

Abstract

The km-scale numerical weather prediction models (NWP) are targeted to describe adequately convective scale phenomena. Due to their nature processes on convective scales have short length of life and low predictability limits. This is why probabilistic forecasts play a particularly important role on those scales. There are many different sources that contribute to the uncertainty of the NWP simulations: observation errors and their temporal and spatial coverage, assumptions used to create the initial state NWP simulations (so-called data assimilation procedure), deficiencies of the forecast model, stochastic nature of the phenomena and interaction of all these sources between themselves. It is infeasible to describe the evolution of uncertainty analytically for real size NWP applications. We sample instead uncertainty based on the our best estimate of statistical moments and we improve our estimates of statistical moments when new observations are available. Ensembles of numerical simulations are used both to quantify the evolution of statistical measures of forecast quality and to describe the range of possible outcomes for probabilistic NWP. In this presentation we will briefly describe methodologies that are used to sample the uncertainty for the NWP applications, we will outline constraints that have to be fulfilled and we will describe challenges that need to be addressed.