



Comparison of a radar tracking and station based nowcasting of rainfall

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Radar tracking is a common practice for nowcasting rainfall patterns at the required resolution for urban models. However, due to the discrepancies between radar and gauge capturing technique, fast evolving storms and other sources the forecasted rainfall volumes suffer from high errors. The aim of this study is to compare these forecasted volumes with the ones from a station based forecast in order to understand the benefits or drawbacks of a radar based forecast.

The HyRaTrac is a radar tracking model that identifies individual storm cells and their movement by comparing two subsequent radar images. On the other hand, a fuzzy-rule based algorithm is adapted to forecast rainfall volumes at a specific location with prior knowledge of previous time steps and surrounding stations. A set of extreme rainfall events is split in half to train and to validate the performance of the fuzzy-rule based model. The study area is located within the 128 km radius of Hannover radar in Lower Saxony, Germany and the data set constitutes of 80 recording stations in 5 min time steps for the period 2000-2012. For the comparison of the nowcasting performance four extreme events (two convective and two stratiform) are considered and the investigation is focused on three stations inside Hannover city. Continuous (bias and rmse) and categorical (POD, and FAR) criteria are used to evaluate the performance for lead times up to two hours. The results reveal which method is more appropriate for forecasting extreme rainfall events that cause urban pluvial flooding.