

Evaluation of different perturbation approaches for the development of a short-range ensemble system.

C. Marsigli, A. Montani, and T. Paccagnella
ARPA-SIMC, Bologna, Italy (cmarsigli@arpa.emr.it)

Aiming at the development of an ensemble forecasting system for the short-range, tests on the validity of a multi-model approach have been started at ARPA-SIMC since a few years, in the framework of the COSMO Consortium. The operational ensemble COSMO-LEPS, designed mainly for a 3-5 days forecast range, is based on a dynamical downscaling of the ECMWF EPS: sixteen integrations of the COSMO model are performed at 7 km horizontal mesh-size. Instead, the multi-model approach has been tested in the experimental COSMO-SREPS system, which receives initial and boundary conditions by a few state-of-the art operational deterministic runs (IFS, GME, GFS), following a multi-analysis multi-boundary approach. Both systems benefit of perturbations applied to the COSMO model itself.

In this work, the impact of the different perturbation strategies on short-range forecast skill is assessed, by performing a detailed intercomparison of the two systems for the first 2 forecast days. The behaviour of the perturbations is studied and a verification of the systems performance is undertaken. The relative importance of initial state and boundary perturbations and of model perturbation is also shown.

Finally, the impact of combining the two different ensembles in different ways, for the aim of short-range forecasting, is assessed, tackling the relative importance of ensemble population and member diversity.