



The effect of horizontal resolution and the assimilation of radar-derived rain rates in a regional reanalysis

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A high-resolution regional reanalysis system for Europe and Germany has been developed by the climate monitoring branch of the Hans-Ertel-Centre for Weather Research. The system is based on DWD's operational NWP system centered around the COSMO model. The reanalyses are driven by ERA-Interim as boundary conditions with two nesting steps. COSMO-REA6 covers Europe (the CORDEX-EURO-11 region) with a horizontal resolution of 0.055 degrees (approx. 6.2 km). Nested into REA6 is the German-focused COSMO-REA2 using a horizontal resolution of 0.018 degrees (approx. 2 km). A continuous nudging (or Newtonian relaxation) scheme is used for data assimilation. In order to enhance the quality of the precipitation fields, a study on the assimilation of radar-derived rain rates through latent heat nudging (LHN) has been carried out.

The work presented here focuses on precipitation reanalyses derived from COSMO-REA6 and REA2 for the time period June to August 2011. The effect of LHN as well as the benefit of the higher resolution is studied using observations from about 1000 rain gauges located in Germany. Moreover, the general capability of the reanalysis to resolve events on the mesoscale (e.g. effective resolution) is investigated by the kinetic energy spectra.