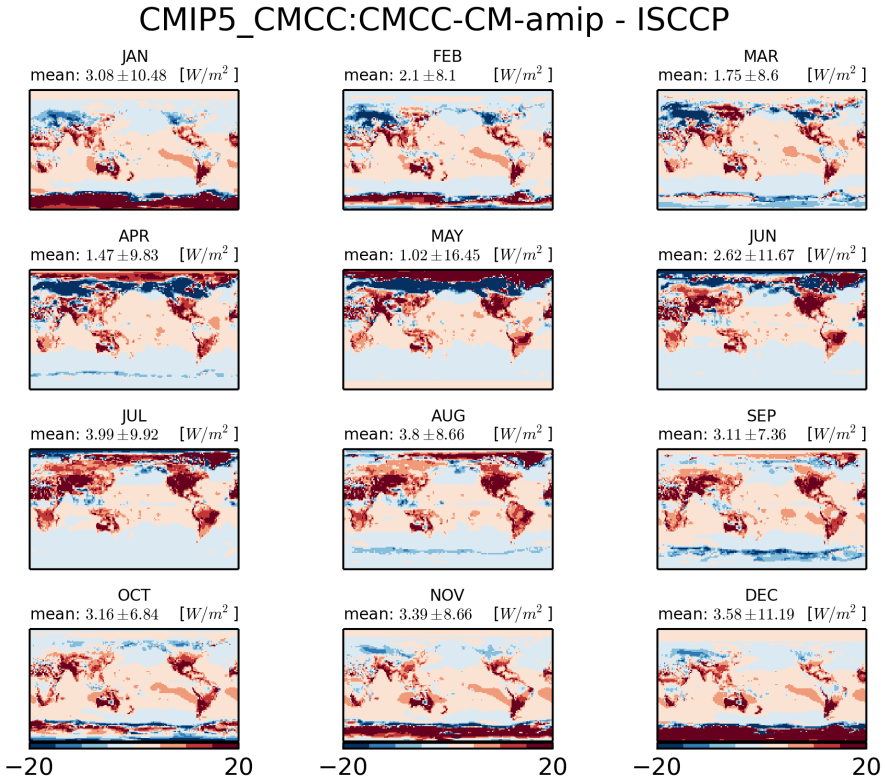



Figure 836: Monthly mean climatology of difference between CMCC:CMCC-CM and ISCCP

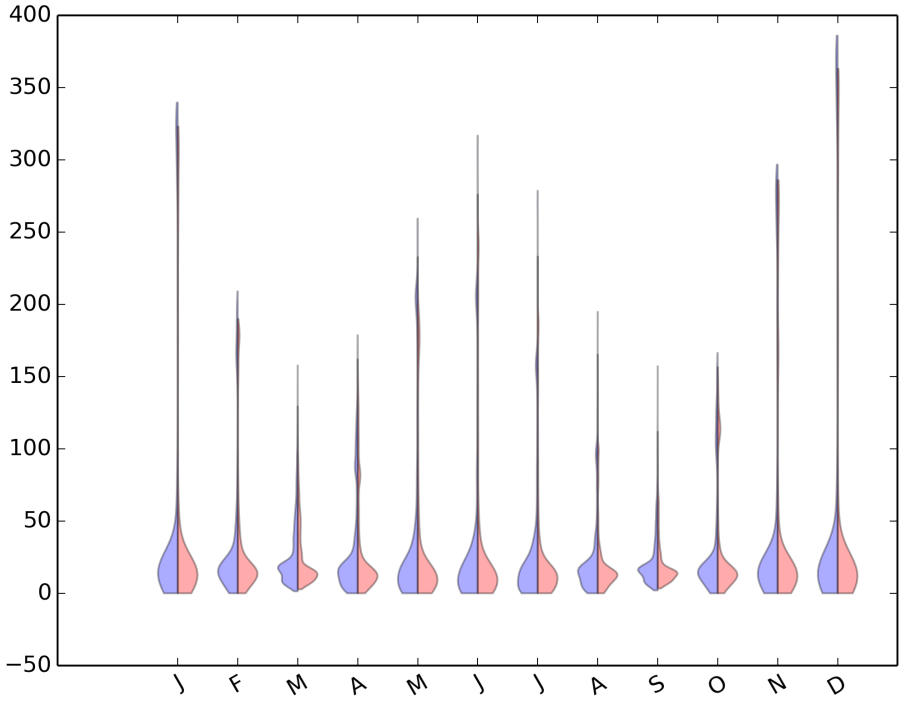



Figure 837: Violin plot for CMIP5-CMCC:CMCC-CM-AMIP

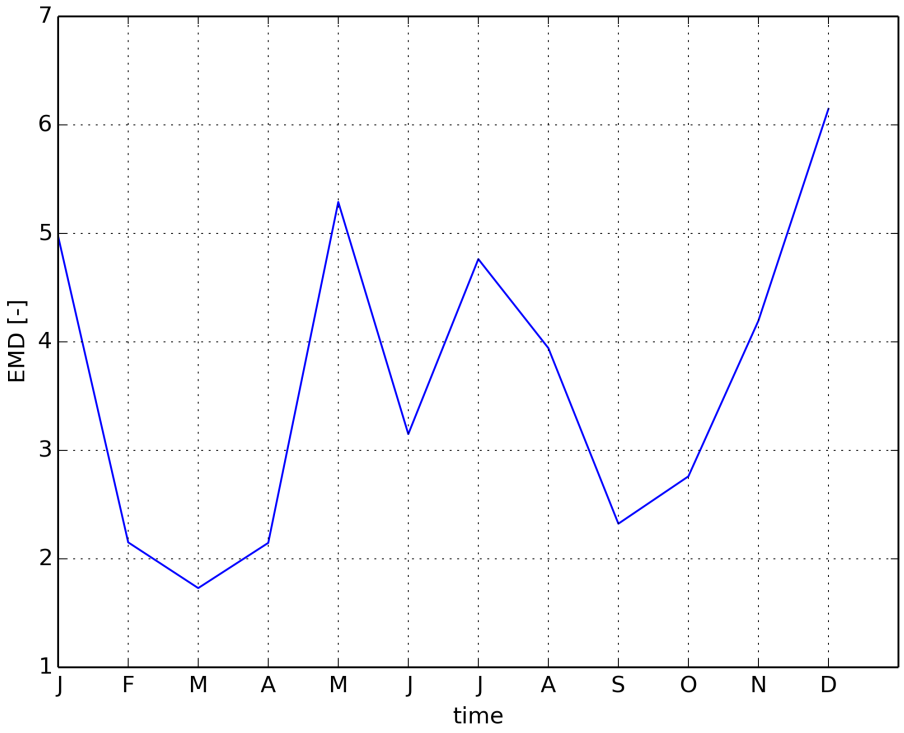



Figure 838: Timeseries of EMD

### 2.1.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

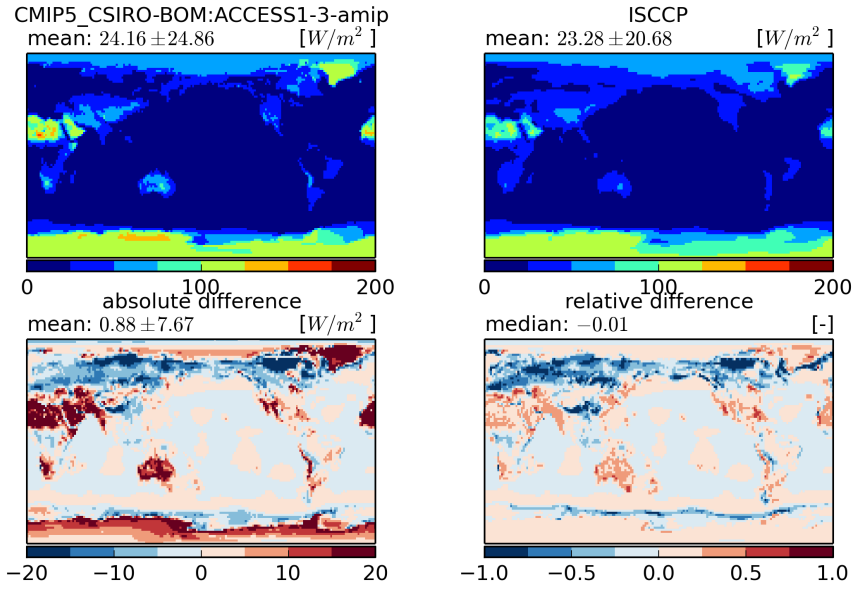



Figure 839: Temporal mean fields (top) and absolute and relative differences (bottom)

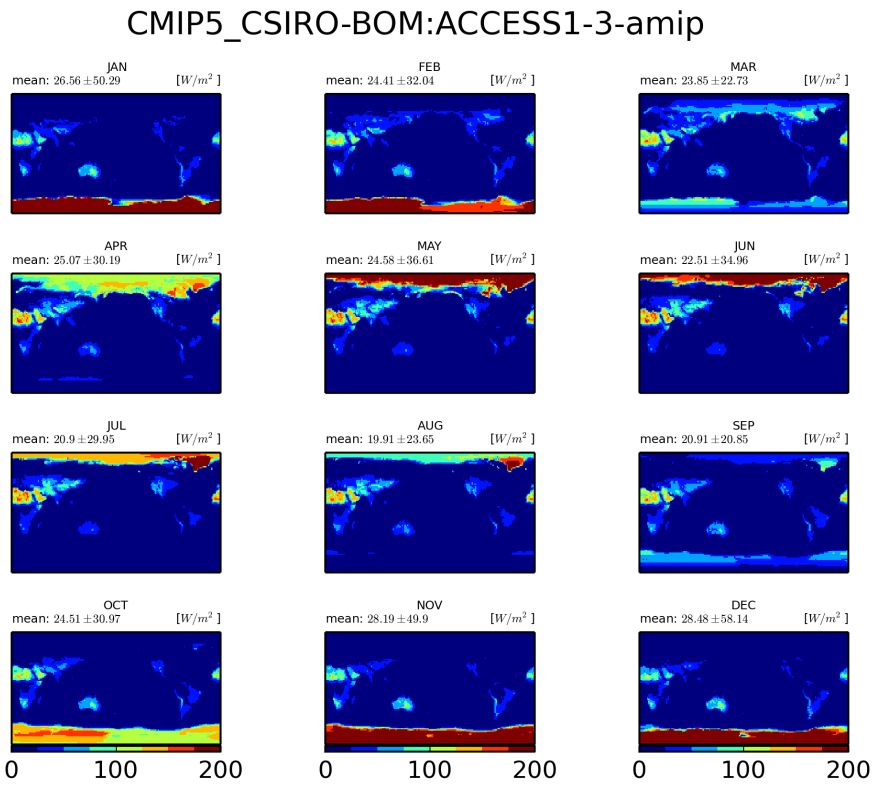



Figure 840: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

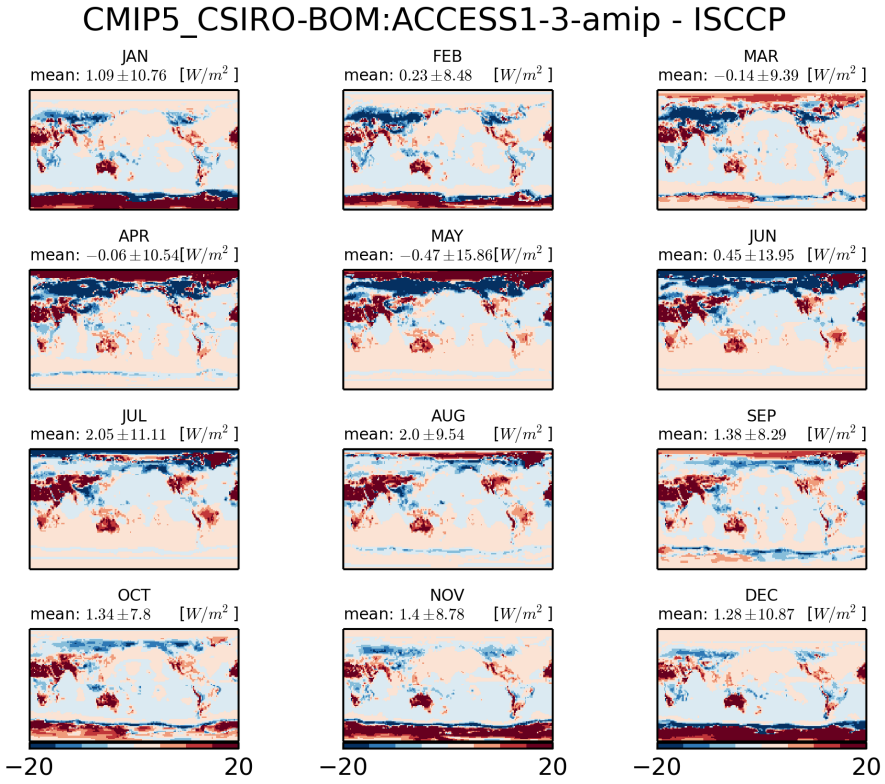



Figure 841: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and ISCCP

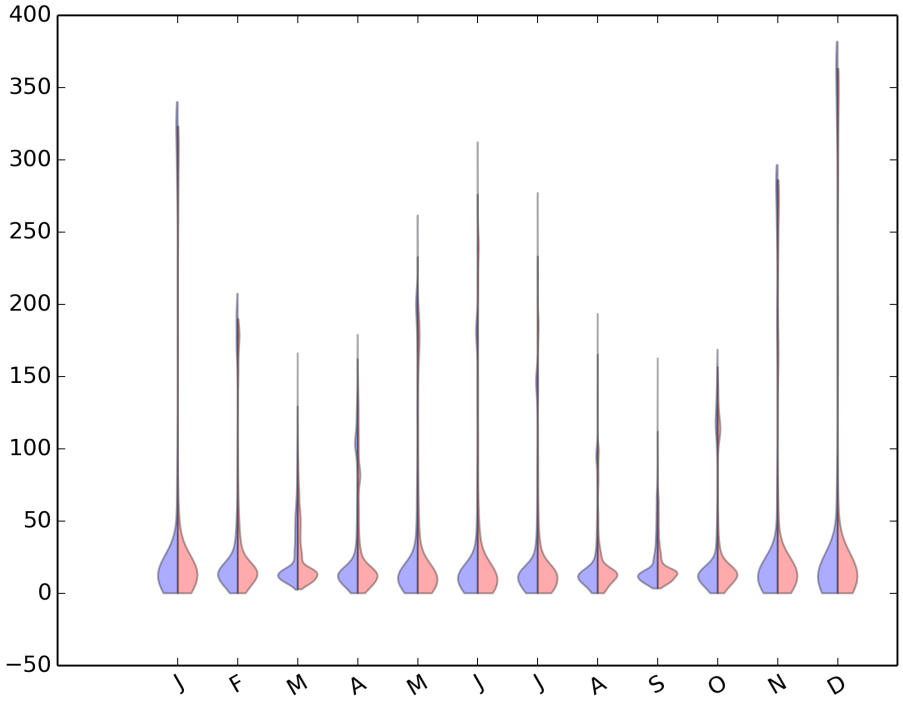



Figure 842: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-3-AMIP

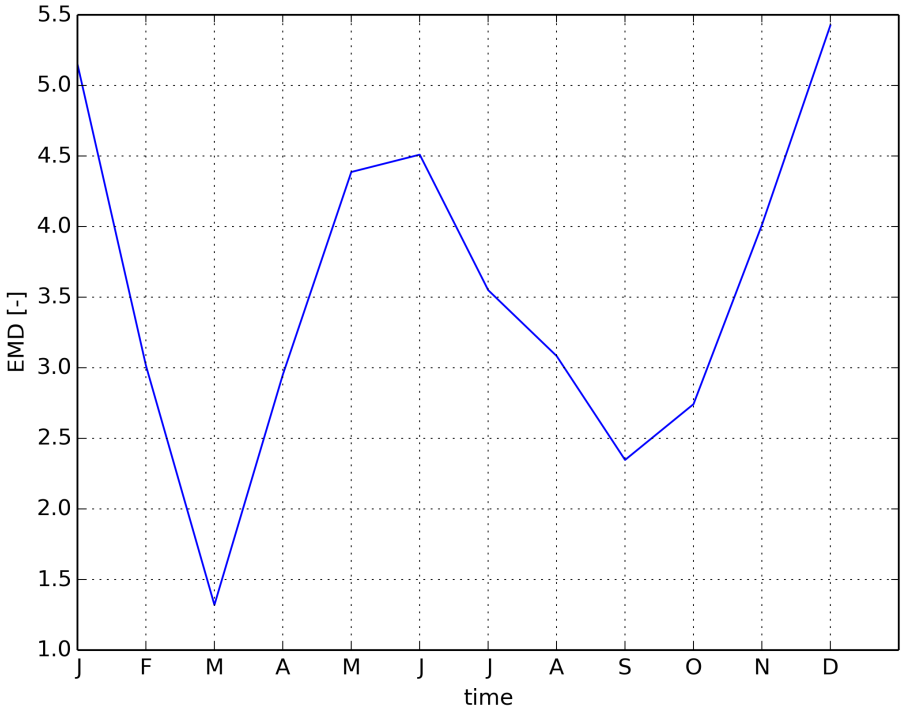



Figure 843: Timeseries of EMD

### 2.1.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

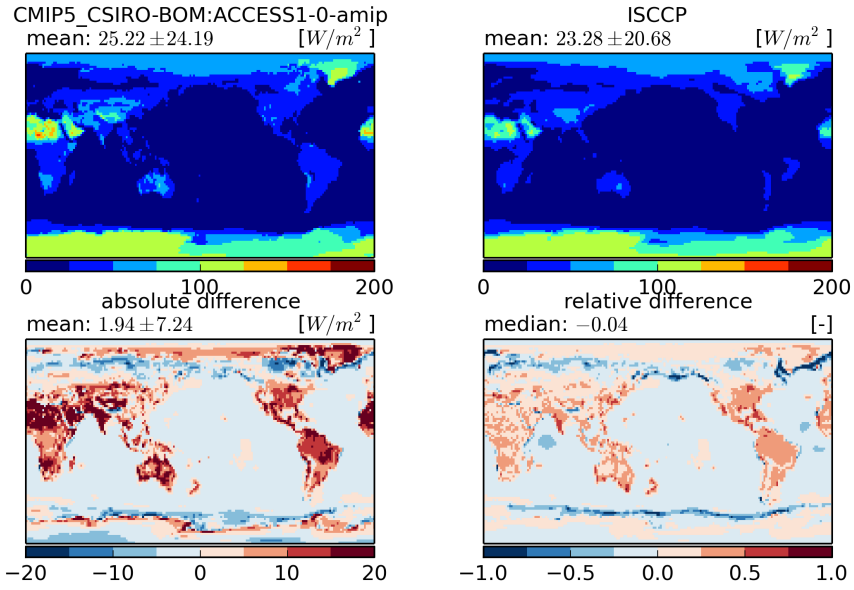



Figure 844: Temporal mean fields (top) and absolute and relative differences (bottom)

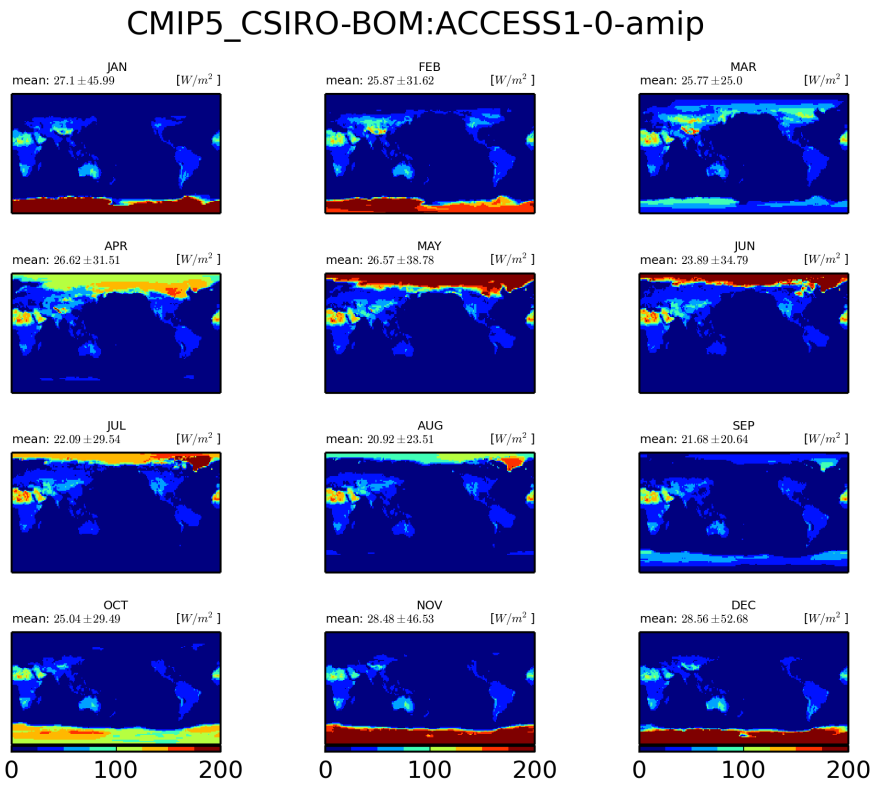



Figure 845: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

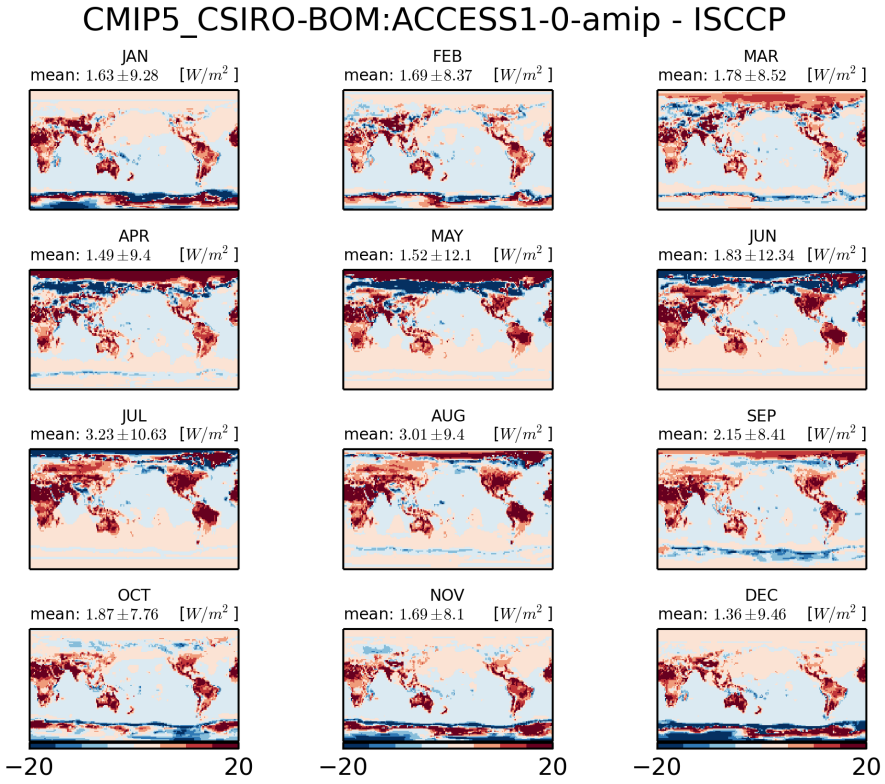



Figure 846: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and ISCCP

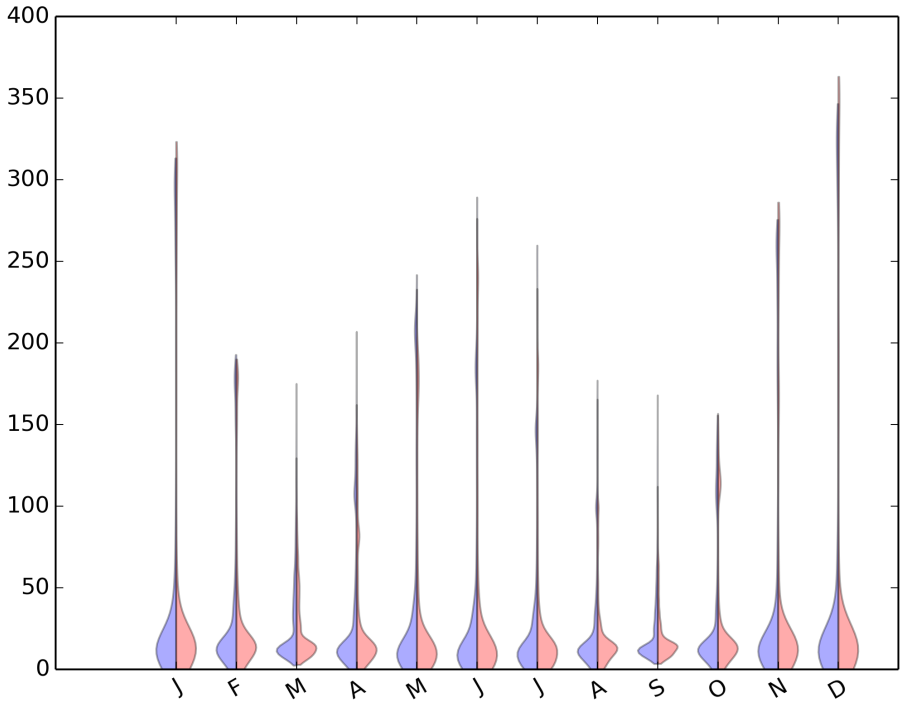



Figure 847: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-0-AMIP

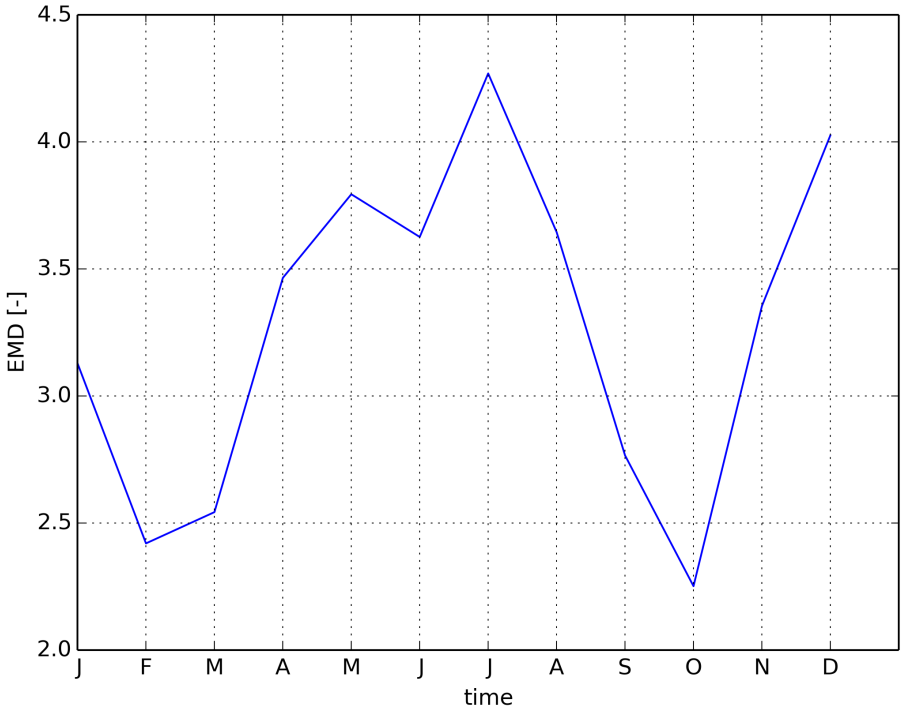



Figure 848: Timeseries of EMD

### 2.1.20 CMIP5 INM:inmcm4-amip

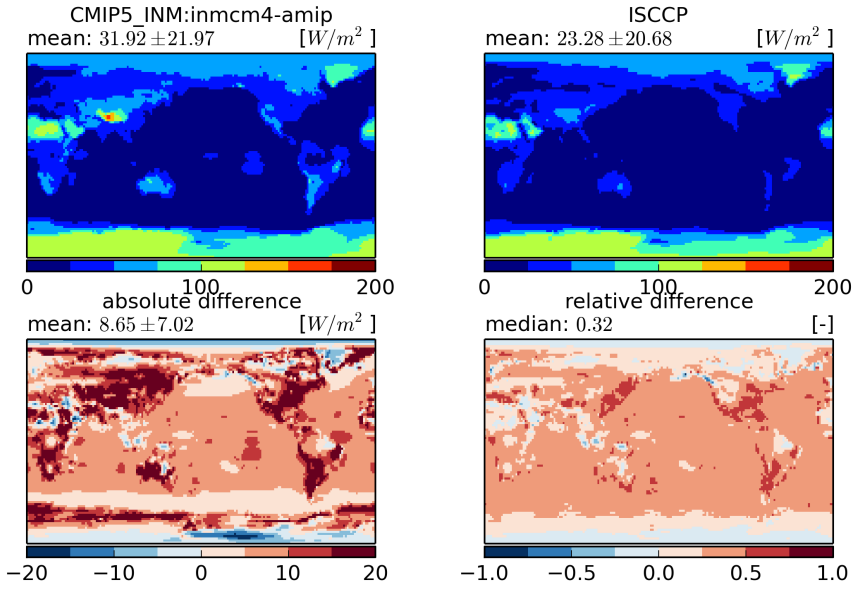



Figure 849: Temporal mean fields (top) and absolute and relative differences (bottom)

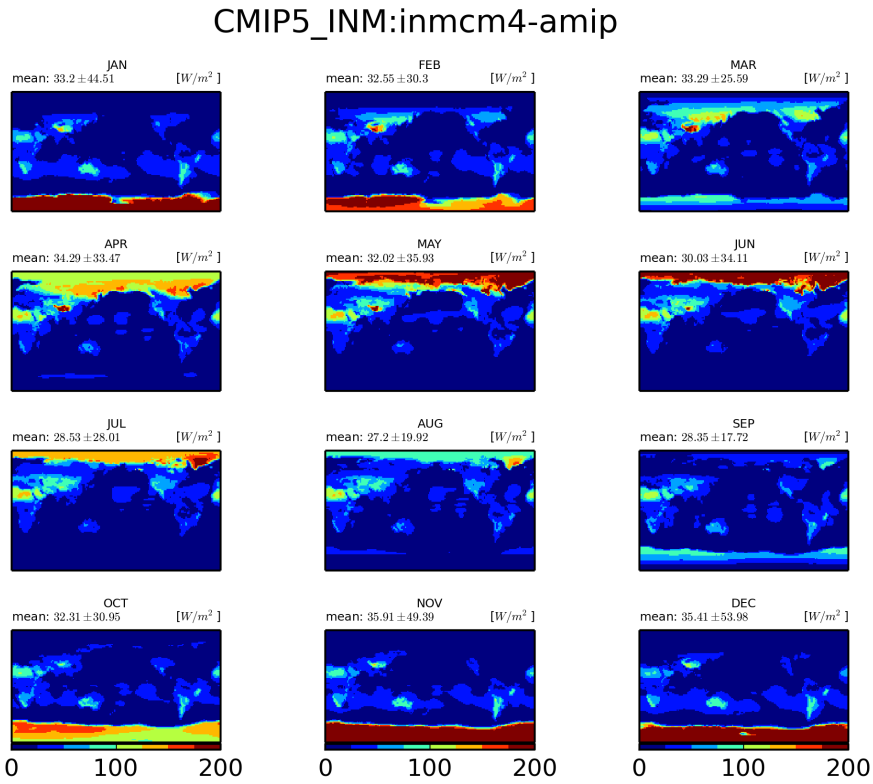



Figure 850: Monthly mean climatology for INM:inmcm4

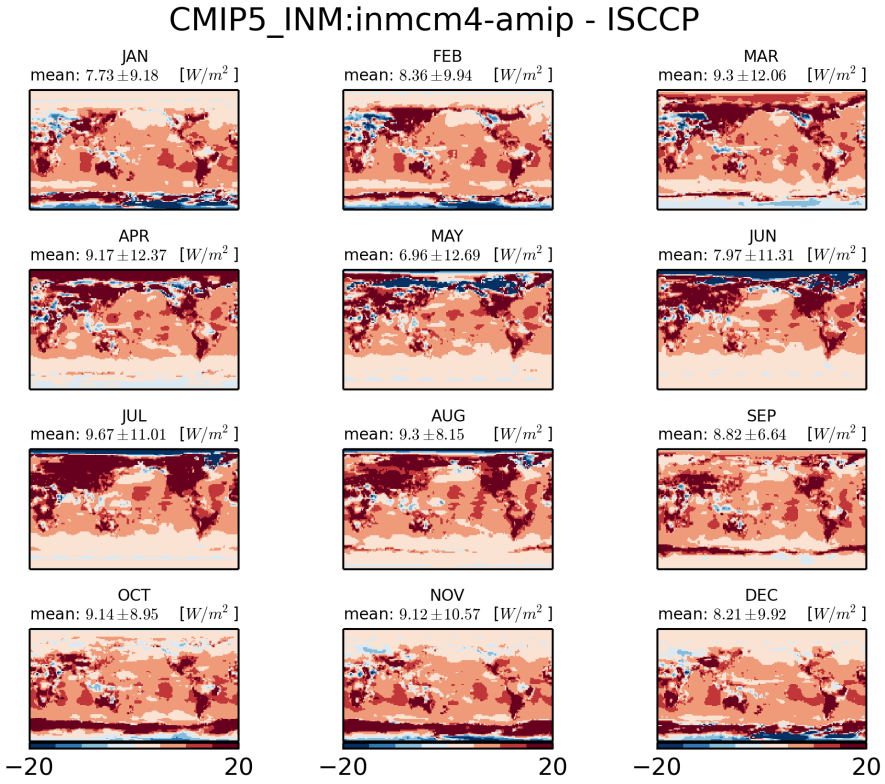



Figure 851: Monthly mean climatology of difference between INM:INMCM4 and ISCCP

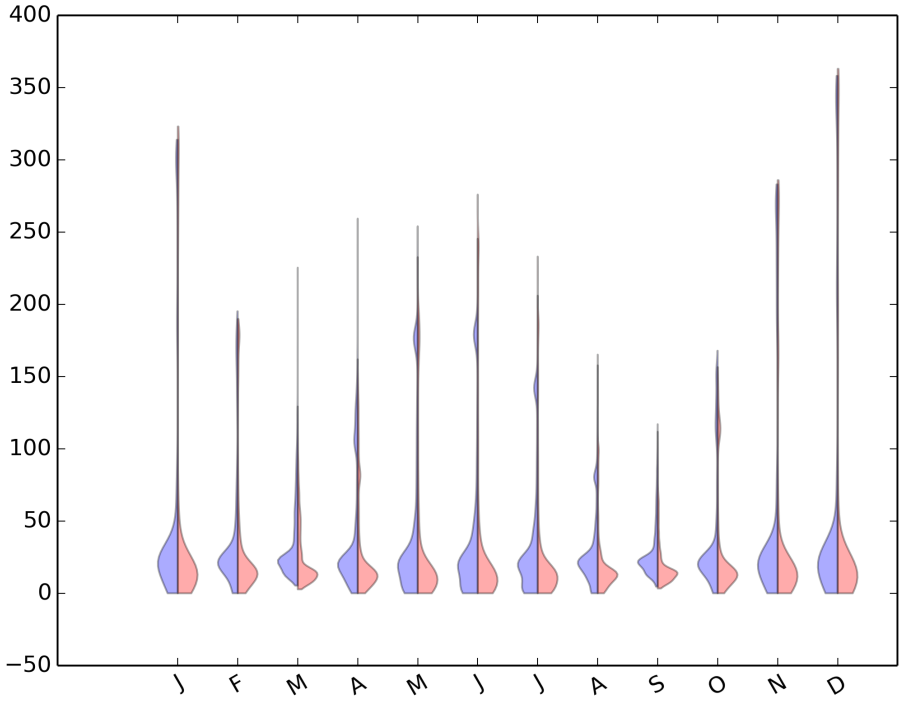



Figure 852: Violin plot for CMIP5-INM:INMCM4-AMIP

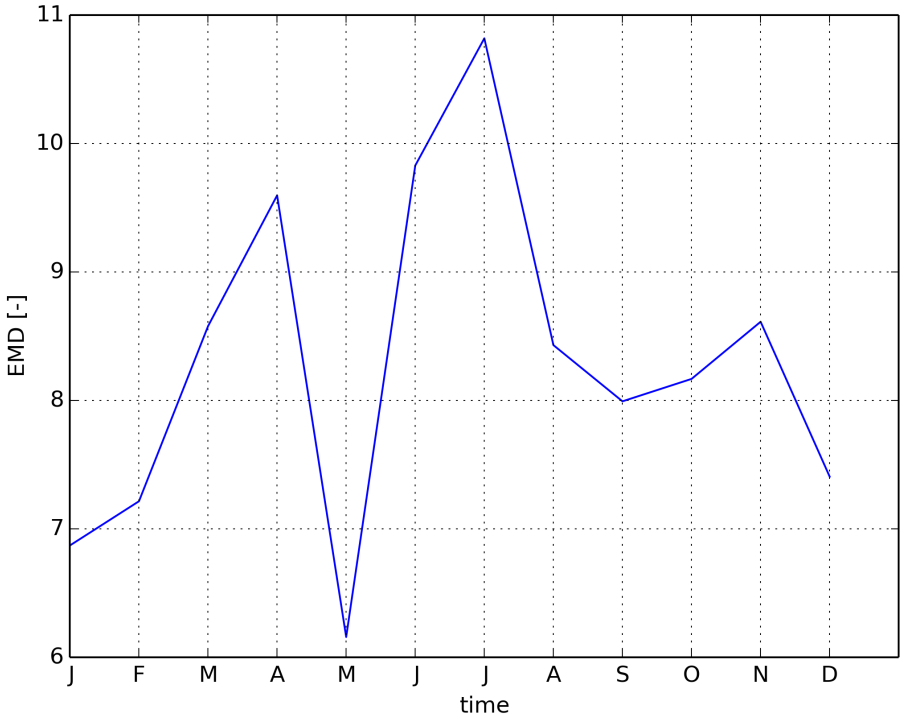



Figure 853: Timeseries of EMD

### 2.1.21 CMIP5 MPI-M:MPI-ESM-LR-amip

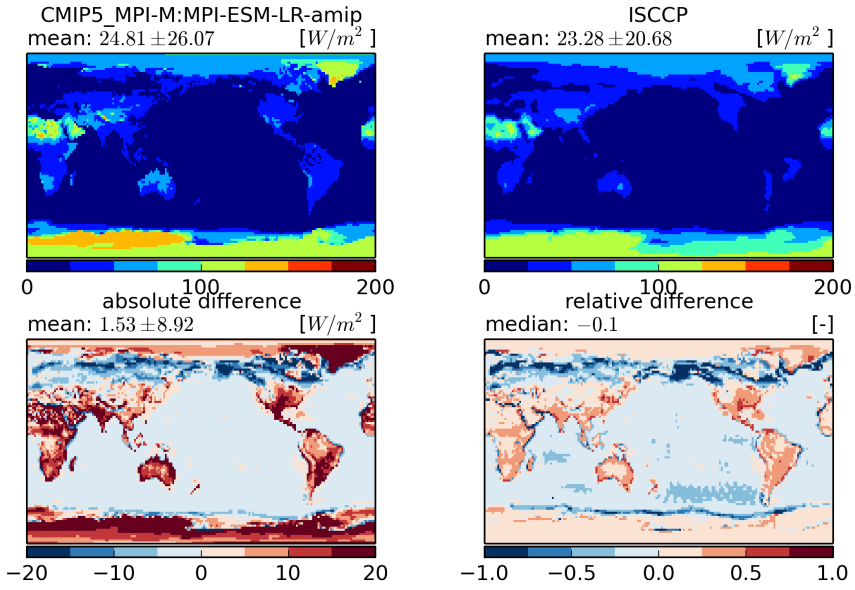



Figure 854: Temporal mean fields (top) and absolute and relative differences (bottom)

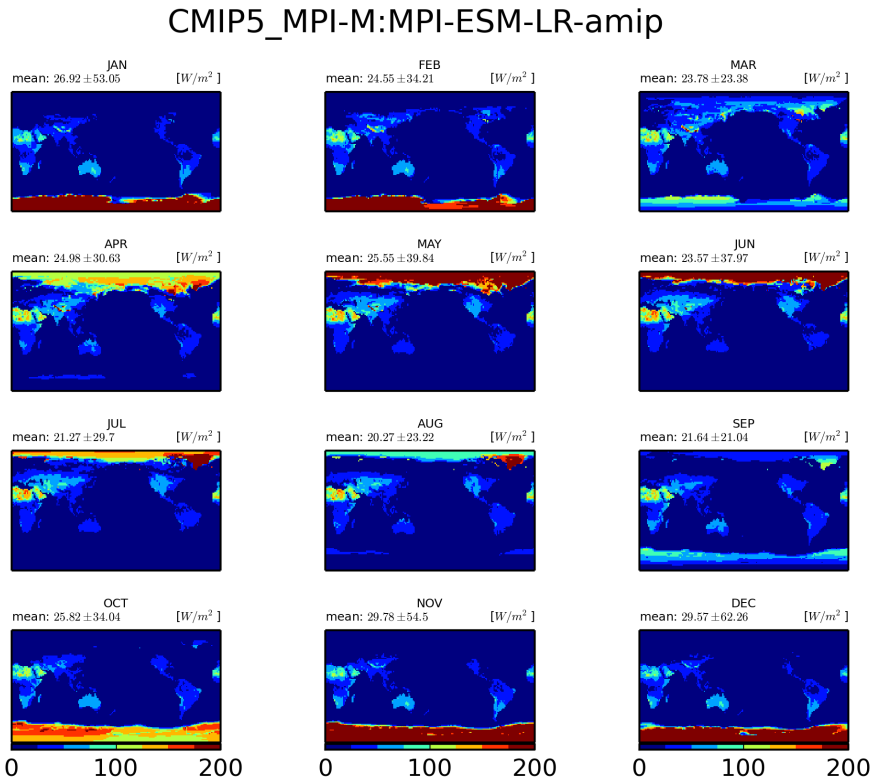



Figure 855: Monthly mean climatology for MPI-M:MPI-ESM-LR

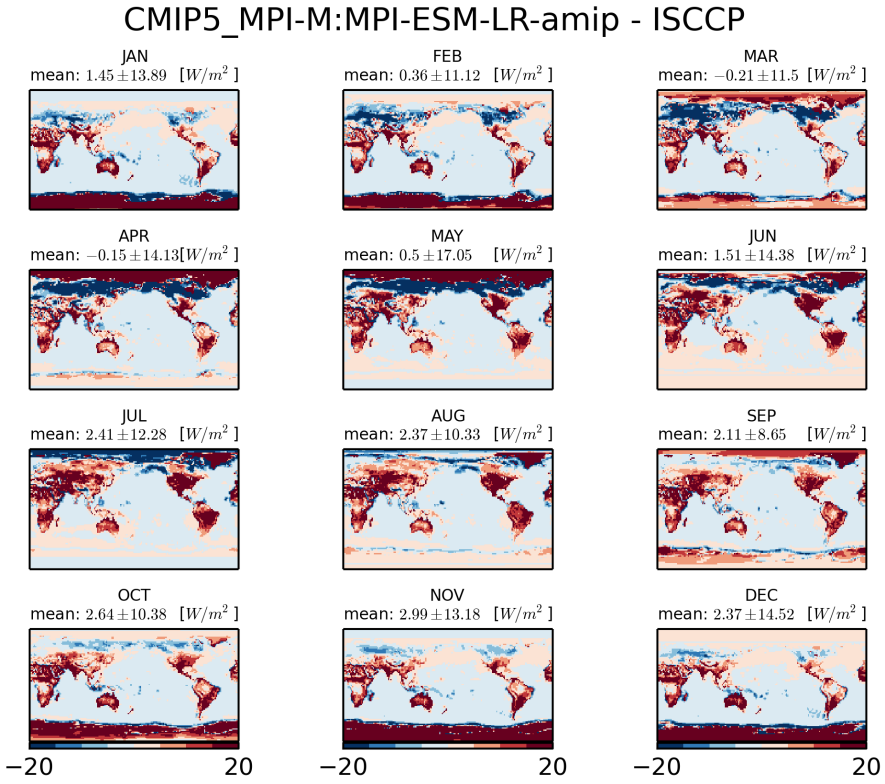



Figure 856: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and ISCCP

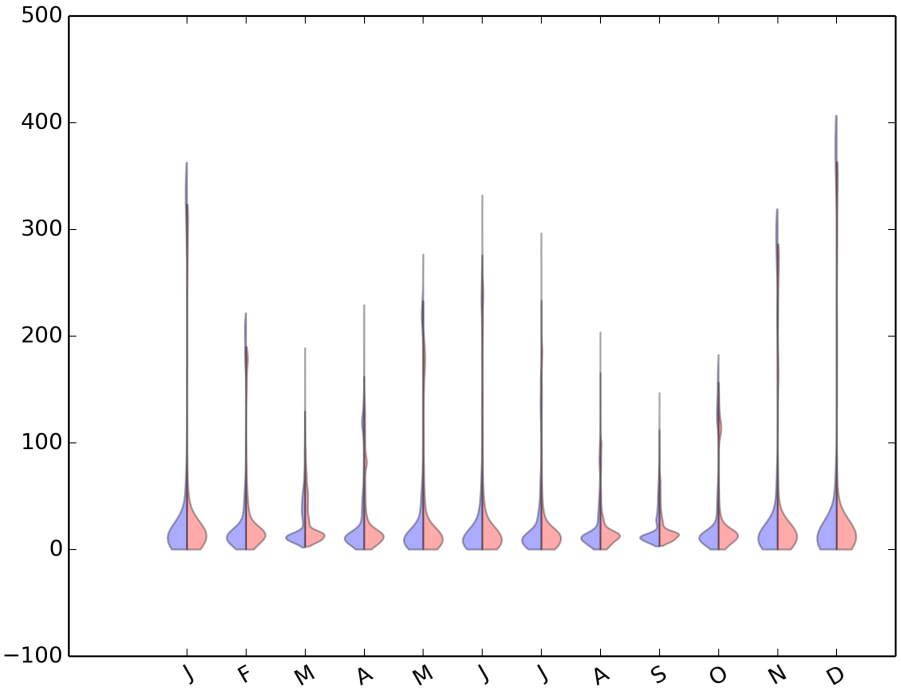



Figure 857: Violin plot for CMIP5-MPI-M:MPI-ESM-LR-AMIP

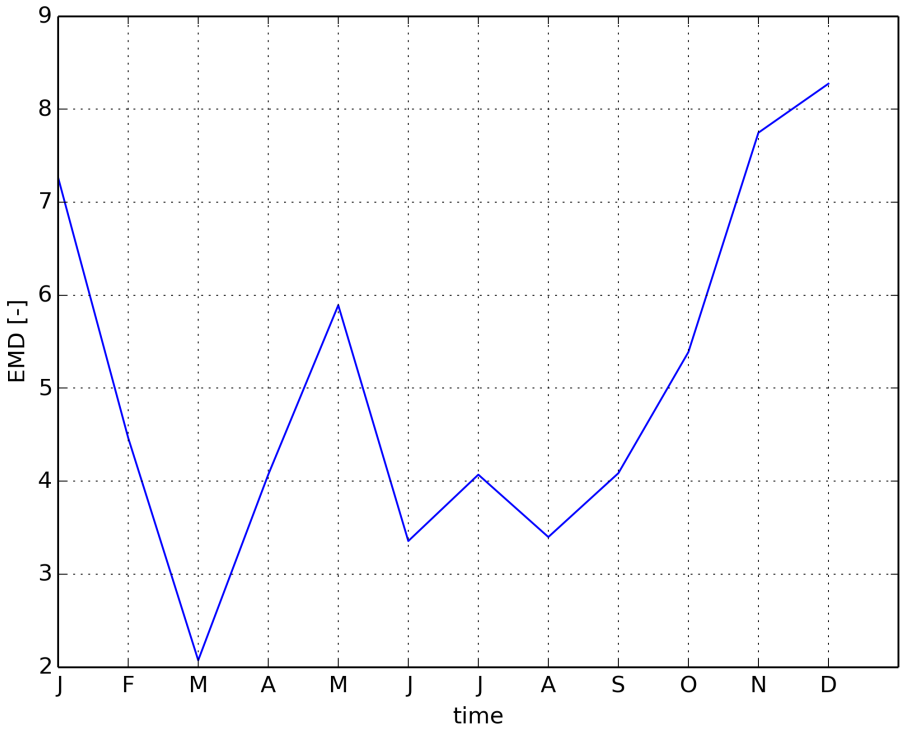



Figure 858: Timeseries of EMD

### 2.1.22 CMIP5 MPI-M:MPI-ESM-MR-amip

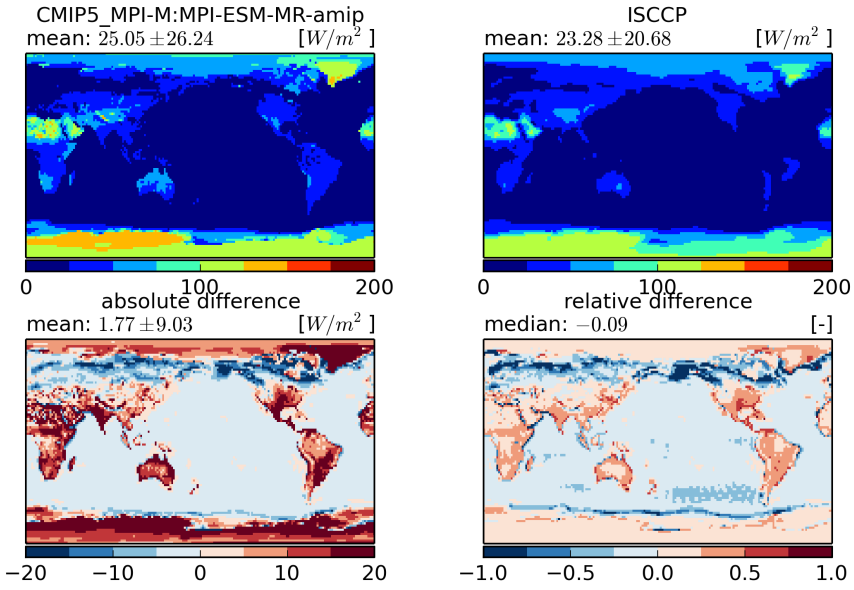



Figure 859: Temporal mean fields (top) and absolute and relative differences (bottom)

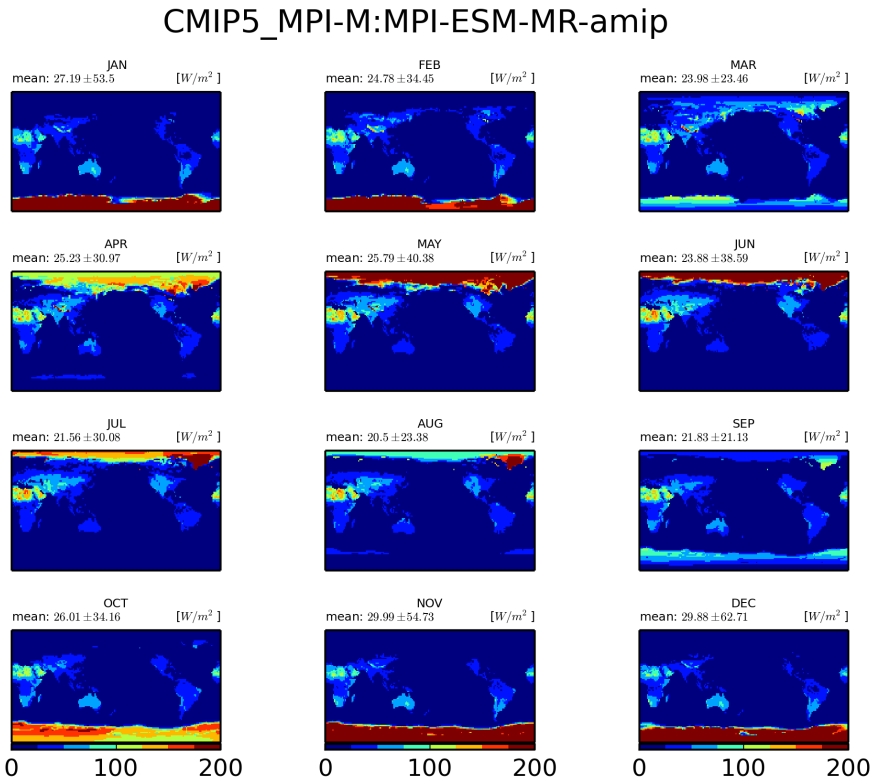



Figure 860: Monthly mean climatology for MPI-M:MPI-ESM-MR

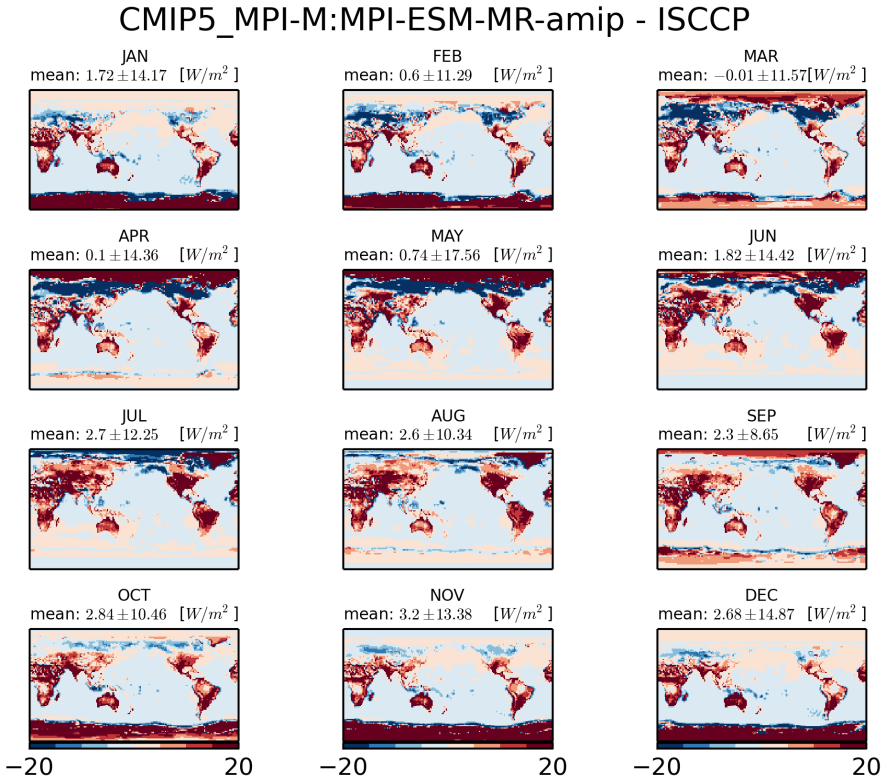



Figure 861: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and ISCCP

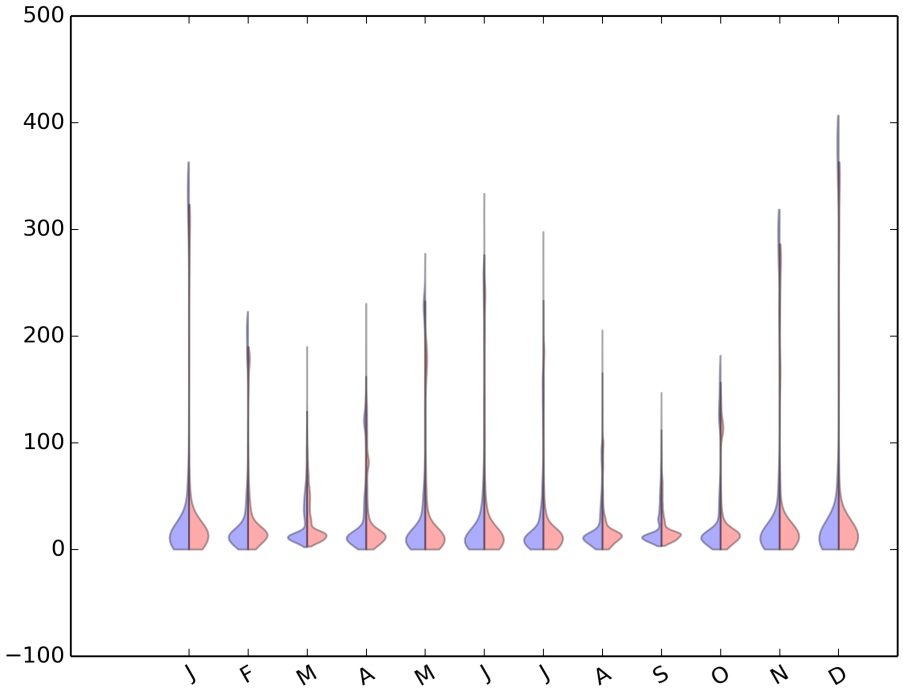



Figure 862: Violin plot for CMIP5-MPI-M:MPI-ESM-MR-AMIP

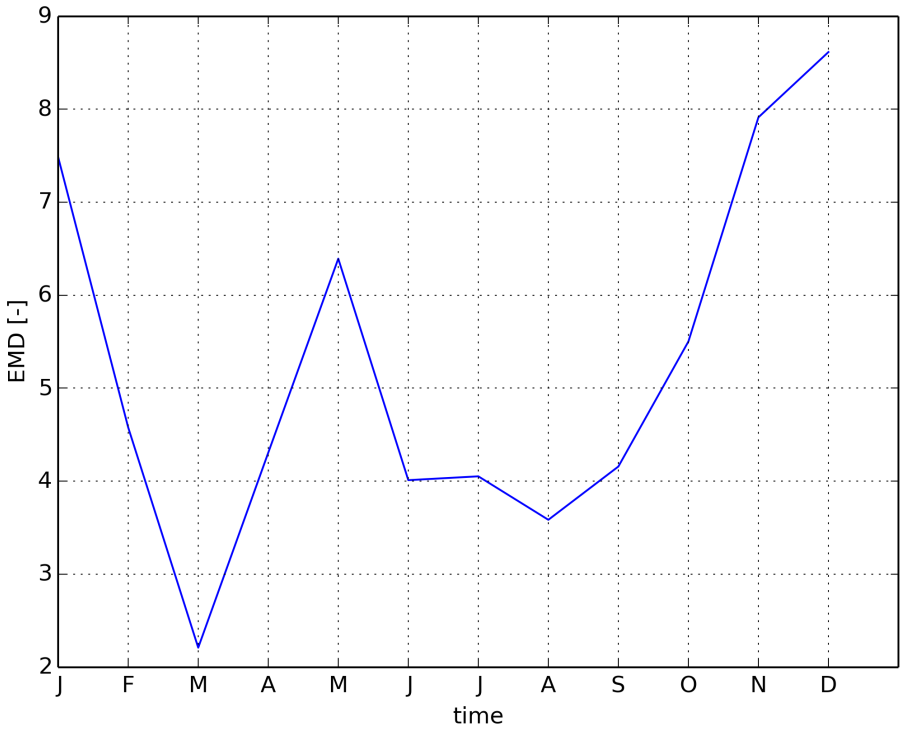



Figure 863: Timeseries of EMD

### 2.1.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

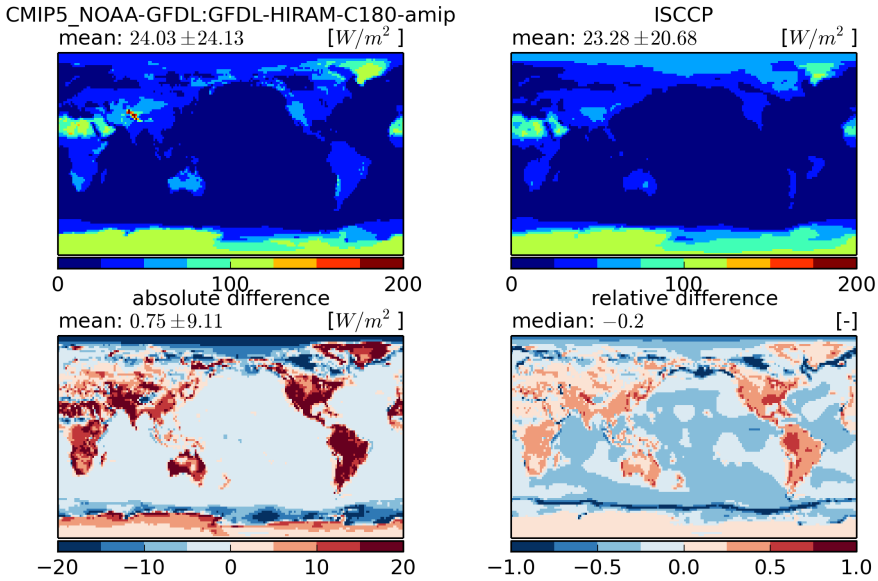



Figure 864: Temporal mean fields (top) and absolute and relative differences (bottom)

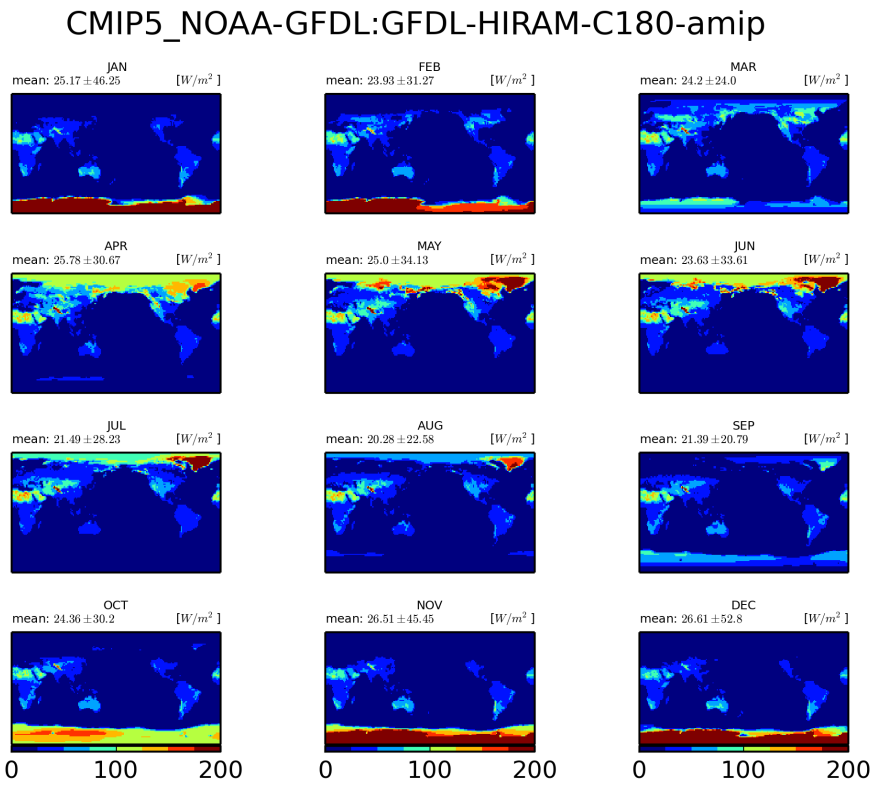



Figure 865: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

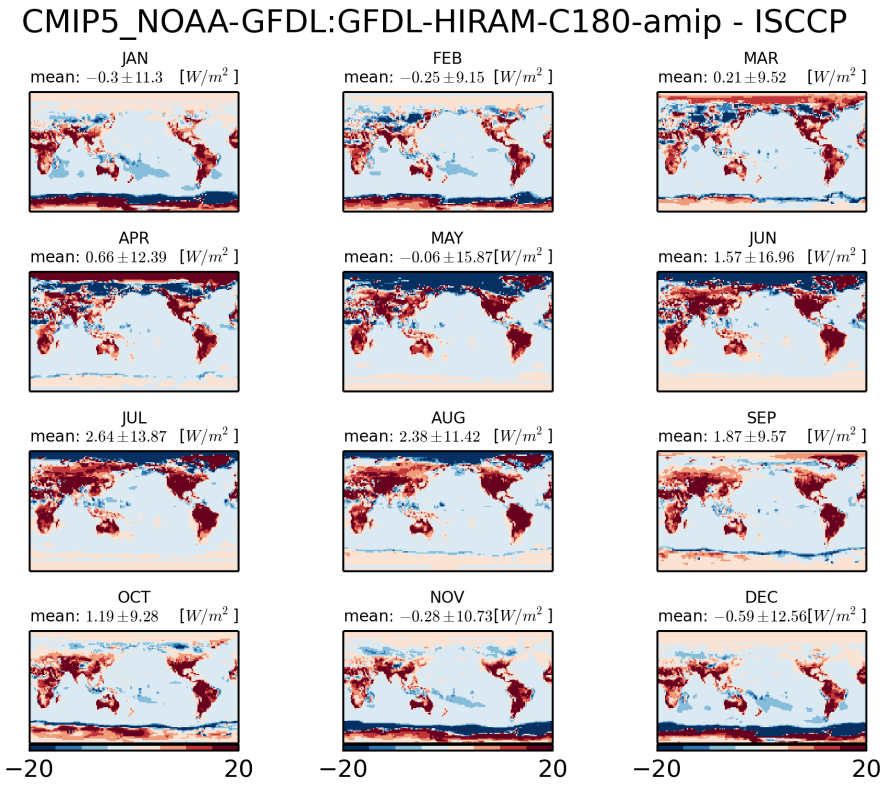



Figure 866: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and ISCCP

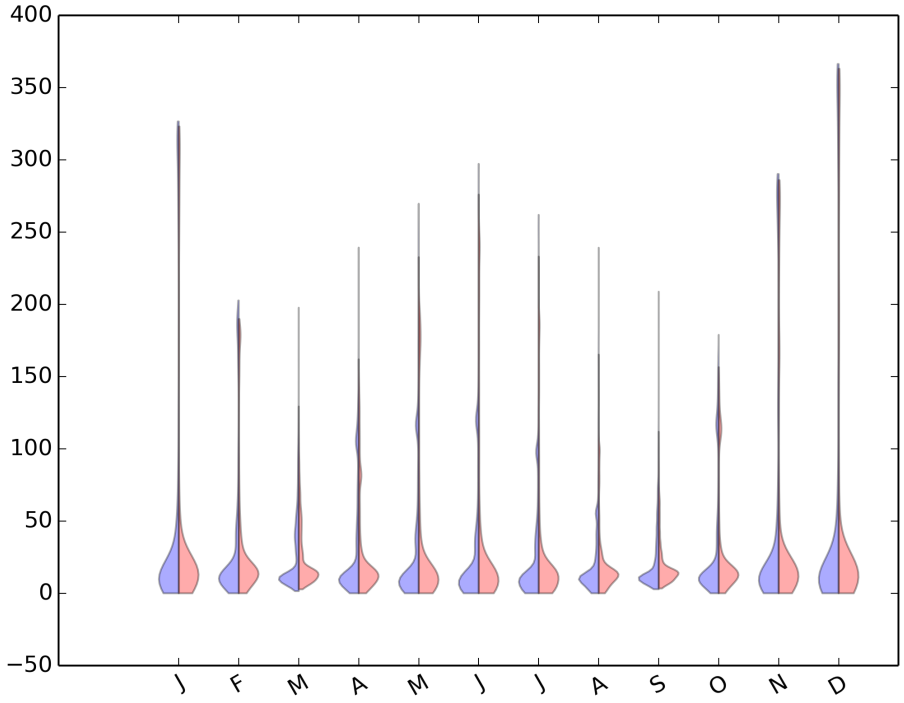



Figure 867: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-AMIP

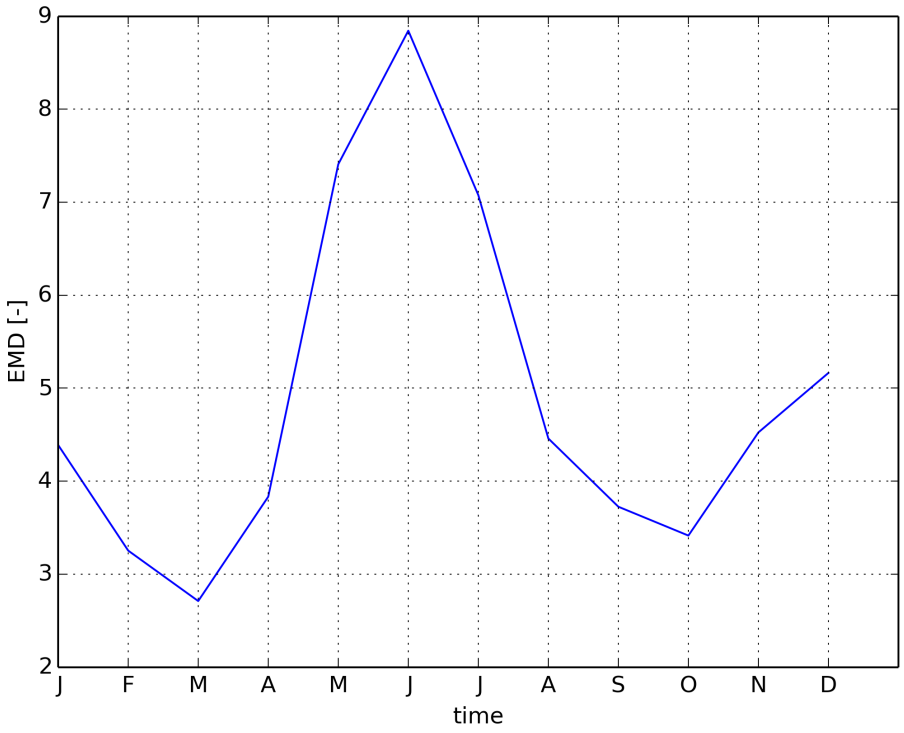



Figure 868: Timeseries of EMD

### 2.1.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

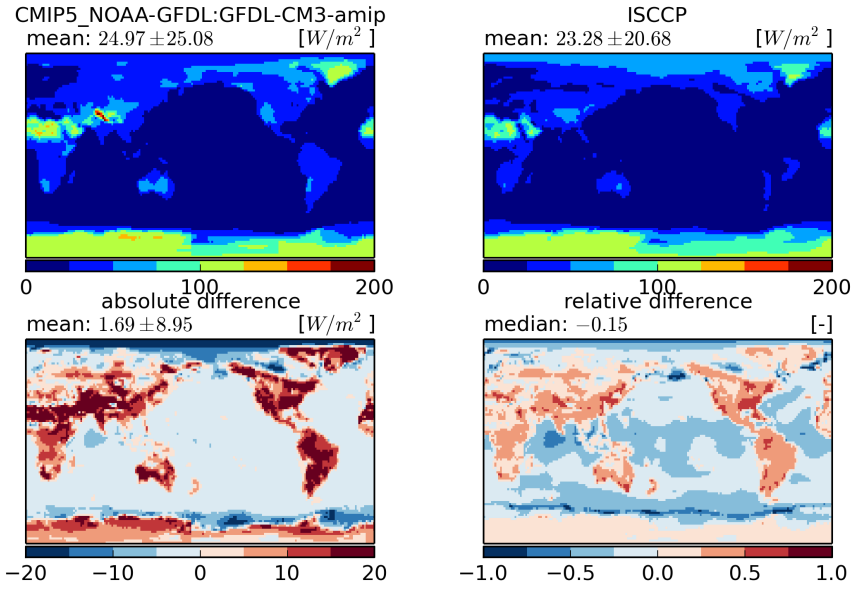



Figure 869: Temporal mean fields (top) and absolute and relative differences (bottom)

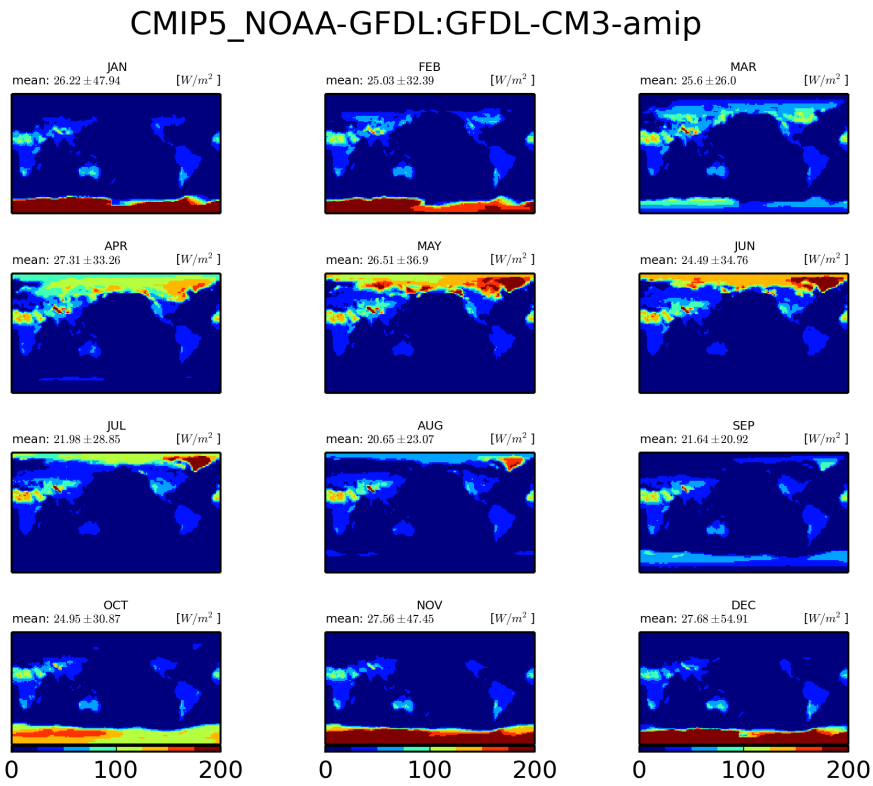



Figure 870: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

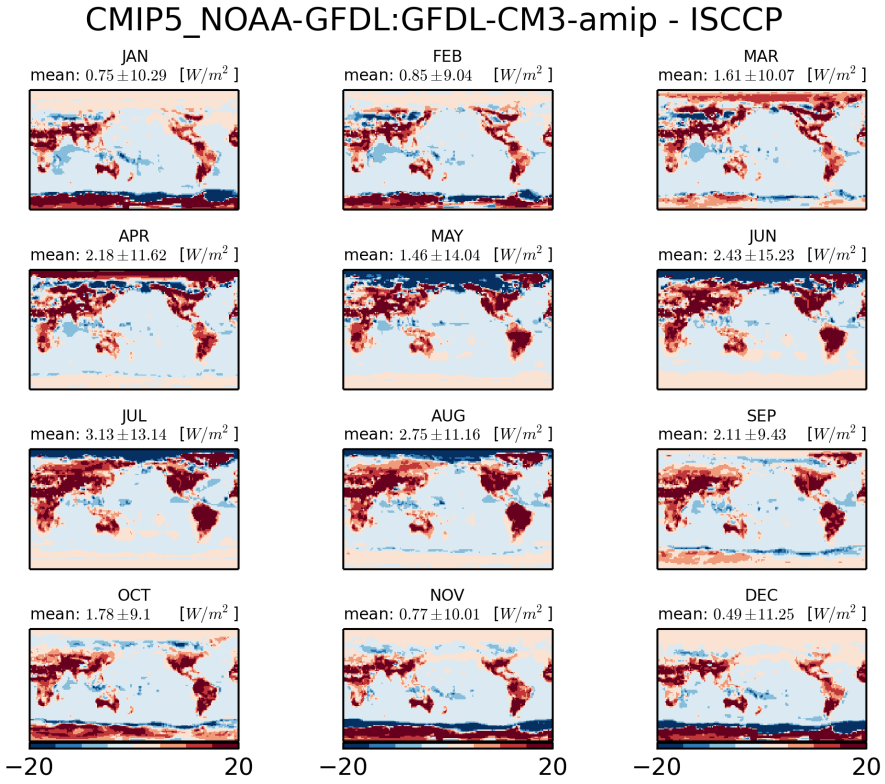



Figure 871: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and ISCCP

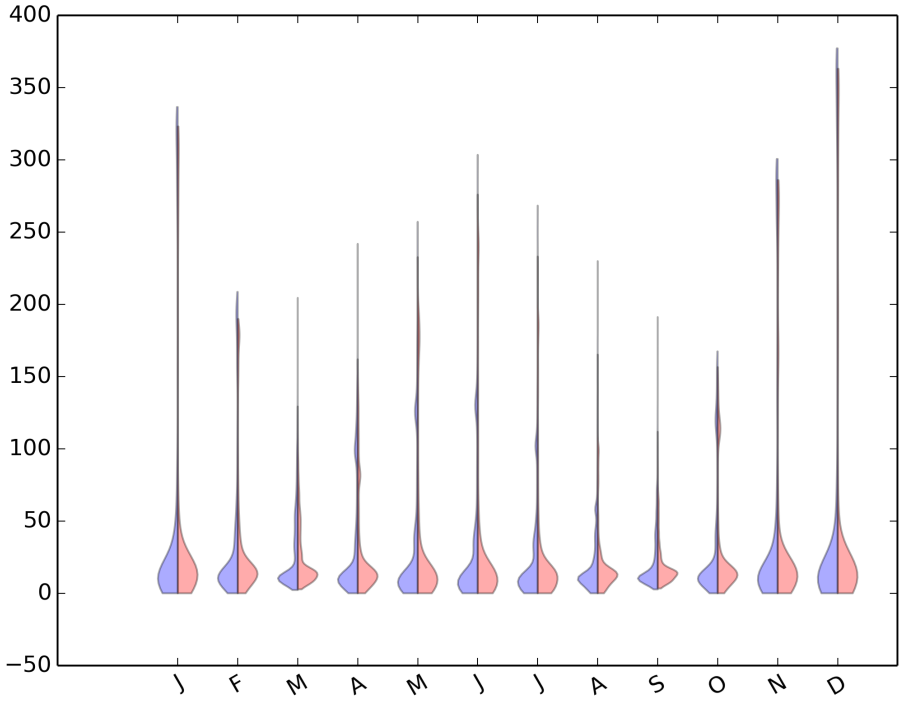



Figure 872: Violin plot for CMIP5-NOAA-GFDL:GFDL-CM3-AMIP

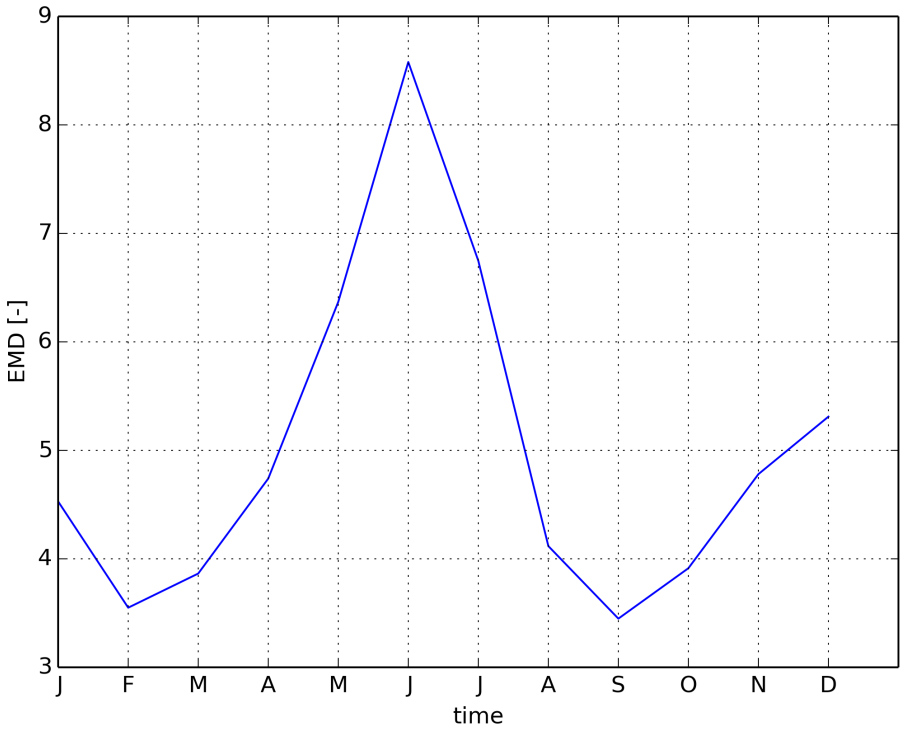



Figure 873: Timeseries of EMD

### 2.1.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

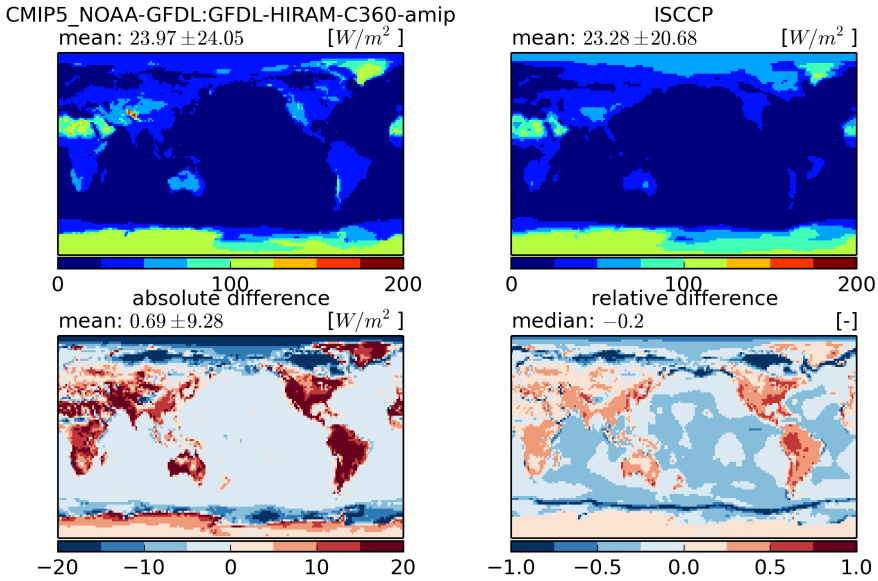



Figure 874: Temporal mean fields (top) and absolute and relative differences (bottom)

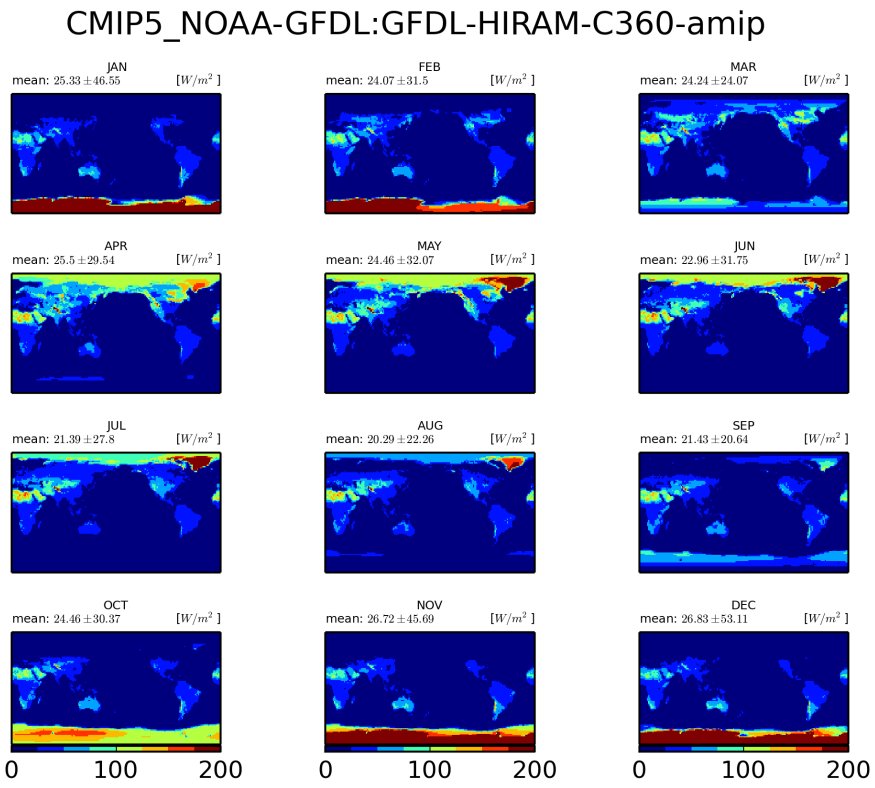



Figure 875: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

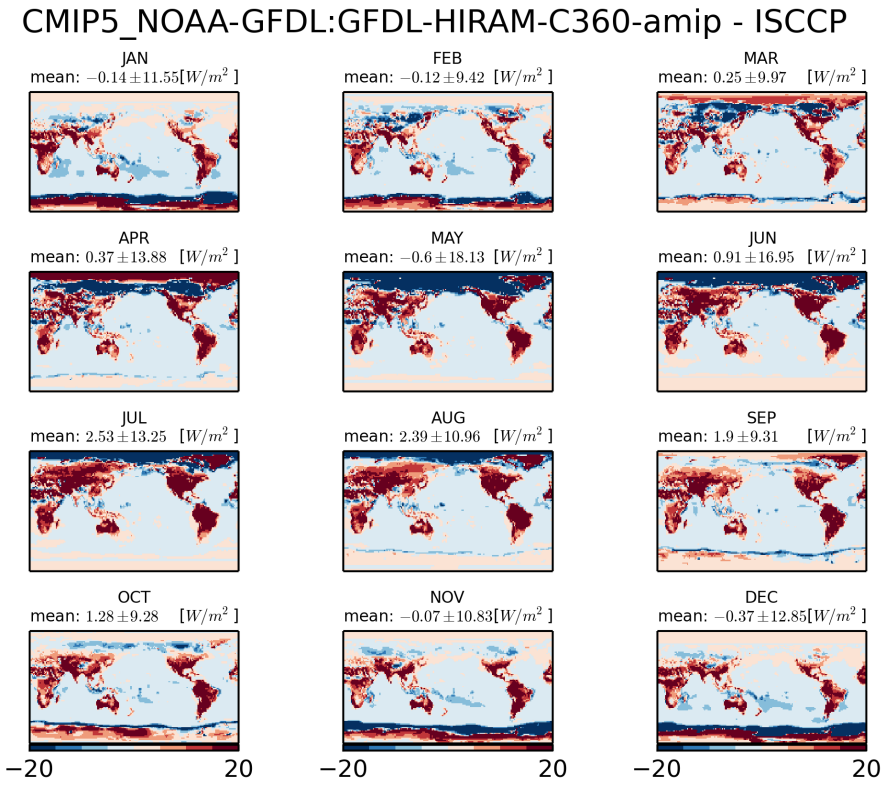



Figure 876: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and ISCCP

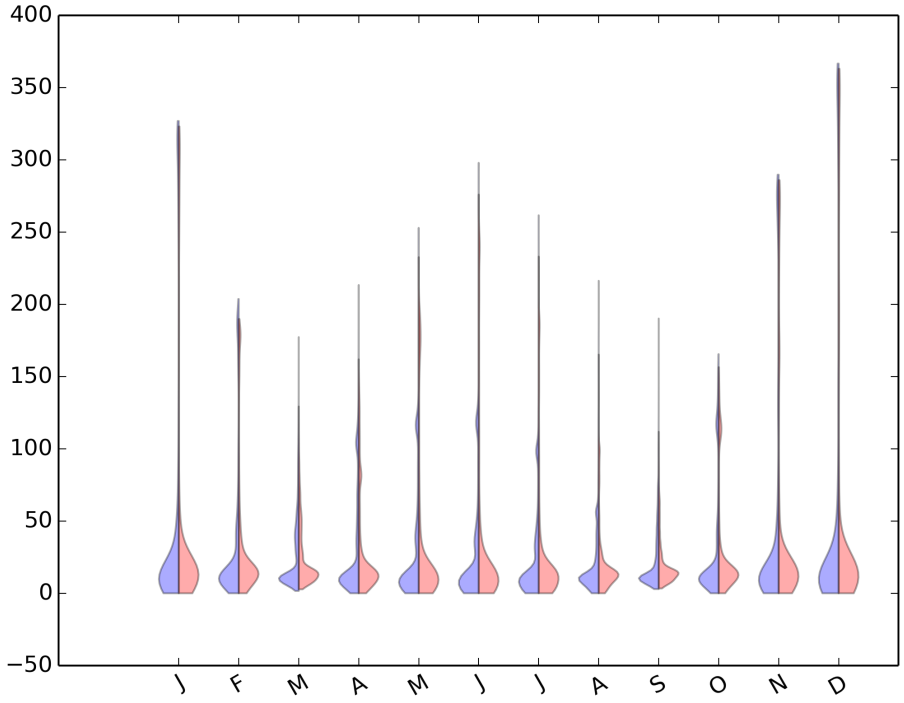



Figure 877: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-AMIP

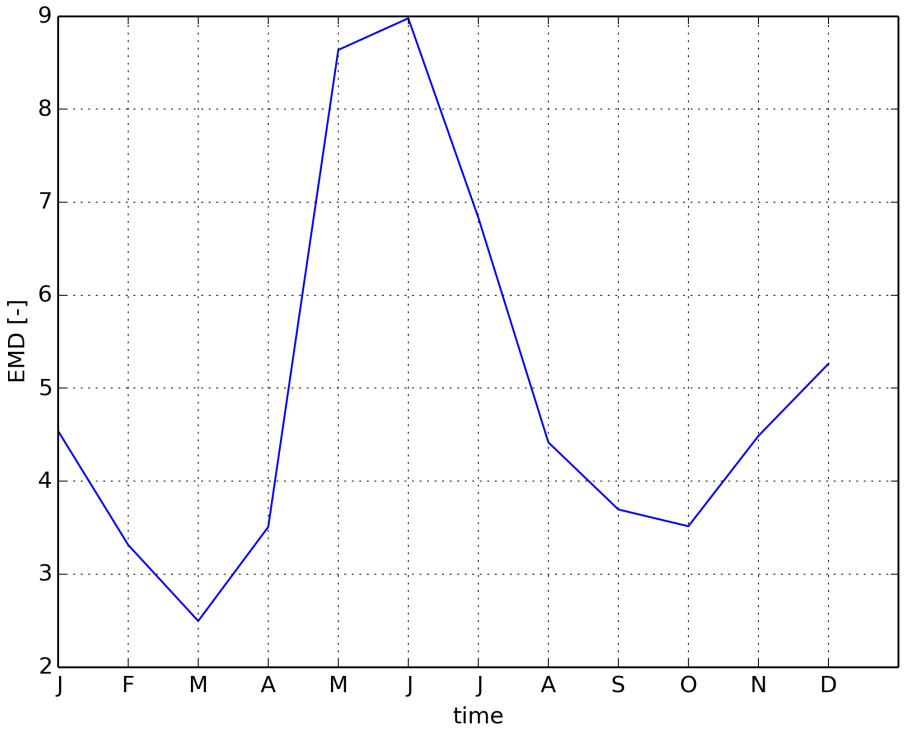



Figure 878: Timeseries of EMD

### 2.1.26 CMIP5 NCAR:CCSM4-amip

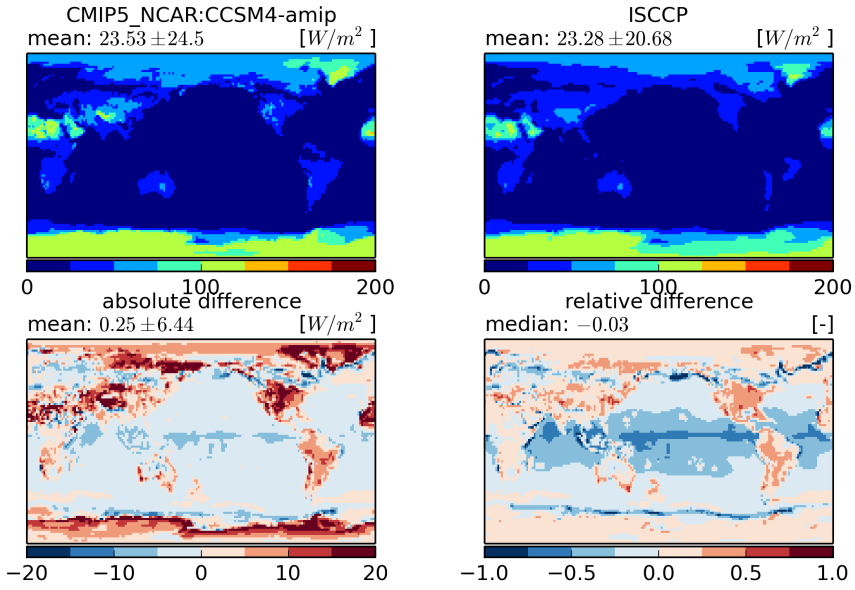



Figure 879: Temporal mean fields (top) and absolute and relative differences (bottom)

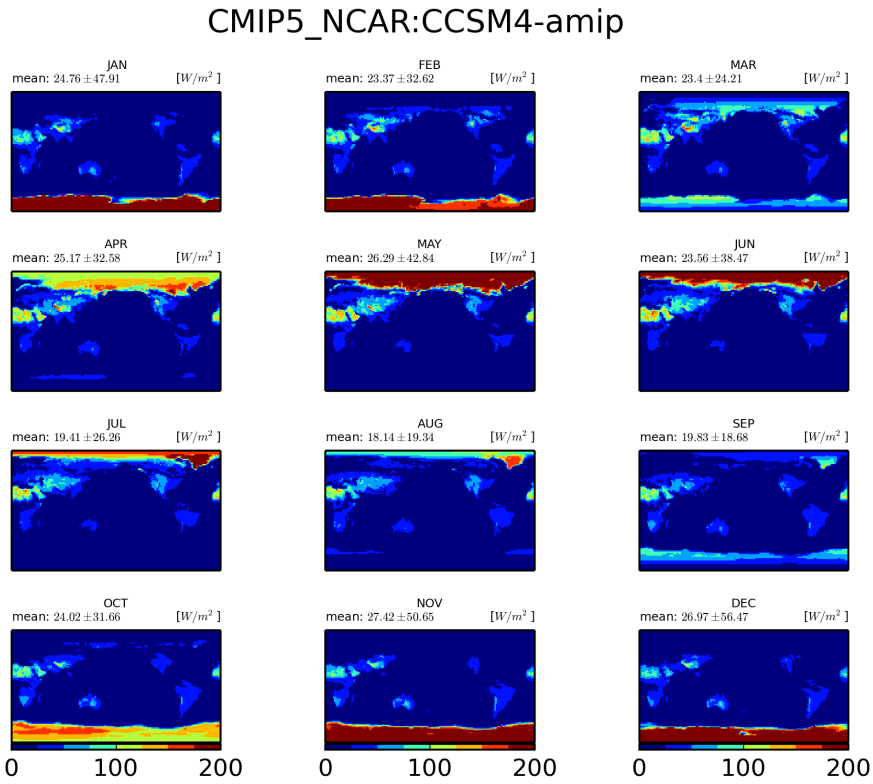



Figure 880: Monthly mean climatology for NCAR:CCSM4

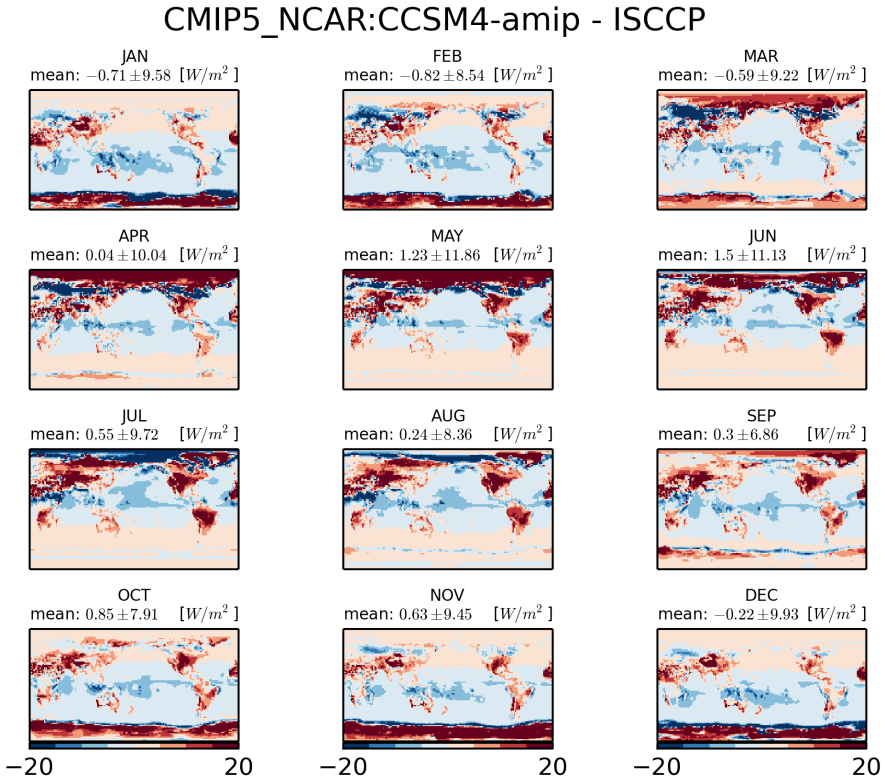



Figure 881: Monthly mean climatology of difference between NCAR:CCSM4 and ISCCP

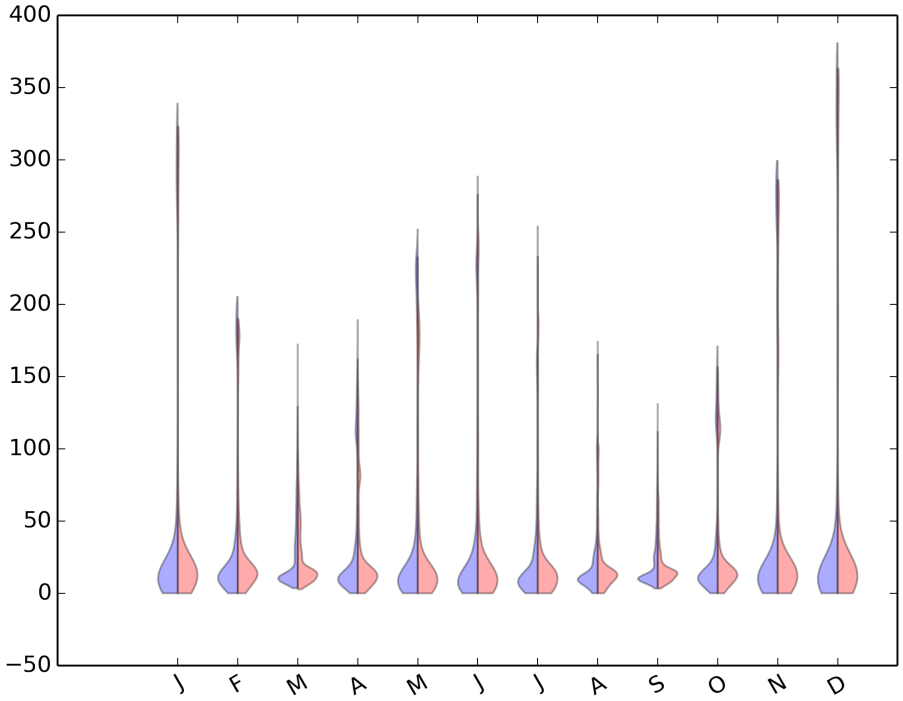



Figure 882: Violin plot for CMIP5-NCAR:CCSM4-AMIP

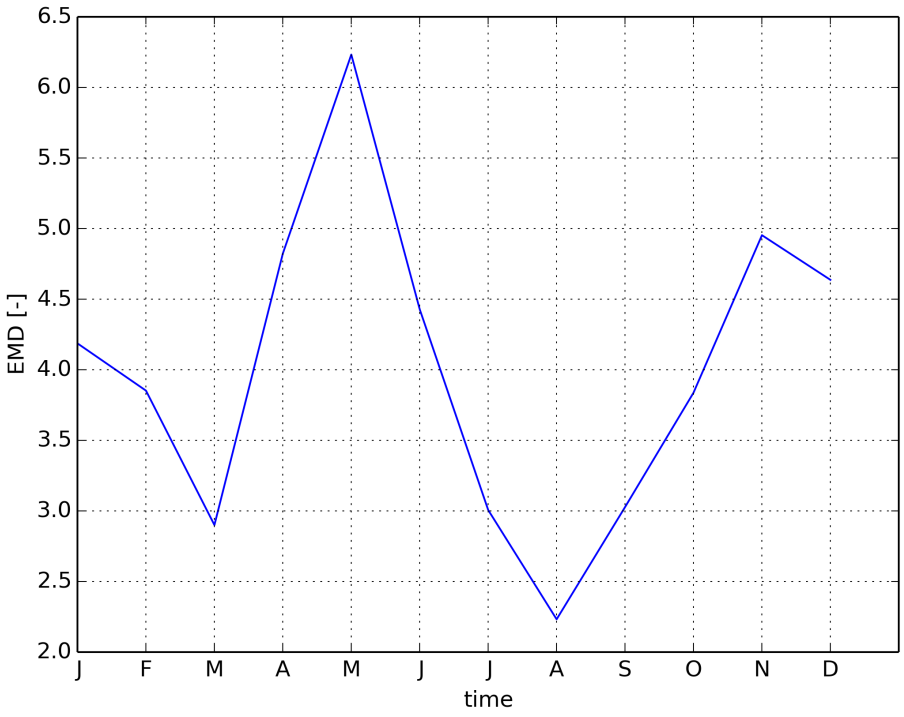



Figure 883: Timeseries of EMD

### 2.1.27 CMIP5 NCC:NorESM1-M-amip

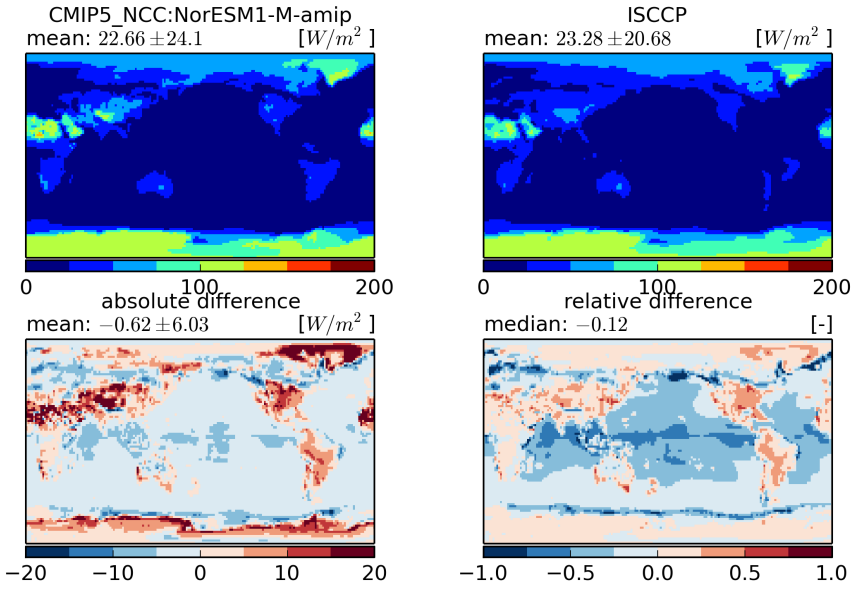



Figure 884: Temporal mean fields (top) and absolute and relative differences (bottom)

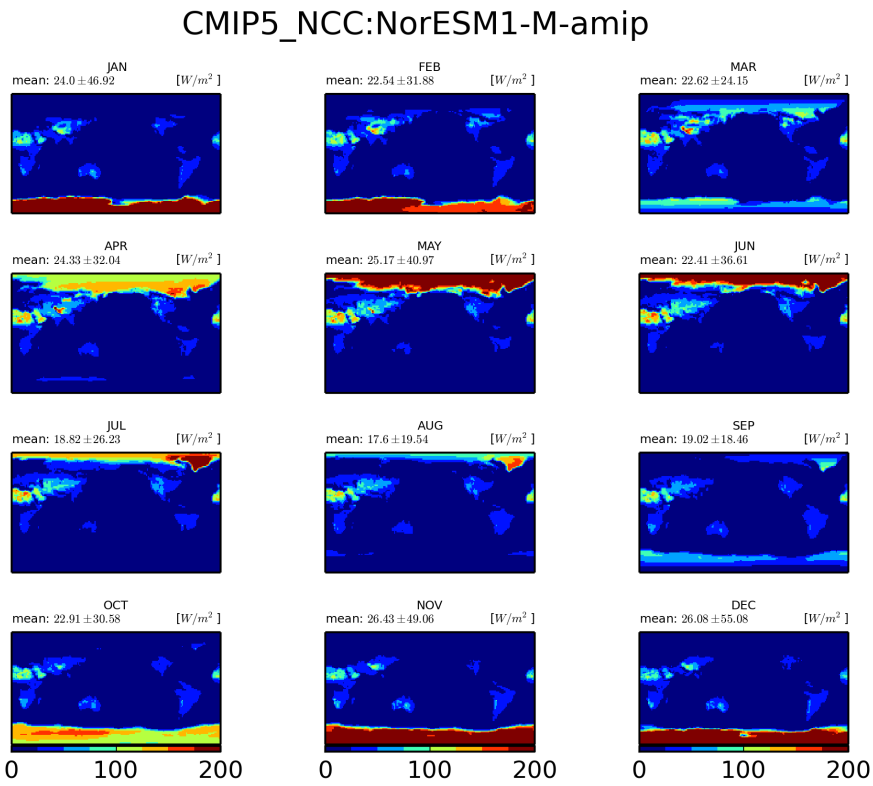



Figure 885: Monthly mean climatology for NCC:NorESM1-M

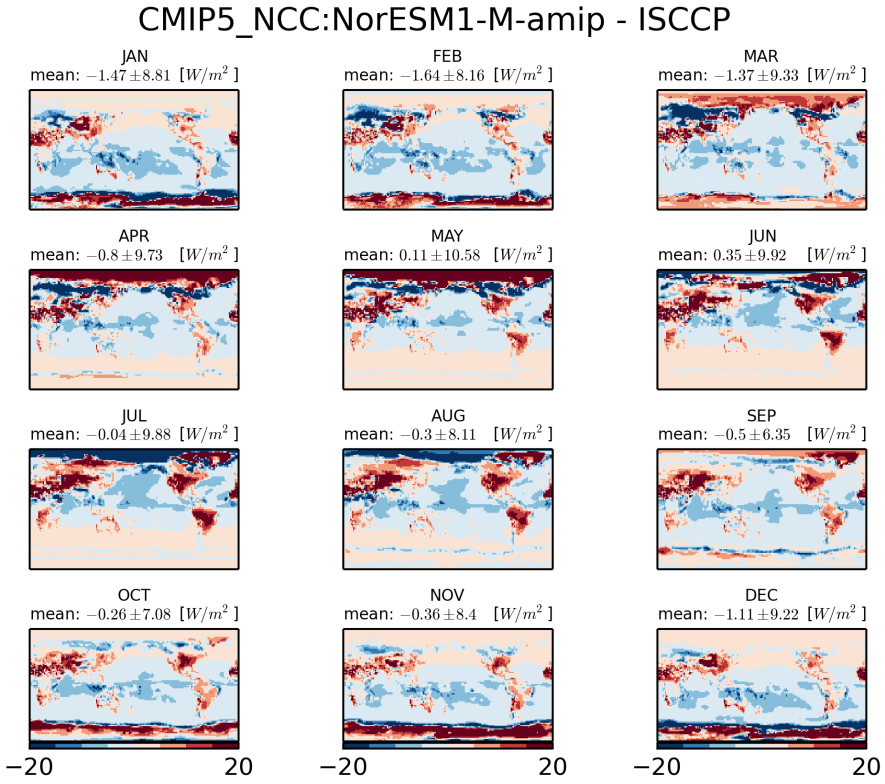



Figure 886: Monthly mean climatology of difference between NCC:NORESM1-M and ISCCP

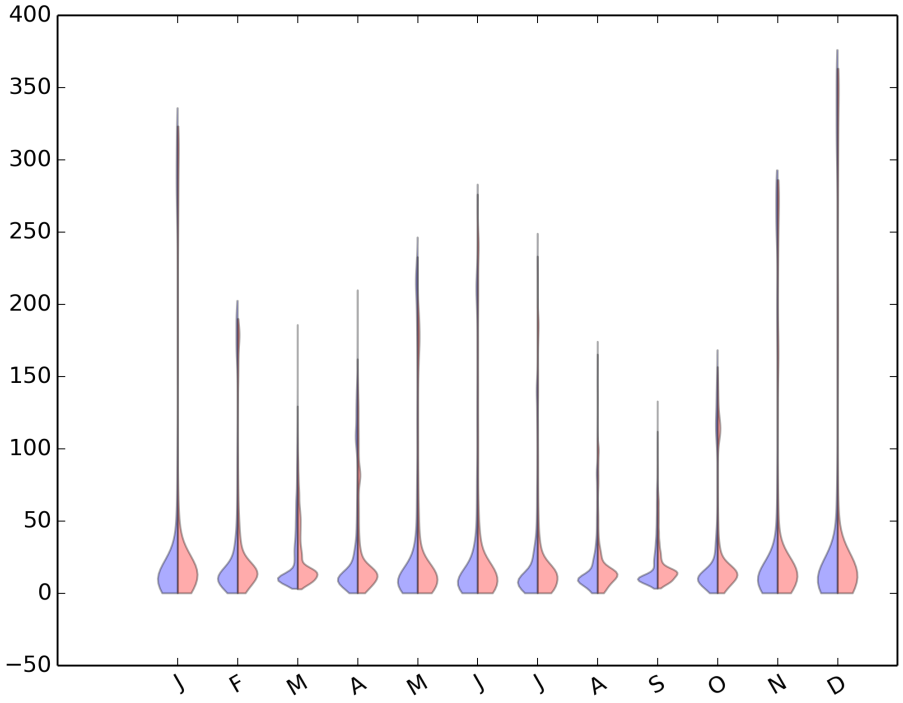



Figure 887: Violin plot for CMIP5-NCC:NORESM1-M-AMIP

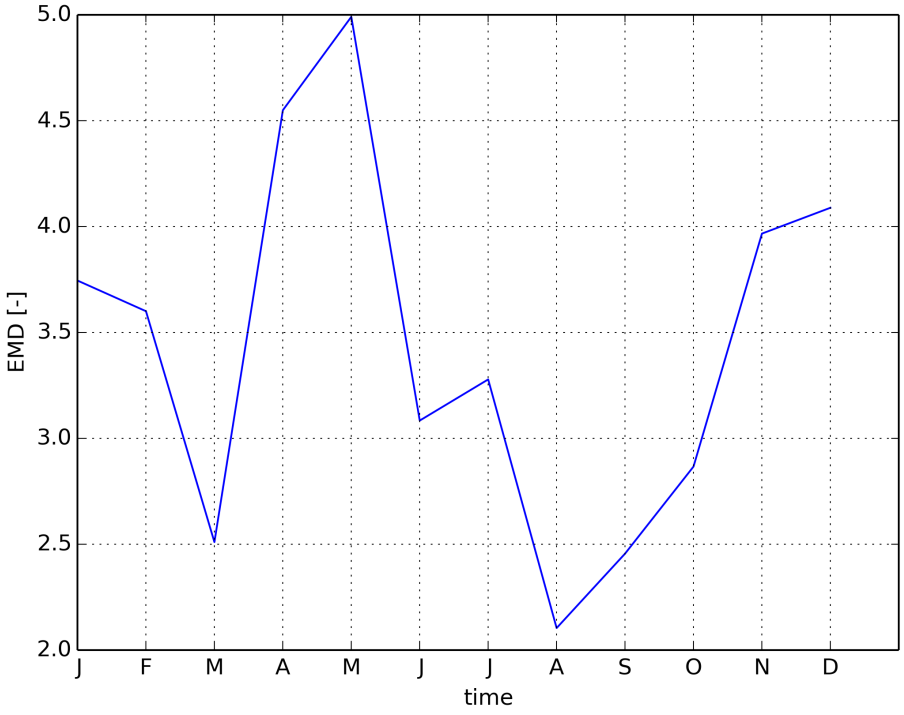



Figure 888: Timeseries of EMD

### 2.1.28 CMIP3 iap fgoals1 0 g-amip

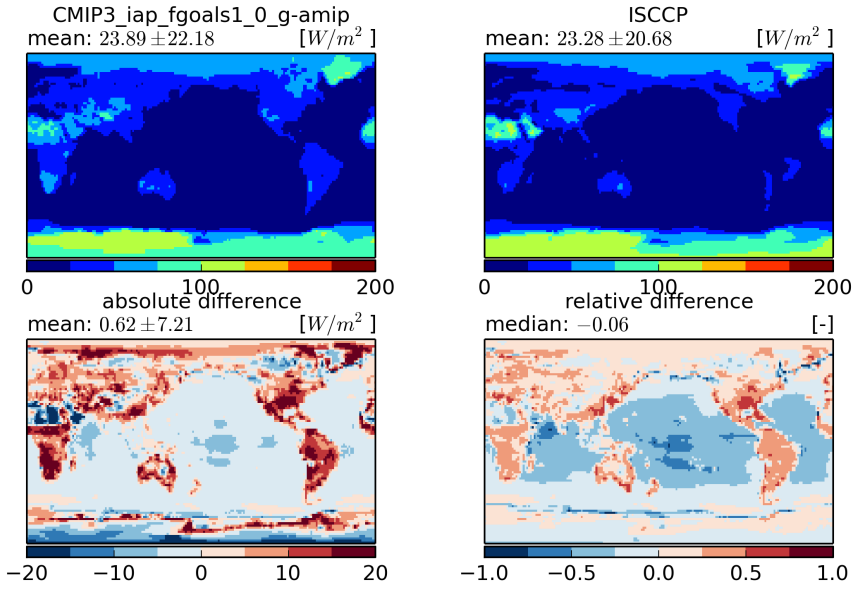



Figure 889: Temporal mean fields (top) and absolute and relative differences (bottom)

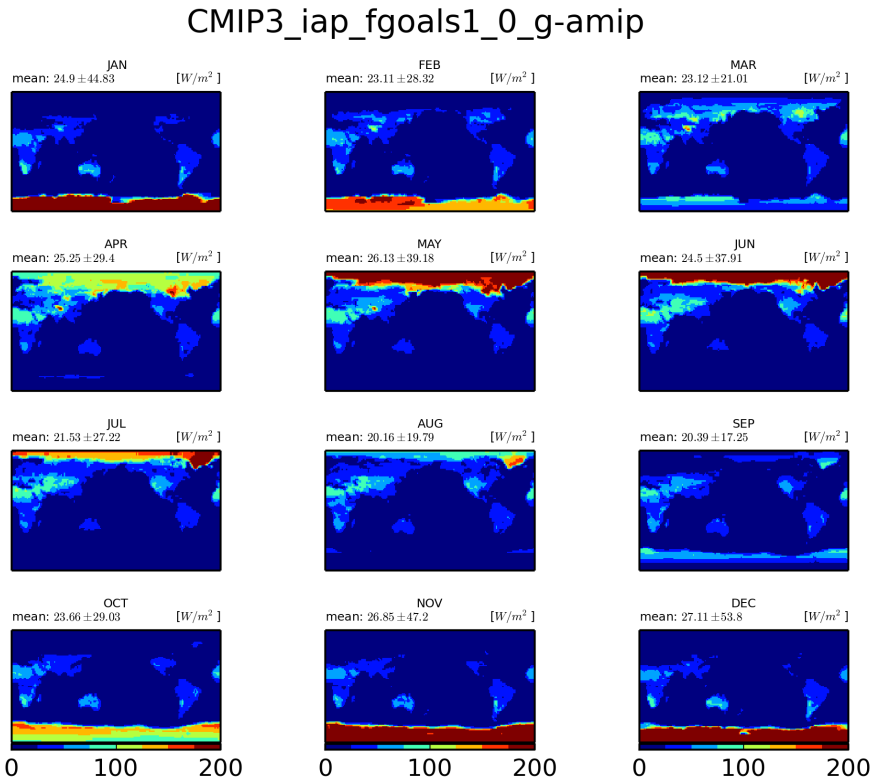



Figure 890: Monthly mean climatology for iap-fgoals1-0-g

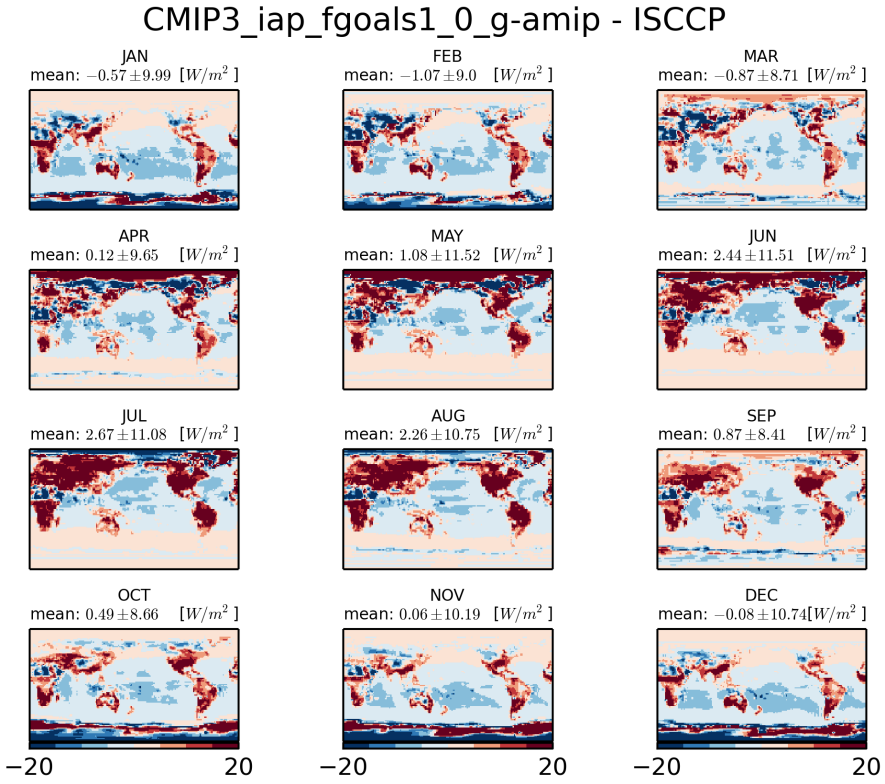



Figure 891: Monthly mean climatology of difference between IAP-FGOALS1-0-G and ISCCP

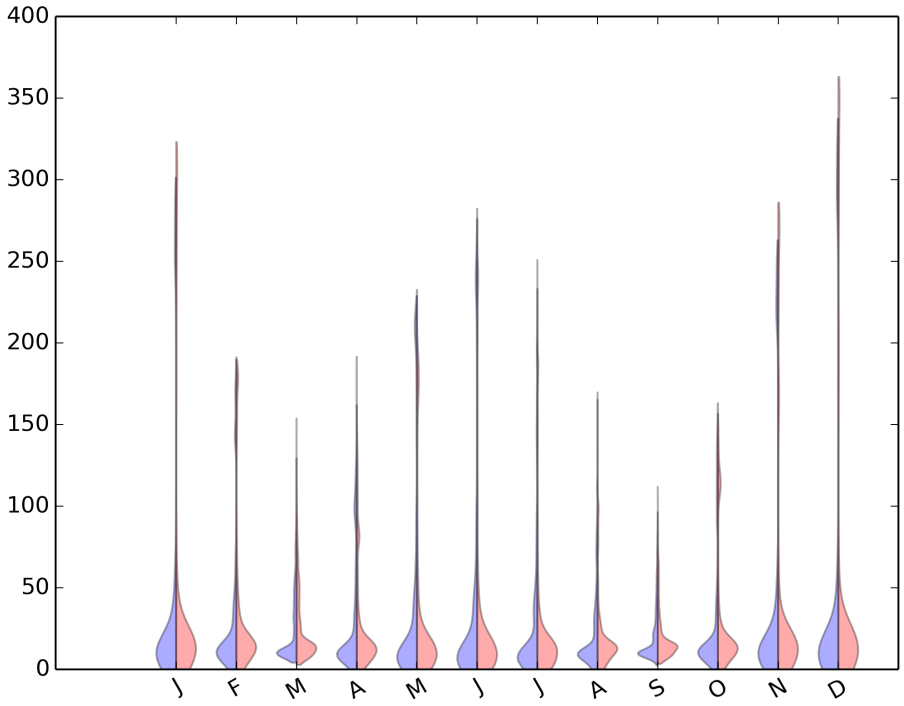



Figure 892: Violin plot for CMIP3-IAP-FGOALS1-0-G-AMIP

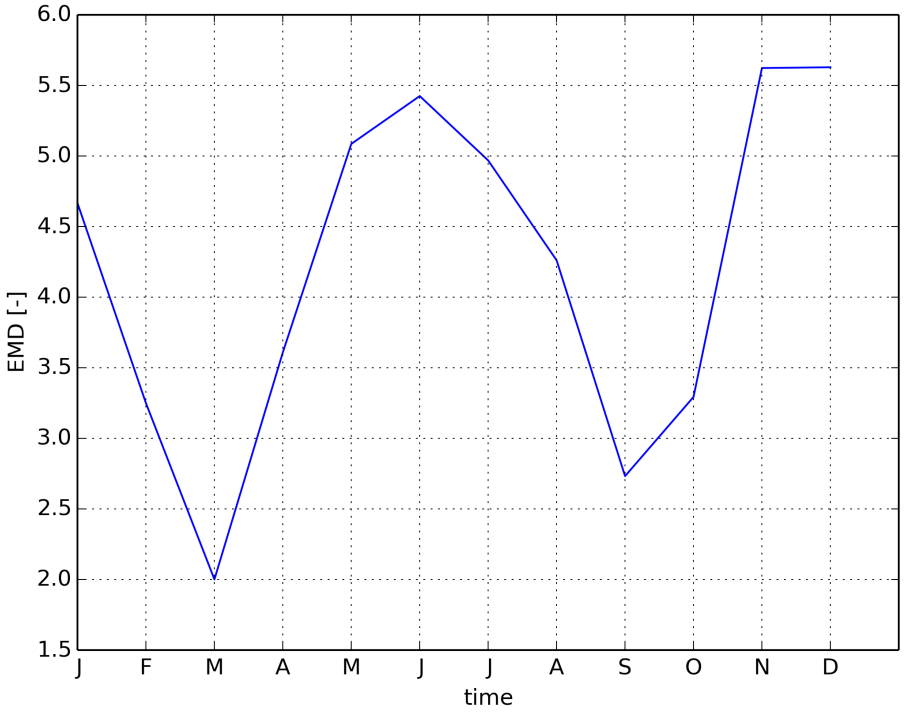



Figure 893: Timeseries of EMD

### 2.1.29 CMIP3 inmcm3 0-amip

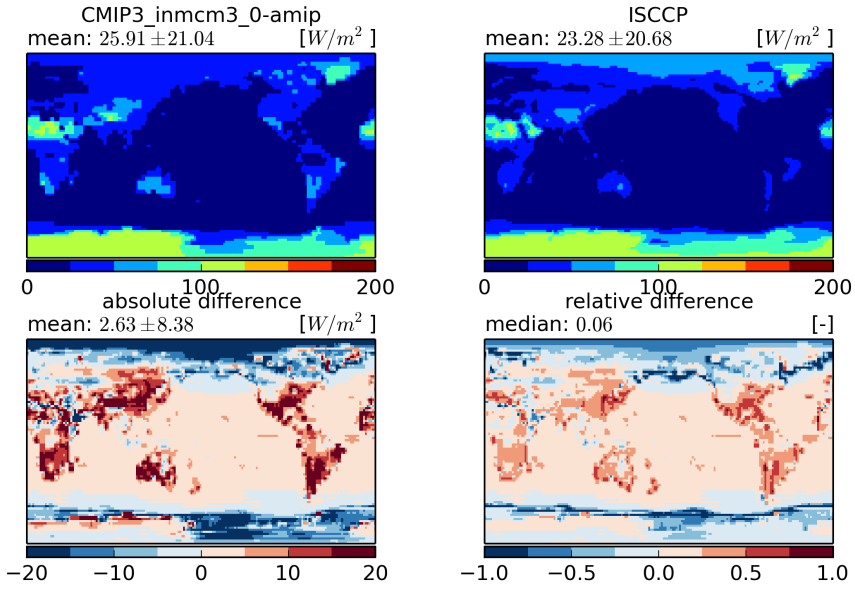



Figure 894: Temporal mean fields (top) and absolute and relative differences (bottom)

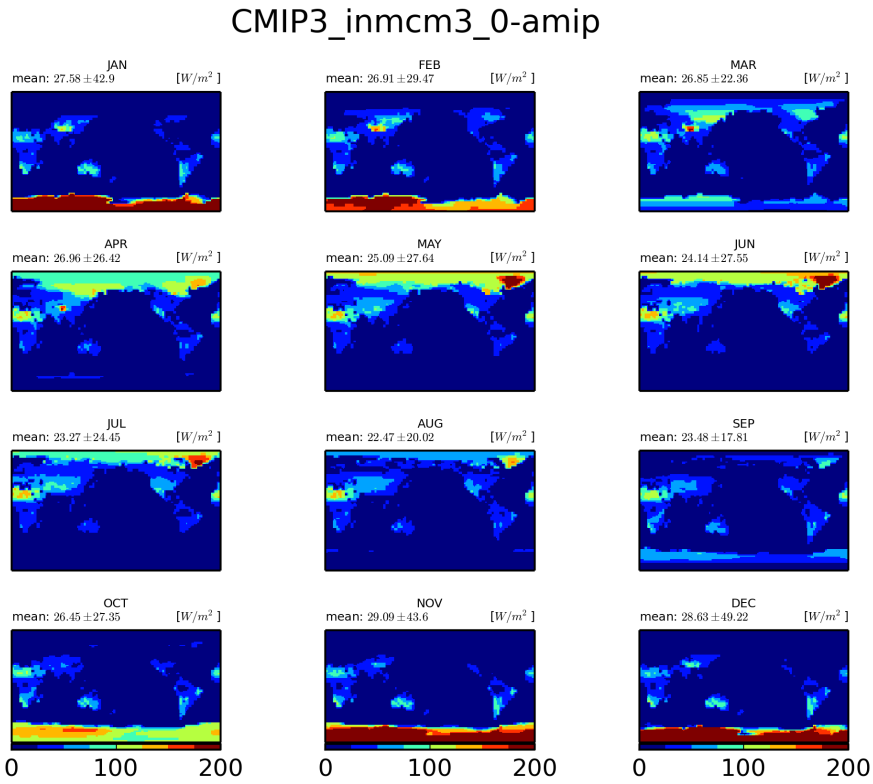



Figure 895: Monthly mean climatology for inmcm3-0

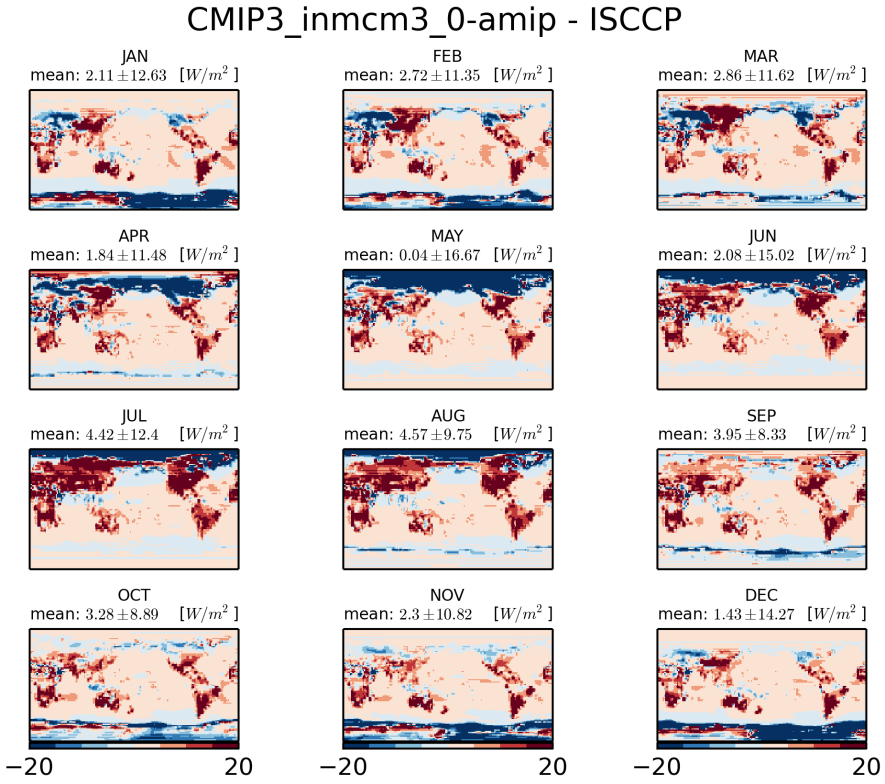



Figure 896: Monthly mean climatology of difference between INMCM3-0 and ISCCP

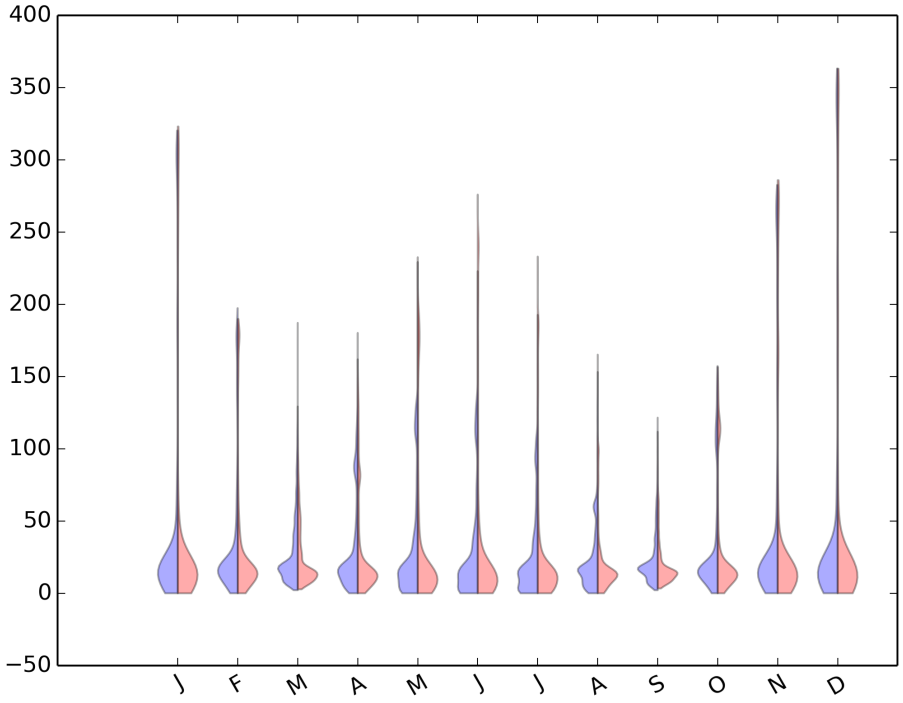



Figure 897: Violin plot for CMIP3-INMCM3-0-AMIP

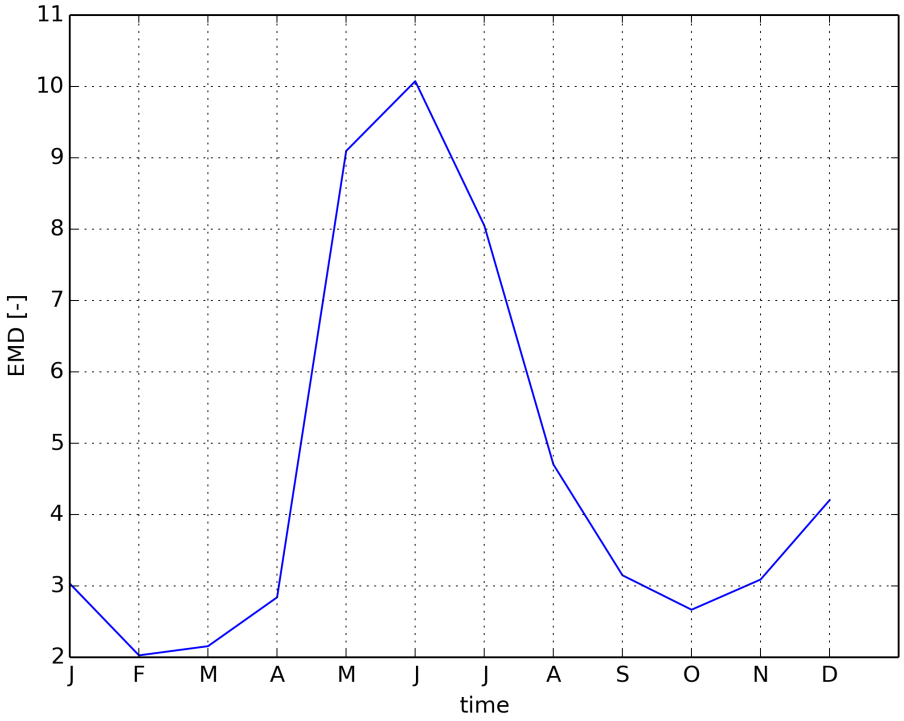



Figure 898: Timeseries of EMD

### 2.1.30 CMIP3 ipsl cm4-amip

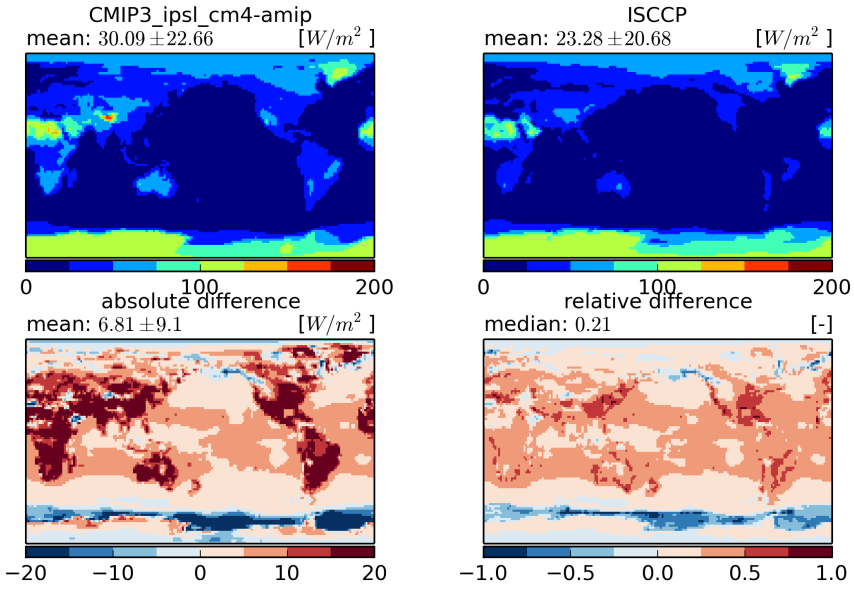



Figure 899: Temporal mean fields (top) and absolute and relative differences (bottom)

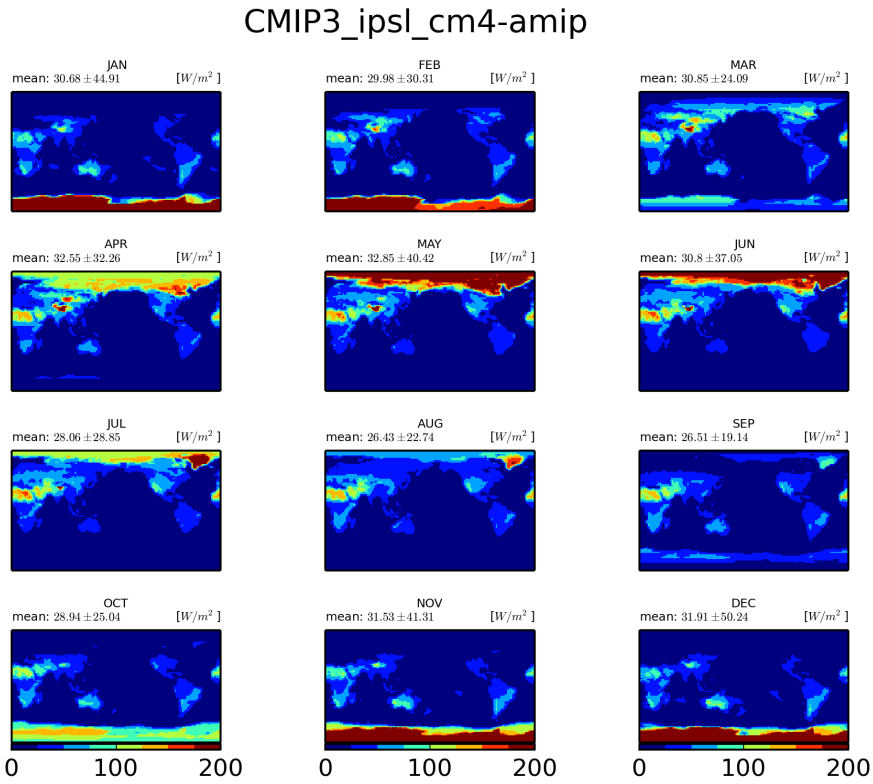



Figure 900: Monthly mean climatology for ipsl-cm4

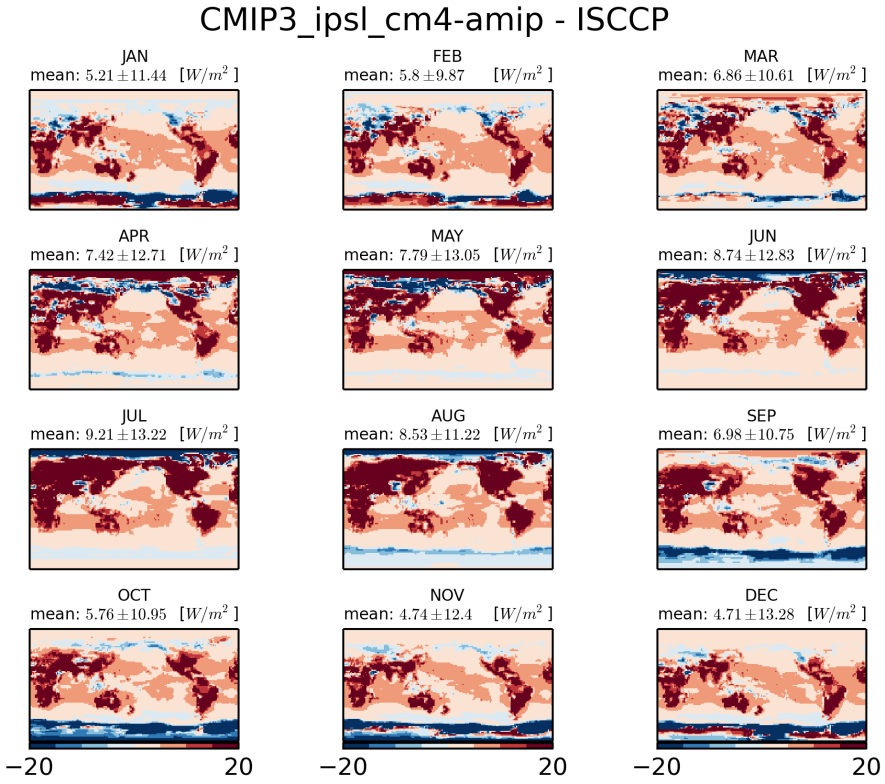



Figure 901: Monthly mean climatology of difference between IPSL-CM4 and ISCCP

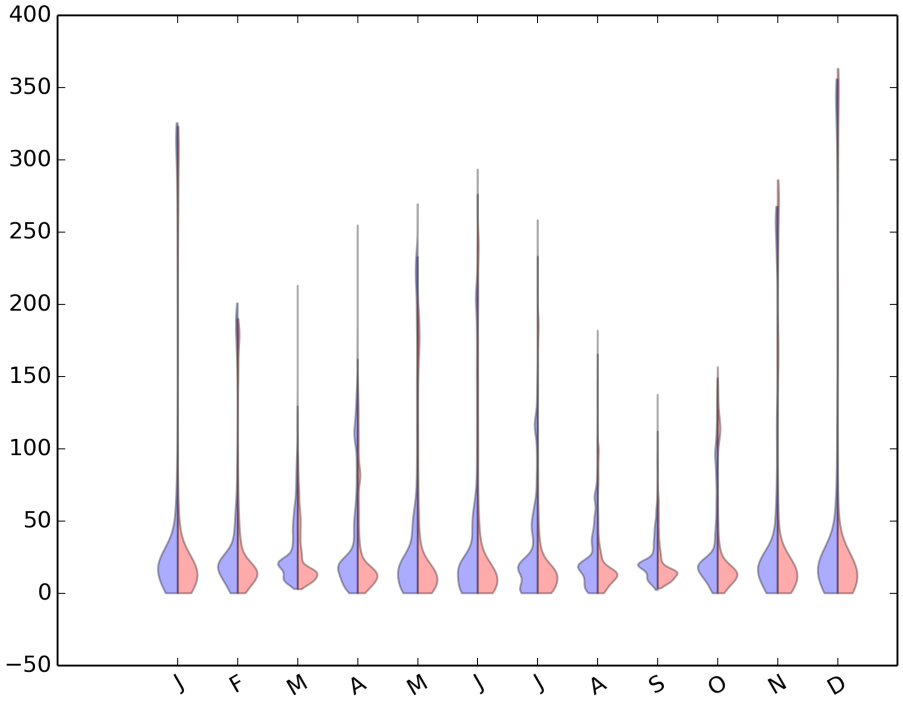



Figure 902: Violin plot for CMIP3-IPSL-CM4-AMIP

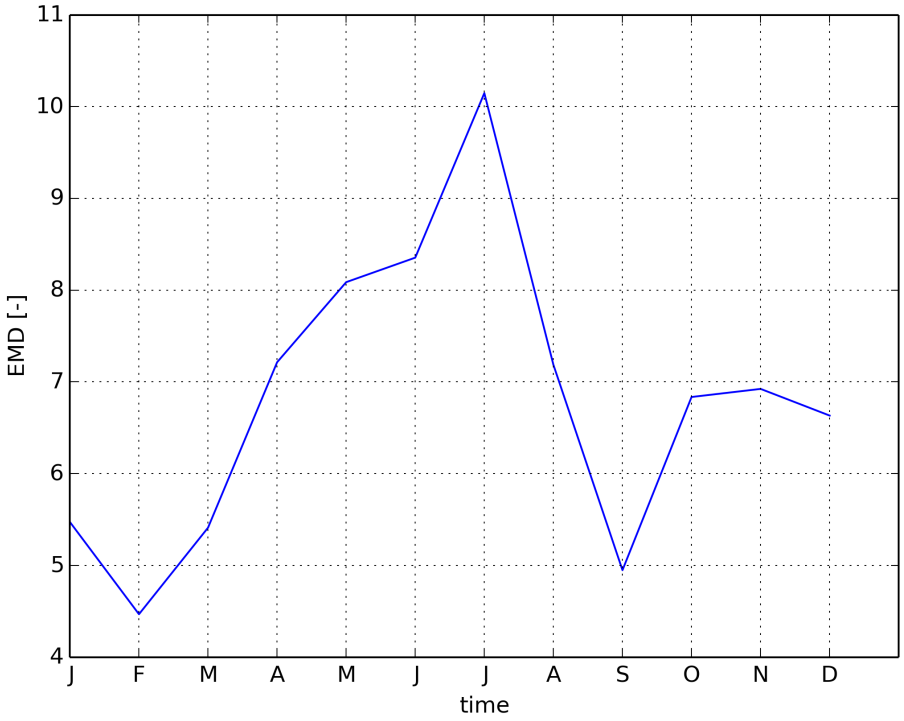



Figure 903: Timeseries of EMD

### 2.1.31 CMIP3 miroc3 2 hires-amip

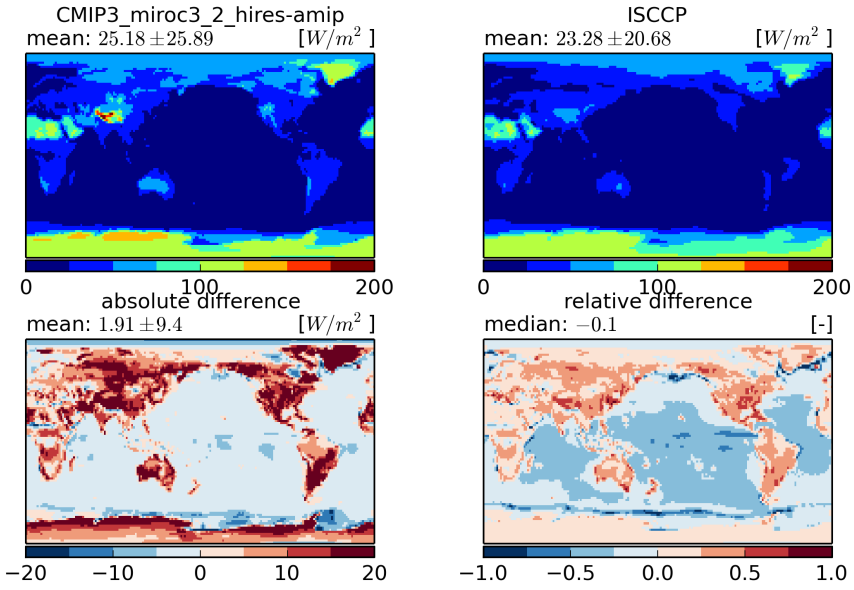



Figure 904: Temporal mean fields (top) and absolute and relative differences (bottom)

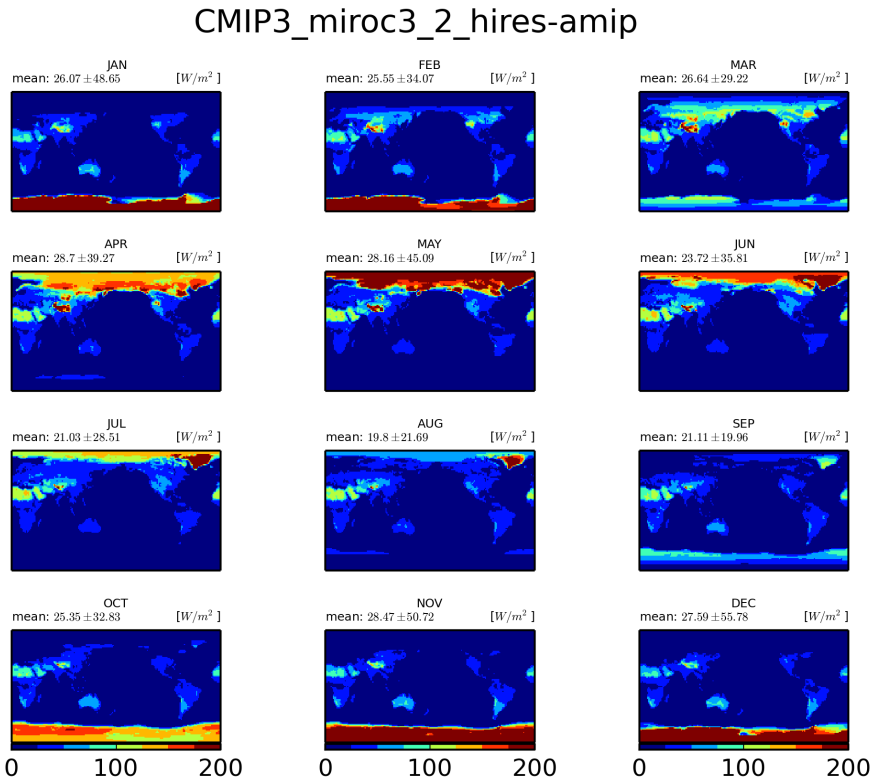



Figure 905: Monthly mean climatology for miroc3-2-hires

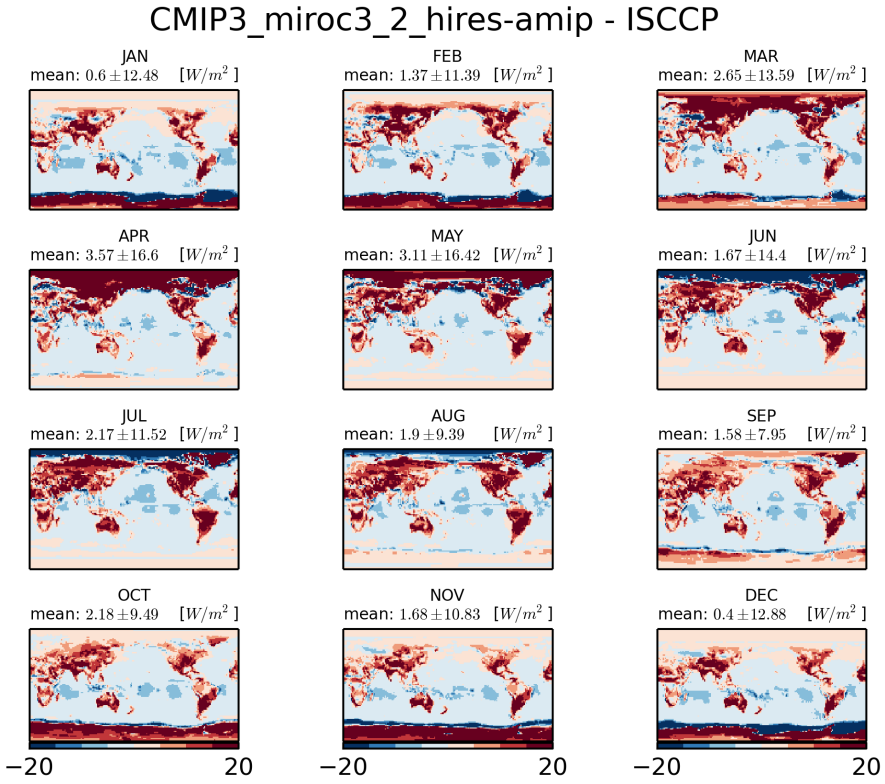



Figure 906: Monthly mean climatology of difference between MIROC3-2-HIRES and ISCCP

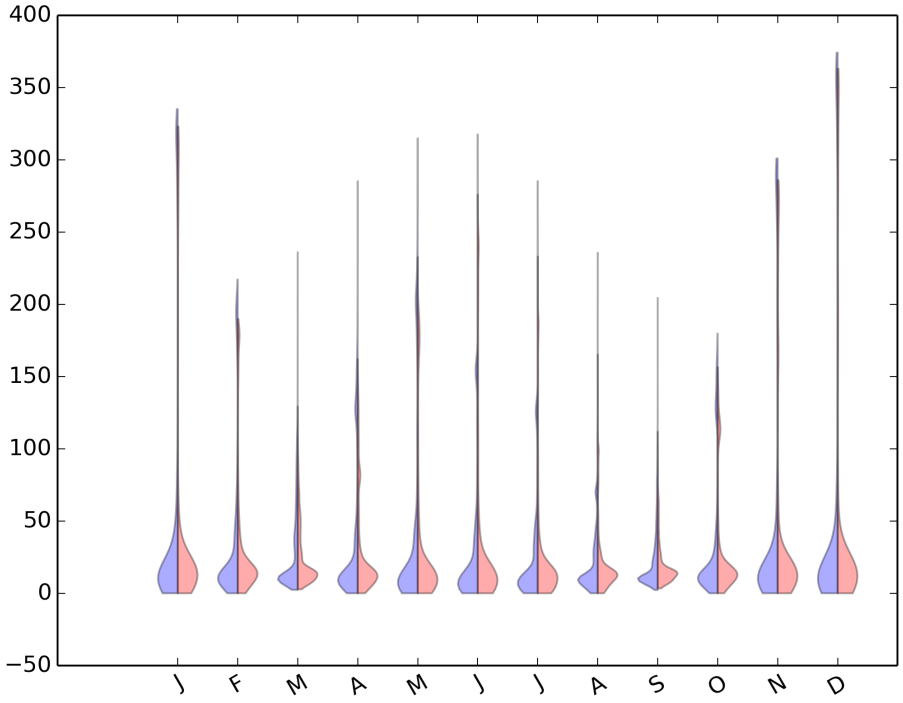



Figure 907: Violin plot for CMIP3-MIROC3-2-HIRES-AMIP

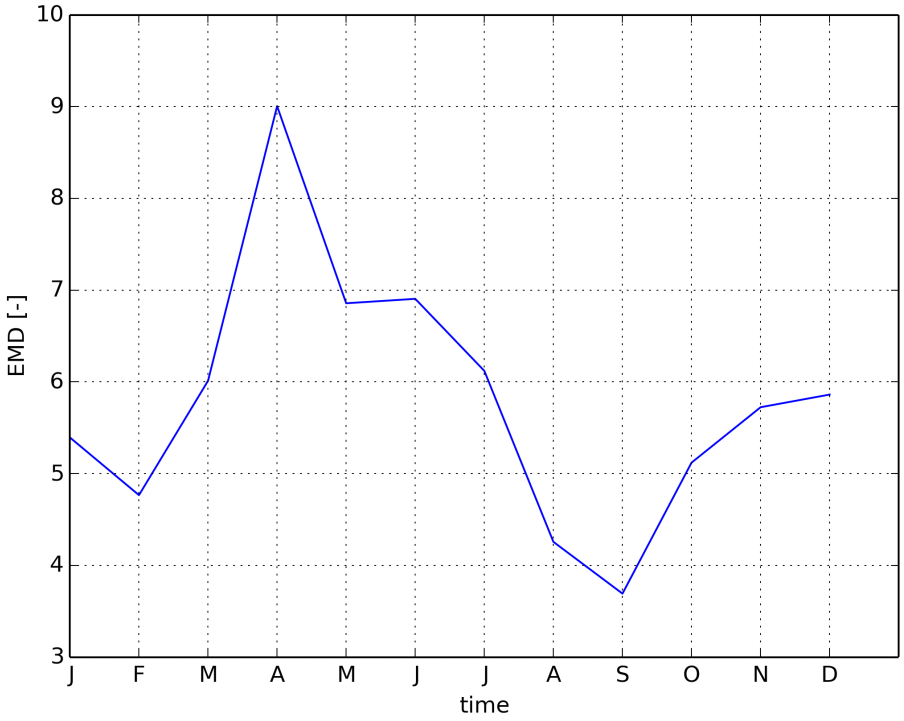



Figure 908: Timeseries of EMD

### 2.1.32 CMIP3 miroc3 2 medres-amip

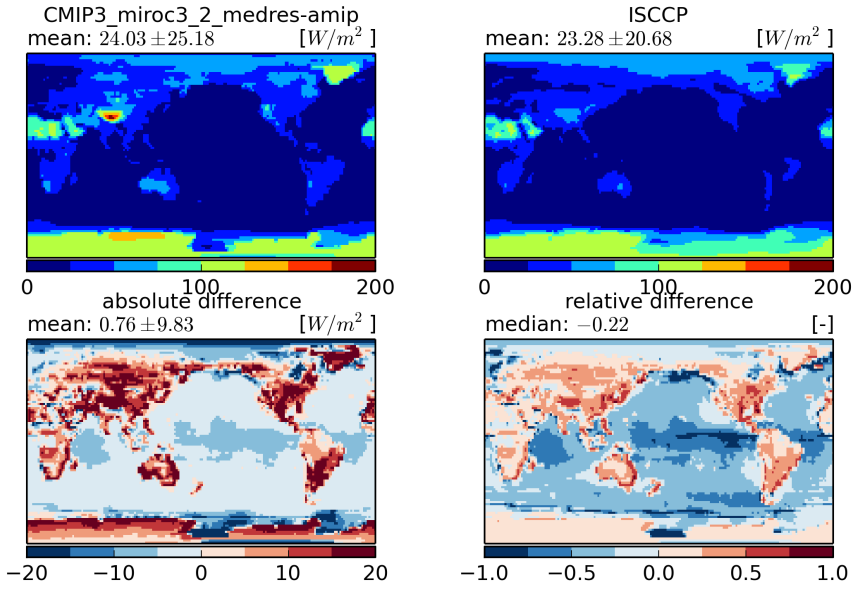



Figure 909: Temporal mean fields (top) and absolute and relative differences (bottom)

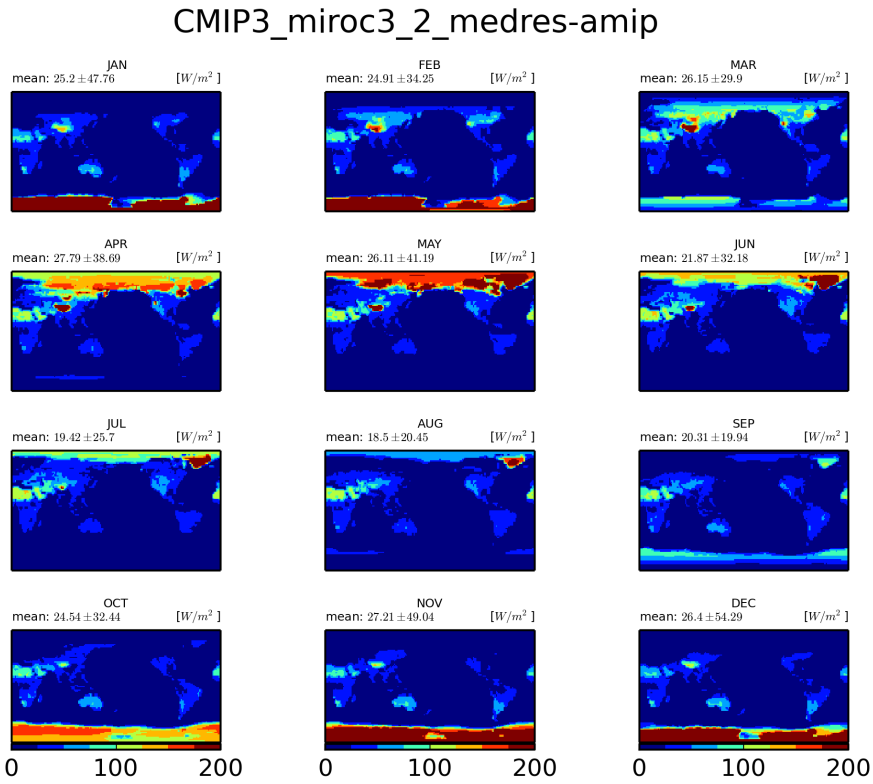



Figure 910: Monthly mean climatology for miroc3-2-medres

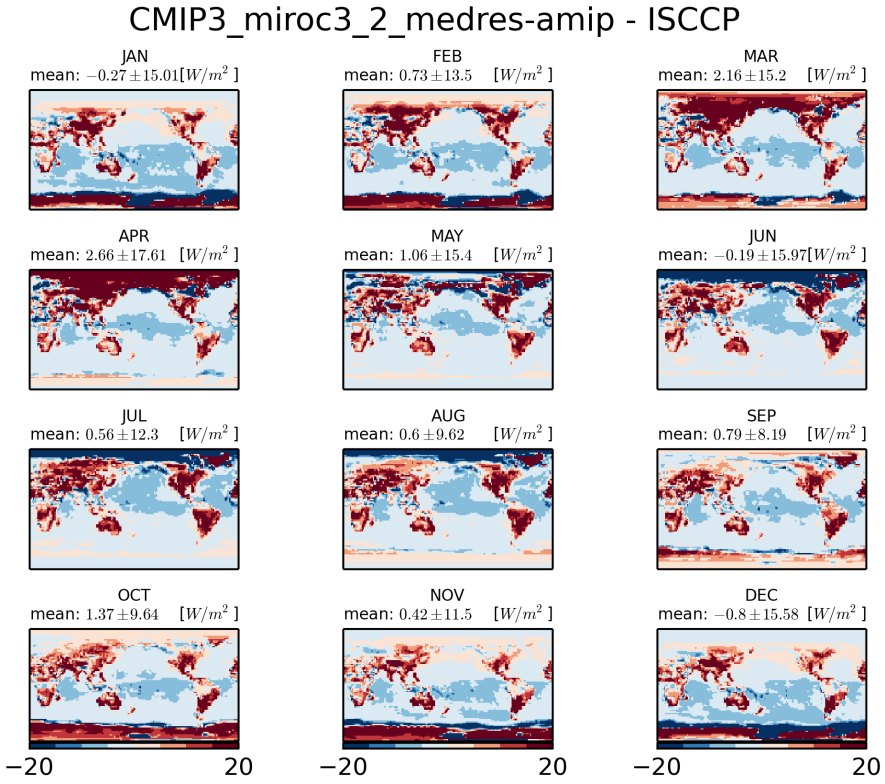



Figure 911: Monthly mean climatology of difference between MIROC3-2-MEDRES and ISCCP

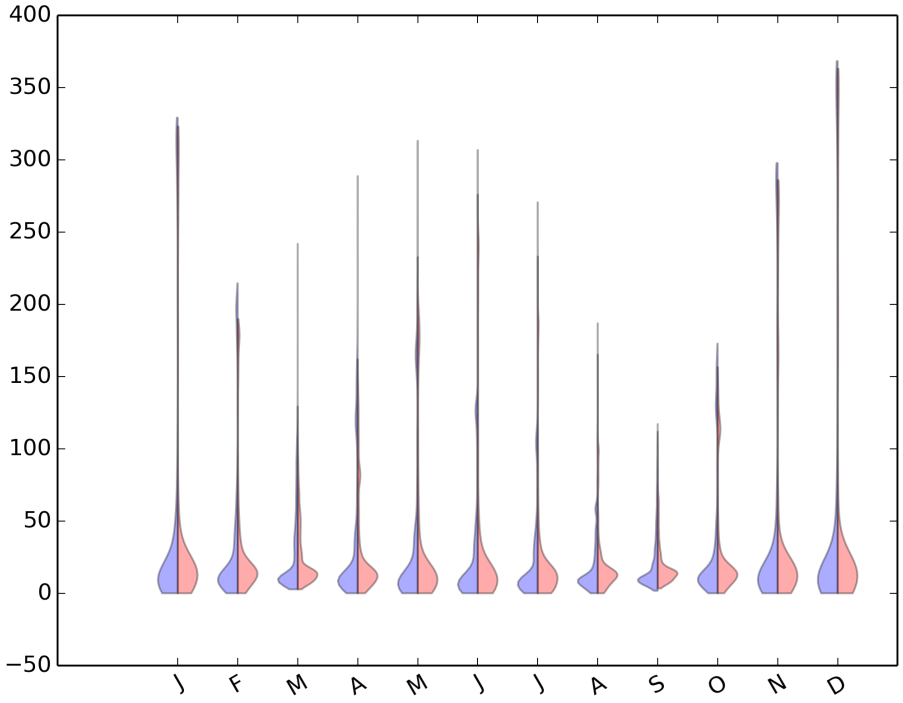



Figure 912: Violin plot for CMIP3-MIROC3-2-MEDRES-AMIP

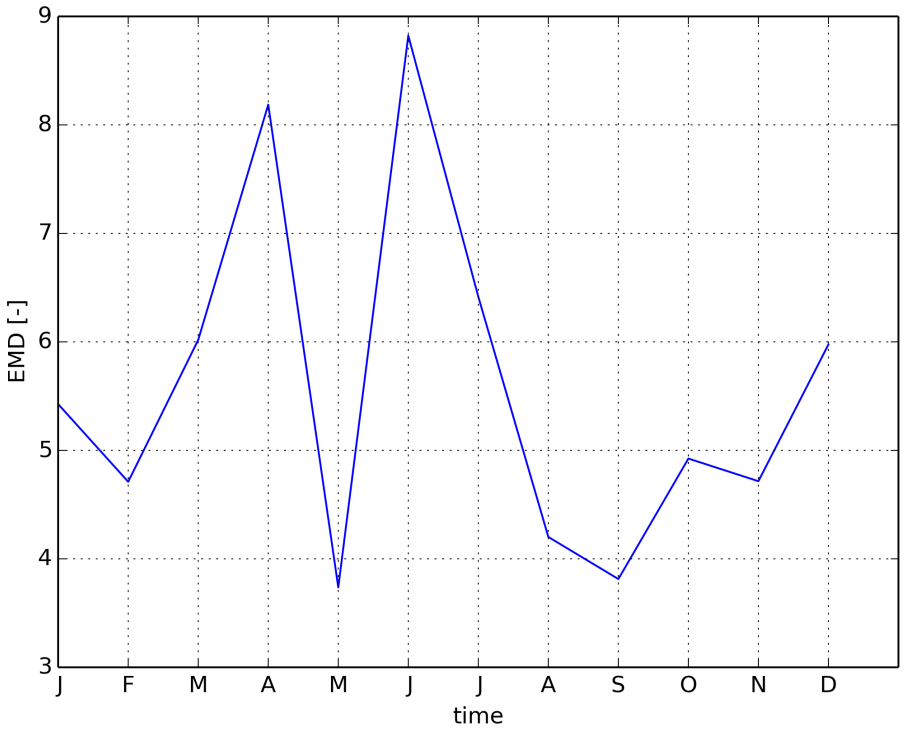



Figure 913: Timeseries of EMD

### 2.1.33 CMIP3 mpi echam5-amip

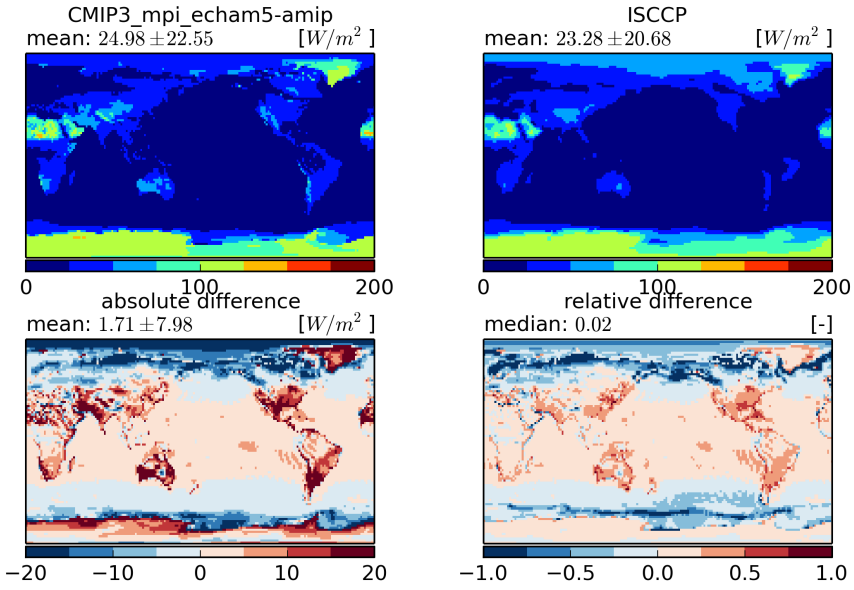



Figure 914: Temporal mean fields (top) and absolute and relative differences (bottom)

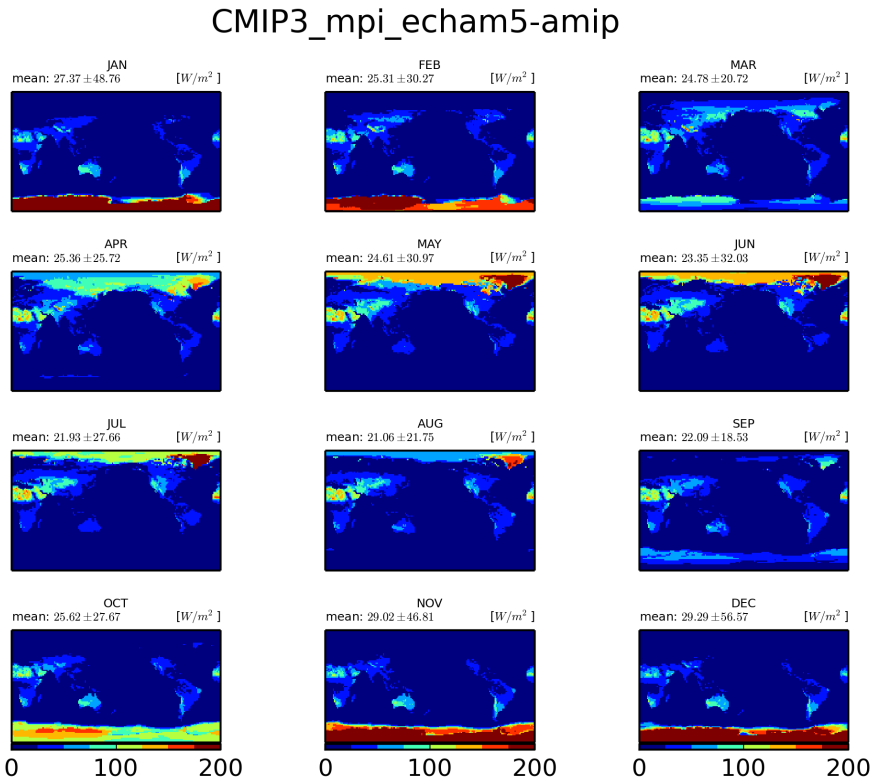



Figure 915: Monthly mean climatology for mpi-echam5

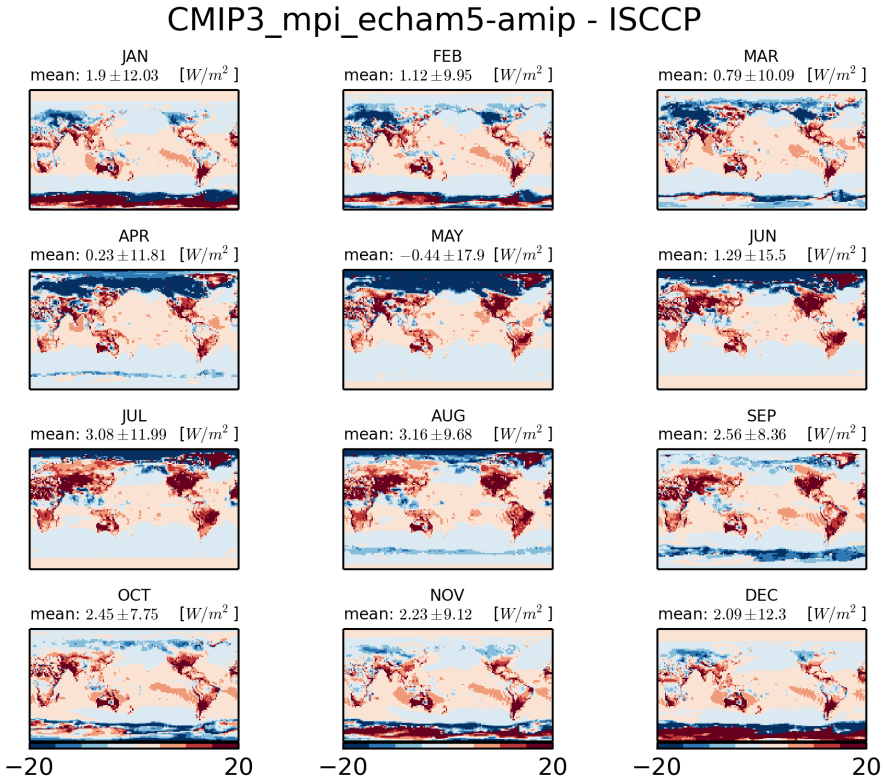



Figure 916: Monthly mean climatology of difference between MPI-ECHAM5 and ISCCP

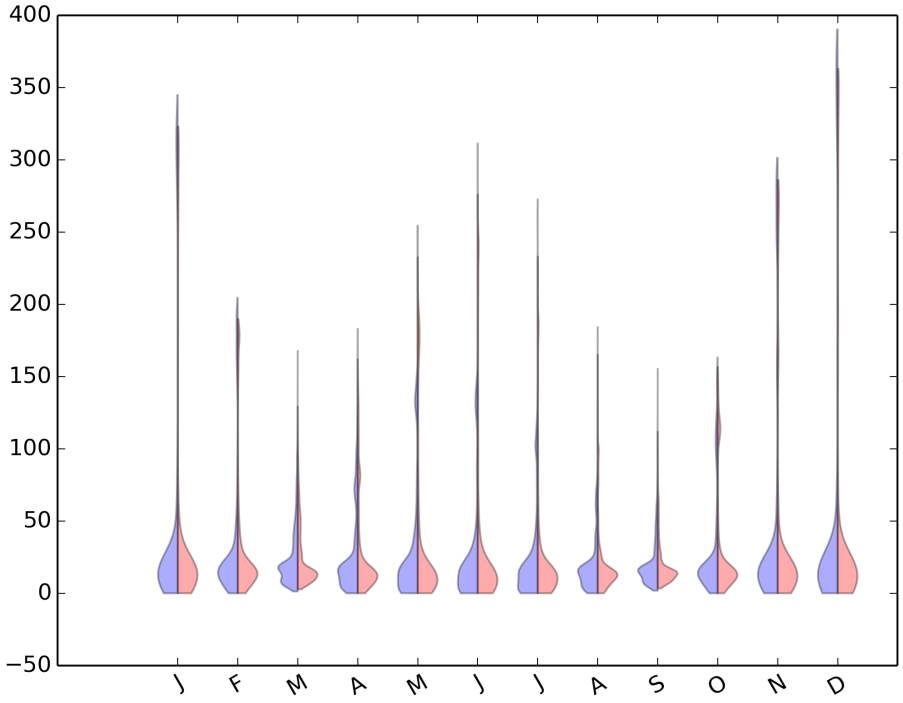



Figure 917: Violin plot for CMIP3-MPI-ECHAM5-AMIP

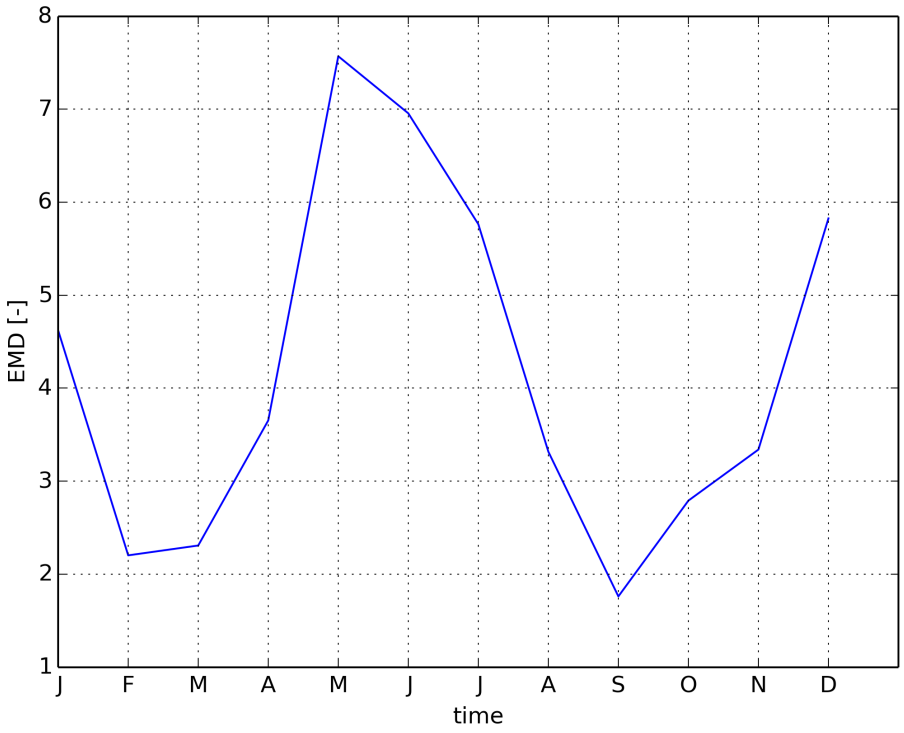



Figure 918: Timeseries of EMD

### 2.1.34 CMIP3 ncar ccsm3 0-amip

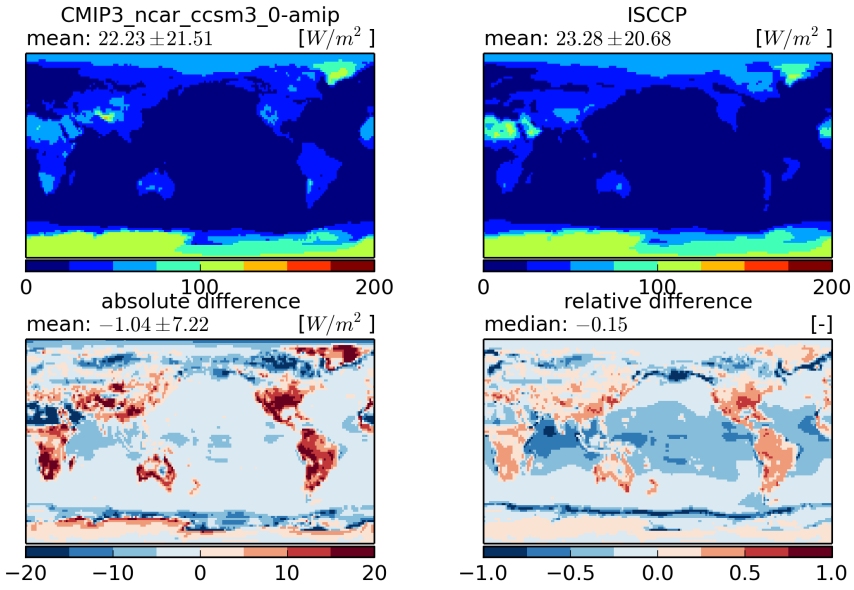



Figure 919: Temporal mean fields (top) and absolute and relative differences (bottom)

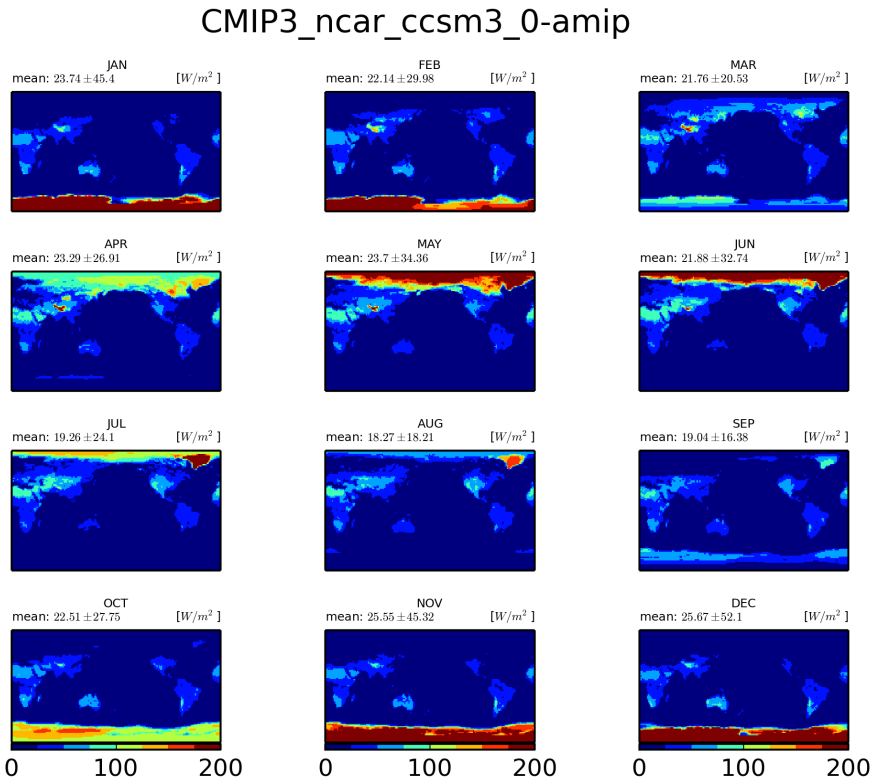



Figure 920: Monthly mean climatology for ncar-ccsm3-0

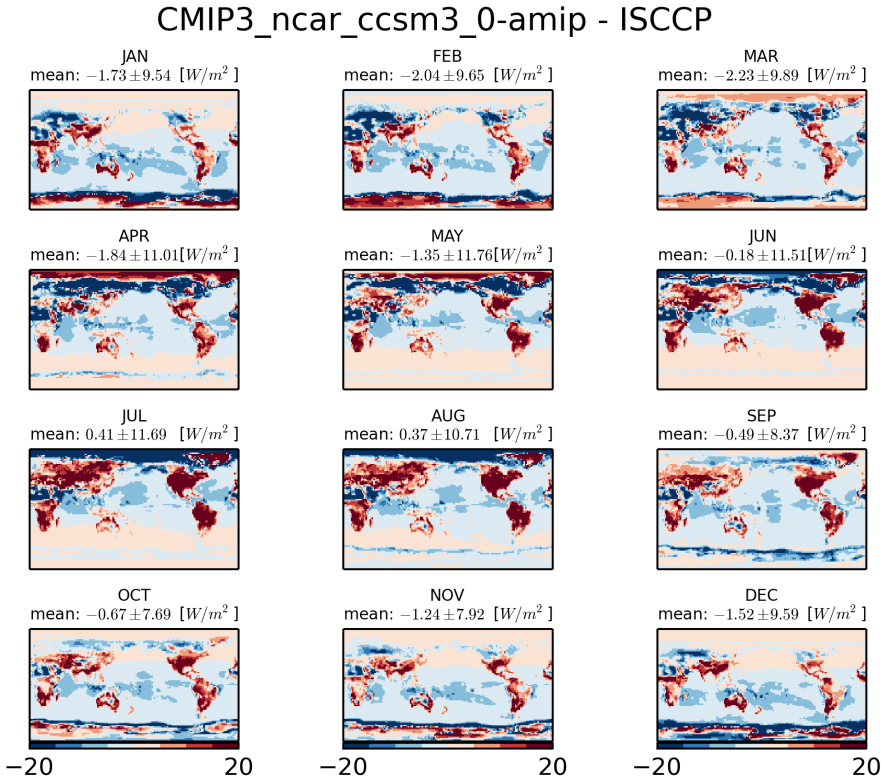



Figure 921: Monthly mean climatology of difference between NCAR-CCSM3-0 and ISCCP

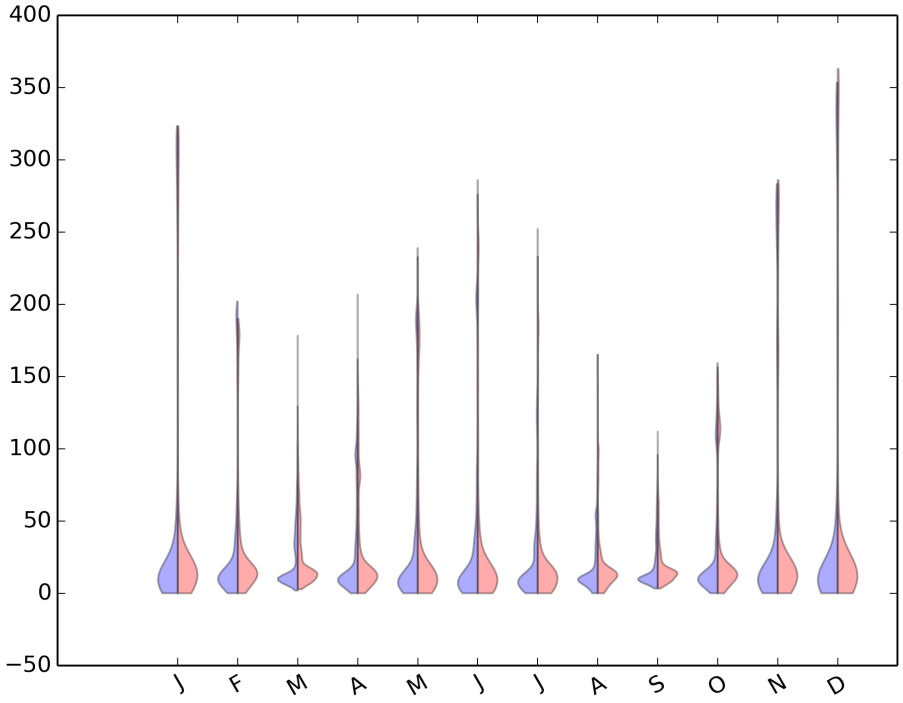



Figure 922: Violin plot for CMIP3-NCAR-CCSM3-0-AMIP

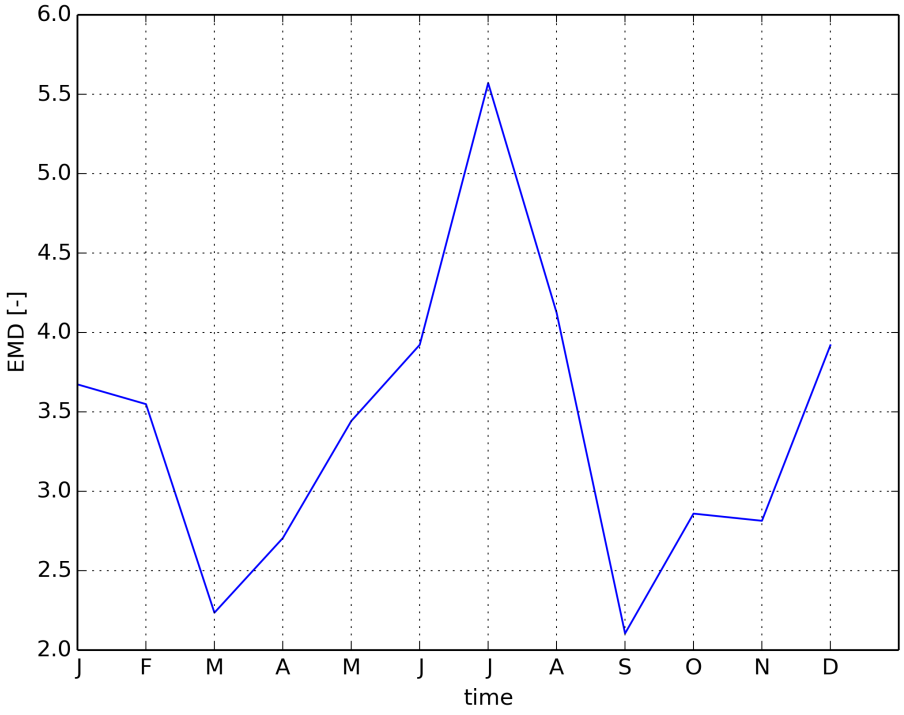



Figure 923: Timeseries of EMD

### 2.1.35 CMIP3 ncar pcm1-amip

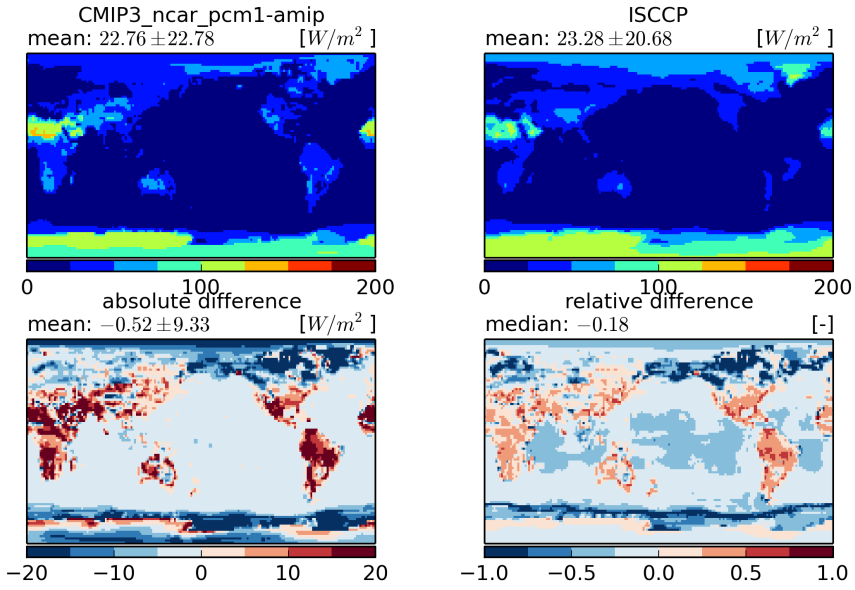



Figure 924: Temporal mean fields (top) and absolute and relative differences (bottom)

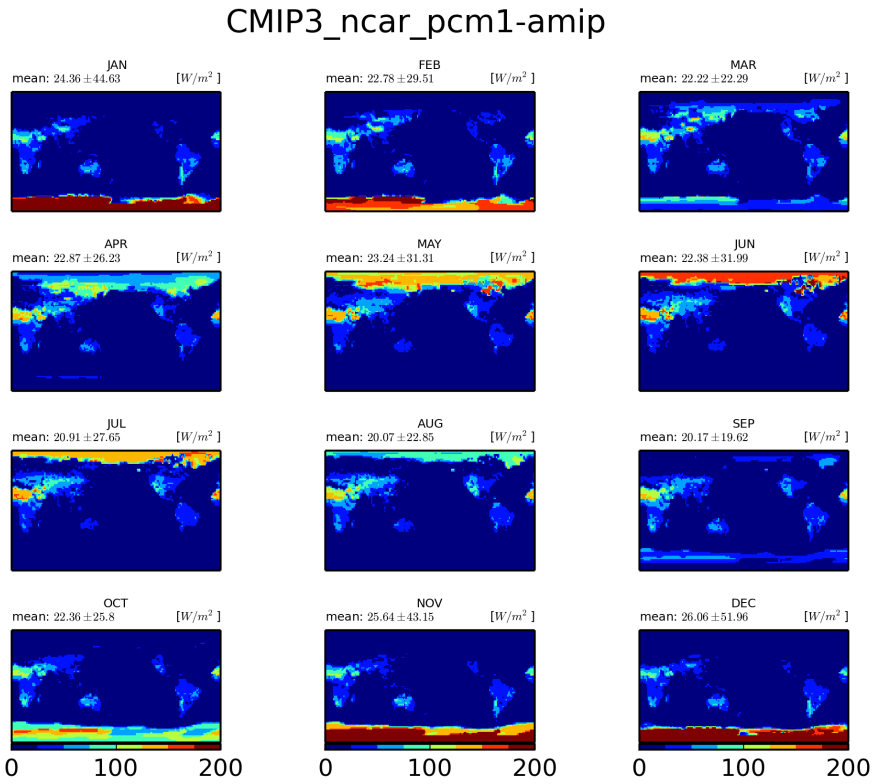



Figure 925: Monthly mean climatology for ncar-pcm1

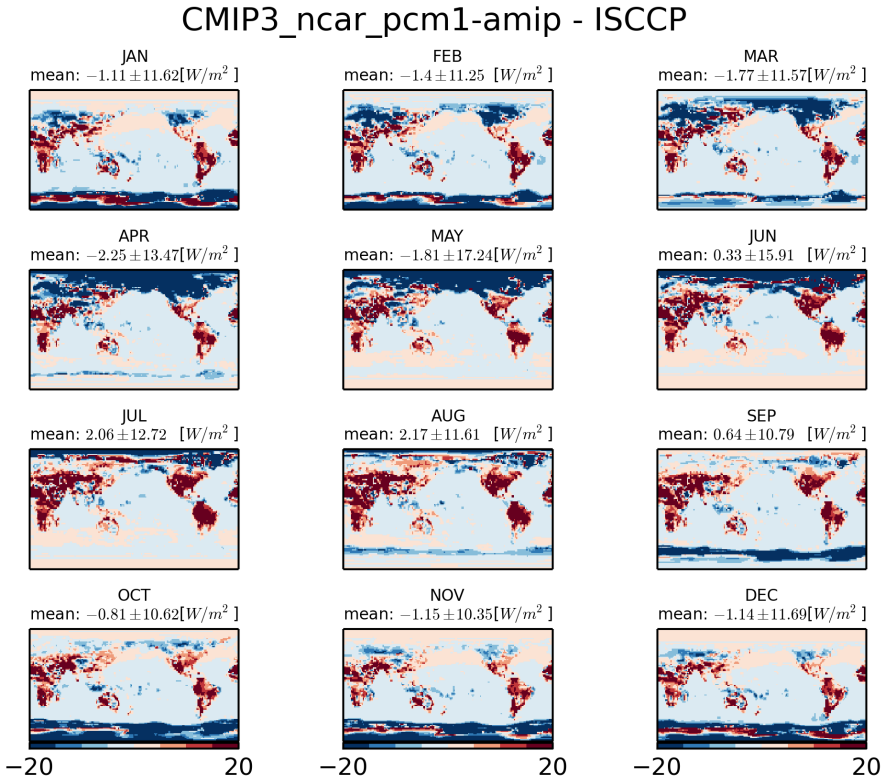



Figure 926: Monthly mean climatology of difference between NCAR-PCM1 and ISCCP

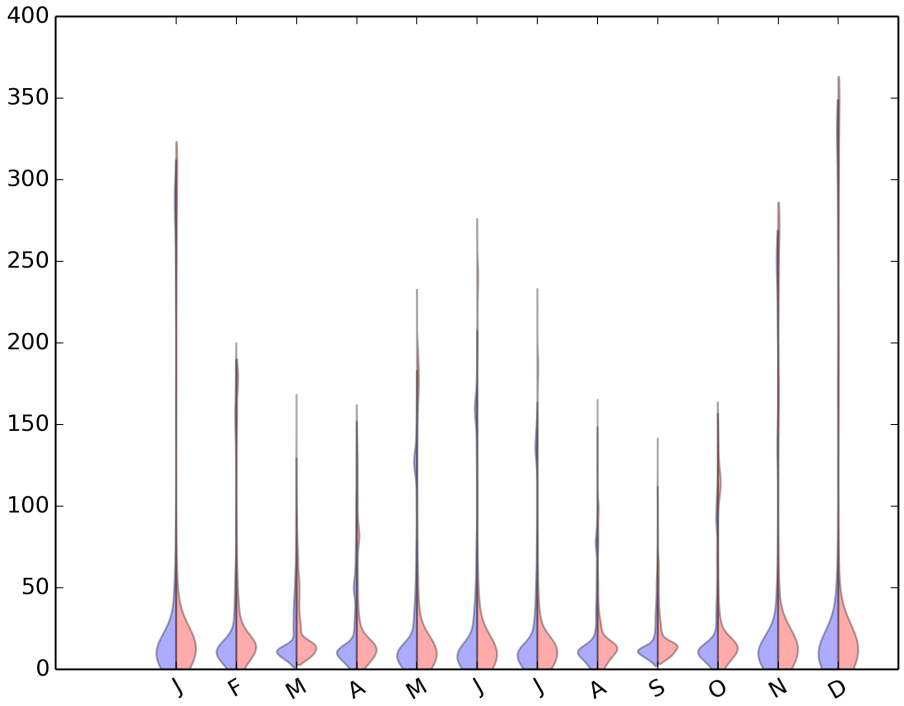



Figure 927: Violin plot for CMIP3-NCAR-PCM1-AMIP

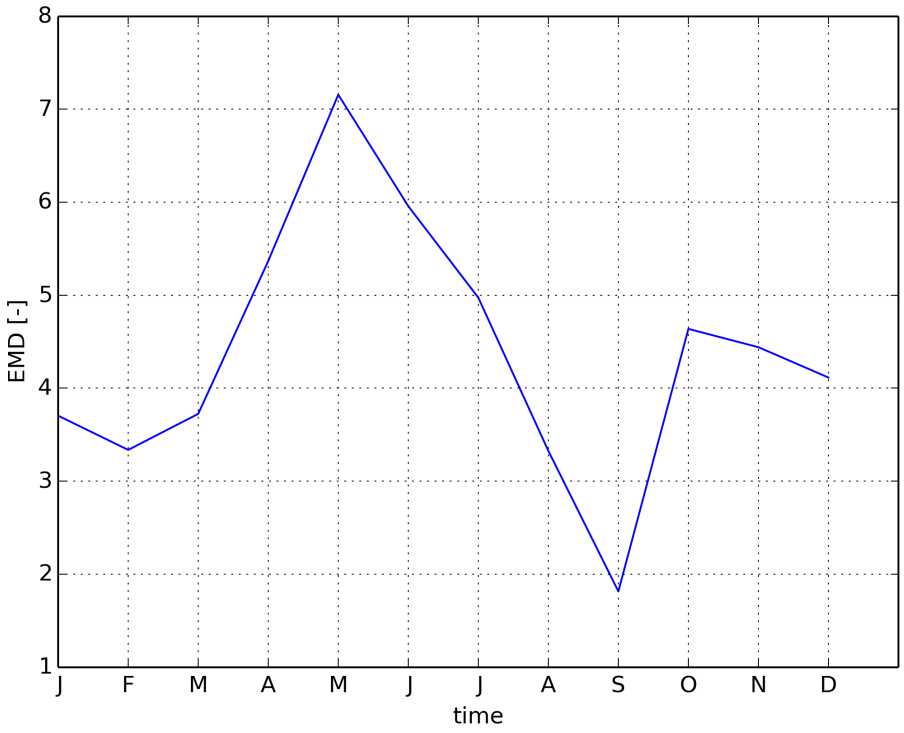



Figure 928: Timeseries of EMD

### 2.1.36 CMIP3 ukmo hadgem1-amip

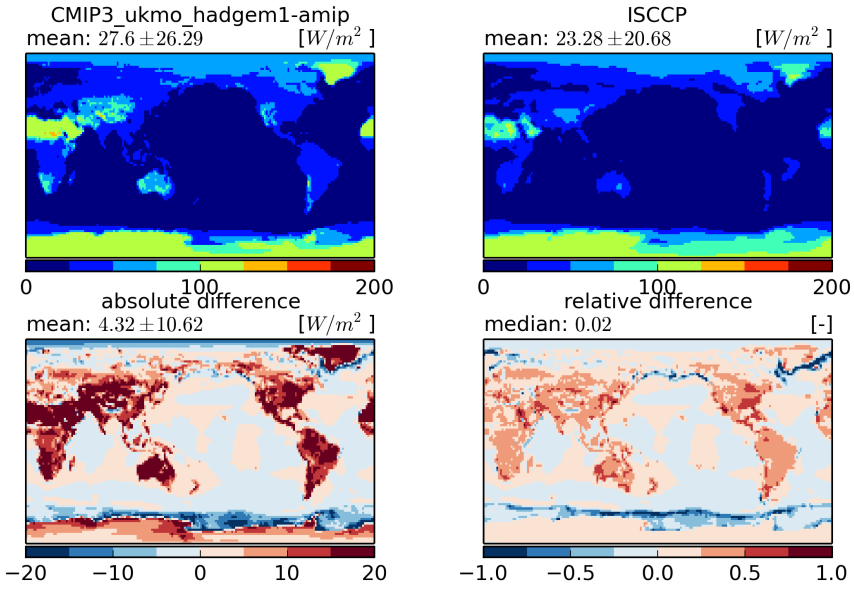



Figure 929: Temporal mean fields (top) and absolute and relative differences (bottom)

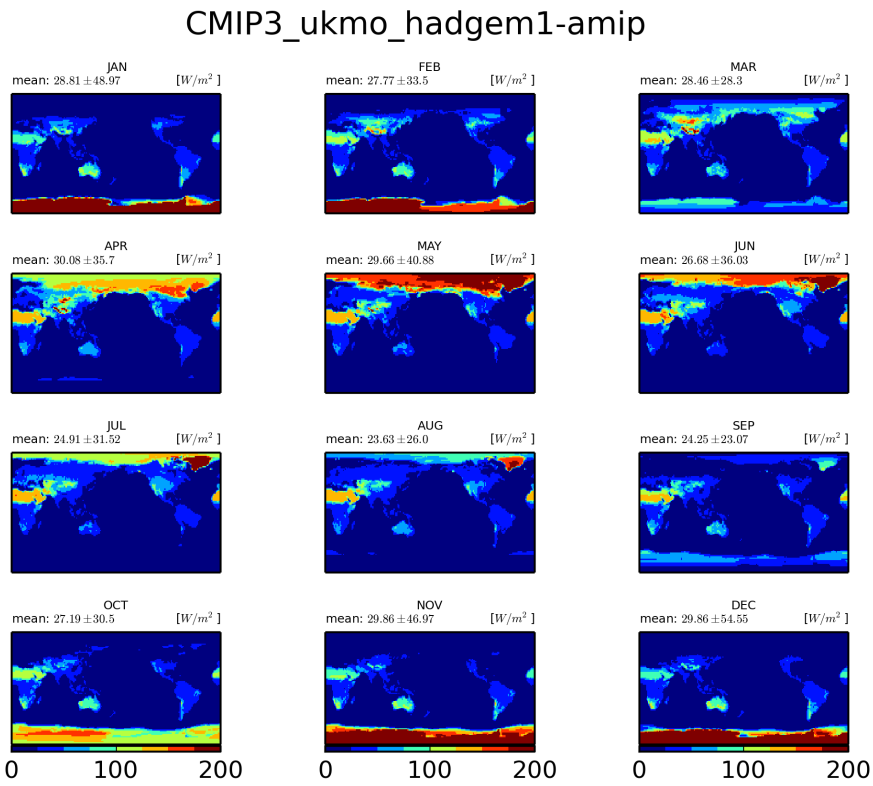



Figure 930: Monthly mean climatology for ukmo-hadgem1

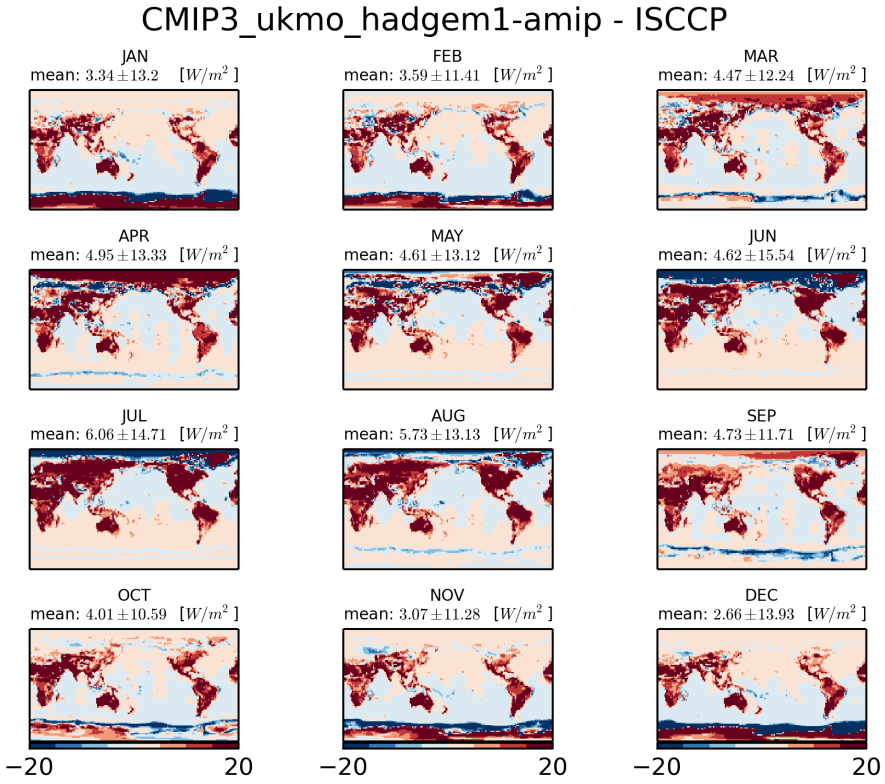



Figure 931: Monthly mean climatology of difference between UKMO-HADGEM1 and ISCCP

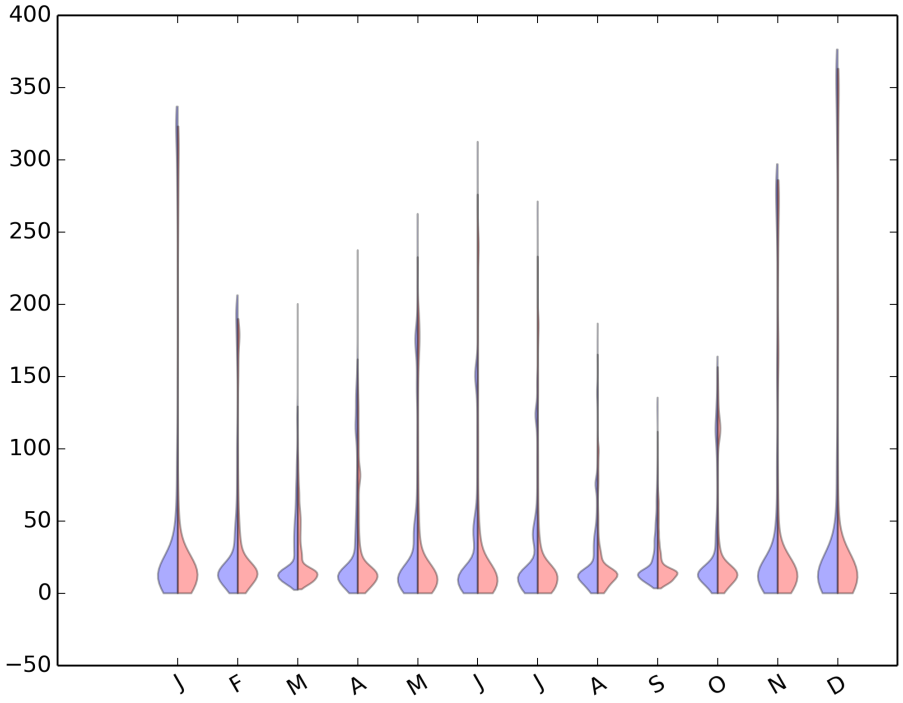



Figure 932: Violin plot for CMIP3-UKMO-HADGEM1-AMIP

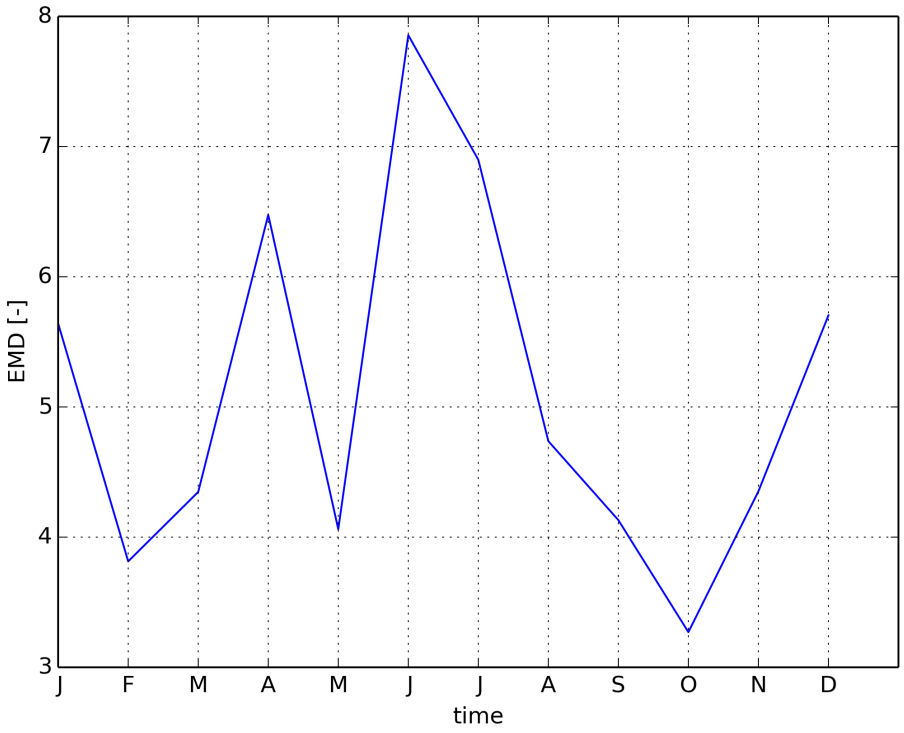



Figure 933: Timeseries of EMD

### 2.1.37 model mean

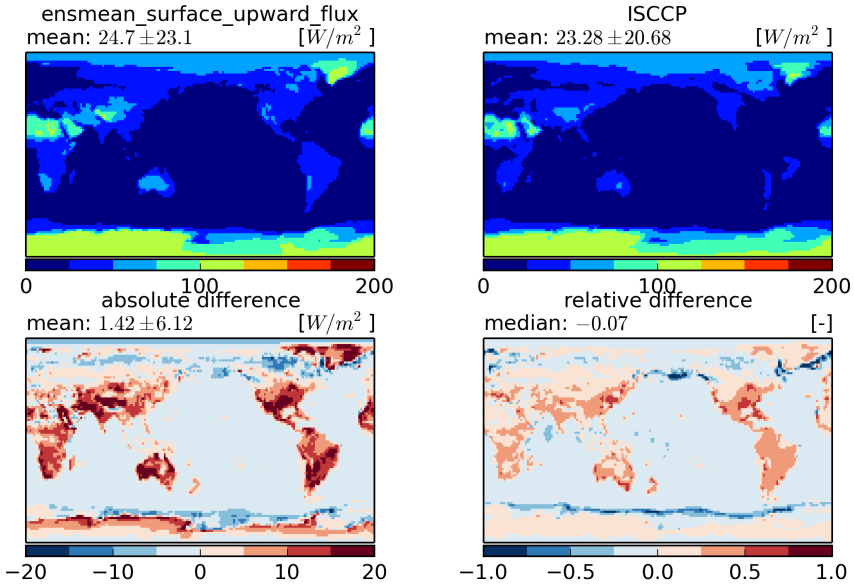



Figure 934: Temporal mean fields (top) and absolute and relative differences (bottom)

