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# Radar data bias correction implementing quantile mapping and investigation of its influence in a hydrological model

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Weather radar is an important source of data for estimating rainfall rate with relatively high temporal and spatial resolution covering large areas. Although weather radar provides fine temporal and spatial resolution data, it is subject to different sources of error. Beside casual problems associated with radar, e.g. clutter and attenuation, weather radar either underestimates or overestimates the rainfall amount. Additionally, time steps with strangely high values result in destroying the structure of time series derived from radar data. In order to estimate areal precipitation for hydrological analyses, radar data could be merged with rain gauge network data. The merging product quality is strongly dependent on radar data quality. The main purpose of this study is to illustrate a method for improving radar data quality and to investigate the influence of radar data quality on merging products by means of cross validation. Quantile mapping on the two sources of data, the radar and rain gauge network, is implemented in this study to improve the radar data quality. After correcting the radar data, considering rain gauge data as the truth, the data is implemented into a hydrological model, HBV-IWW, to investigate the influence of the different input sources regarding model performance. It has been observed that implementing quantile mapping improves radar data quality significantly. On the other hand, using radar data after correction not only improves interpolation performances but also reveals other possible applications like disaggregation of daily rainfall data into finer temporal resolutions. Beside radar data quality, there are other factors influencing the model performance like network density and the applied interpolation technique. The study area is a mesoscale catchment located in Lower Saxony, northern Germany.