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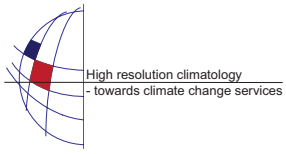

A new linear Model Output Statistics scheme for ensemble forecasts. Theory and applications.

S. Vannitsem

Royal Meteorological Institute of Belgium, Meteorological and Climatological Research, Brussels, Belgium
(stephane.vannitsem@oma.be, +32-(0)2-3730548)

An extension of the classical linear Model Output Statistics (MOS) technique is proposed allowing for the post-processing of ensemble forecasts. In this new approach the cost-function on which the least square parameter estimation is based takes into account the presence of errors in both observations and model observables (called EVMOS in this paper), unlike the classical linear MOS cost-function whose implicit assumption is the absence of errors in the model observables. It allows for the maintenance of an appropriate variability for the corrected forecasts even for long lead times and for providing a framework in which both deterministic and probabilistic forecasts can be corrected. The scheme is successfully tested for ensemble correction in the context of an idealized low-order chaotic system, the Lorenz atmospheric model, in the presence of model errors, and compared with more classical techniques like the Non-homogeneous Gaussian Regression (NGR) method. The potential use of this approach is also briefly discussed in the context of the Ensemble forecasts of the ECMWF.