



The Ensemble-MOS of Deutscher Wetterdienst

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Based on the expected probability of the occurrences of severe weather events like strong wind gusts or heavy precipitation, the forecaster or elaborate user may take decisions according to his individual estimates of impacts and costs. Probabilistic forecasts have become available usually based on ensembles as the COSMO-DE-EPS of DWD or the EPS of ECMWF. In order to fill the gap between ensemble forecasting and the specific requirements of the users, probabilistic forecast products need to be derived that are calibrated and user defined in time and space and for specific levels of strength of weather events.

At DWD, a statistical postprocessing method based on MOS (Model Output Statistics) has been used for deterministic forecast models. This MOS approach is now extended for ensemble forecasting on a probabilistic basis and tailored for IFS-EPS and COSMO-DE-EPS. It is designed to be applied for the generation of a semi-automated warning system within the project AutoWARN.

The system optimizes deterministic and calibrates probabilistic forecasts directly with synoptic observations, where model data is interpolated to the locations of the observation sites. In order to extract the probabilistic information of the ensemble forecasts, all ensemble members are considered having the same forecast quality. Statistical products like ensemble mean and standard deviation are provided as predictors. Linear and logistic regression is available for deterministic respectively probabilistic forecasts. Aggregation of data in time and space increases the number of extreme events that are the focus of the system. In a multiple stepwise regression most relevant predictors are determined for each requested forecast element. In this way conditional biases and calibrations are addressed.

Results and verifications are shown for COSMO-DE-EPS of DWD and for EPS of ECMWF.