

## **Use of a Micro Rain Radar (MRR) for Measurements of Rain Drop Sizes and Quantitative Estimation Precipitation in Mountain Area**

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Observation of Drop Size Distribution (DSD) of precipitation included in clouds and that of reflectivity by precipitation altitude are very important in order to understand development of clouds and conduct Quantitative Precipitation Estimation (QPE). They are also considered as observation data that can help explain physical characteristics of precipitation observed on the ground and in the air. However, few studies have been conducted through the use of these observation data in Korea. In fact, DSD in relation to precipitation by altitude and reflectivity by altitude are considered as the most important information with regard to estimation of quantitative precipitation. It is due to the fact that it helps accurately figure out characteristics of precipitation within clouds and detect estimation errors in radar rain rate. In particular, as the QPE accuracy of precipitation is determined according to how accurately relationships between reflectivity (Z) and rain rate (R) that aim to estimate relationships between precipitation and reflectivity can be explained, it is necessary to take account of rain drop sizes and reflectivity by altitude, which leads to help explain variability of the DSD. In this regard, the study analyzed observation data from Micro Rain Radar (hereafter referred to as MRR), a remotely controlled rain observation device, in an effort to understand physical characteristics of clouds and precipitation, and the MRR data were used to estimate quantitative precipitation. Daegwalryeong (37°41'N, 128°45'E, 843 m ASL, mountain area) was selected to observe rain drop sizes and estimate quantitative precipitation in the mountain area. Generally speaking, this study consists of two parts. First, it examined characteristics of the MRR data and verified the MRR data based on comparison between ground rain gauge data and S-band single-polarization radar data. Second, it estimated quantitative precipitation through the use of the MRR data. This study aimed to examine the efficiency of the MRR data and accurately estimate radar rain rate.