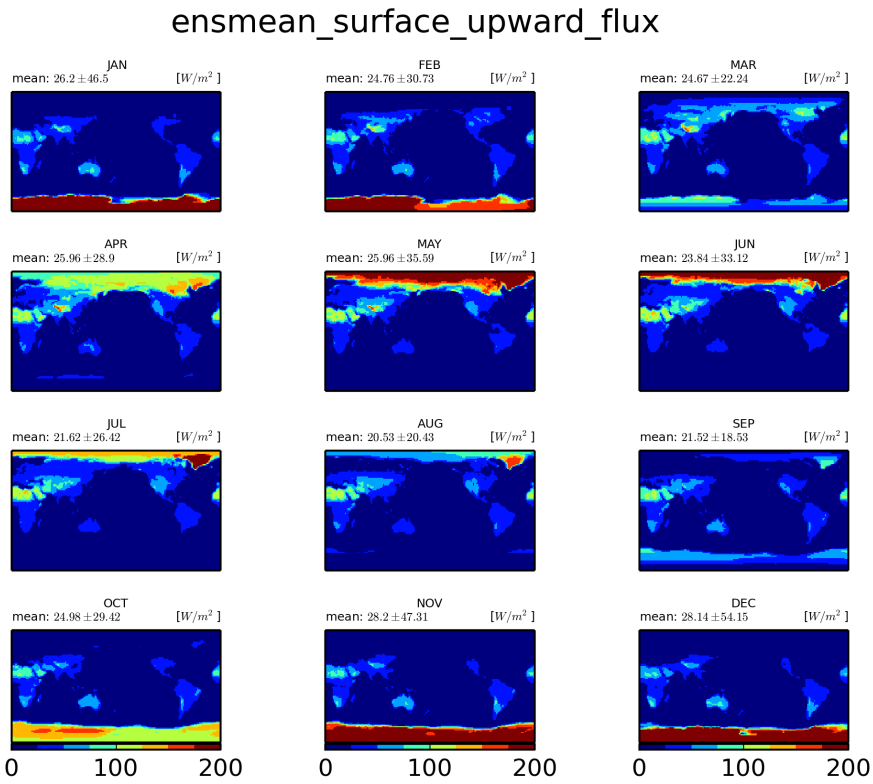



Figure 935: Monthly mean climatology for mean-model

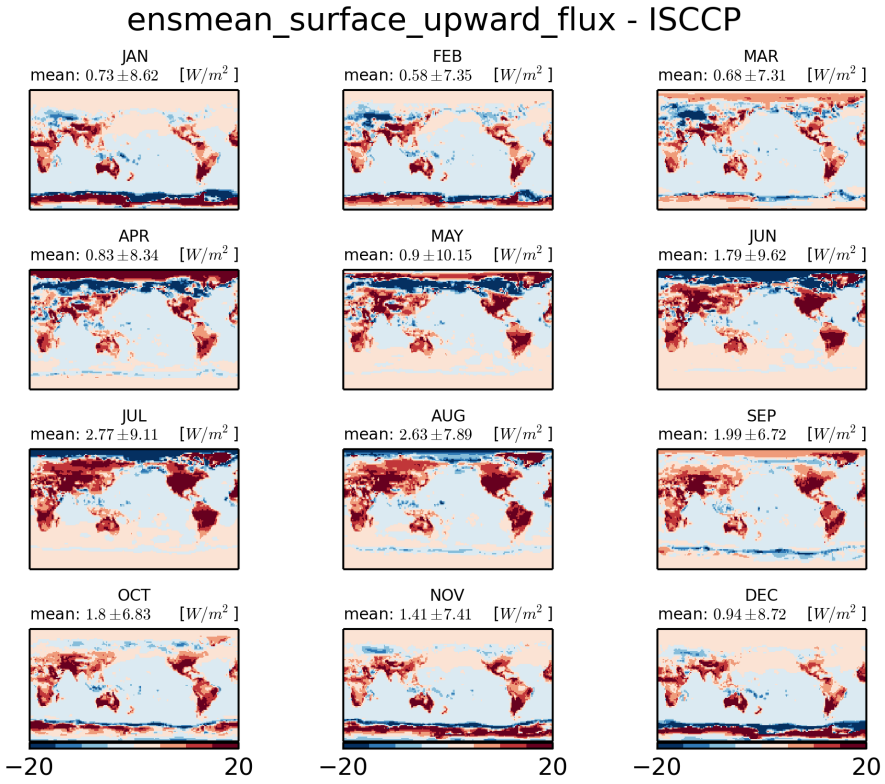



Figure 936: Monthly mean climatology of difference between MEAN-MODEL and ISCCP

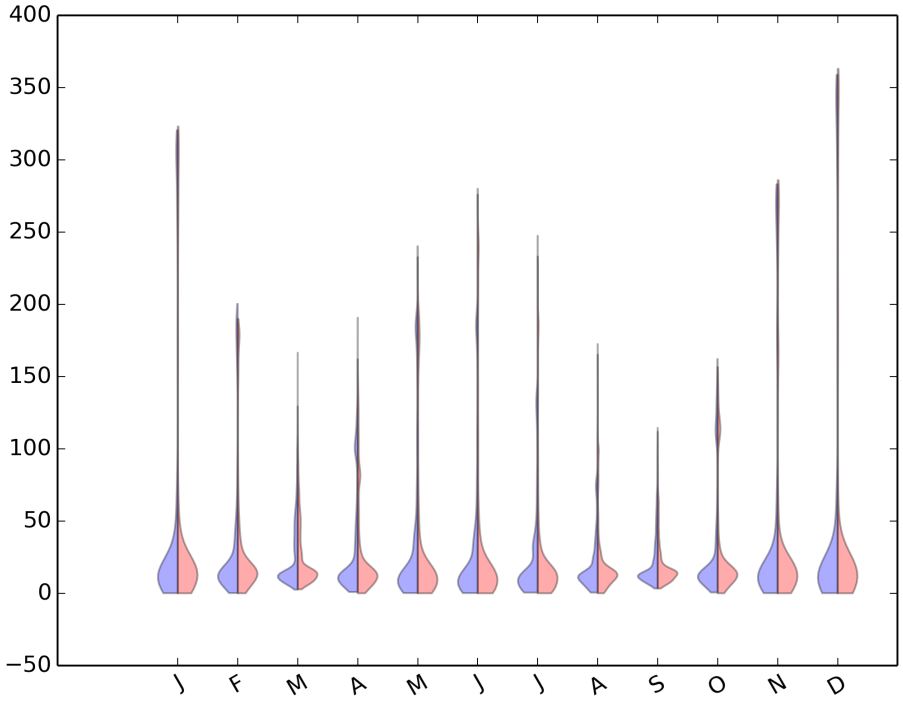



Figure 937: Violin plot for ENSMEAN-SURFACE-UPWARD-FLUX

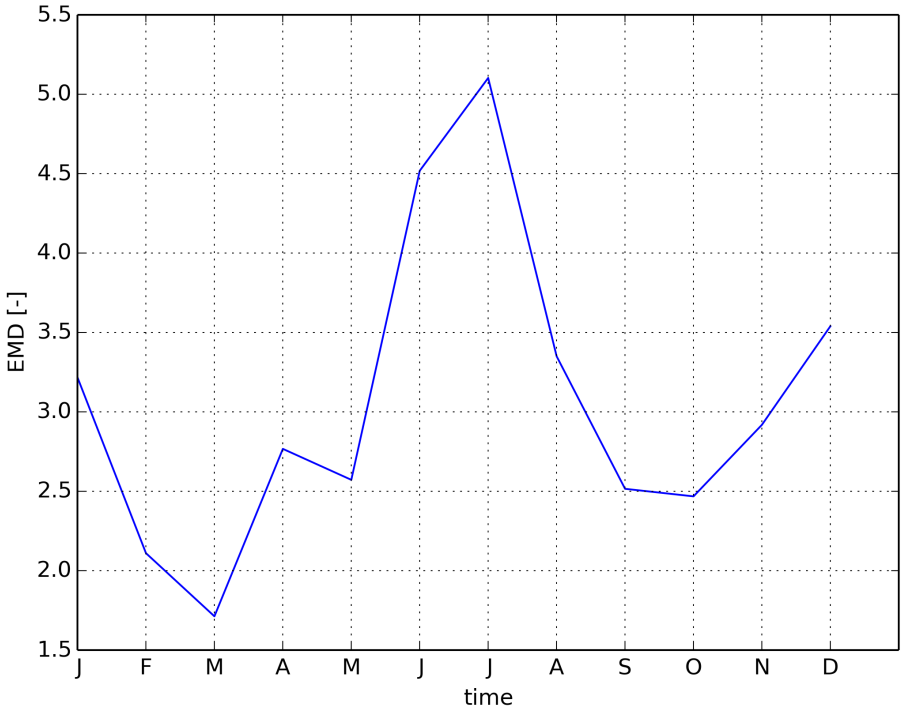



Figure 938: Timeseries of EMD

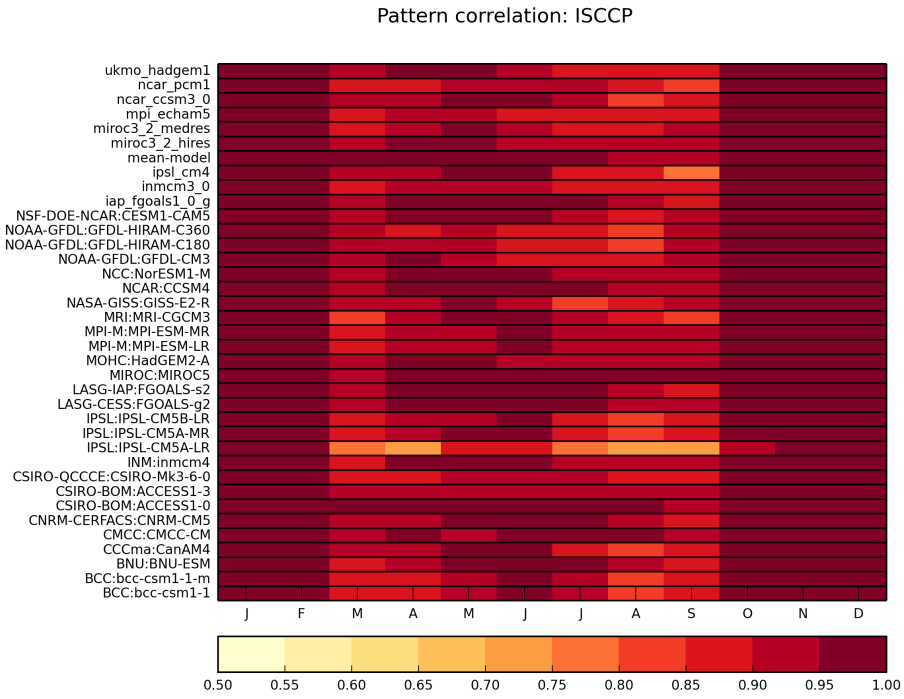



Figure 939: Pattern correlation for ISCCP

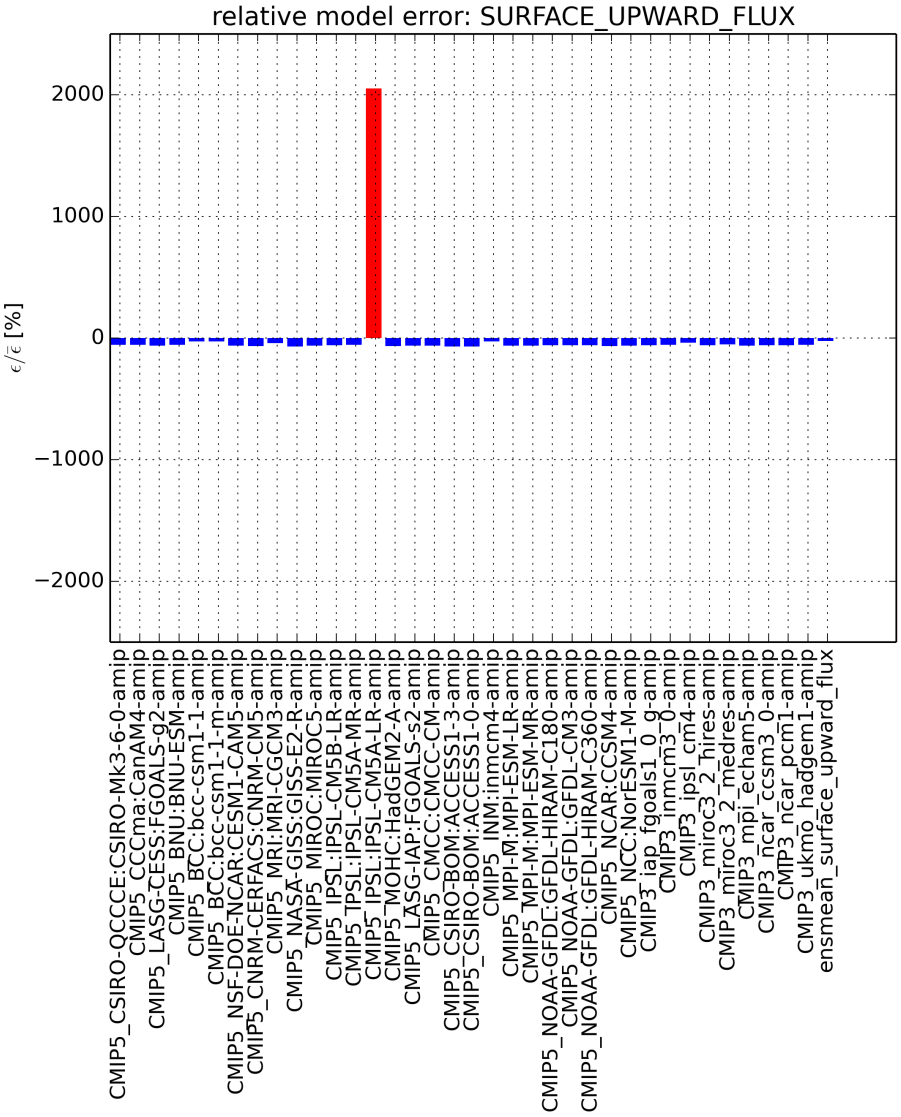



Figure 940: Relative model performance for SURFACE-UPWARD-FLUX

## 2.2 CERES2.7

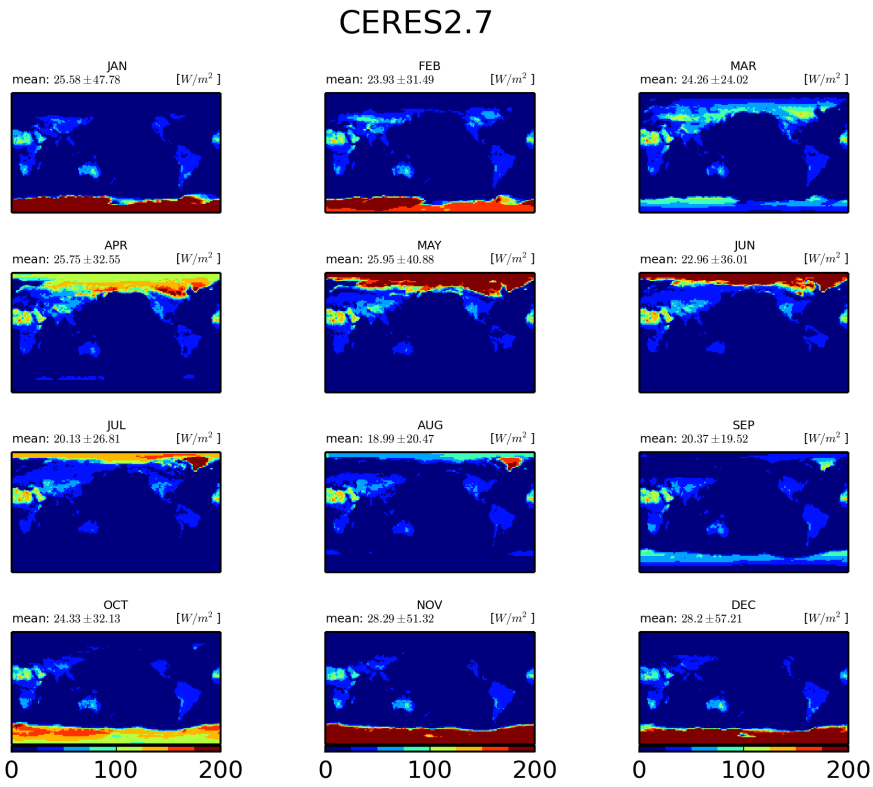



Figure 941: Monthly mean CERES2.7

### 2.2.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

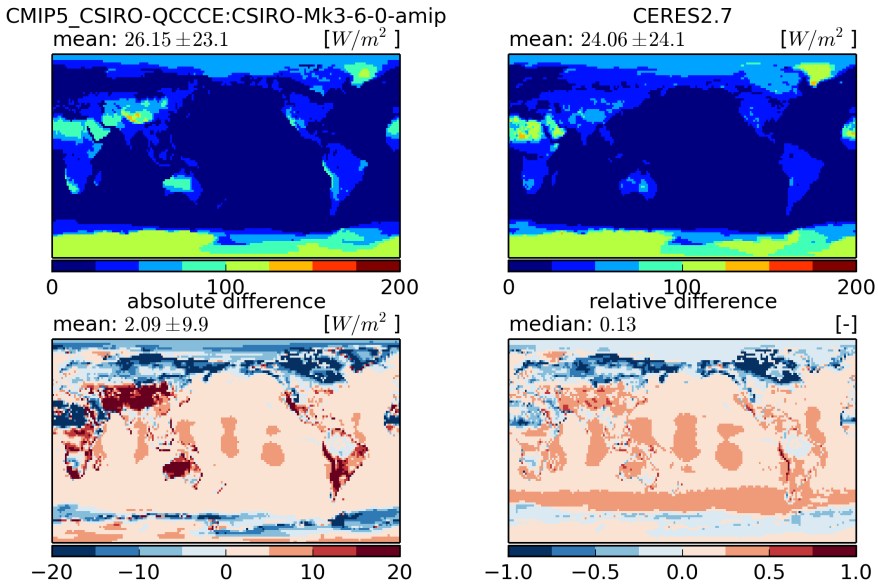



Figure 942: Temporal mean fields (top) and absolute and relative differences (bottom)

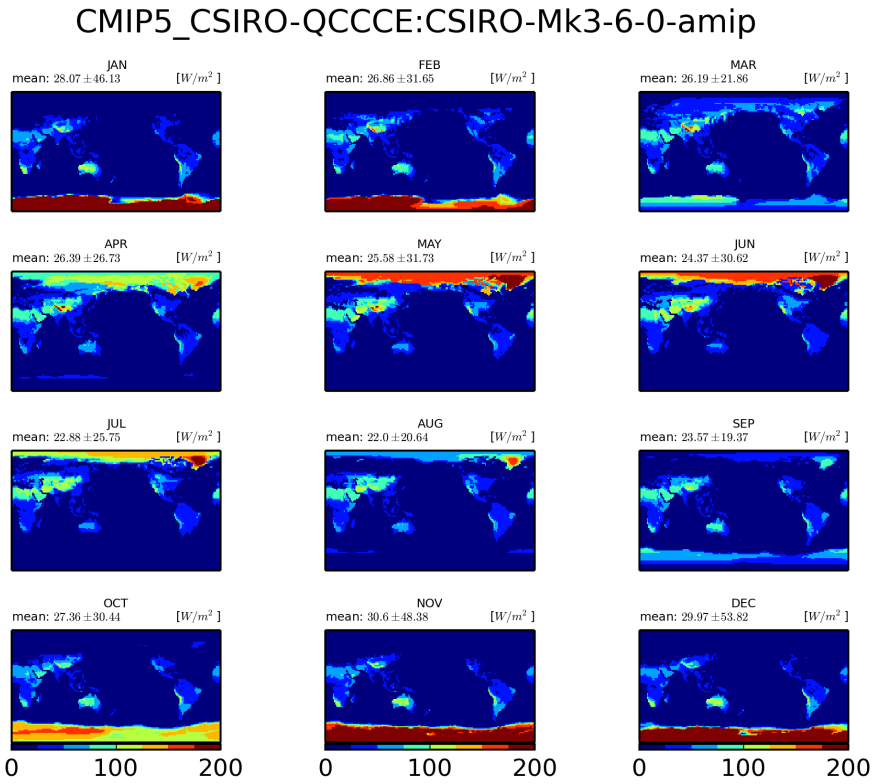



Figure 943: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

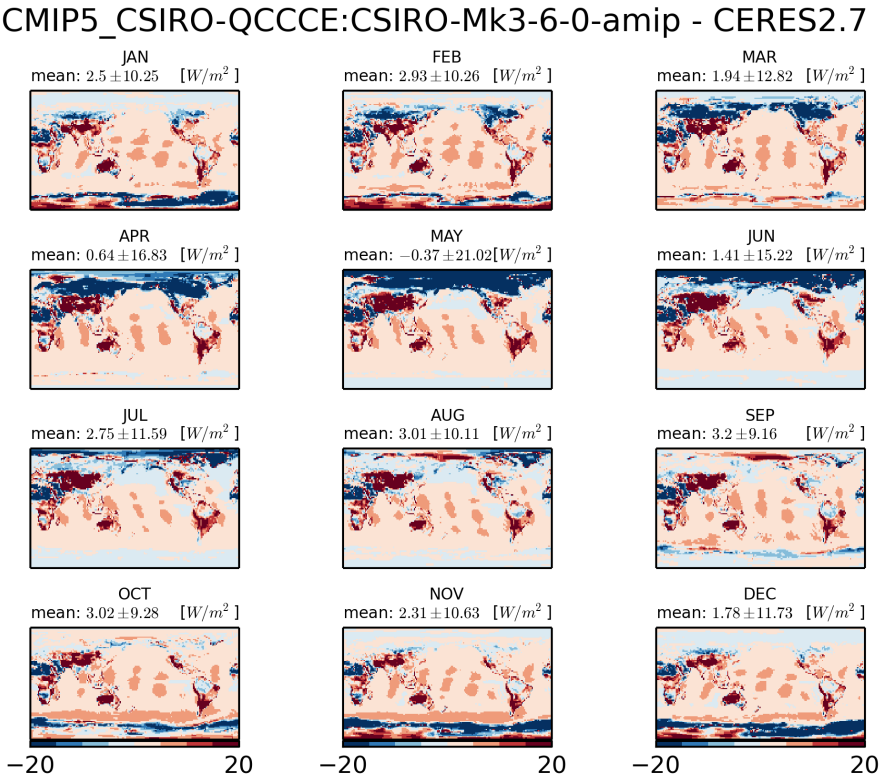



Figure 944: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and CERES2.7

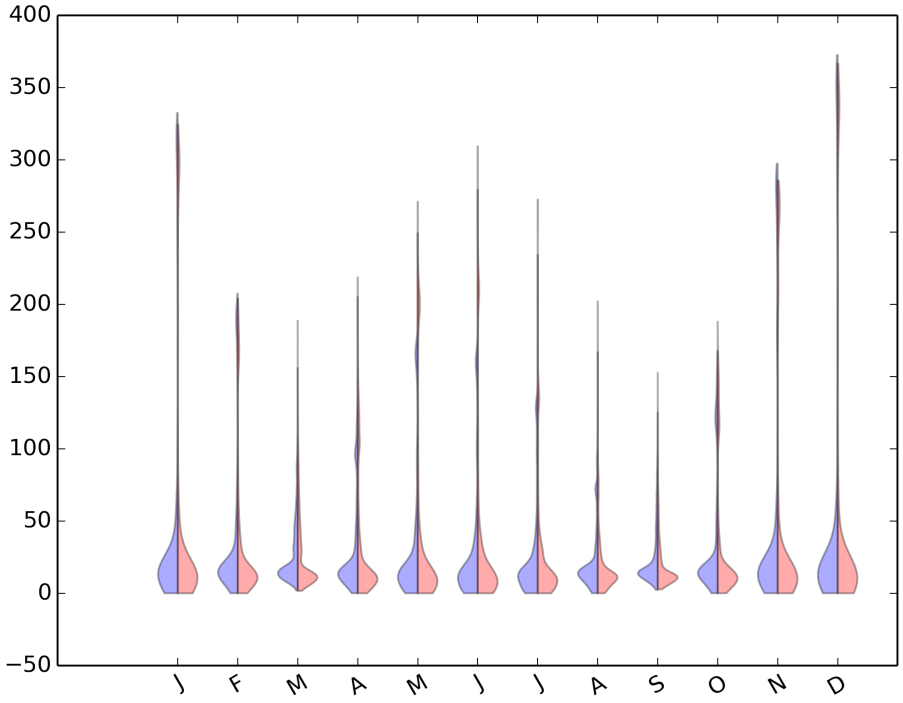



Figure 945: Violin plot for CMIP5-CSIRO-QCCCE:CSIRO-MK3-6-0-AMIP

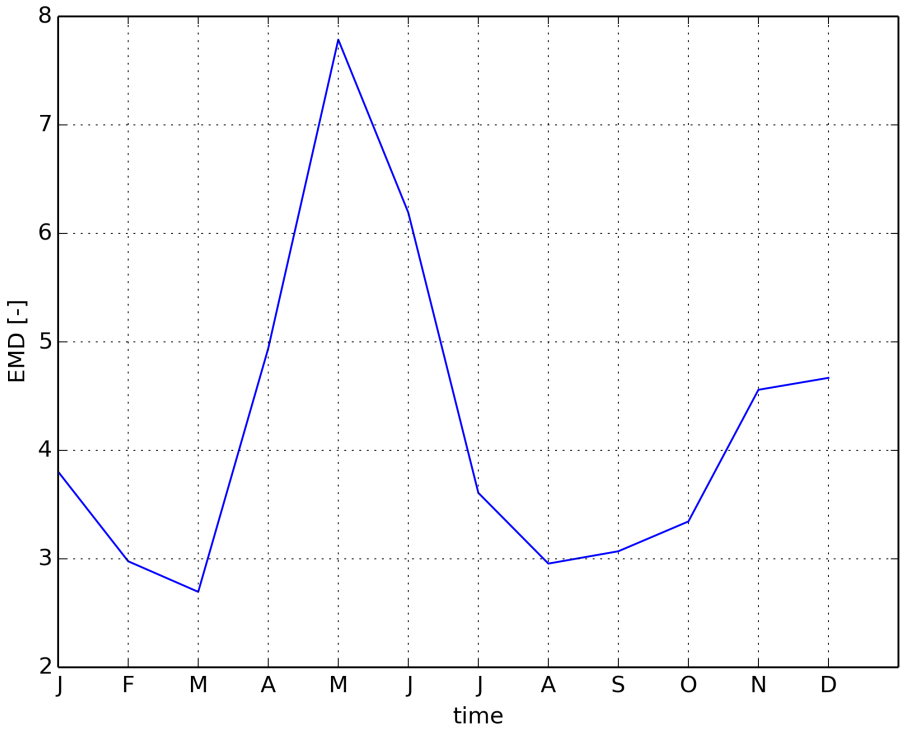



Figure 946: Timeseries of EMD

### 2.2.2 CMIP5 CCCma:CanAM4-amip

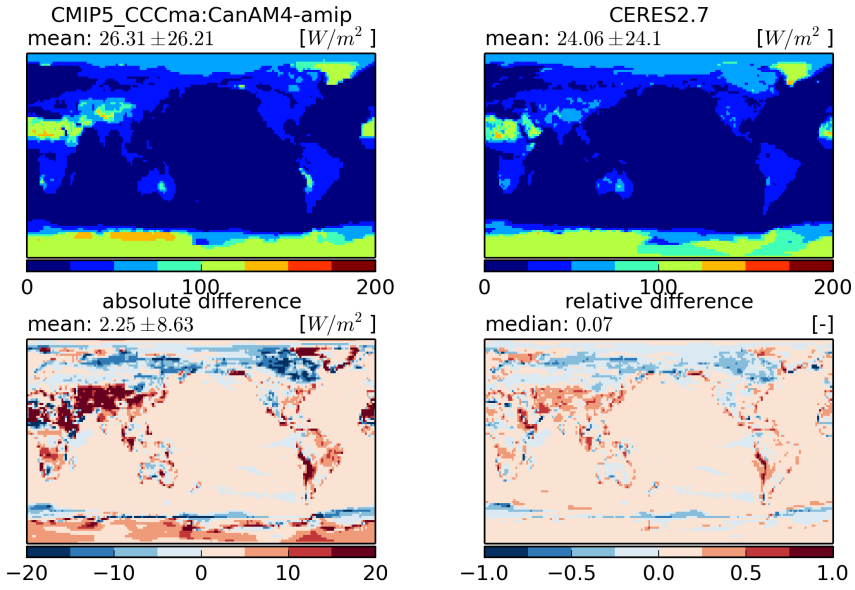



Figure 947: Temporal mean fields (top) and absolute and relative differences (bottom)

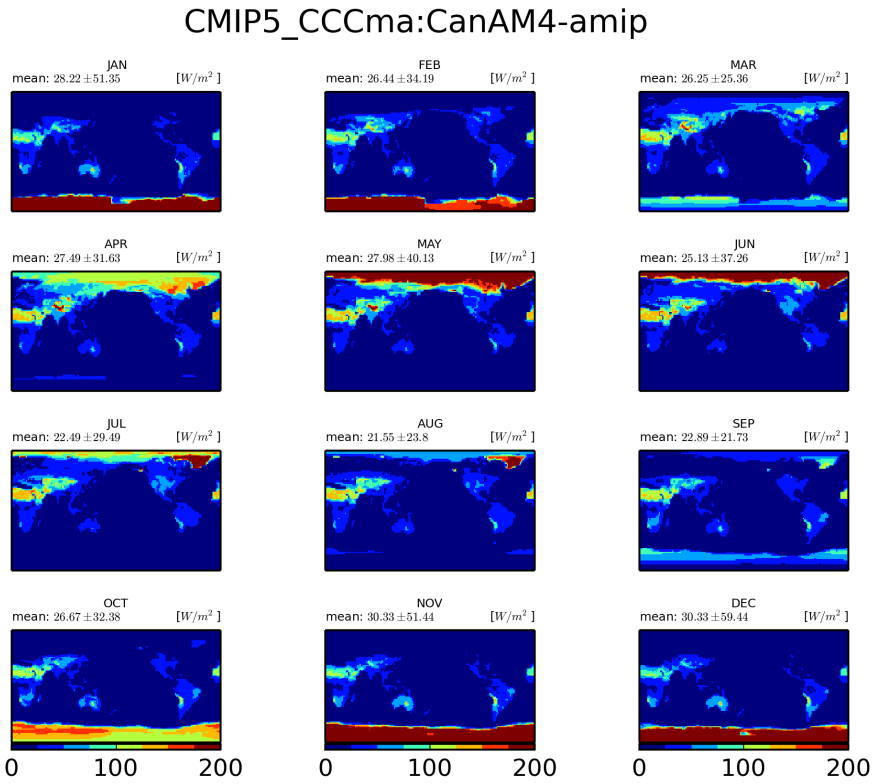



Figure 948: Monthly mean climatology for CCCma:CanAM4

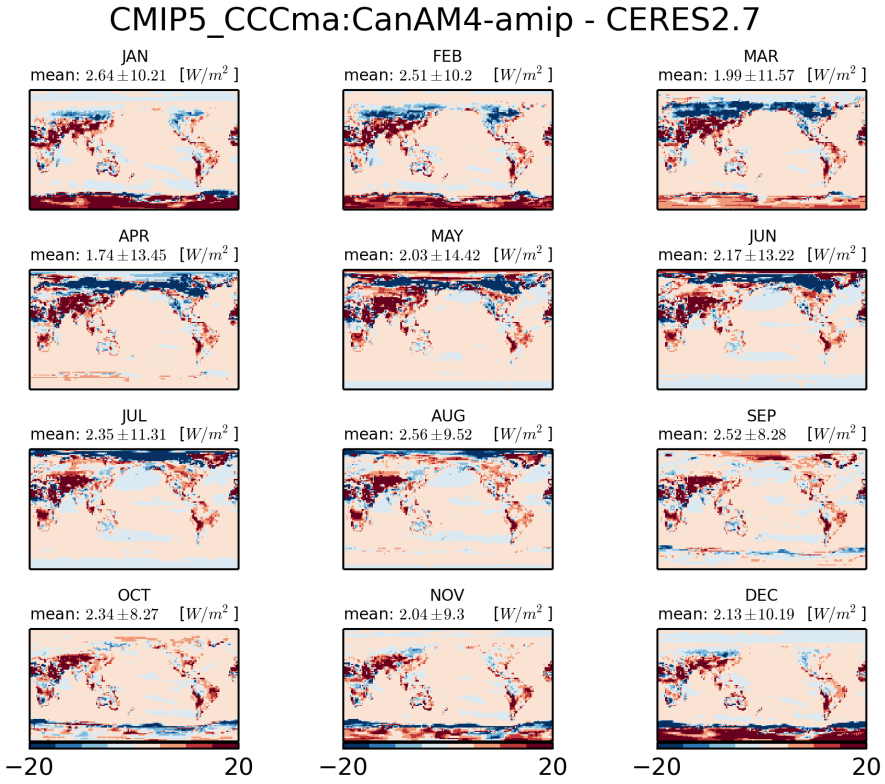



Figure 949: Monthly mean climatology of difference between CCCMA:CANAM4 and CERES2.7

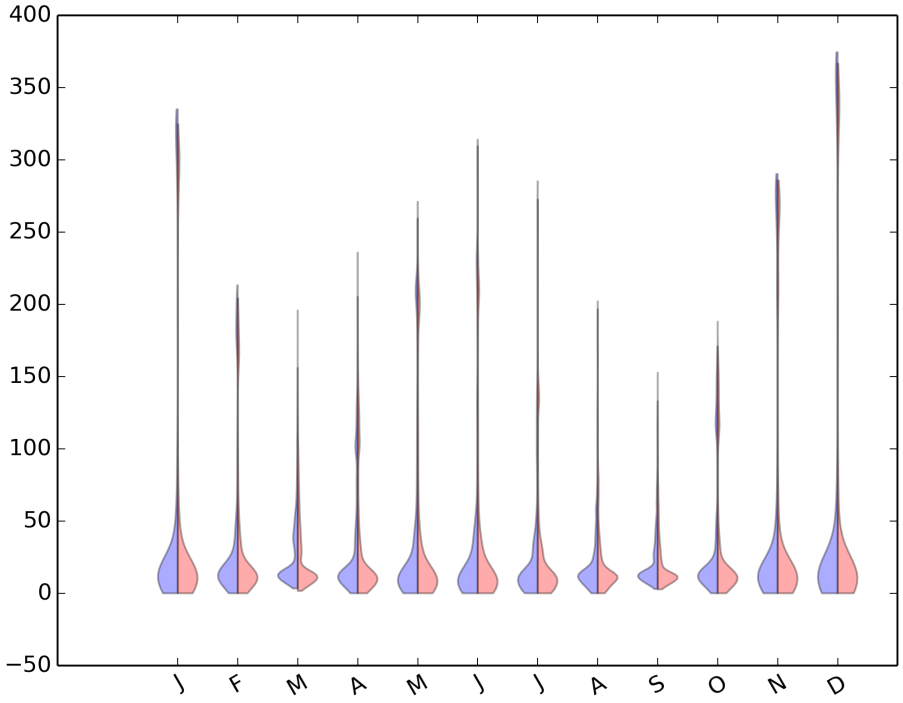



Figure 950: Violin plot for CMIP5-CCCMA:CANAM4-AMIP

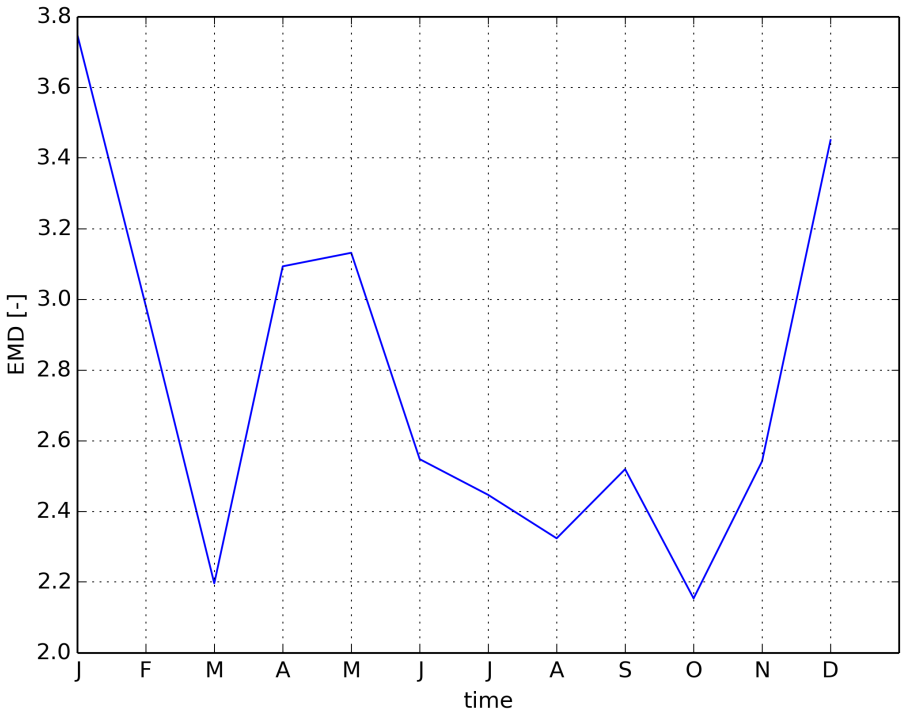



Figure 951: Timeseries of EMD

### 2.2.3 CMIP5 LASG-CESS:FGOALS-g2-amip

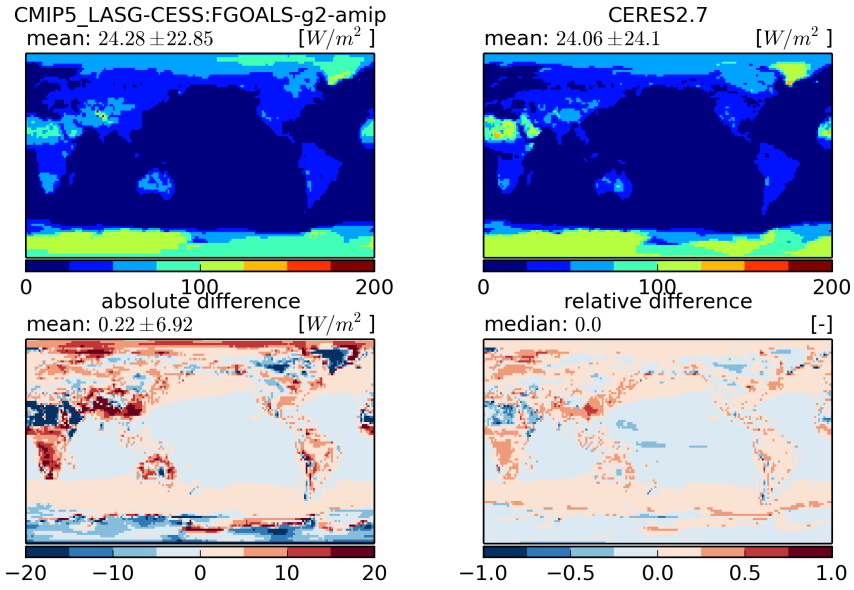



Figure 952: Temporal mean fields (top) and absolute and relative differences (bottom)

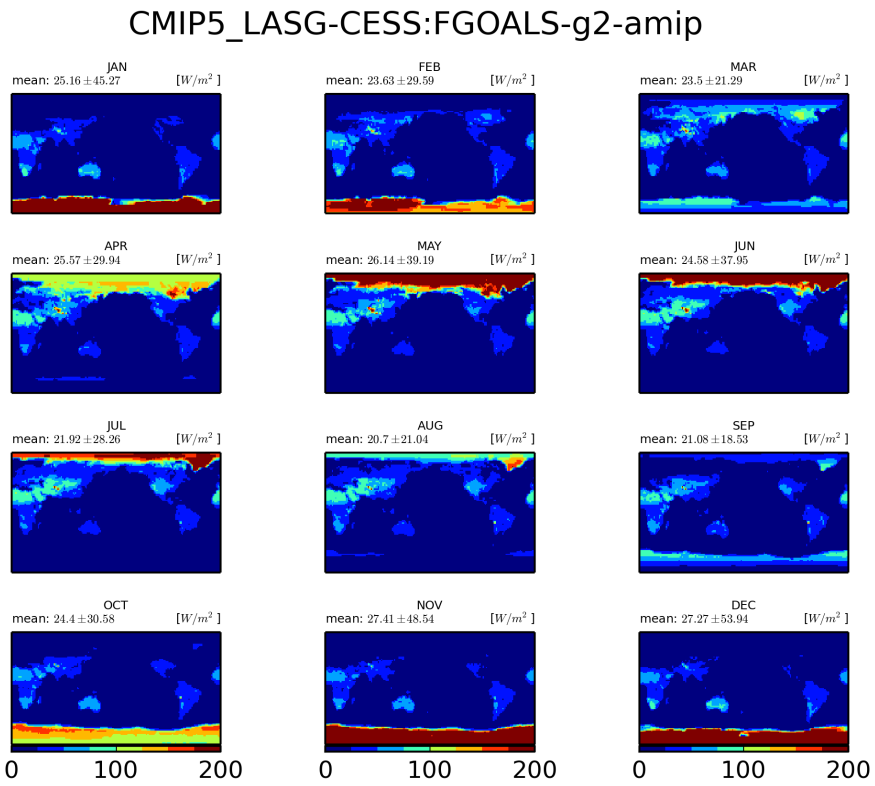



Figure 953: Monthly mean climatology for LASG-CESS:FGOALS-g2

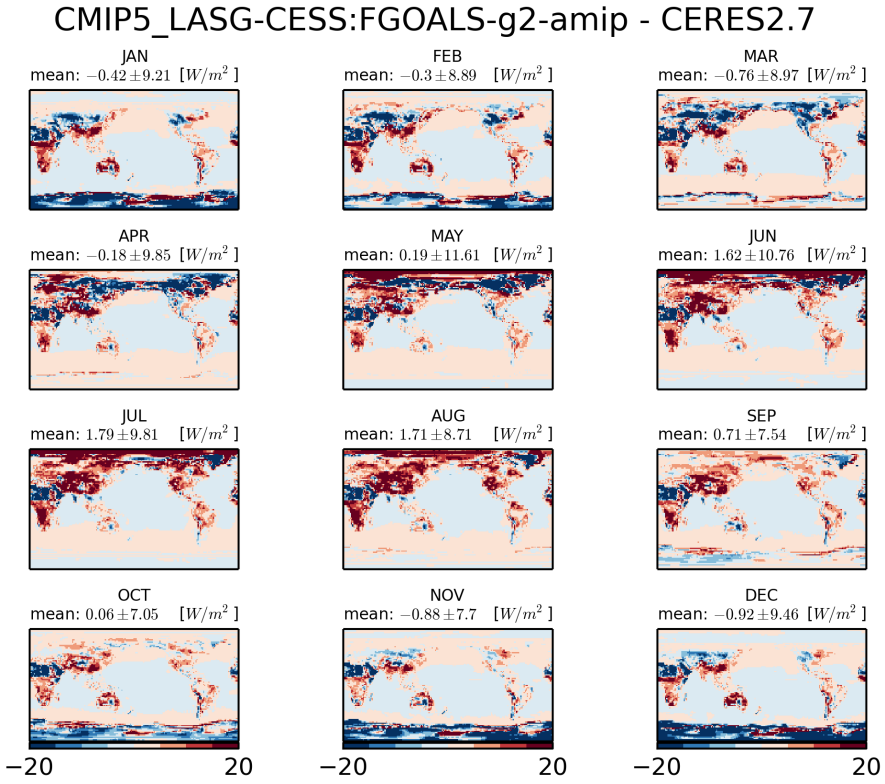



Figure 954: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and CERES2.7

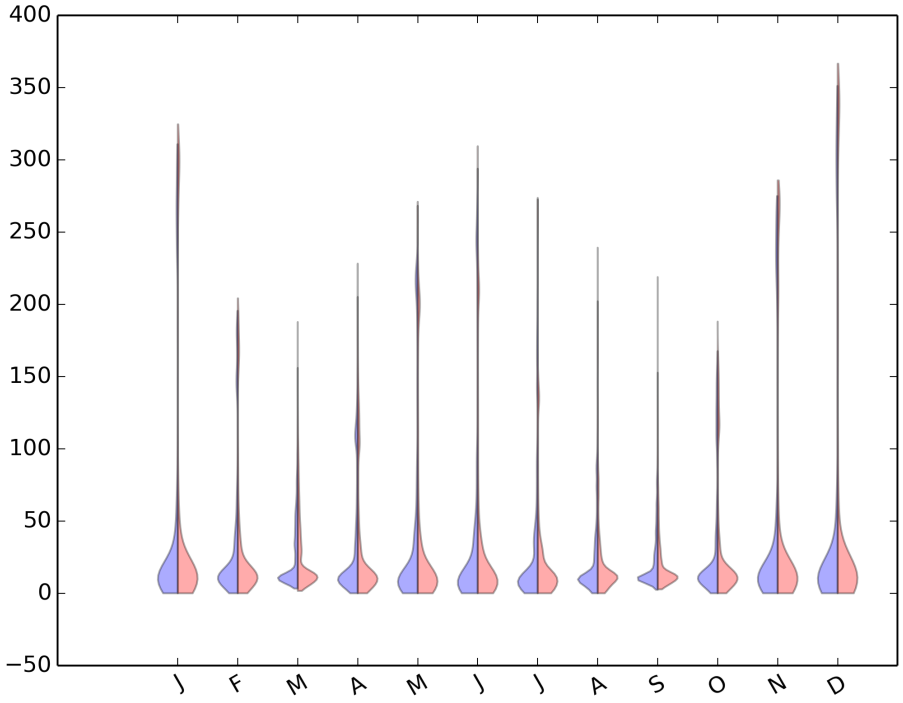



Figure 955: Violin plot for CMIP5-LASG-CESS:FGOALS-G2-AMIP

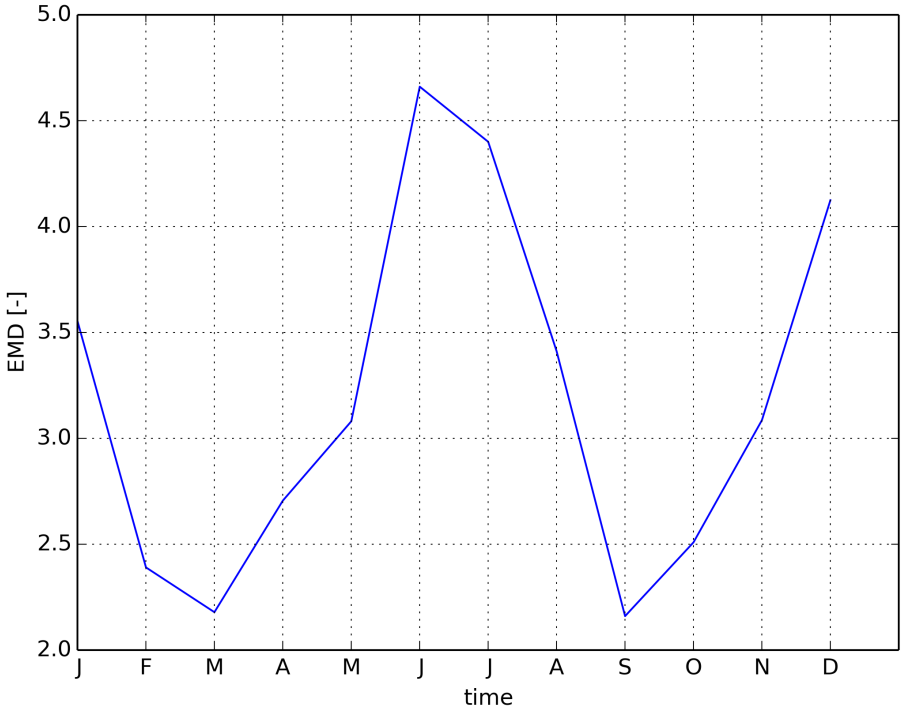



Figure 956: Timeseries of EMD

### 2.2.4 CMIP5 BNU:BNU-ESM-amip

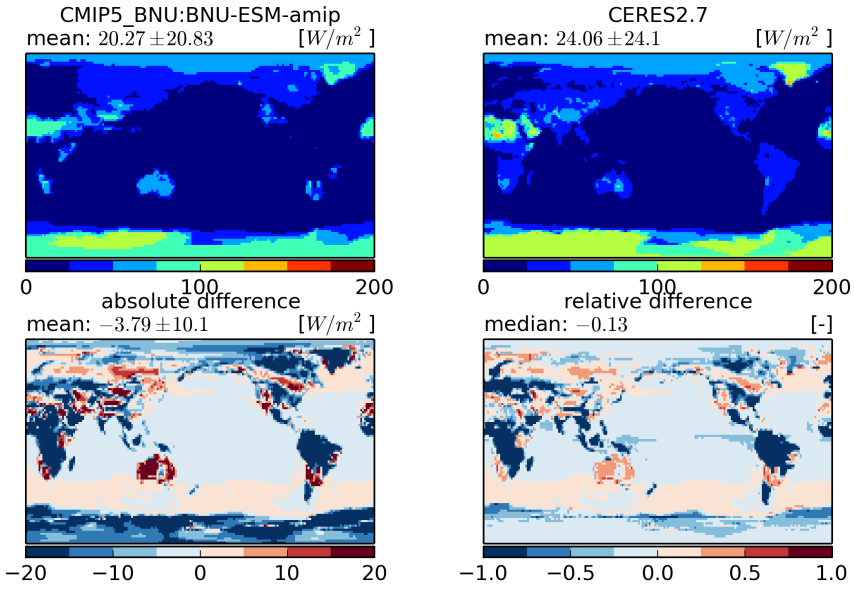



Figure 957: Temporal mean fields (top) and absolute and relative differences (bottom)

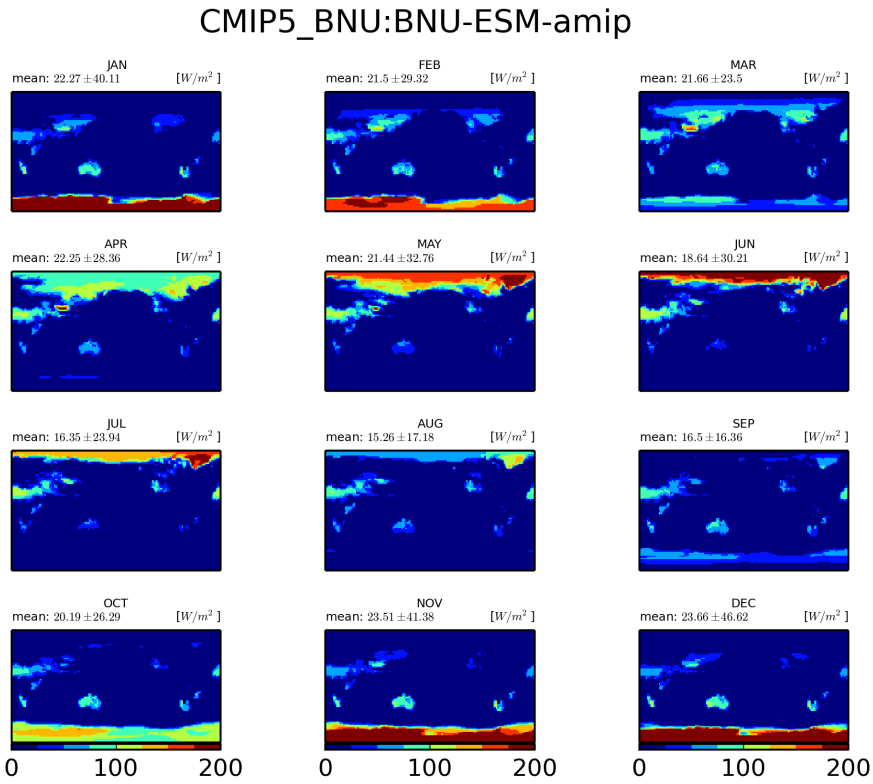



Figure 958: Monthly mean climatology for BNU:BNU-ESM

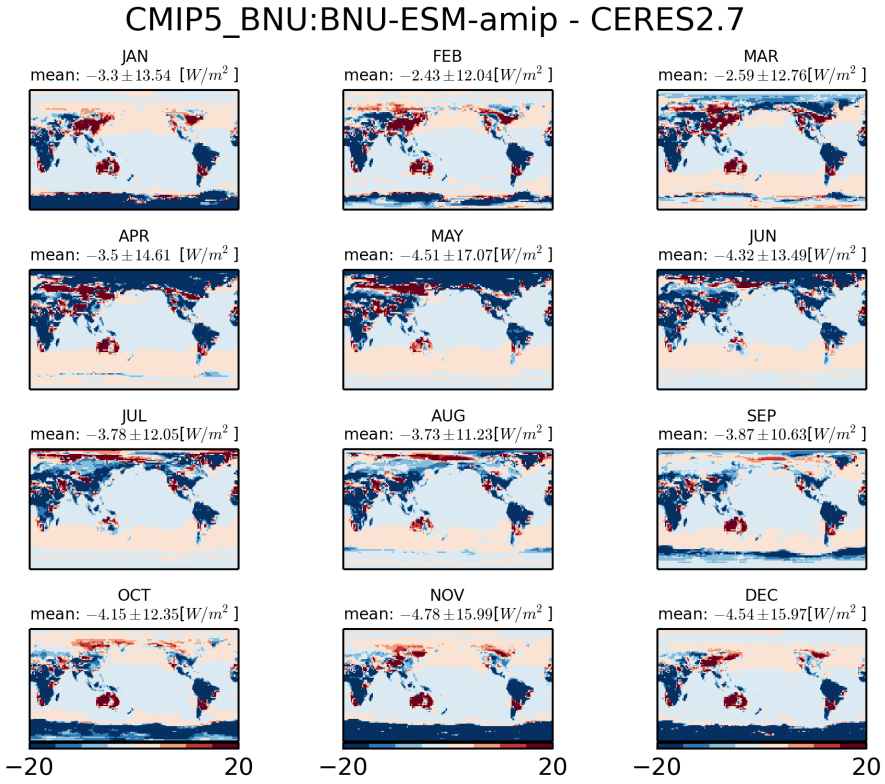



Figure 959: Monthly mean climatology of difference between BNU:BNU-ESM and CERES2.7

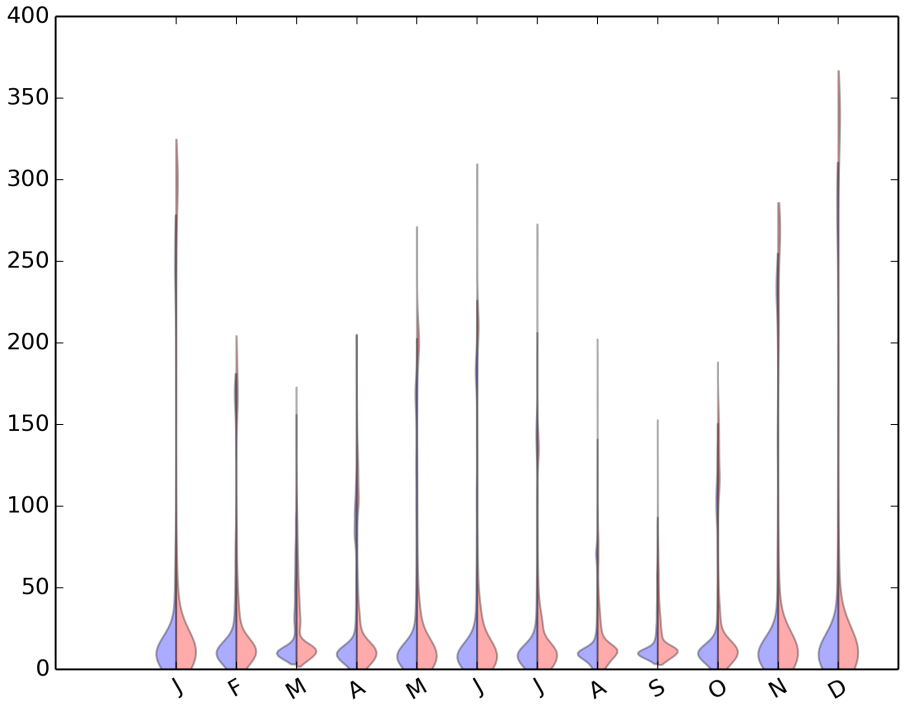



Figure 960: Violin plot for CMIP5-BNU:BNU-ESM-AMIP

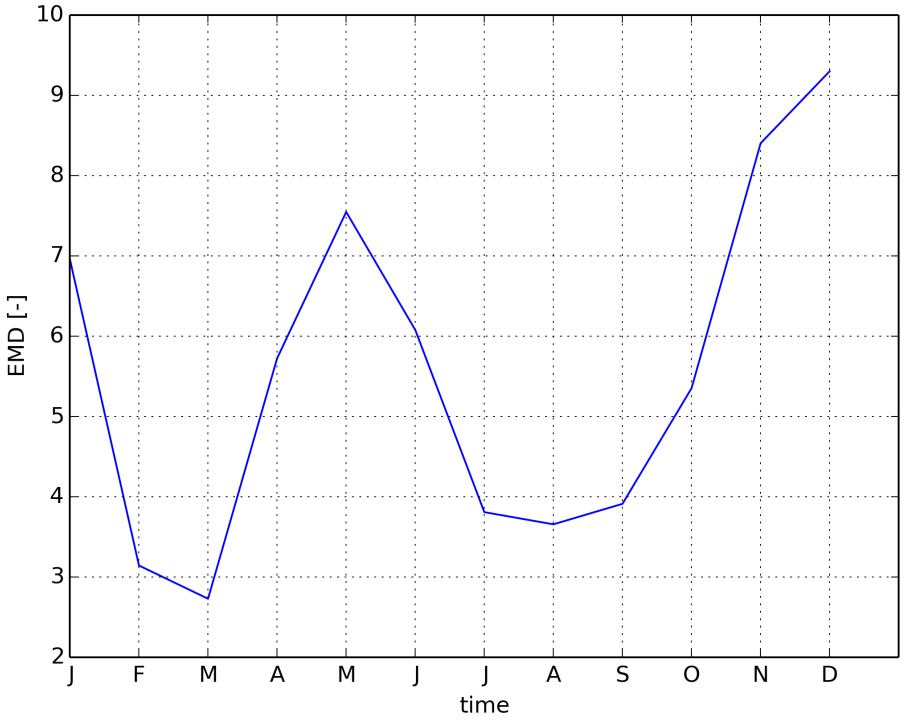



Figure 961: Timeseries of EMD

### 2.2.5 CMIP5 BCC:bcc-csm1-1-amip

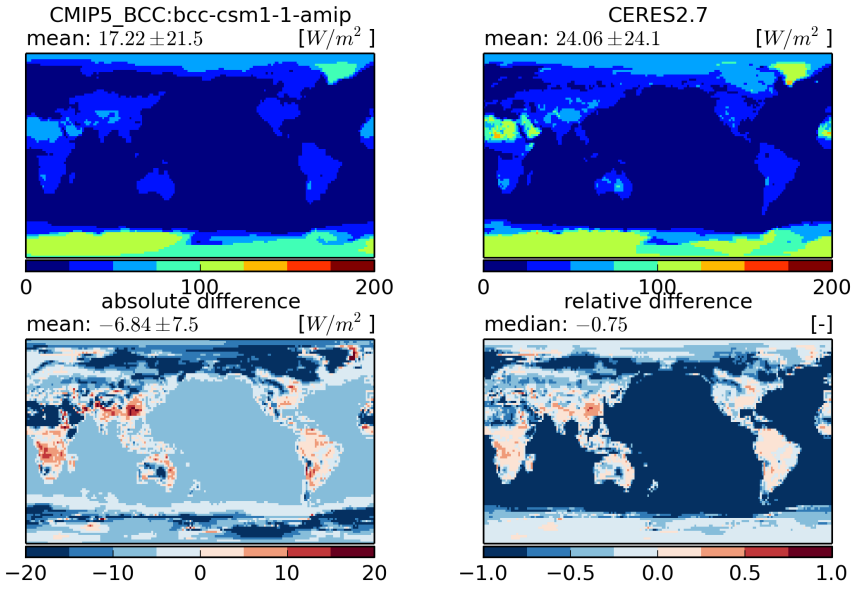



Figure 962: Temporal mean fields (top) and absolute and relative differences (bottom)

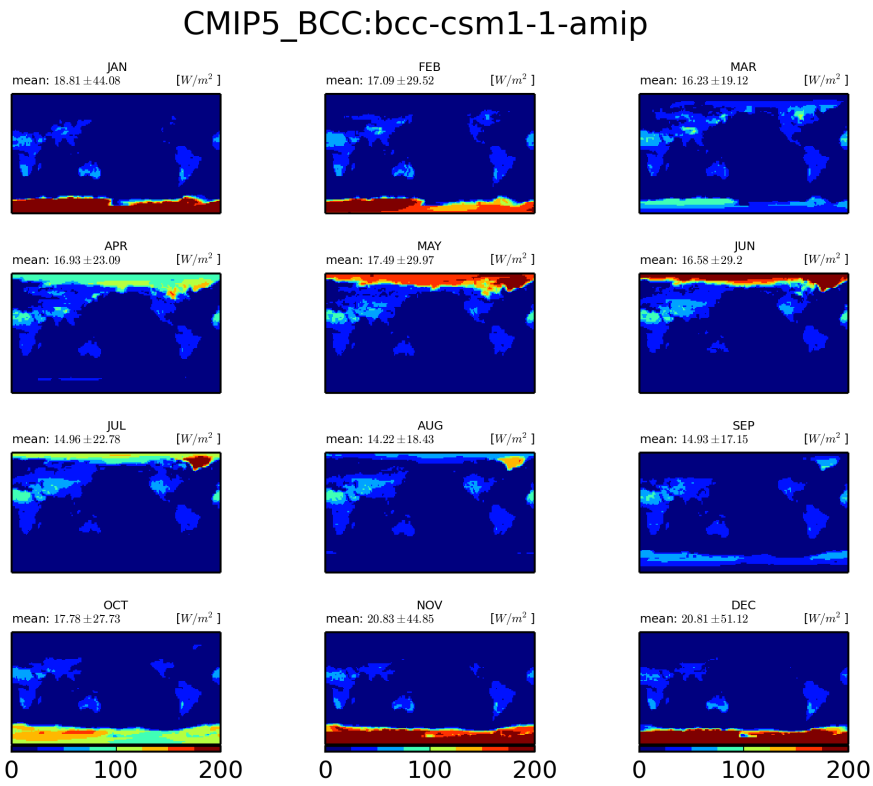



Figure 963: Monthly mean climatology for BCC:bcc-csm1-1

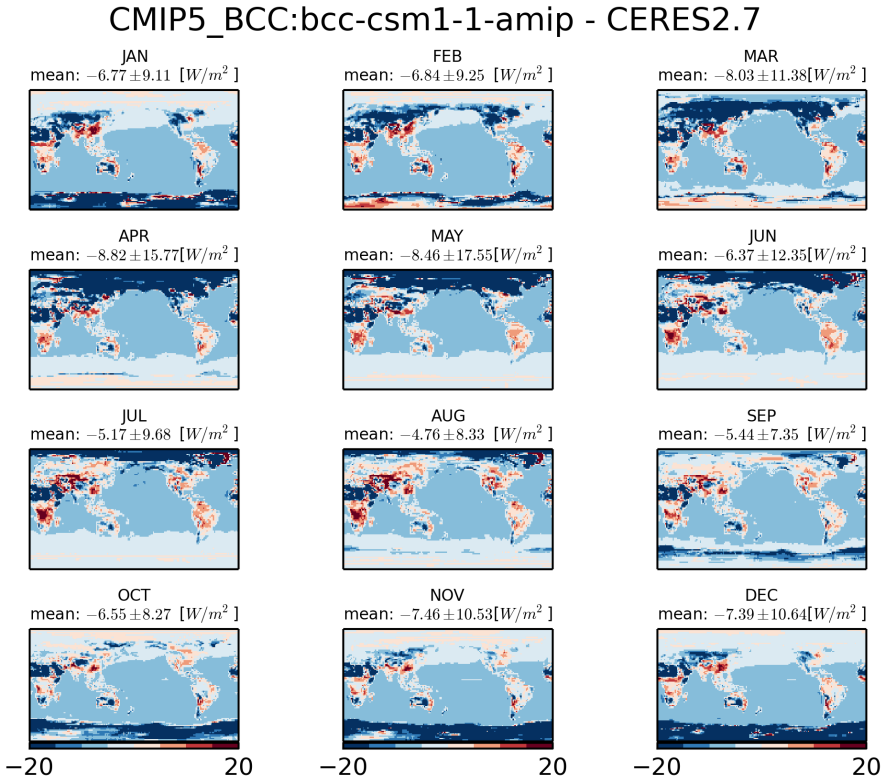



Figure 964: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and CERES2.7

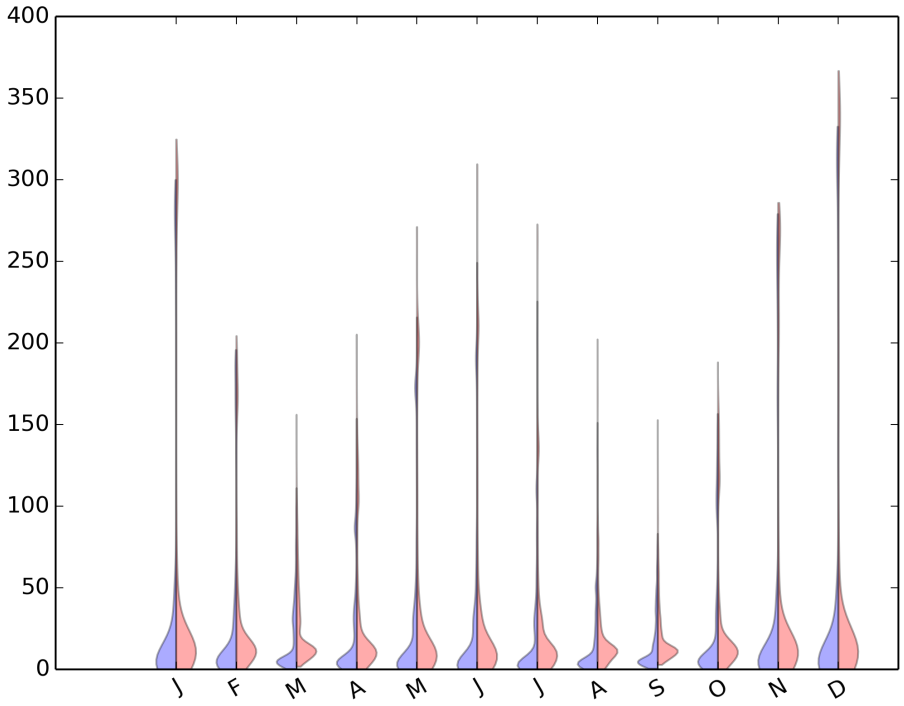



Figure 965: Violin plot for CMIP5-BCC:BCC-CSM1-1-AMIP

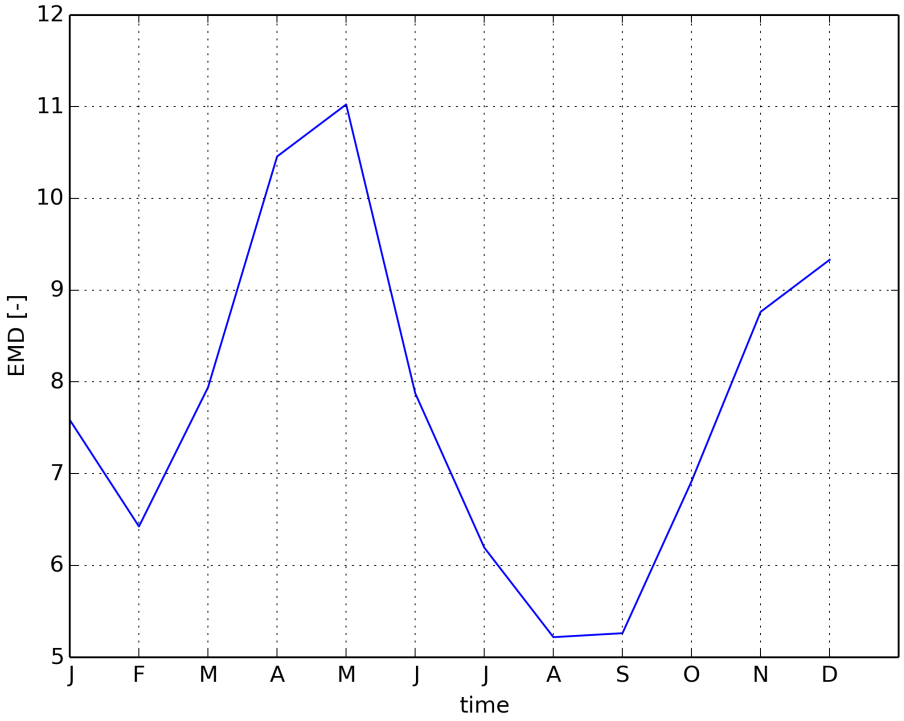



Figure 966: Timeseries of EMD

### 2.2.6 CMIP5 BCC:bcc-csm1-1-m-amip

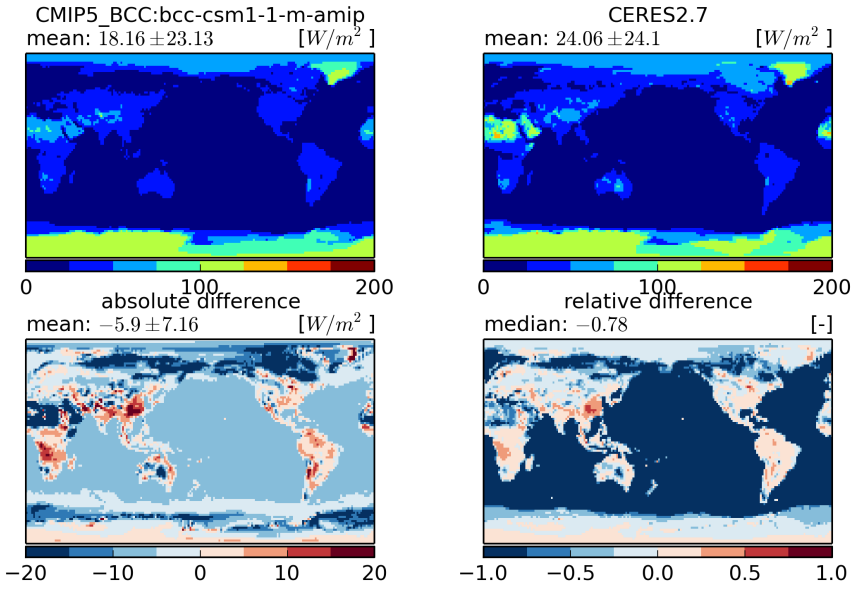



Figure 967: Temporal mean fields (top) and absolute and relative differences (bottom)

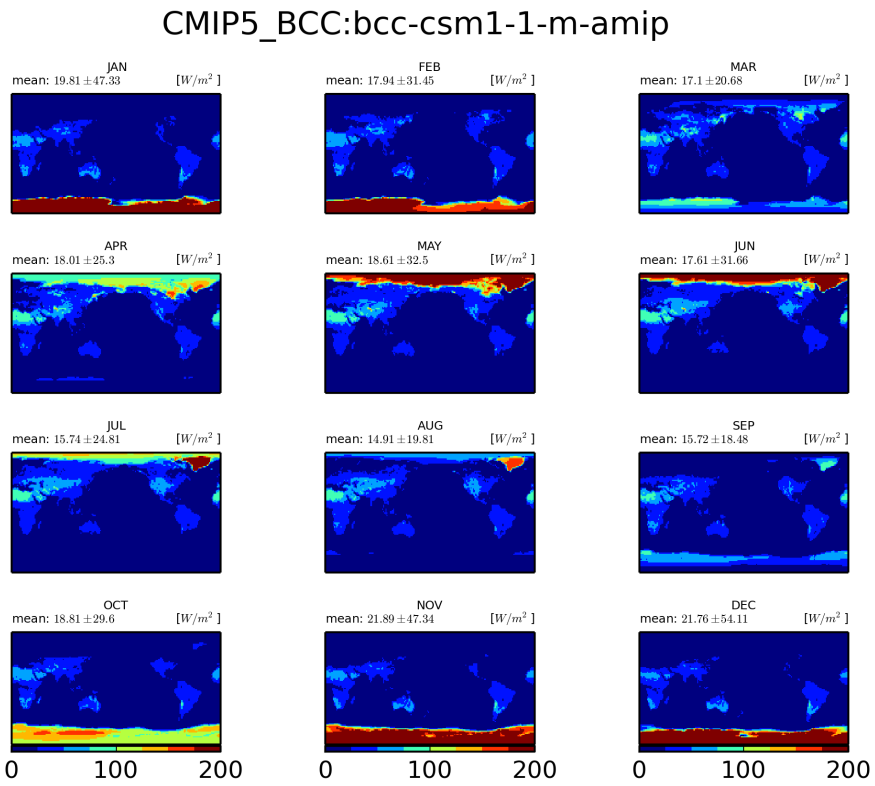



Figure 968: Monthly mean climatology for BCC:bcc-csm1-1-m

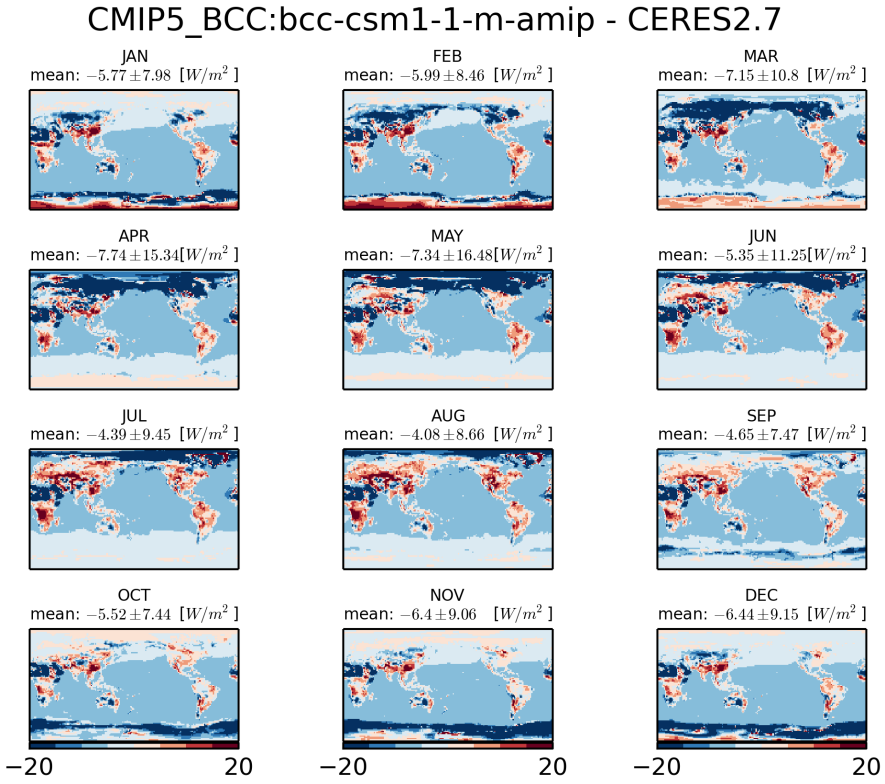



Figure 969: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and CERES2.7

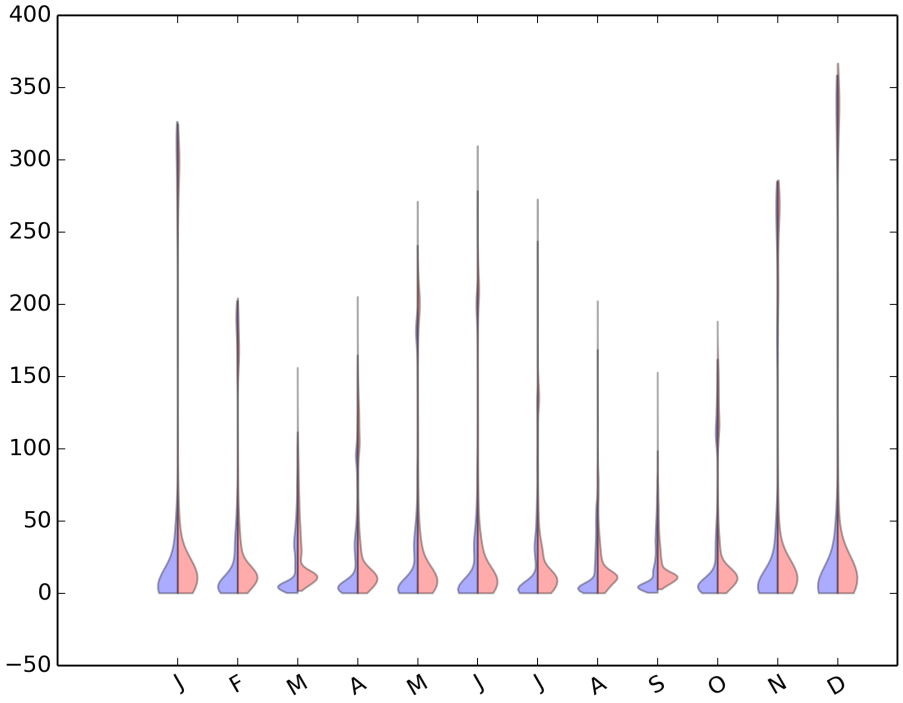



Figure 970: Violin plot for CMIP5-BCC:BCC-CSM1-1-M-AMIP

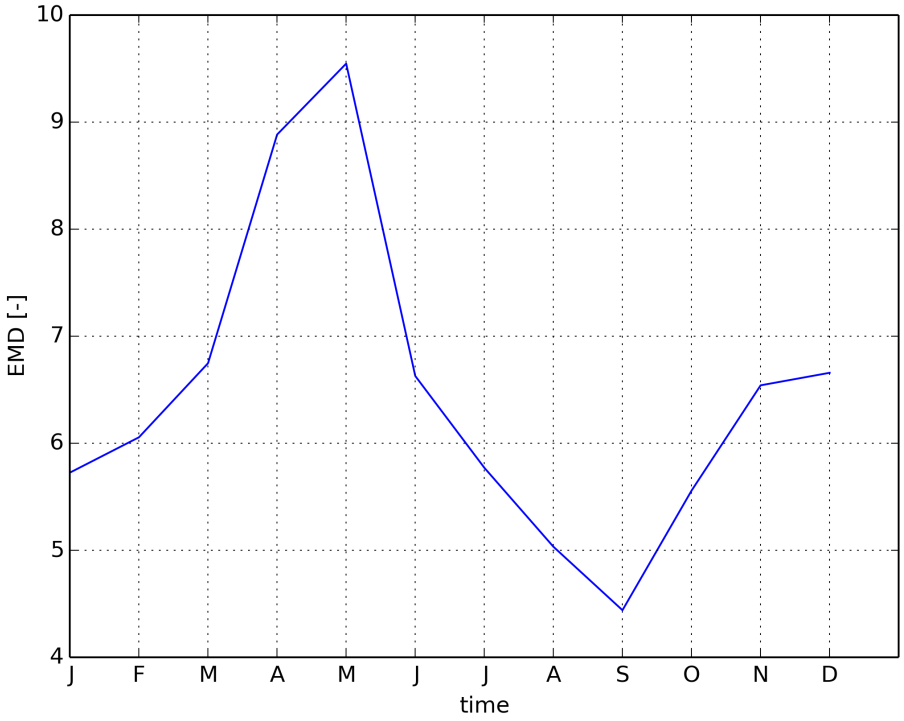



Figure 971: Timeseries of EMD

### 2.2.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

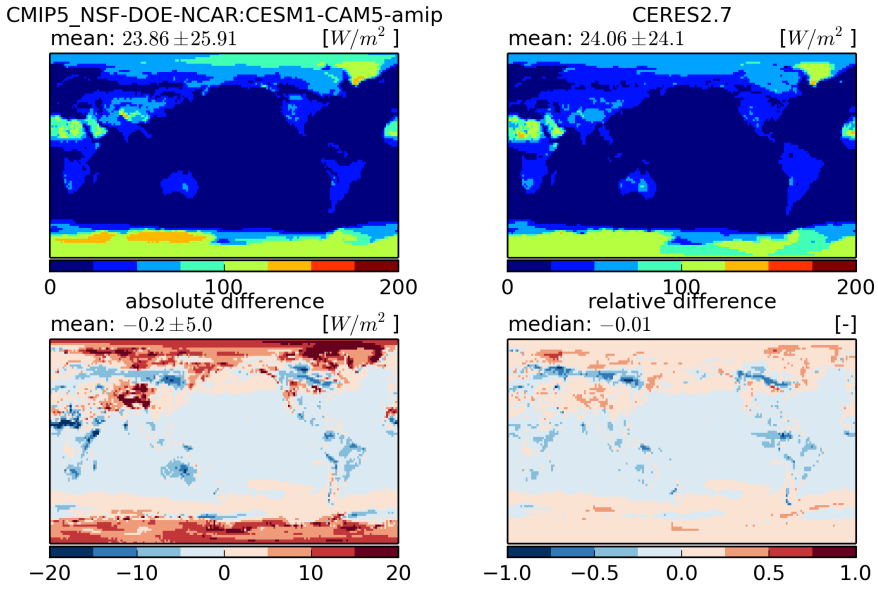



Figure 972: Temporal mean fields (top) and absolute and relative differences (bottom)

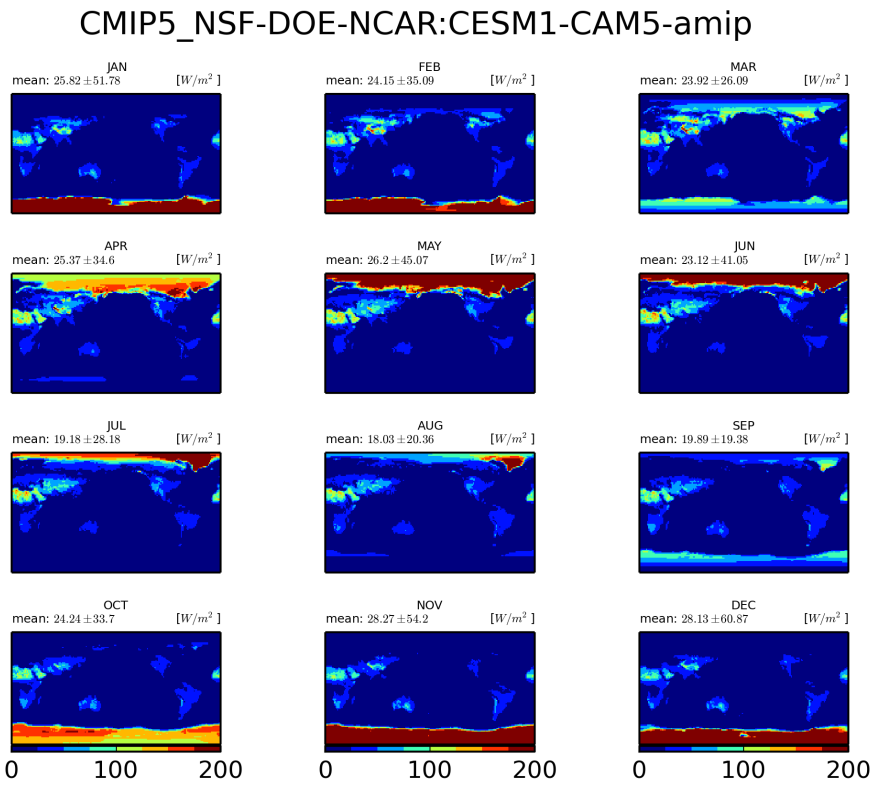



Figure 973: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

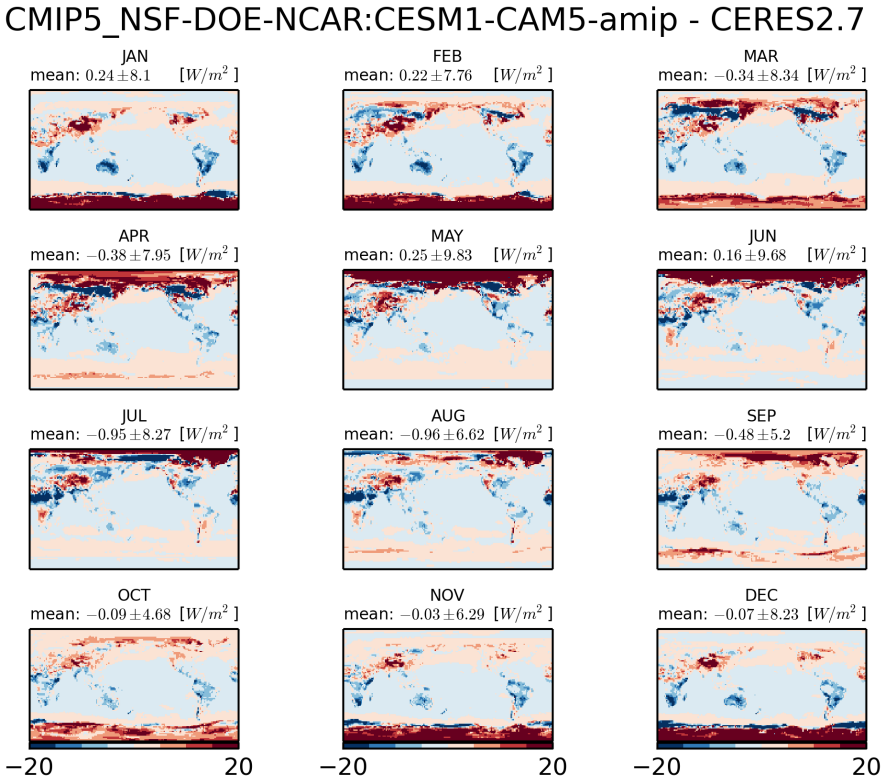



Figure 974: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and CERES2.7

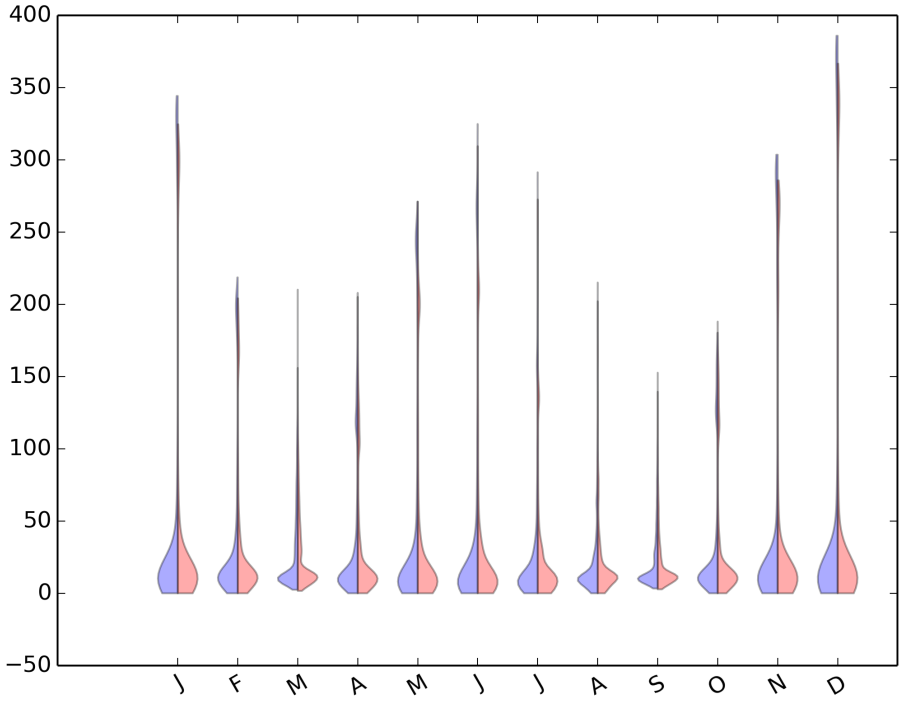



Figure 975: Violin plot for CMIP5-NSF-DOE-NCAR:CESM1-CAM5-AMIP

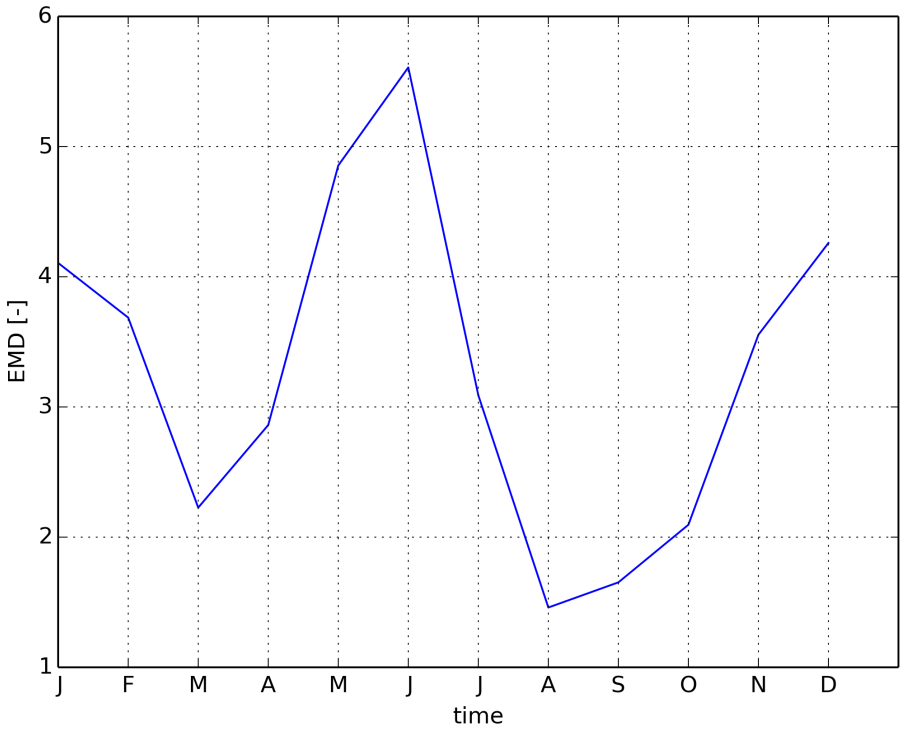



Figure 976: Timeseries of EMD

### 2.2.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

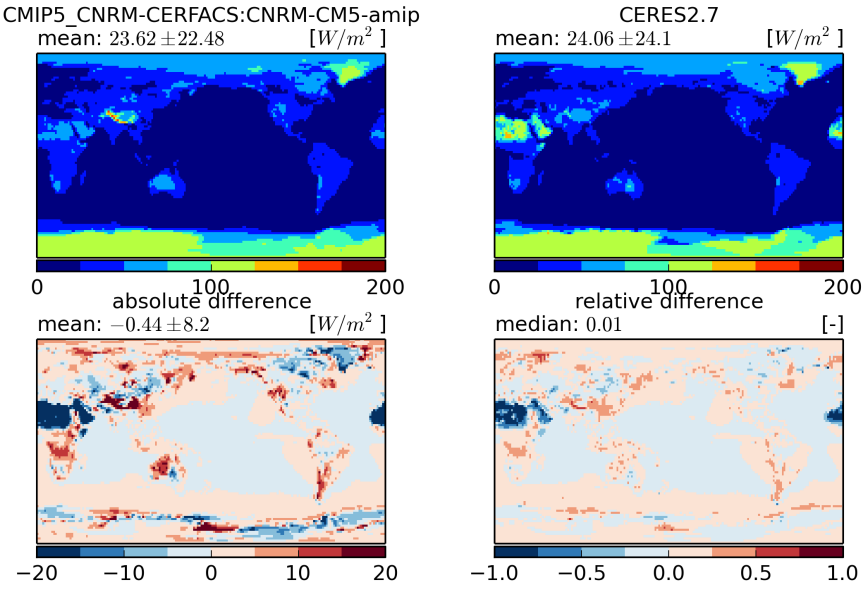



Figure 977: Temporal mean fields (top) and absolute and relative differences (bottom)

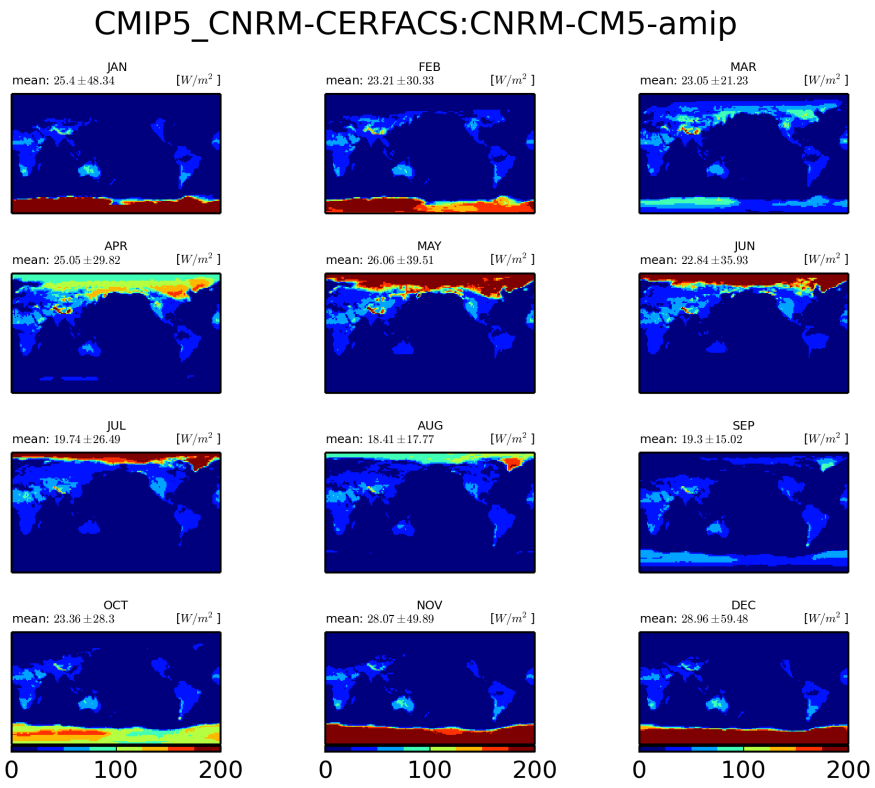



Figure 978: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

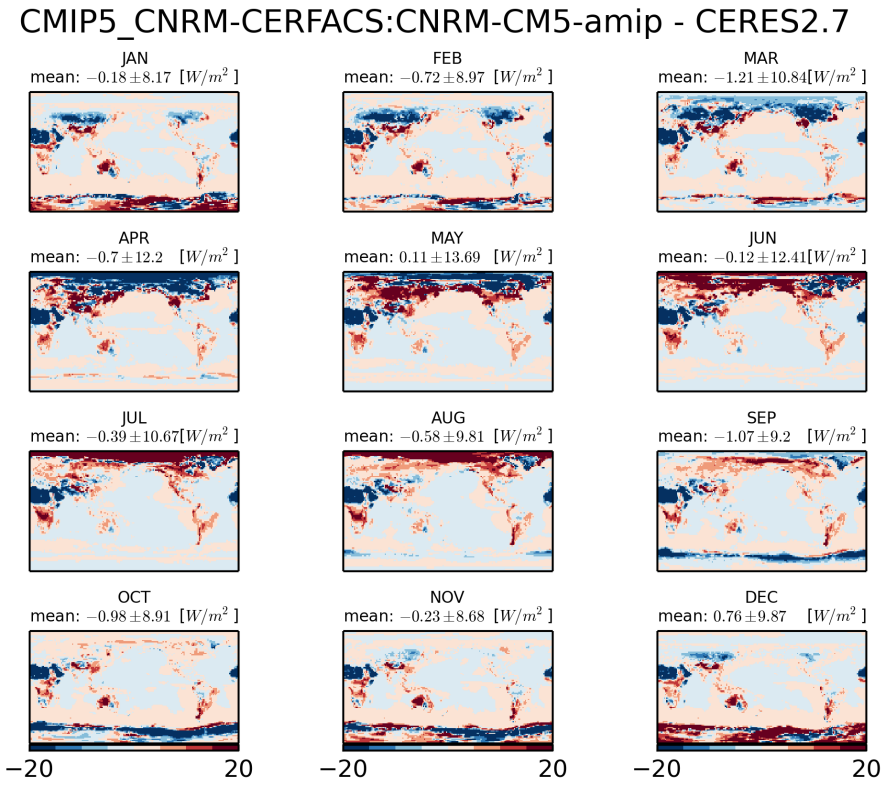



Figure 979: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and CERES2.7

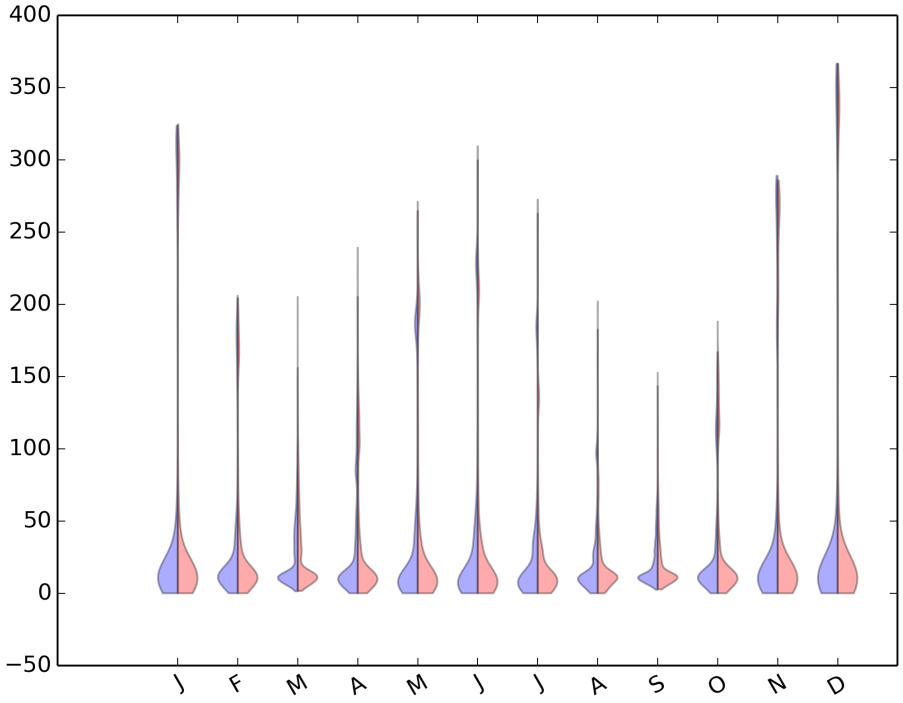



Figure 980: Violin plot for CMIP5-CNRM-CERFACS:CNRM-CM5-AMIP

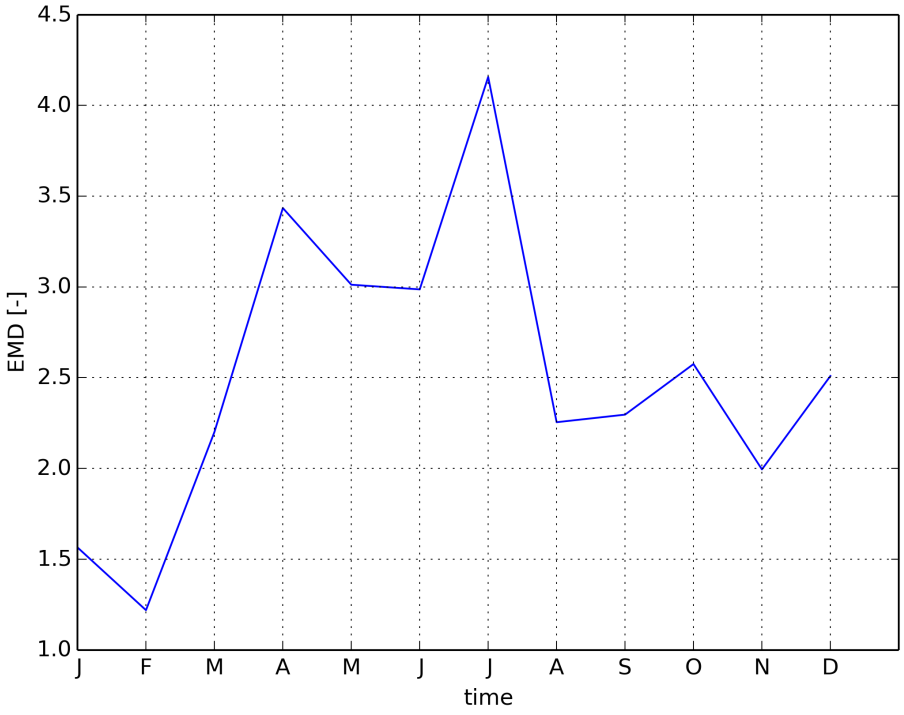



Figure 981: Timeseries of EMD

### 2.2.9 CMIP5 MRI:MRI-CGCM3-amip

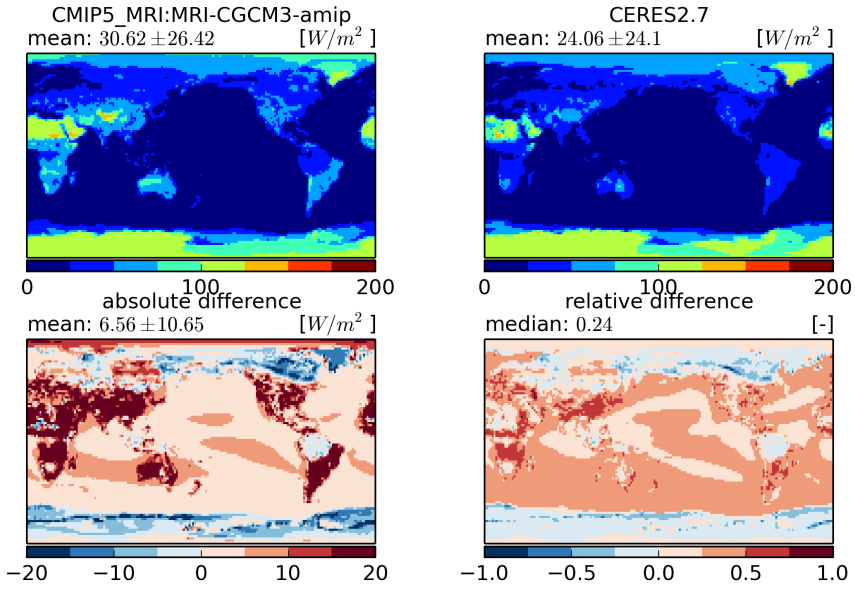



Figure 982: Temporal mean fields (top) and absolute and relative differences (bottom)

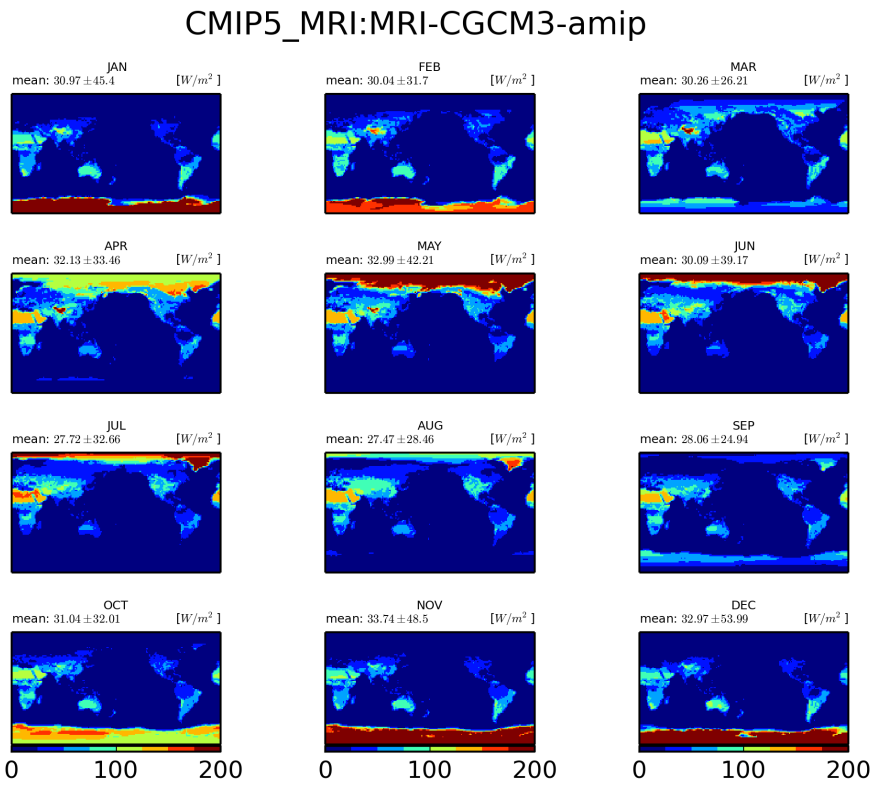



Figure 983: Monthly mean climatology for MRI:MRI-CGCM3

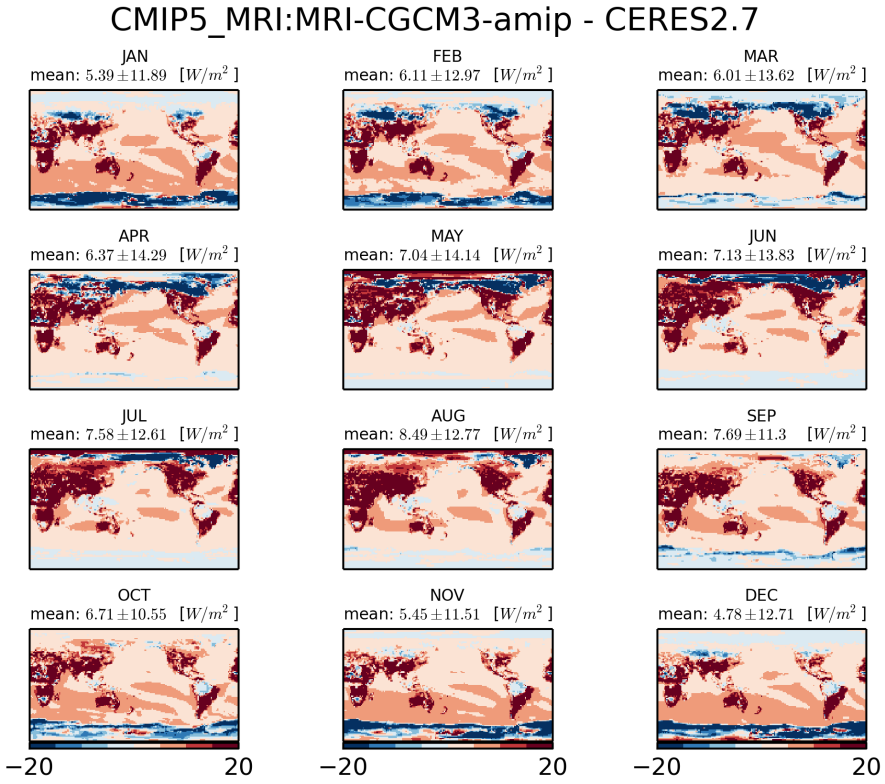



Figure 984: Monthly mean climatology of difference between MRI:MRI-CGCM3 and CERES2.7

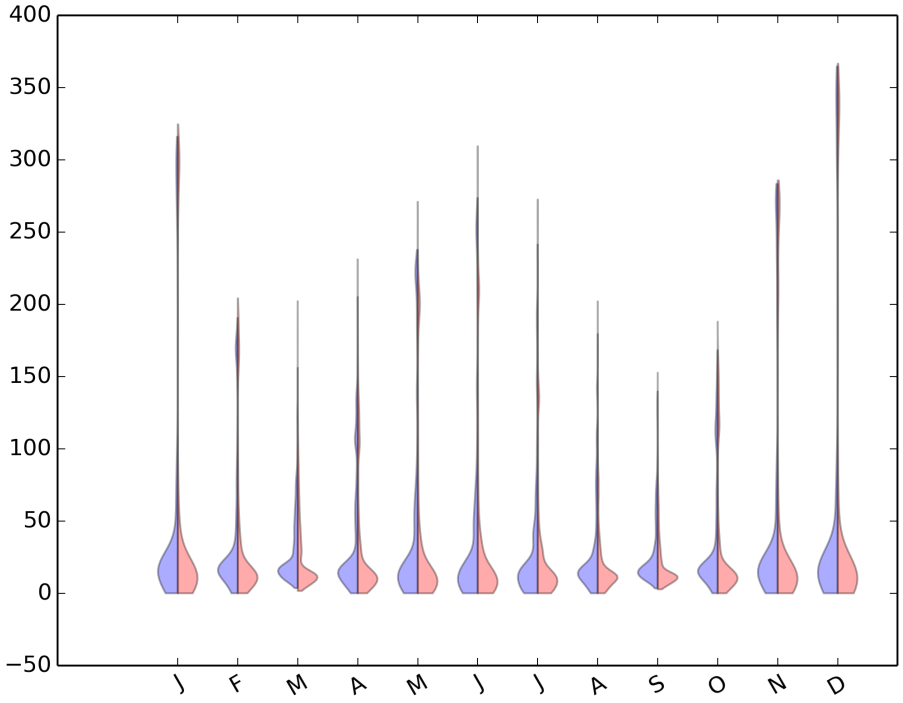



Figure 985: Violin plot for CMIP5-MRI:MRI-CGCM3-AMIP

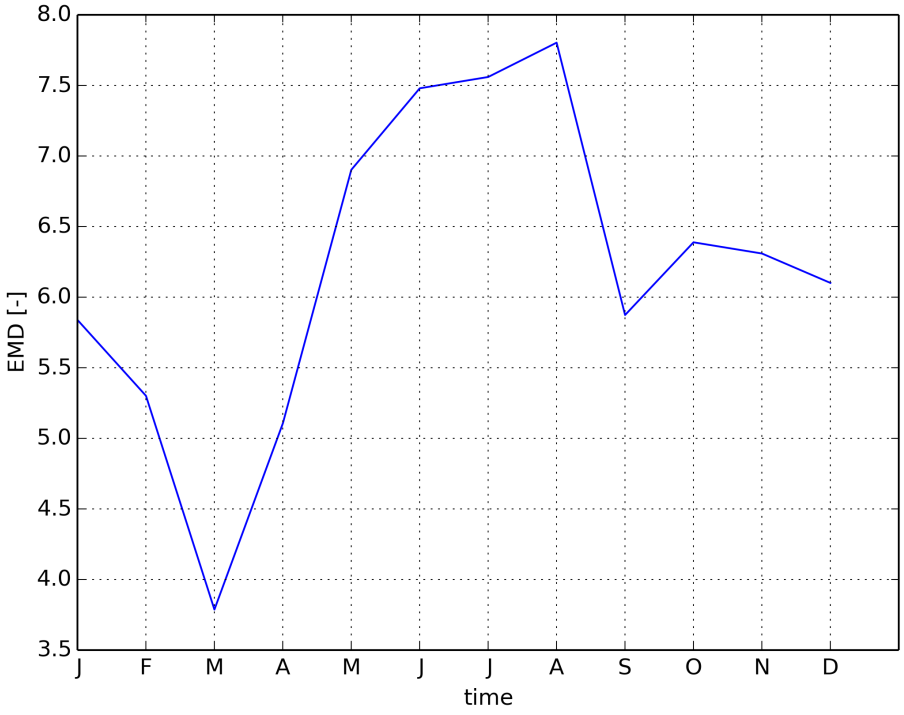



Figure 986: Timeseries of EMD

### 2.2.10 CMIP5 NASA-GISS:GISS-E2-R-amip

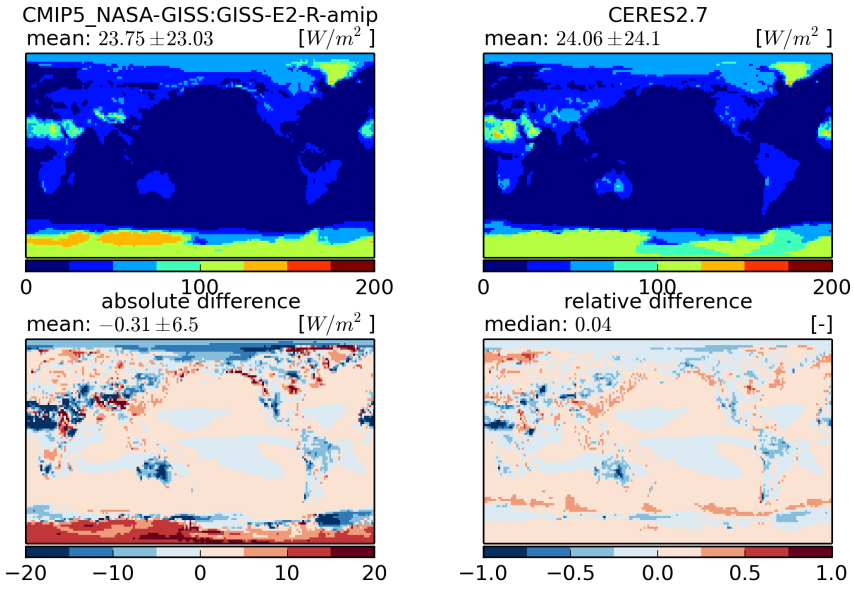



Figure 987: Temporal mean fields (top) and absolute and relative differences (bottom)

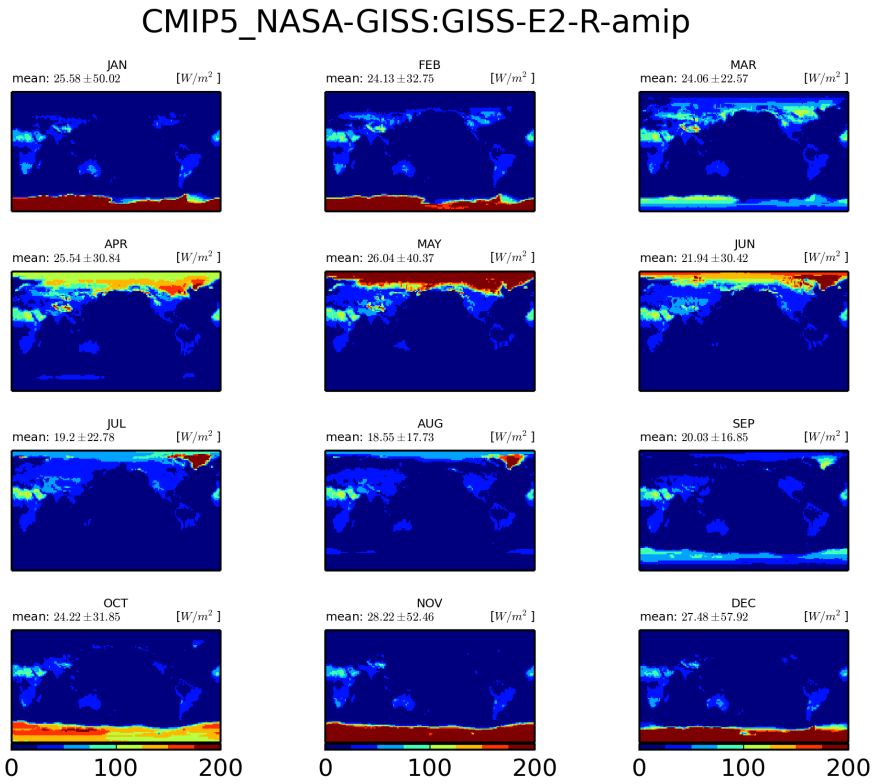



Figure 988: Monthly mean climatology for NASA-GISS:GISS-E2-R

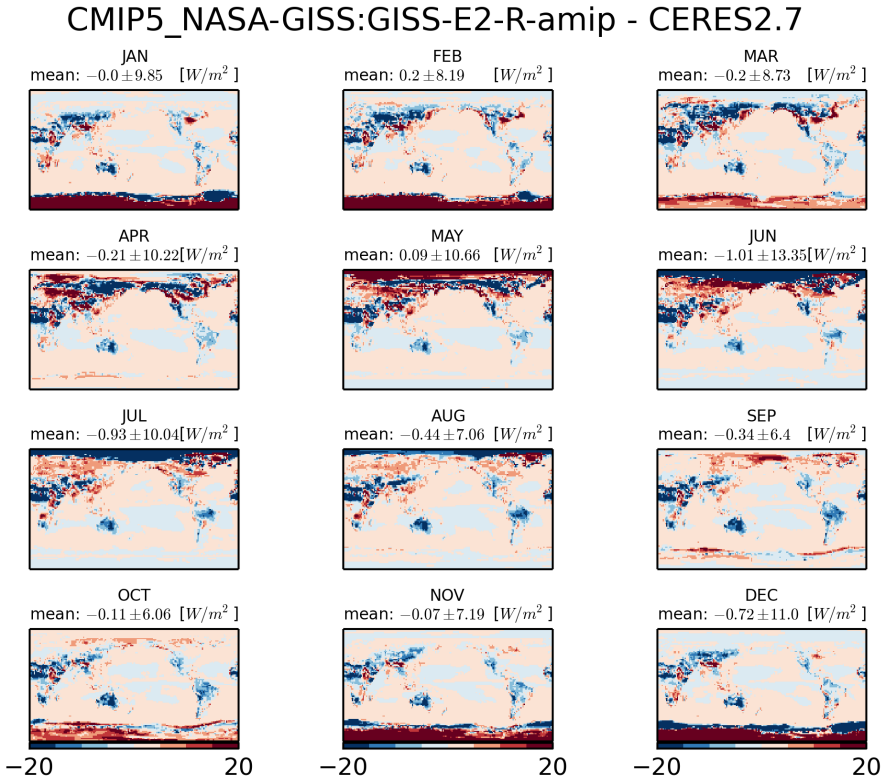



Figure 989: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and CERES2.7

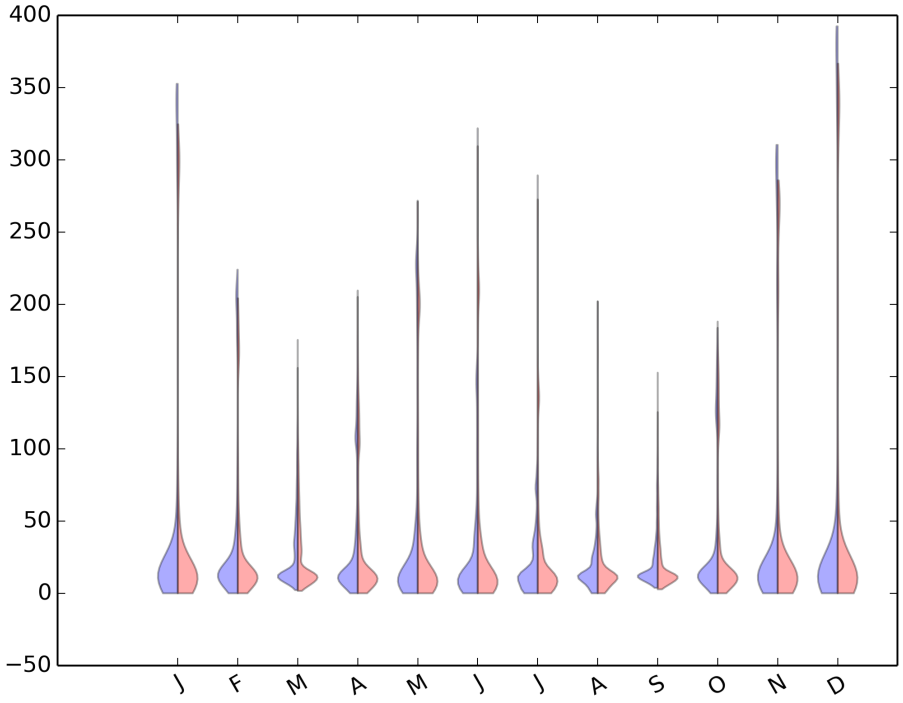



Figure 990: Violin plot for CMIP5-NASA-GISS:GISS-E2-R-AMIP

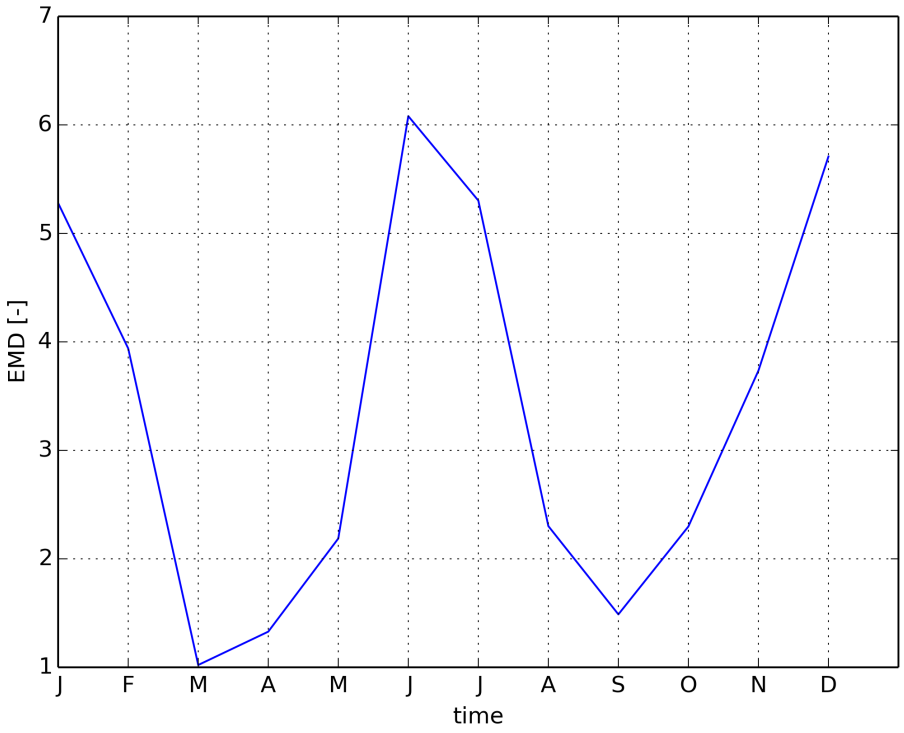



Figure 991: Timeseries of EMD

### 2.2.11 CMIP5 MIROC:MIROC5-amip

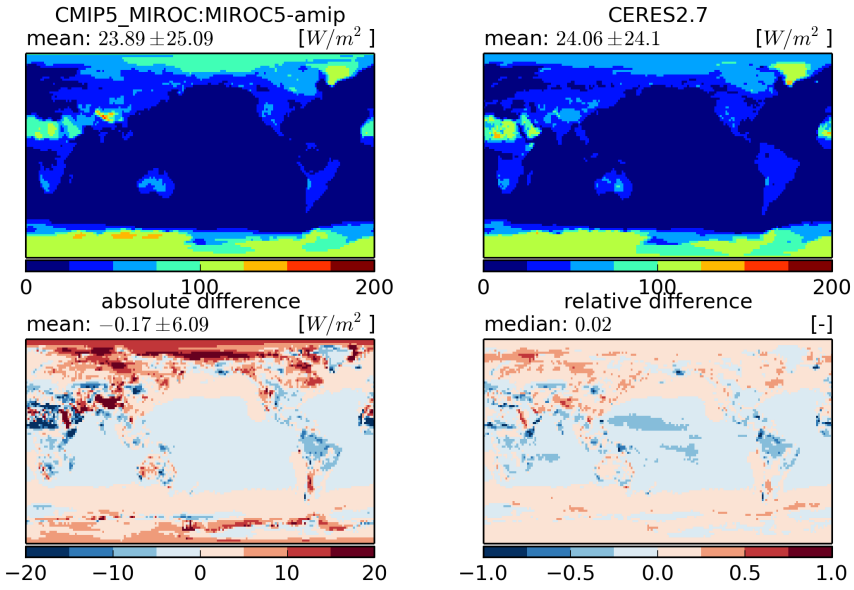



Figure 992: Temporal mean fields (top) and absolute and relative differences (bottom)

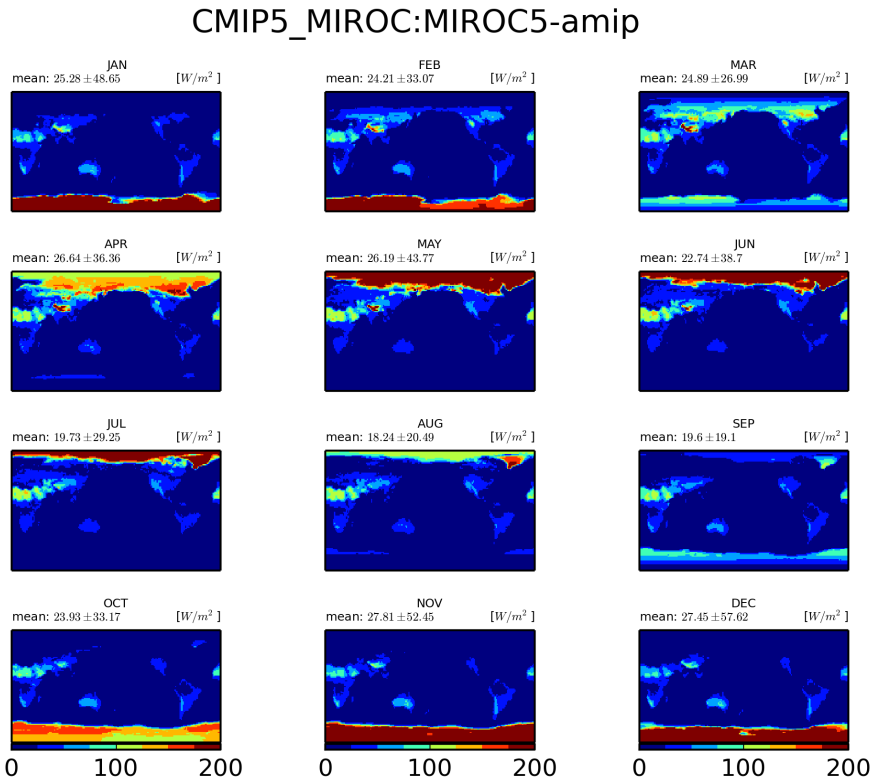



Figure 993: Monthly mean climatology for MIROC:MIROC5

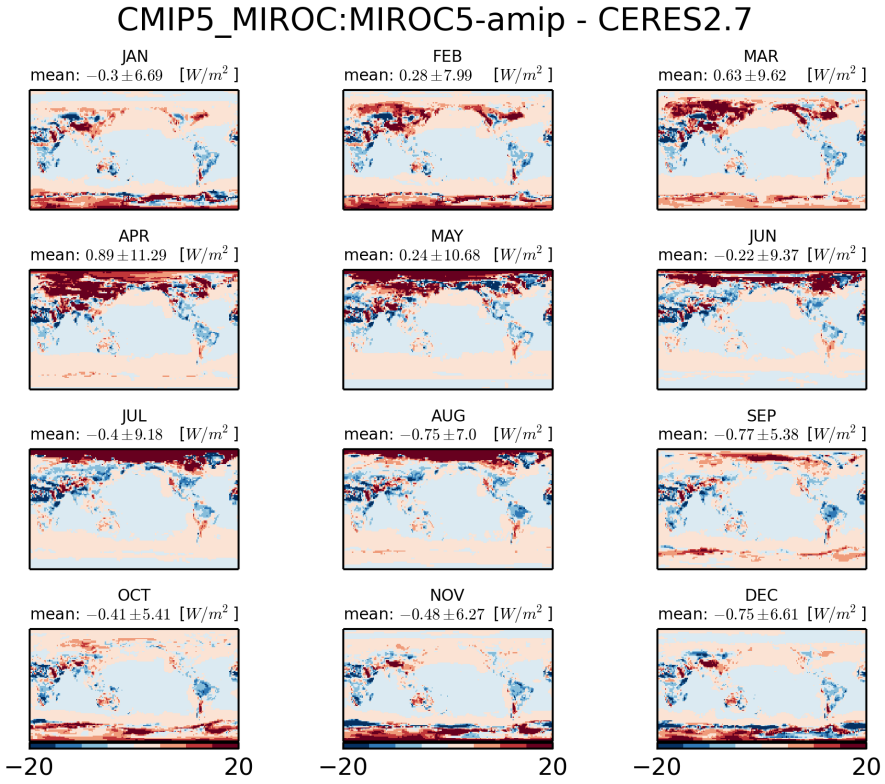



Figure 994: Monthly mean climatology of difference between MIROC:MIROC5 and CERES2.7

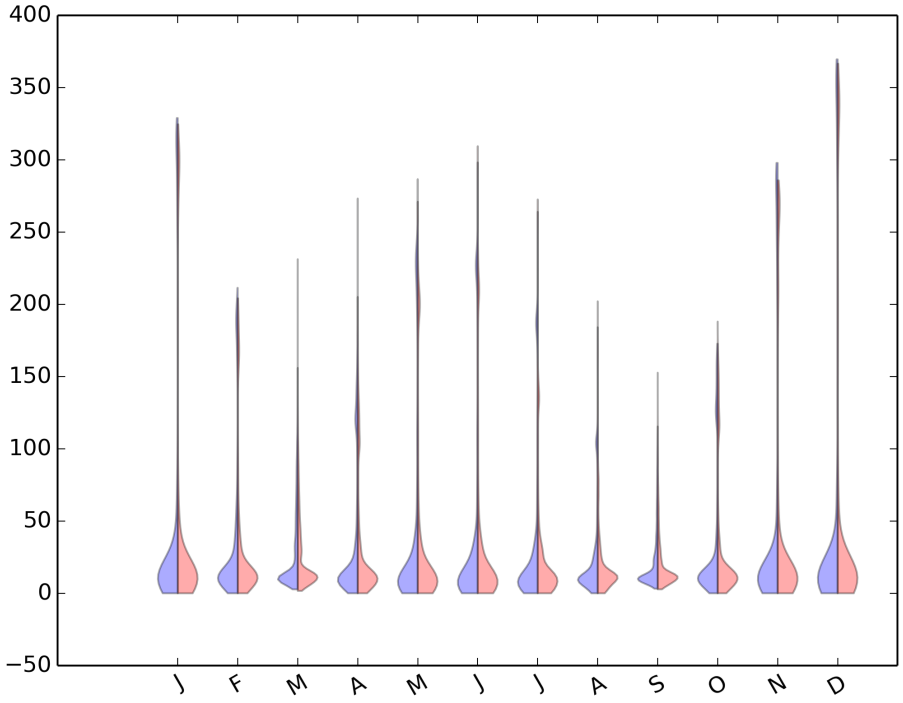



Figure 995: Violin plot for CMIP5-MIROC:MIROC5-AMIP

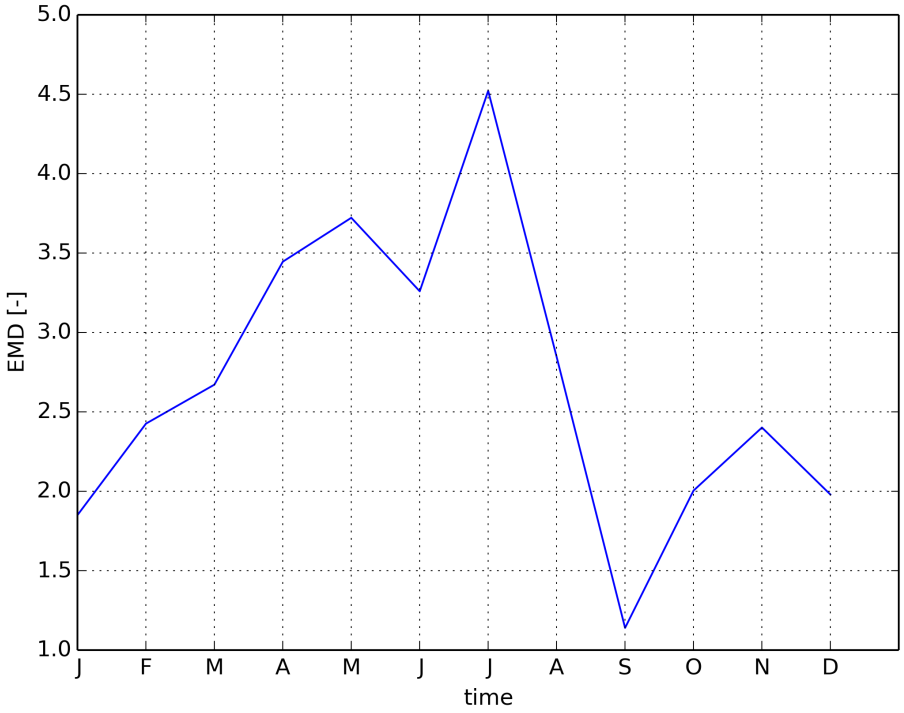



Figure 996: Timeseries of EMD

### 2.2.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

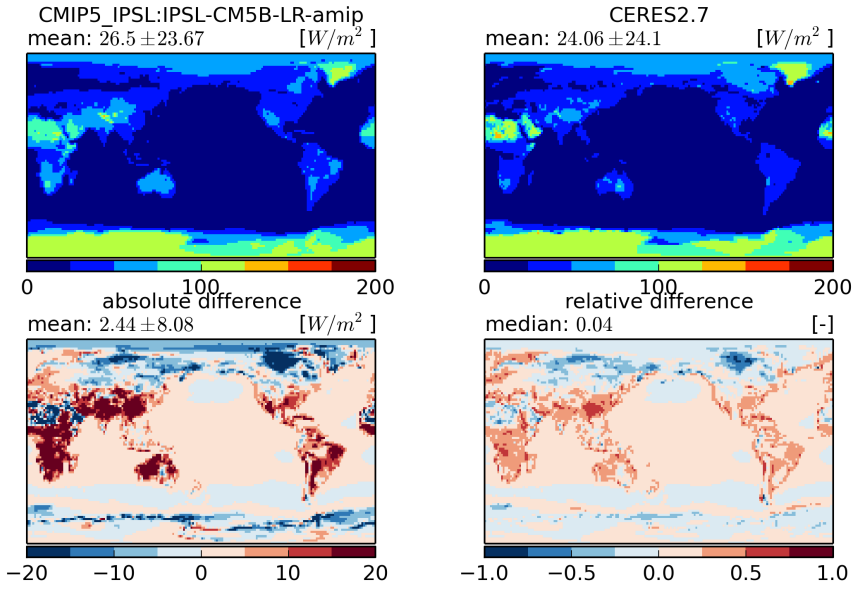



Figure 997: Temporal mean fields (top) and absolute and relative differences (bottom)

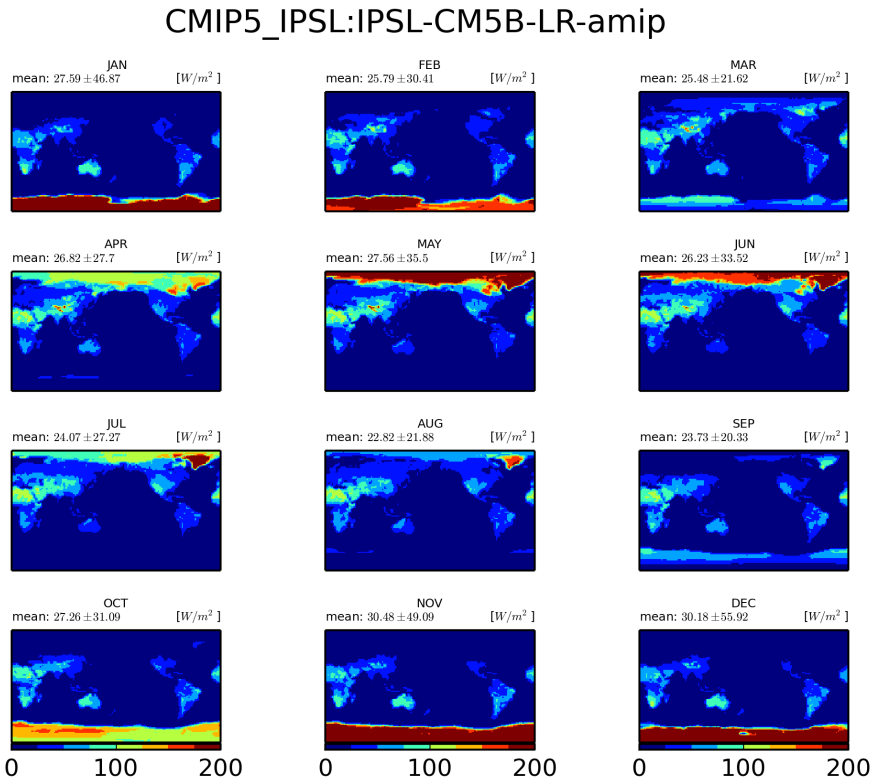



Figure 998: Monthly mean climatology for IPSL:IPSL-CM5B-LR

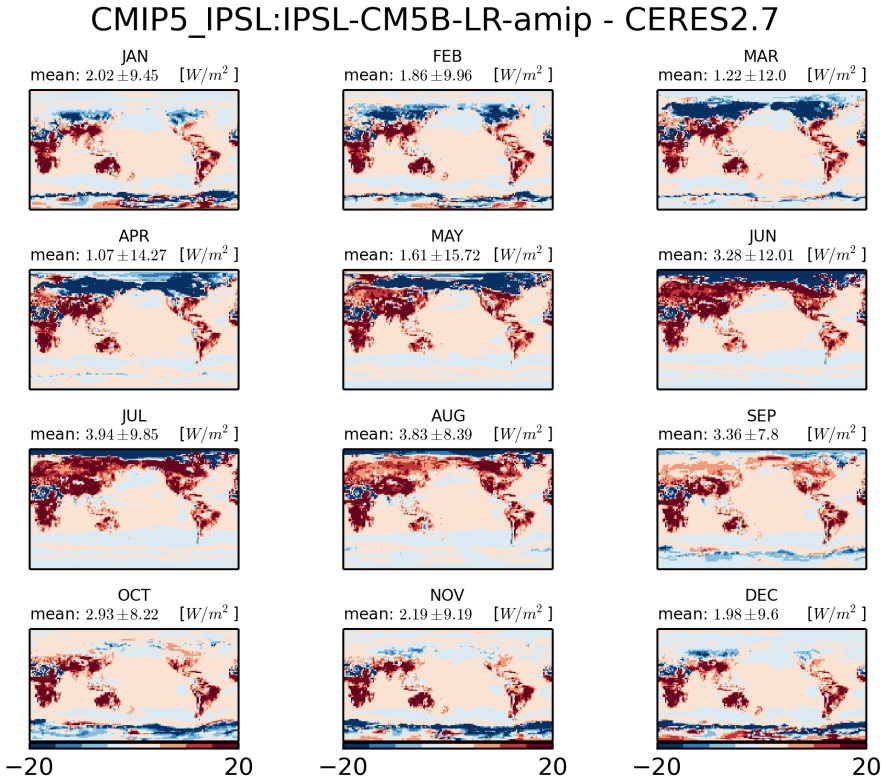



Figure 999: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and CERES2.7

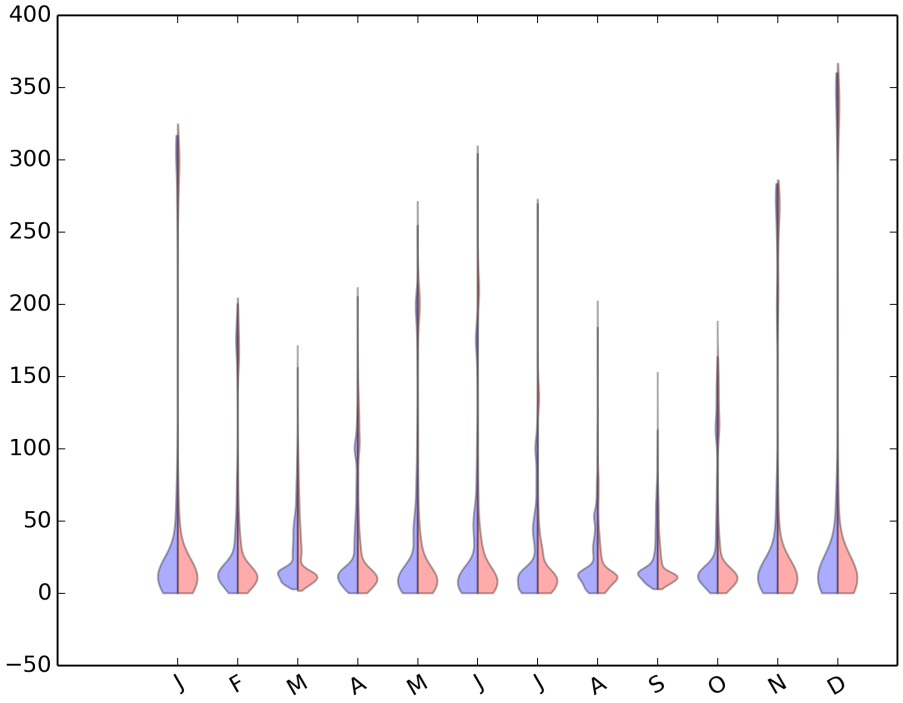



Figure 1000: Violin plot for CMIP5-IPSL:IPSL-CM5B-LR-AMIP

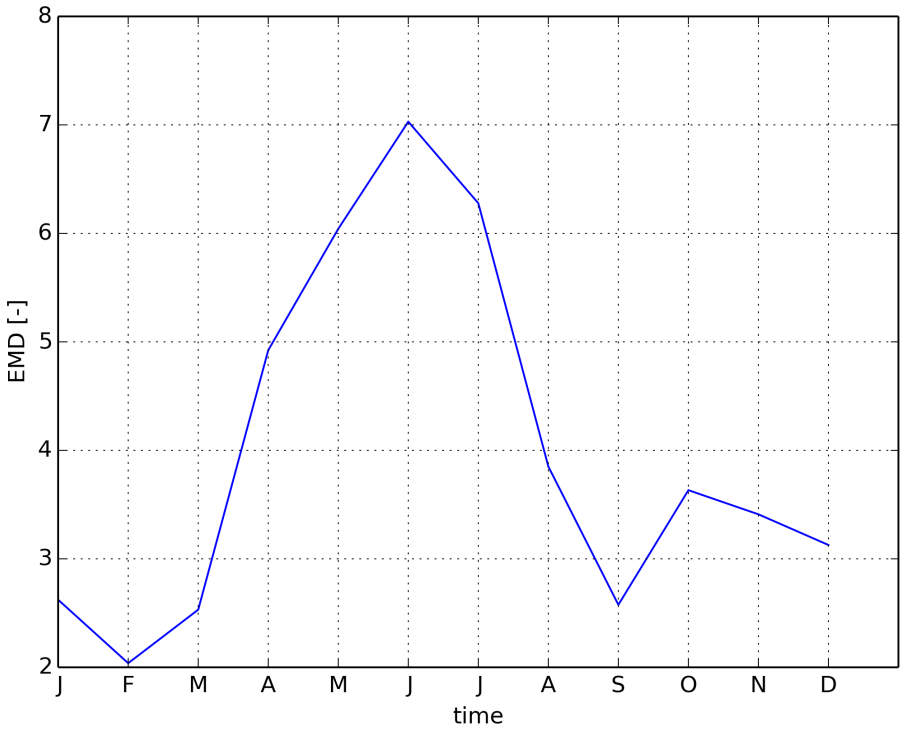



Figure 1001: Timeseries of EMD

### 2.2.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

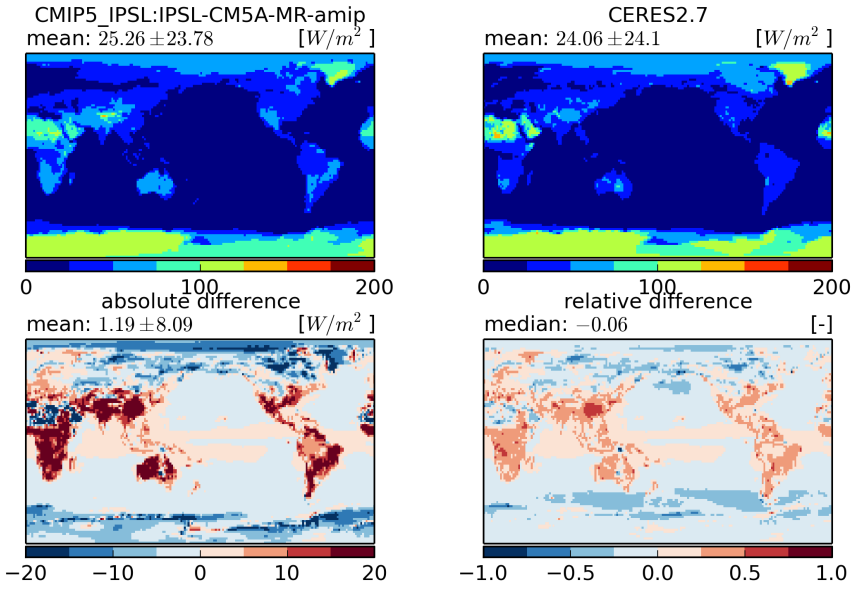



Figure 1002: Temporal mean fields (top) and absolute and relative differences (bottom)

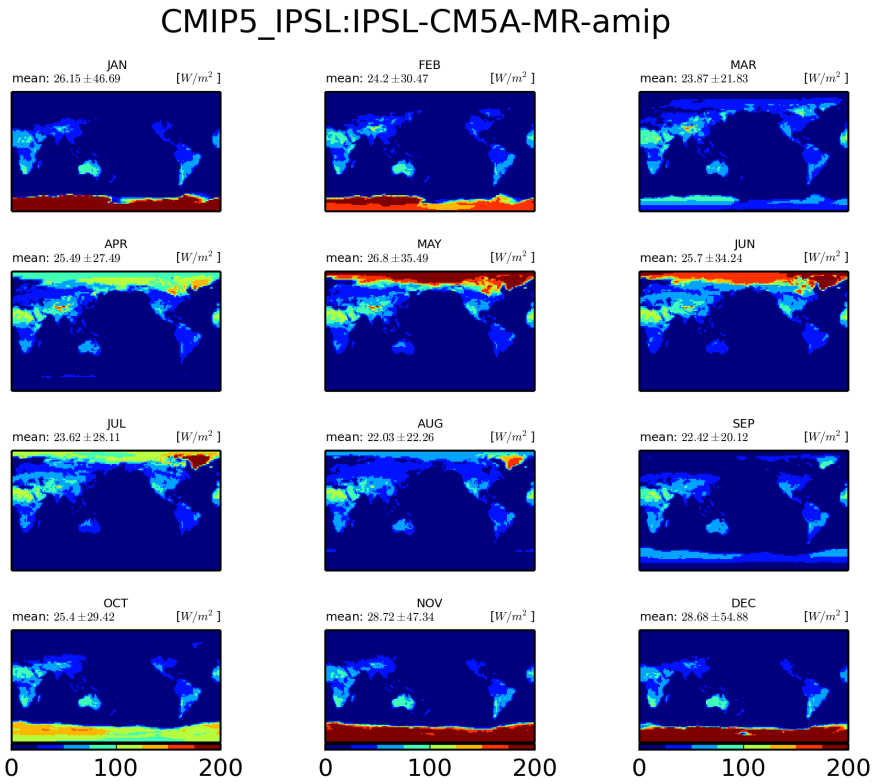



Figure 1003: Monthly mean climatology for IPSL:IPSL-CM5A-MR

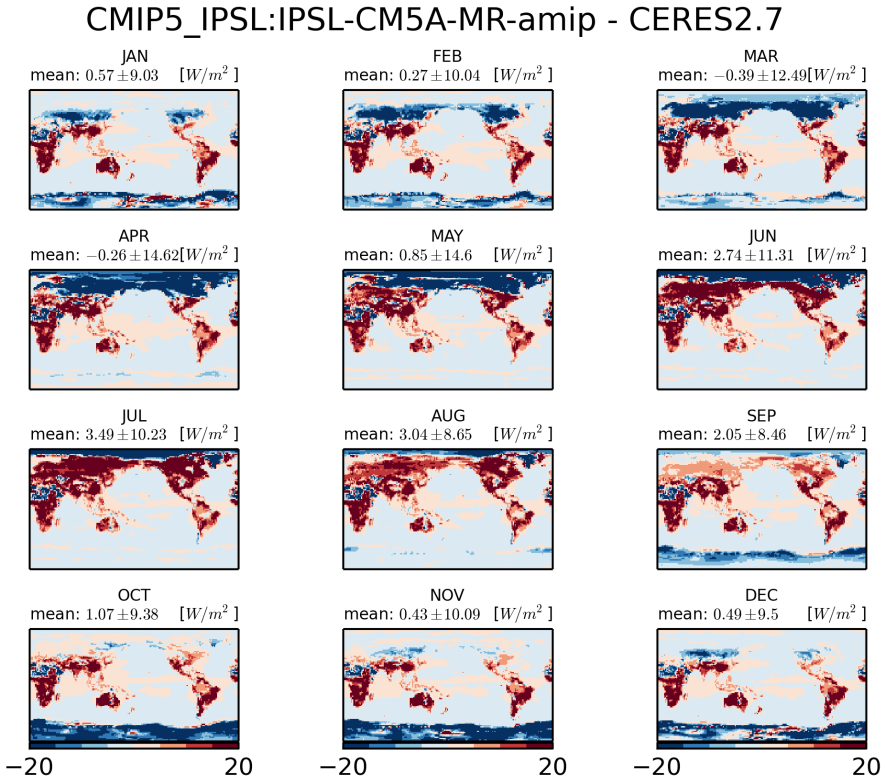



Figure 1004: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and CERES2.7

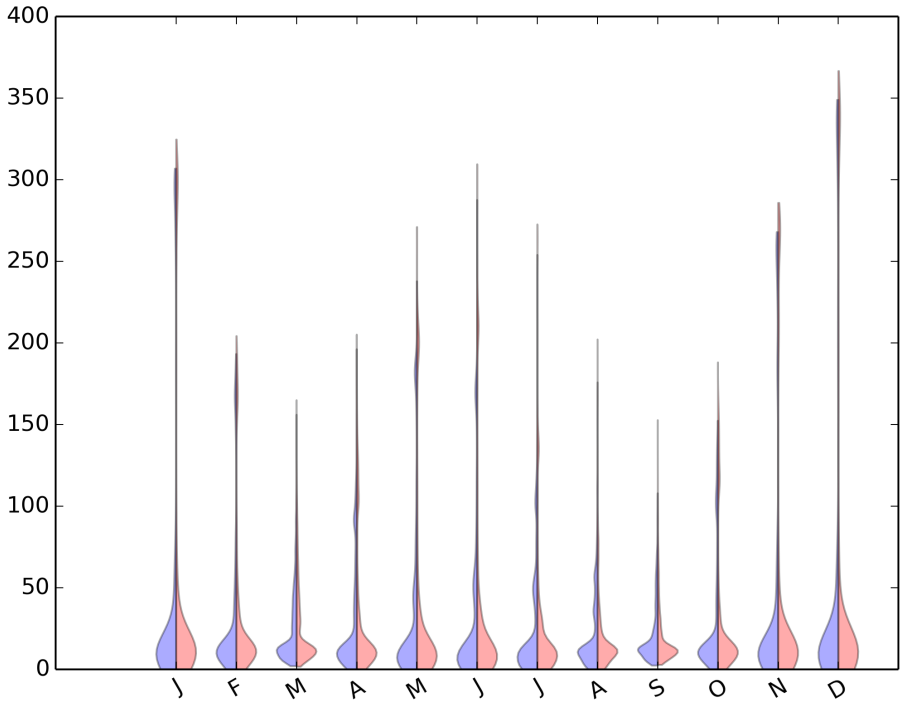



Figure 1005: Violin plot for CMIP5-IPSL:IPSL-CM5A-MR-AMIP

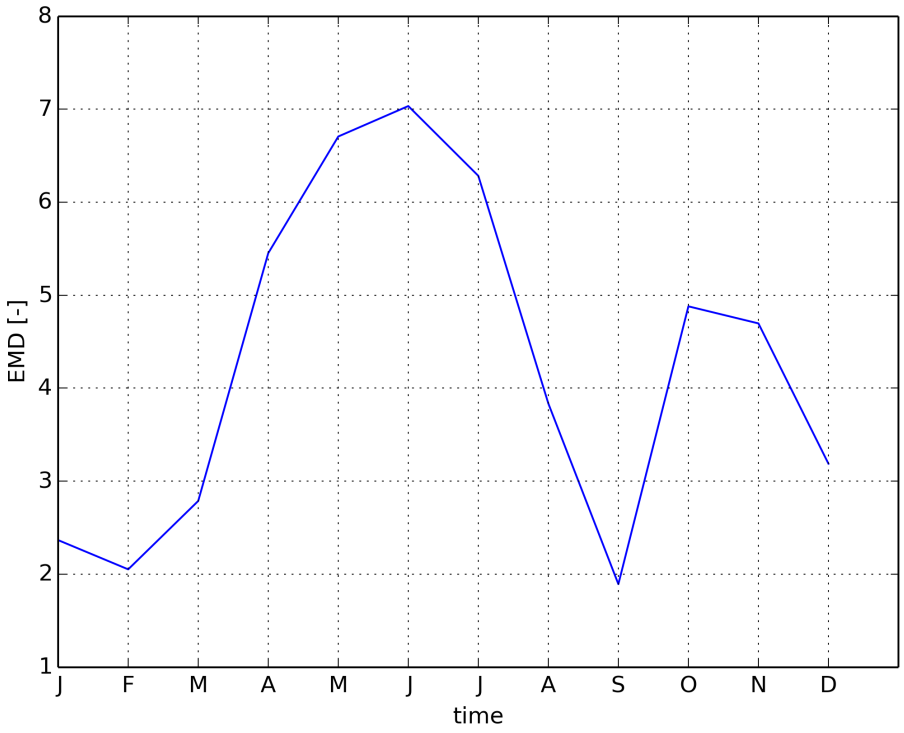



Figure 1006: Timeseries of EMD

### 2.2.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

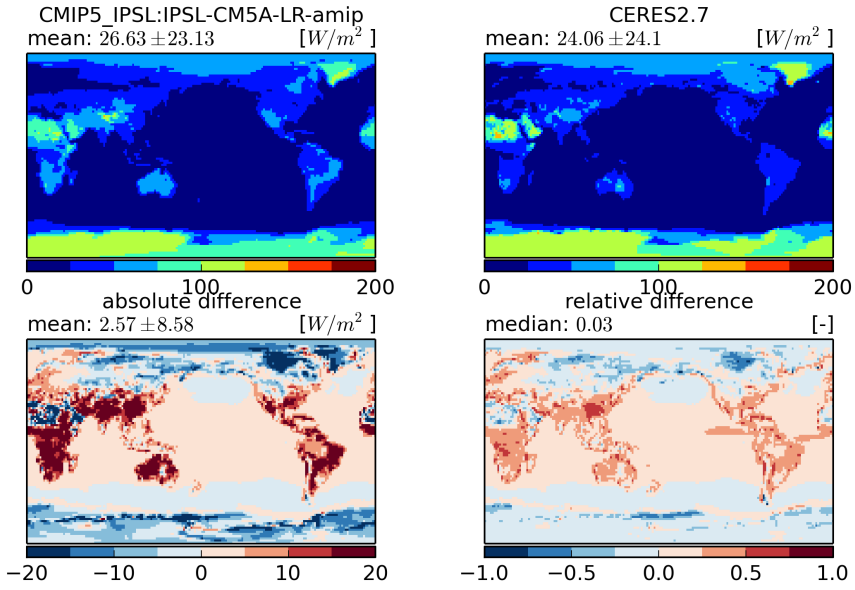



Figure 1007: Temporal mean fields (top) and absolute and relative differences (bottom)

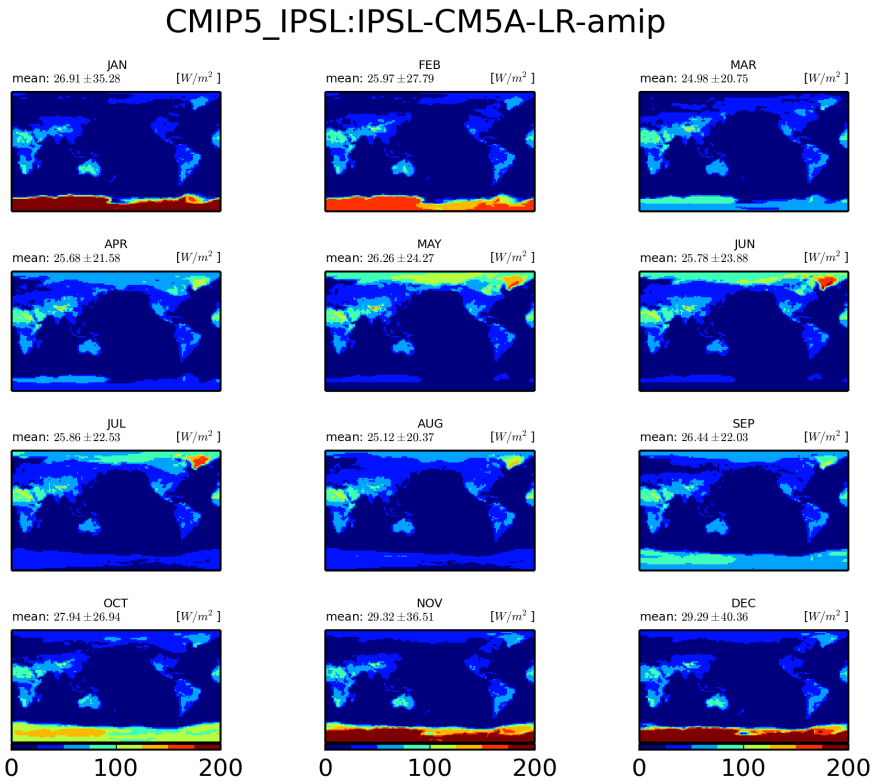



Figure 1008: Monthly mean climatology for IPSL:IPSL-CM5A-LR

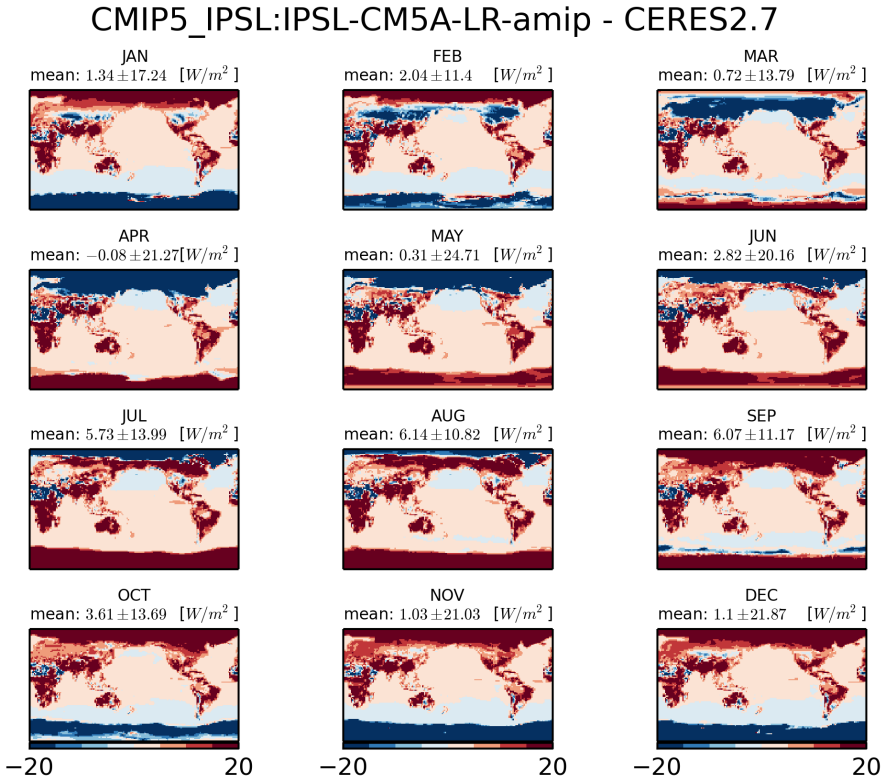



Figure 1009: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and CERES2.7

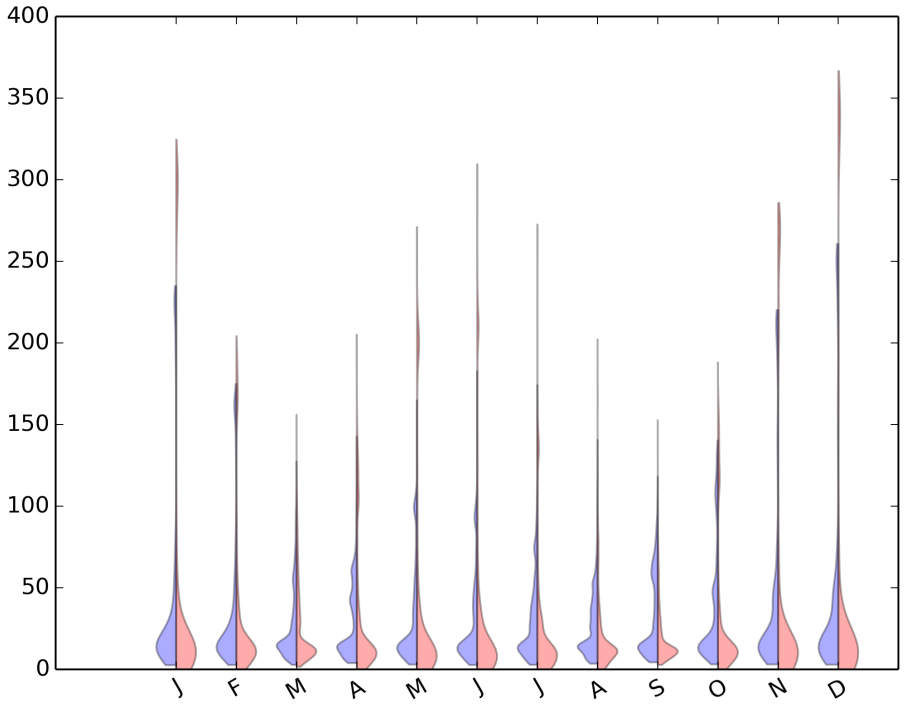



Figure 1010: Violin plot for CMIP5-IPSL:IPSL-CM5A-LR-AMIP

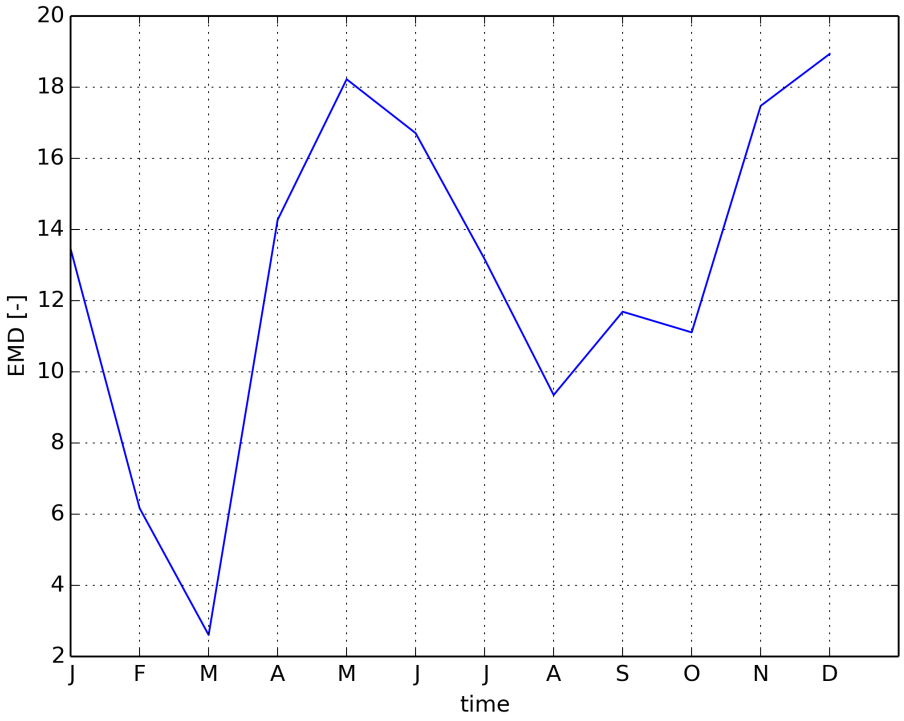



Figure 1011: Timeseries of EMD

### 2.2.15 CMIP5 MOHC:HadGEM2-A-amip

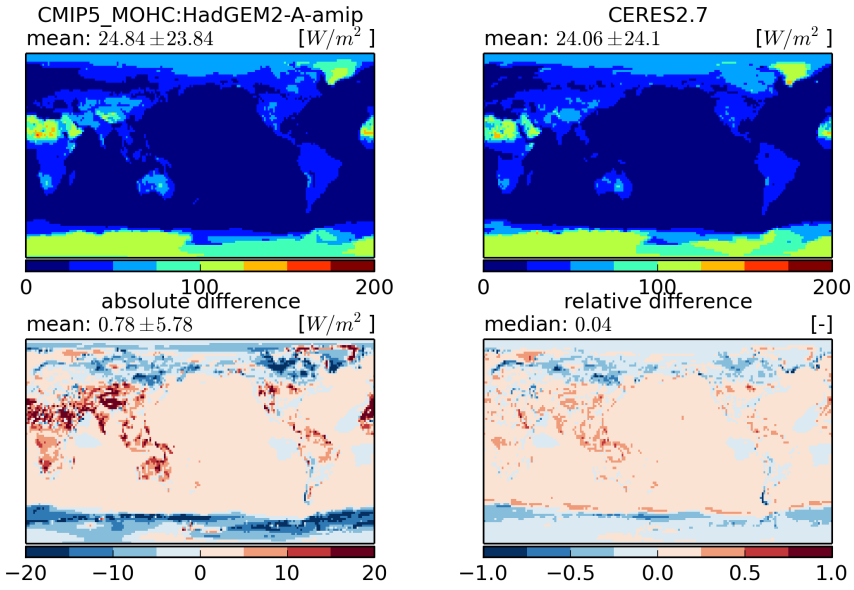



Figure 1012: Temporal mean fields (top) and absolute and relative differences (bottom)

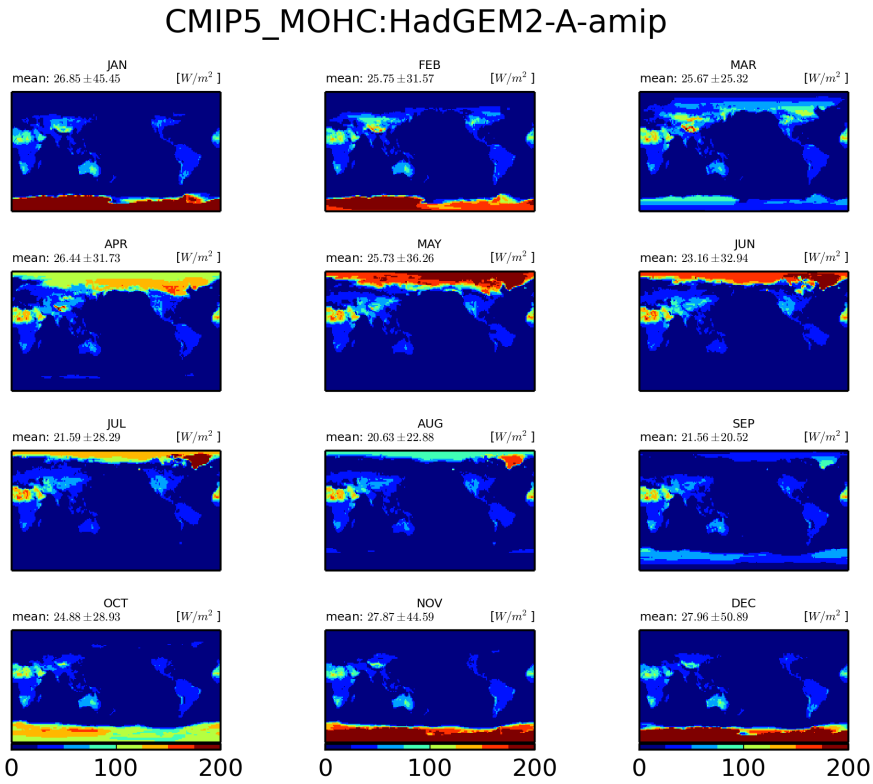



Figure 1013: Monthly mean climatology for MOHC:HadGEM2-A

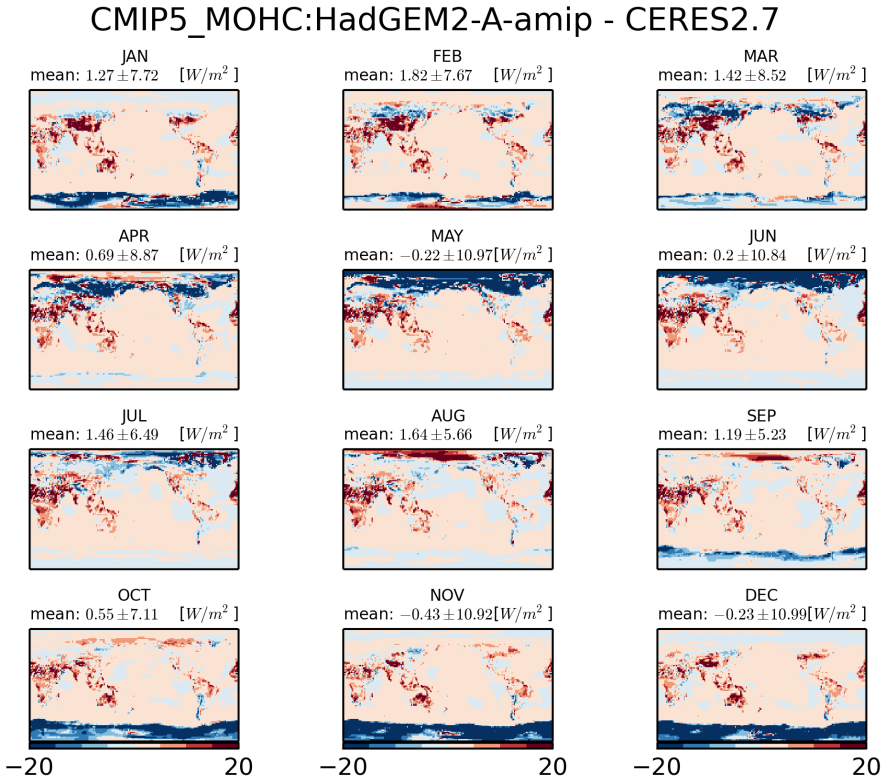



Figure 1014: Monthly mean climatology of difference between MOHC:HADGEM2-A and CERES2.7

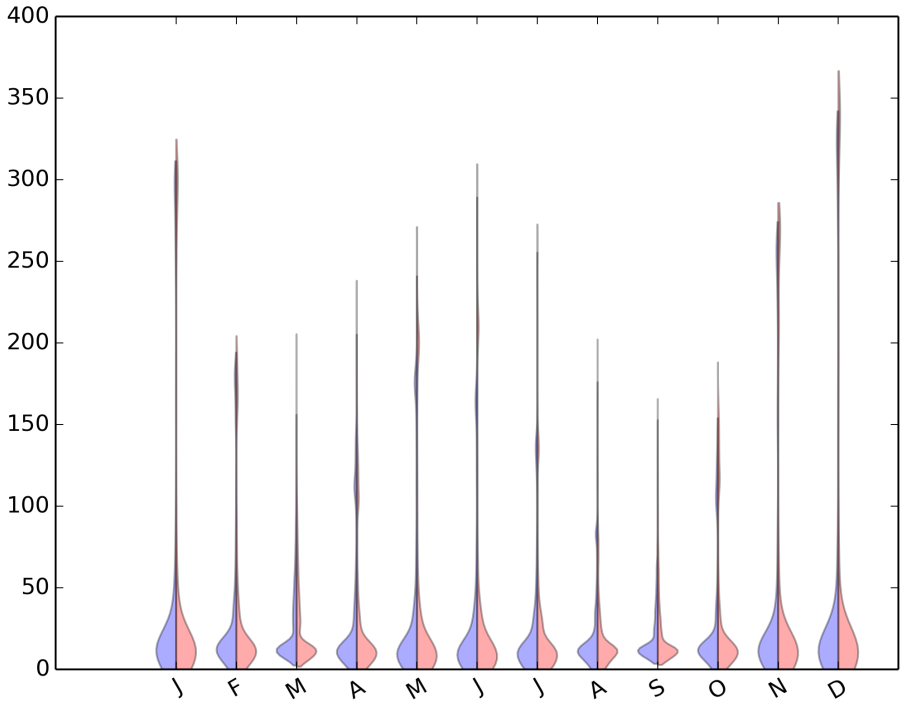



Figure 1015: Violin plot for CMIP5-MOHC:HADGEM2-A-AMIP

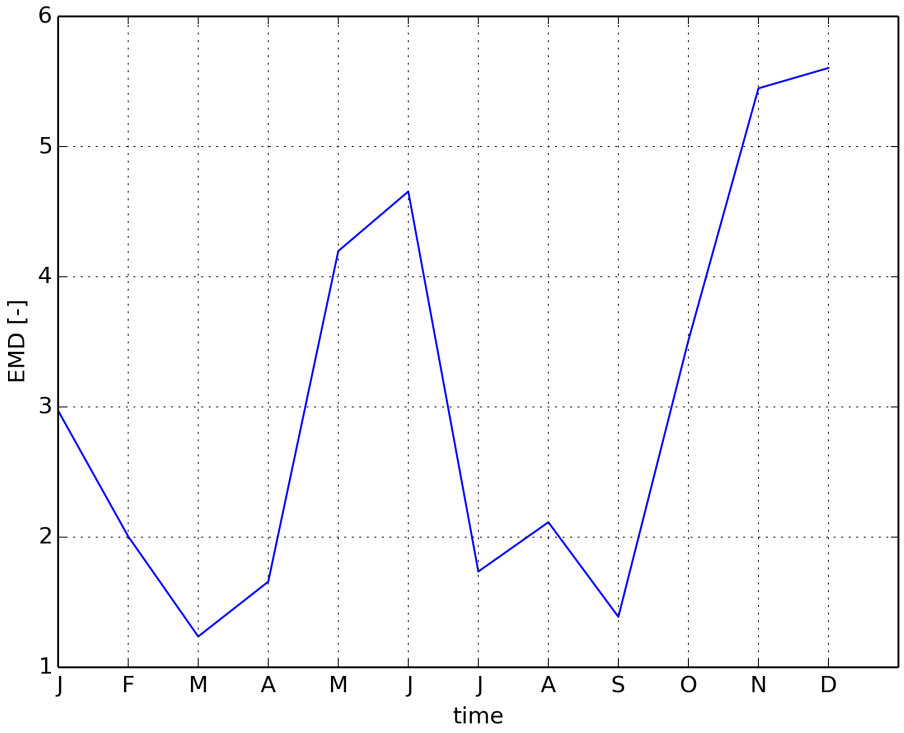



Figure 1016: Timeseries of EMD

### 2.2.16 CMIP5 LASG-IAP:FGOALS-s2-amip

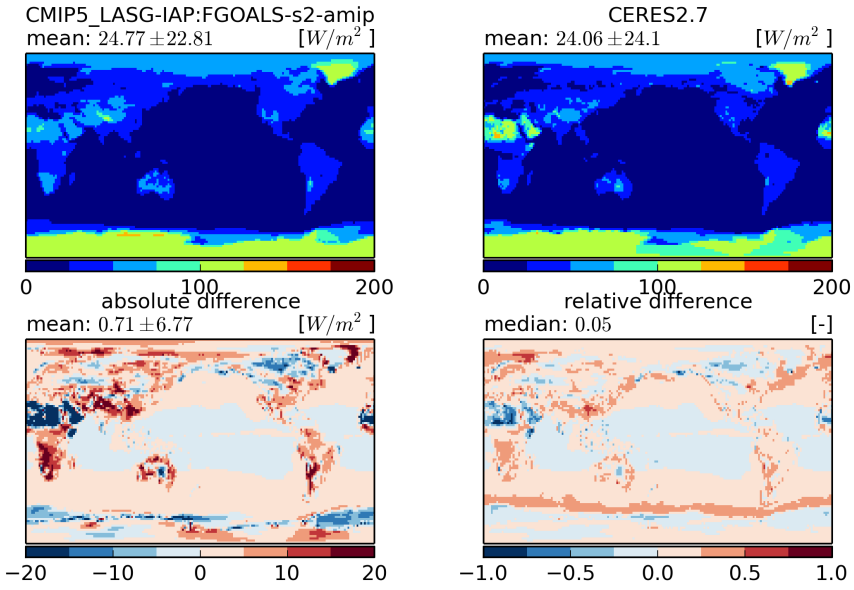



Figure 1017: Temporal mean fields (top) and absolute and relative differences (bottom)

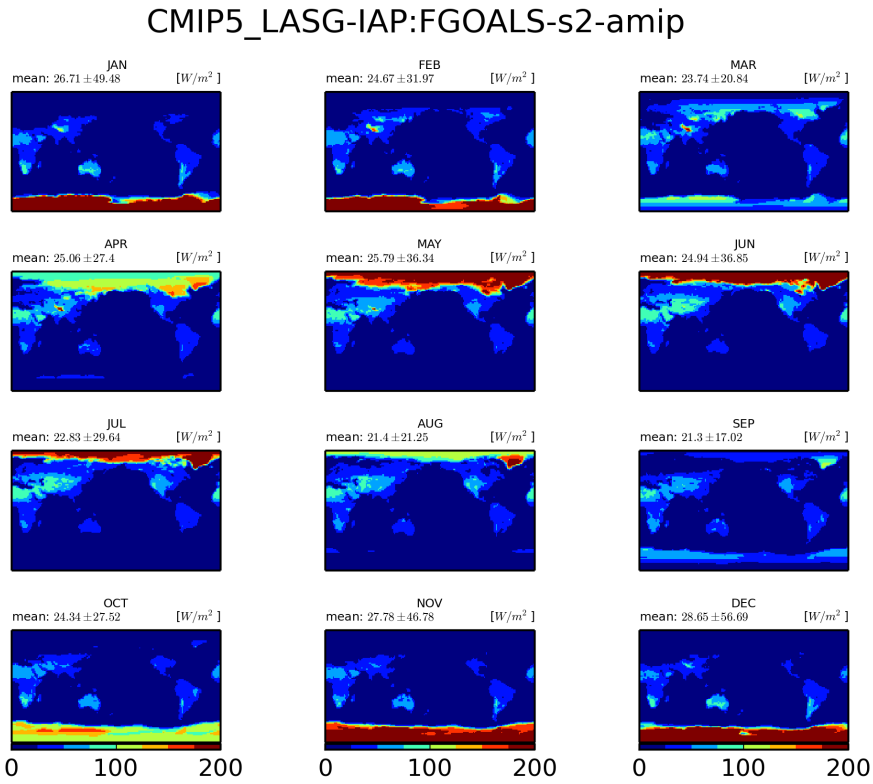



Figure 1018: Monthly mean climatology for LASG-IAP:FGOALS-s2

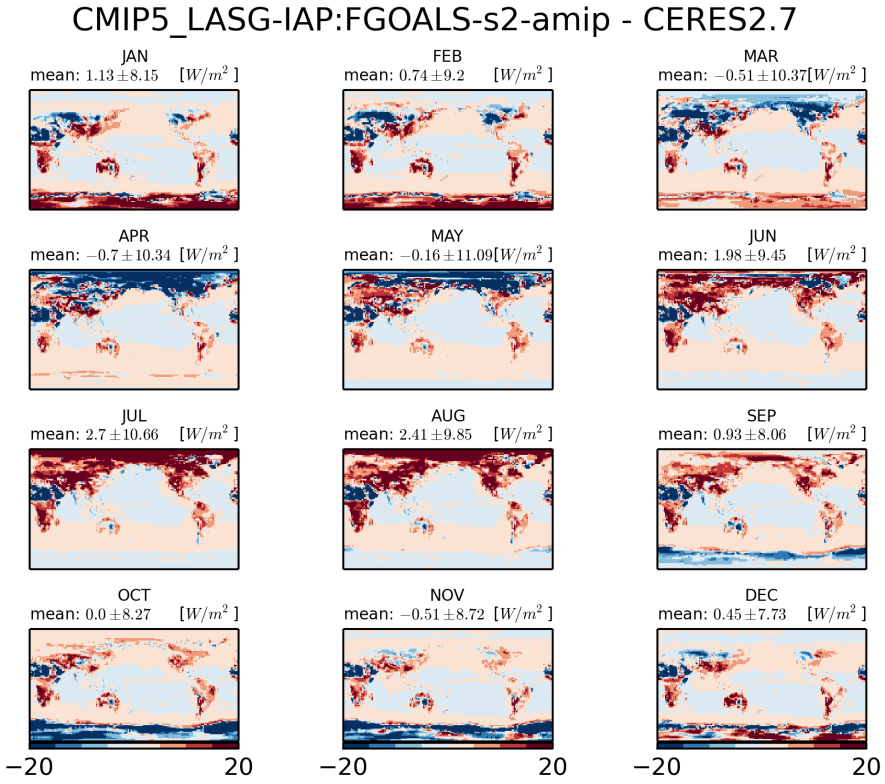



Figure 1019: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and CERES2.7

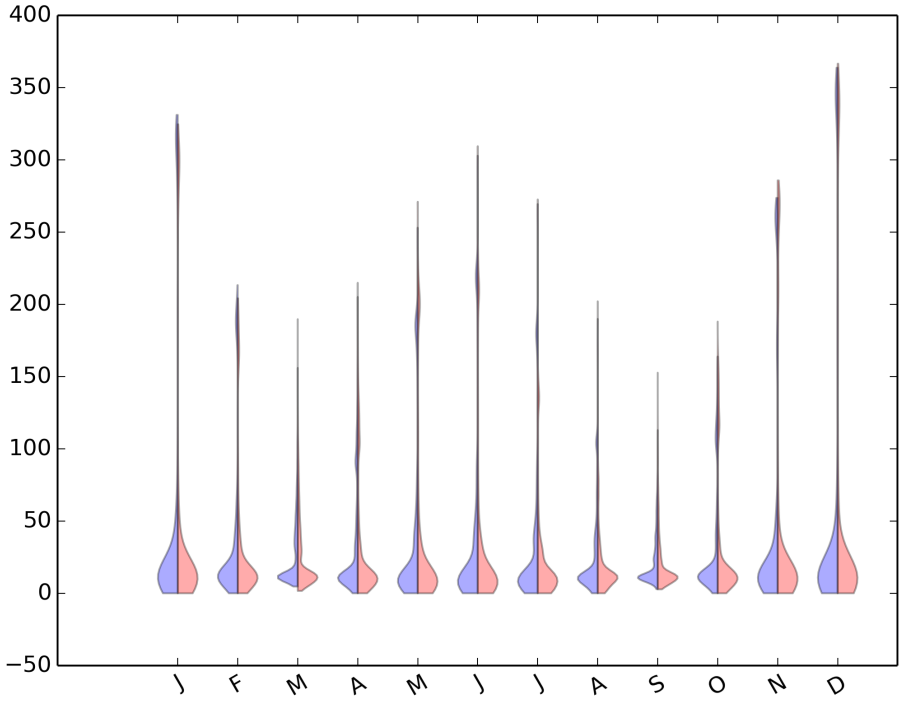



Figure 1020: Violin plot for CMIP5-LASG-IAP:FGOALS-S2-AMIP

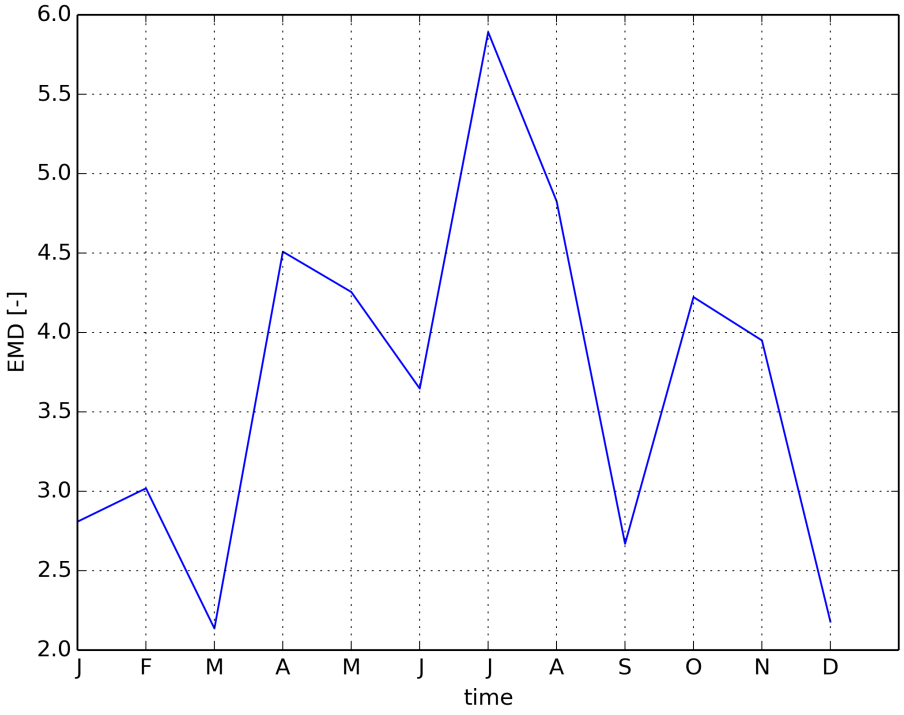



Figure 1021: Timeseries of EMD

### 2.2.17 CMIP5 CMCC:CMCC-CM-amip

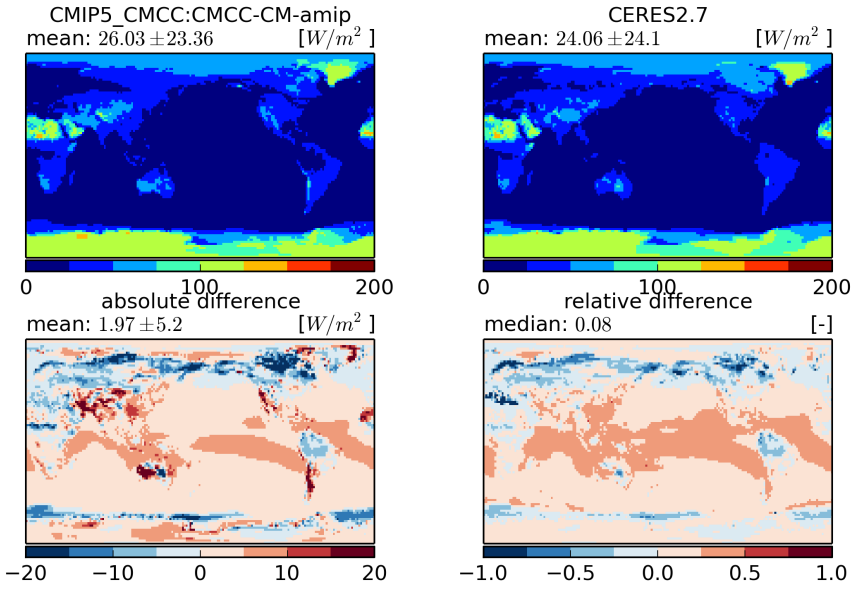



Figure 1022: Temporal mean fields (top) and absolute and relative differences (bottom)

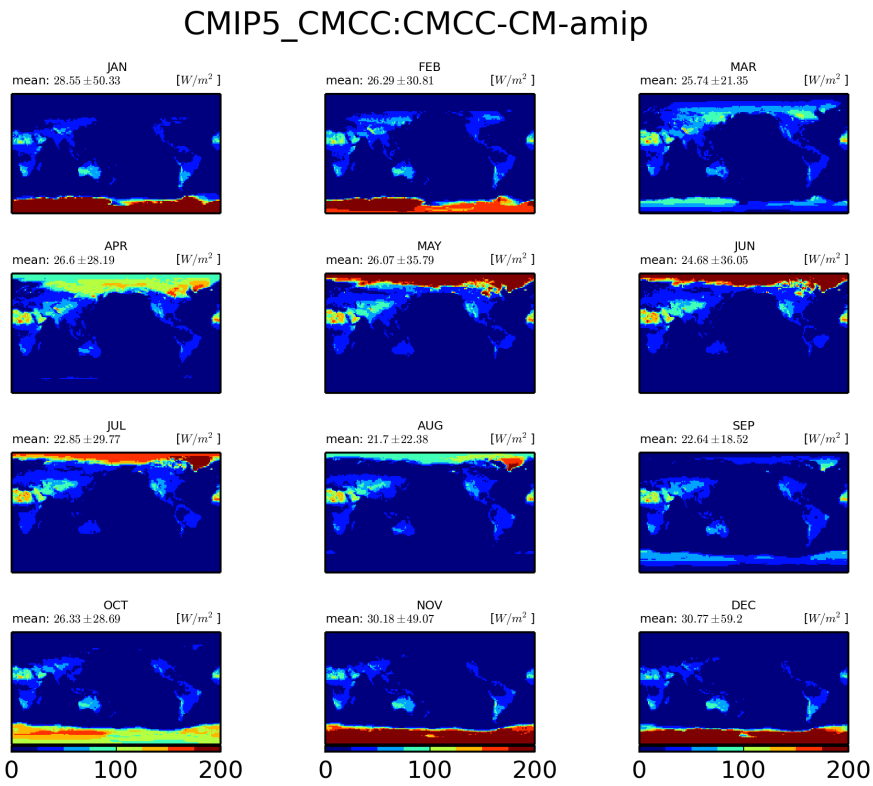



Figure 1023: Monthly mean climatology for CMCC:CMCC-CM

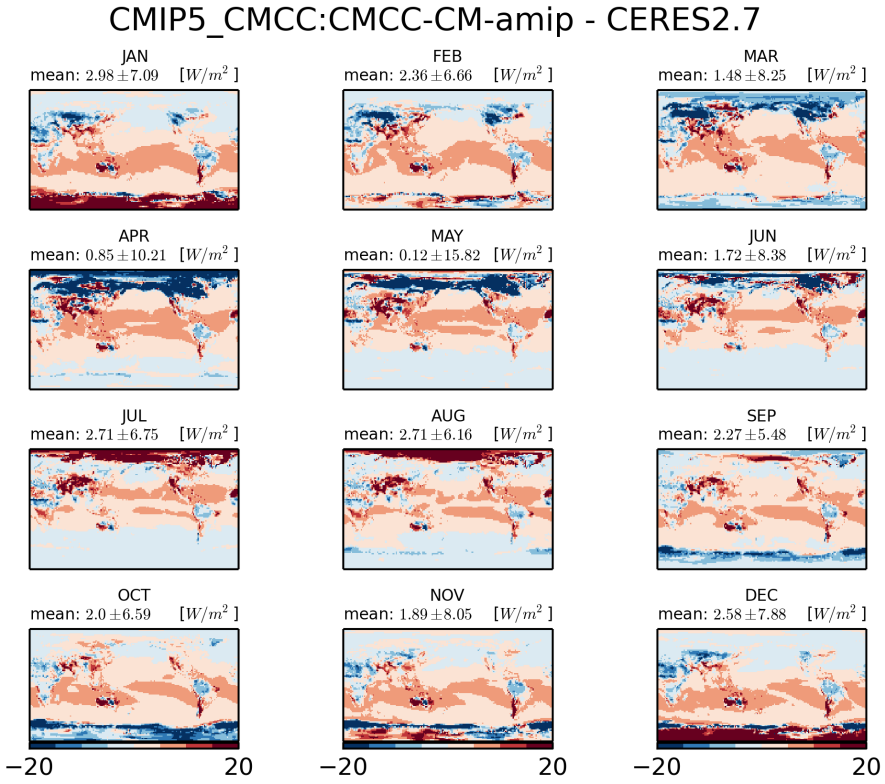



Figure 1024: Monthly mean climatology of difference between CMCC:CMCC-CM and CERES2.7

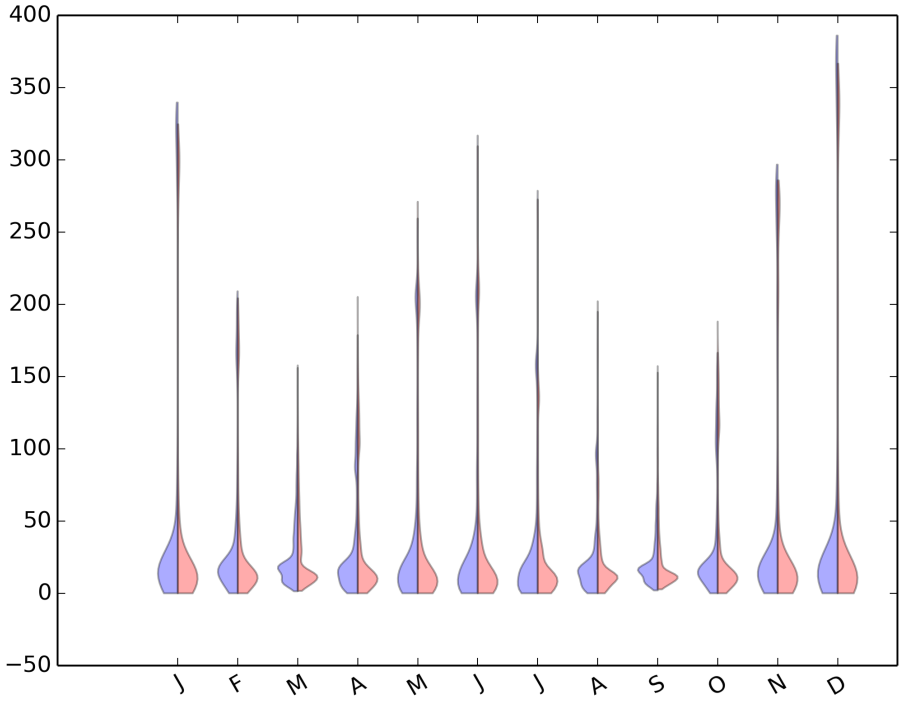



Figure 1025: Violin plot for CMIP5-CMCC:CMCC-CM-AMIP

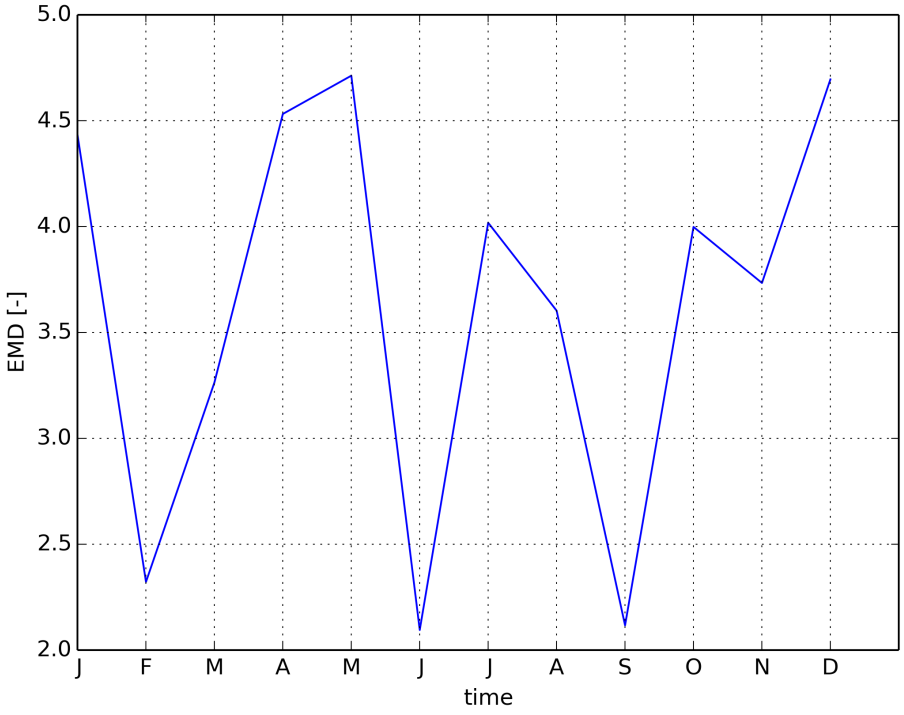



Figure 1026: Timeseries of EMD

### 2.2.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

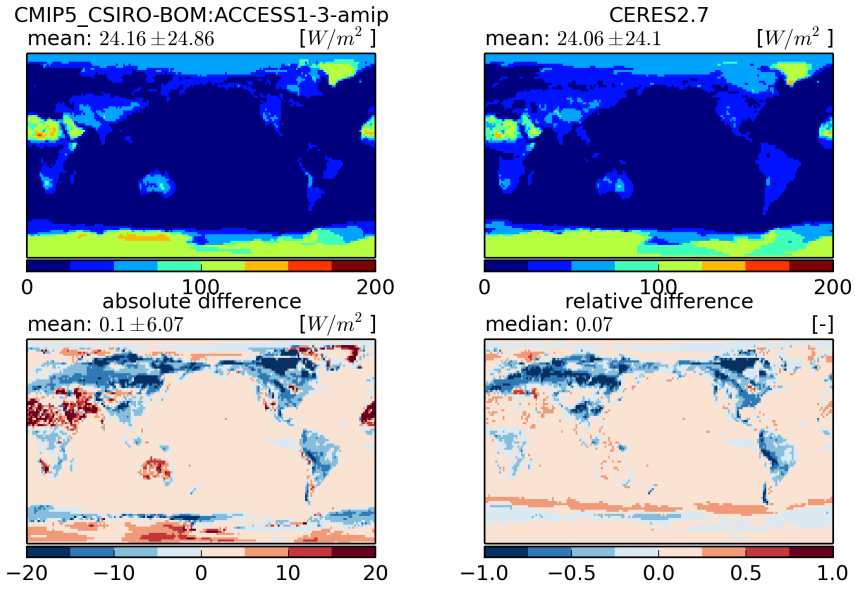



Figure 1027: Temporal mean fields (top) and absolute and relative differences (bottom)

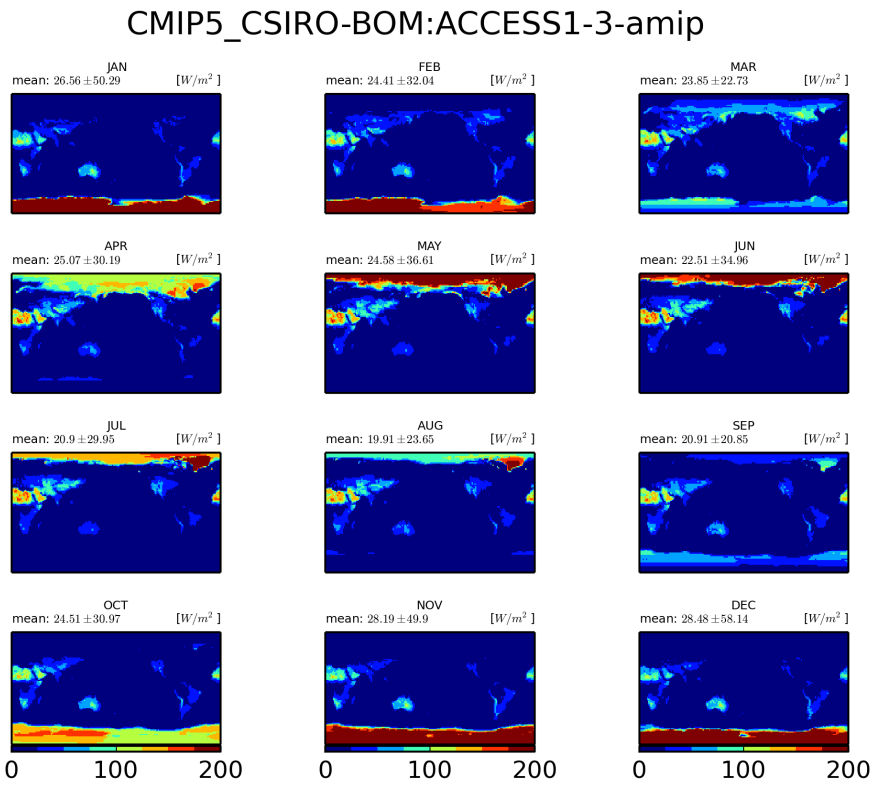



Figure 1028: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

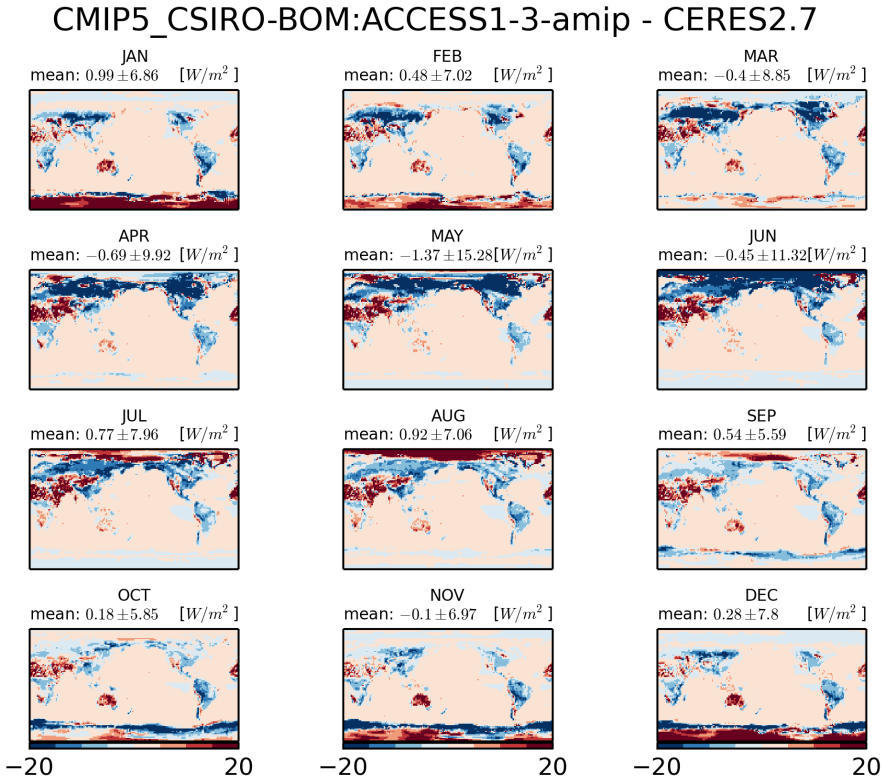



Figure 1029: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and CERES2.7

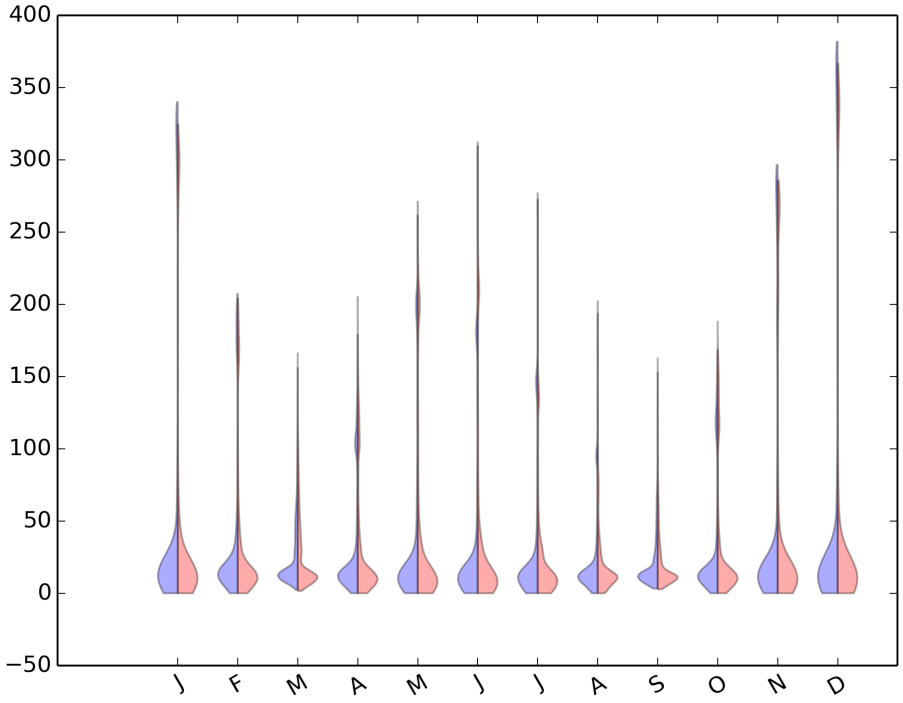



Figure 1030: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-3-AMIP

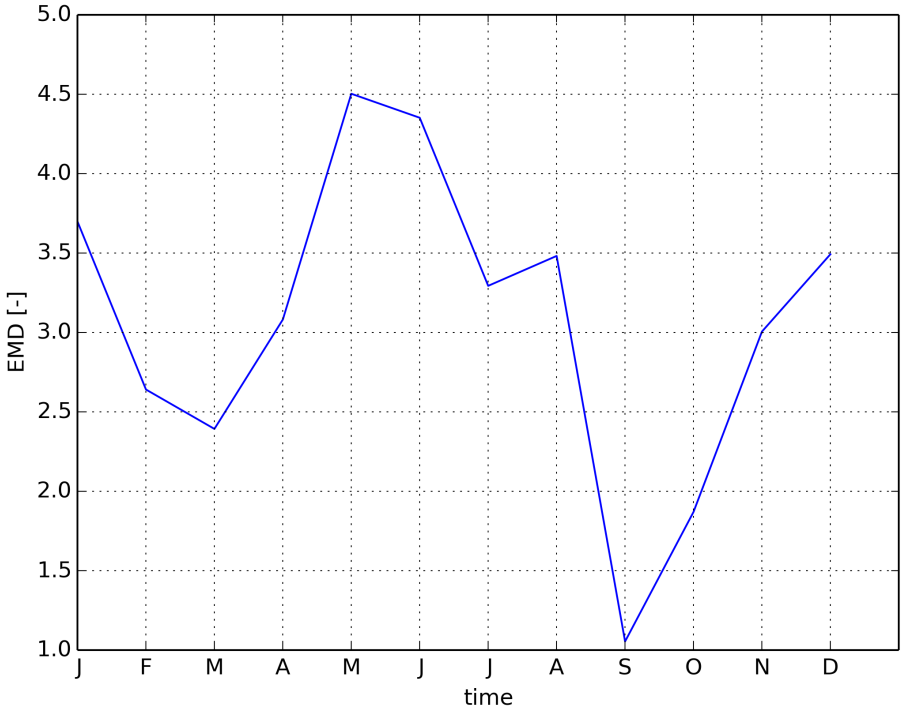



Figure 1031: Timeseries of EMD

### 2.2.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

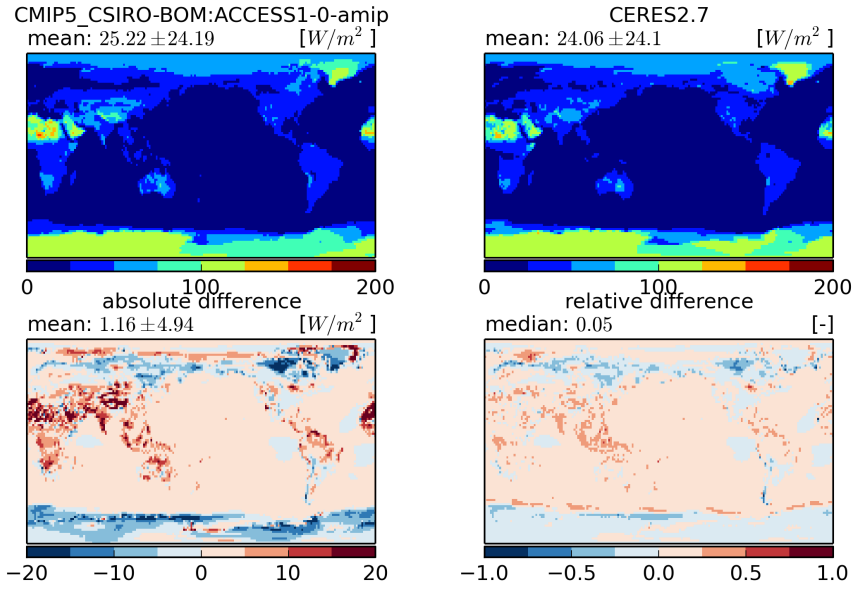



Figure 1032: Temporal mean fields (top) and absolute and relative differences (bottom)

