



## **Local bivariate calibration of ensemble wind forecasts at Frankfurt/Main Airport**

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Wind conditions, even non-hazardous ones, have a significant impact on the air traffic system. The main goal of the research project iPort WiWi (innovative airPort adverse wind conditions) is to develop a customer-oriented probabilistic wind forecasting system for the international airport Frankfurt/Main, in order to support the air traffic management in decisions of runway closure or change of operational direction.

The probabilistic forecasts are based on the COSMO-DE-EPS, the convection-permitting ensemble prediction system running at DWD (German Meteorological Service) in operational mode since May 2012. These forecasts, taking the form of threshold-exceedance probabilities for cross and parallel wind vectors, turn out to be uncalibrated, to the effect that the forecast uncertainty is not represented in a realistic fashion. Therefore, a two-dimensional statistical post-processing technique is implemented, based on ensemble model output statistics, or non-homogeneous Gaussian regression. Employing a bivariate normal distribution, the correlation between the two wind vectors is modelled as a trigonometric function of the ensemble mean wind direction.

Applied to eight runs of the COSMO-DE-EPS per day with lead times from 1 to 15 hours, the resulting forecast products were found to be well-calibrated with high predictive skill for both deterministic and probabilistic forecasts. These findings will be presented in form of an evaluation of the post-processing technique since its implementation in December 2012.