Geophysical Research Abstracts, Vol. 9, 08527, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08527

Fuzzy verification of high-resolution ensemble forecasts using a displacement-based quality measure

C. Keil and G. C. Craig

Institute of Atmospheric Physics, DLR Oberpfaffenhofen, Germany

(Christian.Keil@dlr.de)

Errors in regional forecasts often take the form of phase errors, where a forecasted weather system is displaced in space or time. For such errors, a direct measure of the displacement is likely to be more valuable than traditional measures.

A novel forecast quality measure is proposed that is based on image comparison of observed and forecast imagery of cloud or precipitation fields. The measure combines the magnitude of a mean displacement vector calculated with an image matching algorithm and the final spatial agreement of observed and morphed forecast image.

Mesoscale ensemble forecasts are produced using the COnsortium for Small-scale MOdelling Limited-area Ensemble Prediction System (COSMO-LEPS), in which the global ECMWF EPS provides initial and boundary conditions for the non-hydrostatic Lokal-Modell (LM, dx=7km). The LM provides again initial and boundary conditions for the high-resolution LMK ensemble (dx=2.8km). The generation of model-forecast synthetic satellite and radar imagery allows a direct comparison with observed Meteosat-8 and ground-based radar imagery.

It is shown that this new method provides a plausible measure of forecast error, which is consistent with subjective rankings. Using the displacement-based error measure, individual ensemble members compare better with observations than either a short-term deterministic forecast, or the ensemble mean, throughout the forecast period.