

Doppler lidar observations of the boundary layer near tornadic and non-tornadic supercells

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Abstract

During year 2 of VORTEX-2, a 2- μm wavelength Doppler lidar, the Truck-mounted Wind Observing Lidar Facility (TWOLF), was mounted on the Mobile Weather Radar 2005 X-band Phased array (MWR05XP) radar truck. Velocity and reflectivity data were collected in the low-level inflow region of a number of tornadic and nontornadic supercells. Scanning strategies including PPI's, RHI's and VAD's were used to acquire data about the boundary layer structure. In this paper we present preliminary comparisons of boundary layer features in the tornadic and nontornadic supercell environments. Qualitative comparisons between features such as boundary layer rolls and streaks are made as well as quantitative comparisons of storm-relative low-level inflow strength and direction to identify any commonalities in the tornadic or nontornadic events. The evolution of the boundary layer is also examined to address how the structure changes with time.