1.49 MICROPHYSICAL CHARACTERISTICS OF ORGANIZED CONVECTION OBSERVED BY POLARIMETRIC RADAR IN EASTERN CHINA

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Polarimetric radar and disdrometer data obtained during the 2014 Observation, Prediction and Analysis of Severe Convection of China (OPACC) field campaign are used in the study to investigate the microphysical characteristics over three different organized convection systems (meiyu rainband, typhoon rainband and squall line) with intense rainfall in eastern China. Drop size distributions (DSDs) and vertical distribution of hydrometeors are derived from the Nanjing University C-band polarimetric radar and compared with surface DSDs measured from a disdrometer. All three systems possess deep moist environment below the freezing level, favorable for warm rain processes. Convection is tallest in the squall line where abundant ice-phase processes generated large amount of rimed particles (graupel and hail) above freezing level and possesses the largest raindrops among these three systems at the surface. The lower storm tops in the typhoon rainband and meiyu systems composed of less active ice processes above the freezing level and hold equally high medium to small raindrop concentration causing high rainfall rates. The precipitation is more intense in the typhoon rainband, it is found that higher coalescence efficiency in the typhoon rainband enhances the rainfall rate. A conceptual model is proposed to describe microphysical processes over different environment conditions and illustrate the relative importance of the ice-phased and warm-rain processes to the heavy rainfall.