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Latest Result of Including ZDR Column for Enhanced Radar Data Assimilation at German weather Service (DWD)

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Radar data assimilation has been operationally used in the short-range ensemble numerical weather prediction (SRNWP) system (ICON-D2-KENDA LETKF system) at DWD since 2020 (radial wind from March 2020 and reflectivity from June 2020). It is in addition to the traditional Latent Heat Nudging (LHN) of 2D radar-derived precipitation rates.

Moreover, the study of radar data assimilation in numerical weather prediction (NWP) models, especially its impact on short-term forecasts, has gained significant focus recently at DWD. The seamless Integrated Forecasting System (SINFONY) project, which leads a short-term forecasting system for convective events from minutes up to 12 hours, clearly demonstrates the benefits of radar data assimilation in enhancing shortterm forecast accuracy.

Furthermore, the integration of polarimetric radar parameters as a novel observational source into the data assimilation system at DWD has recently gained attention. Among these parameters, the ZDR column—defined by differential radar reflectivity (ZDR)—stands out as a distinct vertical layer of positive ZDR above the 0°C level. This feature is closely associated with deep convective storms and can indicate large raindrops or hail. We present our latest results on incorporating the ZDR column as a new observational input in Observing System Simulation Experiments (OSSE), complementing radial wind and reflectivity data within DWD's operational data assimilation framework.

VAT

Session

Seamless Prediction: Data assimilation integrating nowcasting and new observations

Preferred Contribution Type

Oral Presentation

Presenting Author

Kobra Khosravian

Email Address of Presenting Author

kobra.khosravianghadikolaei@dwd.de

Affiliation of Presenting Author

DWD

Address of Presenting Author

Frankfurter Str. 135 63067 Offenbach

Authors: DE LOZAR, Alberto (Deutscher Wetterdienst); MENDROK, Jana (Deutscher Wetterdienst, Offenbach, Germany); STEPHAN, Klaus (Deutscher Wetterdienst); KHOSRAVIAN, Kobra; BLAHAK, Ulrich (Deutscher Wetterdienst)

Presenter: KHOSRAVIAN, Kobra