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ECHAM5/MPI-OM model simulations of East Asian monsoon intensity in IPCC SRES Scenerios

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The ECHAM5 atmospheric model coupled to the MPI-OM ocean model has been used to simulate the 20th century climate using historical greenhouse gas and sulfate aerosol forcing. This simulation was extended through the 21st century under three IPCC SRES scenarios A2, A1B and B1. Results are presented from small ensembles of three members for each scenario with the main focus on annual and seasonal surface temperature and precipitation over the East Asia monsoon region. The analyses were performed for two 30-year time slices, representing the present-day climate (1961-1990) and the future climate (2071-2100), respectively.

In the East Asian region (10°-40°N, 100°-130°N), the projected surface warming from 2001 to 2100 is 4.4°C under the scenario A2, 4.3°C under the scenario A1B and 2.5°C under the scenario B1. The regional precipitation changes are relatively small (less than 10%) in the annual mean. In winter (DJF), the mean precipitation increases in the north and decreases in the south of the region. In summer (JJA), on the other hand, precipitation decreases in the north of the region but increases in the south. The pattern of the response is very similar in all three scenarios.