



Ensemble Prediction - Methods and Large-Scale Implementation

M. Ehrendorfer

The University of Reading, Department of Meteorology, UK (Martin.Ehrendorfer@uibk.ac.at)

The primary purpose of ensemble prediction is the a priori assessment of the flow-dependent uncertainty of weather forecasts made with numerical weather prediction (NWP) models. The methodology used for ensemble prediction is fundamentally of a Monte-Carlo-like nature since a limited number of forecasts are generated that start from perturbed initial conditions and that allow for (partly) assessing this uncertainty. Specific implementations at various operational centers differ, however, in the methodology used for generating the initial-time conditions of these perturbed forecasts. Methods utilize singular vectors, bred vectors, or are directly related to ensemble-based data assimilation methods.

In this presentation these perturbation methods, as well as their specific implementations at various NWP centers will be reviewed. Emphasis will also be given to results that compare the efficiency and performance of the different ensemble-prediction approaches, some of which also include representations of model error. Very recent developments in methodology and implementations, specifically those related to ensemble-based data assimilation, will be discussed.