

Ensemble-based approximation of observation impact using an observation-based verification metric

M. Weissmann (1,2), M. Sommer (1,2), T. Necker (1,2)

(1) LMU München, Meteorologisches Institut, München, Germany (martin.weissmann@lmu.de), (2) Hans-Ertel-Centre for Weather Research, Munich, Germany

Knowledge on the contribution of observations to forecast accuracy is crucial for the refinement of observing and data assimilation systems. Several recent publications highlighted the benefits of efficiently approximating this observation impact using adjoint methods or ensembles. This study proposes a modification of an existing method for computing observation impact in an ensemble-based data assimilation and forecasting system and applies the method to the pre-operational, convective-scale regional modeling environment KENDA of Deutscher Wetterdienst. Instead of the analysis, the modified approach uses observation-based verification metrics to mitigate the effect of correlation between the forecast and its verification norm. Furthermore, a peculiar property in the distribution of individual observation impact values is used to define a reliability indicator for the accuracy of the impact approximation. Applying this method to a three-day test period shows that a well-defined observation impact value can be approximated for most observation types and the reliability indicator successfully depicts where results are not significant.