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The East Asian Summer Monsoon at mid-Holocene: Results from PMIP3 simulations

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Ten Coupled General Circulation Models (CGCMs) participating the third phase of Paleoclimate Modeling Intercomparison project (PMIP3) are assessed for the simulations of East Asia Summer Monsoon (EASM) at both the present climate and mid-Holocene. Results show that the PMIP3 model median well captures the characteristics of the EASM, including the two distinct features of the Meiyu Front and the stepwise meridional displacement of the monsoon rainbelt. At mid-Holocene, the enhanced EASM is simulated by the PMIP3 models. The model median shows that the changes of surface air temperature and precipitation are within the range as indicated by the proxy data over the eastern China. Both the changes of monsoonal circulation and the water vapor content favor the increasing of summer precipitation. Regional features can be identified between models because of their different simulations of the above changes. The model spread for the surface air temperature (TAS) is relatively smaller when compared with that of PMIP2 models in both the Northern Hemisphere and the eastern China. However, the model spread of summer precipitation is larger among PMIP3 models, particularly in the lower reaches of Yangzi River. The TAS over Tibetan Plateau has a positive relationship with the precipitation in the lower reaches of Yangzi River, yet this relationship does not apply for those PMIP3 models in which the monsoonal precipitation is more sensitive to the changes of large-scale circulation.