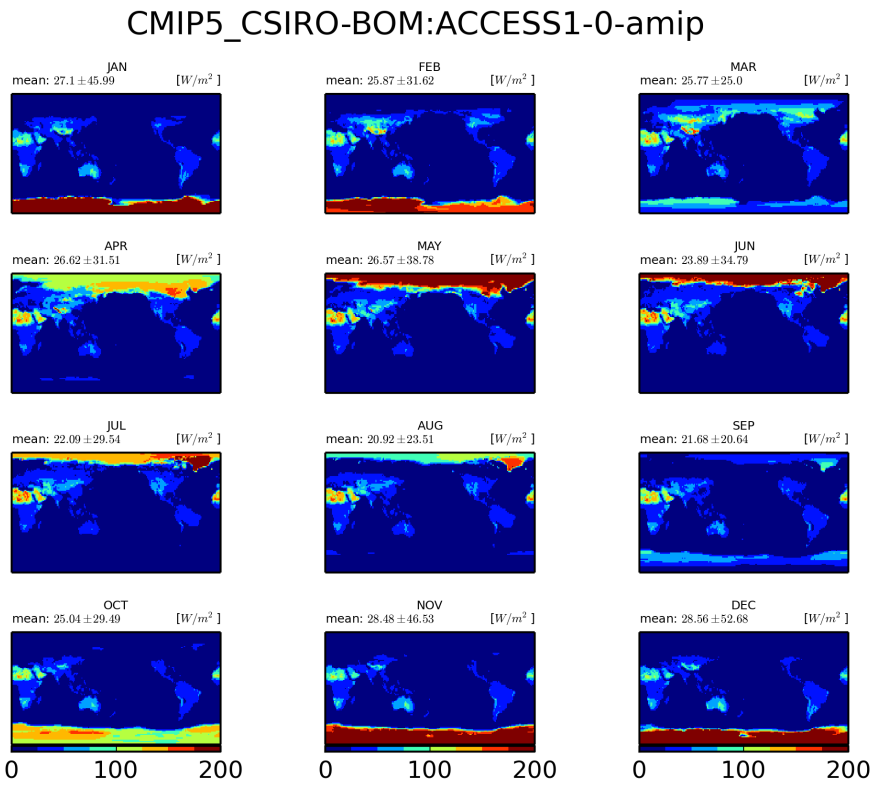



Figure 1033: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

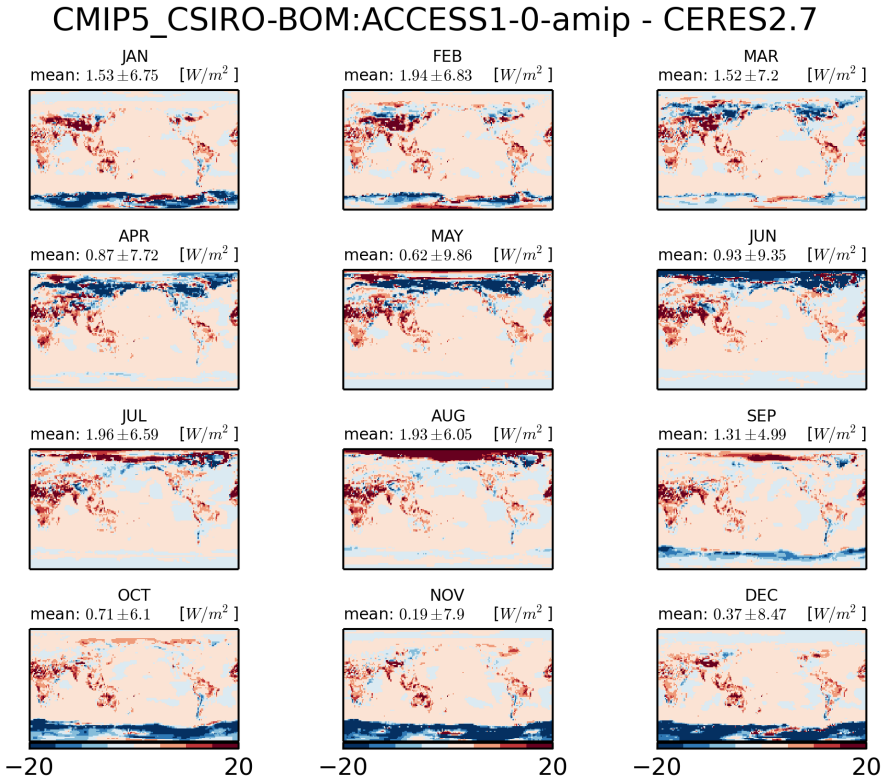



Figure 1034: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and CERES2.7

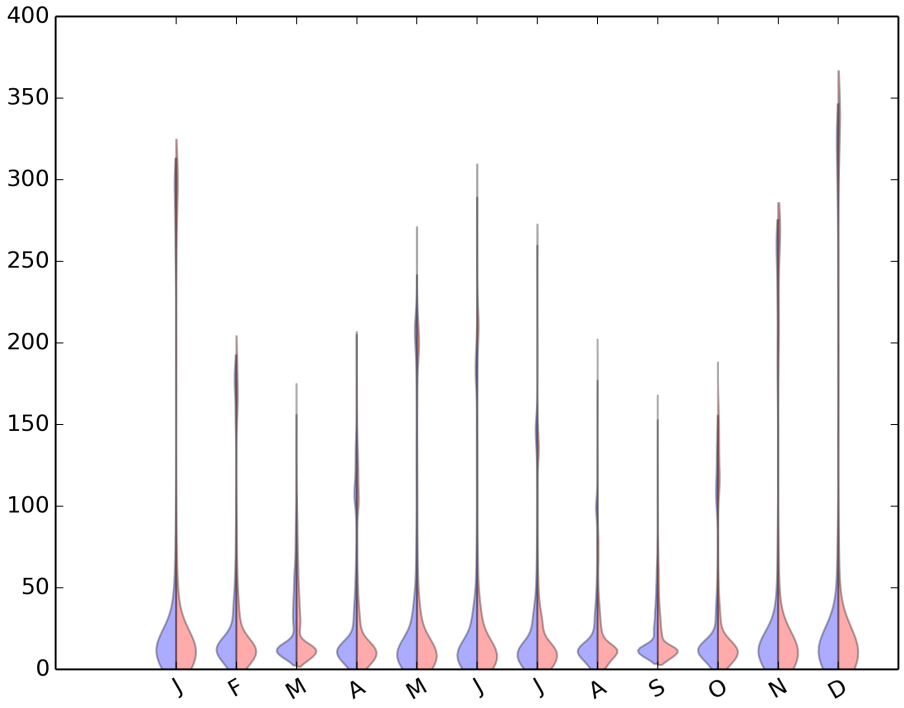



Figure 1035: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-0-AMIP

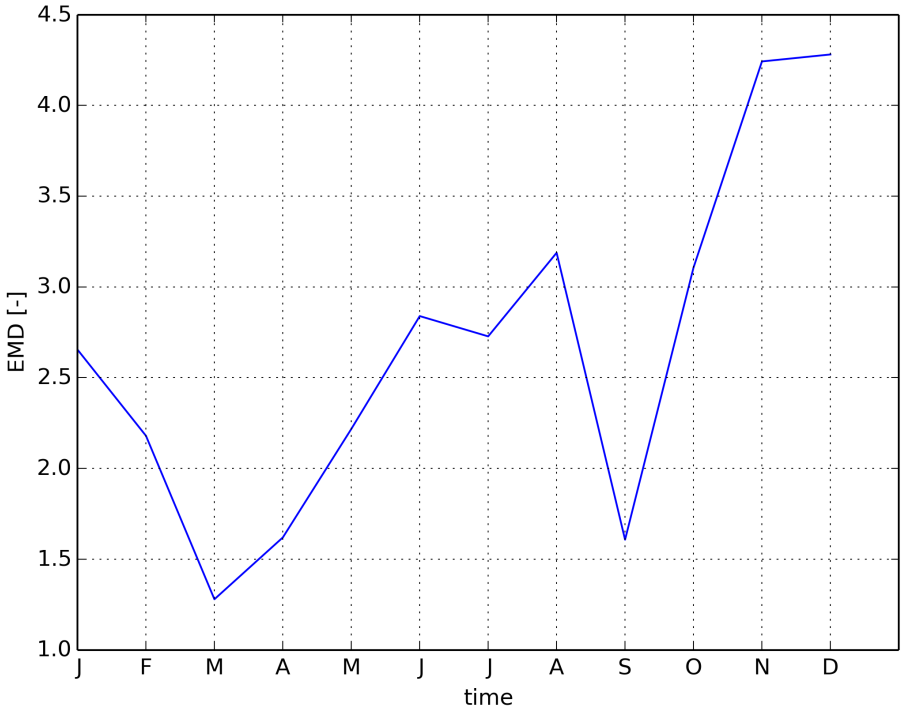



Figure 1036: Timeseries of EMD

### 2.2.20 CMIP5 INM:inmcm4-amip

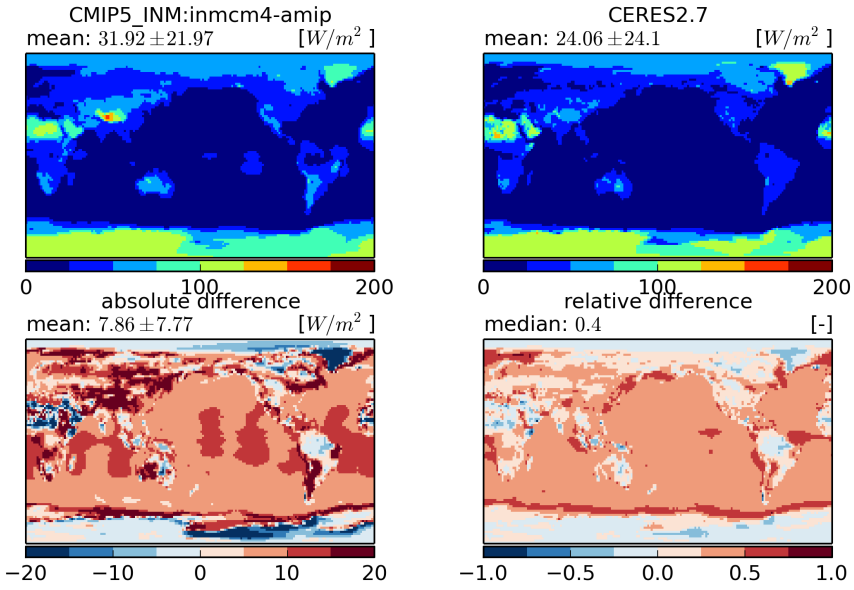



Figure 1037: Temporal mean fields (top) and absolute and relative differences (bottom)

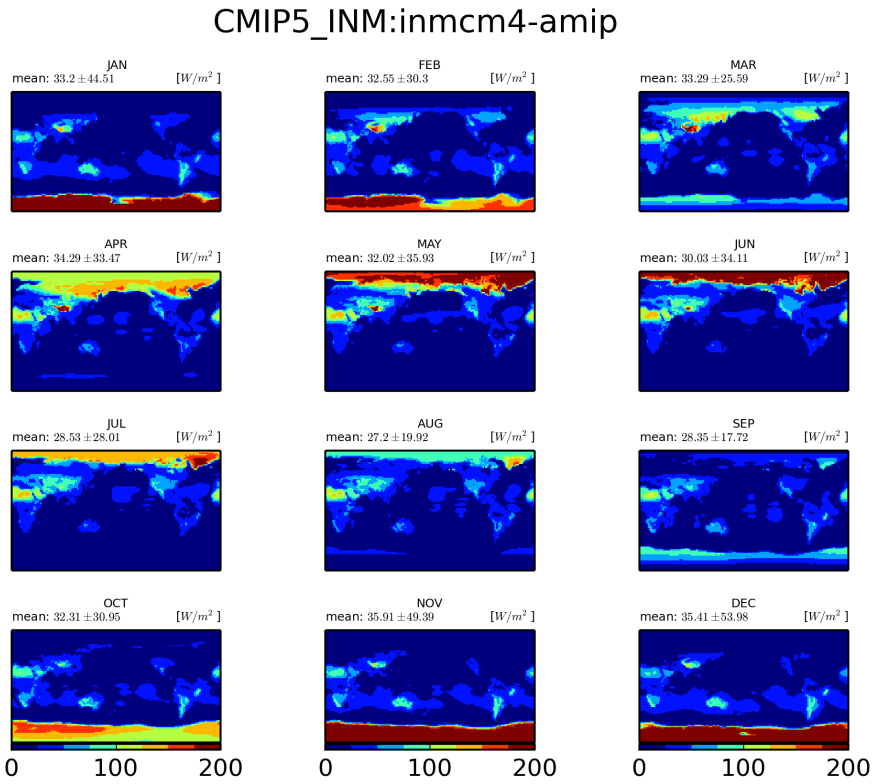



Figure 1038: Monthly mean climatology for INM:inmcm4

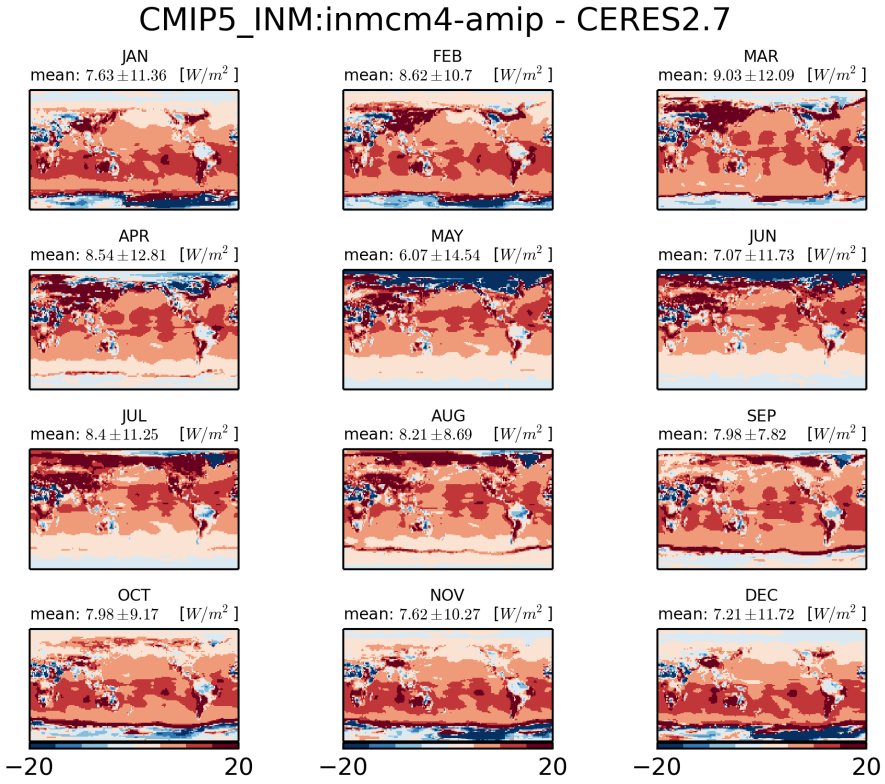



Figure 1039: Monthly mean climatology of difference between INM:INMCM4 and CERES2.7

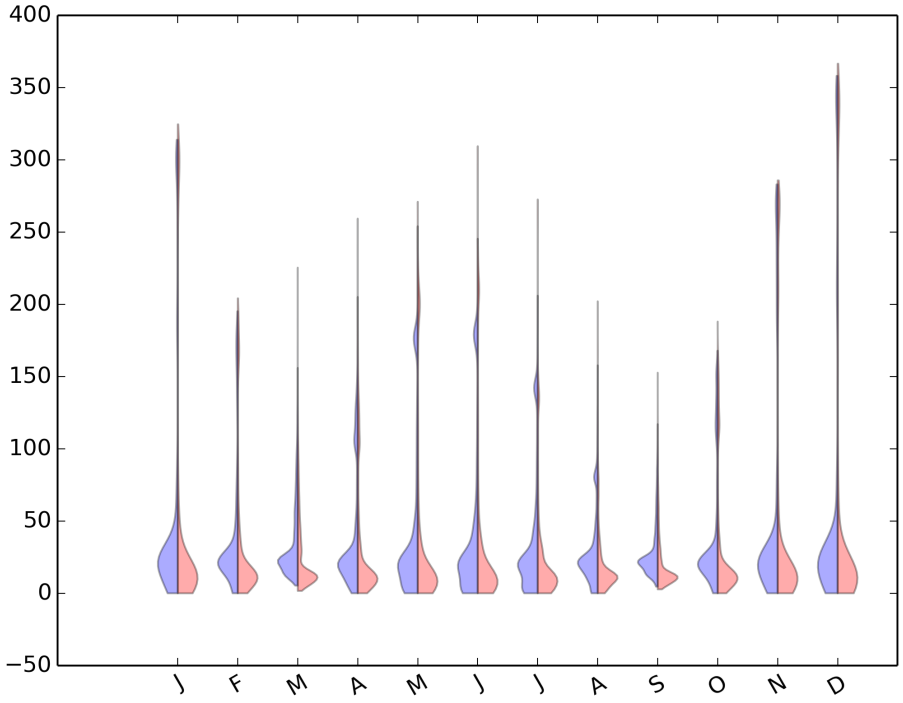



Figure 1040: Violin plot for CMIP5-INM:INMCM4-AMIP

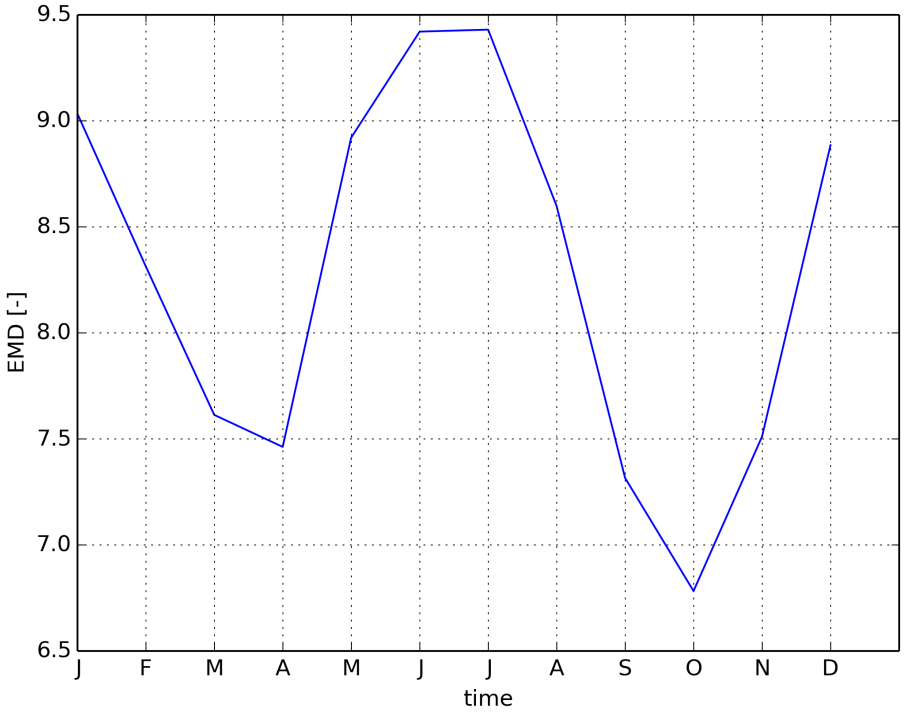



Figure 1041: Timeseries of EMD

### 2.2.21 CMIP5 MPI-M:MPI-ESM-LR-amip

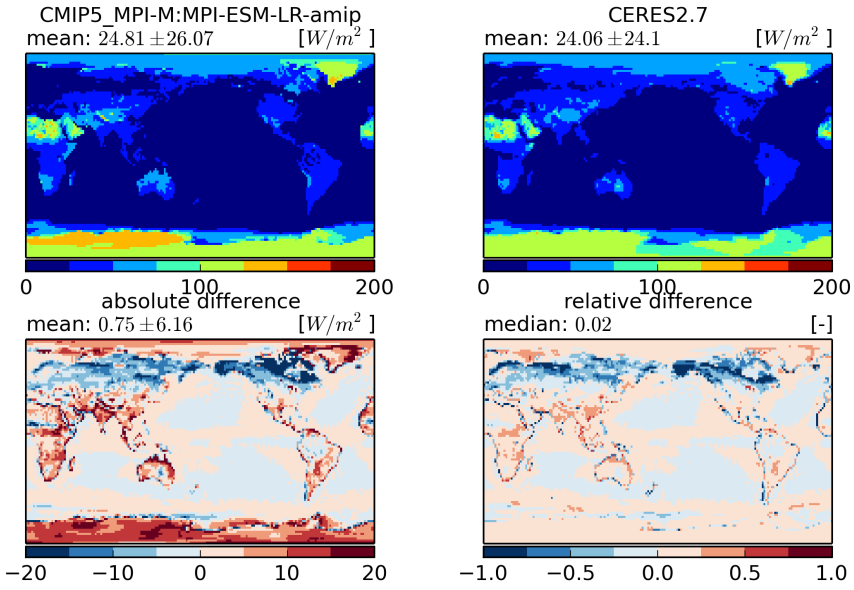



Figure 1042: Temporal mean fields (top) and absolute and relative differences (bottom)

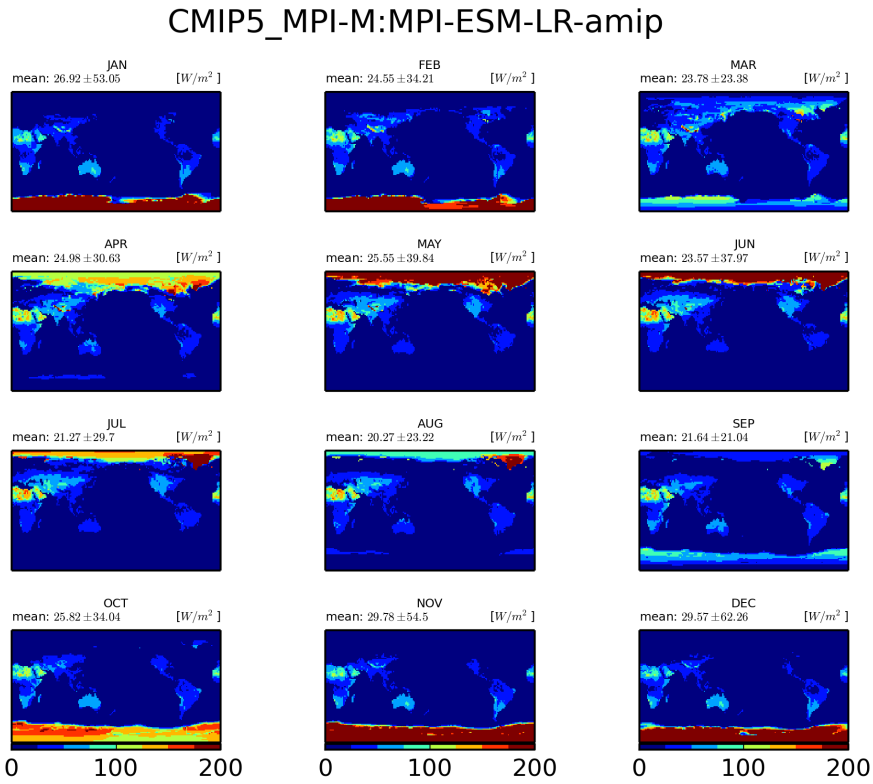



Figure 1043: Monthly mean climatology for MPI-M:MPI-ESM-LR

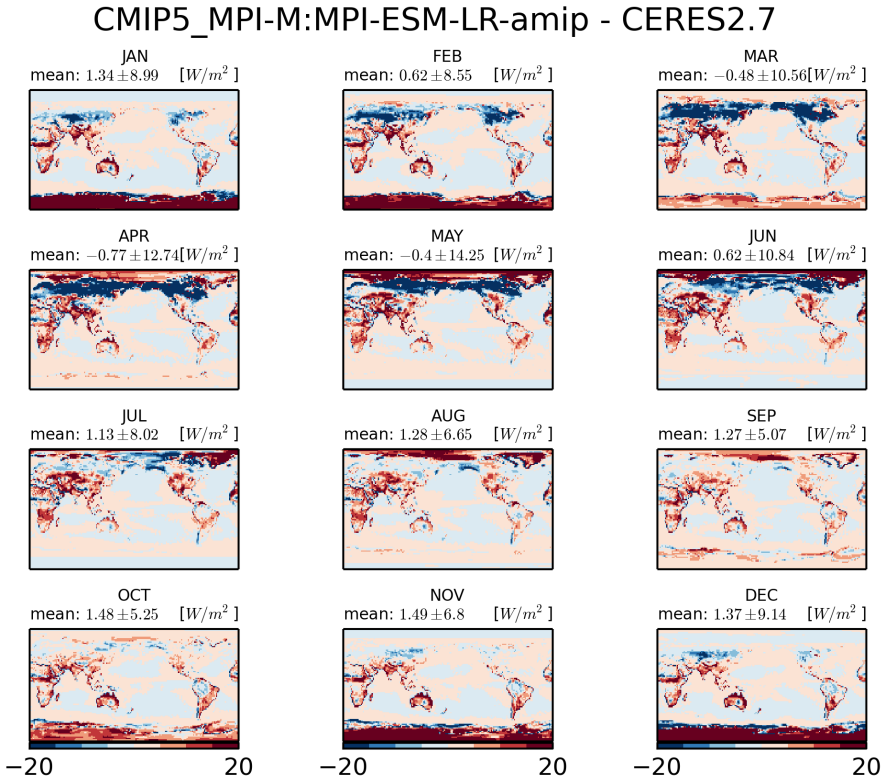



Figure 1044: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and CERES2.7

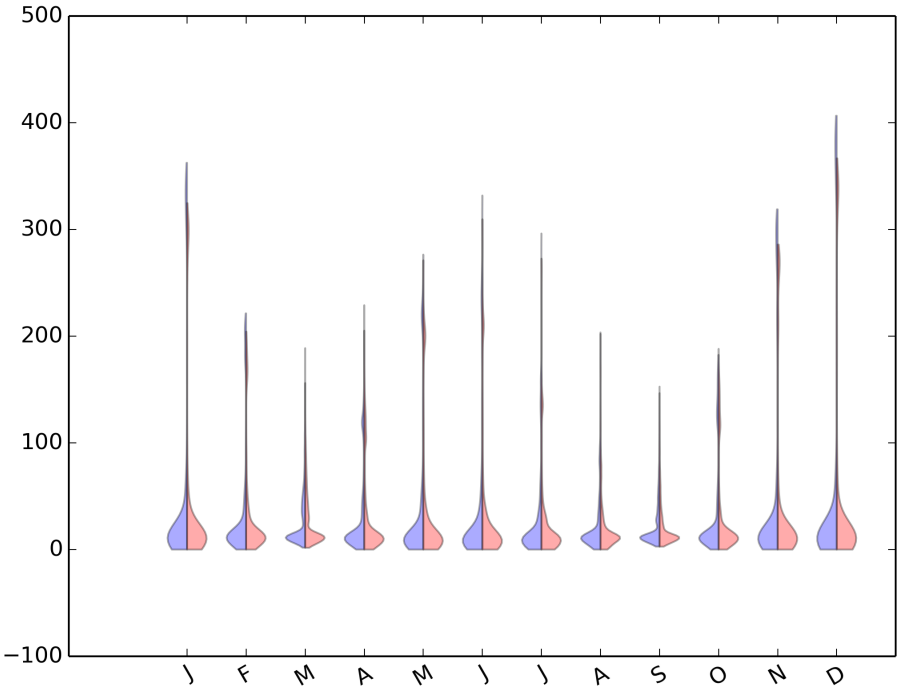



Figure 1045: Violin plot for CMIP5-MPI-M:MPI-ESM-LR-AMIP

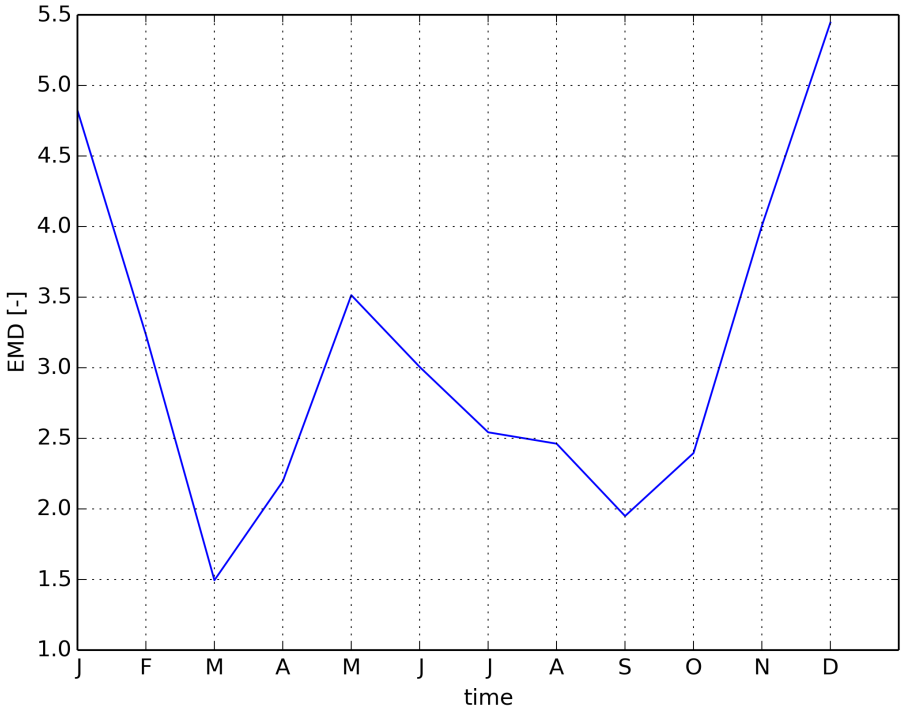



Figure 1046: Timeseries of EMD

### 2.2.22 CMIP5 MPI-M:MPI-ESM-MR-amip

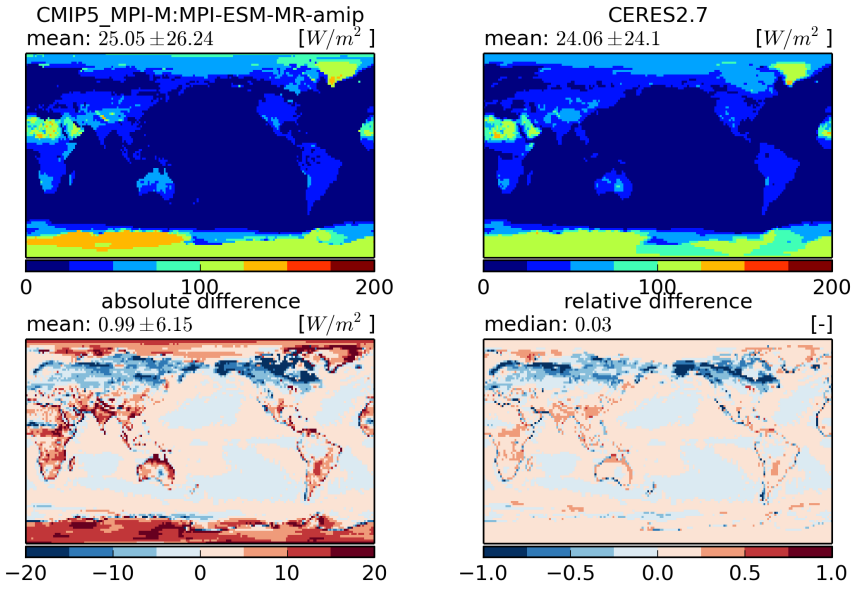



Figure 1047: Temporal mean fields (top) and absolute and relative differences (bottom)

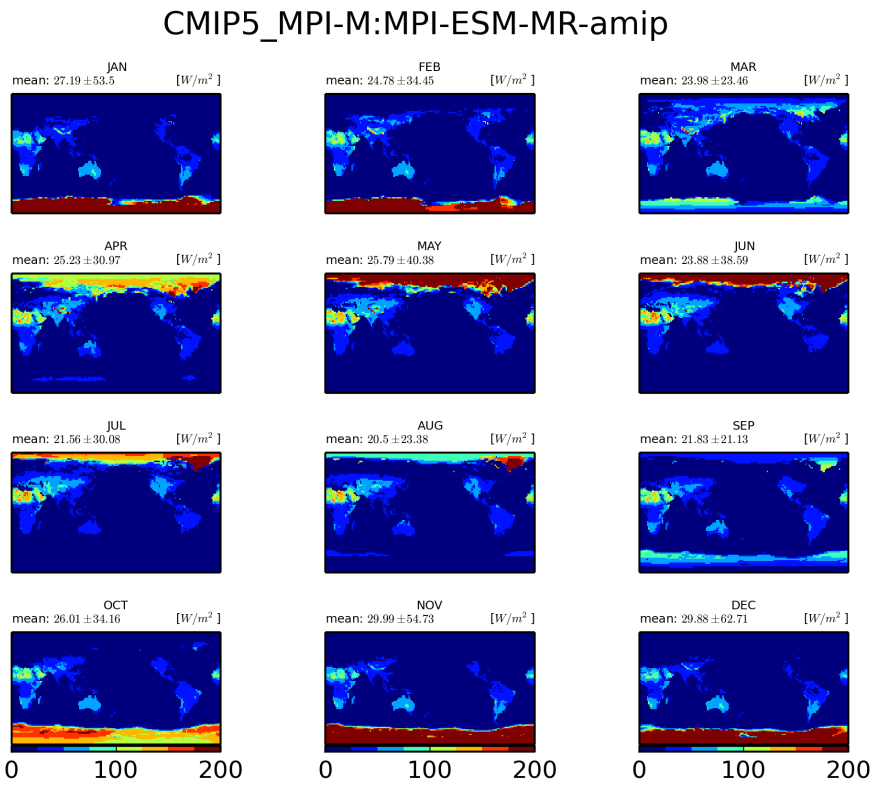



Figure 1048: Monthly mean climatology for MPI-M:MPI-ESM-MR

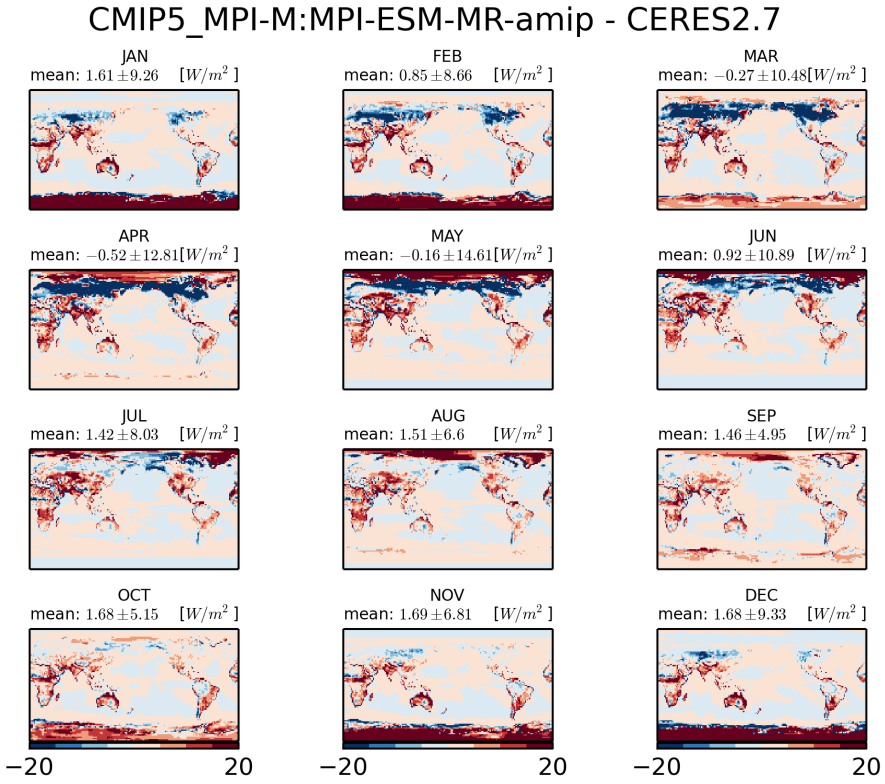



Figure 1049: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and CERES2.7

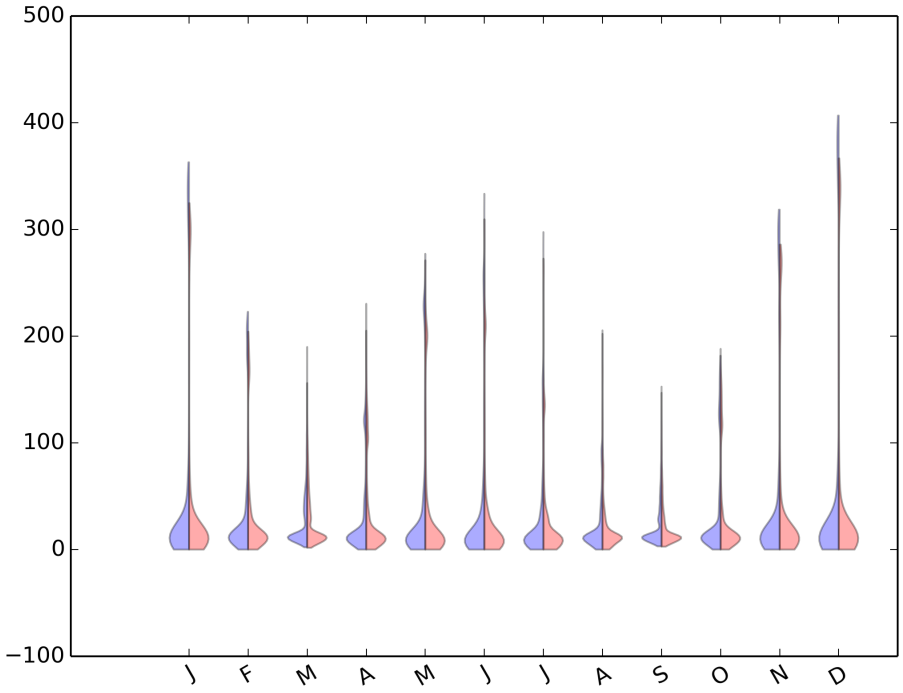



Figure 1050: Violin plot for CMIP5-MPI-M:MPI-ESM-MR-AMIP

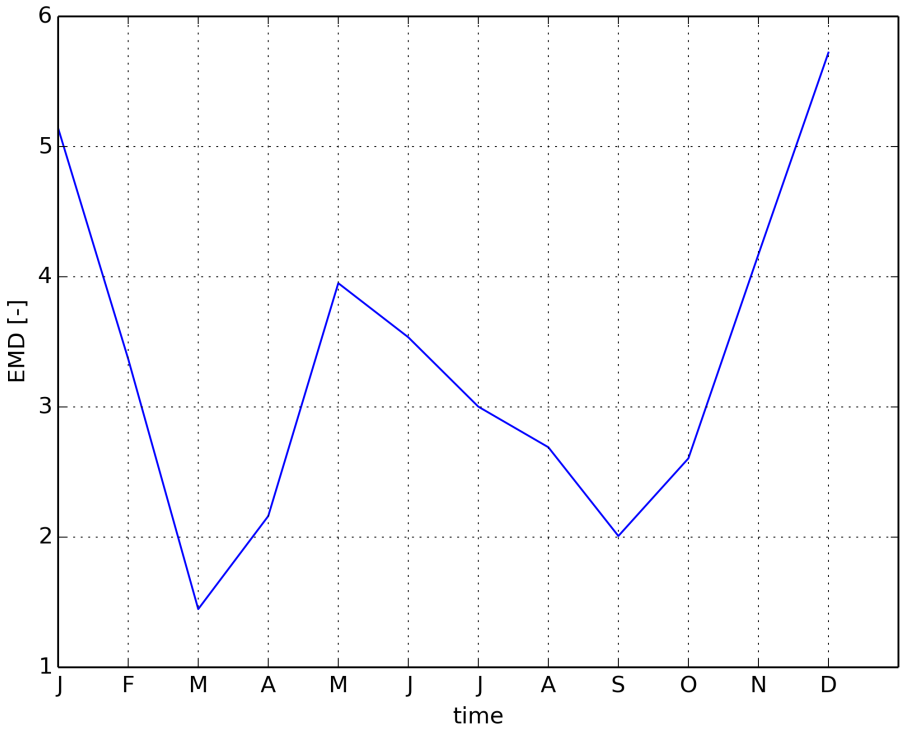



Figure 1051: Timeseries of EMD

### 2.2.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

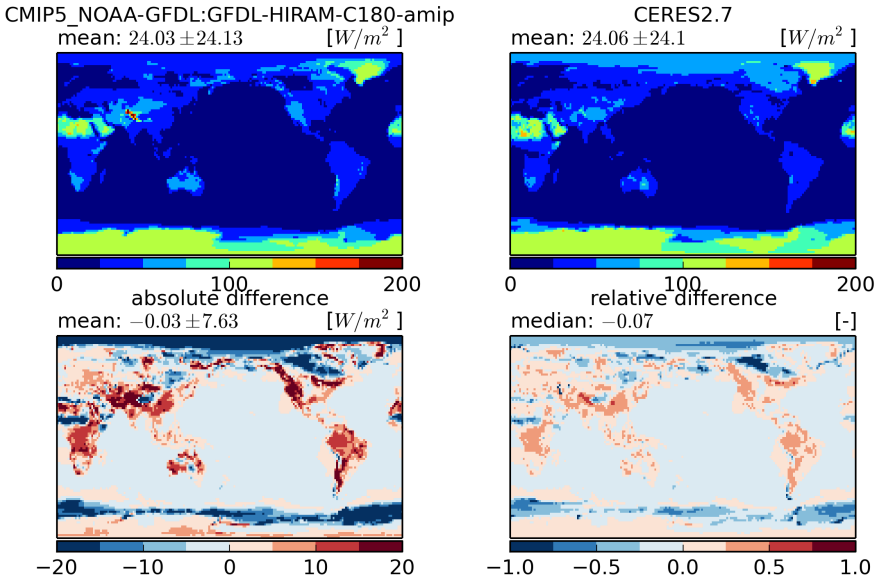



Figure 1052: Temporal mean fields (top) and absolute and relative differences (bottom)

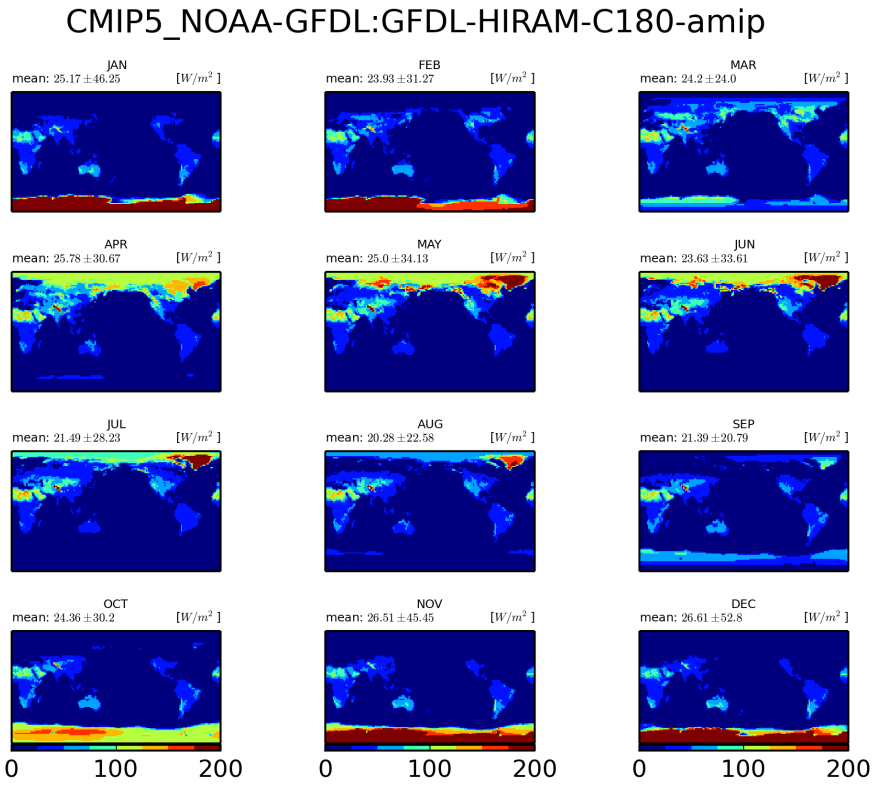



Figure 1053: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

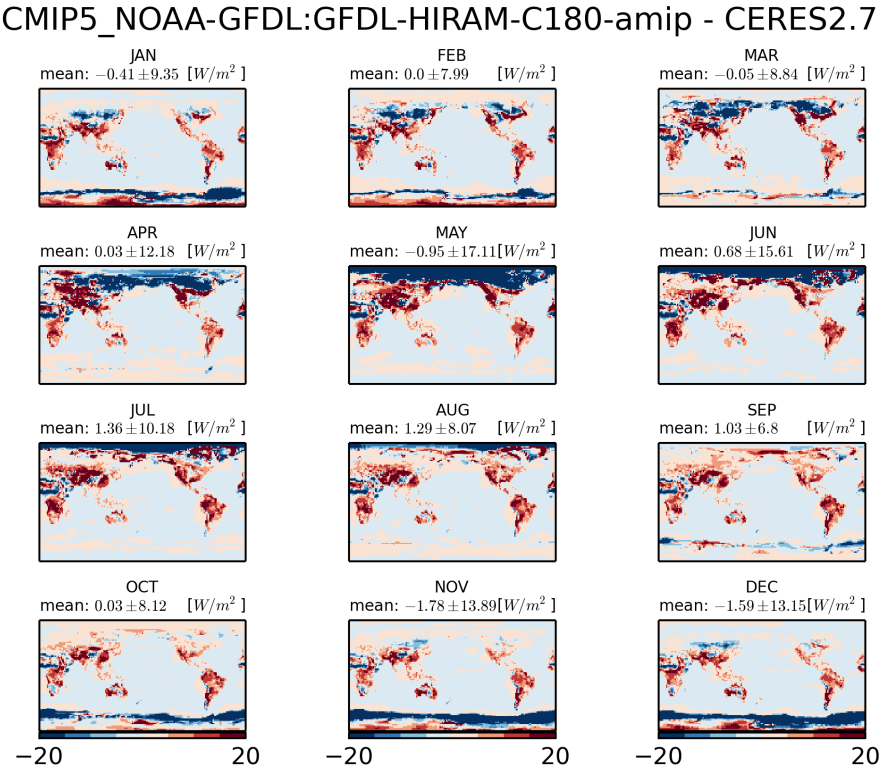



Figure 1054: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and CERES2.7

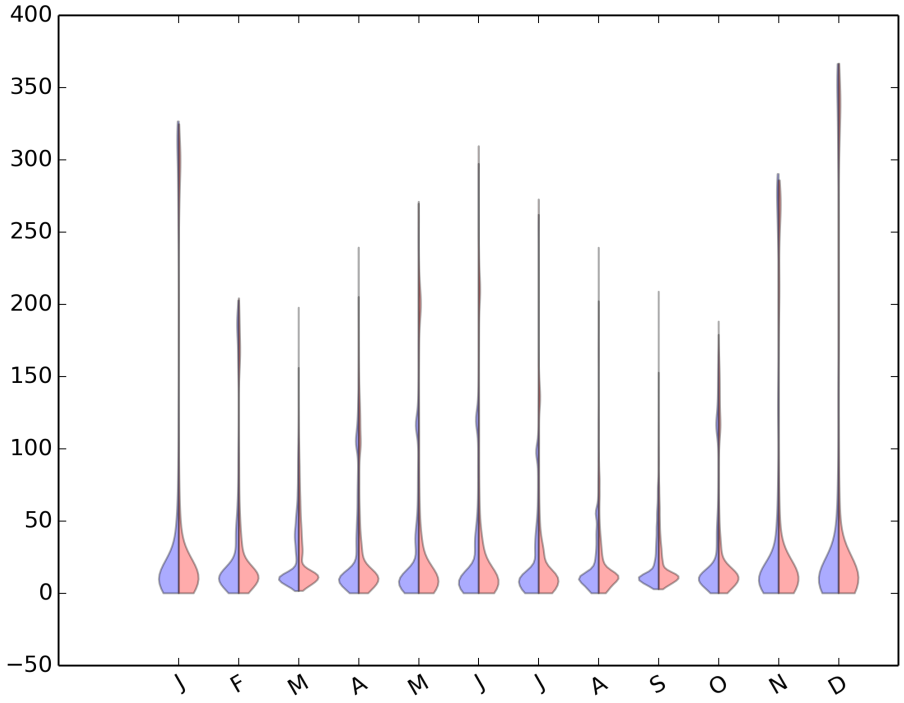



Figure 1055: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-AMIP

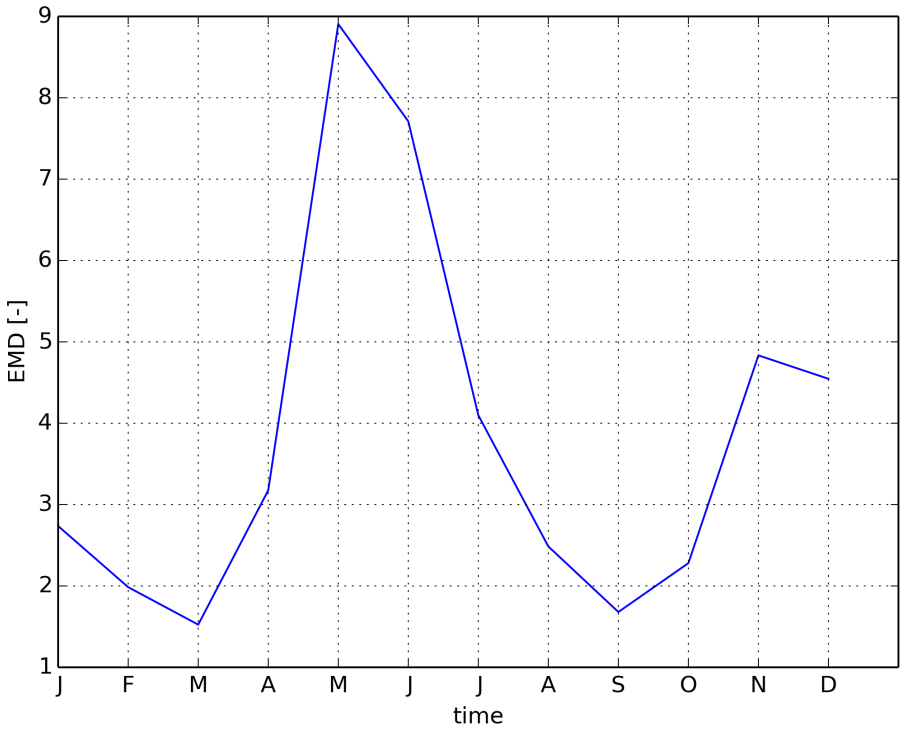



Figure 1056: Timeseries of EMD

### 2.2.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

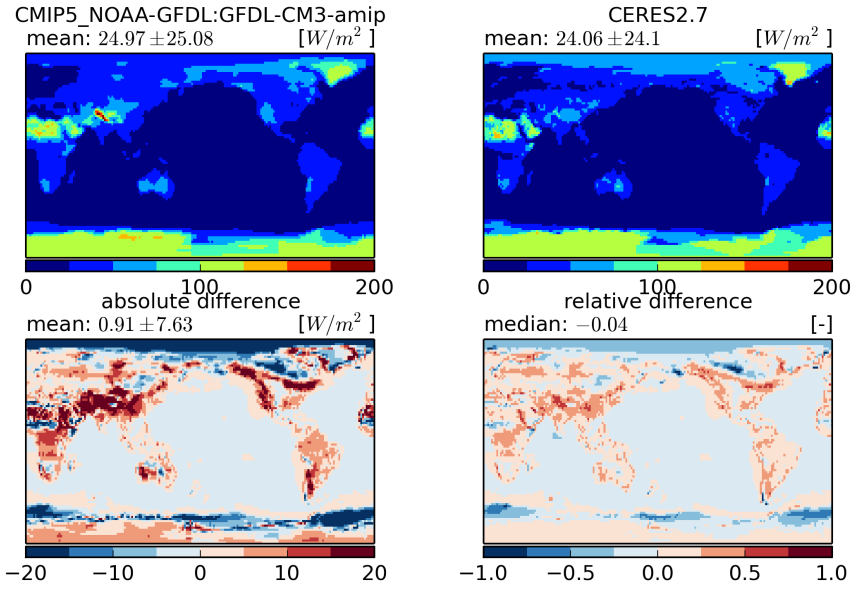



Figure 1057: Temporal mean fields (top) and absolute and relative differences (bottom)

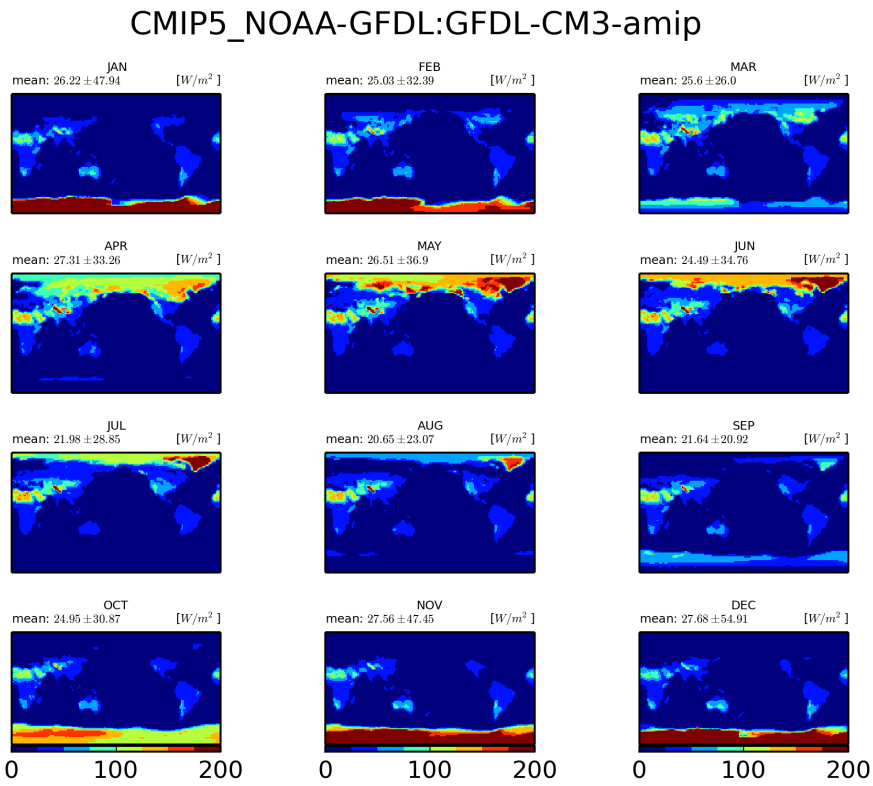



Figure 1058: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

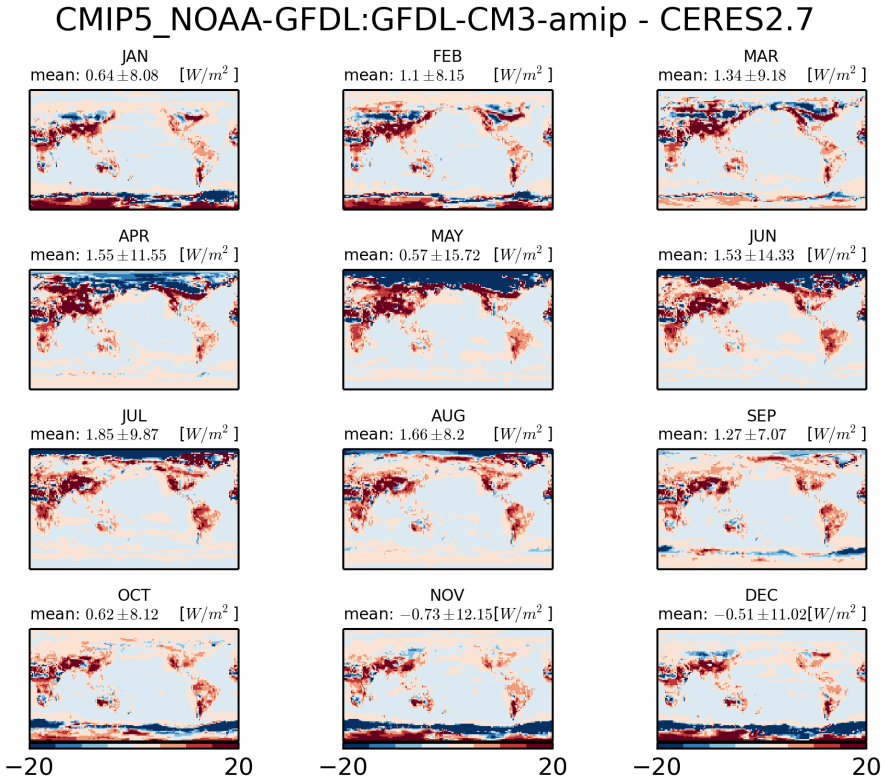



Figure 1059: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and CERES2.7

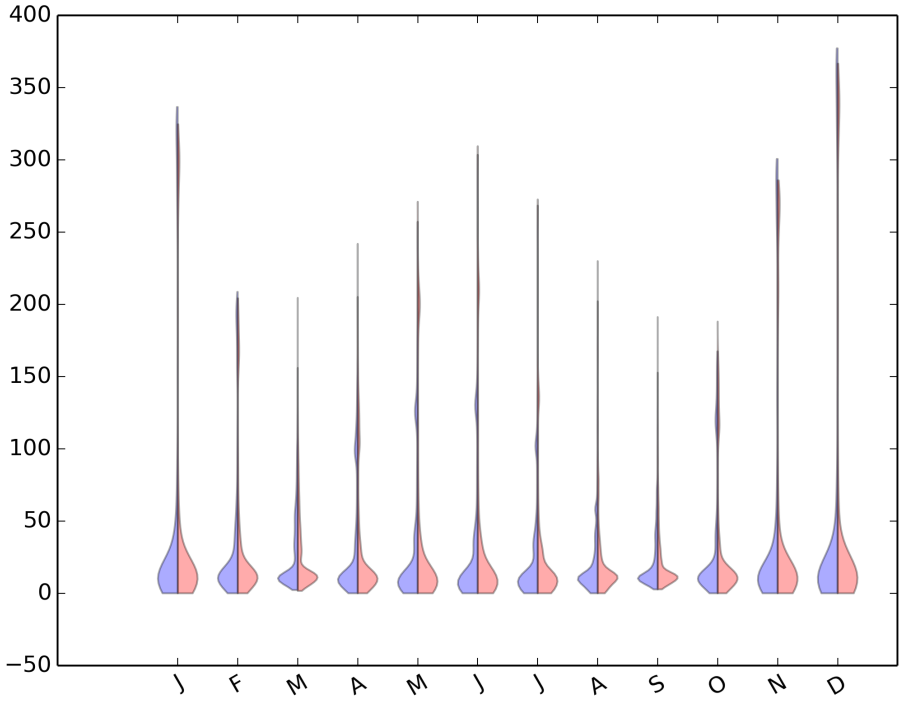



Figure 1060: Violin plot for CMIP5-NOAA-GFDL:GFDL-CM3-AMIP

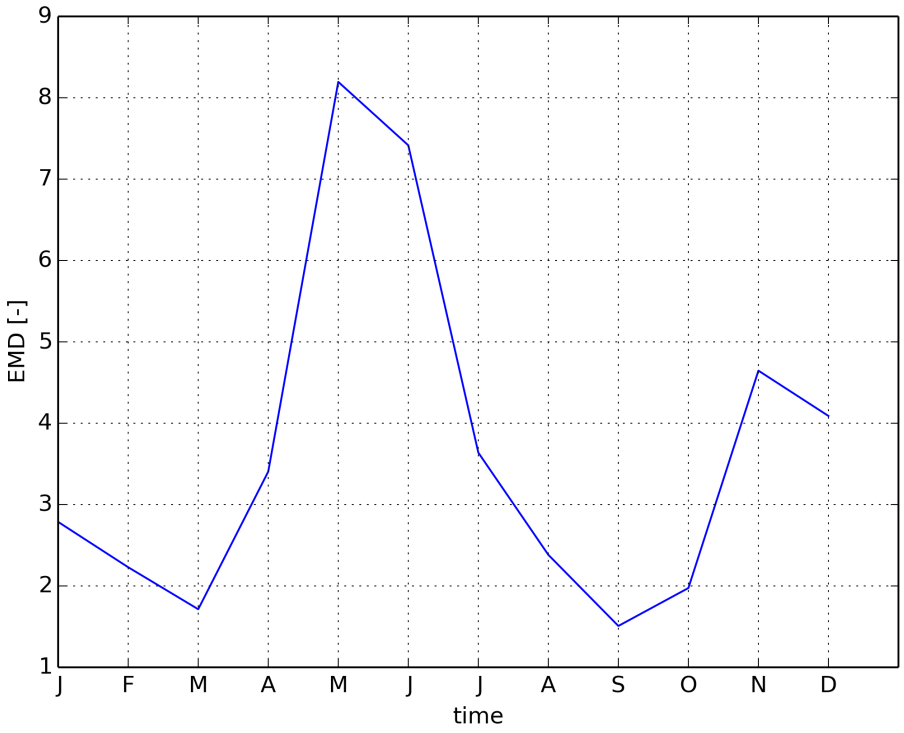



Figure 1061: Timeseries of EMD

### 2.2.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

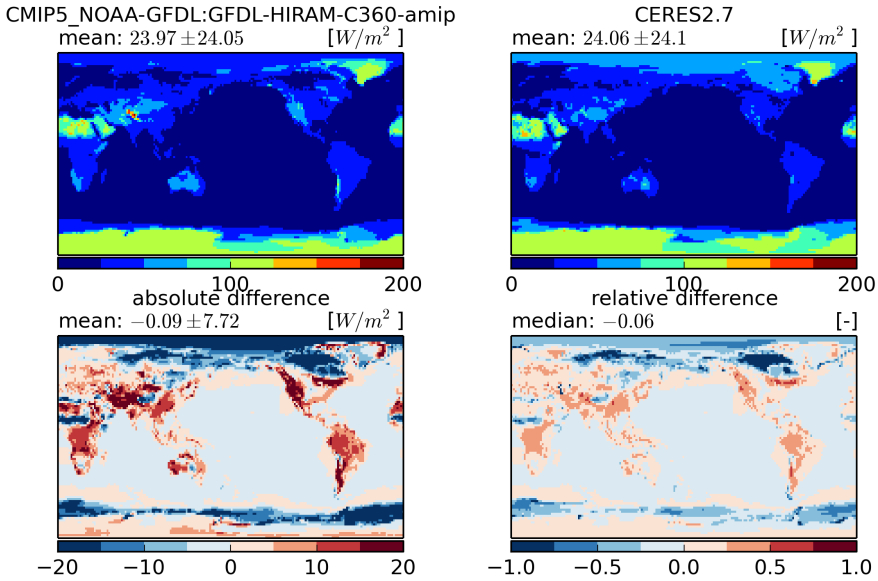



Figure 1062: Temporal mean fields (top) and absolute and relative differences (bottom)

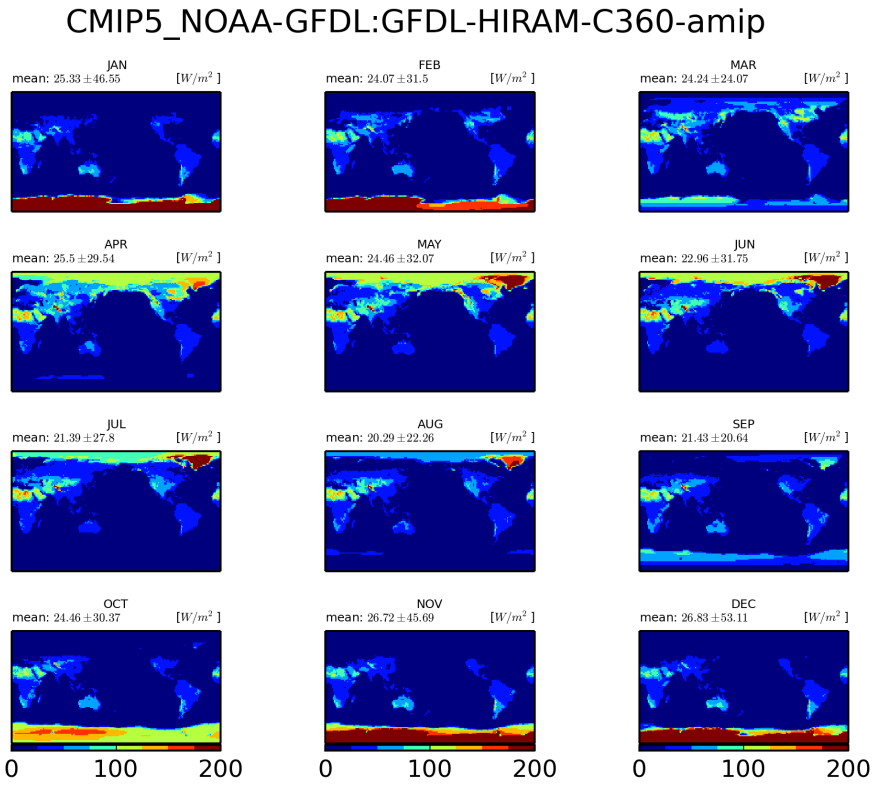



Figure 1063: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

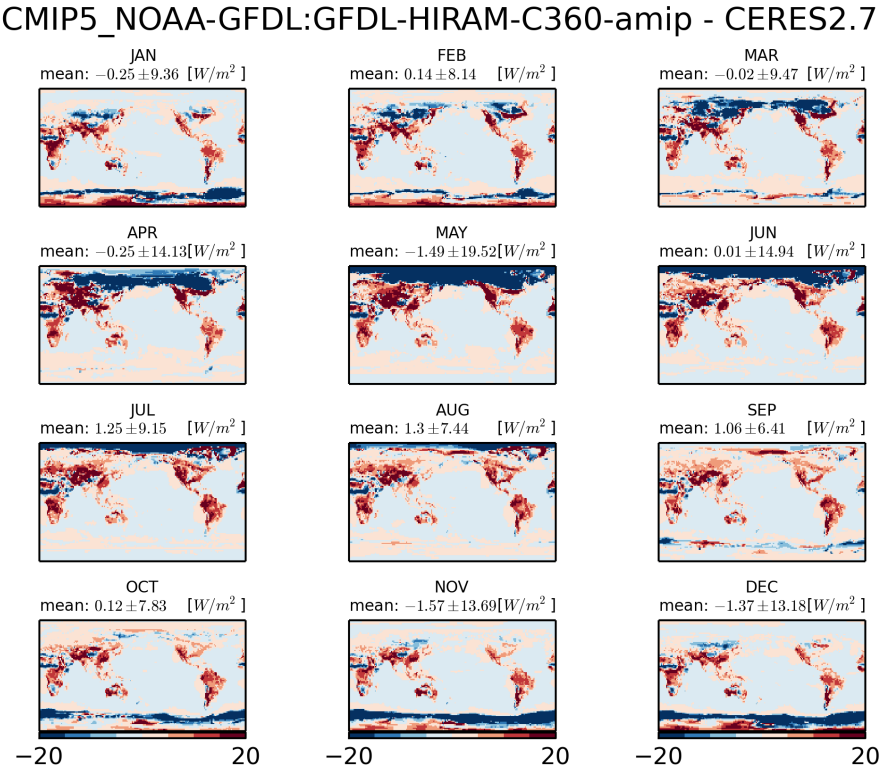



Figure 1064: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and CERES2.7

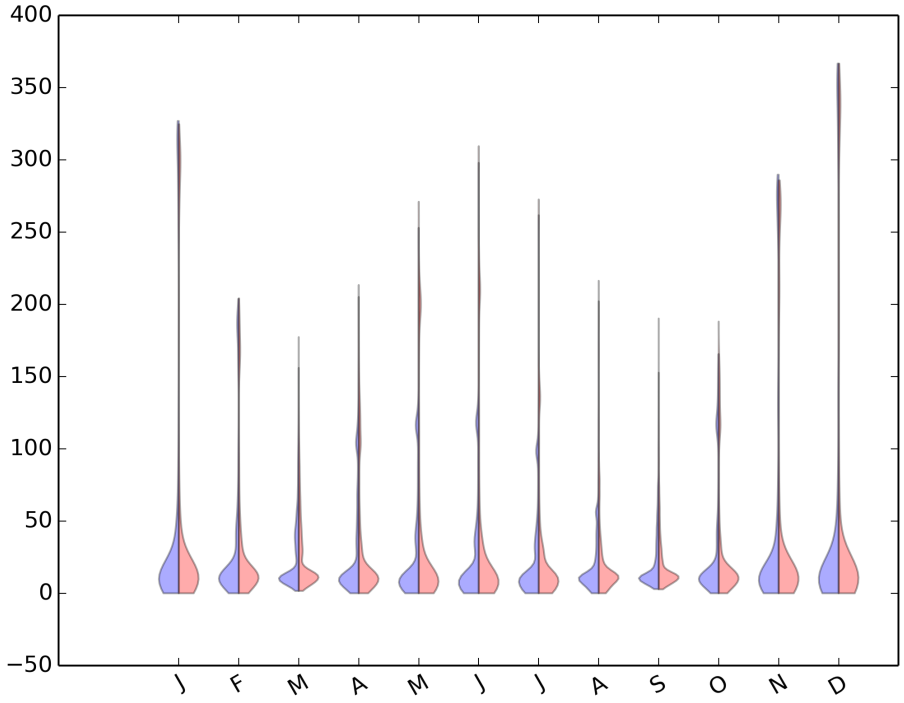



Figure 1065: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-AMIP

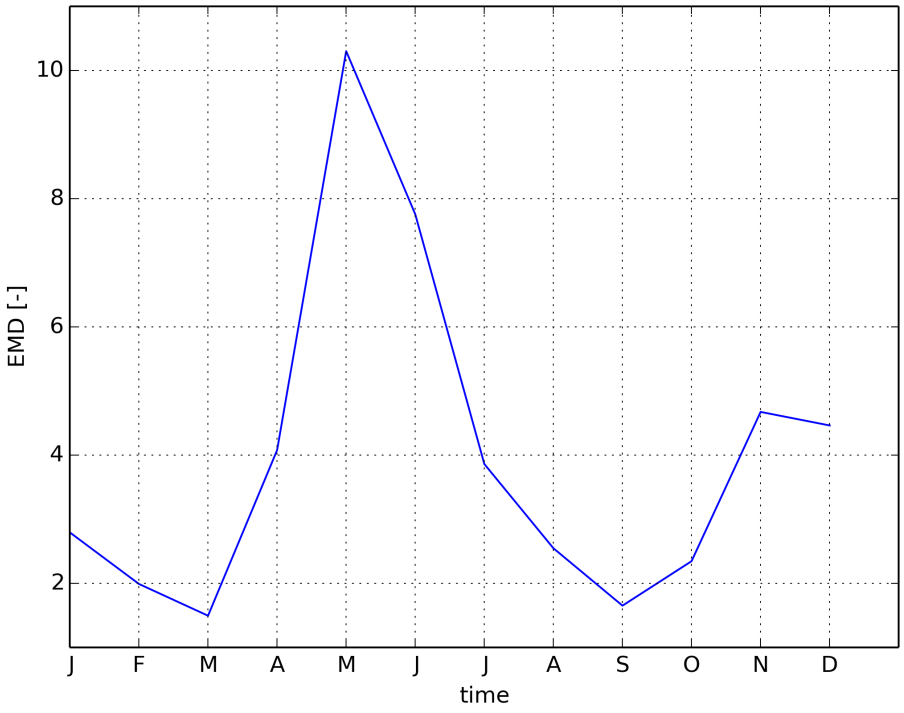



Figure 1066: Timeseries of EMD

### 2.2.26 CMIP5 NCAR:CCSM4-amip

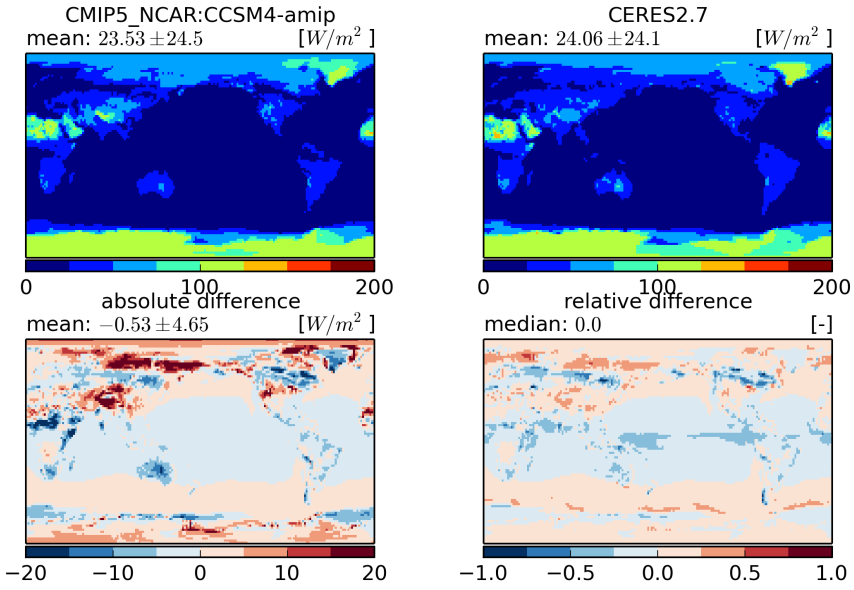



Figure 1067: Temporal mean fields (top) and absolute and relative differences (bottom)

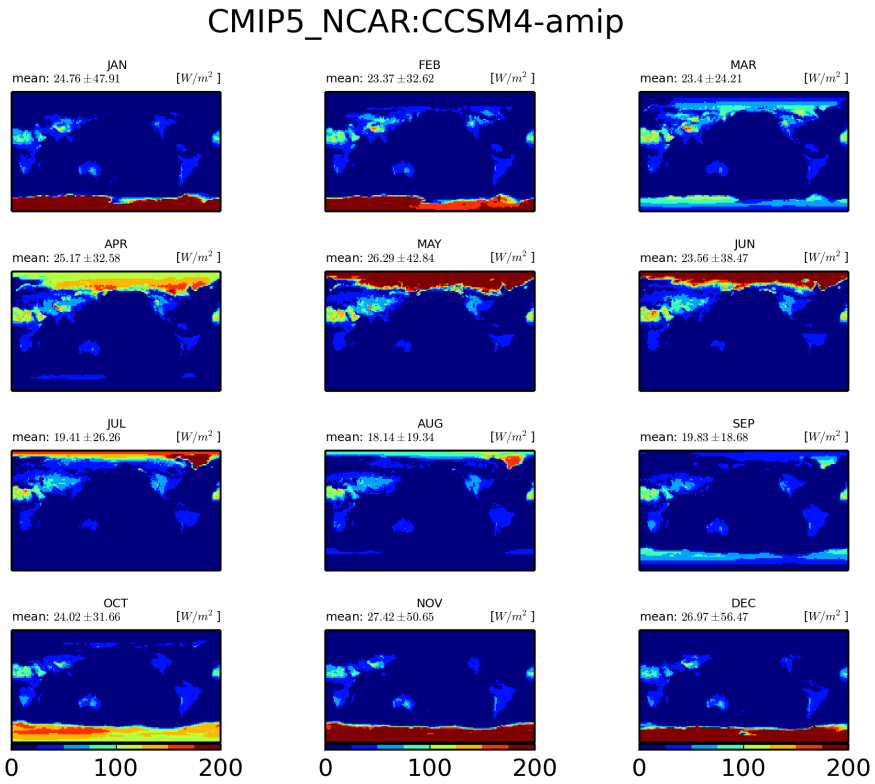



Figure 1068: Monthly mean climatology for NCAR:CCSM4

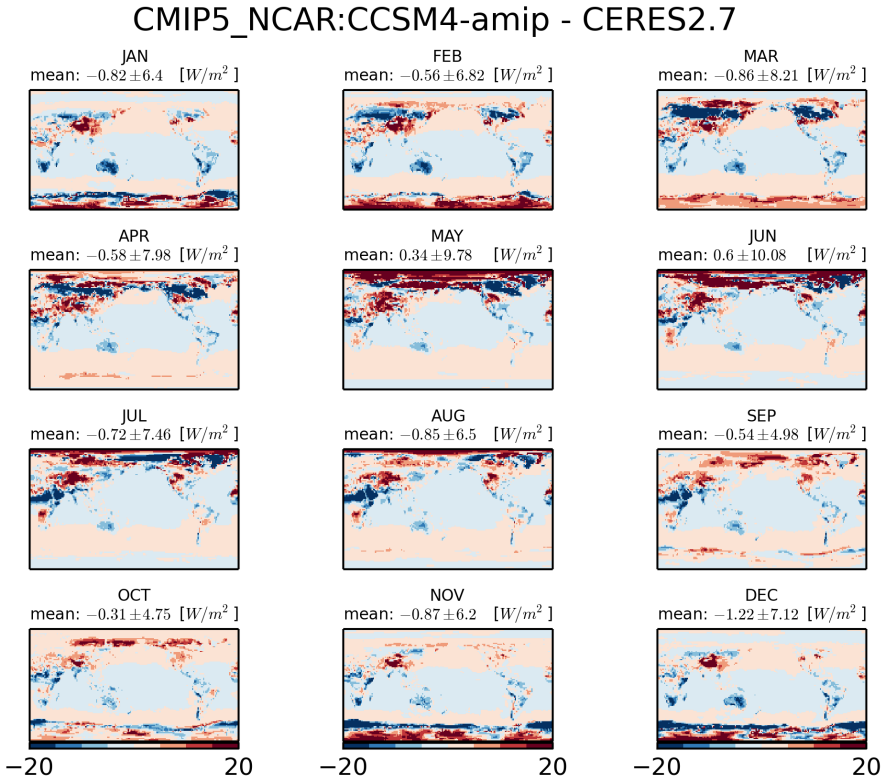



Figure 1069: Monthly mean climatology of difference between NCAR:CCSM4 and CERES2.7

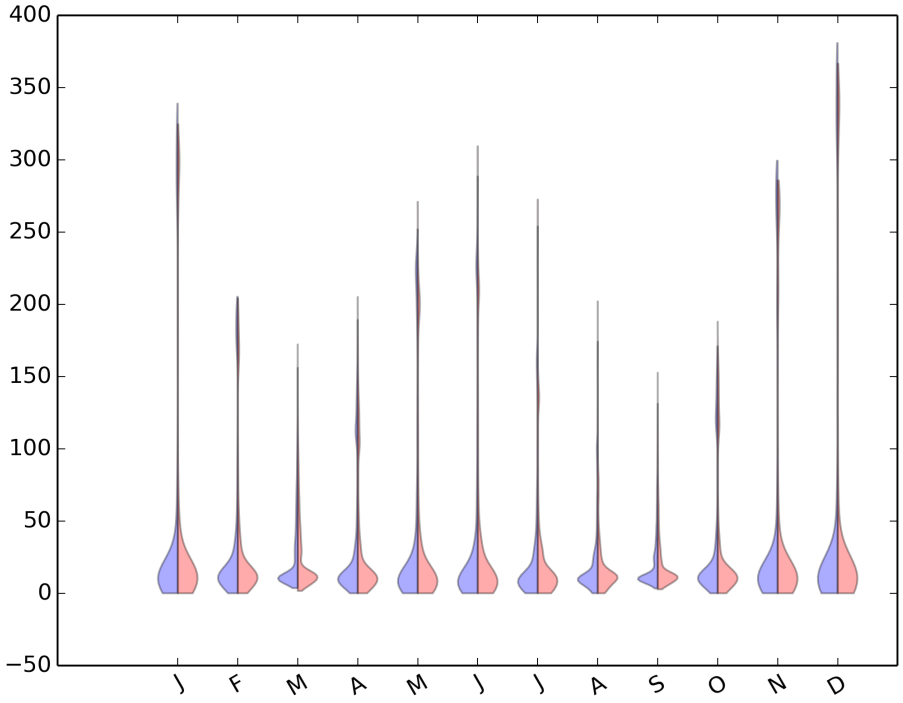



Figure 1070: Violin plot for CMIP5-NCAR:CCSM4-AMIP

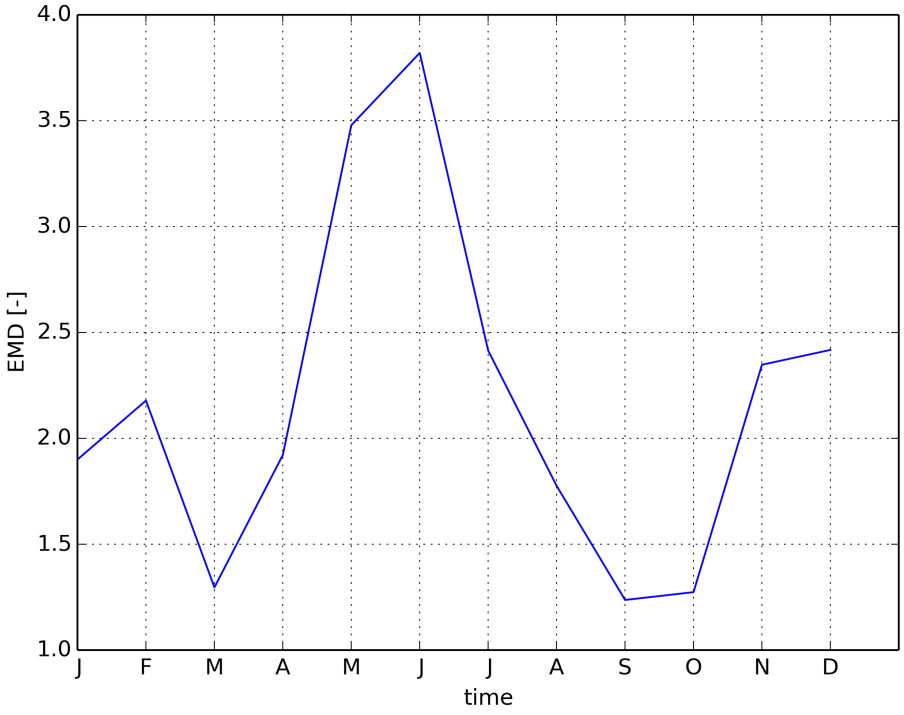



Figure 1071: Timeseries of EMD

### 2.2.27 CMIP5 NCC:NorESM1-M-amip

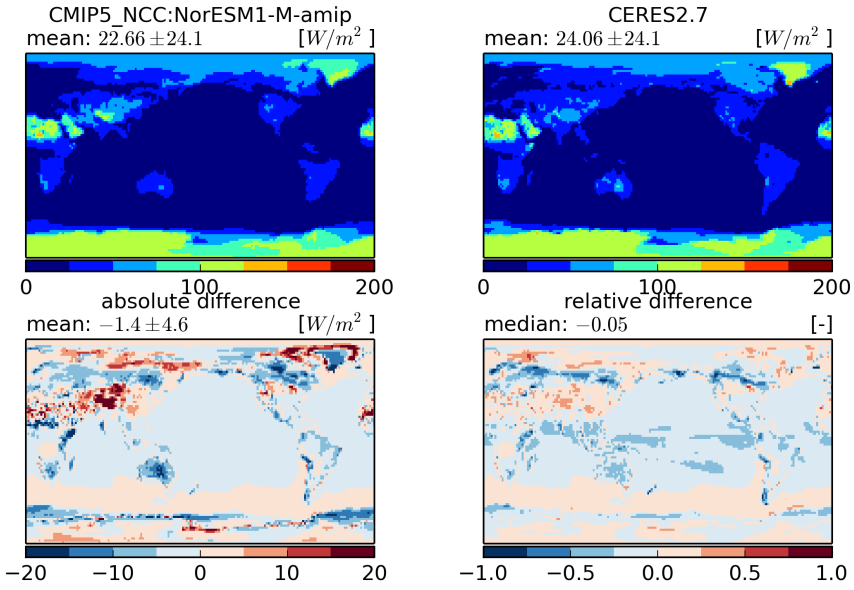



Figure 1072: Temporal mean fields (top) and absolute and relative differences (bottom)

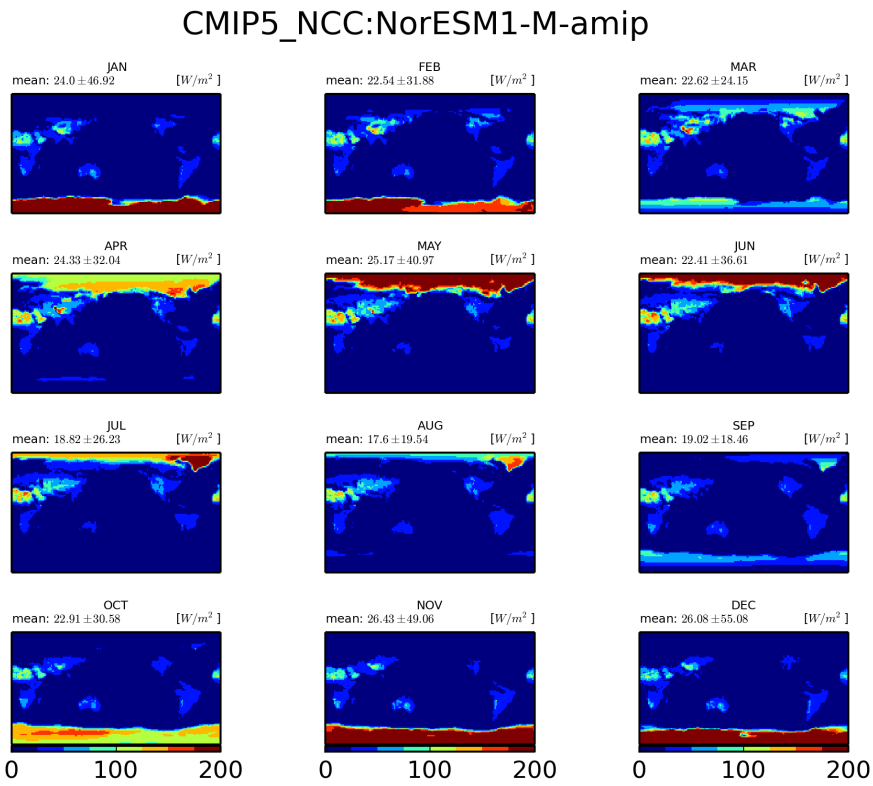



Figure 1073: Monthly mean climatology for NCC:NorESM1-M

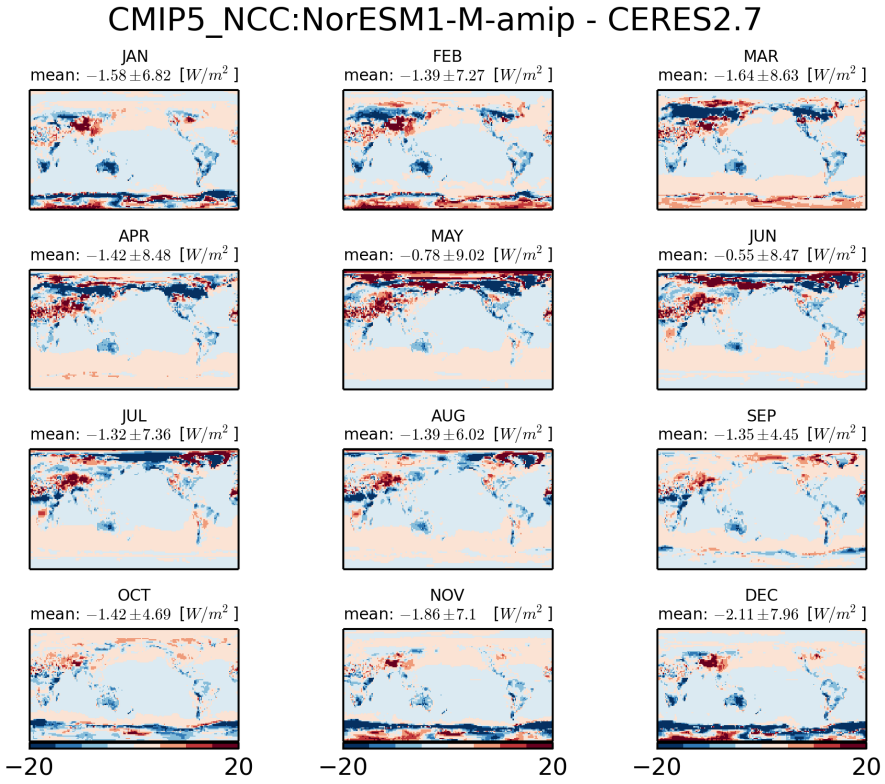



Figure 1074: Monthly mean climatology of difference between NCC:NORESM1-M and CERES2.7

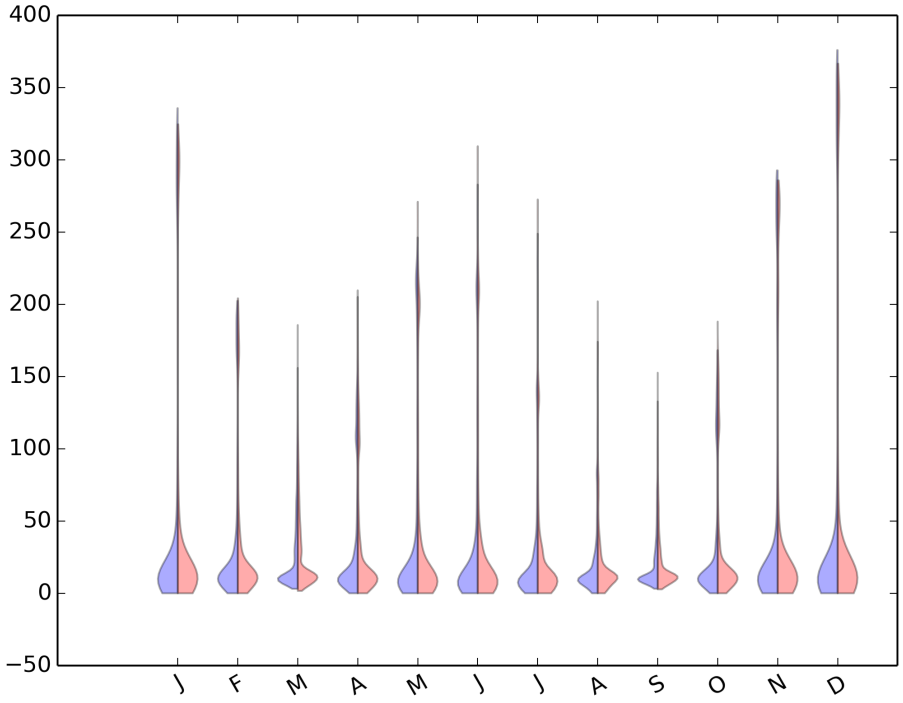



Figure 1075: Violin plot for CMIP5-NCC:NORESM1-M-AMIP

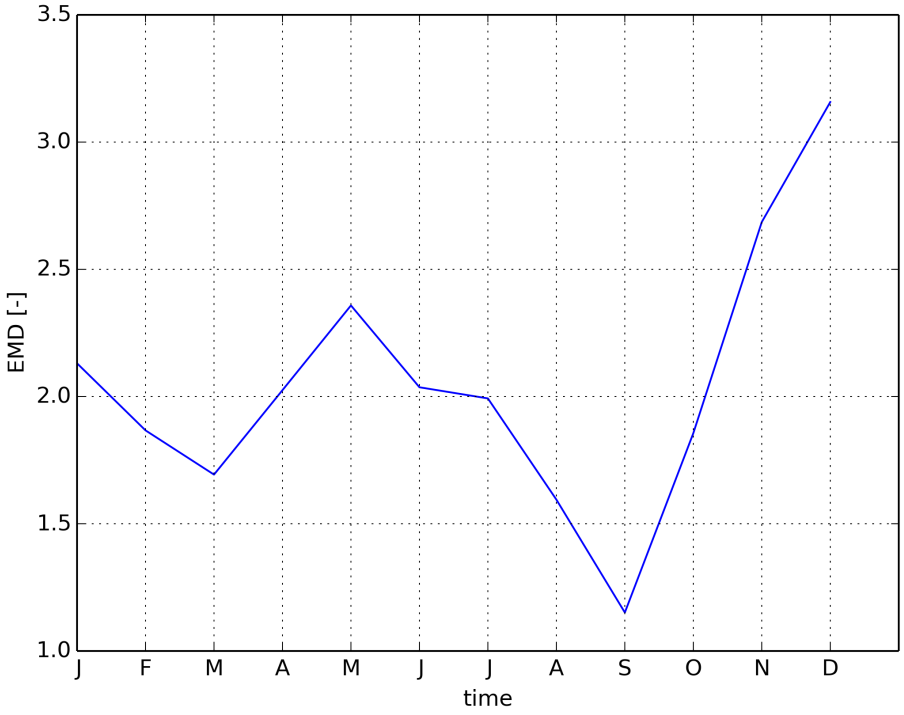



Figure 1076: Timeseries of EMD

### 2.2.28 CMIP3 iap fgoals1 0 g-amip

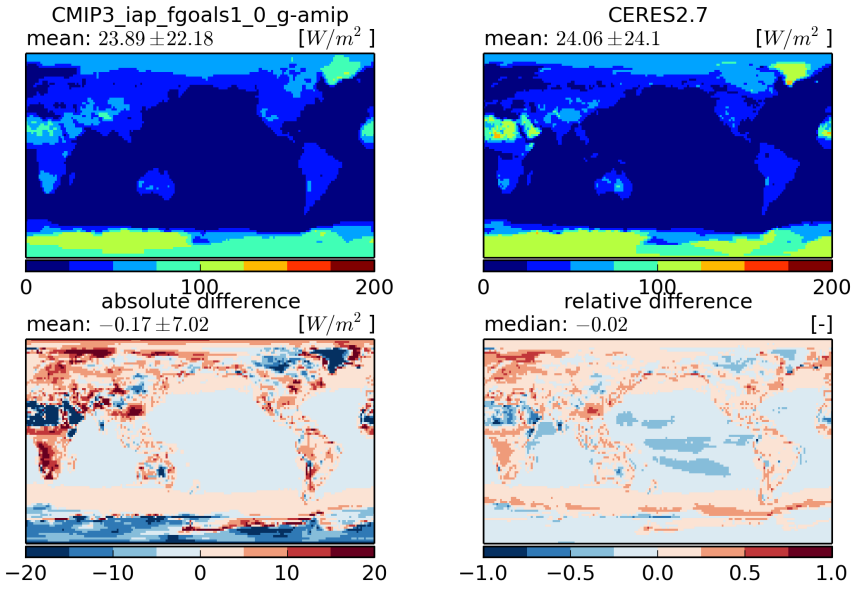



Figure 1077: Temporal mean fields (top) and absolute and relative differences (bottom)

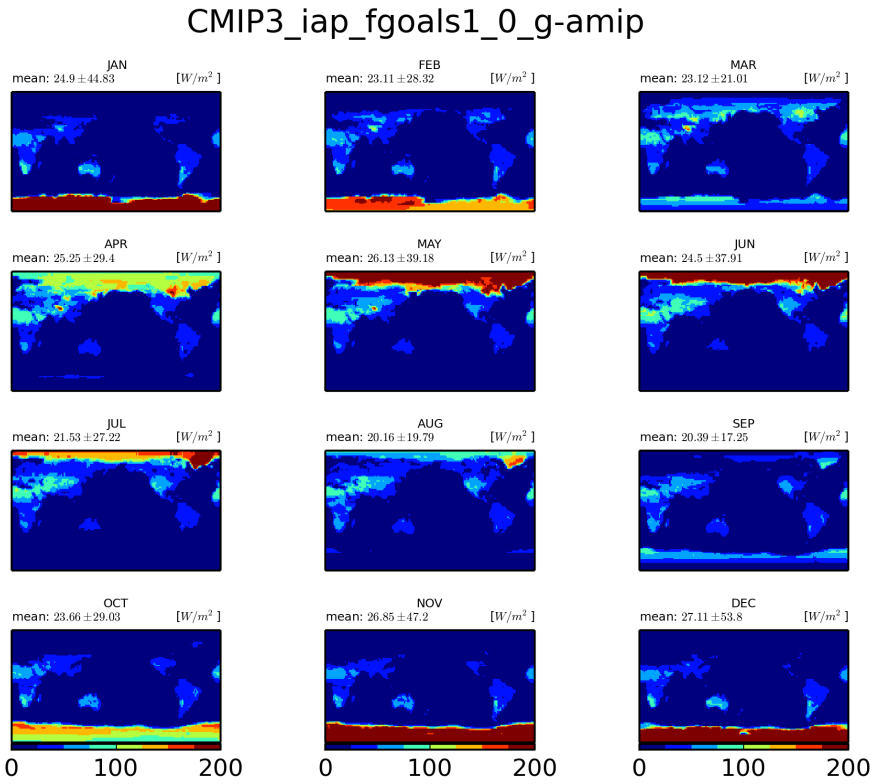



Figure 1078: Monthly mean climatology for iap-fgoals1-0-g

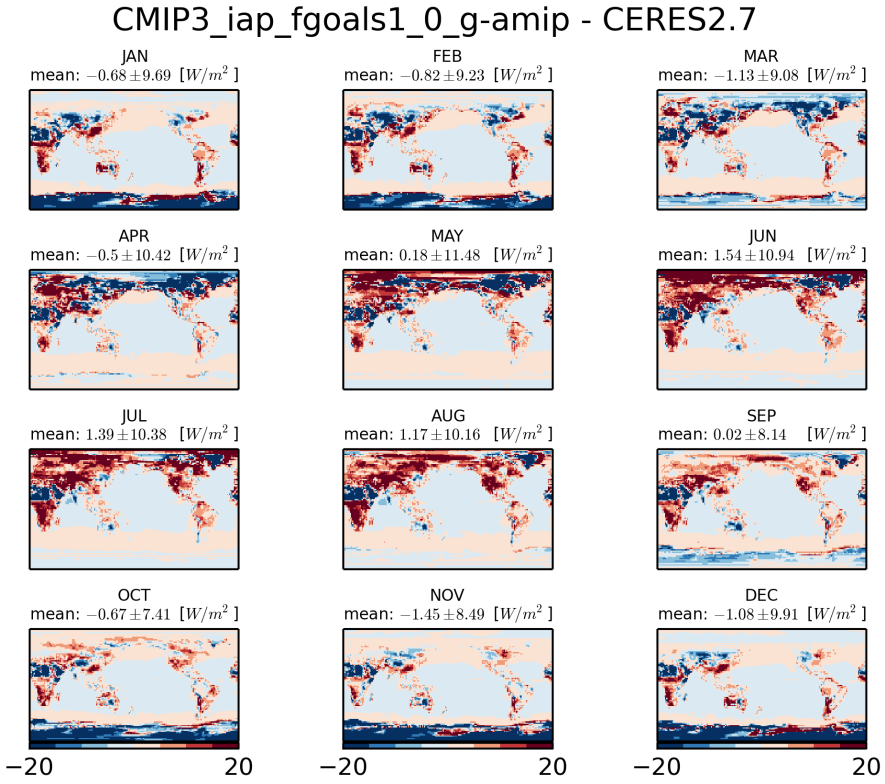



Figure 1079: Monthly mean climatology of difference between IAP-FGOALS1-0-G and CERES2.7

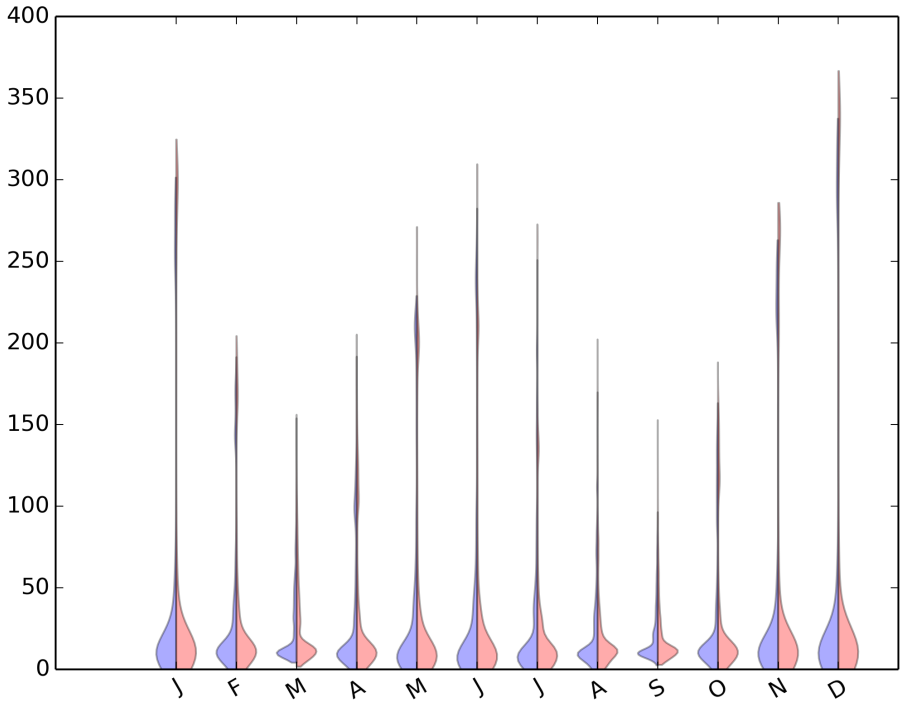



Figure 1080: Violin plot for CMIP3-IAP-FGOALS1-0-G-AMIP

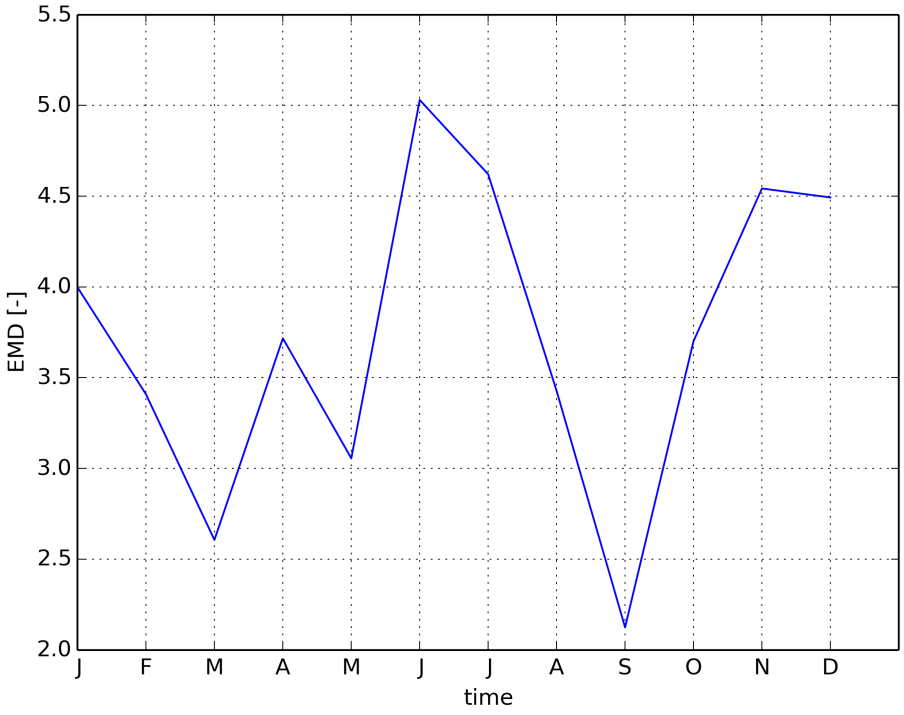



Figure 1081: Timeseries of EMD

### 2.2.29 CMIP3 inmcm3 0-amip

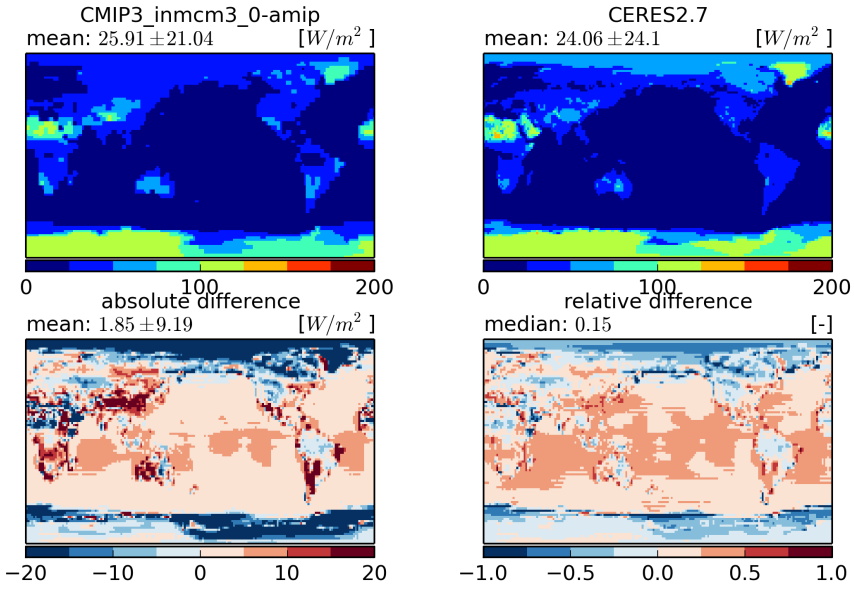



Figure 1082: Temporal mean fields (top) and absolute and relative differences (bottom)

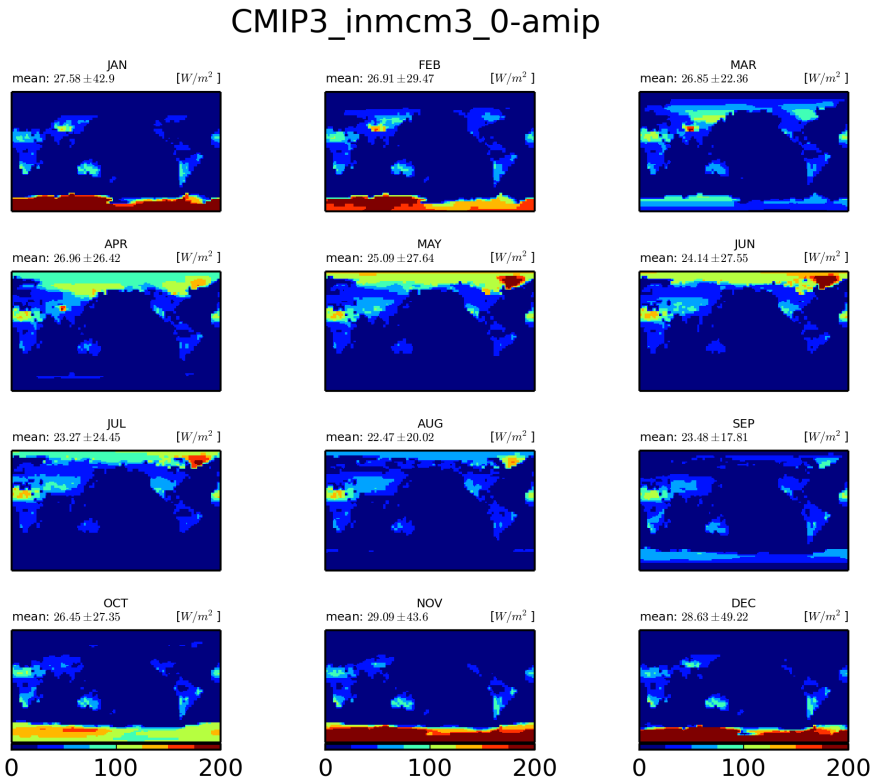



Figure 1083: Monthly mean climatology for inmcm3-0

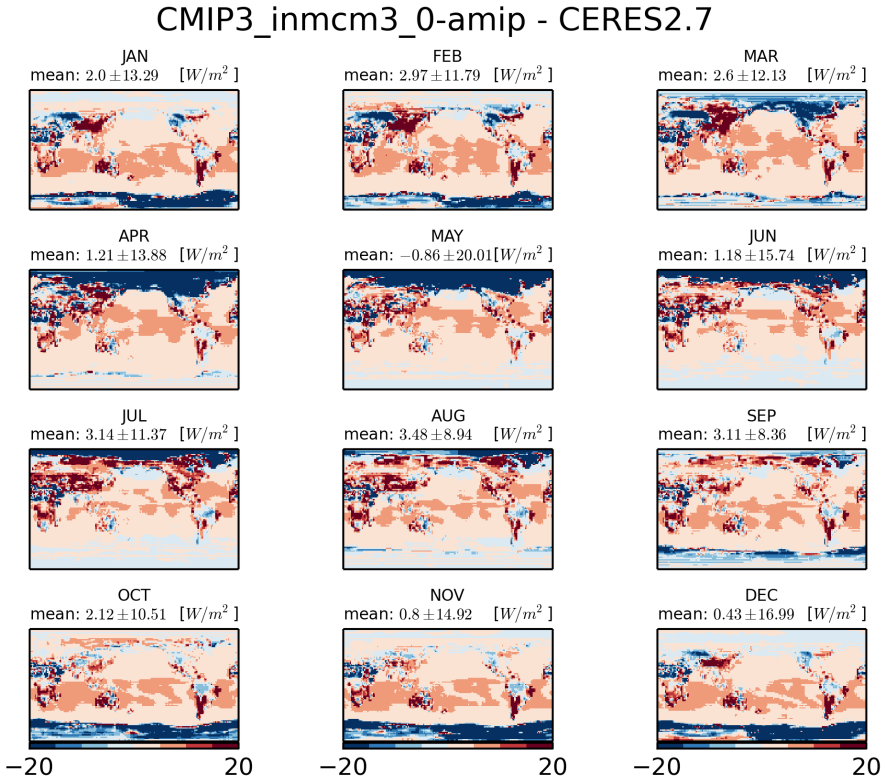



Figure 1084: Monthly mean climatology of difference between INMCM3-0 and CERES2.7

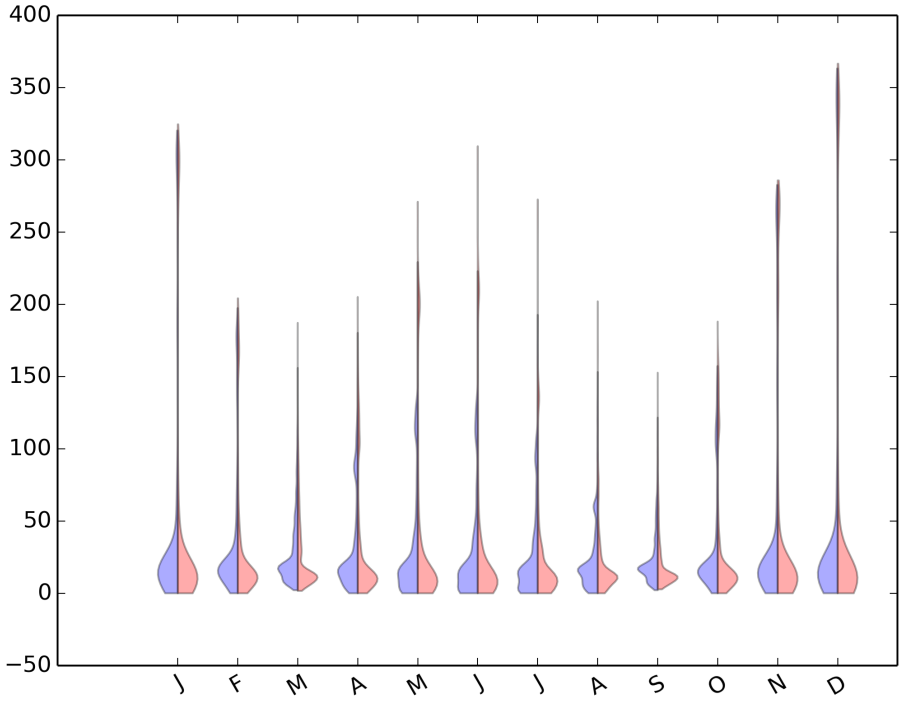



Figure 1085: Violin plot for CMIP3-INMCM3-0-AMIP

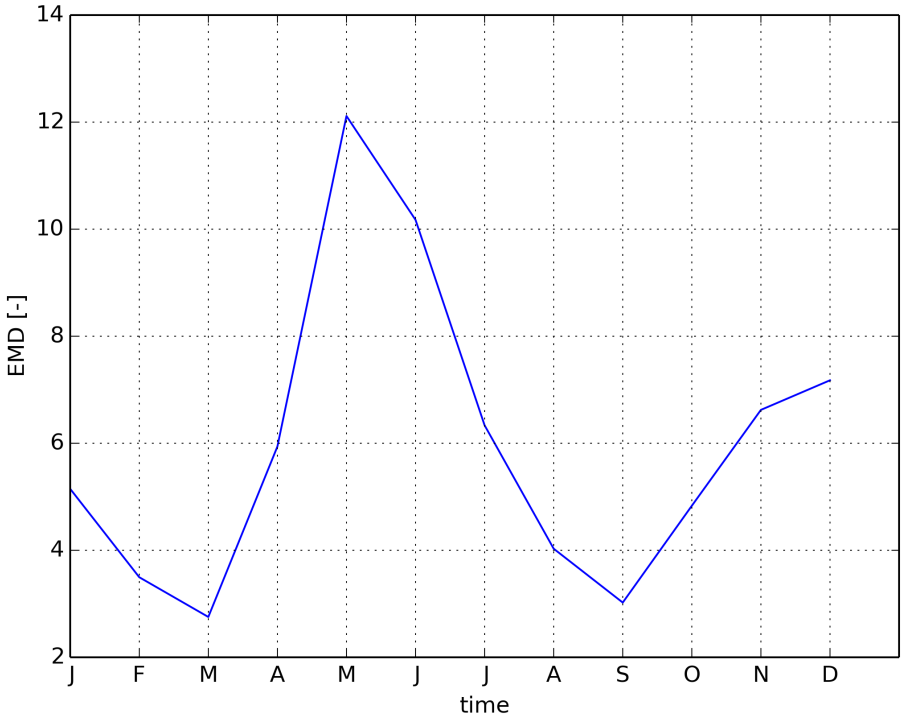



Figure 1086: Timeseries of EMD

### 2.2.30 CMIP3 ipsl cm4-amip

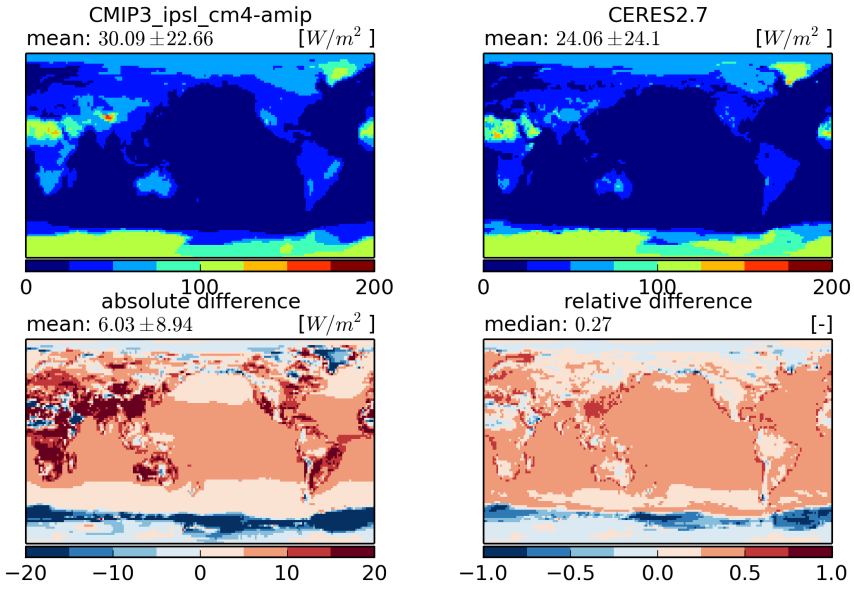



Figure 1087: Temporal mean fields (top) and absolute and relative differences (bottom)

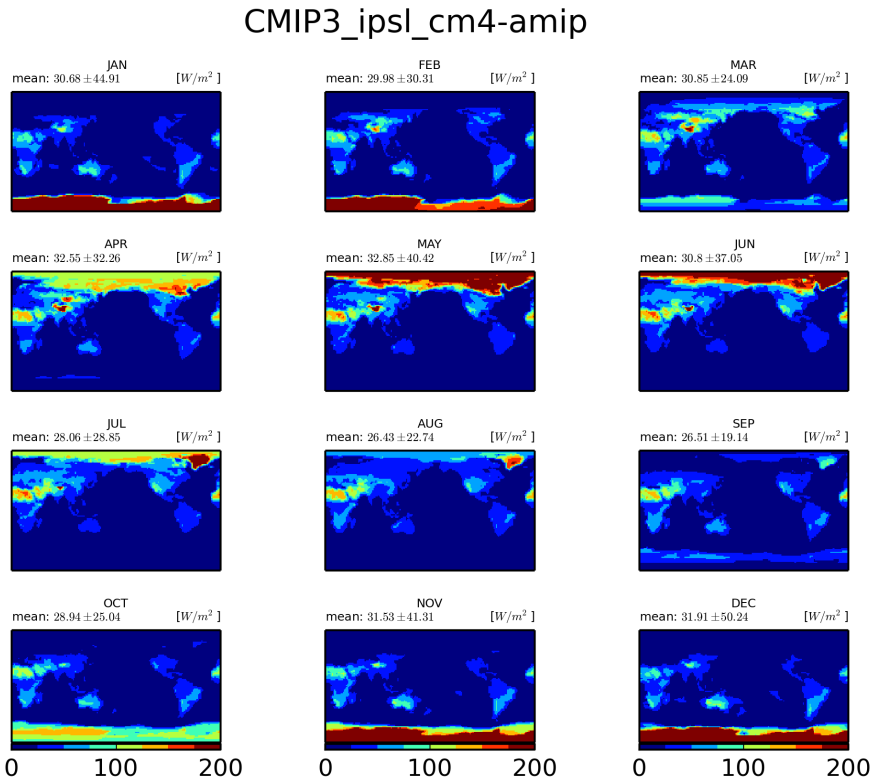



Figure 1088: Monthly mean climatology for ipsl-cm4

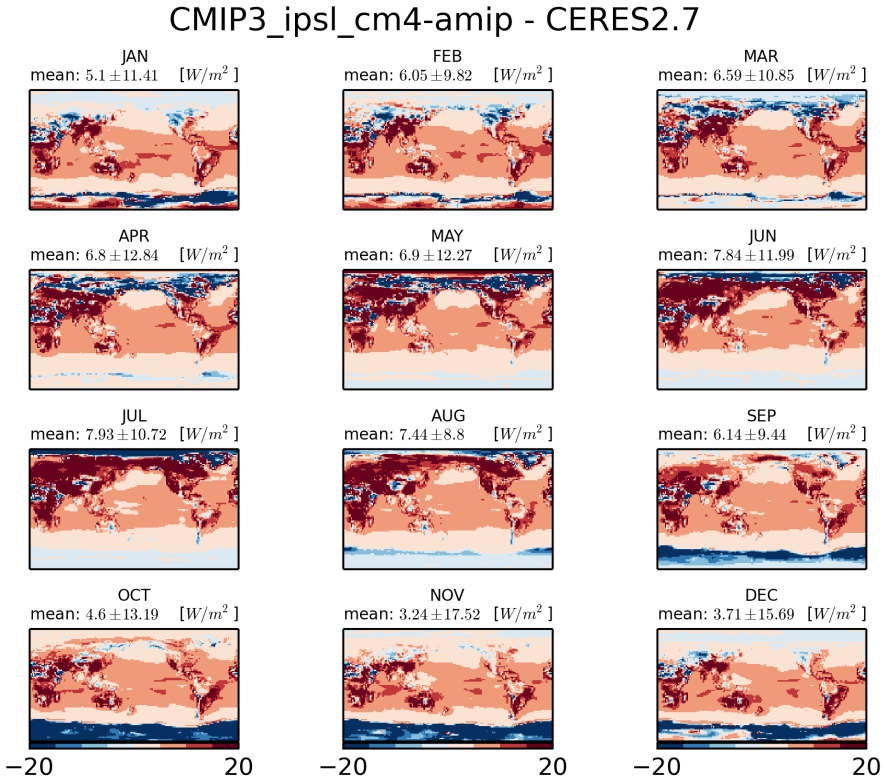



Figure 1089: Monthly mean climatology of difference between IPSL-CM4 and CERES2.7

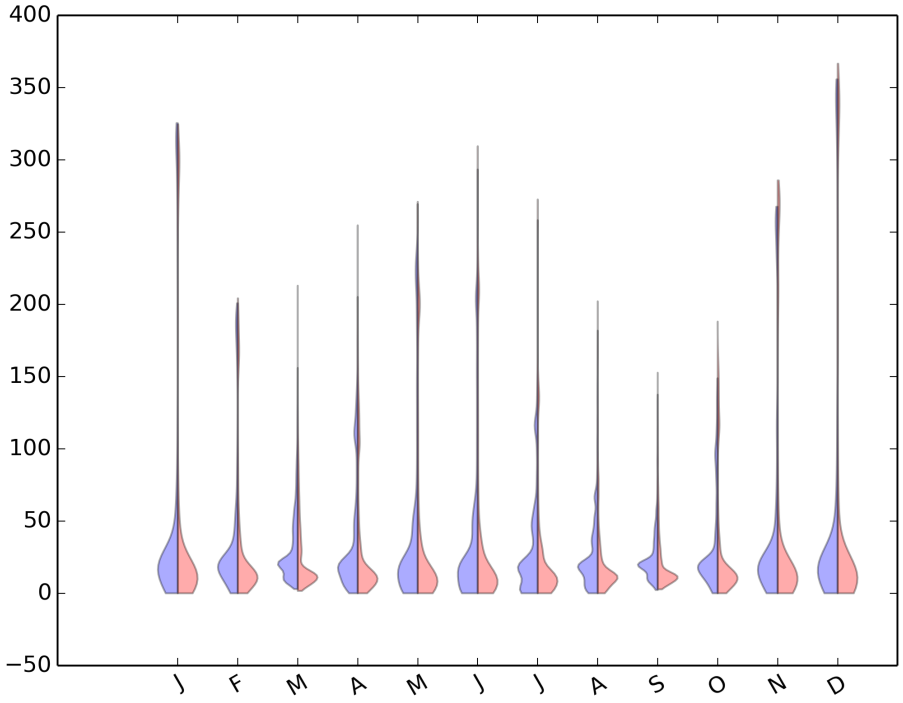



Figure 1090: Violin plot for CMIP3-IPSL-CM4-AMIP

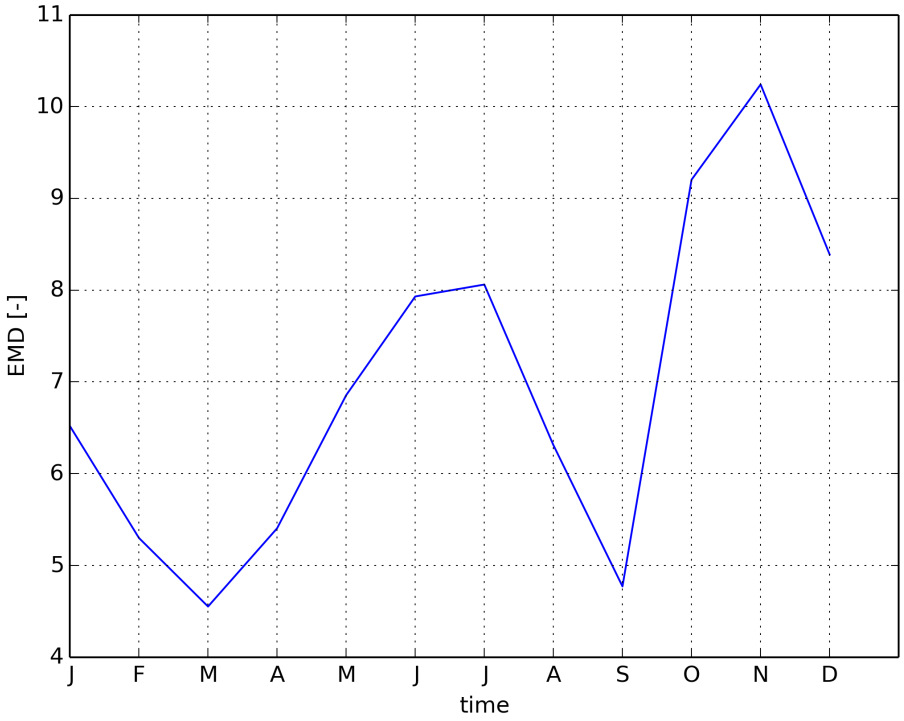



Figure 1091: Timeseries of EMD

### 2.2.31 CMIP3 miroc3 2 hires-amip

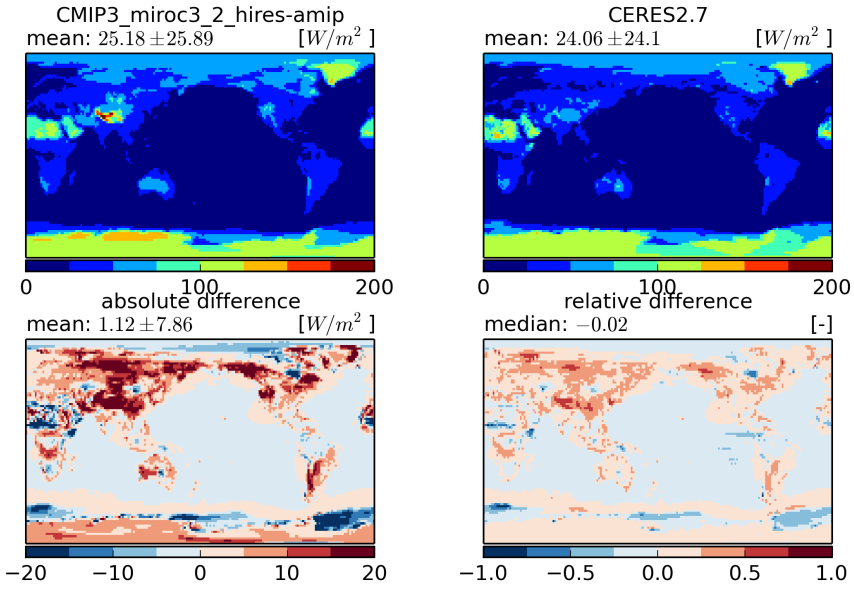



Figure 1092: Temporal mean fields (top) and absolute and relative differences (bottom)

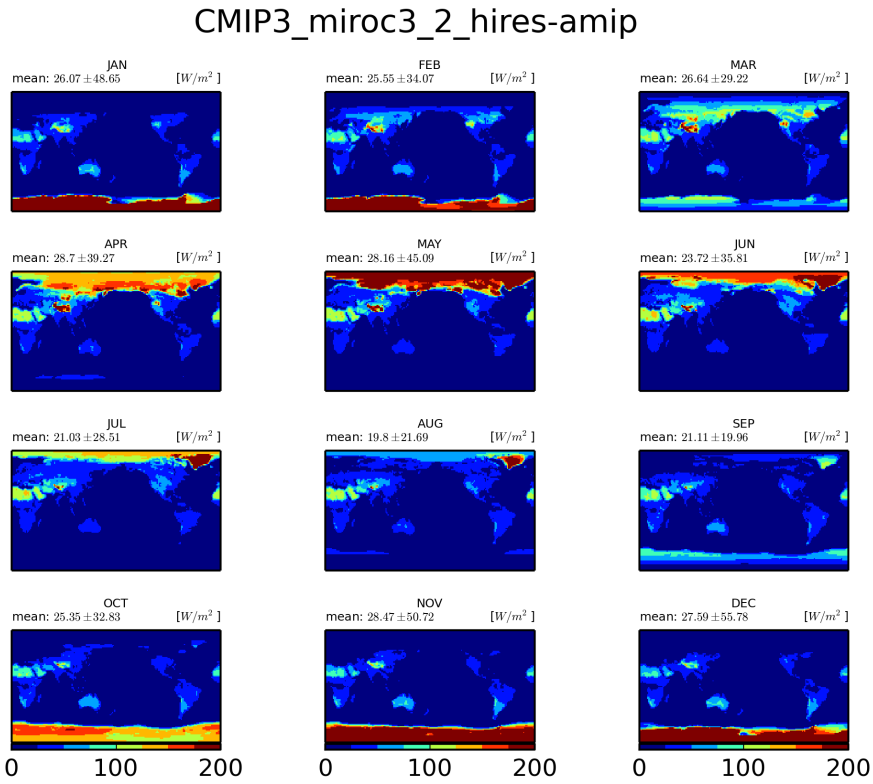



Figure 1093: Monthly mean climatology for miroc3-2-hires

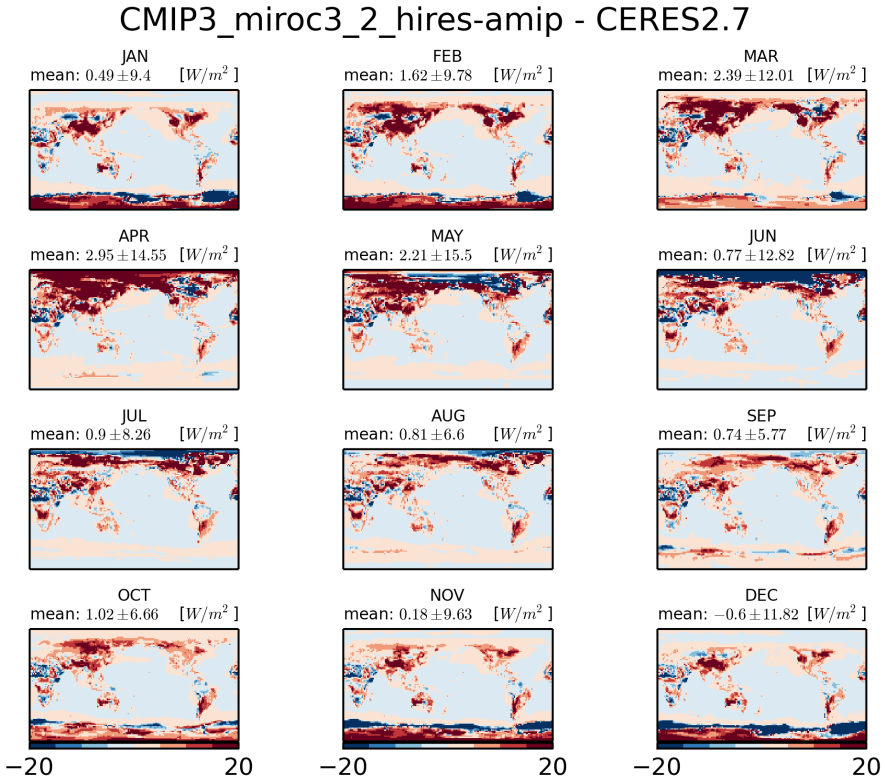



Figure 1094: Monthly mean climatology of difference between MIROC3-2-HIRES and CERES2.7

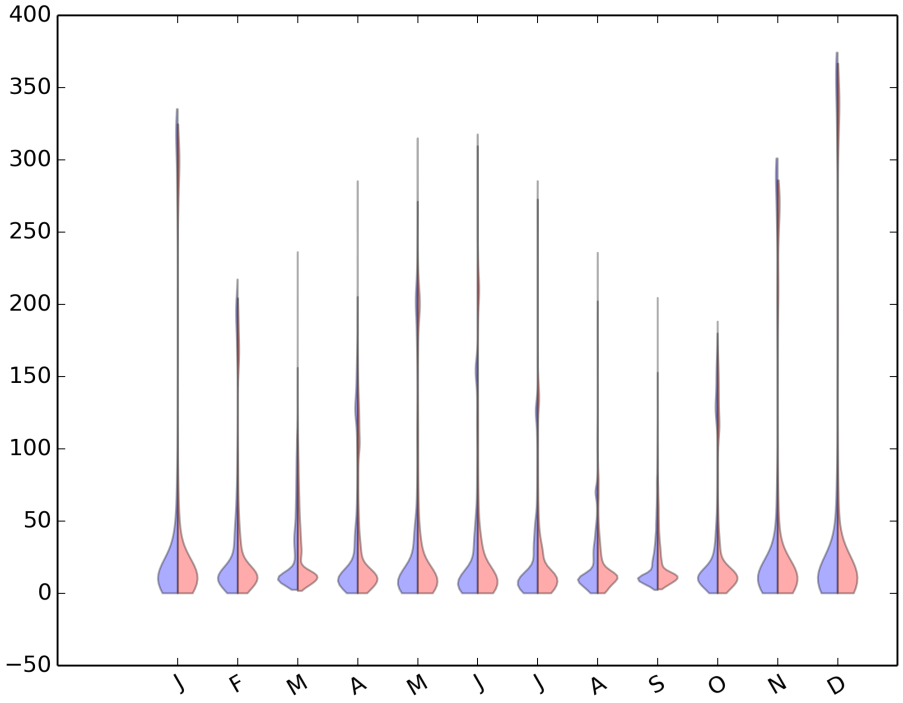



Figure 1095: Violin plot for CMIP3-MIROC3-2-HIRES-AMIP

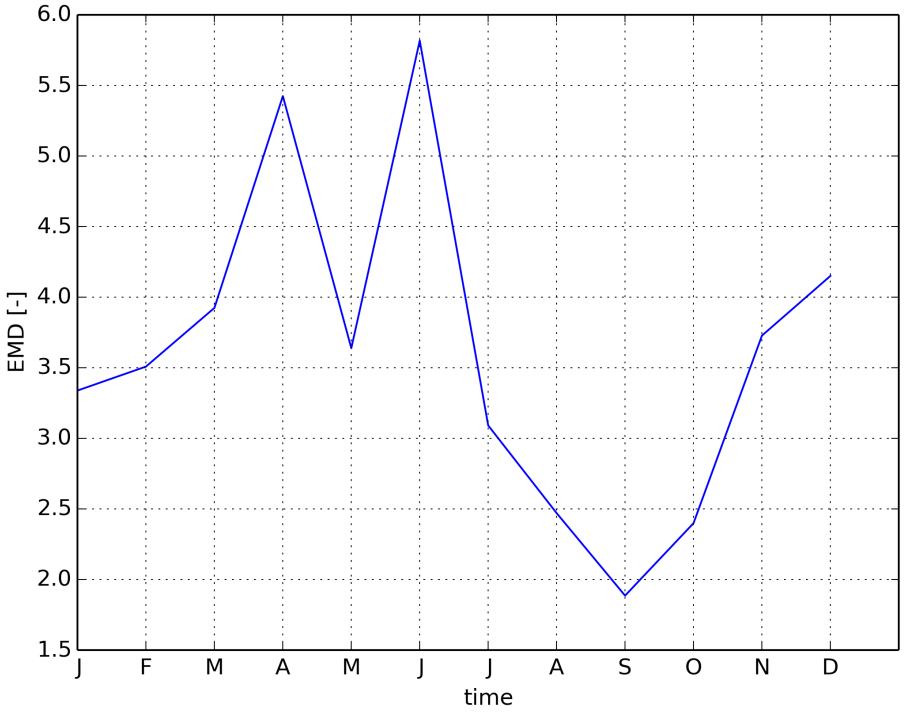



Figure 1096: Timeseries of EMD

### 2.2.32 CMIP3 miroc3 2 medres-amip

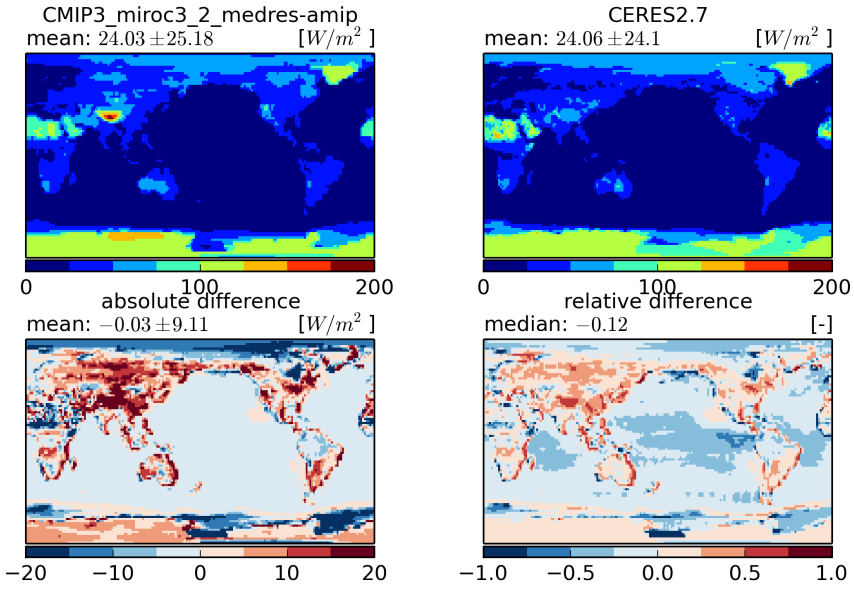



Figure 1097: Temporal mean fields (top) and absolute and relative differences (bottom)

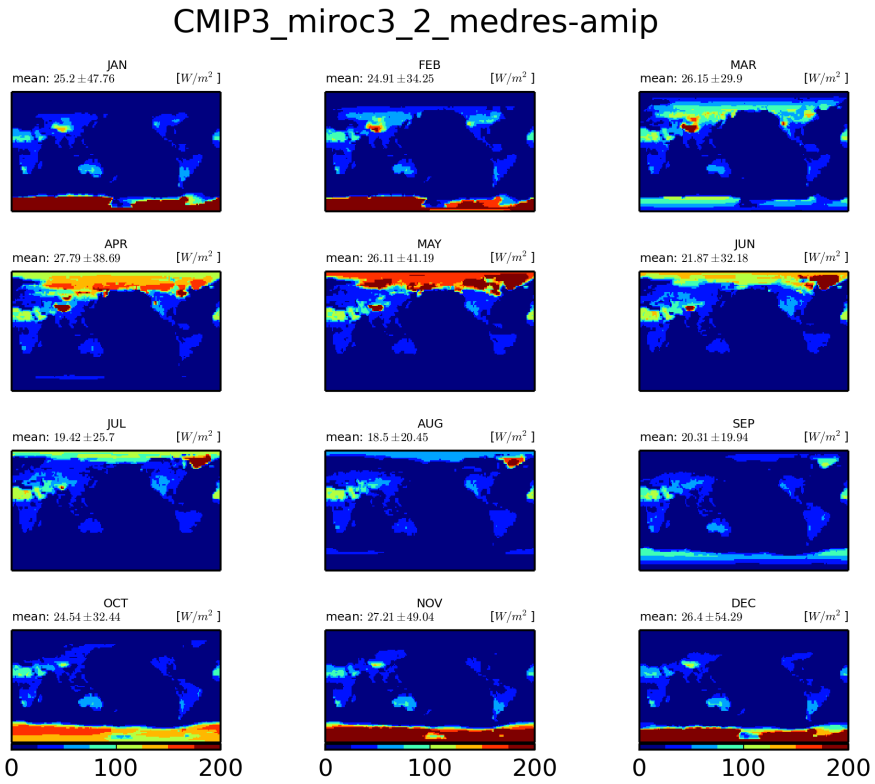



Figure 1098: Monthly mean climatology for miroc3-2-medres

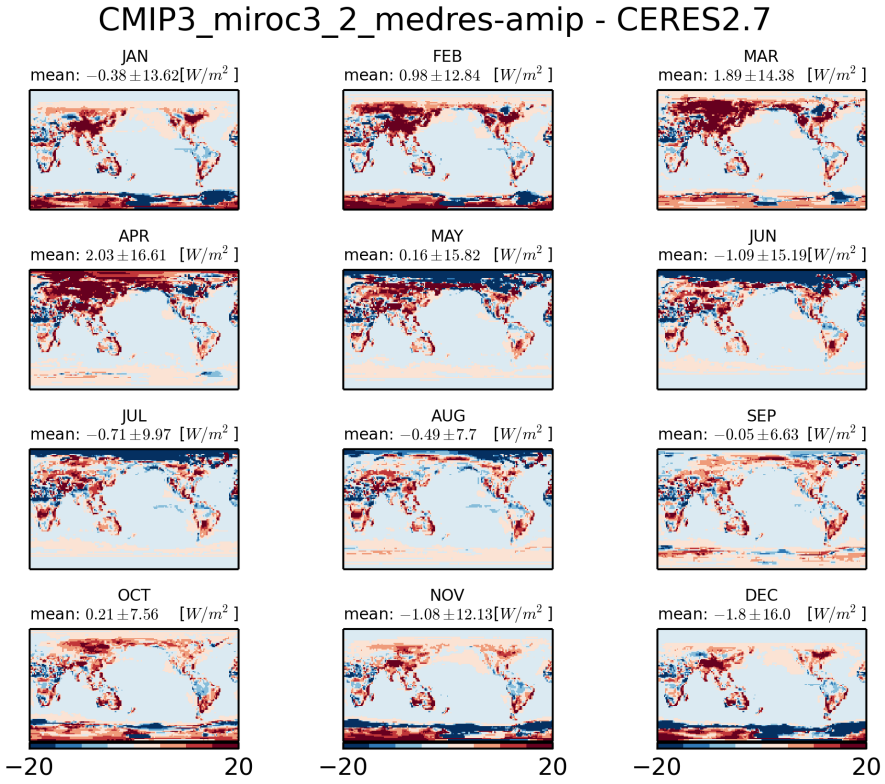



Figure 1099: Monthly mean climatology of difference between MIROC3-2-MEDRES and CERES2.7

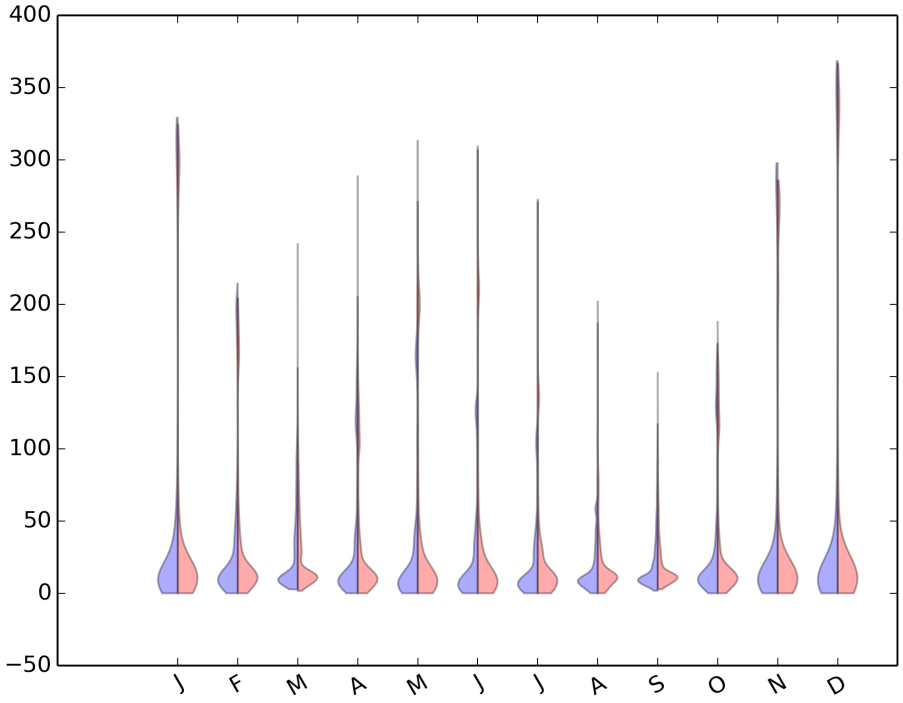



Figure 1100: Violin plot for CMIP3-MIROC3-2-MEDRES-AMIP

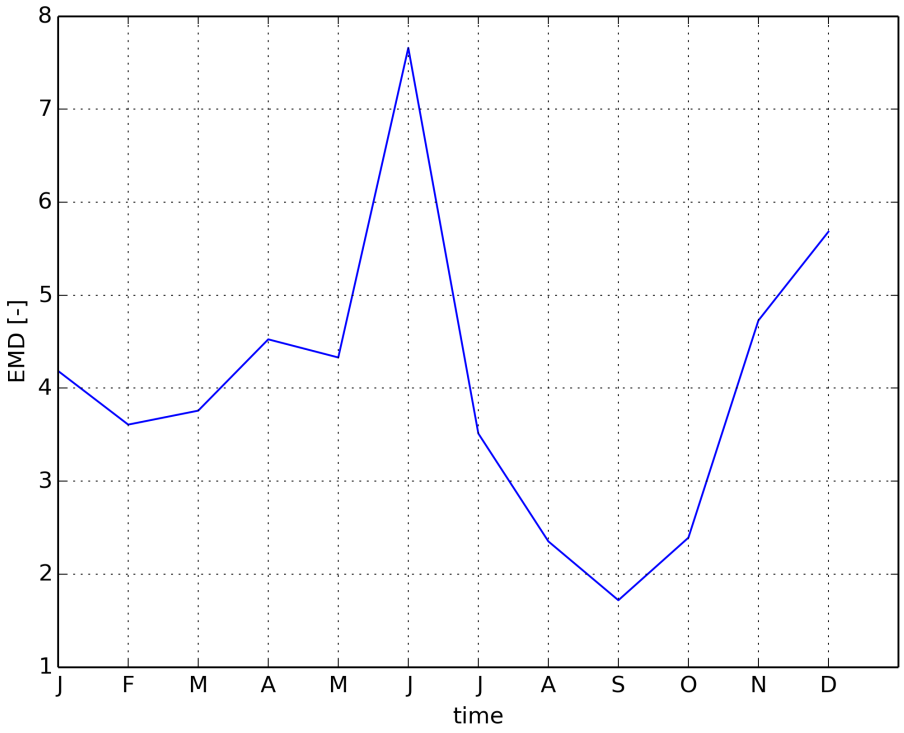



Figure 1101: Timeseries of EMD

### 2.2.33 CMIP3 mpi echam5-amip

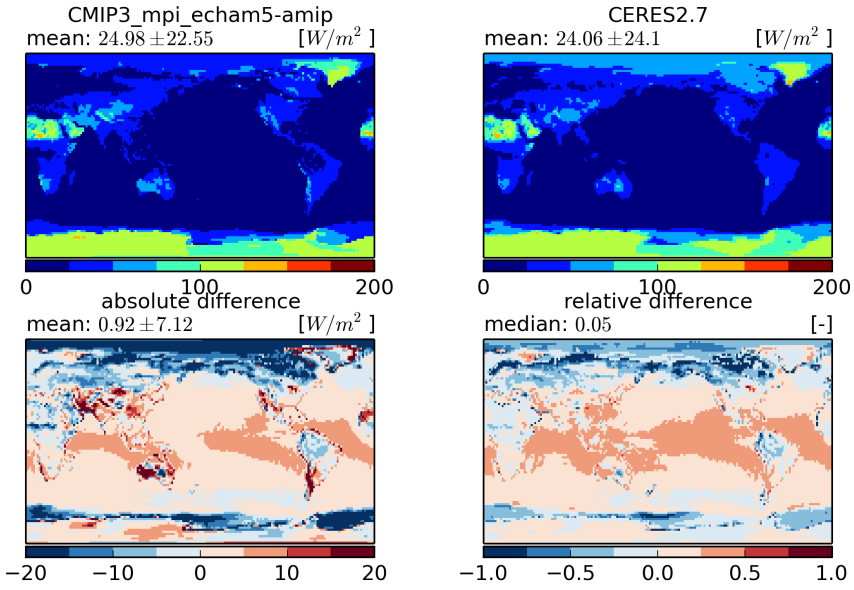



Figure 1102: Temporal mean fields (top) and absolute and relative differences (bottom)

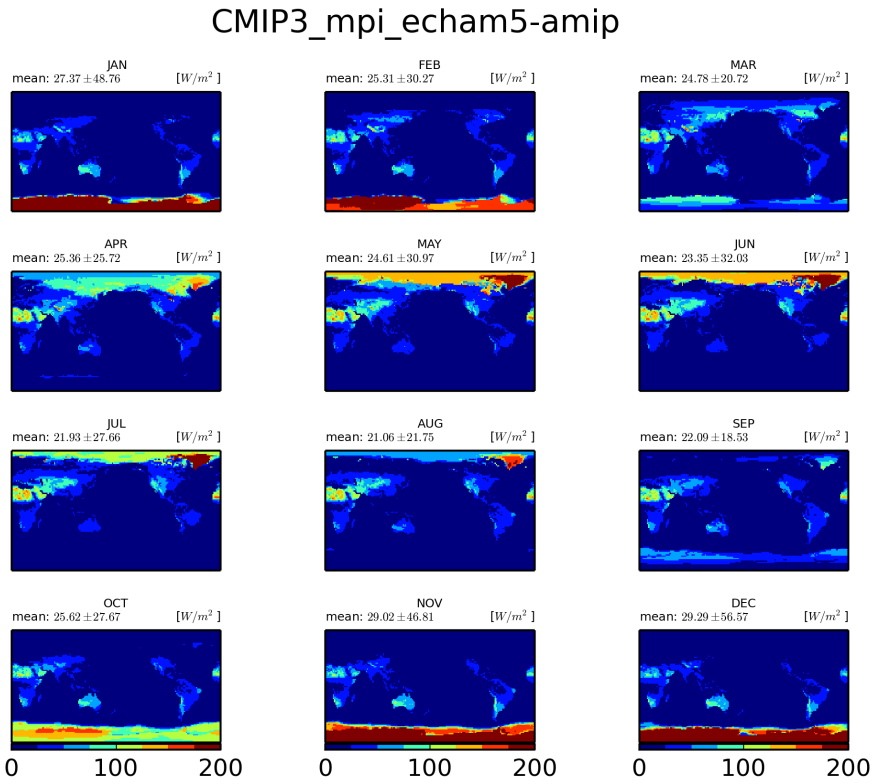



Figure 1103: Monthly mean climatology for mpi-echam5

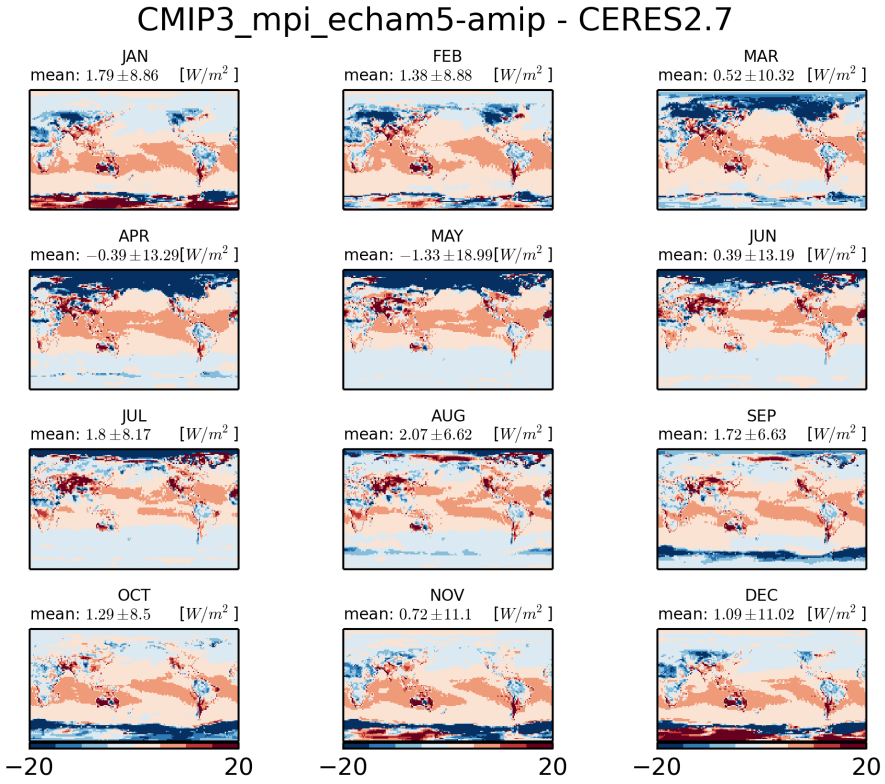



Figure 1104: Monthly mean climatology of difference between MPI-ECHAM5 and CERES2.7

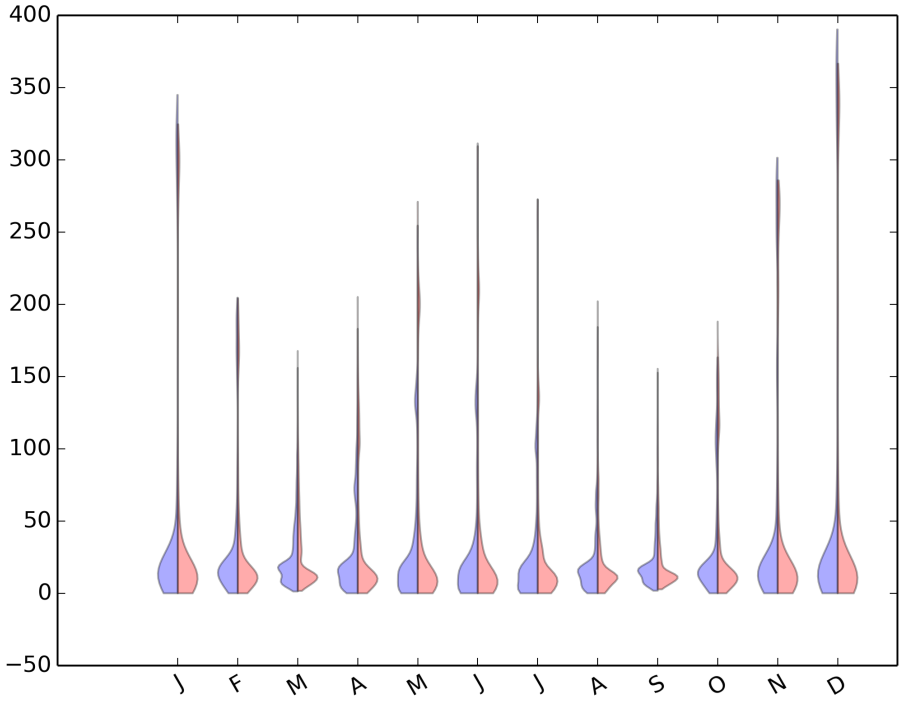



Figure 1105: Violin plot for CMIP3-MPI-ECHAM5-AMIP

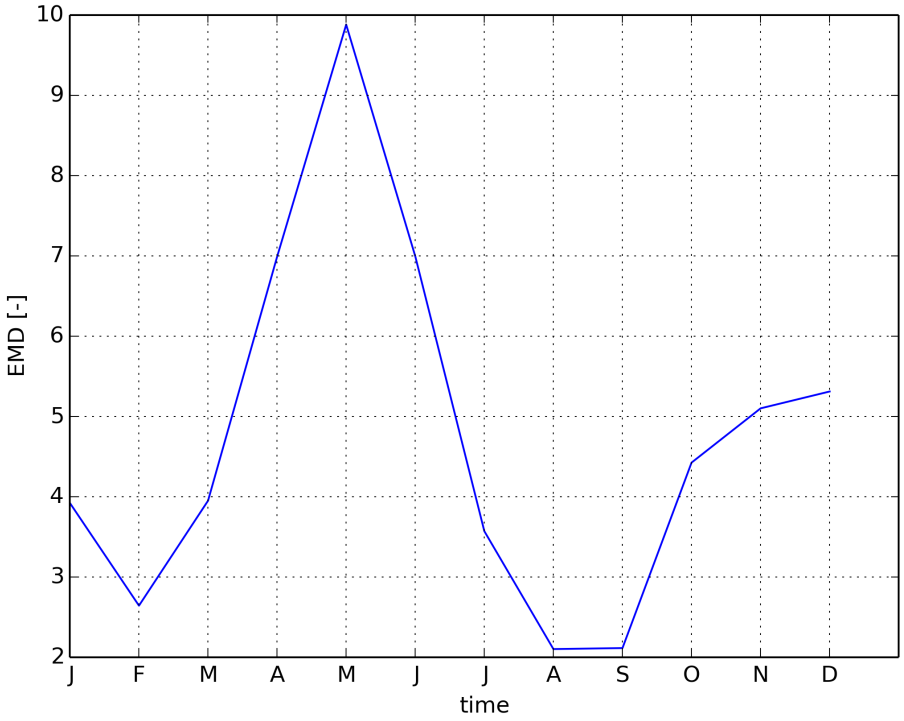



Figure 1106: Timeseries of EMD

### 2.2.34 CMIP3 ncar ccsm3 0-amip

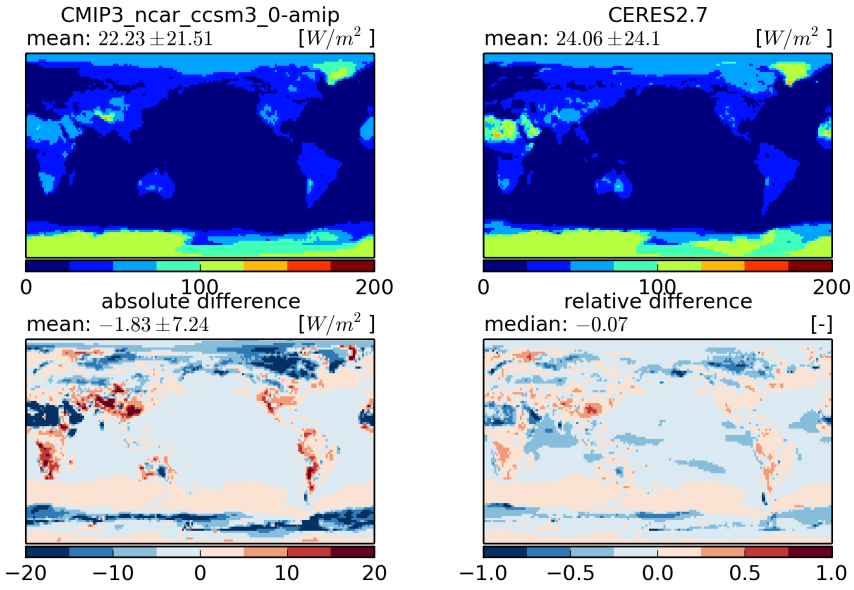



Figure 1107: Temporal mean fields (top) and absolute and relative differences (bottom)

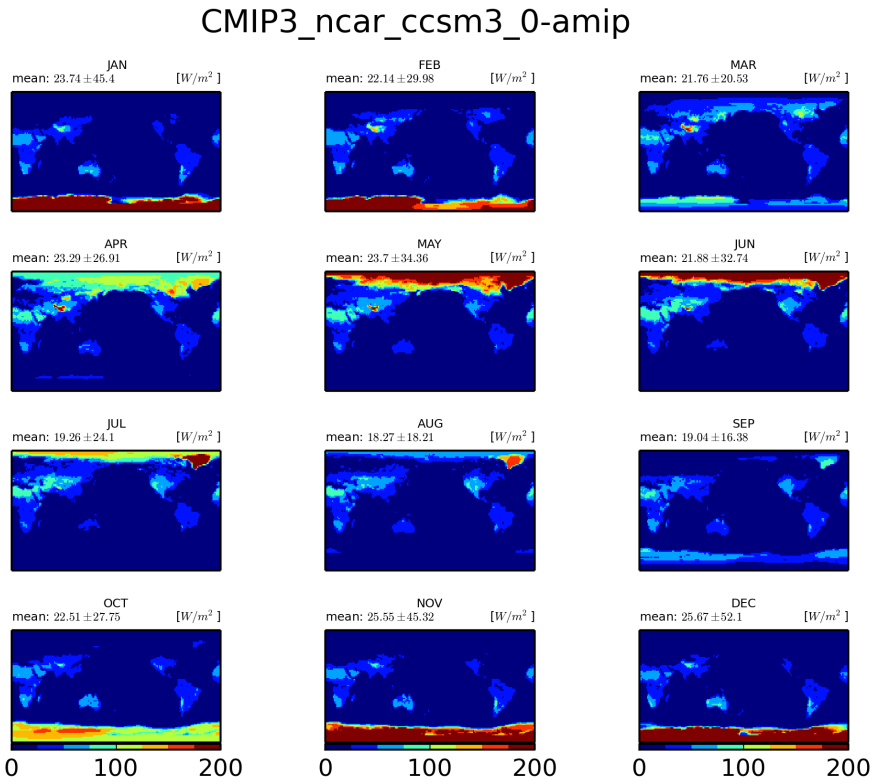



Figure 1108: Monthly mean climatology for ncar-ccsm3-0

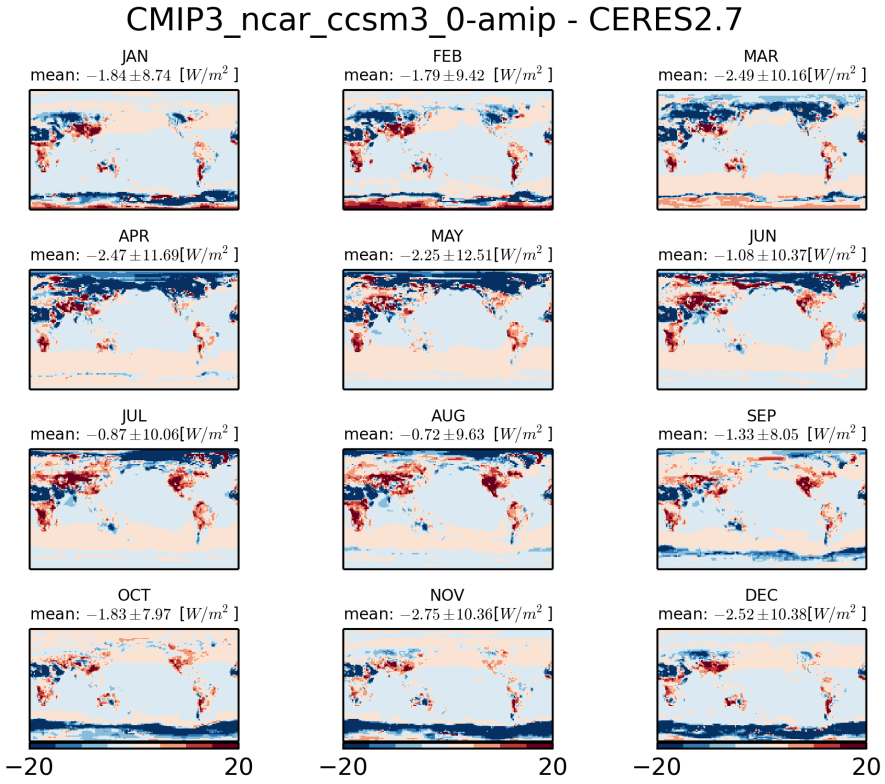



Figure 1109: Monthly mean climatology of difference between NCAR-CCSM3-0 and CERES2.7

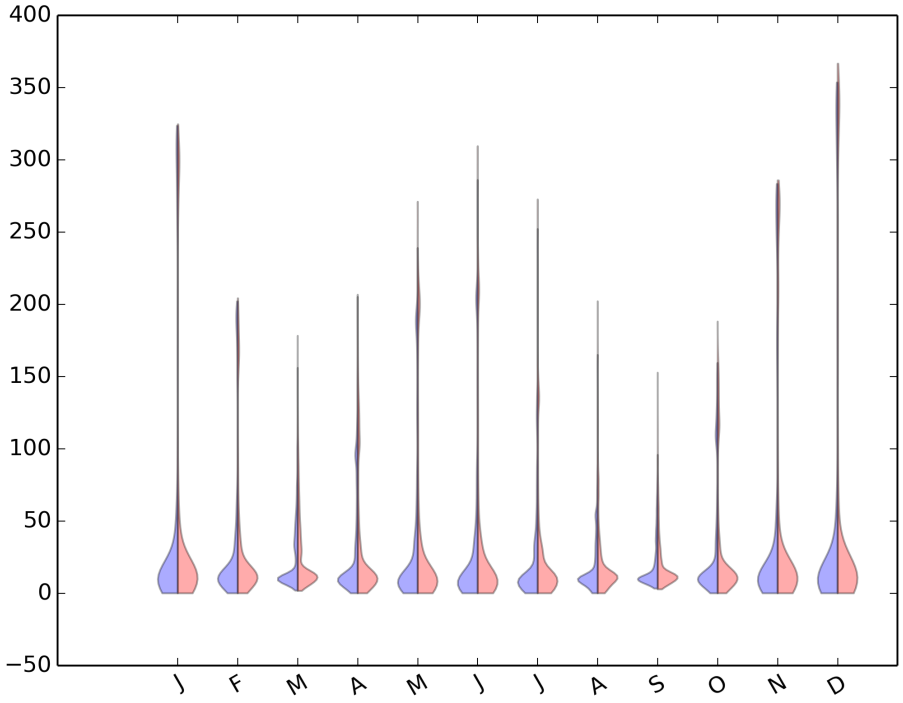



Figure 1110: Violin plot for CMIP3-NCAR-CCSM3-0-AMIP

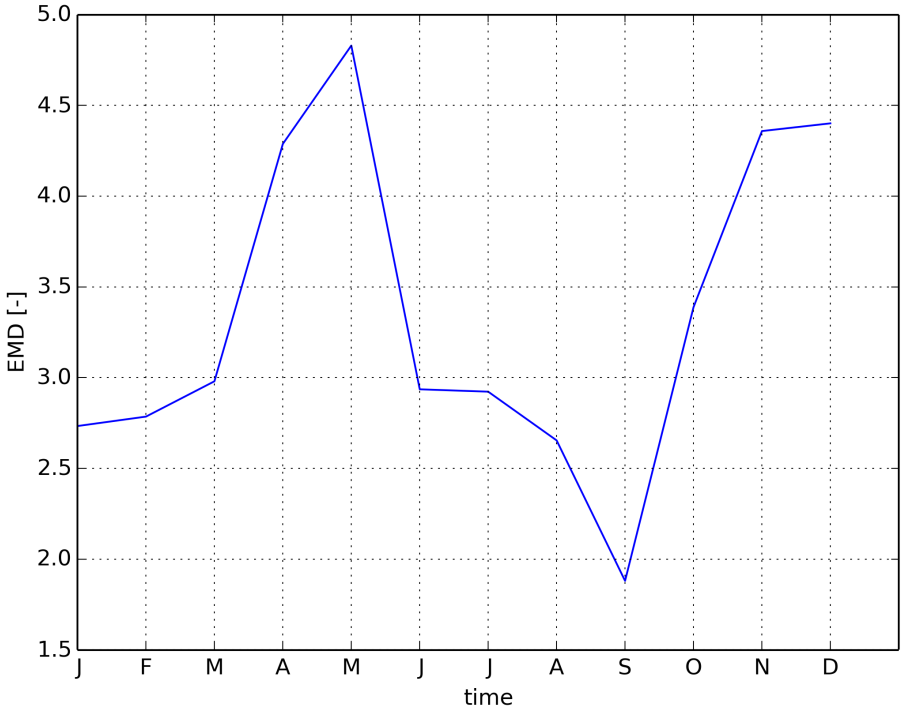



Figure 1111: Timeseries of EMD

### 2.2.35 CMIP3 ncar pcm1-amip

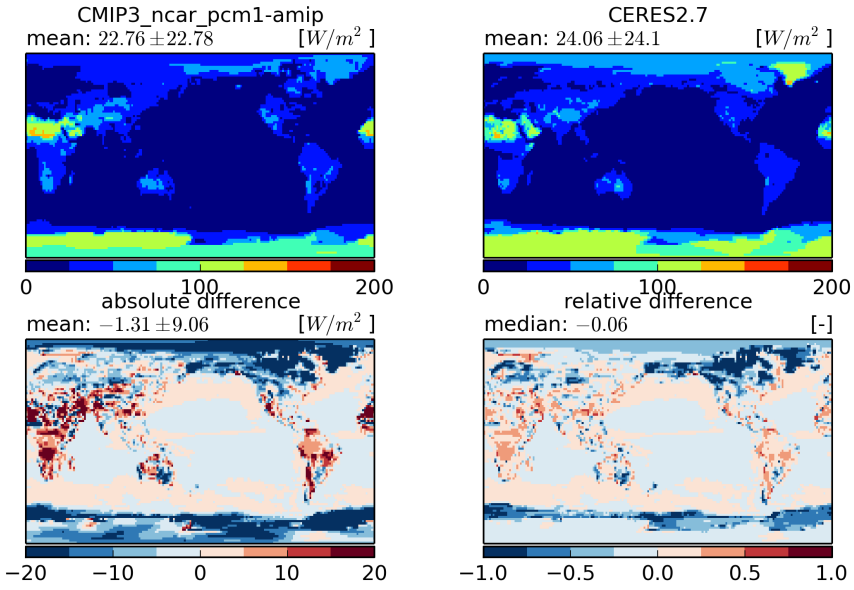



Figure 1112: Temporal mean fields (top) and absolute and relative differences (bottom)

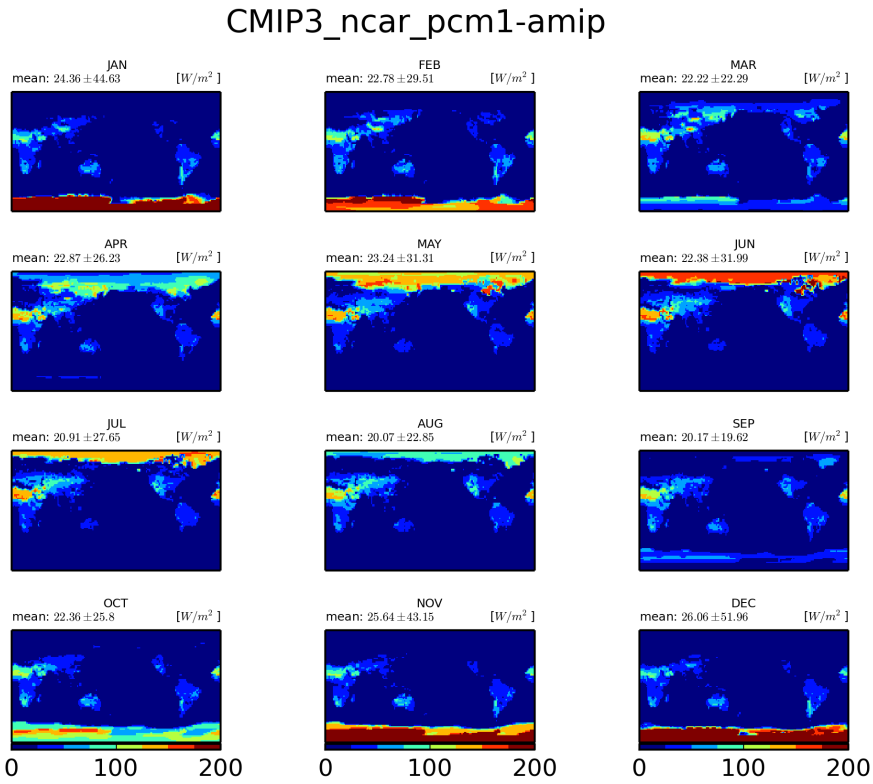



Figure 1113: Monthly mean climatology for ncar-pcm1

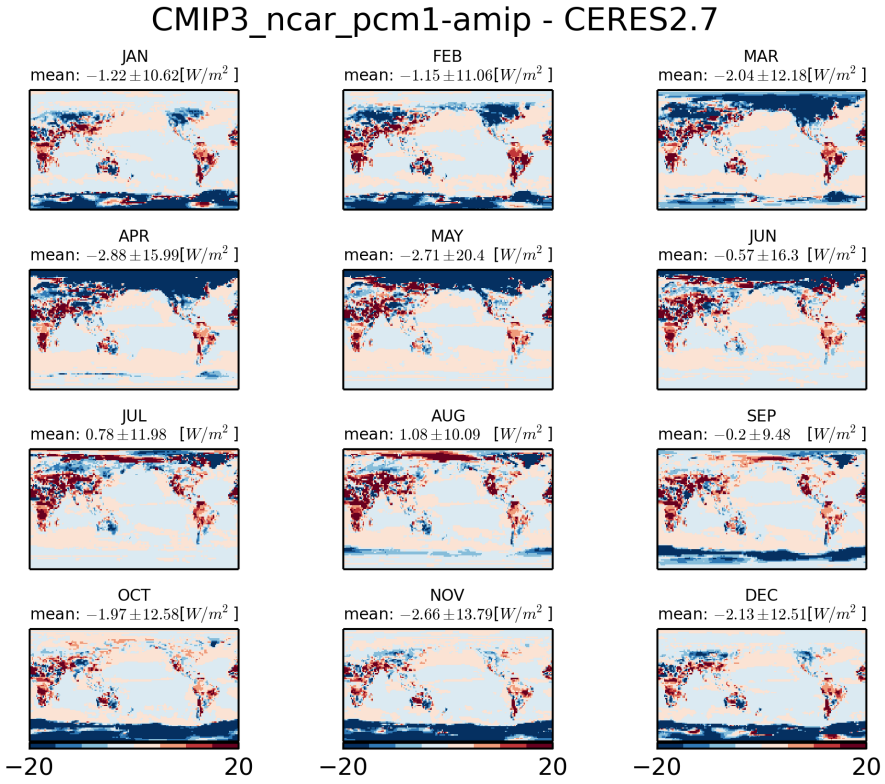



Figure 1114: Monthly mean climatology of difference between NCAR-PCM1 and CERES2.7

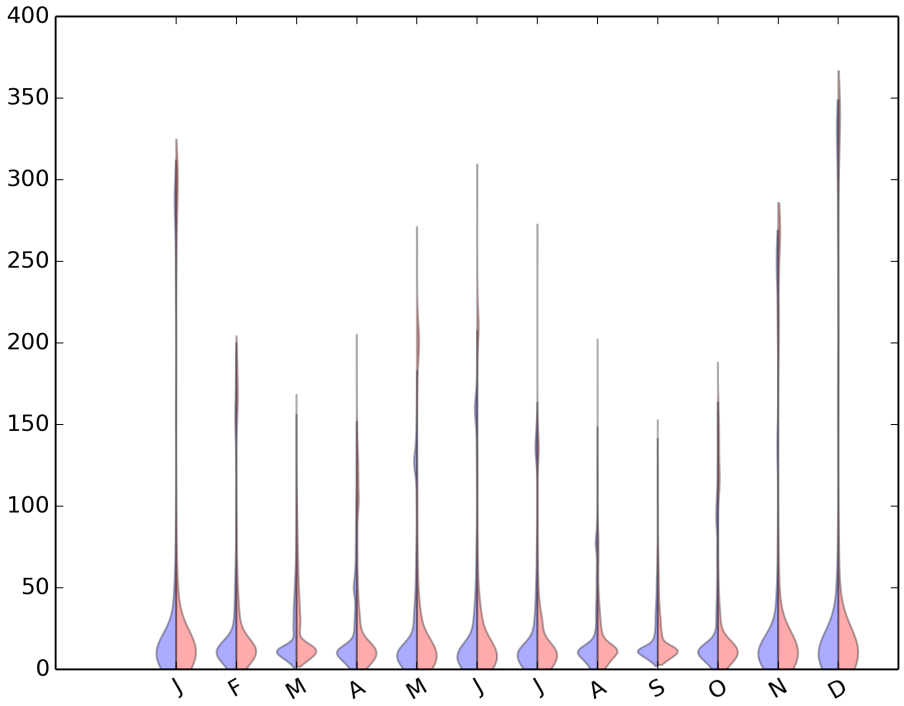



Figure 1115: Violin plot for CMIP3-NCAR-PCM1-AMIP

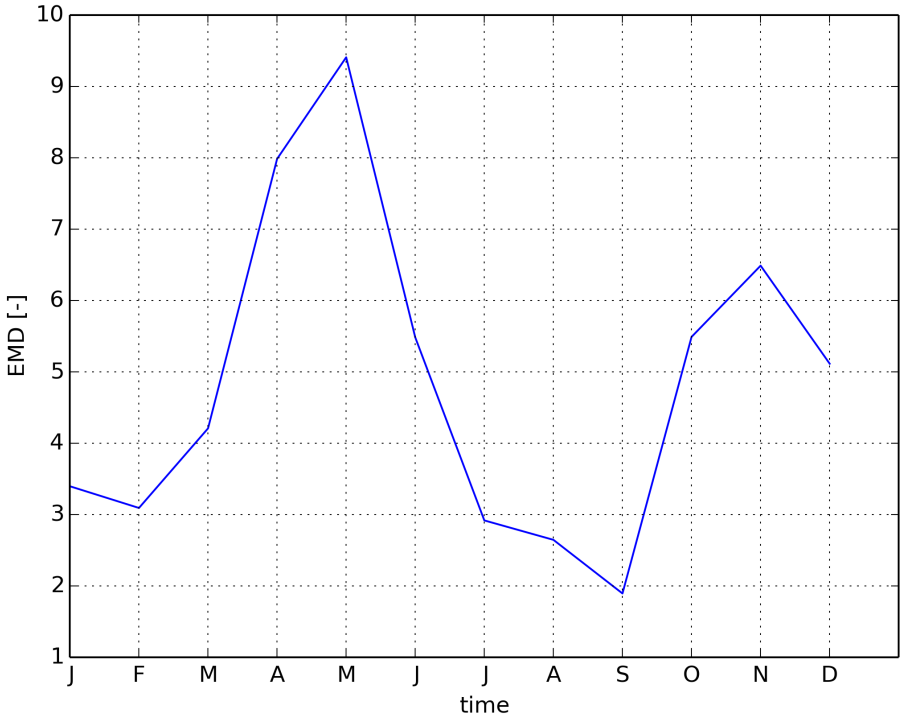



Figure 1116: Timeseries of EMD

### 2.2.36 CMIP3 ukmo hadgem1-amip

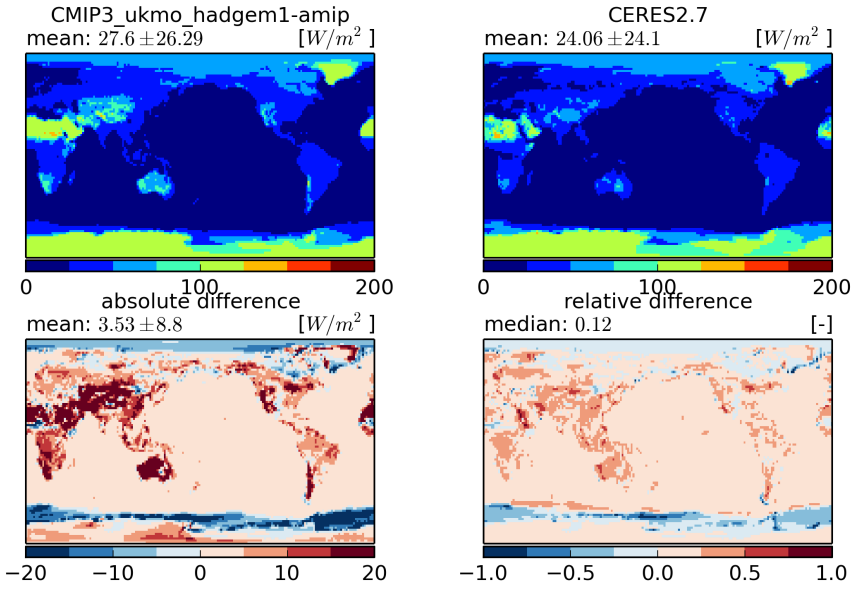



Figure 1117: Temporal mean fields (top) and absolute and relative differences (bottom)

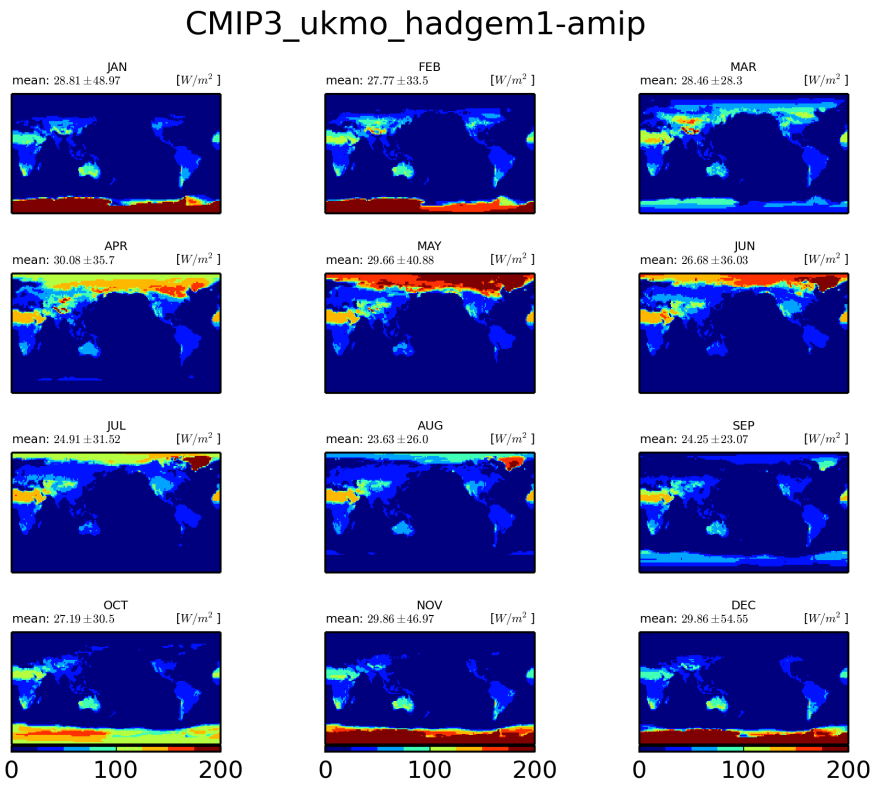



Figure 1118: Monthly mean climatology for ukmo-hadgem1

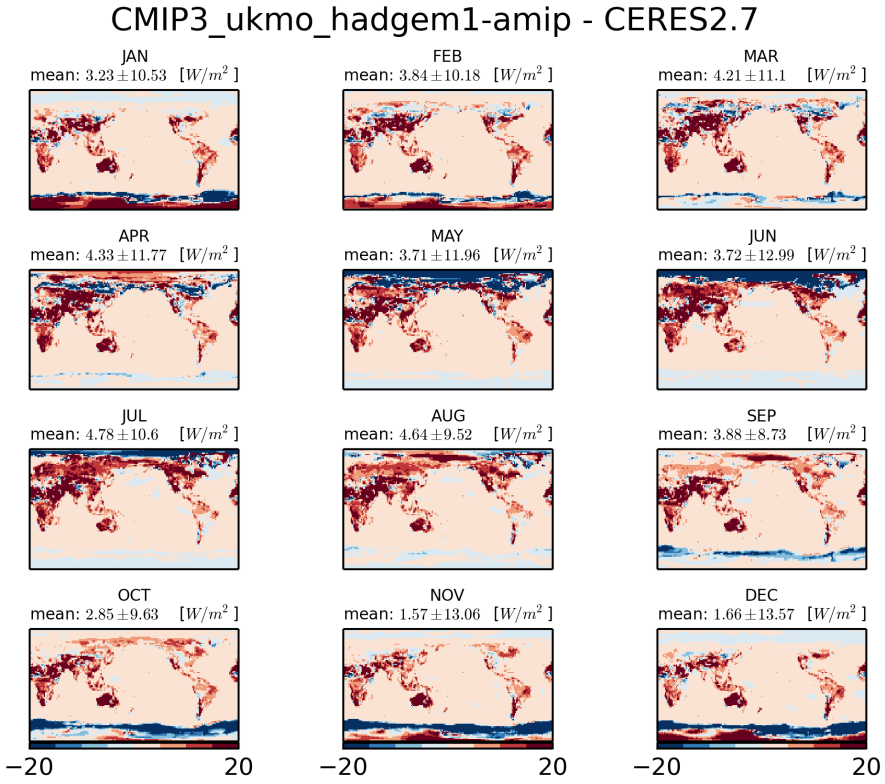



Figure 1119: Monthly mean climatology of difference between UKMO-HADGEM1 and CERES2.7

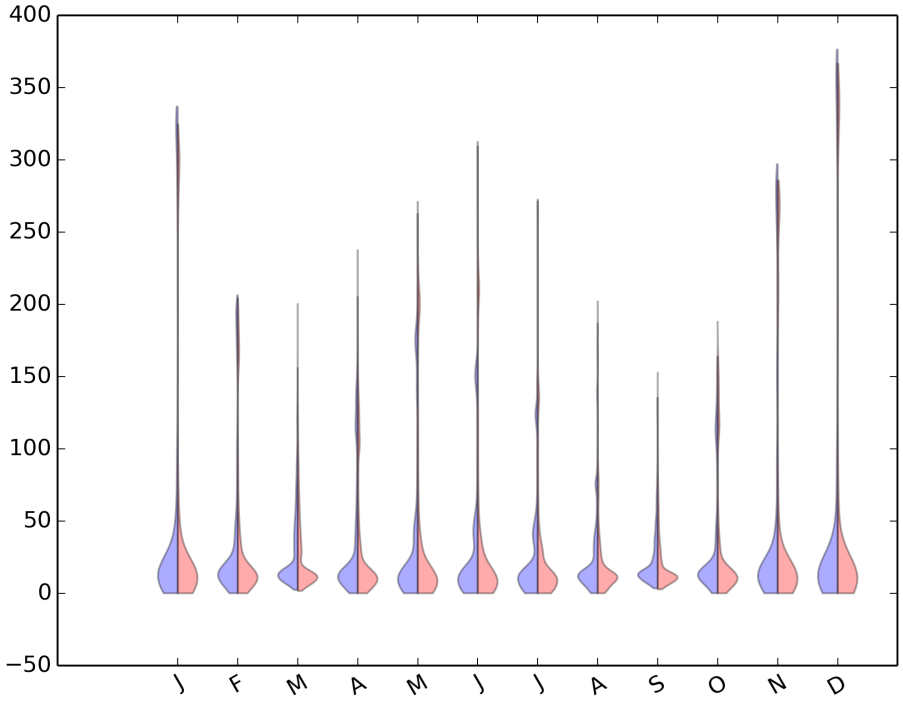



Figure 1120: Violin plot for CMIP3-UKMO-HADGEM1-AMIP

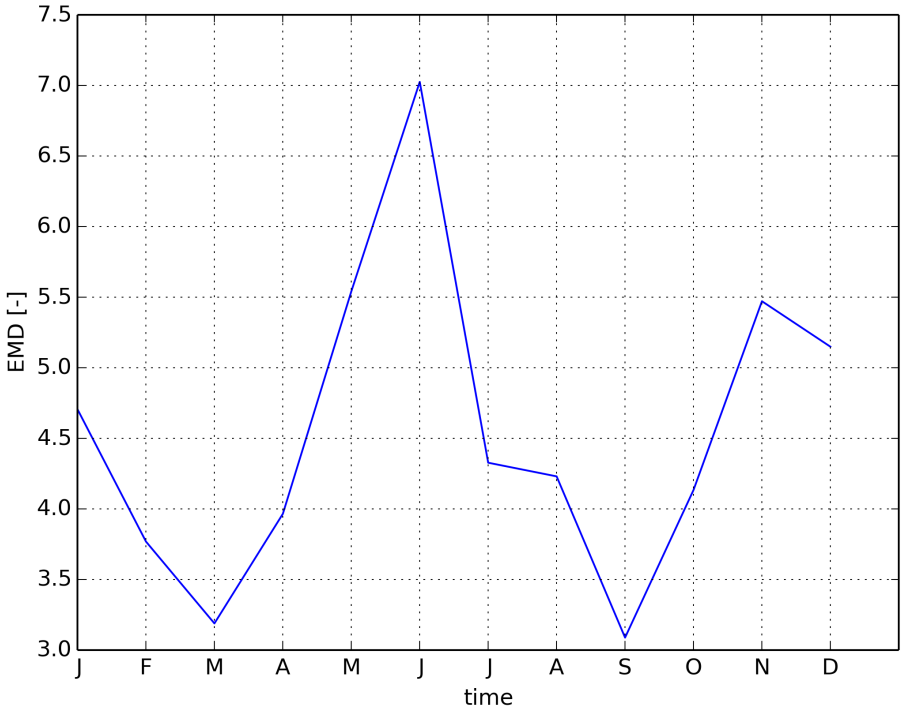



Figure 1121: Timeseries of EMD

### 2.2.37 model mean

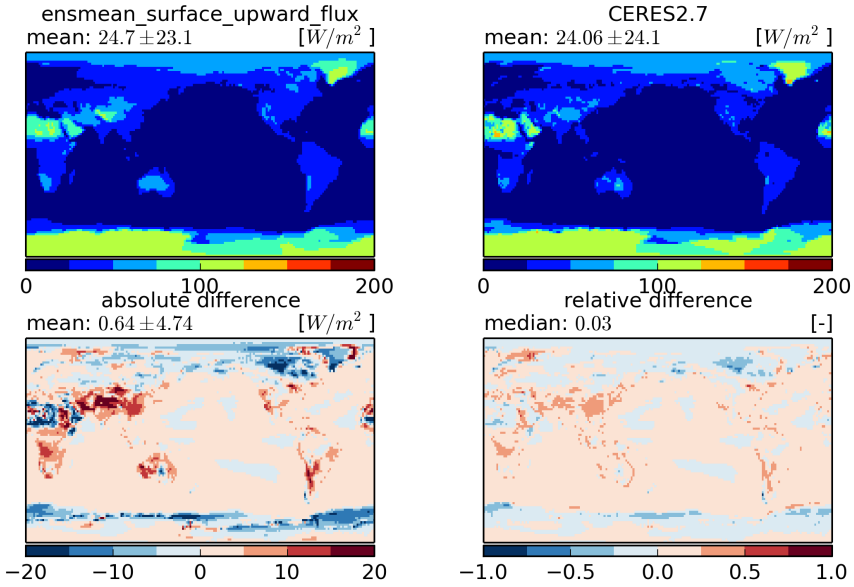



Figure 1122: Temporal mean fields (top) and absolute and relative differences (bottom)

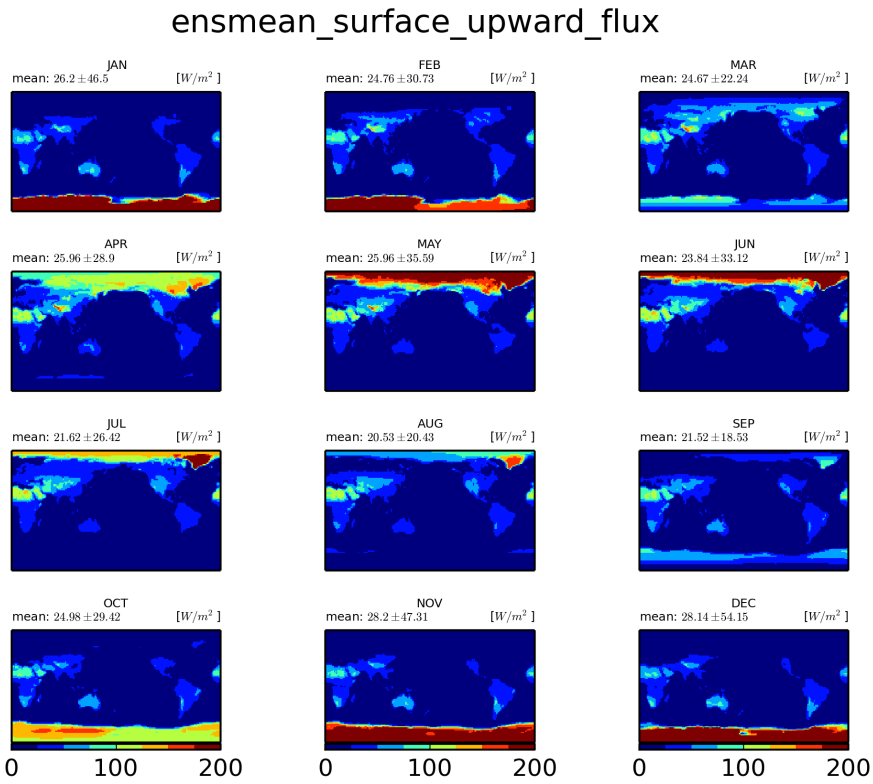



Figure 1123: Monthly mean climatology for mean-model

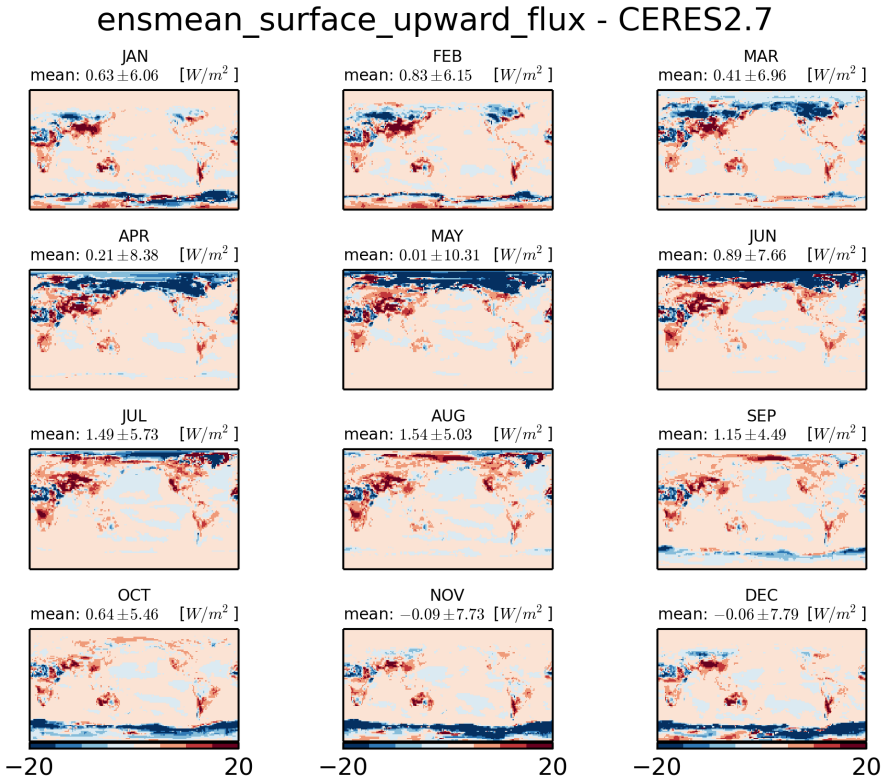



Figure 1124: Monthly mean climatology of difference between MEAN-MODEL and CERES2.7

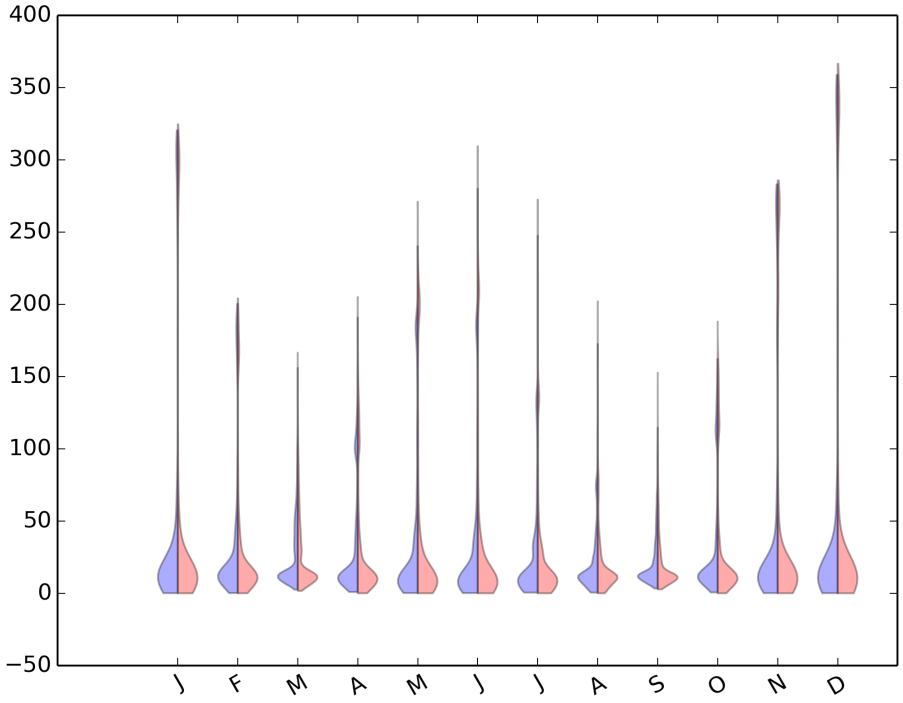



Figure 1125: Violin plot for ENSMEAN-SURFACE-UPWARD-FLUX

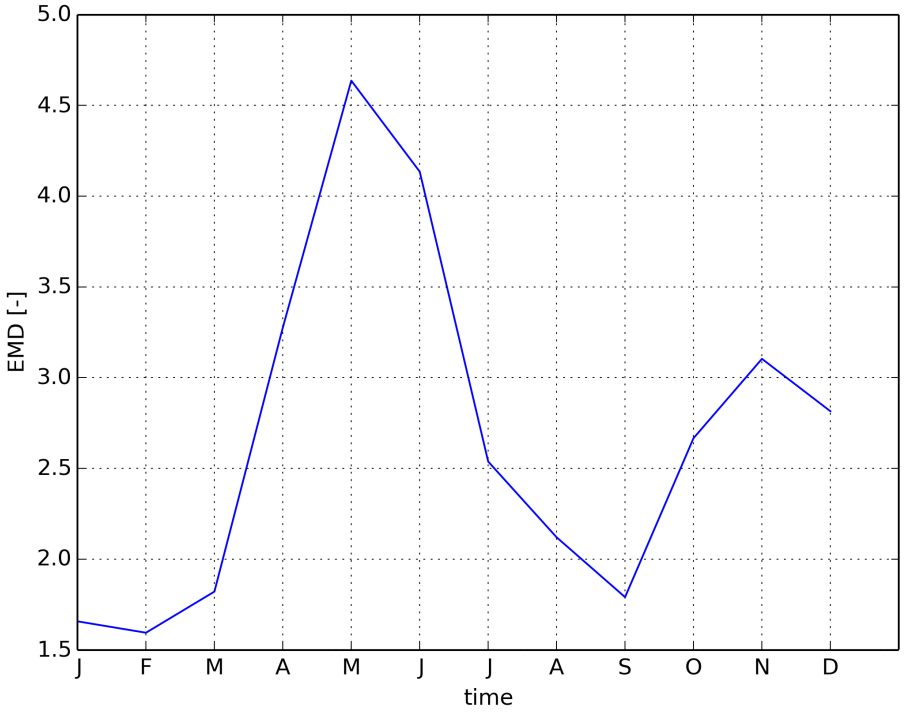



Figure 1126: Timeseries of EMD

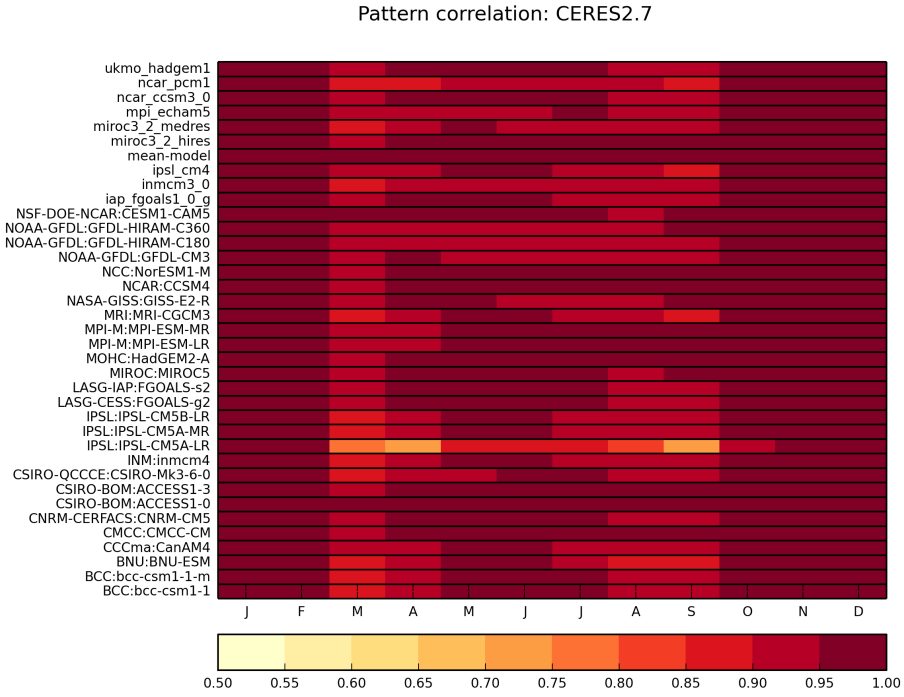



Figure 1127: Pattern correlation for CERES2.7

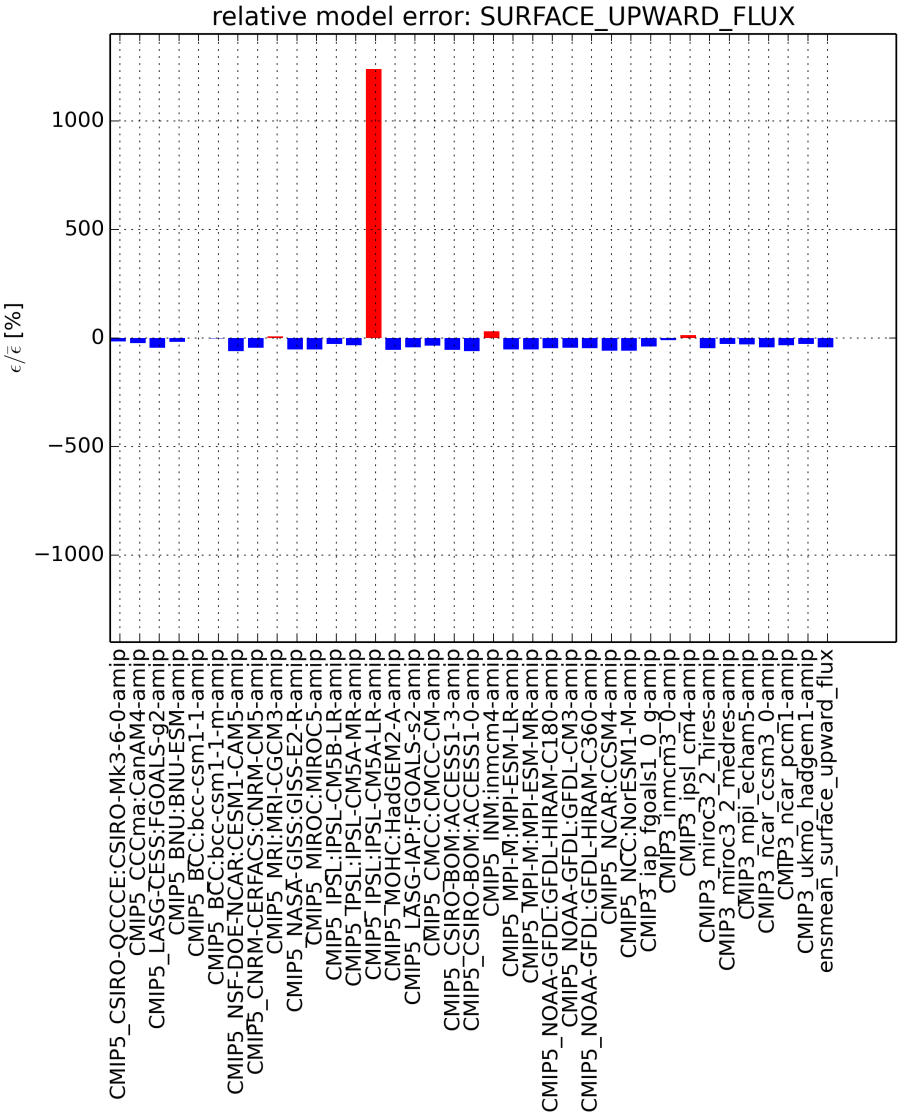



Figure 1128: Relative model performance for SURFACE-UPWARD-FLUX

## 2.3 SRBv3.0

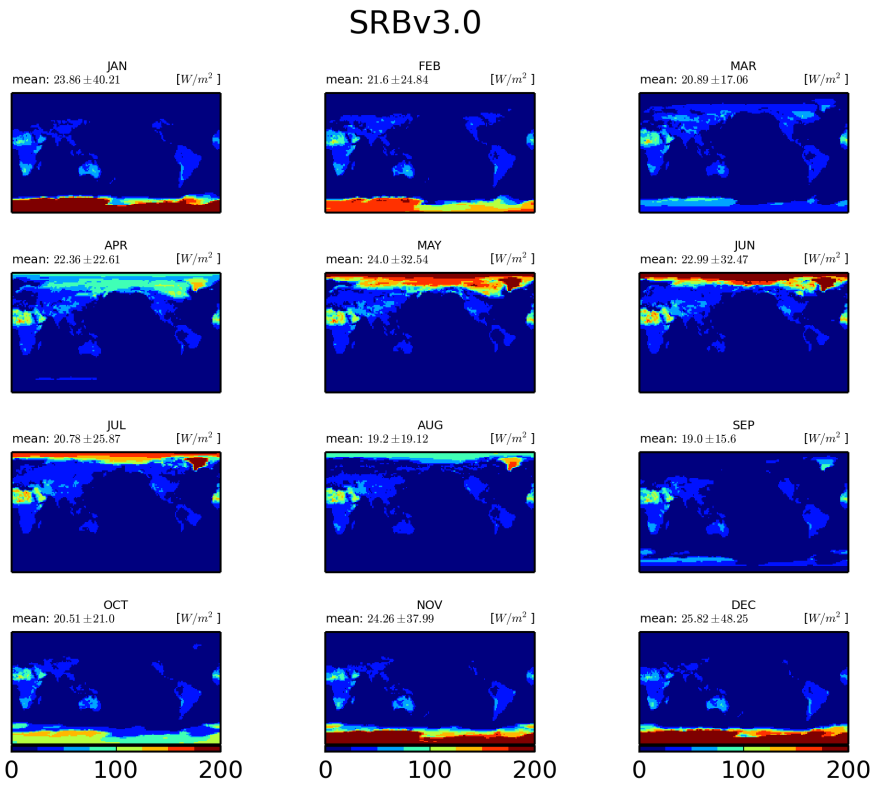



Figure 1129: Monthly mean SRBv3.0

### 2.3.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

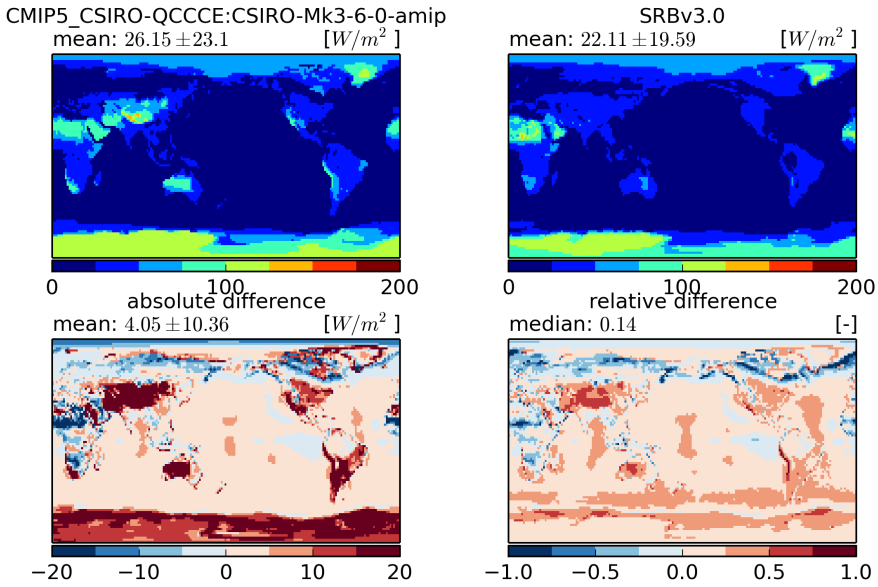



Figure 1130: Temporal mean fields (top) and absolute and relative differences (bottom)

