

A study on microphysical characteristics of Mei-yu season rainfall over Taiwan

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The Mei-yu season over Taiwan, mainly associated with frontal systems, is a transition period (May and June) between the winter and summer seasons. The interactions of Mei-yu season frontal systems with the complex topography of Taiwan lead to heavy precipitations across the island. The present study investigates rain and microphysical attributes of the Mei-yu season over Taiwan using Global precipitation measurement mission dual-frequency precipitation radar (GPM DPR). To analyze the regional and intra-seasonal characteristics of the Mei-yu season, May and June are segregated into pre-Mei-Yu (5/15-5/31), mid-Mei-Yu (6/1-6/15), post-Mei-Yu (6/16-6/30). There are clear distinctions in the raindrop size distributions among pre-, mid-, and post-Mei-yu seasons, with abundant large drops in the post-Mei-yu. Furthermore, raindrop size distributions also showed apparent differences among four regions (north, south, central, and eastern part) of Taiwan, with relatively bigger drops in central Taiwan. The contoured frequency by altitude diagrams of rain rate, radar reflectivity, mass-weighted mean diameter, and normalized intercept parameters are used to understand the microphysical processes responsible for the regional and intra-seasonal variations.

Keywords: GPM DPR, Mei-yu season, rain microphysics