



The Study of CoLM (Common Land Model) over Gobi Desert Surface

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By using the observation data, e.g. energy fluxes, temperature, soil temperature, at Dunhuang Gobi station in northwest China during Land-Atmosphere Interaction Experiment. The simulation capability of the Common Land Model (CoLM) was evaluated. Furthermore, the new value of albedo in gobi surface at Dunhuang, and empirical relation of the surface thermal exchange coefficient calculated by observation data, were used to improve the capability of CoLM. The main conclusions are as follows:

1. Daily variation trend of the sensible heat and net radiation flux were estimated well in unmodified CoLM experiment, but the extreme value of energy flux were different from observation data, especially at midday. The model overestimates the sensible heat and underestimates the net radiation.
2. The albedo of gobi in model is 0.32, and it is higher than 0.26, which is calculated by observation data. Using the new value we conducted the simulation, and the net radiation is closer to observation, but the surface temperature and sensible heat were not meeting our expectation.
3. As the new empirical relationship of the surface thermal exchange coefficient was used to modify the thermal aerodynamic impedance, the simulated soil surface temperature was significantly closer to the observed data. Meanwhile, the simulated surface sensible heat and the net radiation fluxes were also improved. The energy flux can be simulated reasonable in the modified CoLM model over gobi land surface.

Key words: land surface model, numerical simulation, parameterization scheme

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