

Simulation and Projection of Blocking Highs Influencing East Asia by CMIP5 Models

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Atmospheric blocking as simulated by 13 models from phase 5 of the Coupled Model Intercomparison Project (CMIP5) were analyzed over key regions (Ural, Baikal, and Okhotsk regions) where blocking influence climate extraordinarily in East Asia. From the aspect of blocking days by the distribution of seasonal variation characteristics, it is found that patterns simulated by 13 CMIP5 models of winter half year is obviously superior to the ability of that in the summer half year. Results of multimodal ensemble average show that compared to results analyzed by NCEP/NCAR reanalysis data, blocking days are underestimated and overestimated in the Ural mountains and the sea of Okhotsk region respectively. Throughout Asia high resistance area (40 ° E - 160 ° E), the model set simulation between June and August are less. Taylor figure quantitatively reveals that the ability of simulating the high number of longitudinal distribution pattern in winter half year is better than that in summer half year for most of these 13 models, especially the BCC - csm1.1, CanESM2, CCSM4, CNRM CM5, GFDL ESM2G model. Projection of CMIP5 models indicates that blocking frequencies are higher in RCP 8.5 integrations than that in RCP 4.5 for 2006-2100, RCP 8.5 of blocking frequency exhibited significant increasing trend in summertime over Ural and Baikal regions during the latter part of the 21st century.

Key words: Blocking high; CMIP5; coupled climate models; projection; simulation