

Comparison of online and offline based merging methods for high resolution rainfall intensities

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Accurate rainfall intensities with high spatial and temporal resolution are crucial for urban flow prediction. Commonly, raw or bias corrected radar fields are used for forecasting, while different merging products are employed for simulation. The merging products are proven to be adequate for rainfall intensities estimation, however their application in forecasting is limited as they are developed for offline mode. This study aims at adapting and refining the offline merging techniques for the online implementation, and at comparing the performance of these methods for high resolution rainfall data.

Radar bias correction based on mean fields and quantile mapping are analyzed individually and also are implemented in conditional merging. Special attention is given to the impact of different spatial and temporal filters on the predictive skill of all methods. Raw radar data and kriging interpolation of station data are considered as a reference to check the benefit of the merged products. The methods are applied for several extreme events in the time period 2006-2012 caused by different meteorological conditions, and their performance is evaluated by split sampling. The study area is located within the 112 km radius of Hannover radar in Lower Saxony, Germany and the data set constitutes of 80 recording stations in 5 min time steps.

The results of this study reveal how the performance of the methods is affected by the adjustment of radar data, choice of merging method and selected event. Merging techniques can be used to improve the performance of online rainfall estimation, which gives way to the application of merging products in forecasting.