



## **Heteroscedastic Extended Logistic Regression for Post-Processing of Ensemble Guidance**

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To achieve well-calibrated probabilistic weather forecasts, numerical ensemble forecasts are often statistically post-processed. One recent ensemble-calibration method is extended logistic regression which extends the popular logistic regression to yield full probability distribution forecasts. Although the purpose of this method is to post-process ensemble forecasts, usually only the ensemble mean is used as predictor variable, whereas the ensemble spread is neglected because it does not improve the forecasts. In this study we show that when simply used as ordinary predictor variable in extended logistic regression, the ensemble spread only affects the location but not the variance of the predictive distribution. Uncertainty information contained in the ensemble spread is therefore not utilized appropriately. To solve this drawback we propose a new approach where the ensemble spread is directly used to predict the dispersion of the predictive distribution. With wind speed data and ensemble forecasts from the European Centre for Medium-Range Weather Forecasts (ECMWF) we show that using this approach, the ensemble spread can be used effectively to improve forecasts from extended logistic regression.