

Wind profilers for diagnosis of precipitating cloud systems over Asia and Western Tropical Pacific Ocean

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We describe research on the microphysical (i.e., drop size distributions) and kinematic (i.e., vertical air motion) properties of precipitating cloud systems. For this purpose wind profilers operated at five different locations over Asia and Western Tropical Pacific Ocean [at India (Gadanki), China (Dongshan), Thailand (Bangkok) and Japan (Tokyo)] and Palau (Aimeliik) are utilized to understand threedimensional wind field, convective boundary layer associated with mesoscale precipitating systems. In particular, these wind profilers directly measure the vertical wind component within a convective environment and reveal details about the vertical structure of precipitating cloud systems. In addition, data from TRMM Satellite, radiosonde/rawinsonde and surface meteorological measurements were used to analyze the thermodynamics, detailed precipitation systems. Results from a variety of precipitation systems observed at different locations related to the vertical draft structure and the microphysics. The Summer/winter monsoon precipitating cloud systems are associated with frontal systems, thunderstorms, cumulus convection, flow instability in the jet stream, and the interaction of airflow with topography will be discussed during presentation. Tropical wind profilers and JW disdrometers (Gadanki and Aimeliik) analysis/results show clear seasonal dependence raindrop size distribution characteristics in summer monsoon and winter monsoon. During the summer monsoon often the precipitating systems are associated with lightening and mesoscale convection activities and also short lived (~ 1 - 2hours) with high intensity of rainfall. Our study also focuses on understanding the key components of the South and East Asia monsoon system and their variability within the context of the evolving land surface-atmosphere-ocean within the boundary layer.