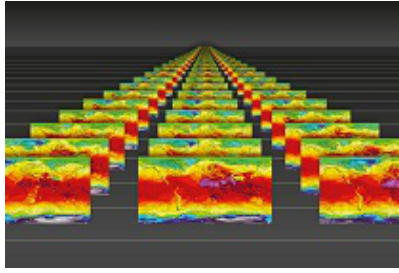


Workshop on Predictability, dynamics and applications research using the TIGGE and S2S ensembles



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A Bayesian framework for postprocessing multi-ensemble weather forecasts

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A Bayesian framework for postprocessing multi-ensemble weather forecasts

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Ensemble weather forecasts often under-represent uncertainty, leading to overconfidence in their predictions. Multi-model forecasts combining several individual ensembles have been shown to display greater skill than single-ensemble forecasts in predicting temperatures, but tend to retain some bias in their joint predictions. Established postprocessing techniques are able to correct bias and calibration issues in univariate forecasts, but are generally not designed to handle multivariate forecasts (of several variables or at several locations, say) without separate specification of the structure of the inter-variable dependence.

We propose a flexible multivariate Bayesian postprocessing framework, developed around a directed acyclic graph representing the relationships between the ensembles and the observed weather. The posterior forecast is inferred from the ensemble forecasts and an estimate of their shared discrepancy, which is obtained from a collection of past forecast-observation pairs. The approach is illustrated with an application to forecasts of UK surface temperatures during the winter period from 2007-2013.

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Session Classification: Prediction and Verification Multi-model approaches to prediction

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