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Verification of a short-range ensemble precipitation prediction system over Iberia

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Abstract. The purpose of this paper is the verification of a short-range ensemble prediction system (SREPS) built with five different model physical process parameterization schemes and two different initial conditions from global models, allowing to construct several versions of the non-hydrostatic mesoscale MM5 model for a 1-month period of October 2006. From the SREPS, flow-dependent probabilistic forecasts are provided by means of predictive probability distributions over the Iberian Peninsula down to 10-km grid spacing. In order to carry out the verification, 25 km grid of observational precipitation records over Spain from the Spanish Climatic Network has been used to evaluate the ensemble accuracy together with the mean model performance and forecast variability by means of comparisons between such records and the ensemble forecasts. This verification has been carried out upscaling the 10 km probabilistic forecast to the observational data grid. Temporal evolution of precipitation forecasts for spatial averaged ensemble members and the ensemble mean is shown, illustrating the consistency of the SREPS. Such evolutions summarize the SREPS information, showing each of the members as well as the ensemble mean evolutions. The Talagrand diagram derived from the SREPS results shows underdispersion which indicates some bias behaviour. The Relative Operating Characteristic (ROC) curve shows a very outstanding area, indicating potential usefulness of the forecasting system. The forecast probability and the mean observed frequency present good agreement with the SREPS results close to the no-skill line. Because the probability has a good reliability and a positive contribution to the brier skill score, a positive value of this skill is obtained. Moreover, the probabilistic meteogram of the spatial daily mean precipitation values shows the range of forecast values, providing discrete probability information in different quantile intervals. The epsgram shows different daily distributions, indicating the predictability of each day.

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