Cloud modeling in a regional climate model: Assessment of grid and time scale issues

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Today, regional climate models are able to perform long climate simulations on very high grid resolutions. The regional climate model REMO developed at the Max Planck Institute for Meteorology in Hamburg e.g. is running operationally on grid resolutions from 50 x 50 km to 10 x 10 km. When going to such high resolutions, the scale dependency of the model's physical parameterizations, which often are adopted from global climate models, has to be examined.

This is especially true for the modeling of clouds, where the common approach of separating convective cloud processes (sub-grid scale) and large scale cloud processes (grid resolved) is strongly dependent on the grid scale and time stepping of the model.

This work presents an assessment of the clouds simulated by the regional climate model REMO applied on different grid resolutions. Special focus will be on the effect of the Tiedtke convection scheme on selected large scale variables.