

## **Recent Developments at National MST Radar Facility, India**

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National MST Radar Facility was established to study the structure, dynamics and interaction between different regions of the middle atmosphere. It has been operational since 1991 (1994) in ST (MST) mode. Since then several major instruments, such as, a Lower Atmospheric Wind Profiler (LAWP), a Lidar, a Disdrometer, etc, have been added to the existing facility to support the scientific activities at NMRF. Very recently, Raman LIDAR, Boundary Layer LIDAR (BLL), and sodium LIDAR have also been established. Many interesting scientific results have been obtained making use of these instruments, including, characterization and quantification of turbulence and its variation at different scales, retrieving temperature and humidity profiles, studying wave phenomena at different scales starting from gravity waves to Quasi biennial oscillation, diurnal evolution of the Boundary layer and its features in different seasons, studying jet streams (TEJ, in particular), etc. The data have also been used to classify the precipitating systems, study the melting layer characteristics, derive Drop Size Distributions (DSD), and establish Z-R relationships for different precipitating systems as well as for different monsoon systems. The MST Radar has been used to study the irregularities in the E- and F- regions of the ionosphere. Further, the radar has been providing wind information for rocket launch programs at SHAR Centre.

To overcome the limitations posed by the present system for some of the scientific studies, NMRF has initiated a new project, Space Domain Interferometry/Coherent Radar Imaging (SDI/CRI). Another project, "Estimation of electron density profile using Faraday rotation of coherent scattered signal" is also being implemented. Development of Rayleigh Doppler LIDAR is also taken up to measure stratospheric and mesospheric winds.

National MST Radar Facility (NMRF) is making an initiative to formulate the International Network of Tropical Atmosphere Radars (INTAR). Some of the scientific objectives of INTAR are to study east-west circulation pattern in the vast region covering India and Pacific, Madden-Julian oscillations, Quasi-Biennial Oscillations, Stratosphere-Troposphere Exchange Processes, etc.