

## **Assessing Uncertainty in Numerical Weather Prediction**

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### **Abstract**

We will briefly review the goals of a new Multidisciplinary University Research Project aimed at developing methods for assessing and communicating uncertainty in numerical weather prediction. Our goals are to develop methods for evaluating the uncertainty of mesoscale meteorological model predictions, and to create methods for the integration and visualization of multisource information derived from model output, observations and expert knowledge. We take several approaches to this, including one based on the recently developed Bayesian melding approach (Poole and Raftery, 2000, JASA). Direct application of Bayesian melding is not feasible in this problem because of the very high dimensionality, and we will outline an alternative based on generating ensembles of initializations from a posterior distribution of the initial state of the atmosphere. The project also aims to develop tools and methods for visualizing predictions of quantities of interest and the uncertainty about them by (i) choosing appropriate quantities of interest for display based on cognitive factors, and (ii) developing appropriate plots, maps, three-dimensional displays, and video displays for decision support. This is joint work with Montserrat Fuentes, Tilmann Gneiting and Yulia Gel.