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Spatial and temporal rainfall variation observed by vertically pointing radar clusters and disdrometers

W. Yen and S. Crewell

University of Cologne, Institute for Geophysics and Meteorology, Cologne, Germany (yen@meteo.uni-koeln.de / Phone: +49-221-4701611)

One of the major uncertainties in quantitative precipitation estimation using scanning radar and in-situ instruments is the temporal and spatial ambiguity between these sensors, such as sample volume mismatch, drop-sorting and horizontal drift by fallout. Information of raindrop size distribution (RDSD) is indispensible for identification and quantification of rainfall variations. The vertically pointing micro rain radar (MRR) can measure RDSD profile and rainfall integral parameters including reflectivity Z with high temporal resolution. It thus fits in as a linkage between in-situ measurements and the radar pixel aloft.

Here a comparative analysis using clustered MRRs and disdrometers on variation of rainfall integral and physical RDSD parameters in space and time is presented. Concurrent observations from nine MRRs, two disdrometers (optical and impact type) and one high resolution rain gauge were collected during the AQUARadar (Advances in Quantitative Areal Precipitation Estimation by Radar) field campaign for over three months in summer 2006. The instruments were distributed to two field sites with a separation of 5.5 km in a east-weast alignment. Clustered MRRs at each site were separated by an average distance of 300 m.