1.51 VARIATIONS IN RADAR RAINFALL ESTIMATORS WITH GENERAL WEATHER TYPES AND LOCATION IN BAVARIA

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Accurate estimation of rain intensity is vital for many environmental and hydrological applications. Radar estimation of rain intensity is based on the equation $Z=AR^b$, where the parameters A and b are linked to local and temporal features in rain microstructure as well as to other factors such as rain type (convective - stratiform). However, general weather types exhibit a number of properties which might influence rain microstructure, including cyclonity, wind direction and humidity in upper levels. This research inspects the variation of rain properties with each of these factors, and explores the possibility of improving radar estimation of rain intensity by accounting for them.

The raw output of 11 disdrometers in southern Bavaria with a temporal resolution of one minute from June, 2013 through June, 2017 was combined with daily records of objective weather types as classified by the German Meteorological Service DWD. The disdrometers′ raw output was used to extract the main properties of rain in each interval: rain intensity R [$mm.h^{-1}$], total concentration N [m^{-3}] and mass weighted rain drop diameter D_m [mm]. Each interval was classified by rain type into convective or stratiform. Z-R parameters were determined for each rain type (general model) and then for each combination of rain type and general weather type (weather type model). The accuracy of both models in determining rain intensity was evaluated.

The preliminary results suggest significant differences in R, N and D_m values between weather types in both convective and stratiform rain. Consequently, the general model is expected to perform better than the weather type model. Wind direction in upper levels might provide a plausible explanation for the variation in rain microstructure indicators particularly in stratiform rain.