



Assessing the impact of the use of model perturbations in a limited-area ensemble forecasting system for the short-range

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A strategy to provide high-resolution meteorological ensemble forecasts for the short-range (up to three days) is here presented.

Different sources of forecast errors have been considered, trying to describe the variability affecting the scales of interest in the high-resolution weather forecast at the considered time range. In particular, being the study based on the non-hydrostatic limited area model Lokal Modell (LM, horizontal resolution of about 10 km), errors both in the initial and boundary conditions and in the model have been considered. As regards the driving model, a Multi-Analysis Multi-Boundary approach has been explored: the impact of using initial and boundary conditions for the LM runs provided by different global models, which use independent analyses, is assessed. Aiming at encompassing also the smaller scale uncertainty, limited-area model perturbations have been applied as well. In particular, the effect of randomly changing (within their range of variability) the values of the parameters included in the schemes for the parameterisation of the sub-grid processes is shown.

Results are presented for some selected events in terms of ensemble spread and skill. The performance of the ensemble is compared with that of the COSMO-LEPS system, an operational ensemble based on the a global ensemble downscaling technique which use the same limited-area model. Results show that the inclusion of the limited-area model error, although based on a very simple technique, allow to increase the spread of the ensemble forecasts in terms of surface variables. Furthermore, for the selected case study, the skill of the precipitation prediction is higher when model perturbations are ingested.