*Forecasting the weather
- ensemble techniques
in probabilistic weather prediction*

Assimilation experiments for COPS IOP 9c with the WRF 3DVAR system in a rapid update cycle configuration

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On 20 July 2007, an interesting convective situation developed during the COPS intensive observation period 9c. A severe line of thunderstorms moved from southwest to northeast over Germany and caused significant damage in southern and southeastern parts of Germany. None of the models that participated in the WWRP forecast demonstration project D-PHASE was successful in correctly representing this situation.

In this study, we utilize the WRF model and its assimilation system WRF-Var in a European domain with 3.6 km horizontal resolution without a parameterization of convection. The model is forced by ECMWF analysis data and is selected large enough so that the whole synoptic situation develops in the high-resolution WRF domain. To further improve the initialization, a 1h-cycled 3DVAR is applied for 12 h. From the final analysis of this cycle, a free forecast over 24 hours is started.

Several types of observations, including the surface network of the Joint D-PHASE /COPS data set, atmospheric motion vectors, radiosondes, aircraft and airport reports, GPS data provided by GFZ Potsdam as well as radial wind and reflectivity from German and French radar systems are assimilated. The presentation focuses on the influence of 3D radar data on the performance of the forecast.

The results demonstrate that WRF is successful in reproducing the evolution of the squall line and that the consideration of 3D radar data is an important contributor to this success. However, differences in timing and the intensity of the developing precipitation patterns remain and will be further investigated in more detail by means of verification and sensitivity studies.