



Complex terrain influence on radar-based rainfall estimation

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The main issue regarding radar-based quantitative precipitation estimation (QPE) is the level of trust that the forecaster should have when warnings, regarding weather phenomena that might put human lives and good in danger, must be issued. The aim of the current research is to objectively evaluate the difference between radar estimated and gauge measured precipitation over an area with complex terrain (e.g., mountainous areas). Radar data used in this study are supplied by an S-band, single polarization, Doppler weather system, Weather Surveillance Radar 98 Doppler (WSR-98D), located in the center of Romania. Ground observations of precipitation are supplied by 27 weather stations located within the coverage area of the radar system. The approach consists in few steps: in the first step, the reflectivity data are converted into rainfall rates, using the Nexrad convective Z-R relationship, while the second step consists in accumulation of the rainfall field over certain time intervals. During another step, the differences between gauge and radar rainfall accumulations were investigated using four objective functions: mean bias between ground measurements and radar estimations, root mean square factor, Pearson and Spearman correlations. The results point that both differences and correlations, respectively, between rain gauge amounts and radar-based accumulations have more local significance than general relevance over the investigated area.