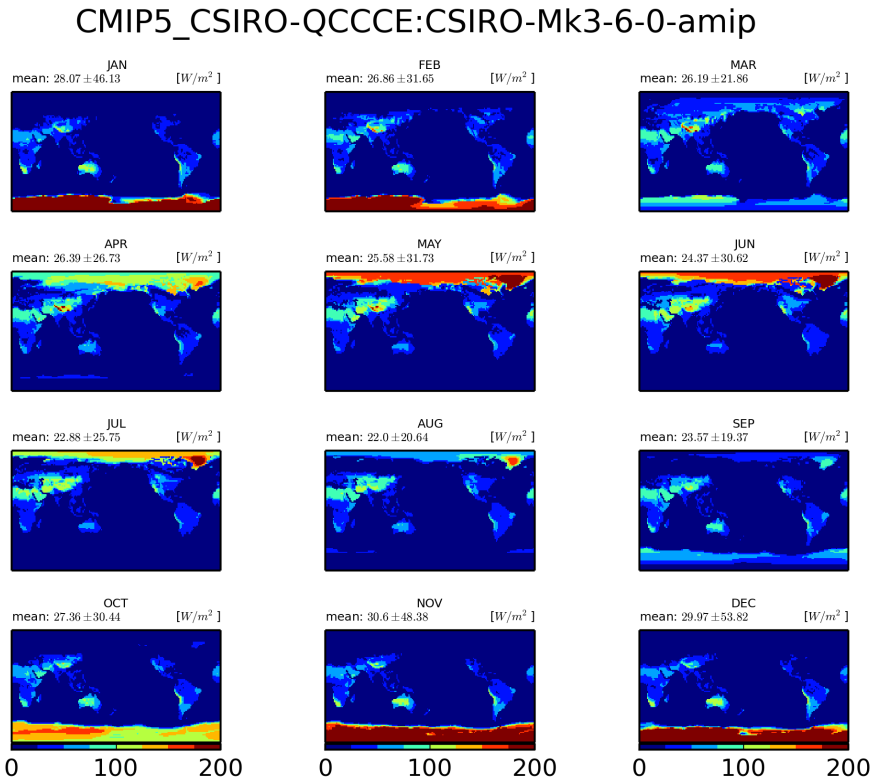



Figure 1131: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

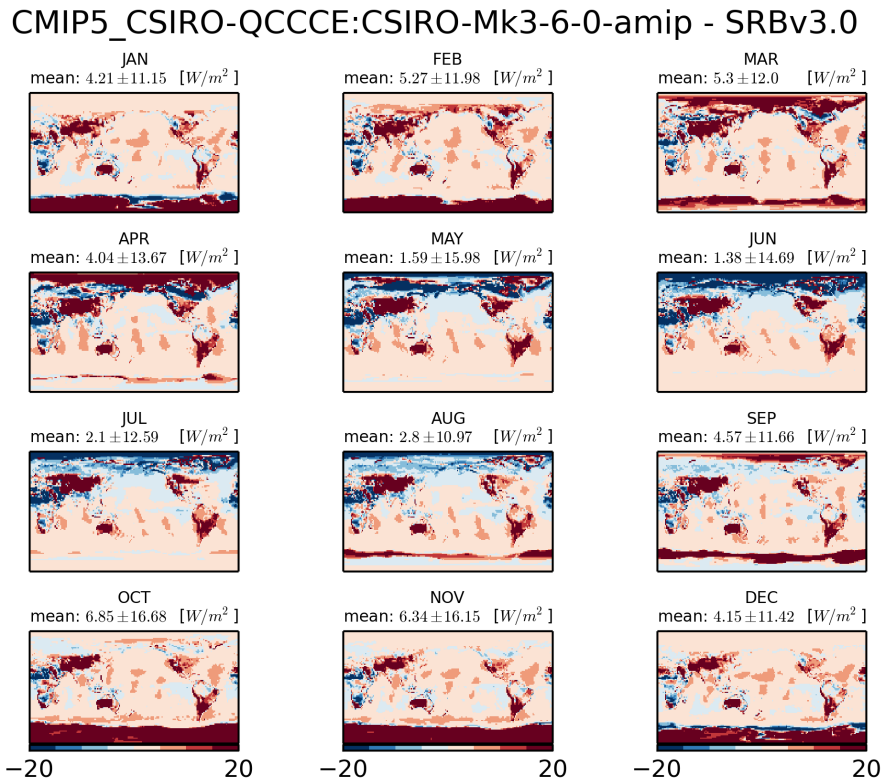



Figure 1132: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and SRBV3.0

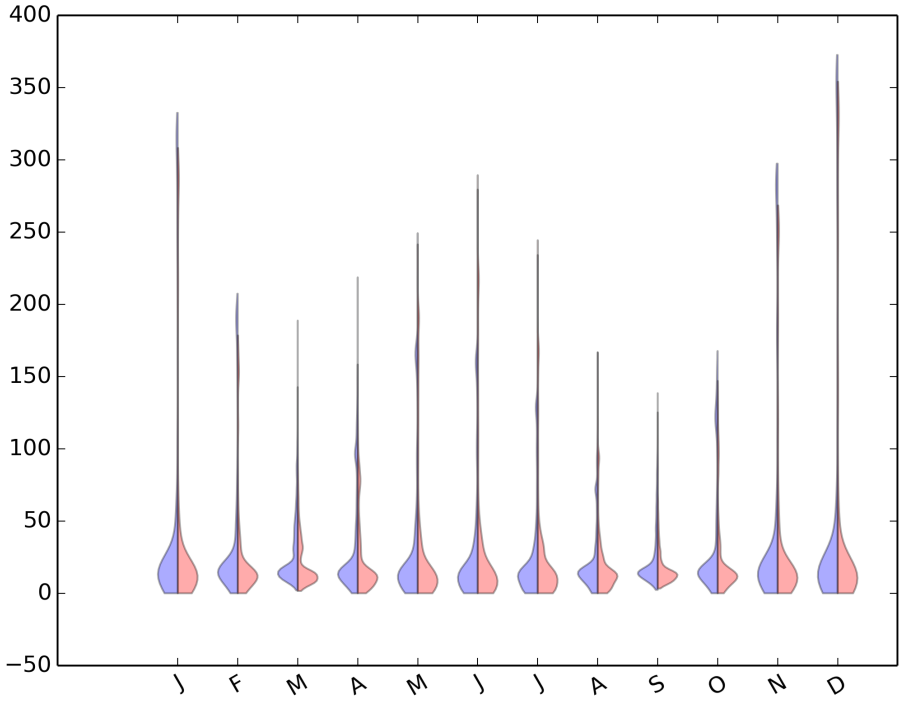



Figure 1133: Violin plot for CMIP5-CSIRO-QCCCE:CSIRO-MK3-6-0-AMIP

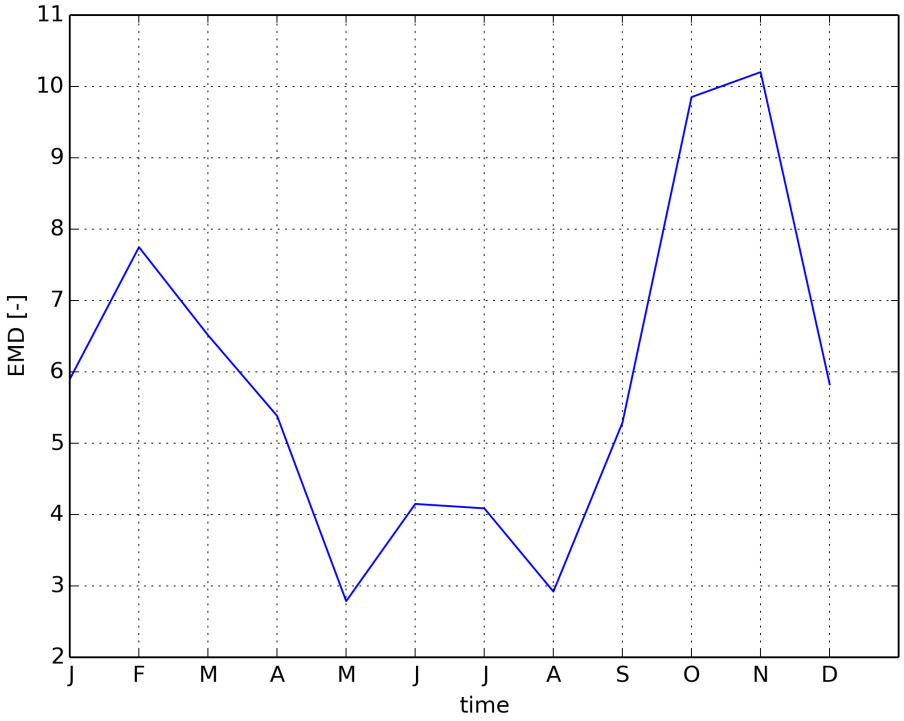



Figure 1134: Timeseries of EMD

### 2.3.2 CMIP5 CCCma:CanAM4-amip

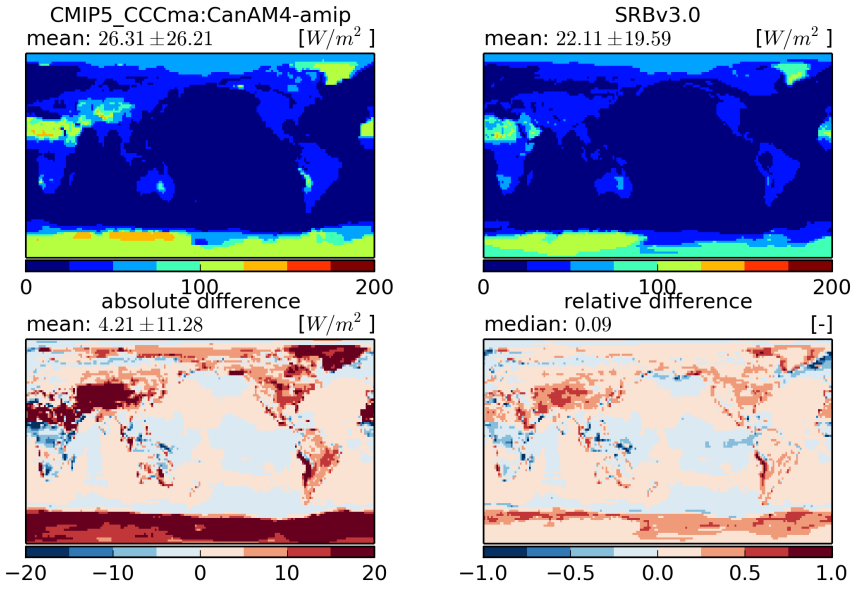



Figure 1135: Temporal mean fields (top) and absolute and relative differences (bottom)

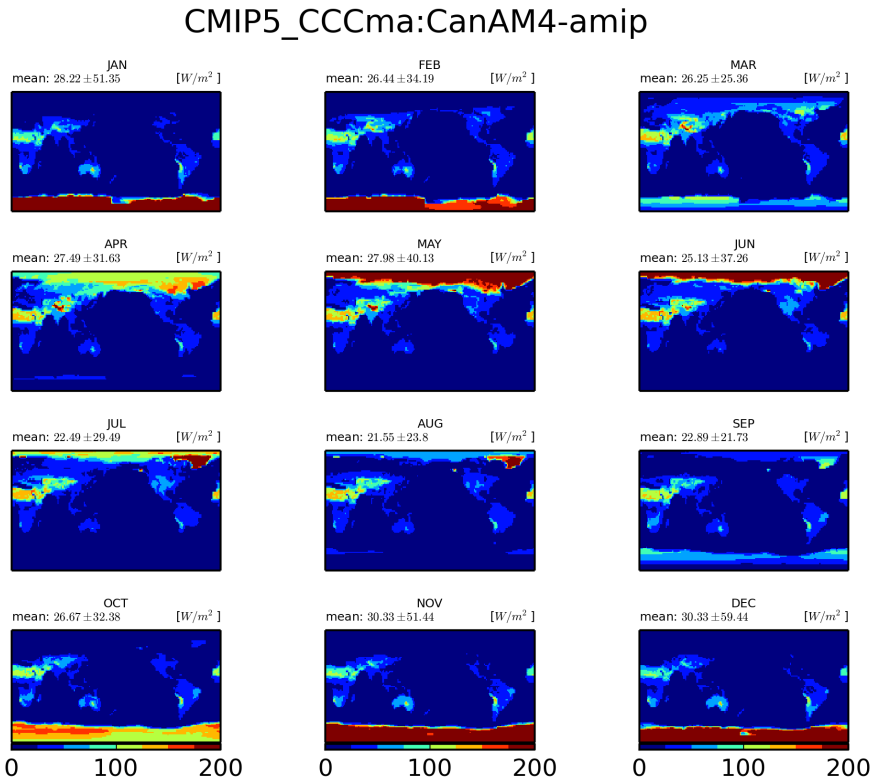



Figure 1136: Monthly mean climatology for CCCma:CanAM4

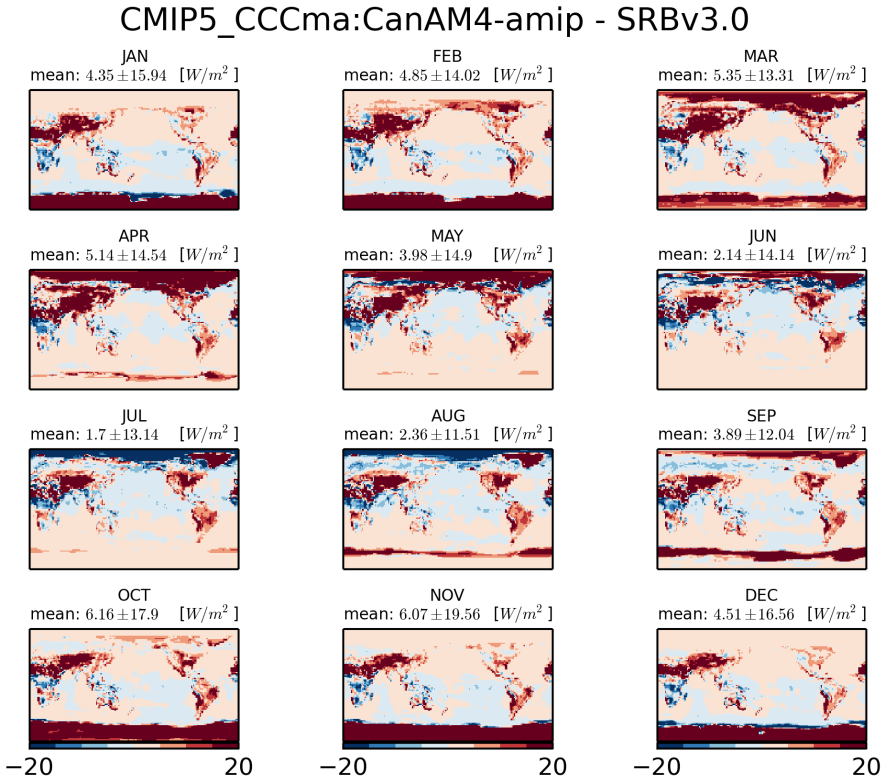



Figure 1137: Monthly mean climatology of difference between CCCMA:CANAM4 and SRBV3.0

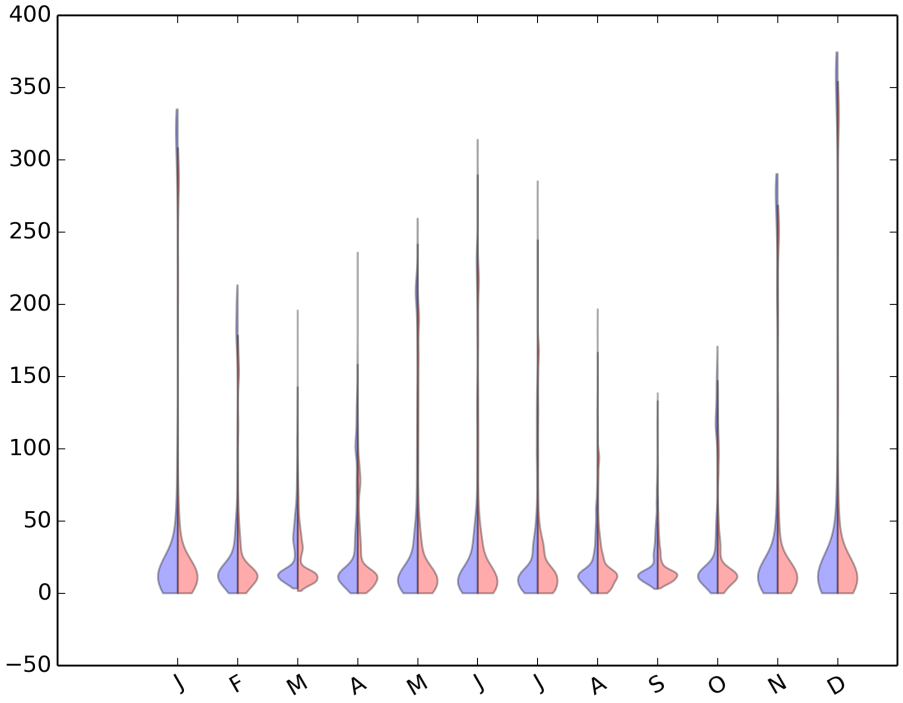



Figure 1138: Violin plot for CMIP5-CCCMA:CANAM4-AMIP

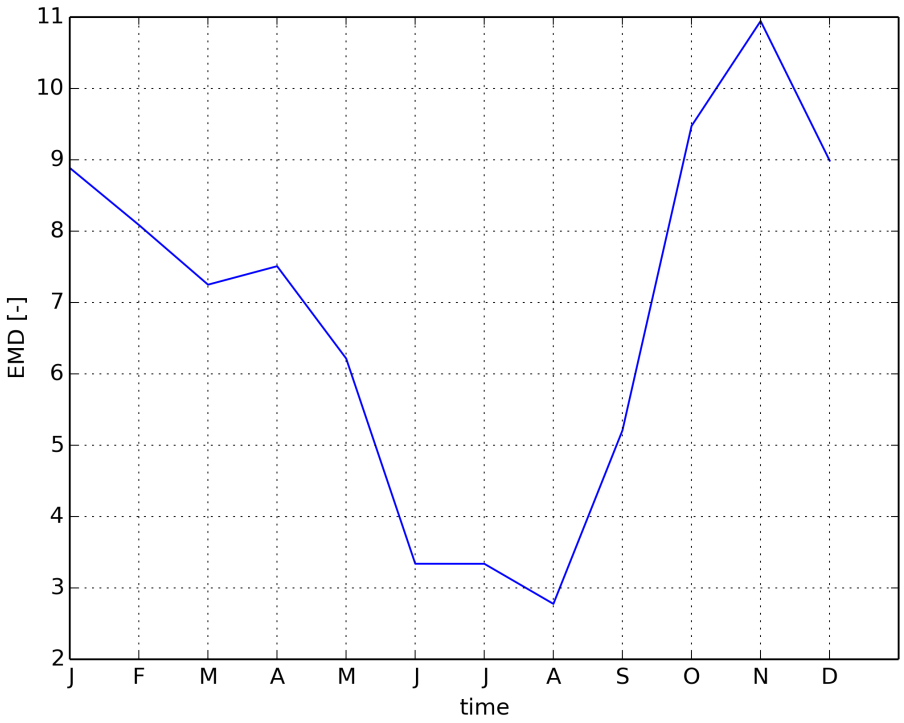



Figure 1139: Timeseries of EMD

### 2.3.3 CMIP5 LASG-CESS:FGOALS-g2-amip

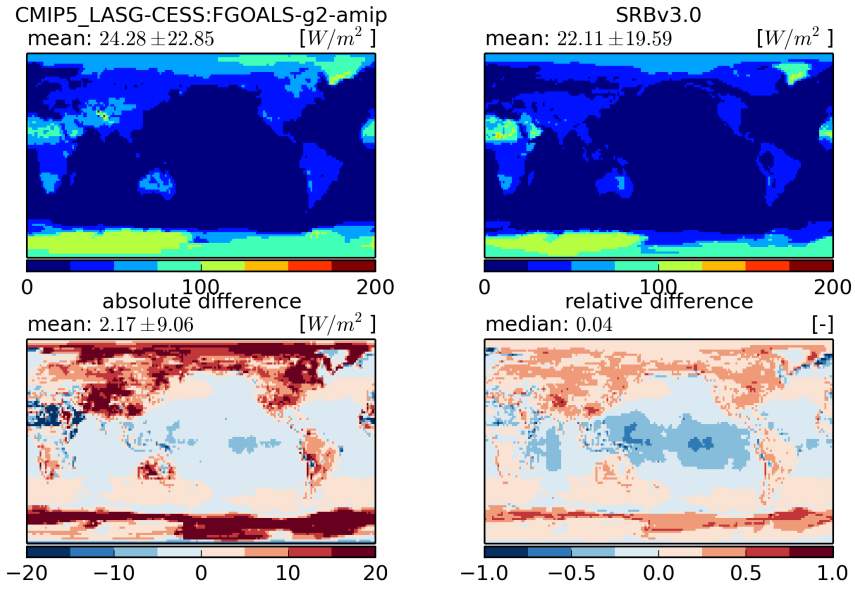



Figure 1140: Temporal mean fields (top) and absolute and relative differences (bottom)

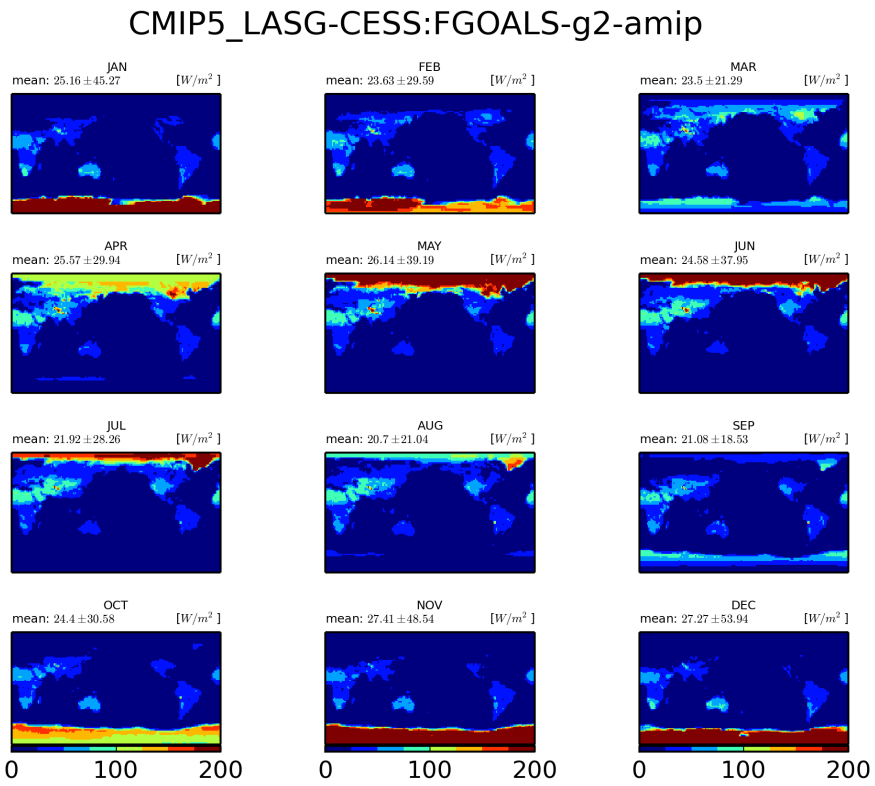



Figure 1141: Monthly mean climatology for LASG-CESS:FGOALS-g2

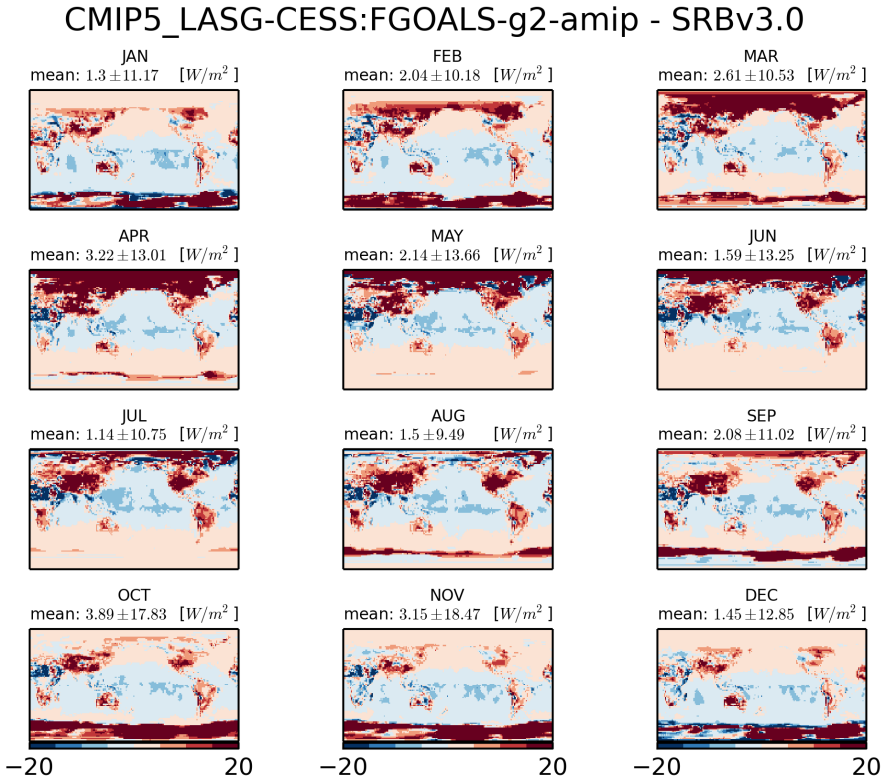



Figure 1142: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and SRBV3.0

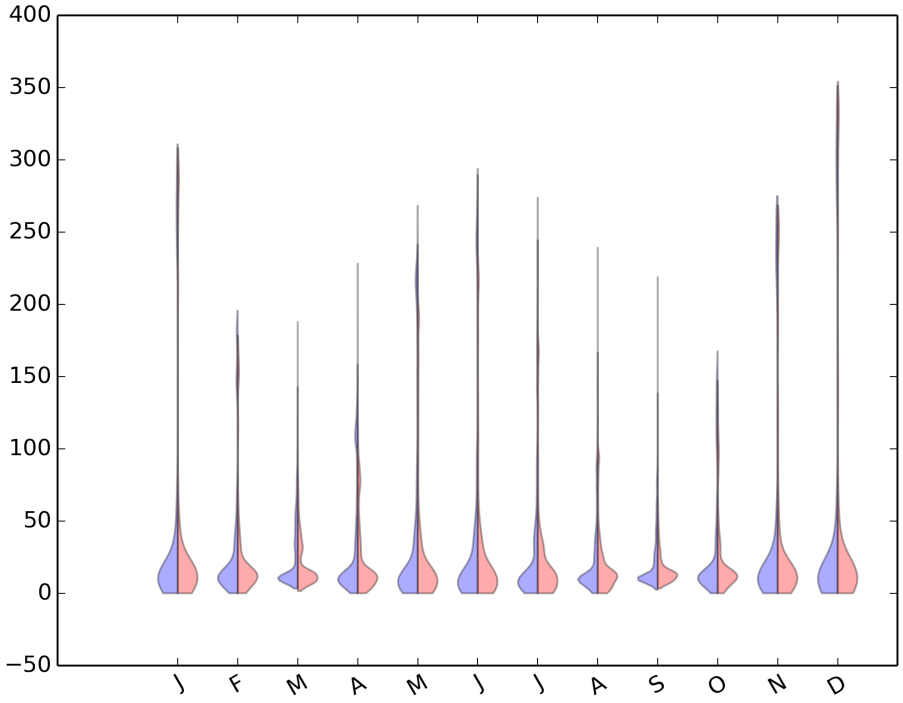



Figure 1143: Violin plot for CMIP5-LASG-CESS:FGOALS-G2-AMIP

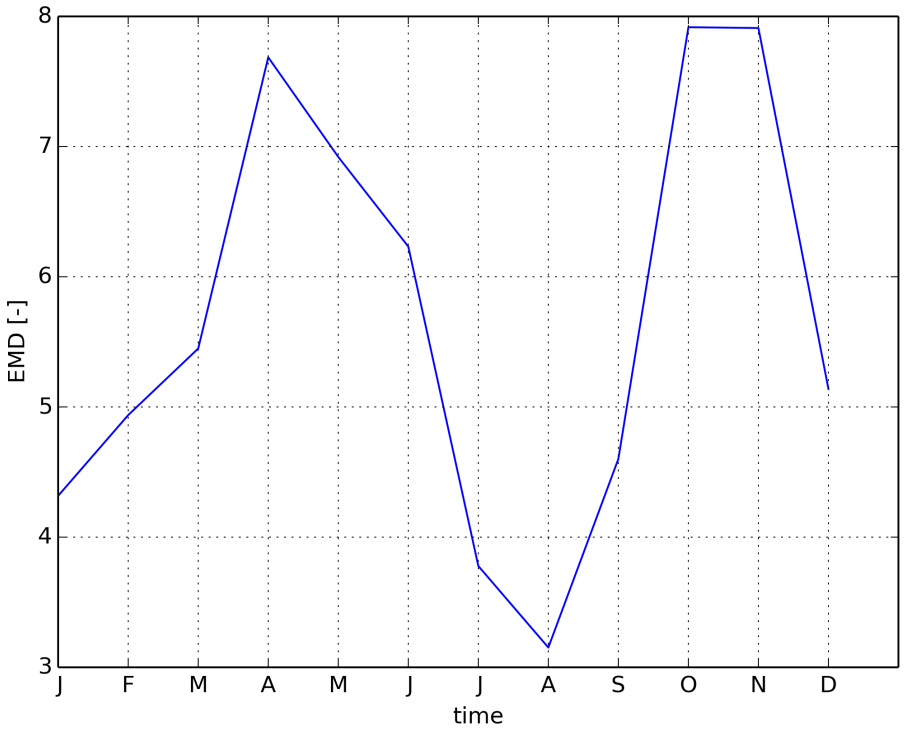



Figure 1144: Timeseries of EMD

### 2.3.4 CMIP5 BNU:BNU-ESM-amip

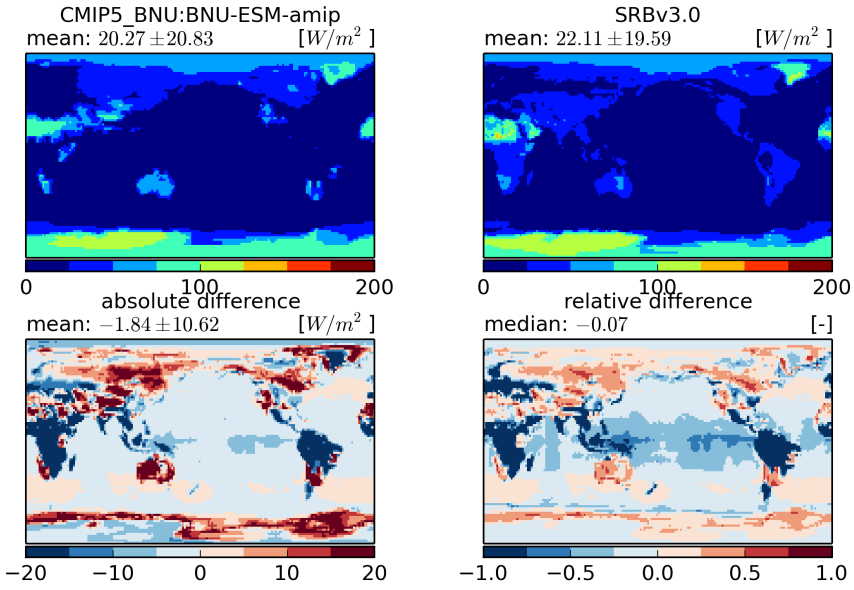



Figure 1145: Temporal mean fields (top) and absolute and relative differences (bottom)

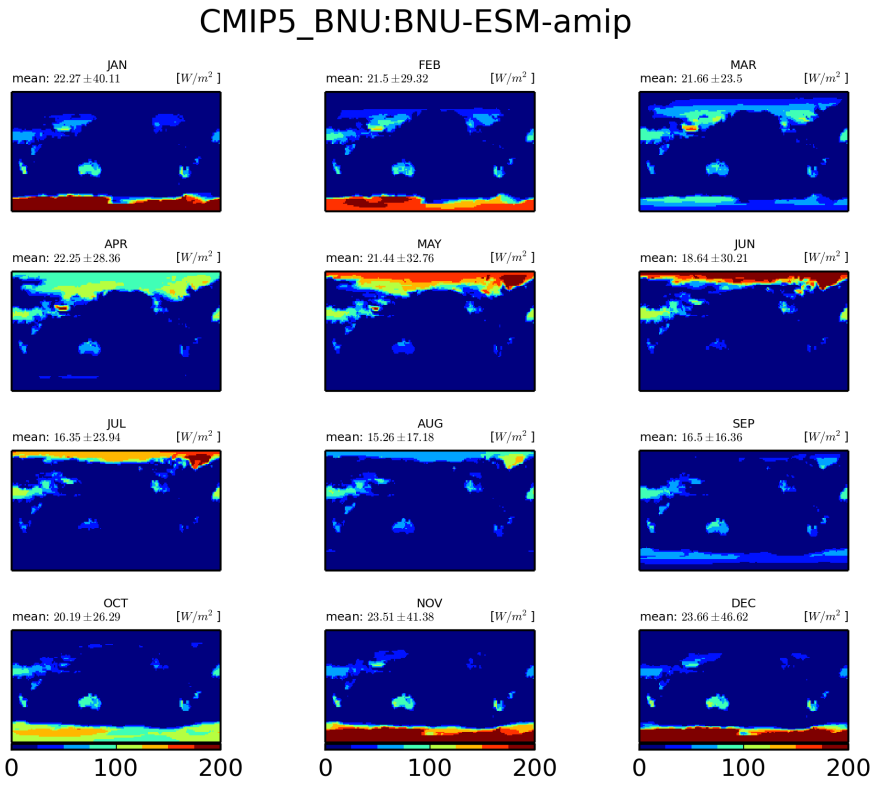



Figure 1146: Monthly mean climatology for BNU:BNU-ESM

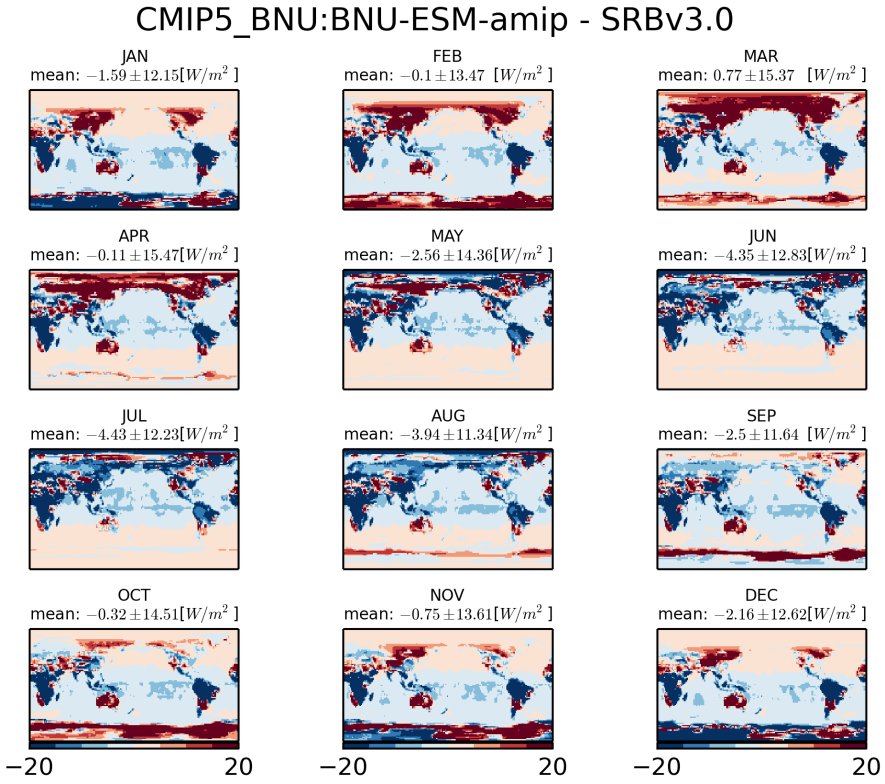



Figure 1147: Monthly mean climatology of difference between BNU:BNU-ESM and SRBV3.0

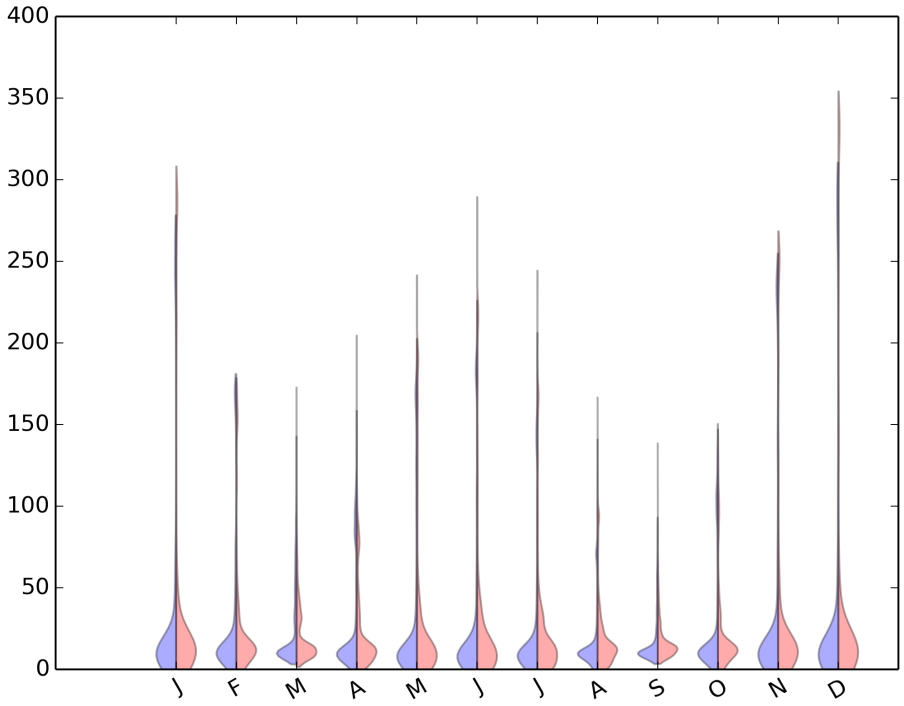



Figure 1148: Violin plot for CMIP5-BNU:BNU-ESM-AMIP

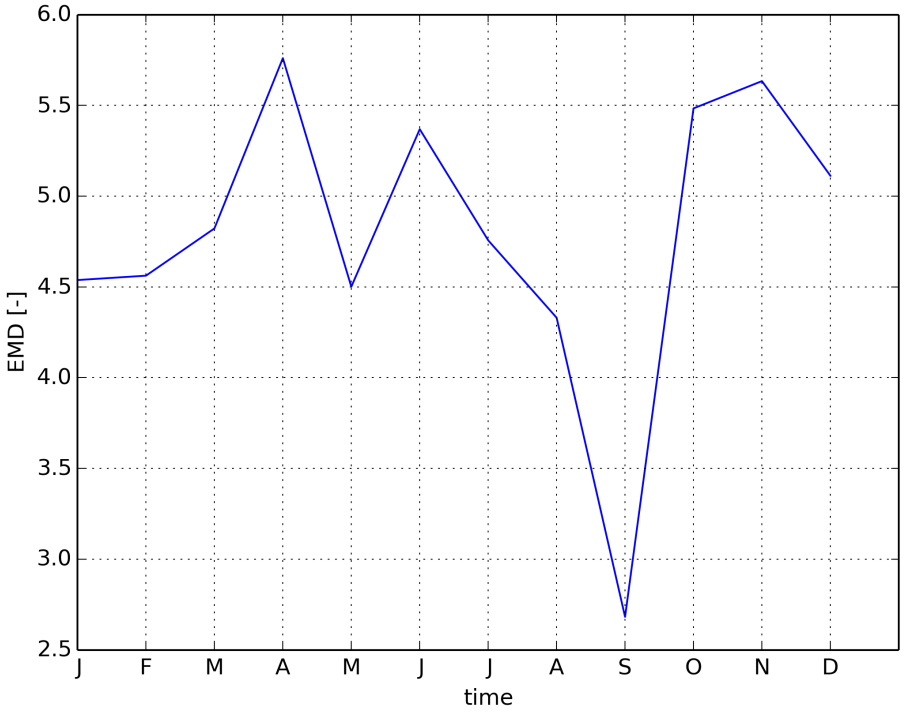



Figure 1149: Timeseries of EMD

### 2.3.5 CMIP5 BCC:bcc-csm1-1-amip

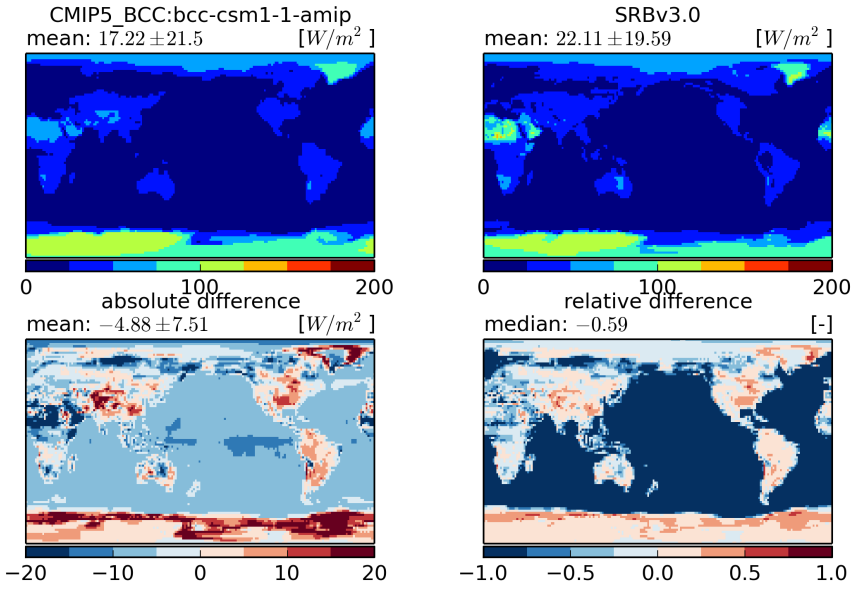



Figure 1150: Temporal mean fields (top) and absolute and relative differences (bottom)

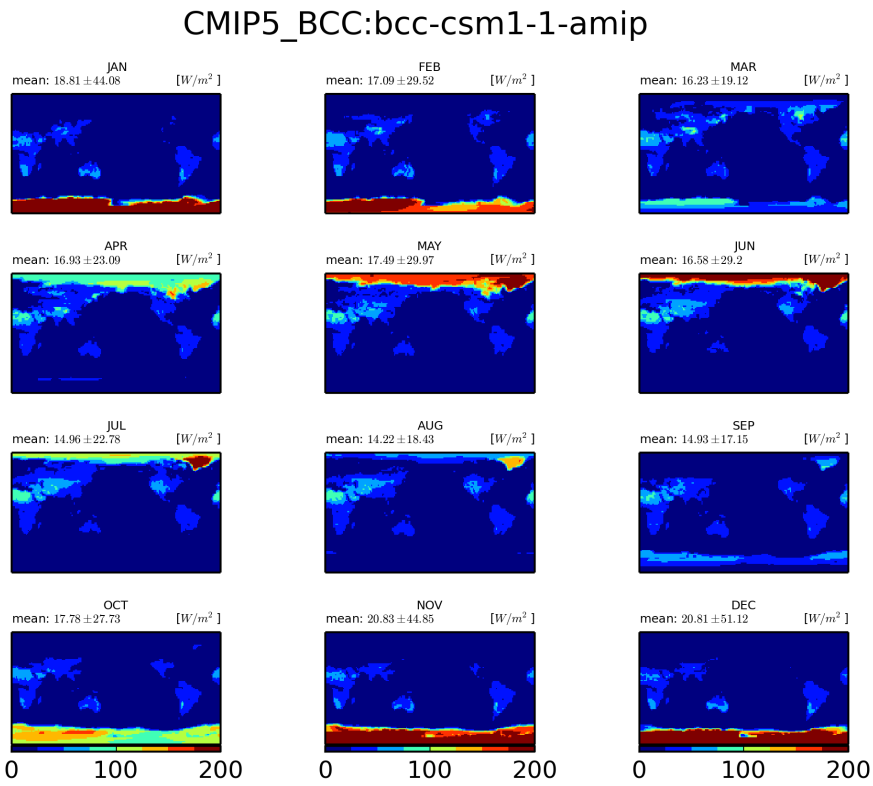



Figure 1151: Monthly mean climatology for BCC:bcc-csm1-1

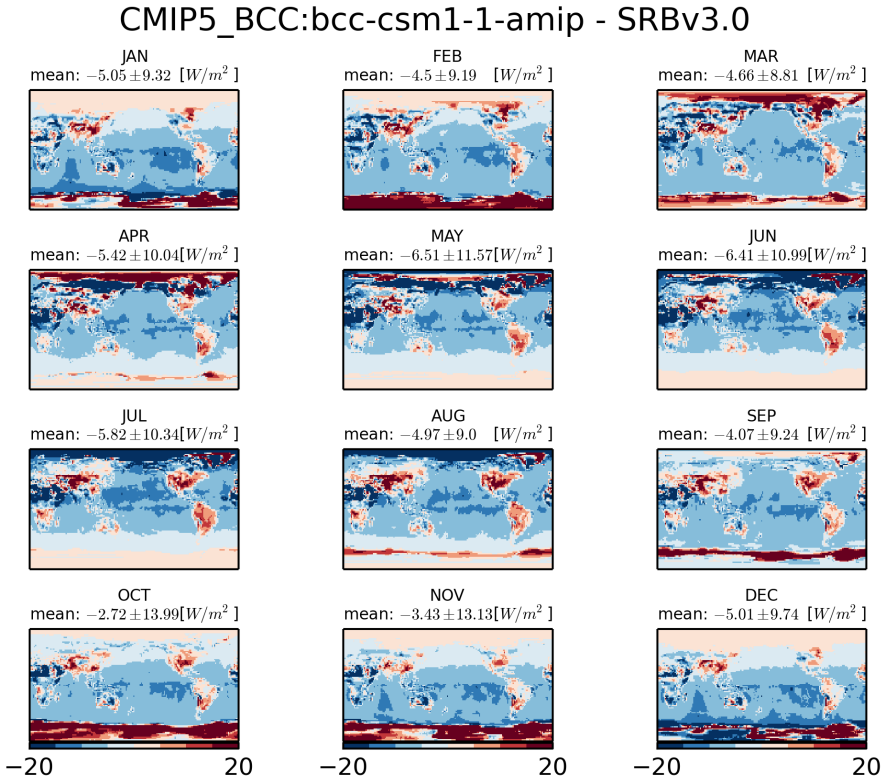



Figure 1152: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and SRBV3.0

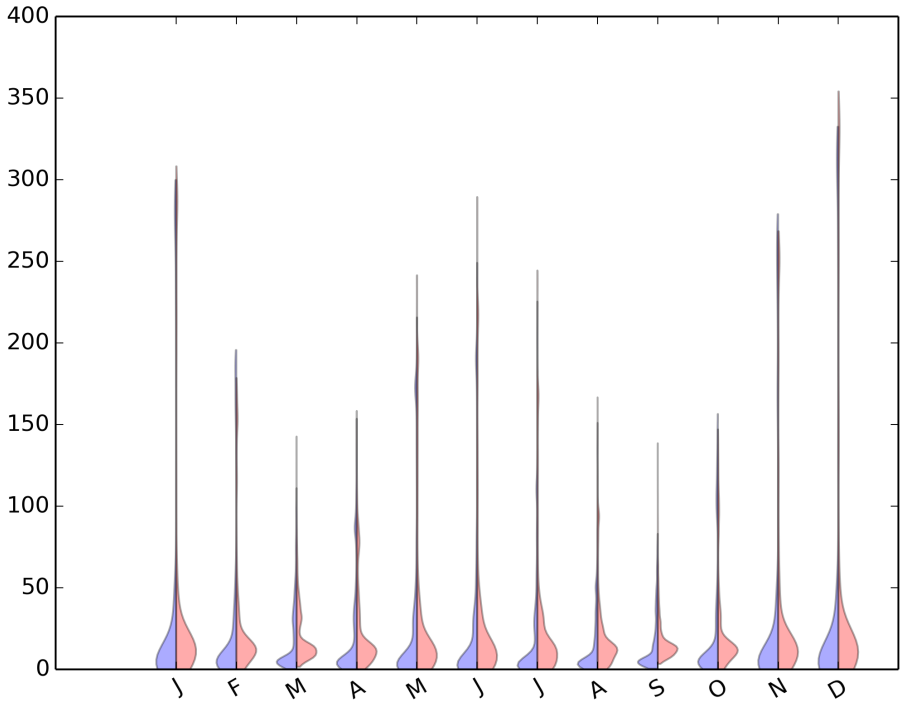



Figure 1153: Violin plot for CMIP5-BCC:BCC-CSM1-1-AMIP

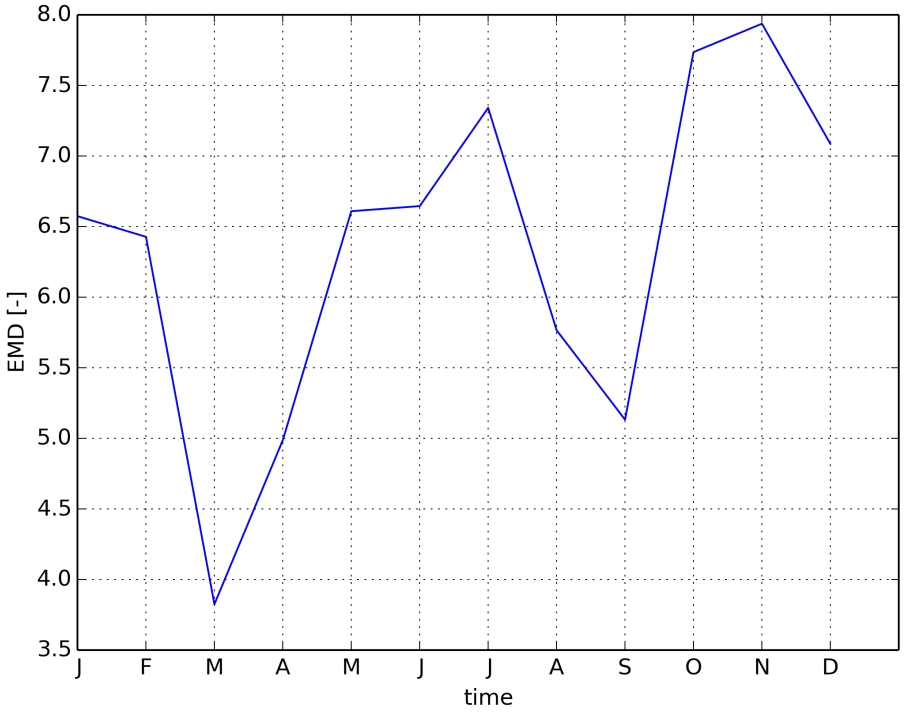



Figure 1154: Timeseries of EMD

### 2.3.6 CMIP5 BCC:bcc-csm1-1-m-amip

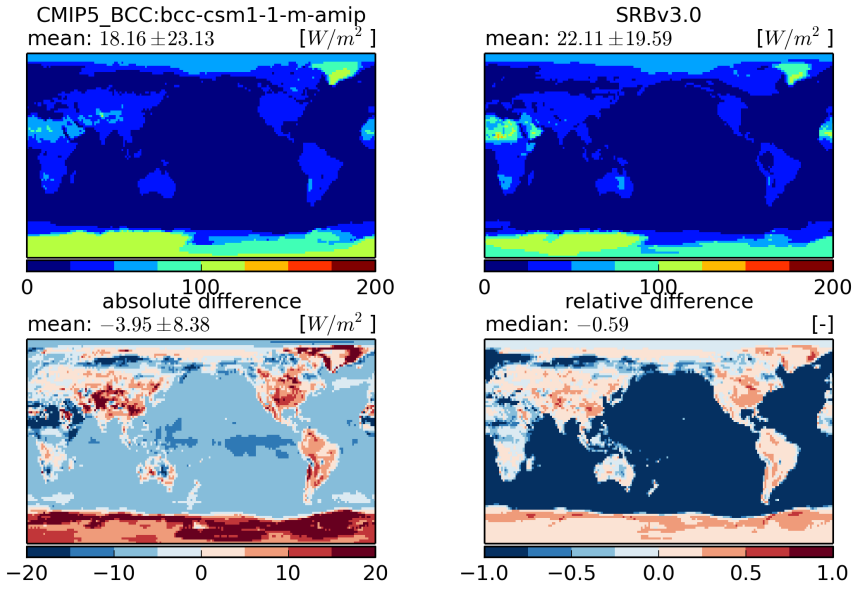



Figure 1155: Temporal mean fields (top) and absolute and relative differences (bottom)

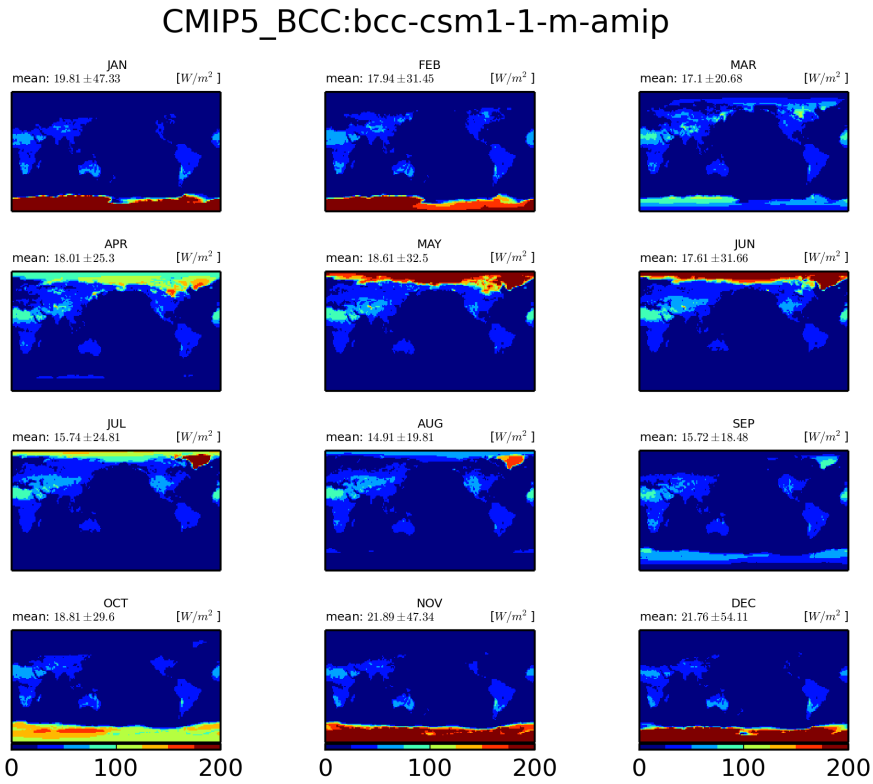



Figure 1156: Monthly mean climatology for BCC:bcc-csm1-1-m

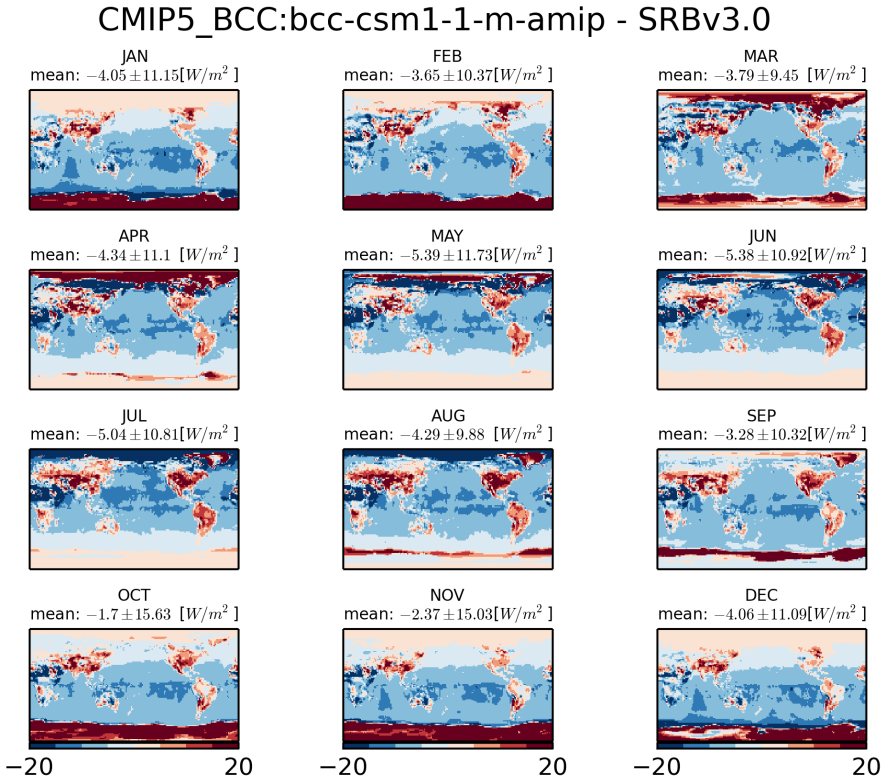



Figure 1157: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and SRBV3.0

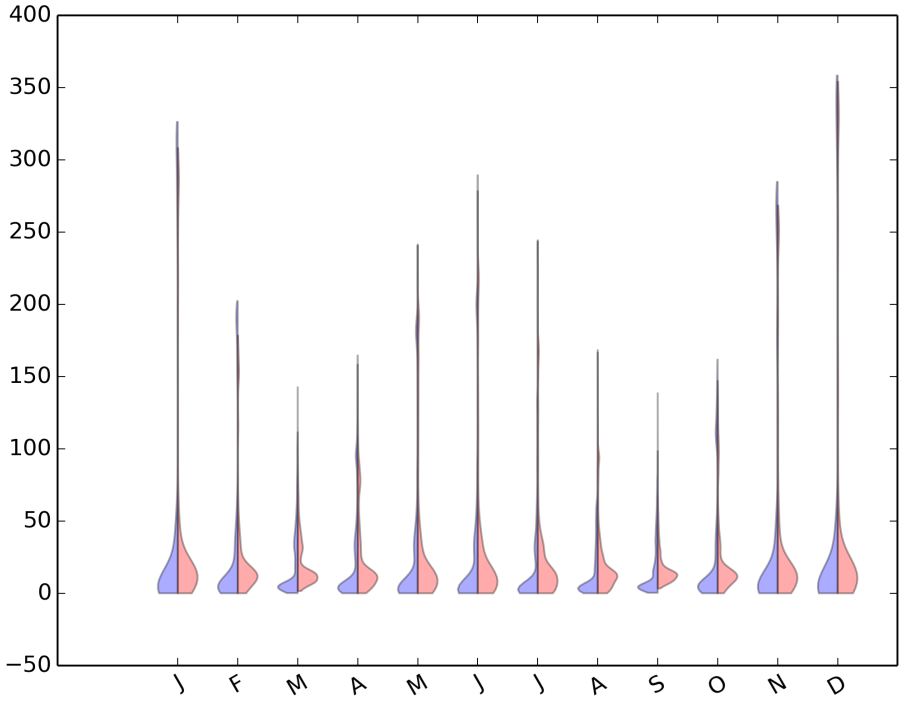



Figure 1158: Violin plot for CMIP5-BCC:BCC-CSM1-1-M-AMIP

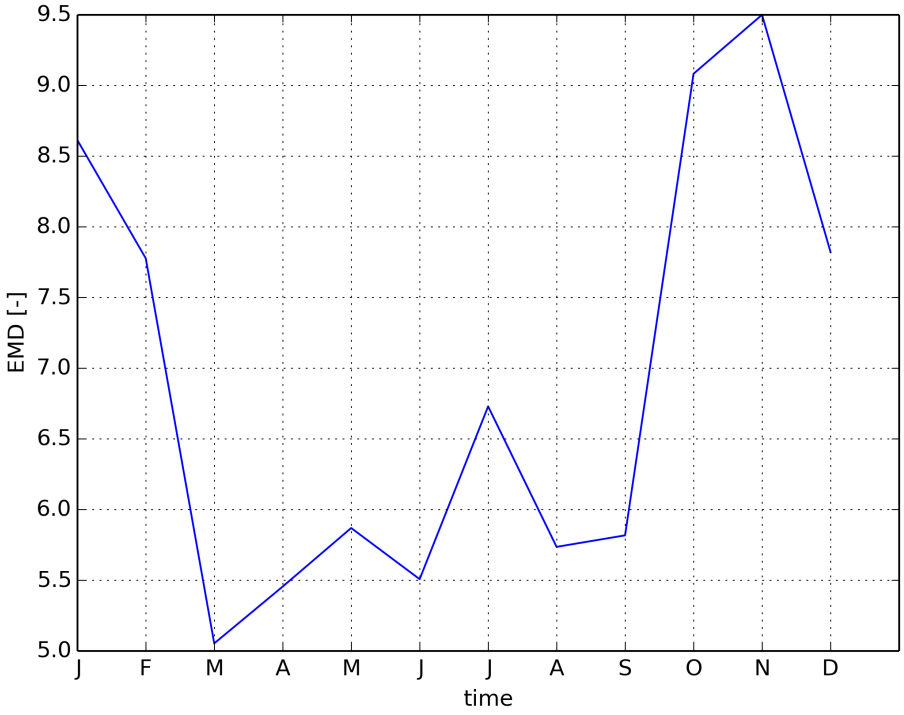



Figure 1159: Timeseries of EMD

### 2.3.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

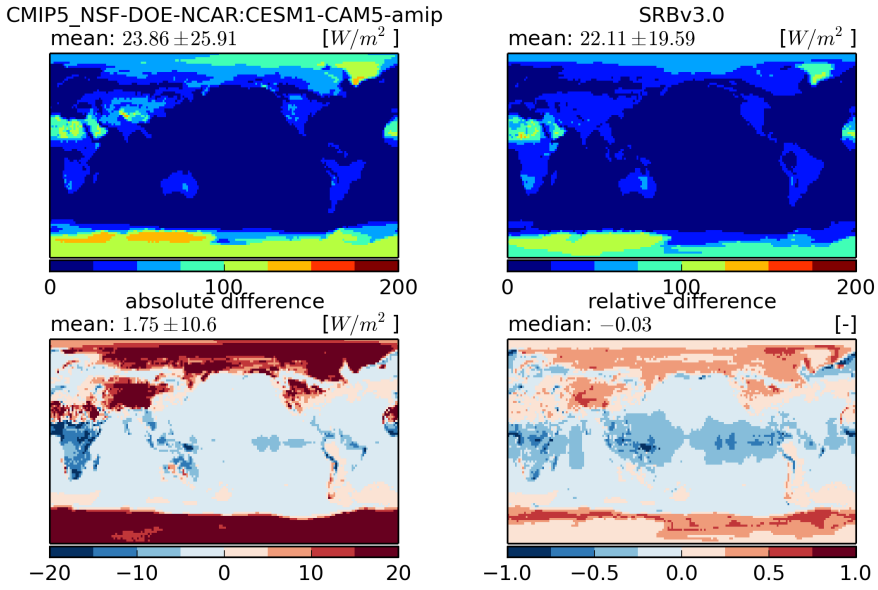



Figure 1160: Temporal mean fields (top) and absolute and relative differences (bottom)

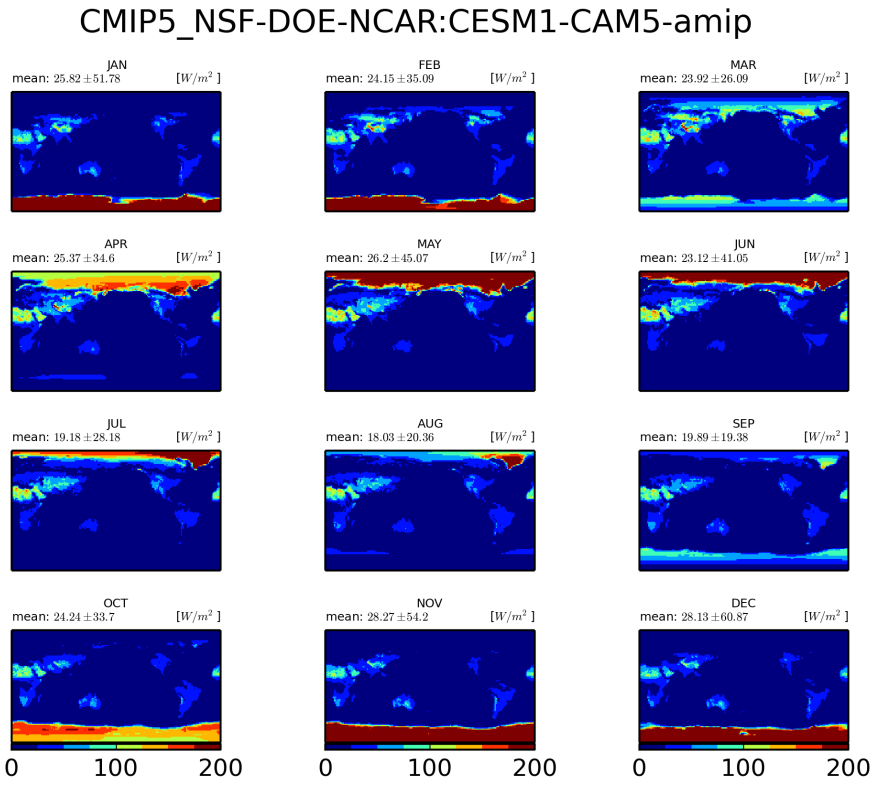



Figure 1161: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

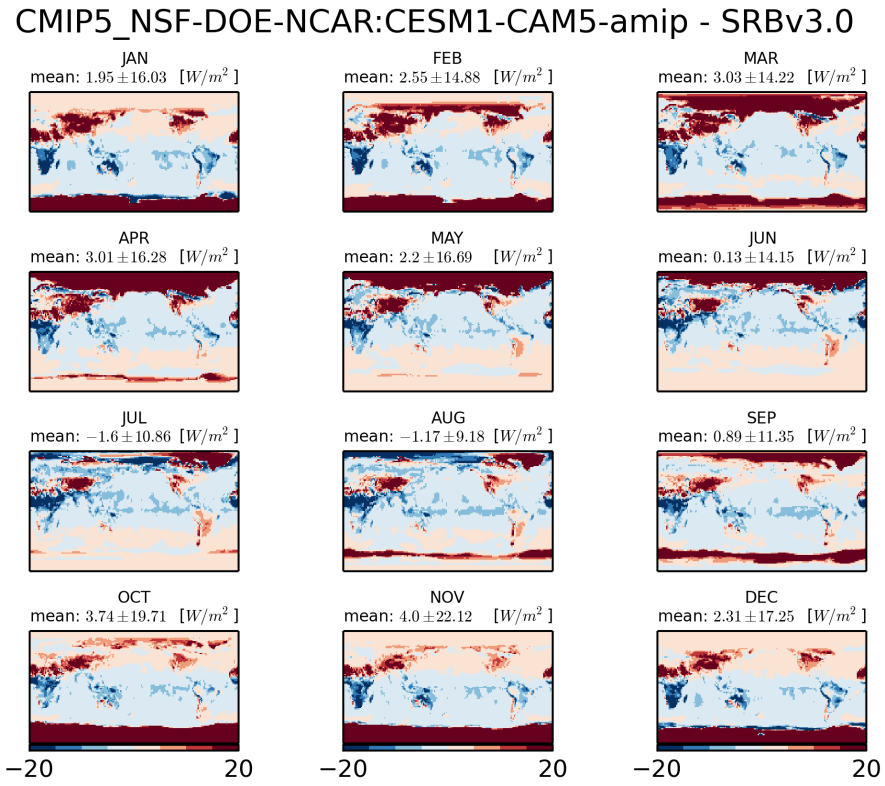



Figure 1162: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and SRBV3.0

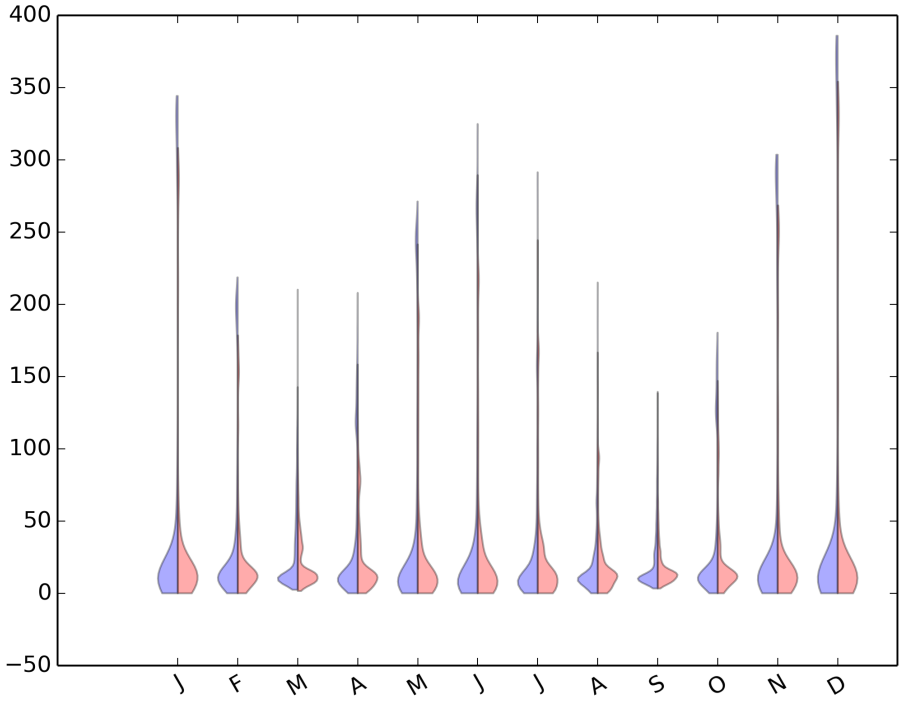



Figure 1163: Violin plot for CMIP5-NSF-DOE-NCAR:CESM1-CAM5-AMIP

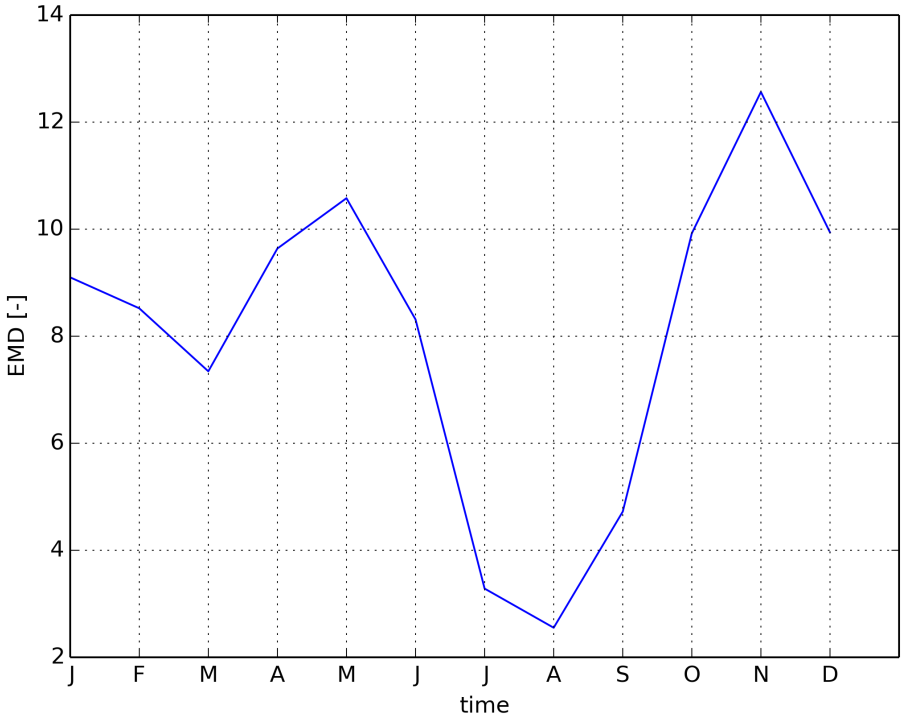



Figure 1164: Timeseries of EMD

### 2.3.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

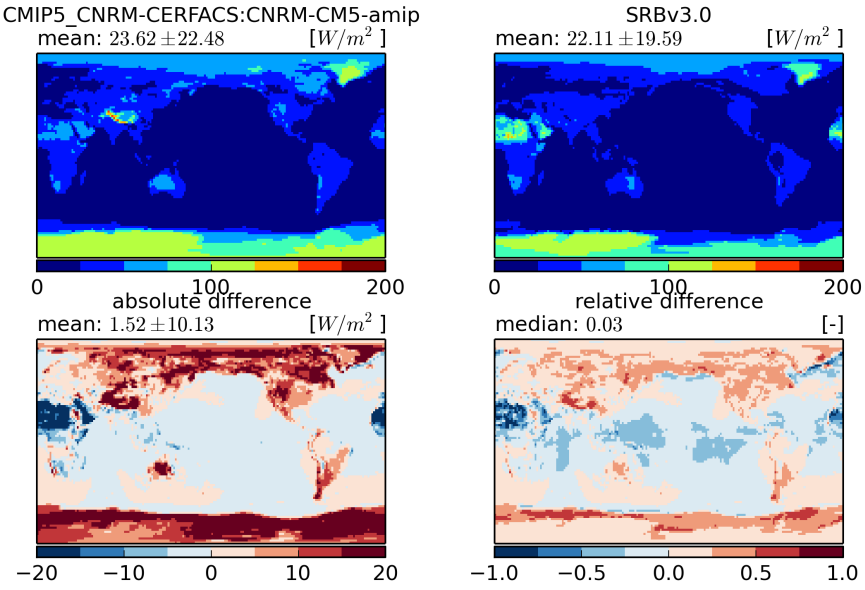



Figure 1165: Temporal mean fields (top) and absolute and relative differences (bottom)

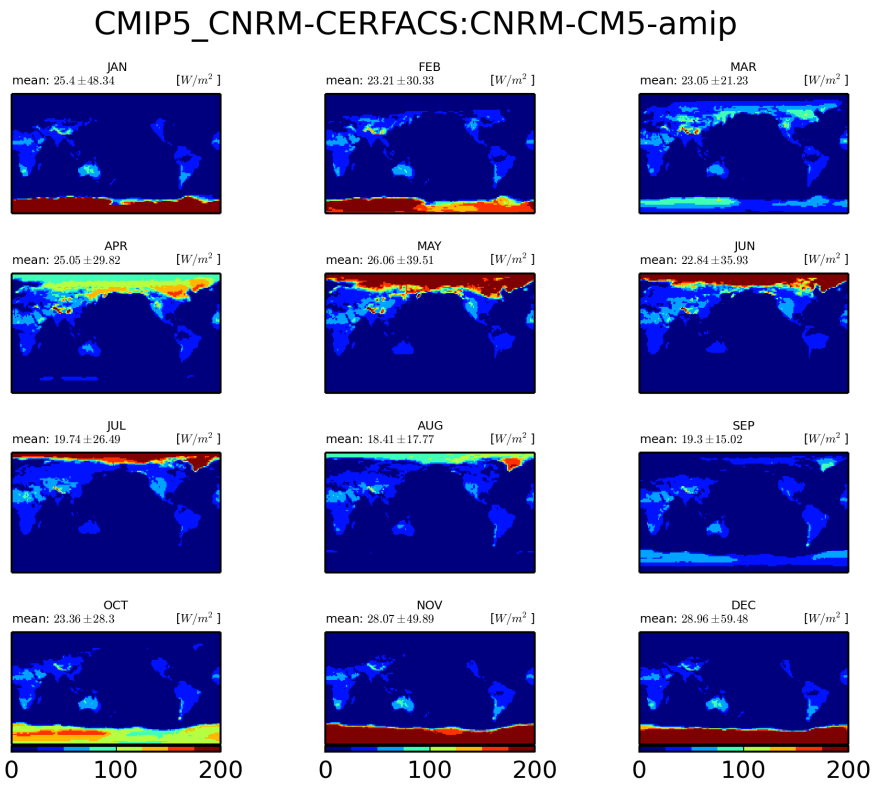



Figure 1166: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

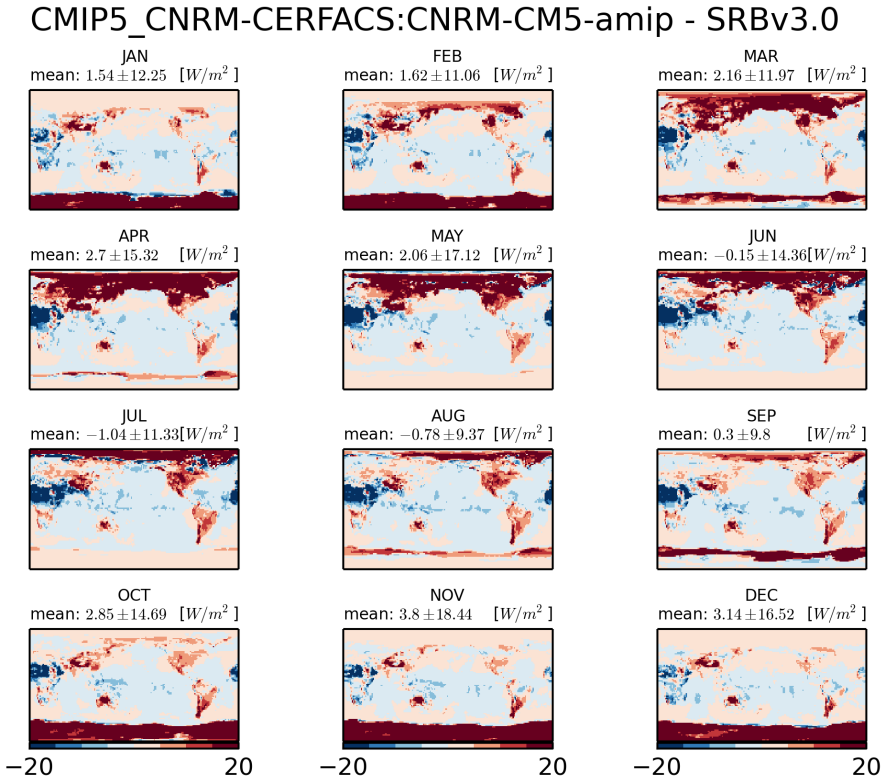



Figure 1167: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and SRBV3.0

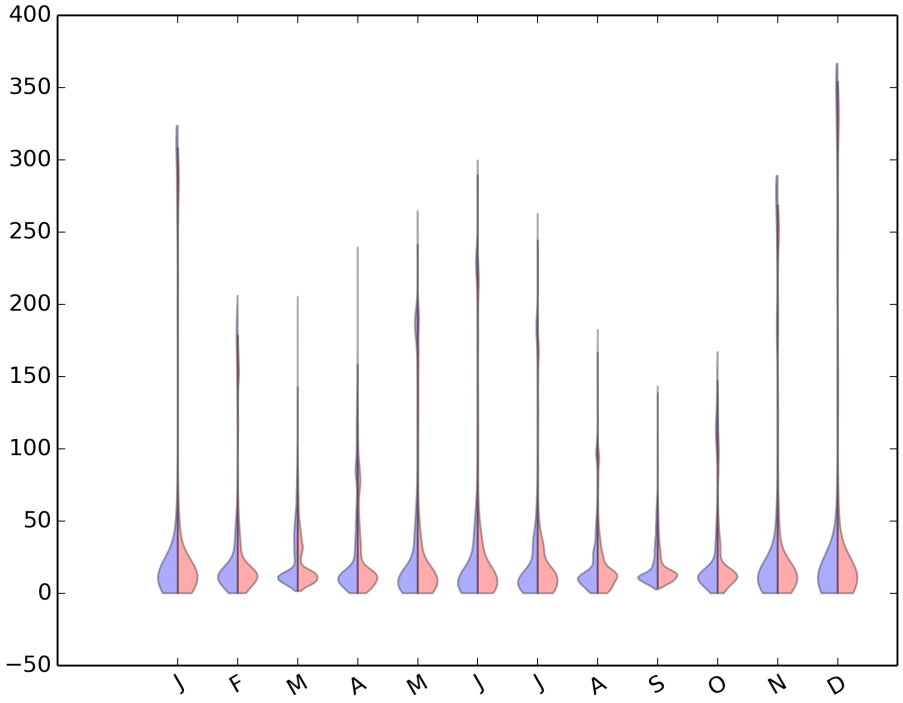



Figure 1168: Violin plot for CMIP5-CNRM-CERFACS:CNRM-CM5-AMIP

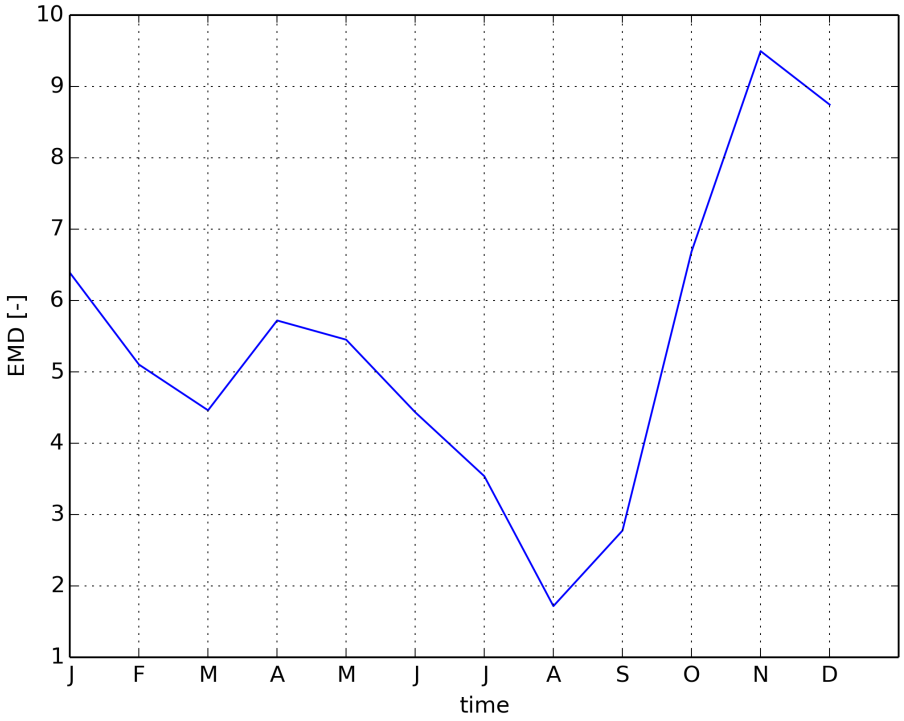



Figure 1169: Timeseries of EMD

### 2.3.9 CMIP5 MRI:MRI-CGCM3-amip

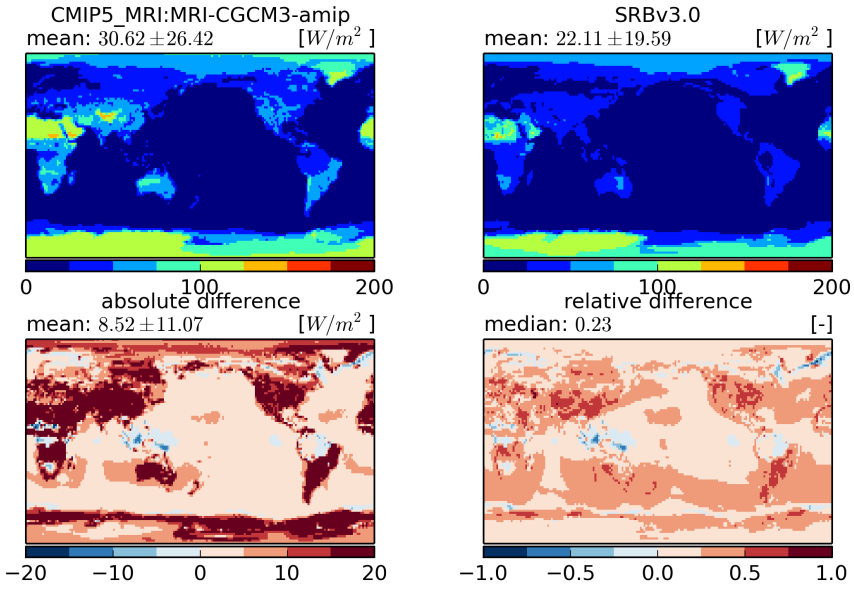



Figure 1170: Temporal mean fields (top) and absolute and relative differences (bottom)

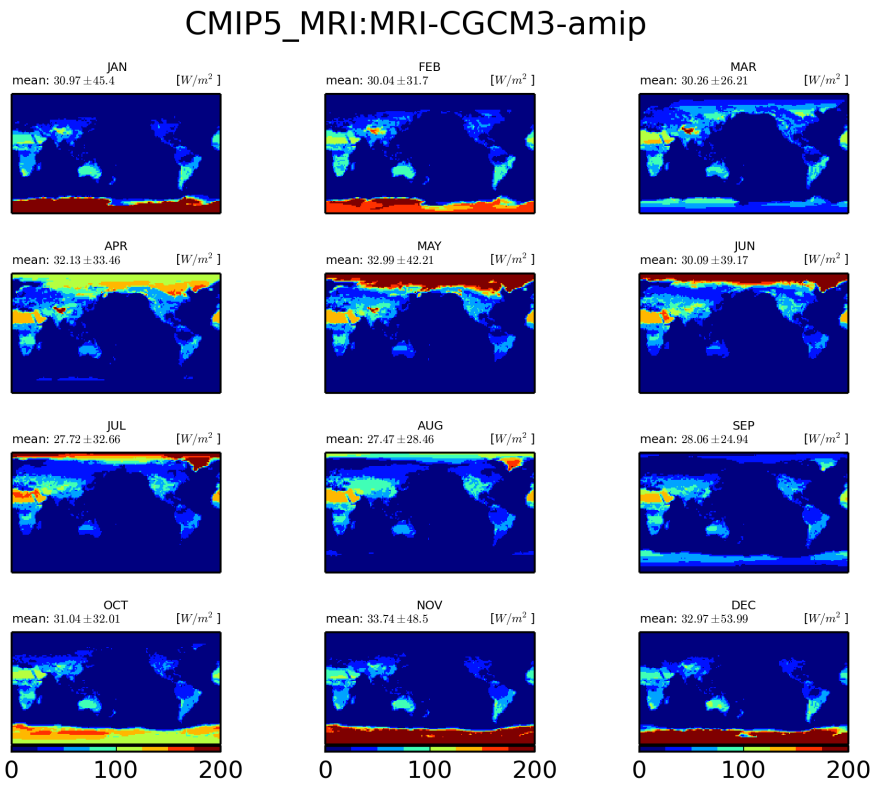



Figure 1171: Monthly mean climatology for MRI:MRI-CGCM3

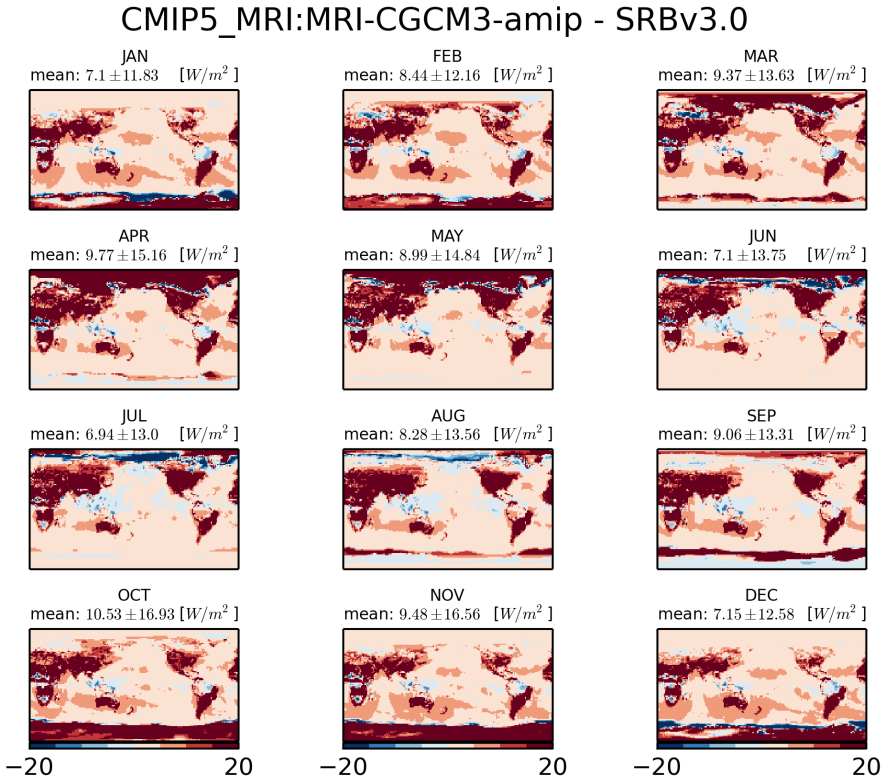



Figure 1172: Monthly mean climatology of difference between MRI:MRI-CGCM3 and SRBV3.0

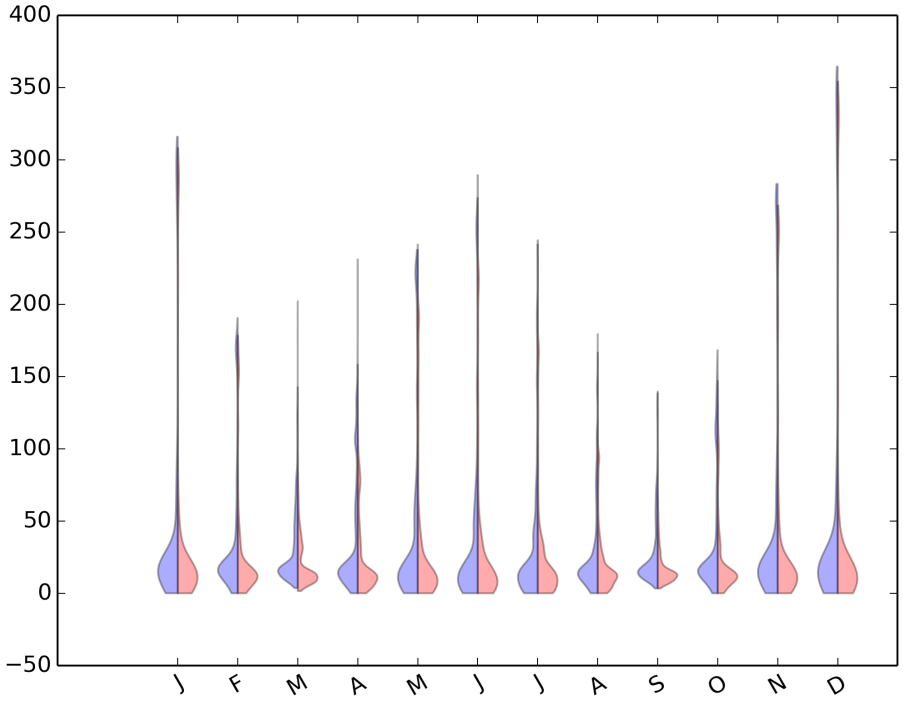



Figure 1173: Violin plot for CMIP5-MRI:MRI-CGCM3-AMIP

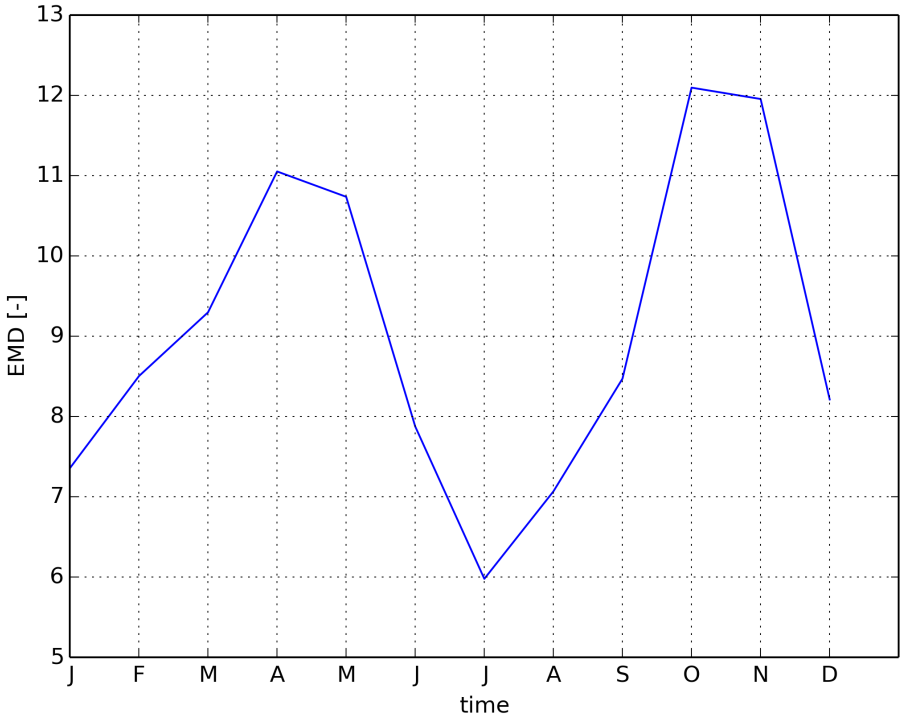



Figure 1174: Timeseries of EMD

### 2.3.10 CMIP5 NASA-GISS:GISS-E2-R-amip

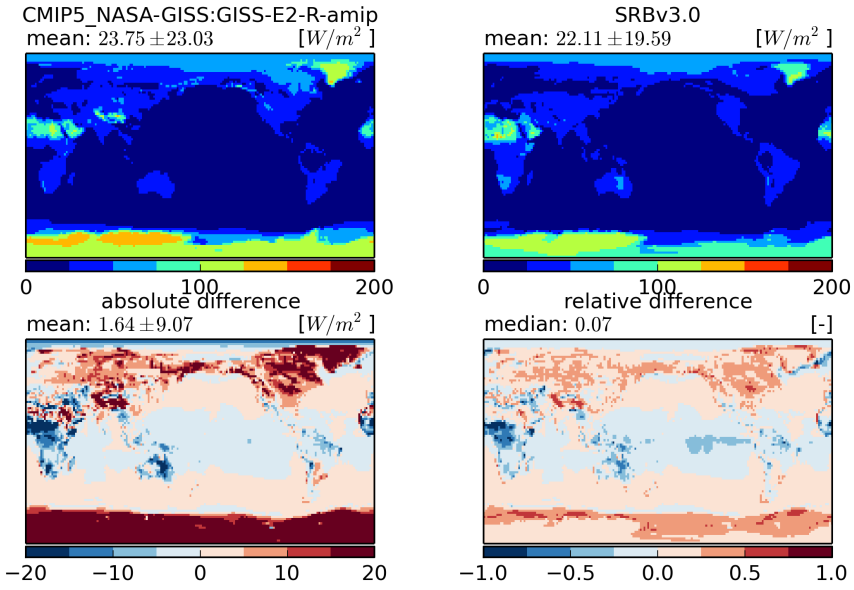



Figure 1175: Temporal mean fields (top) and absolute and relative differences (bottom)

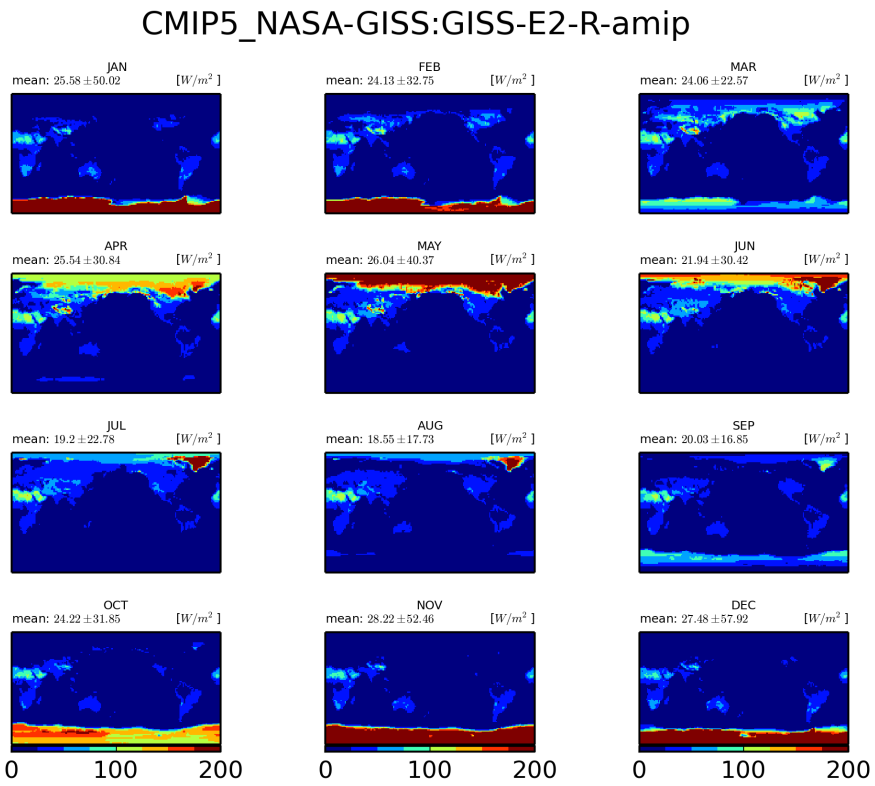



Figure 1176: Monthly mean climatology for NASA-GISS:GISS-E2-R

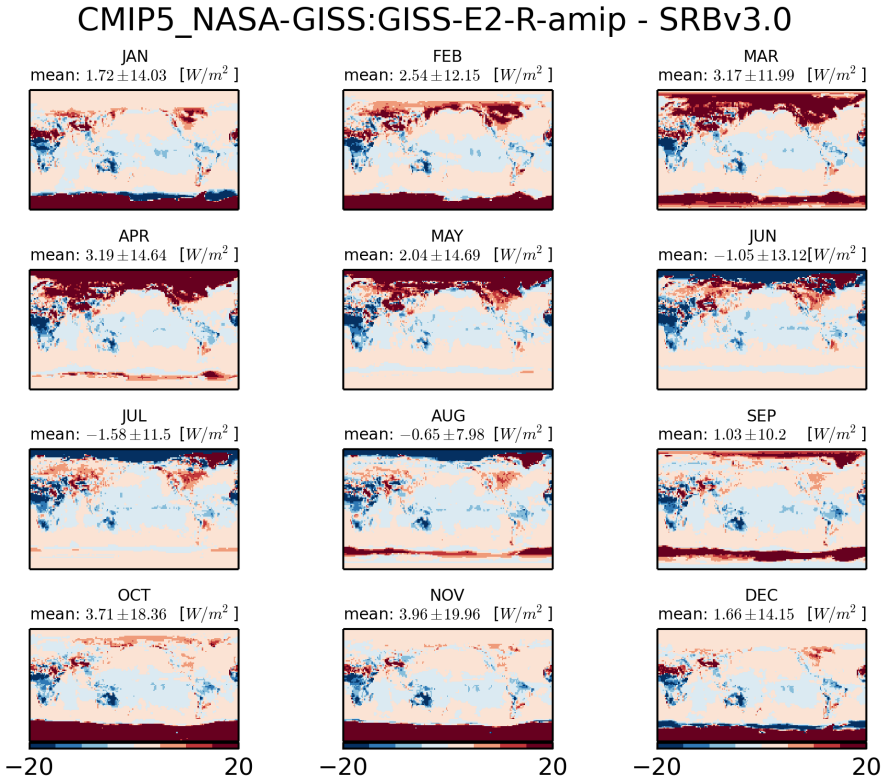



Figure 1177: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and SRBV3.0

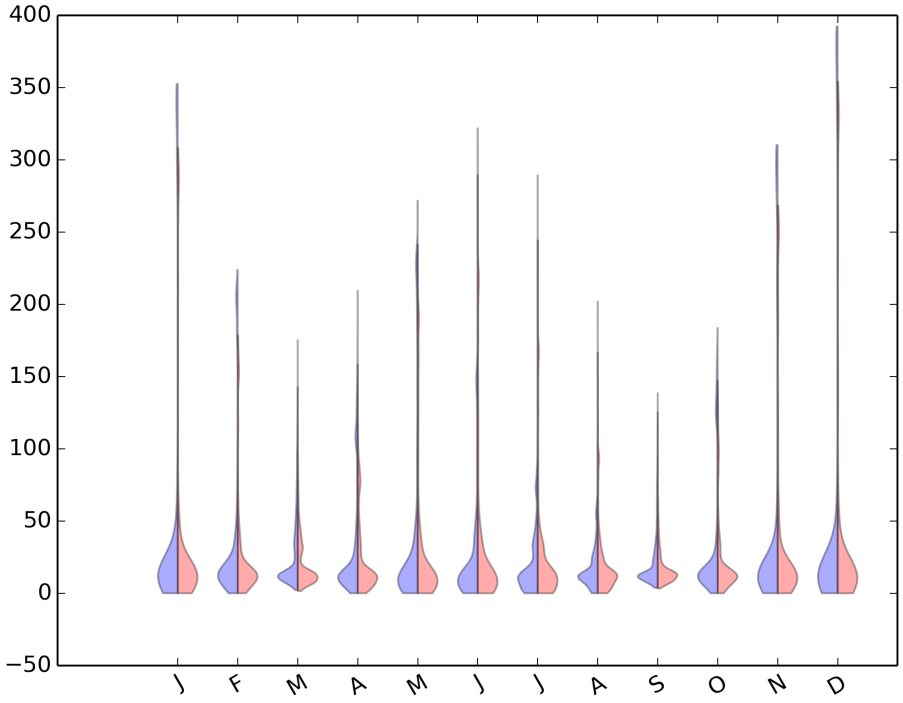



Figure 1178: Violin plot for CMIP5-NASA-GISS:GISS-E2-R-AMIP

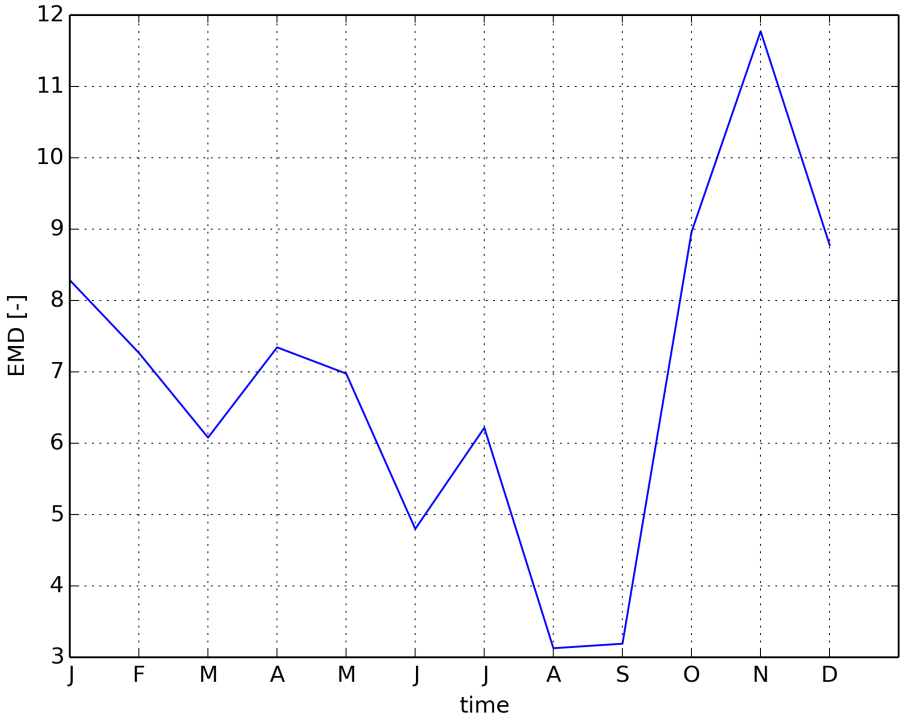



Figure 1179: Timeseries of EMD

### 2.3.11 CMIP5 MIROC:MIROC5-amip

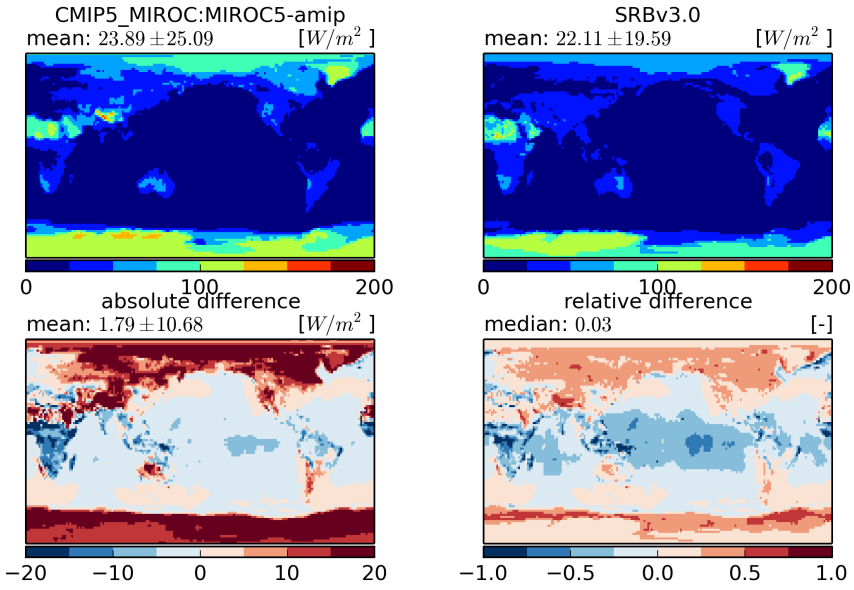



Figure 1180: Temporal mean fields (top) and absolute and relative differences (bottom)

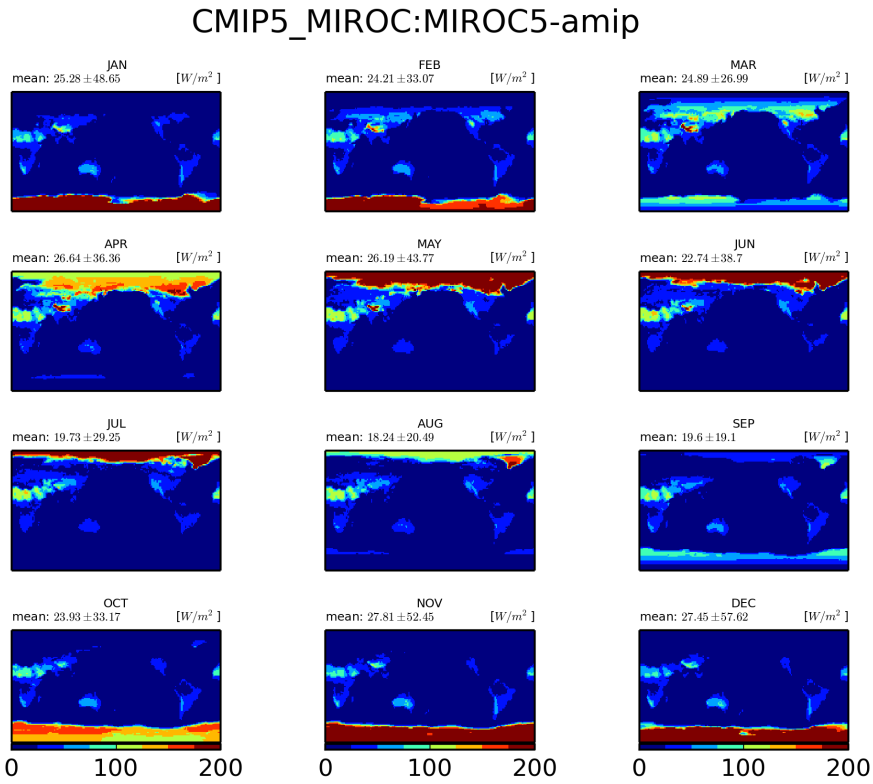



Figure 1181: Monthly mean climatology for MIROC:MIROC5

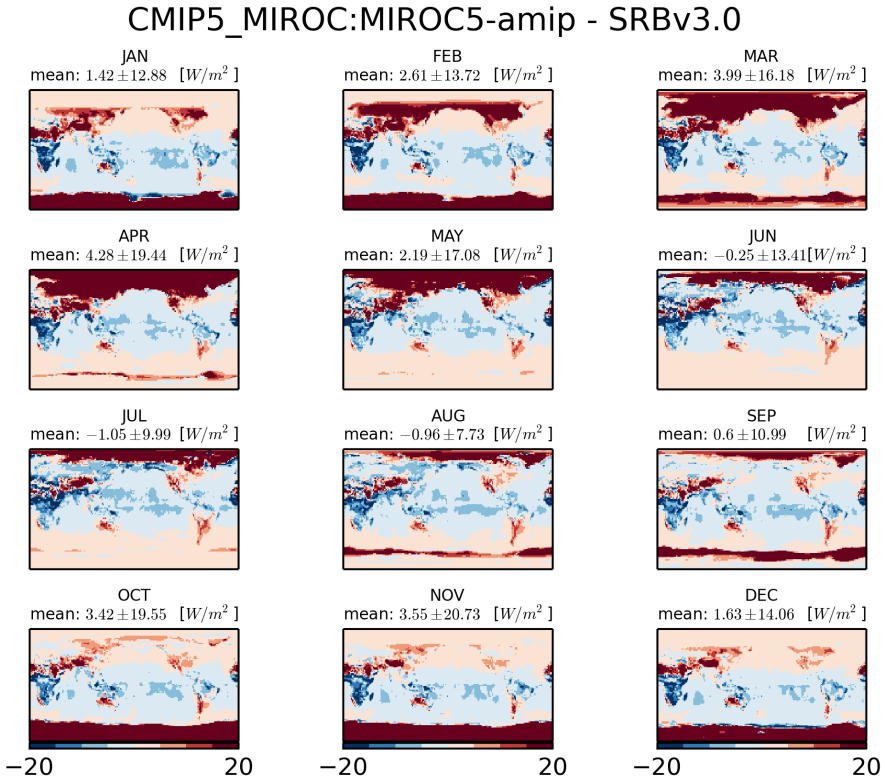



Figure 1182: Monthly mean climatology of difference between MIROC:MIROC5 and SRBV3.0

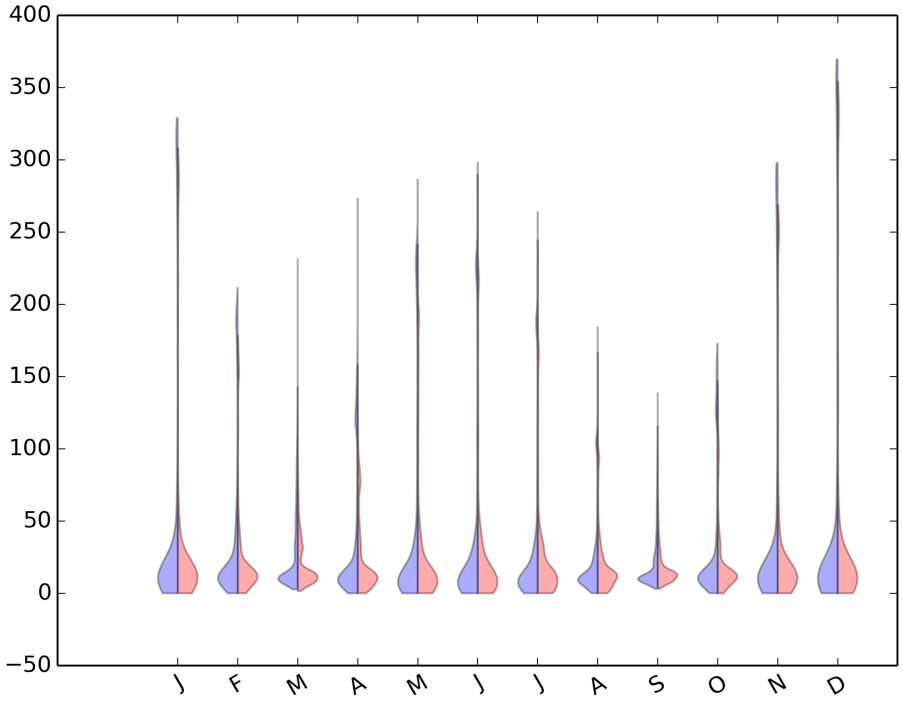



Figure 1183: Violin plot for CMIP5-MIROC:MIROC5-AMIP

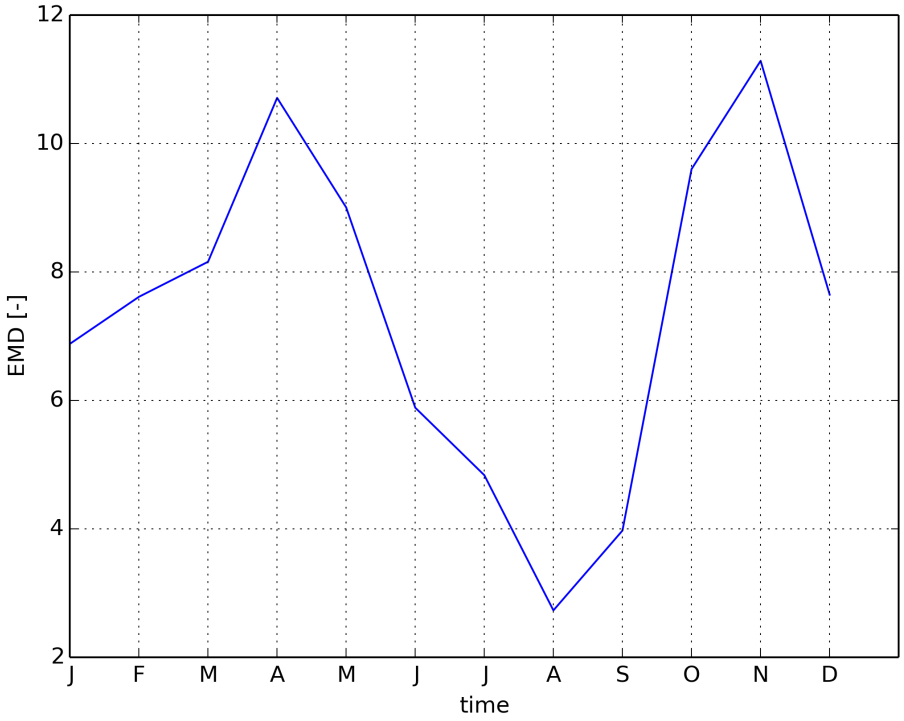



Figure 1184: Timeseries of EMD

### 2.3.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

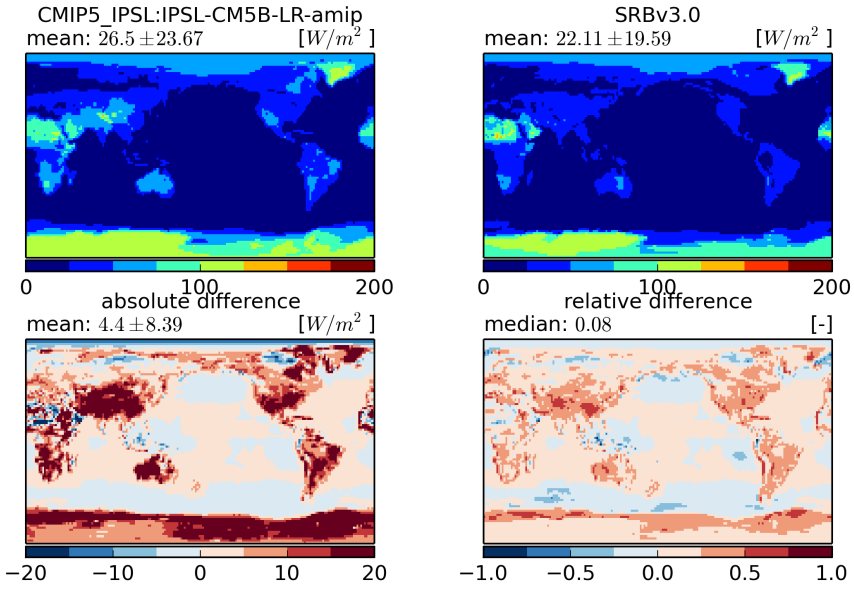



Figure 1185: Temporal mean fields (top) and absolute and relative differences (bottom)

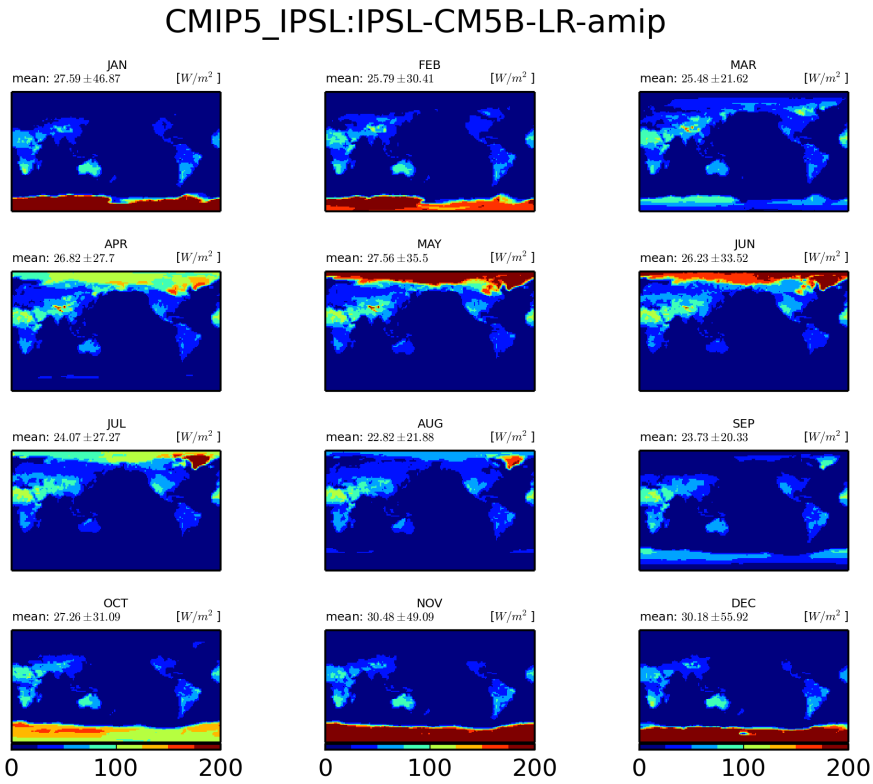



Figure 1186: Monthly mean climatology for IPSL:IPSL-CM5B-LR

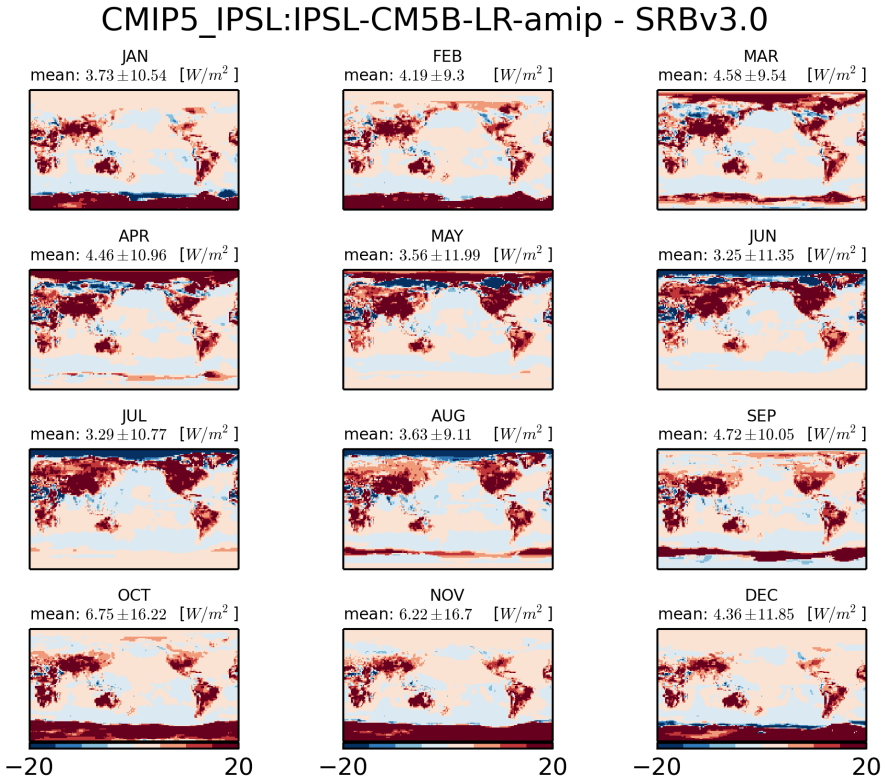



Figure 1187: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and SRBV3.0

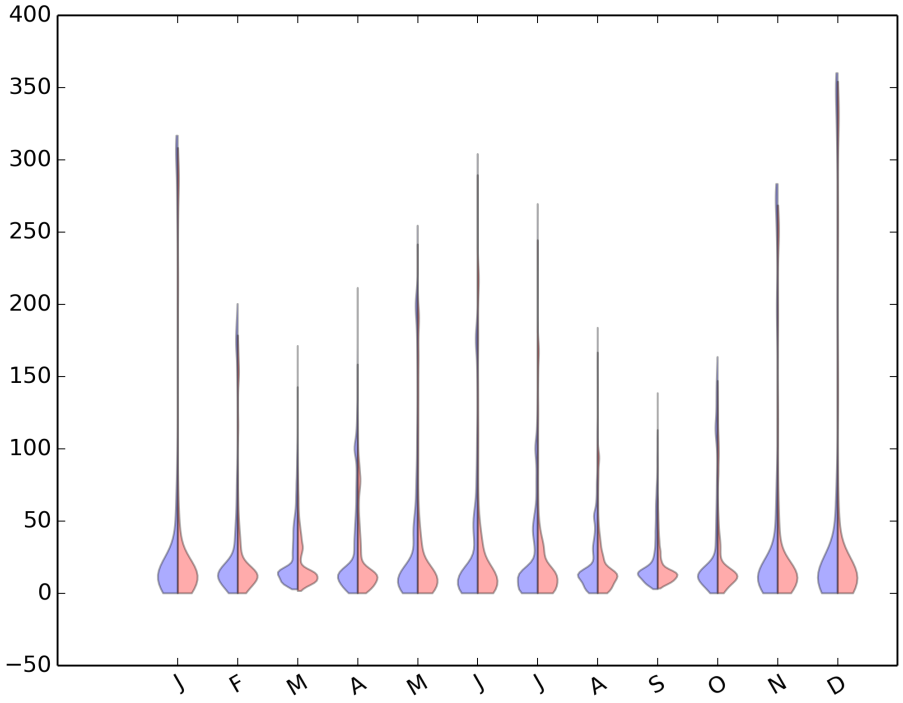



Figure 1188: Violin plot for CMIP5-IPSL:IPSL-CM5B-LR-AMIP

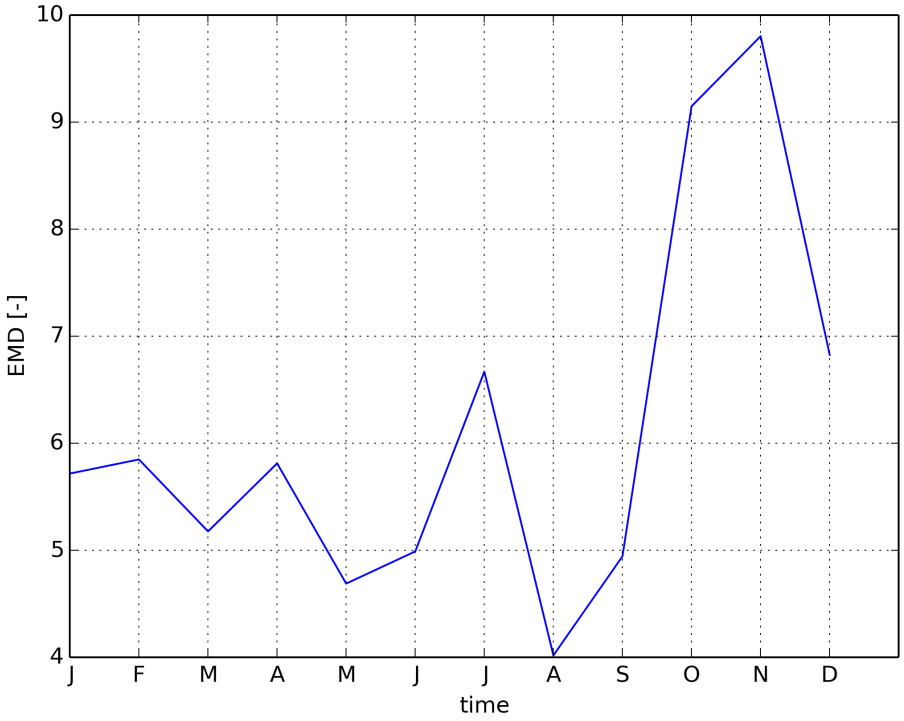



Figure 1189: Timeseries of EMD

### 2.3.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

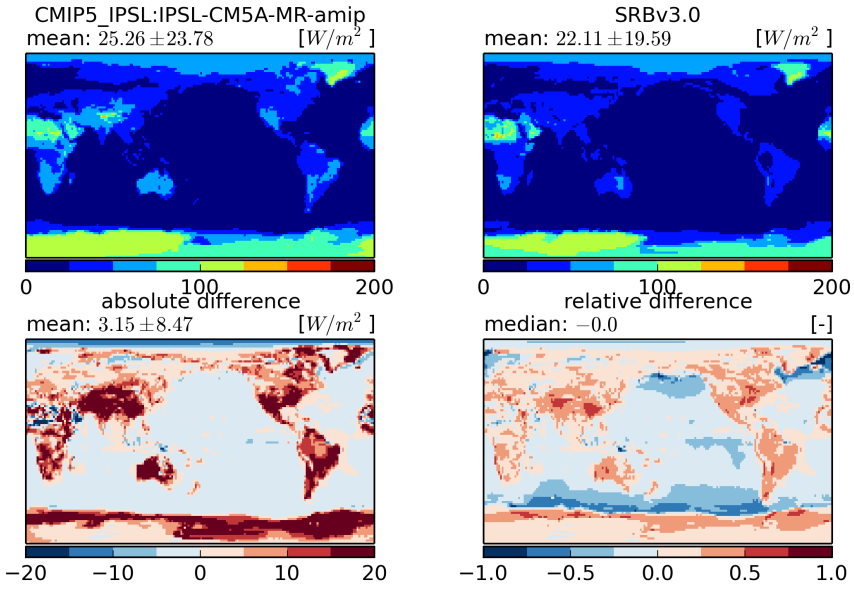



Figure 1190: Temporal mean fields (top) and absolute and relative differences (bottom)

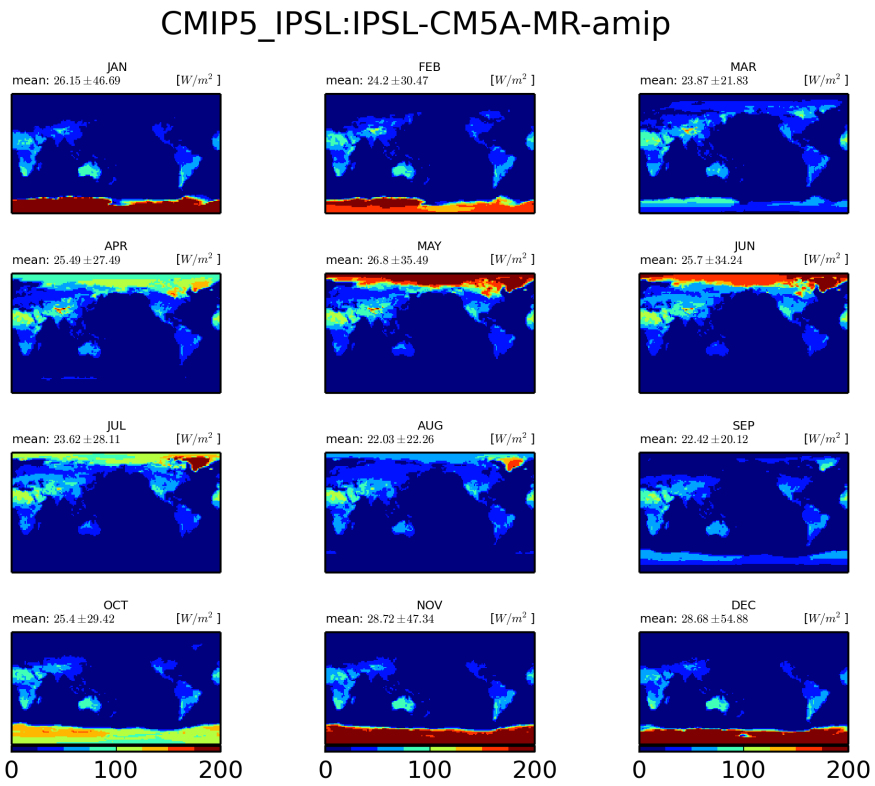



Figure 1191: Monthly mean climatology for IPSL:IPSL-CM5A-MR

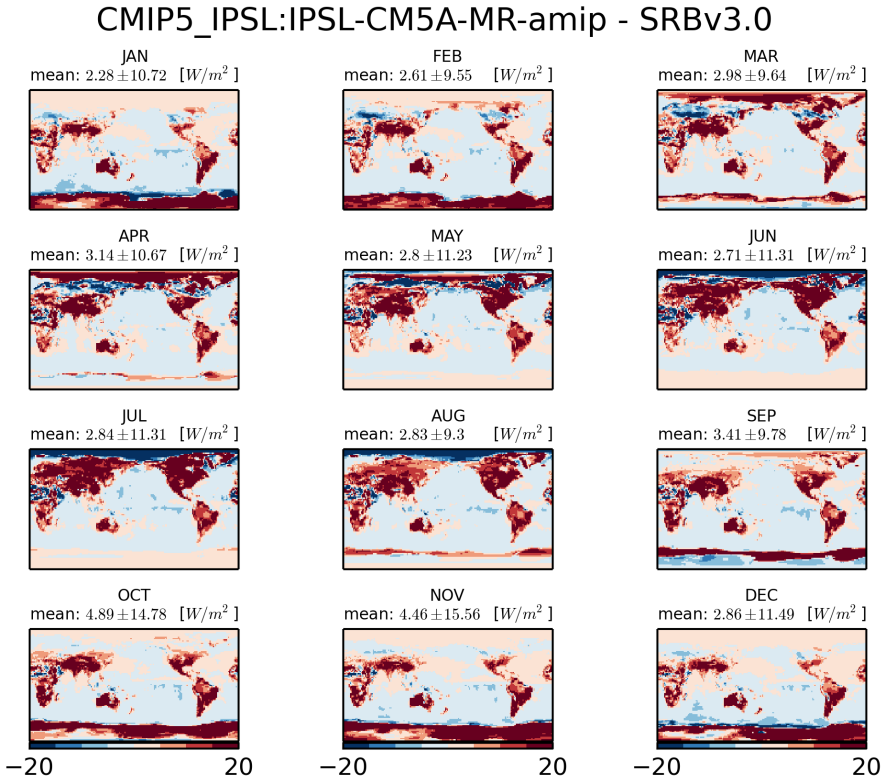



Figure 1192: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and SRBV3.0

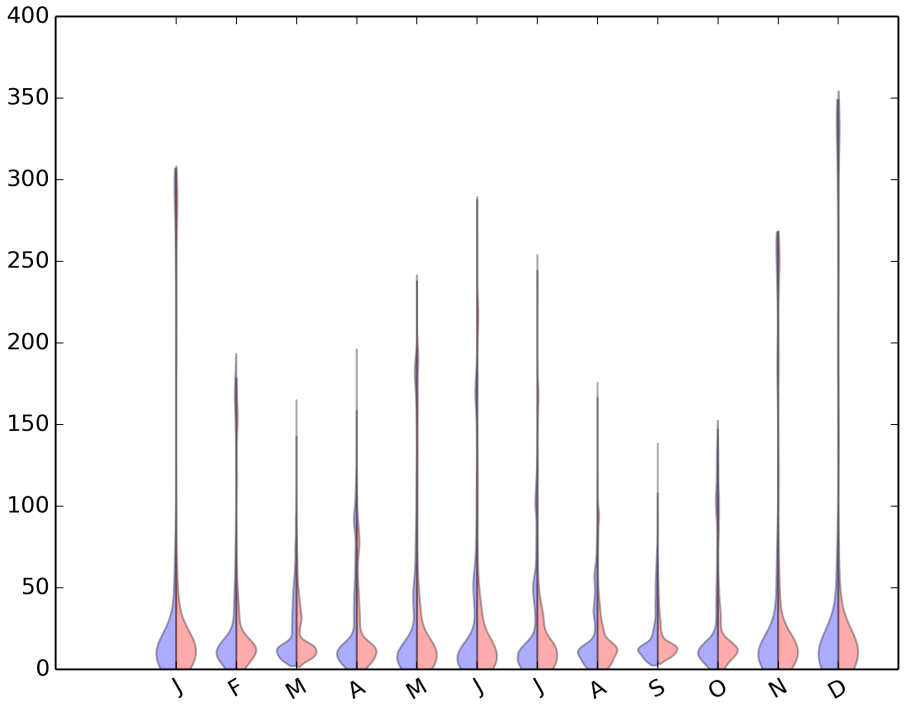



Figure 1193: Violin plot for CMIP5-IPSL:IPSL-CM5A-MR-AMIP

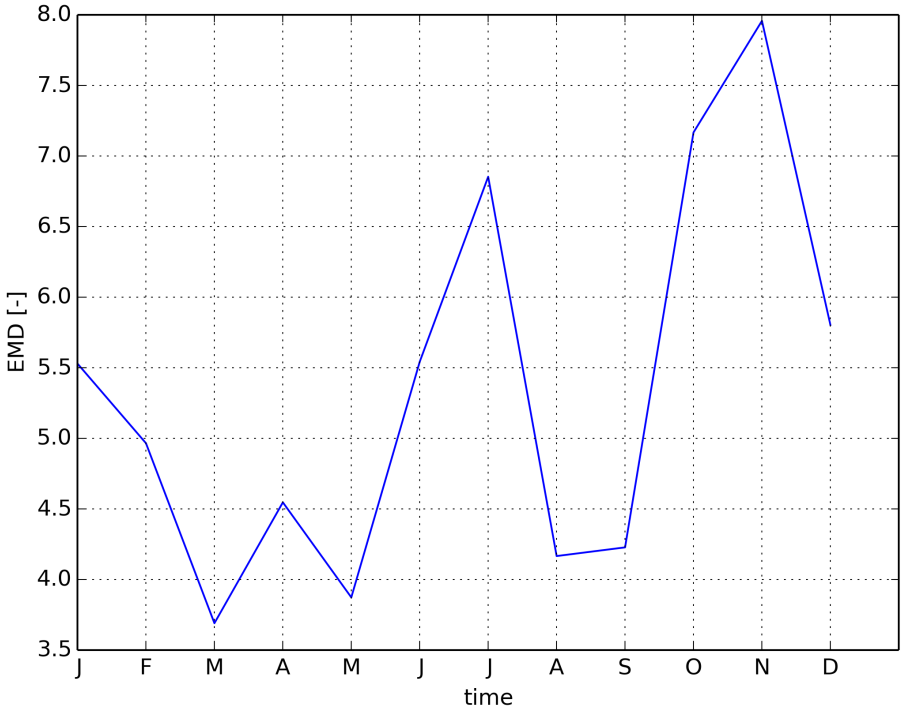



Figure 1194: Timeseries of EMD

### 2.3.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

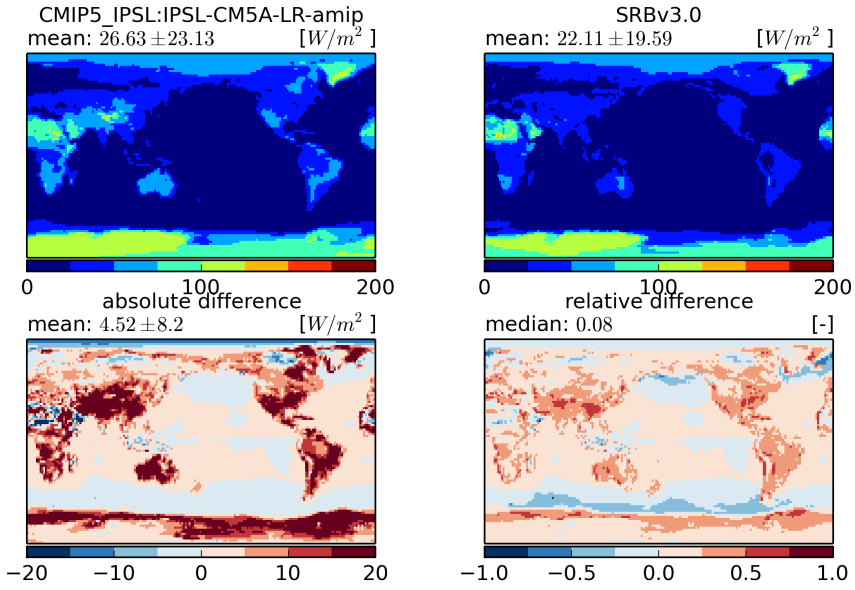



Figure 1195: Temporal mean fields (top) and absolute and relative differences (bottom)

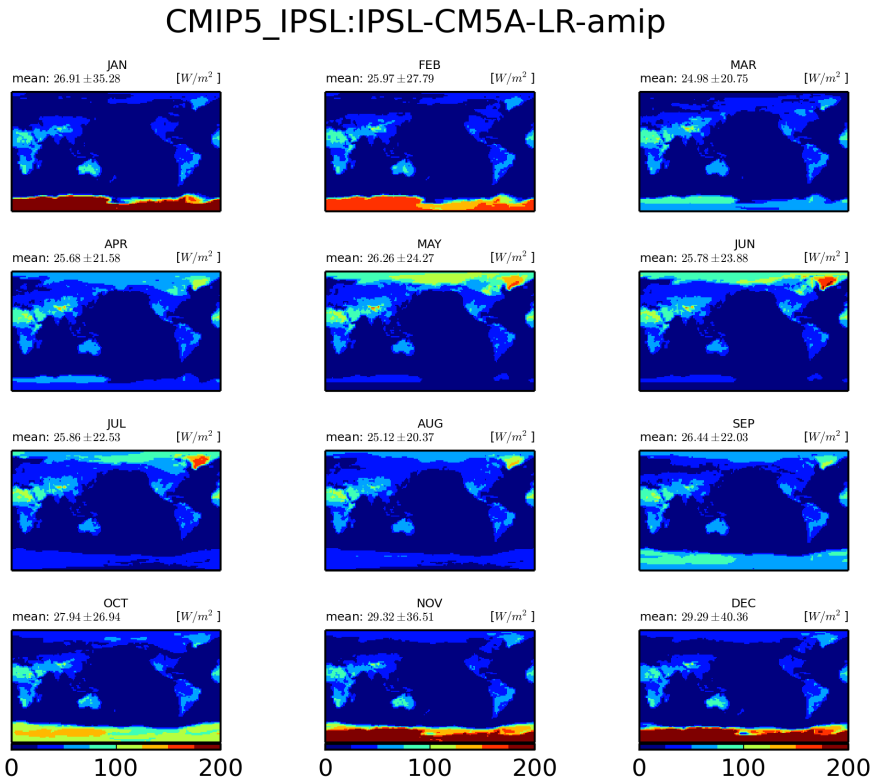



Figure 1196: Monthly mean climatology for IPSL:IPSL-CM5A-LR

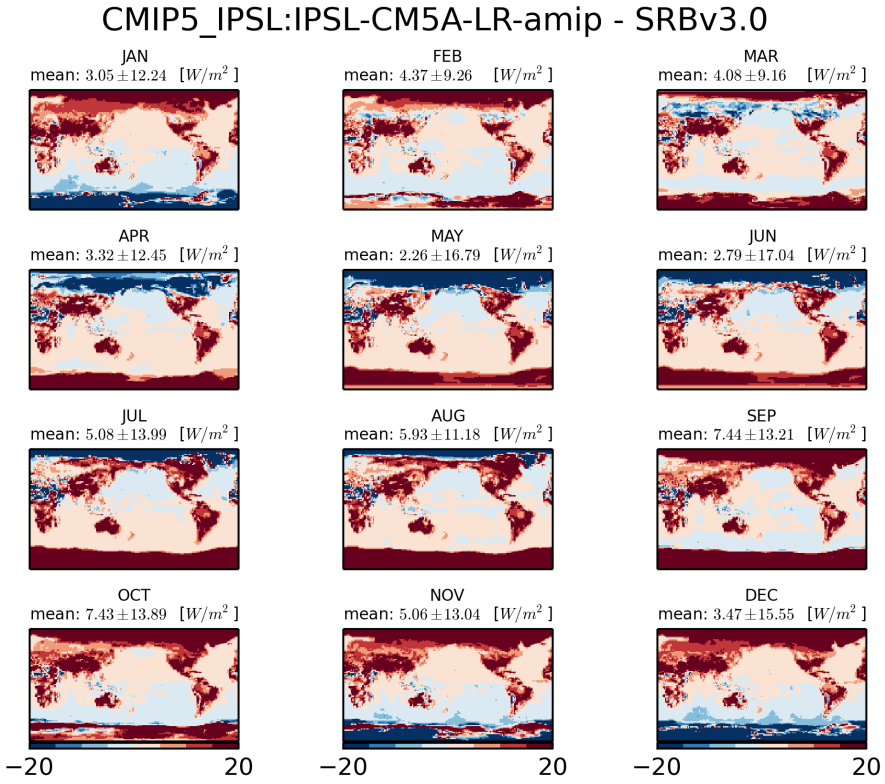



Figure 1197: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and SRBV3.0

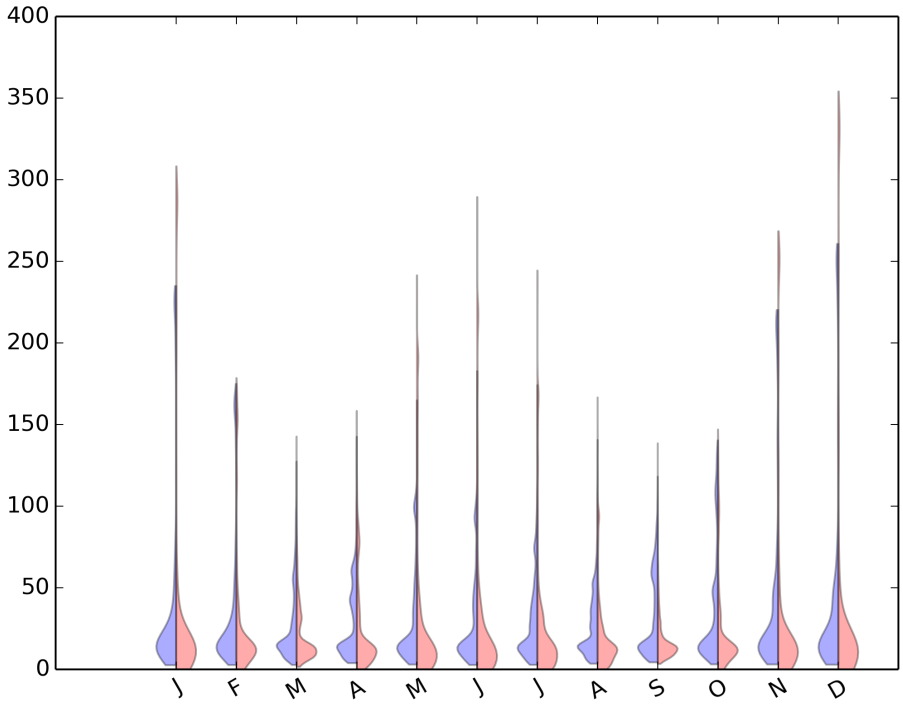



Figure 1198: Violin plot for CMIP5-IPSL:IPSL-CM5A-LR-AMIP

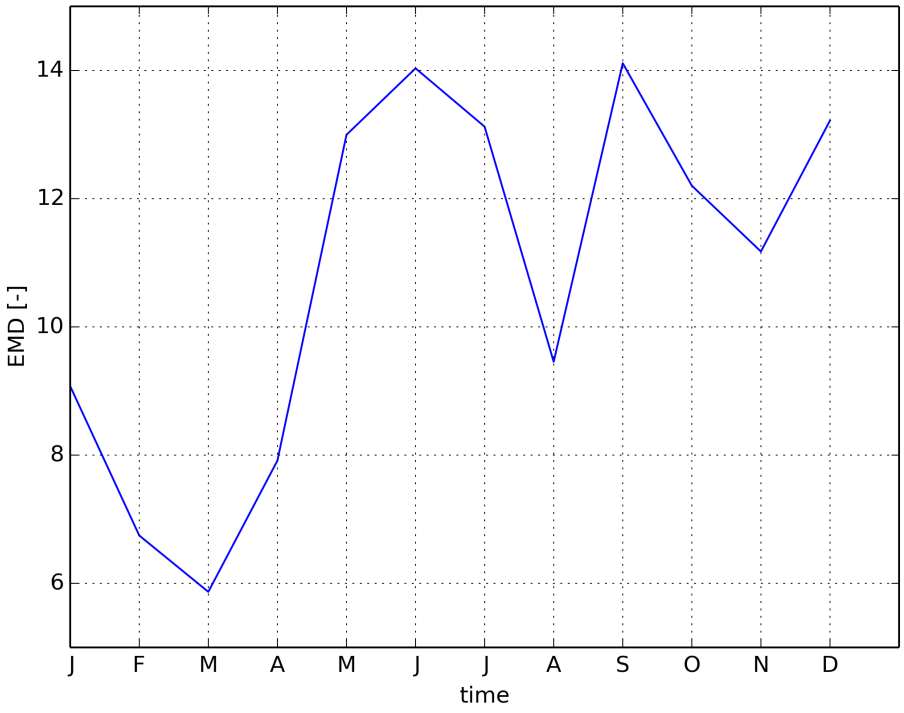



Figure 1199: Timeseries of EMD

### 2.3.15 CMIP5 MOHC:HadGEM2-A-amip

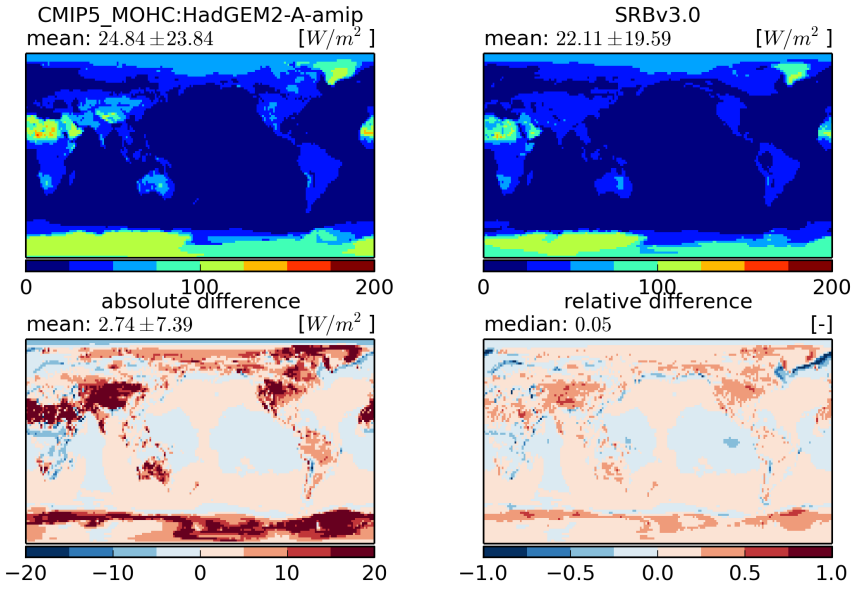



Figure 1200: Temporal mean fields (top) and absolute and relative differences (bottom)

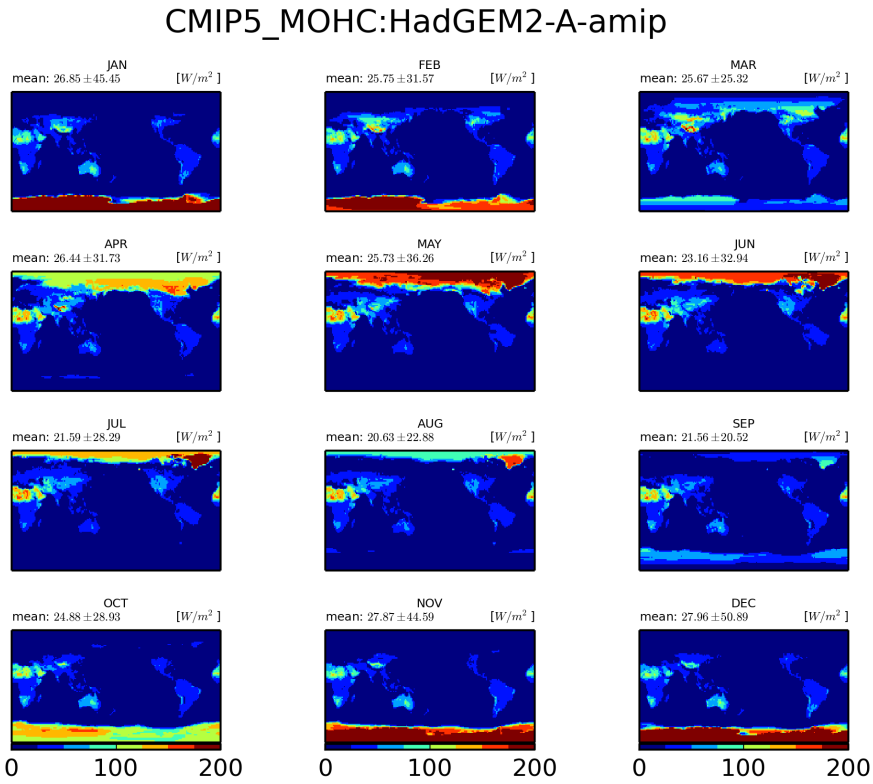



Figure 1201: Monthly mean climatology for MOHC:HadGEM2-A

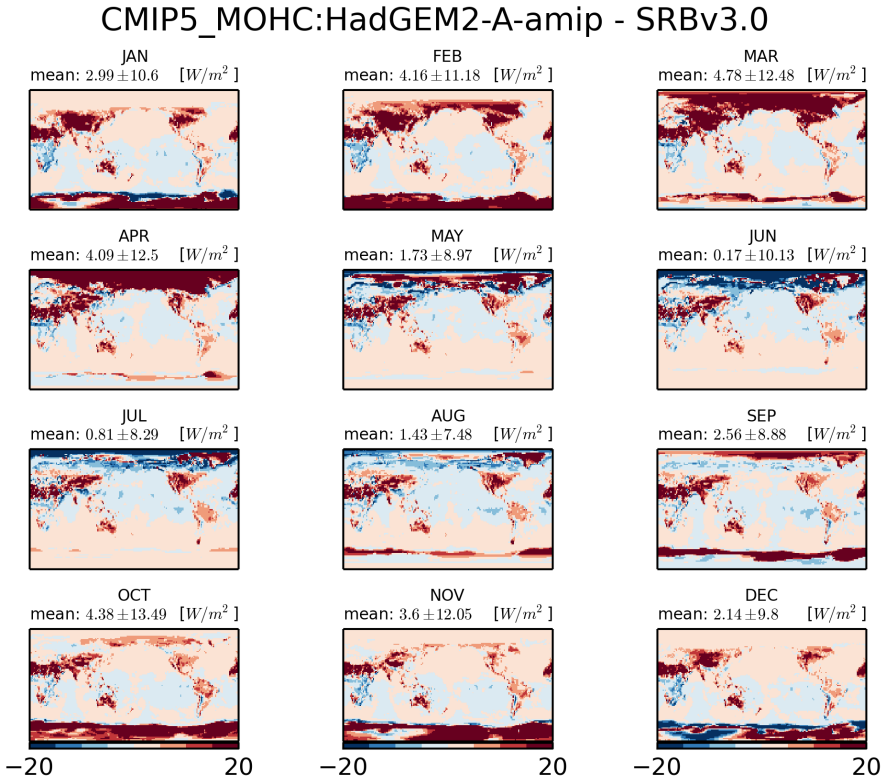



Figure 1202: Monthly mean climatology of difference between MOHC:HADGEM2-A and SRBV3.0

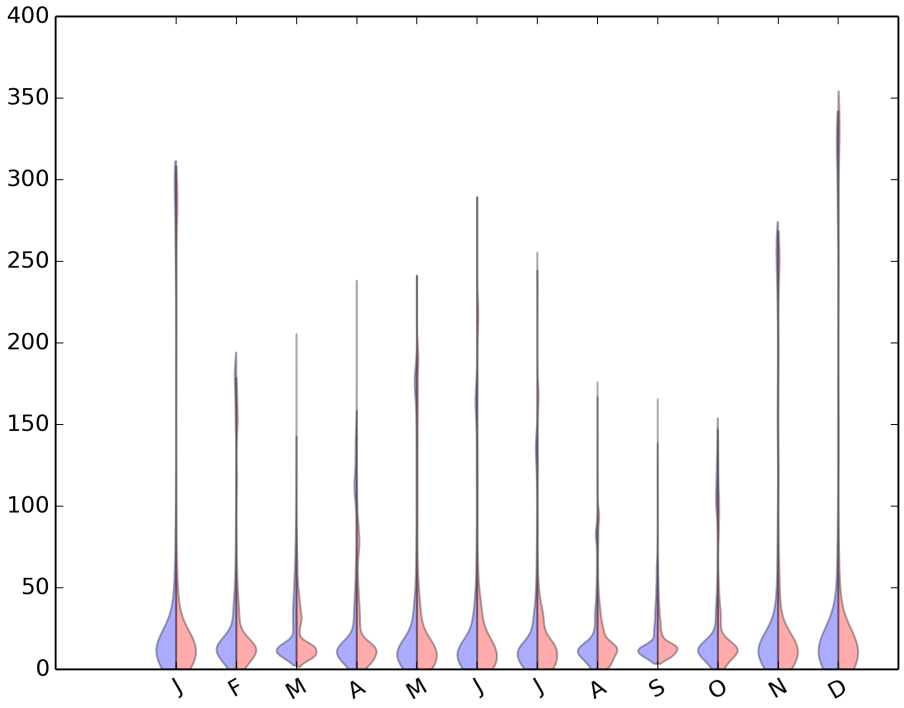



Figure 1203: Violin plot for CMIP5-MOHC:HADGEM2-A-AMIP

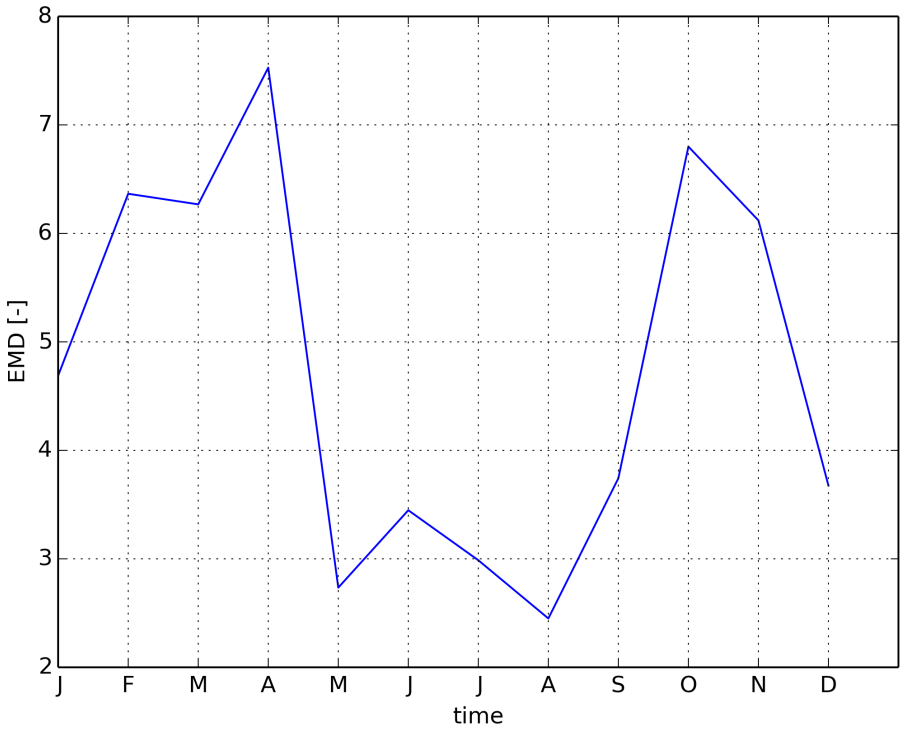



Figure 1204: Timeseries of EMD

### 2.3.16 CMIP5 LASG-IAP:FGOALS-s2-amip

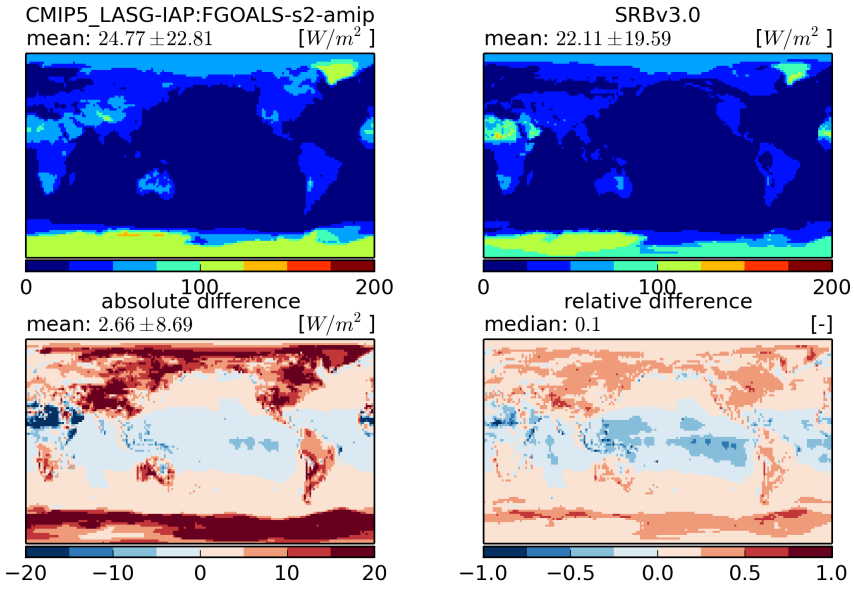



Figure 1205: Temporal mean fields (top) and absolute and relative differences (bottom)

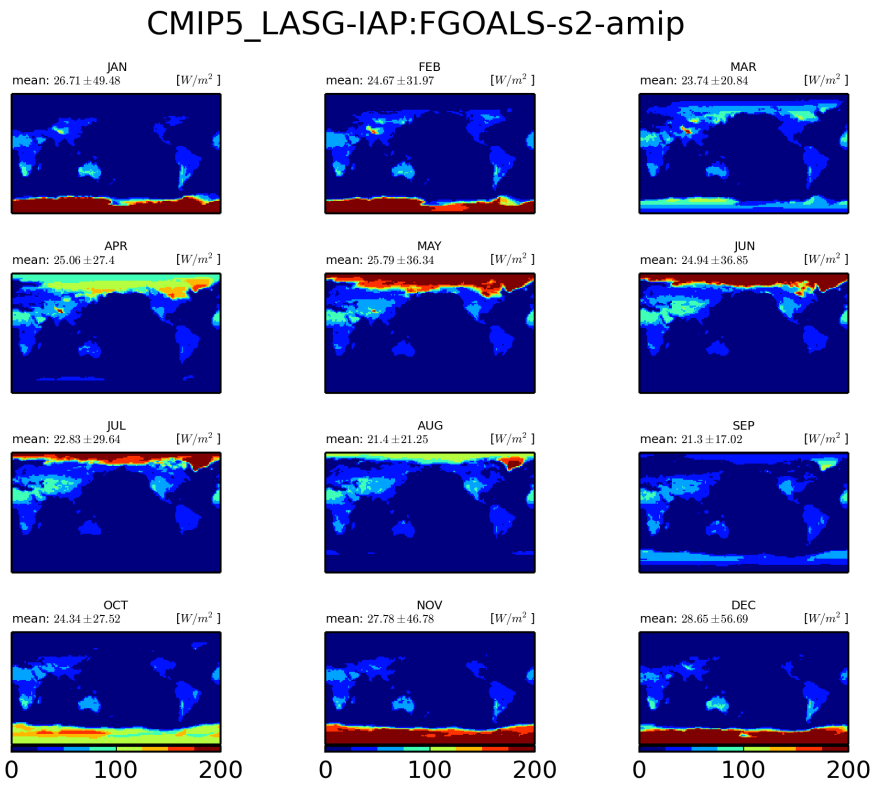



Figure 1206: Monthly mean climatology for LASG-IAP:FGOALS-s2

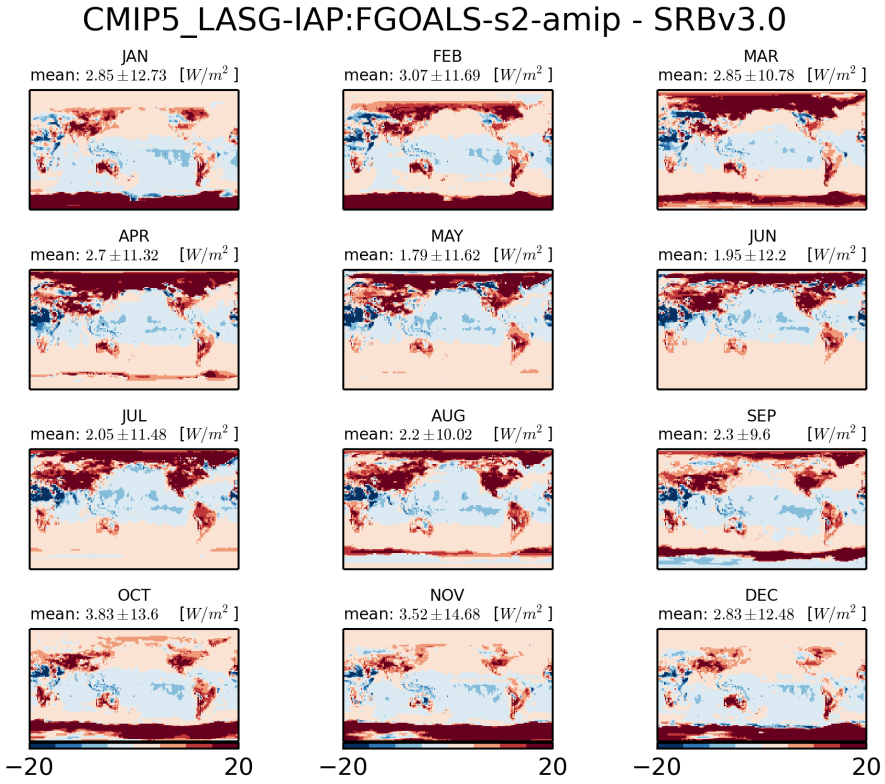



Figure 1207: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and SRBV3.0

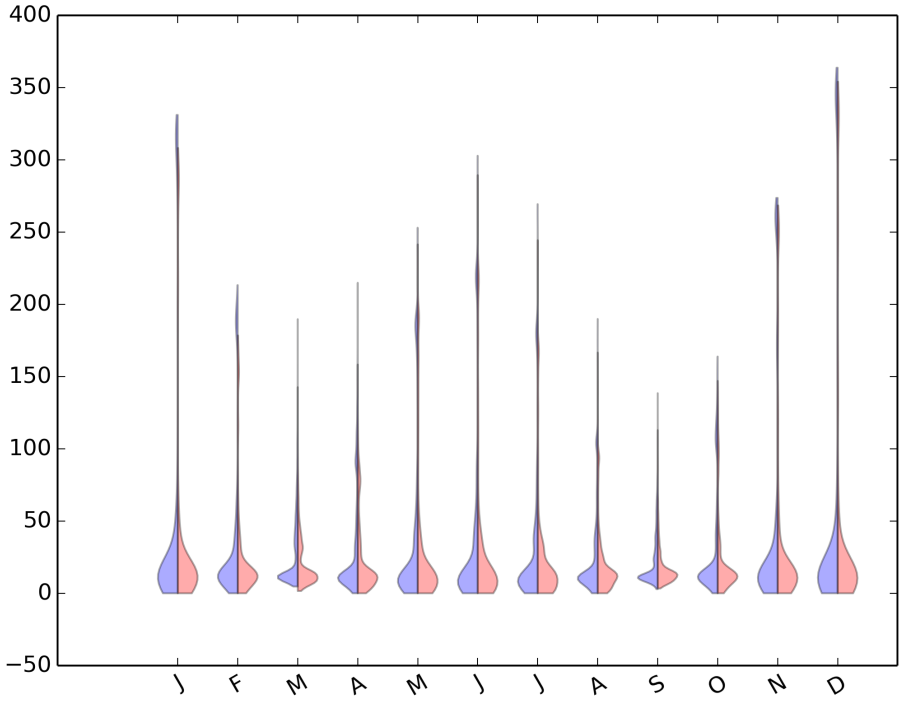



Figure 1208: Violin plot for CMIP5-LASG-IAP:FGOALS-S2-AMIP

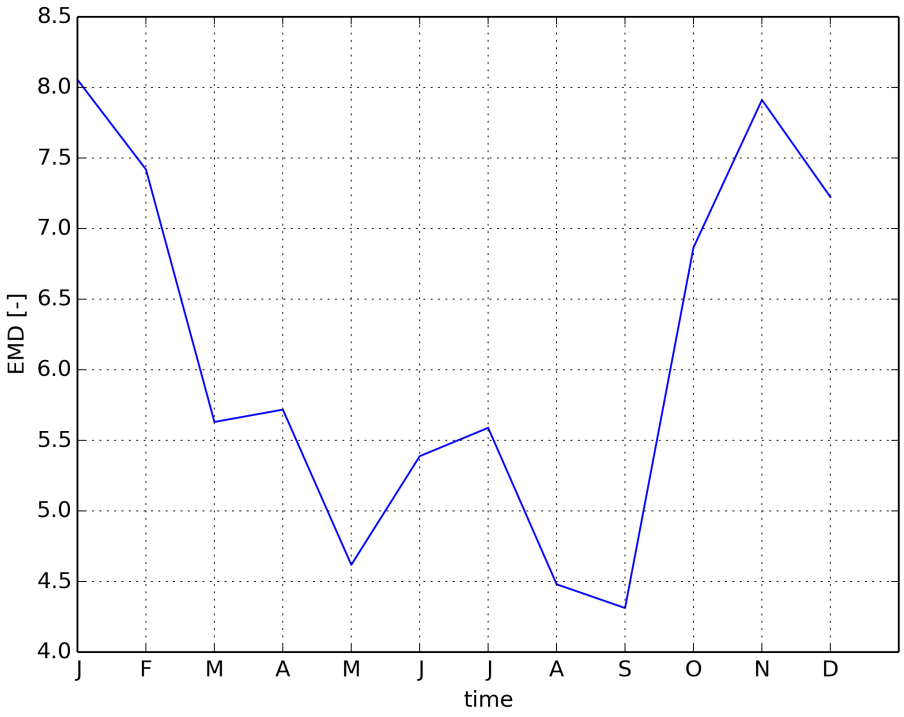



Figure 1209: Timeseries of EMD

### 2.3.17 CMIP5 CMCC:CMCC-CM-amip

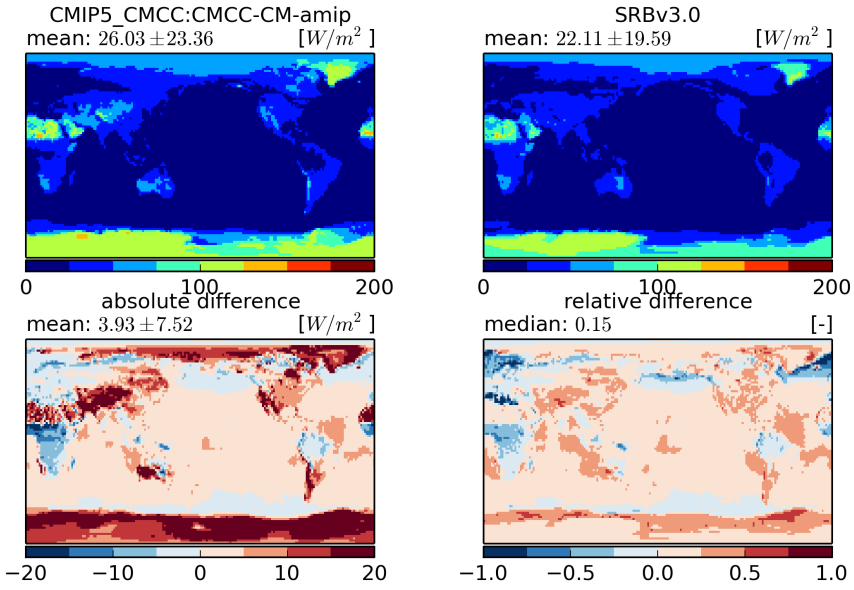



Figure 1210: Temporal mean fields (top) and absolute and relative differences (bottom)

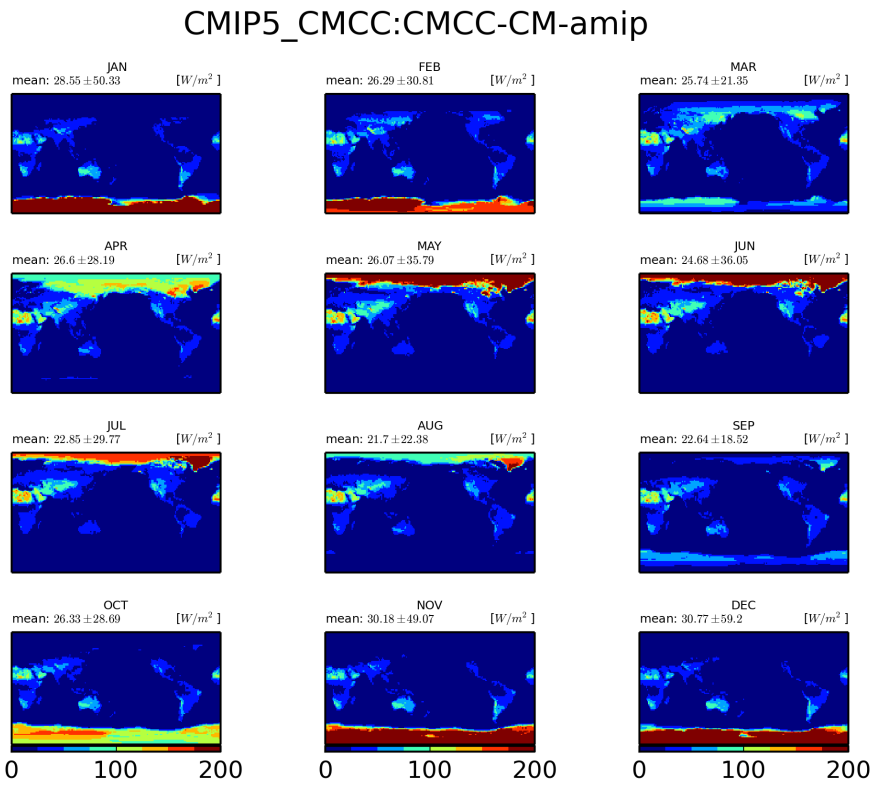



Figure 1211: Monthly mean climatology for CMCC:CMCC-CM

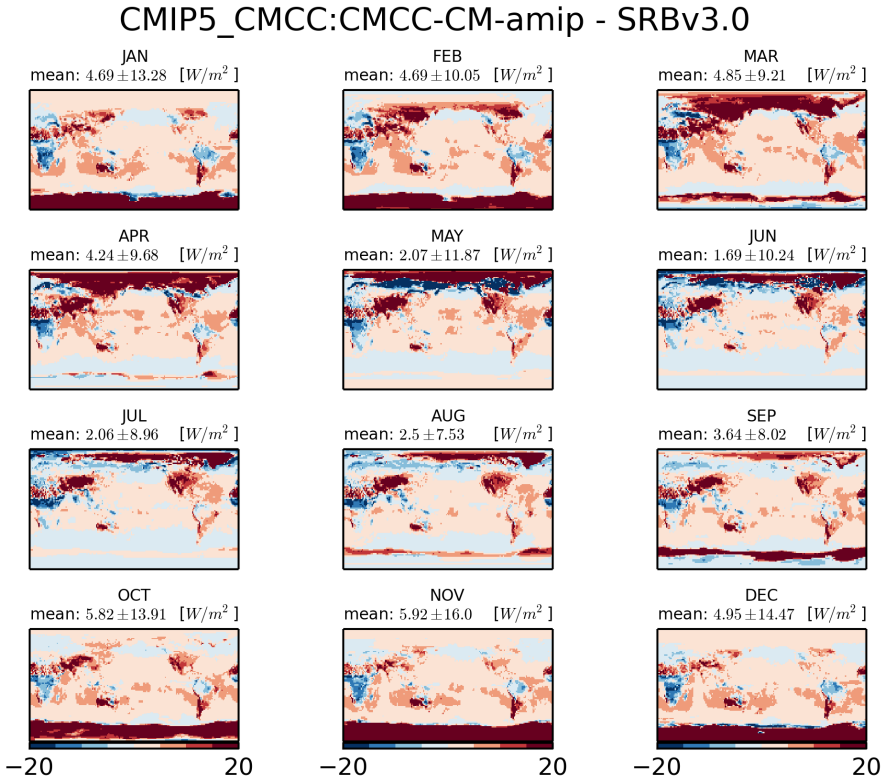



Figure 1212: Monthly mean climatology of difference between CMCC:CMCC-CM and SRBV3.0

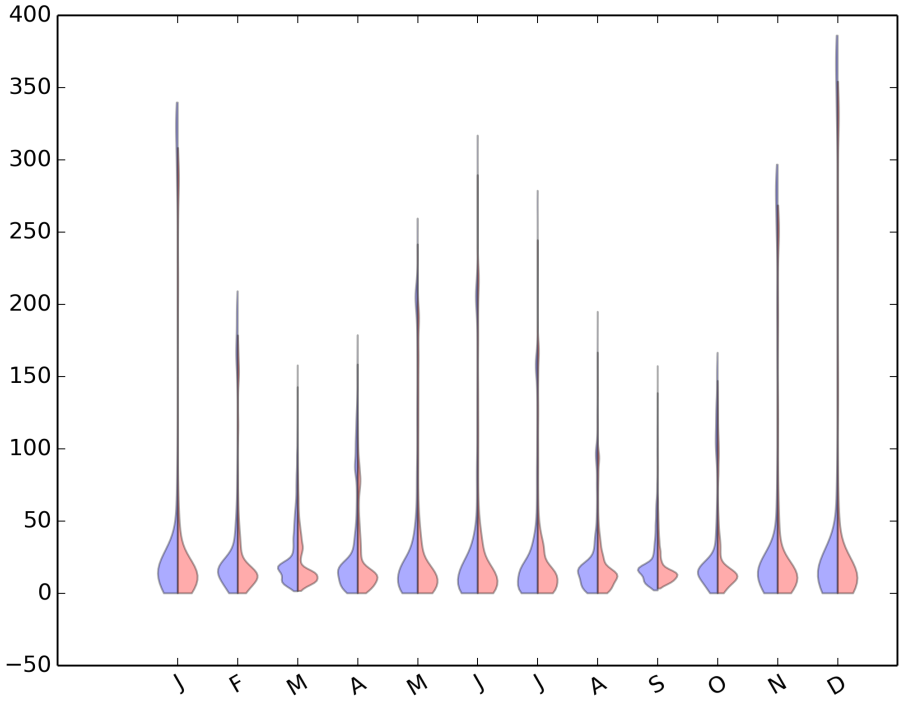



Figure 1213: Violin plot for CMIP5-CMCC:CMCC-CM-AMIP

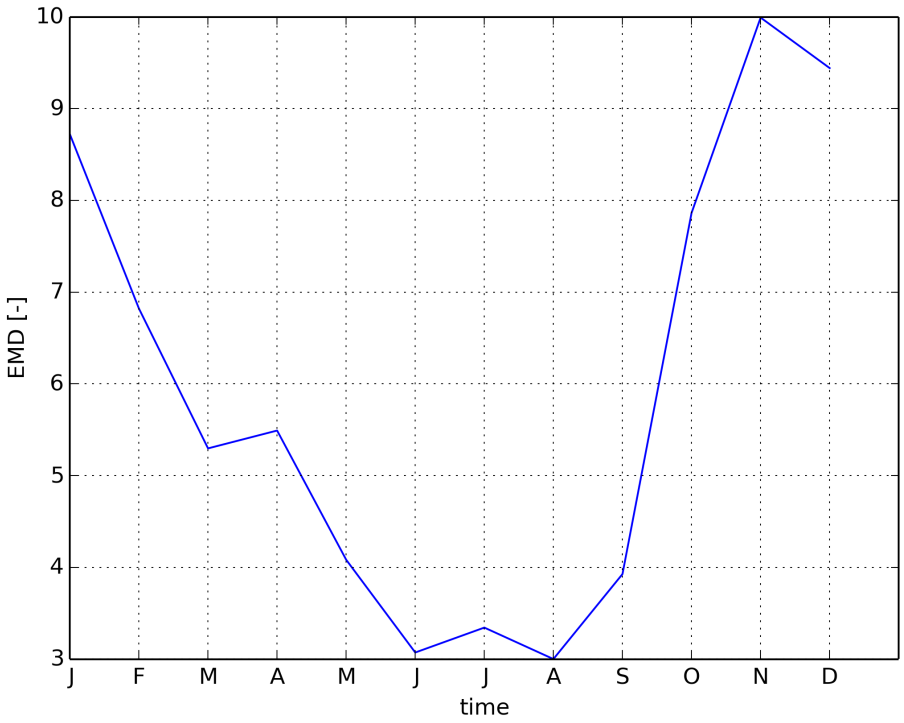



Figure 1214: Timeseries of EMD

### 2.3.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

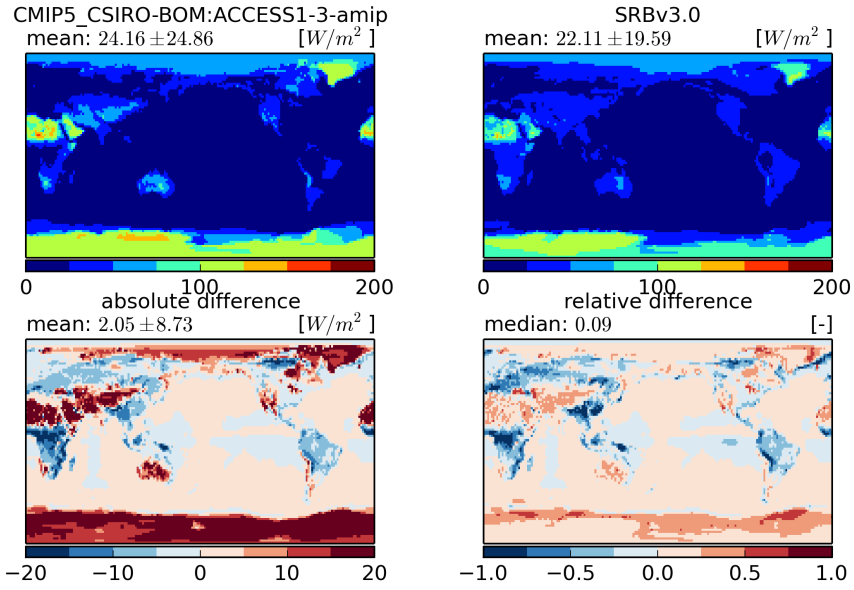



Figure 1215: Temporal mean fields (top) and absolute and relative differences (bottom)

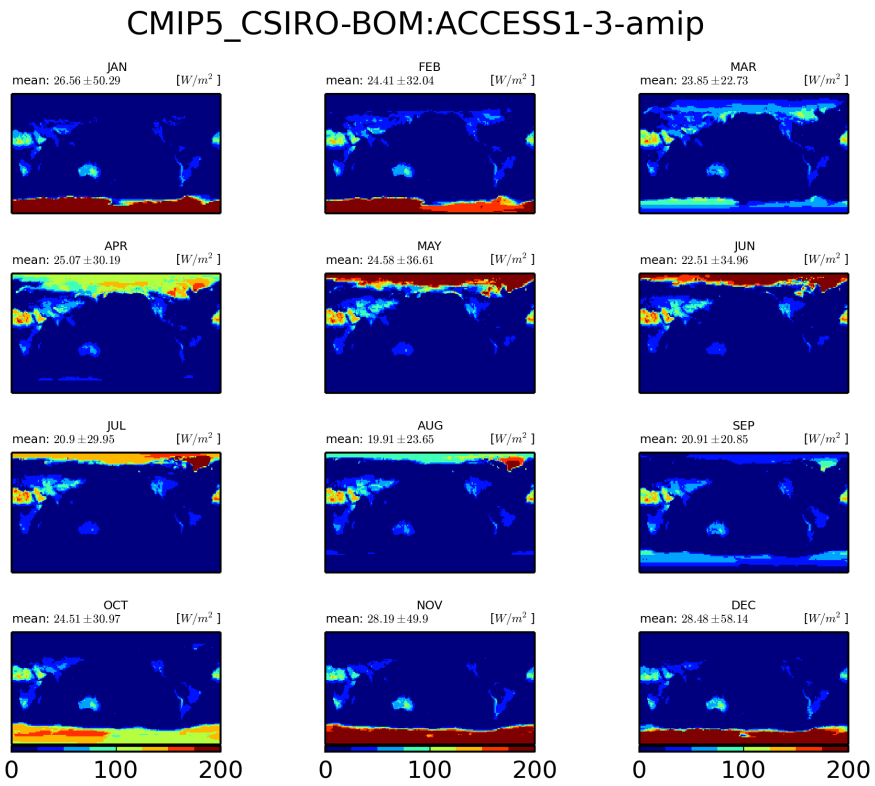



Figure 1216: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

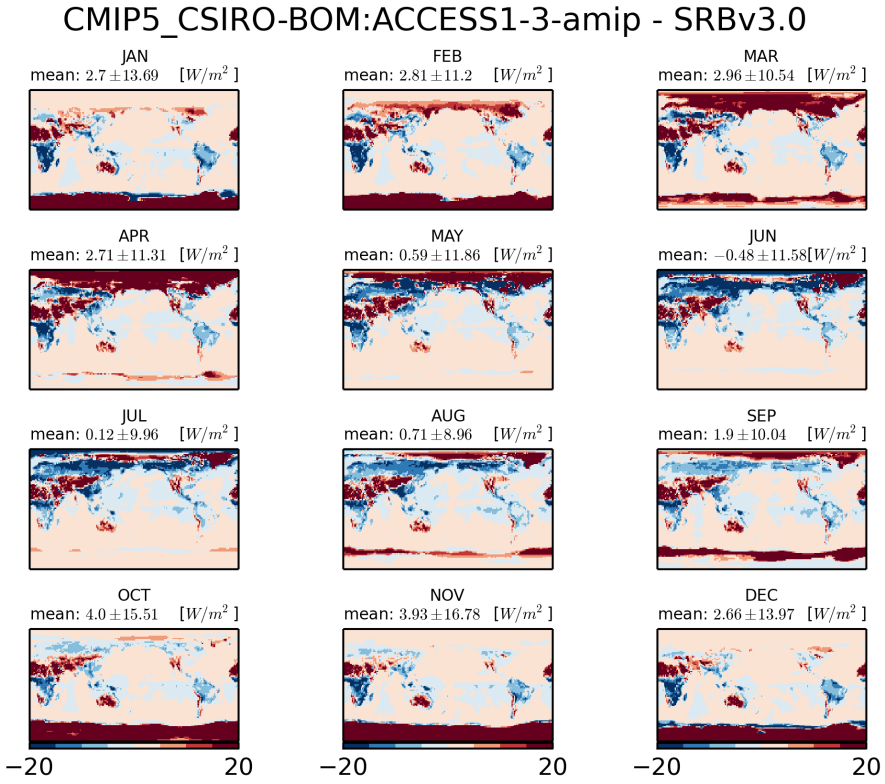



Figure 1217: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and SRBV3.0

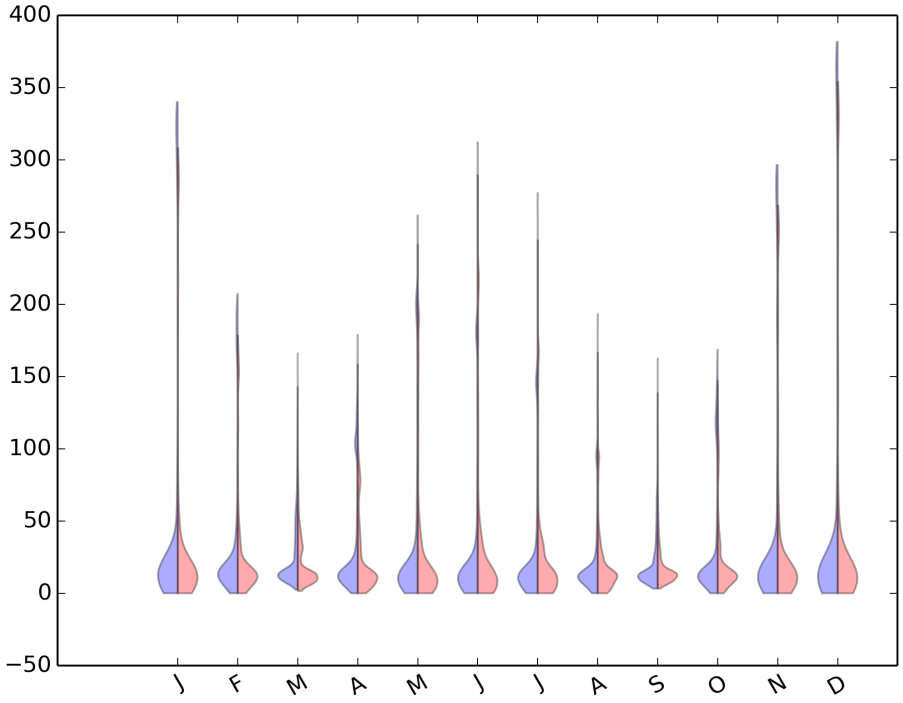



Figure 1218: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-3-AMIP

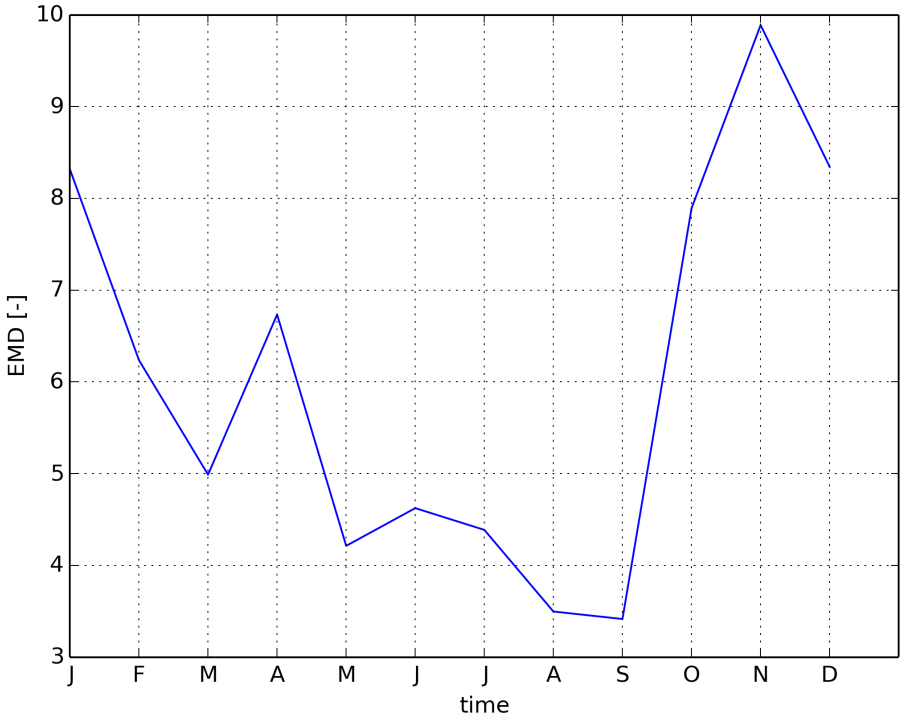



Figure 1219: Timeseries of EMD

### 2.3.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

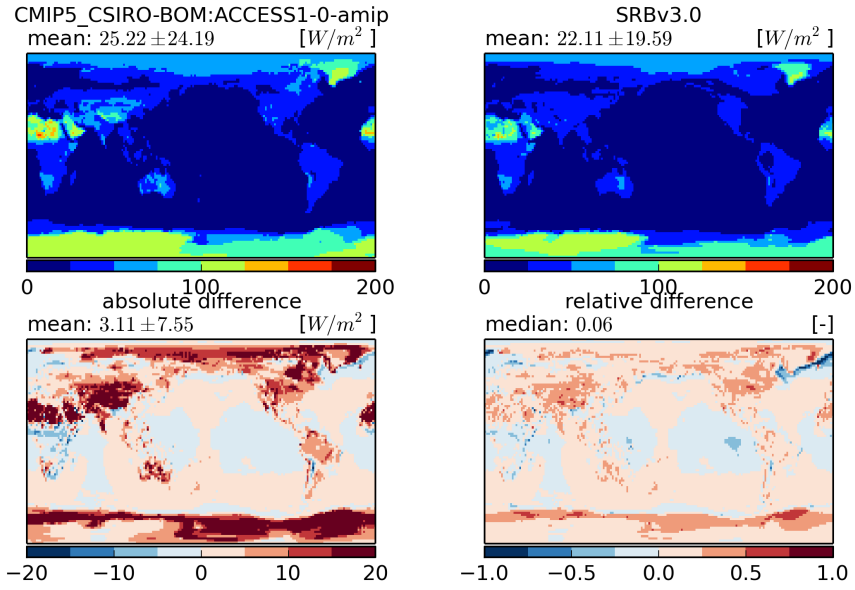



Figure 1220: Temporal mean fields (top) and absolute and relative differences (bottom)

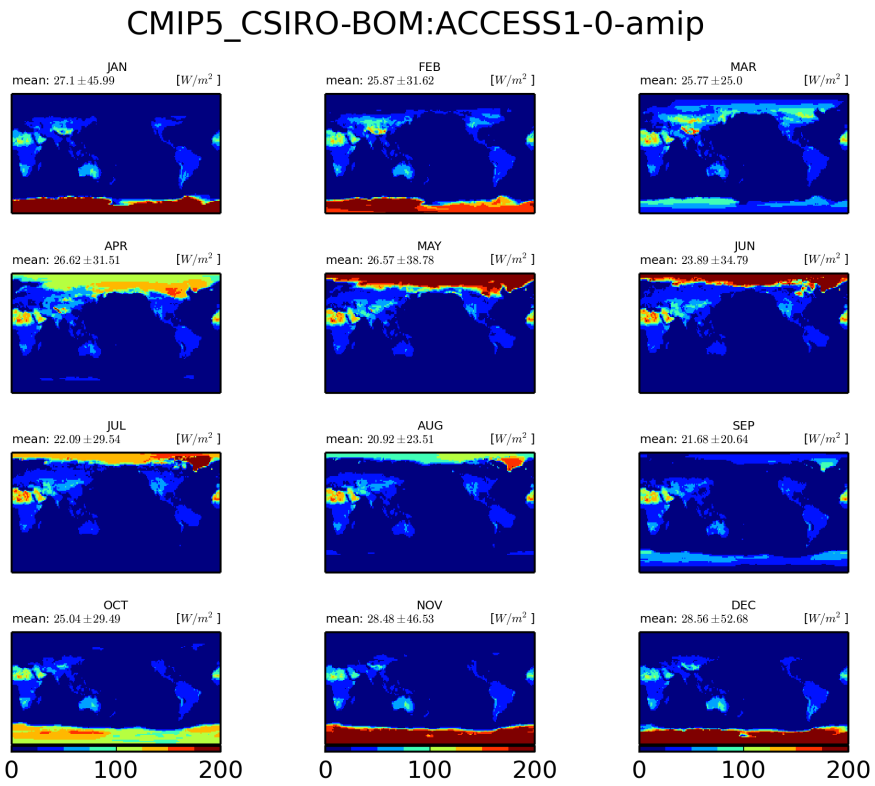



Figure 1221: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

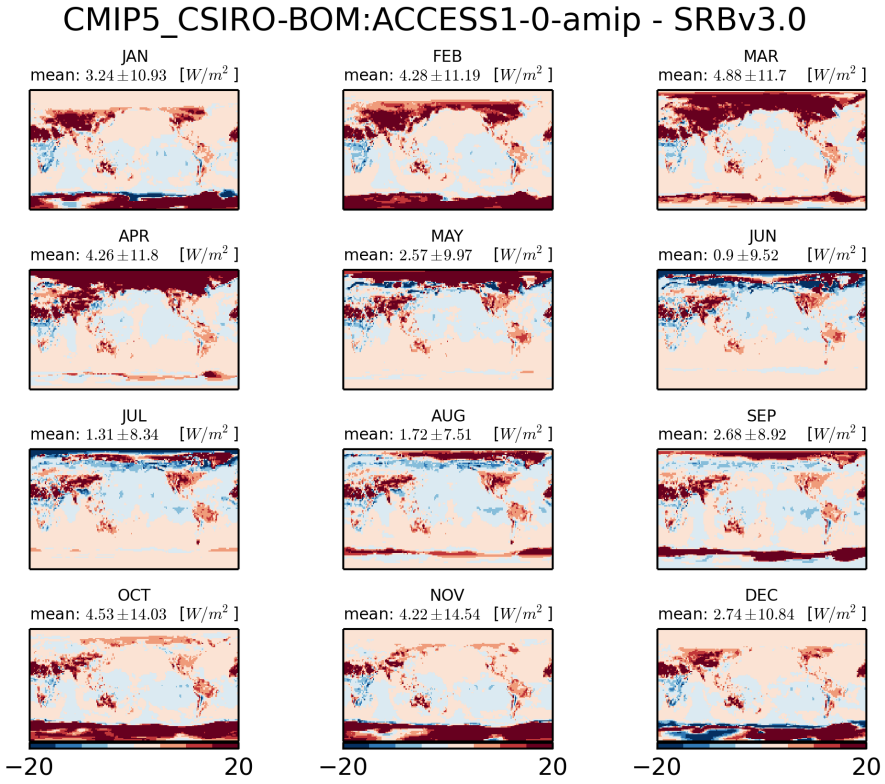



Figure 1222: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and SRBV3.0

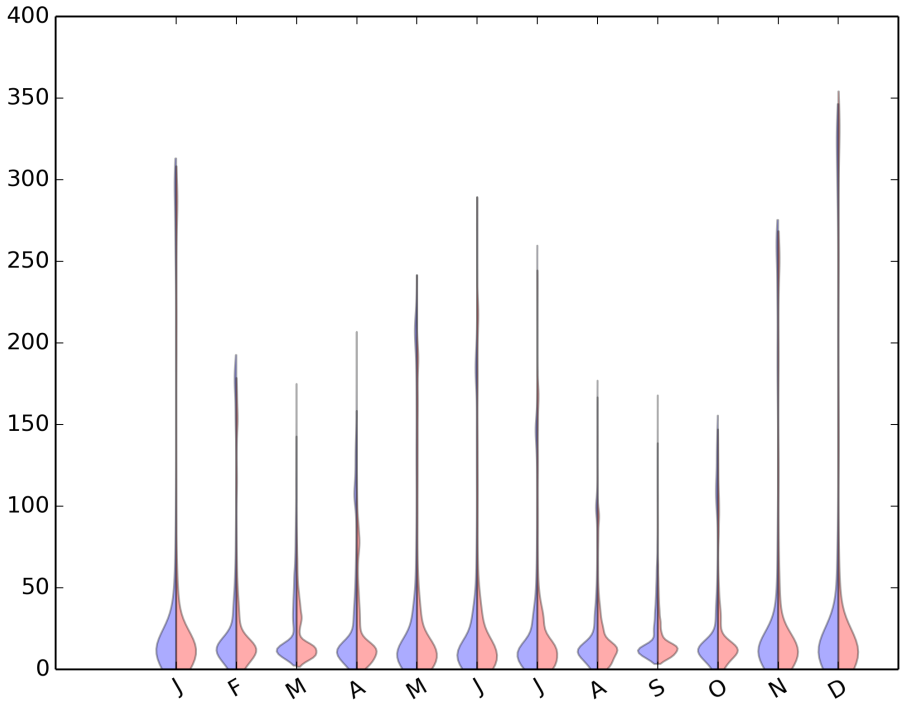



Figure 1223: Violin plot for CMIP5-CSIRO-BOM:ACCESS1-0-AMIP

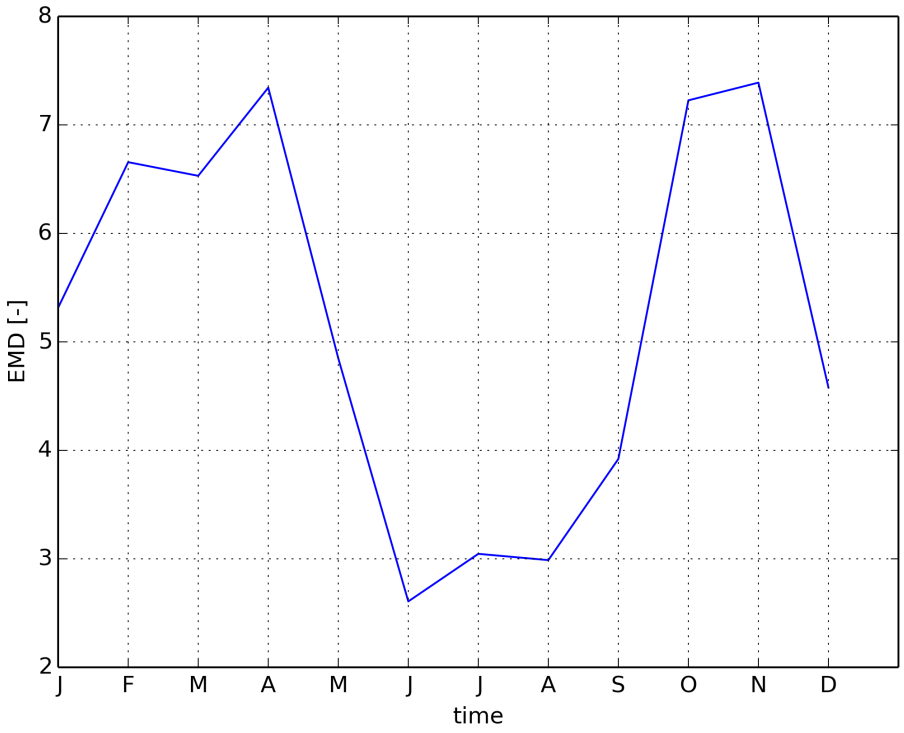



Figure 1224: Timeseries of EMD

### 2.3.20 CMIP5 INM:inmcm4-amip

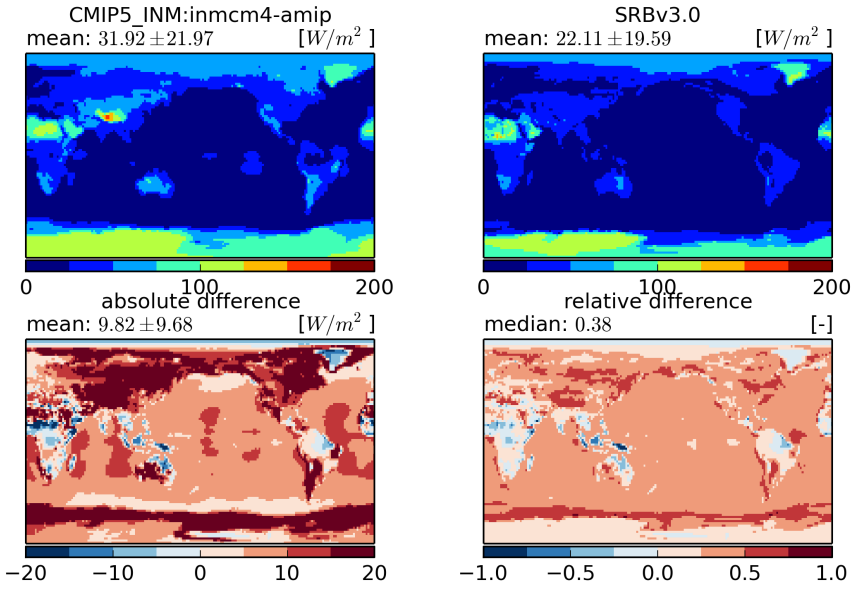



Figure 1225: Temporal mean fields (top) and absolute and relative differences (bottom)

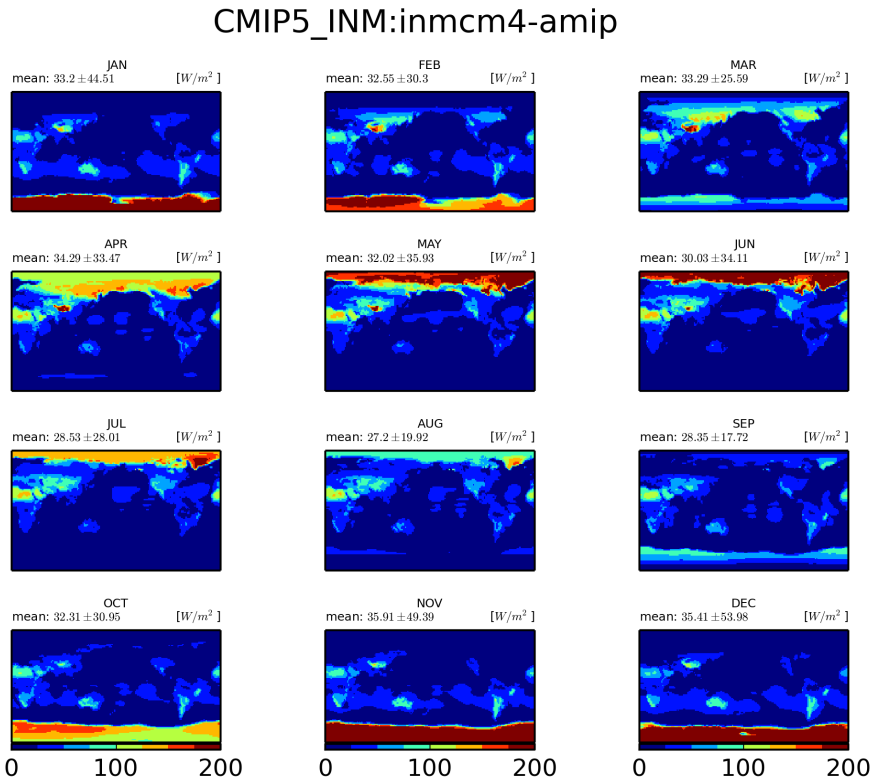



Figure 1226: Monthly mean climatology for INM:inmcm4

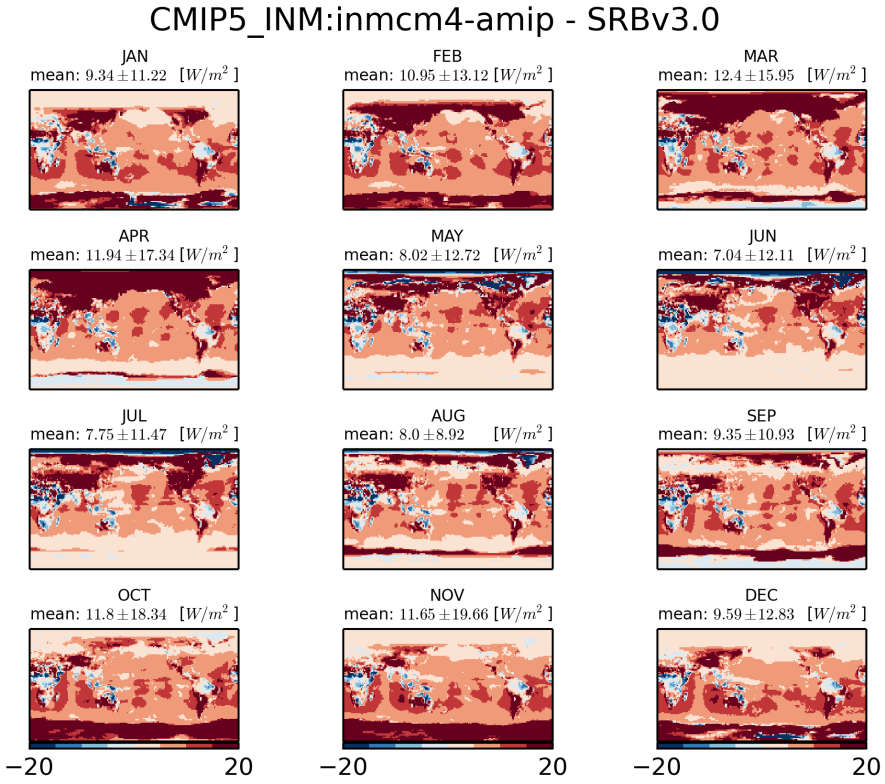



Figure 1227: Monthly mean climatology of difference between INM:INMCM4 and SRBV3.0

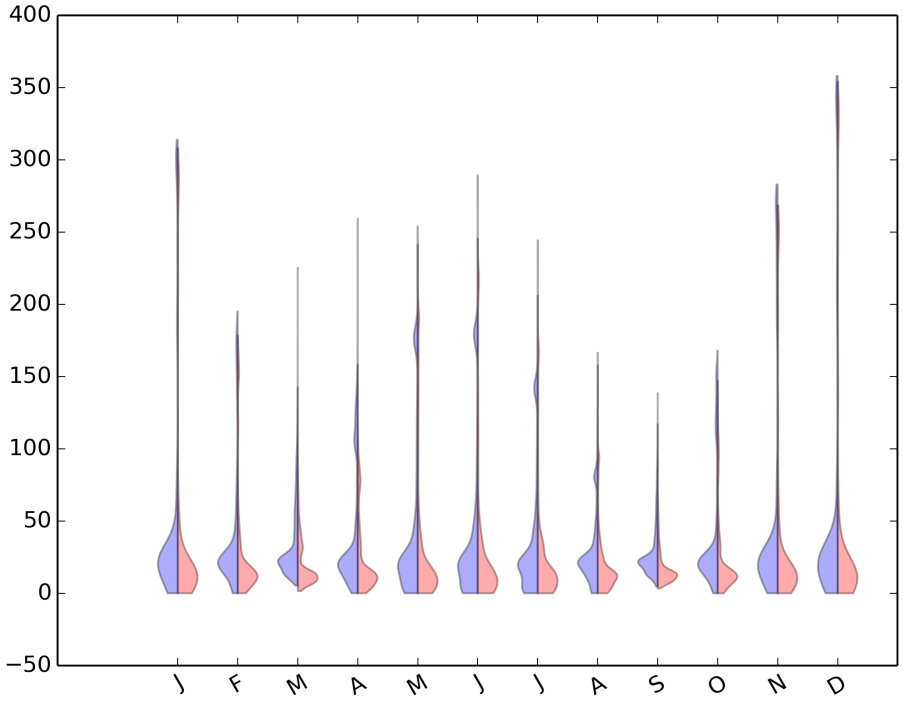



Figure 1228: Violin plot for CMIP5-INM:INMCM4-AMIP

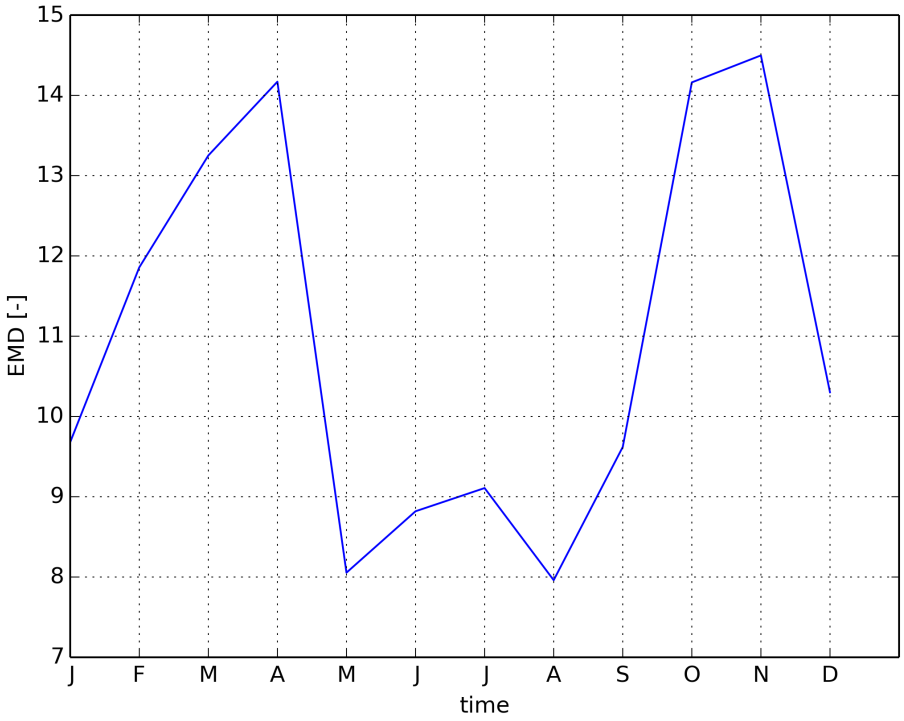



Figure 1229: Timeseries of EMD

### 2.3.21 CMIP5 MPI-M:MPI-ESM-LR-amip

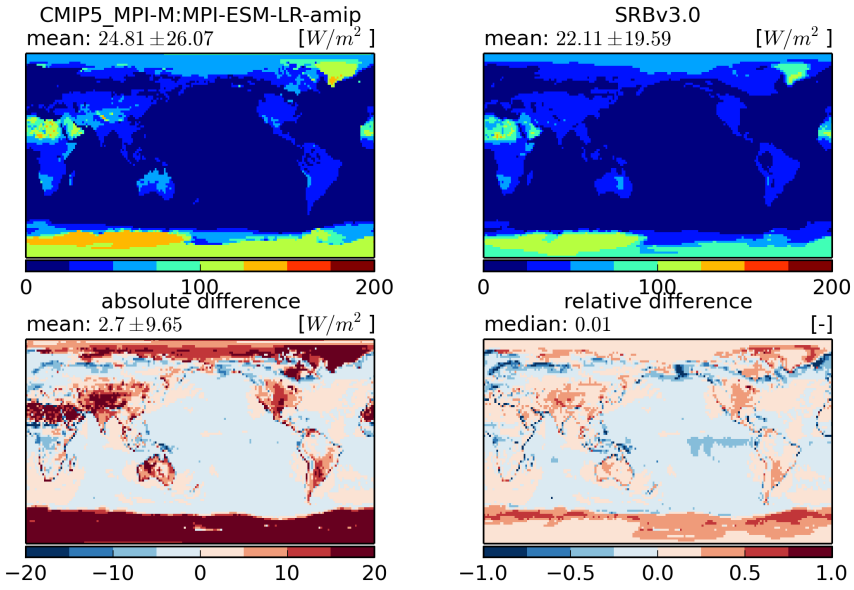



Figure 1230: Temporal mean fields (top) and absolute and relative differences (bottom)

