

## **Combining distinct Model Output Statistics forecasts: Enhancements in probabilistic gust forecasting**

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Currently, Model Output Statistics (MOS) is used at DWD in the forecasting system ModelMIX in order to obtain an optimized combination of individual MOS forecasts. This combination exhibits deficiencies, e.g. the need for a technically demanding calculation of MOS coefficients. Therefore, an alternative procedure was developed which shall reduce technical effort and improve forecast quality. For combined forecasts of threshold exceedance probabilities (TEPs), it is based on a weighted average with weights derived from the developments of MOS coefficients of the input forecasts. In order to ensure calibration, a consecutive remapping technique is applied which yields a bias-corrected TEP conditional on the input probability. Moreover, by means of regression techniques for TEPs of various thresholds, this new procedure can be extended in order to provide comprehensive probabilistic forecasts in terms of probability distribution functions.

In a verification study for TEPs of the one-hourly gust maximum, ModelMIX via MOS was compared to the new forecasting methods: The latter are mostly well-calibrated and they predominantly exhibit a better Brier score up to lead times of 76 hours.