

Analysis of radar estimated precipitation

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Good understanding and monitoring of precipitation is of big importance for scientific community (atmospheric dynamics, climatology, wetter forecast, warning systems...), but also in applied circles such as agriculture, traffic control, tourism, economy. Since the main characteristic of precipitation is high spatial and temporal variability on all scales, it is very important to use methods which can provide good spatial and temporal resolution of the phenomena. Weather radar has the capability to provide good spatial and temporal resolution but to consider its application one needs to be aware of uncertainty following its measurements. Until now, the radars in Croatia were used only in hail defense system and as qualitative factor in nowcasting. This study presents first steps in better understanding of radar estimates of precipitation in Croatia, foundation for further analysis and encouragement for new application of radar in general. For that purpose, pre liminary analysis was obtained for summer period (June-September) using nine longer precipitation events, showing that currently used, Marshall-Palmer relationship caused total underestimation of precipitation of around 40% compared with ground measurements. Newly obtained Z-R relationship underestimated the same data set for 5%. Through this study the main factors causing the uncertainty were variation in drop size distribution, radar beam spreading and horizontal displacement of precipitation due to stronger wind-drift. Also, new method for correcting uncertainty of wind-drift effect on precipitation was developed. Parameters obtained from corrected data set were improved for about 10%, compared to parameters of uncorrected data set.