



Influence of sub-scale land surface processes on the simulation of RCM-modeled surface climate over the region of complex topography

I. Nadeem, H. Formayer

Institute of Meteorology, University of Natural Resources and Applied Life Sciences Vienna (BOKU), Vienna, Austria (imran.nadeem@boku.ac.at)

Even RCMs with spatial resolution of 10km are not able to resolve big European mountain valleys in a realistic way. The RCM surface fields in mountainous regions represent the situation at the average altitude within the grid box. But especially snow accumulation and snow melt highly depend on temperature and hence on the surface altitude. Even the sensitivity of snow accumulation to temperature changes is influenced by the altitude. As snow cover significantly influences the surface energy fluxes, a realistic snow modeling is essential within mountainous regions. The effect of high resolution subscale land-surface and topography scheme (Sub-BATs) has been evaluated on the RCM-modeled surface climate over the Alpine region. The introduction of sub-grid scheme (Giorgi et al 2003) in the ICTP Regional Climate Model (RegCM3) could result in better representation of the physical processes in the surface layer in regions with complex topography. Two 10 years simulations are compared: the control that uses standard BATS land surface scheme and the other employs sub-BATS scheme where the near surface variables (air temperature, water vapor and precipitation) are disaggregated from coarse grid (10km) to fine grid (1km) using standard lapse rate.

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