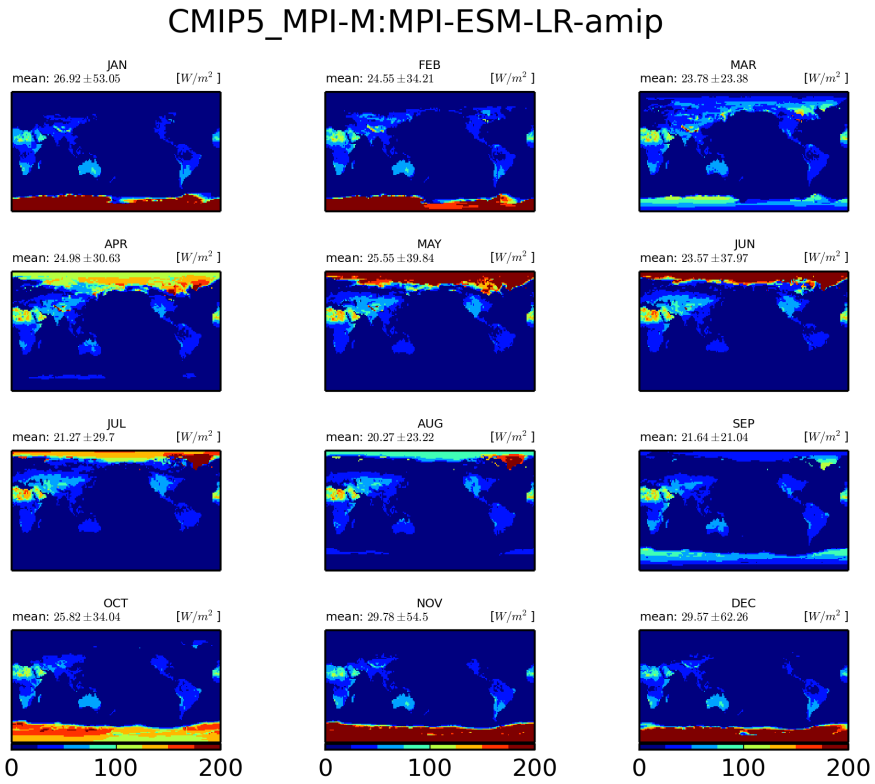



Figure 1231: Monthly mean climatology for MPI-M:MPI-ESM-LR

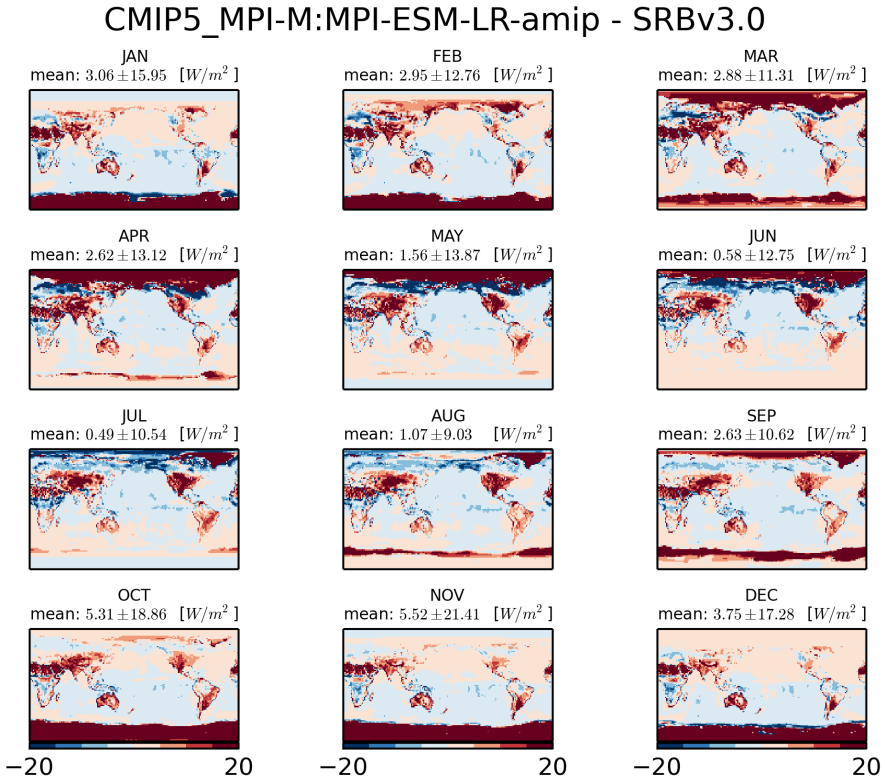



Figure 1232: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and SRBV3.0

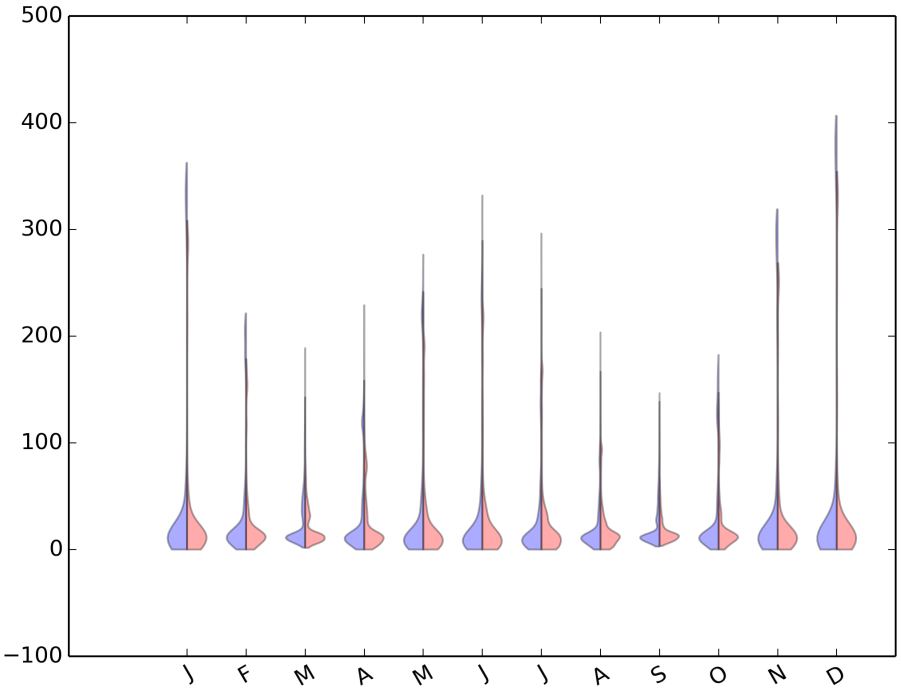



Figure 1233: Violin plot for CMIP5-MPI-M:MPI-ESM-LR-AMIP

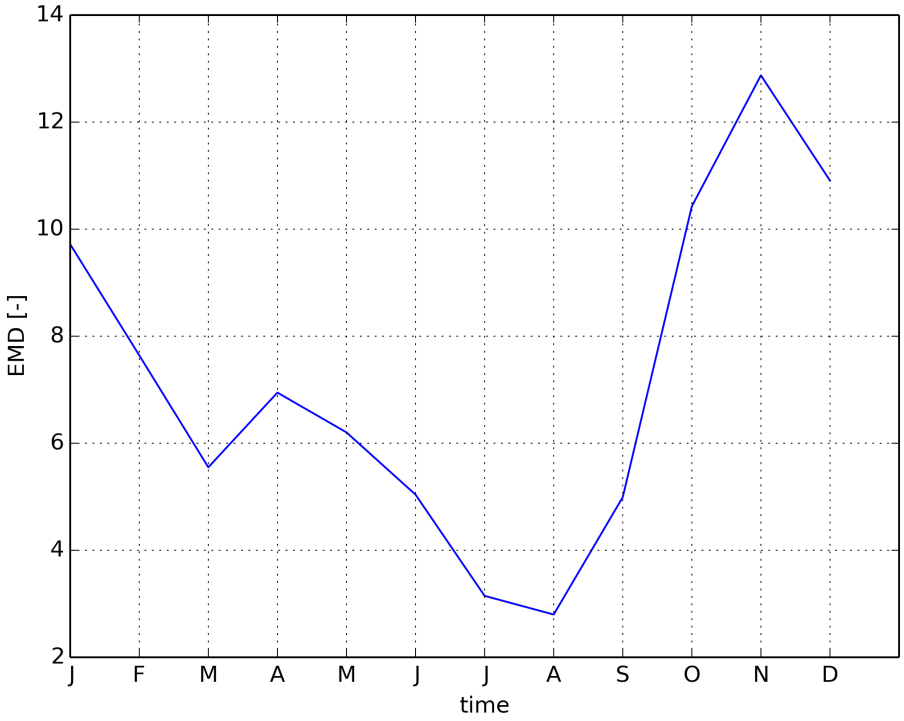



Figure 1234: Timeseries of EMD

### 2.3.22 CMIP5 MPI-M:MPI-ESM-MR-amip

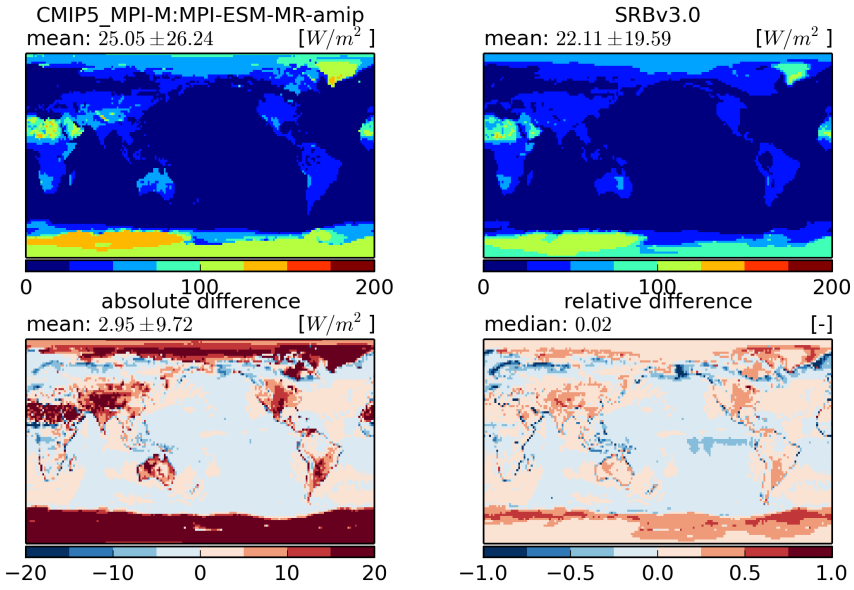



Figure 1235: Temporal mean fields (top) and absolute and relative differences (bottom)

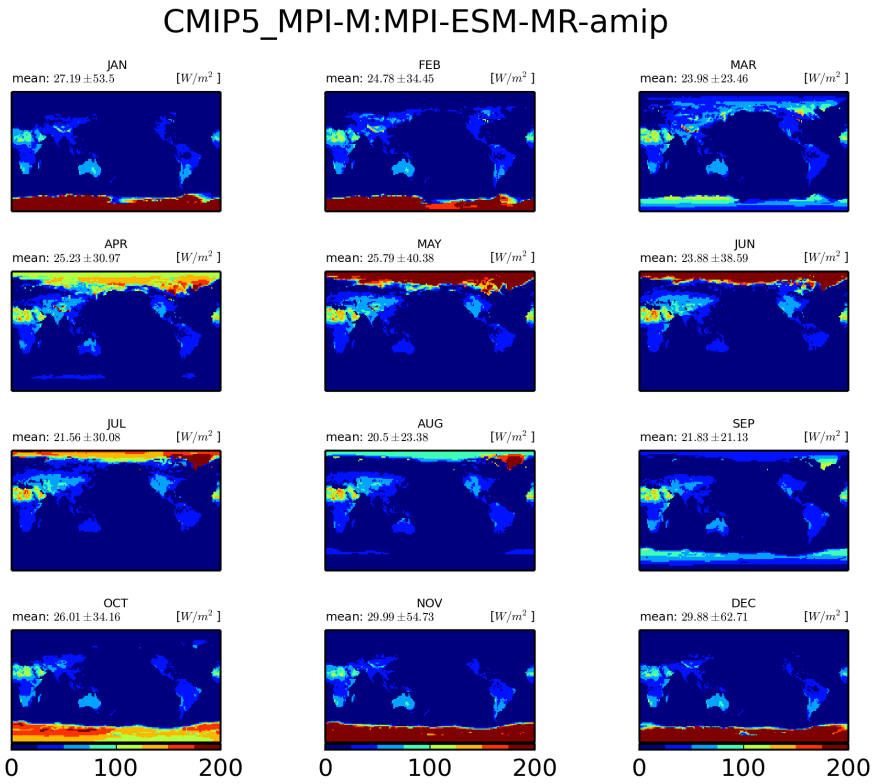



Figure 1236: Monthly mean climatology for MPI-M:MPI-ESM-MR

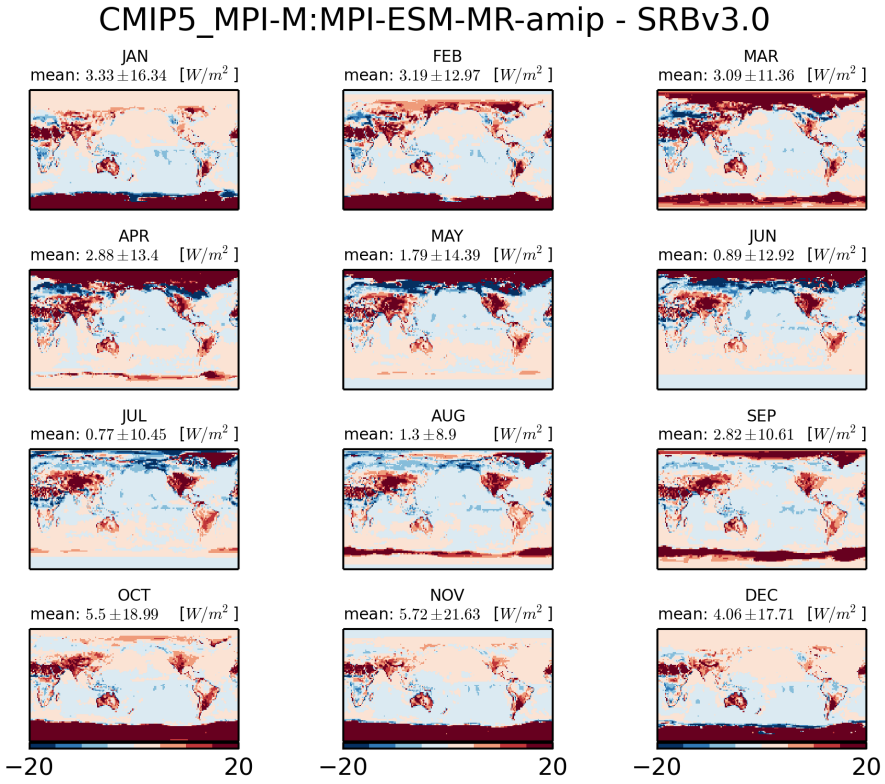



Figure 1237: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and SRBV3.0

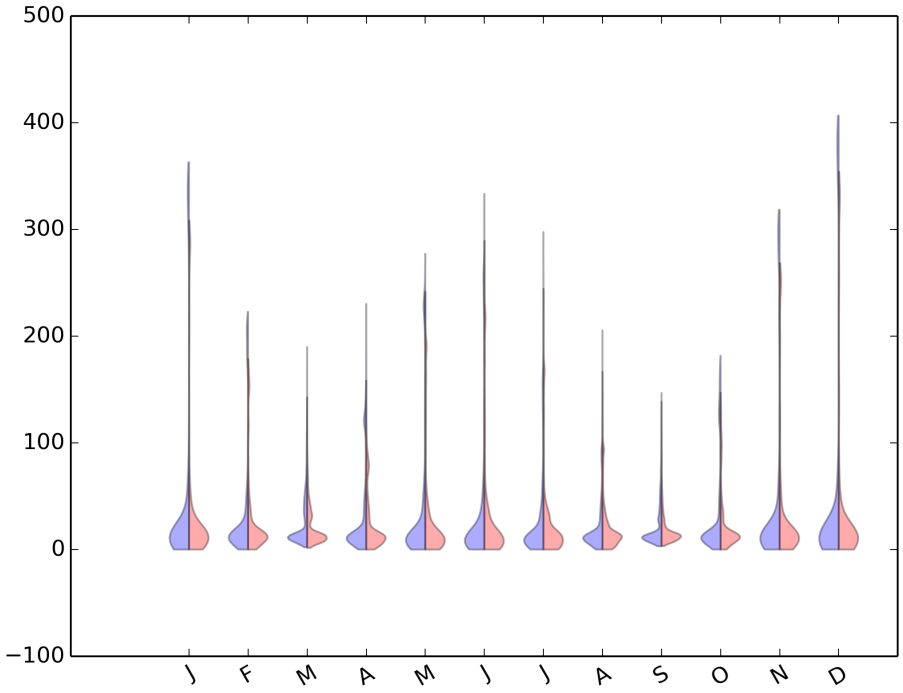



Figure 1238: Violin plot for CMIP5-MPI-M:MPI-ESM-MR-AMIP

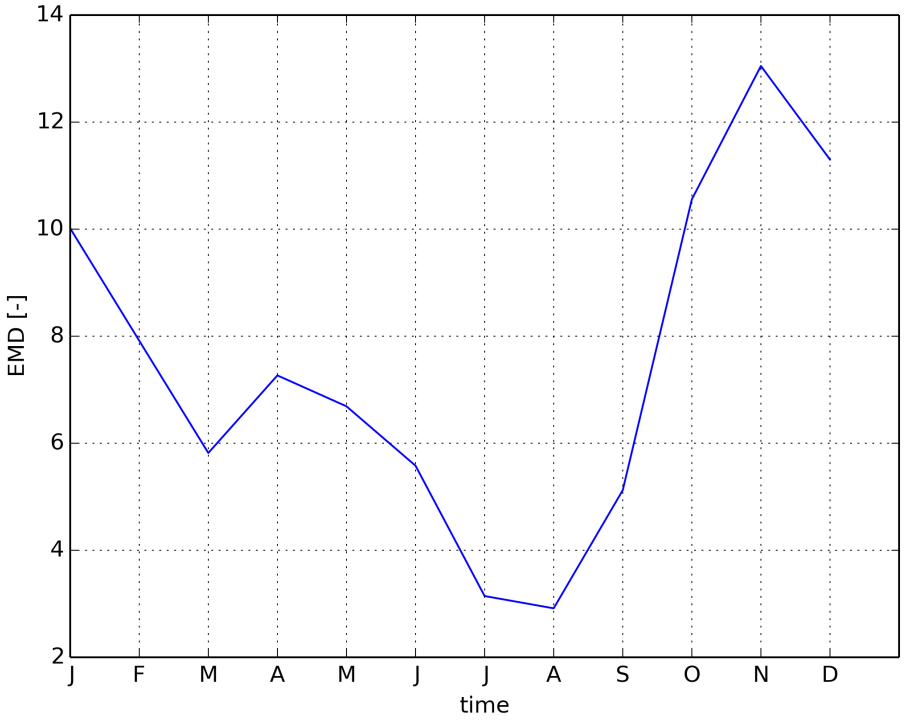



Figure 1239: Timeseries of EMD

### 2.3.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

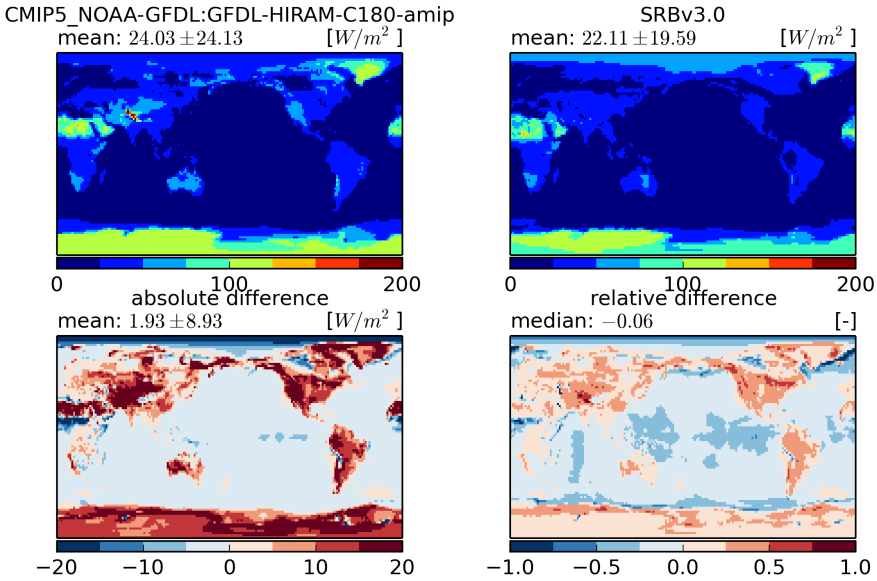



Figure 1240: Temporal mean fields (top) and absolute and relative differences (bottom)

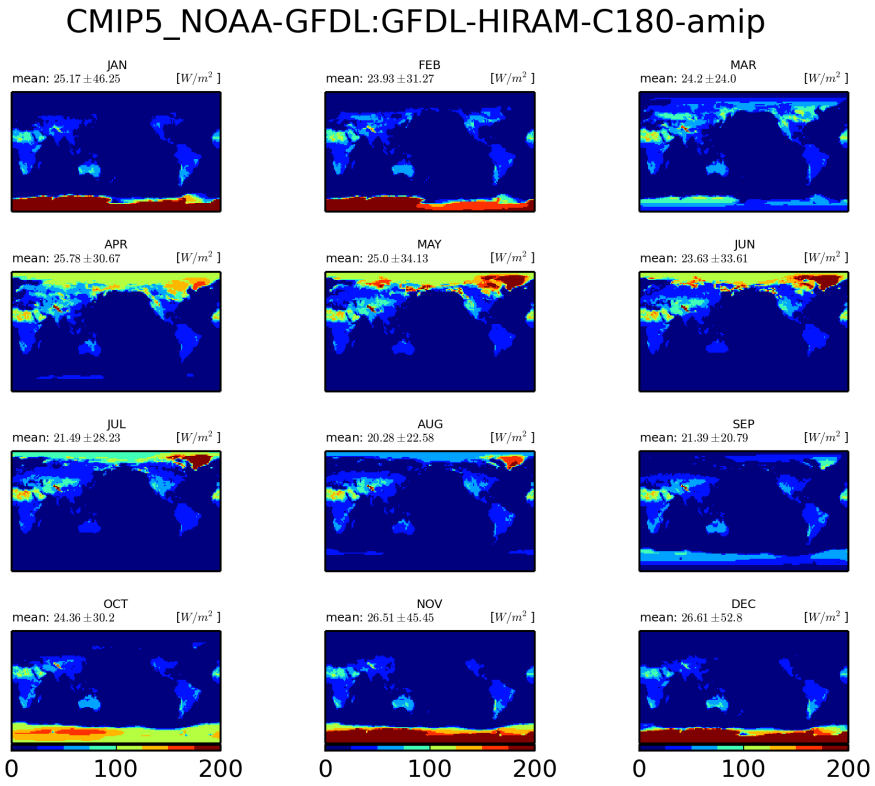



Figure 1241: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

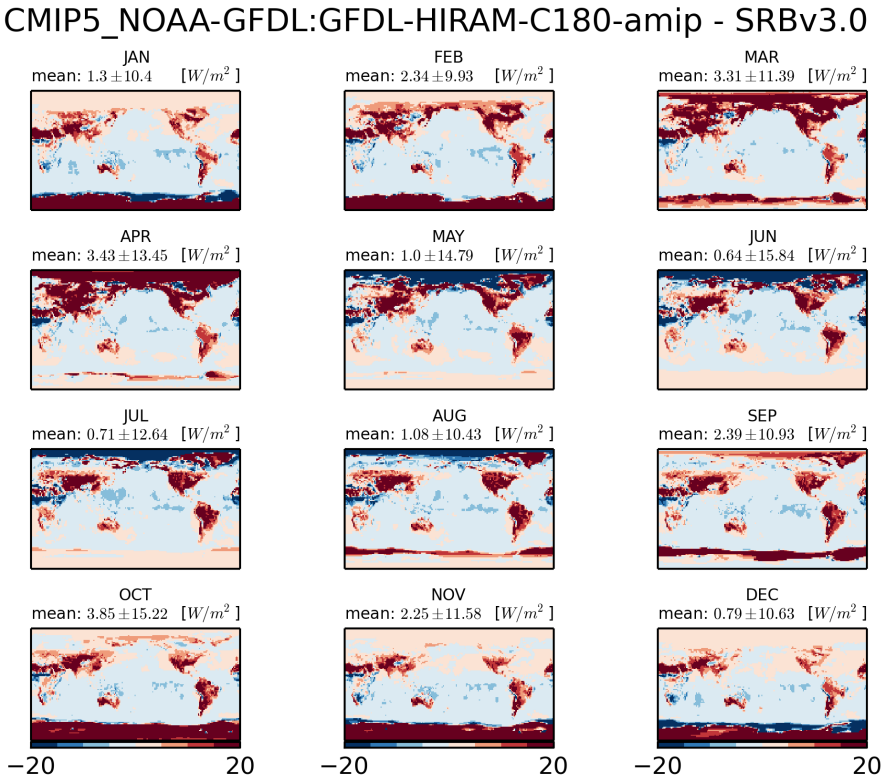



Figure 1242: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and SRBV3.0

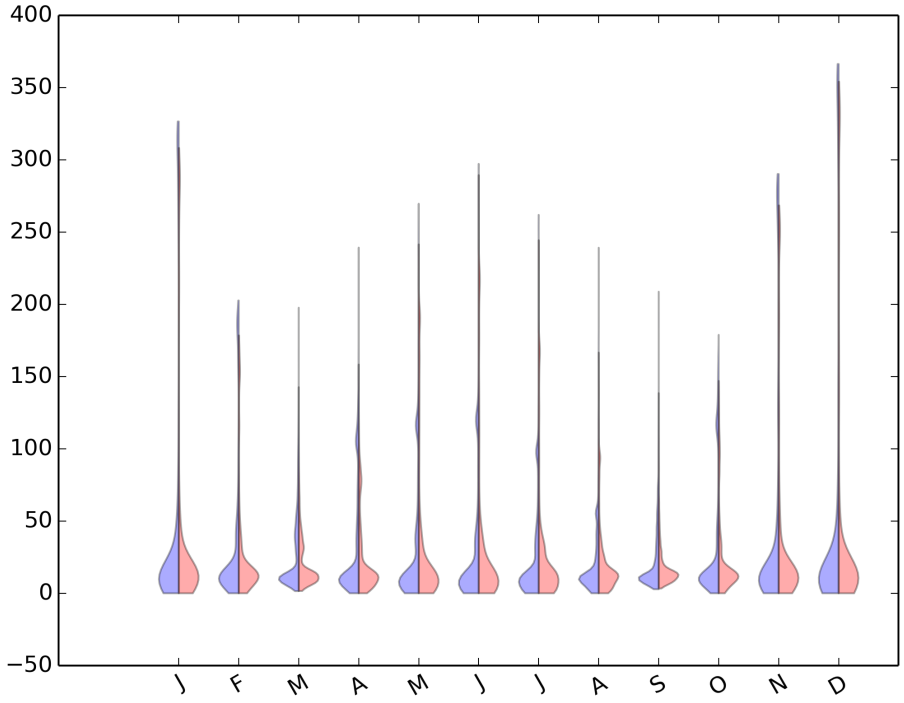



Figure 1243: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-AMIP

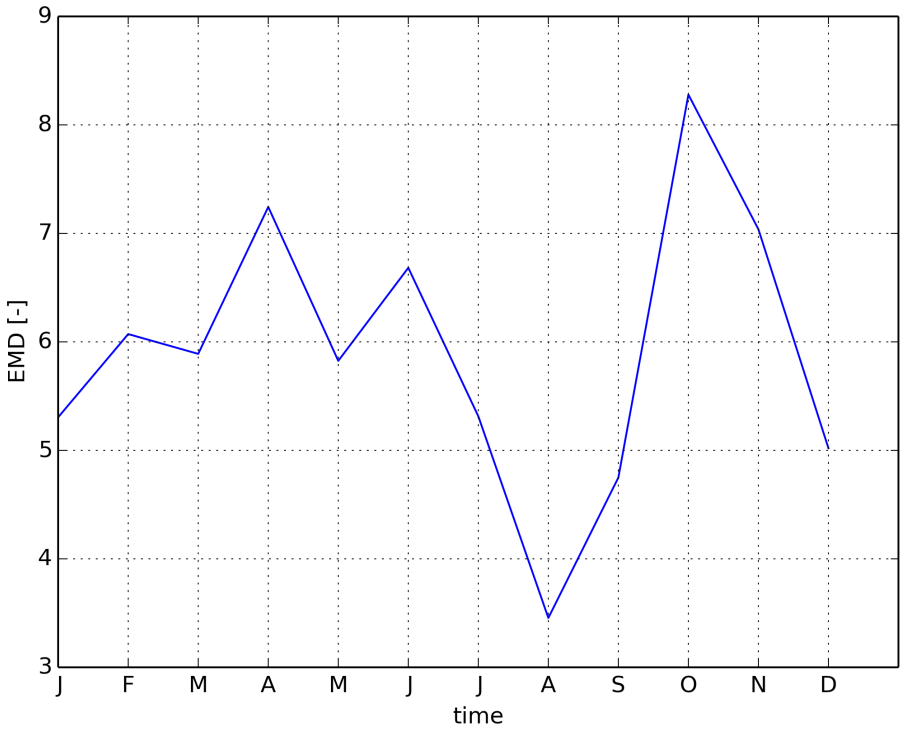



Figure 1244: Timeseries of EMD

### 2.3.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

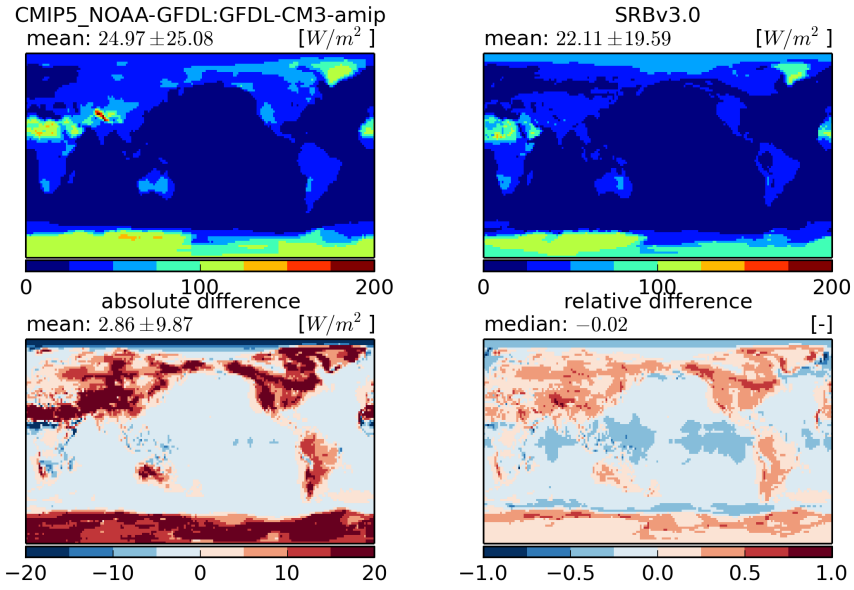



Figure 1245: Temporal mean fields (top) and absolute and relative differences (bottom)

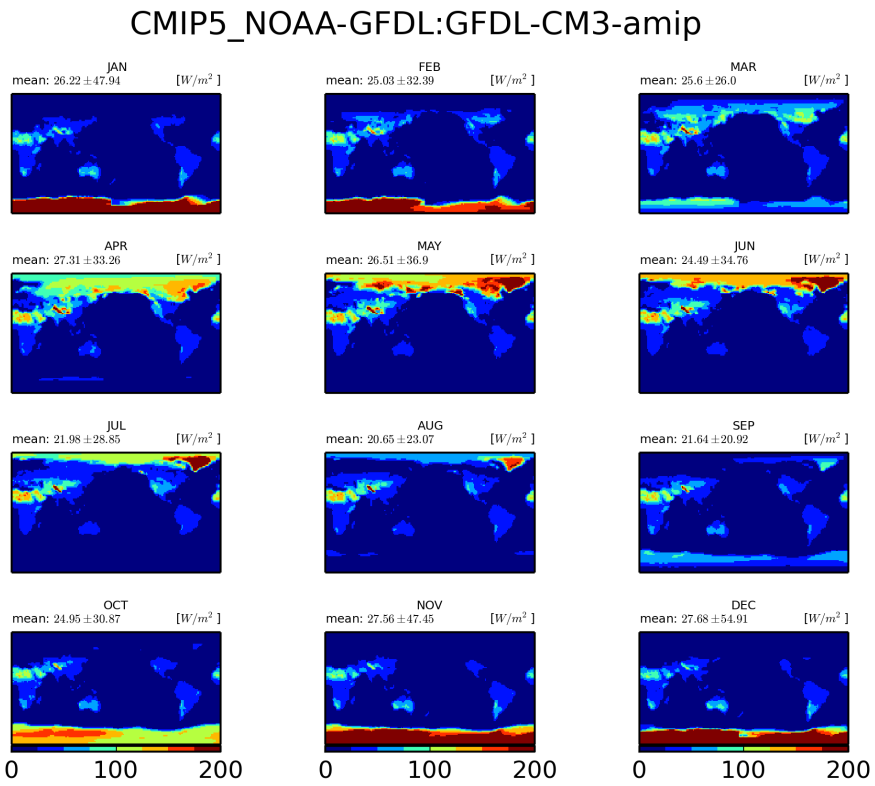



Figure 1246: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

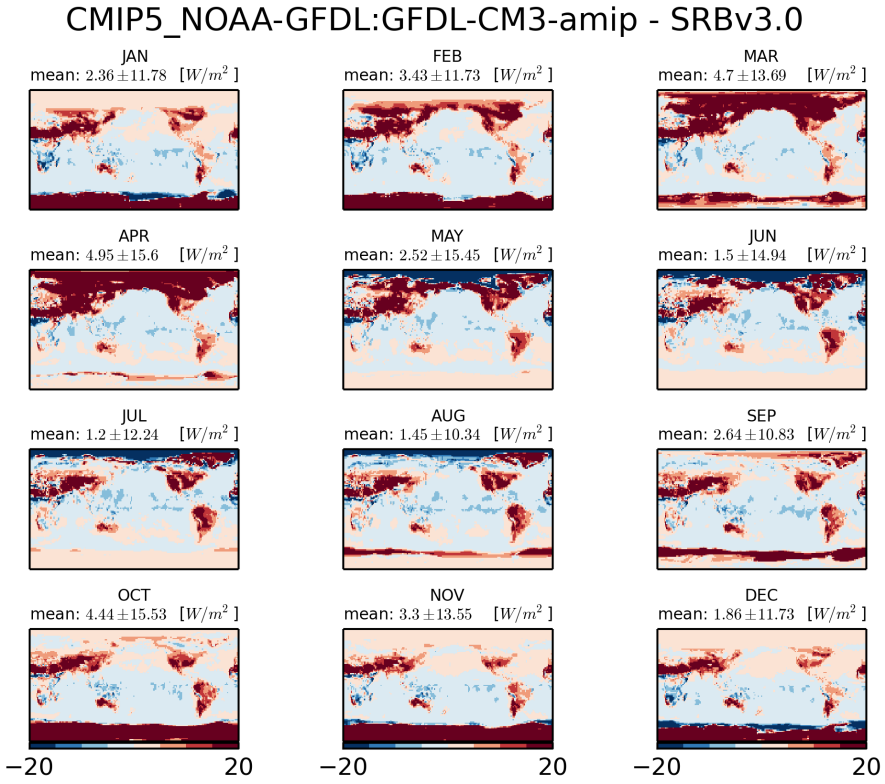



Figure 1247: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and SRBV3.0

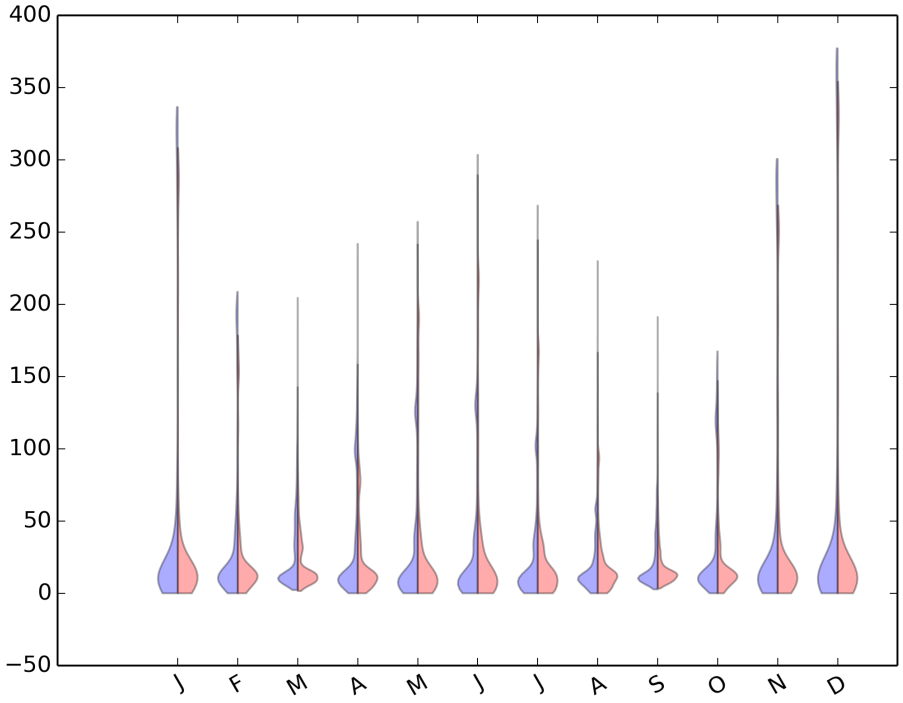



Figure 1248: Violin plot for CMIP5-NOAA-GFDL:GFDL-CM3-AMIP

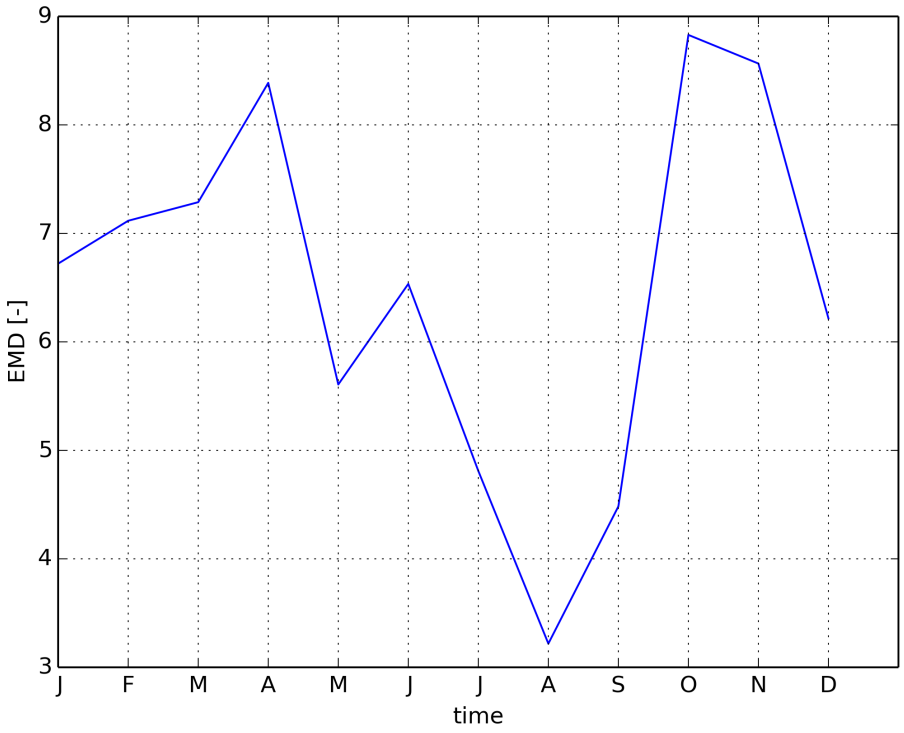



Figure 1249: Timeseries of EMD

### 2.3.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

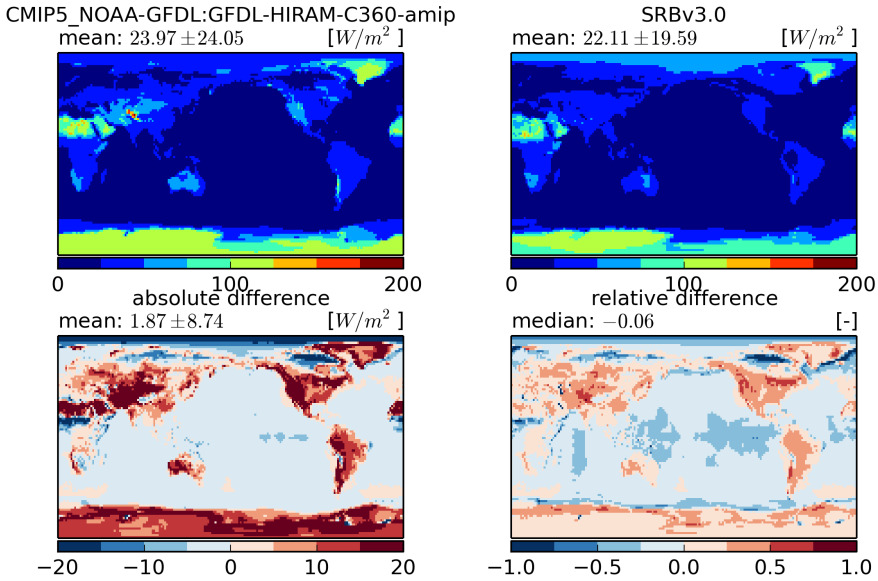



Figure 1250: Temporal mean fields (top) and absolute and relative differences (bottom)

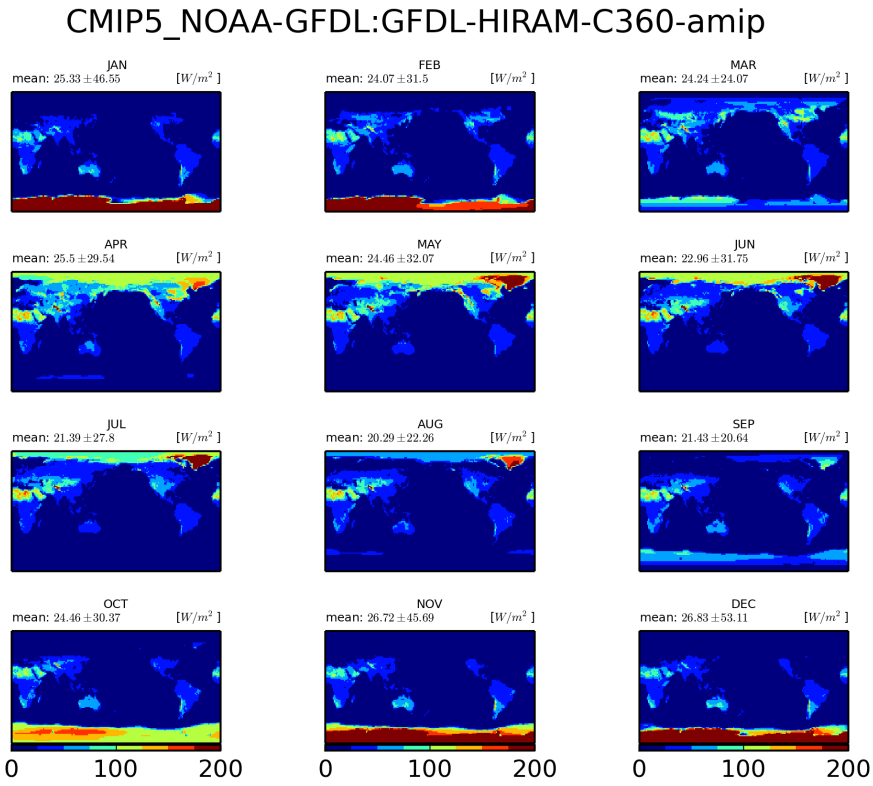



Figure 1251: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

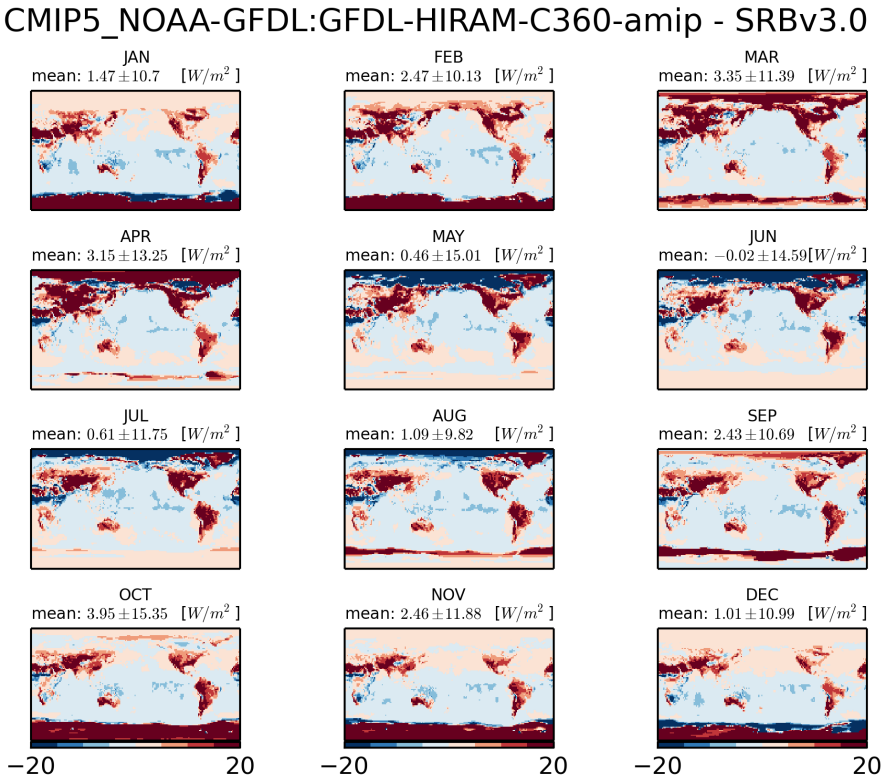



Figure 1252: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and SRBV3.0

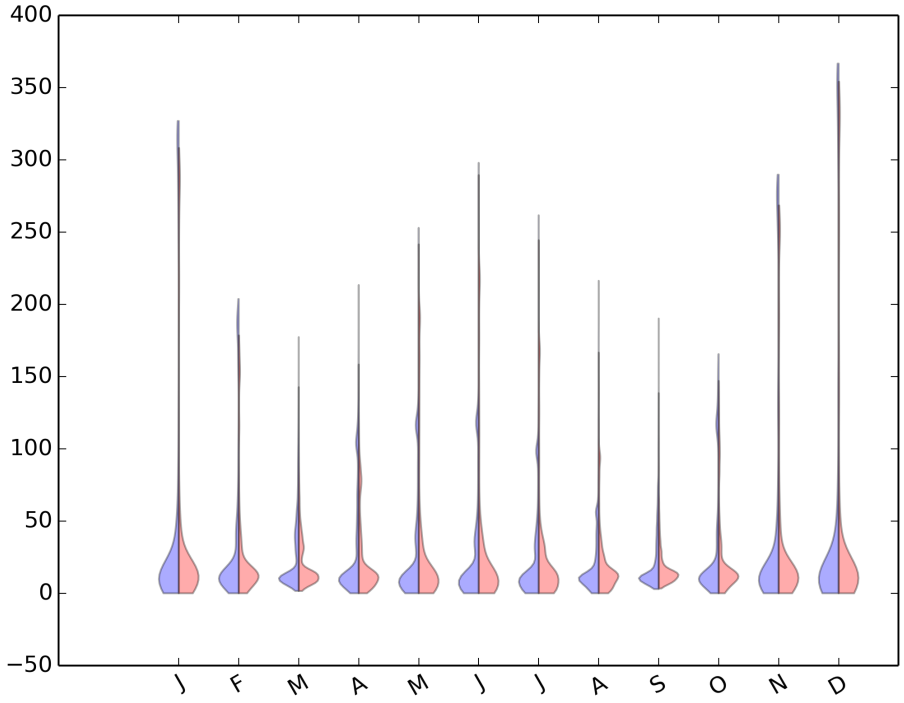



Figure 1253: Violin plot for CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-AMIP

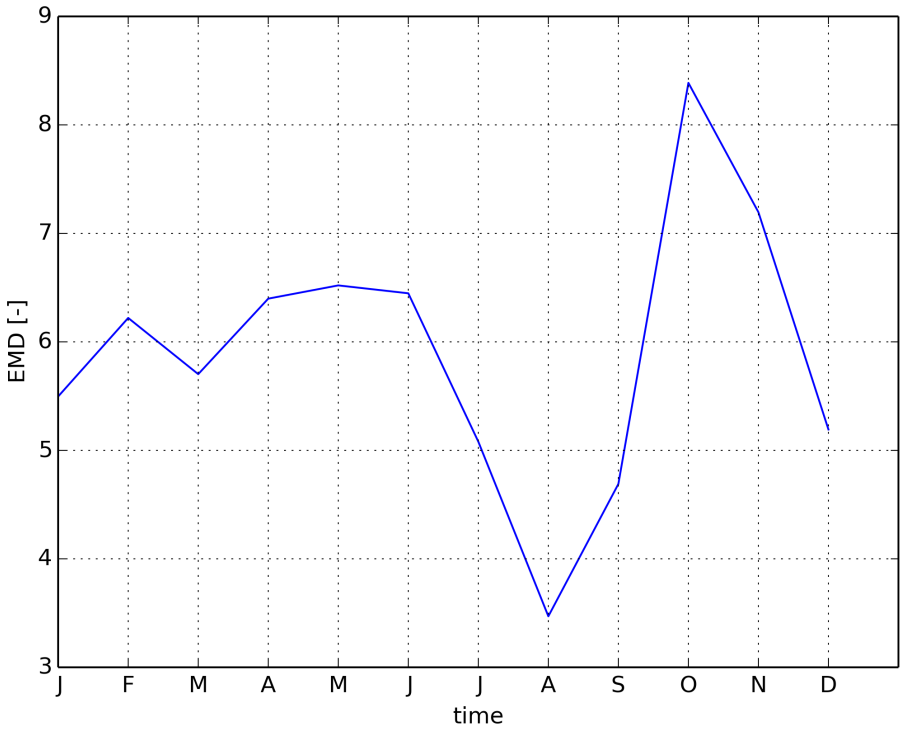



Figure 1254: Timeseries of EMD

### 2.3.26 CMIP5 NCAR:CCSM4-amip

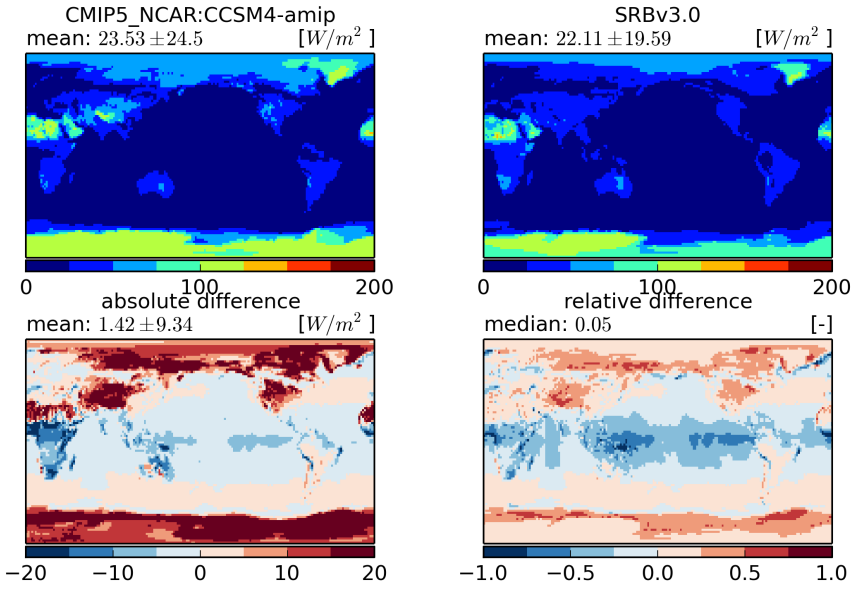



Figure 1255: Temporal mean fields (top) and absolute and relative differences (bottom)

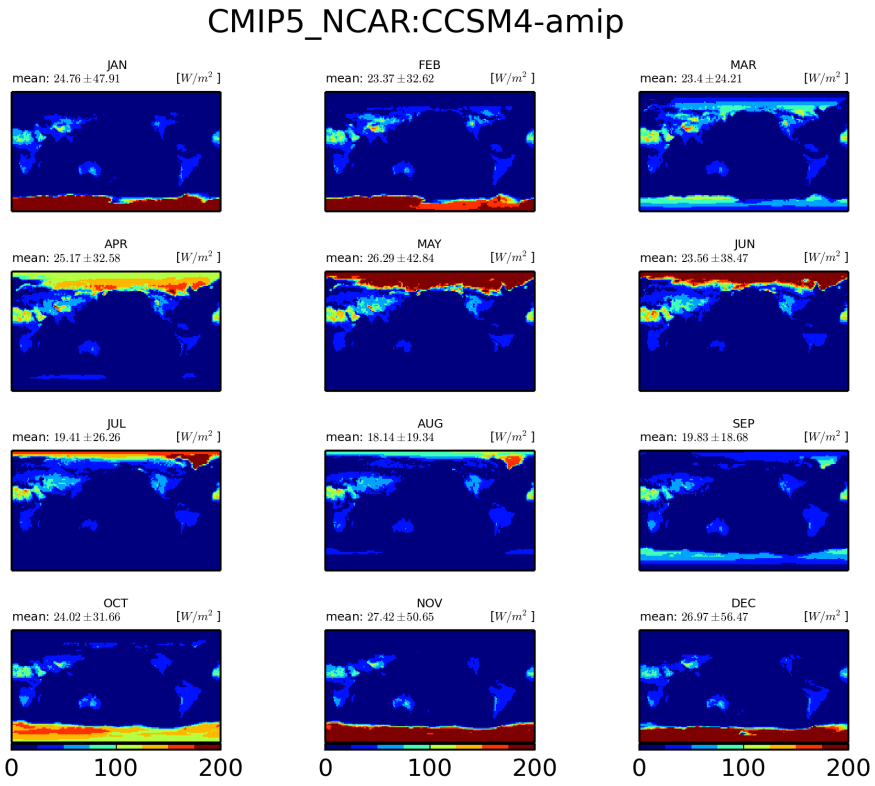



Figure 1256: Monthly mean climatology for NCAR:CCSM4

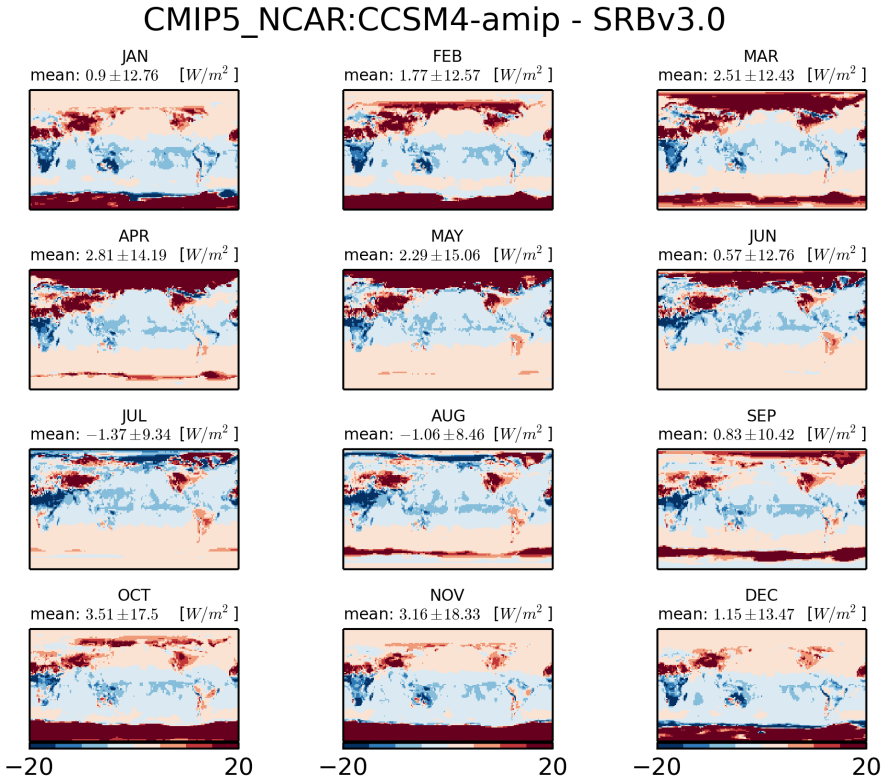



Figure 1257: Monthly mean climatology of difference between NCAR:CCSM4 and SRBV3.0

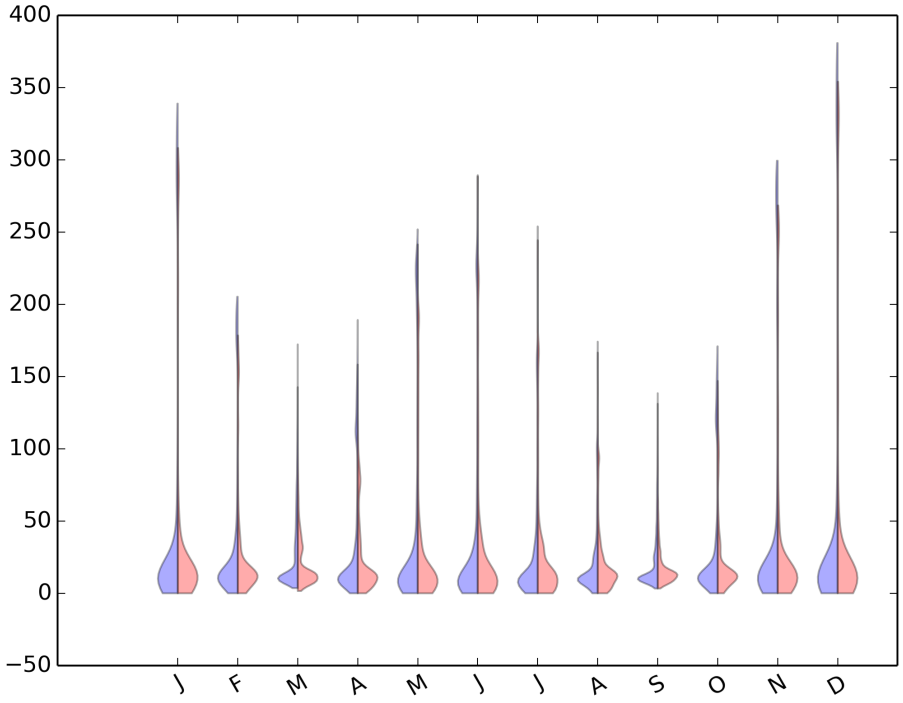



Figure 1258: Violin plot for CMIP5-NCAR:CCSM4-AMIP

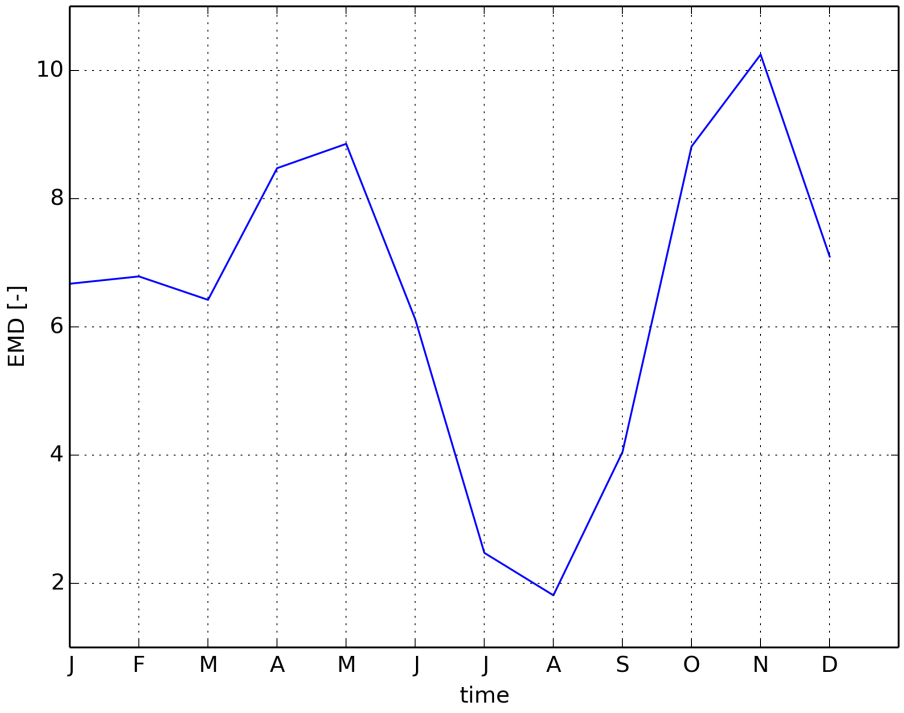



Figure 1259: Timeseries of EMD

### 2.3.27 CMIP5 NCC:NorESM1-M-amip

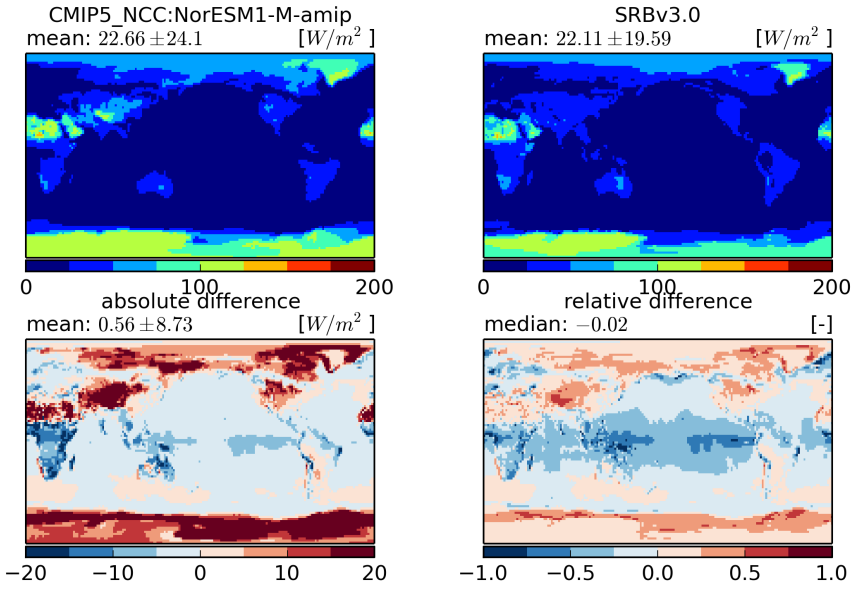



Figure 1260: Temporal mean fields (top) and absolute and relative differences (bottom)

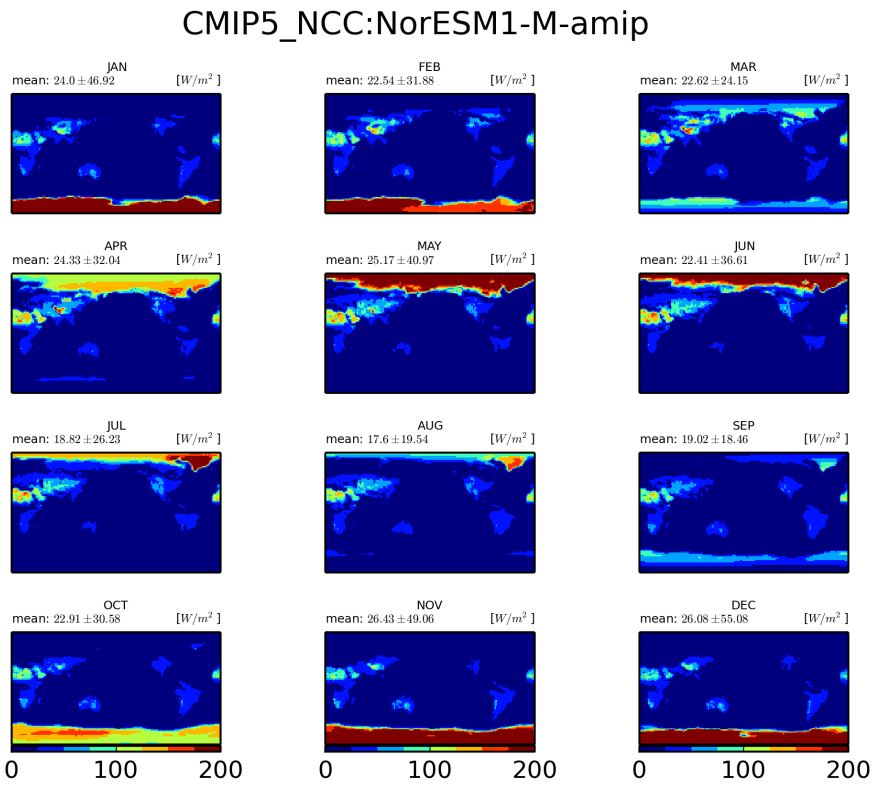



Figure 1261: Monthly mean climatology for NCC:NorESM1-M

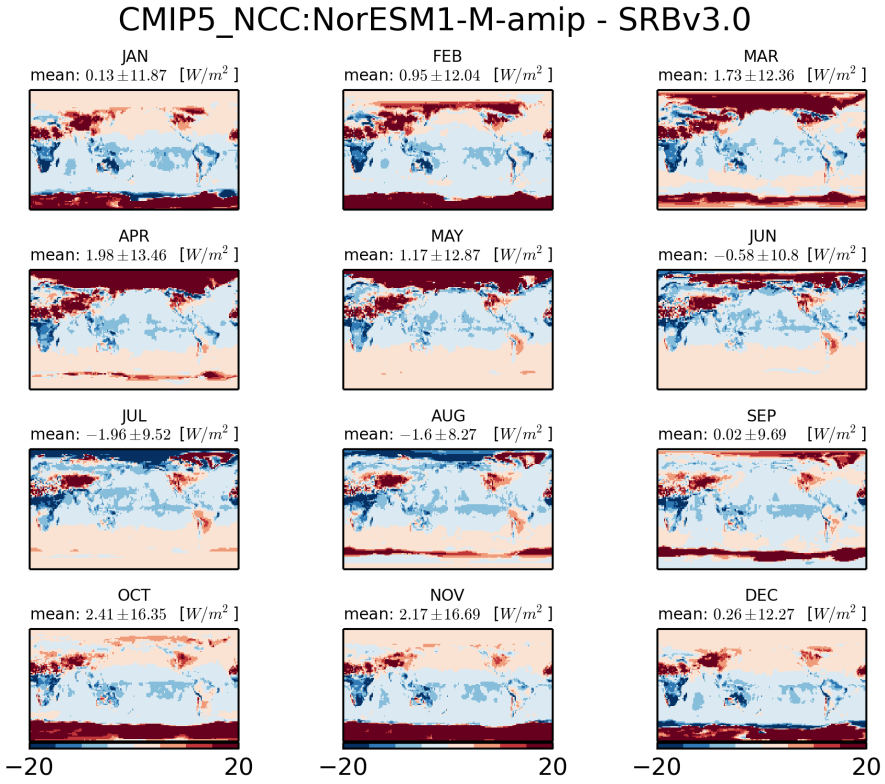



Figure 1262: Monthly mean climatology of difference between NCC:NORESM1-M and SRBV3.0

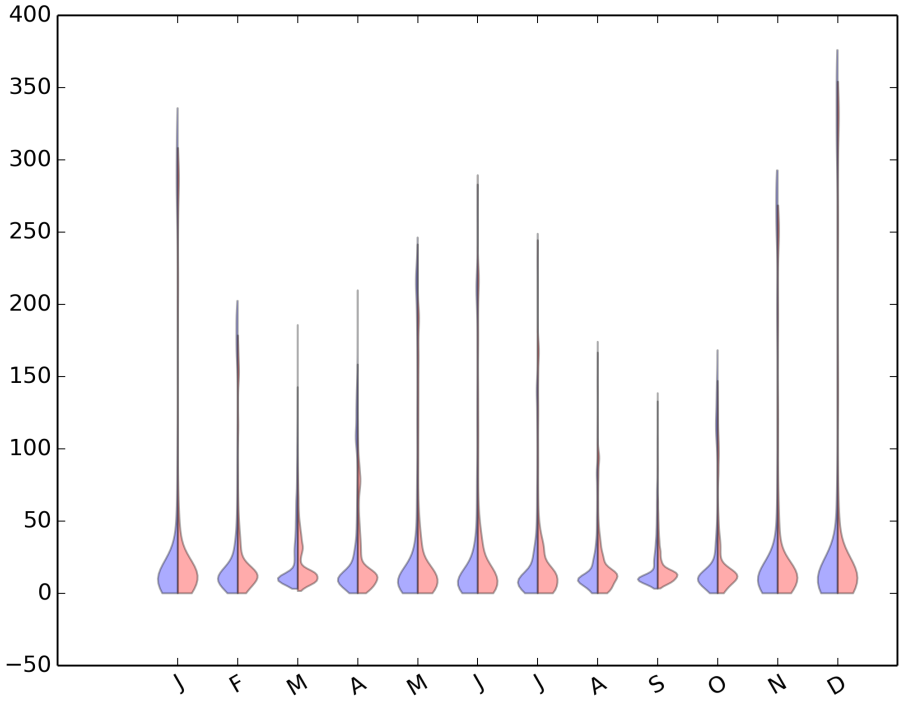



Figure 1263: Violin plot for CMIP5-NCC:NORESM1-M-AMIP

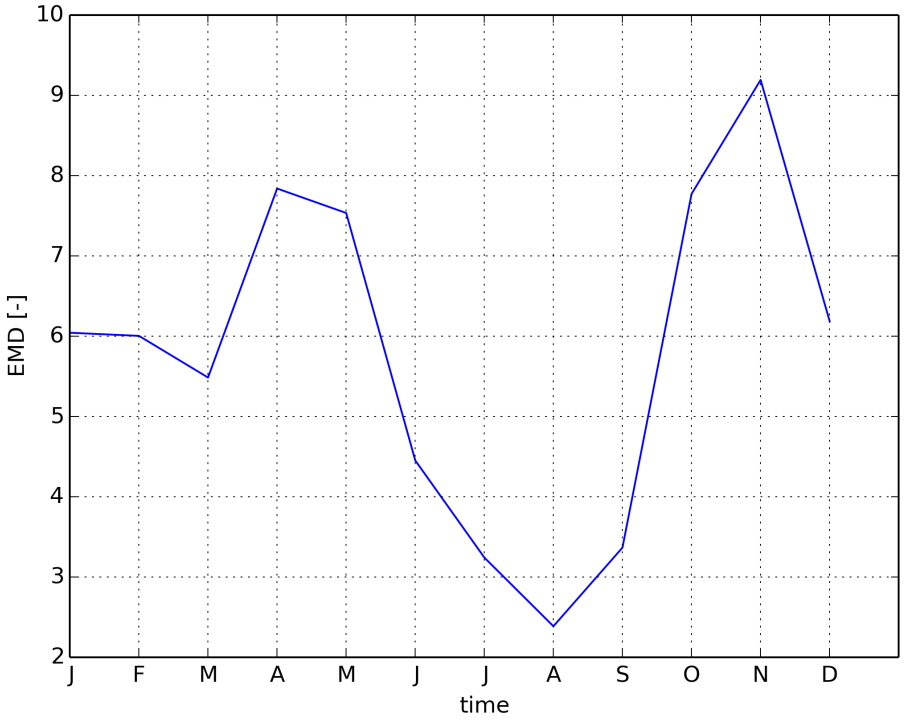



Figure 1264: Timeseries of EMD

### 2.3.28 CMIP3 iap fgoals1 0 g-amip

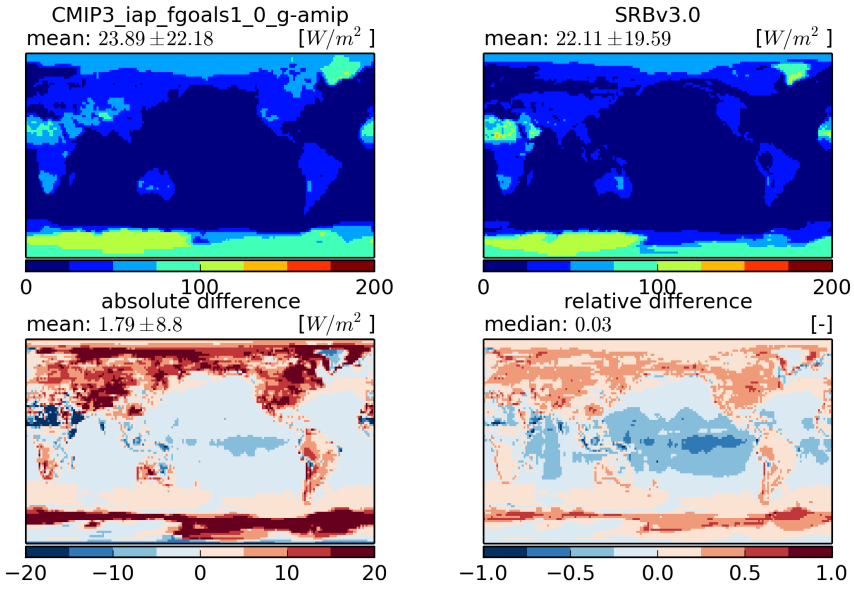



Figure 1265: Temporal mean fields (top) and absolute and relative differences (bottom)

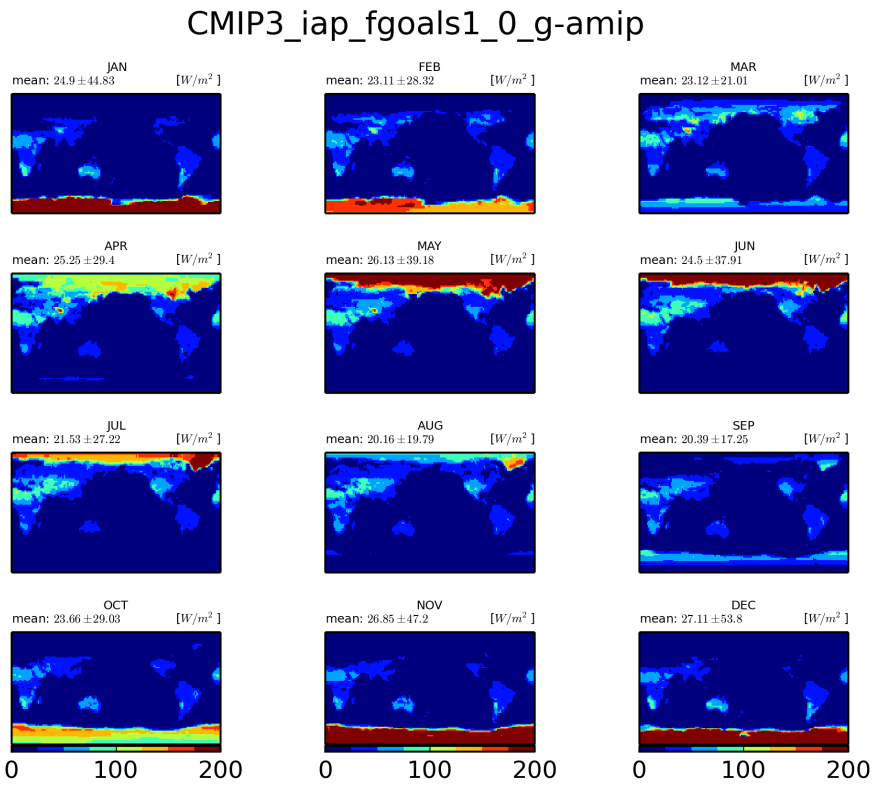



Figure 1266: Monthly mean climatology for iap-fgoals1-0-g

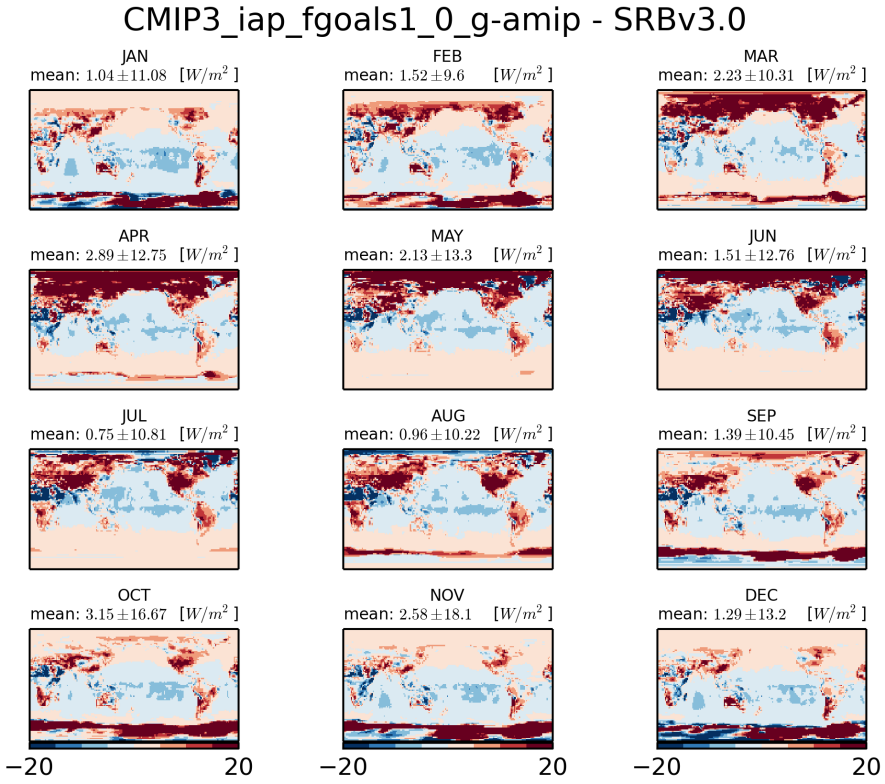



Figure 1267: Monthly mean climatology of difference between IAP-FGOALS1-0-G and SRBV3.0

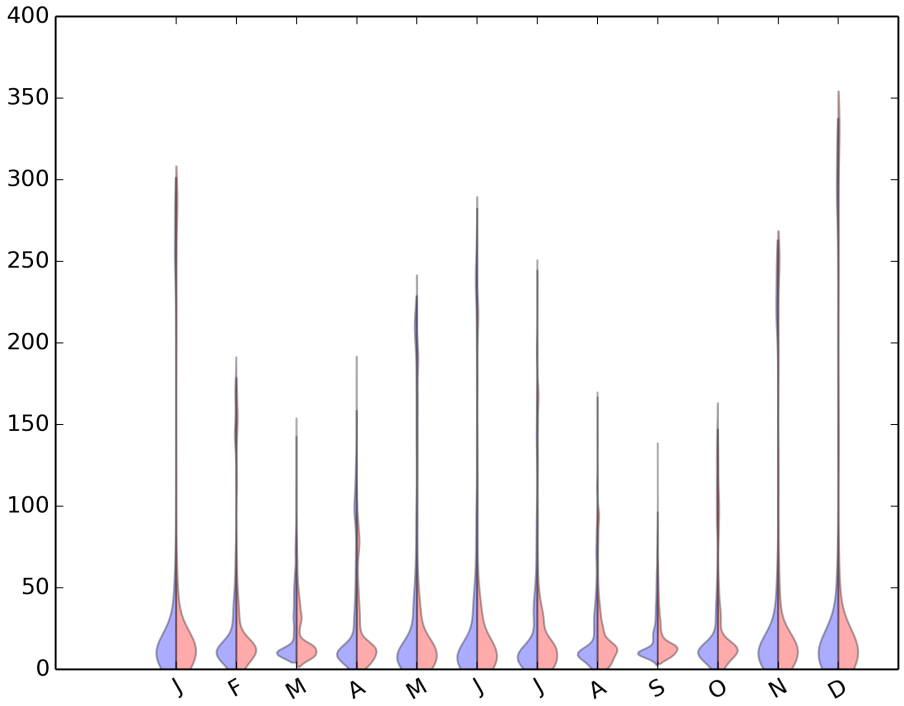



Figure 1268: Violin plot for CMIP3-IAP-FGOALS1-0-G-AMIP

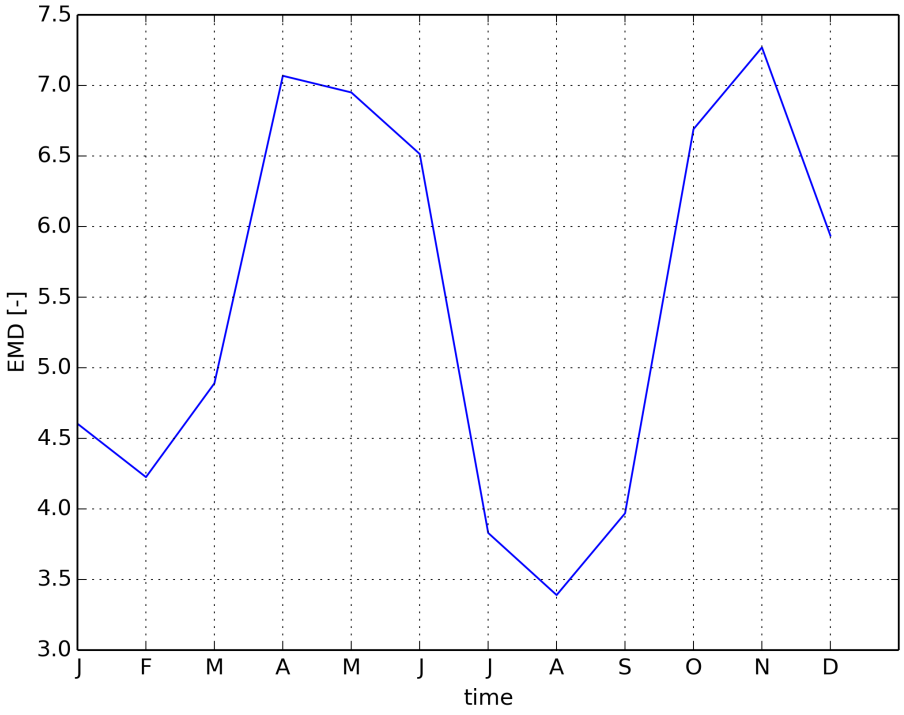



Figure 1269: Timeseries of EMD

### 2.3.29 CMIP3 inmcm3 0-amip

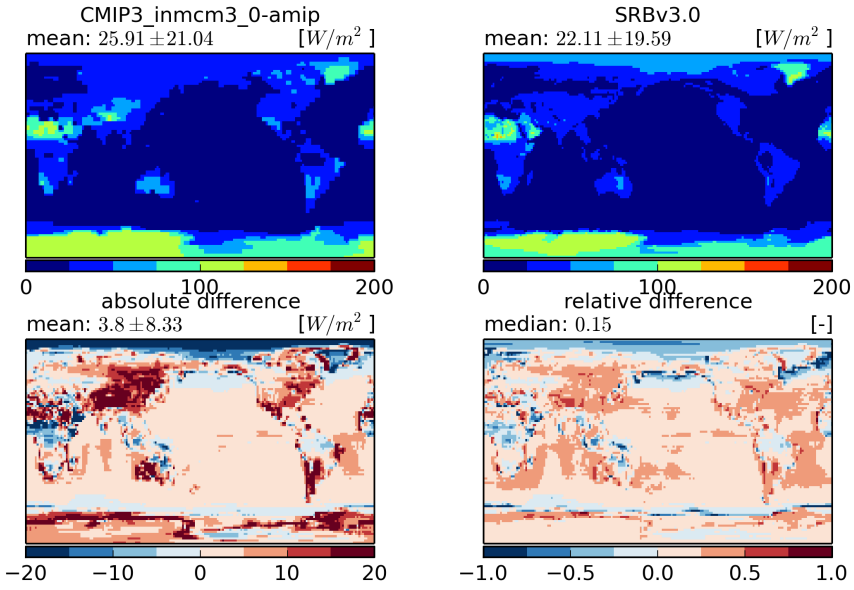



Figure 1270: Temporal mean fields (top) and absolute and relative differences (bottom)

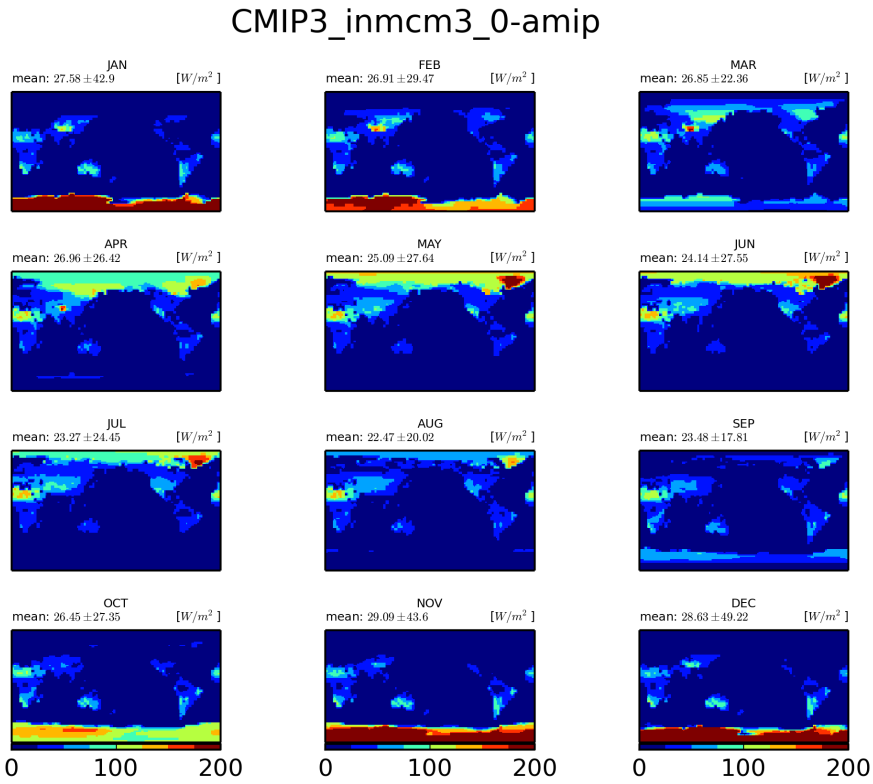



Figure 1271: Monthly mean climatology for inmcm3-0

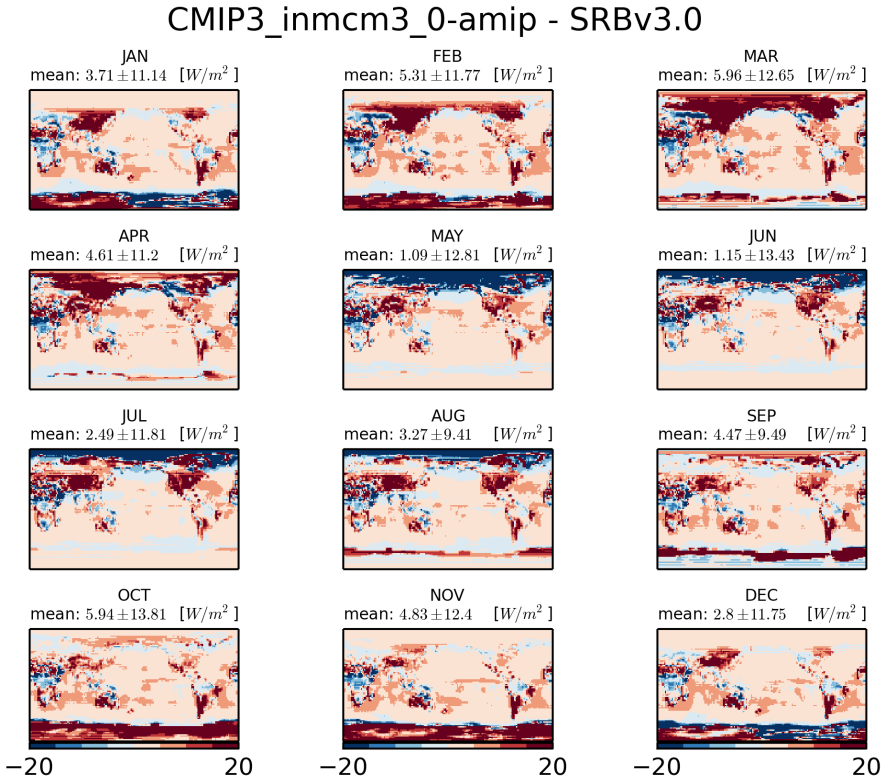



Figure 1272: Monthly mean climatology of difference between INMCM3-0 and SRBV3.0

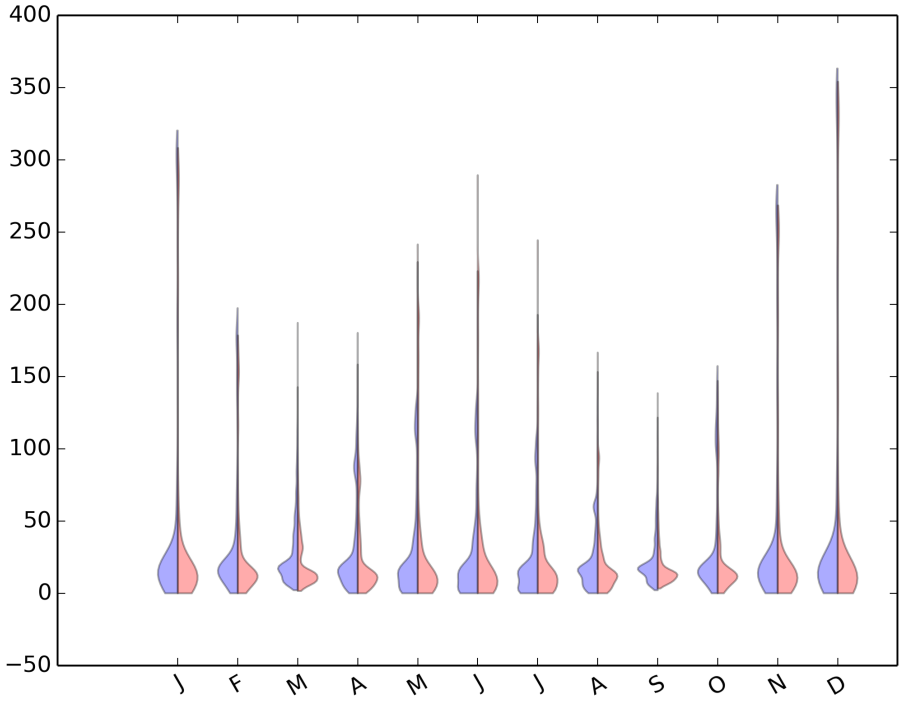



Figure 1273: Violin plot for CMIP3-INMCM3-0-AMIP

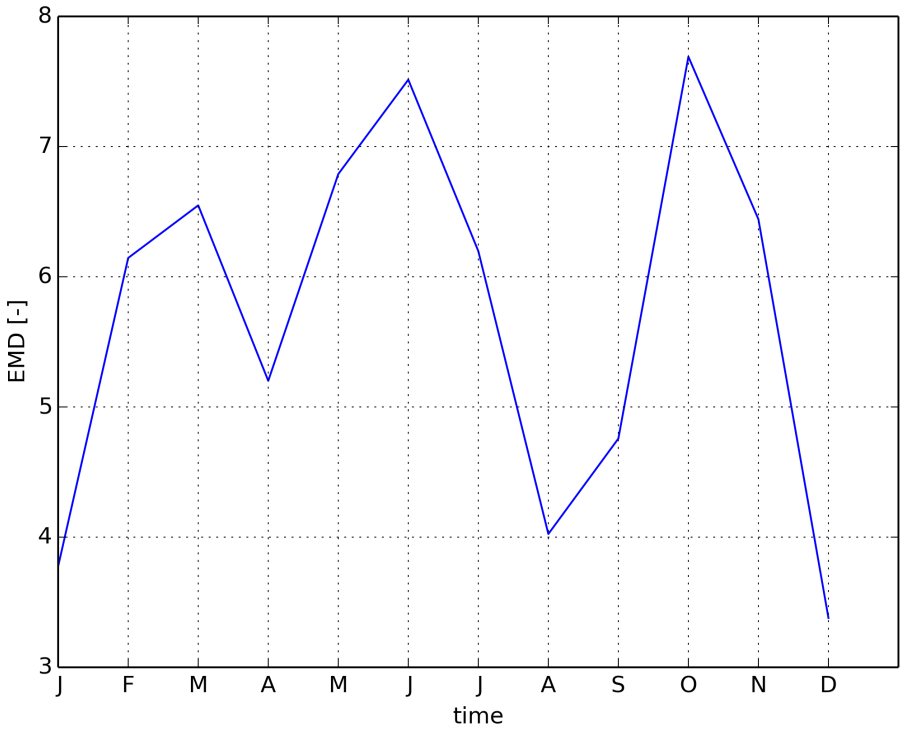



Figure 1274: Timeseries of EMD

### 2.3.30 CMIP3 ipsl cm4-amip

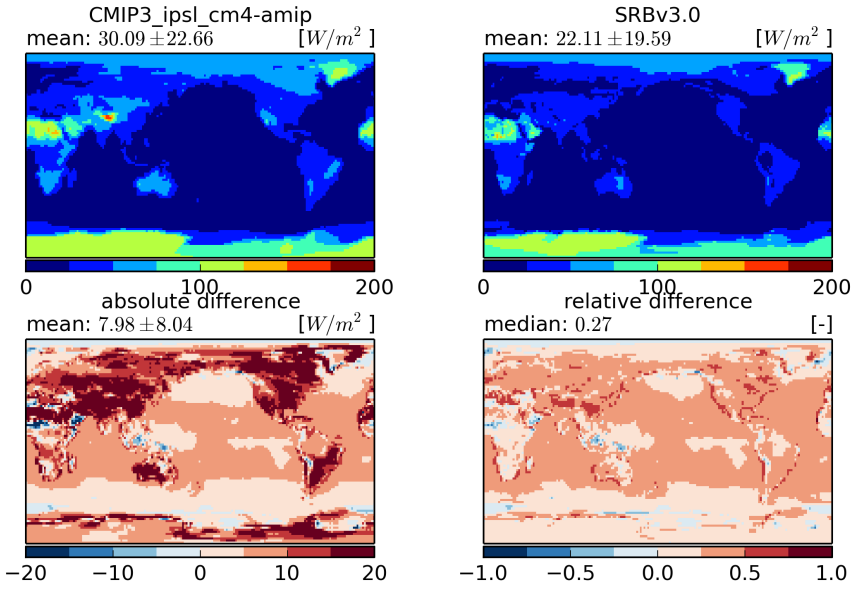



Figure 1275: Temporal mean fields (top) and absolute and relative differences (bottom)

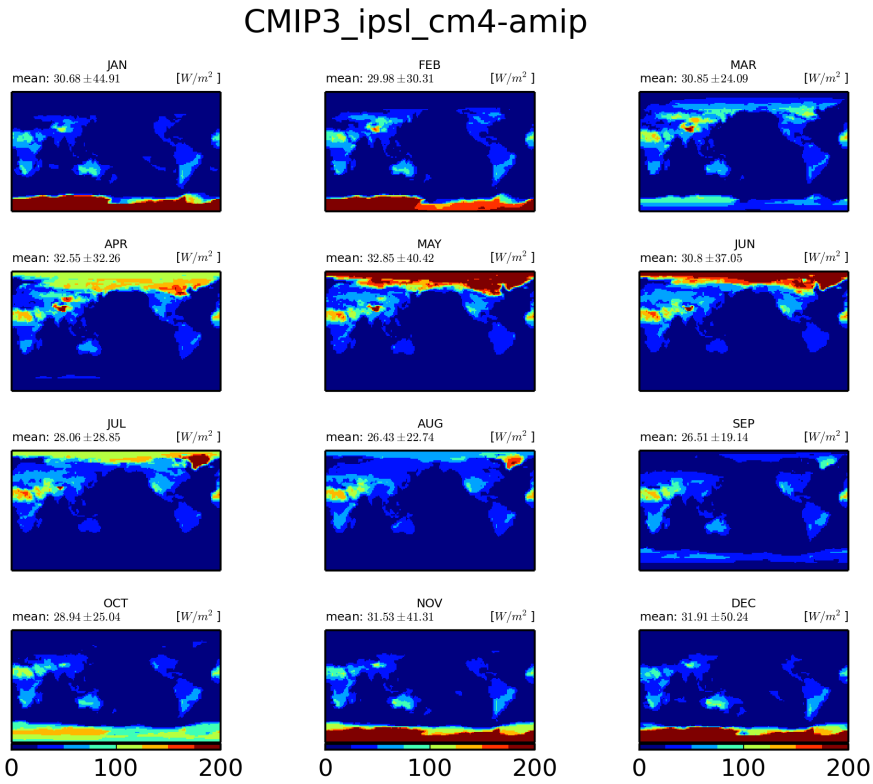



Figure 1276: Monthly mean climatology for ipsl-cm4

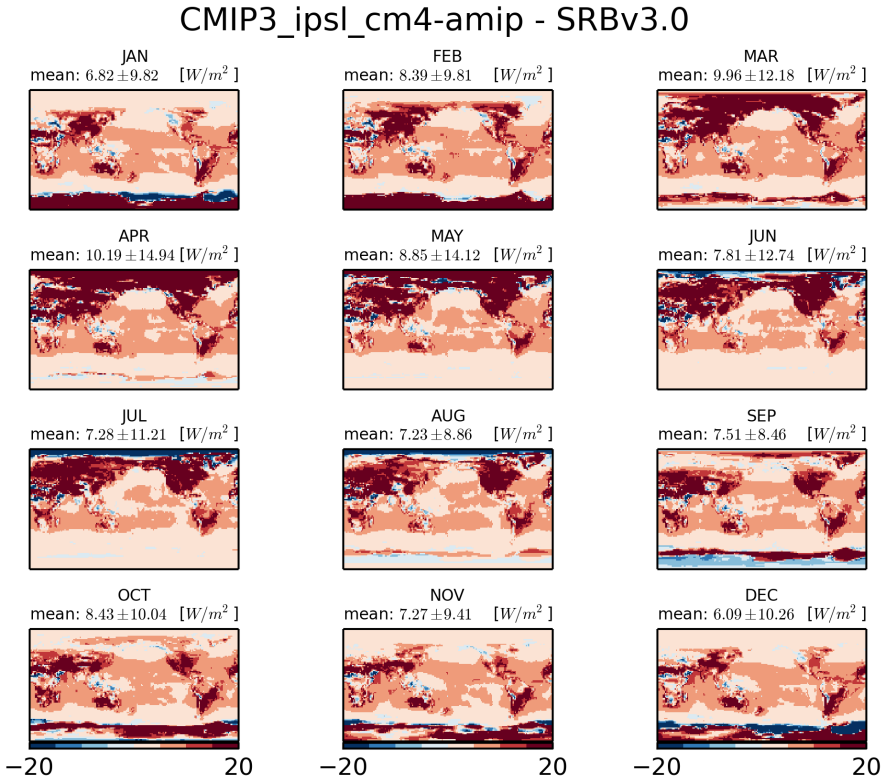



Figure 1277: Monthly mean climatology of difference between IPSL-CM4 and SRBV3.0

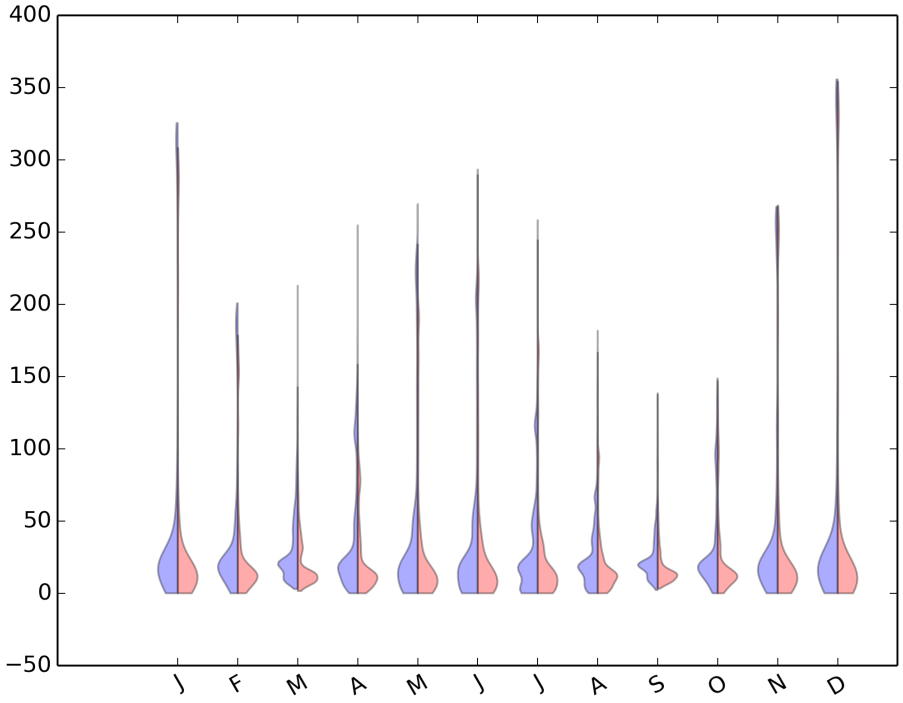



Figure 1278: Violin plot for CMIP3-IPSL-CM4-AMIP

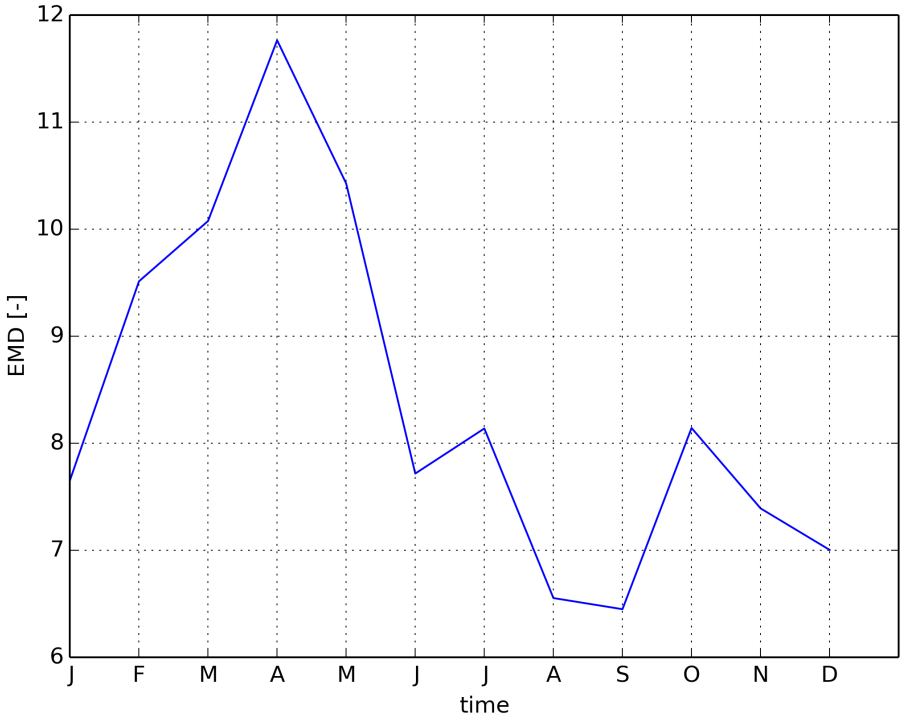



Figure 1279: Timeseries of EMD

### 2.3.31 CMIP3 miroc3 2 hires-amip

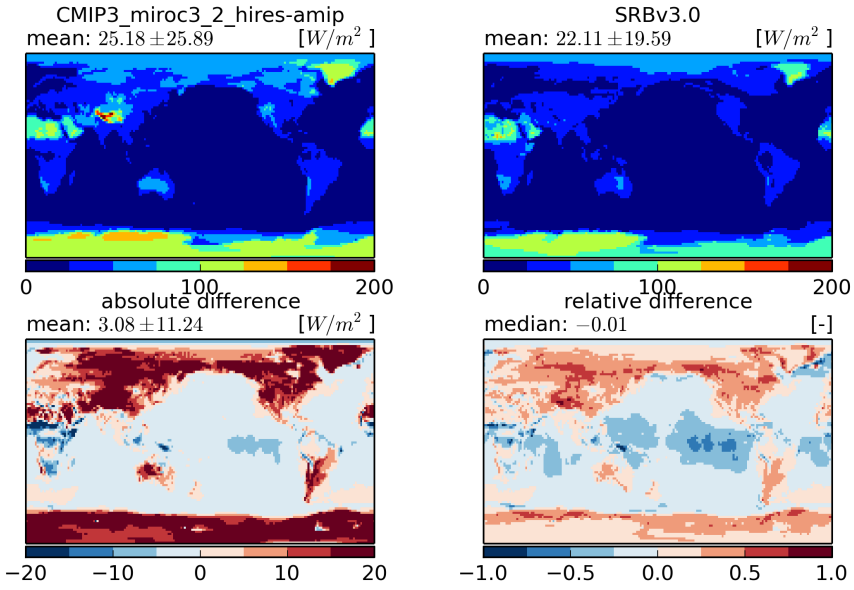



Figure 1280: Temporal mean fields (top) and absolute and relative differences (bottom)

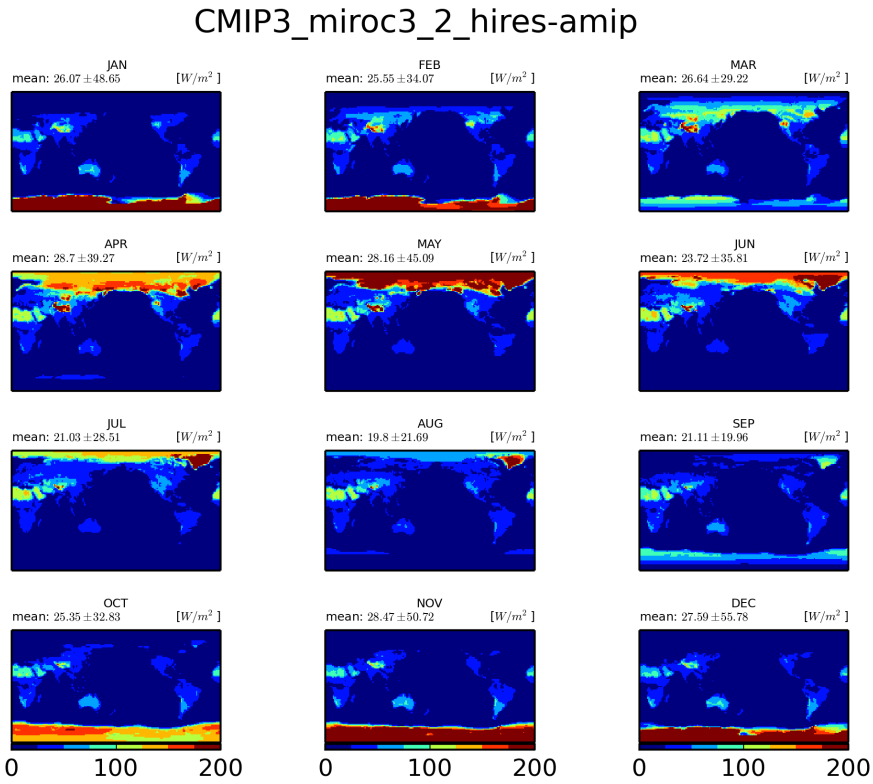



Figure 1281: Monthly mean climatology for miroc3-2-hires

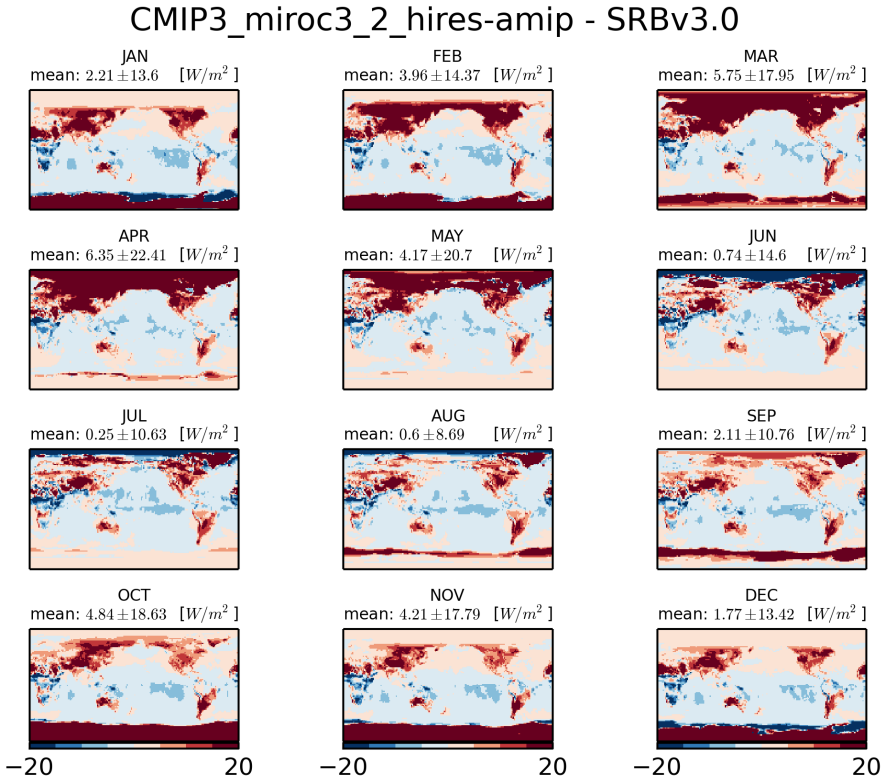



Figure 1282: Monthly mean climatology of difference between MIROC3-2-HIRES and SRBV3.0

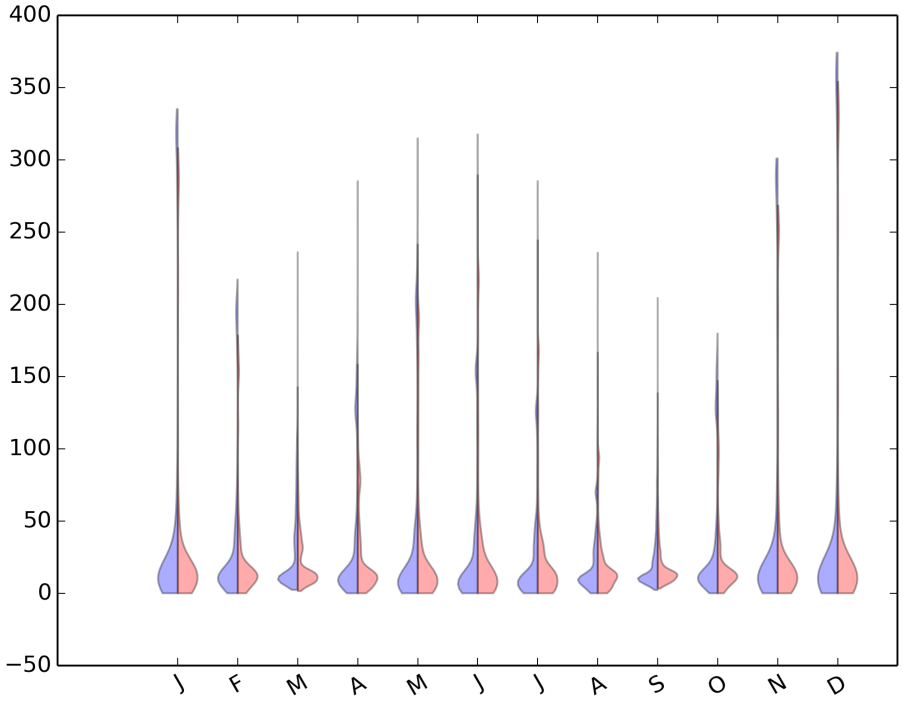



Figure 1283: Violin plot for CMIP3-MIROC3-2-HIRES-AMIP

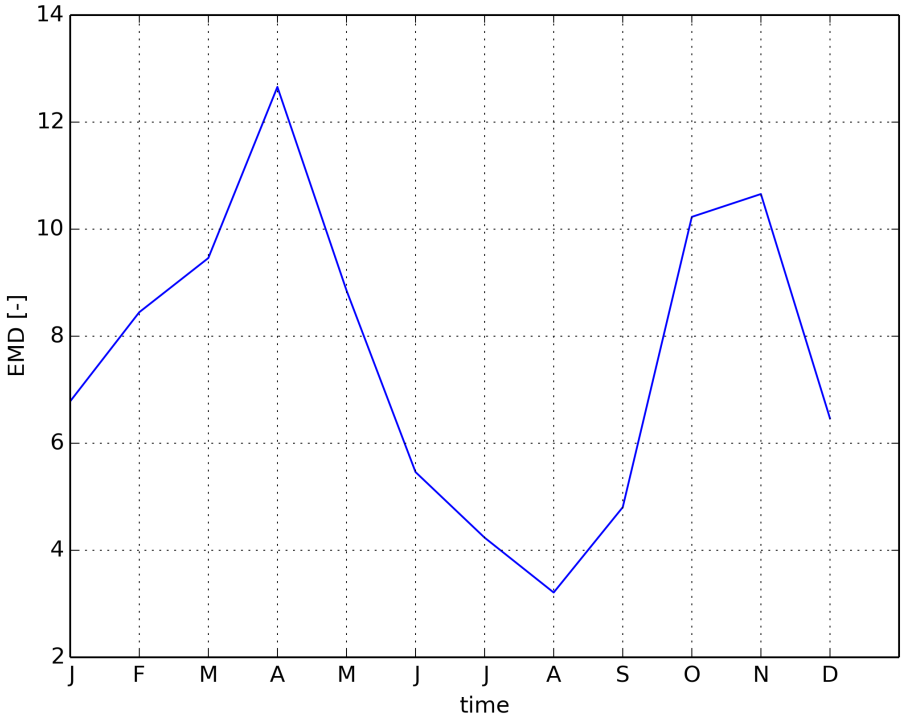



Figure 1284: Timeseries of EMD

### 2.3.32 CMIP3 miroc3 2 medres-amip

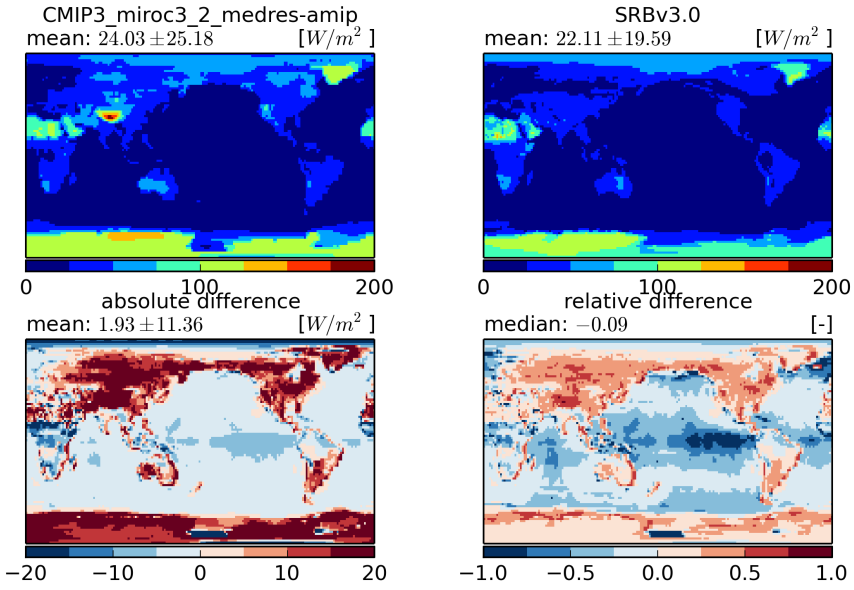



Figure 1285: Temporal mean fields (top) and absolute and relative differences (bottom)

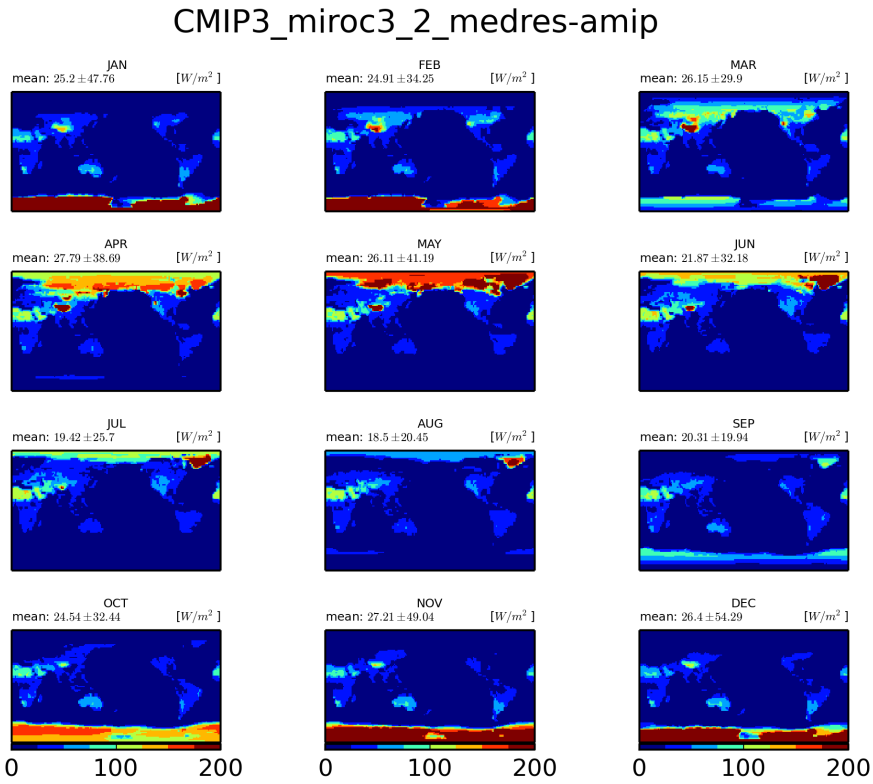



Figure 1286: Monthly mean climatology for miroc3-2-medres

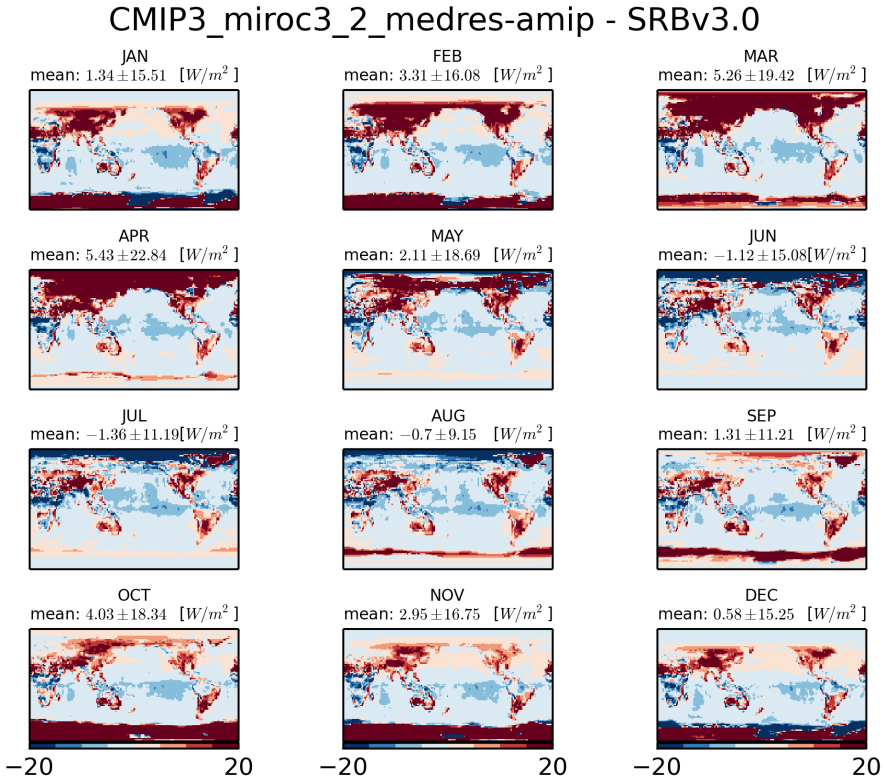



Figure 1287: Monthly mean climatology of difference between MIROC3-2-MEDRES and SRBV3.0

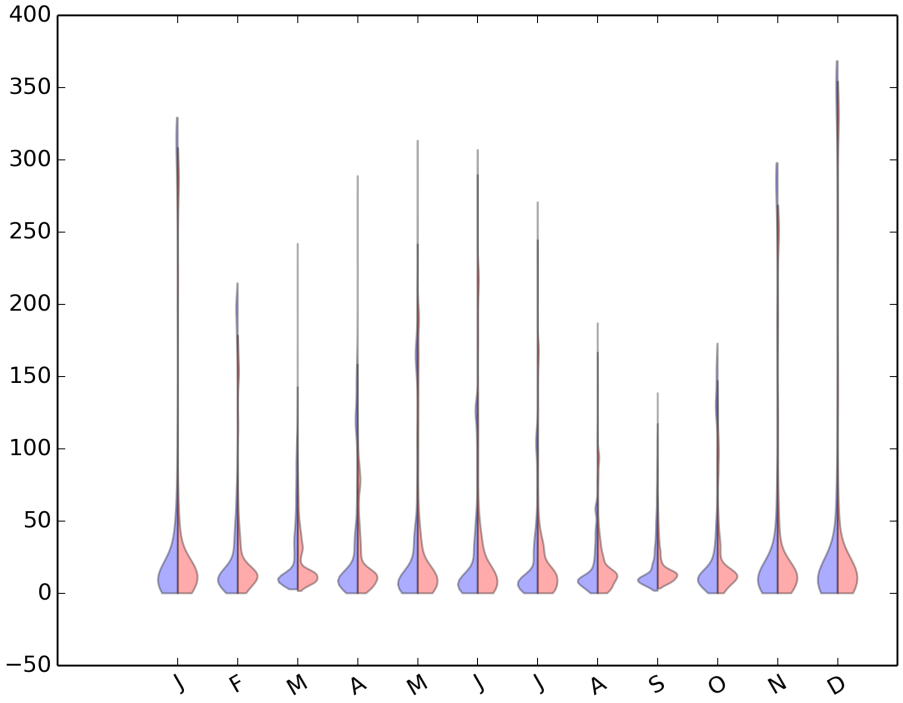



Figure 1288: Violin plot for CMIP3-MIROC3-2-MEDRES-AMIP

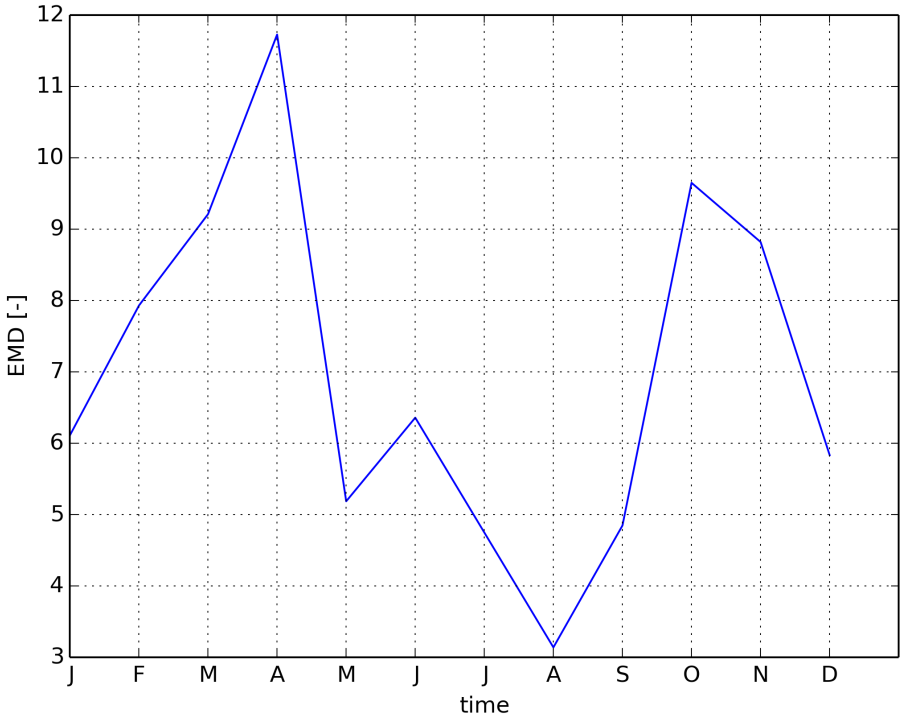



Figure 1289: Timeseries of EMD

### 2.3.33 CMIP3 mpi echam5-amip

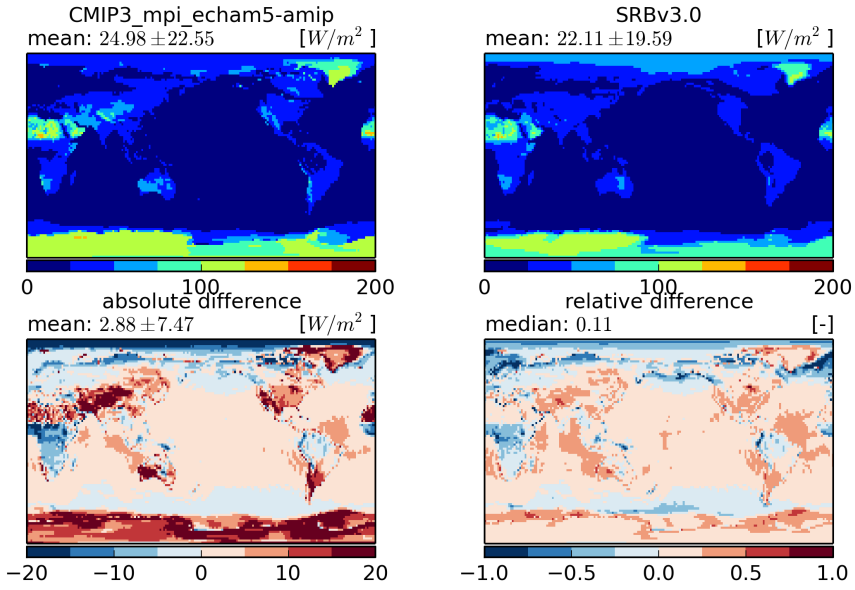



Figure 1290: Temporal mean fields (top) and absolute and relative differences (bottom)

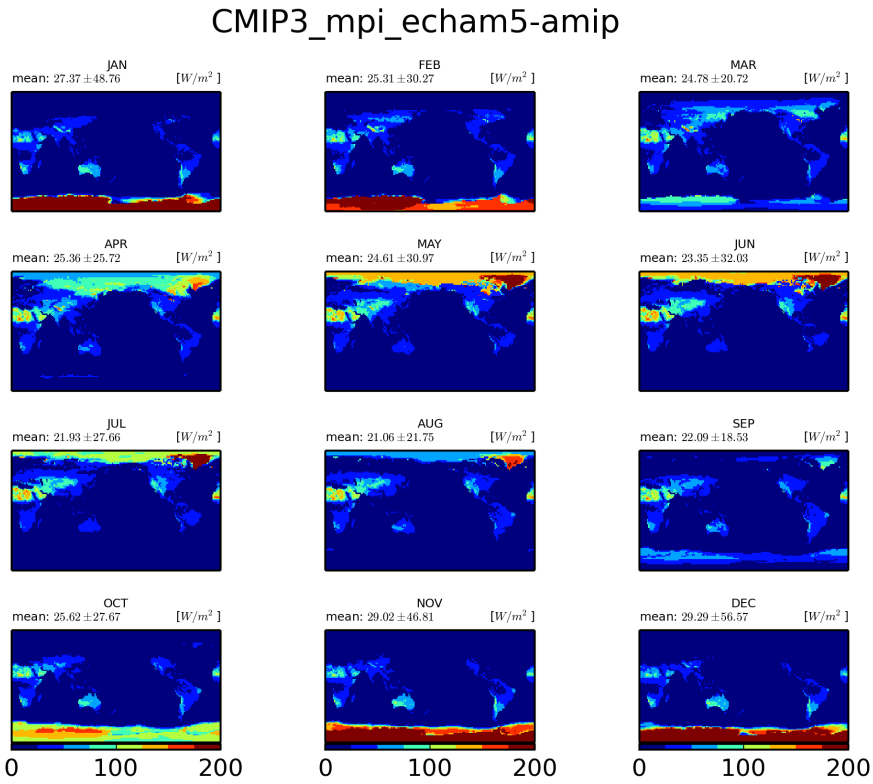



Figure 1291: Monthly mean climatology for mpi-echam5

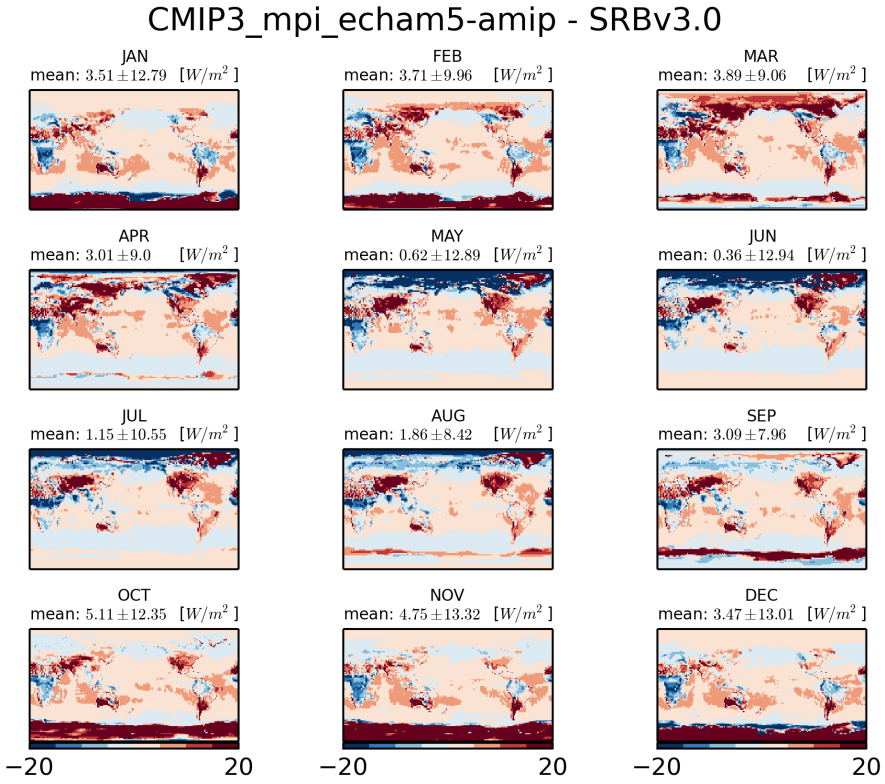



Figure 1292: Monthly mean climatology of difference between MPI-ECHAM5 and SRBV3.0

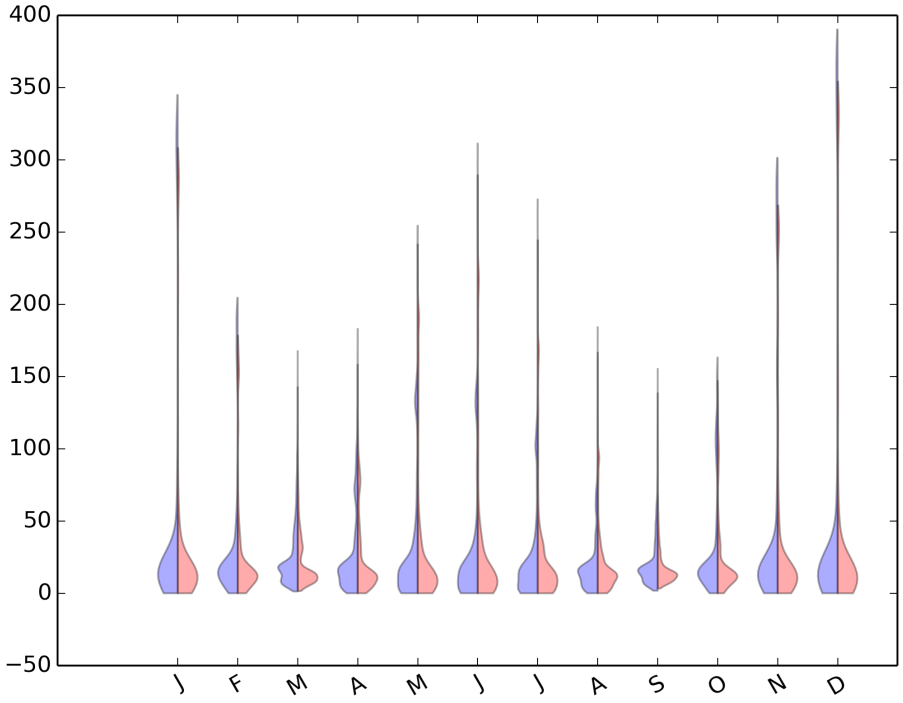



Figure 1293: Violin plot for CMIP3-MPI-ECHAM5-AMIP

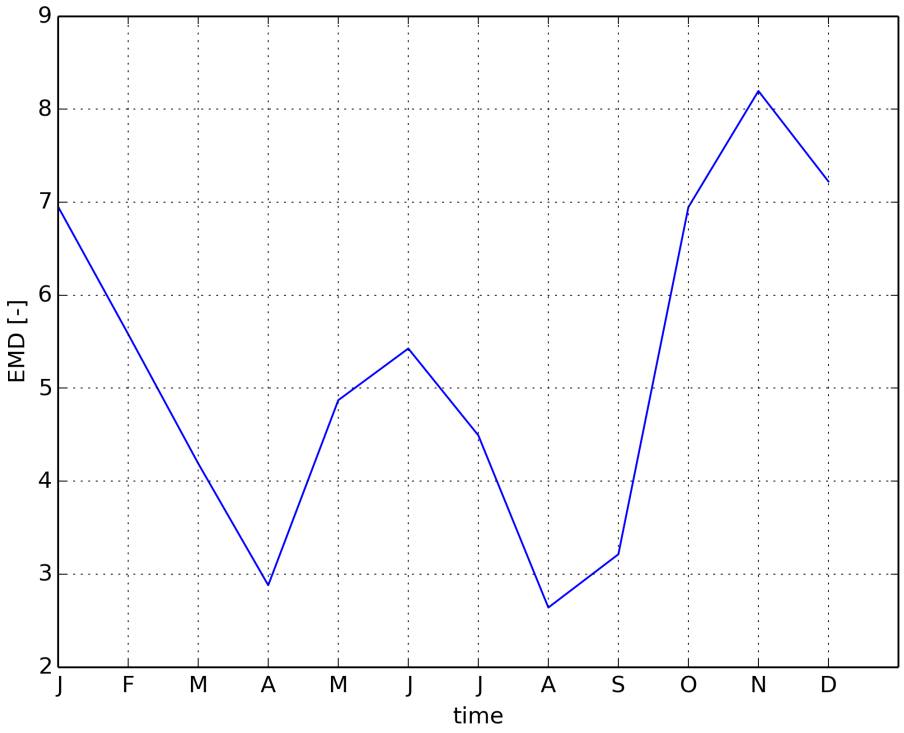



Figure 1294: Timeseries of EMD

### 2.3.34 CMIP3 ncar ccsm3 0-amip

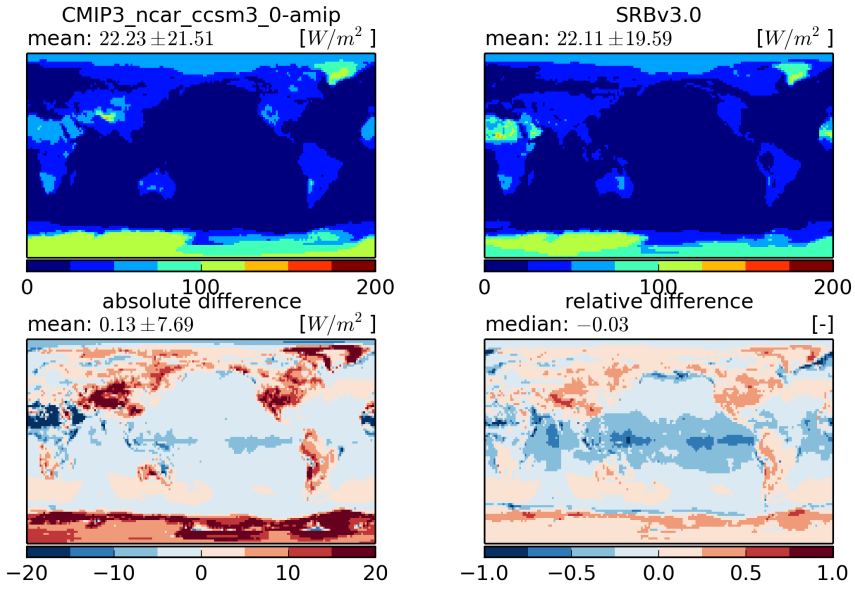



Figure 1295: Temporal mean fields (top) and absolute and relative differences (bottom)

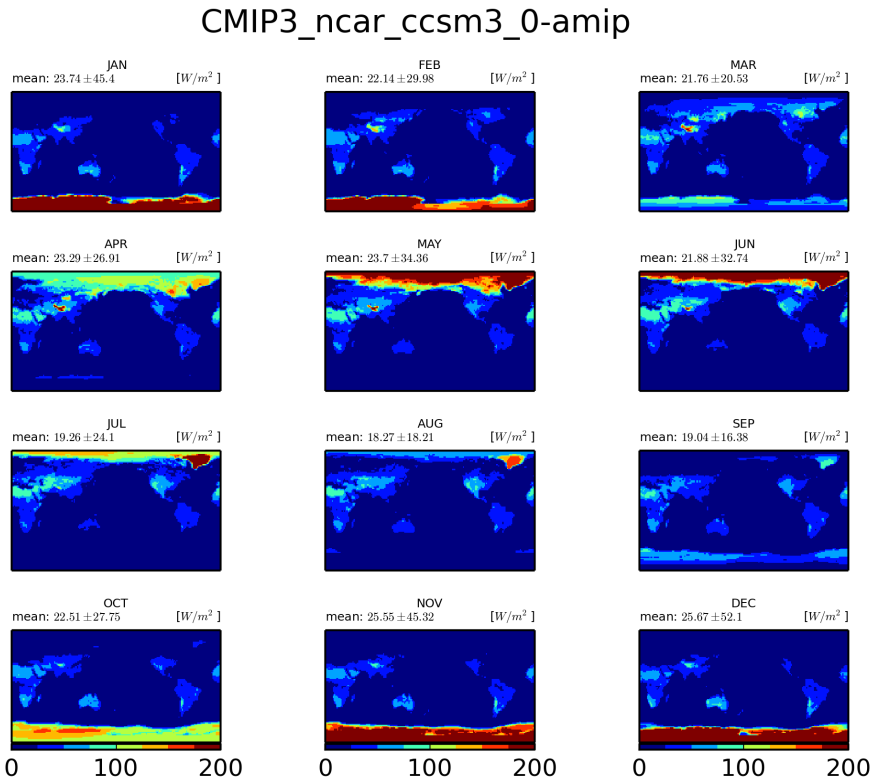



Figure 1296: Monthly mean climatology for ncar-ccsm3-0

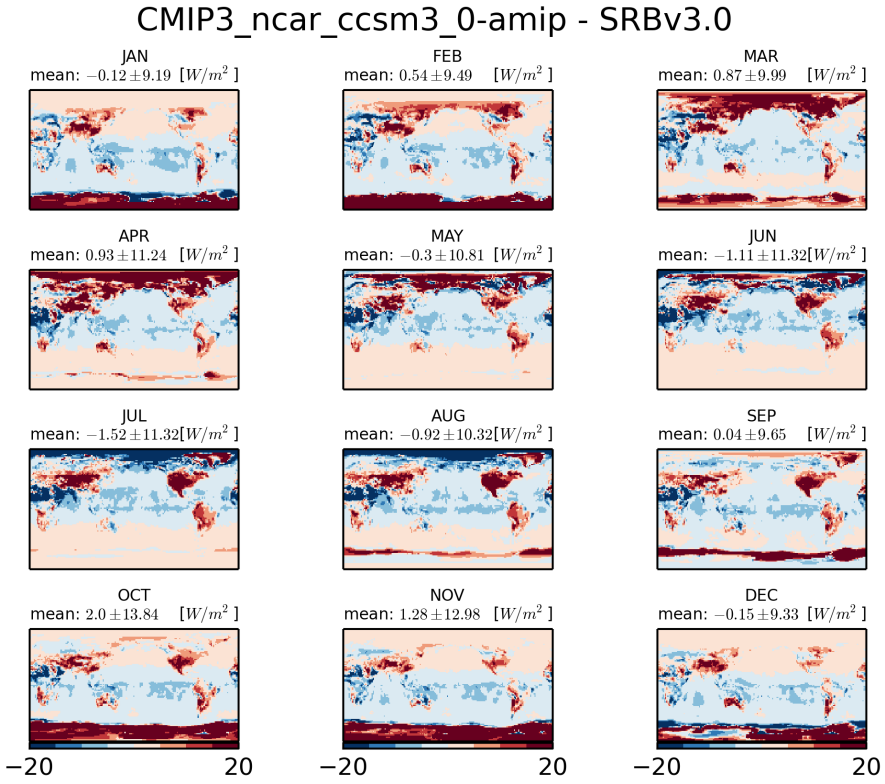



Figure 1297: Monthly mean climatology of difference between NCAR-CCSM3-0 and SRBV3.0

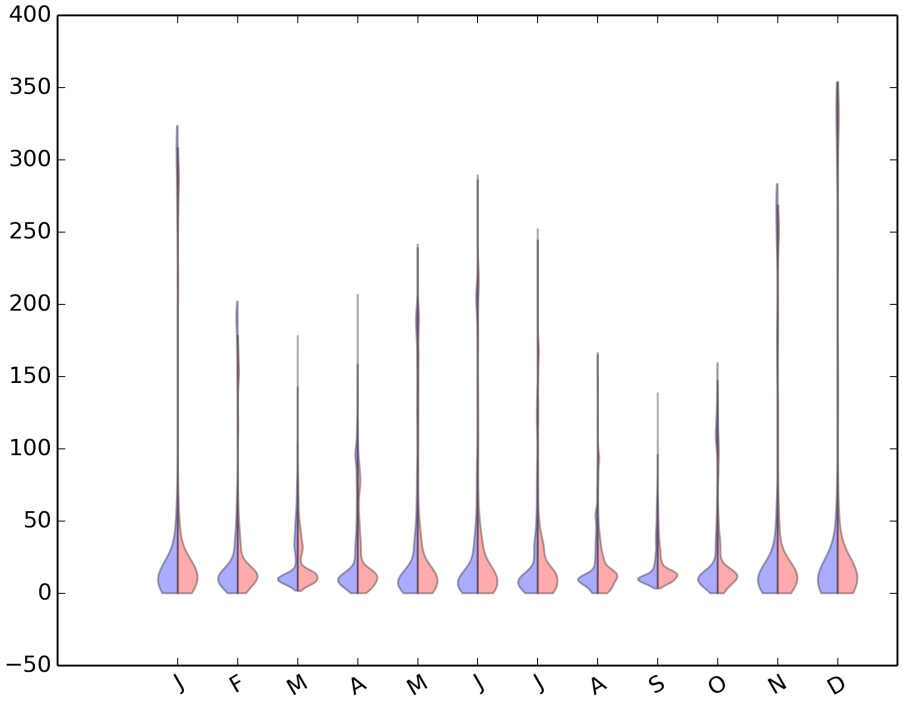



Figure 1298: Violin plot for CMIP3-NCAR-CCSM3-0-AMIP

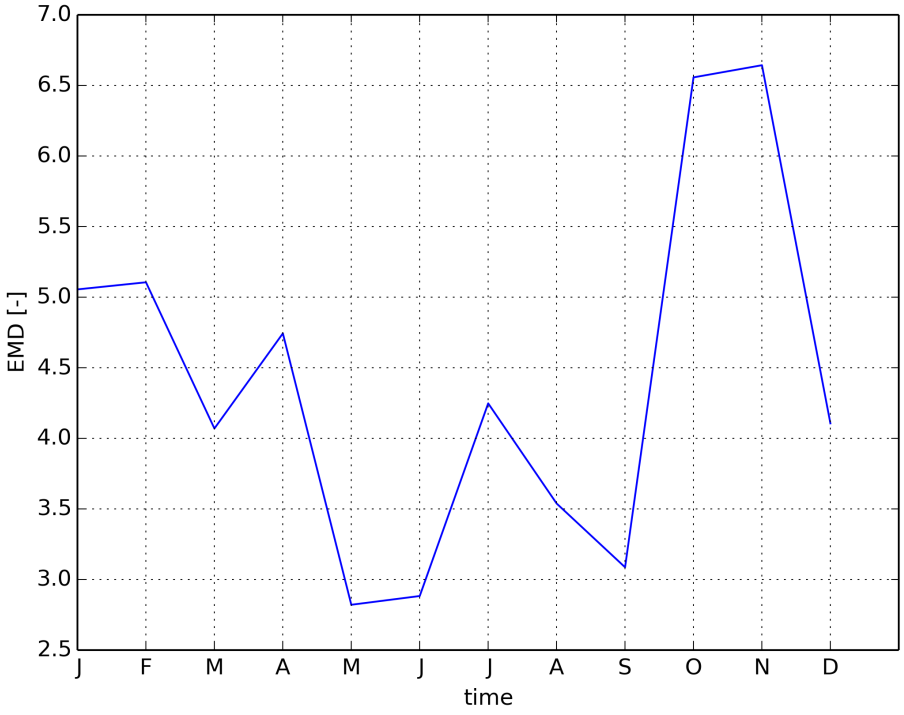



Figure 1299: Timeseries of EMD

### 2.3.35 CMIP3 ncar pcm1-amip

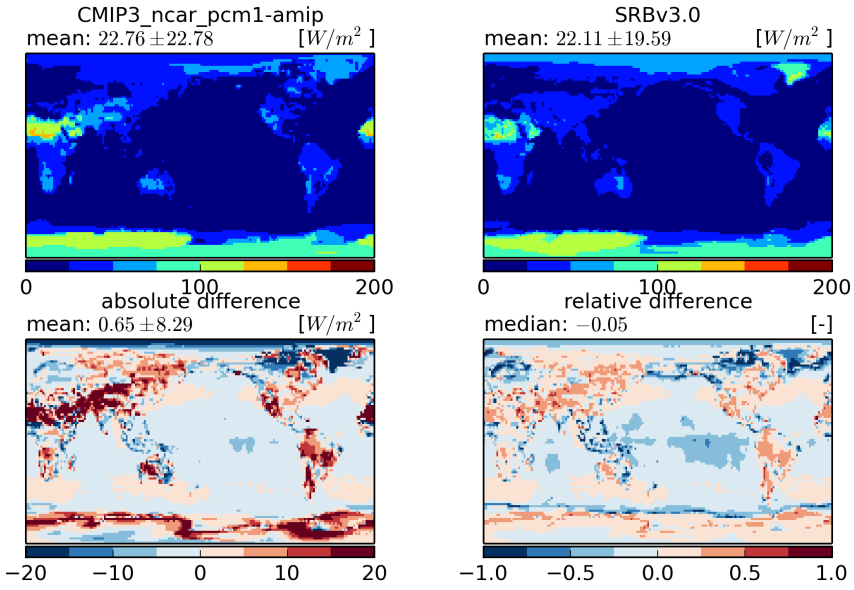



Figure 1300: Temporal mean fields (top) and absolute and relative differences (bottom)

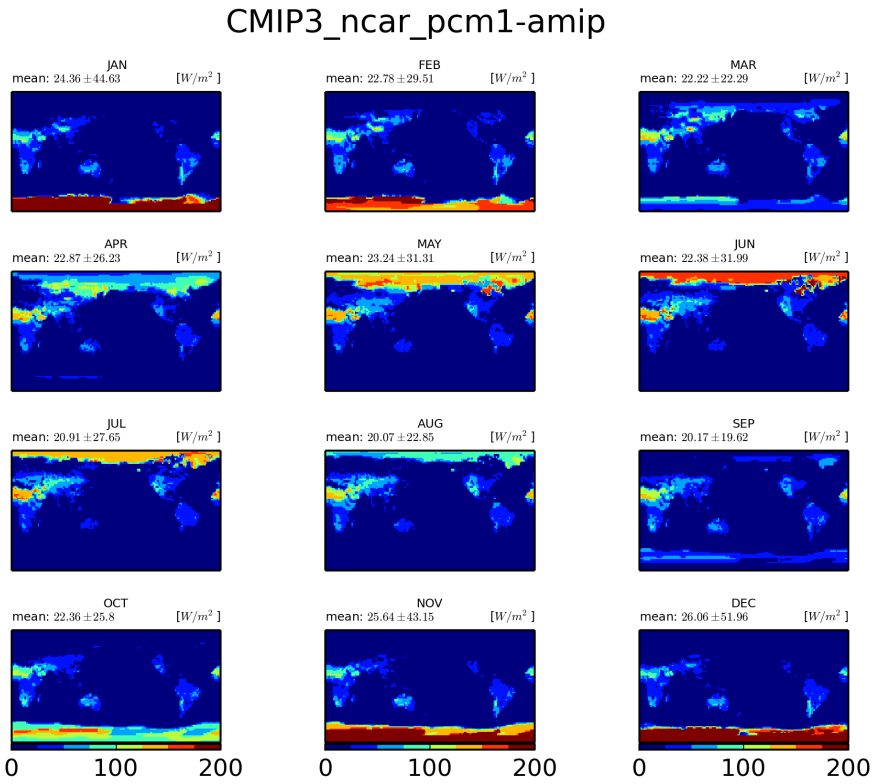



Figure 1301: Monthly mean climatology for ncar-pcm1

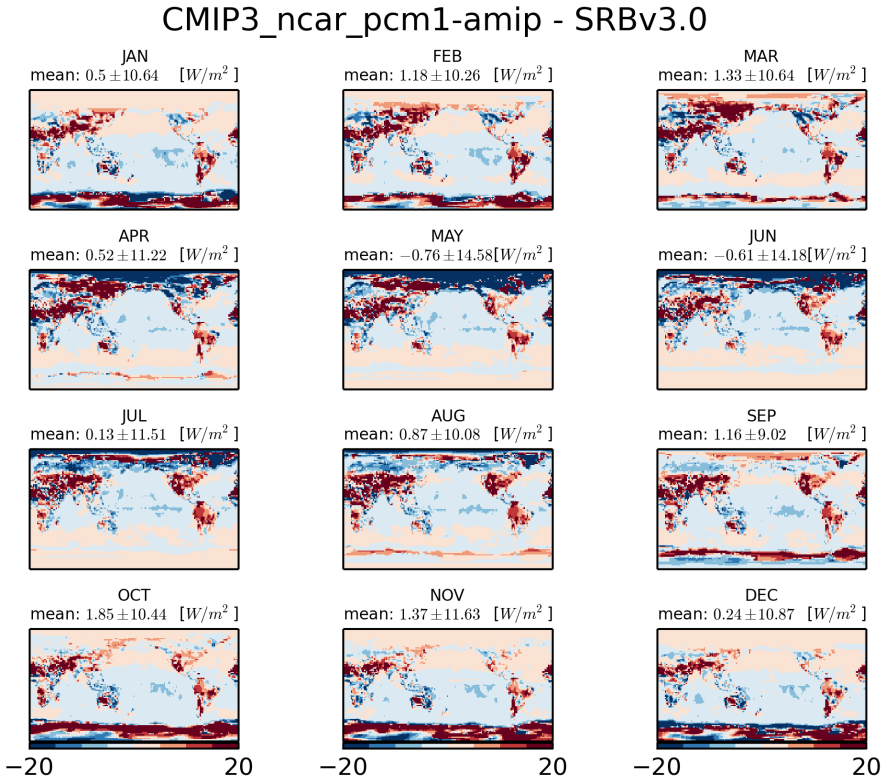



Figure 1302: Monthly mean climatology of difference between NCAR-PCM1 and SRBV3.0

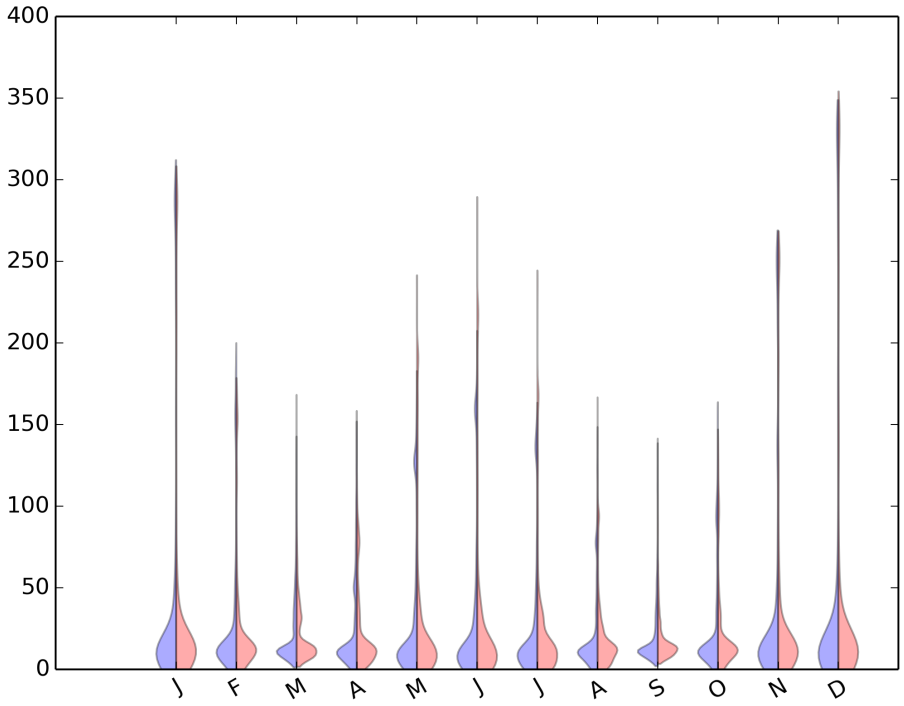



Figure 1303: Violin plot for CMIP3-NCAR-PCM1-AMIP

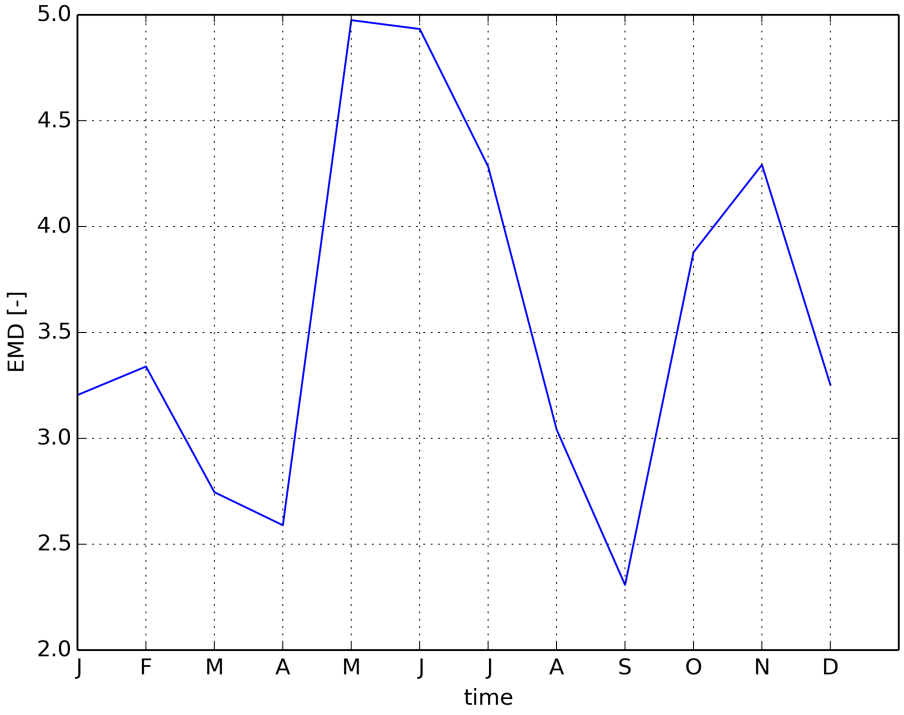



Figure 1304: Timeseries of EMD

### 2.3.36 CMIP3 ukmo hadgem1-amip

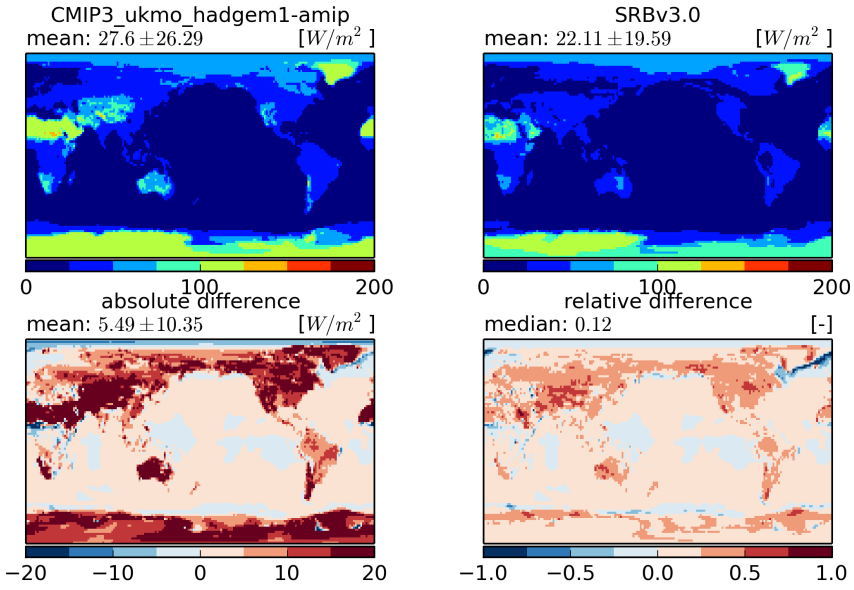



Figure 1305: Temporal mean fields (top) and absolute and relative differences (bottom)

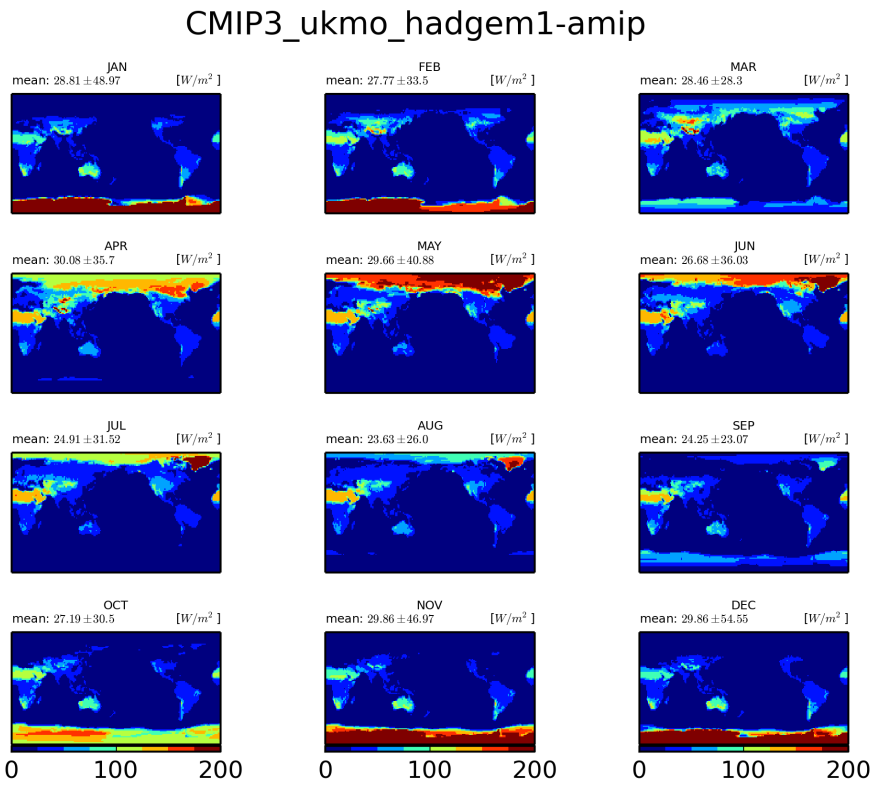



Figure 1306: Monthly mean climatology for ukmo-hadgem1

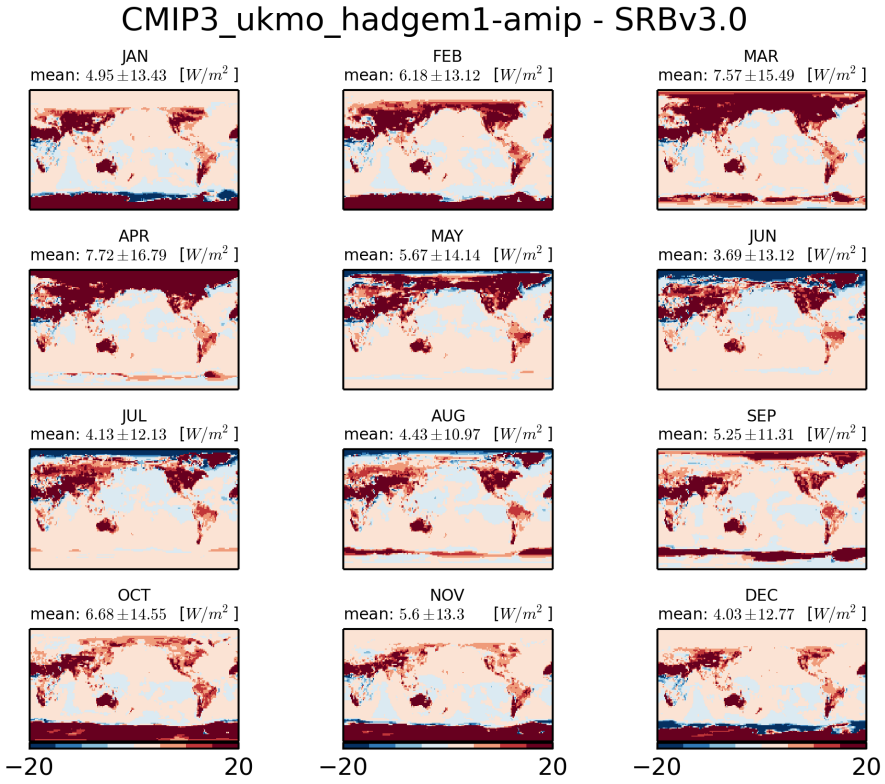



Figure 1307: Monthly mean climatology of difference between UKMO-HADGEM1 and SRBV3.0

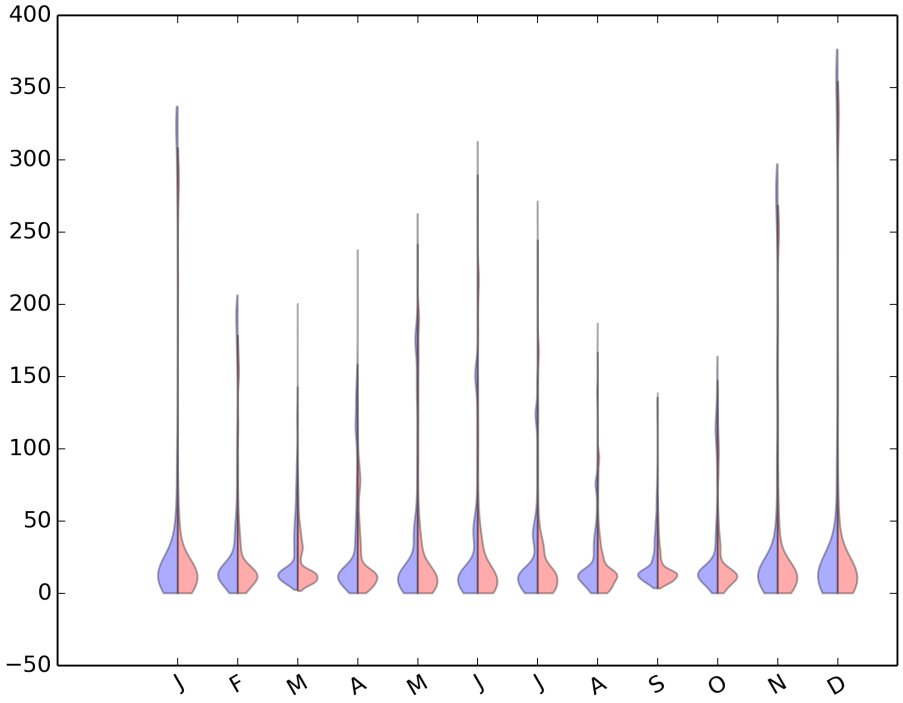



Figure 1308: Violin plot for CMIP3-UKMO-HADGEM1-AMIP

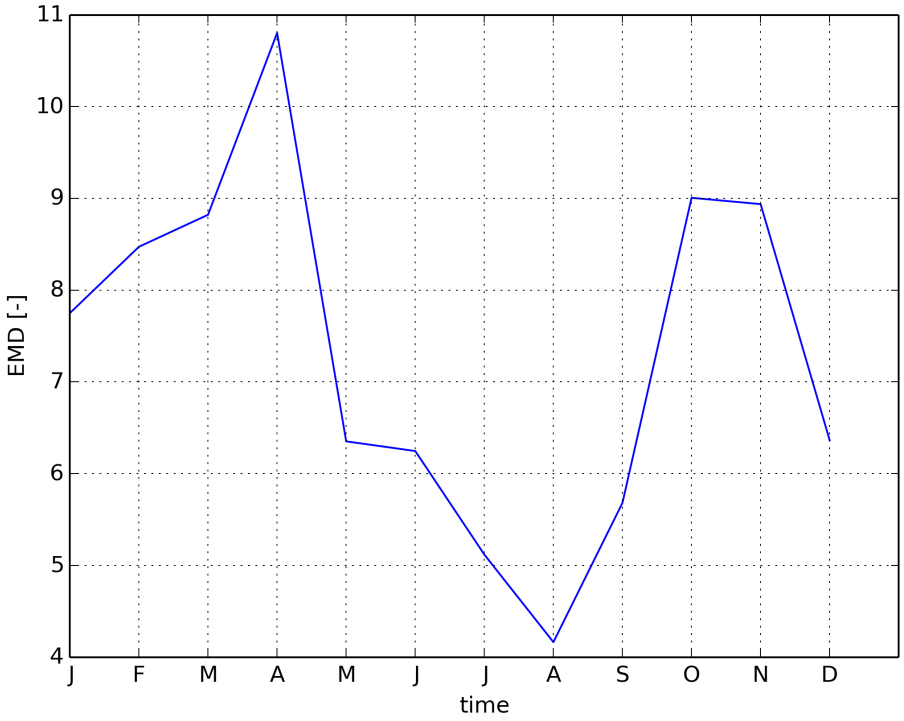



Figure 1309: Timeseries of EMD

### 2.3.37 model mean

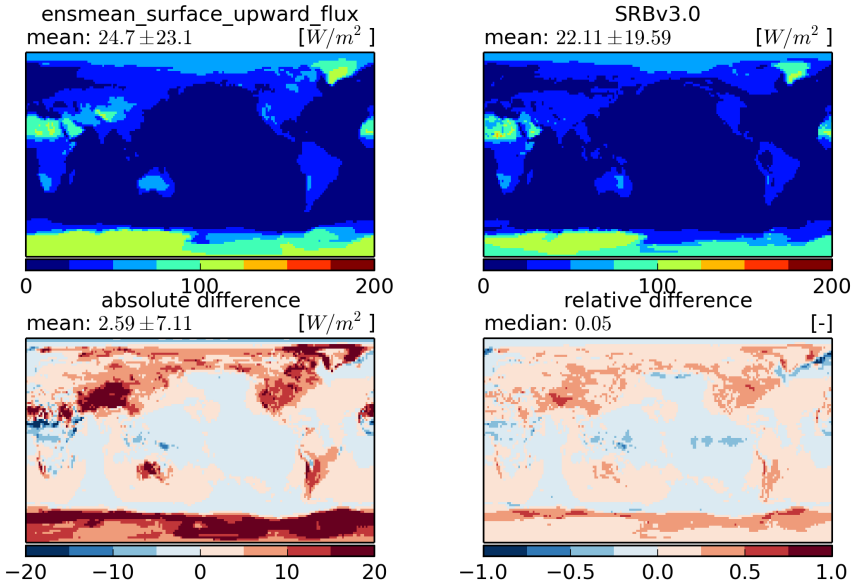



Figure 1310: Temporal mean fields (top) and absolute and relative differences (bottom)

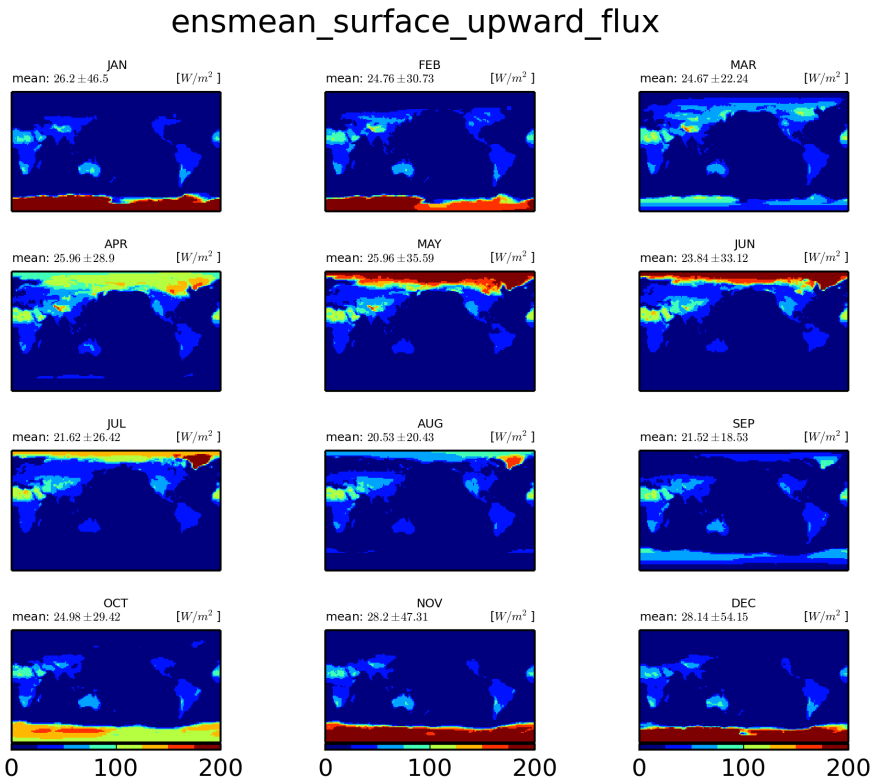



Figure 1311: Monthly mean climatology for mean-model

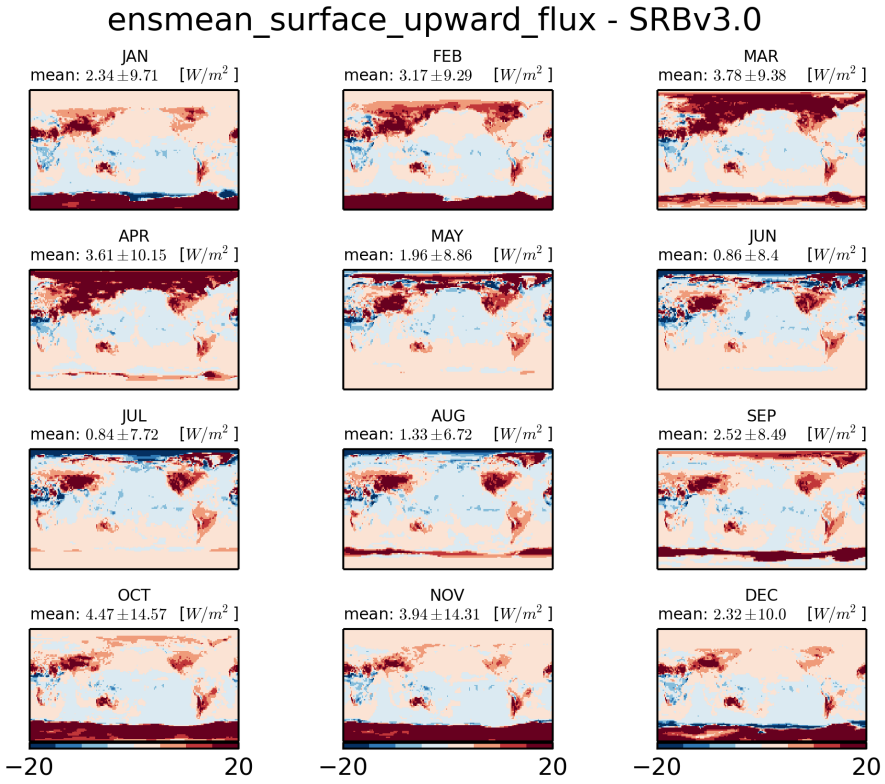



Figure 1312: Monthly mean climatology of difference between MEAN-MODEL and SRBV3.0

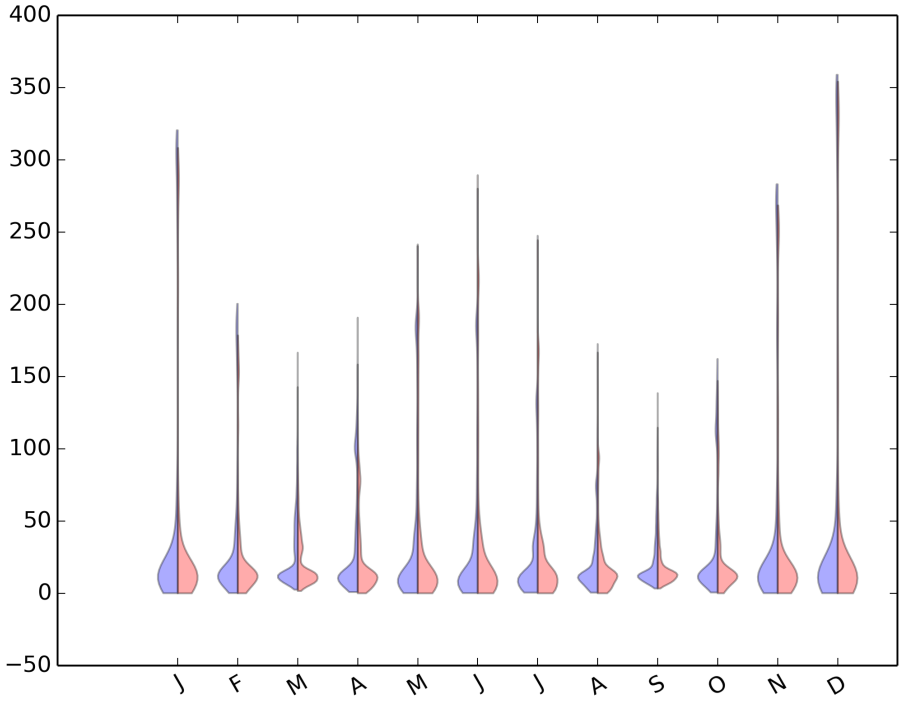



Figure 1313: Violin plot for ENSMEAN-SURFACE-UPWARD-FLUX

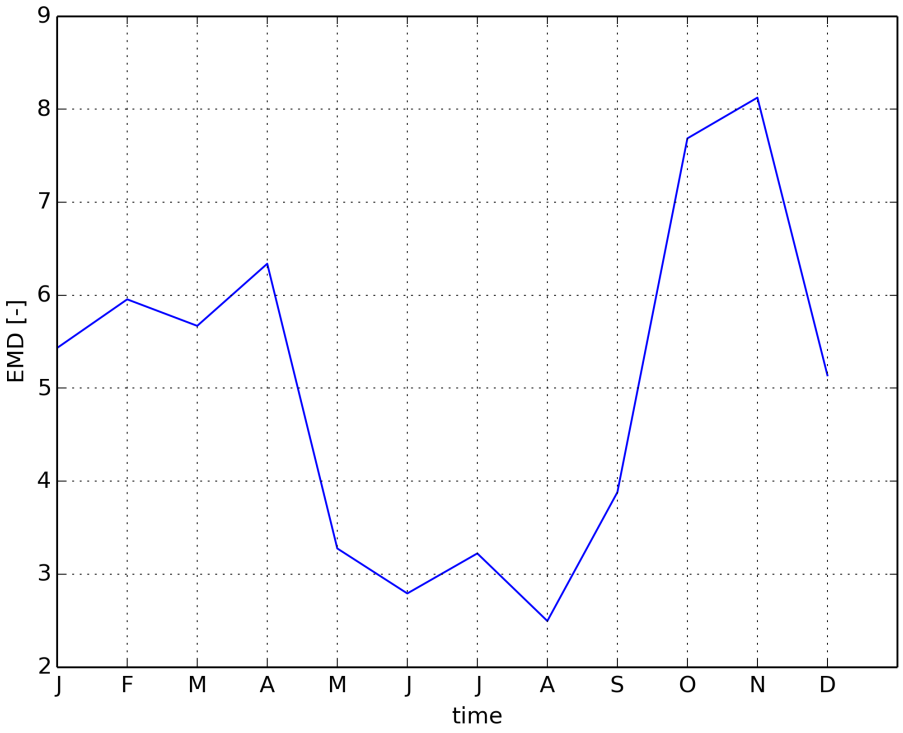



Figure 1314: Timeseries of EMD

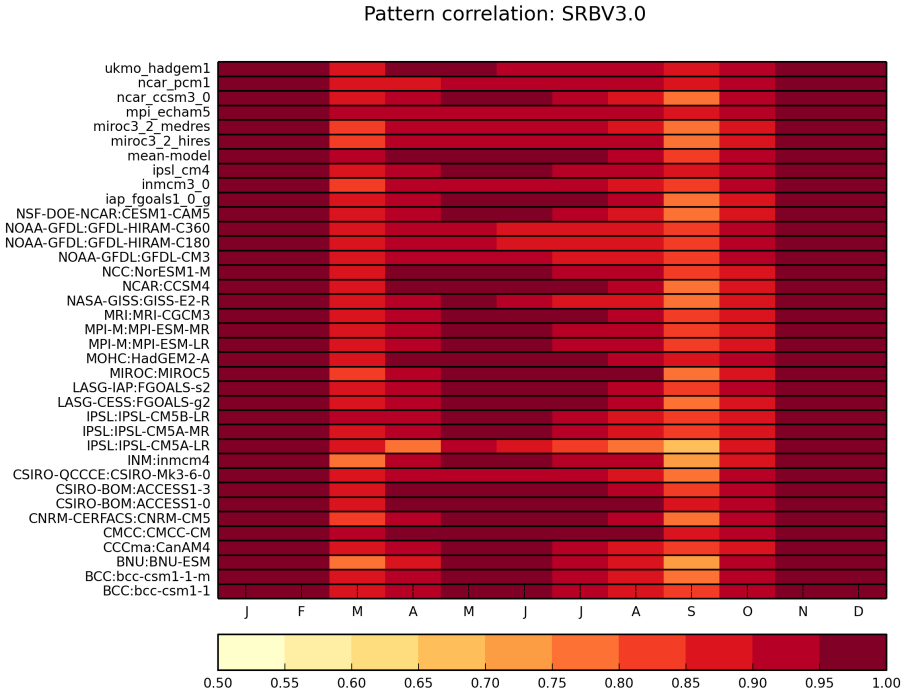



Figure 1315: Pattern correlation for SRBV3.0

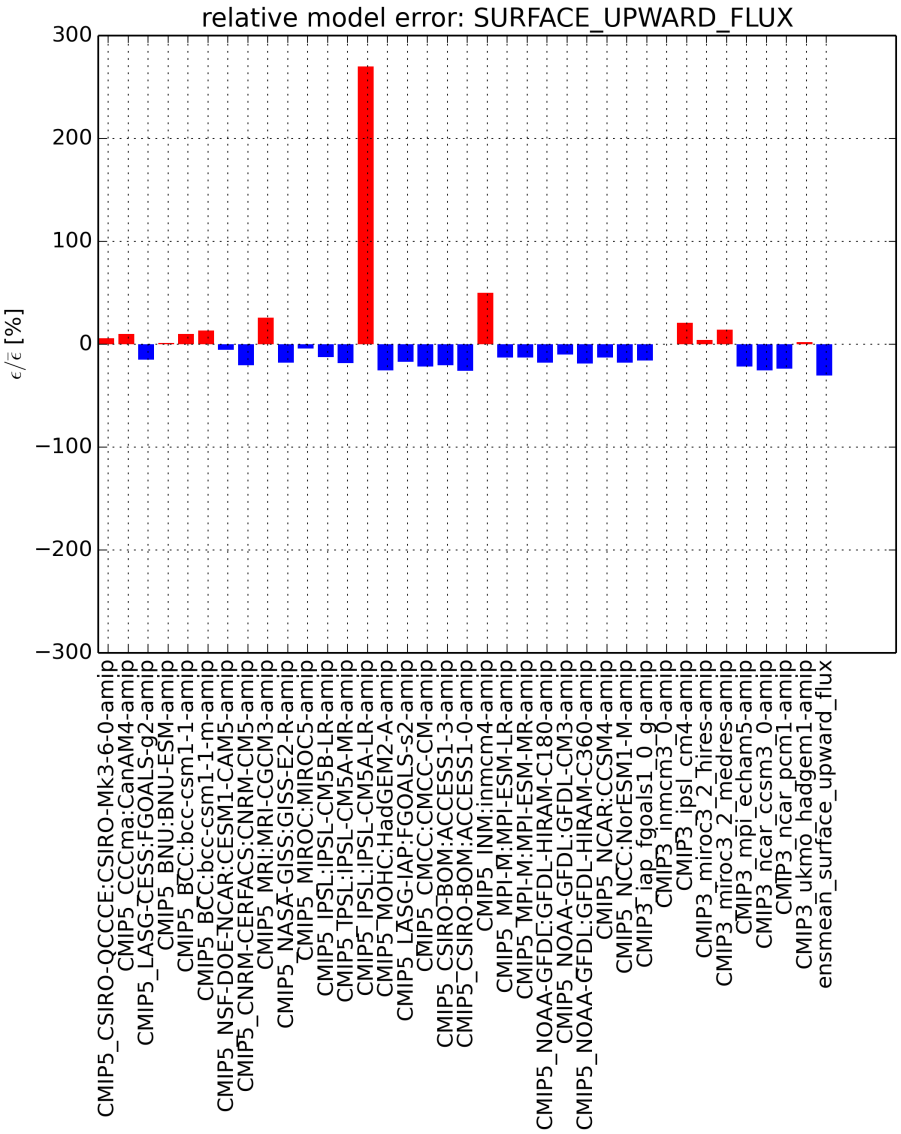



Figure 1316: Relative model performance for SURFACE-UPWARD-FLUX

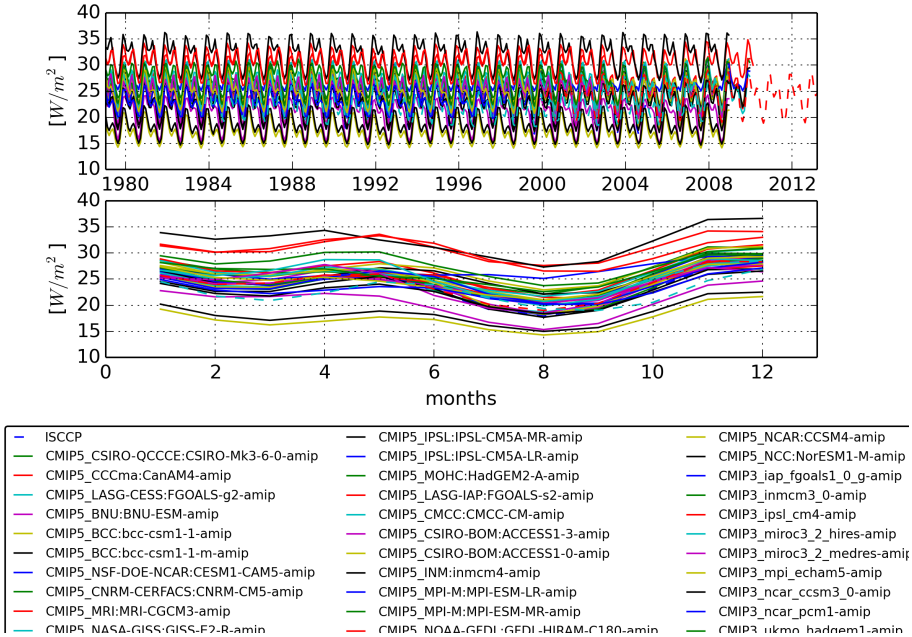



Figure 1317: Global means for SHORTWAVE UPWARD RADIATION FLUX IN AIR

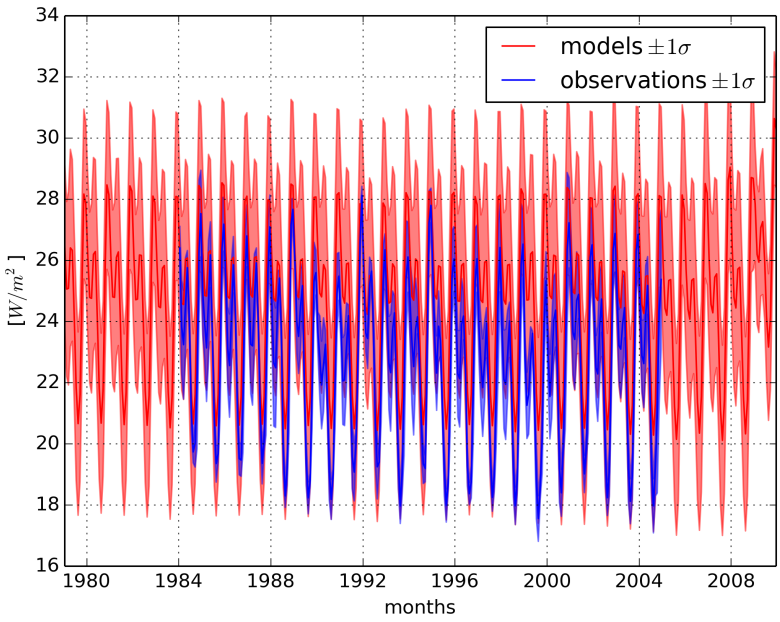



Figure 1318: Global means for SHORTWAVE UPWARD RADIATION FLUX IN AIR (summary); areas indicate $\pm 1\sigma$ as derived from the ensemble of models or observations

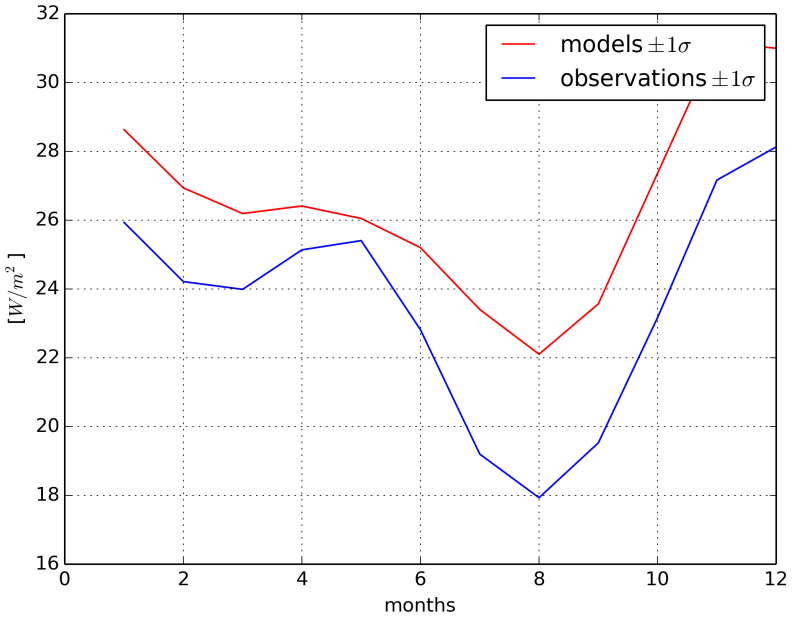



Figure 1319: Global means for SHORTWAVE UPWARD RADIATION FLUX IN AIR (summary climatology)

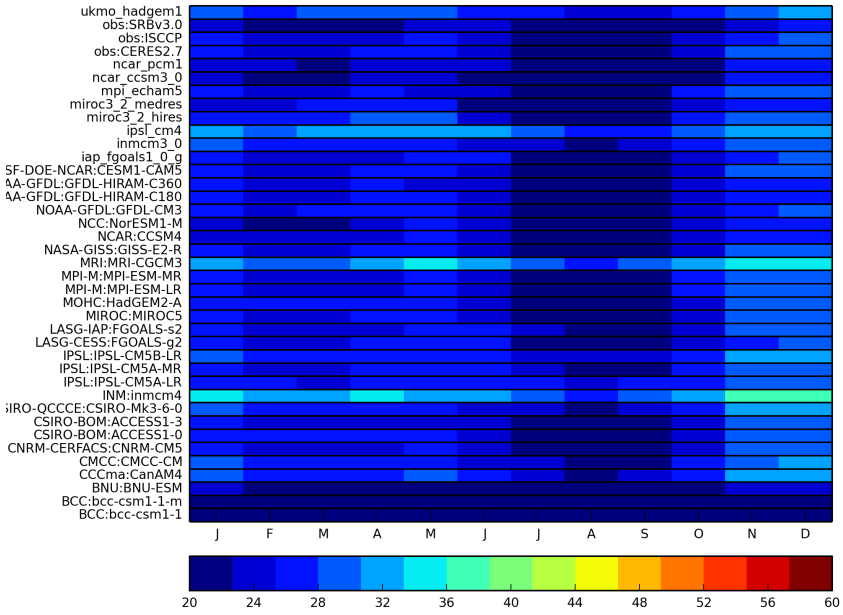



Figure 1320: Global means climatology for SHORTWAVE UPWARD RADIATION FLUX IN AIR

# 3 NET SURFACE SOLAR RADIATION FLUX IN AIR

## 3.1 ISCCP

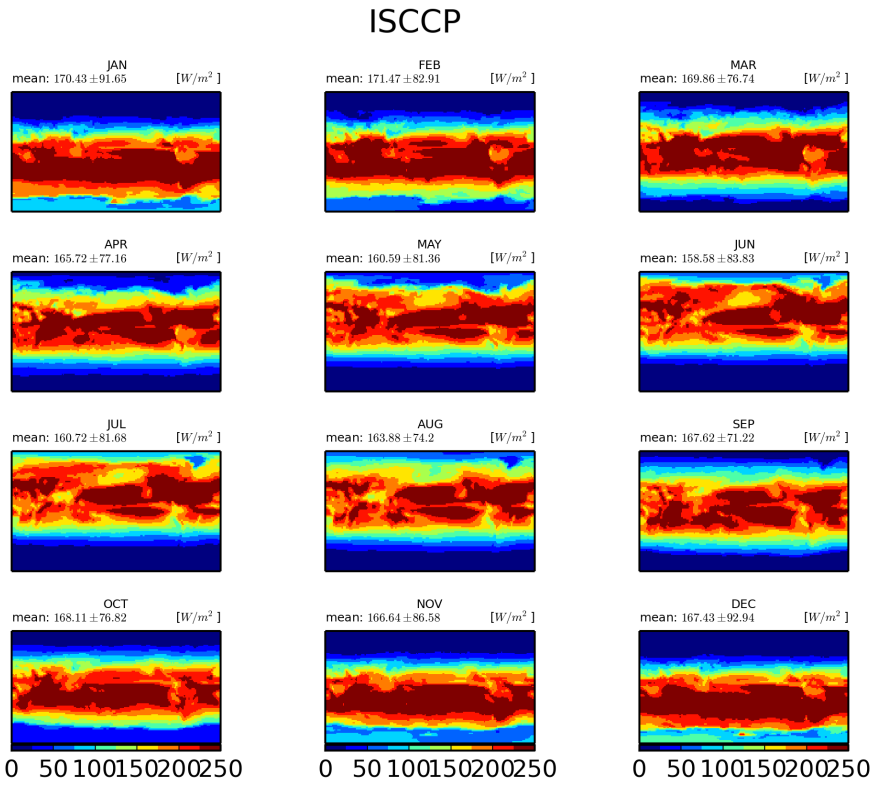



Figure 1321: Monthly mean ISCCP

### 3.1.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

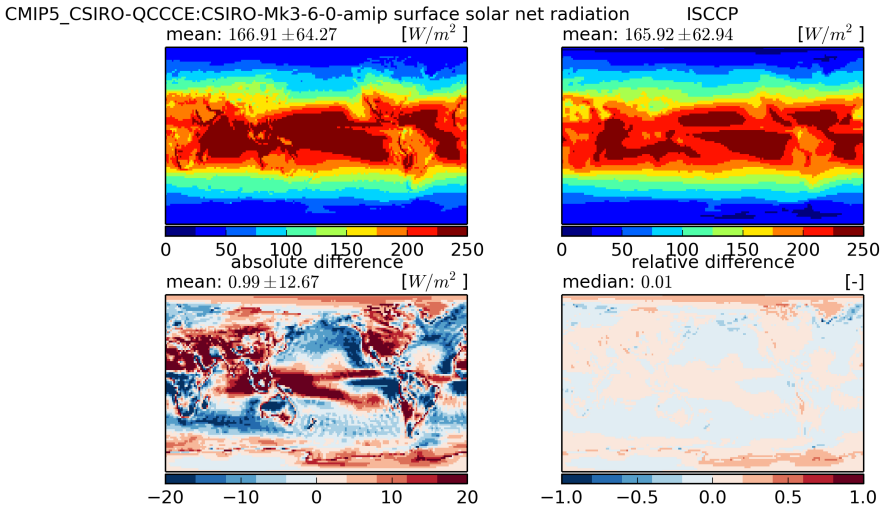



Figure 1322: Temporal mean fields (top) and absolute and relative differences (bottom)

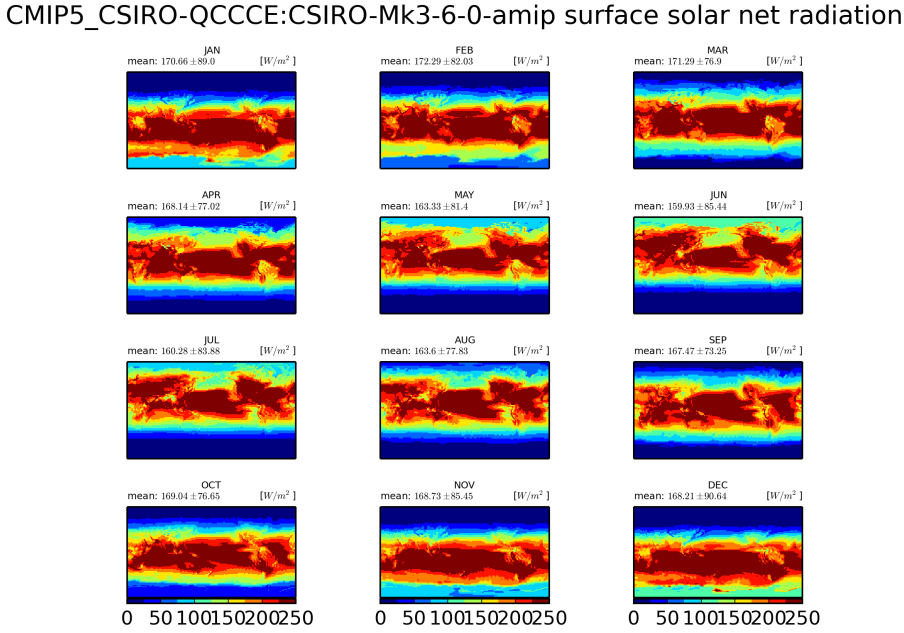



Figure 1323: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

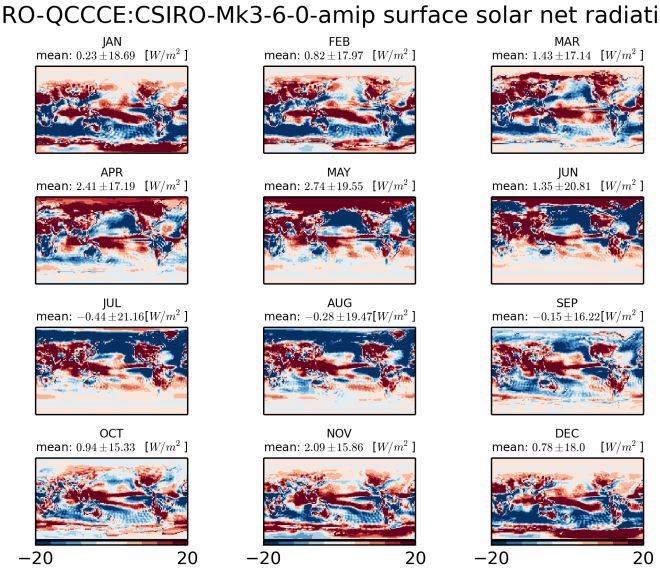



Figure 1324: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and ISCCP

### 3.1.2 CMIP5 CCCma:CanAM4-amip

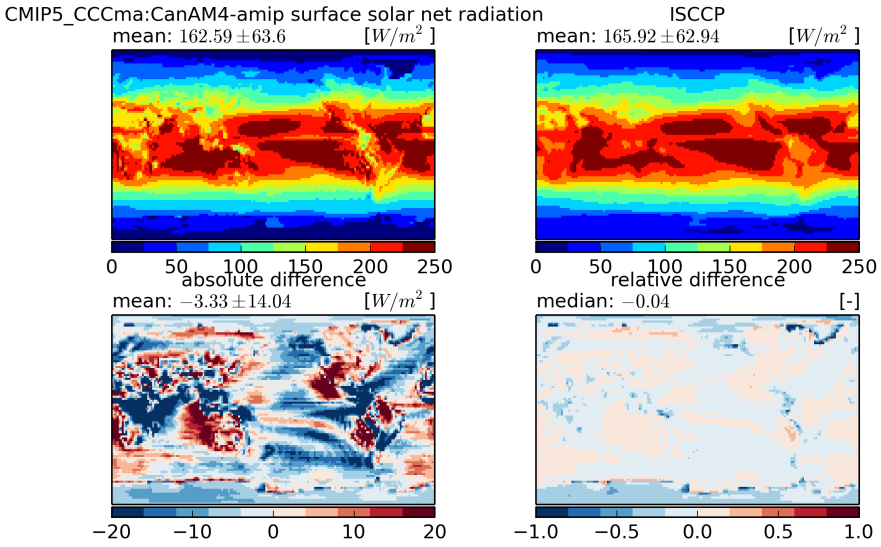



Figure 1325: Temporal mean fields (top) and absolute and relative differences (bottom)

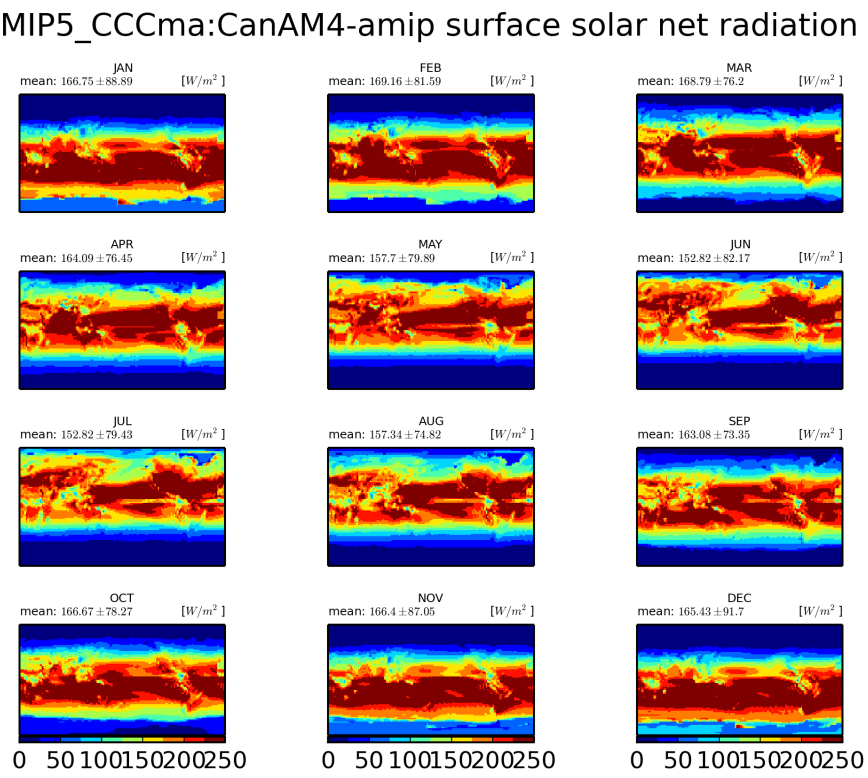



Figure 1326: Monthly mean climatology for CCCma:CanAM4

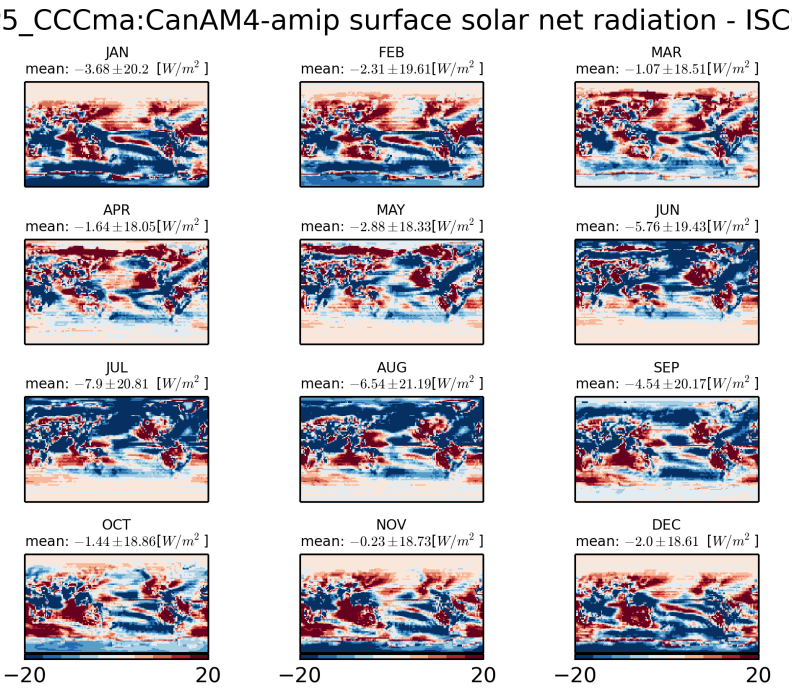



Figure 1327: Monthly mean climatology of difference between CCCMA:CANAM4 and ISCCP

### 3.1.3 CMIP5 LASG-CESS:FGOALS-g2-amip

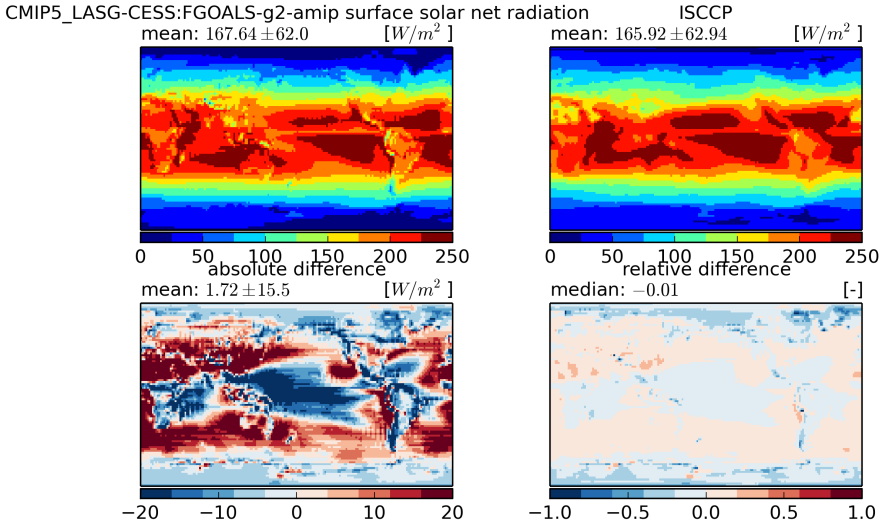



Figure 1328: Temporal mean fields (top) and absolute and relative differences (bottom)

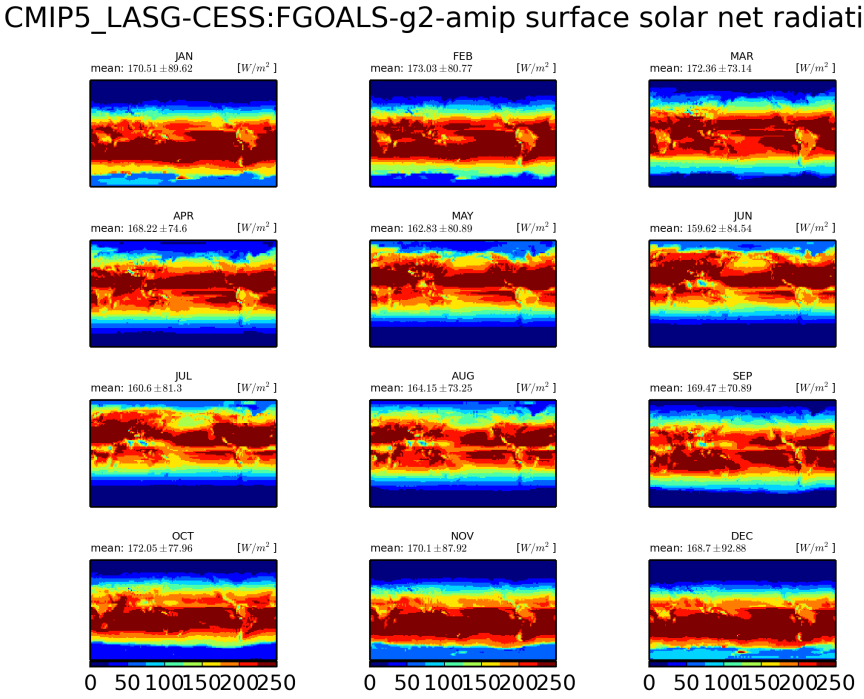



Figure 1329: Monthly mean climatology for LASG-CESS:FGOALS-g2

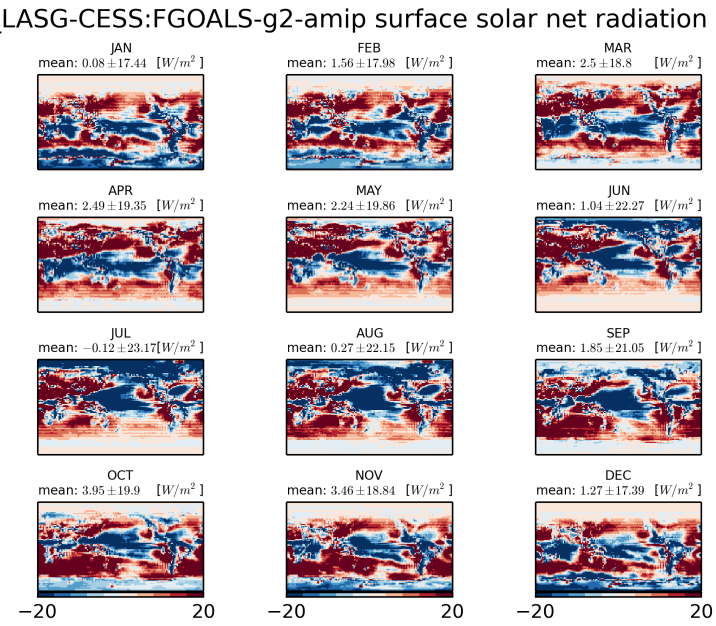



Figure 1330: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and ISCCP

### 3.1.4 CMIP5 BNU:BNU-ESM-amip

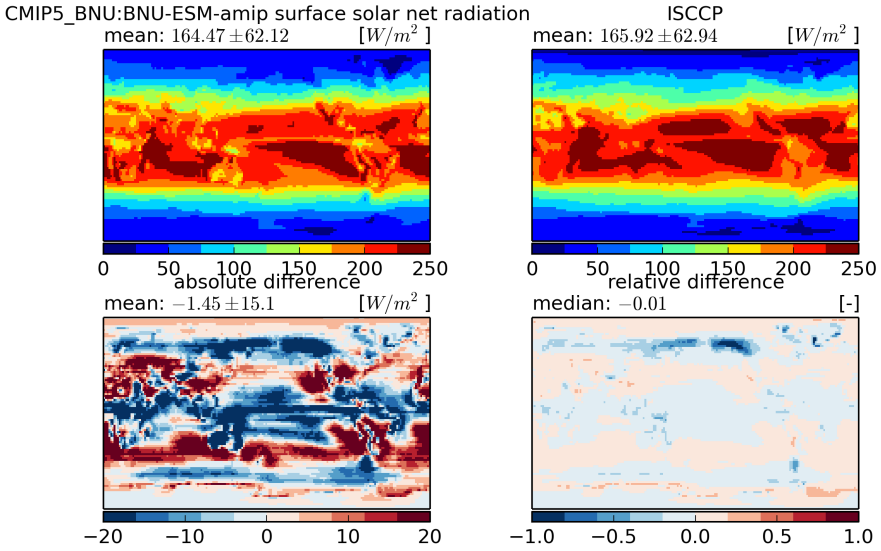



Figure 1331: Temporal mean fields (top) and absolute and relative differences (bottom)

