Radar-Based Precipitation Climatology for Germany – First Results and Future Directions

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The National Meteorogical Service of Germany (Deutscher Wetterdienst, DWD) operates since nine years a radar-based precipitation analysis in real-time combining weather radar data every five minutes and hourly surface precipitation observations (s. www.dwd.de/RADOLAN, [1], [2]). The temporal and spatial high resolved precipitation data are especially delivered to the German flood forecasting centres for real-time hydrological applications and are also used within the weather warning management of DWD himself for severe precipitation warnings.

A first climatological application of these hourly radar-based precipitation data was realised for deriving a precipitation statistics in the region of Cologne. The first results are compared with the conventional so-called KOSTRA method (s. www.dwd.de/kostra, [3]), which is calculating the severe precipitation amounts depending of its duration and annuality, using only the surface precipitation data.

The data basis for the radar-based precipitation climatology is determined by the availability of the high resolved radar data of the German radar network of DWD. It is limited to the time since 2001. A first complete reanalyse from 2001 until today with the actual RADOLAN procedure is just now running and will be used within the project "Production of a decennial radar-based high-resolution precipitation climatology of Germany for evaluation of the recent change in extreme precipitation pattern (Radar Climatology)" by the five Federal State Authorities BBK (Bundesamt für Bevölkerungsschutz und Katastrophenhilfe), BBSR (Bundesinstitut für Bau-, Stadt- und Raumforschung), DWD, THW (Technische Hilfswerk) and UBA (Umweltbundesamt).

[1] Bartels, H., Weigl, E., Reich, T., Lang, P., Wagner, A., Köhler, O., Gerlach, N., 2004: Zusammenfassender Abschlussbericht zum Projekt RADOLAN

[2] Winterrath, T., W. Rosenow and E. Weigl, 2012: On the DWD quantitative precipitation analysis and nowcasting system for real-time application in German flood risk management. Weather Radar and Hydrology, Proceedings of a symposium held in Exeter, UK, April 2011, IAHS Publ. 351

[3] Bartels, H., Dietzer, B., Malitz, G., Albrecht, F., Guttenberger, J., 2005: KOSTRA-DWD-2000 Starkniederschlagshöhen für Deutschland (1951 – 2000)