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Blending a probabilistic nowcasting method with a high resolution ensemble for convective precipitation forecasts

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A seamless prediction of convective precipitation for a continuous range of lead times from 0 to 8 hours requires the application of different approaches. Here, a nowcasting method and a high-resolution ensemble are combined to provide probabilistic precipitation forecasts. Concerning the nowcast, an existing deterministic extrapolation technique was modified by the Local Lagrangian method to calculate the probability of exceeding a threshold value in radar reflectivity. Secondly, an experimental high-resolution ensemble provides 20 different deterministic forecasts of synthetic radar reflectivity. Probabilistic information was calculated by different approaches from the ensemble output. The probabilistic forecasts based on the ensemble were calibrated with the reliability diagram statistics method. Various probabilistic quality measures were applied to evaluate the forecast skill. This forecast skill determines the weighting functions of the nowcasting and ensemble methods as function of lead time. The combination of both approaches through the respective weighting functions provides a seamless and skilful probabilistic forecast of convective precipitation. The sensitivity of the forecast skill does not depend on the applied quality measures.