

Simulation Experiments of Land Surface Physical Processes and Ecological Effect over Different Underlying Surface

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摘要 Based on the existing Land Surface Physical Process Models (Deardorff, Dickinson, LIU, Noilhan, Seller, ZHAO), a Comprehensive Land Surface Physical Process Model (CLSPPM) is developed by considering the different physical processes of the earth's surface vegetation atmosphere system more completely. Compared with SiB and BATS, which are famous for their detailed parameterizations of physical variables, this simplified model is more convenient and saves much more computation time. Though simple, the feasibility of the model has been well proved in this paper. CLSPPM can not only simulate land surface physical process and ecological effect but also simulate interaction between land surface and atmospheric boundary layer in arid, semi-arid, forest and water surface regions. The numerical simulation results from CLSPPM show good agreement with reality, using which can obtain reasonable simulation for diurnal variations of radiation energy, turbulence heat flux, surface temperature, ecology effect, cold island effect, inversion humidity effect, fields and profiles of temperature, humidity, wind, and turbulence kinetic energy and soon over different underlying surfaces. So the CLSPPM have the comprehensive capability as a land surface model to simulate the land surface physical process, ecological effect and land-atmosphere interactions over various underlying surfaces on the global region. The model can also be extended for study of regional and global climatic change and effect.

关键词 [Comprehensive land surface; Physical process model \(CLSPPM\); Simulation experiment; Land surface physical process; Ecological effect.](#)

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