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Precipitation intensity of East Asian summer monsoon simulated by CMIP3 models

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Precipitation intensity of East Asian summer monsoon simulated by Couple Model Intercomparison Project 3 (CMIP3) models was evaluated. Daily precipitation output data for Climate of the 20th Century experiments (20C3M) were collected from simulations of seventeen models;BCCR-BCM2.0, CCSM3, CGCM3.1(T30), CGCM3.1(T42), CNRM-CM3, CSIRO-MK3.0, ECHAM5/MPI-OM, FGOALS-g1.0, GFDL-CM2.0, GISS-AOM, GISS-ER, INGV-SXG, INM-CM3.0, MIROC3.2(hires), MIROC3.2(medres), MRI-CGCM2.3.2, PCM. We focused on two months period from June to July which is main part of summer rainy season over the East Asia. Year from 1991 to 2000 (10 years) was selected as target period of analysis. The one-degree daily precipitation data of Global Precipitation Climatology Project (GPCP) from 1979 to 2003 (7 years) were used for verification. We adopted two indices of precipitation intensity. One is Simple Daily precipitation Intensity Index (SDII) which is defined as the total precipitation in June and July divided by the number of rainy days (precipitation >= 1 mm/day). The other is the number of heavy rainfall days with precipitation greater than or equal to 30 mm/day in June and July.

Higher horizontal resolution models tend to show higher reproducibility of precipitation intensity than lower resolution model do. When models with almost same horizontal resolution are compared, the reproducibility of precipitation intensity does not depend on the use of flux adjustment. Models with higher reproducibility of precipitation intensity tend to show higher reproducibility of precipitation climatology in terms of geographical distribution and seasonal march of rain band.