



Using a neural network to benchmark a diagnostic parametrization: the UK Met Office's visibility scheme

B. Claxton

Met Office, United Kingdom (bernie.claxton@metoffice.gov.uk)

Within the UK Met Office's Unified Model the visibility is diagnosed from a set of the model's prognostic variables using a parametrization. This parametrization has been optimized to minimize the error in modelled visibility, relative to observed visibility. The performance of the parametrization is dependant on two aspects; (1) the quality of the input meteorological variables and (2) the structure of the parametrization itself. Presented is a technique for obtaining a quantitative assessment of how much improvement is possible in the structure of the visibility parametrization. This is achieved by constructing an alternative visibility diagnostic scheme using a neural network. This statistical model provides a benchmark against which the performance of the current visibility parametrization can be judged, irrespective of the input error. It was found that the neural network achieved significant improvements over the current diagnostic parametrization: a 22% improvement in the geometric mean of the fractional error, and a 15% improvement in the geometric variance of the fractional error.