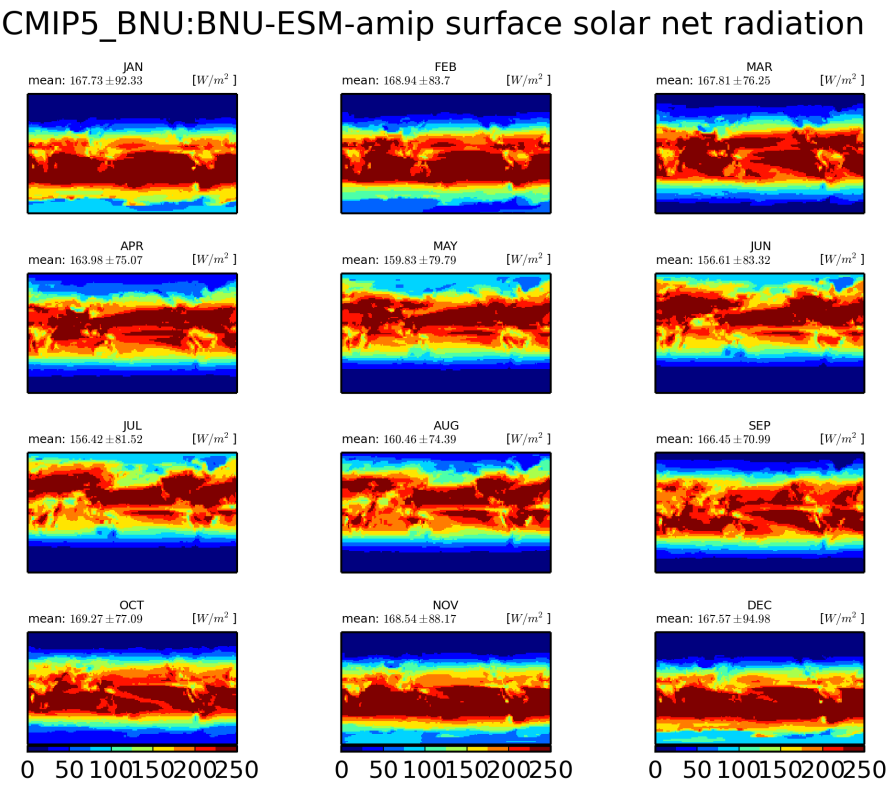



Figure 1332: Monthly mean climatology for BNU:BNU-ESM

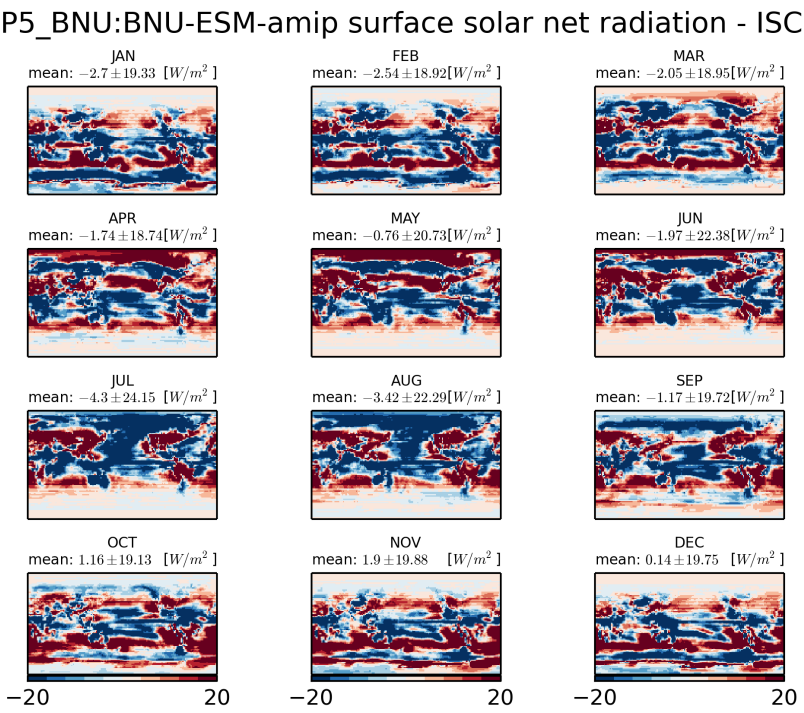



Figure 1333: Monthly mean climatology of difference between BNU:BNU-ESM and ISCCP

### 3.1.5 CMIP5 BCC:bcc-csm1-1-amip

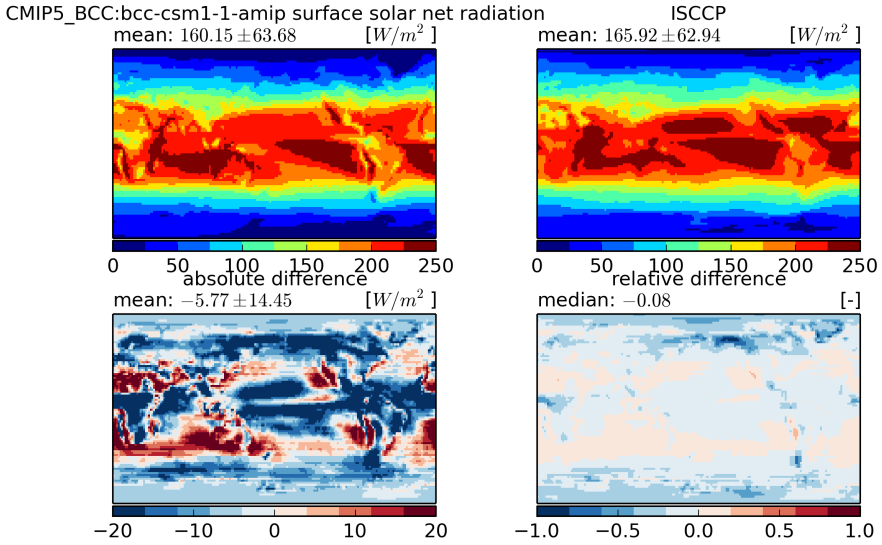



Figure 1334: Temporal mean fields (top) and absolute and relative differences (bottom)

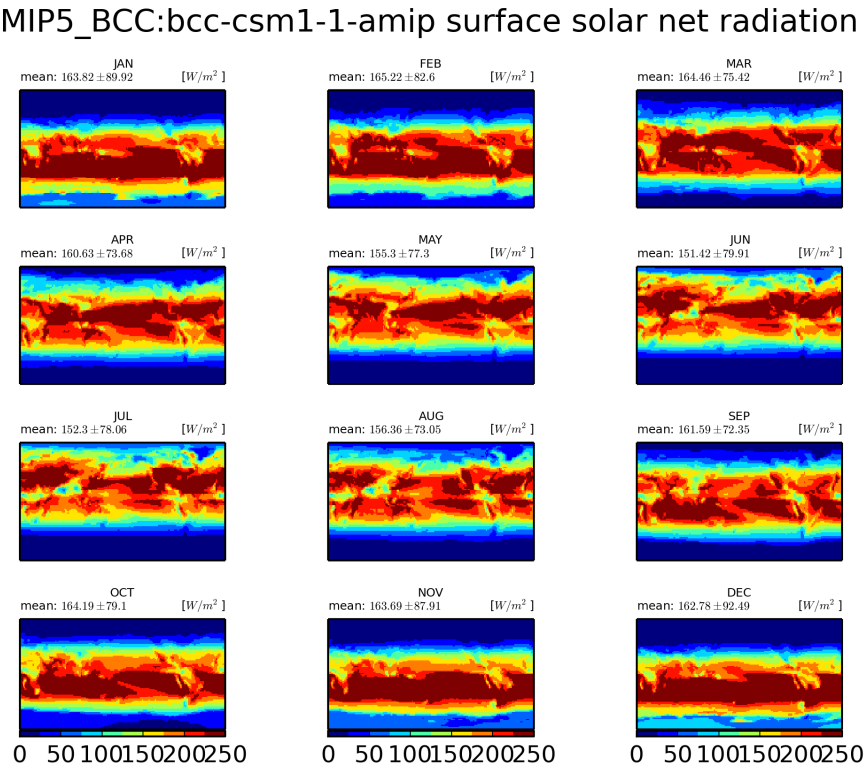



Figure 1335: Monthly mean climatology for BCC:bcc-csm1-1

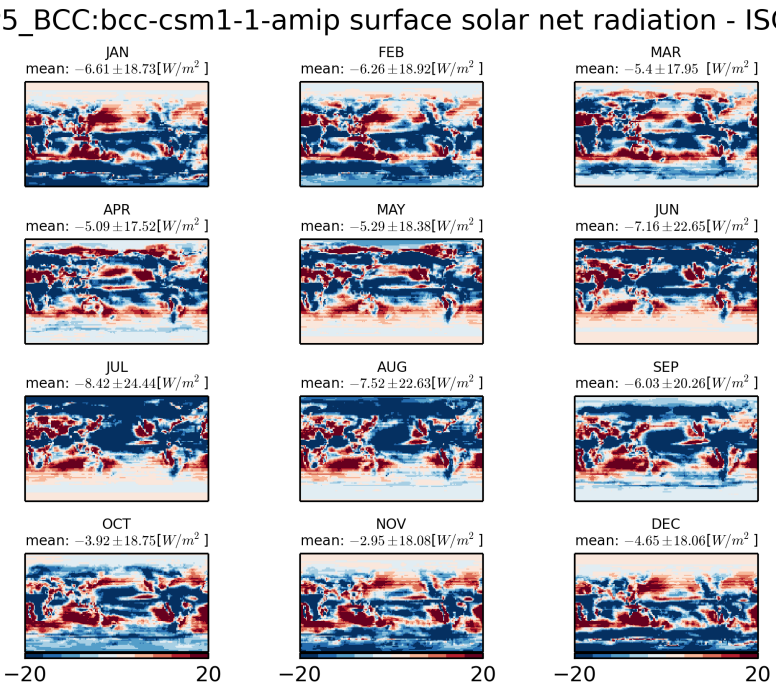



Figure 1336: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and ISCCP

### 3.1.6 CMIP5 BCC:bcc-csm1-1-m-amip

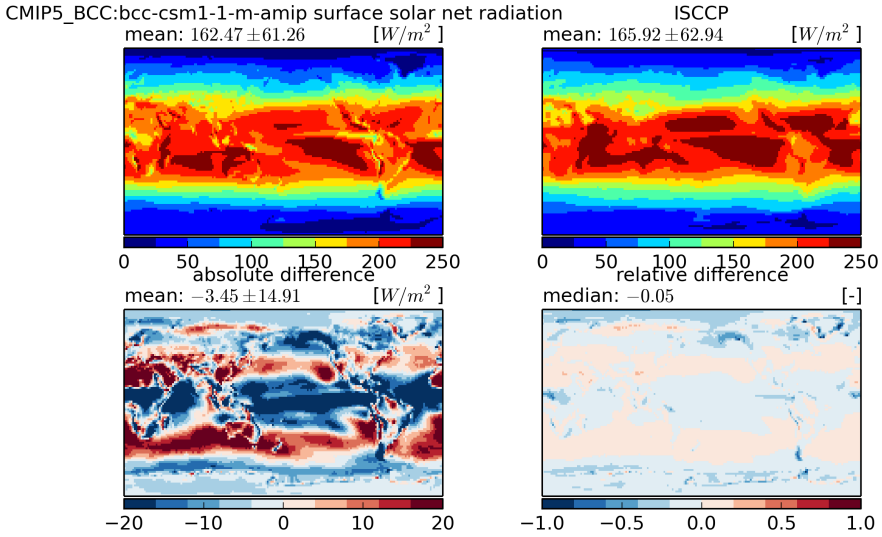



Figure 1337: Temporal mean fields (top) and absolute and relative differences (bottom)

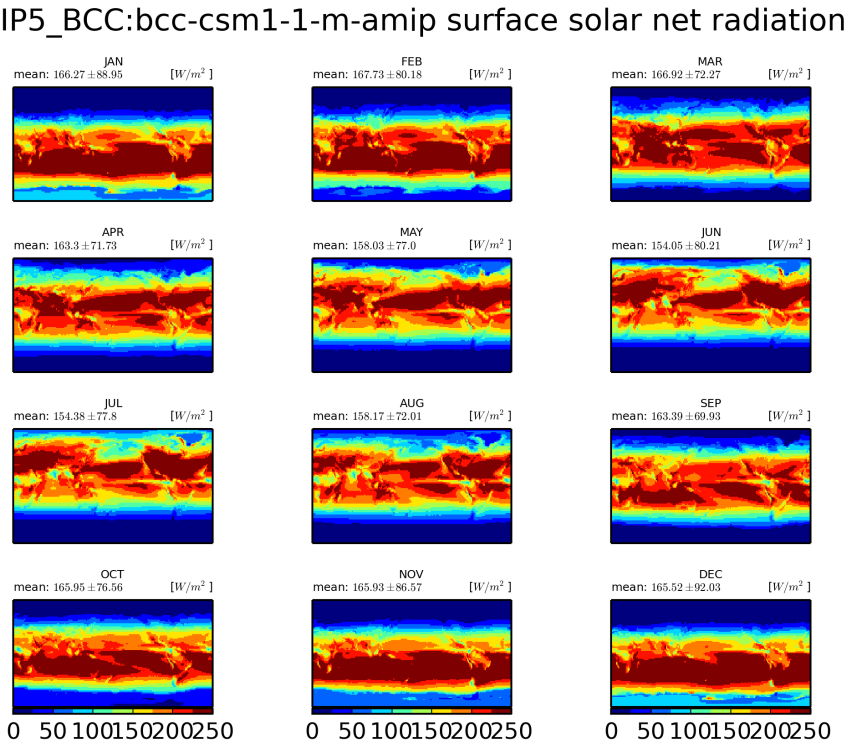



Figure 1338: Monthly mean climatology for BCC:bcc-csm1-1-m

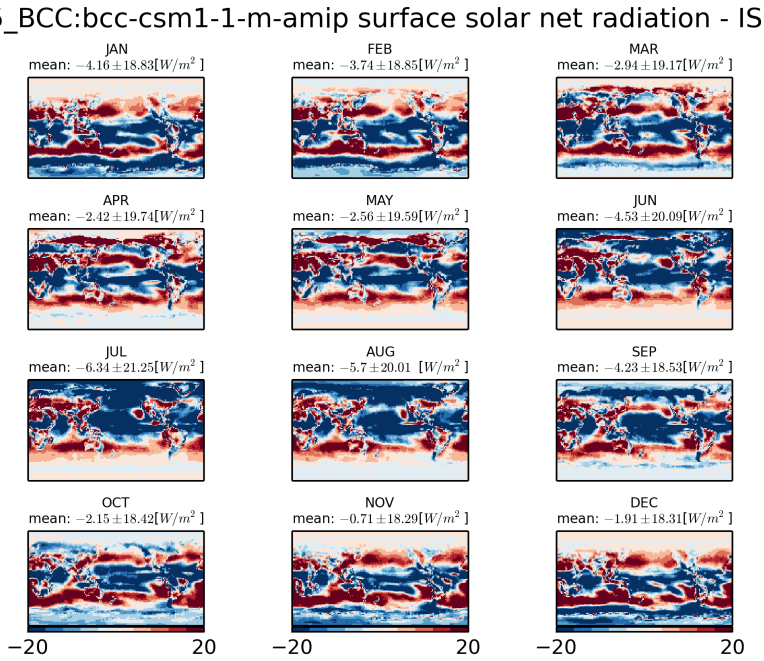



Figure 1339: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and ISCCP

### 3.1.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

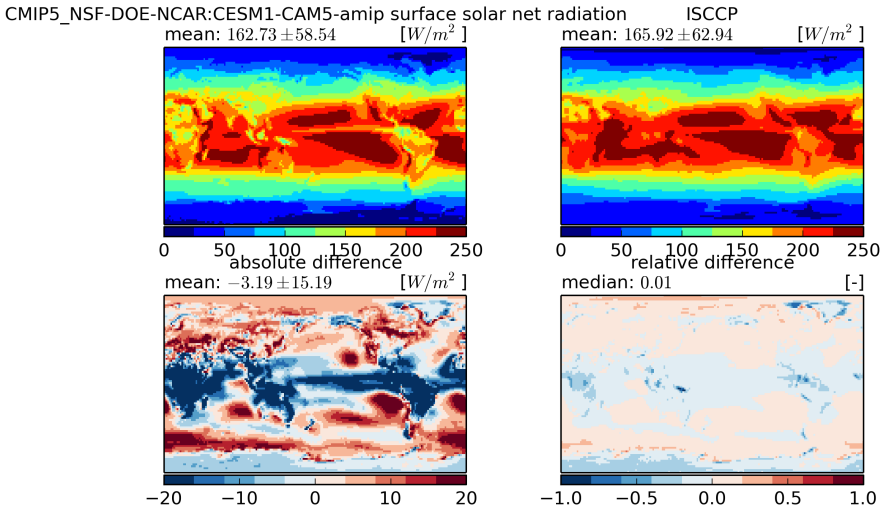



Figure 1340: Temporal mean fields (top) and absolute and relative differences (bottom)

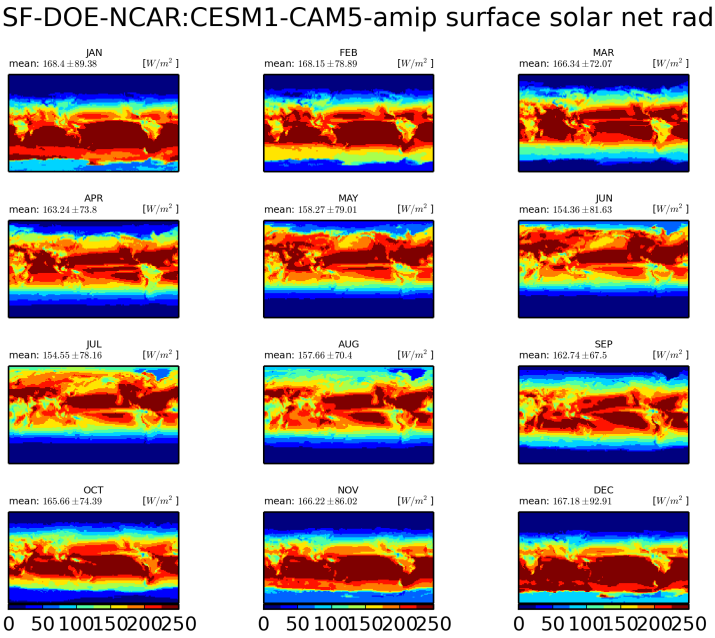



Figure 1341: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

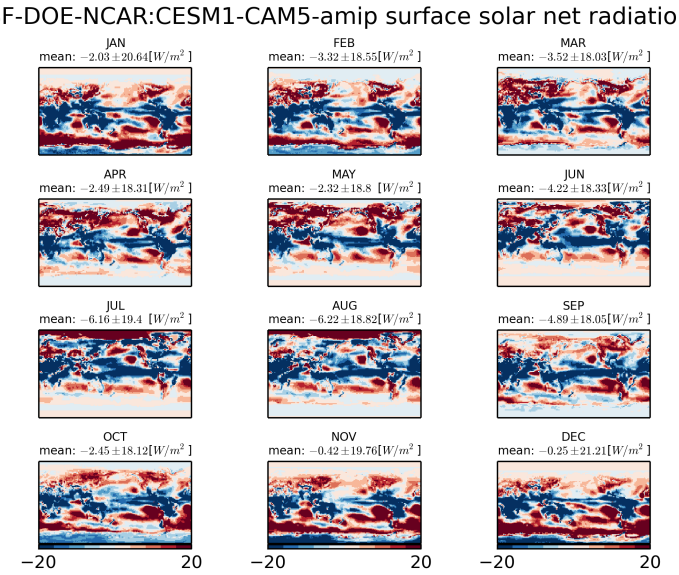



Figure 1342: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and ISCCP

### 3.1.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

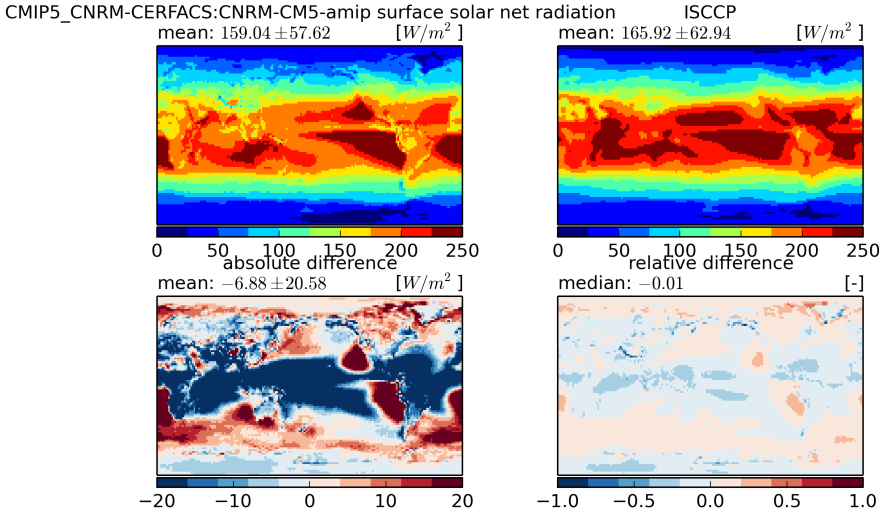



Figure 1343: Temporal mean fields (top) and absolute and relative differences (bottom)

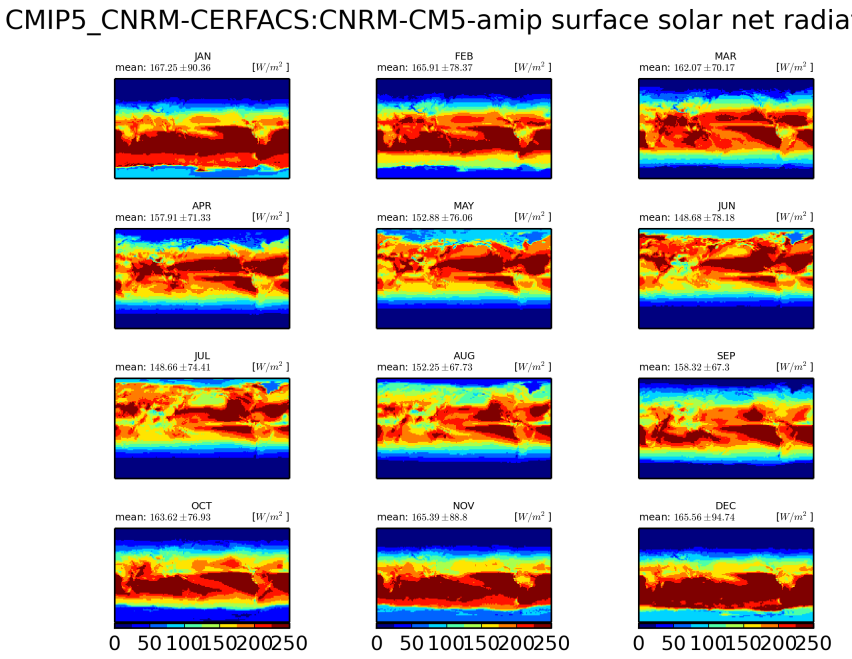



Figure 1344: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

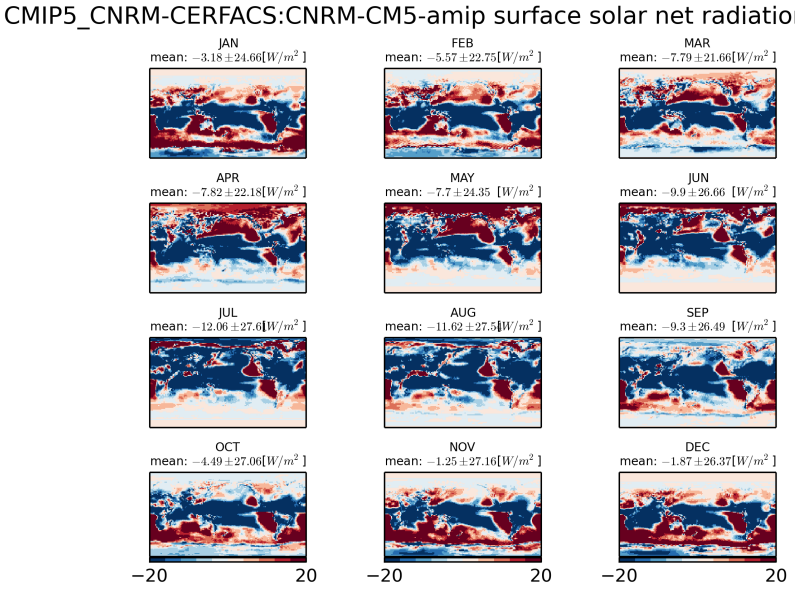



Figure 1345: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and ISCCP

### 3.1.9 CMIP5 MRI:MRI-CGCM3-amip

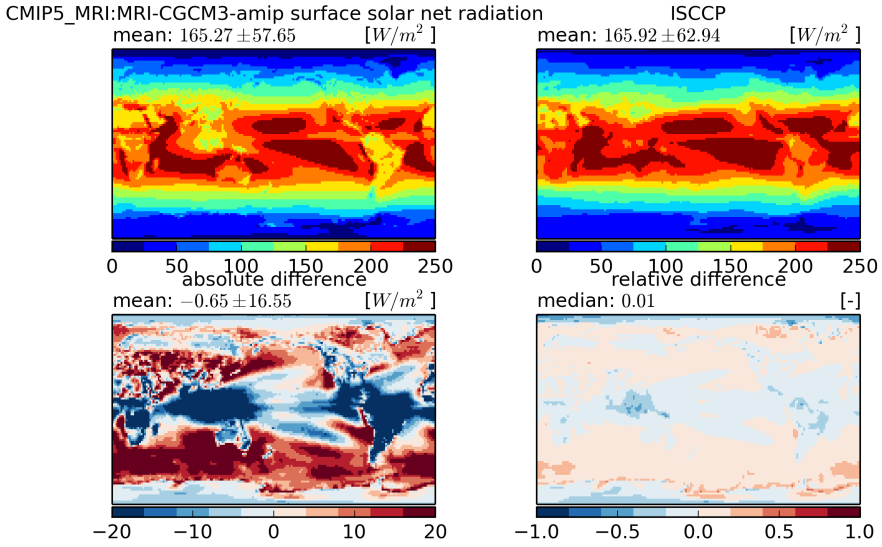



Figure 1346: Temporal mean fields (top) and absolute and relative differences (bottom)

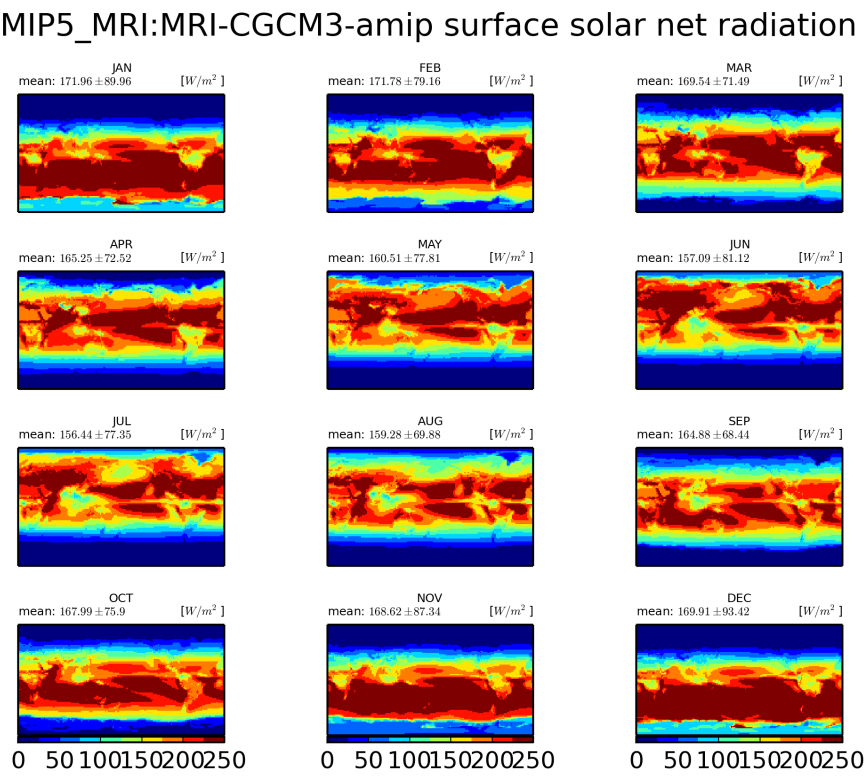



Figure 1347: Monthly mean climatology for MRI:MRI-CGCM3

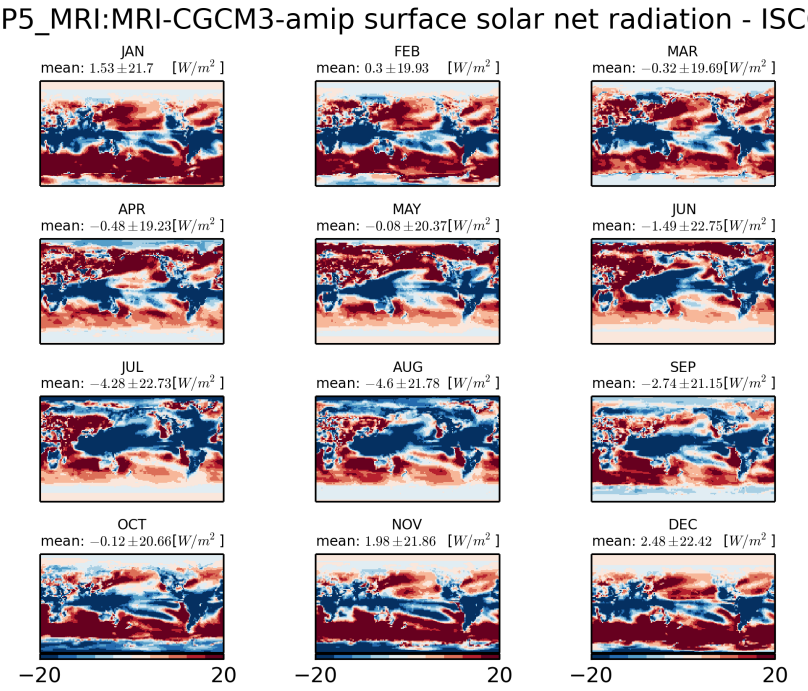



Figure 1348: Monthly mean climatology of difference between MRI:MRI-CGCM3 and ISCCP

### 3.1.10 CMIP5 NASA-GISS:GISS-E2-R-amip

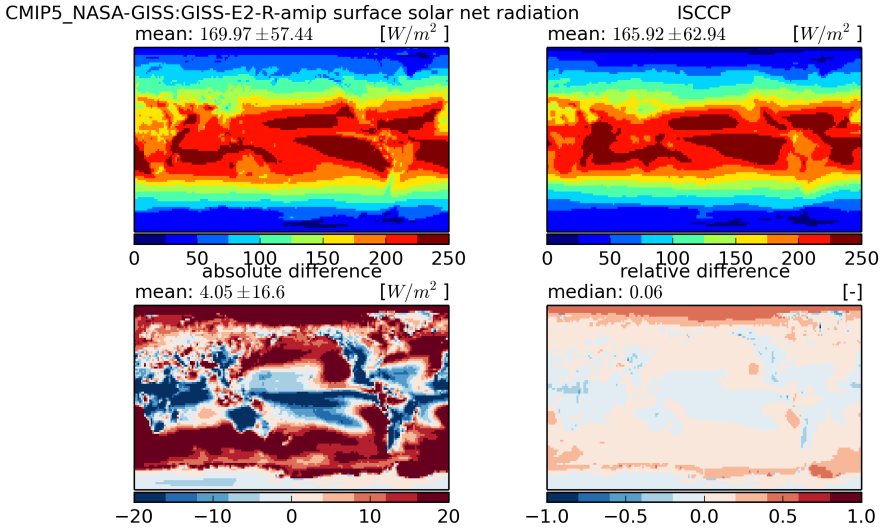



Figure 1349: Temporal mean fields (top) and absolute and relative differences (bottom)

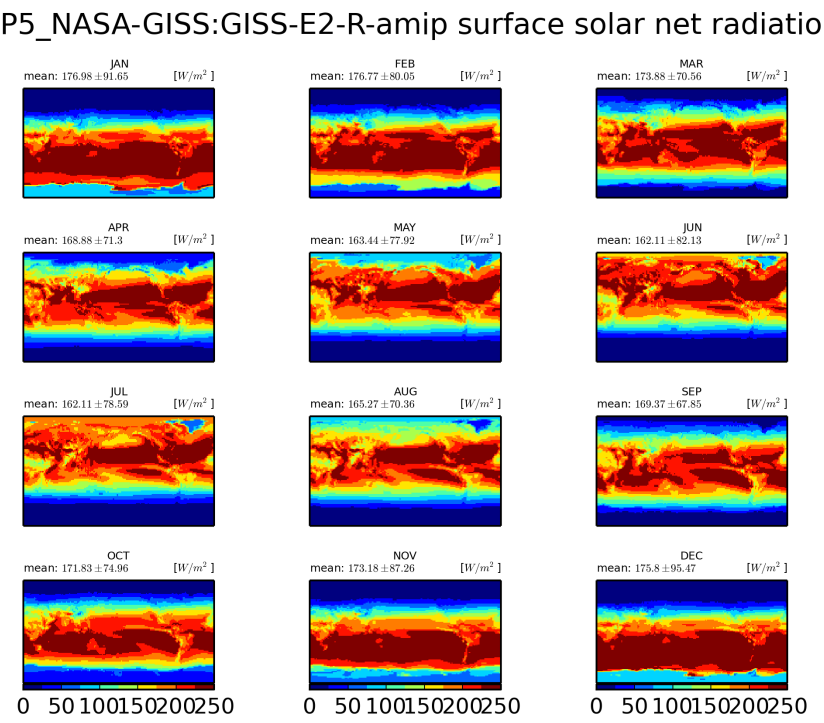



Figure 1350: Monthly mean climatology for NASA-GISS:GISS-E2-R

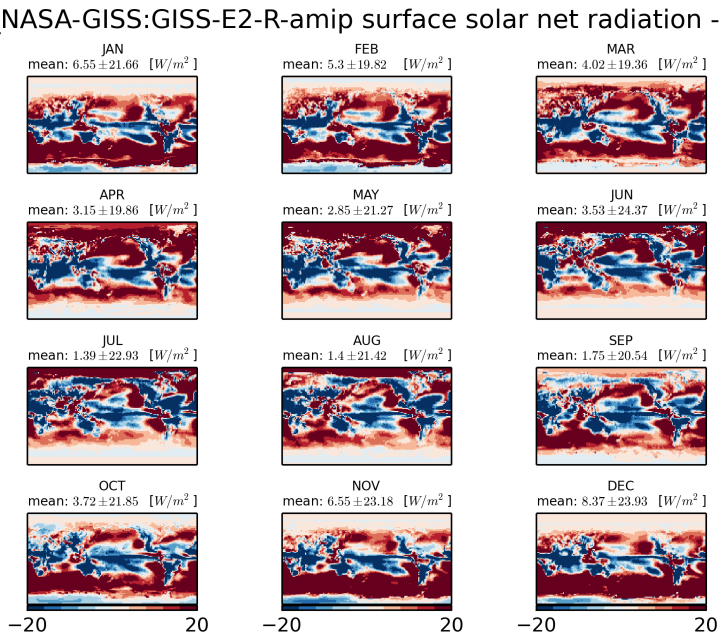



Figure 1351: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and ISCCP

### 3.1.11 CMIP5 MIROC:MIROC5-amip

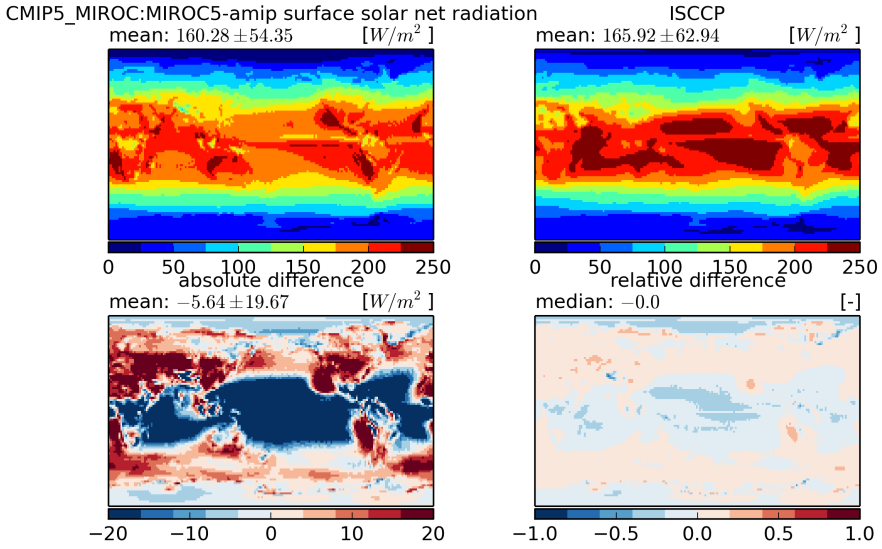



Figure 1352: Temporal mean fields (top) and absolute and relative differences (bottom)

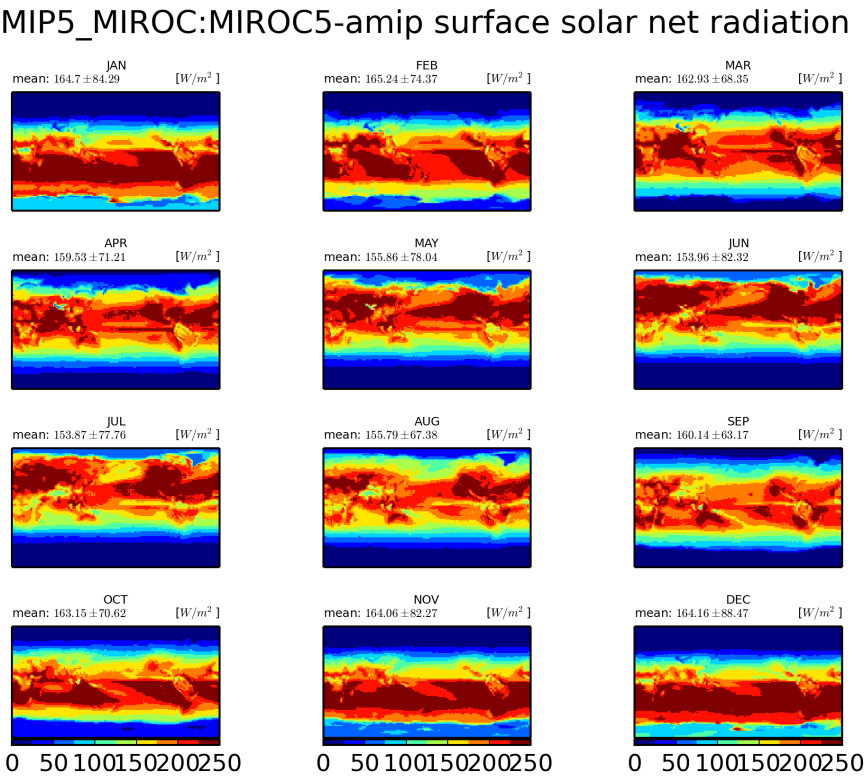



Figure 1353: Monthly mean climatology for MIROC:MIROC5

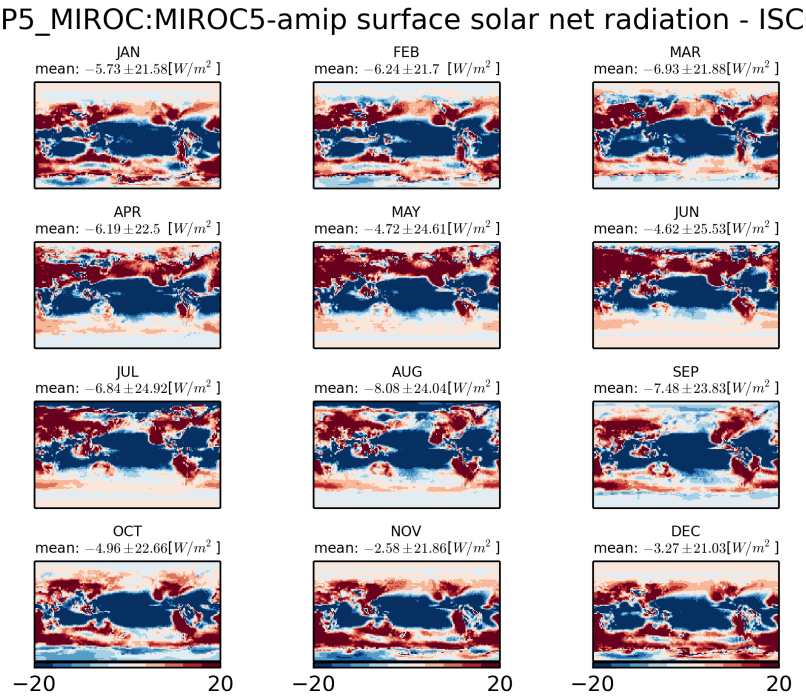



Figure 1354: Monthly mean climatology of difference between MIROC:MIROC5 and ISCCP

### 3.1.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

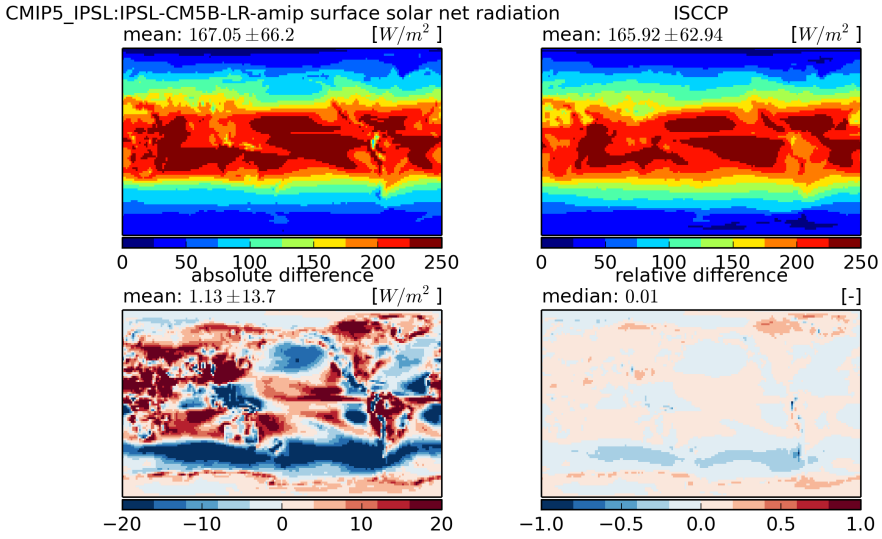



Figure 1355: Temporal mean fields (top) and absolute and relative differences (bottom)

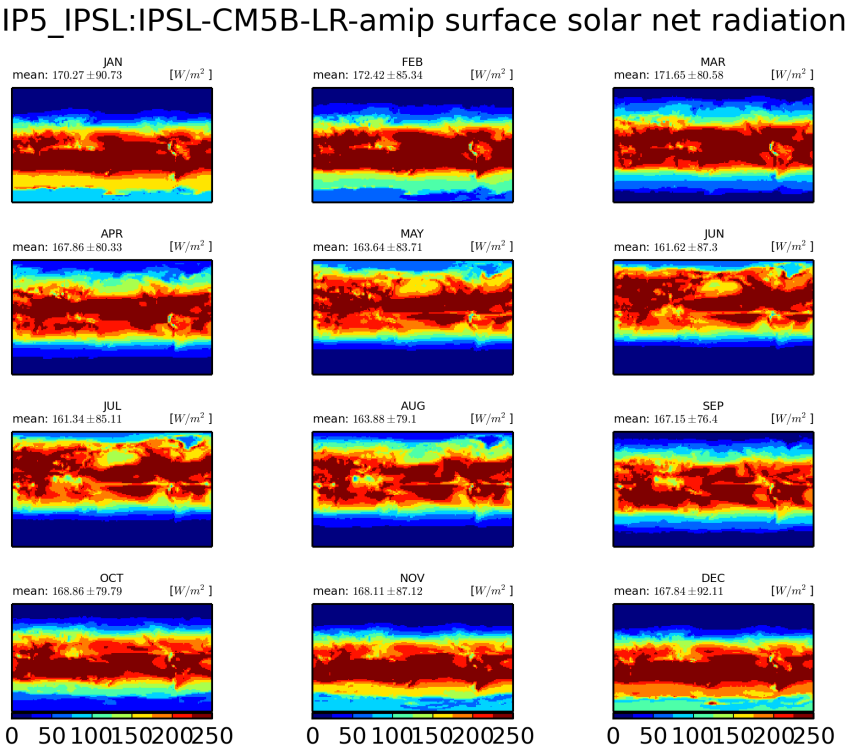



Figure 1356: Monthly mean climatology for IPSL:IPSL-CM5B-LR

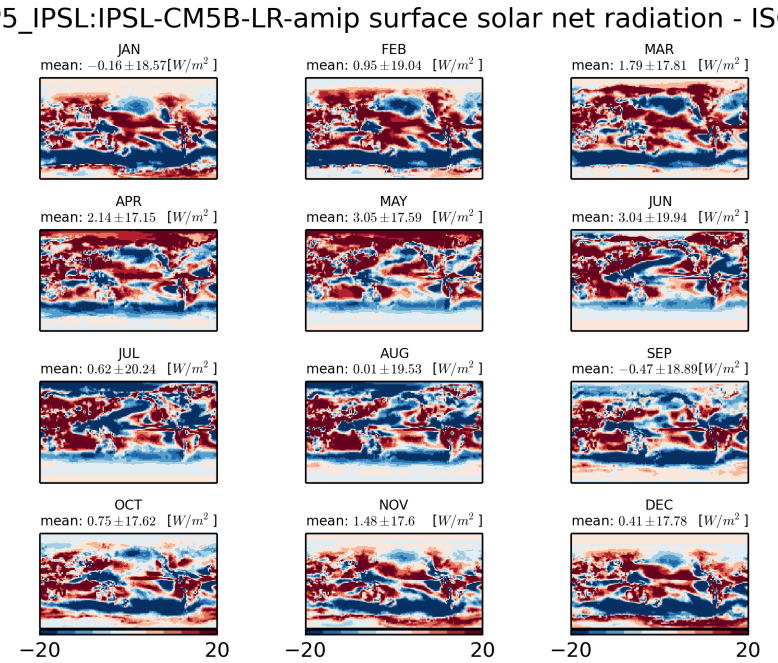



Figure 1357: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and ISCCP

### 3.1.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

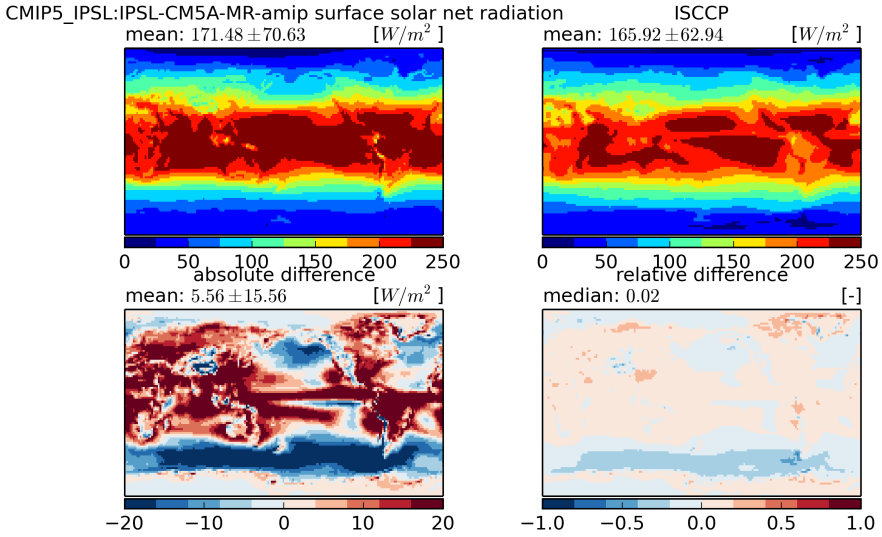



Figure 1358: Temporal mean fields (top) and absolute and relative differences (bottom)

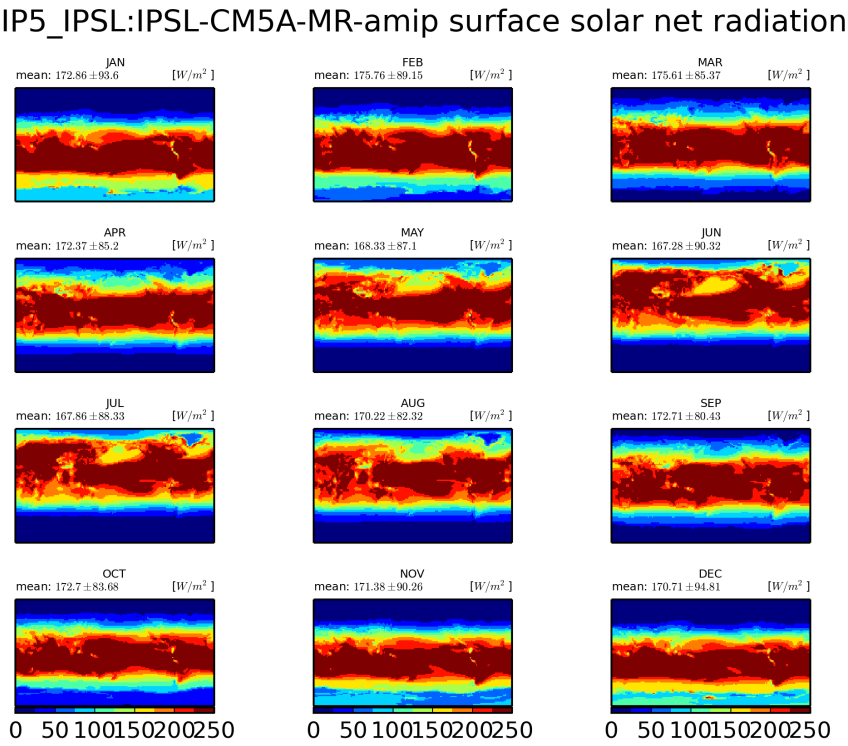



Figure 1359: Monthly mean climatology for IPSL:IPSL-CM5A-MR

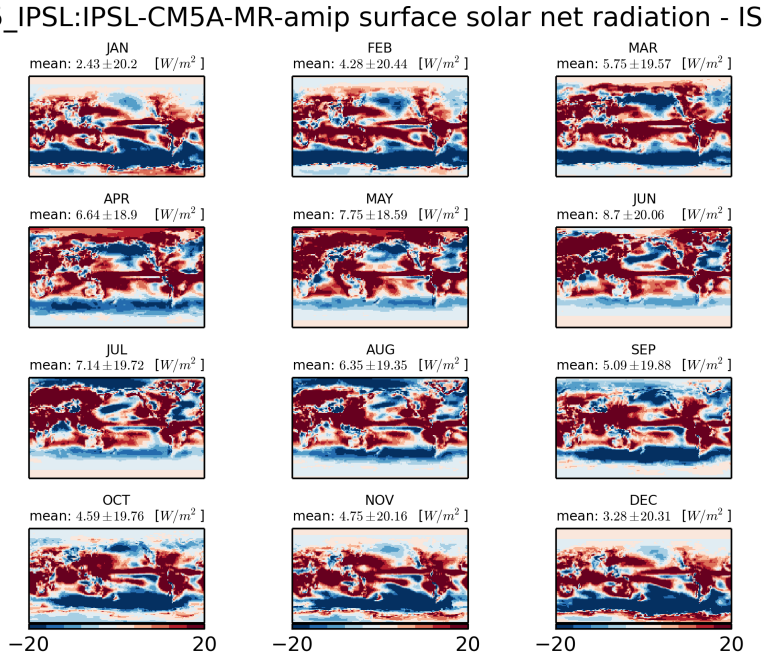



Figure 1360: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and ISCCP

### 3.1.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

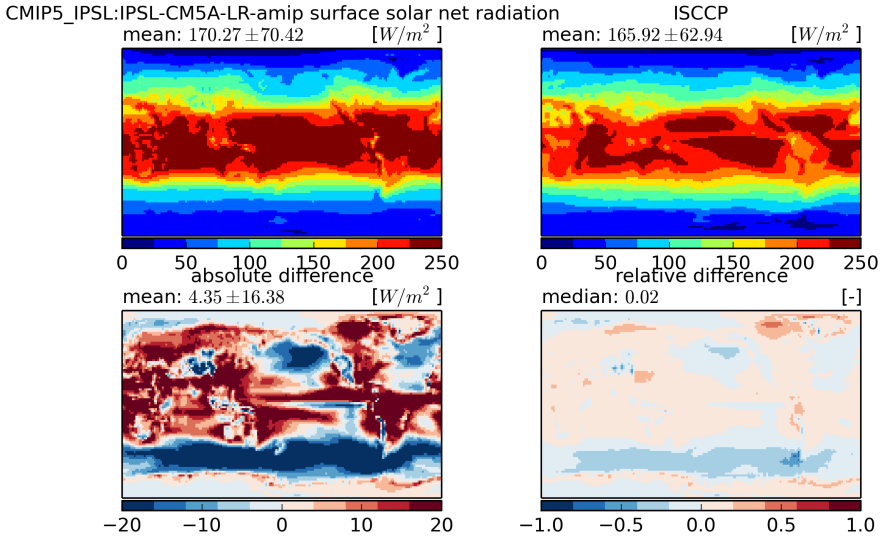



Figure 1361: Temporal mean fields (top) and absolute and relative differences (bottom)

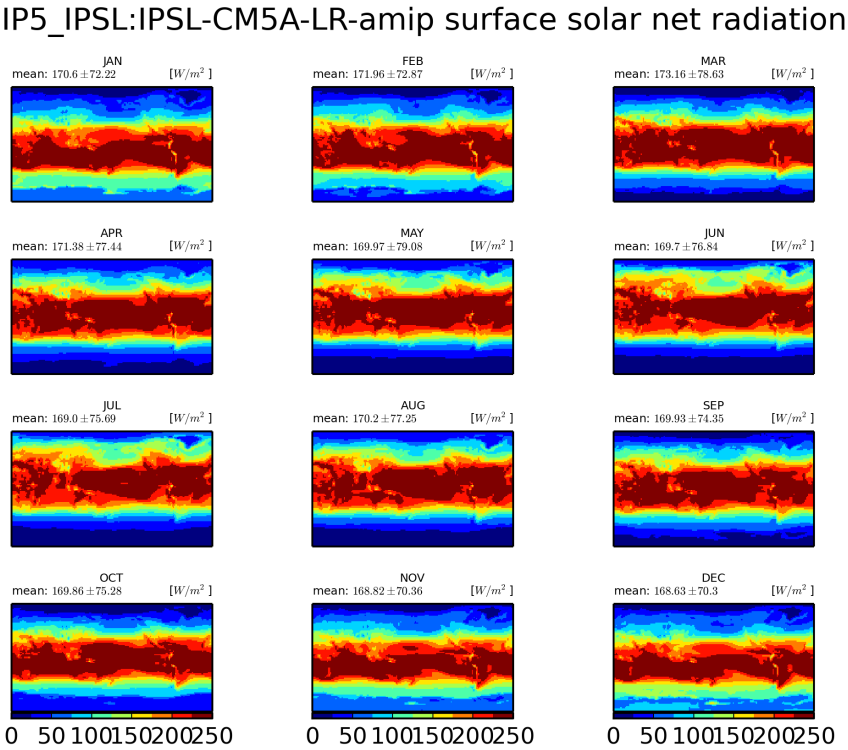



Figure 1362: Monthly mean climatology for IPSL:IPSL-CM5A-LR

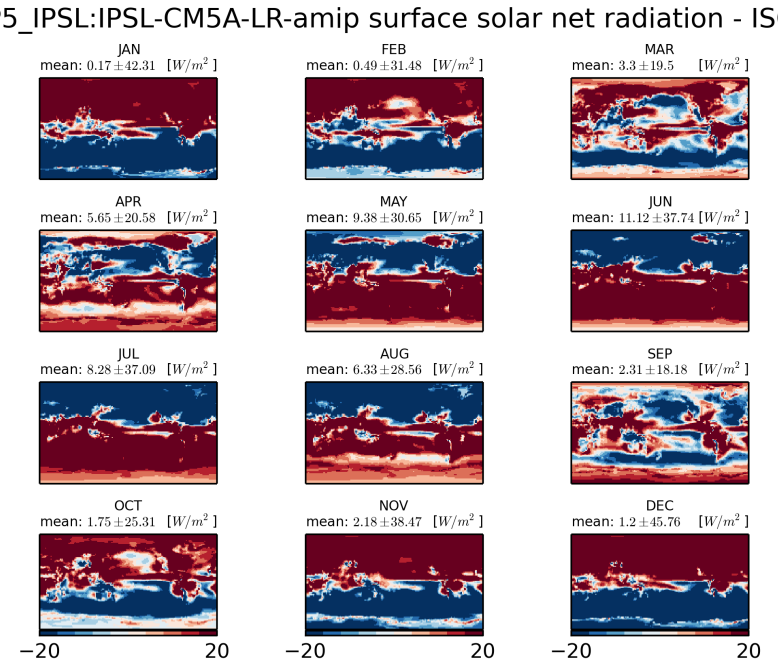



Figure 1363: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and ISCCP

### 3.1.15 CMIP5 MOHC:HadGEM2-A-amip

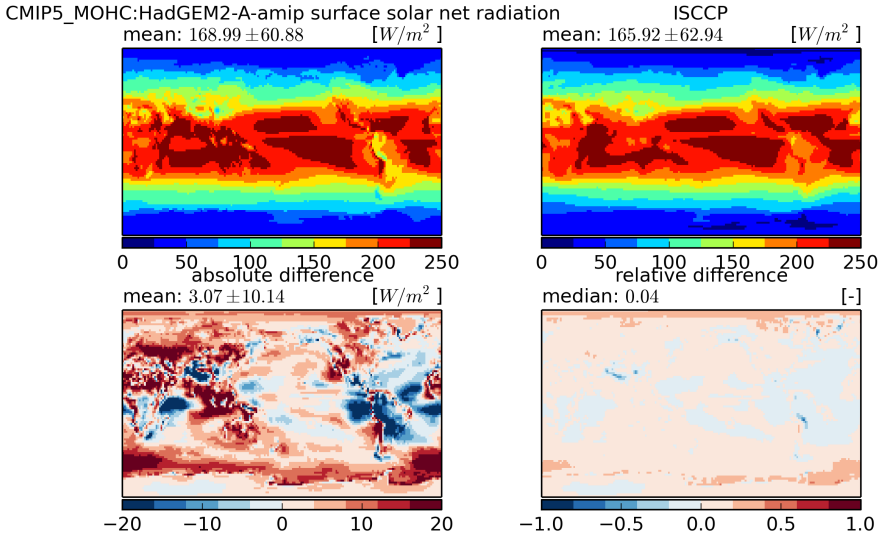



Figure 1364: Temporal mean fields (top) and absolute and relative differences (bottom)

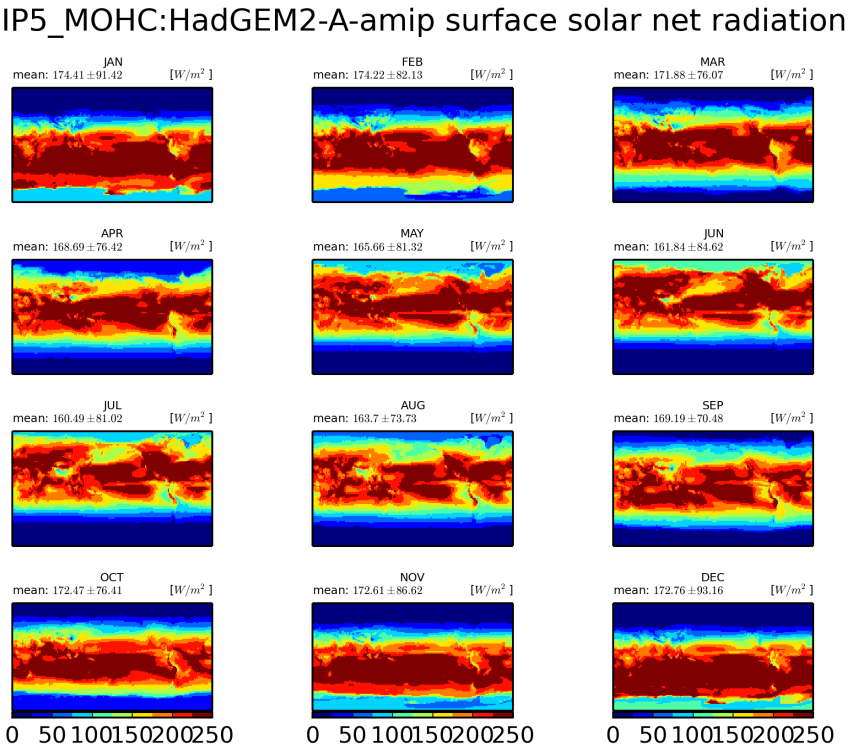



Figure 1365: Monthly mean climatology for MOHC:HadGEM2-A

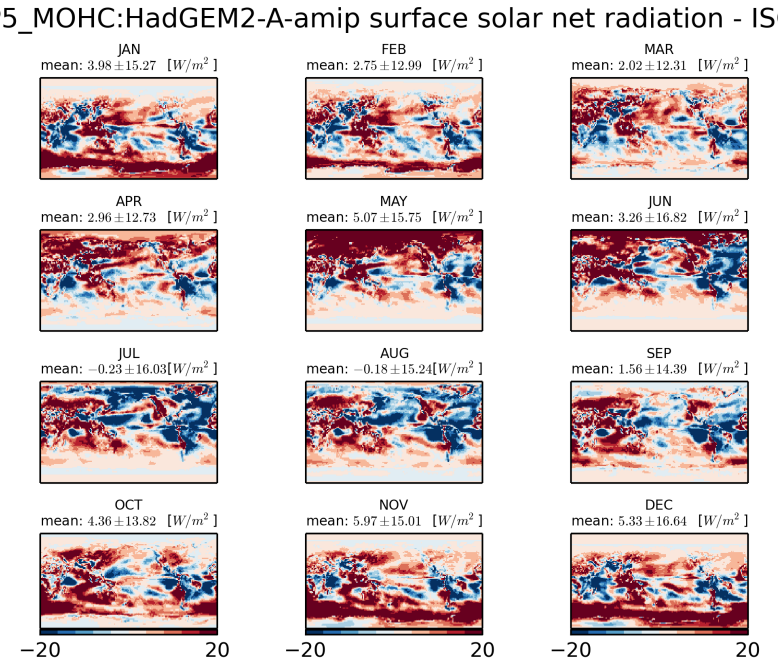



Figure 1366: Monthly mean climatology of difference between MOHC:HADGEM2-A and ISCCP

### 3.1.16 CMIP5 LASG-IAP:FGOALS-s2-amip

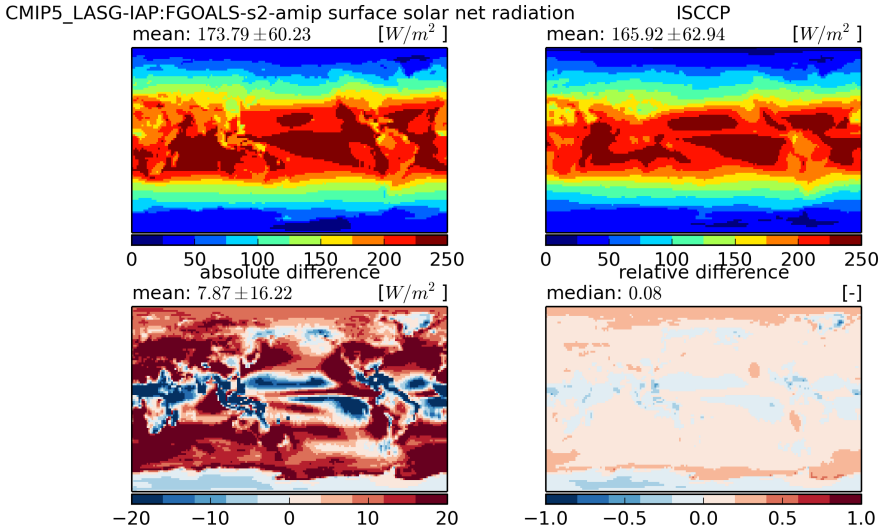



Figure 1367: Temporal mean fields (top) and absolute and relative differences (bottom)

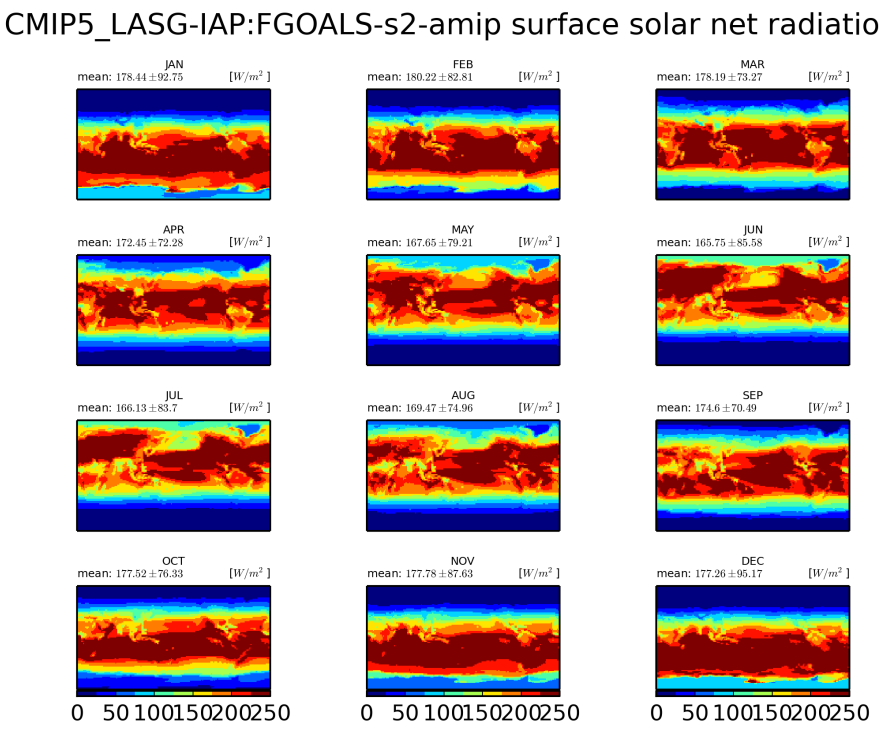



Figure 1368: Monthly mean climatology for LASG-IAP:FGOALS-s2

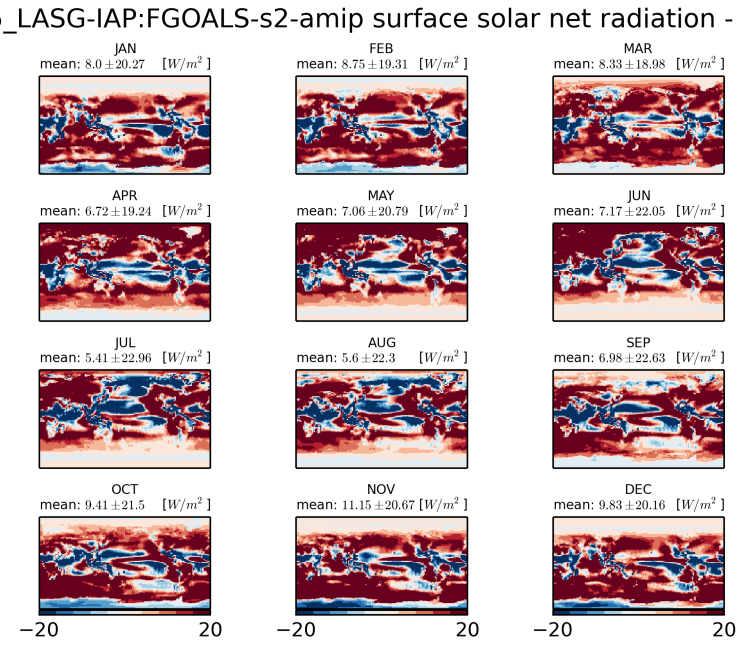



Figure 1369: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and ISCCP

### 3.1.17 CMIP5 CMCC:CMCC-CM-amip

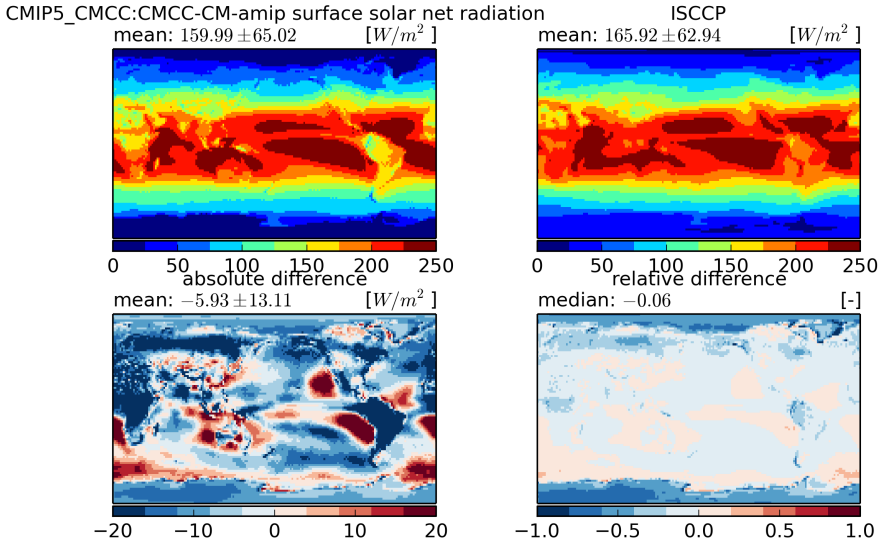



Figure 1370: Temporal mean fields (top) and absolute and relative differences (bottom)

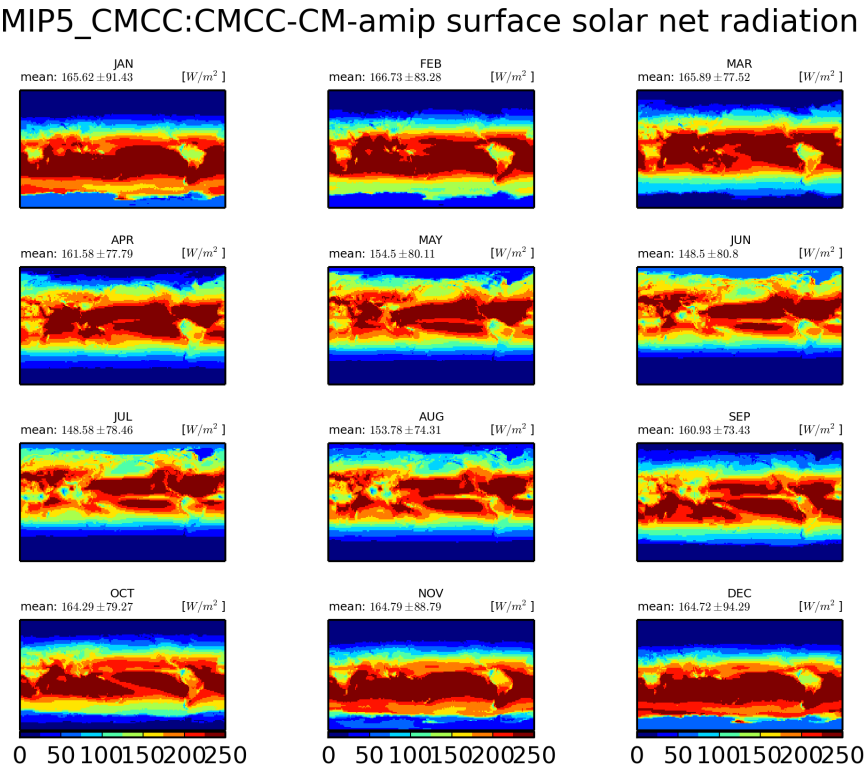



Figure 1371: Monthly mean climatology for CMCC:CMCC-CM

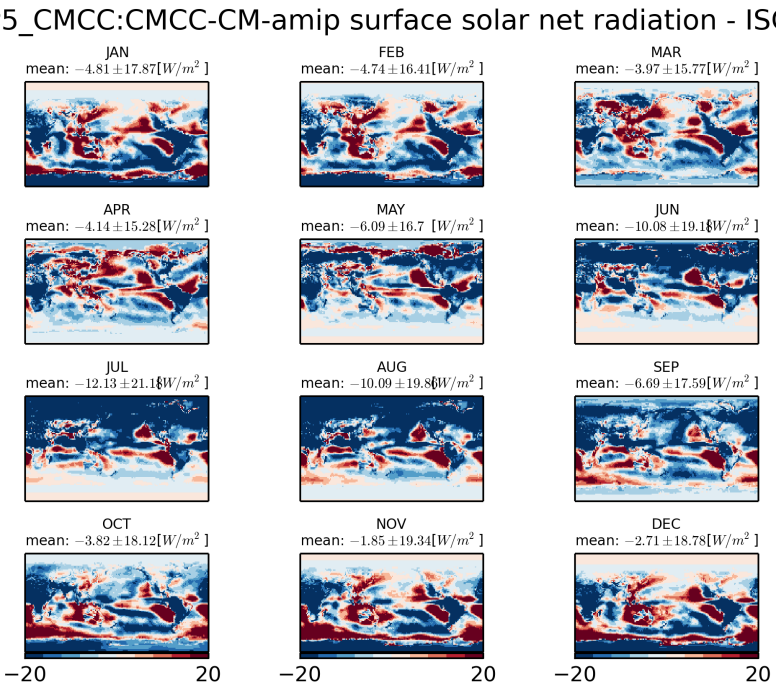



Figure 1372: Monthly mean climatology of difference between CMCC:CMCC-CM and ISCCP

### 3.1.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

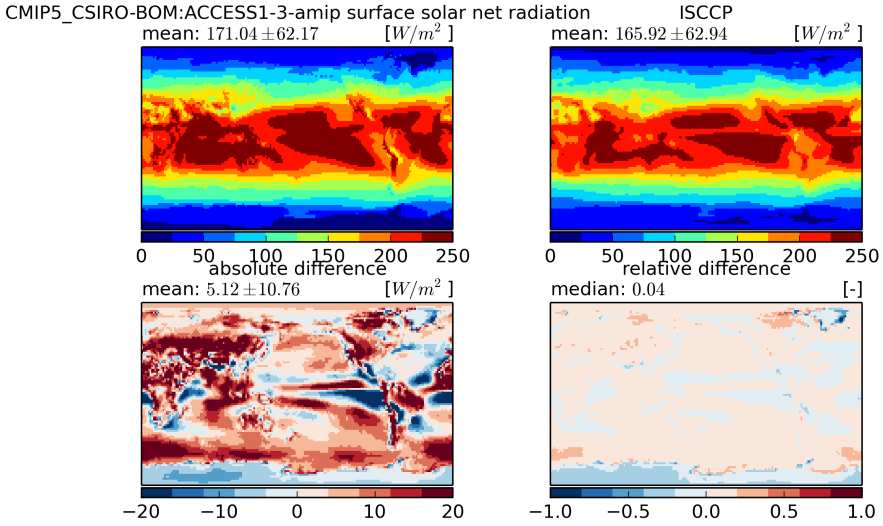



Figure 1373: Temporal mean fields (top) and absolute and relative differences (bottom)

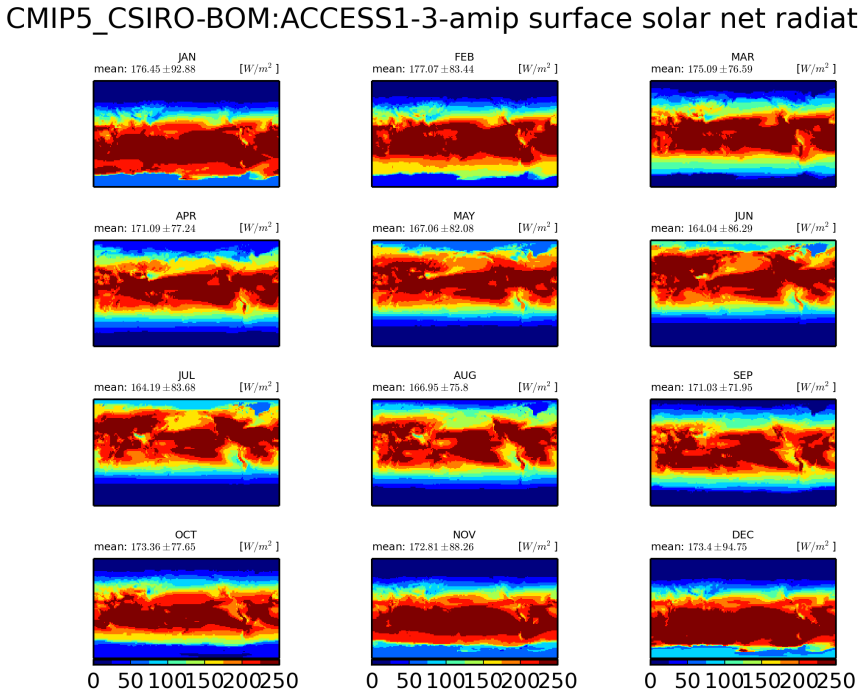



Figure 1374: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

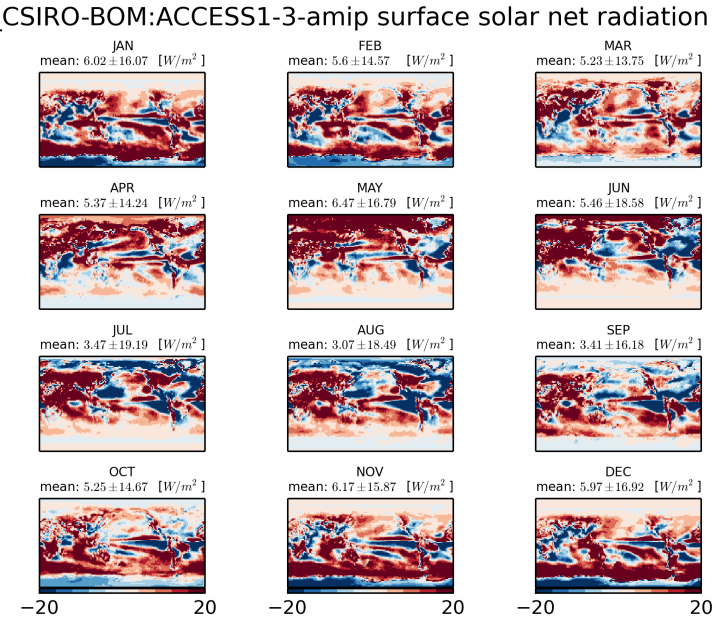



Figure 1375: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and ISCCP

### 3.1.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

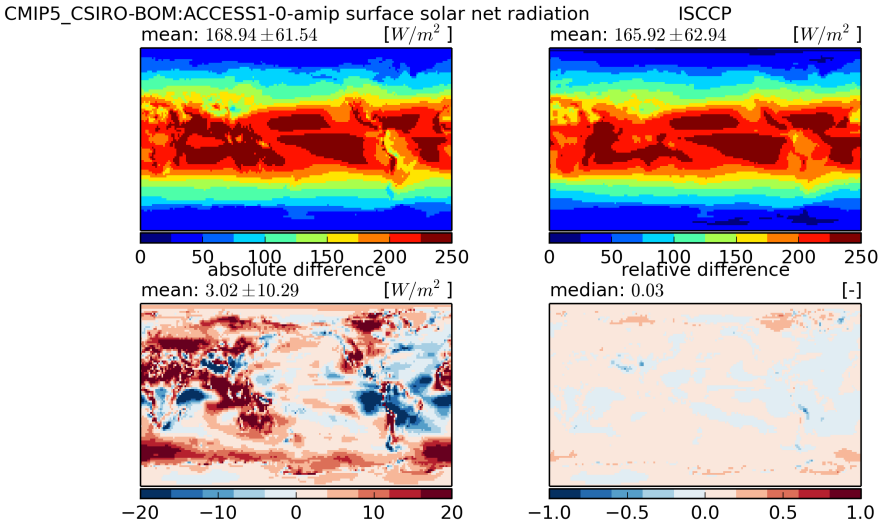



Figure 1376: Temporal mean fields (top) and absolute and relative differences (bottom)

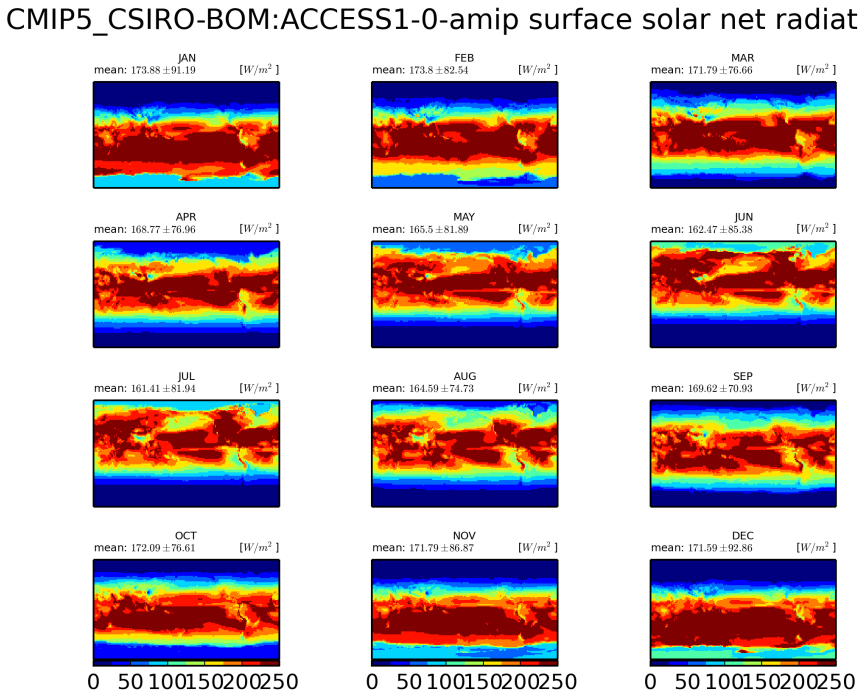



Figure 1377: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

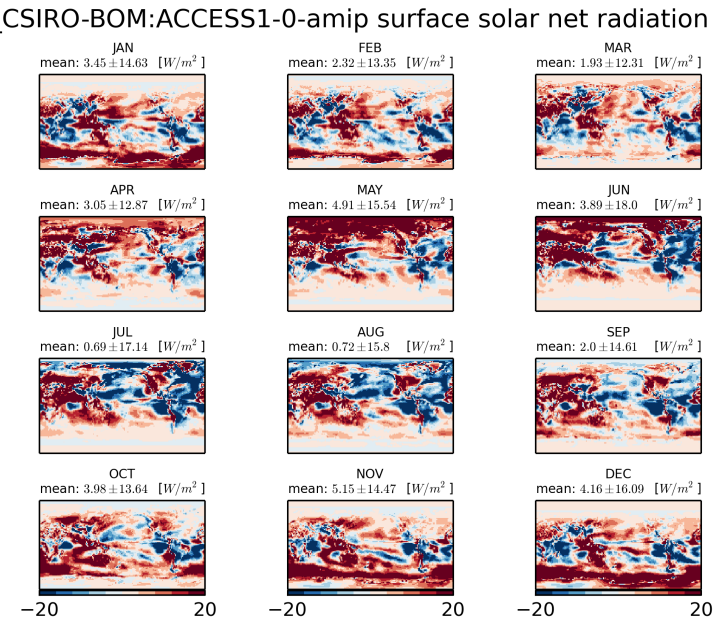



Figure 1378: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and ISCCP

### 3.1.20 CMIP5 INM:inmcm4-amip

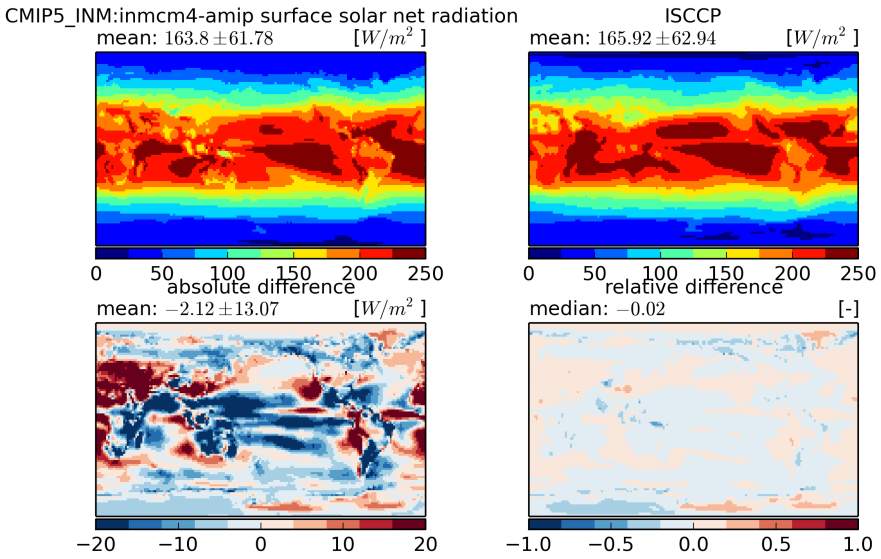



Figure 1379: Temporal mean fields (top) and absolute and relative differences (bottom)

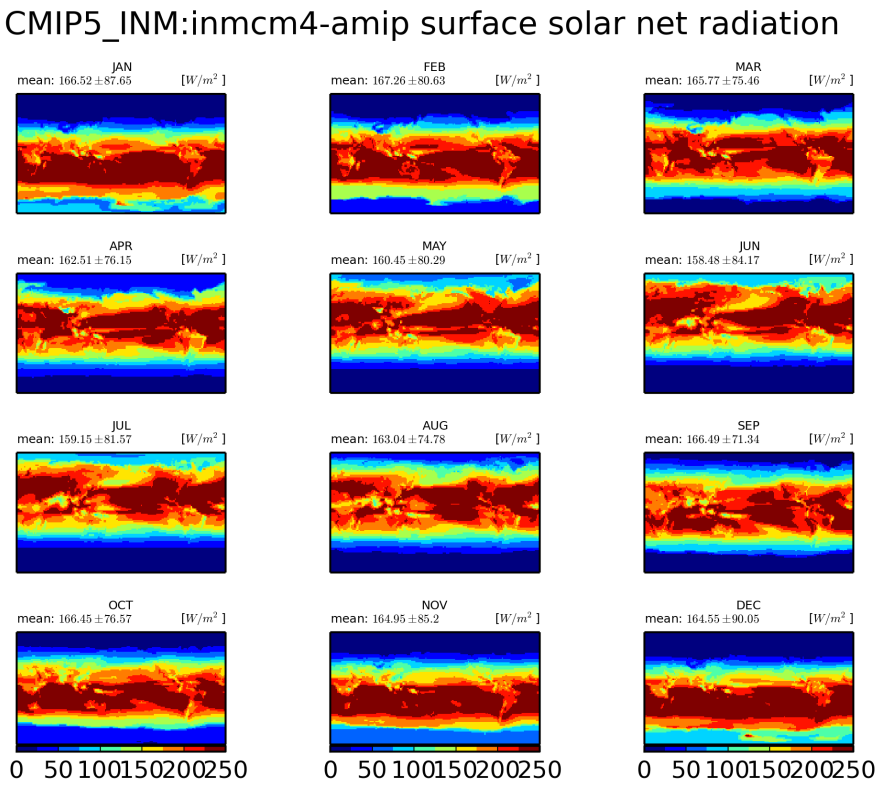



Figure 1380: Monthly mean climatology for INM:inmcm4

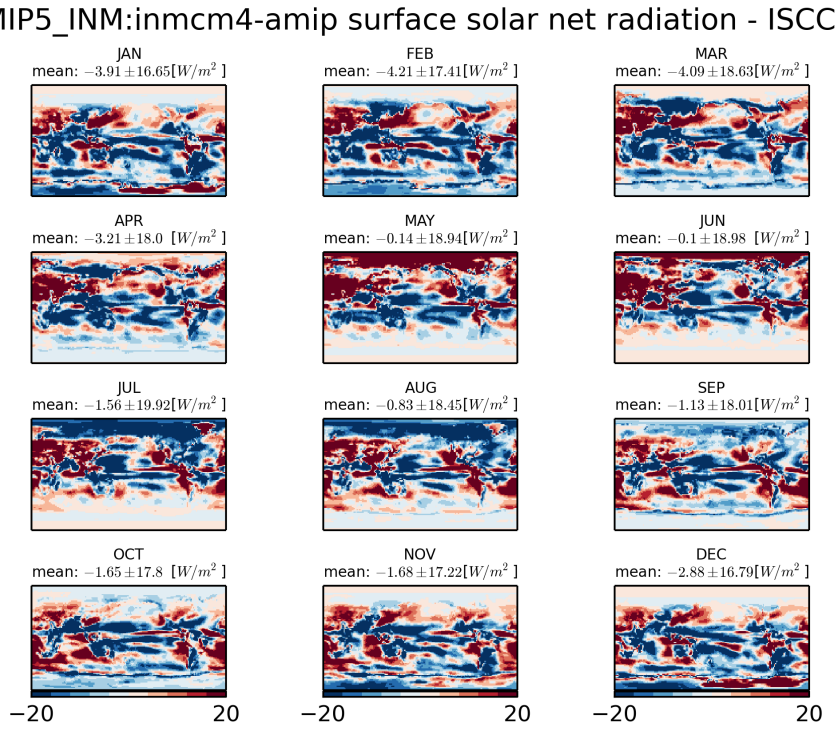



Figure 1381: Monthly mean climatology of difference between INM:INMCM4 and ISCCP

### 3.1.21 CMIP5 MPI-M:MPI-ESM-LR-amip

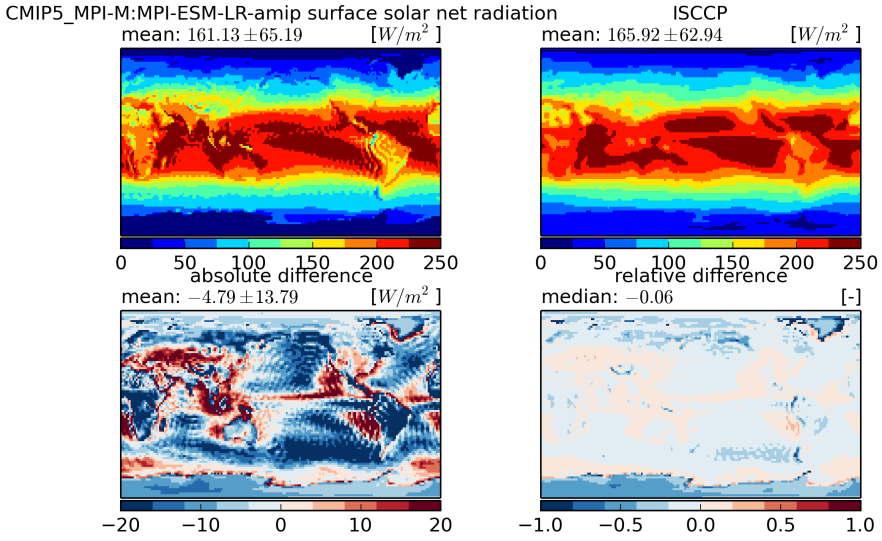



Figure 1382: Temporal mean fields (top) and absolute and relative differences (bottom)

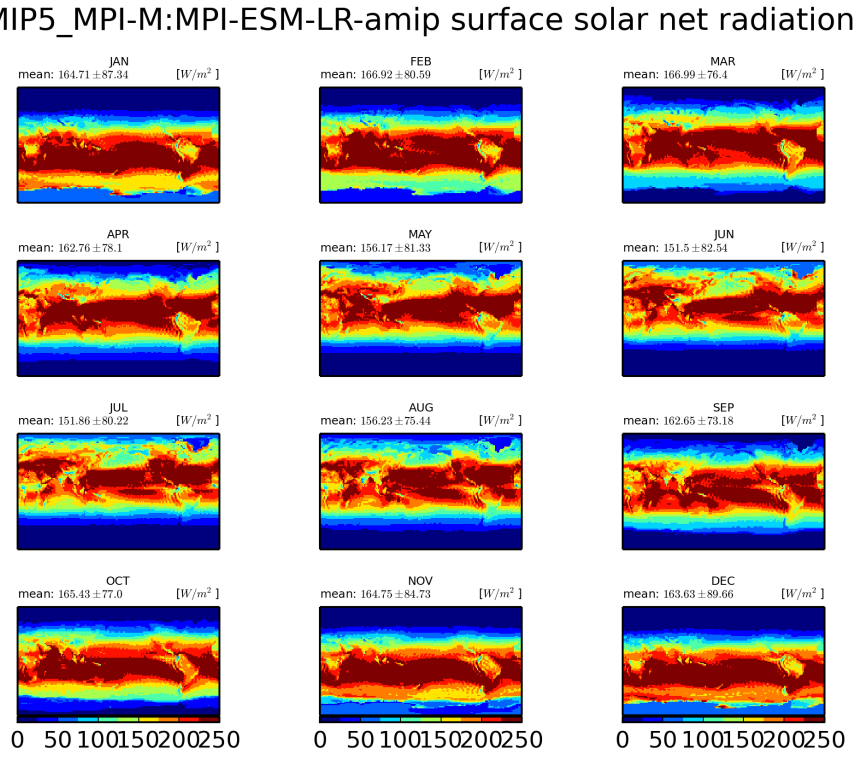



Figure 1383: Monthly mean climatology for MPI-M:MPI-ESM-LR

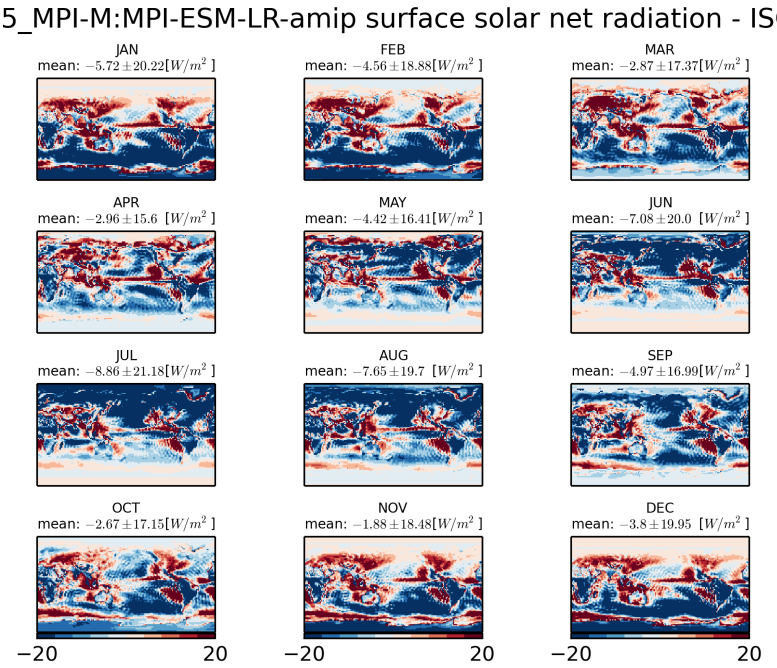



Figure 1384: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and ISCCP

### 3.1.22 CMIP5 MPI-M:MPI-ESM-MR-amip

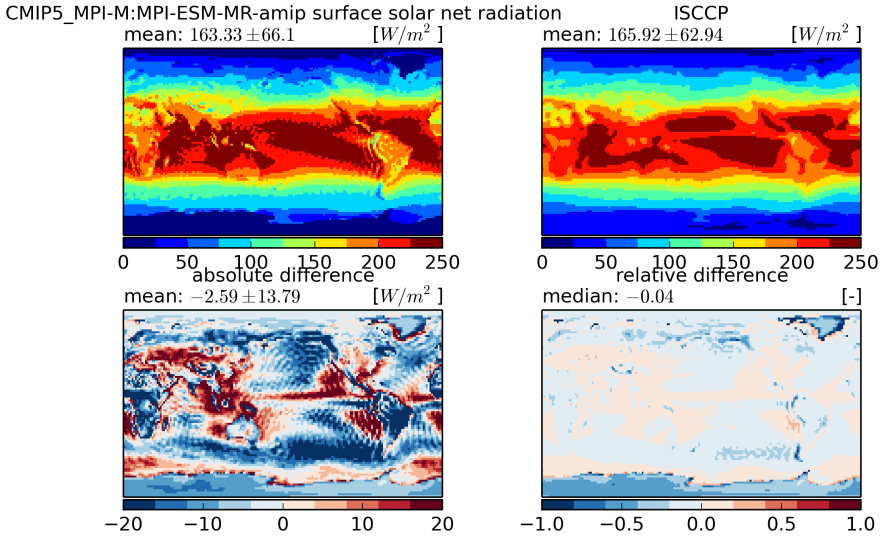



Figure 1385: Temporal mean fields (top) and absolute and relative differences (bottom)

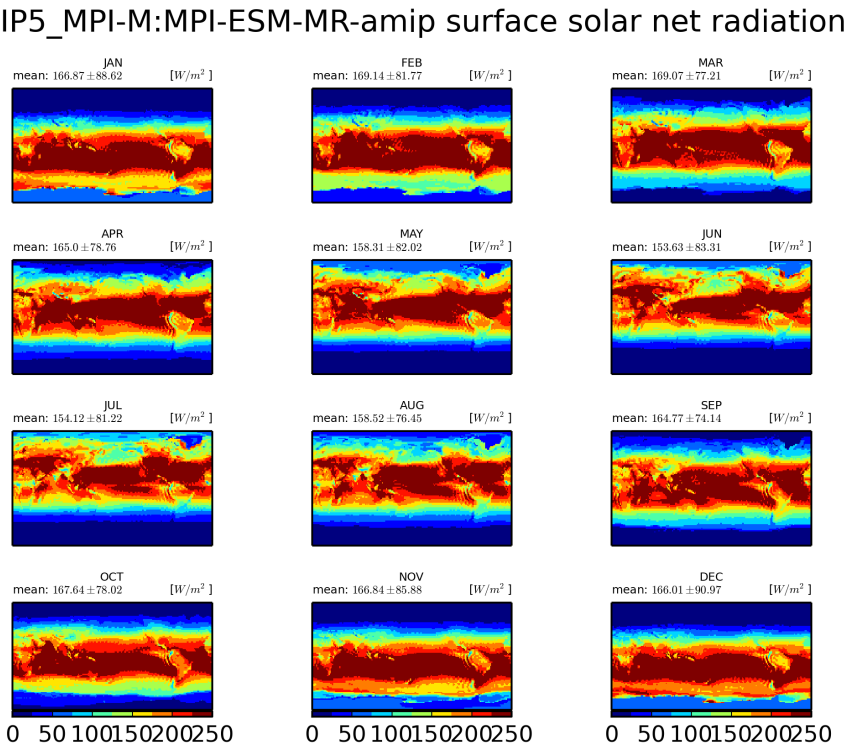



Figure 1386: Monthly mean climatology for MPI-M:MPI-ESM-MR

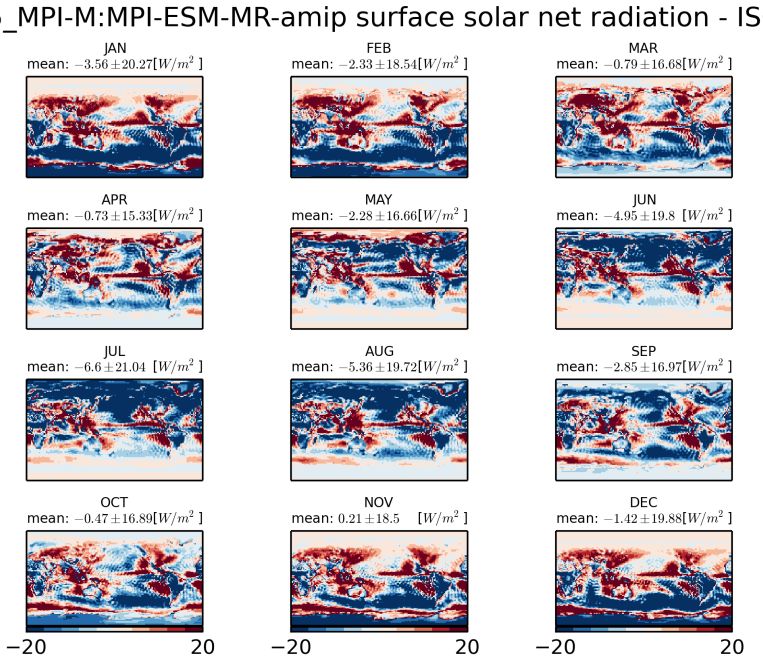



Figure 1387: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and ISCCP

### 3.1.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

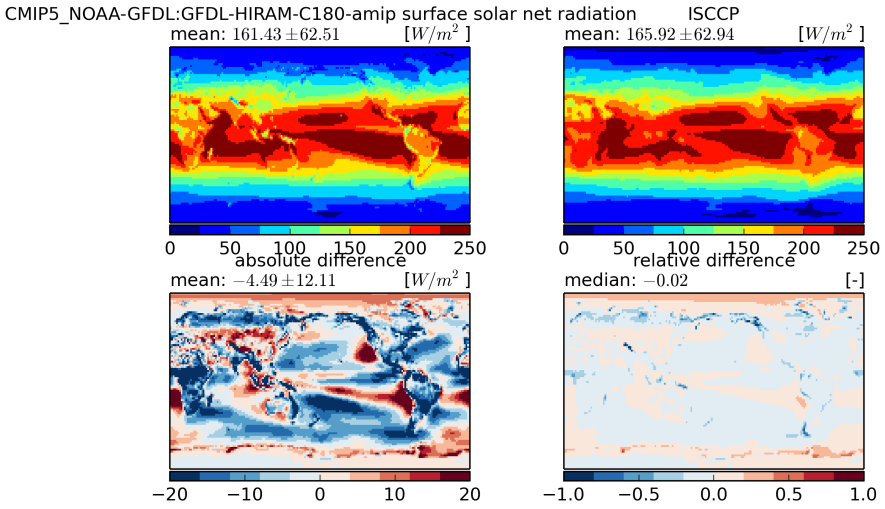



Figure 1388: Temporal mean fields (top) and absolute and relative differences (bottom)

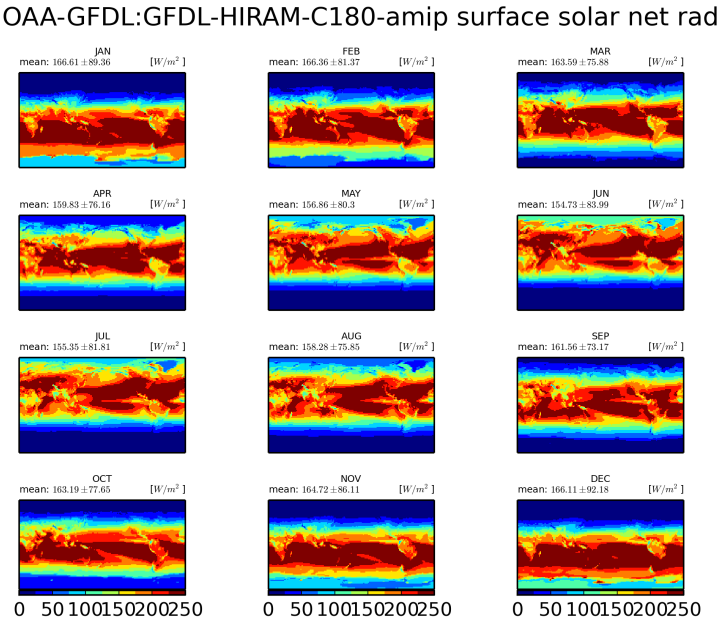



Figure 1389: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

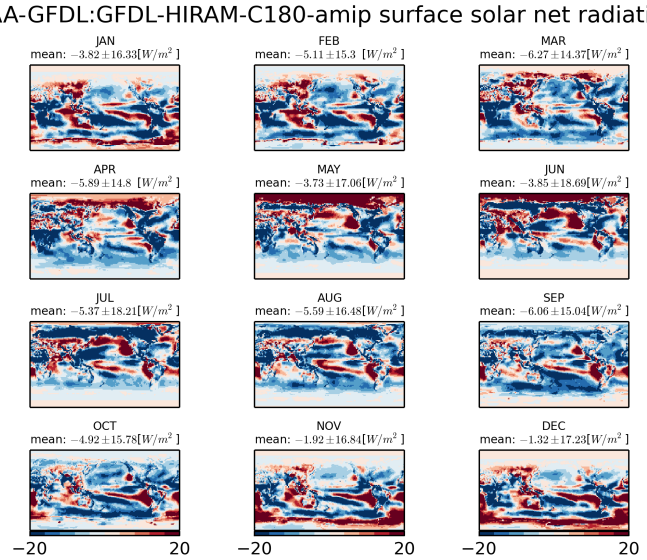



Figure 1390: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and ISCCP

### 3.1.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

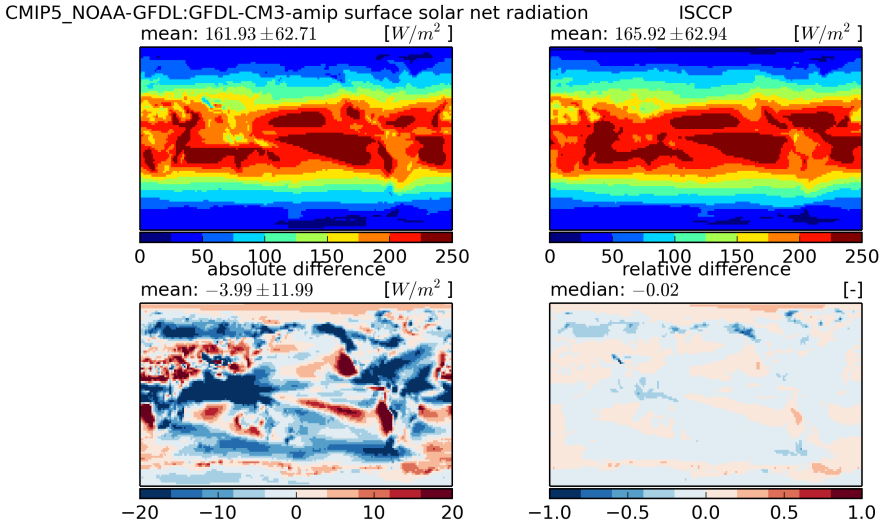



Figure 1391: Temporal mean fields (top) and absolute and relative differences (bottom)

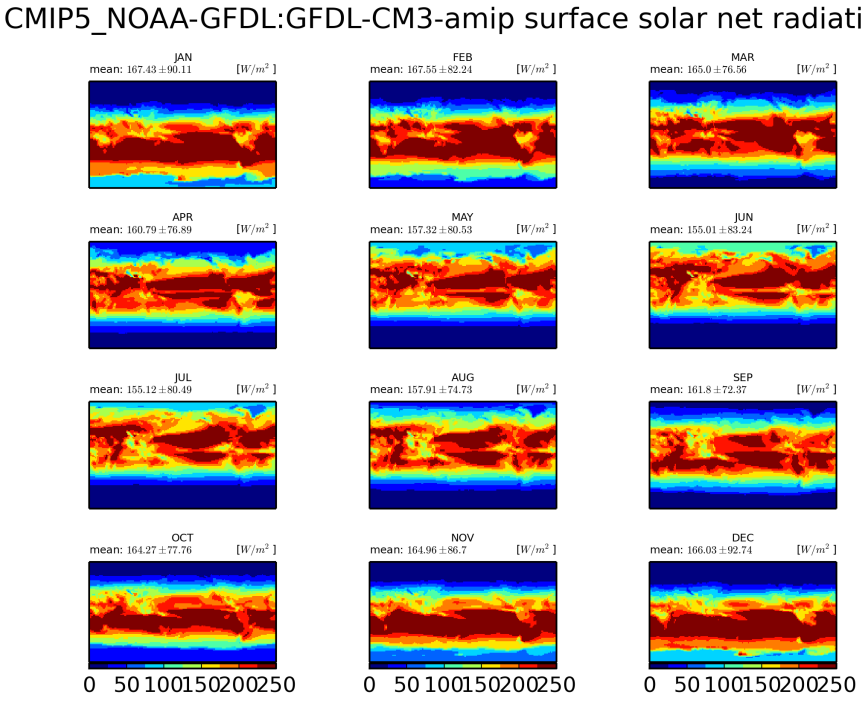



Figure 1392: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

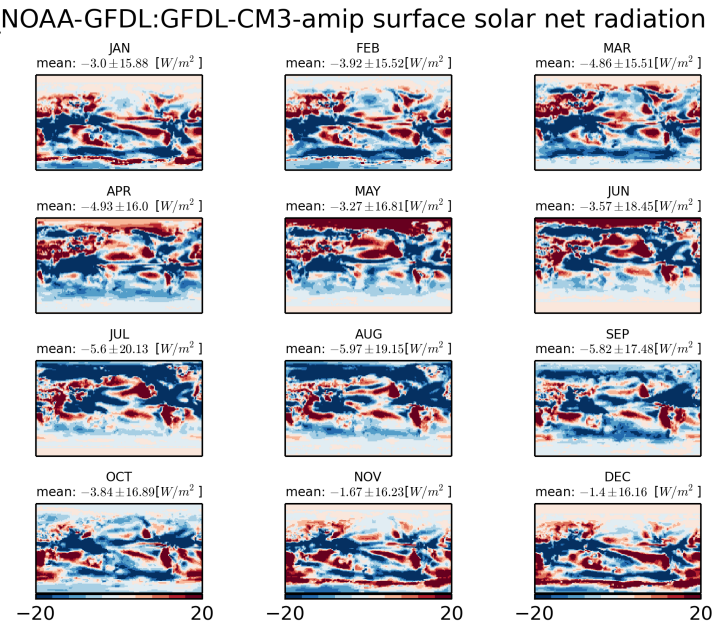



Figure 1393: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and ISCCP

### 3.1.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

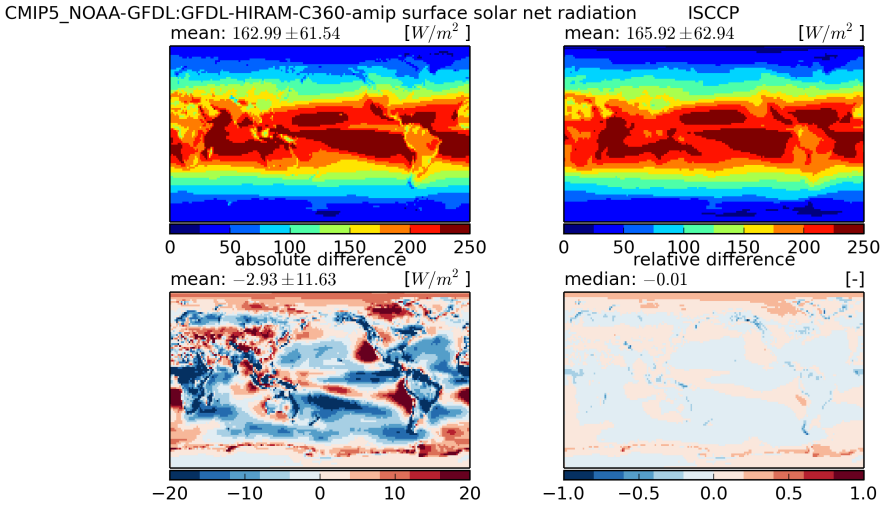



Figure 1394: Temporal mean fields (top) and absolute and relative differences (bottom)

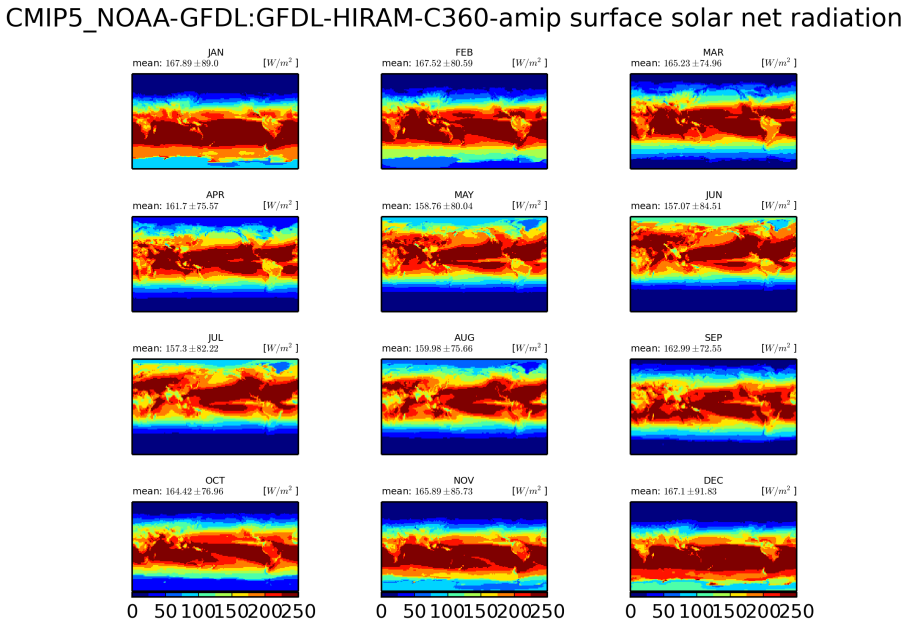



Figure 1395: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

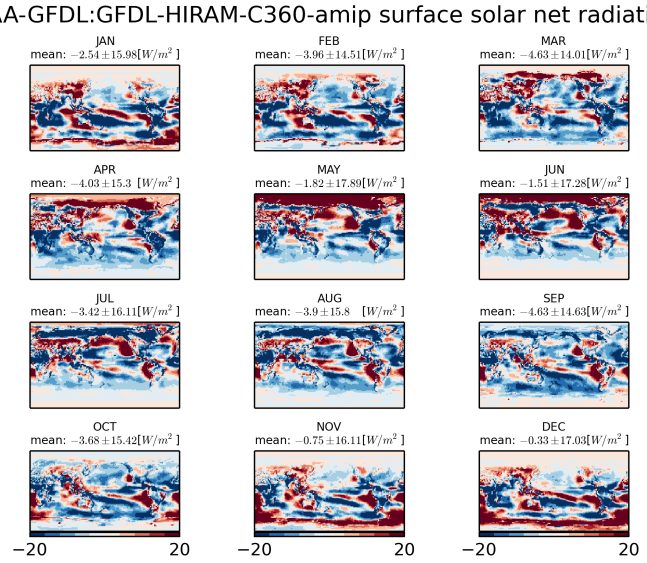



Figure 1396: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and ISCCP

### 3.1.26 CMIP5 NCAR:CCSM4-amip

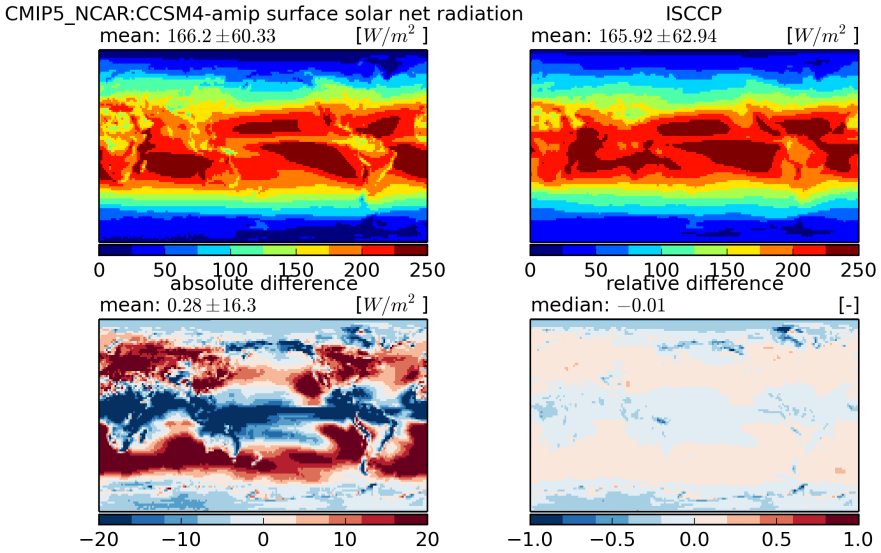



Figure 1397: Temporal mean fields (top) and absolute and relative differences (bottom)

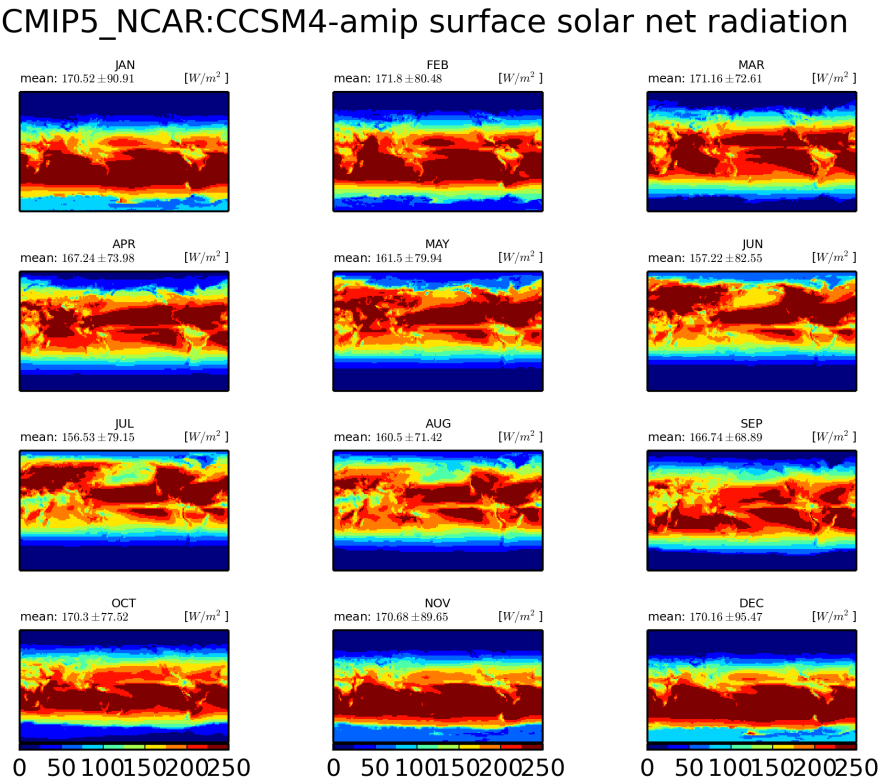



Figure 1398: Monthly mean climatology for NCAR:CCSM4

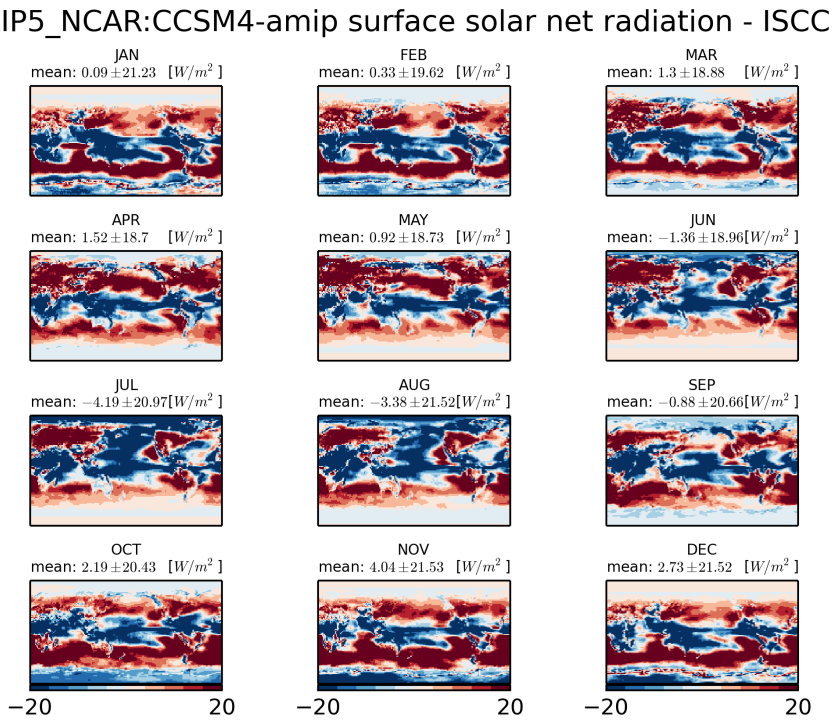



Figure 1399: Monthly mean climatology of difference between NCAR:CCSM4 and ISCCP

### 3.1.27 CMIP5 NCC:NorESM1-M-amip

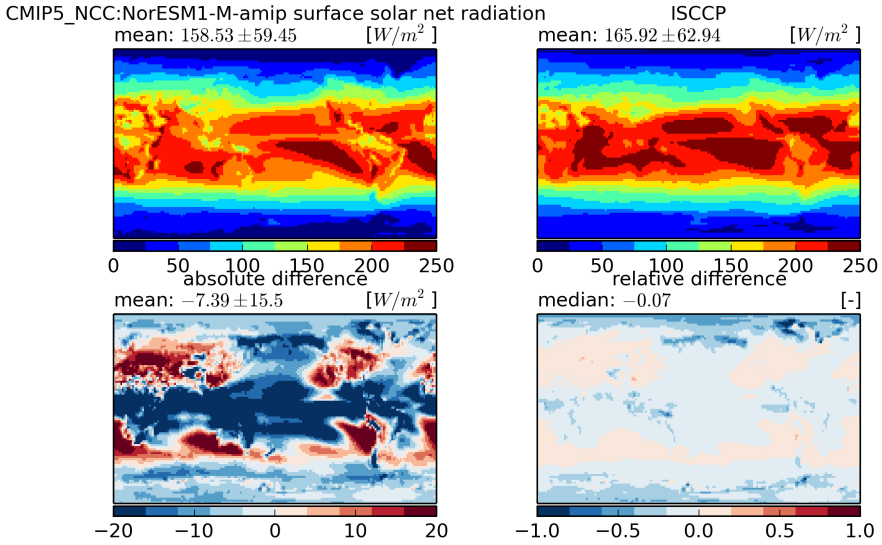



Figure 1400: Temporal mean fields (top) and absolute and relative differences (bottom)

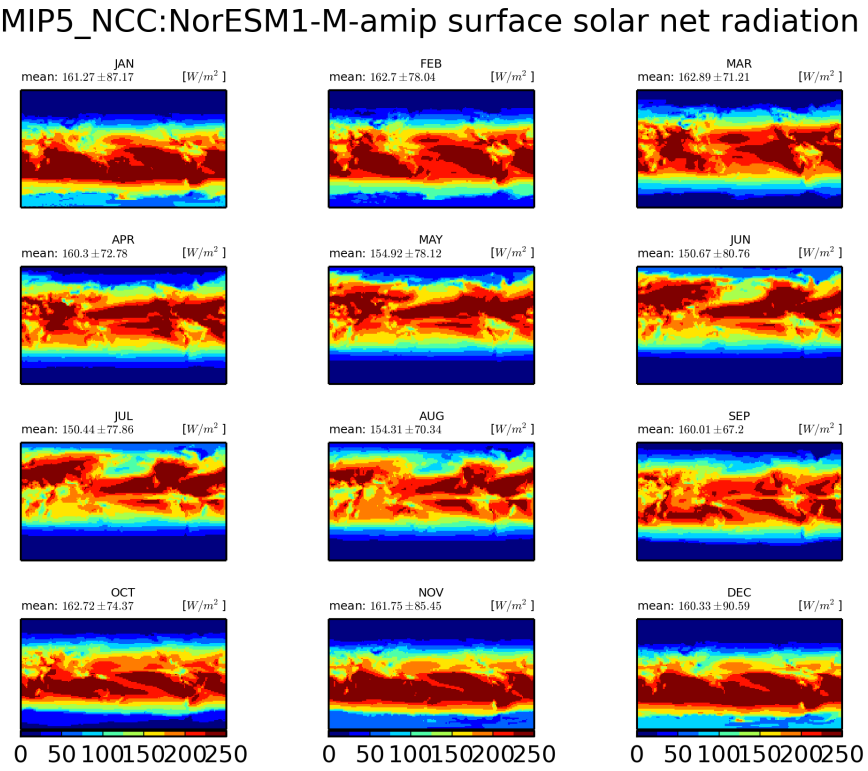



Figure 1401: Monthly mean climatology for NCC:NorESM1-M

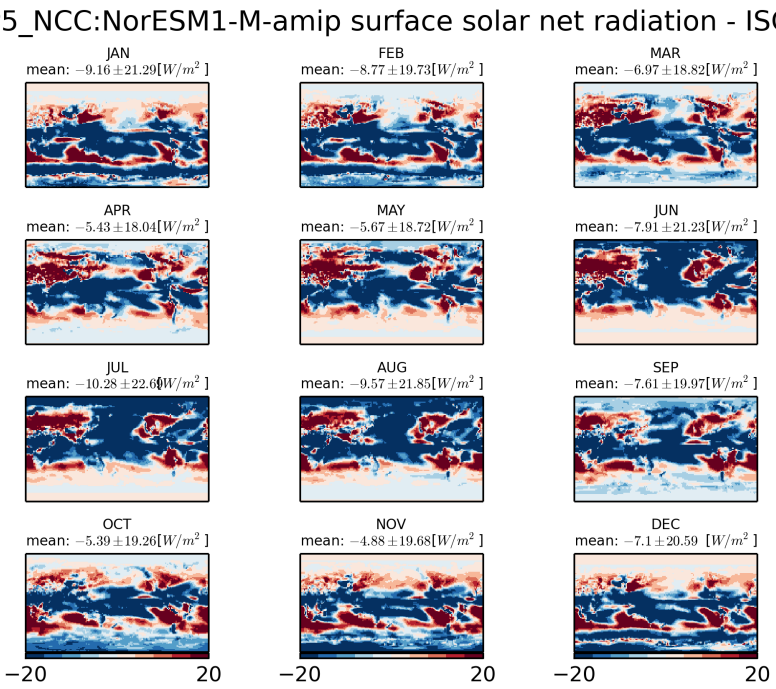



Figure 1402: Monthly mean climatology of difference between NCC:NORESM1-M and ISCCP

### 3.1.28 CMIP3 iap fgoals1 0 g-amip

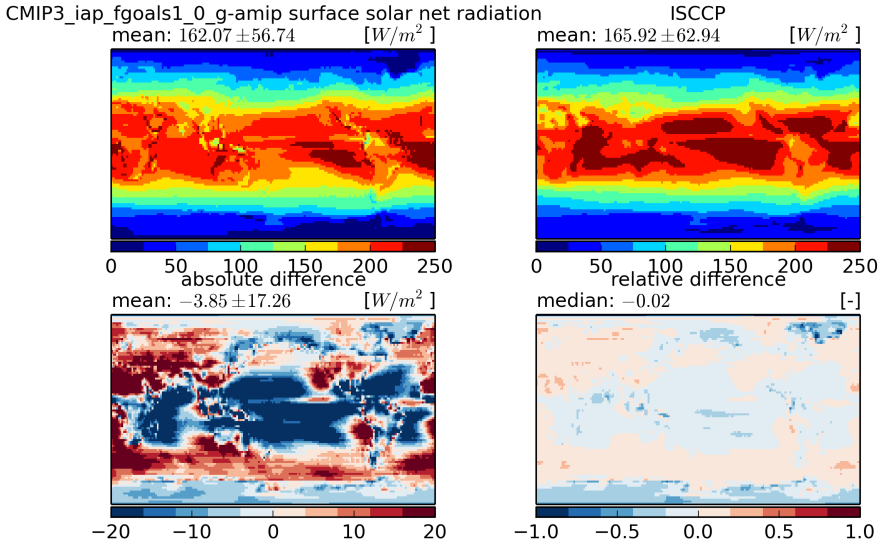



Figure 1403: Temporal mean fields (top) and absolute and relative differences (bottom)

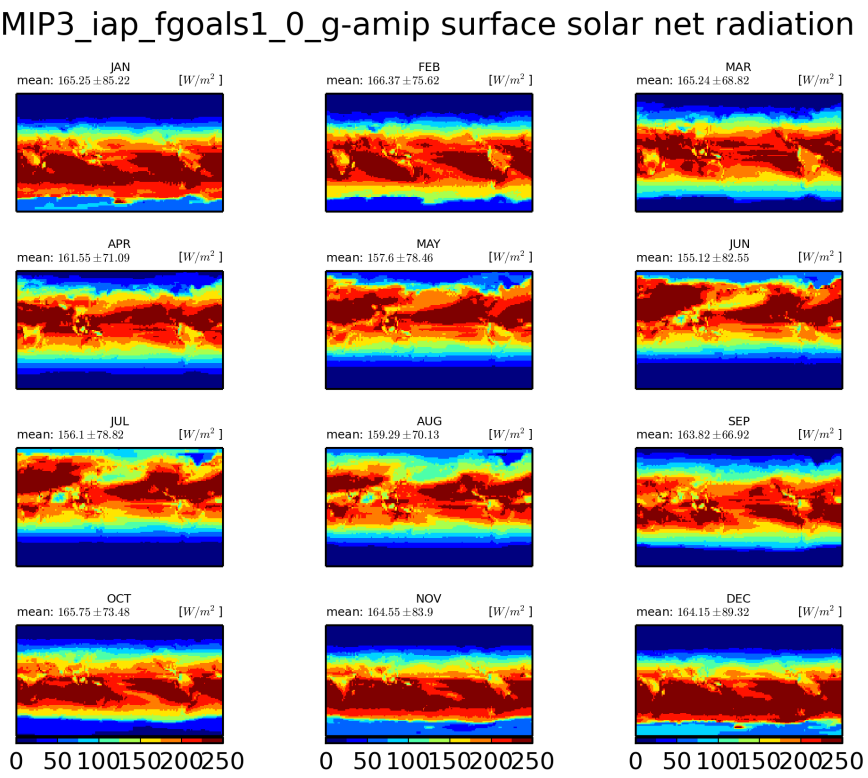



Figure 1404: Monthly mean climatology for iap-fgoals1-0-g

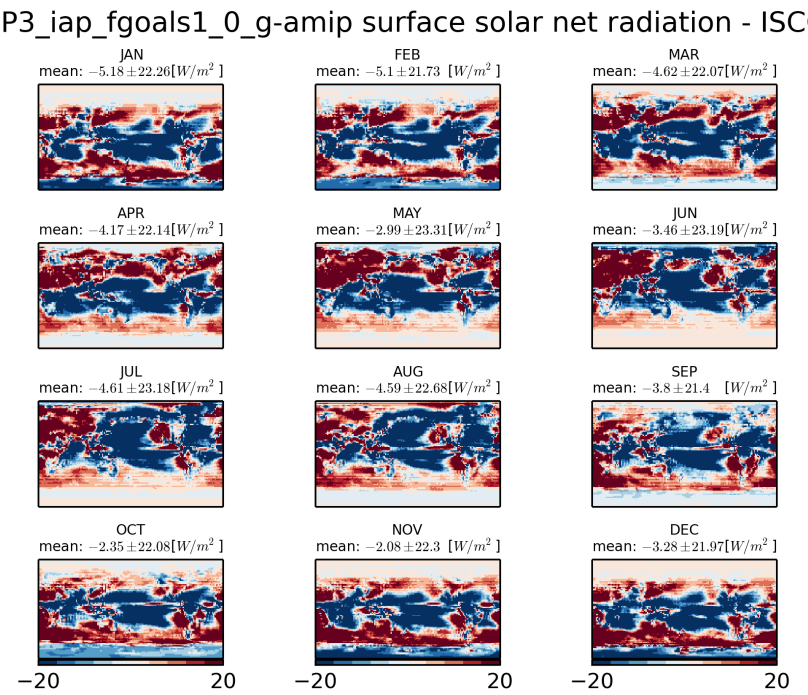



Figure 1405: Monthly mean climatology of difference between IAP-FGOALS1-0-G and ISCCP

### 3.1.29 CMIP3 inmcm3 0-amip

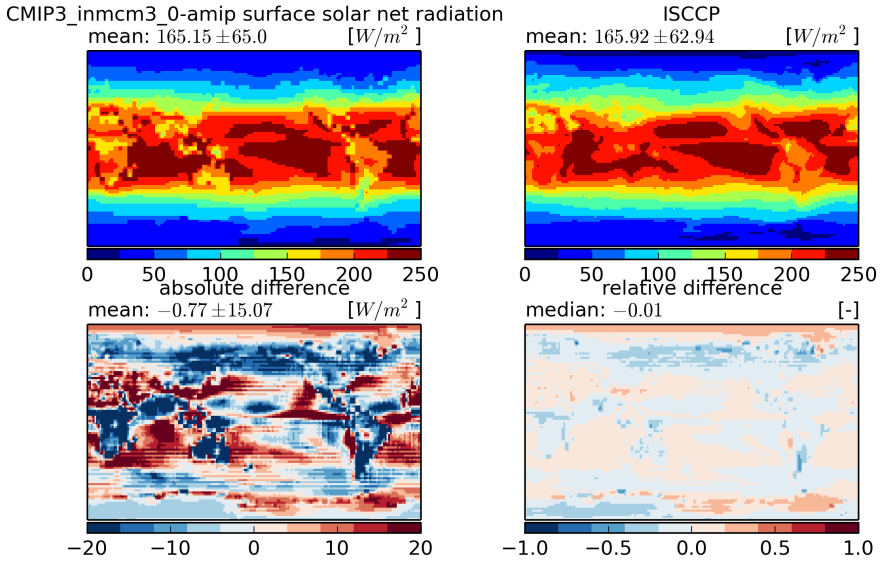



Figure 1406: Temporal mean fields (top) and absolute and relative differences (bottom)

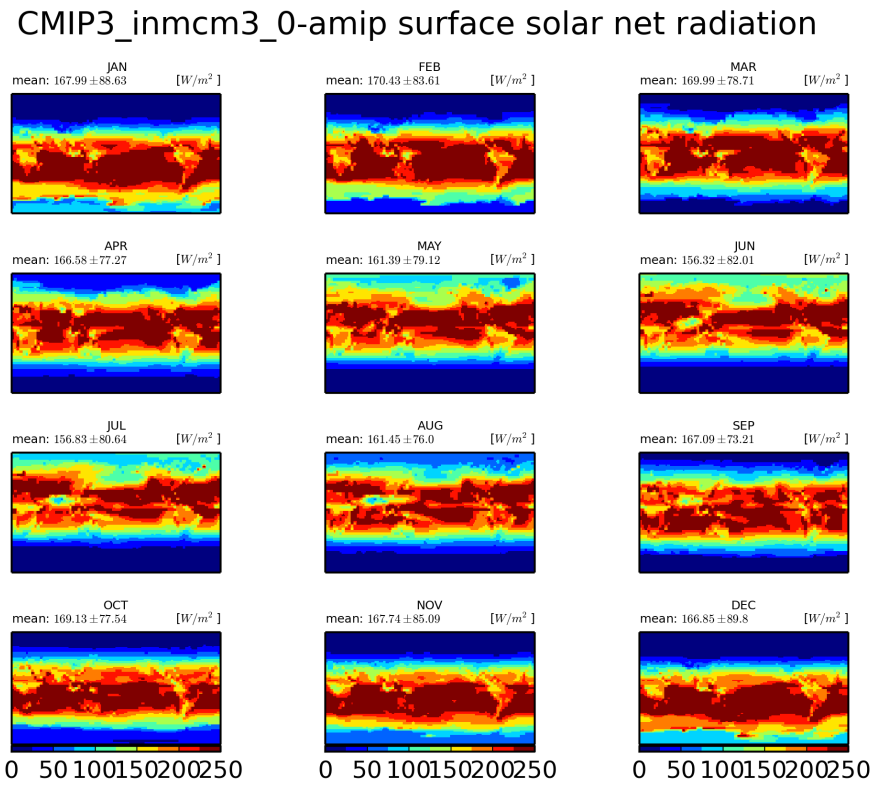



Figure 1407: Monthly mean climatology for inmcm3-0

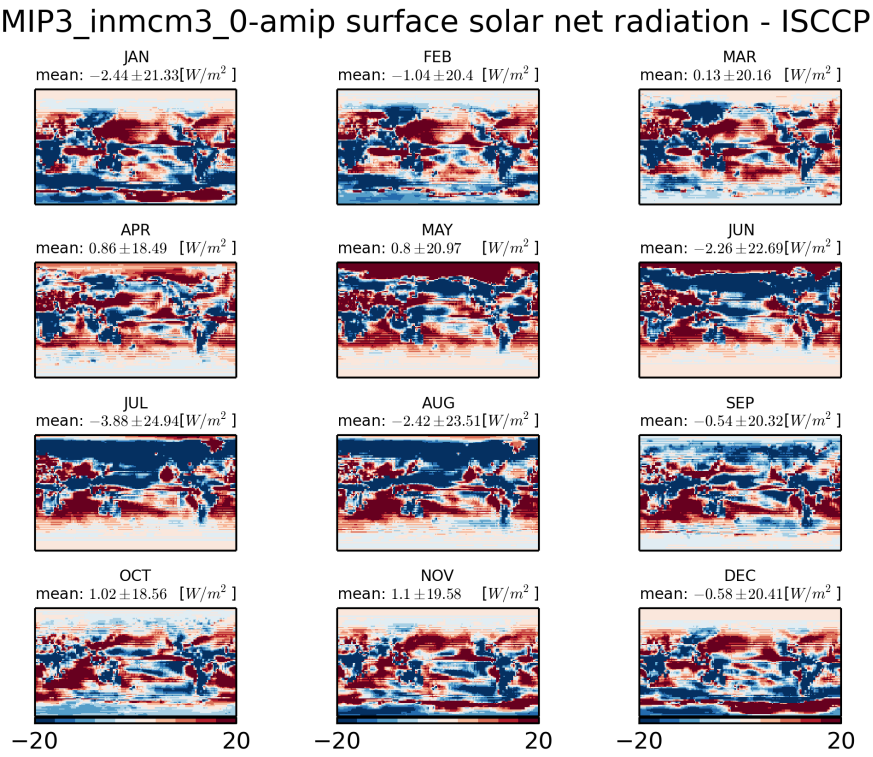



Figure 1408: Monthly mean climatology of difference between INMCM3-0 and ISCCP

### 3.1.30 CMIP3 ipsl cm4-amip

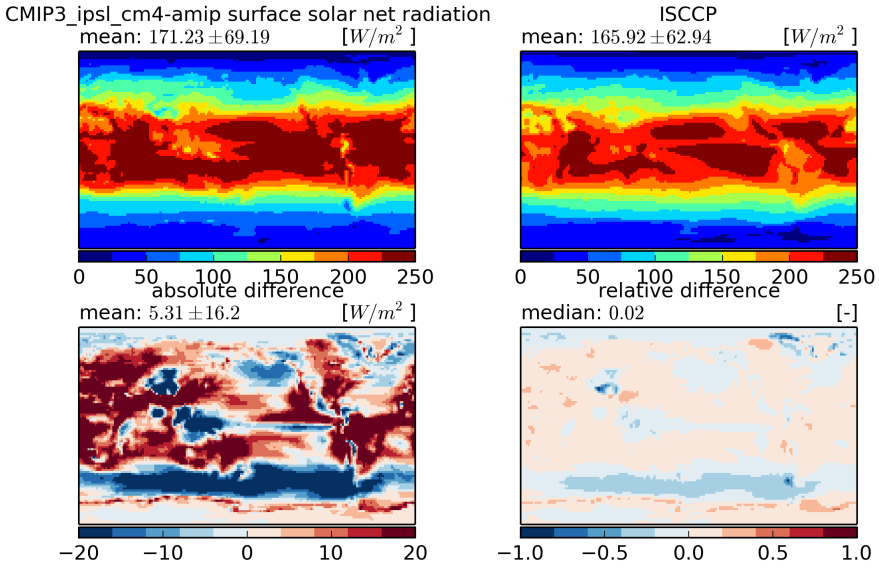



Figure 1409: Temporal mean fields (top) and absolute and relative differences (bottom)

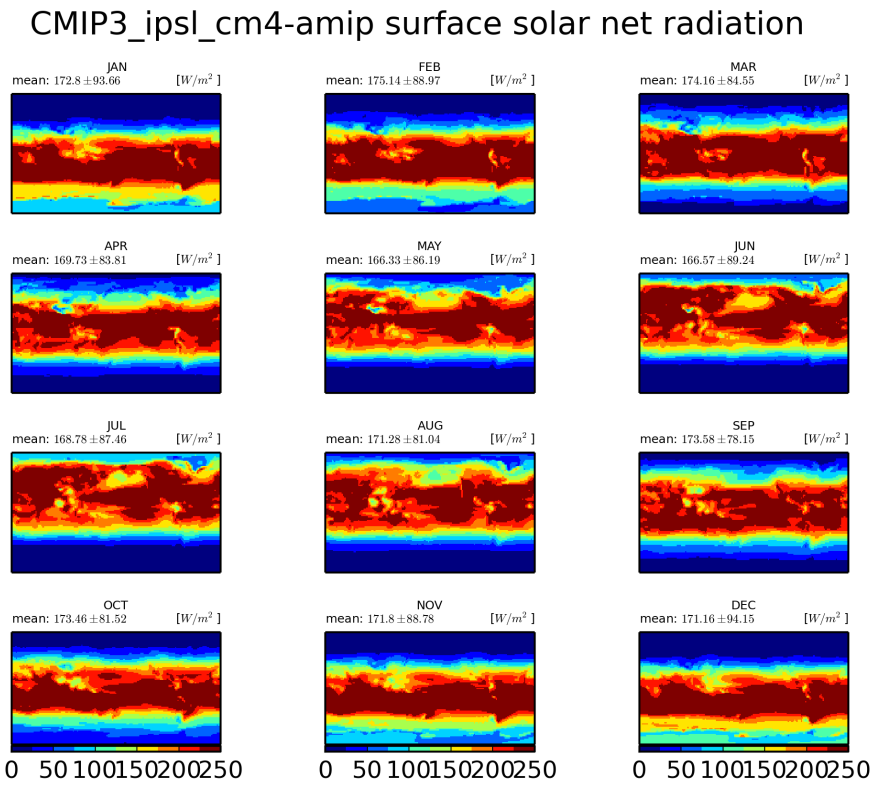



Figure 1410: Monthly mean climatology for ipsl-cm4

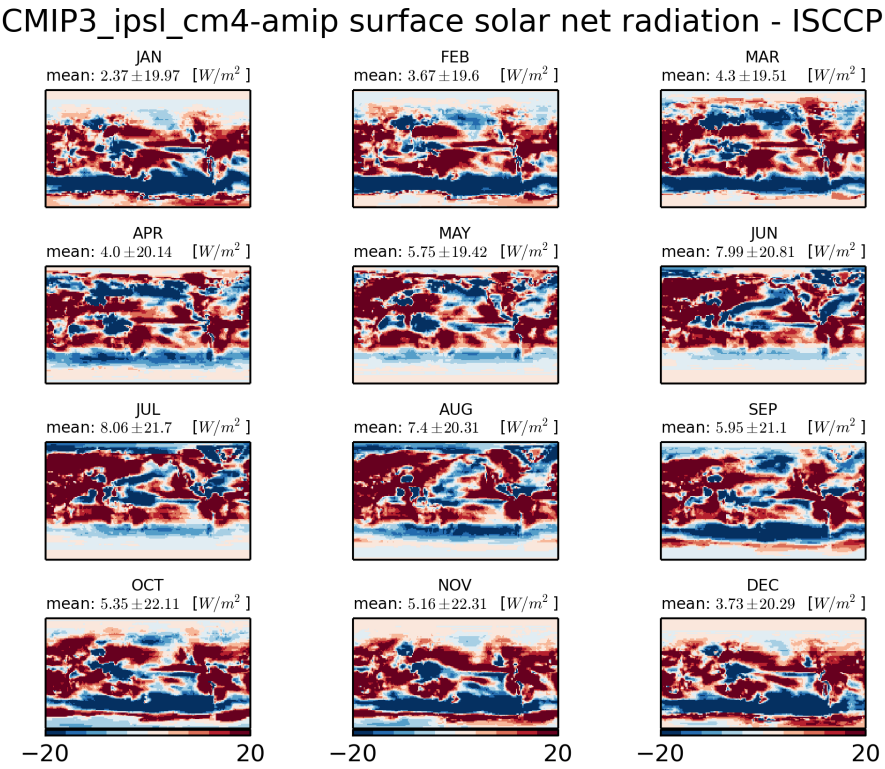



Figure 1411: Monthly mean climatology of difference between IPSL-CM4 and ISCCP

### 3.1.31 CMIP3 miroc3 2 hires-amip

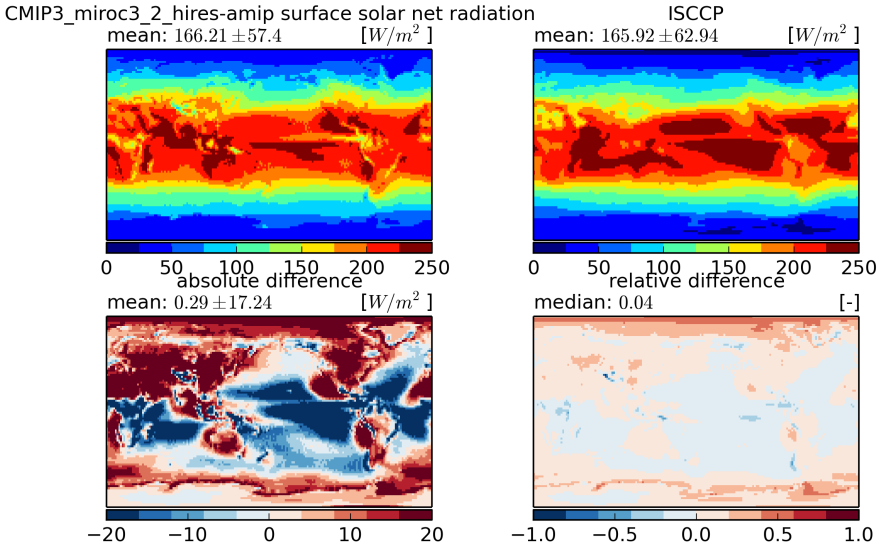



Figure 1412: Temporal mean fields (top) and absolute and relative differences (bottom)

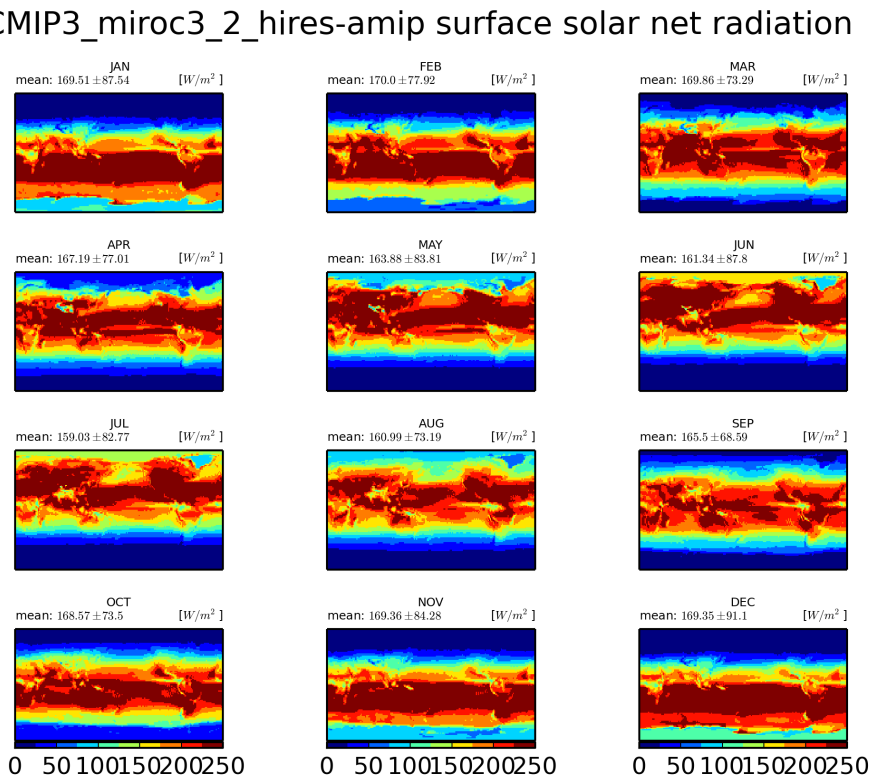



Figure 1413: Monthly mean climatology for miroc3-2-hires

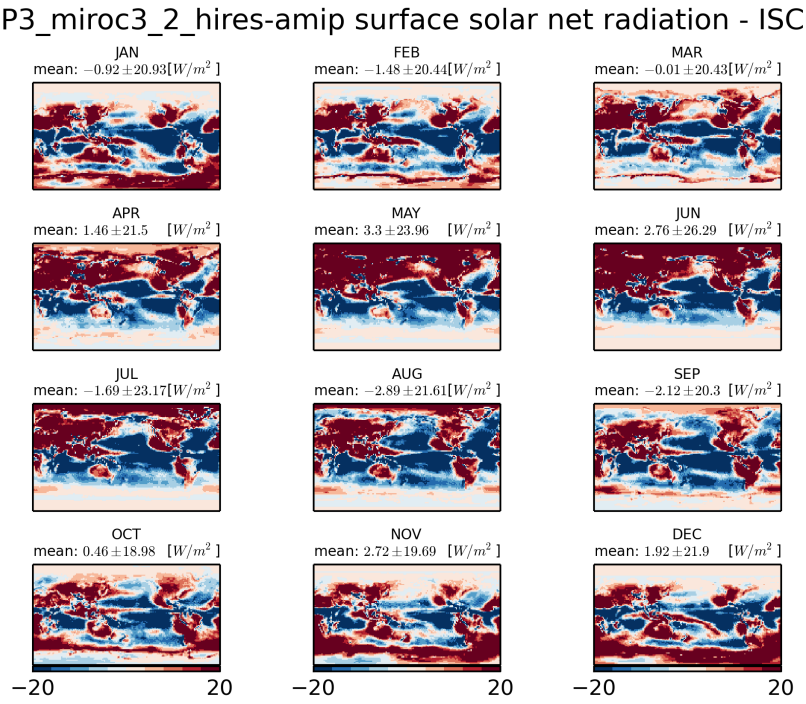



Figure 1414: Monthly mean climatology of difference between MIROC3-2-HIRES and ISCCP

### 3.1.32 CMIP3 miroc3 2 medres-amip

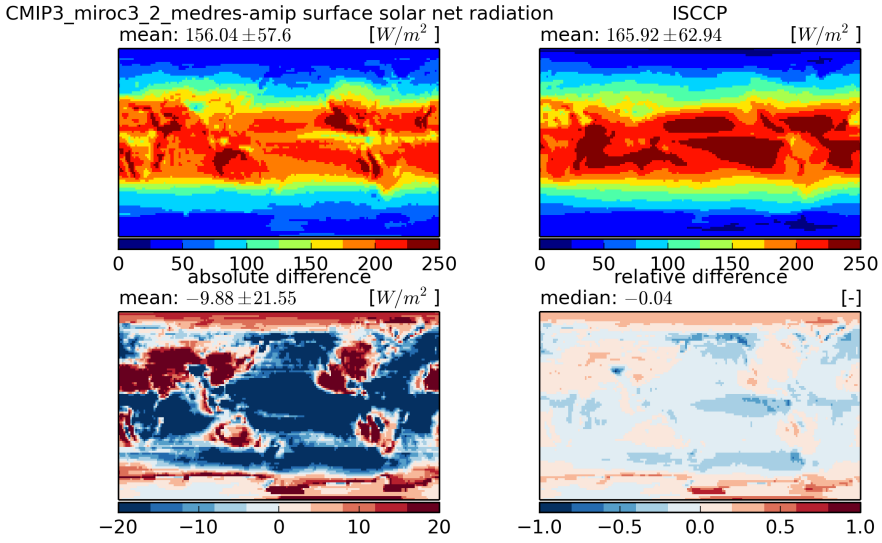



Figure 1415: Temporal mean fields (top) and absolute and relative differences (bottom)

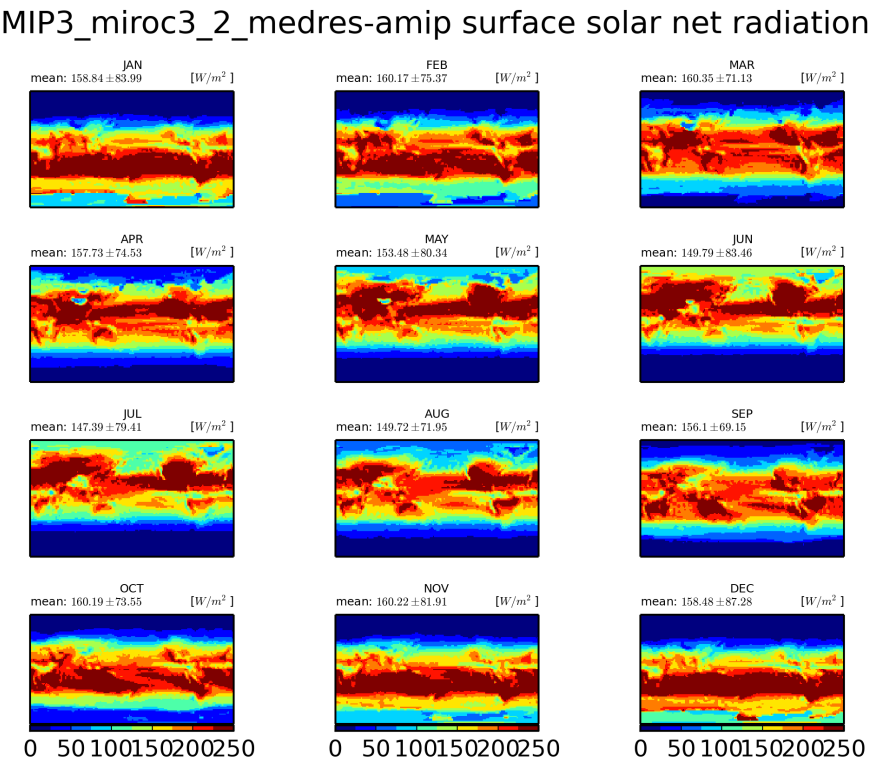



Figure 1416: Monthly mean climatology for miroc3-2-medres

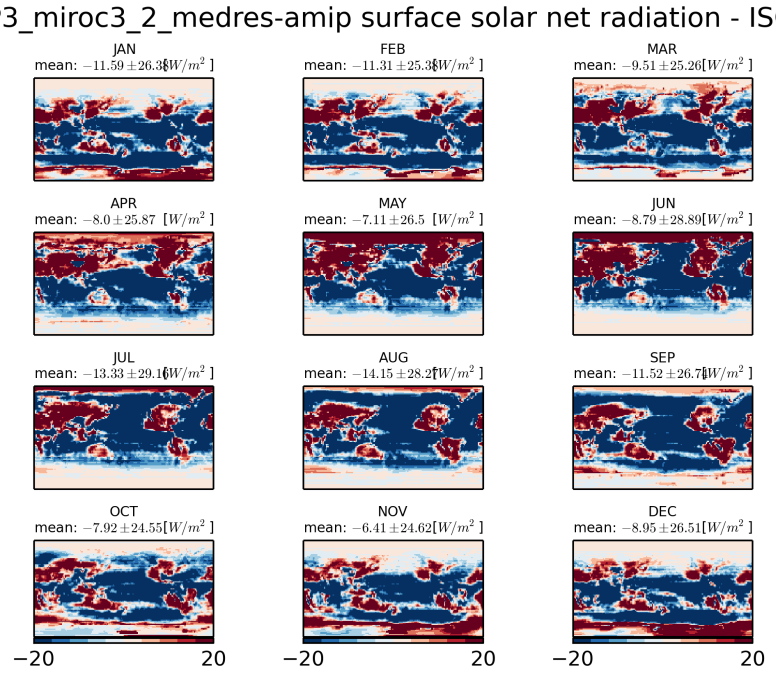



Figure 1417: Monthly mean climatology of difference between MIROC3-2-MEDRES and ISCCP

### 3.1.33 CMIP3 mpi echam5-amip

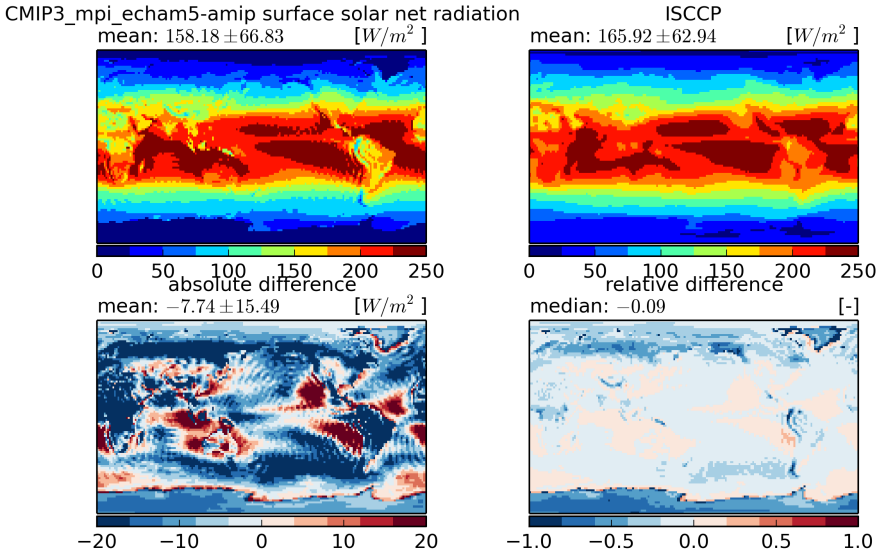



Figure 1418: Temporal mean fields (top) and absolute and relative differences (bottom)

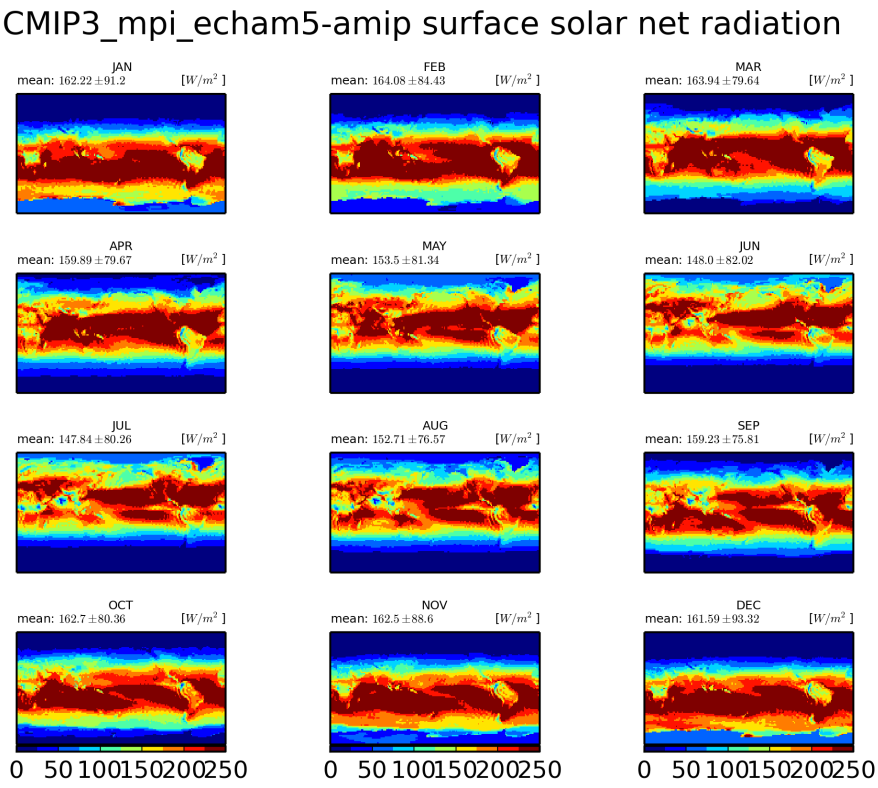



Figure 1419: Monthly mean climatology for mpi-echam5

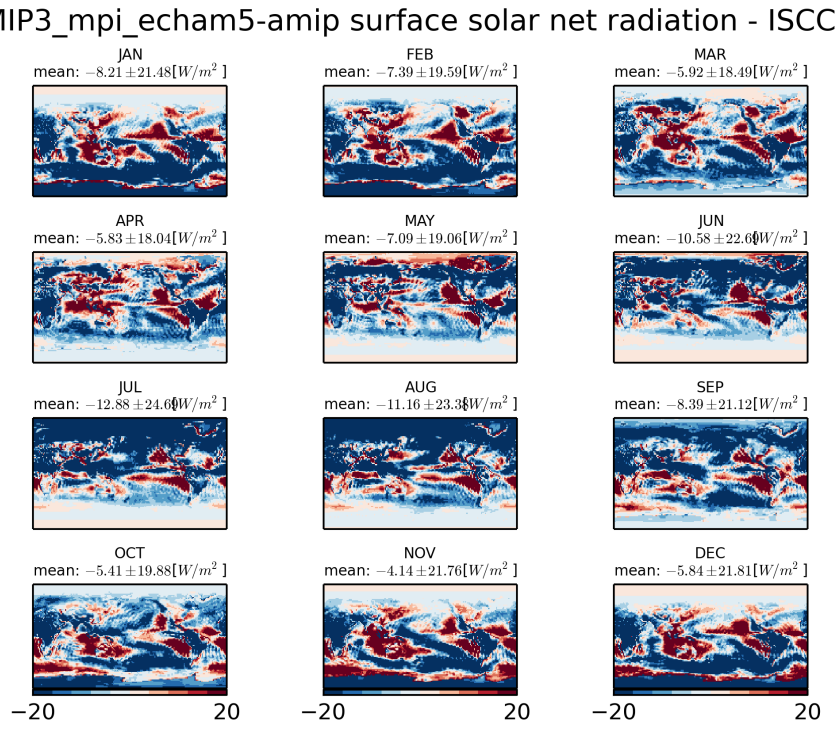



Figure 1420: Monthly mean climatology of difference between MPI-ECHAM5 and ISCCP

### 3.1.34 CMIP3 ncar ccsm3 0-amip

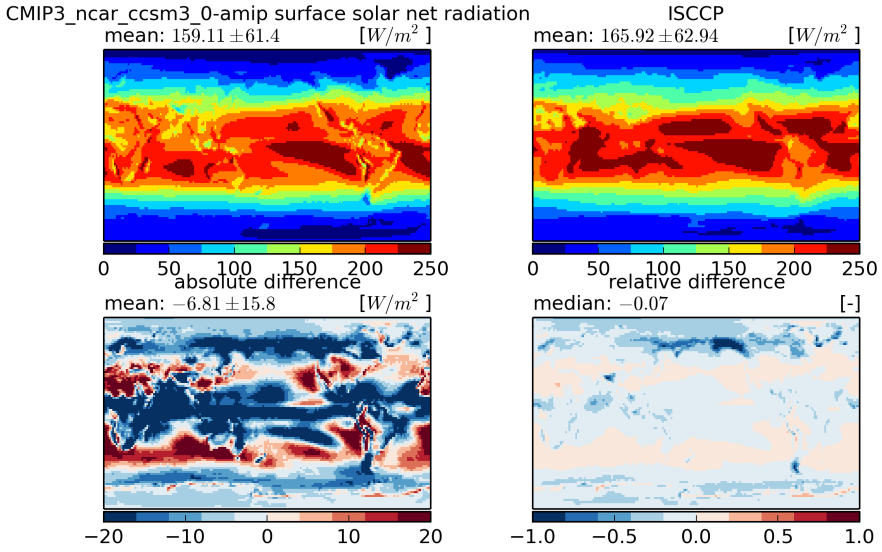



Figure 1421: Temporal mean fields (top) and absolute and relative differences (bottom)

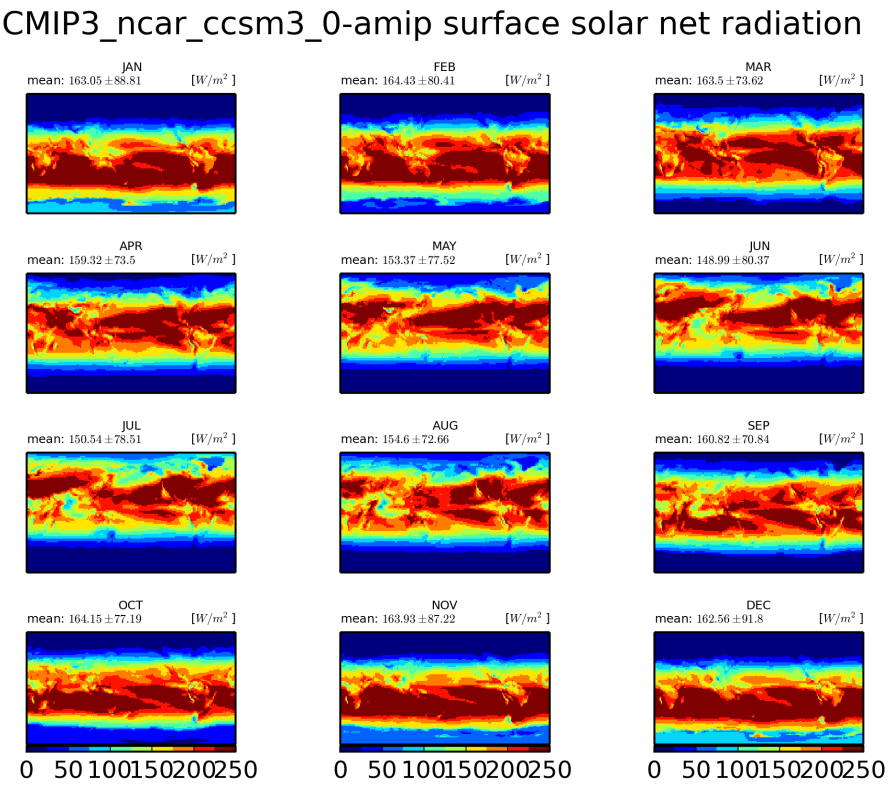



Figure 1422: Monthly mean climatology for ncar-ccsm3-0

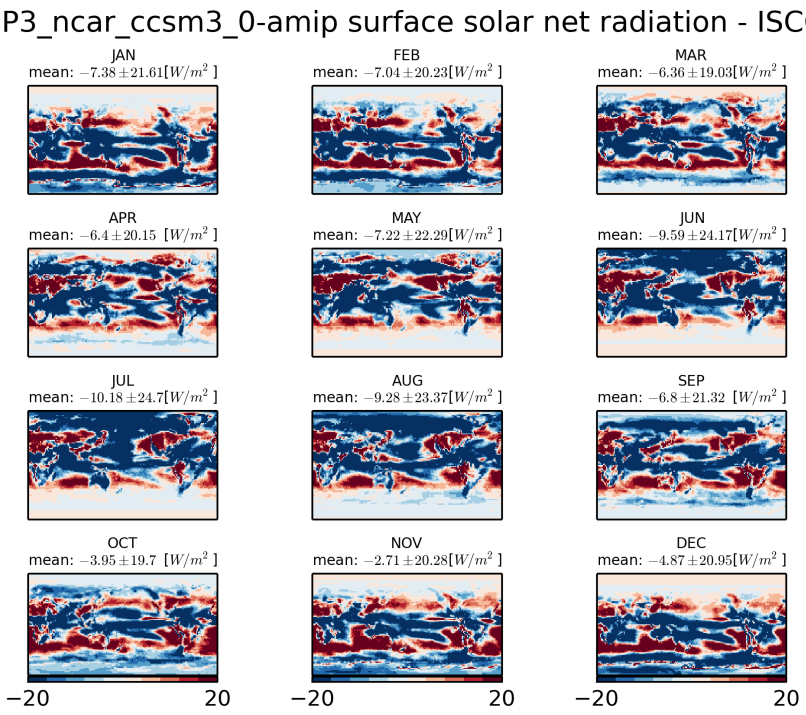



Figure 1423: Monthly mean climatology of difference between NCAR-CCSM3-0 and ISCCP

### 3.1.35 CMIP3 ncar pcm1-amip

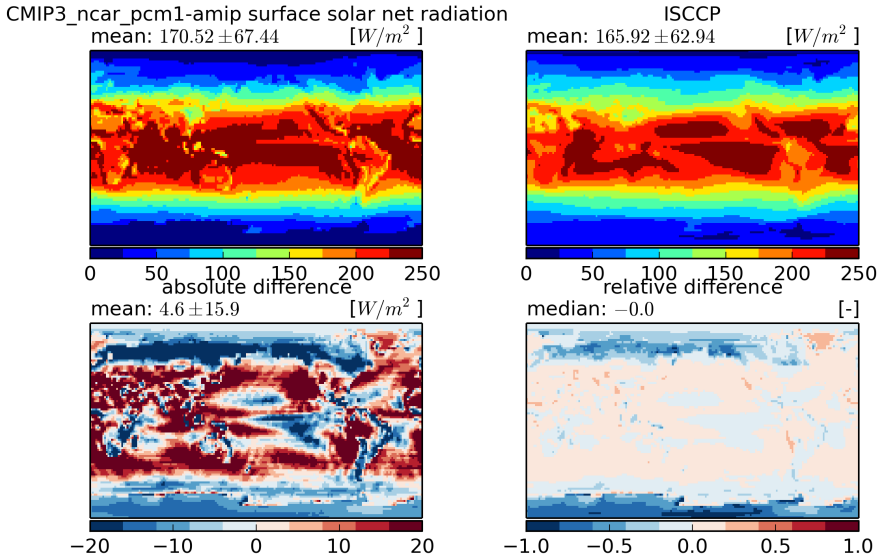



Figure 1424: Temporal mean fields (top) and absolute and relative differences (bottom)

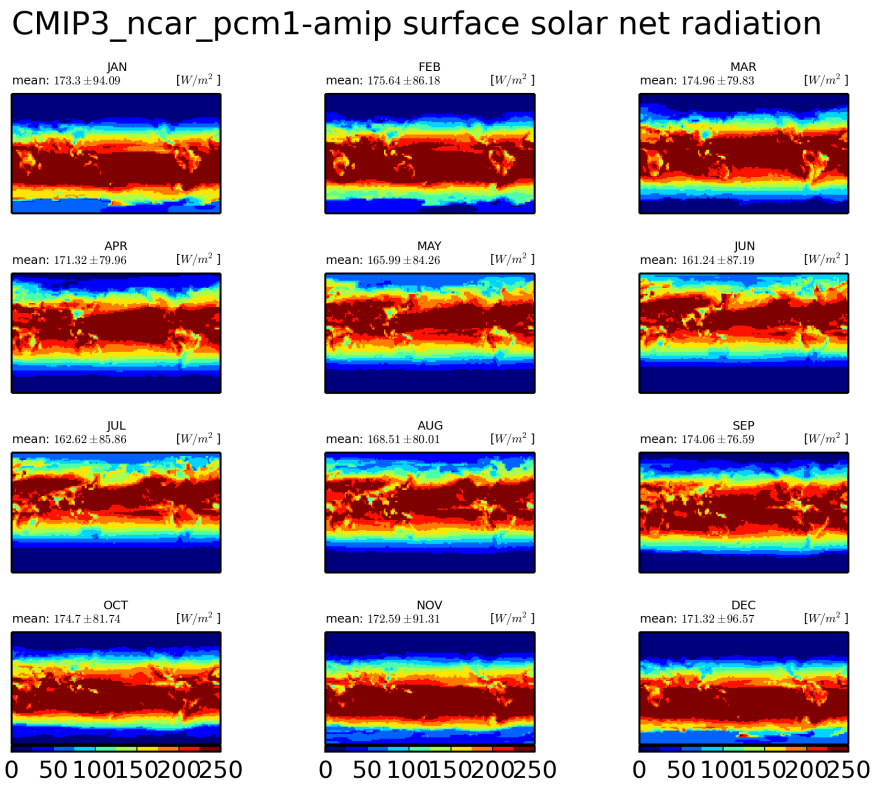



Figure 1425: Monthly mean climatology for ncar-pcm1

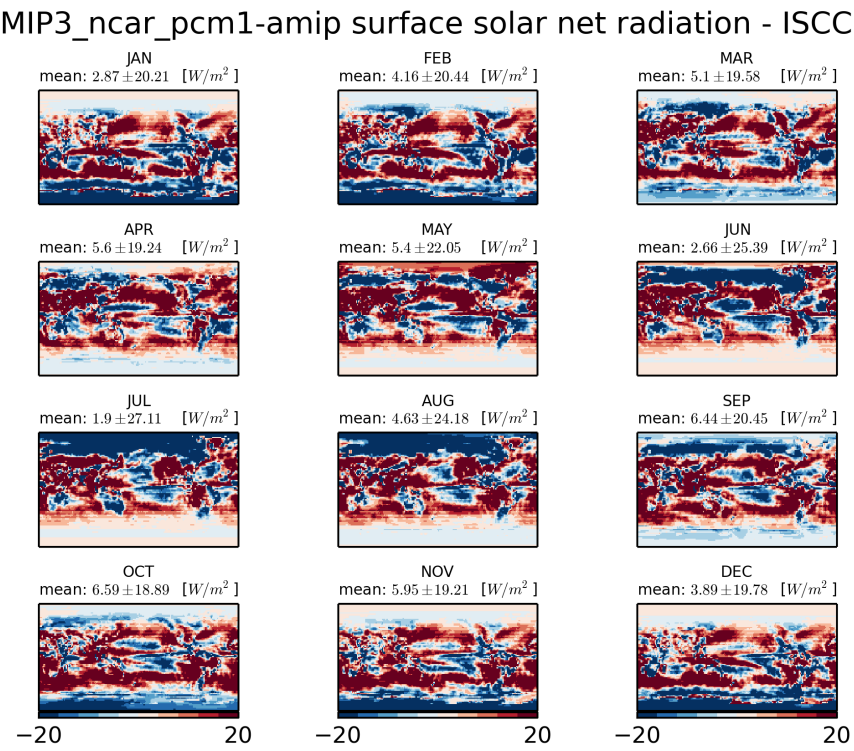



Figure 1426: Monthly mean climatology of difference between NCAR-PCM1 and ISCCP

### 3.1.36 CMIP3 ukmo hadgem1-amip

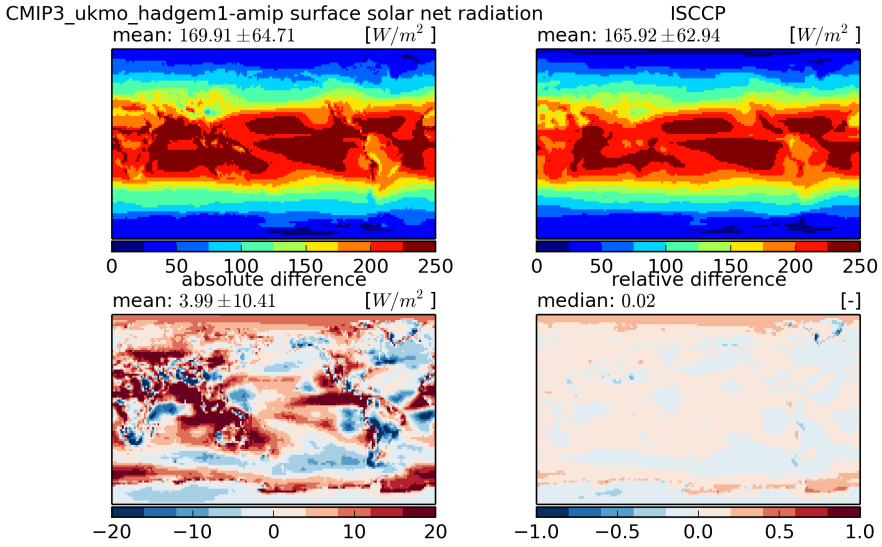



Figure 1427: Temporal mean fields (top) and absolute and relative differences (bottom)

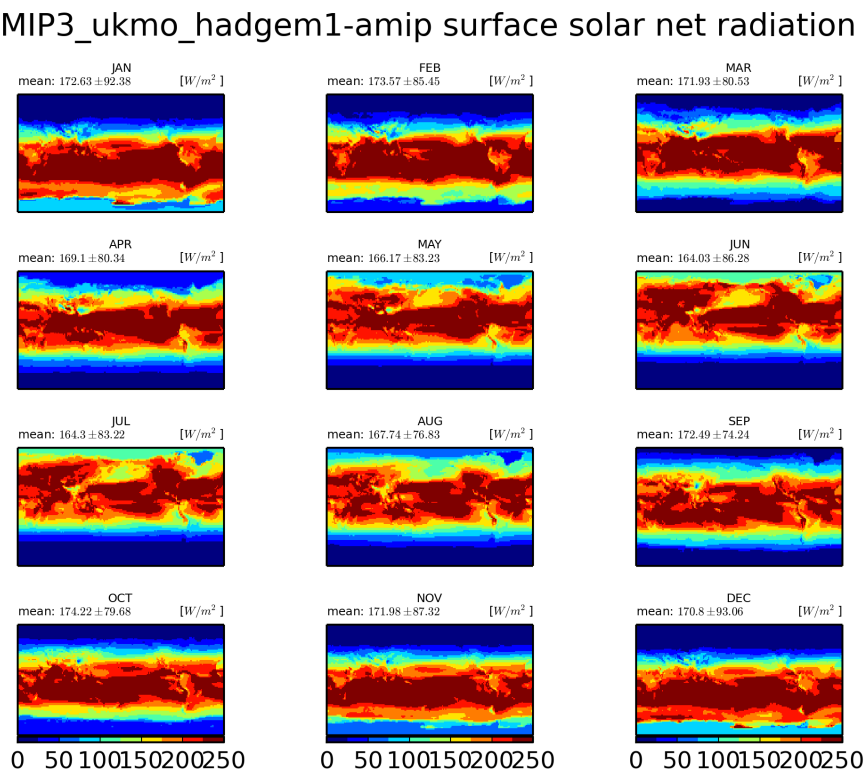



Figure 1428: Monthly mean climatology for ukmo-hadgem1

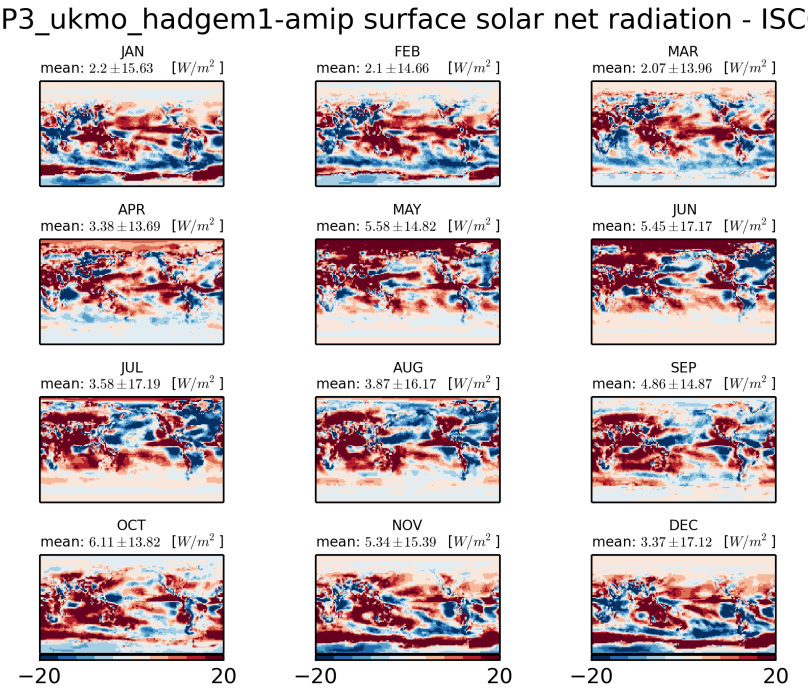



Figure 1429: Monthly mean climatology of difference between UKMO-HADGEM1 and ISCCP

### 3.1.37 model mean

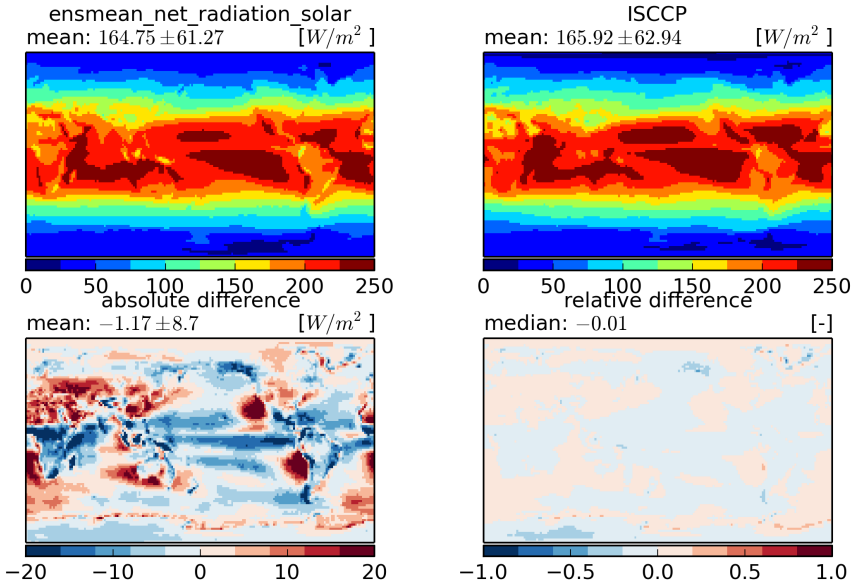



Figure 1430: Temporal mean fields (top) and absolute and relative differences (bottom)

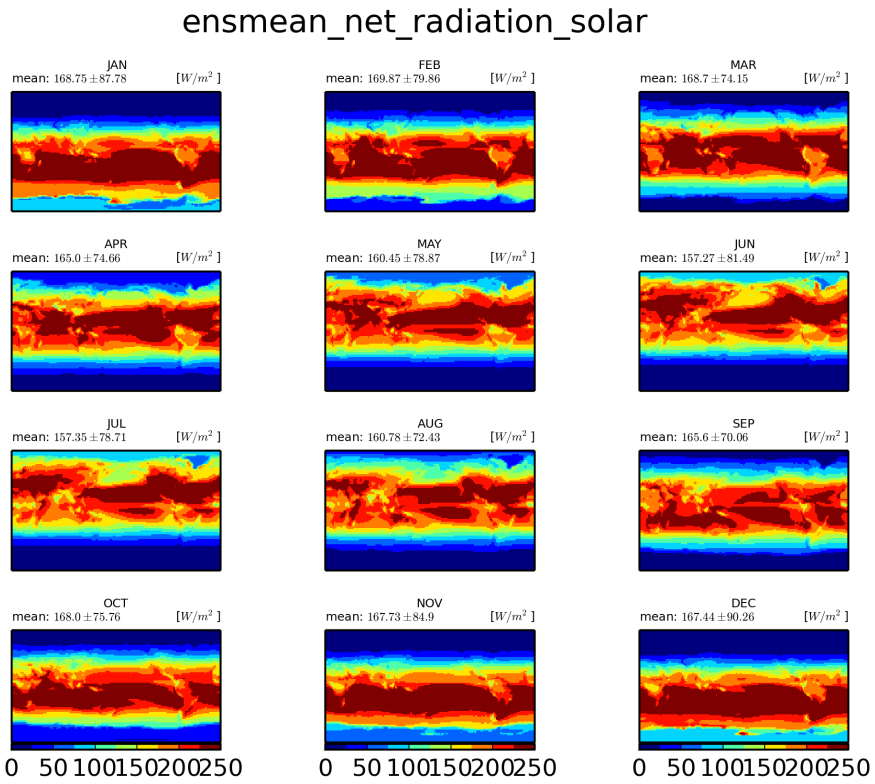



Figure 1431: Monthly mean climatology for mean-model

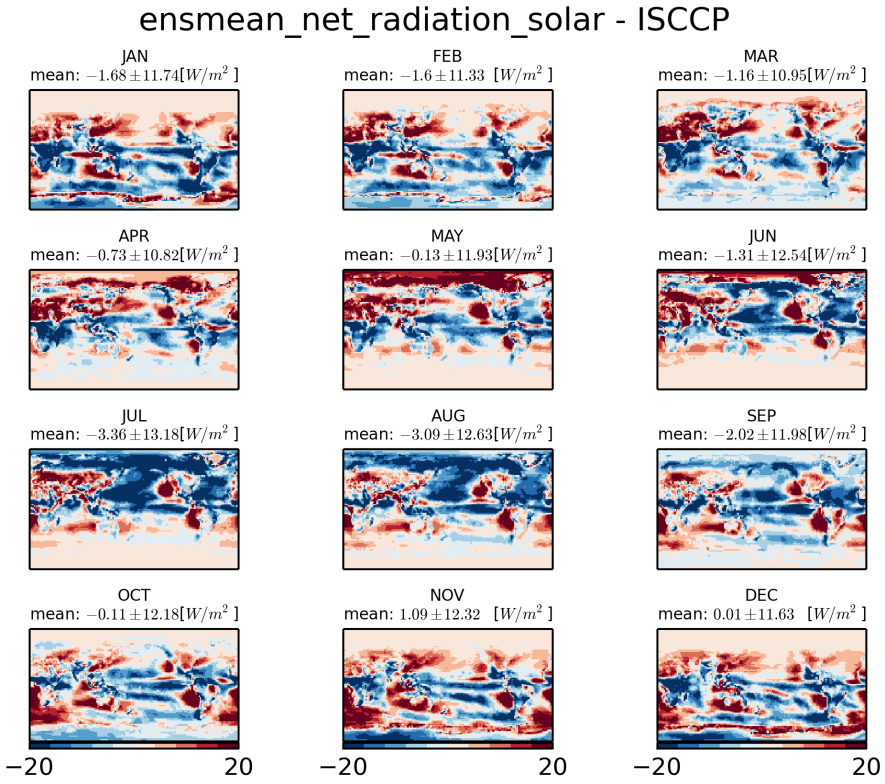



Figure 1432: Monthly mean climatology of difference between MEAN-MODEL and ISCCP

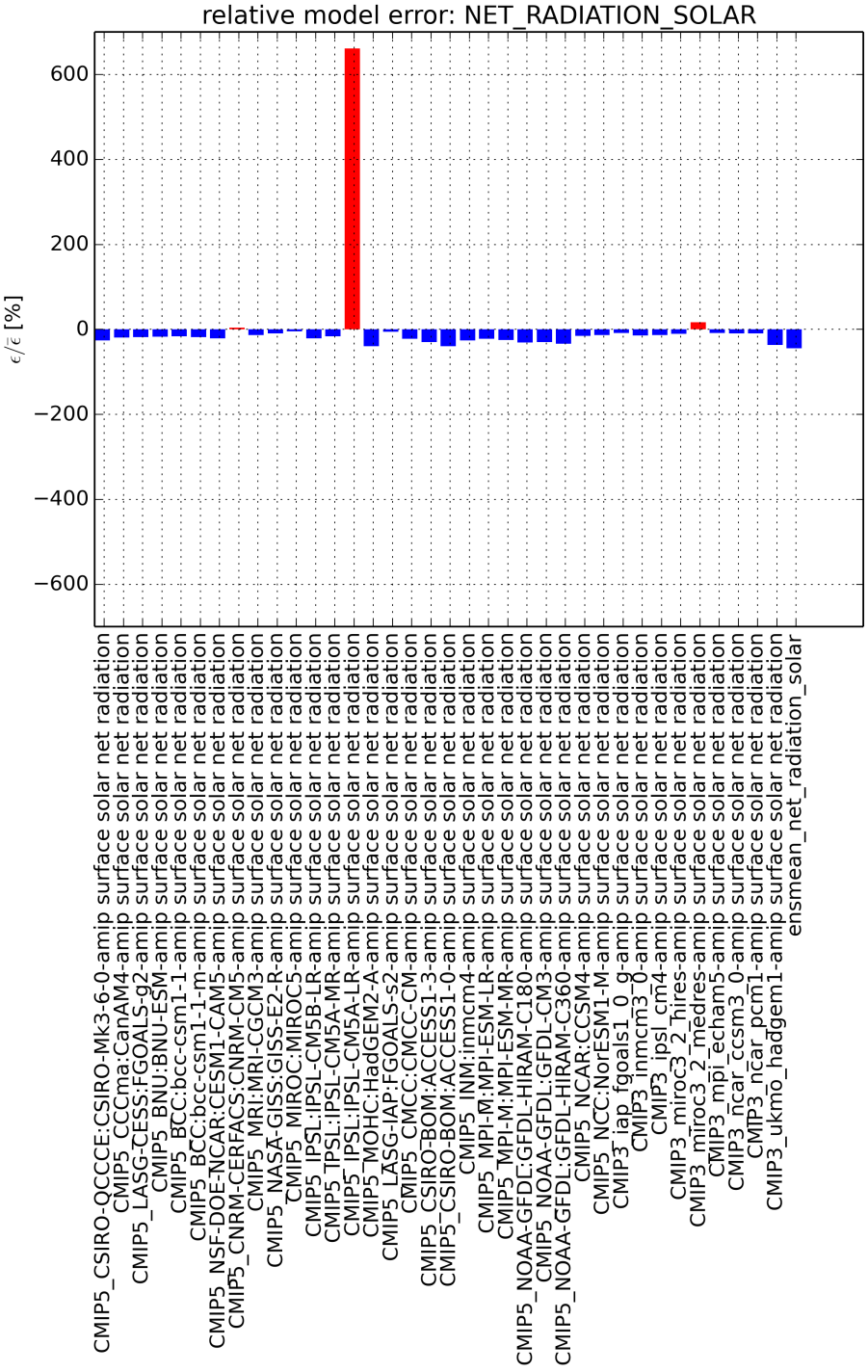



Figure 1433: Relative model performance for NET-RADIATION-SOLAR

## 3.2 CERES2.7

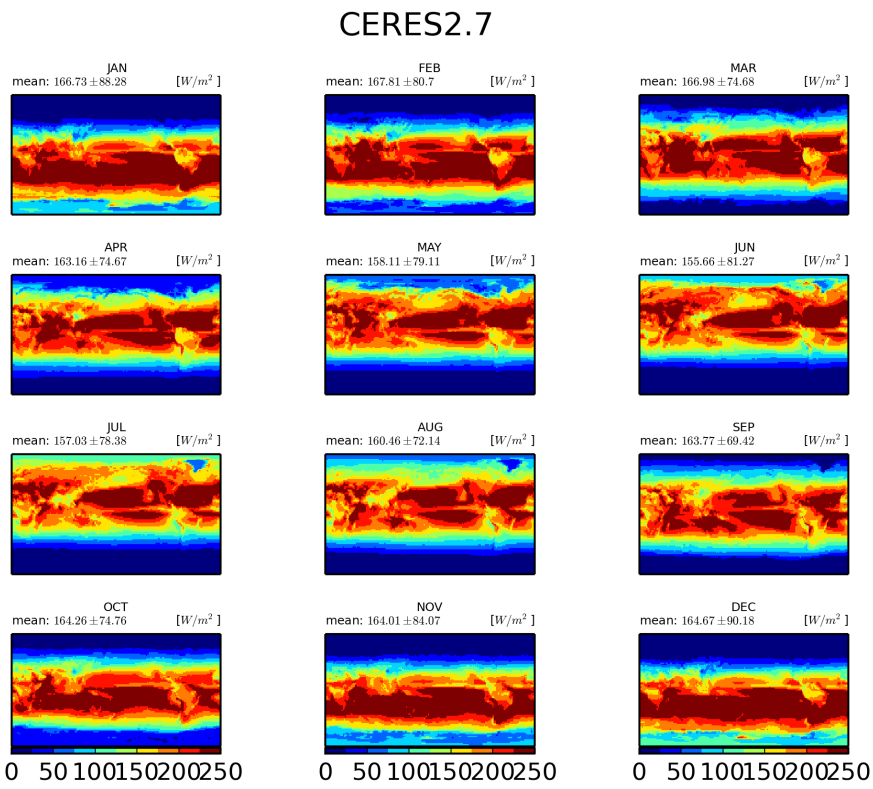



Figure 1434: Monthly mean CERES2.7

### 3.2.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

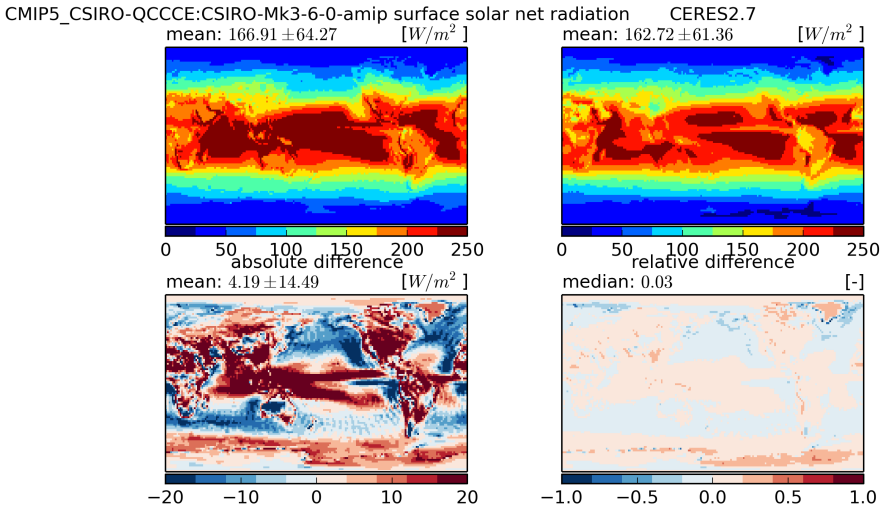



Figure 1435: Temporal mean fields (top) and absolute and relative differences (bottom)

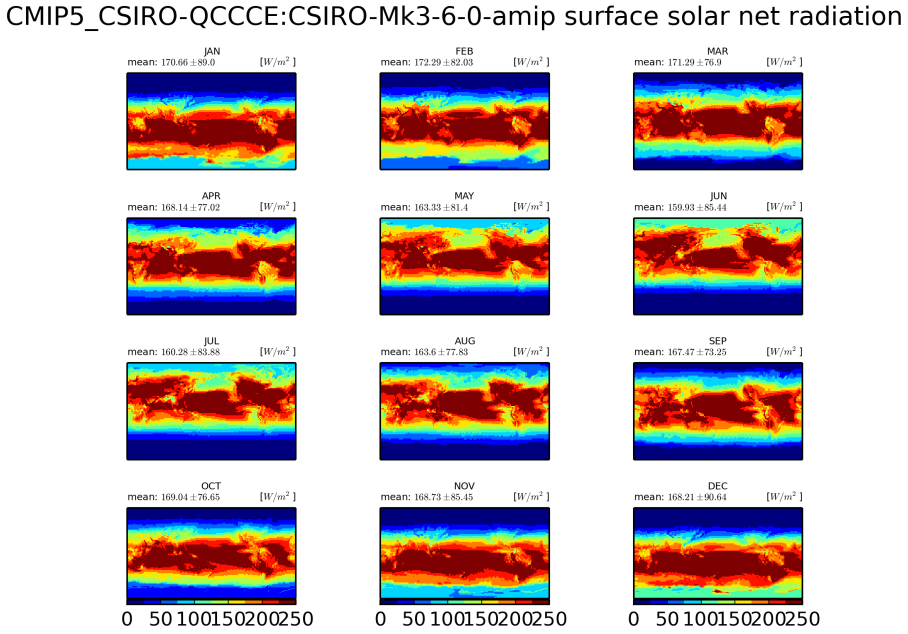



Figure 1436: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

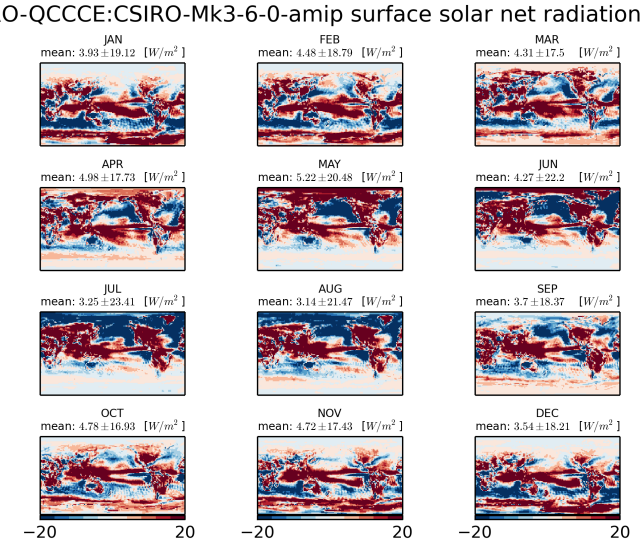



Figure 1437: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and CERES2.7

### 3.2.2 CMIP5 CCCma:CanAM4-amip

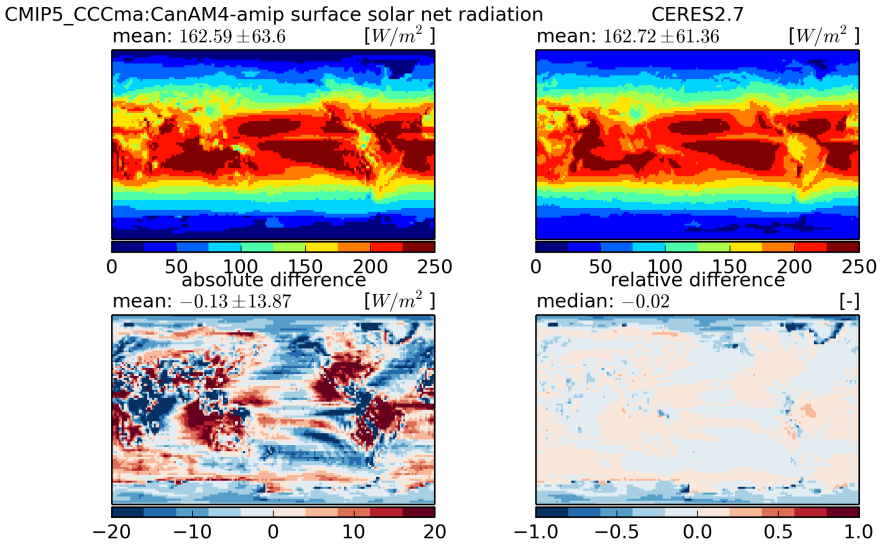



Figure 1438: Temporal mean fields (top) and absolute and relative differences (bottom)

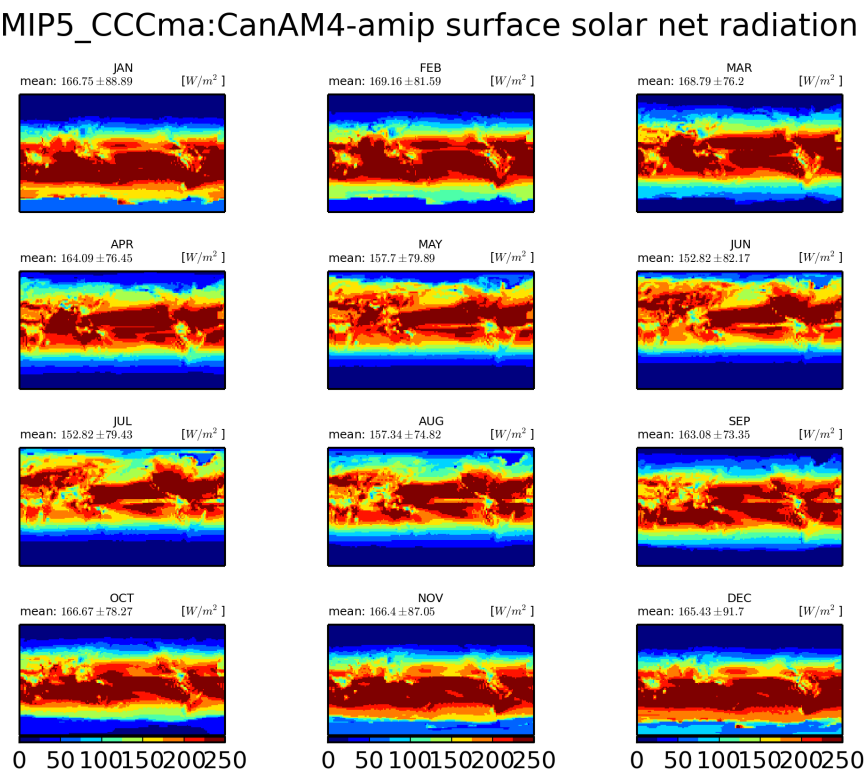



Figure 1439: Monthly mean climatology for CCCma:CanAM4

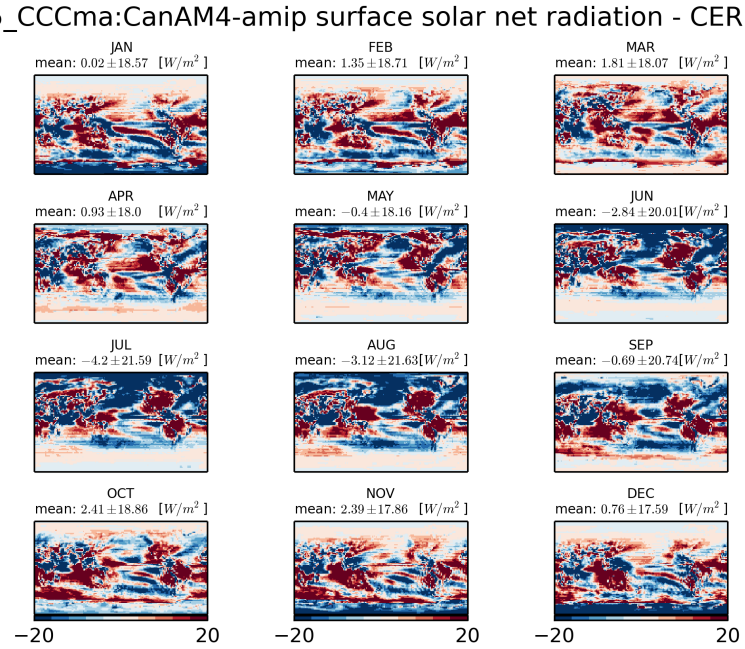



Figure 1440: Monthly mean climatology of difference between CCCMA:CANAM4 and CERES2.7

### 3.2.3 CMIP5 LASG-CESS:FGOALS-g2-amip

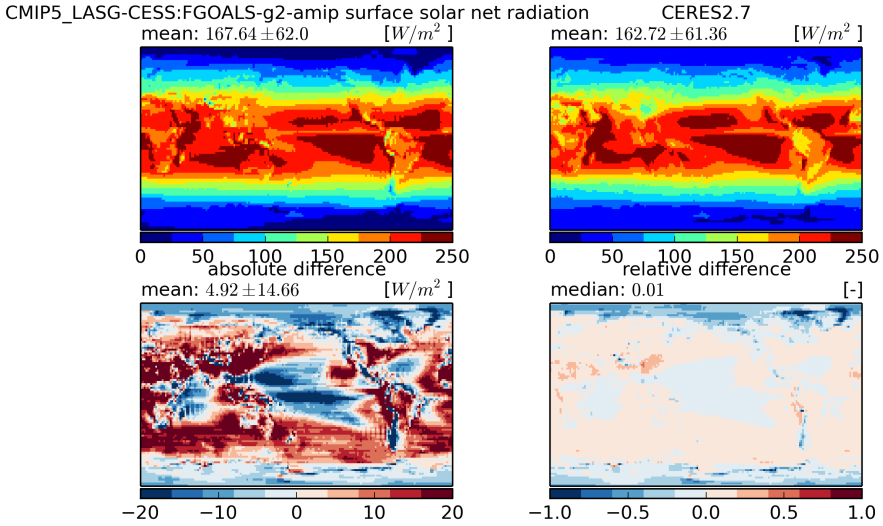



Figure 1441: Temporal mean fields (top) and absolute and relative differences (bottom)

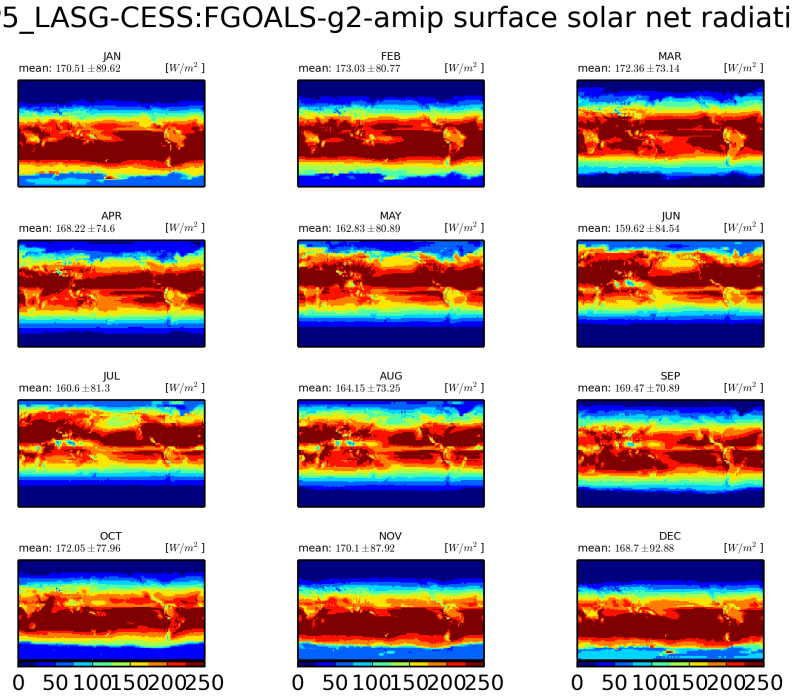



Figure 1442: Monthly mean climatology for LASG-CESS:FGOALS-g2

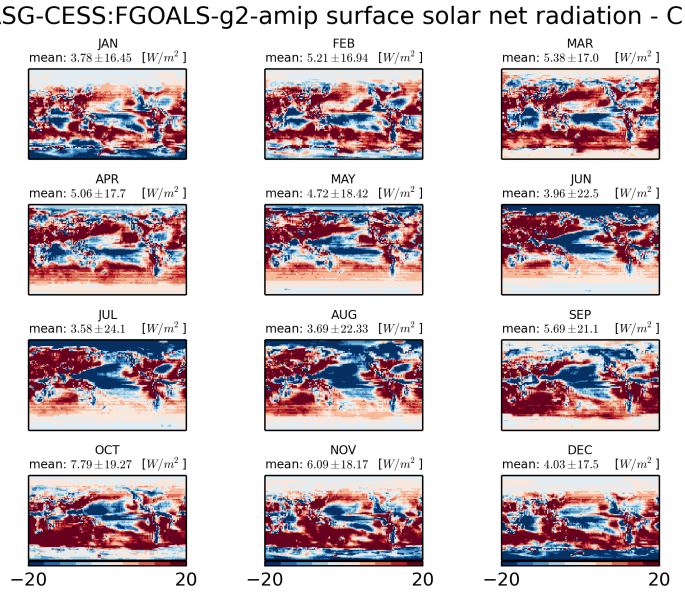



Figure 1443: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and CERES2.7

### 3.2.4 CMIP5 BNU:BNU-ESM-amip

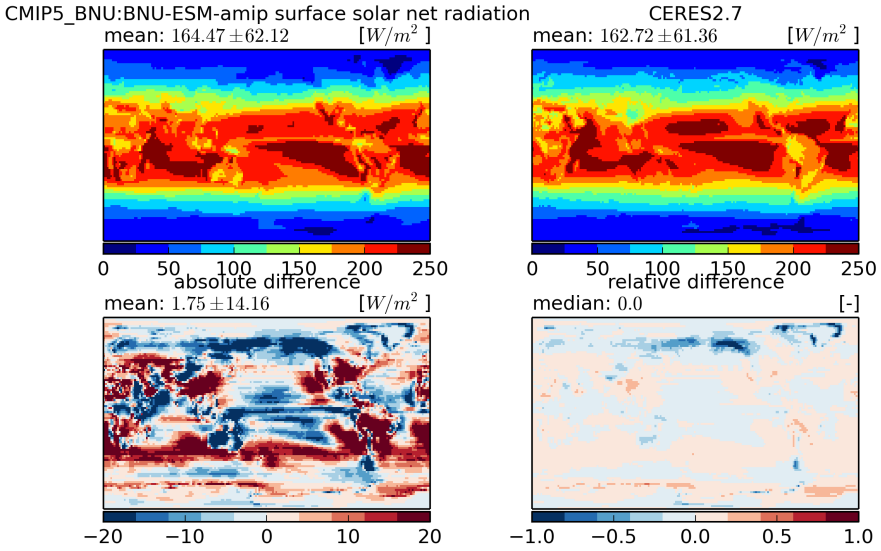



Figure 1444: Temporal mean fields (top) and absolute and relative differences (bottom)

