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A probabilistic ensemble based wind forecasting system for the airport Frankfurt

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Wind conditions even non-hazardous ones have significant impact on the air-traffic system. Both arrivals and departures should be performed under headwind conditions. Thus, in dependence of the wind direction and speed the decision is made which runway is in use.
Within the aviation research project iPort WiWi (innovative airPort adverse wind conditions) a probabilistic wind forecasting system for the international airport Frankfurt is developed. The main goal of the project is to derive categorical decisions from probabilistic forecasts in order to support the air traffic management in, for example, the decision which runway is in use.
The probabilistic forecasts are based on the COSMO-DE-EPS, the convection-permitting ensemble prediction system developed at DWD (German Meteorological Service). The COSMO-DE-EPS is running operational since spring 2012.
Besides the generation of calibrated ensemble based wind forecast products (e.g. exceedance probabilities or quantiles) from the beginning of the project high attention is given to develop costumer-oriented forecasting products as basis for proper decision making. Thus, after assembling the customer requirements the wind forecast products have been designed and visualised accordingly. For this reason, the communication of the use of ensemble forecast products is an important part within this project.
The findings presented include a description of the development of the wind forecasting system as well as results and experiences from a three month testing phase.