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Post-processing of COSMO-DE Ensemble Precipitation Forecasts

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COSMO-DE-EPS is an ensemble prediction system based on the convection-permitting model COSMO-DE (2.8 km grid size). 20 members are generated including variations in boundary conditions, physics parameterization and initial conditions. The forecasts cover Germany and have a lead time of 21 hours. Probabilistic forecasts are derived from the ensemble using equal weighting of ensemble members.

Two post-processing techniques applied to probabilistic precipitation forecasts are investigated. The first technique is the neighbourhood method which increases the ensemble sample size by including forecasts of the spatial neighbourhood. Neighbourhood probabilities are derived considering all forecasts within a given neighbourhood area around each grid point as equally probable. The second technique is an ensemble calibration method which accounts for systematic errors. Calibrated probabilities are derived using an extended logistic regression approach.

Probabilistic forecasts assessment is performed for the summer period of 2011. The benefit of ensemble post-processing is shown for both techniques applied separately and for a combined approach.