



A study on the spread/error relationship of the COSMO-LEPS ensemble

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COSMO-LEPS is the Limited-area Ensemble Prediction System of the COSMO Consortium, developed and maintained by ARPA-SIMC and running at ECMWF, on a COSMO account, since November 2002.

At present, the system consists of 16 runs of the COSMO model, with 7 km of horizontal resolution, nested on 16 selected EPS members; perturbations to some parameters of the COSMO model physics schemes are also applied. An analysis of the relationship between spread and error of the ensemble is here presented, for two seasons (Summer and Fall) of 2009.

The ensemble spread is compared with the root-mean-squared error of the ensemble mean, computed with respect to IFS analysis, over the whole domain. The analysis is carried out in terms of two upper air variables (geopotential height at 700 hPa and temperature at 850 hPa) and one surface variable (2m temperature).

Both the spatial and the temporal correlations between spread and error are considered, for the entire forecast range, up to 132 h. In particular, the similarity of the spatial structures of spread and error are visually compared, and then assessed in a more statistically robust manner.

Results show that a good correlation between spread and error exists, especially after day 2, for upper air variables. A sub-division of the ensemble domain in 4 sub-areas shows that the extent to which this relation holds has a clear dependence on the area over which it is computed.