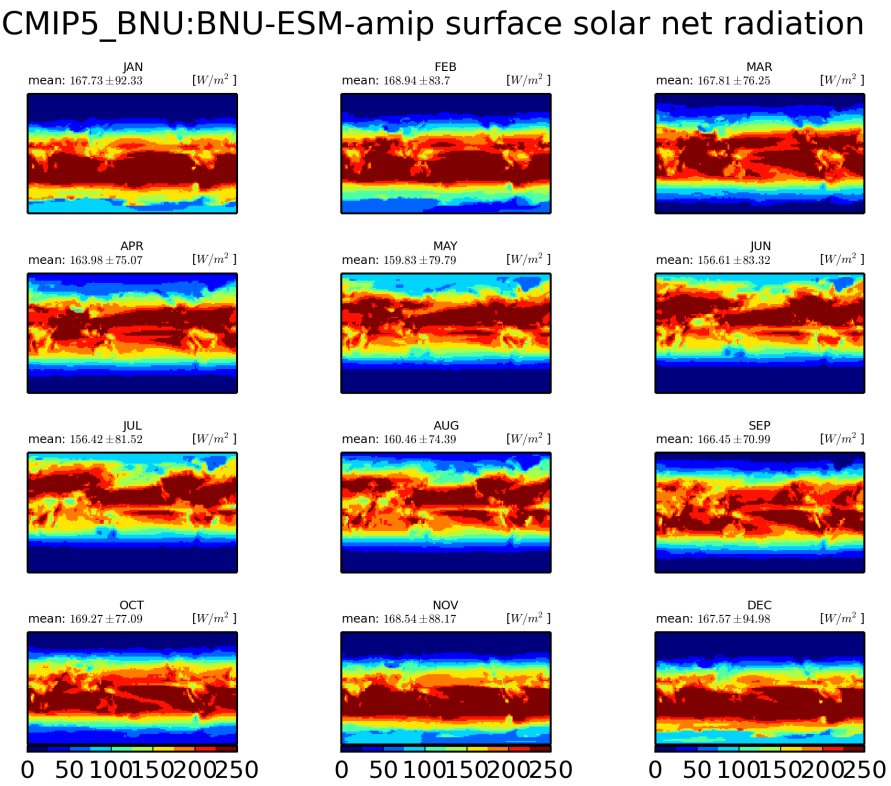



Figure 1445: Monthly mean climatology for BNU:BNU-ESM

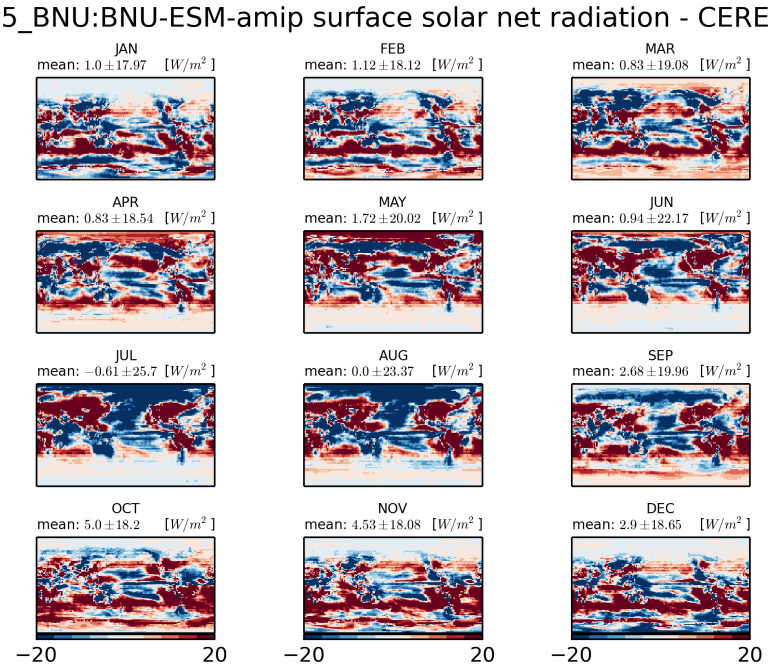



Figure 1446: Monthly mean climatology of difference between BNU:BNU-ESM and CERES2.7

### 3.2.5 CMIP5 BCC:bcc-csm1-1-amip

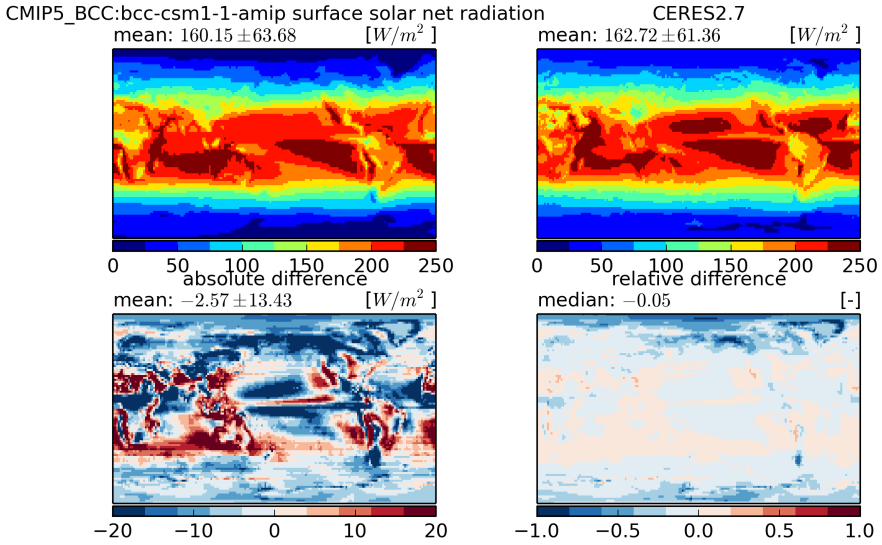



Figure 1447: Temporal mean fields (top) and absolute and relative differences (bottom)

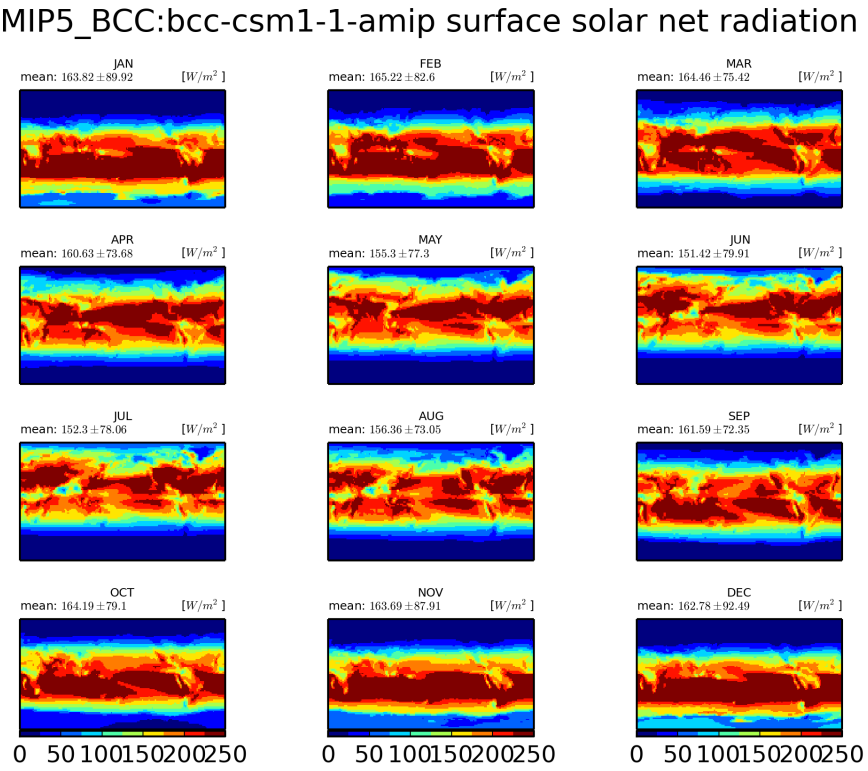



Figure 1448: Monthly mean climatology for BCC:bcc-csm1-1

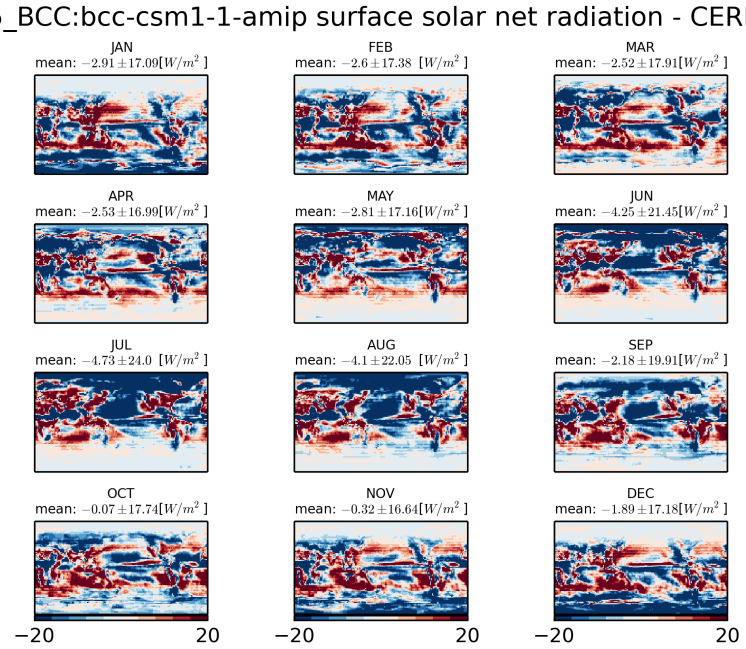



Figure 1449: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and CERES2.7

### 3.2.6 CMIP5 BCC:bcc-csm1-1-m-amip

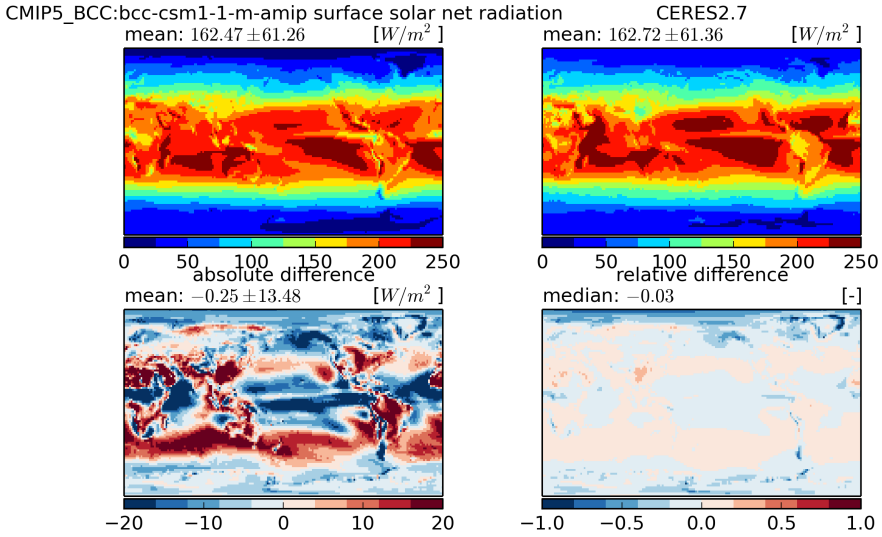



Figure 1450: Temporal mean fields (top) and absolute and relative differences (bottom)

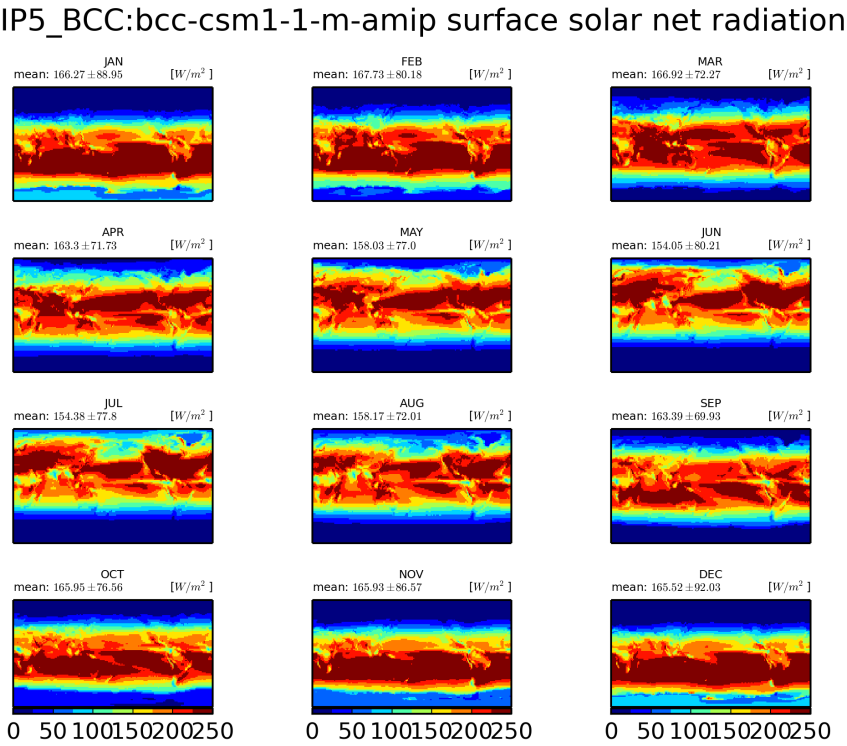



Figure 1451: Monthly mean climatology for BCC:bcc-csm1-1-m

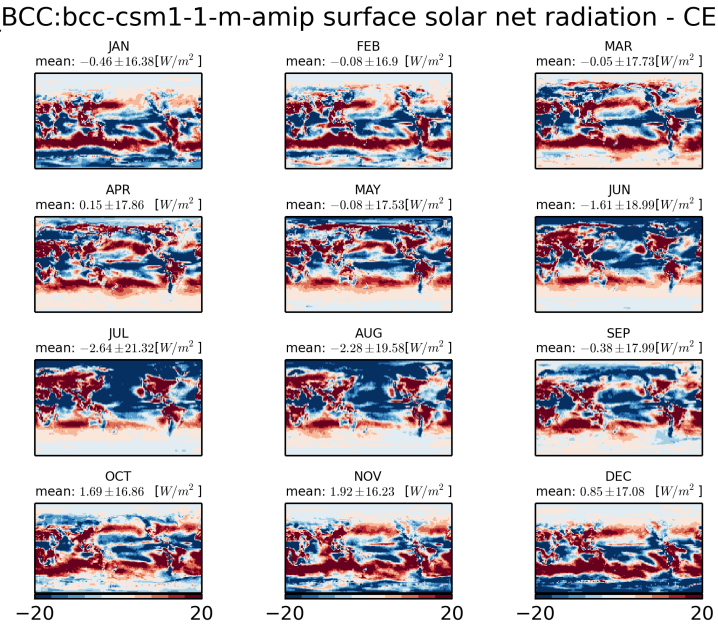



Figure 1452: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and CERES2.7

### 3.2.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

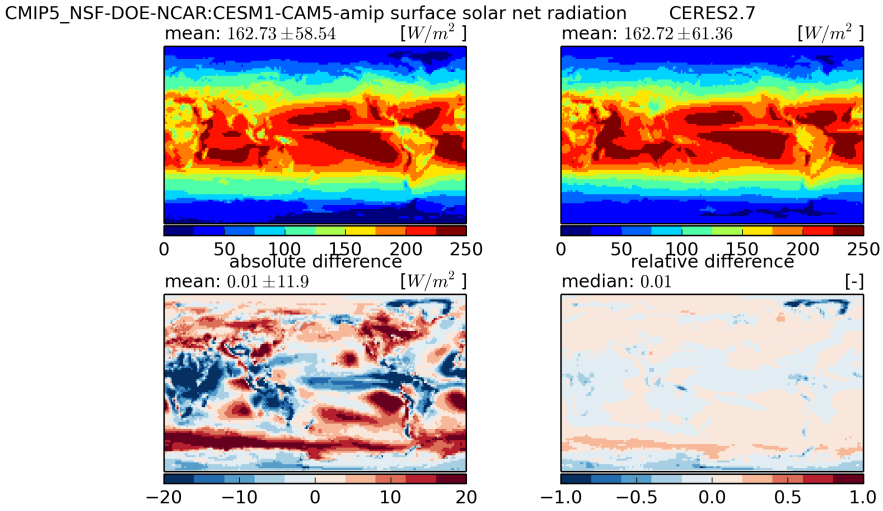



Figure 1453: Temporal mean fields (top) and absolute and relative differences (bottom)

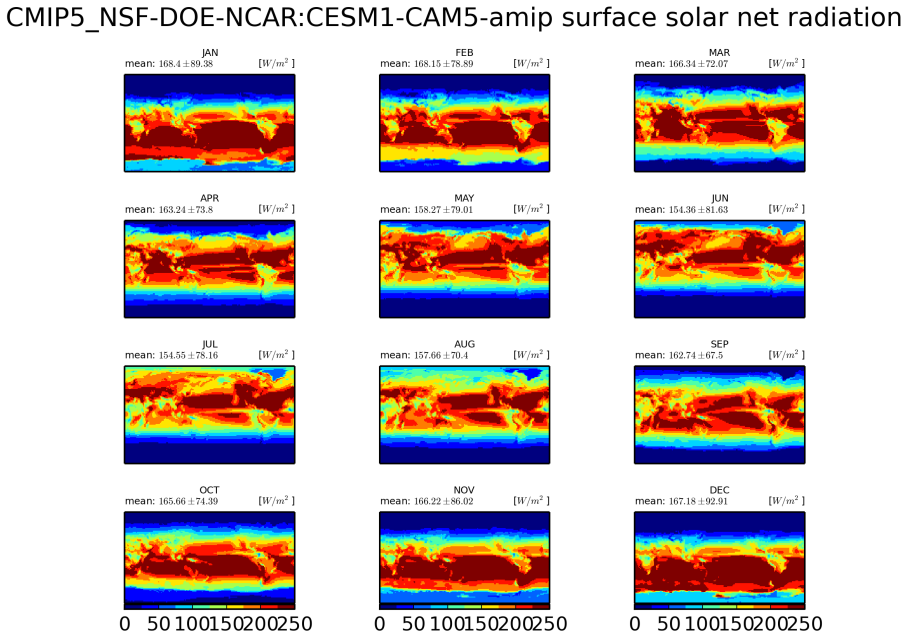



Figure 1454: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

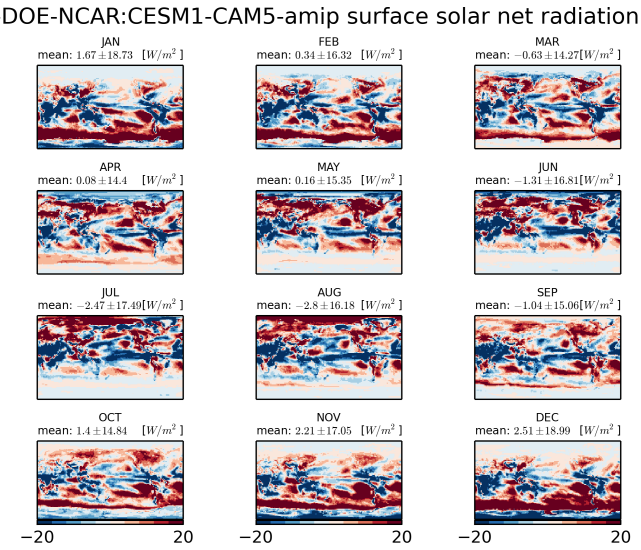



Figure 1455: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and CERES2.7

### 3.2.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

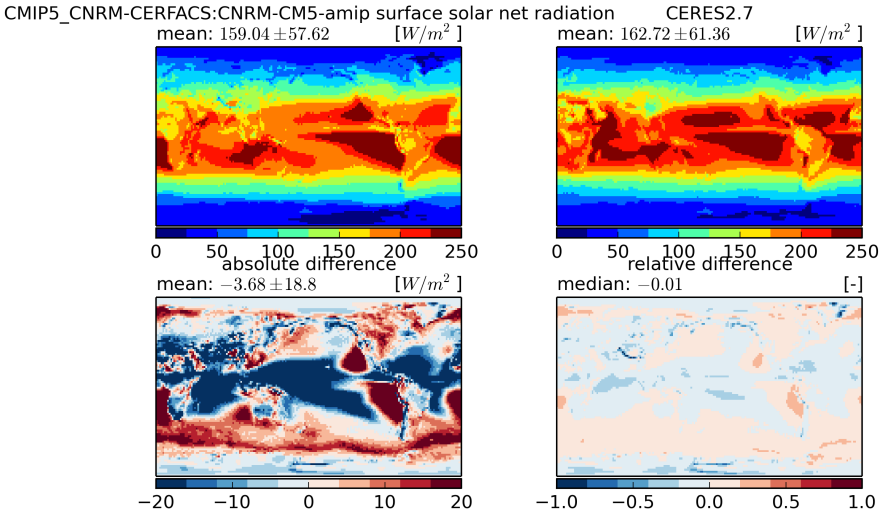



Figure 1456: Temporal mean fields (top) and absolute and relative differences (bottom)

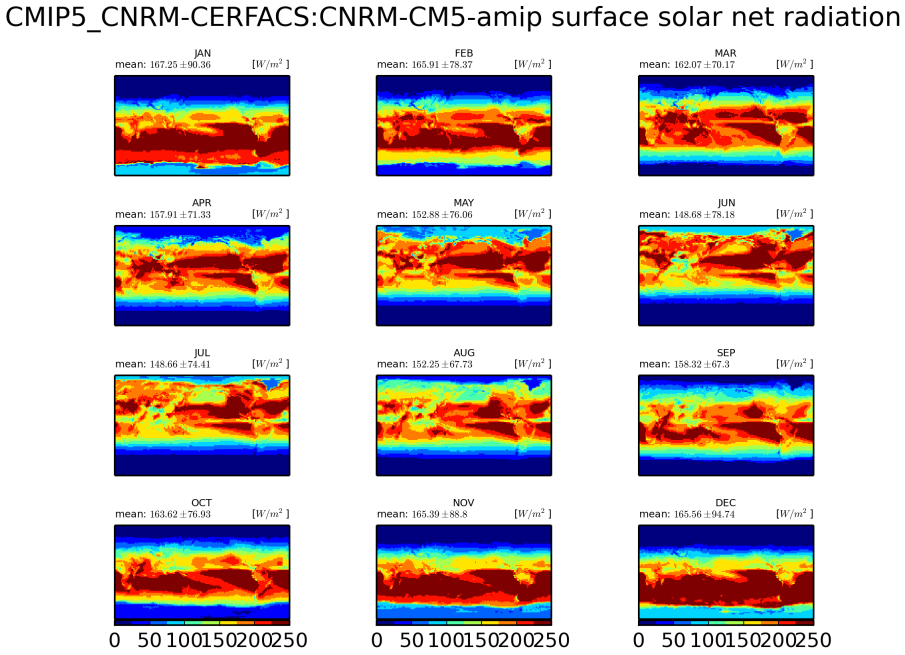



Figure 1457: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

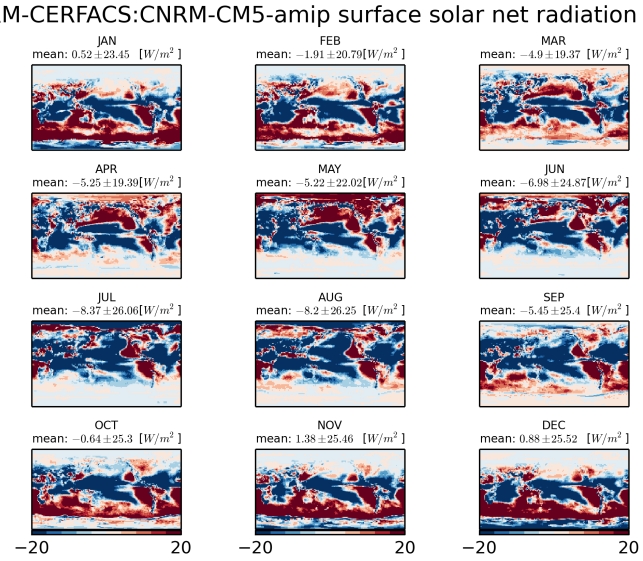



Figure 1458: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and CERES2.7

### 3.2.9 CMIP5 MRI:MRI-CGCM3-amip

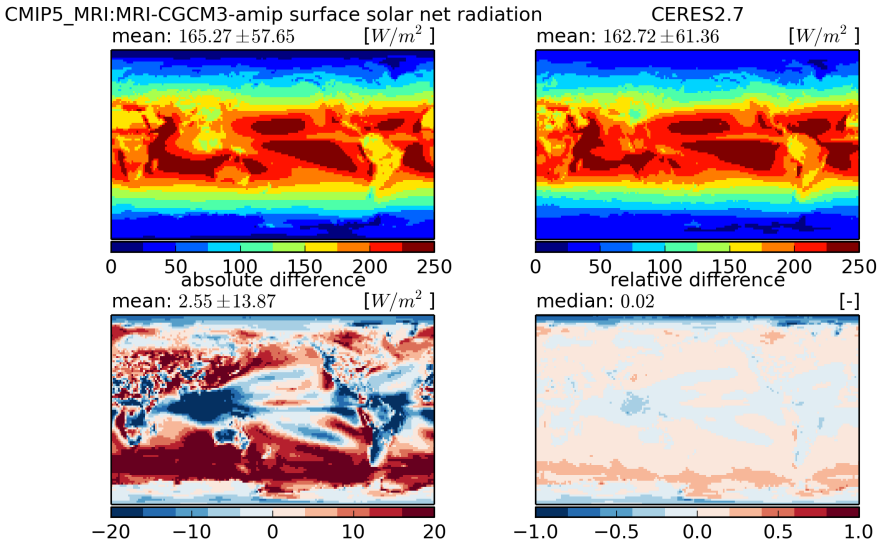



Figure 1459: Temporal mean fields (top) and absolute and relative differences (bottom)

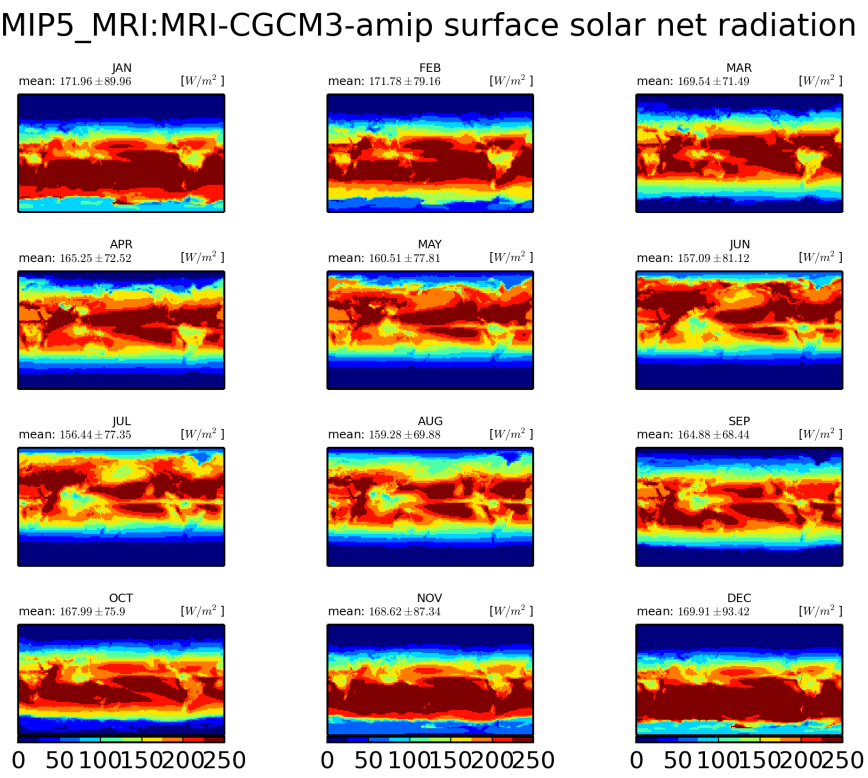



Figure 1460: Monthly mean climatology for MRI:MRI-CGCM3

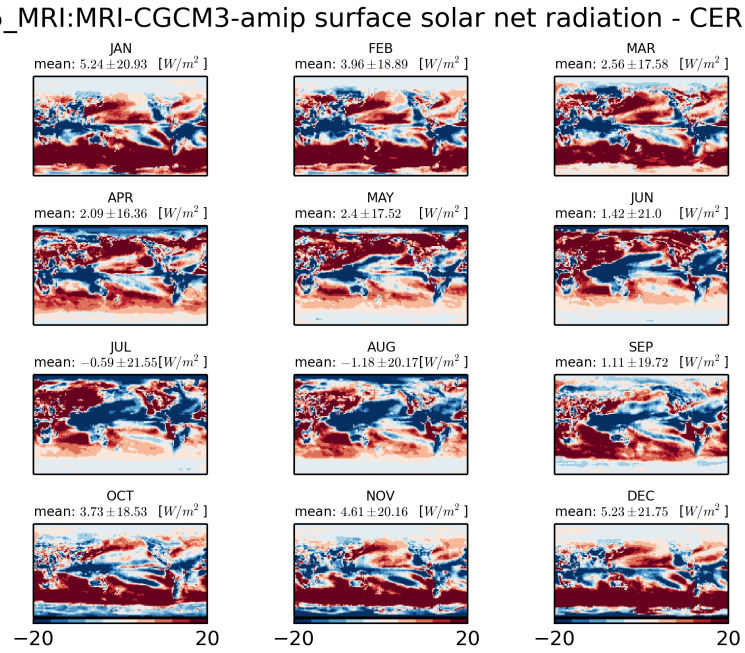



Figure 1461: Monthly mean climatology of difference between MRI:MRI-CGCM3 and CERES2.7

### 3.2.10 CMIP5 NASA-GISS:GISS-E2-R-amip

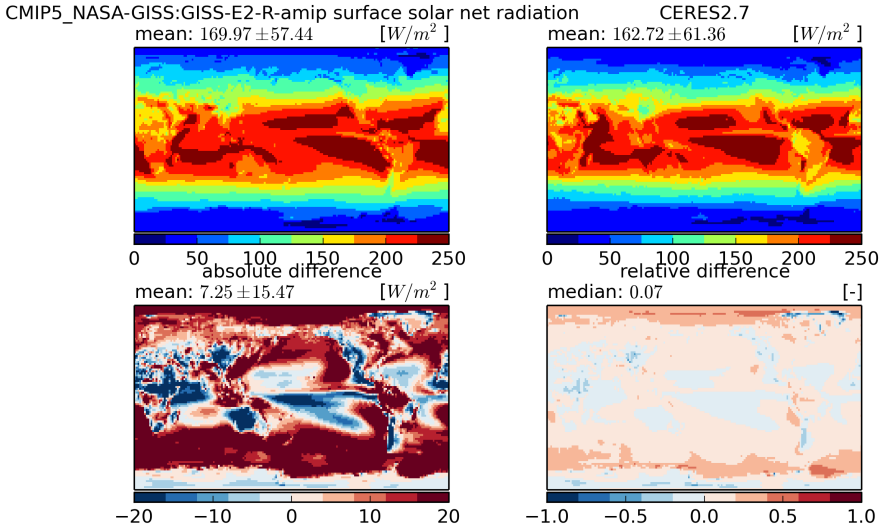



Figure 1462: Temporal mean fields (top) and absolute and relative differences (bottom)

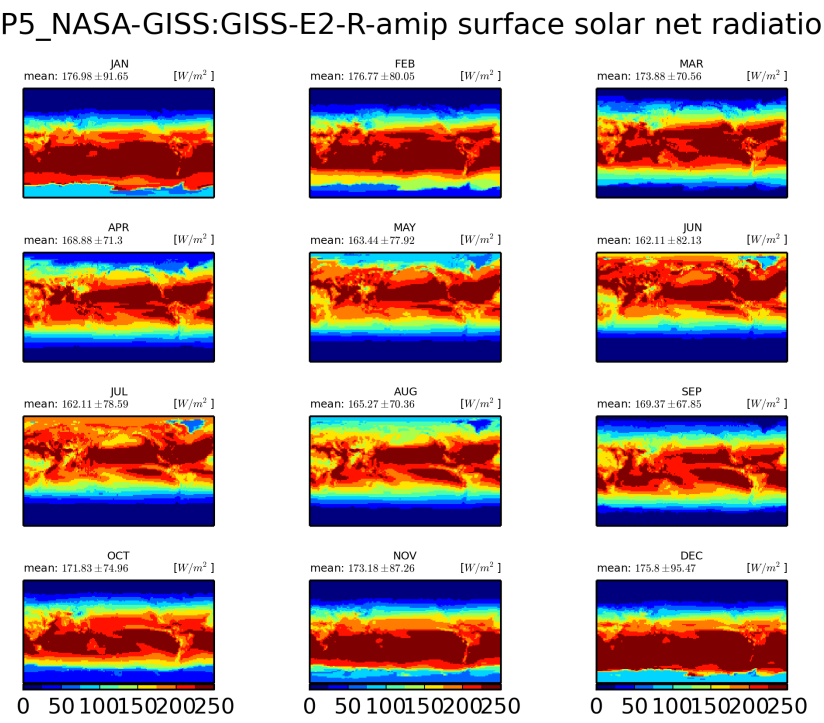



Figure 1463: Monthly mean climatology for NASA-GISS:GISS-E2-R

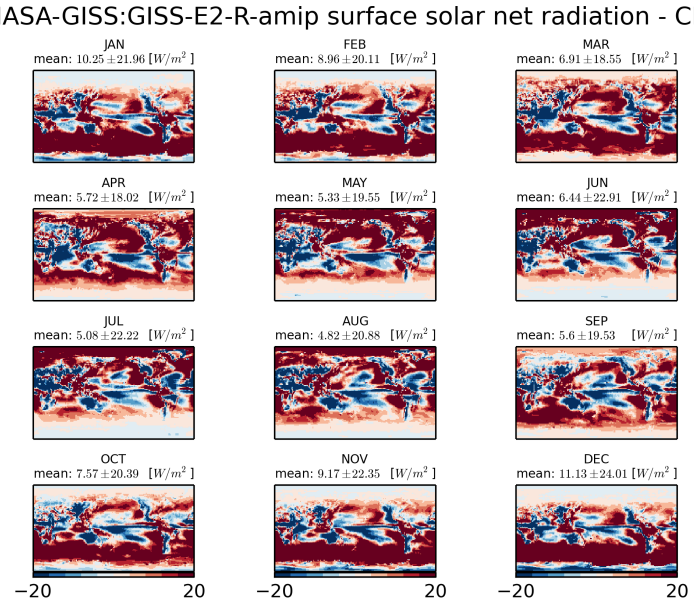



Figure 1464: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and CERES2.7

### 3.2.11 CMIP5 MIROC:MIROC5-amip

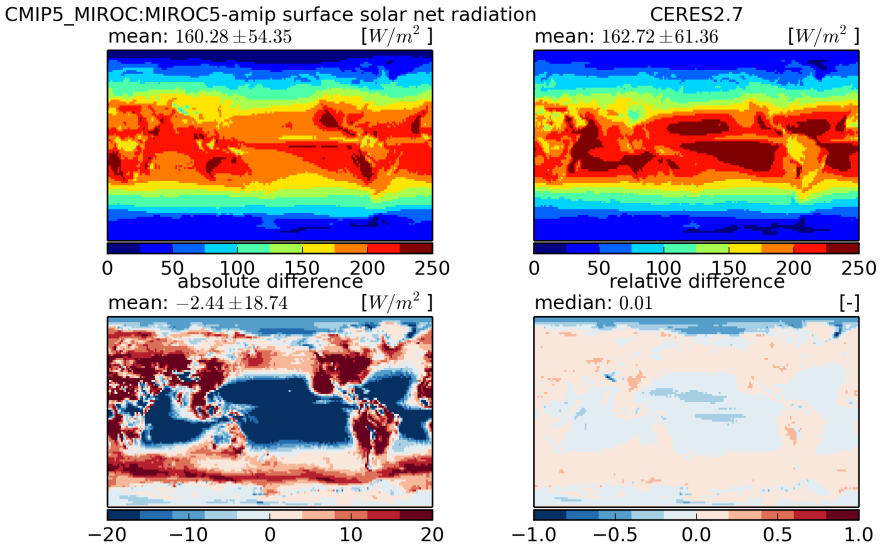



Figure 1465: Temporal mean fields (top) and absolute and relative differences (bottom)

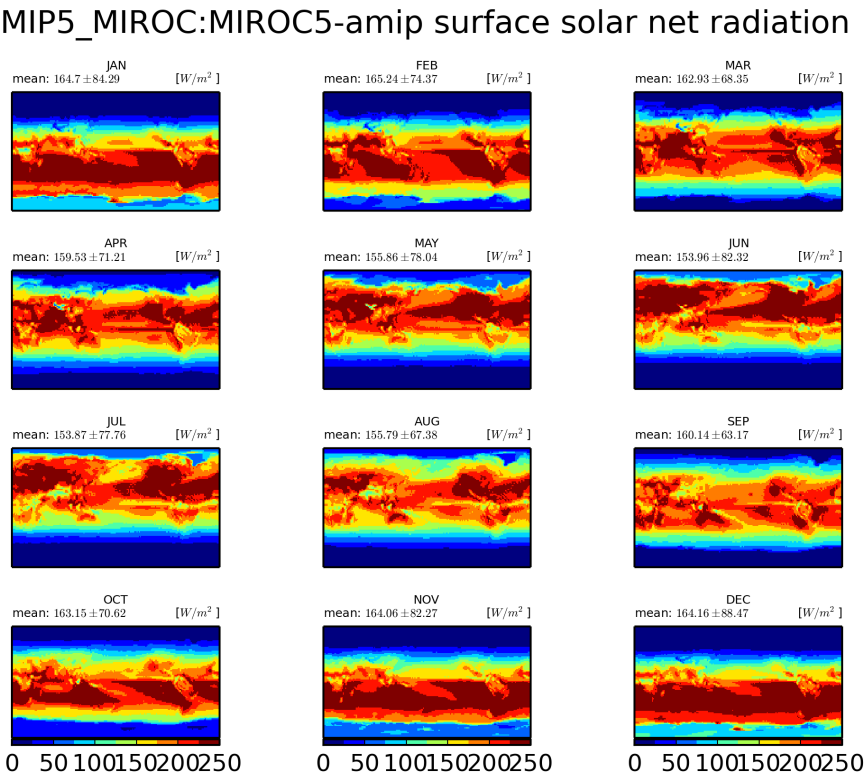



Figure 1466: Monthly mean climatology for MIROC:MIROC5

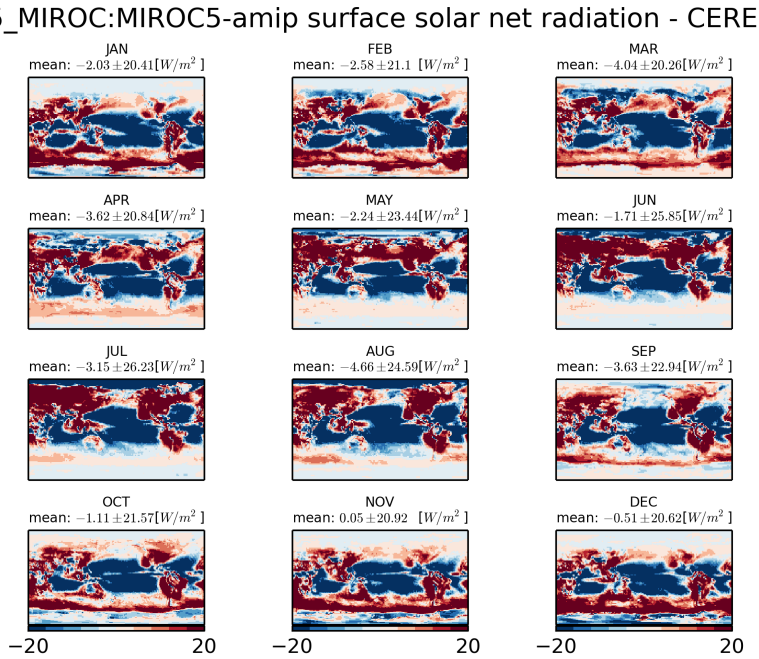



Figure 1467: Monthly mean climatology of difference between MIROC:MIROC5 and CERES2.7

### 3.2.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

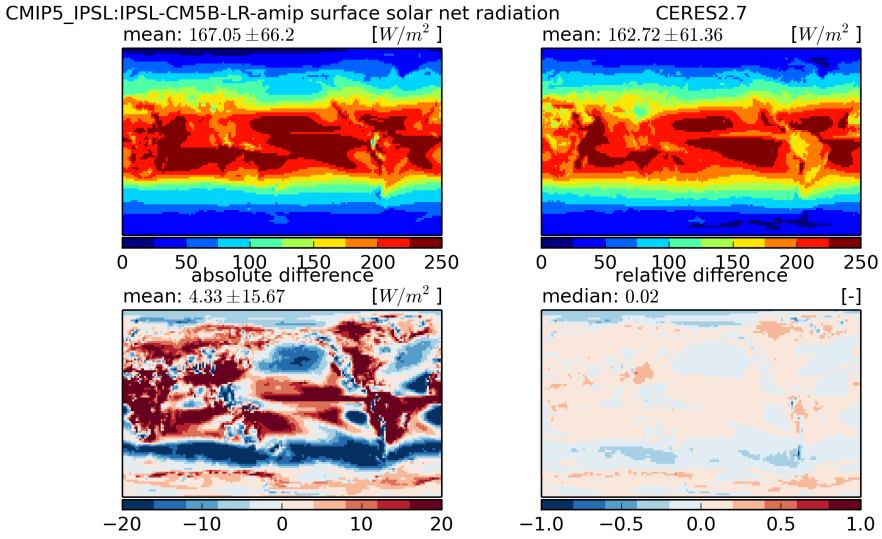



Figure 1468: Temporal mean fields (top) and absolute and relative differences (bottom)

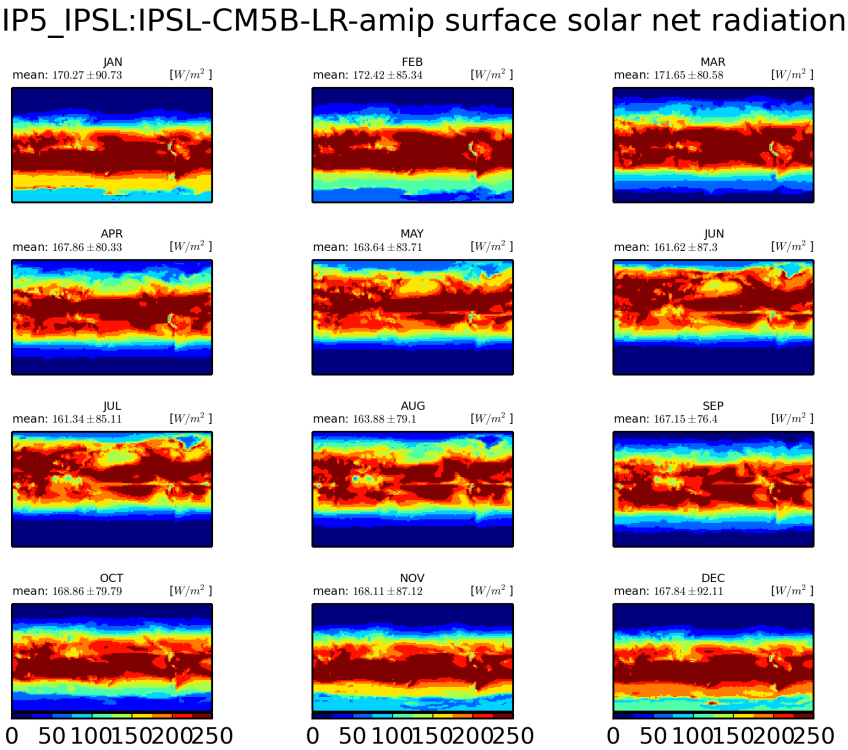



Figure 1469: Monthly mean climatology for IPSL:IPSL-CM5B-LR

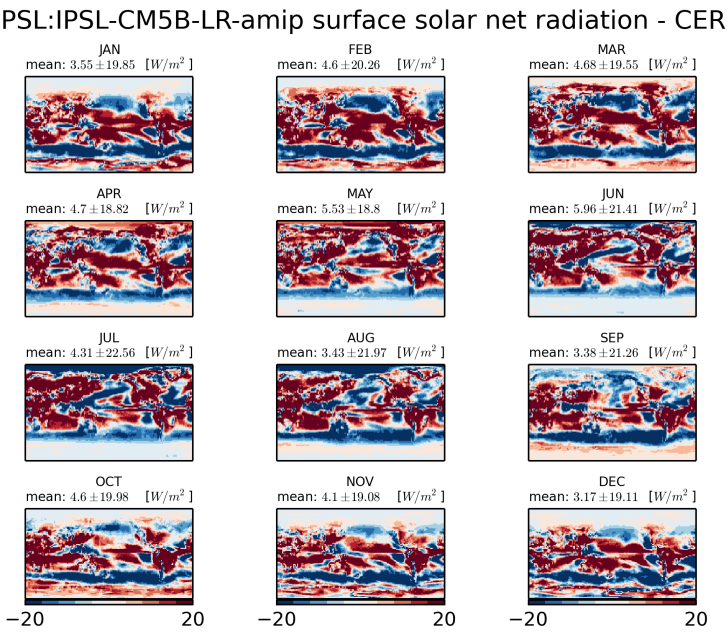



Figure 1470: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and CERES2.7

### 3.2.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

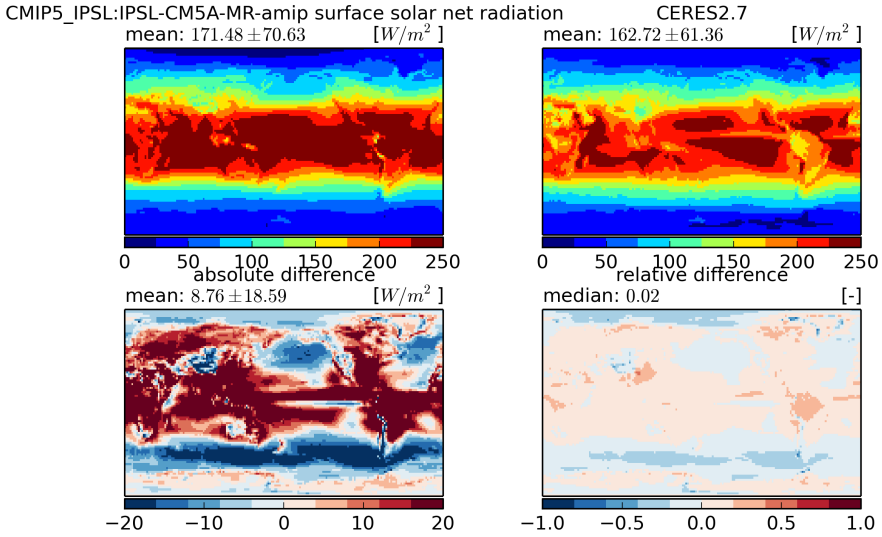



Figure 1471: Temporal mean fields (top) and absolute and relative differences (bottom)

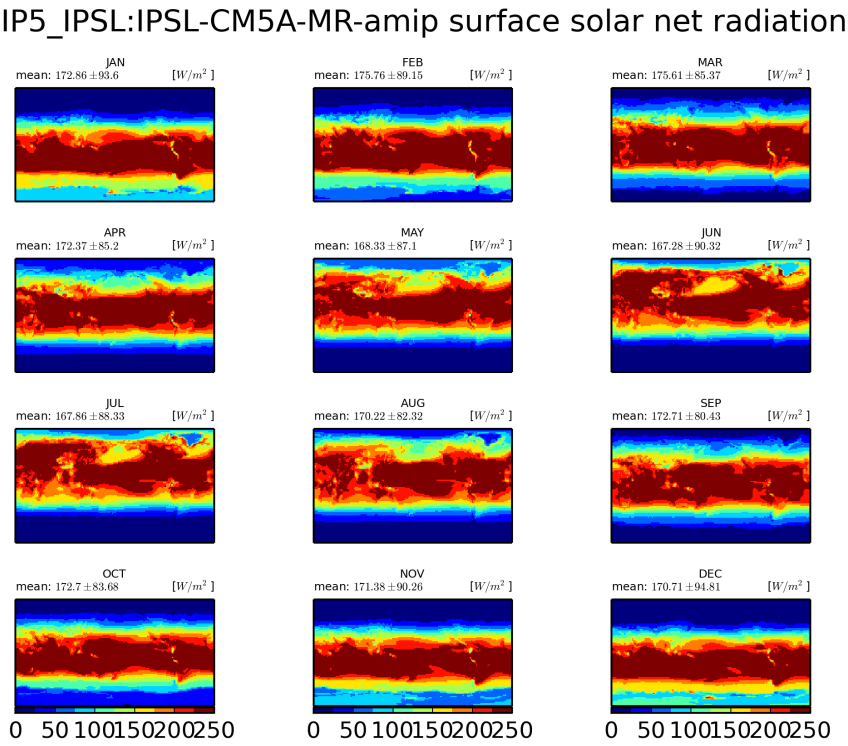



Figure 1472: Monthly mean climatology for IPSL:IPSL-CM5A-MR

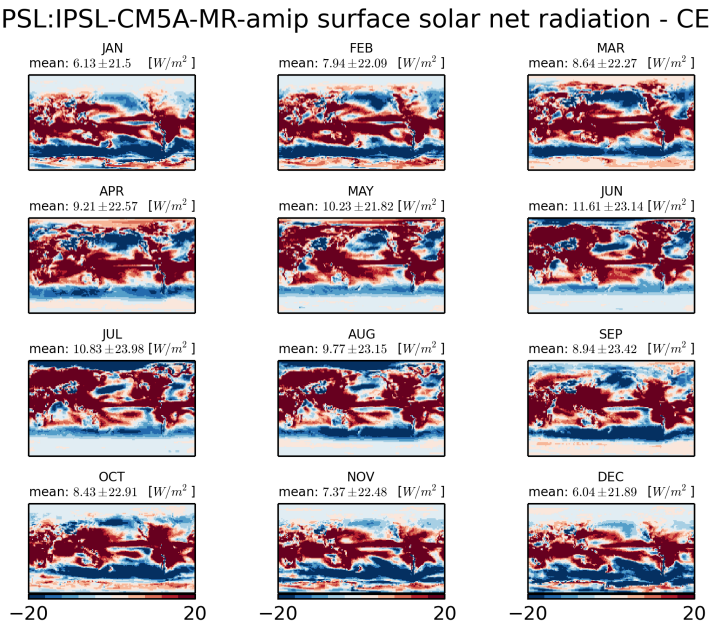



Figure 1473: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and CERES2.7

### 3.2.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

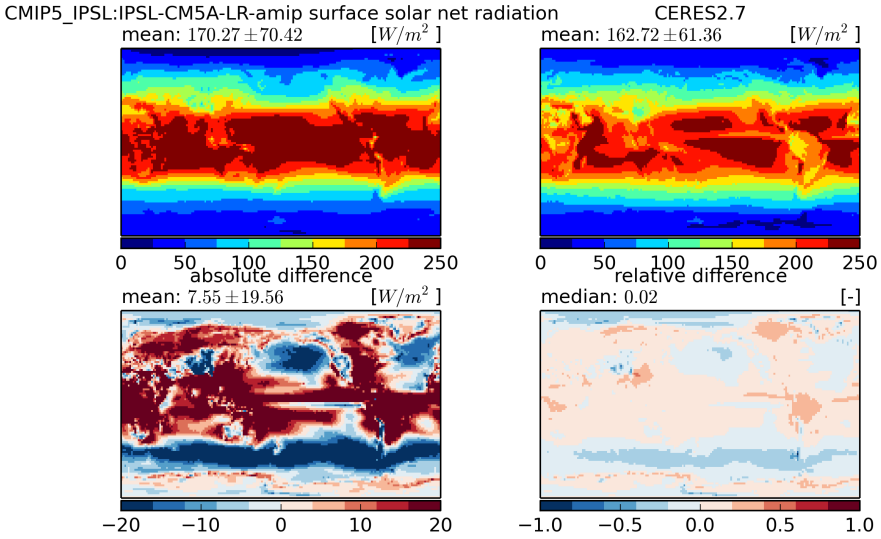



Figure 1474: Temporal mean fields (top) and absolute and relative differences (bottom)

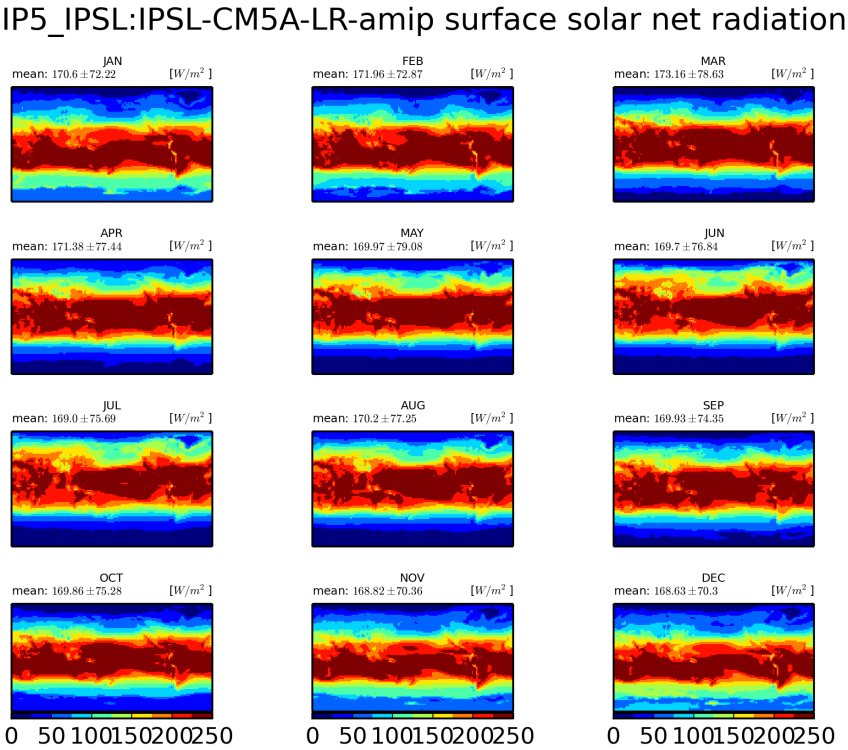



Figure 1475: Monthly mean climatology for IPSL:IPSL-CM5A-LR

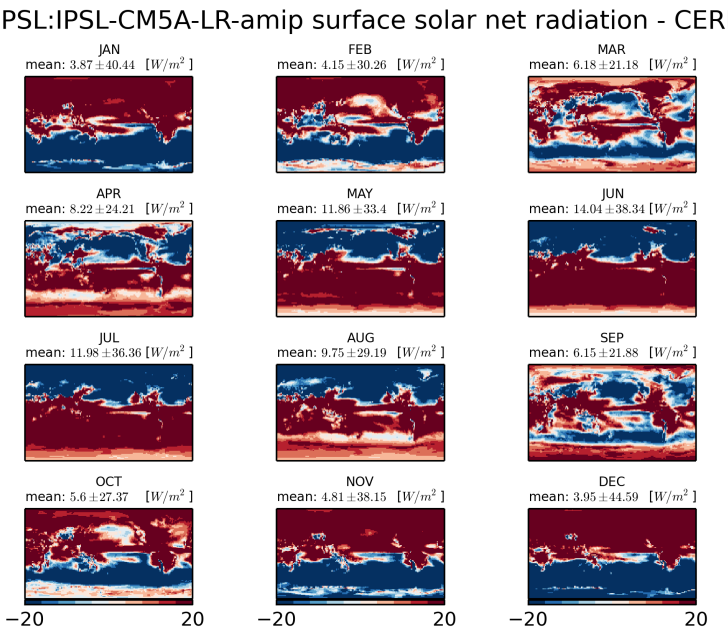



Figure 1476: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and CERES2.7

### 3.2.15 CMIP5 MOHC:HadGEM2-A-amip

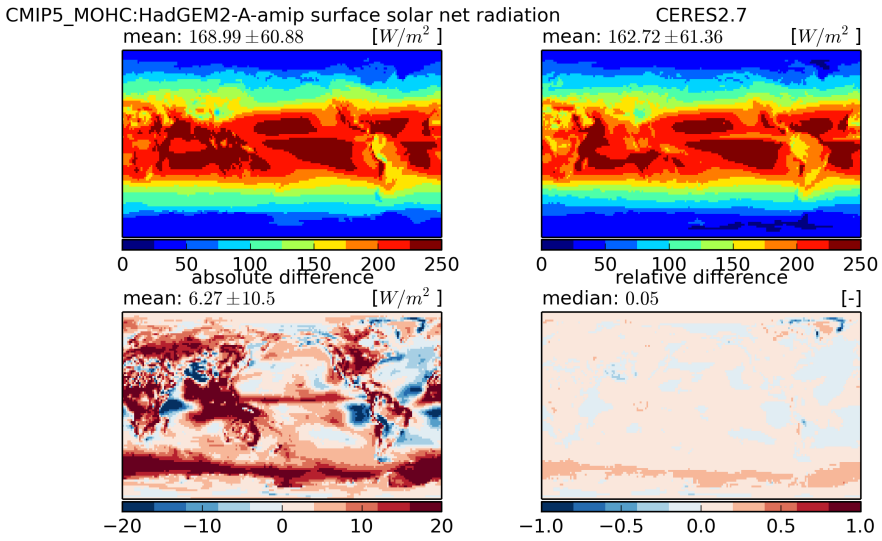



Figure 1477: Temporal mean fields (top) and absolute and relative differences (bottom)

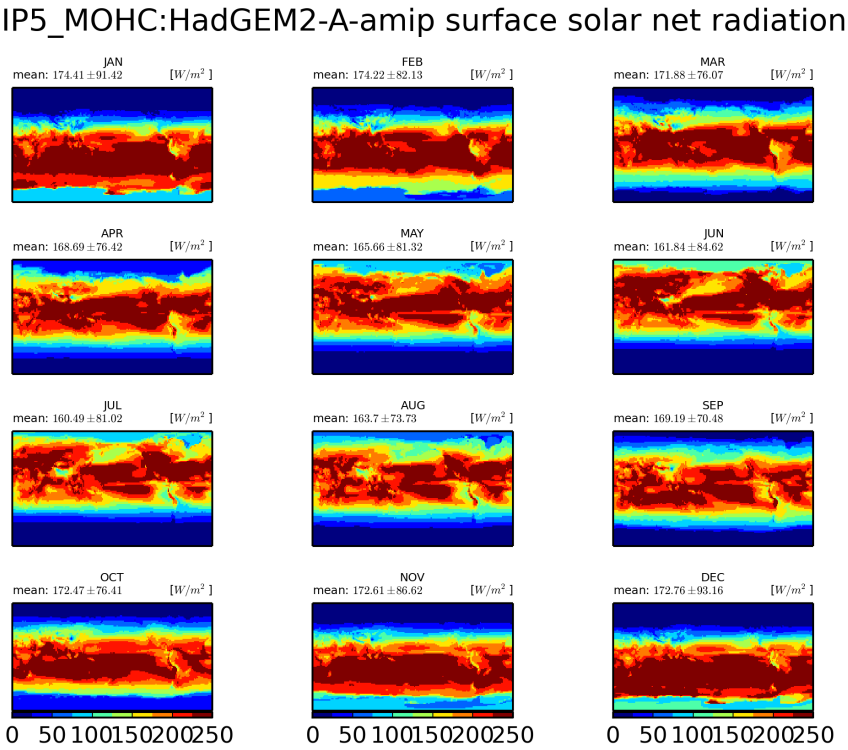



Figure 1478: Monthly mean climatology for MOHC:HadGEM2-A

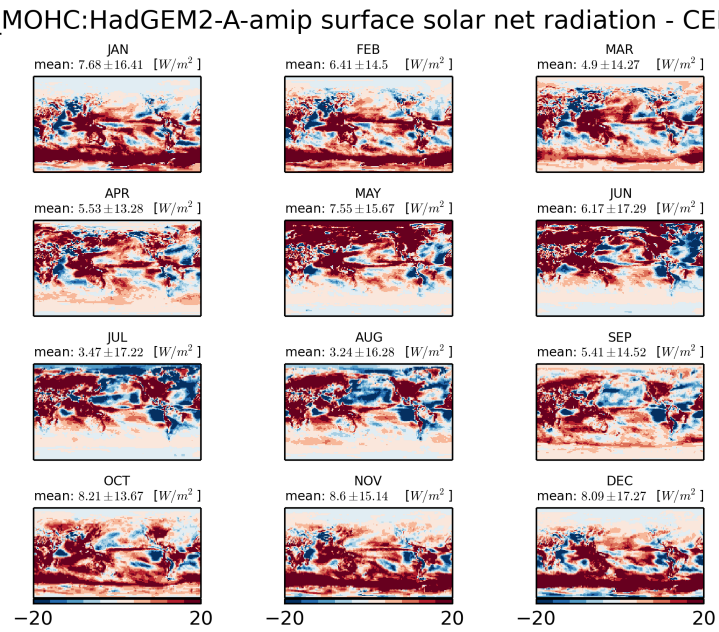



Figure 1479: Monthly mean climatology of difference between MOHC:HADGEM2-A and CERES2.7

### 3.2.16 CMIP5 LASG-IAP:FGOALS-s2-amip

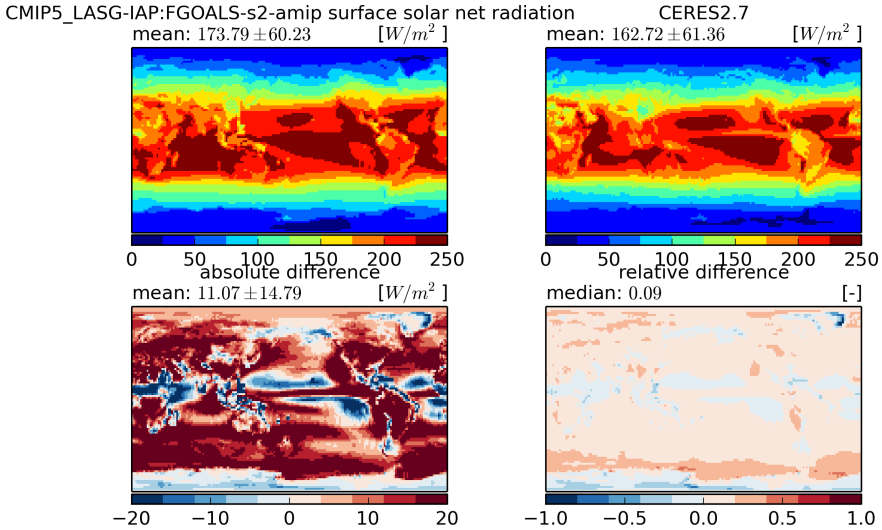



Figure 1480: Temporal mean fields (top) and absolute and relative differences (bottom)

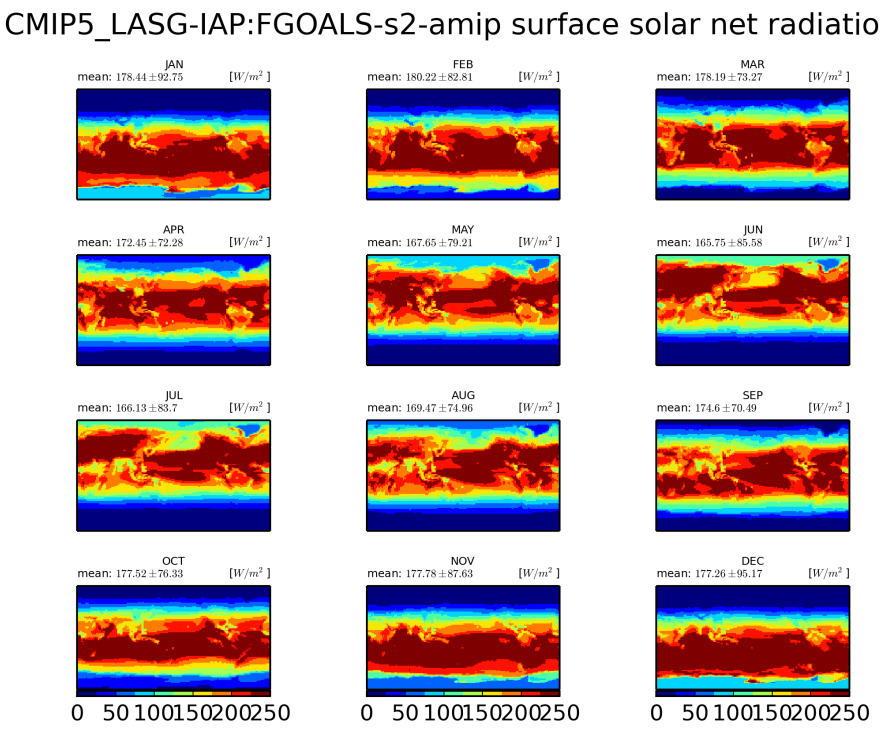



Figure 1481: Monthly mean climatology for LASG-IAP:FGOALS-s2

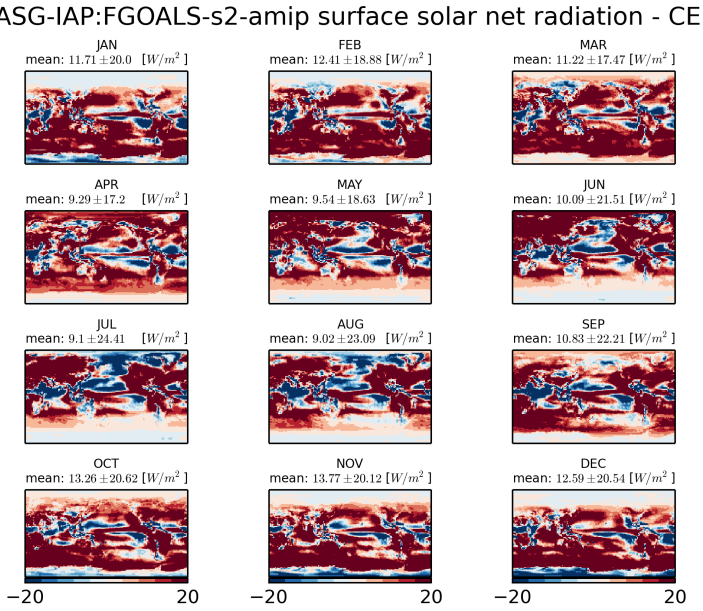



Figure 1482: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and CERES2.7

### 3.2.17 CMIP5 CMCC:CMCC-CM-amip

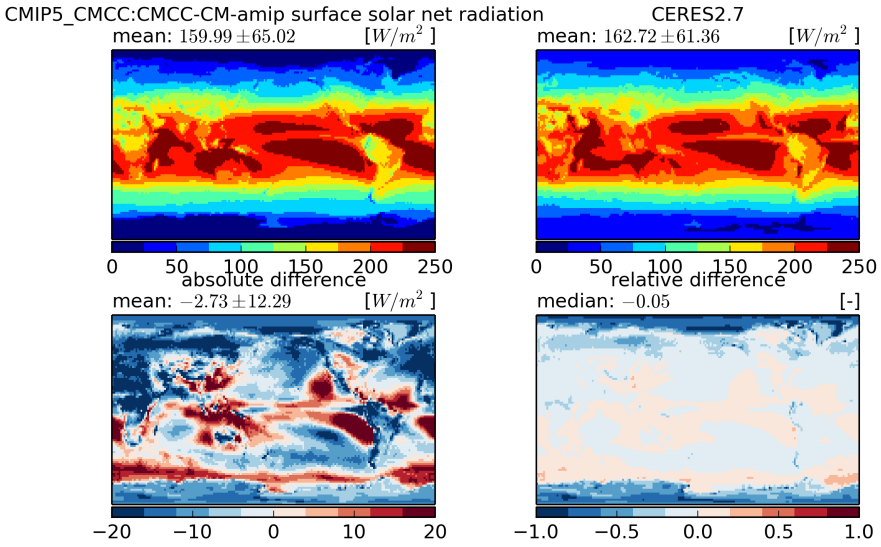



Figure 1483: Temporal mean fields (top) and absolute and relative differences (bottom)

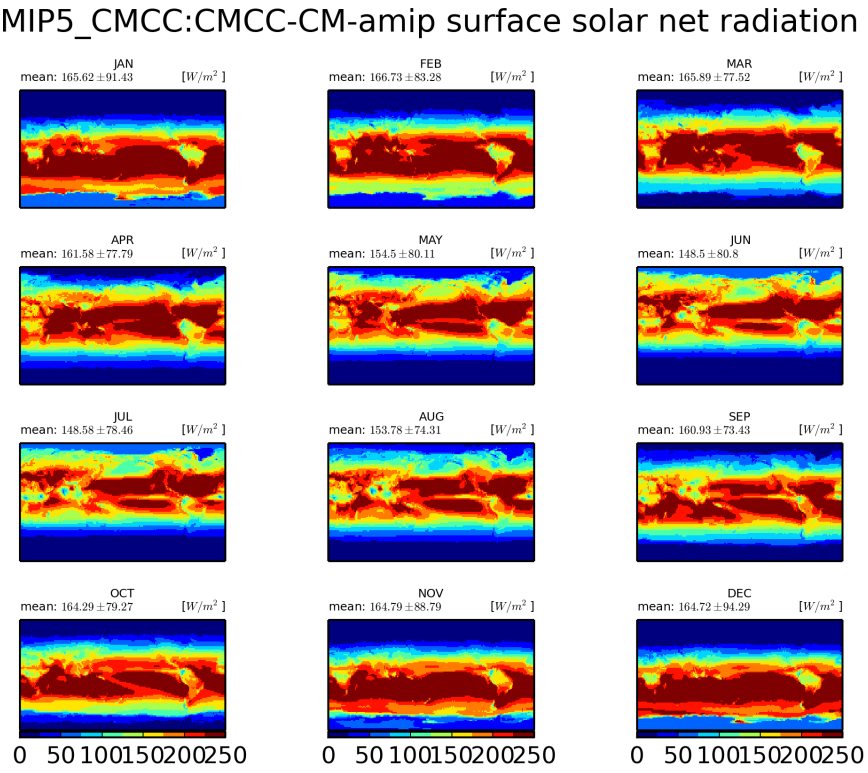



Figure 1484: Monthly mean climatology for CMCC:CMCC-CM

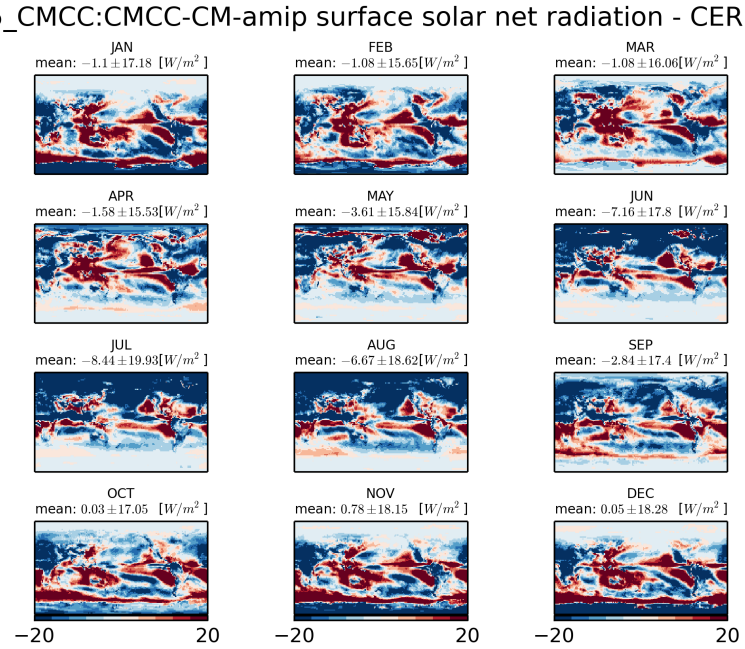



Figure 1485: Monthly mean climatology of difference between CMCC:CMCC-CM and CERES2.7

### 3.2.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

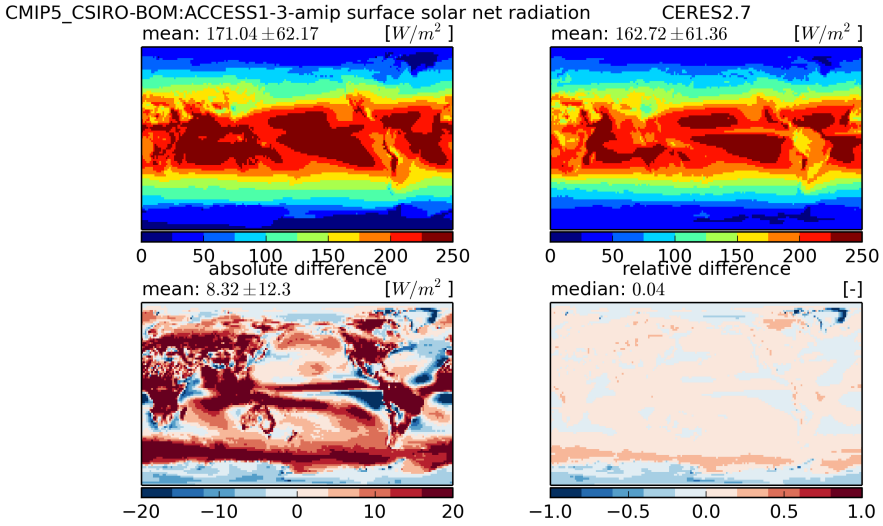



Figure 1486: Temporal mean fields (top) and absolute and relative differences (bottom)

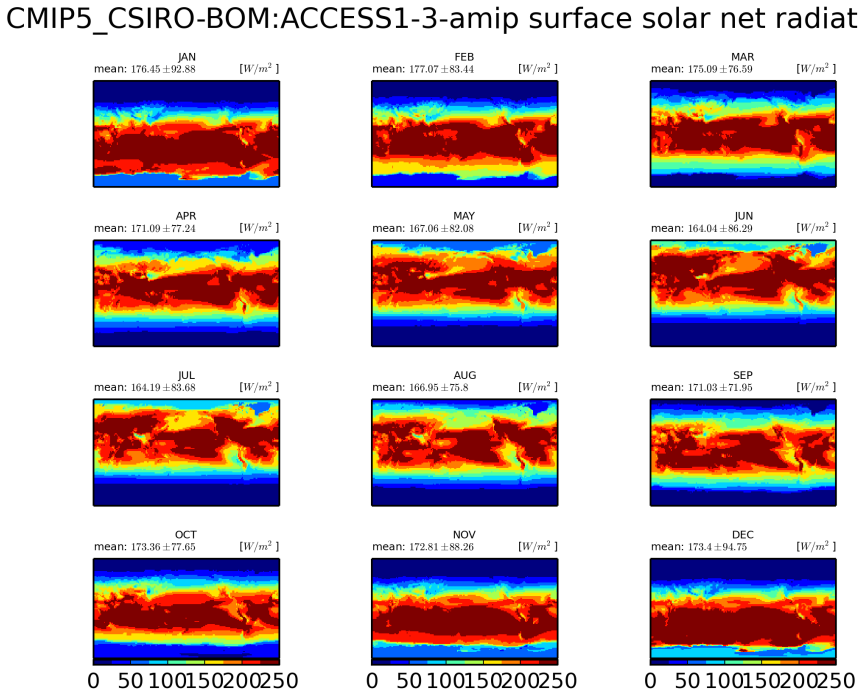



Figure 1487: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

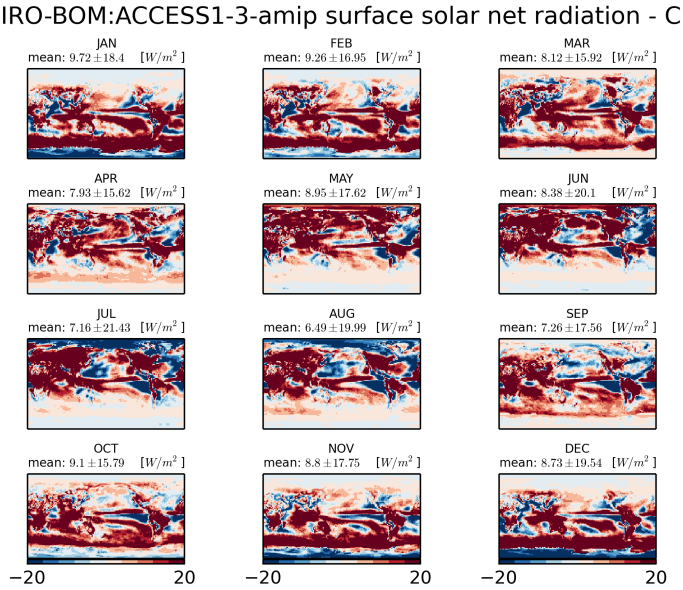



Figure 1488: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and CERES2.7

### 3.2.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

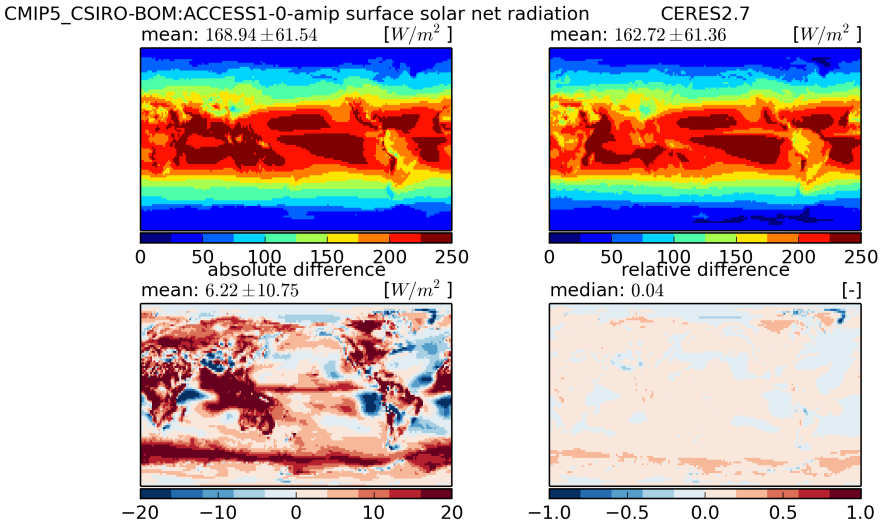



Figure 1489: Temporal mean fields (top) and absolute and relative differences (bottom)

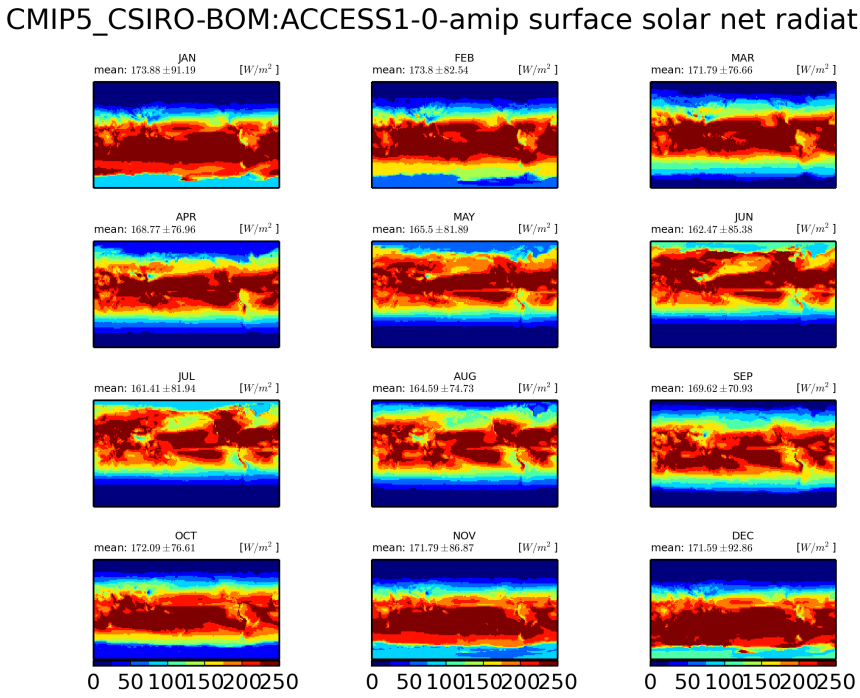



Figure 1490: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

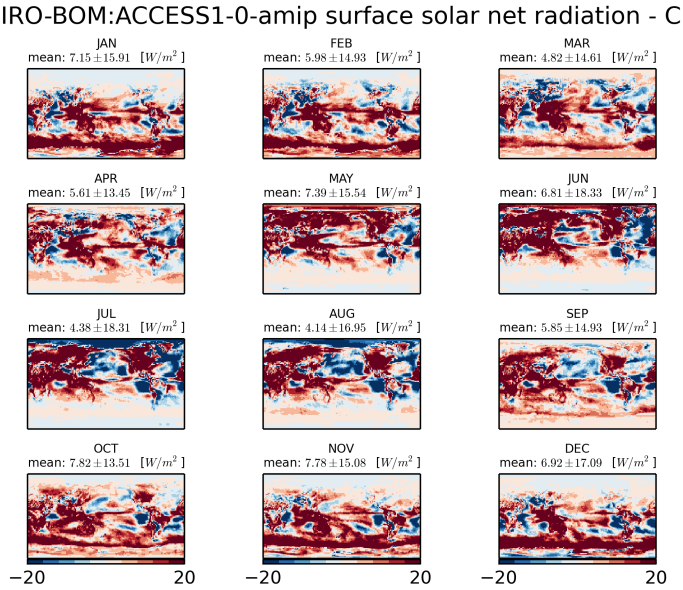



Figure 1491: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and CERES2.7

### 3.2.20 CMIP5 INM:inmcm4-amip

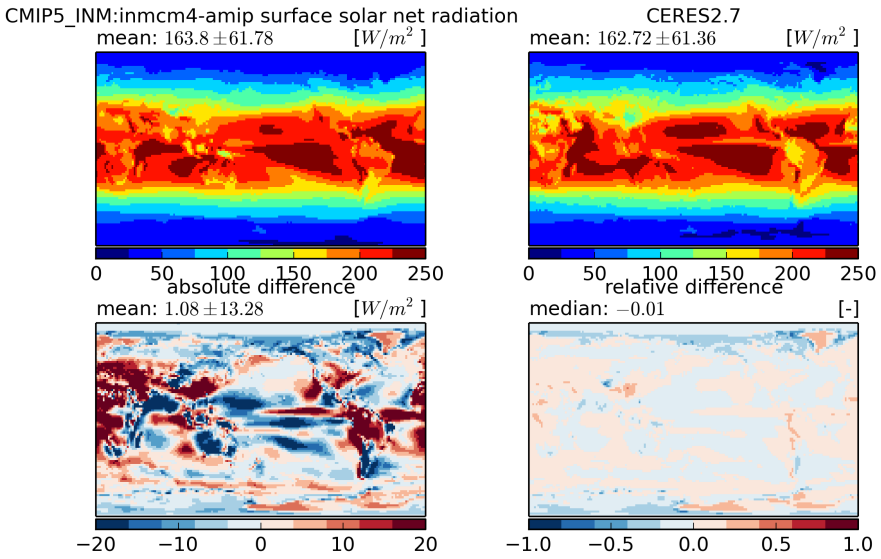



Figure 1492: Temporal mean fields (top) and absolute and relative differences (bottom)

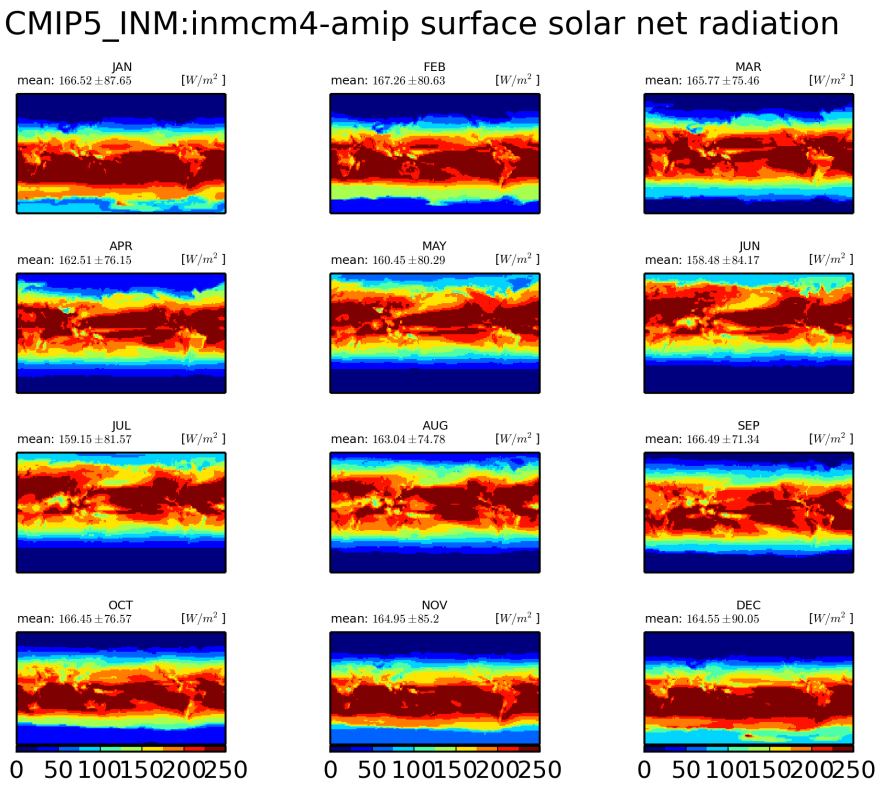



Figure 1493: Monthly mean climatology for INM:inmcm4

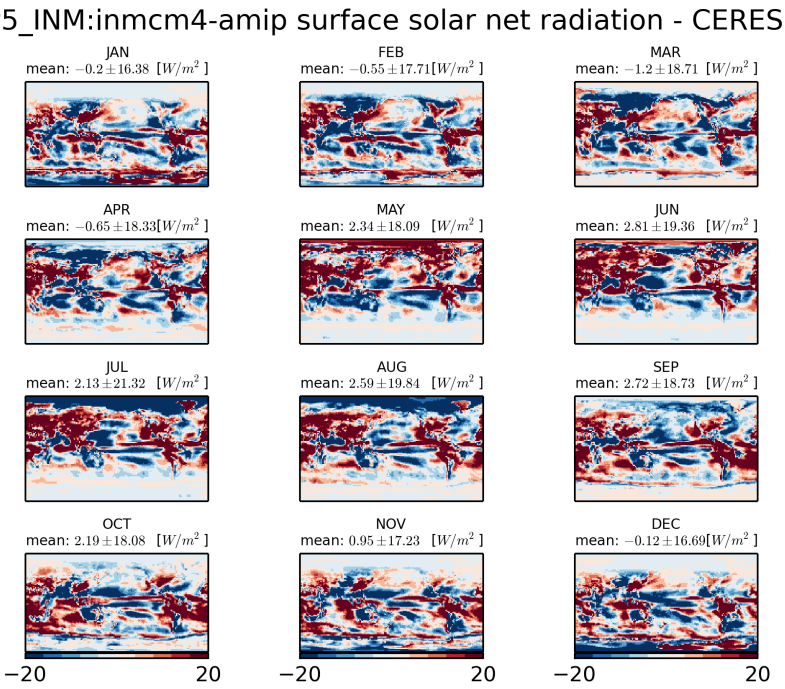



Figure 1494: Monthly mean climatology of difference between INM:INMCM4 and CERES2.7

### 3.2.21 CMIP5 MPI-M:MPI-ESM-LR-amip

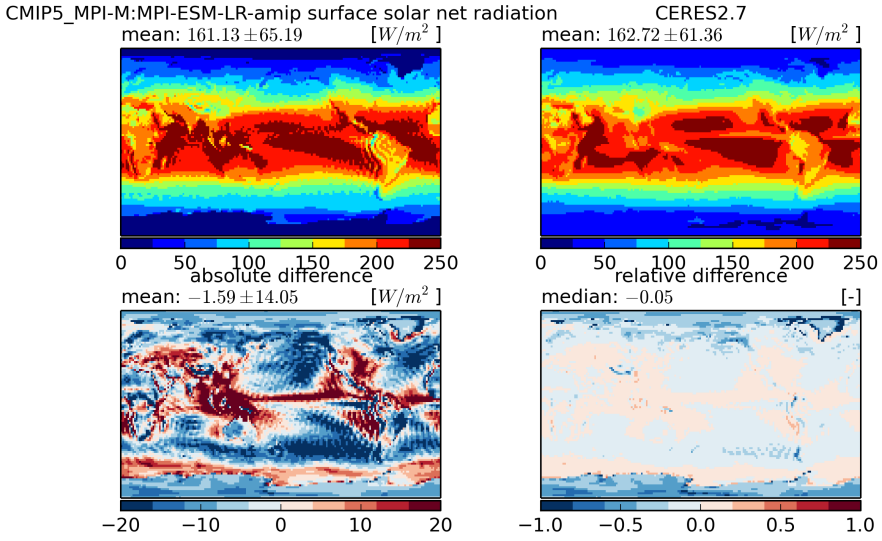



Figure 1495: Temporal mean fields (top) and absolute and relative differences (bottom)

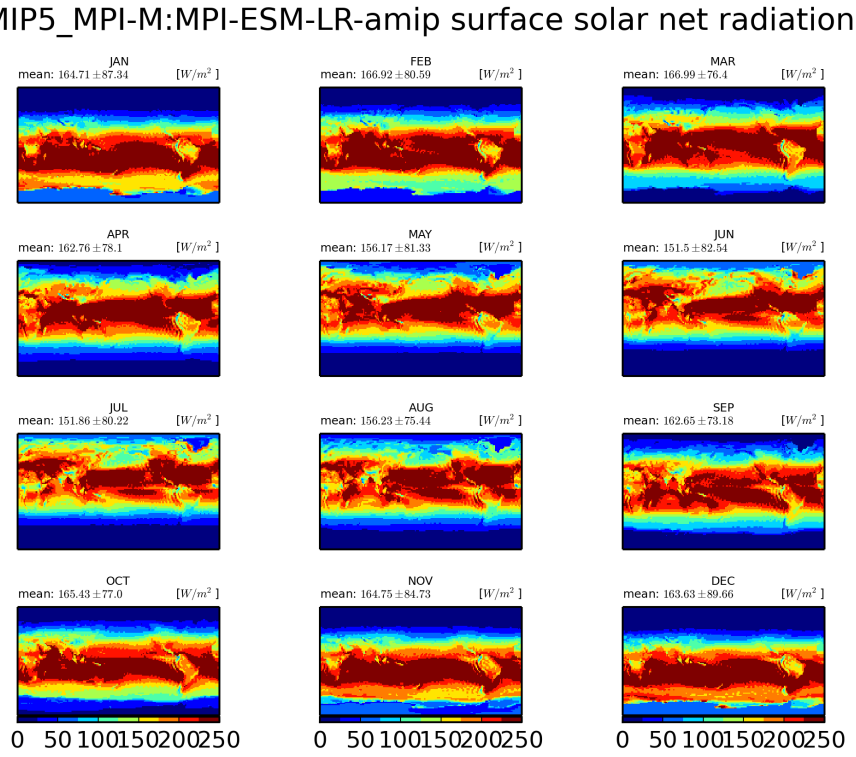



Figure 1496: Monthly mean climatology for MPI-M:MPI-ESM-LR

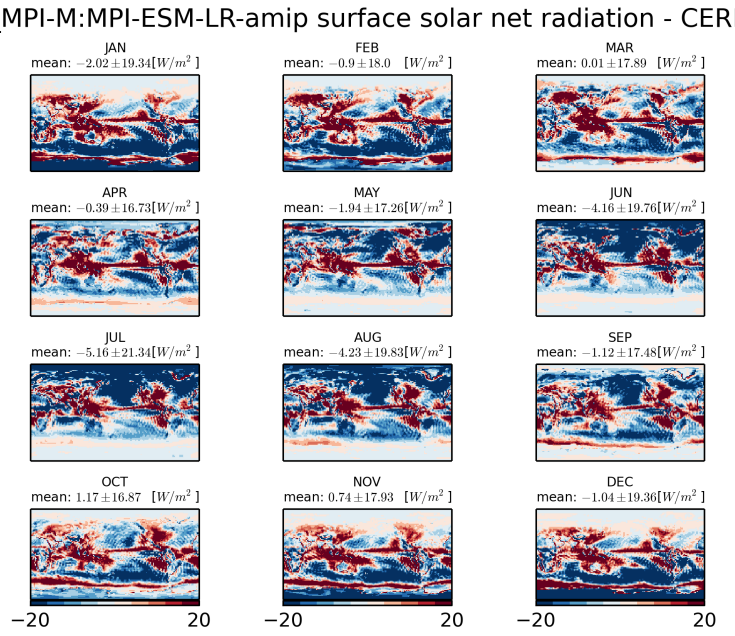



Figure 1497: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and CERES2.7

### 3.2.22 CMIP5 MPI-M:MPI-ESM-MR-amip

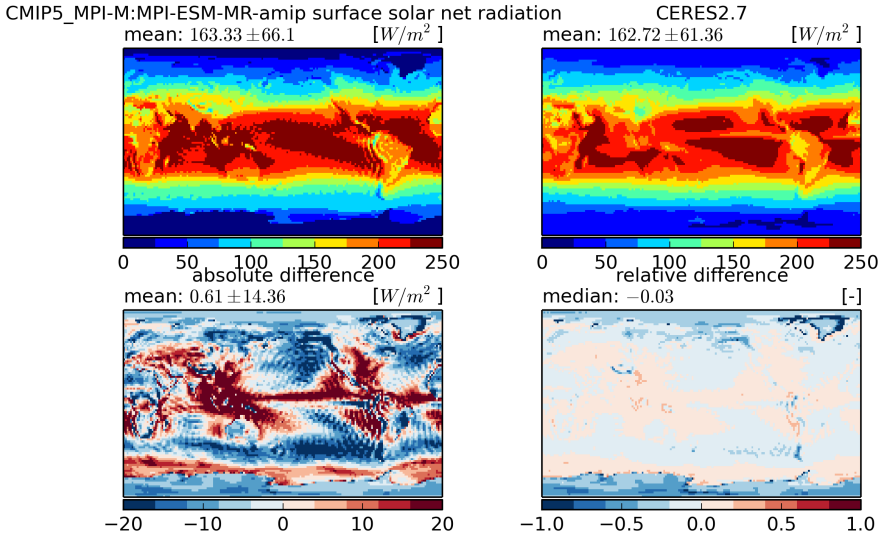



Figure 1498: Temporal mean fields (top) and absolute and relative differences (bottom)

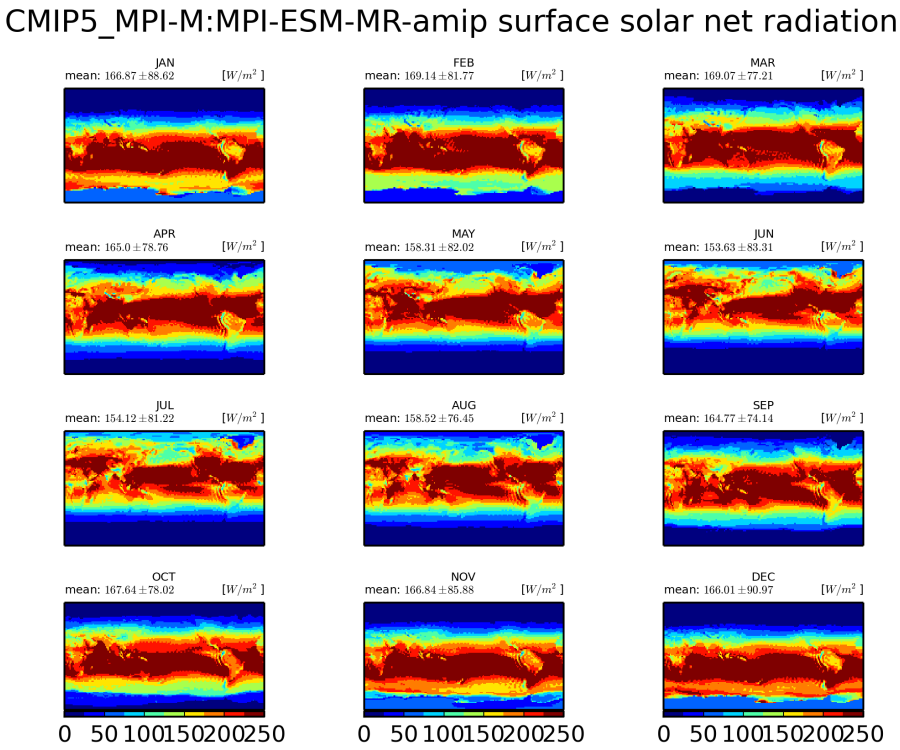



Figure 1499: Monthly mean climatology for MPI-M:MPI-ESM-MR

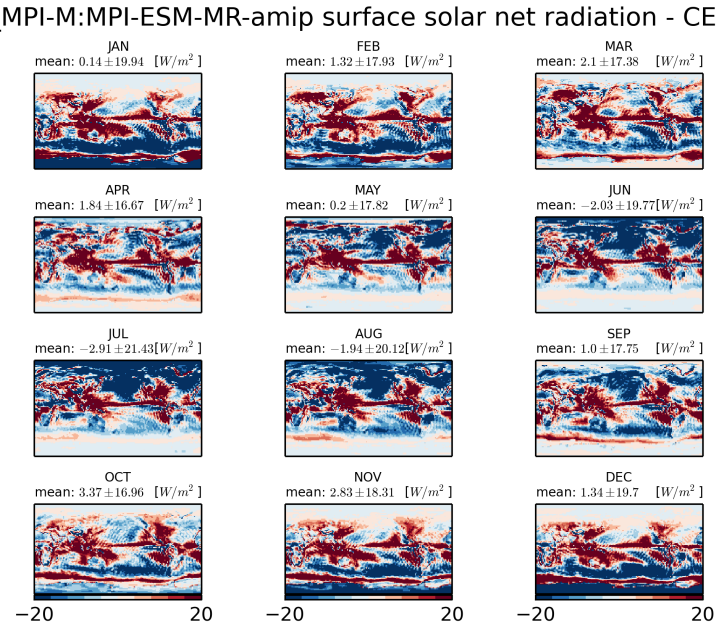



Figure 1500: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and CERES2.7

### 3.2.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

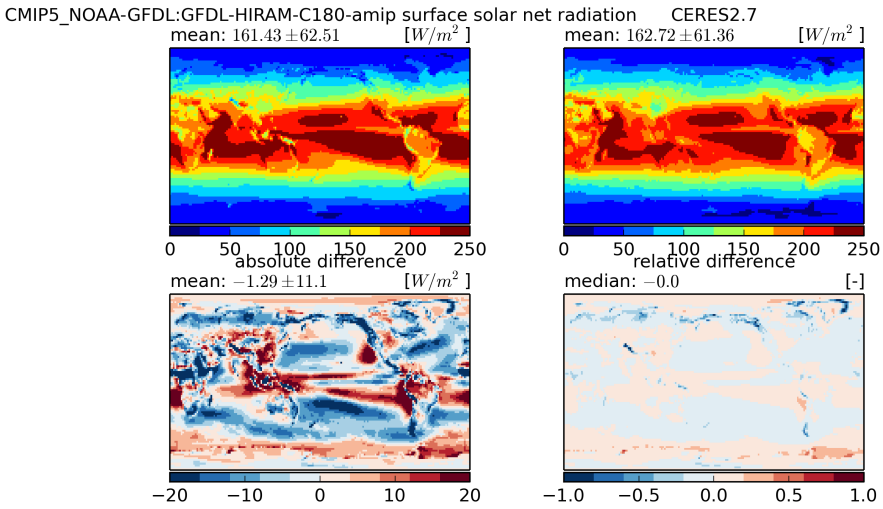



Figure 1501: Temporal mean fields (top) and absolute and relative differences (bottom)

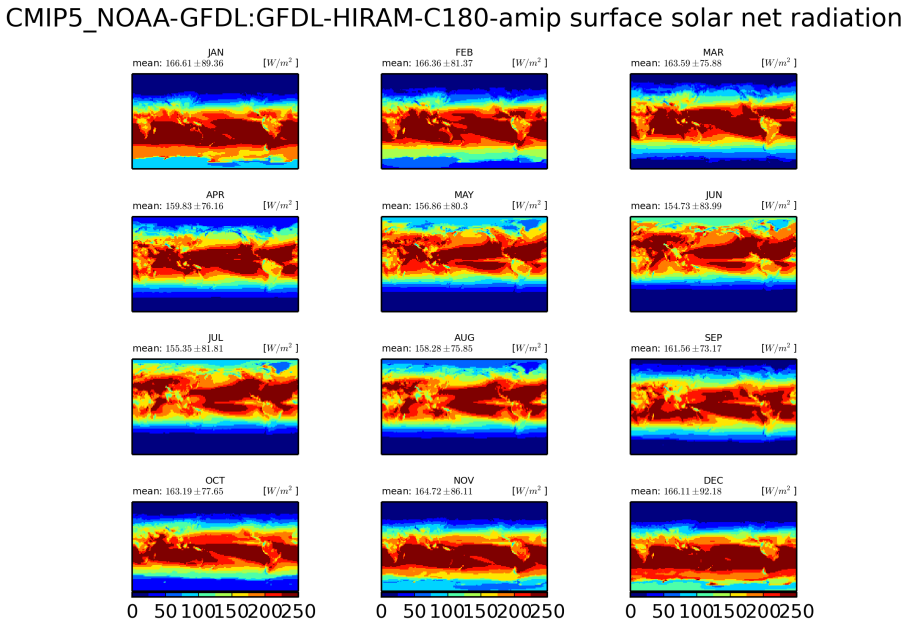



Figure 1502: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

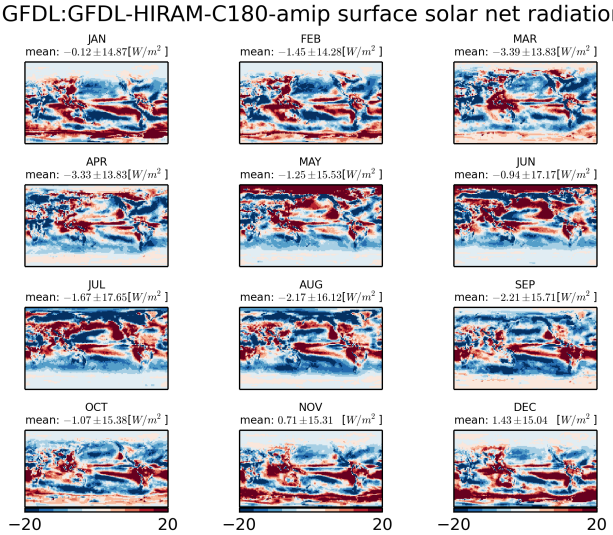



Figure 1503: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and CERES2.7

### 3.2.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

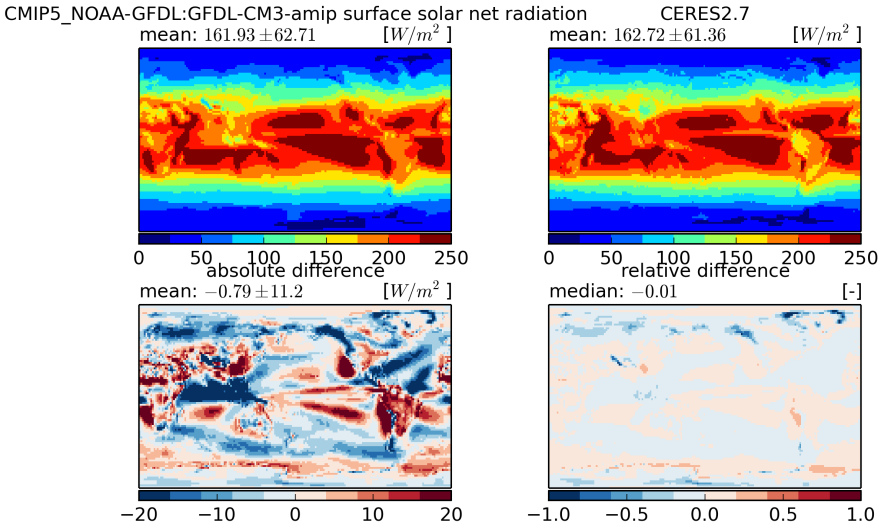



Figure 1504: Temporal mean fields (top) and absolute and relative differences (bottom)

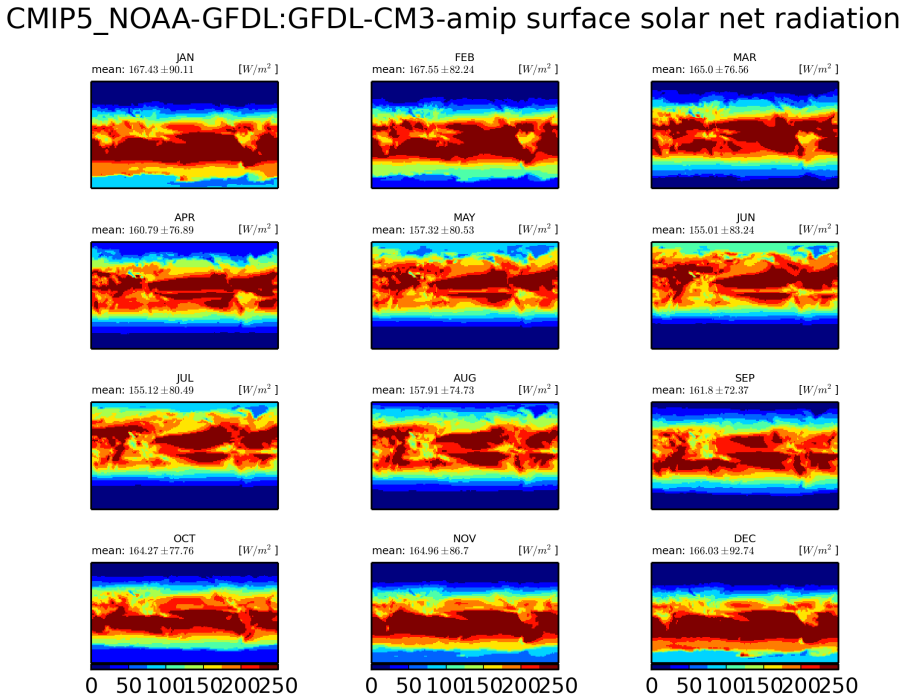



Figure 1505: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

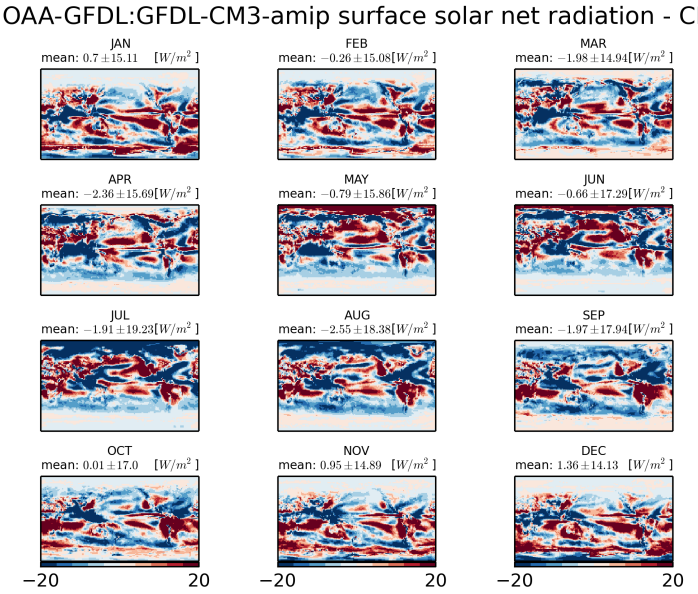



Figure 1506: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and CERES2.7

### 3.2.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

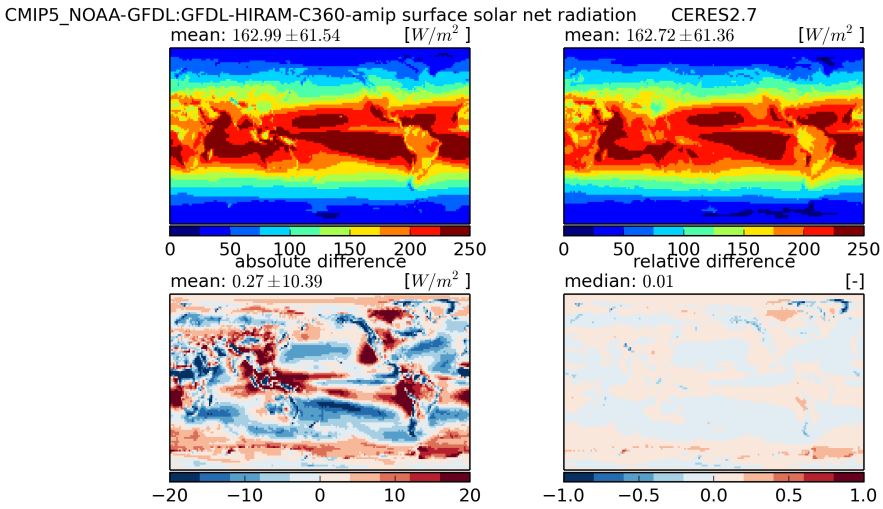



Figure 1507: Temporal mean fields (top) and absolute and relative differences (bottom)

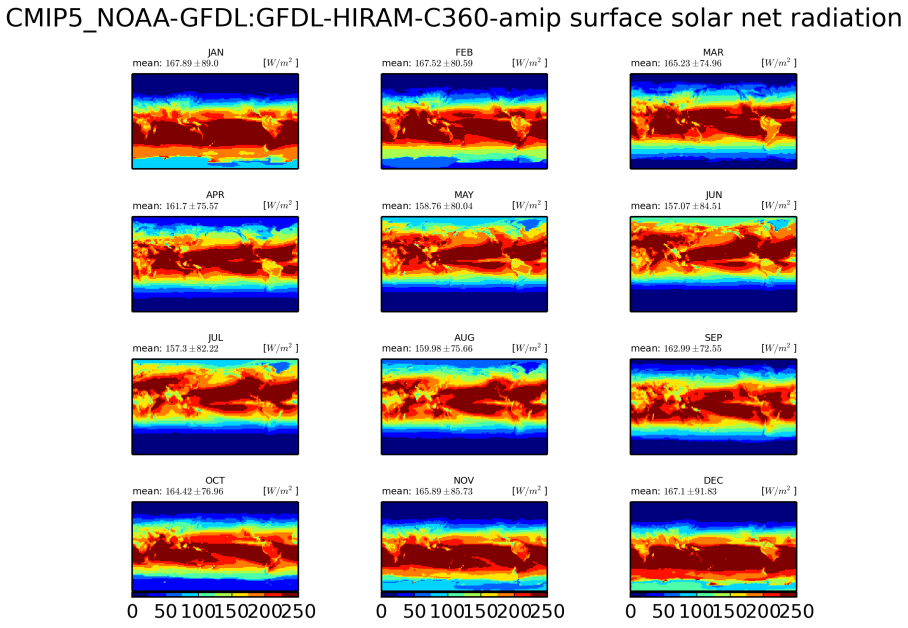



Figure 1508: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

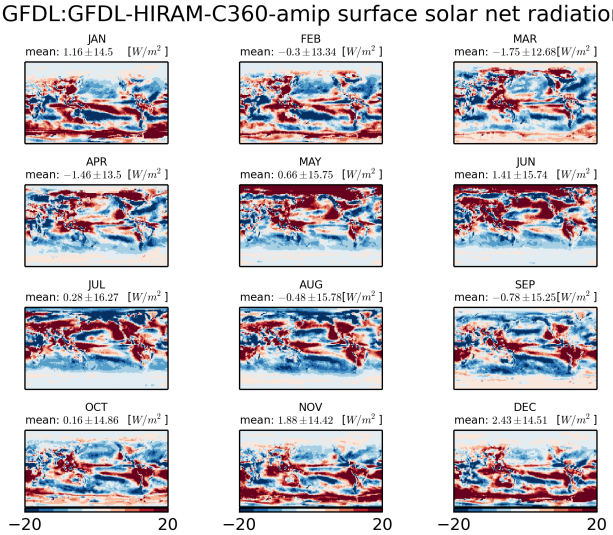



Figure 1509: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and CERES2.7

### 3.2.26 CMIP5 NCAR:CCSM4-amip

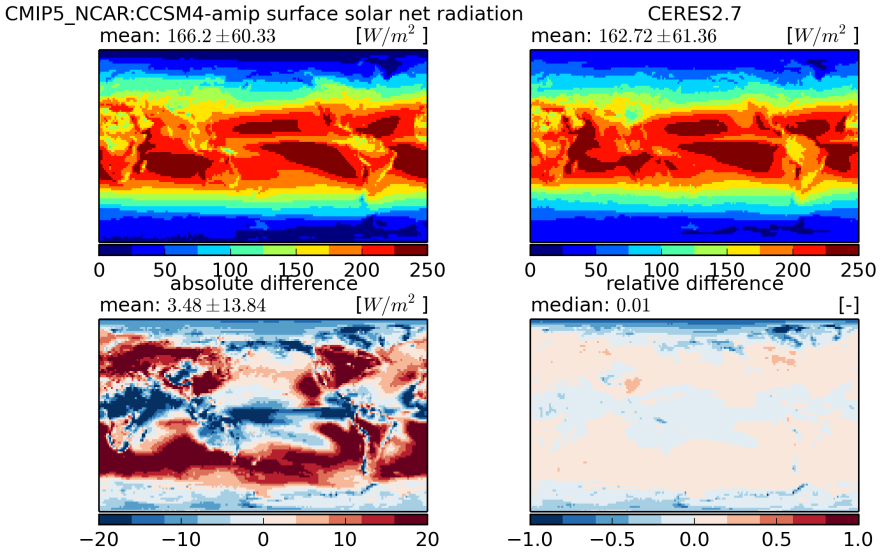



Figure 1510: Temporal mean fields (top) and absolute and relative differences (bottom)

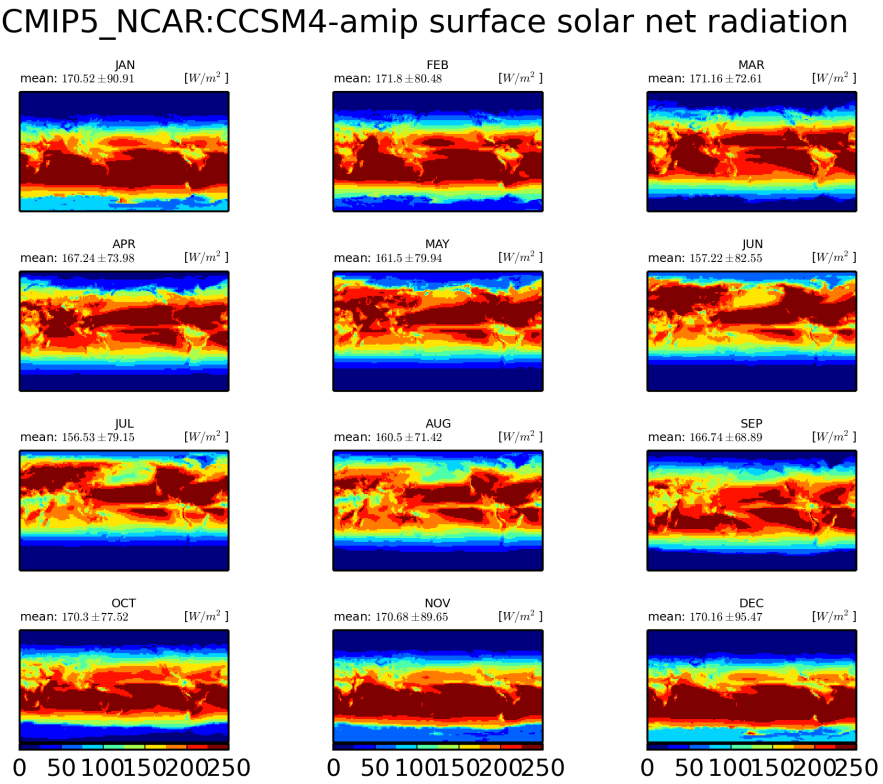



Figure 1511: Monthly mean climatology for NCAR:CCSM4

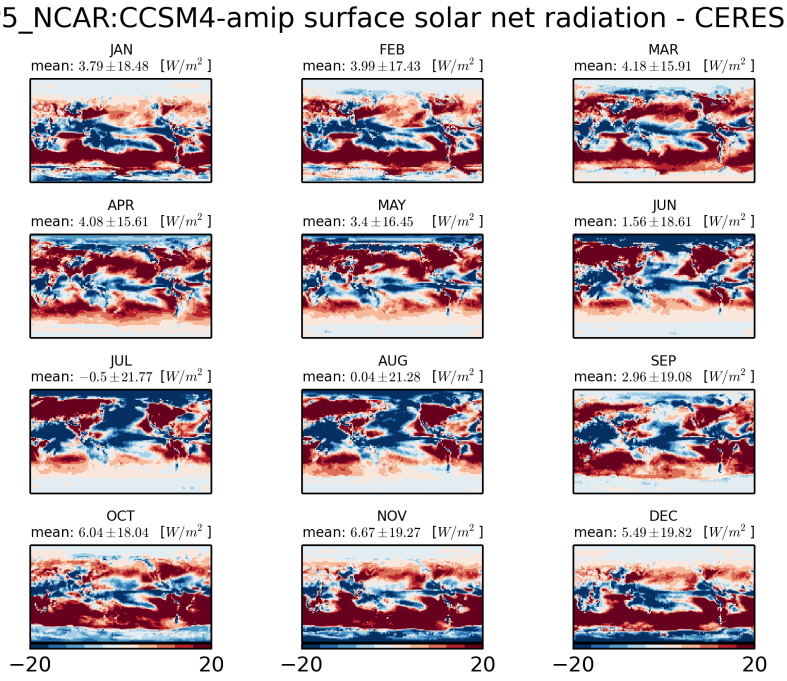



Figure 1512: Monthly mean climatology of difference between NCAR:CCSM4 and CERES2.7

### 3.2.27 CMIP5 NCC:NorESM1-M-amip

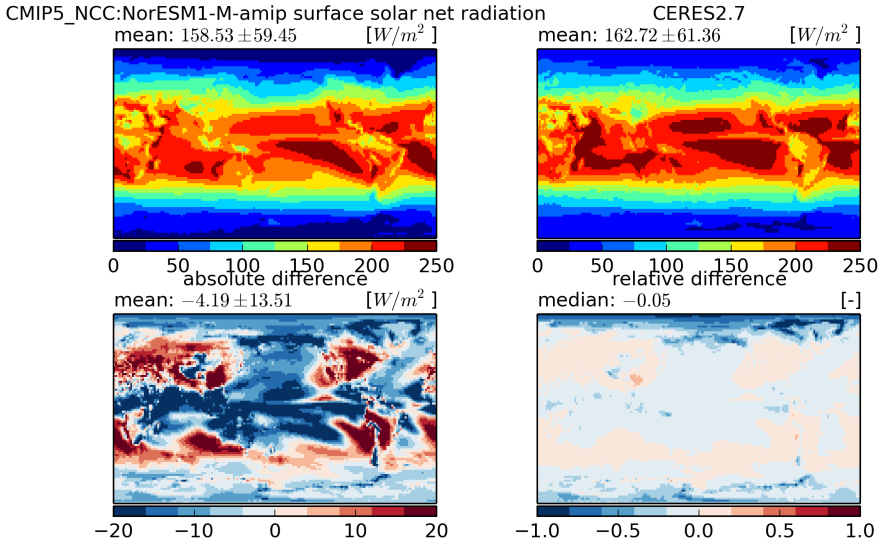



Figure 1513: Temporal mean fields (top) and absolute and relative differences (bottom)

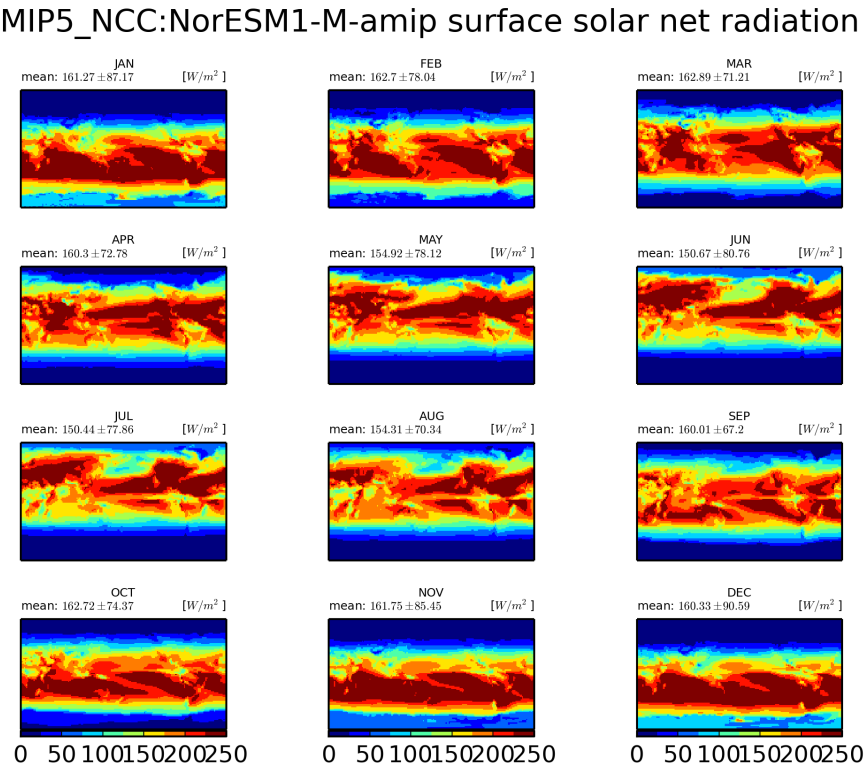



Figure 1514: Monthly mean climatology for NCC:NorESM1-M

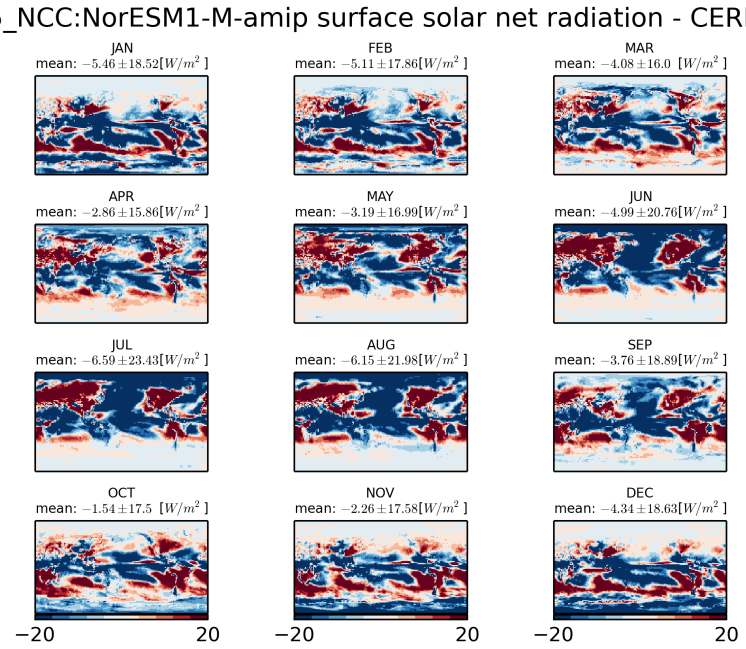



Figure 1515: Monthly mean climatology of difference between NCC:NORESM1-M and CERES2.7

### 3.2.28 CMIP3 iap fgoals1 0 g-amip

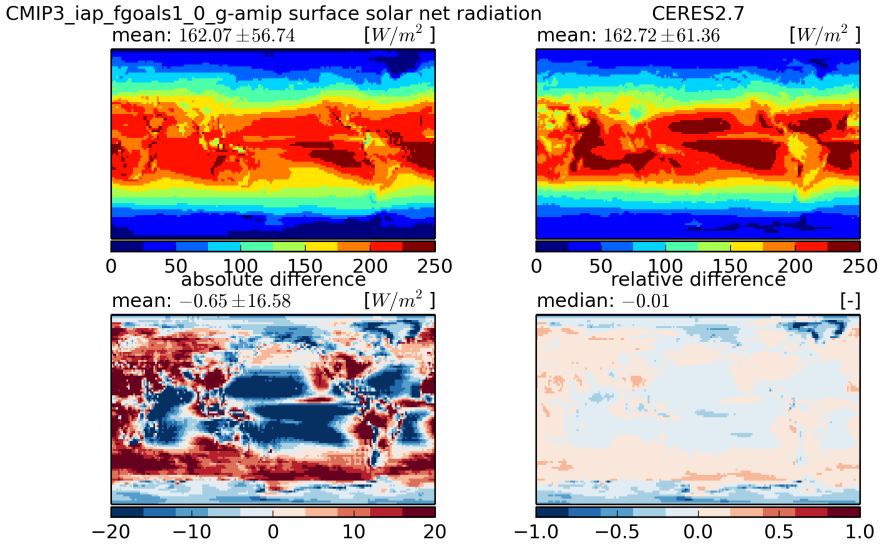



Figure 1516: Temporal mean fields (top) and absolute and relative differences (bottom)

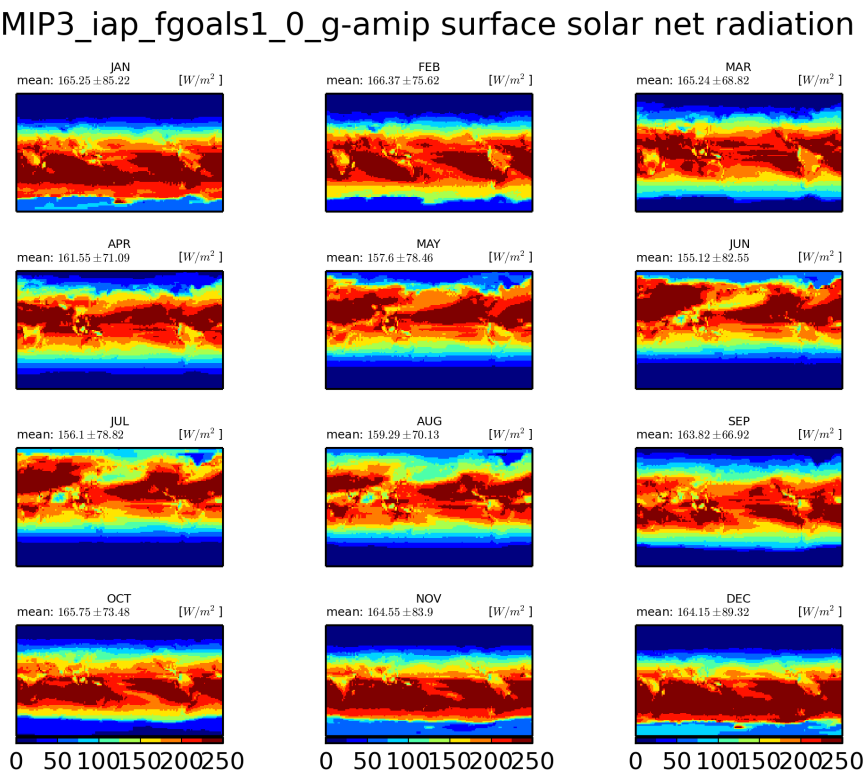



Figure 1517: Monthly mean climatology for iap-fgoals1-0-g

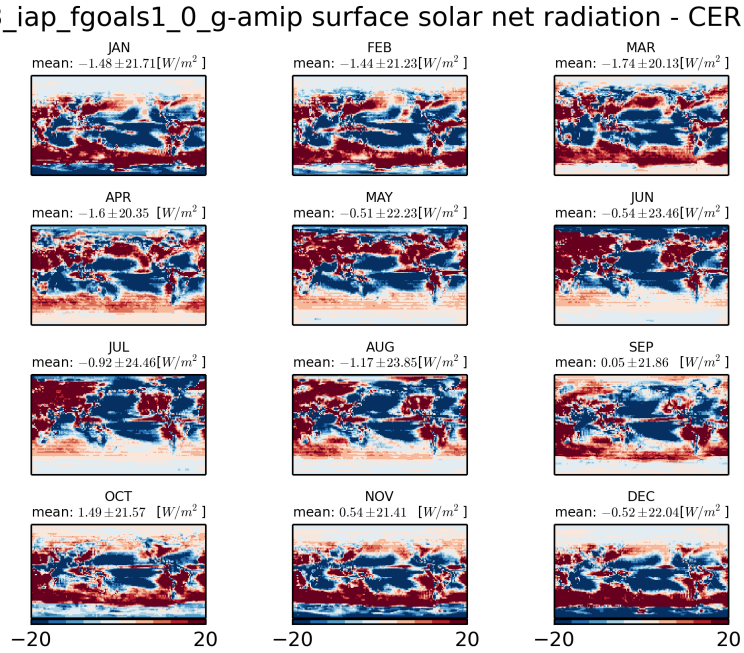



Figure 1518: Monthly mean climatology of difference between IAP-FGOALS1-0-G and CERES2.7

### 3.2.29 CMIP3 inmcm3 0-amip

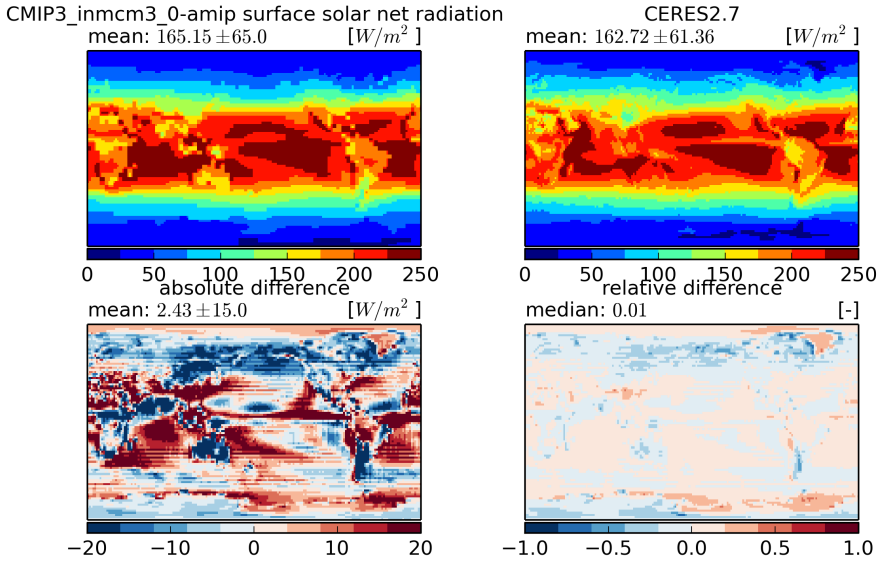



Figure 1519: Temporal mean fields (top) and absolute and relative differences (bottom)

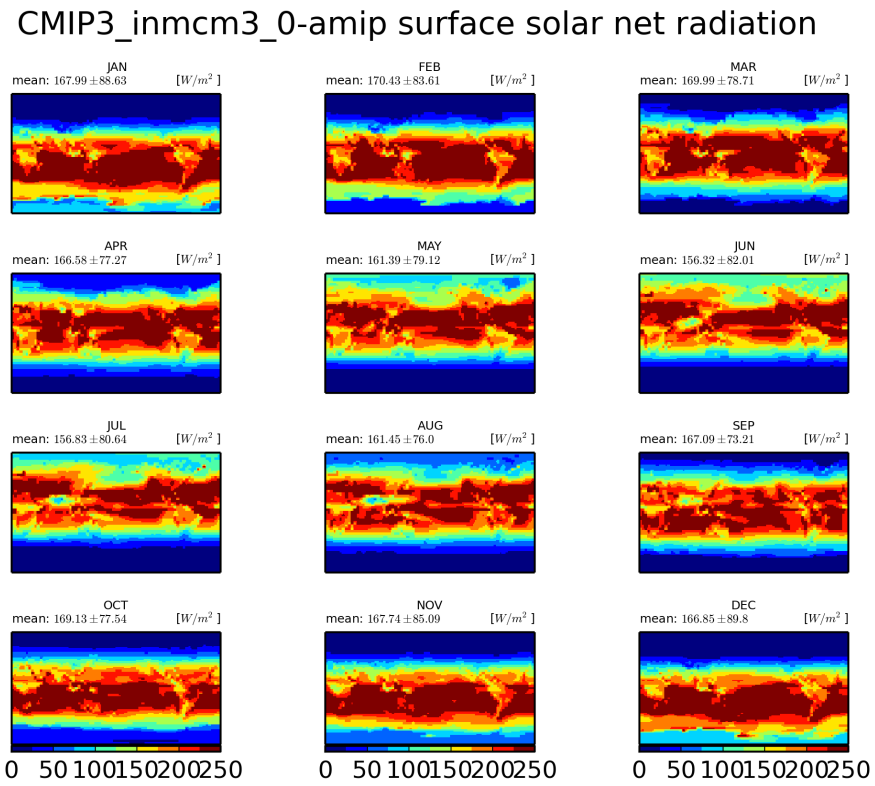



Figure 1520: Monthly mean climatology for inmcm3-0

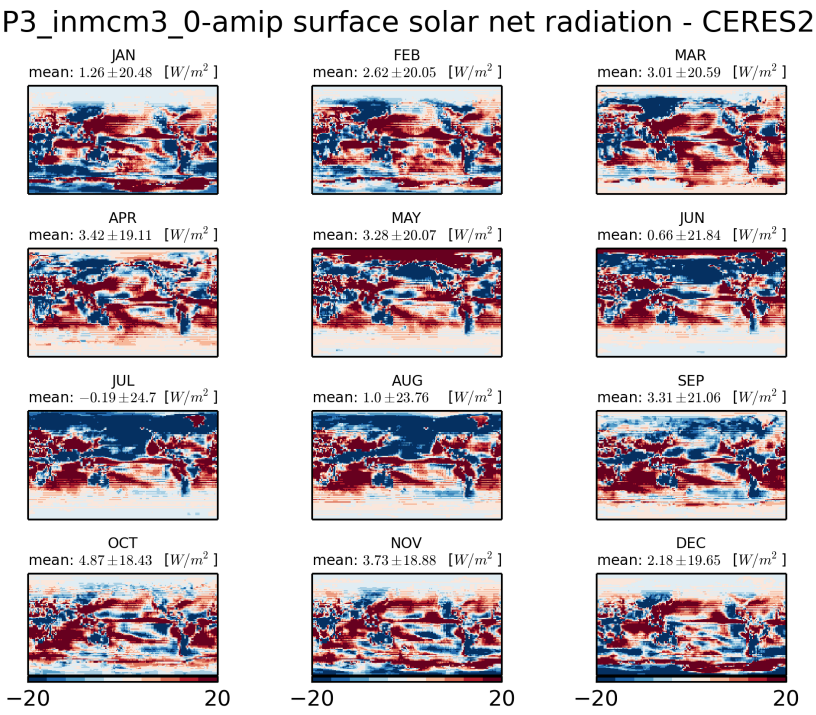



Figure 1521: Monthly mean climatology of difference between INMCM3-0 and CERES2.7

### 3.2.30 CMIP3 ipsl cm4-amip

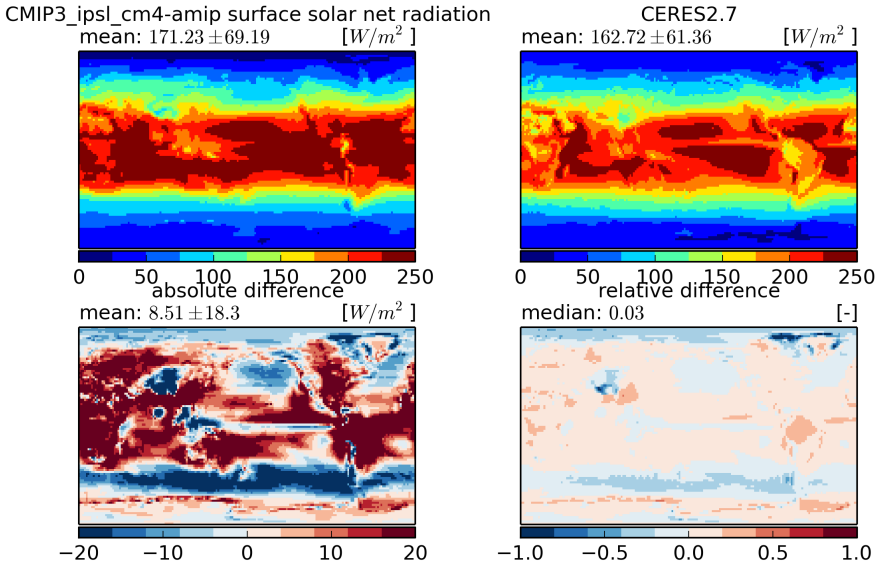



Figure 1522: Temporal mean fields (top) and absolute and relative differences (bottom)

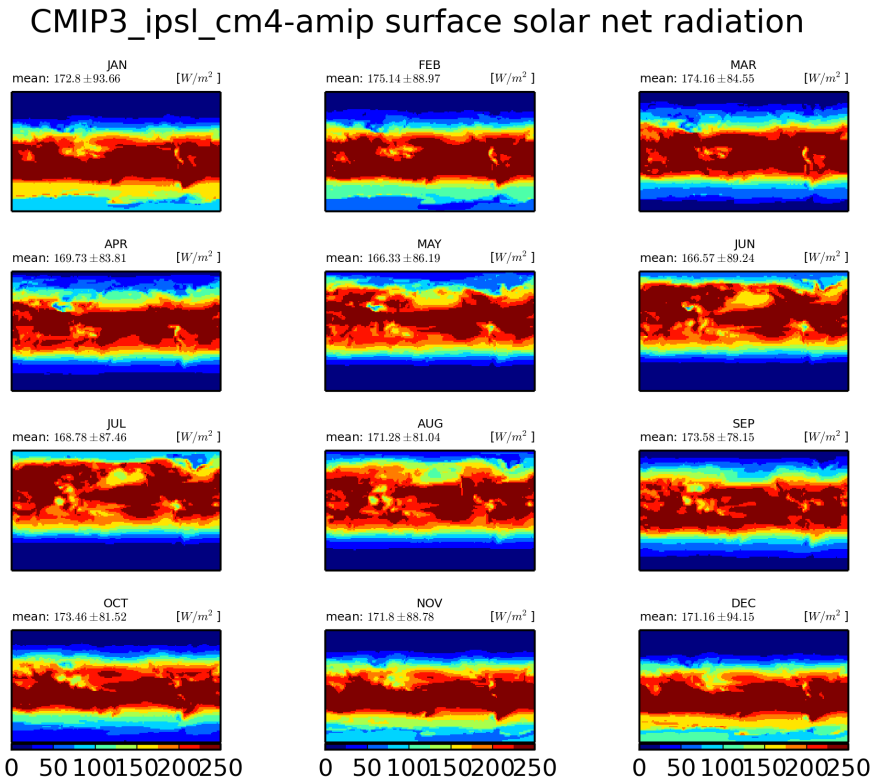



Figure 1523: Monthly mean climatology for ipsl-cm4

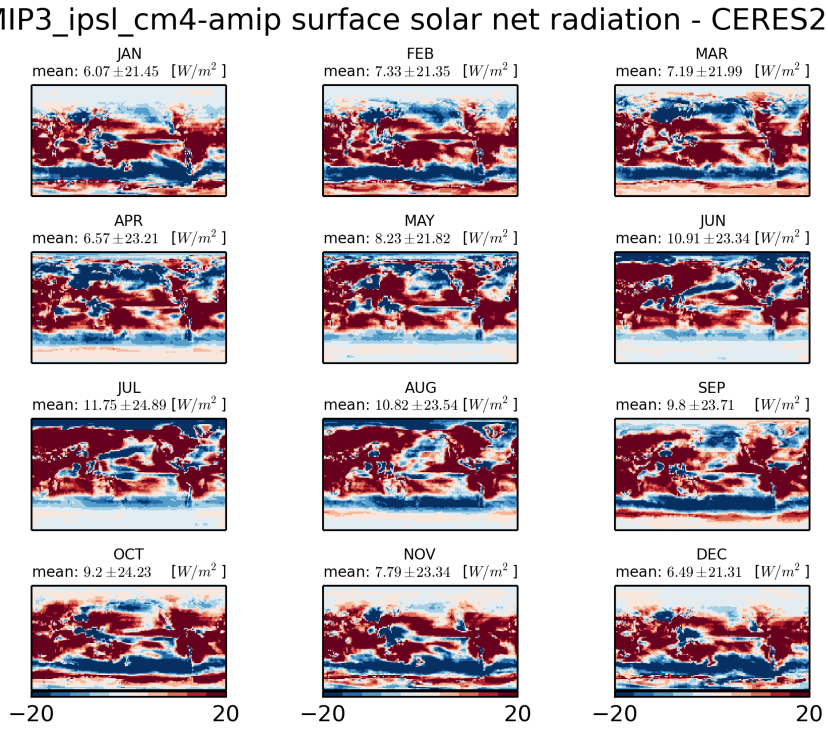



Figure 1524: Monthly mean climatology of difference between IPSL-CM4 and CERES2.7

### 3.2.31 CMIP3 miroc3 2 hires-amip

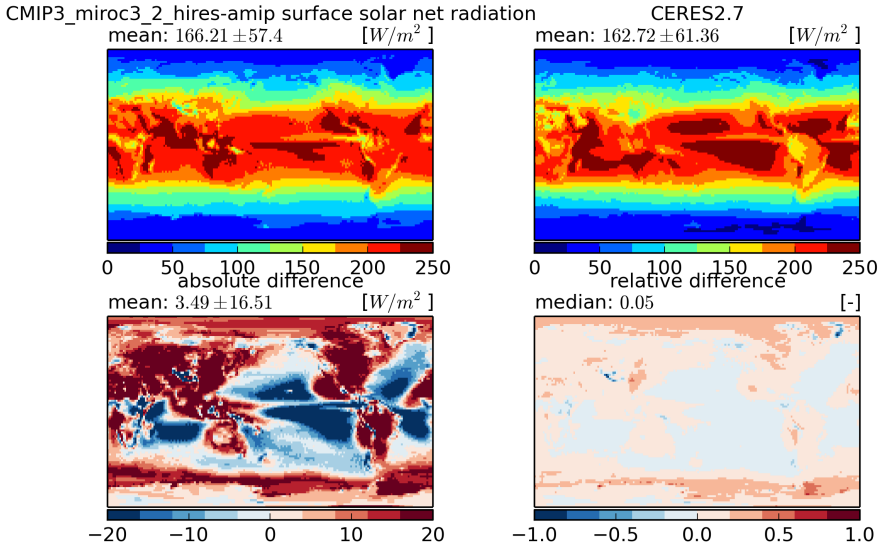



Figure 1525: Temporal mean fields (top) and absolute and relative differences (bottom)

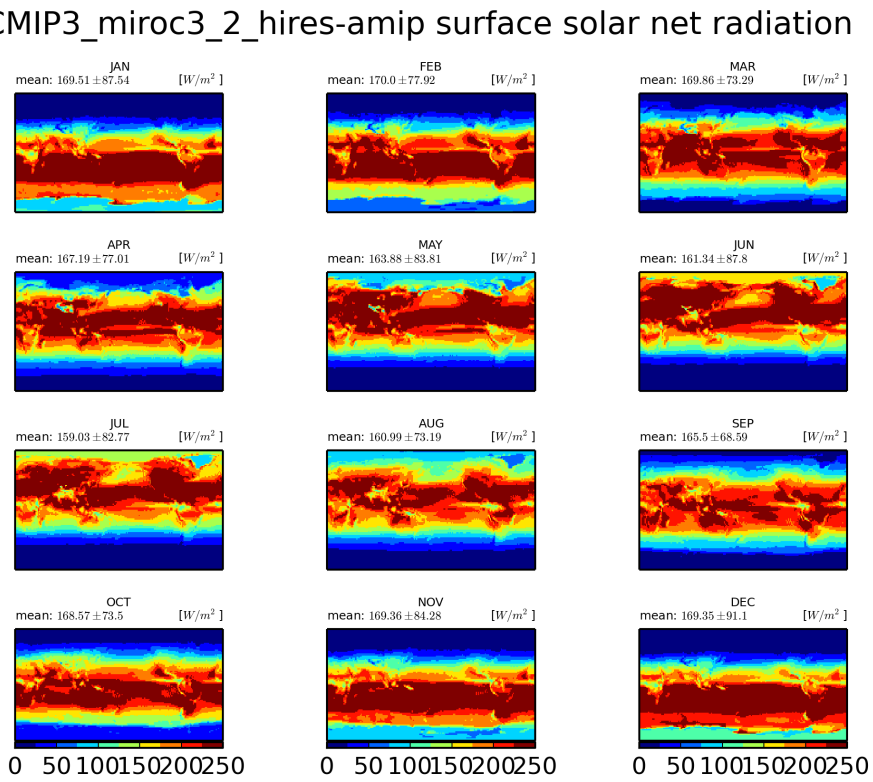



Figure 1526: Monthly mean climatology for miroc3-2-hires

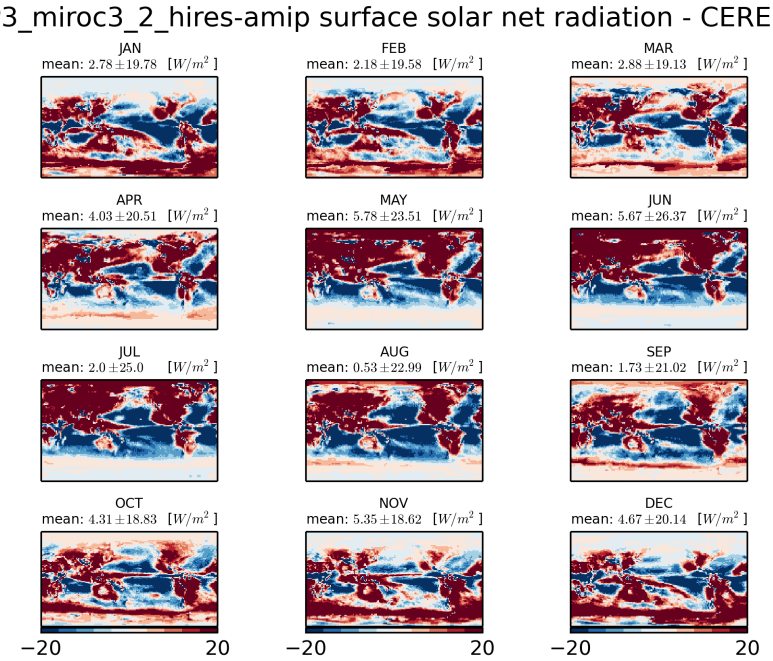



Figure 1527: Monthly mean climatology of difference between MIROC3-2-HIRES and CERES2.7

### 3.2.32 CMIP3 miroc3 2 medres-amip

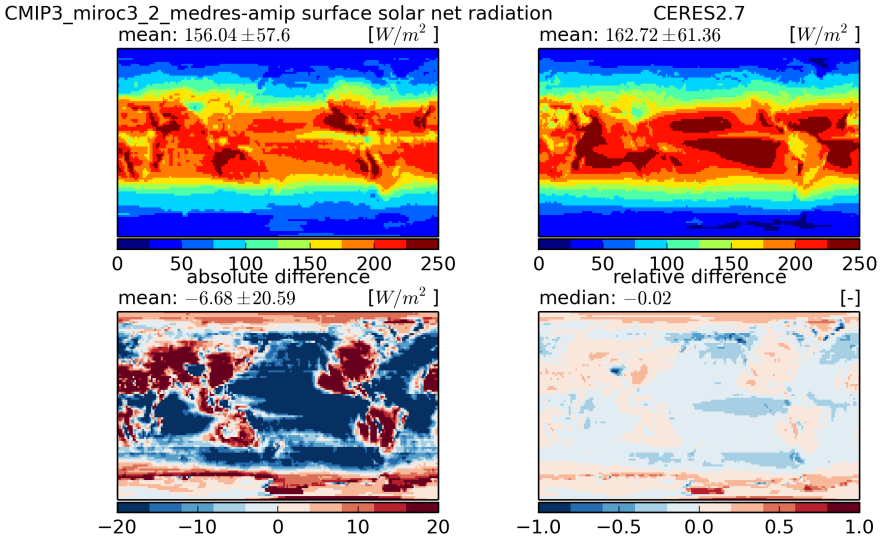



Figure 1528: Temporal mean fields (top) and absolute and relative differences (bottom)

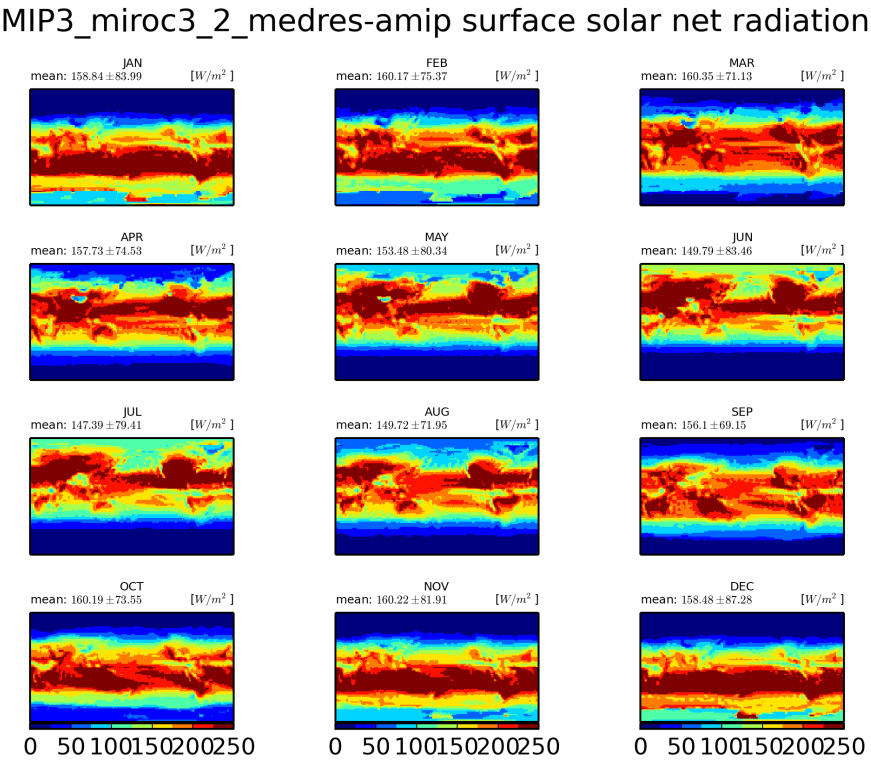



Figure 1529: Monthly mean climatology for miroc3-2-medres

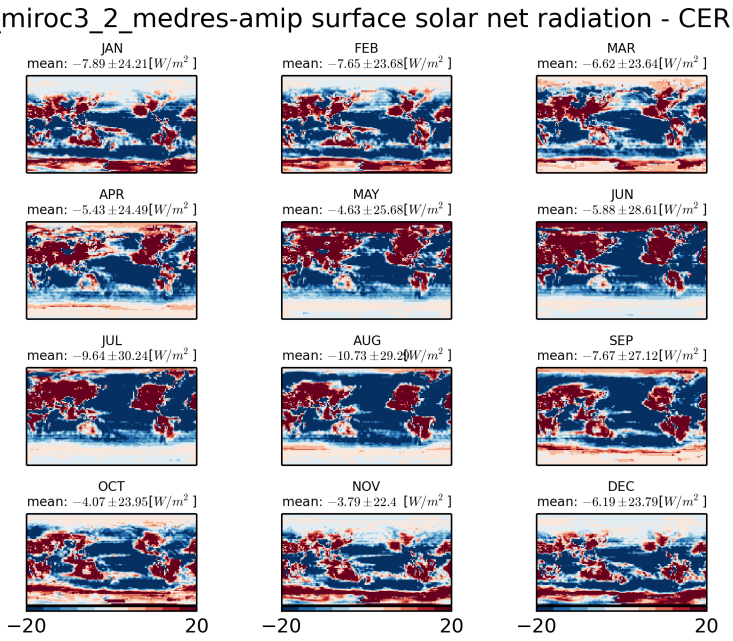



Figure 1530: Monthly mean climatology of difference between MIROC3-2-MEDRES and CERES2.7

### 3.2.33 CMIP3 mpi echam5-amip

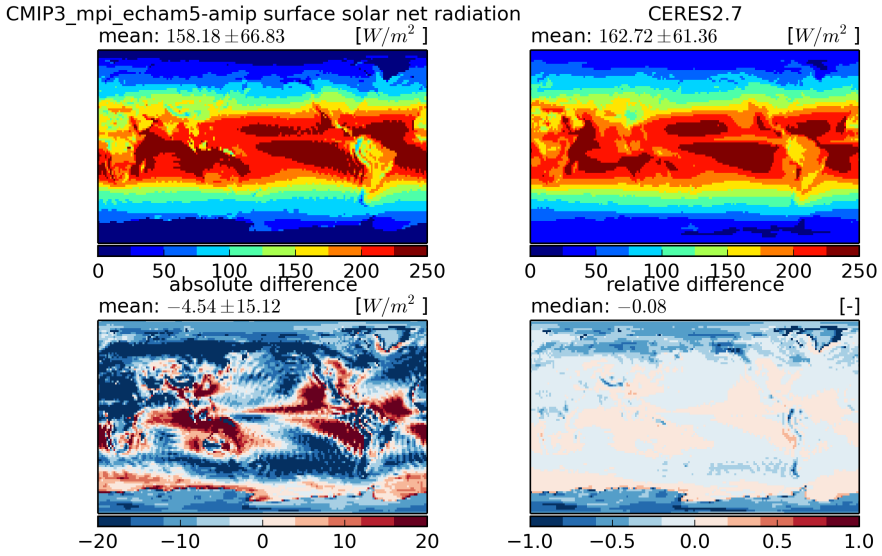



Figure 1531: Temporal mean fields (top) and absolute and relative differences (bottom)

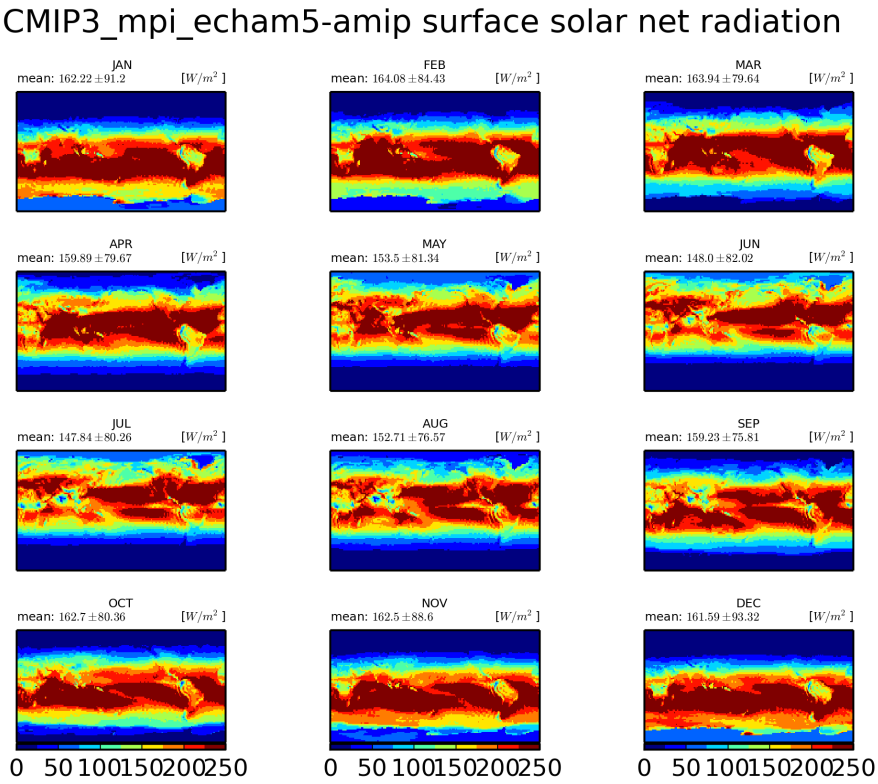



Figure 1532: Monthly mean climatology for mpi-echam5

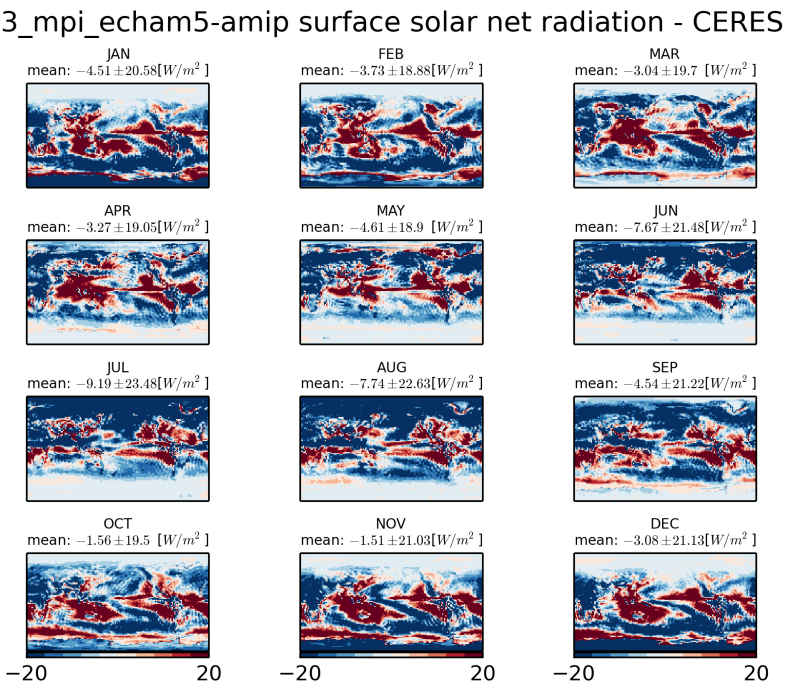



Figure 1533: Monthly mean climatology of difference between MPI-ECHAM5 and CERES2.7

### 3.2.34 CMIP3 ncar ccsm3 0-amip

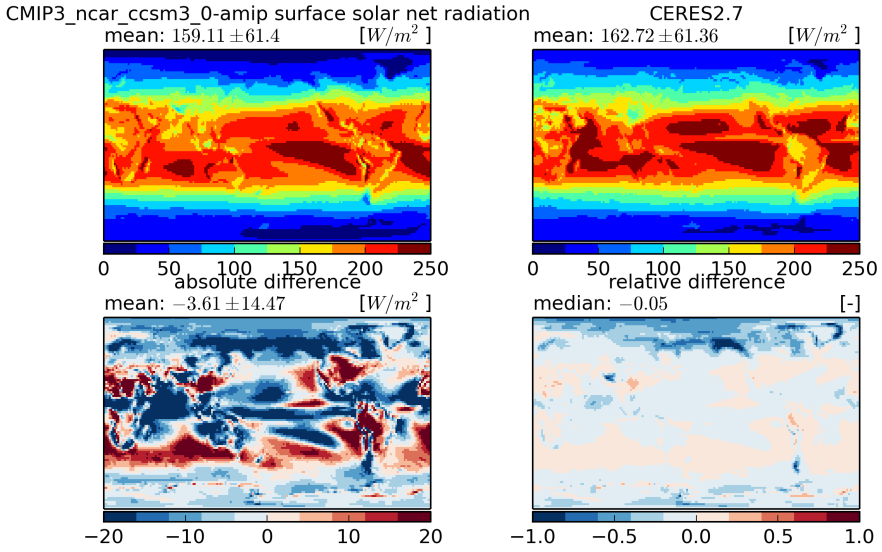



Figure 1534: Temporal mean fields (top) and absolute and relative differences (bottom)

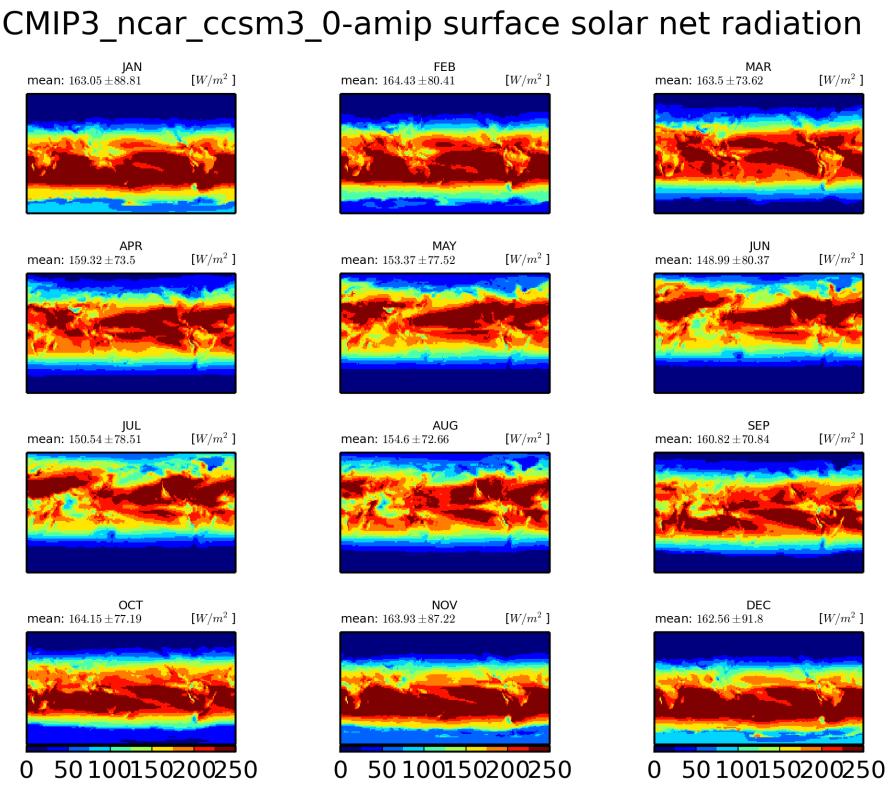



Figure 1535: Monthly mean climatology for ncar-ccsm3-0

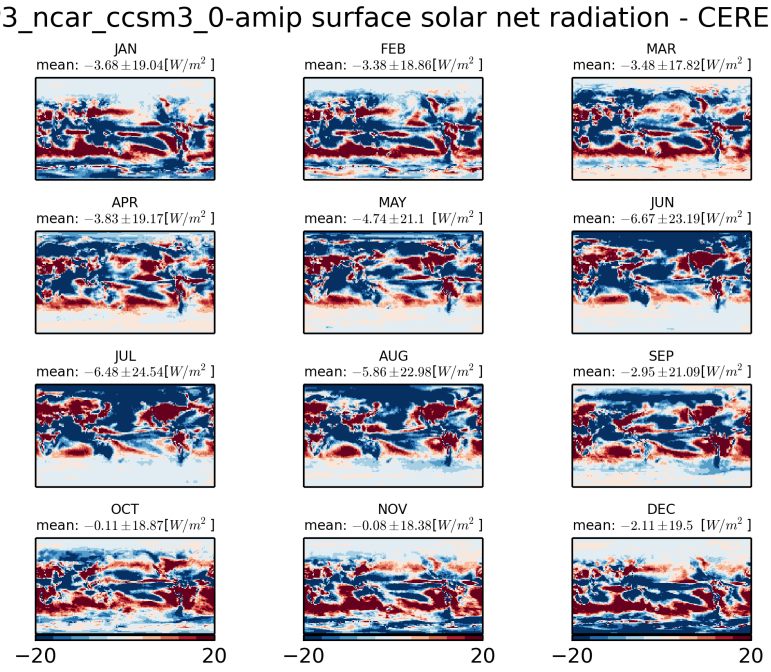



Figure 1536: Monthly mean climatology of difference between NCAR-CCSM3-0 and CERES2.7

### 3.2.35 CMIP3 ncar pcm1-amip

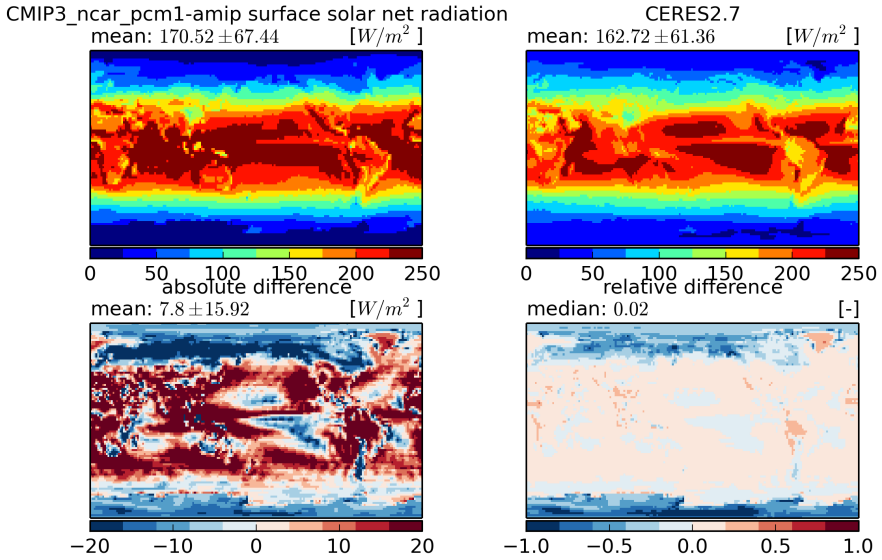



Figure 1537: Temporal mean fields (top) and absolute and relative differences (bottom)

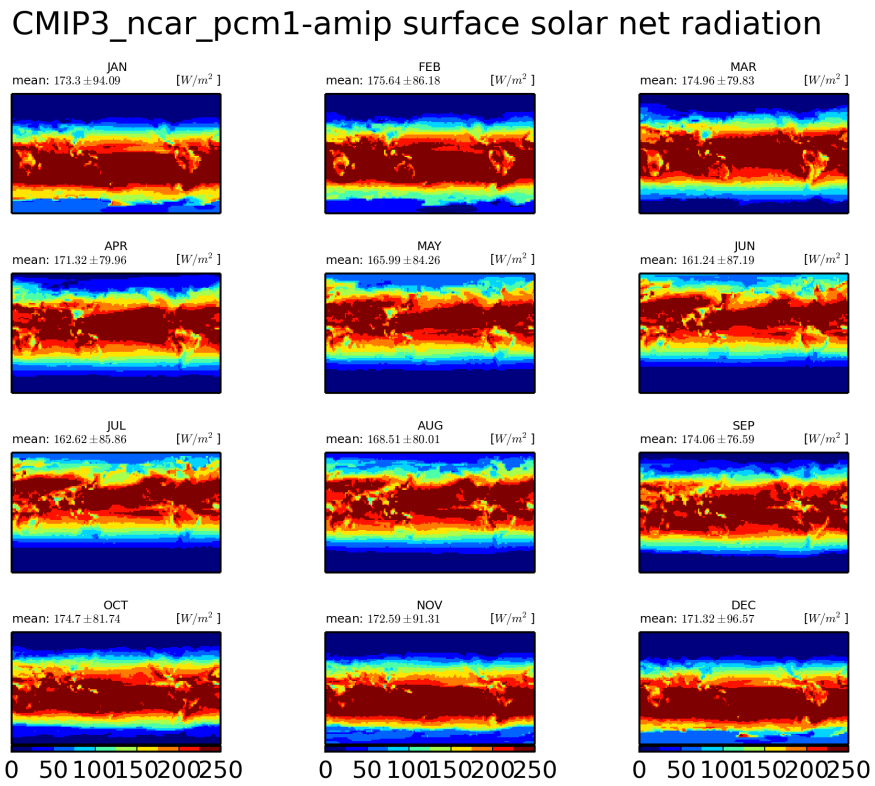



Figure 1538: Monthly mean climatology for ncar-pcm1

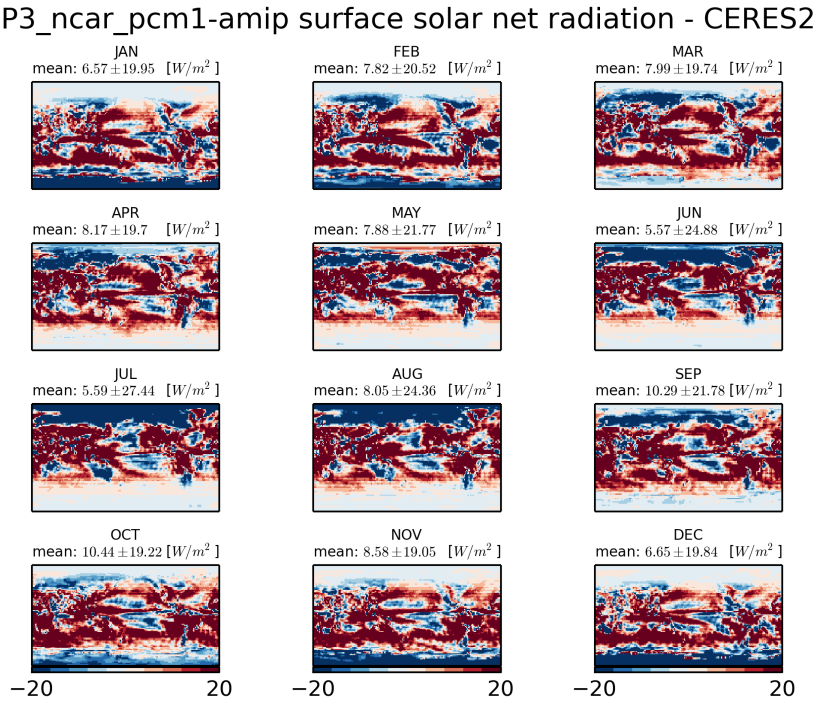



Figure 1539: Monthly mean climatology of difference between NCAR-PCM1 and CERES2.7

### 3.2.36 CMIP3 ukmo hadgem1-amip

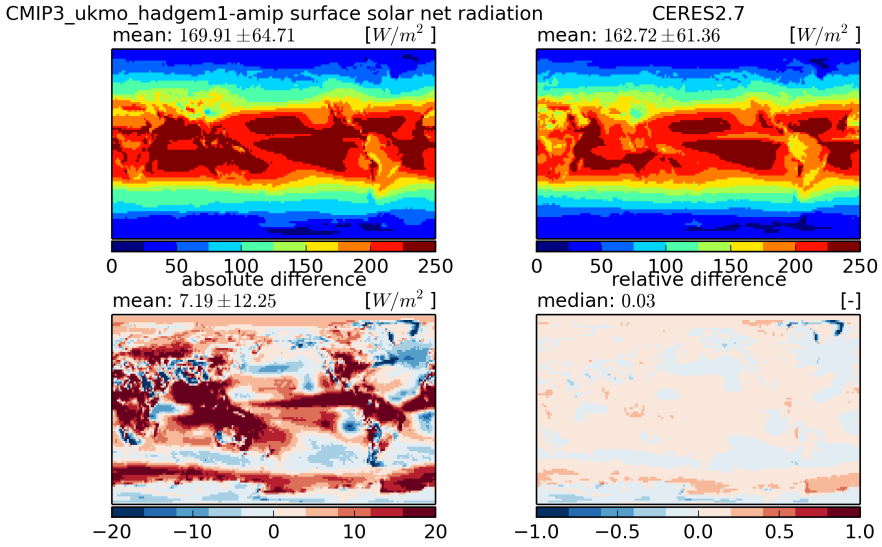



Figure 1540: Temporal mean fields (top) and absolute and relative differences (bottom)

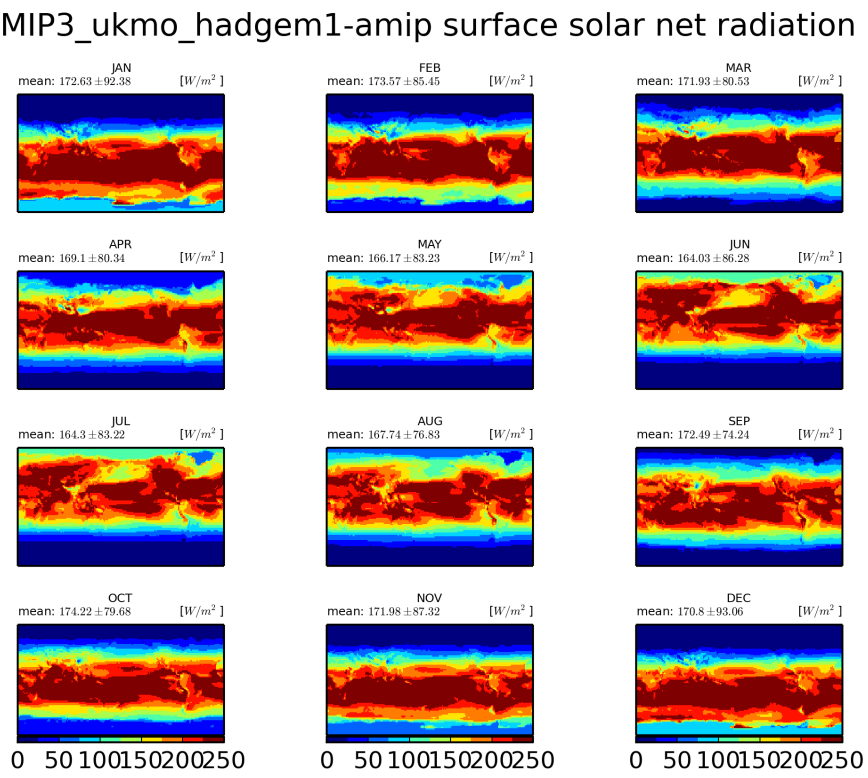



Figure 1541: Monthly mean climatology for ukmo-hadgem1

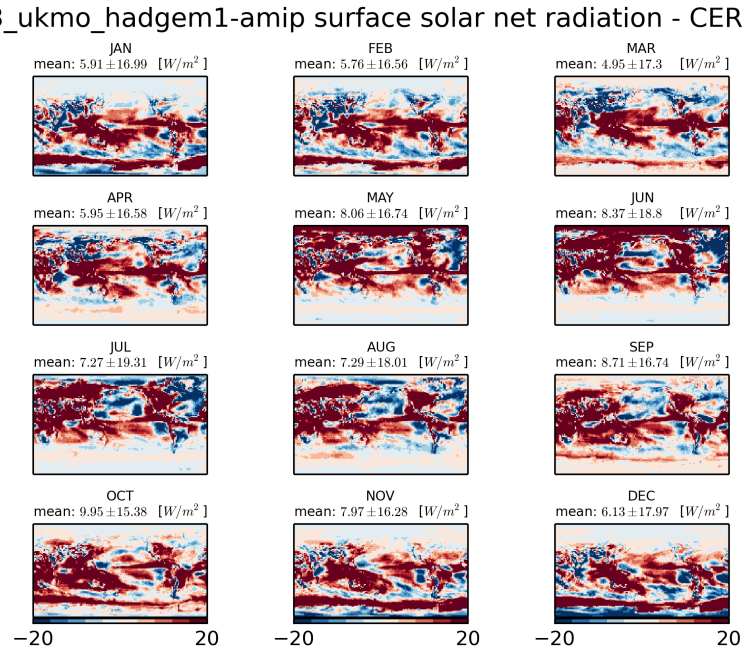



Figure 1542: Monthly mean climatology of difference between UKMO-HADGEM1 and CERES2.7

### 3.2.37 model mean

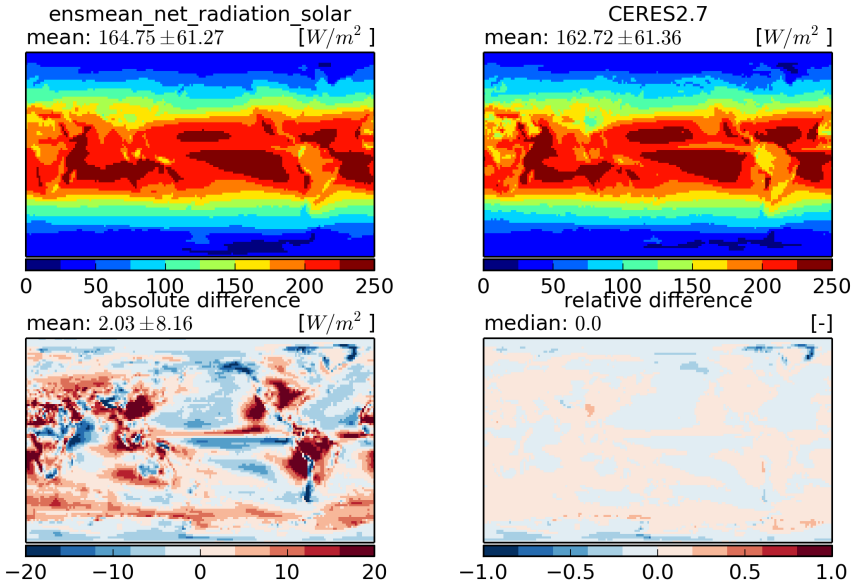



Figure 1543: Temporal mean fields (top) and absolute and relative differences (bottom)

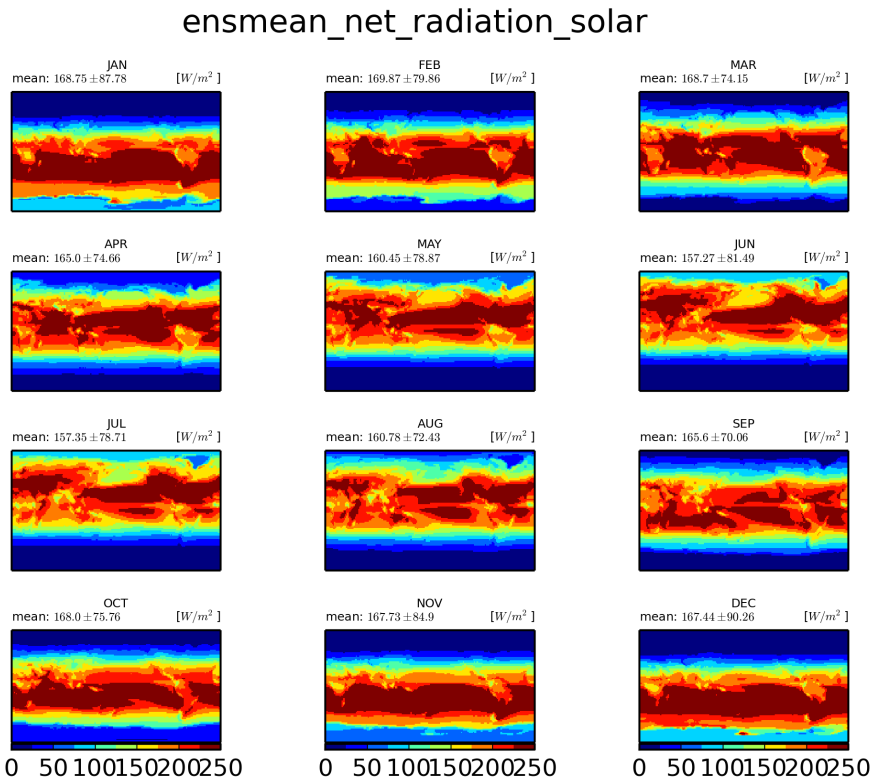



Figure 1544: Monthly mean climatology for mean-model

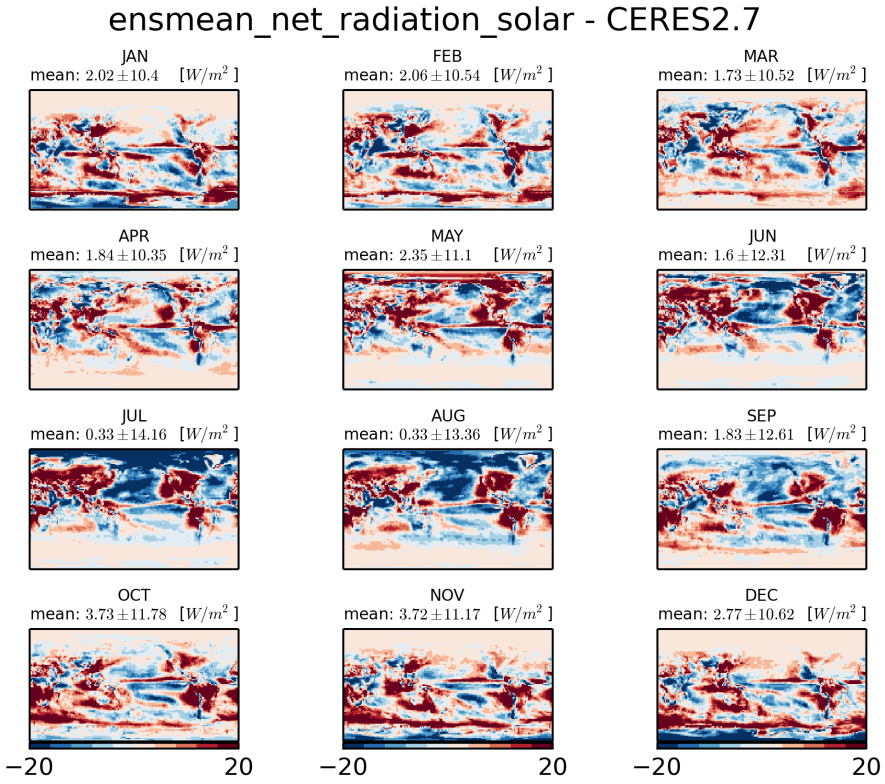



Figure 1545: Monthly mean climatology of difference between MEAN-MODEL and CERES2.7

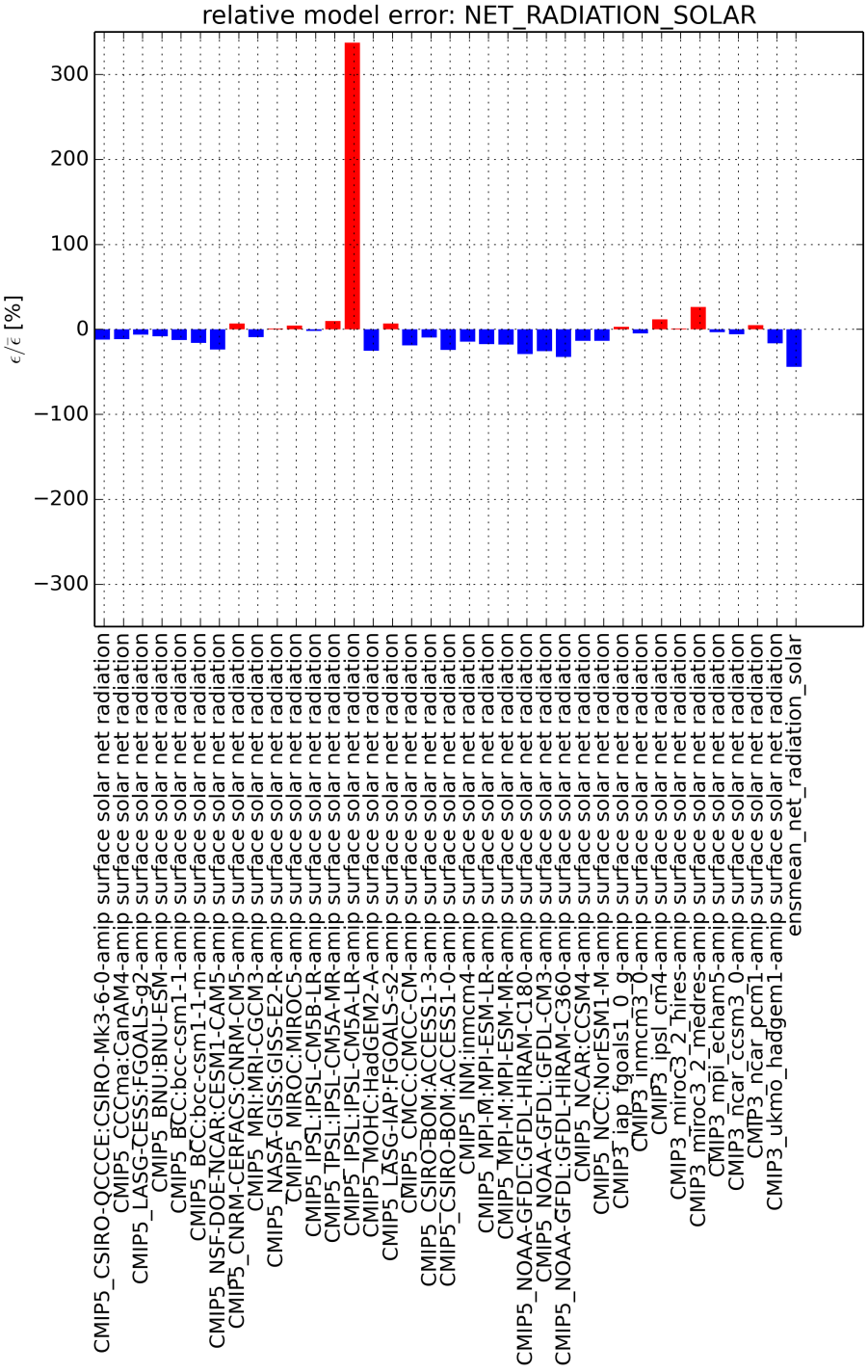



Figure 1546: Relative model performance for NET-RADIATION-SOLAR

## 3.3 SRBv3.0

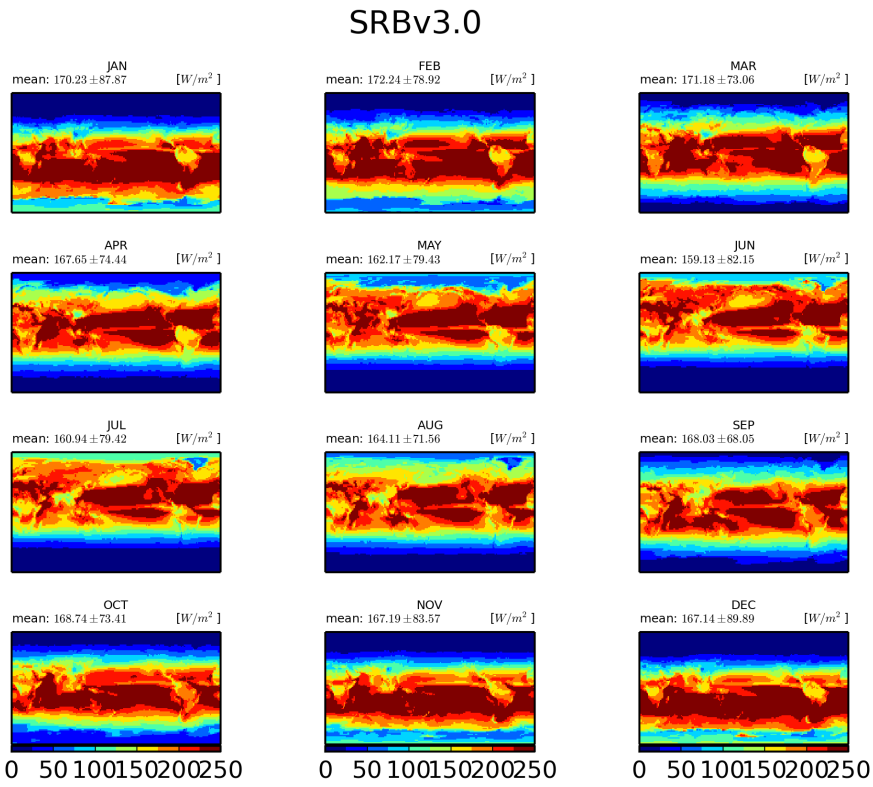



Figure 1547: Monthly mean SRBv3.0

### 3.3.1 CMIP5 CSIRO-QCCCE:CSIRO-Mk3-6-0-amip

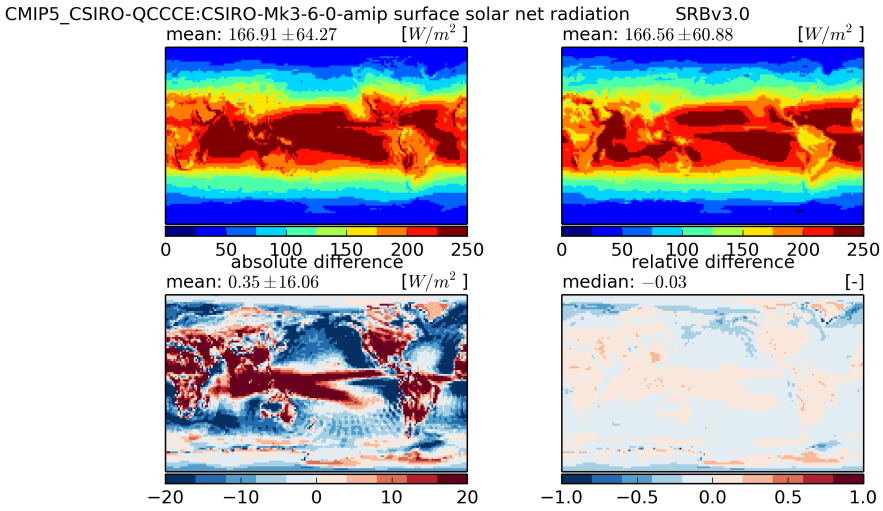



Figure 1548: Temporal mean fields (top) and absolute and relative differences (bottom)

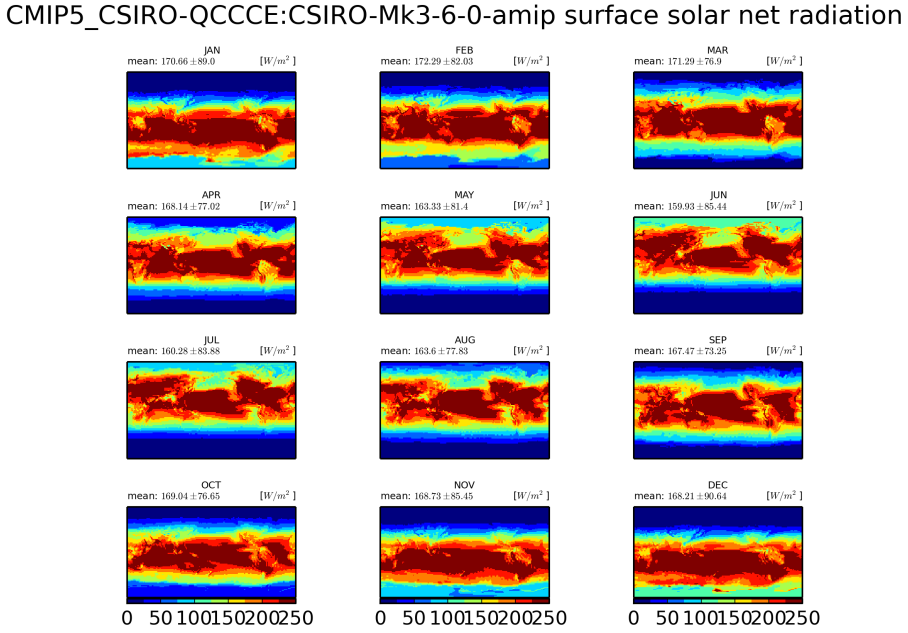



Figure 1549: Monthly mean climatology for CSIRO-QCCCE:CSIRO-Mk3-6-0

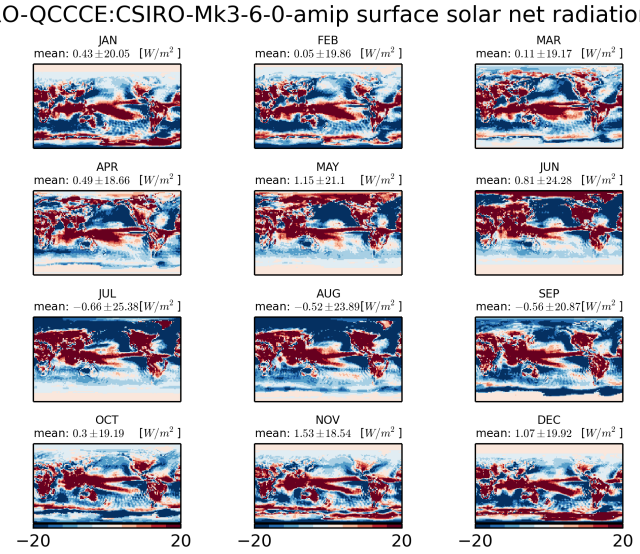



Figure 1550: Monthly mean climatology of difference between CSIRO-QCCCE:CSIRO-MK3-6-0 and SRBV3.0

### 3.3.2 CMIP5 CCCma:CanAM4-amip

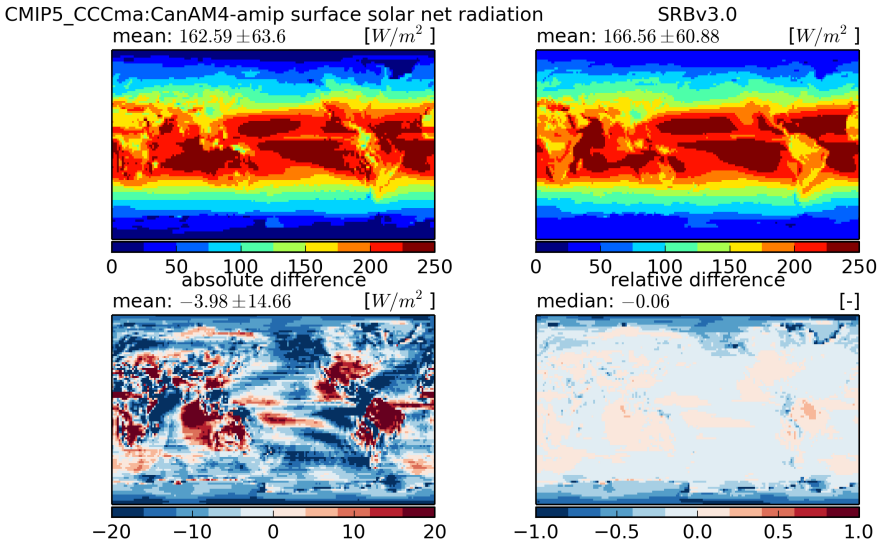



Figure 1551: Temporal mean fields (top) and absolute and relative differences (bottom)

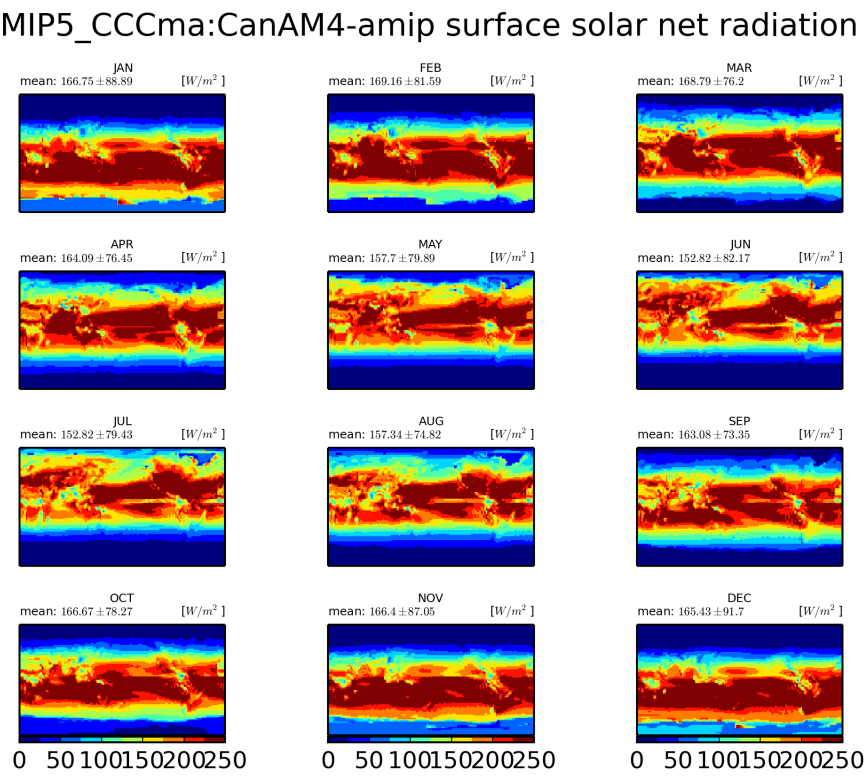



Figure 1552: Monthly mean climatology for CCCma:CanAM4

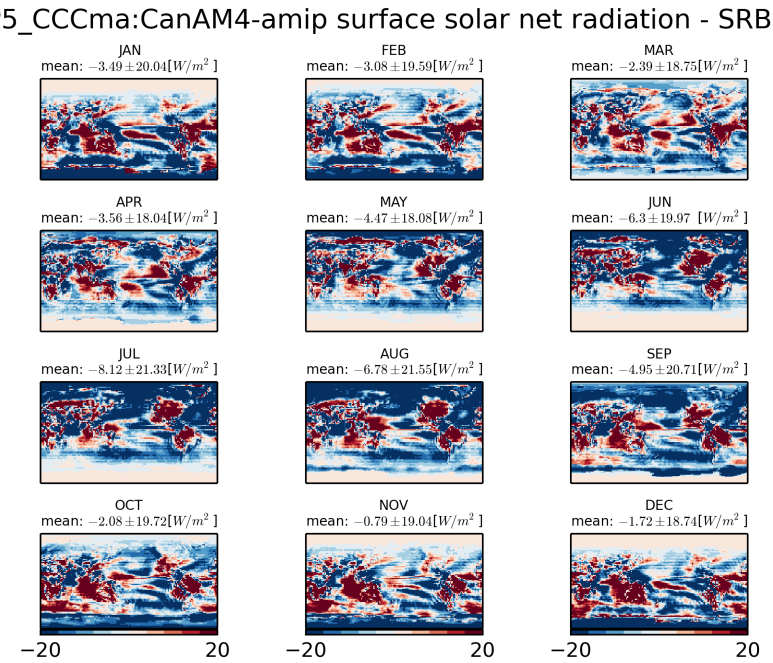



Figure 1553: Monthly mean climatology of difference between CCCMA:CANAM4 and SRBV3.0

### 3.3.3 CMIP5 LASG-CESS:FGOALS-g2-amip

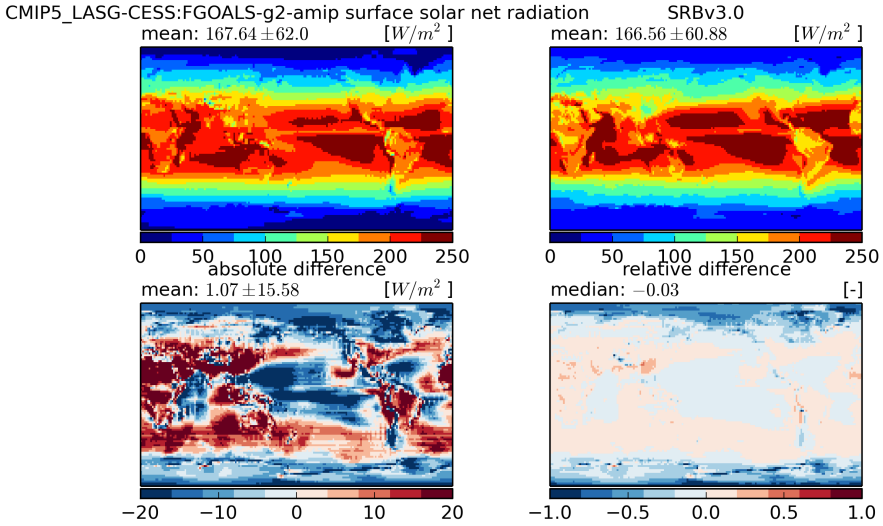



Figure 1554: Temporal mean fields (top) and absolute and relative differences (bottom)

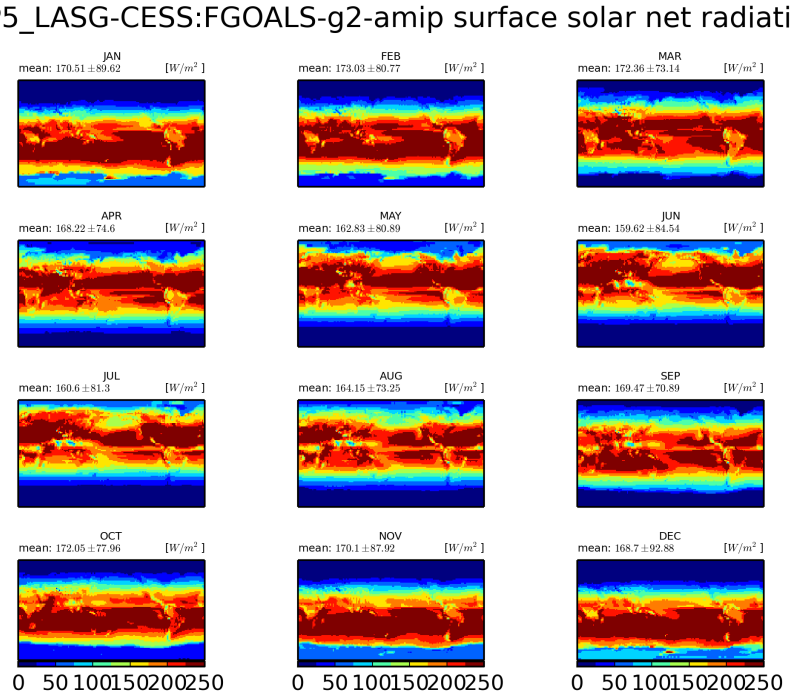



Figure 1555: Monthly mean climatology for LASG-CESS:FGOALS-g2

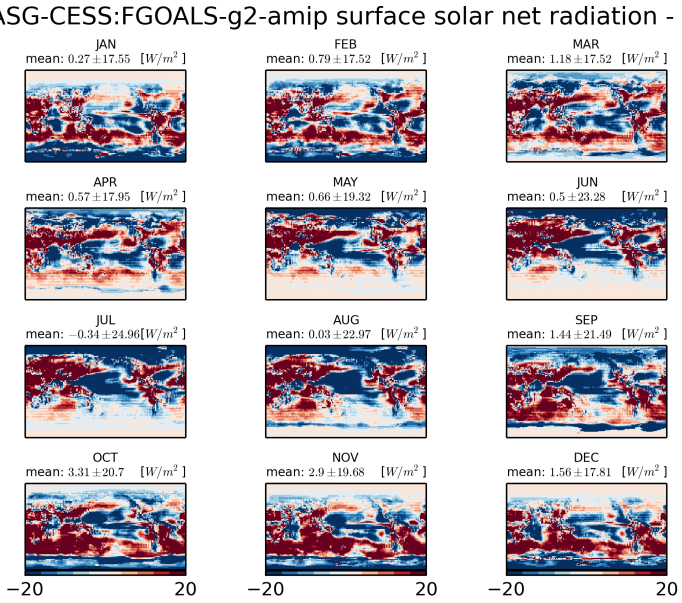



Figure 1556: Monthly mean climatology of difference between LASG-CESS:FGOALS-G2 and SRBV3.0

### 3.3.4 CMIP5 BNU:BNU-ESM-amip

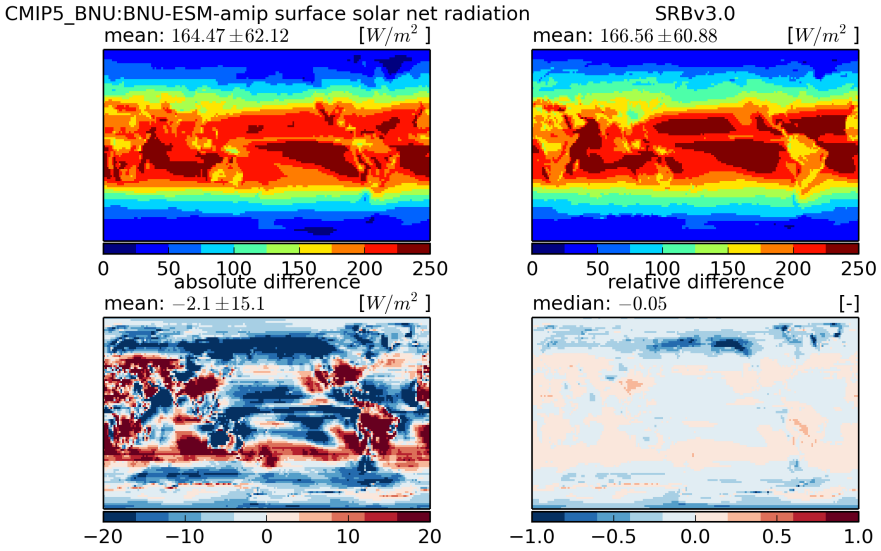



Figure 1557: Temporal mean fields (top) and absolute and relative differences (bottom)

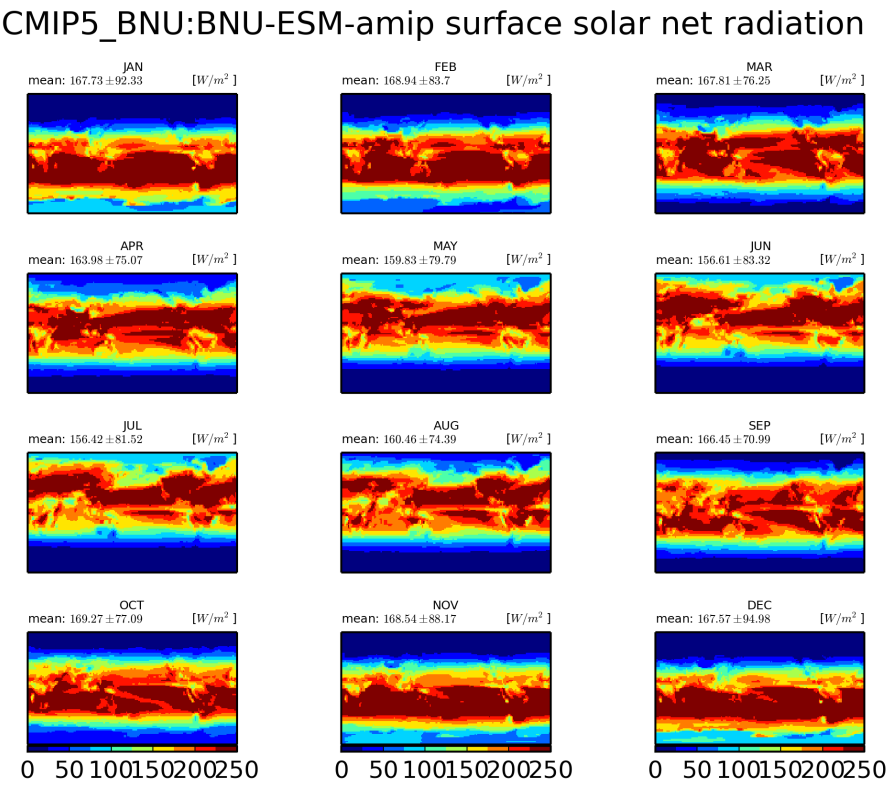



Figure 1558: Monthly mean climatology for BNU:BNU-ESM

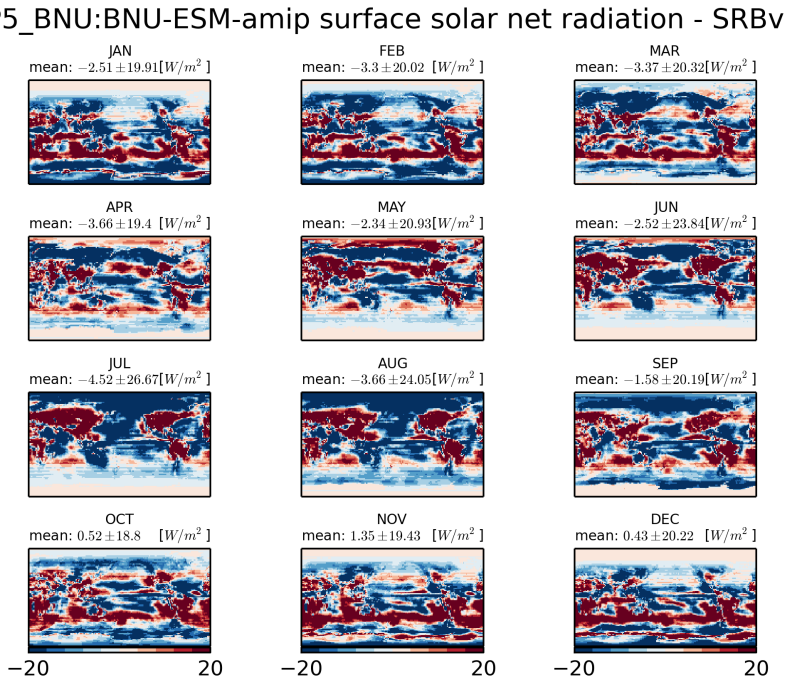



Figure 1559: Monthly mean climatology of difference between BNU:BNU-ESM and SRBV3.0

### 3.3.5 CMIP5 BCC:bcc-csm1-1-amip

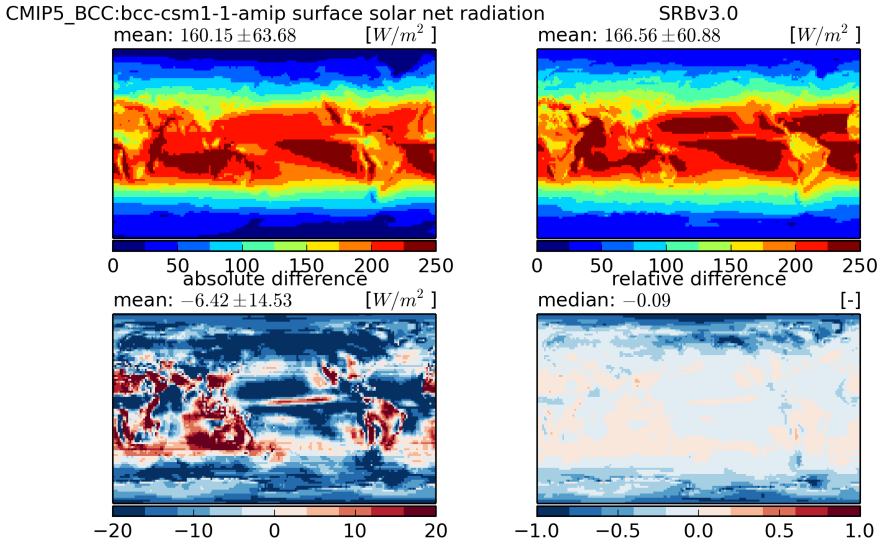



Figure 1560: Temporal mean fields (top) and absolute and relative differences (bottom)

