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# Verification of high-resolution precipitation forecast over Germany

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The verification of precipitation forecasts from numerical models is essential for the future improvement of quantitative precipitation forecasts (QPF). In this study, as a part of a German Priority Programme, the "Lokal-Modell" (LM) from the German Weather Service is verified over Germany and both a new observational data set with 1-hour temporal resolution and a novel error score for QPF validation are introduced. The LM, operational since December 1999, is a non-hydrostatic grid point model with a resolution of 7 km and 40 vertical layers. Each day two simulations are started at 00 and 12 UTC with a forecast duration of 48 hours. The high resolution observational data set for Germany is based upon 24-hour accumulated observations from the rain gauge network, a 30-year climatology of precipitation from the German Weather Service and hourly Radar composites. The Radar data and a disaggregation technique (developed earlier within the Mesoscale Alpine Project) are used to introduce the high temporal resolution into the gridded rain-gauge analysis. The temporal variability of the resulting data set is consistent with the Radar data, whereas the daily total of the hourly fields corresponds to the rain gauge measurements. The novel observational data set offers several new possibilities for verification. One is the verification of the diurnal cycle, either for single gridpoints or averaged over larger areas for instance river catchments. The diurnal cycle of precipitation in the LM and the disaggregated data set differs substantially. Where possible the latter is also compared with data from hourly measurement sites. In the final part, first results of the novel 3-component error score "SAL" are presented. SAL is based on the identification of precipitation objects (threshold dependent) within a catchment and calculates the differences between model and observations in their structure (S), amplitude (A) and location (L). SAL of-

fers additional insight into a model's QPF performance and highlights model qualities and deficiencies that are particularly relevant for the prediction of small-scale intense events.