



Drop size distribution and radar rainfall estimate for different precipitation systems in Taiwan

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Taiwan is located in the subtropics off the southeastern coast of China. Its climate is strongly affected by the East Asian monsoons. In addition, the presence of the central mountain range (CMR) causes large spatial variations in the island climate throughout the

year. Precipitation in Taiwan is influenced by the topographic effect and the prevailing wind in different season. The major weather systems influence Taiwan are cold surges in winter, cold fronts in spring, Mei-yu fronts, mesoscale convective systems (MCSs) and

orographic rainshowers during Mei-yu season (mid-May to mid-June), tropical disturbances (including tropical storms) and orographic rainshowers in summer, late season's tropical storms, cold fronts and MCSs in fall.

The disdrometer, raingauge network and Doppler radar data were collected since 2002 in Taiwan. Simultaneous observations made with optical-and impact-type disdrometers were analyzed. Drop size distribution(DSDs) of the different precipitation systems were compared and discuss. The DSDs were used to calculate the radar rainfall estimate.

The Gamma drop size distributions are derived from disdrometer observation at six minutes interval. The Z-R relations through Gamma distribution are calculated. Dur-

ing the heaviest rainfall period of Typhoon Nari, the disdrometer observation indicated the maximum drop size did not exceed 4mm. The preliminary results showed that the N_0 increased as the rainfall rate increased. The Z-R relation with the average of the coefficients have been derived from drop size distributions. The rainfall estimate from the disdrometer derived Z-R relations will be compared to the probability matching method results. Due to the complex terrain of northern Taiwan, the locations of the underestimate of the reflectivity by the blockage and partial beam filling have been identified. The vertical profiles of reflectivity in both stratiform and convective regions will be studied for the purpose of better extrapolation of reflectivity at lowest level. The derived reflectivity from drop size distribution will also be compared to the radar observation.