Cheating predictability - project SINFONY: a push towards more accurate operational convective forecasting at DWD

Dr. Ulrich Blahak (DWD)

Abstract:

At DWD a new internal project has been set up recently to develop its future seamless ensemble prediction system for storm-scale forecasting from observation time up to +6 h / +12 h forecasts. The focus is on severe summertime convective events with their associated hazards (heavy precipitation, hail, wind gusts, etc.).

Up to now, for the first 1-2 h this relies mostly on observation-based nowcasting products, whereas convection-allowing ensemble NWP (COSMO-DE-EPS) is only able to reach/outperform the quality of nowcasting at later times. New NWP forecasts are started only every 3 h and after a rather long cut-off time to wait for incoming observational data.

Moreover, nowcasting and ensemble NWP are treated as two separate and independent methods, and there are few common products available for the forecasters.

The goal of the new project is to narrow down these gaps, on the one hand by enhancements to both nowcasting and NWP separately and on the other hand by mutual information exchange and combination, to further enhance the quality of both. High-resolution observational data (radar, satellite, lightning, GPS-derived moisture, etc.) will be exploited.

For this presentation, the focus will be on the radar data assimilation aspect of the project, which includes direct assimilation of 3D volume scans of radial wind and reflectivity of the German C-Band weather radar network into the km-scale convection-allowing COSMO-DE model. The data are directly assimilated using DWD's LETKF system and the conventional radar forward operator EMVORADO. First results from several weeks of intense convection in May/June 2016 over Germany are shown.

These results suggest that there are still problems in propagating the relatively good quality of the analyses (in terms of reflectivity) into the forecasts. Reasons and possible ways forward are discussed, which are currently evaluated in co-operation with LMU.