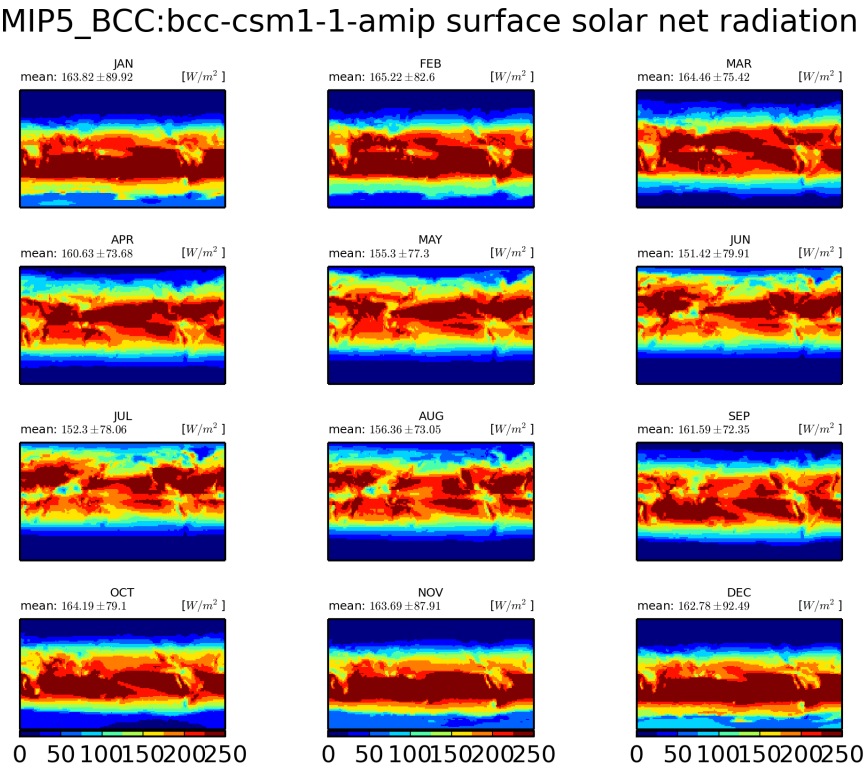



Figure 1561: Monthly mean climatology for BCC:bcc-csm1-1

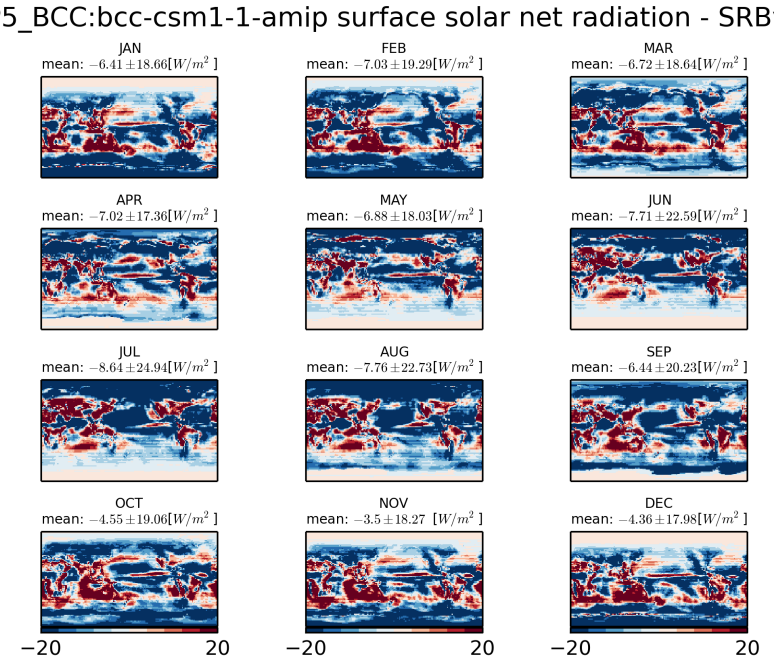



Figure 1562: Monthly mean climatology of difference between BCC:BCC-CSM1-1 and SRBV3.0

### 3.3.6 CMIP5 BCC:bcc-csm1-1-m-amip

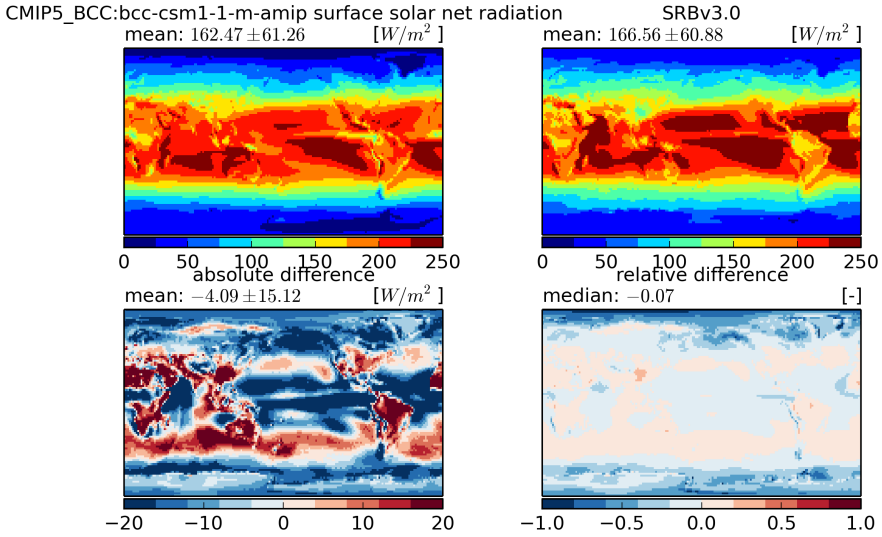



Figure 1563: Temporal mean fields (top) and absolute and relative differences (bottom)

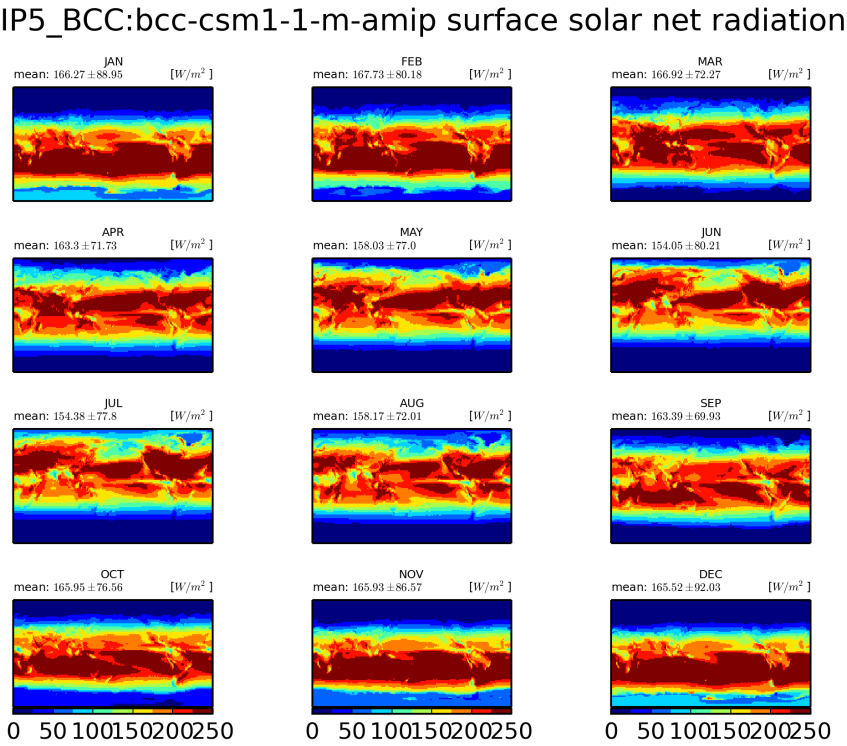



Figure 1564: Monthly mean climatology for BCC:bcc-csm1-1-m

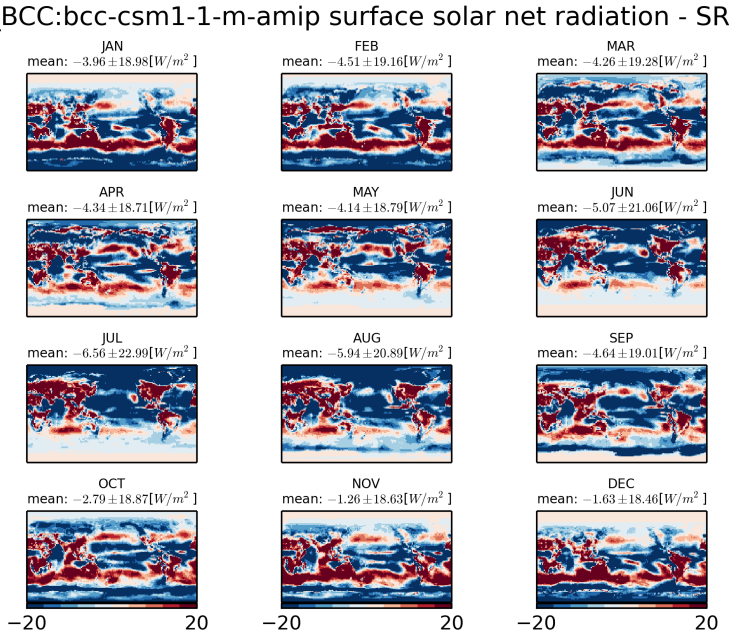



Figure 1565: Monthly mean climatology of difference between BCC:BCC-CSM1-1-M and SRBV3.0

### 3.3.7 CMIP5 NSF-DOE-NCAR:CESM1-CAM5-amip

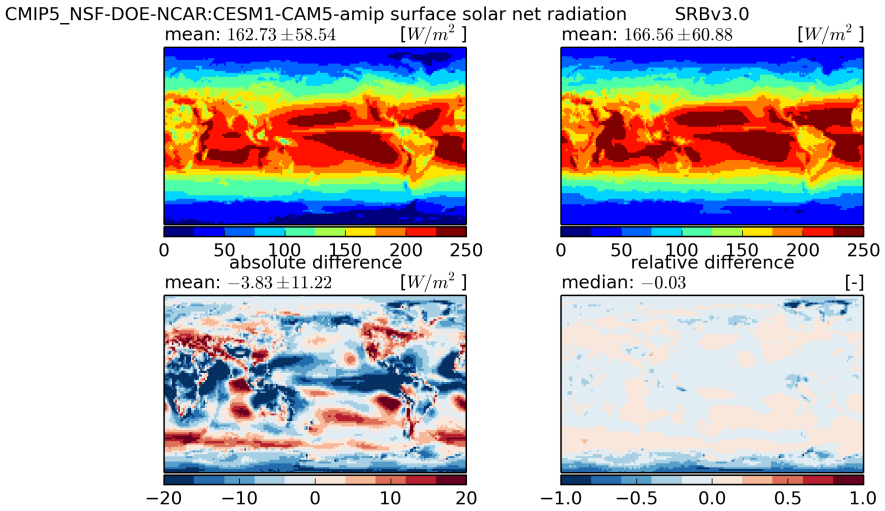



Figure 1566: Temporal mean fields (top) and absolute and relative differences (bottom)

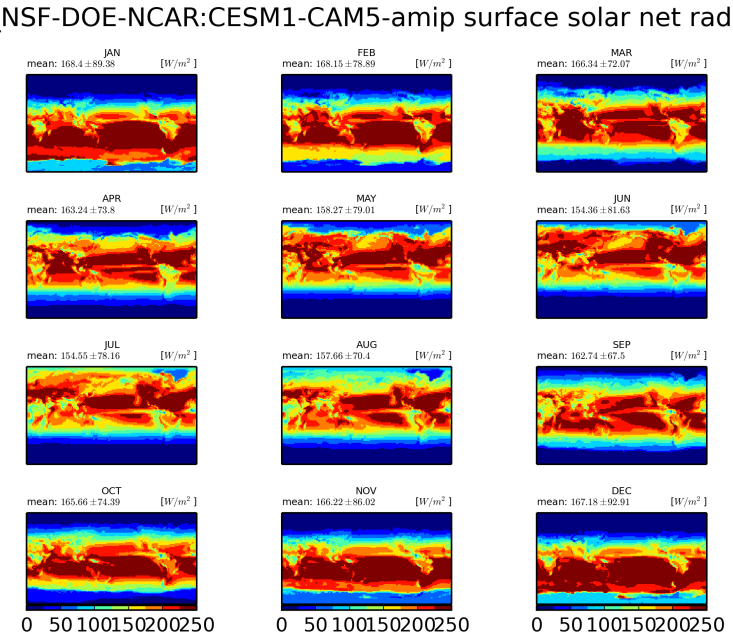



Figure 1567: Monthly mean climatology for NSF-DOE-NCAR:CESM1-CAM5

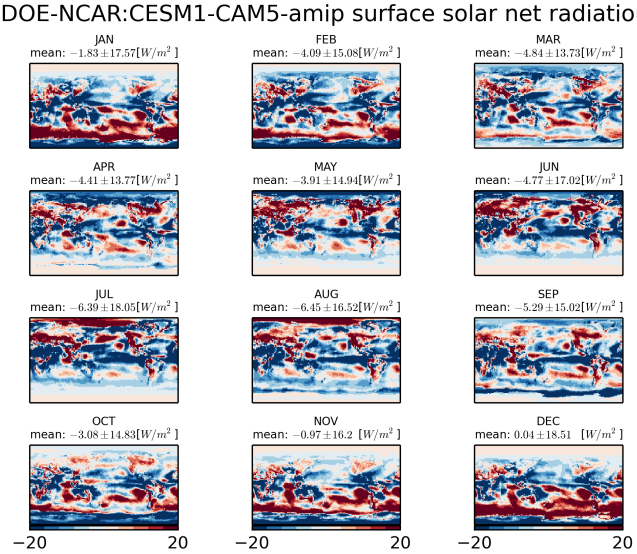



Figure 1568: Monthly mean climatology of difference between NSF-DOE-NCAR:CESM1-CAM5 and SRBV3.0

### 3.3.8 CMIP5 CNRM-CERFACS:CNRM-CM5-amip

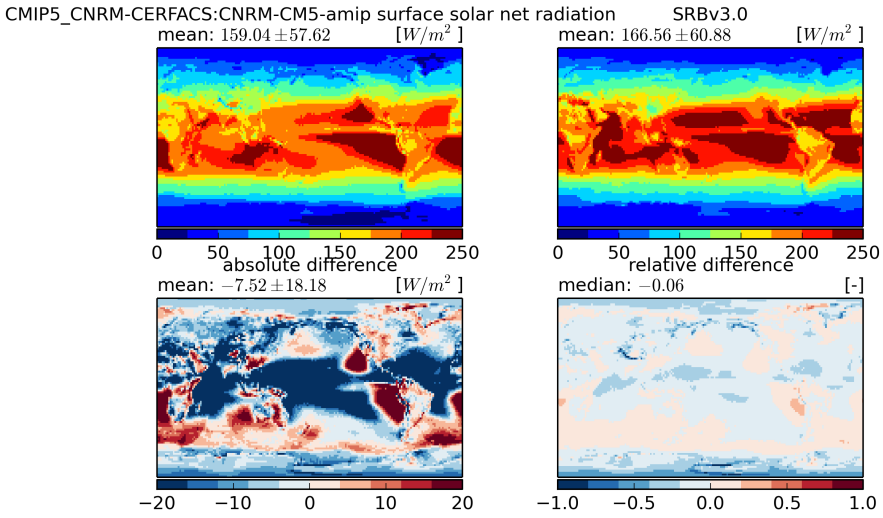



Figure 1569: Temporal mean fields (top) and absolute and relative differences (bottom)

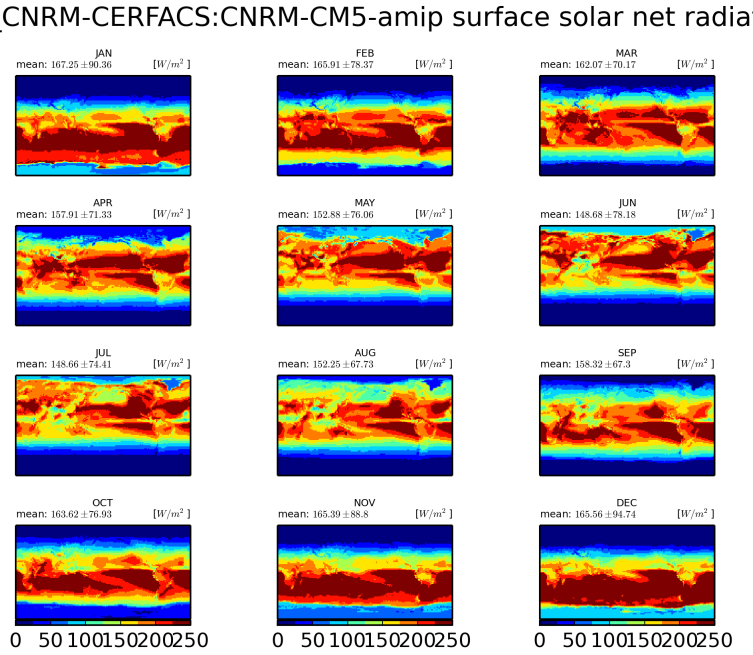



Figure 1570: Monthly mean climatology for CNRM-CERFACS:CNRM-CM5

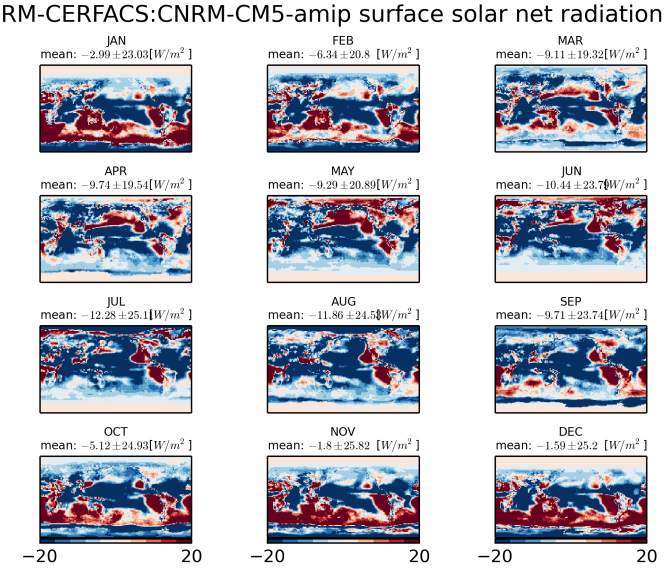



Figure 1571: Monthly mean climatology of difference between CNRM-CERFACS:CNRM-CM5 and SRBV3.0

### 3.3.9 CMIP5 MRI:MRI-CGCM3-amip

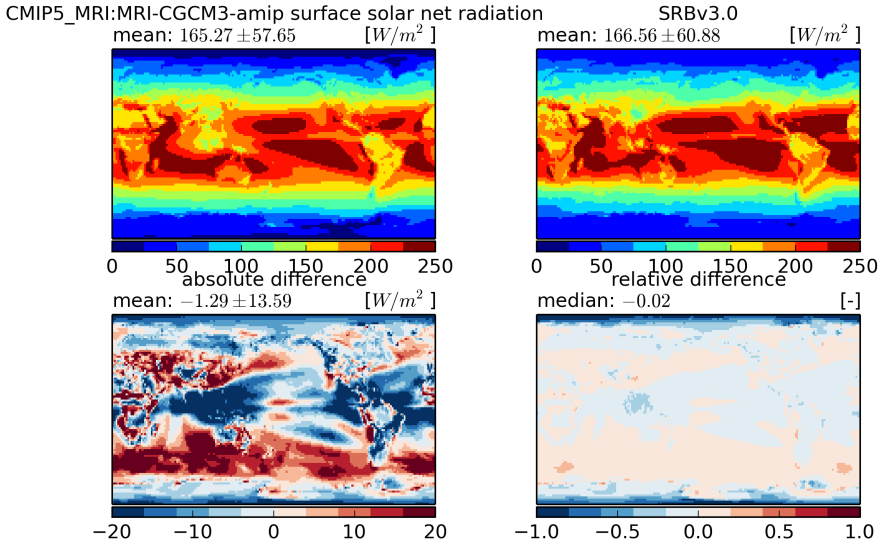



Figure 1572: Temporal mean fields (top) and absolute and relative differences (bottom)

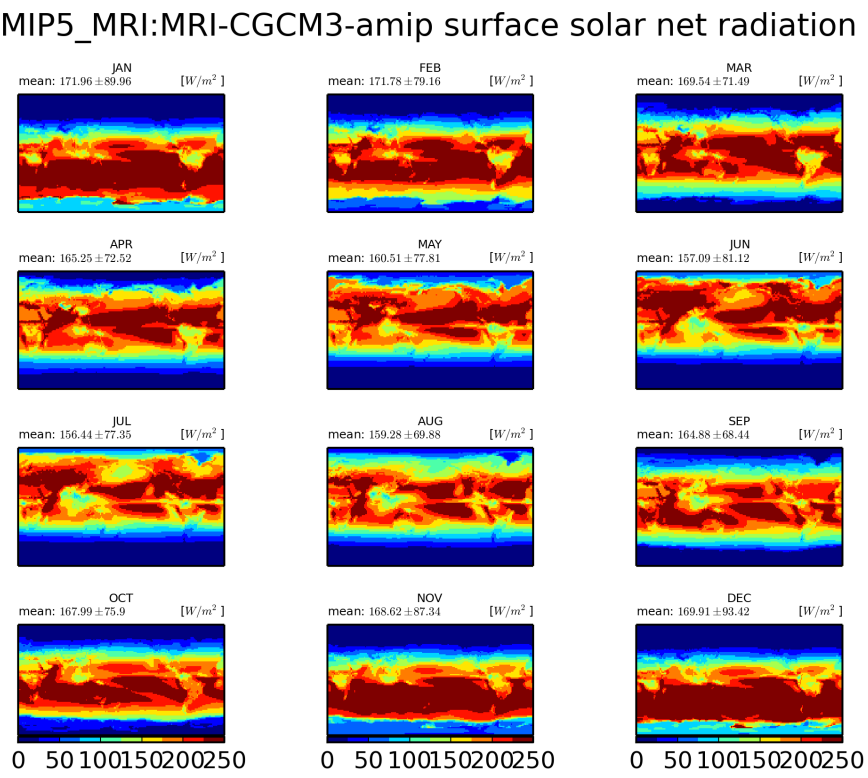



Figure 1573: Monthly mean climatology for MRI:MRI-CGCM3

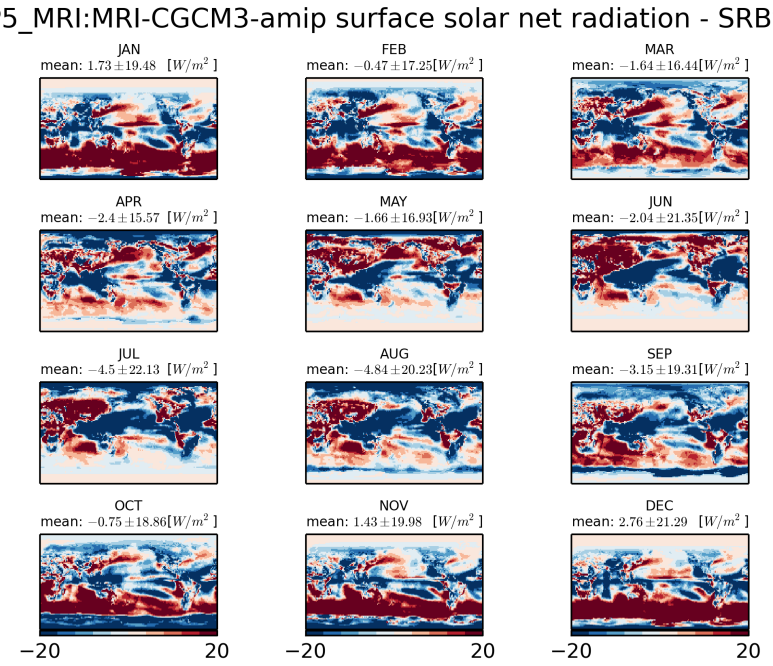



Figure 1574: Monthly mean climatology of difference between MRI:MRI-CGCM3 and SRBV3.0

### 3.3.10 CMIP5 NASA-GISS:GISS-E2-R-amip

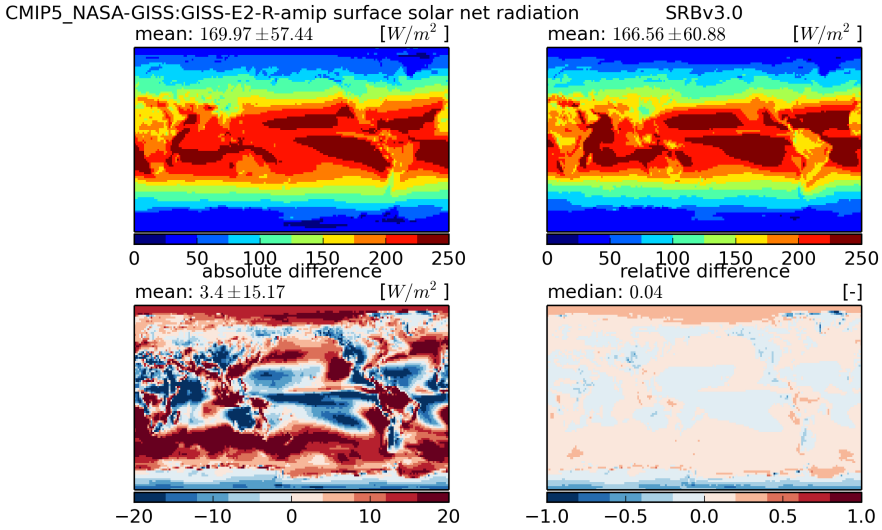



Figure 1575: Temporal mean fields (top) and absolute and relative differences (bottom)

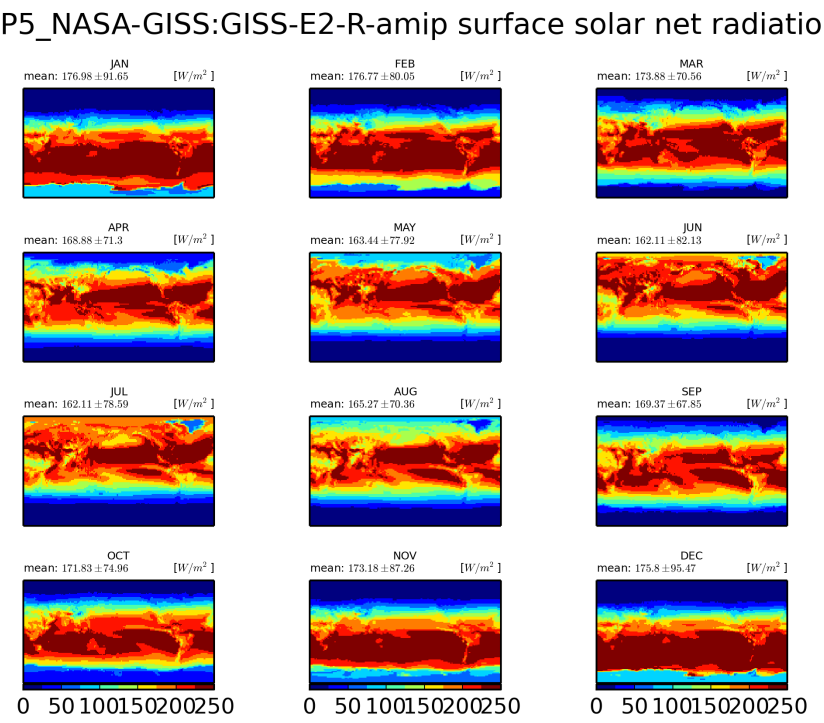



Figure 1576: Monthly mean climatology for NASA-GISS:GISS-E2-R

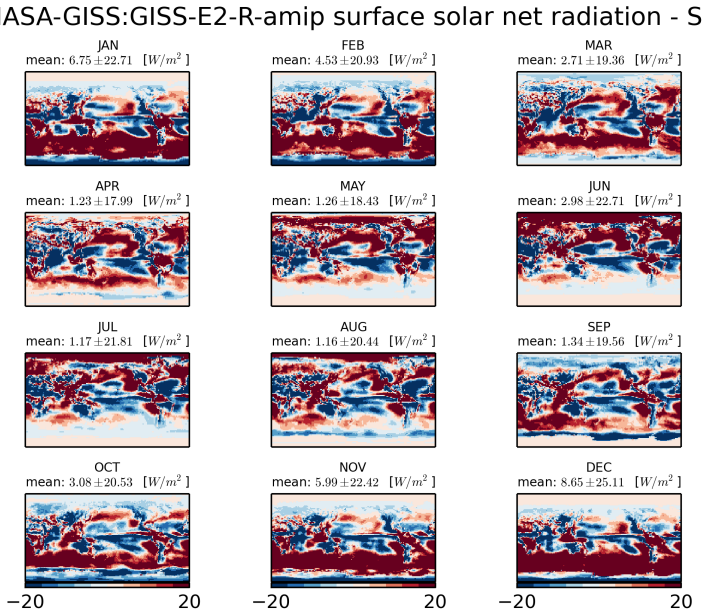



Figure 1577: Monthly mean climatology of difference between NASA-GISS:GISS-E2-R and SRBV3.0

### 3.3.11 CMIP5 MIROC:MIROC5-amip

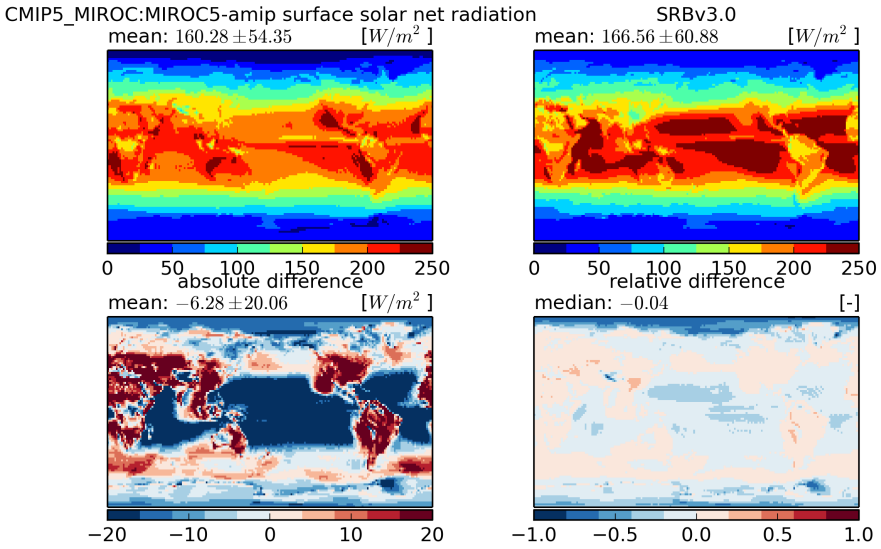



Figure 1578: Temporal mean fields (top) and absolute and relative differences (bottom)

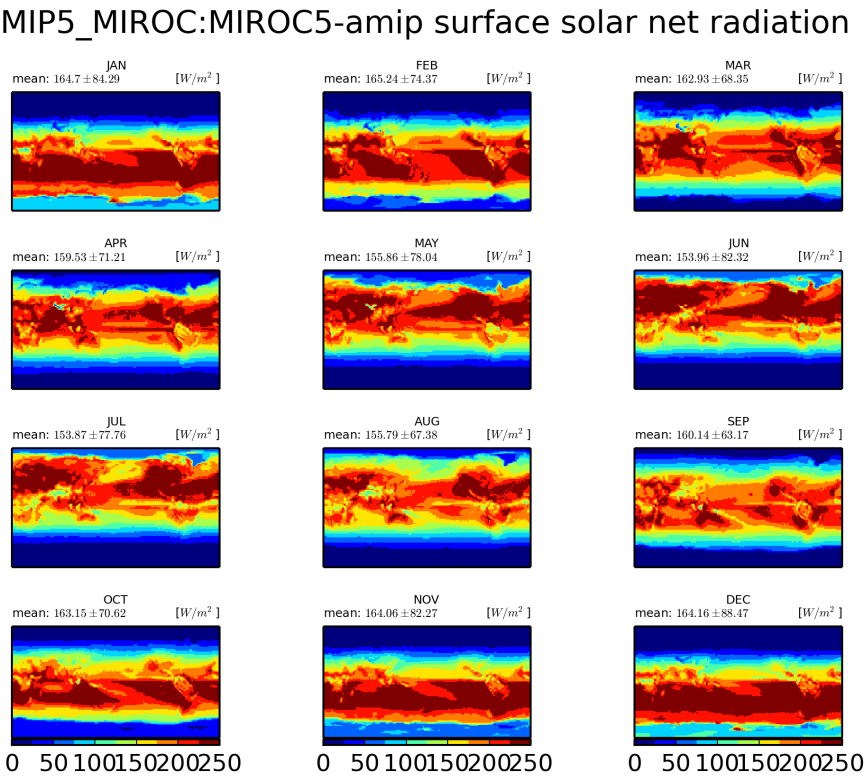



Figure 1579: Monthly mean climatology for MIROC:MIROC5

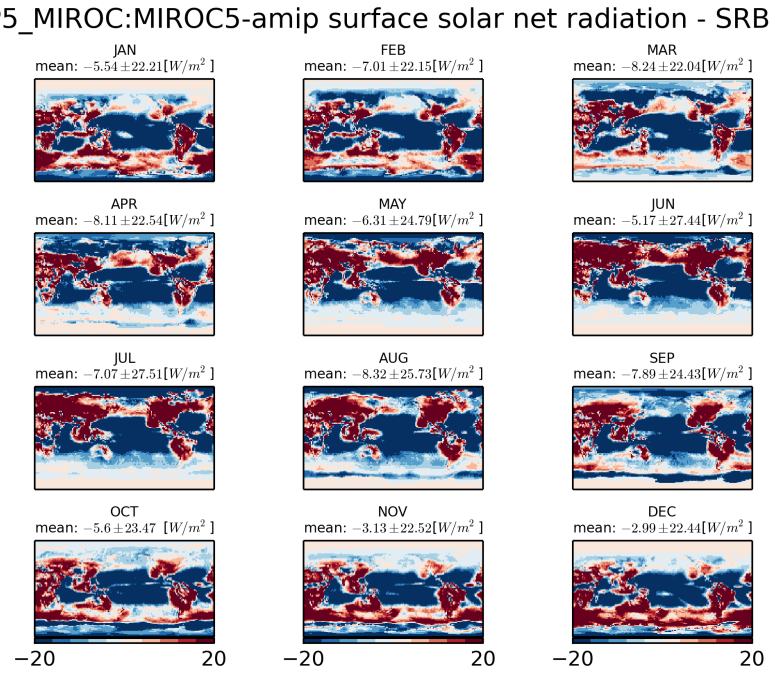



Figure 1580: Monthly mean climatology of difference between MIROC:MIROC5 and SRBV3.0

### 3.3.12 CMIP5 IPSL:IPSL-CM5B-LR-amip

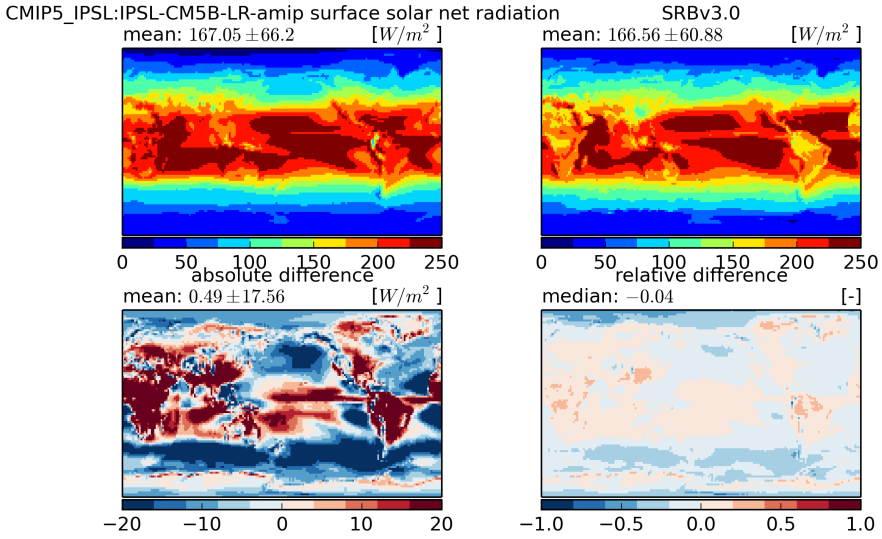



Figure 1581: Temporal mean fields (top) and absolute and relative differences (bottom)

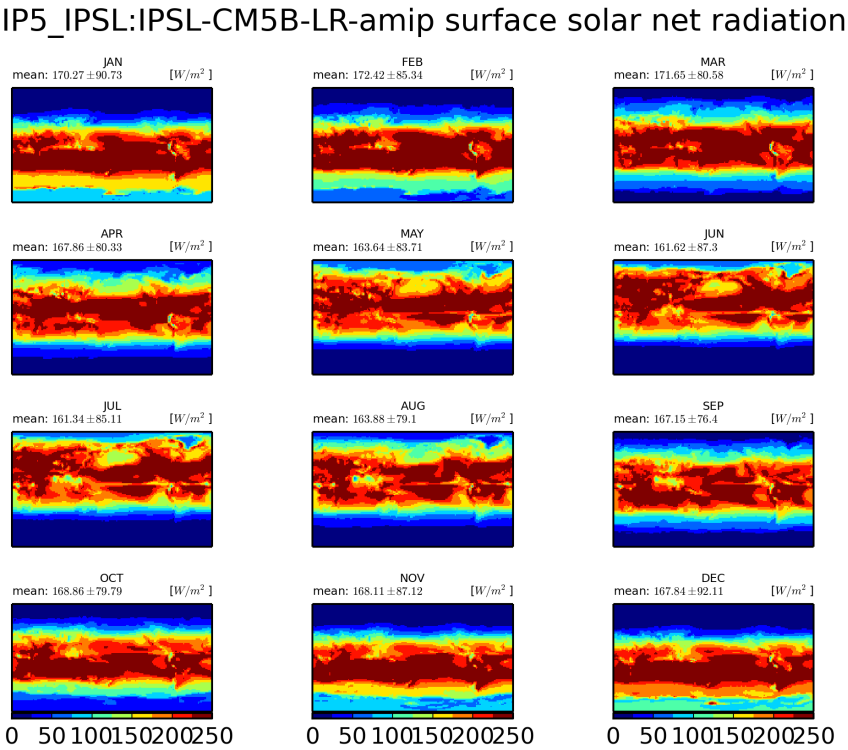



Figure 1582: Monthly mean climatology for IPSL:IPSL-CM5B-LR

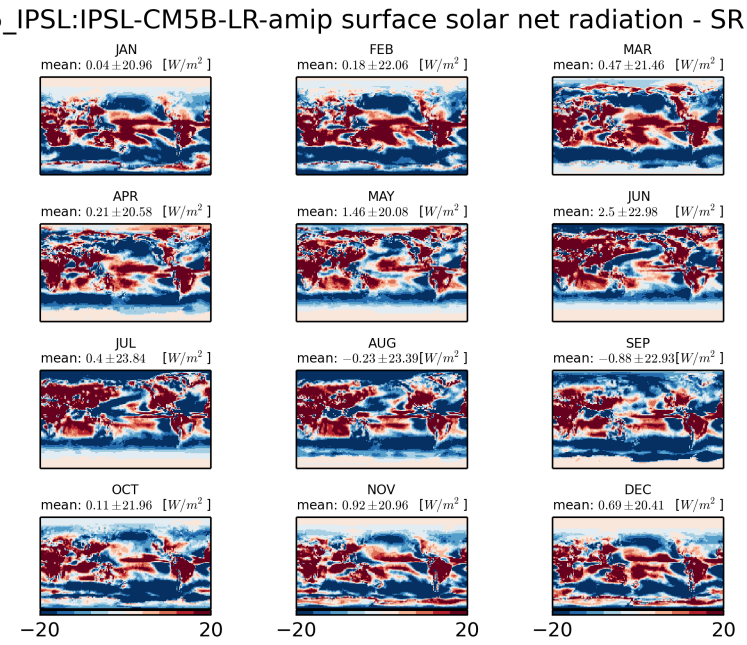



Figure 1583: Monthly mean climatology of difference between IPSL:IPSL-CM5B-LR and SRBV3.0

### 3.3.13 CMIP5 IPSL:IPSL-CM5A-MR-amip

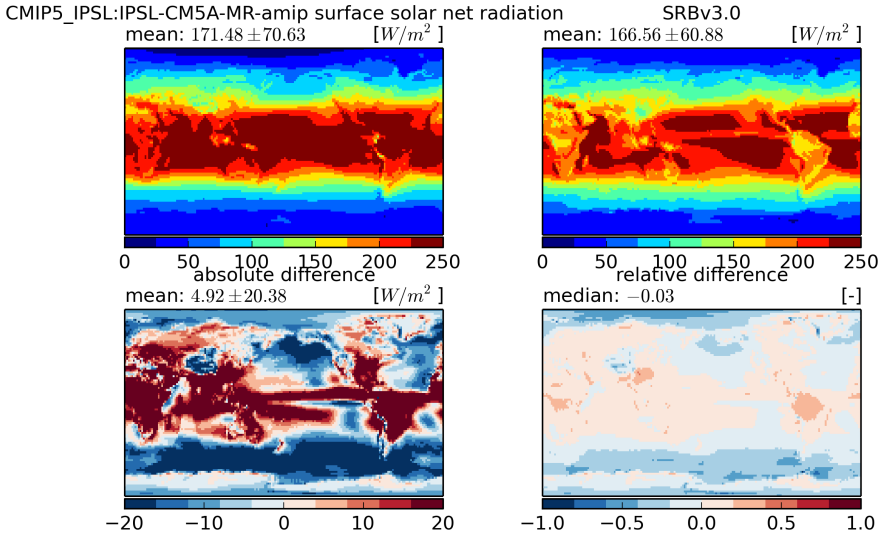



Figure 1584: Temporal mean fields (top) and absolute and relative differences (bottom)

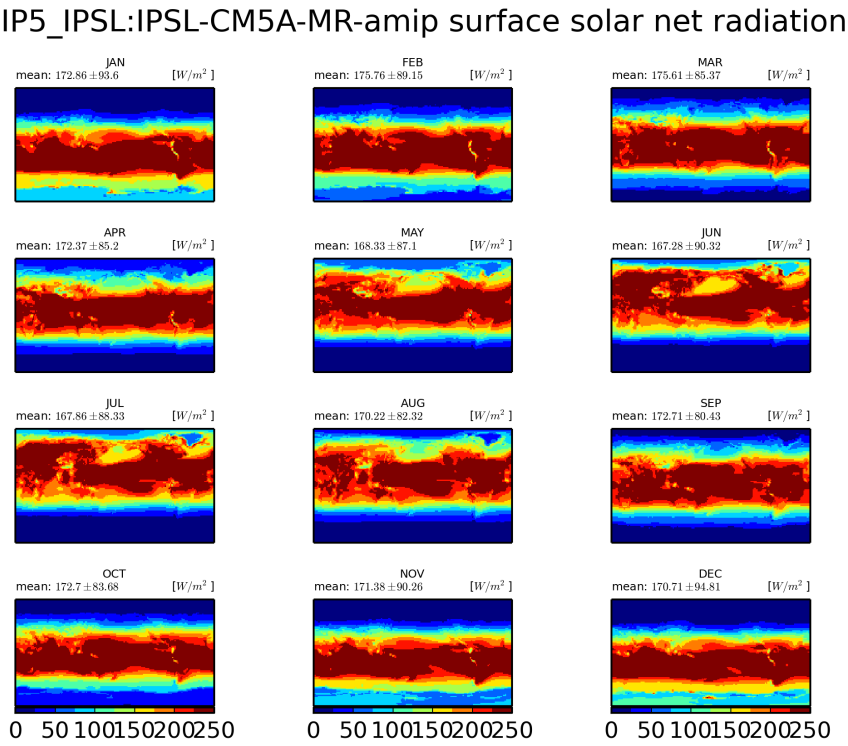



Figure 1585: Monthly mean climatology for IPSL:IPSL-CM5A-MR

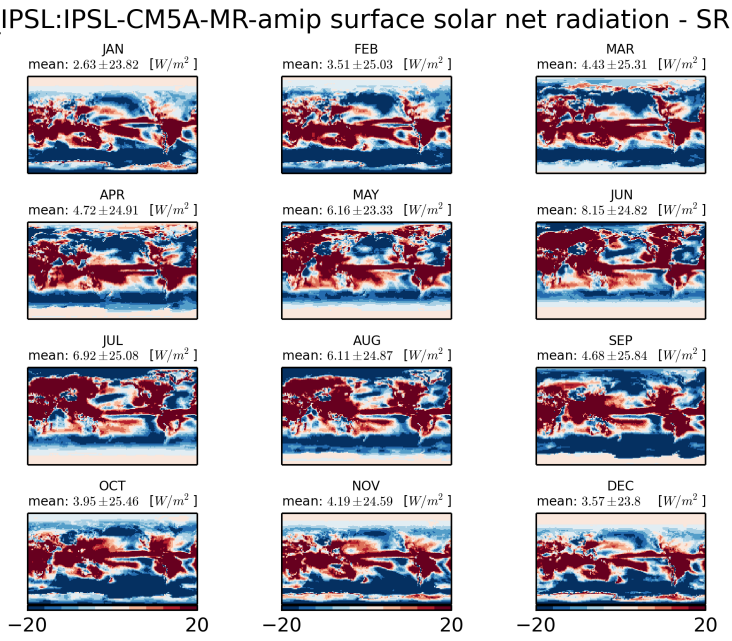



Figure 1586: Monthly mean climatology of difference between IPSL:IPSL-CM5A-MR and SRBV3.0

### 3.3.14 CMIP5 IPSL:IPSL-CM5A-LR-amip

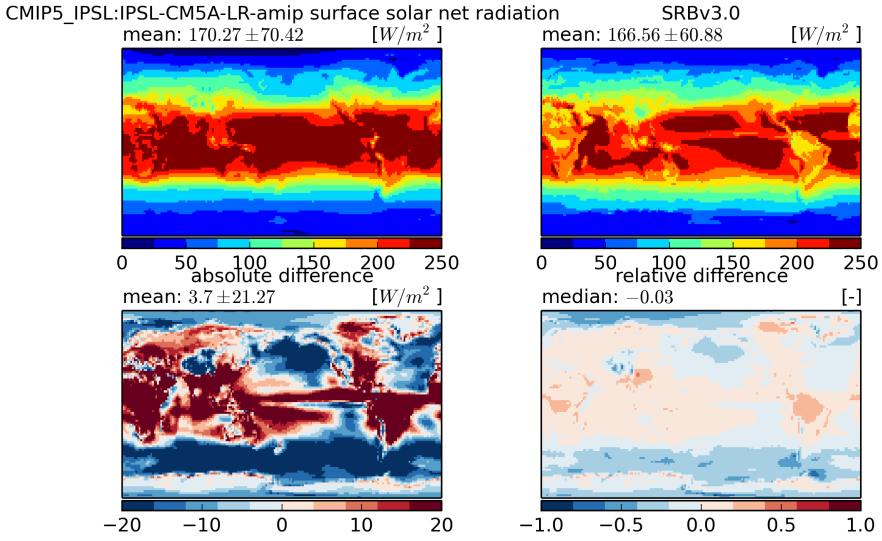



Figure 1587: Temporal mean fields (top) and absolute and relative differences (bottom)

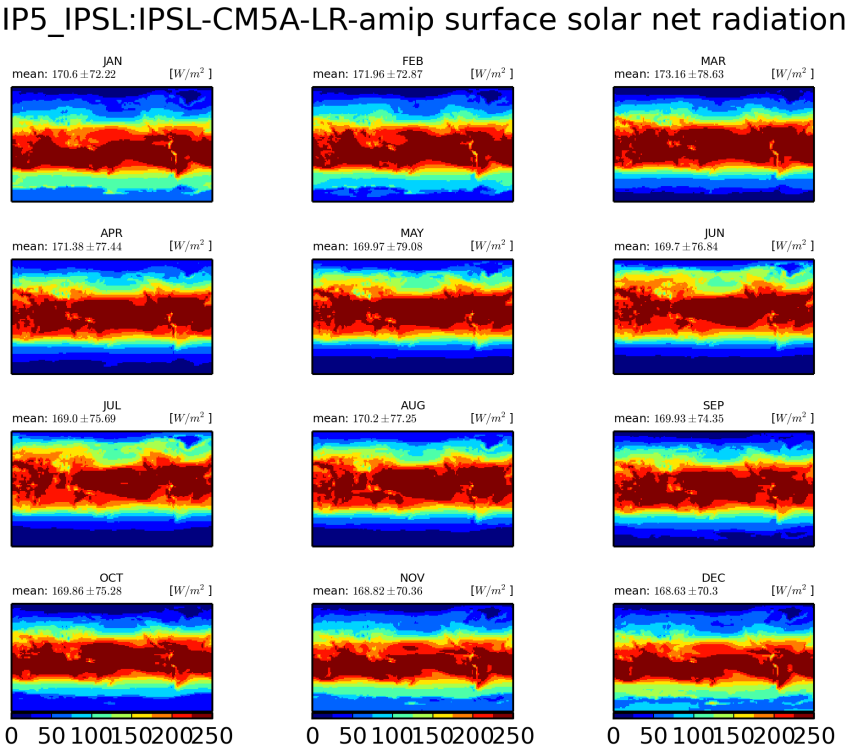



Figure 1588: Monthly mean climatology for IPSL:IPSL-CM5A-LR

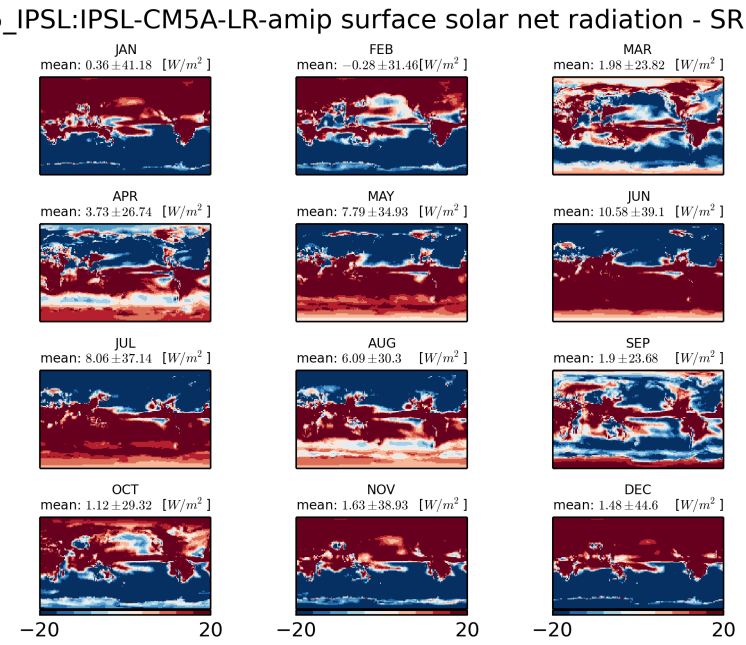



Figure 1589: Monthly mean climatology of difference between IPSL:IPSL-CM5A-LR and SRBV3.0

### 3.3.15 CMIP5 MOHC:HadGEM2-A-amip

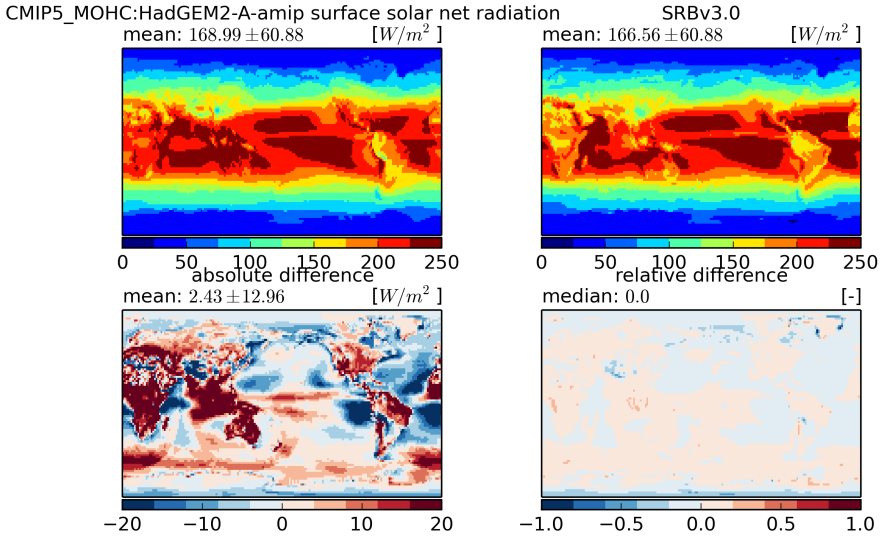



Figure 1590: Temporal mean fields (top) and absolute and relative differences (bottom)

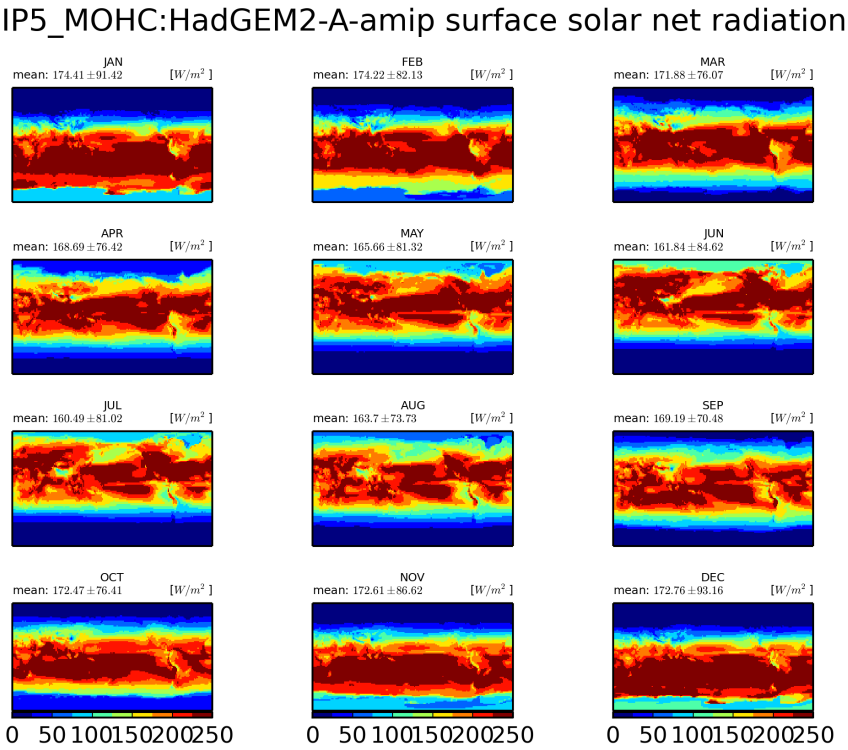



Figure 1591: Monthly mean climatology for MOHC:HadGEM2-A

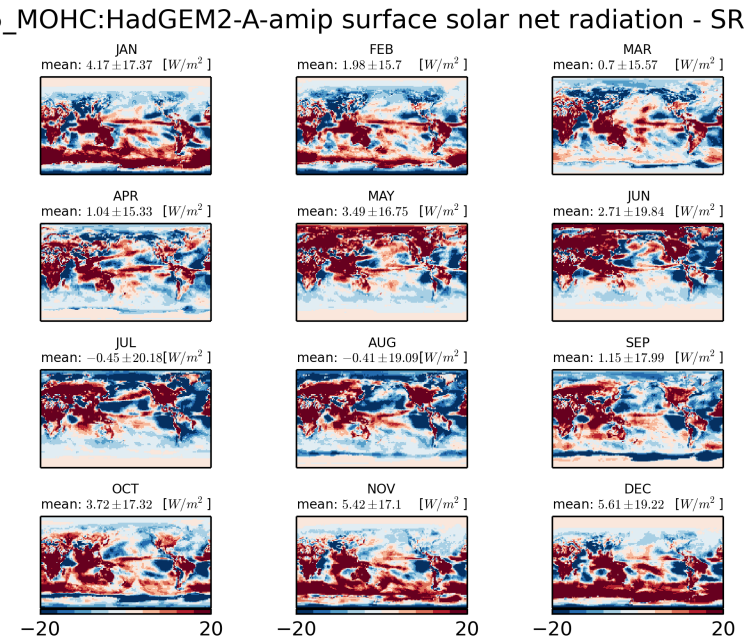



Figure 1592: Monthly mean climatology of difference between MOHC:HADGEM2-A and SRBV3.0

### 3.3.16 CMIP5 LASG-IAP:FGOALS-s2-amip

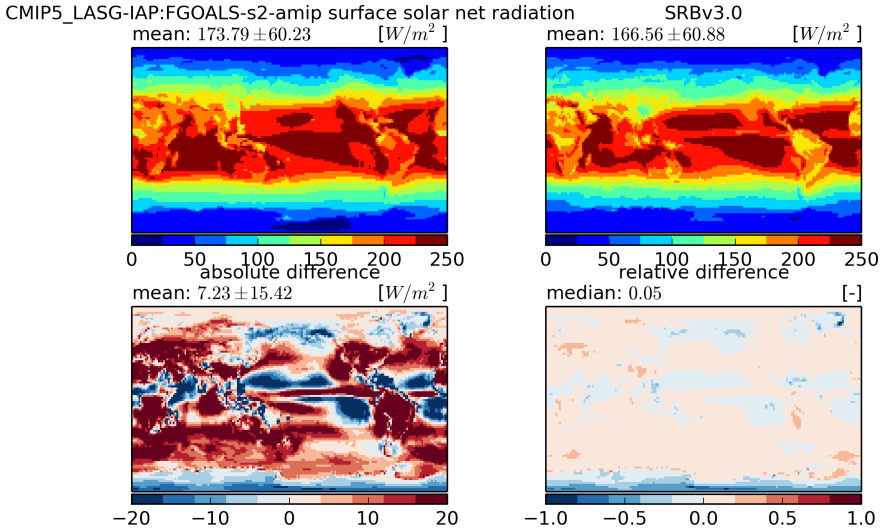



Figure 1593: Temporal mean fields (top) and absolute and relative differences (bottom)

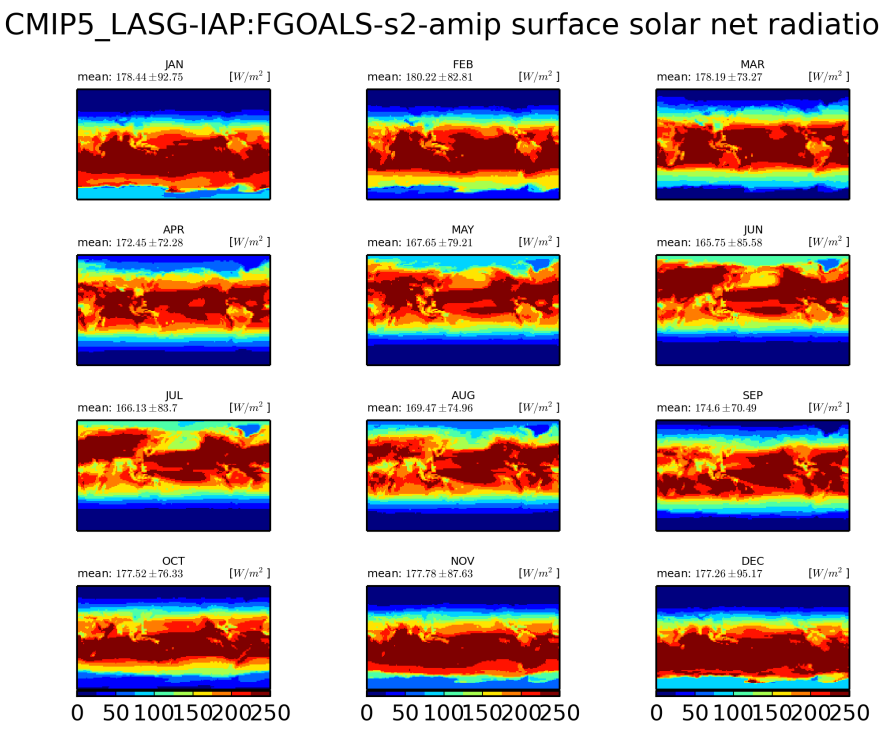



Figure 1594: Monthly mean climatology for LASG-IAP:FGOALS-s2

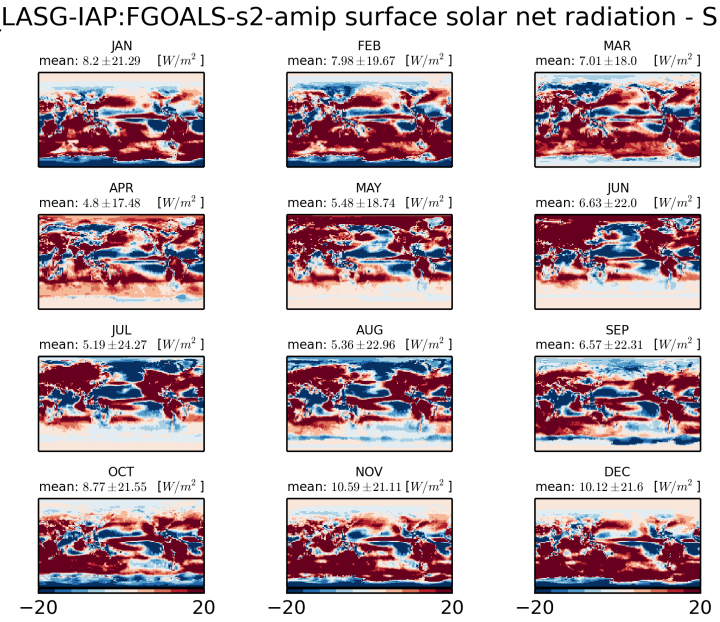



Figure 1595: Monthly mean climatology of difference between LASG-IAP:FGOALS-S2 and SRBV3.0

### 3.3.17 CMIP5 CMCC:CMCC-CM-amip

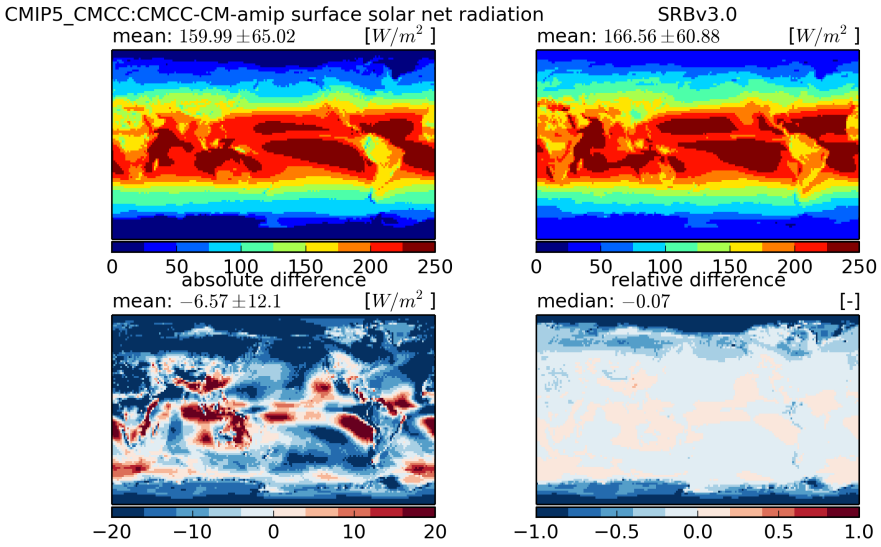



Figure 1596: Temporal mean fields (top) and absolute and relative differences (bottom)

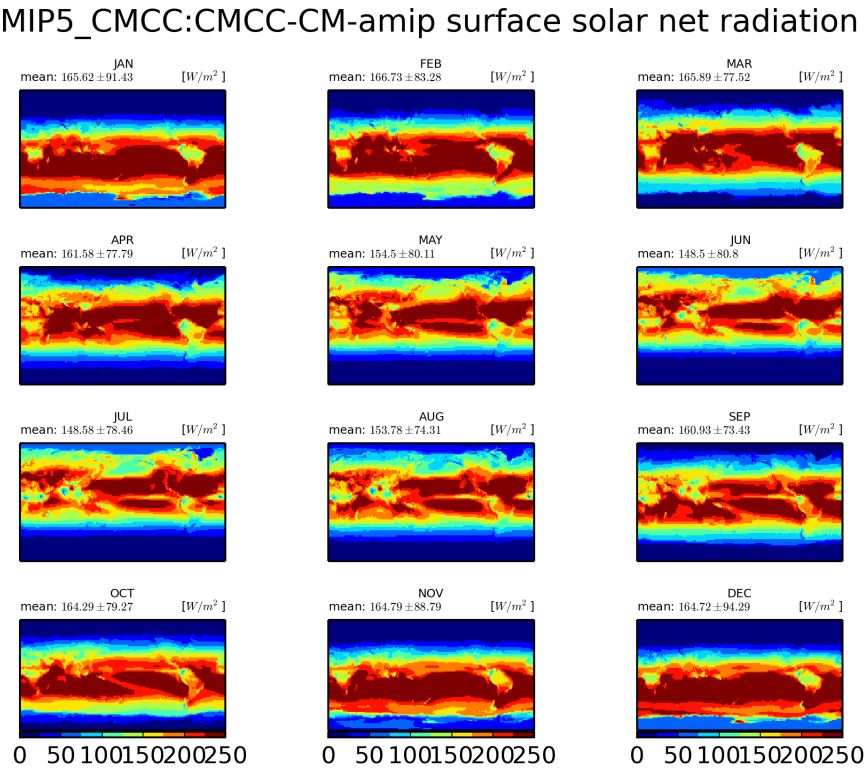



Figure 1597: Monthly mean climatology for CMCC:CMCC-CM

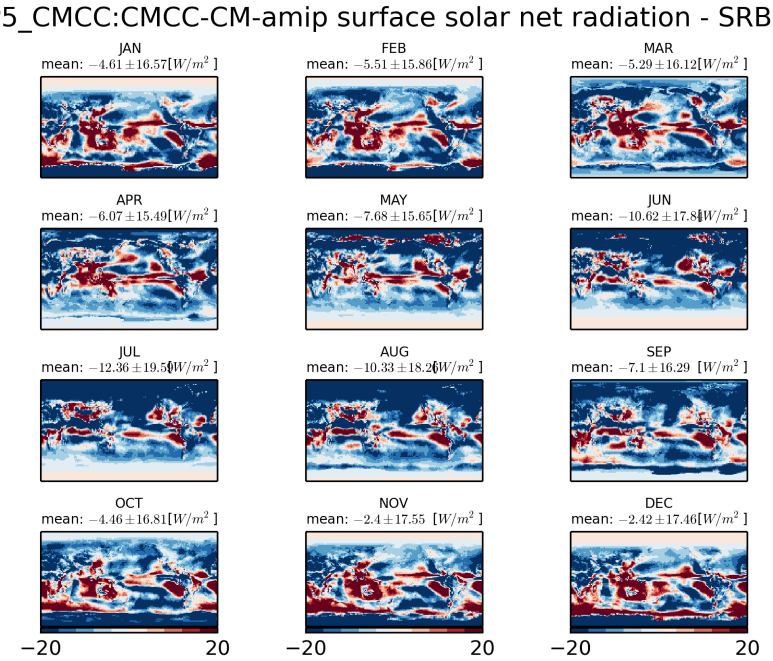



Figure 1598: Monthly mean climatology of difference between CMCC:CMCC-CM and SRBV3.0

### 3.3.18 CMIP5 CSIRO-BOM:ACCESS1-3-amip

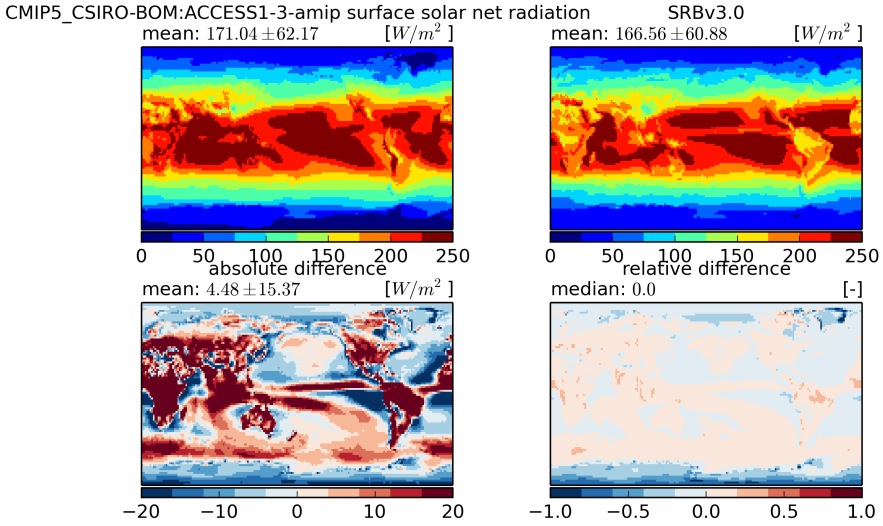



Figure 1599: Temporal mean fields (top) and absolute and relative differences (bottom)

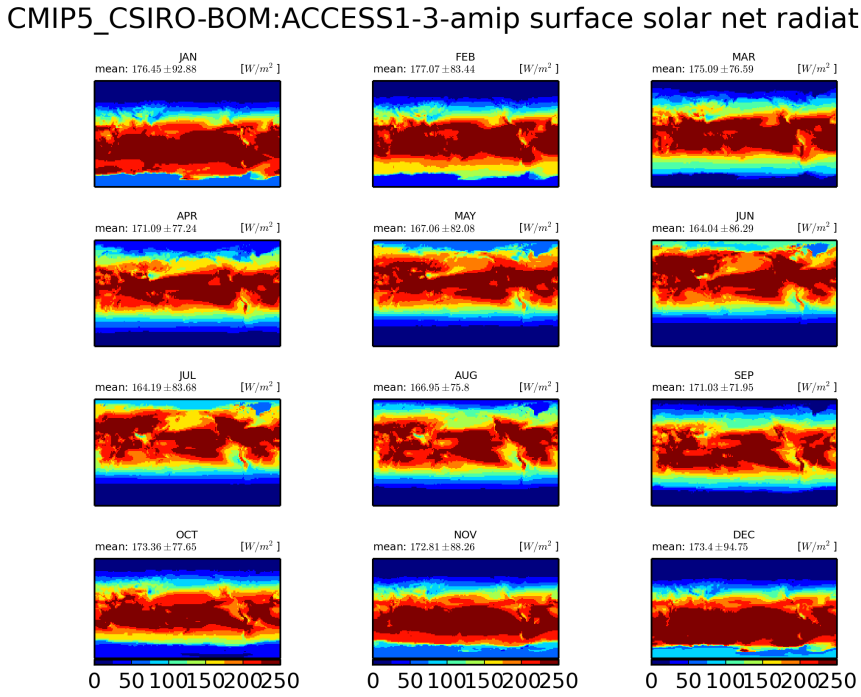



Figure 1600: Monthly mean climatology for CSIRO-BOM:ACCESS1-3

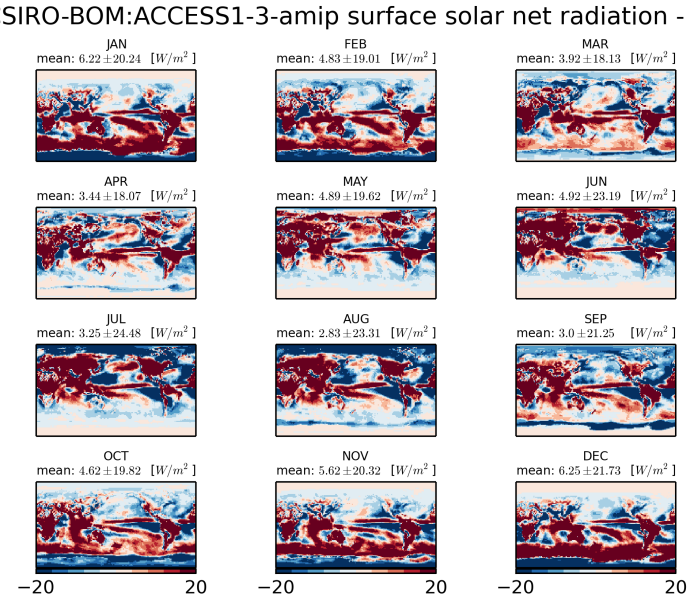



Figure 1601: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-3 and SRBV3.0

### 3.3.19 CMIP5 CSIRO-BOM:ACCESS1-0-amip

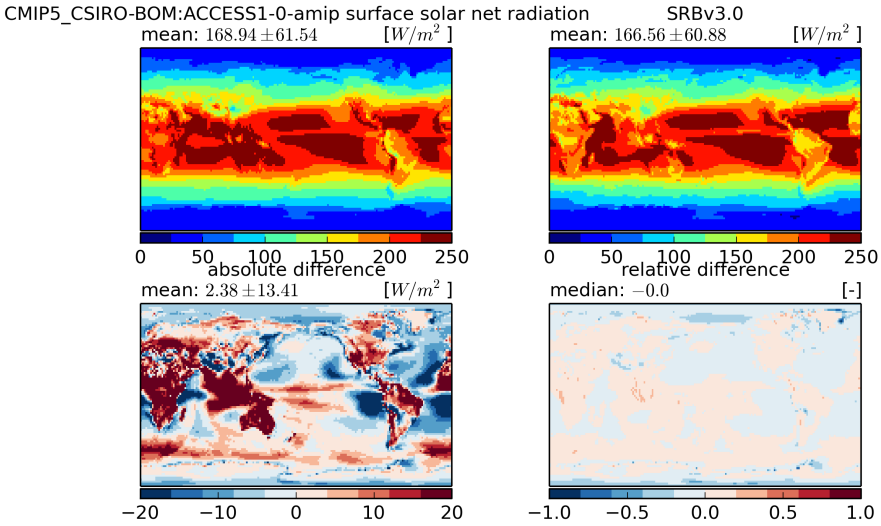



Figure 1602: Temporal mean fields (top) and absolute and relative differences (bottom)

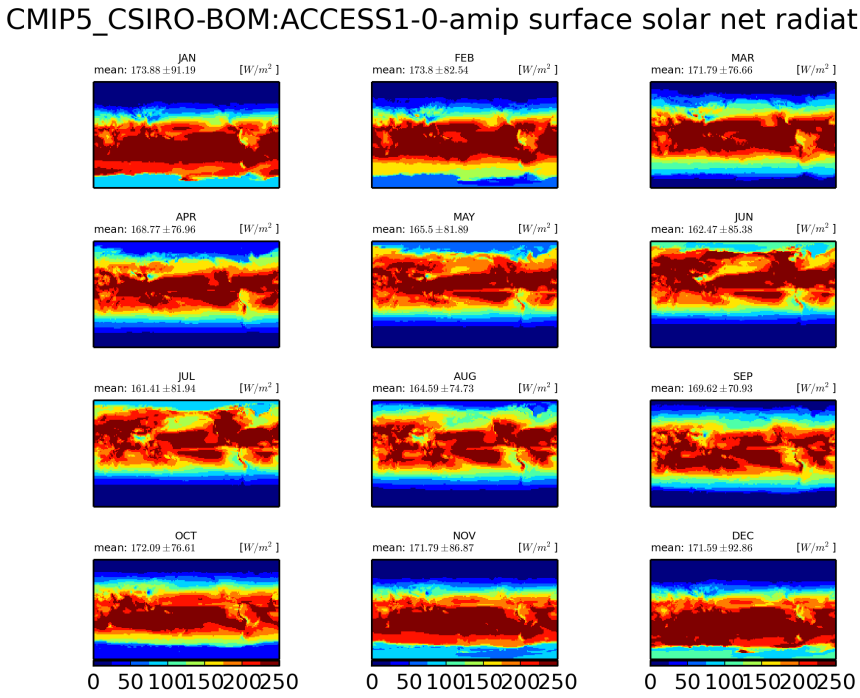



Figure 1603: Monthly mean climatology for CSIRO-BOM:ACCESS1-0

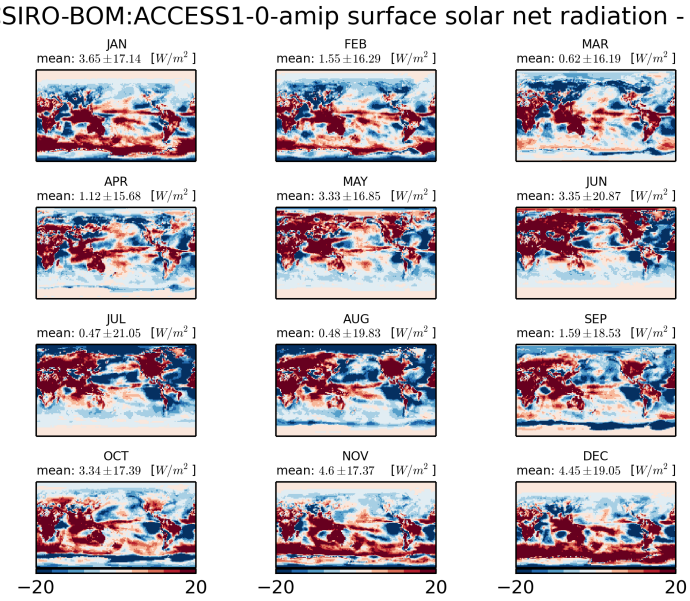



Figure 1604: Monthly mean climatology of difference between CSIRO-BOM:ACCESS1-0 and SRBV3.0

### 3.3.20 CMIP5 INM:inmcm4-amip

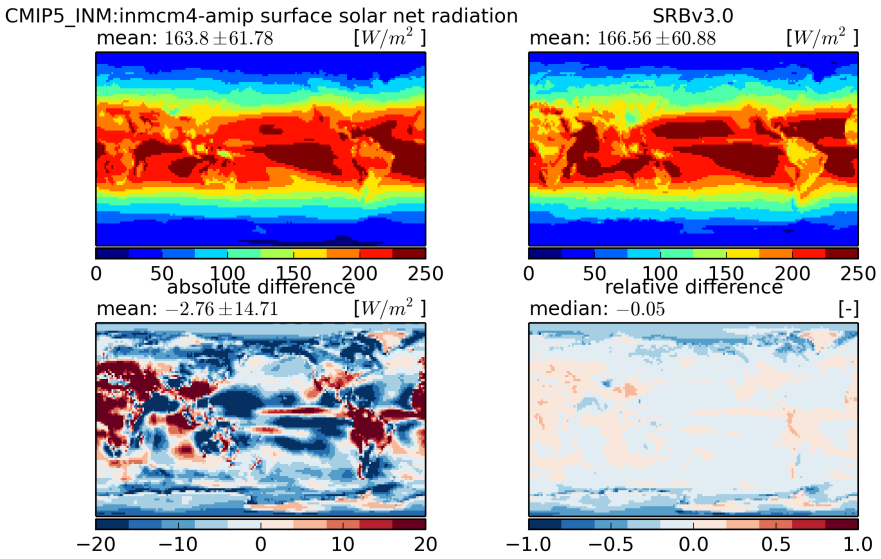



Figure 1605: Temporal mean fields (top) and absolute and relative differences (bottom)

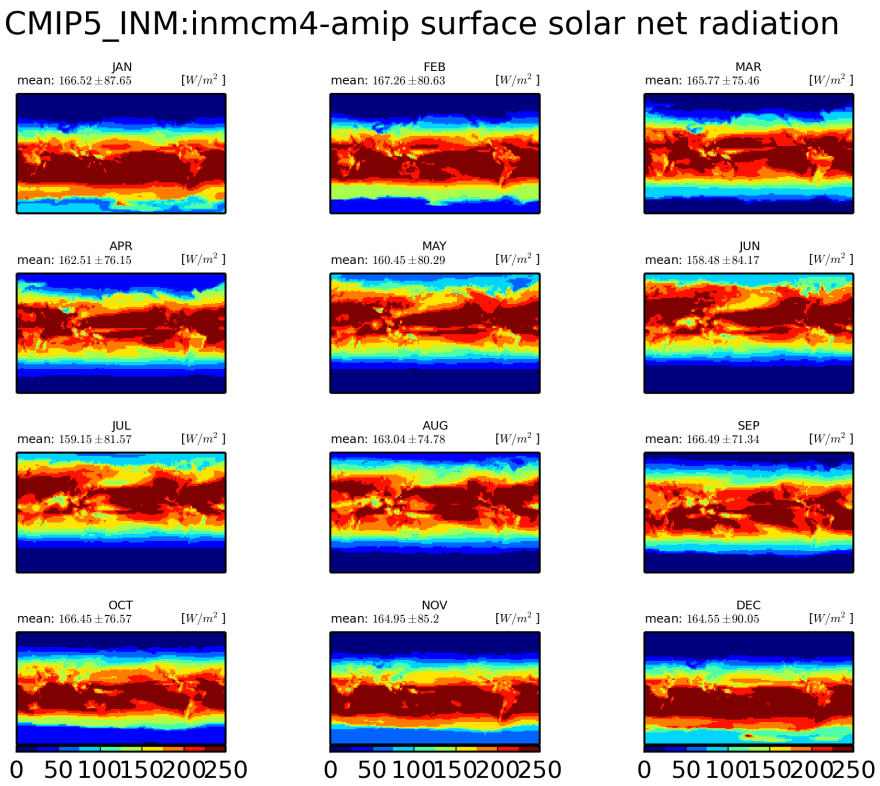



Figure 1606: Monthly mean climatology for INM:inmcm4

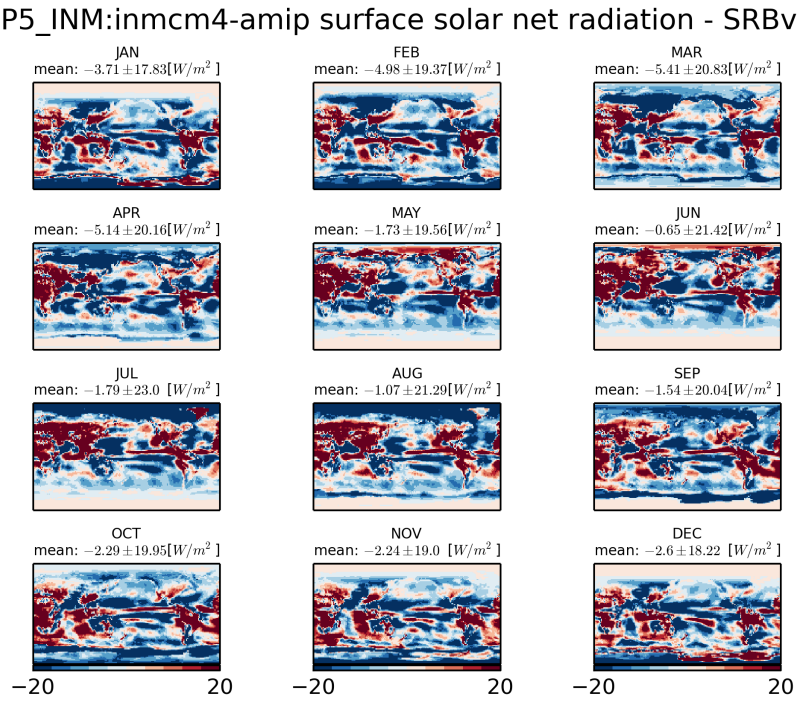



Figure 1607: Monthly mean climatology of difference between INM:INMCM4 and SRBV3.0

### 3.3.21 CMIP5 MPI-M:MPI-ESM-LR-amip

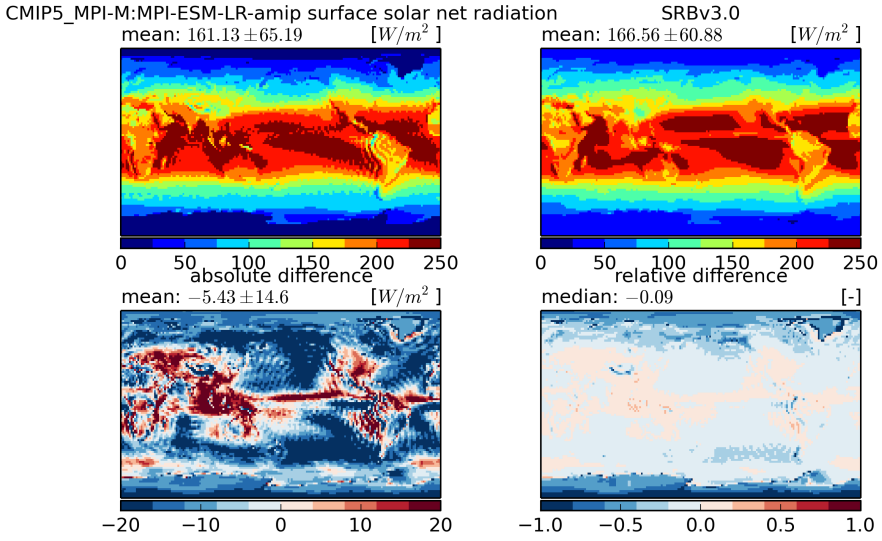



Figure 1608: Temporal mean fields (top) and absolute and relative differences (bottom)

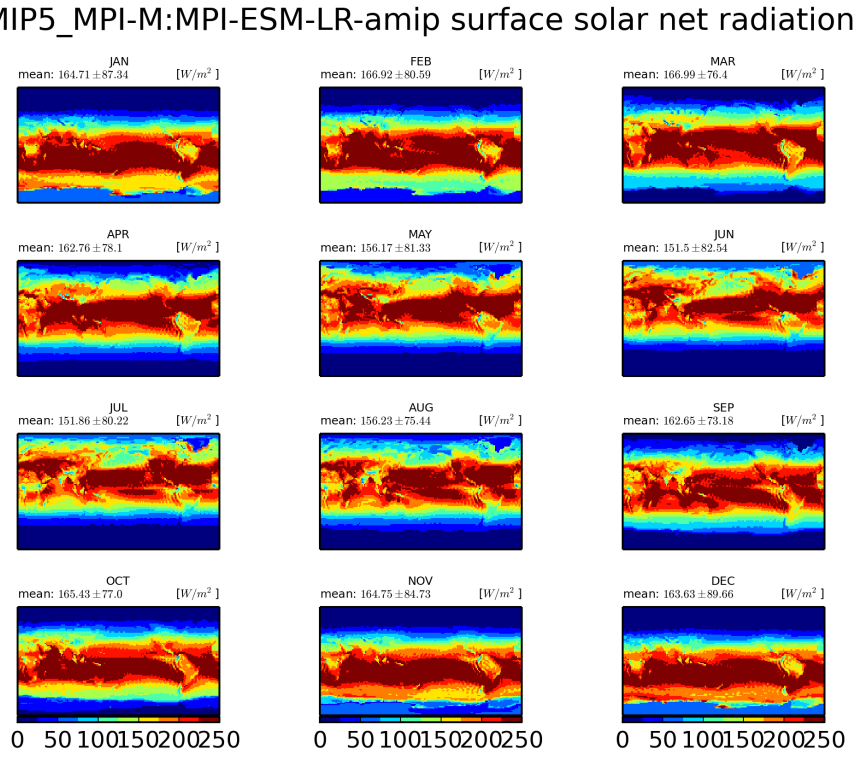



Figure 1609: Monthly mean climatology for MPI-M:MPI-ESM-LR

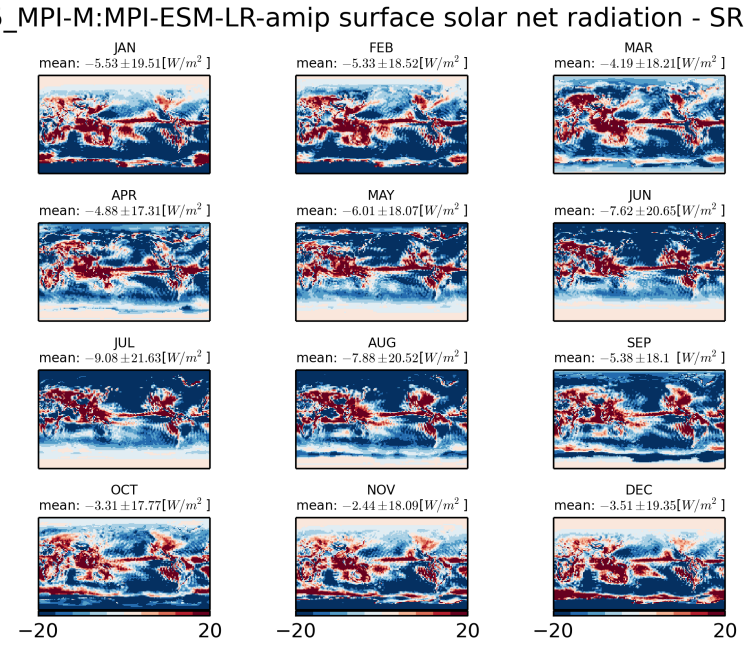



Figure 1610: Monthly mean climatology of difference between MPI-M:MPI-ESM-LR and SRBV3.0

### 3.3.22 CMIP5 MPI-M:MPI-ESM-MR-amip

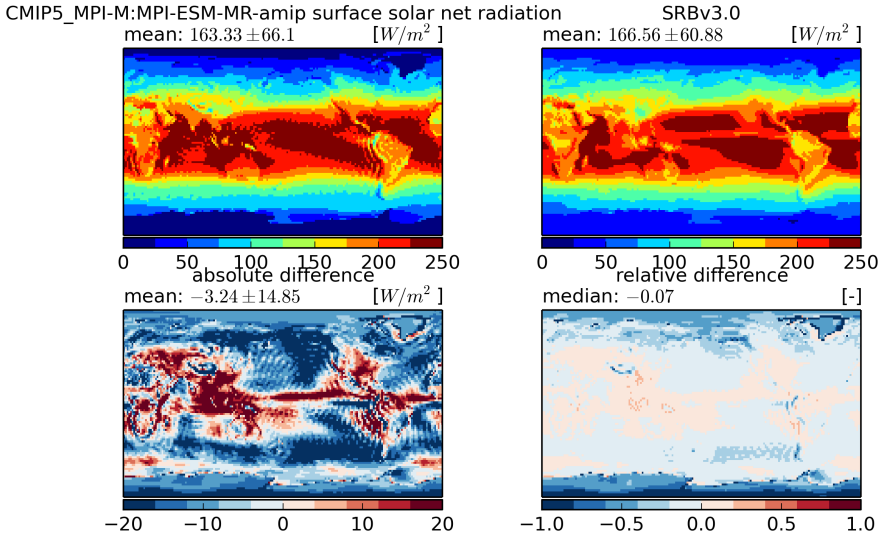



Figure 1611: Temporal mean fields (top) and absolute and relative differences (bottom)

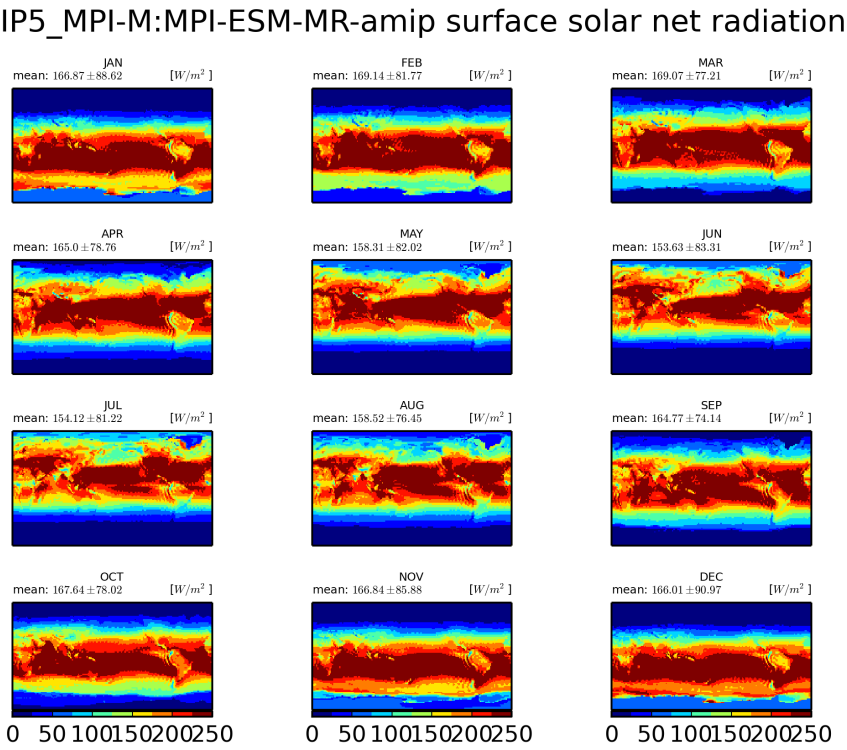



Figure 1612: Monthly mean climatology for MPI-M:MPI-ESM-MR

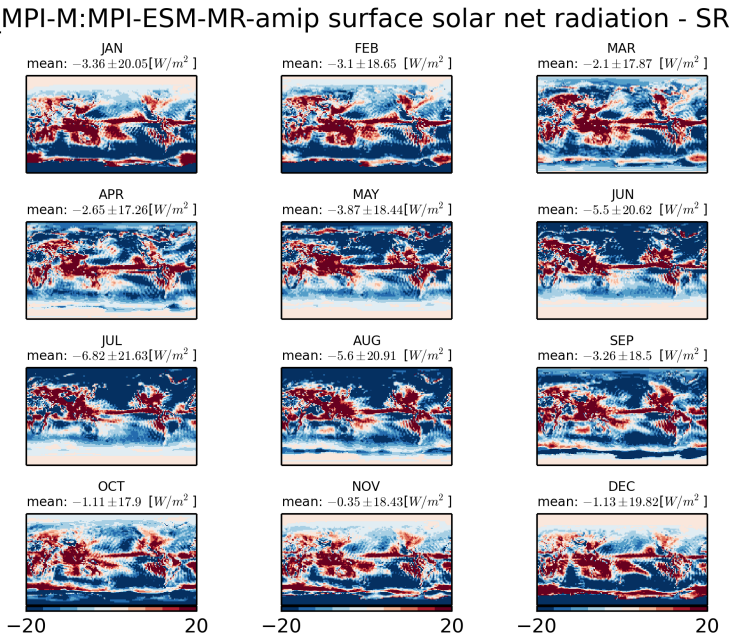



Figure 1613: Monthly mean climatology of difference between MPI-M:MPI-ESM-MR and SRBV3.0

### 3.3.23 CMIP5 NOAA-GFDL:GFDL-HIRAM-C180-amip

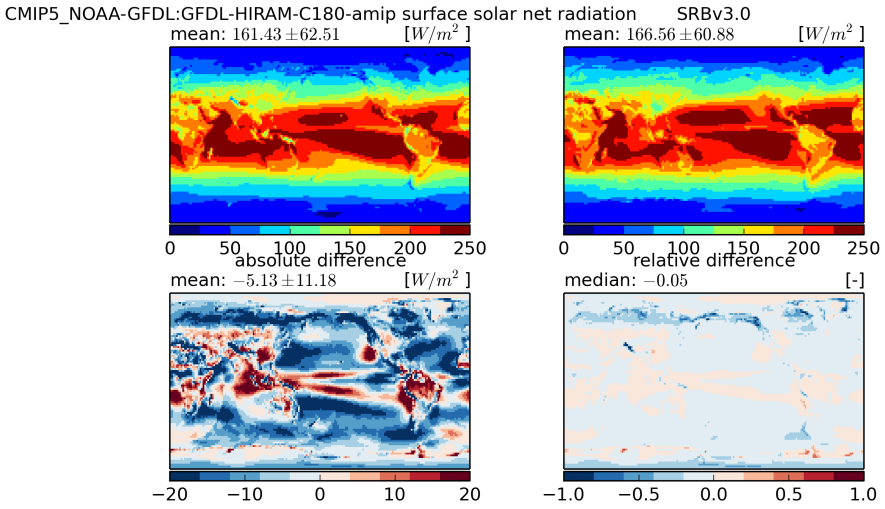



Figure 1614: Temporal mean fields (top) and absolute and relative differences (bottom)

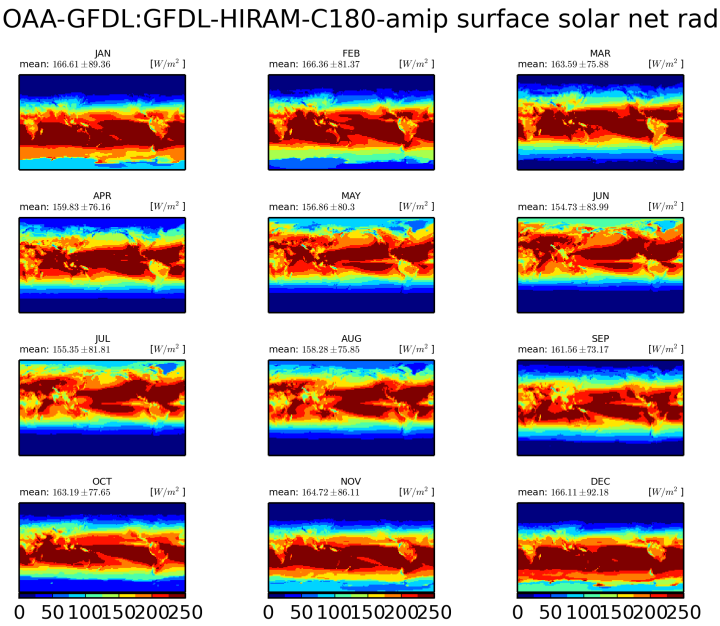



Figure 1615: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C180

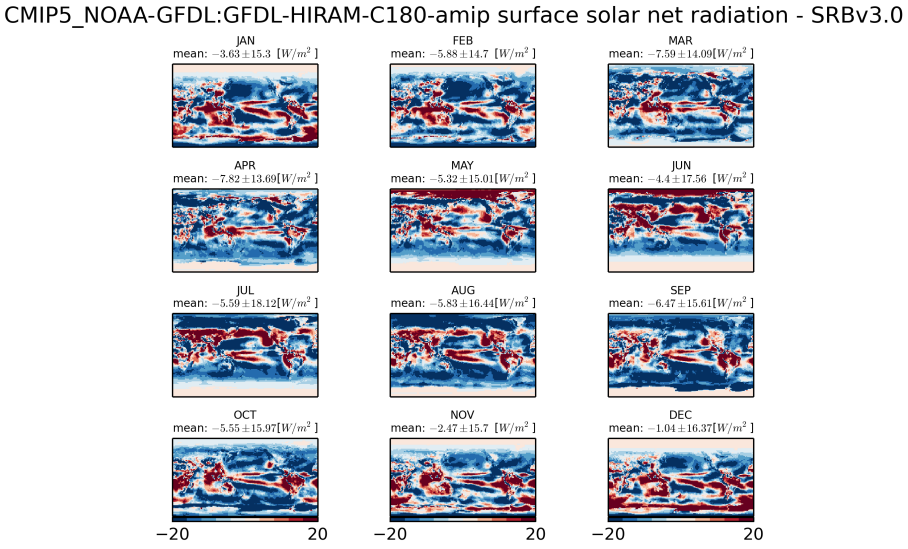



Figure 1616: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C180 and SRBV3.0

### 3.3.24 CMIP5 NOAA-GFDL:GFDL-CM3-amip

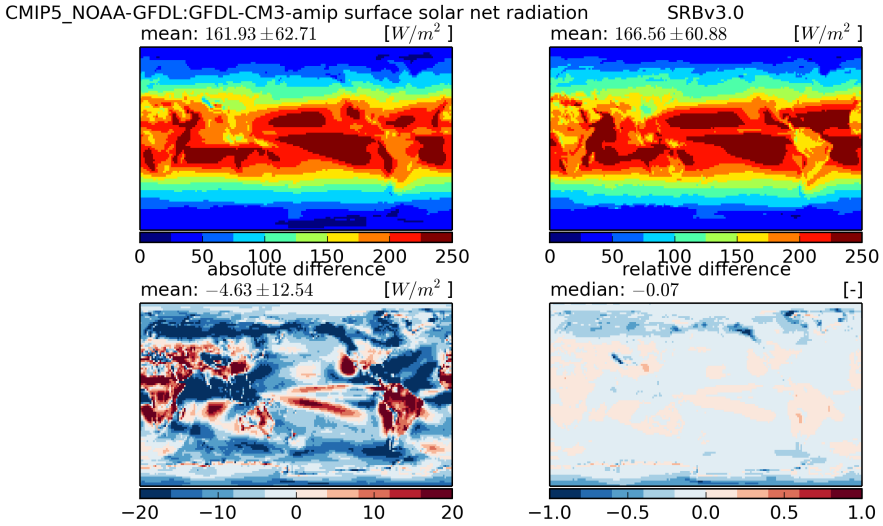



Figure 1617: Temporal mean fields (top) and absolute and relative differences (bottom)

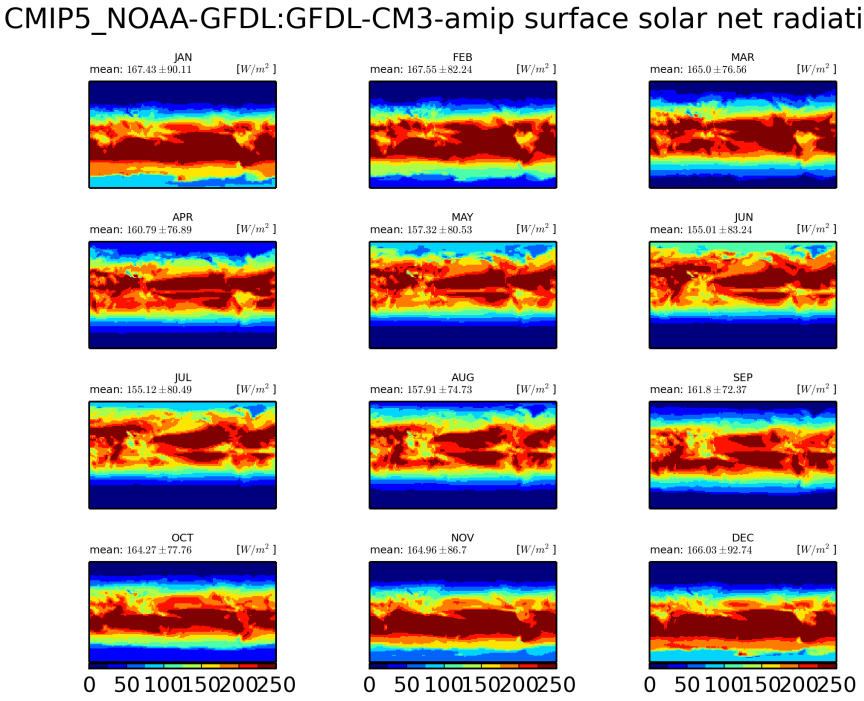



Figure 1618: Monthly mean climatology for NOAA-GFDL:GFDL-CM3

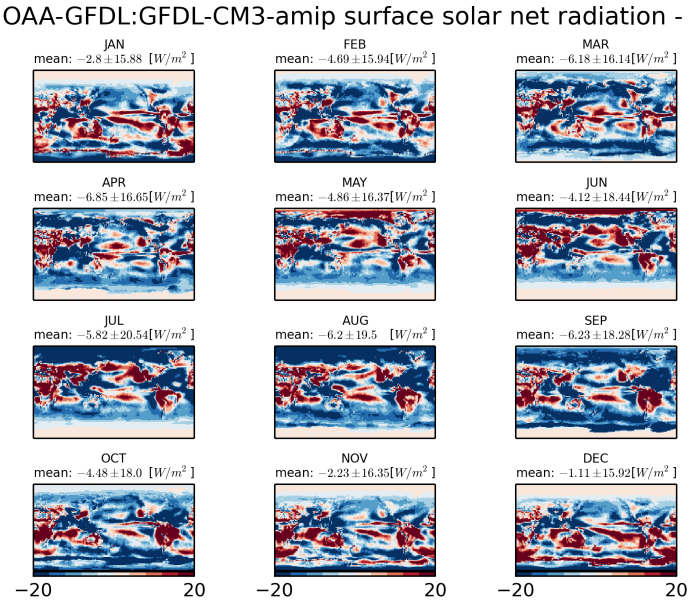



Figure 1619: Monthly mean climatology of difference between NOAA-GFDL:GFDL-CM3 and SRBV3.0

### 3.3.25 CMIP5 NOAA-GFDL:GFDL-HIRAM-C360-amip

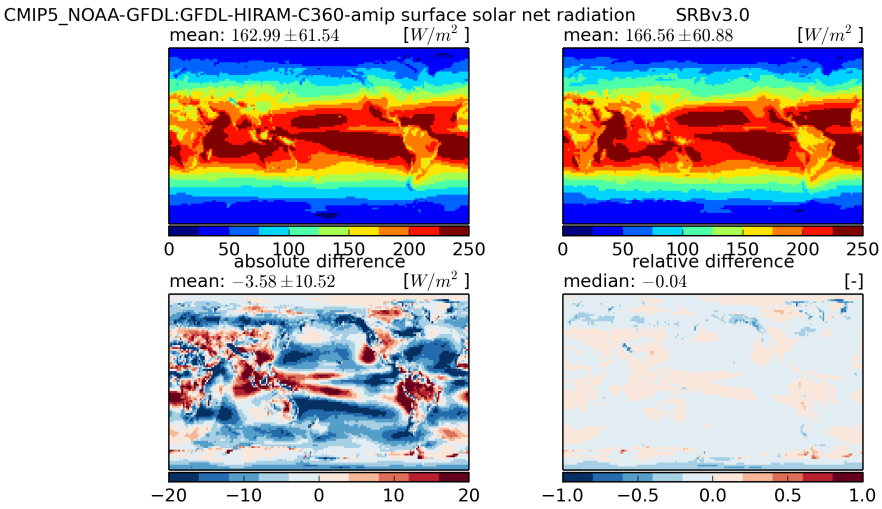



Figure 1620: Temporal mean fields (top) and absolute and relative differences (bottom)

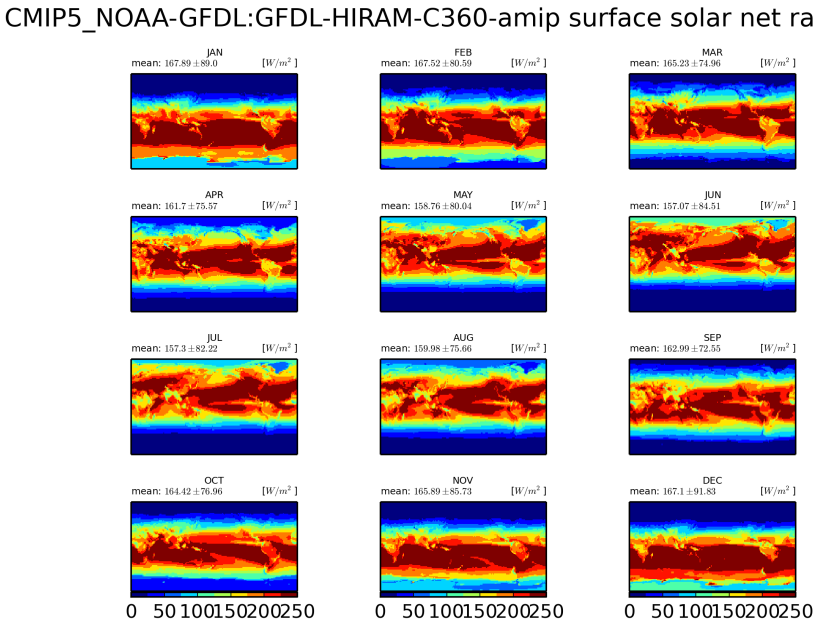



Figure 1621: Monthly mean climatology for NOAA-GFDL:GFDL-HIRAM-C360

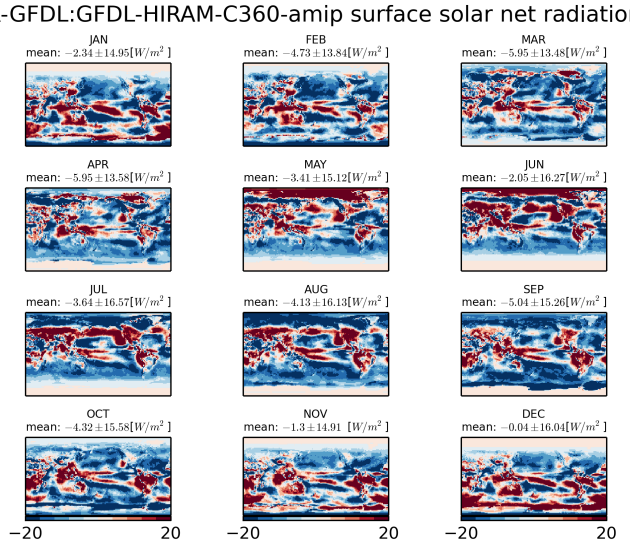



Figure 1622: Monthly mean climatology of difference between NOAA-GFDL:GFDL-HIRAM-C360 and SRBV3.0

### 3.3.26 CMIP5 NCAR:CCSM4-amip

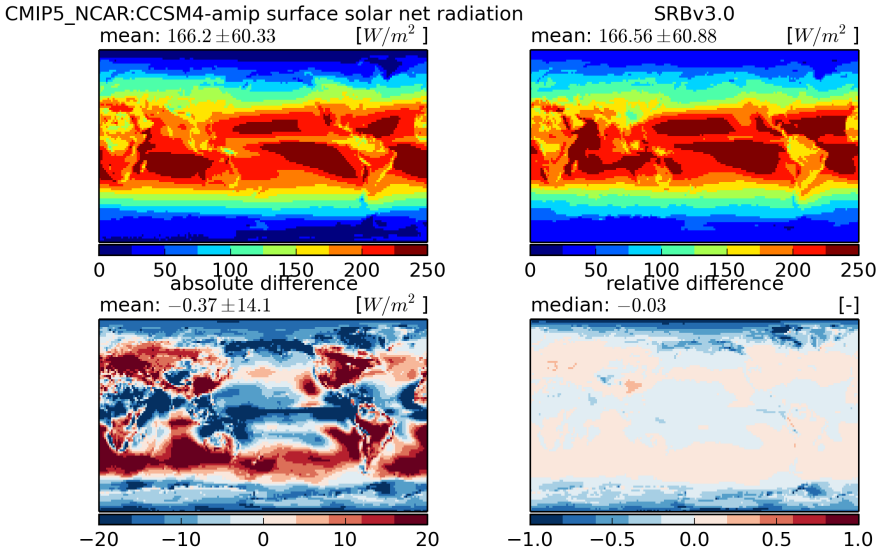



Figure 1623: Temporal mean fields (top) and absolute and relative differences (bottom)

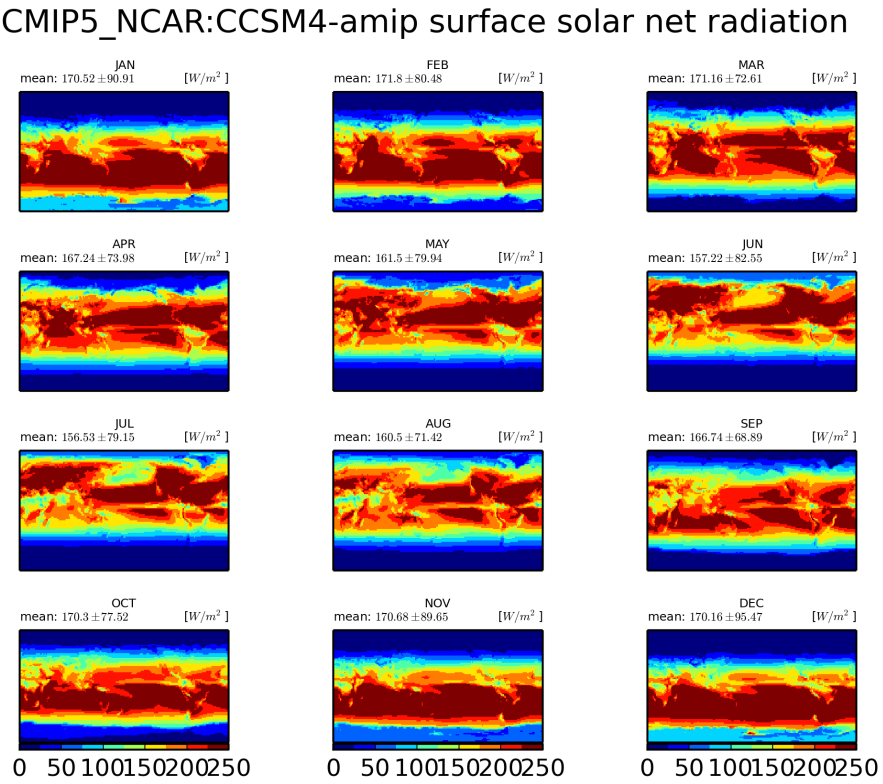



Figure 1624: Monthly mean climatology for NCAR:CCSM4

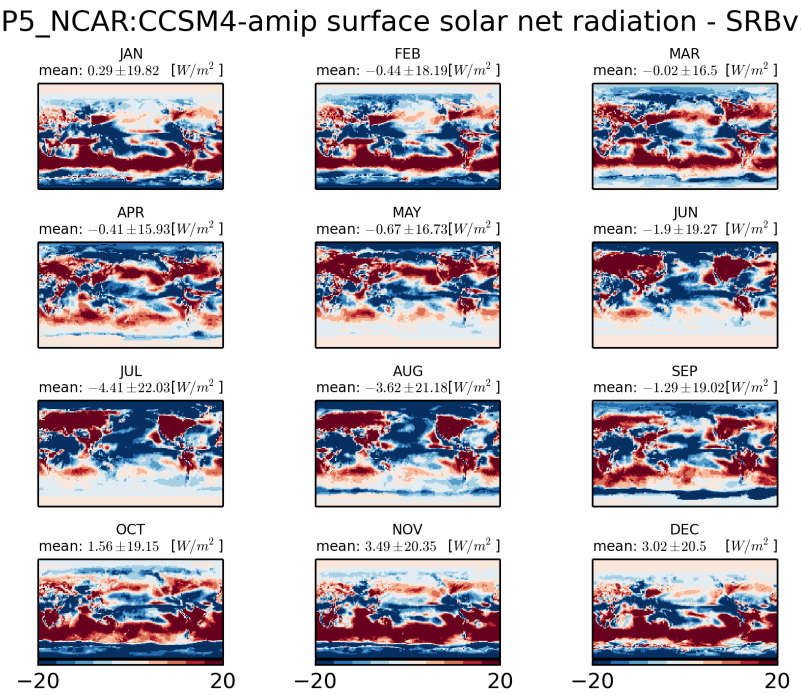



Figure 1625: Monthly mean climatology of difference between NCAR:CCSM4 and SRBV3.0

### 3.3.27 CMIP5 NCC:NorESM1-M-amip

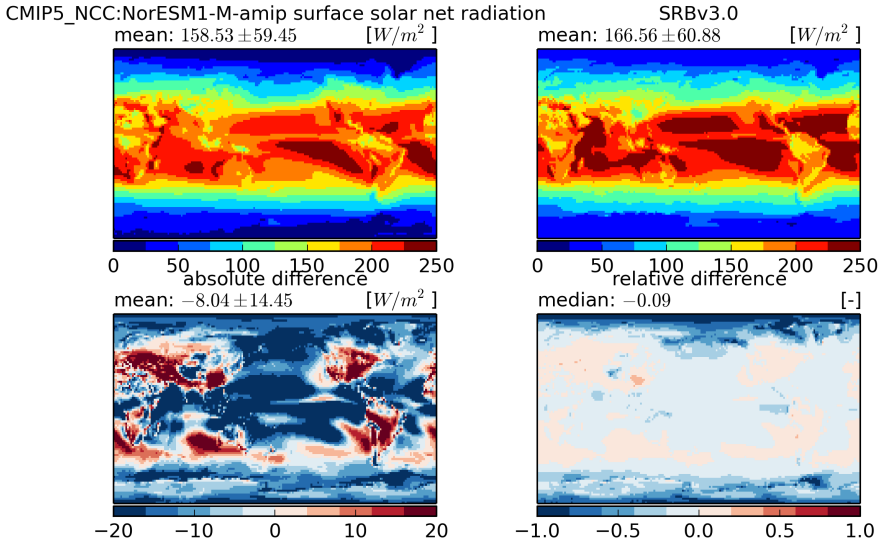



Figure 1626: Temporal mean fields (top) and absolute and relative differences (bottom)

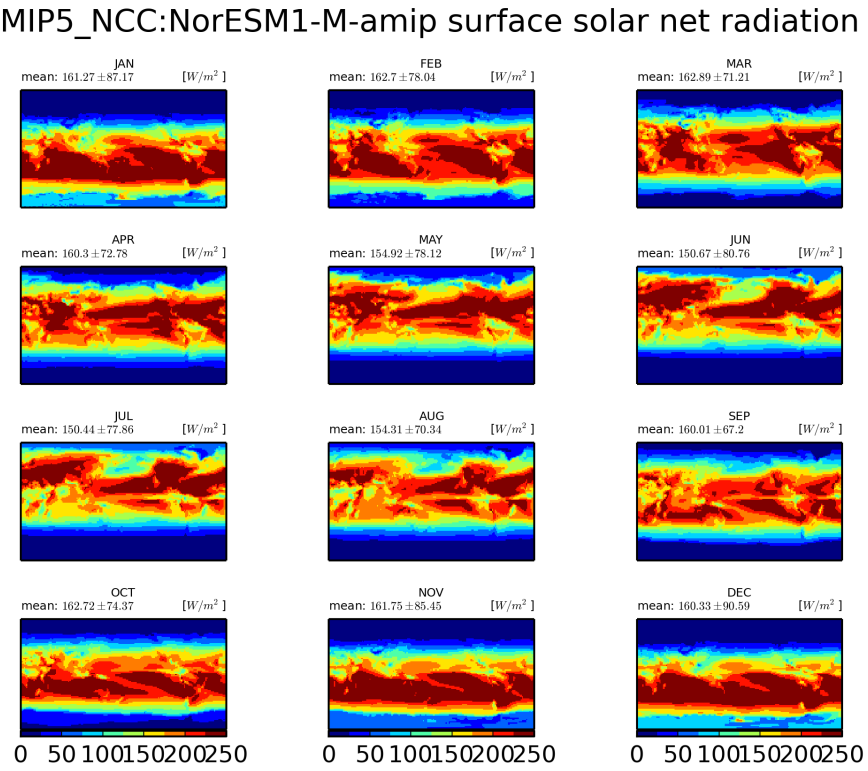



Figure 1627: Monthly mean climatology for NCC:NorESM1-M

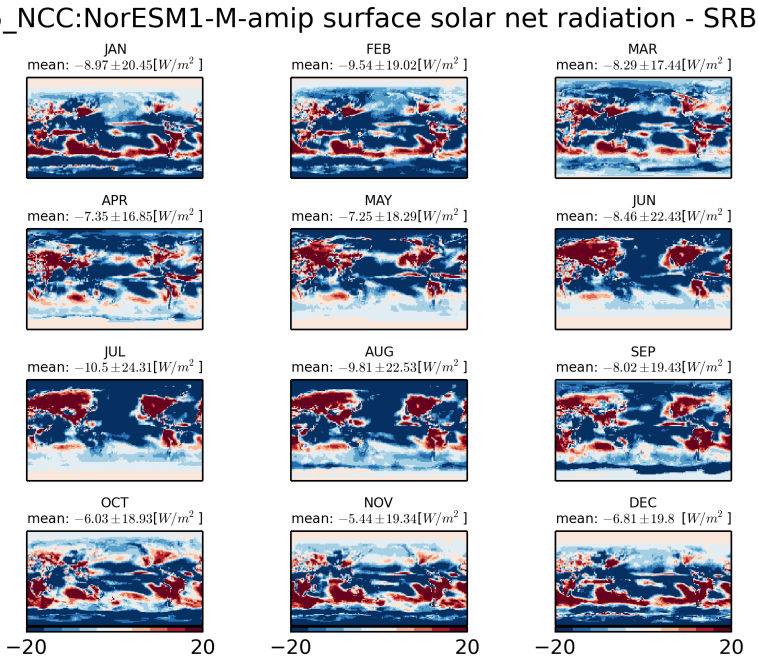



Figure 1628: Monthly mean climatology of difference between NCC:NORESM1-M and SRBV3.0

### 3.3.28 CMIP3 iap fgoals1 0 g-amip

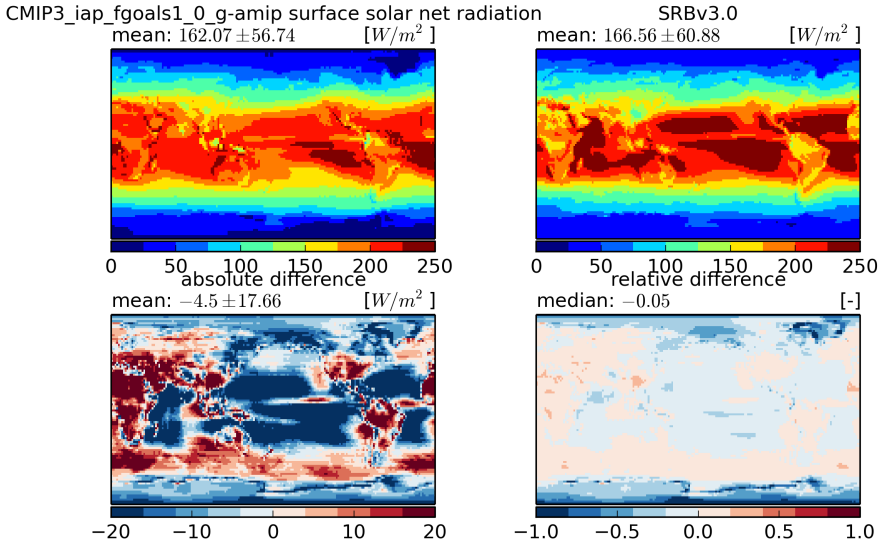



Figure 1629: Temporal mean fields (top) and absolute and relative differences (bottom)

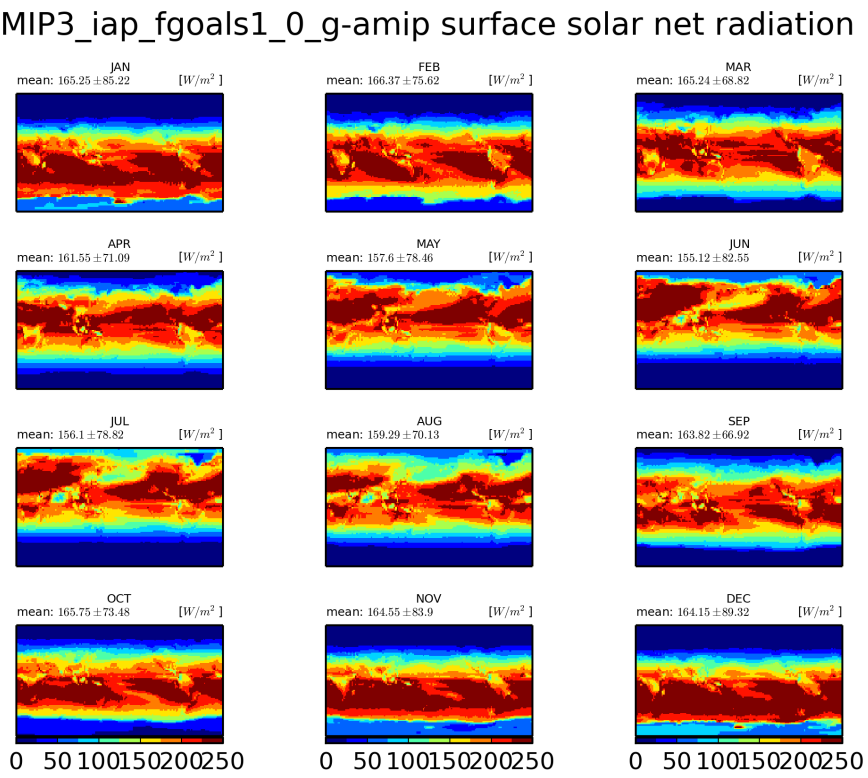



Figure 1630: Monthly mean climatology for iap-fgoals1-0-g

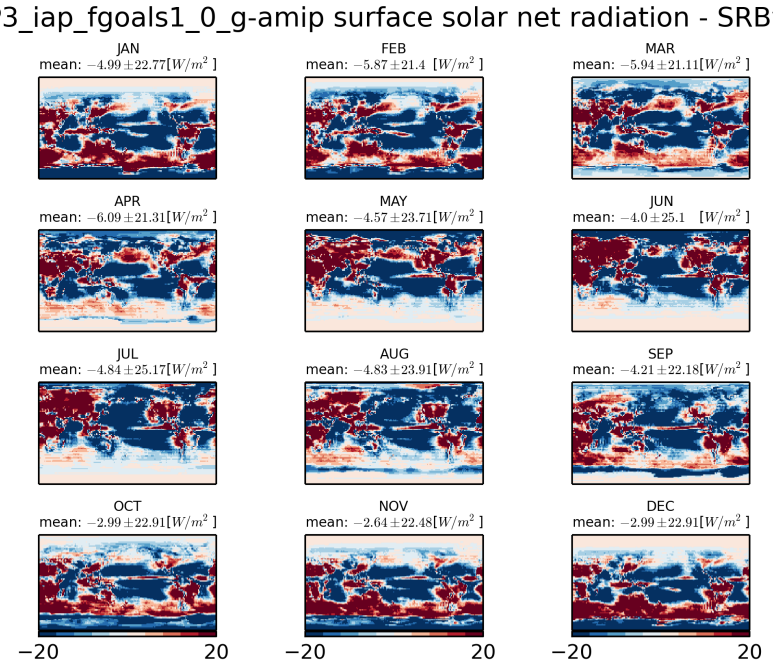



Figure 1631: Monthly mean climatology of difference between IAP-FGOALS1-0-G and SRBV3.0

### 3.3.29 CMIP3 inmcm3 0-amip

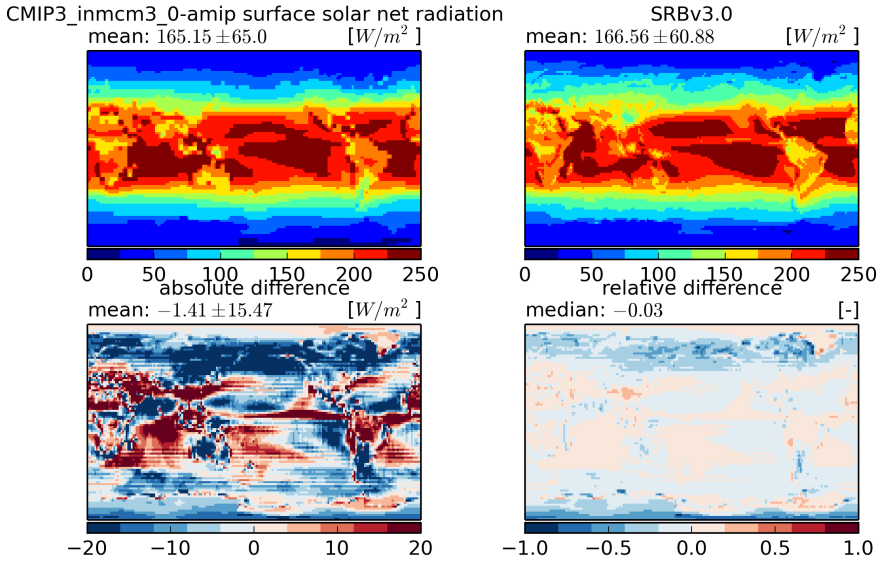



Figure 1632: Temporal mean fields (top) and absolute and relative differences (bottom)

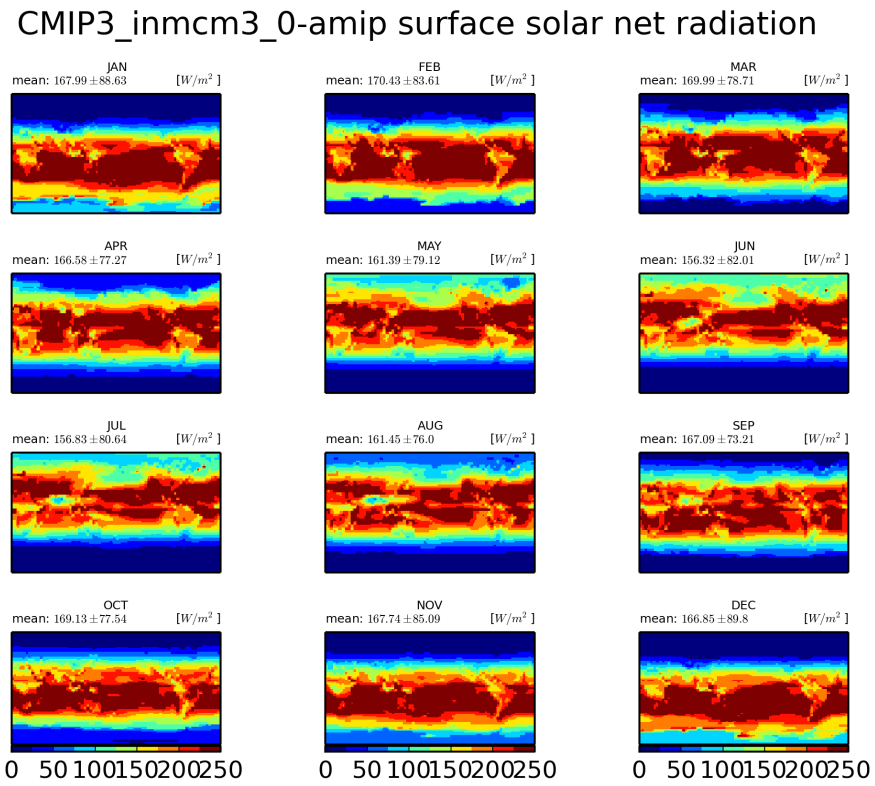



Figure 1633: Monthly mean climatology for inmcm3-0

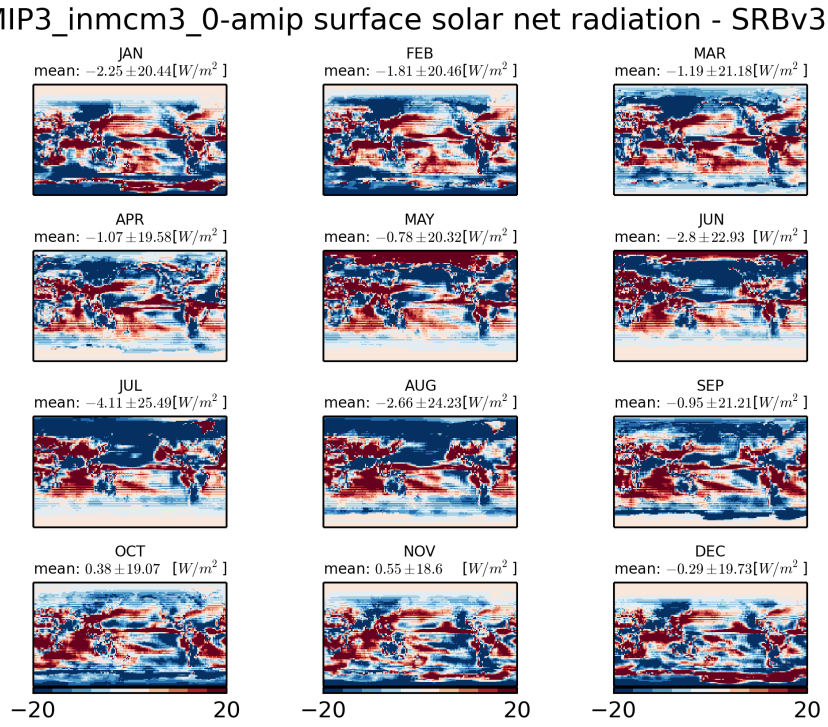



Figure 1634: Monthly mean climatology of difference between INMCM3-0 and SRBV3.0

### 3.3.30 CMIP3 ipsl cm4-amip

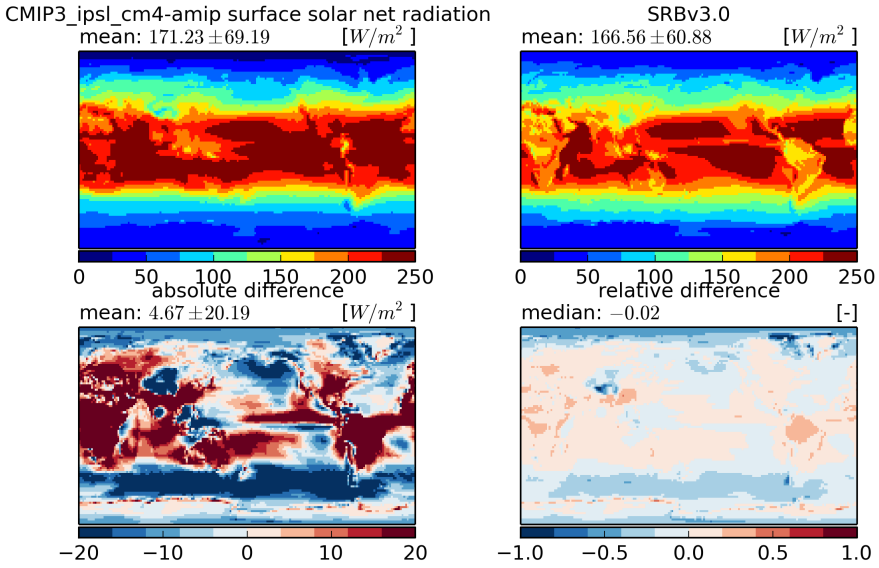



Figure 1635: Temporal mean fields (top) and absolute and relative differences (bottom)

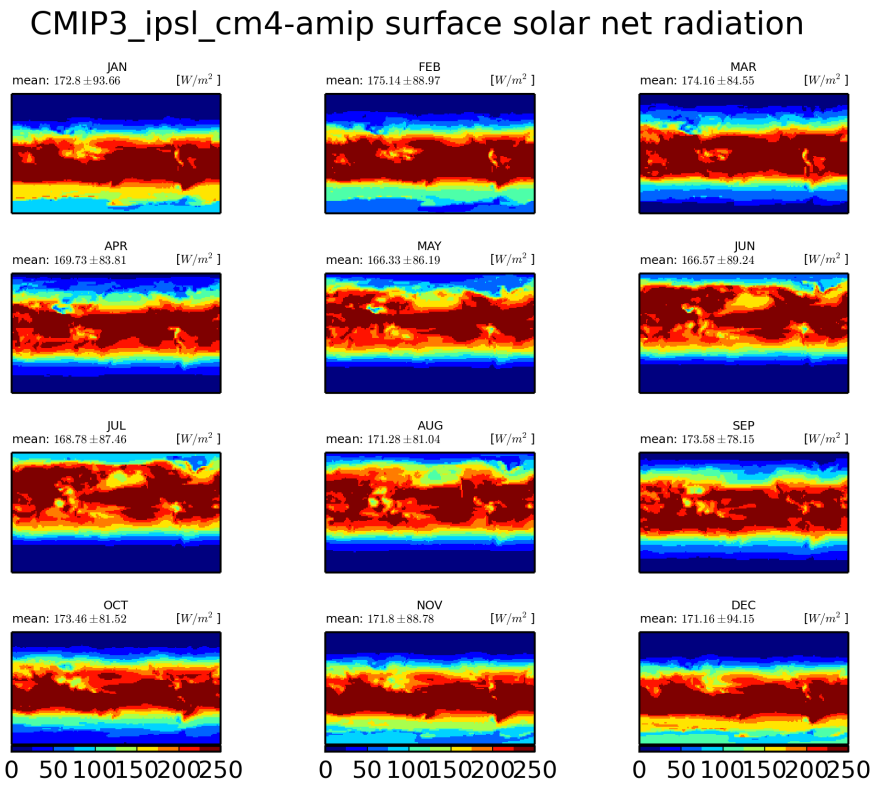



Figure 1636: Monthly mean climatology for ipsl-cm4

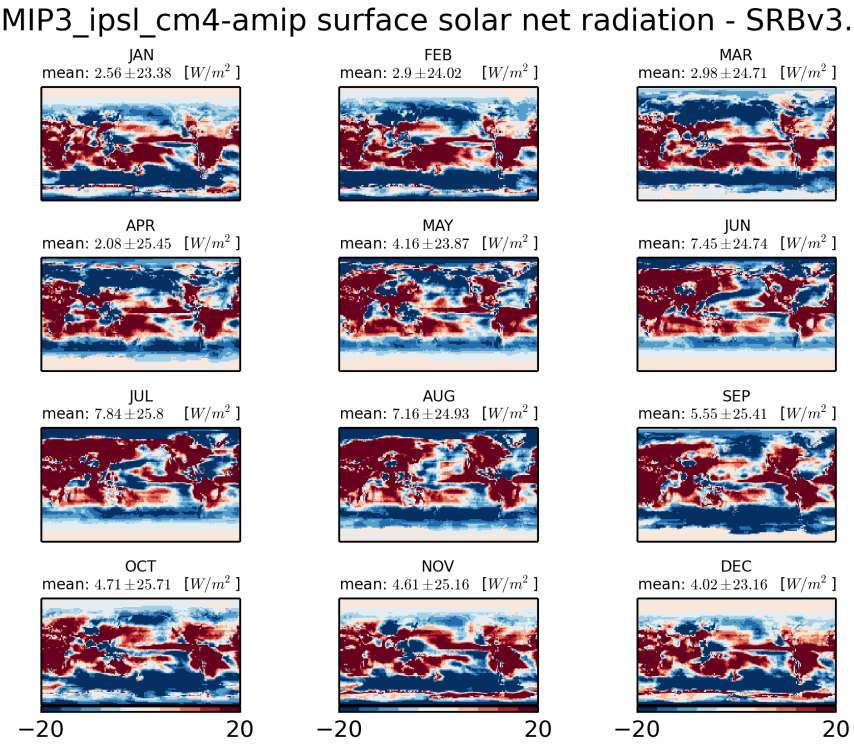



Figure 1637: Monthly mean climatology of difference between IPSL-CM4 and SRBV3.0

### 3.3.31 CMIP3 miroc3 2 hires-amip

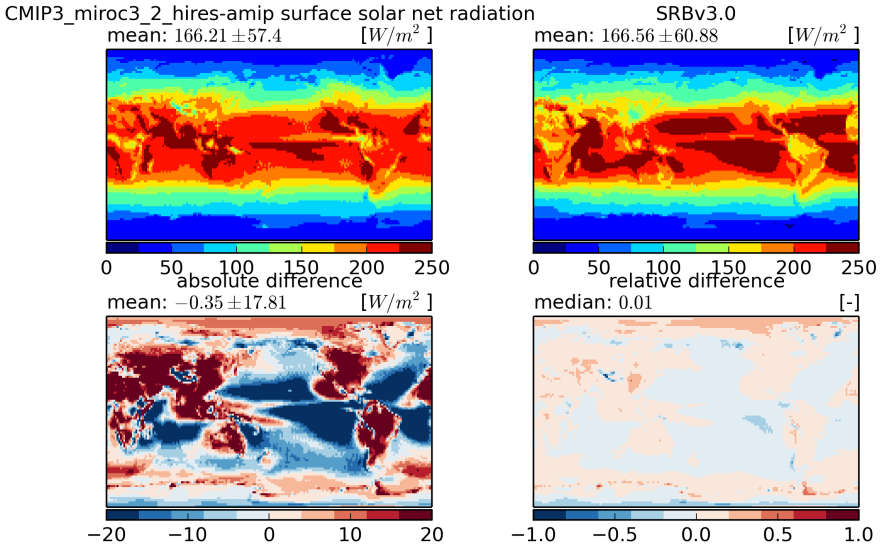



Figure 1638: Temporal mean fields (top) and absolute and relative differences (bottom)

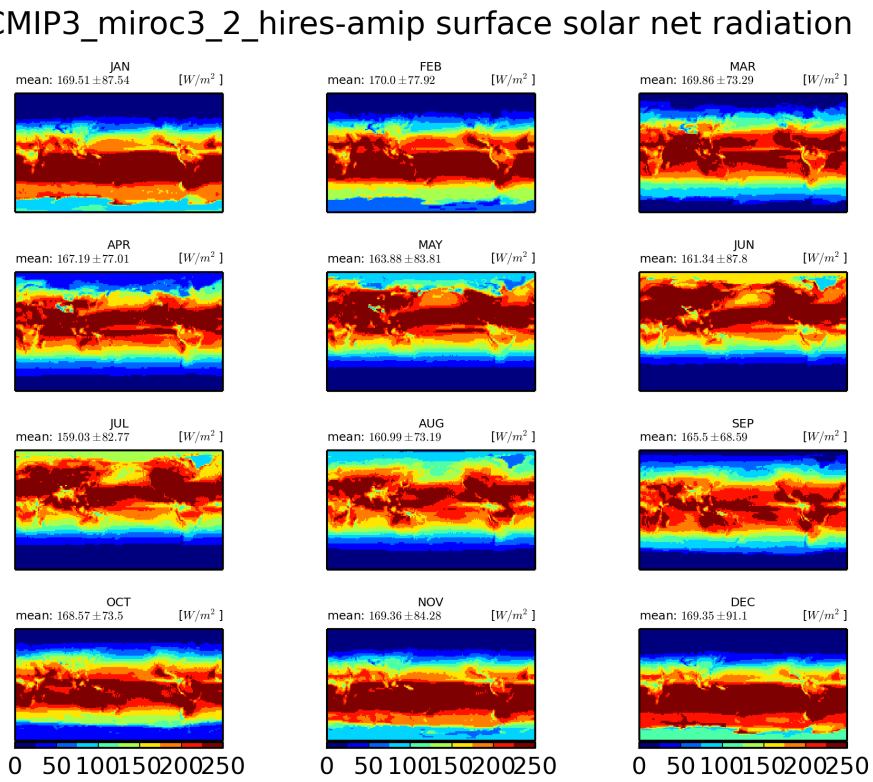



Figure 1639: Monthly mean climatology for miroc3-2-hires

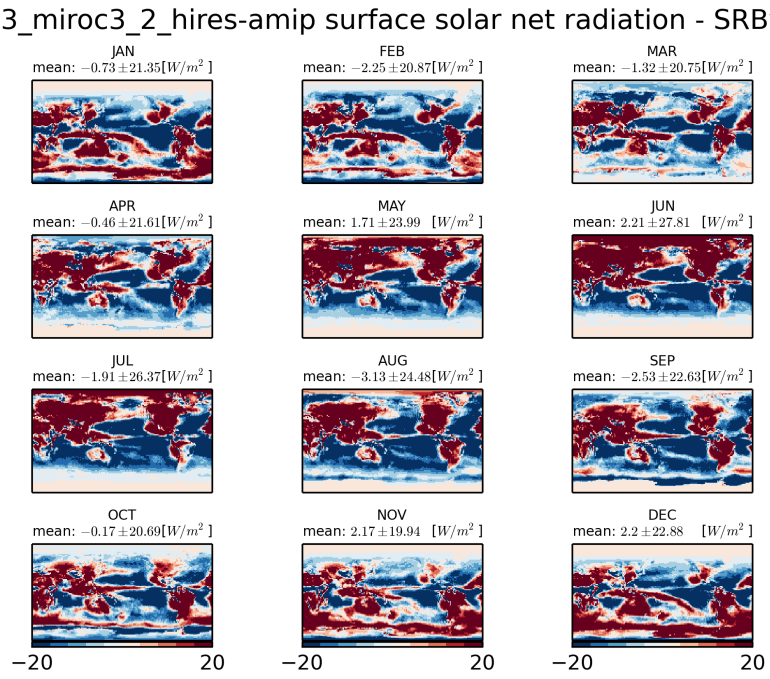



Figure 1640: Monthly mean climatology of difference between MIROC3-2-HIRES and SRBV3.0

### 3.3.32 CMIP3 miroc3 2 medres-amip

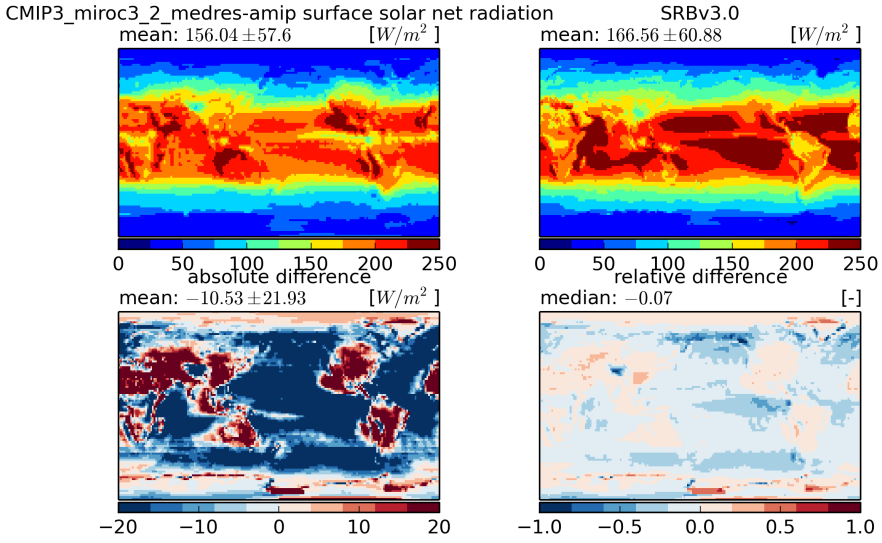



Figure 1641: Temporal mean fields (top) and absolute and relative differences (bottom)

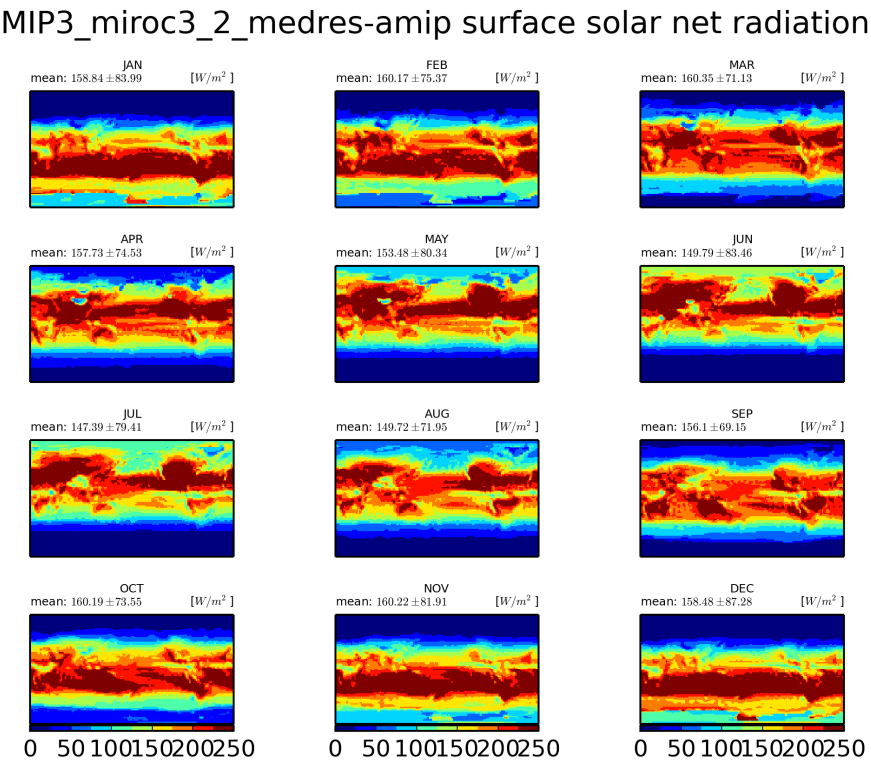



Figure 1642: Monthly mean climatology for miroc3-2-medres

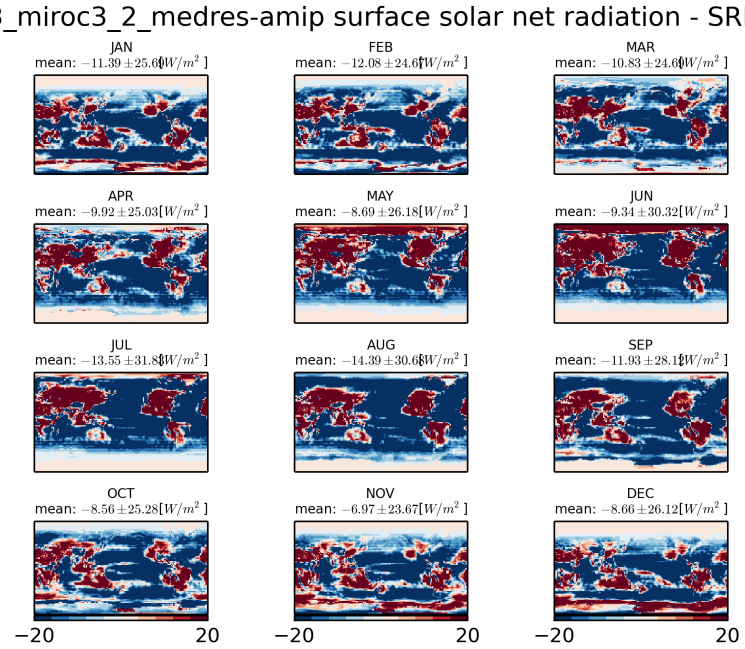



Figure 1643: Monthly mean climatology of difference between MIROC3-2-MEDRES and SRBV3.0

### 3.3.33 CMIP3 mpi echam5-amip

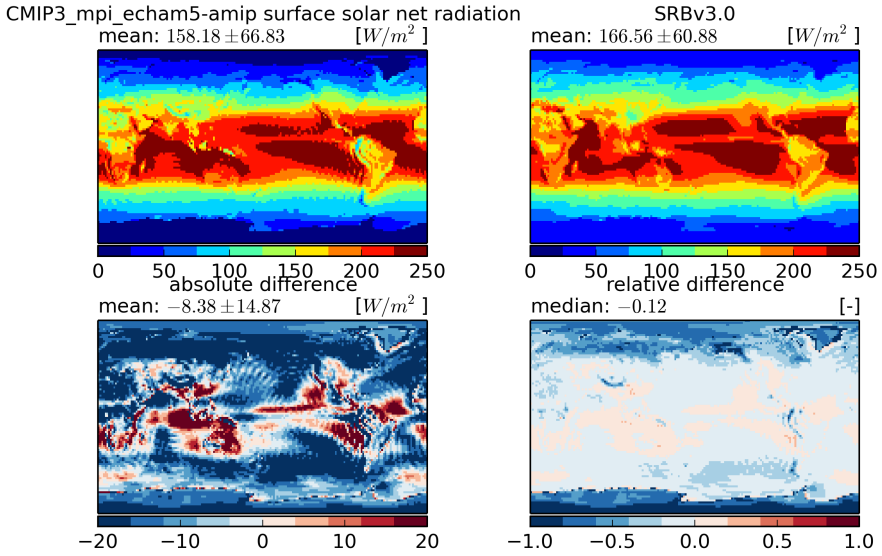



Figure 1644: Temporal mean fields (top) and absolute and relative differences (bottom)

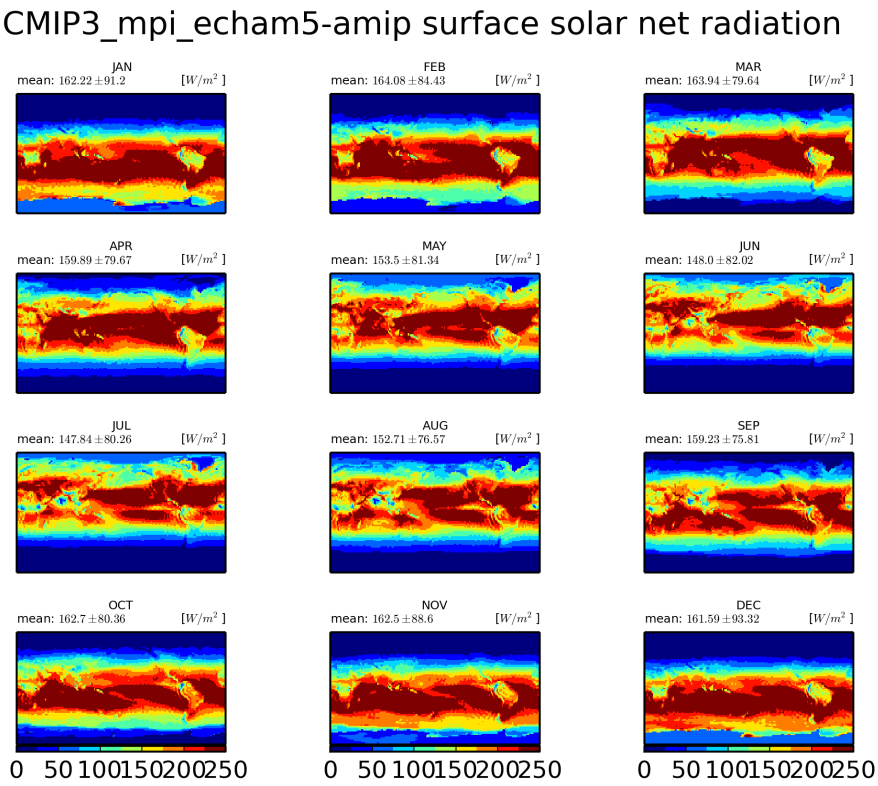



Figure 1645: Monthly mean climatology for mpi-echam5

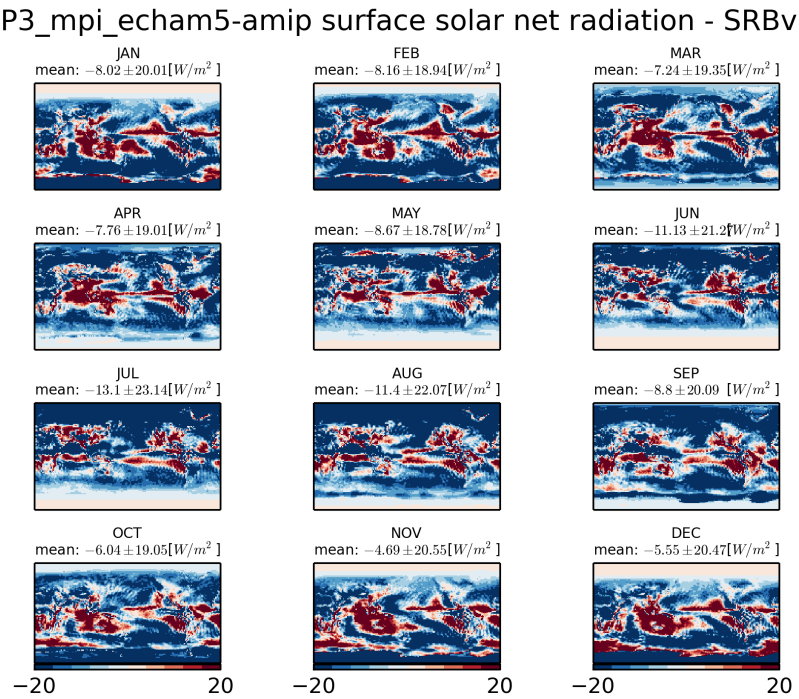



Figure 1646: Monthly mean climatology of difference between MPI-ECHAM5 and SRBV3.0

### 3.3.34 CMIP3 ncar ccsm3 0-amip

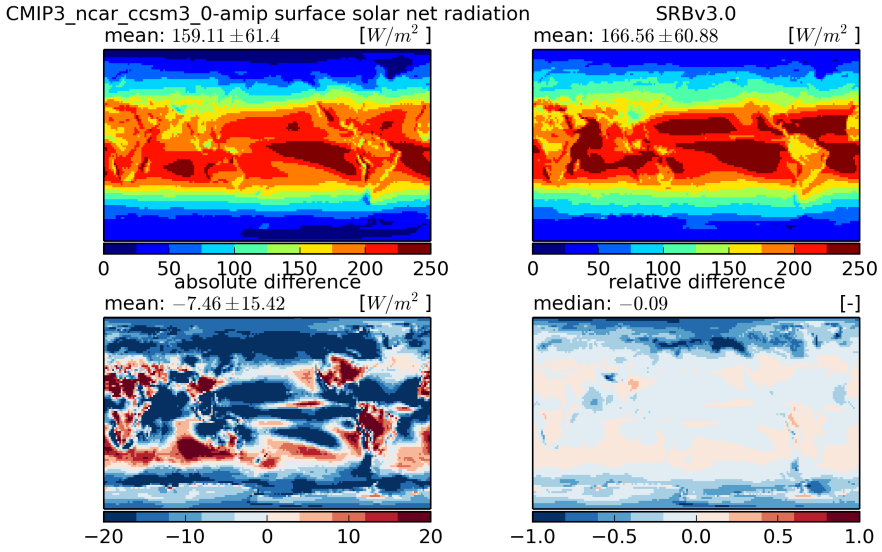



Figure 1647: Temporal mean fields (top) and absolute and relative differences (bottom)

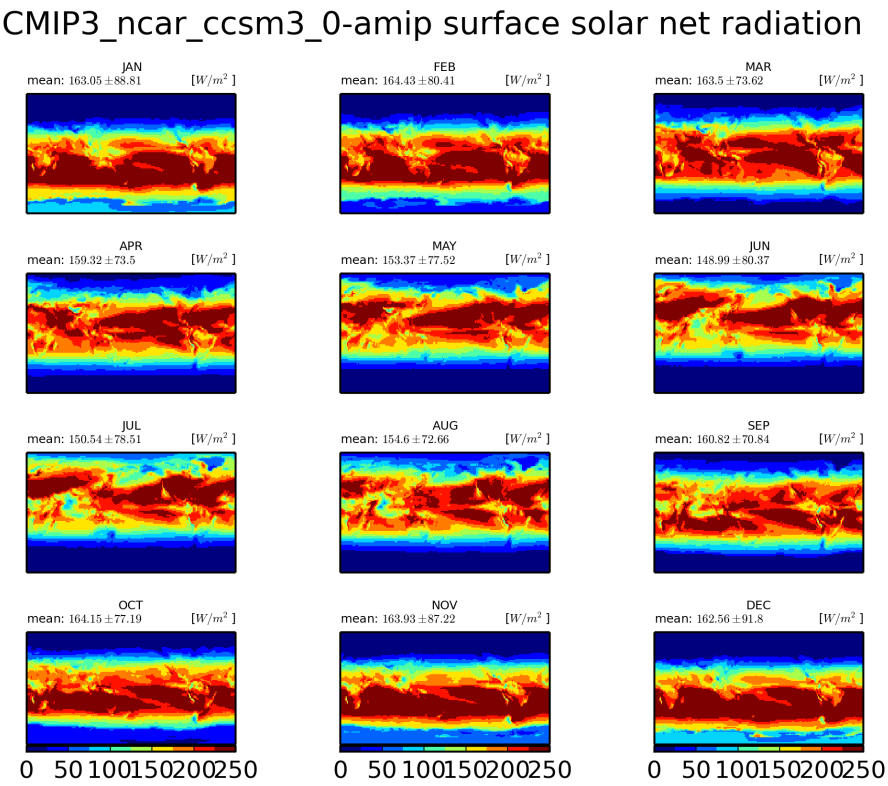



Figure 1648: Monthly mean climatology for ncar-ccsm3-0

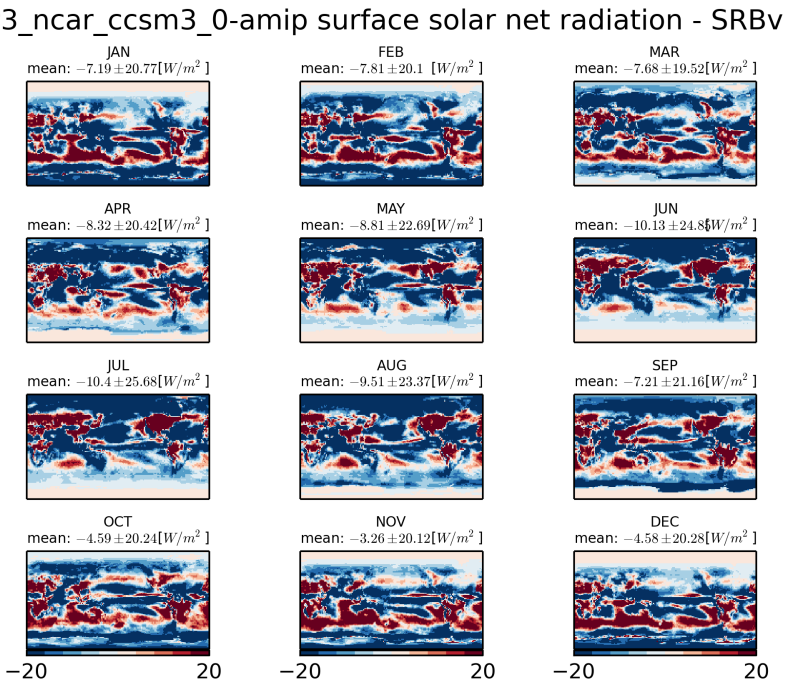



Figure 1649: Monthly mean climatology of difference between NCAR-CCSM3-0 and SRBV3.0

### 3.3.35 CMIP3 ncar pcm1-amip

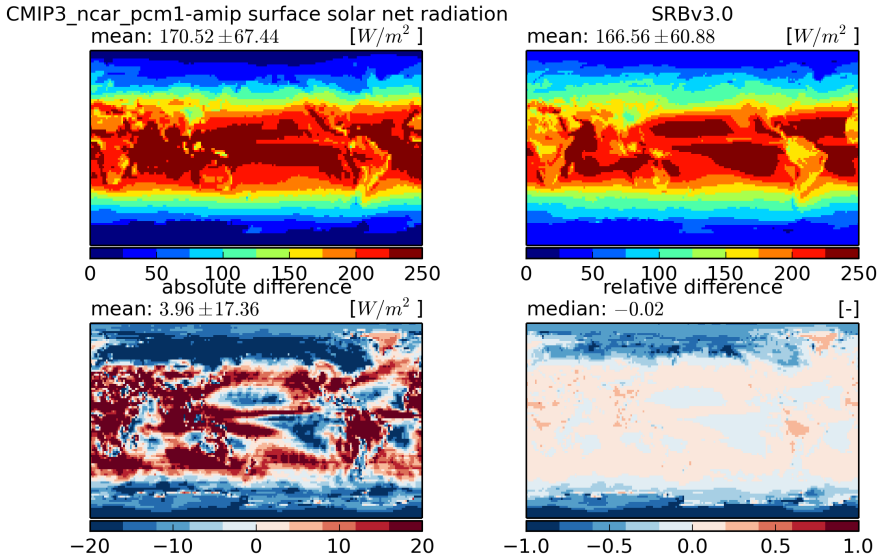



Figure 1650: Temporal mean fields (top) and absolute and relative differences (bottom)

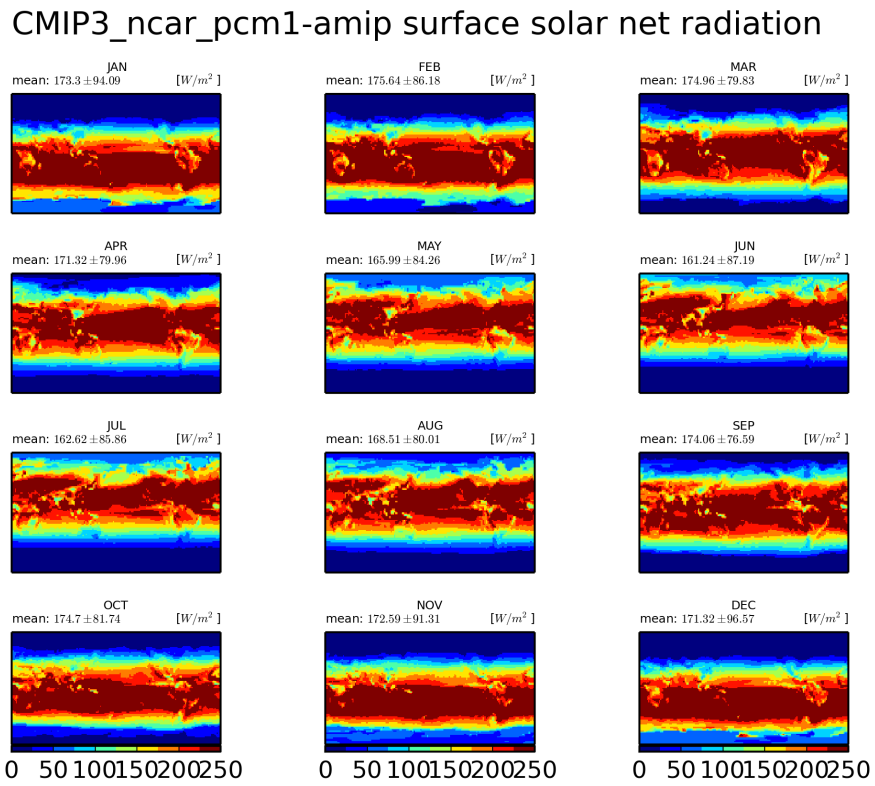



Figure 1651: Monthly mean climatology for ncar-pcm1

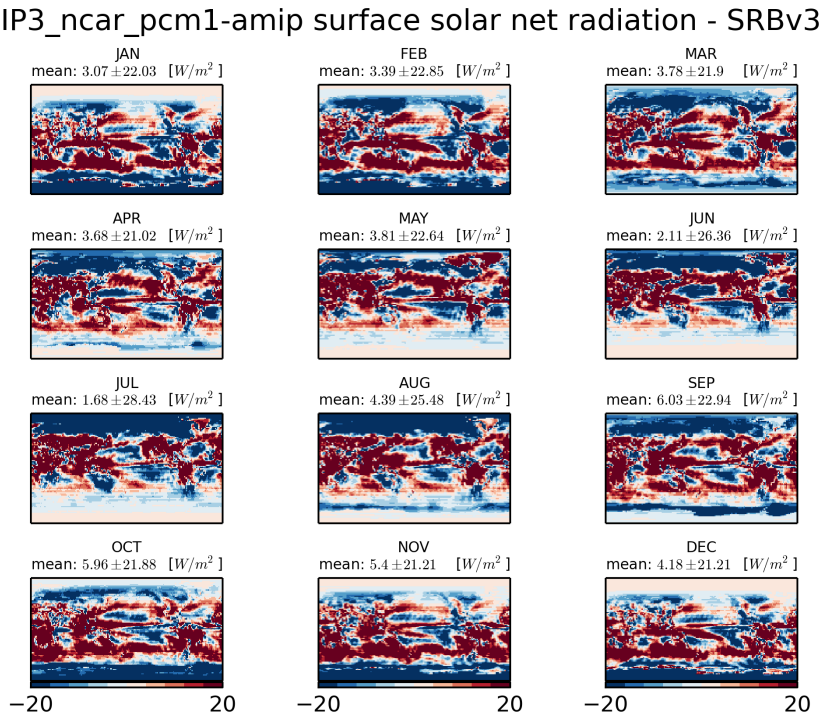



Figure 1652: Monthly mean climatology of difference between NCAR-PCM1 and SRBV3.0

### 3.3.36 CMIP3 ukmo hadgem1-amip

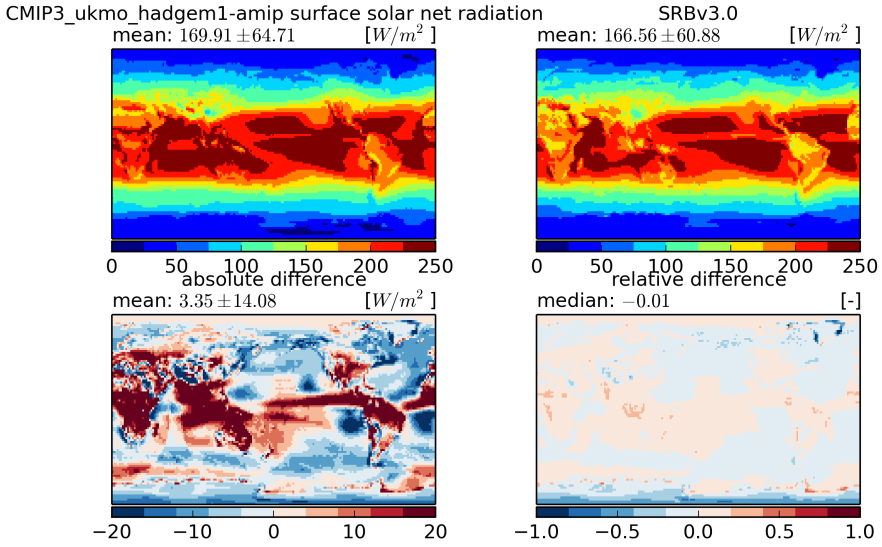



Figure 1653: Temporal mean fields (top) and absolute and relative differences (bottom)

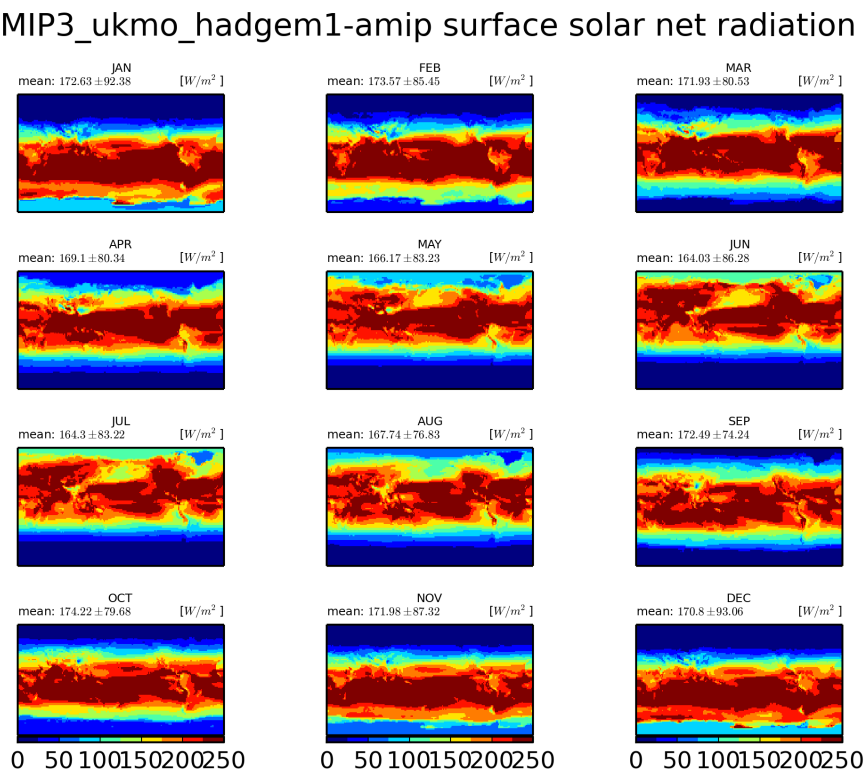



Figure 1654: Monthly mean climatology for ukmo-hadgem1

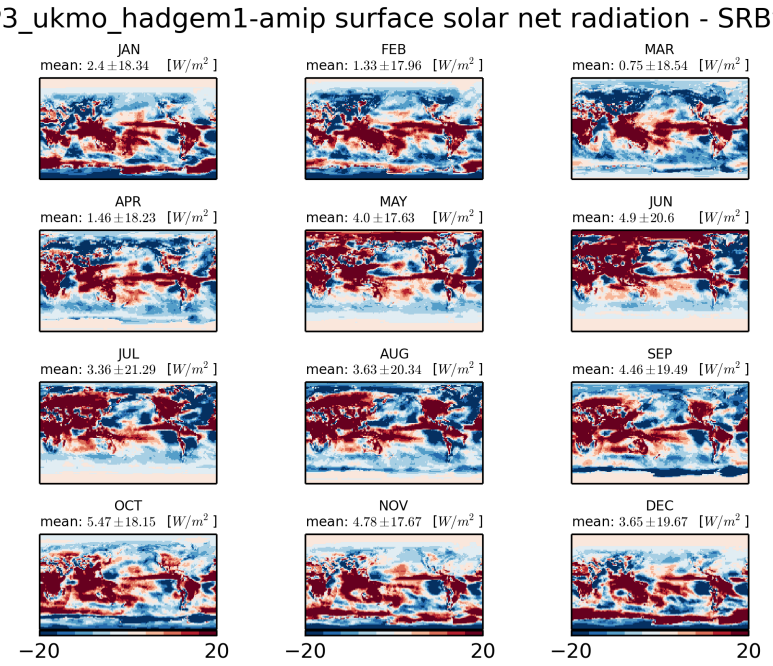



Figure 1655: Monthly mean climatology of difference between UKMO-HADGEM1 and SRBV3.0

### 3.3.37 model mean

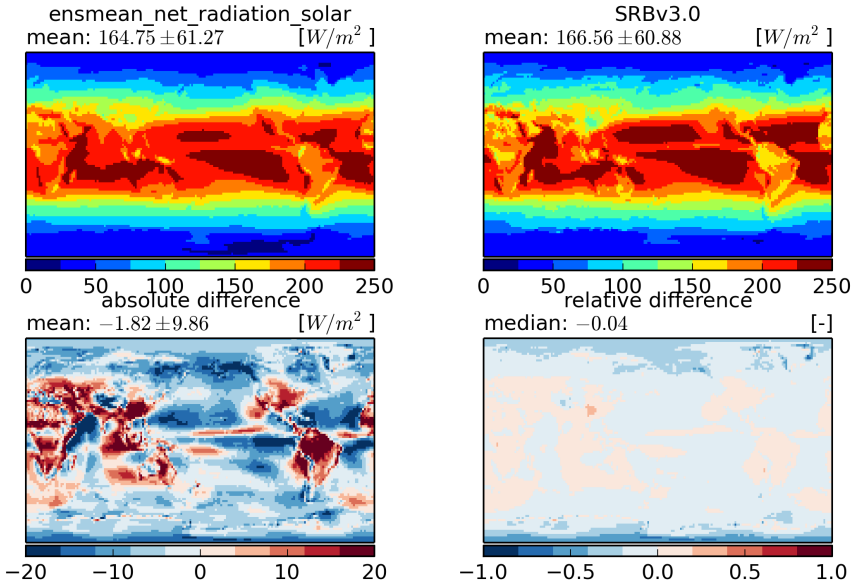



Figure 1656: Temporal mean fields (top) and absolute and relative differences (bottom)

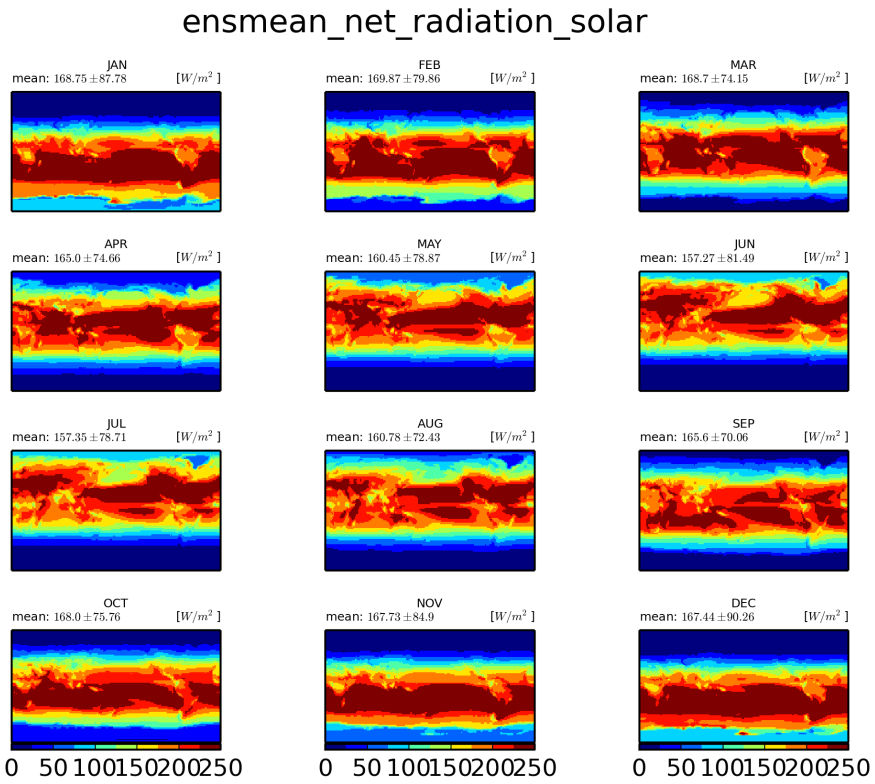



Figure 1657: Monthly mean climatology for mean-model

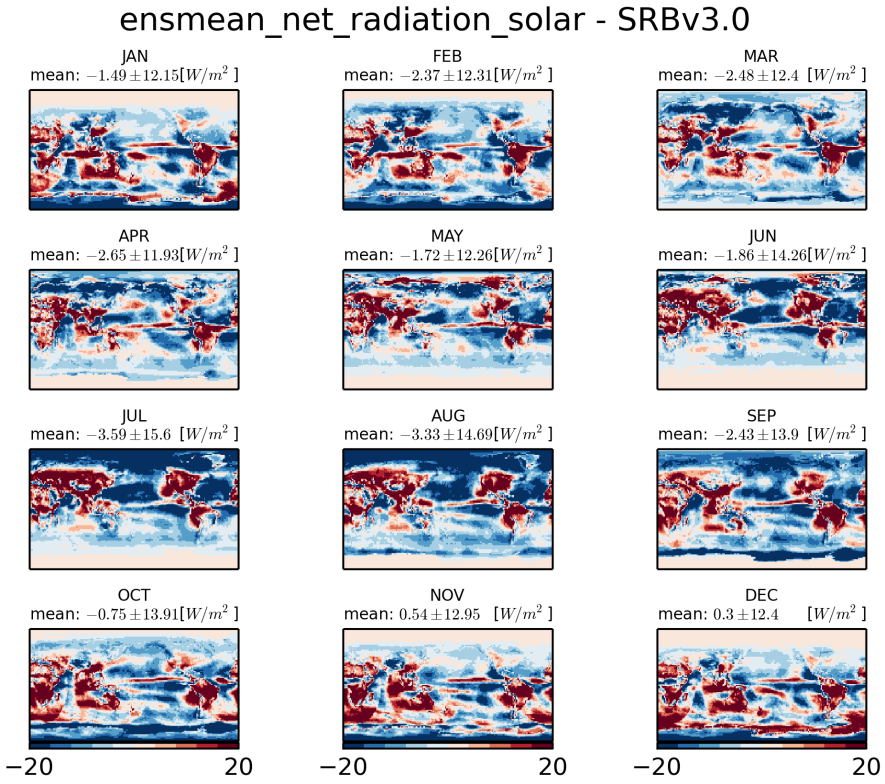



Figure 1658: Monthly mean climatology of difference between MEAN-MODEL and SRBV3.0

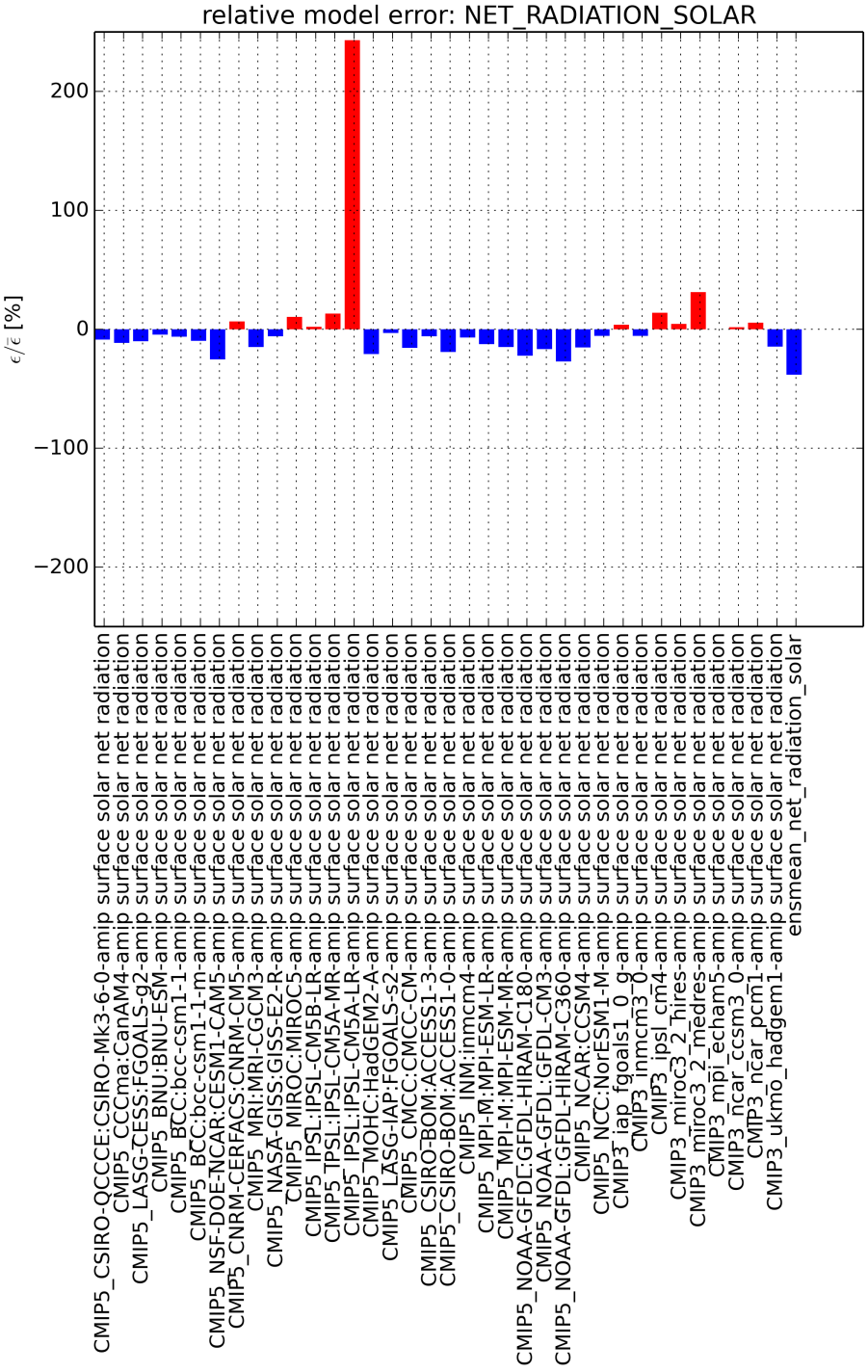



Figure 1659: Relative model performance for NET-RADIATION-SOLAR

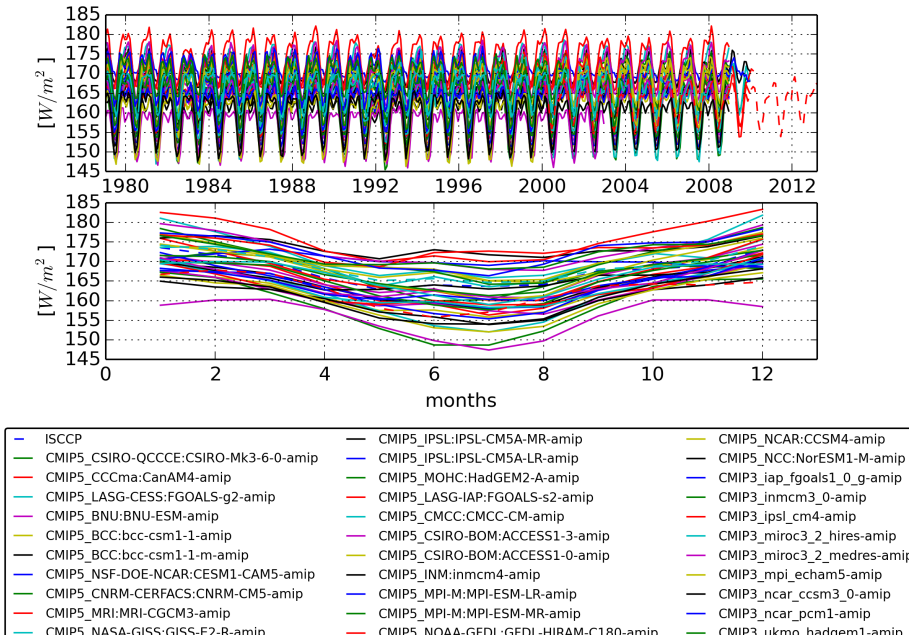



Figure 1660: Global means for NET SURFACE SOLAR RADIATION FLUX IN AIR

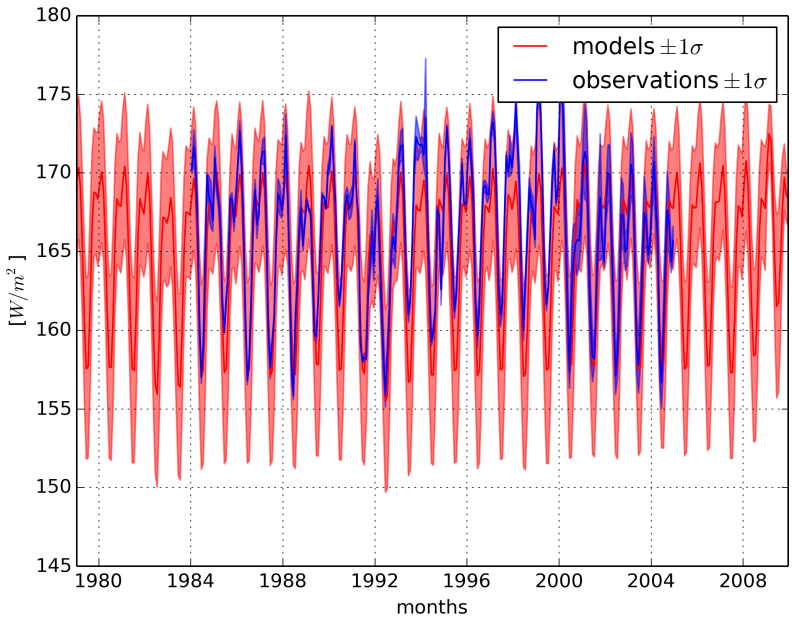



Figure 1661: Global means for NET SURFACE SOLAR RADIATION FLUX IN AIR (summary); areas indicate $\pm 1\sigma$ as derived from the ensemble of models or observations

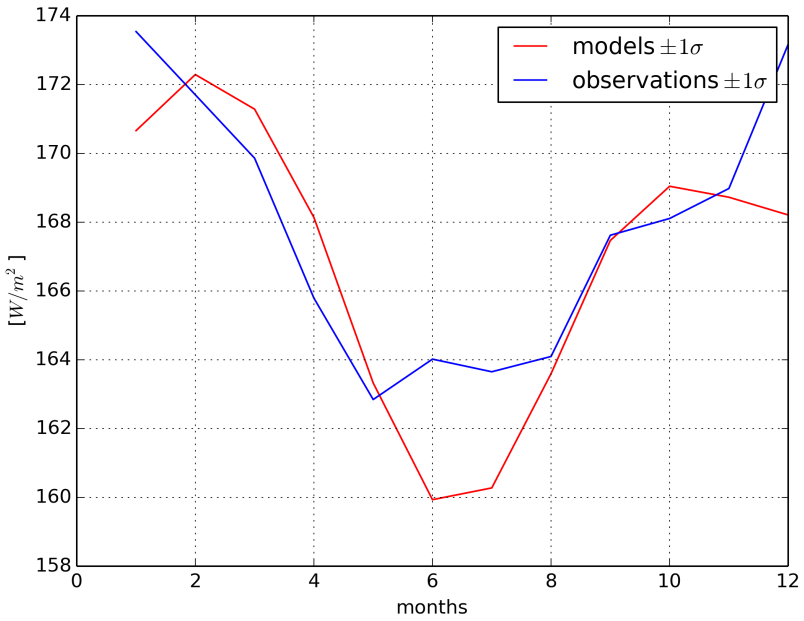



Figure 1662: Global means for NET SURFACE SOLAR RADIATION FLUX IN AIR (summary climatology)

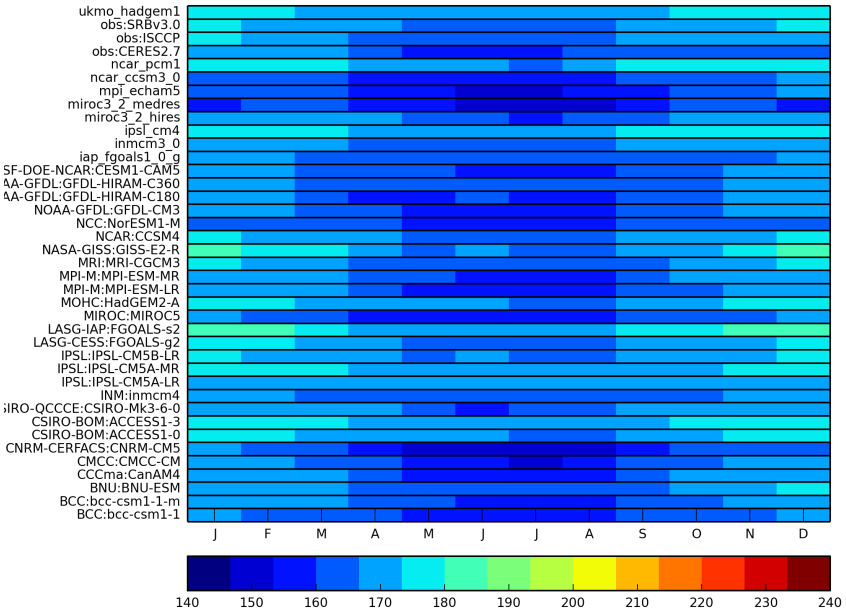



Figure 1663: Global means climatology for NET SURFACE SOLAR RADIATION FLUX IN AIR

# 4 Summary error statistics

## 4.1 Gleckler metric

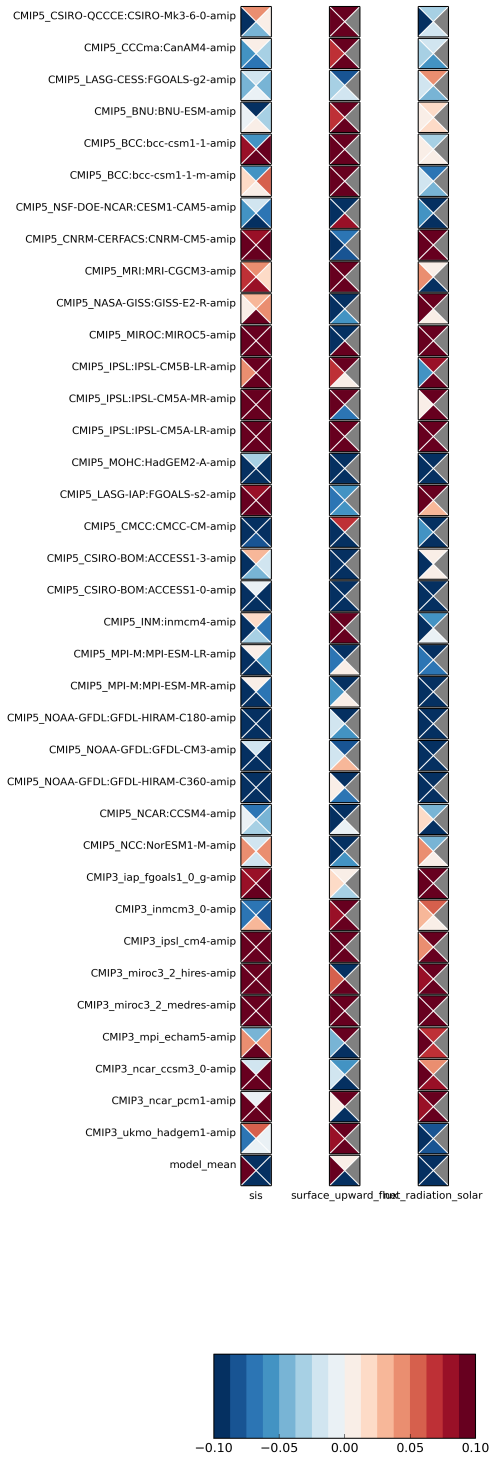
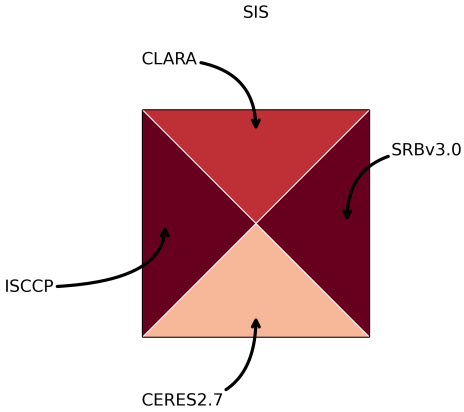
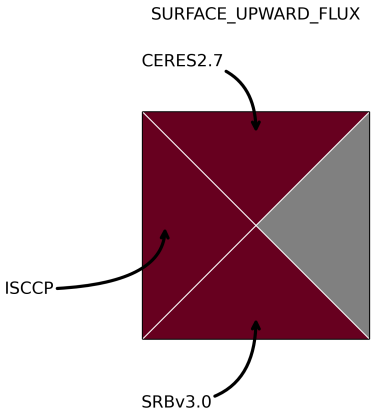
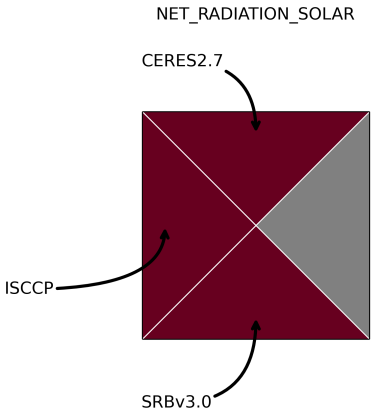



Figure 1664: Gleckler et al. (2008) model performance index


SIS
CLARA
SRBv3.0
ISCCP
CERES2.7


SURFACE_UPWARD_FLUX
CERES2.7
ISCCP
SRBv3.0


NET_RADIATION_SOLAR
CERES2.7
ISCCP
SRBv3.0

## 4.2 Model ranking consistency

### 4.2.1 SIS

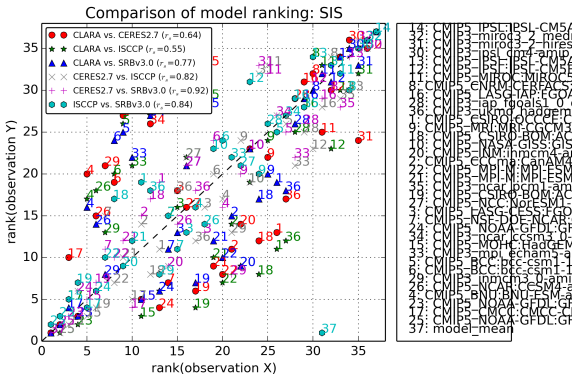



Figure 1665: Model RANKING for different observational datasets: SIS

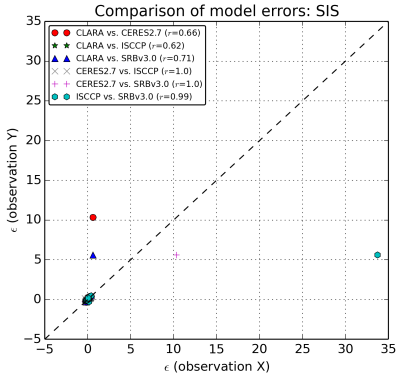



Figure 1666: Model ERROR for different observational datasets: SIS

| model | CLARA | CERES2.7 | ISCCP | SRBv3.0 |
|---|---|---|---|---|
| CMIP5-CSIRO-QCCCE:CSIRO-Mk3-6-0-amip | 26 | 13 | 11 | 19 |
| CMIP5-CCCma:CanAM4-amip | 21 | 11 | 14 | 15 |
| CMIP5-LASG-CESS:FGOALS-g2-amip | 15 | 18 | 16 | 13 |
| CMIP5-BNU:BNU-ESM-amip | 5 | 20 | 17 | 16 |
| CMIP5-BCC:bcc-csm1-1-amip | 9 | 27 | 26 | 25 |
| CMIP5-BCC:bcc-csm1-1-m-amip | 8 | 19 | 20 | 24 |
| CMIP5-NSF-DOE-NCAR:CESM1-CAM5-amip | 14 | 7 | 15 | 11 |
| CMIP5-CNRM-CERFACS:CNRM-CM5-amip | 30 | 32 | 34 | 30 |
| CMIP5-MRI:MRI-CGCM3-amip | 25 | 22 | 24 | 20 |
| CMIP5-NASA-GISS:GISS-E2-R-amip | 23 | 23 | 19 | 23 |
| CMIP5-MIROC:MIROC5-amip | 31 | 25 | 33 | 32 |
| CMIP5-IPSL:IPSL-CM5B-LR-amip | 32 | 30 | 23 | 31 |
| CMIP5-IPSL:IPSL-CM5A-MR-amip | 33 | 34 | 30 | 34 |
| CMIP5-IPSL:IPSL-CM5A-LR-amip | 37 | 37 | 37 | 37 |
| CMIP5-MOHC:HadGEM2-A-amip | 11 | 5 | **3** | 5 |
| CMIP5-LASG-IAP:FGOALS-s2-amip | 29 | 31 | 28 | 29 |
| CMIP5-CMCC:CMCC-CM-amip | **3** | 10 | 5 | 4 |
| CMIP5-CSIRO-BOM:ACCESS1-3-amip | 24 | 12 | 8 | 17 |
| CMIP5-CSIRO-BOM:ACCESS1-0-amip | 17 | 6 | 4 | 7 |
| CMIP5-INM:inmcm4-amip | 22 | 14 | 9 | 9 |
| CMIP5-MPI-M:MPI-ESM-LR-amip | 19 | 9 | 10 | 12 |
| CMIP5-MPI-M:MPI-ESM-MR-amip | 20 | 8 | 7 | 10 |
| CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-amip | 4 | **3** | **2** | **3** |
| CMIP5-NOAA-GFDL:GFDL-CM3-amip | 13 | 4 | 6 | 6 |
| CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-amip | **2** | **2** | **1** | **2** |
| CMIP5-NCAR:CCSM4-amip | 6 | 15 | 18 | 14 |
| CMIP5-NCC:NorESM1-M-amip | 16 | 16 | 22 | 21 |
| CMIP3-iap-fgoals1-0-g-amip | 28 | 29 | 25 | 26 |
| CMIP3-inmcm3-0-amip | 7 | 21 | 13 | 8 |
| CMIP3-ipsl-cm4-amip | 34 | 36 | 35 | 35 |
| CMIP3-miroc3-2-hires-amip | 35 | 24 | 32 | 33 |
| CMIP3-miroc3-2-medres-amip | 36 | 35 | 36 | 36 |
| CMIP3-mpi-echam5-amip | 10 | 28 | 21 | 22 |
| CMIP3-ncar-ccsm3-0-amip | 12 | 26 | 27 | 27 |
| CMIP3-ncar-pcm1-amip | 18 | 33 | 29 | 28 |
| CMIP3-ukmo-hadgem1-amip | 27 | 17 | 12 | 18 |
| model-mean | **1** | **1** | 31 | **1** |

Table 1: Model rankings for variable SIS

### 4.2.2 SURFACE UPWARD FLUX

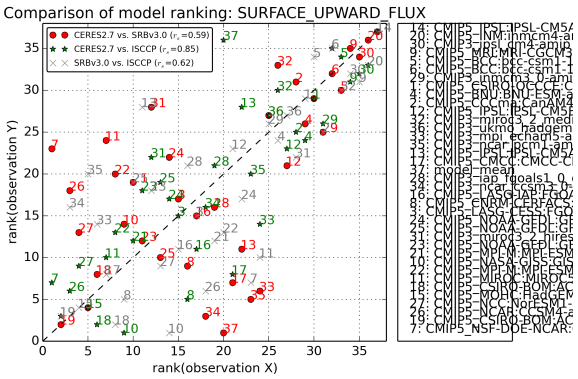



Figure 1667: Model RANKING for different observational datasets: SURFACE-UPWARD-FLUX

| model | CERES2.7 | SRBv3.0 | ISCCP |
|---|---|---|---|
| CMIP5-CSIRO-QCCCE:CSIRO-Mk3-6-0-amip | 30 | 29 | 29 |
| CMIP5-CCCma:CanAM4-amip | 28 | 31 | 25 |
| CMIP5-LASG-CESS:FGOALS-g2-amip | 15 | 17 | 15 |
| CMIP5-BNU:BNU-ESM-amip | 29 | 26 | 24 |
| CMIP5-BCC:bcc-csm1-1-amip | 33 | 30 | 34 |
| CMIP5-BCC:bcc-csm1-1-m-amip | 32 | 32 | 35 |
| CMIP5-NSF-DOE-NCAR:CESM1-CAM5-amip | **1** | 23 | 7 |
| CMIP5-CNRM-CERFACS:CNRM-CM5-amip | 16 | 9 | 5 |
| CMIP5-MRI:MRI-CGCM3-amip | 34 | 35 | 31 |
| CMIP5-NASA-GISS:GISS-E2-R-amip | 9 | 14 | **1** |
| CMIP5-MIROC:MIROC5-amip | 7 | 24 | 10 |
| CMIP5-IPSL:IPSL-CM5B-LR-amip | 27 | 21 | 23 |
| CMIP5-IPSL:IPSL-CM5A-MR-amip | 22 | 11 | 28 |
| CMIP5-IPSL:IPSL-CM5A-LR-amip | 37 | 37 | 37 |
| CMIP5-MOHC:HadGEM2-A-amip | 5 | 4 | 4 |
| CMIP5-LASG-IAP:FGOALS-s2-amip | 17 | 15 | 11 |
| CMIP5-CMCC:CMCC-CM-amip | 21 | 7 | 8 |
| CMIP5-CSIRO-BOM:ACCESS1-3-amip | 6 | 8 | **2** |
| CMIP5-CSIRO-BOM:ACCESS1-0-amip | **2** | **2** | **3** |
| CMIP5-INM:inmcm4-amip | 36 | 36 | 33 |
| CMIP5-MPI-M:MPI-ESM-LR-amip | 10 | 19 | 12 |
| CMIP5-MPI-M:MPI-ESM-MR-amip | 8 | 20 | 13 |
| CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-amip | 11 | 12 | 18 |
| CMIP5-NOAA-GFDL:GFDL-CM3-amip | 14 | 22 | 17 |
| CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-amip | 13 | 10 | 19 |
| CMIP5-NCAR:CCSM4-amip | **3** | 18 | 6 |
| CMIP5-NCC:NorESM1-M-amip | 4 | 13 | 9 |
| CMIP3-iap-fgoals1-0-g-amip | 19 | 16 | 21 |
| CMIP3-inmcm3-0-amip | 31 | 25 | 26 |
| CMIP3-ipsl-cm4-amip | 35 | 34 | 32 |
| CMIP3-miroc3-2-hires-amip | 12 | 28 | 22 |
| CMIP3-miroc3-2-medres-amip | 26 | 33 | 30 |
| CMIP3-mpi-echam5-amip | 24 | 6 | 14 |
| CMIP3-ncar-ccsm3-0-amip | 18 | **3** | 16 |
| CMIP3-ncar-pcm1-amip | 23 | 5 | 20 |
| CMIP3-ukmo-hadgem1-amip | 25 | 27 | 27 |
| model-mean | 20 | **1** | 36 |

Table 2: Model rankings for variable SURFACE-UPWARD-FLUX

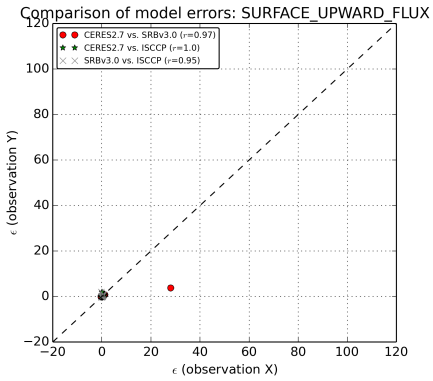



Figure 1668: Model ERROR for different observational datasets: SURFACE-UPWARD-FLUX

### 4.2.3 NET RADIATION SOLAR

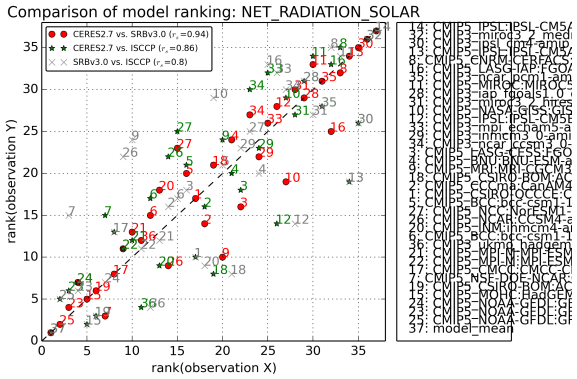



Figure 1669: Model RANKING for different observational datasets: NET-RADIATION-SOLAR

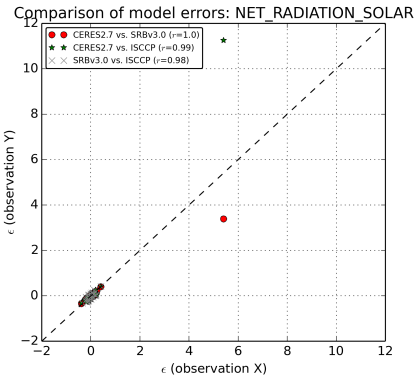



Figure 1670: Model ERROR for different observational datasets: NET-RADIATION-SOLAR

| model | CERES2.7 | SRBv3.0 | ISCCP |
|---|---|---|---|
| CMIP5-CSIRO-QCCCE:CSIRO-Mk3-6-0-amip | 17 | 17 | 10 |
| CMIP5-CCCma:CanAM4-amip | 18 | 14 | 16 |
| CMIP5-LASG-CESS:FGOALS-g2-amip | 22 | 16 | 18 |
| CMIP5-BNU:BNU-ESM-amip | 21 | 24 | 20 |
| CMIP5-BCC:bcc-csm1-1-amip | 16 | 20 | 21 |
| CMIP5-BCC:bcc-csm1-1-m-amip | 12 | 15 | 17 |
| CMIP5-NSF-DOE-NCAR:CESM1-CAM5-amip | 7 | **3** | 15 |
| CMIP5-CNRM-CERFACS:CNRM-CM5-amip | 33 | 32 | 35 |
| CMIP5-MRI:MRI-CGCM3-amip | 20 | 10 | 24 |
| CMIP5-NASA-GISS:GISS-E2-R-amip | 27 | 19 | 29 |
| CMIP5-MIROC:MIROC5-amip | 30 | 33 | 34 |
| CMIP5-IPSL:IPSL-CM5B-LR-amip | 26 | 28 | 14 |
| CMIP5-IPSL:IPSL-CM5A-MR-amip | 34 | 34 | 19 |
| CMIP5-IPSL:IPSL-CM5A-LR-amip | 37 | 37 | 37 |
| CMIP5-MOHC:HadGEM2-A-amip | 5 | 5 | **2** |
| CMIP5-LASG-IAP:FGOALS-s2-amip | 32 | 25 | 33 |
| CMIP5-CMCC:CMCC-CM-amip | 8 | 8 | 13 |
| CMIP5-CSIRO-BOM:ACCESS1-3-amip | 19 | 21 | 8 |
| CMIP5-CSIRO-BOM:ACCESS1-0-amip | 6 | 6 | **3** |
| CMIP5-INM:inmcm4-amip | 13 | 18 | 9 |
| CMIP5-MPI-M:MPI-ESM-LR-amip | 10 | 13 | 12 |
| CMIP5-MPI-M:MPI-ESM-MR-amip | 9 | 11 | 11 |
| CMIP5-NOAA-GFDL:GFDL-HIRAM-C180-amip | **3** | 4 | 6 |
| CMIP5-NOAA-GFDL:GFDL-CM3-amip | 4 | 7 | 7 |
| CMIP5-NOAA-GFDL:GFDL-HIRAM-C360-amip | **2** | **2** | 5 |
| CMIP5-NCAR:CCSM4-amip | 14 | 9 | 22 |
| CMIP5-NCC:NorESM1-M-amip | 15 | 23 | 25 |
| CMIP3-iap-fgoals1-0-g-amip | 29 | 29 | 31 |
| CMIP3-inmcm3-0-amip | 24 | 22 | 23 |
| CMIP3-ipsl-cm4-amip | 35 | 35 | 26 |
| CMIP3-miroc3-2-hires-amip | 28 | 30 | 27 |
| CMIP3-miroc3-2-medres-amip | 36 | 36 | 36 |
| CMIP3-mpi-echam5-amip | 25 | 26 | 32 |
| CMIP3-ncar-ccsm3-0-amip | 23 | 27 | 30 |
| CMIP3-ncar-pcm1-amip | 31 | 31 | 28 |
| CMIP3-ukmo-hadgem1-amip | 11 | 12 | 4 |
| model-mean | **1** | **1** | **1** |

Table 3: Model rankings for variable NET-RADIATION-SOLAR