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Simulation and Improvement of Common Land Model on the Bare Soil of Loess Plateau Underlying Surface

zhenchao li and Zhigang Wei

Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, Lanzhou, China (zhenchaoli@lzb.ac.cn)

Climate model has become an irreplaceable tool for the study and prediction of climate changes. As one of the factors that affects climate changes, the land surface process model, which needs to be considered for any climate model, is a crucial point for research and development. To improve the simulative ability of land surface models is an important way of improving climate model. The paper make use of the LOPEX experiment data to drive the Common Land Model (CoLM), so as to simulate the characteristics of land surface processes of the Loess Plateau. Furthermore, the simulative performance of CoLM in the Loess Plateau region was examined through a comparison between the field observation data and simulated results. The result has indicated to us that, CoLM can be used to perfectly simulate net radiations and net short-wave radiations. However, the simulated land-surface temperature is slightly higher than actual measured value, while the simulated soil temperature value in lower layers (5cm, 10cm, 20cm, 40cm) is comparatively smaller with a certain retardation phenomenon. Moreover, the simulated sensible heat flux is a little larger, while the simulated soil thermal conductivity in the model is obviously lower. Through modifying the calculation plan of soil thermal conductivity, the simulated result has been greatly improved. As a whole, when applying CoLM in the loess plateau of Northwestern china, we will have to improve the parameterization of soil thermal conductivity, so as to improve its simulative capacity in the Loess Plateau regions.