

Recent upgrade of the MU radar and optical observation in the MLT region over Shigaraki, Japan.

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The MU radar meteor echo observation has been used to derive precise horizontal wind velocities in the MLT region (80 - 100 km). Relative temperature fluctuation can also be derived using ambipolar diffusion coefficient measured by decay time constants of meteor echoes. Coordinated optical observations such as all-sky imagers, FPI, airglow photometers, sodium and rayleigh lidars have been carried out in order to study atmospheric waves and dynamics/structures of the MLT region. Recently, a sodium temperature lidar, which was operated in Syowa, Antarctica, was moved to Uji, near Shigaraki (about 30 km west), and started temperature profiling of the MLT region in 2005. The temperature profiles observed with this lidar provides important information of N^2 (Buoyancy frequency squared) in discussing vertical wave propagation and instability. The coordinated observations with the new sodium lidar, the MU radar and the airglow imager (of OMTI: optical mesosphere thermosphere imagers) were conducted in October/ November 2005. Variations of wind, temperature and sodium density showed significant effect of atmospheric tides. Characteristics and propagations of the waves observed in the airglow imager are discussed using the temperature and wind data from the lidar and the radar. We also present the new MU radar capability of ultra-multi channel digital receivers (25 channels) and GPS synchronized radar operation, which enables multichannel-multistatic meteor radar observations. The plan of new meteor observations to derive high resolution horizontal structure of MLT wind field as well as meteor orbit determinations will also be presented.