METEOROLOGISCH - GEOPHYSIKALISCHES KOLLOQUIUM

SS 2018

Eine Lehrveranstaltung des Instituts für Meteorologie und Geophysik der Universität Wien

Zeit: Dienstag, 15.5.2018, 12.15 Uhr

Ort: HS 1 (UZAII, Raum 2A120, Althanstr. 14, 1090 Wien)

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Meteo France

Post-processing of ensemble wind-speed forecasts using standardized anomaly model output statistics (SAMOS) with CRPS minimization

Ensemble forecasts are produced by weather services in order to issue probabilistic forecasts and to quantify the uncertainty of the forecast depending on the meteorological situation. The ensemble forecasts typically lack spread for short lead-times especially for near-surface variables and may have local biases. Ensemble post-processing techniques are commonly used to improve the ensemble characteristics and issue reliable probability forecasts. Ensemble model output statistics are regression-based post-processing methods. A recent flavor of this type of methods is standardized anomaly model output statistics (SAMOS), where the regression is done on standardized anomalies with respect to the observed- and modeled climatology respectively. The advantage of this procedure is that it allows to pool data from different stations and lead-times for training the regression model while still being able to correct for local biases.
Two extensions of SAMOS are presented. The first one consists of using CRPS minimisation instead of a maximum likelihood estimation and the second one of assuming Gumbel distributed standardized anomalies instead of Gaussian ones. Validation results are shown for forecasts of 10m wind-speed from the operational French Arome PE model at a few thousand stations mainly in France and neighboring countries over one year and for lead-times up to 45 hours. Assuming Gumbel distributed standardized anomalies leads to forecasts with larger spread than assuming Gaussian anomalies. Since wind-speed is overestimated for low wind situations and underestimated for high wind situations by the model even after the post-processing, the larger spread results in slightly higher hit-rates for high wind-speed thresholds. On the downside, there is a high bias essentially stemming from low-wind situations and higher root-mean-squared errors of the ensemble members. In general, SAMOS improves the forecasts for all months and wind-speed classes. The decomposition of the CRPS shows that SAMOS improves not only the reliability but also the resolution of the forecasts.

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