Geophysical Research Abstracts
Vol. 16, EGU2014-10933, 2014
EGU General Assembly 2014

Evaluation of the transition to deep convection in COSMO-1 using Large Eddy Simulations

Steef Böing (1), Jürg Schmidli (1), and Oliver Fuhrer (2)

(1) ETH, Institute for Atmospheric and Climate Science, Zürich, Switzerland (steven.boeing@env.ethz.ch), (2) MeteoSwiss, Zürich, Switzerland

The next generation of operational models will run with a grid spacing of about 1 kilometer. Although deep convection is coarsely represented at such resolutions, shallow clouds are too small to be resolved. Previous experience with COSMO and other models have shown significant biases: shallow clouds tend to be underrepresented and deep convection is too intense. The focus of the current study is to investigate how realistically COSMO represents the transition from shallow to deep convection as it occurs in the diurnal cycle of summertime convection. We focus on a case with idealized topography, where the triggering of convection has a strong spatial preference. We compare the current one- and three-dimensional schemes that are available in COSMO to results from Large Eddy Simulations with a resolution of 100 to 200 m. We consider the timing of the onset of convection, as well as the spatial distribution of clouds and the induced valley winds.