

Impacts of Land Surface Process on the simulation of Heavy Rainfalls over Korean Peninsula

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In this study, the impacts of land surface process on the numerical simulation of heavy rainfalls are investigated using meso-scale model (MM5). To examine the impacts of land surface process, three types of experiment are performed using the five-layer soil model, NOAH LSM and Pleim-Xiu LSM for the 7 selected heavy rainfall cases. The spatial resolutions of 3-step nested model domains are 54km, 18km, and 6 km, respectively. The initial and boundary conditions used in this simulation are NCEP/NCAR reanalysis data with 6 hour intervals and 1° x 1° resolutions. Although, the skill of MM5 for the heavy rainfalls is dependent on the case by case, the MM5 captures well the rainfall area, the accumulated rainfall amount and the onset/cease of rainfalls. However, the simulated rainfall area and intensity are systematically shifted southward about 50 km and considerably weakened especially for the localized heavy rainfalls. Although the effects of land surface scheme changes on the simulated rainfalls dependent on the case by case and are generally weak, it changes considerably the amount, locations and onset/cease of rainfalls in some cases. This result suggests that more study is needed for the improvement in the land-atmosphere interaction schemes.