

Overview of ground based radar/lidar remote sensing study of cloud and precipitation at Tropical Indian region

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Theme of this work is to provide overview on the current understanding of physics and dynamics of tropical cloud (PDTC) systems over Indian region. It mainly focuses on the insights gained from the observations of ground based remote sensing tools like weather and cloud radars, wind lidar and other complementary observations. Indian Institute of Tropical Meteorology (IITM)'s acquired X- and Ka-band radar for the Study of the interaction between Cloud and Environment for formation of Precipitation. Main objective of it is to make simultaneous high resolution measurements on dynamical, cloud microphysical and precipitation parameters pertain to monsoon system probably at diverse locations over tropical Indian region. For this, Polarimetric Doppler Weather Radar (DWR) at higher frequencies (9.5 and 35 GHz) with other complimentary observations from Microwave rain radar (MRR), rain gauges and disdrometer, GPS sounder and etc., are being potential tools to gain knowledge on this scientific as well as societal application oriented programme. Ka-band Scanning Polarimetric Doppler Radar (KaSPR) is cloud radar operating at wavelength of 8.5 mm with average powers of 110 W and X-band Scanning Polarimetric Radar (XSPR) is DWR operating at 3.14 cm with peak powers of 200 kW with duty ratio of 0.1%. IITM's mobile Polarimetric scanning X- and Ka-band (cloud) radar observations have been started respectively since monsoon seasons of 2011 and 2013. Vertical structure of precipitating systems and the associated local dynamics have been analyzing to understand PDTC systems. Co-located XSPR and KaSPR have been providing simultaneous high sensitivity versatile measurements of cloud and precipitation at tropical high altitude site (Manderdev, 18.04 N, 73.87 E, 1.35 km AMSL) from a scanning mobile platform since June, 2013. Those first of its kind results over tropical Indian region will be discussed.