

Statistical methods in weather forecasting*

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Abstract

Recently, all major weather prediction centres provide forecast ensembles of different weather quantities, which are obtained from multiple runs of numerical weather prediction models with various initial conditions and model parametrizations. However, ensemble forecasts often show an underdispersive character and may also be biased, so that some post-processing is needed to account for these deficiencies.

We present an overview of state of the art parametric approaches to statistical calibration of ensemble forecasts of different weather quantities, namely the Bayesian model averaging and the ensemble model output statistics, both providing full predictive distributions of the weather variable at hand. We show the fundamental methods of forecast evaluation, and via several case studies, illustrate the predictive performance of these models.

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