

5.6 DATA ASSIMILATION OF RADAR REFLECTIVITY VOLUMES IN A LETKF SCHEME

V. POLI¹, T. GASTALDO^{1,2}, C. MARSIGLI¹, P.P. ALBERONI¹, T. PACCAGNELLA¹

¹ ARPAE Emilia Romagna - SIMC, Italy

² Department of Physics and Astronomy - University of Bologna, Italy
vpoli@arpae.it

At Arpae, the HydroMeteorological Service of Emilia-Romagna Region (Italy), it is operational an ensemble data assimilation system at the convection permitting scale (KENDA), based on a LETKF scheme. The system has been developed for the Consortium for Small scale Modeling (COSMO) model and, currently, it is used to assimilate only conventional observations.

The main issue of the presented work is to produce the most accurate analysis to initialize deterministic and ensemble forecast runs. For rapidly evolving systems, such as summer thunderstorms, this involves the assimilation of dense and frequent observations. For this reason in the experimental KENDA set-up, reflectivity volumes from the Italian radar network are assimilated by means of the COSMO Radar Forward Operator (EMVORADO).

The quality of the analysis depends on various factors, but the observational error plays a crucial role. This is influenced by three sources: instrumental error, representativity error and errors derived from observation operator. Since none of these are known and their effects are not distinguishable, the choice of its value is not straightforward. To estimate this error a diagnostic based on statistical averages of observation-minus-background and observation-minus-analysis residual is used. This is performed separately for each radar since the Italian radar network is inhomogeneous both in the acquisition strategy and from an instrumental point of view.

Results, both in the assimilation and in the forecast cycle, are presented by means of a statistical analysis and the verification of forecasted fields.