



Multi-model ensemble combination and calibration

C. Johnson and R. Swinbank

Met Office (christine.johnson@metoffice.gov.uk)

Probabilistic weather forecasts are based on an ensemble of forecasts that aim to sample the uncertainty in both the initial conditions and the forecast model. The aim of a multi-model ensemble is to obtain a better representation of the forecast model errors, in comparison to a single-model ensemble. In this paper, we show the results from a global, 15-day multi-model ensemble that has been developed as part of the Met Office contribution to the international THORPEX research program.

The multi-model ensemble combines ensembles from the ECMWF, Met Office and NCEP and is calibrated to give further improvements. The ensemble post-processing includes bias correction, model-dependent weights and variance adjustment, and is based on a running-average over past observation-forecast pairs. The post-processing parameters are calculated separately for each grid-point and forecast lead-time, and we show that the optimal size of the training data set is dependent on the forecast lead-time.

The ensembles are verified using RMS errors of the ensemble means, probabilistic measures such as Brier skill scores and case studies. The results show that the multi-model ensemble gives an improvement in comparison to a calibrated single-model ensemble, particularly for surface temperature. However, the results also show only small improvements from the use of the model-dependent weights, because the component-model forecast errors are similar.