



Evaluating and improving probabilistic wind forecasts of the high-resolution ensemble system COSMO-DE-EPS

Tobias Heppelmann, Zied Ben Bouallegue, and Susanne Theis
Deutscher Wetterdienst, Offenbach, Germany (tobias.heppelmann@dwd.de)

With the change in energy policy towards renewable energies, the proportion of wind and solar power in the electricity network increases rapidly. In order to ensure the stability and security of the grid, the Transmission System Operators (TSO) need high-quality intraday and day-ahead power forecasts. In this context the German research project EWeLiNE started a cooperation between Deutscher Wetterdienst (DWD), Fraunhofer Institute for Wind Energy and Energy System Technology (IWES), and three German TSOs. One aim of the project is to provide the TSOs with probabilistic power forecasts for operational applications that could be useful for risk management. Probabilistic power forecasts are derived from probabilistic weather forecasts, provided by the high-resolution ensemble prediction system COSMO-DE-EPS, operational at DWD.

Here, we focus on ensemble wind forecasts and present verification results against observation data at wind masts in 100 m hub height that are relevant to wind farms within the model area. The performance of the ensemble system is assessed using different probabilistic scores, e.g. the rank histogram, reliability diagrams for probability and quantile forecasts. Since the operational raw ensemble forecast suffers from bias and underdispersiveness, statistical post-processing methods are developed to correct such deficiencies. The benefit of calibration, applying e.g. bivariate Ensemble Model Output Statistics, is shown for individual sites. Future plans include accounting for spatial correlations and the research of well suited predictors.