



Weather Radars and Lidar for Observing the Atmosphere

J. (Vivek) Vivekanandan

Earth Observing Laboratory, National Center for Atmospheric Research Boulder, Colorado, USA

The Earth Observing Laboratory (EOL) at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado develops and deploys state-of-the-art ground-based radar, airborne radar and lidar instruments to advance scientific understanding of the earth system. The ground-based radar (S-Pol) is equipped with dual-wavelength capability (S-band and K_a-band). S-Pol is the only transportable radar in the world. In order to capture faster moving weather events such as tornadoes and record observations of clouds over rugged mountainous terrain and ocean, an airborne radar (ELDORA) is used. It is the only airborne Doppler meteorological radar that is able to detect motions in the clear air.

The EOL is in the process of building the first phase of a three phase dual wavelength W/K_a-band airborne cloud radar to be called the HIAPER Cloud Radar (HCR). This phase is a pod based W-band radar system with scanning capability. The second phase will add pulse compression and polarimetric capability to the W-band system, while the third phase will add complementary K_a-band radar. The pod-based radar is primarily designed to fly on the Gulfstream V (GV) and C-130 aircraft. The envisioned capability of a millimeter wave radar system on GV is enhanced by coordination with microwave radiometer, in situ probes, and especially by the NCAR GV High-Spectral Resolution Lidar (HSRL) which is also under construction. The presentation will describe the capabilities of current instruments and also planned instrumentation development.