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SPATIAL VERIFICATION OF ENSEMBLE FORECASTS WITH SAL AND THE ROLE OF OBSERVATION UNCERTAINTY

par Sabine RADANOVICS

(GMME/MICADO)

en salle Joël Noilhan

Résumé :

With the increased resolution of modern ensemble forecasts, their gridpointwise verification now faces the same issues the verification of deterministic forecasts encountered a decade ago, for example the double penalty problem.

Therefore the spatial verification methods that were designed to solve these issues have to be adapted for ensemble forecasts.

First, I present an ensemble version of the SAL spatial verification method. Then the ensemble version and the original deterministic SAL are compared using precipitation data from the core case of the MesoVICT project, an intercomparison project of spatial verification methods, including deterministic and ensemble forecasts (COSMO2, CLEPS) and deterministic and ensemble analysis (VERA).

The comparison results show that the ensemble S and A components are close to the median of the score distribution resulting from calculating the deterministic SAL for every ensemble forecast member-ensemble analysis member pair, while the ensemble L tends to be smaller than the median of deterministic L scores. The ensemble SAL can diagnose the structure and amplitude biases introduced in the VERA ensemble analysis due to the way the analysis ensemble was constructed. These biases are, for very short forecast lead times of less than one day, larger than the systematic differences between the two forecast models. The ensemble SAL has the advantage of being faster to calculate than a large number of deterministic SAL scores and of being somewhat more robust with respect to changes in thresholds or observation uncertainties. Its main disadvantage is that it does not provide information on the ensemble spread.

Pour tout renseignement, contacter Y. Poirier (05 61 07 96 55) ou J.L. Sportouch (05 61 07 93 63)

Centre National de Recherches Météorologiques
42, Avenue G. Coriolis - 31057 Toulouse Cedex