

## **Developmental Environment and Early Evolution of the 8 May 2009 Super Derecho**

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This talk documents the environment and early evolution of the remarkable derecho that crossed parts of the central United States on 8 May 2009. Central to the presentation is a comparison of the 8 May 2009 derecho environment to that of other mesoscale convective systems (MCSs) that have occurred over the central U.S. during a similar time of year. Synoptic-scale forcing was weak and thermodynamic instability was limited during the development of the initial convection over the central High Plains. Nonetheless, several mesoscale features appeared to contribute to initiation, including a mountain wave, a mid-level jet streak, a weak mid-level vorticity maximum, a “Denver cyclone”, and a region of upper-tropospheric inertial instability.

The subsequent MCS developed from several convective elements that formed along mesoscale features over the lower plains. An unusually strong and deep low-level jet transported exceptionally high amounts of low-level moisture northward very rapidly, destabilized the lower troposphere, and generated frontogenetical circulations that appeared to aid convective development. The thermodynamic environment ahead of the developing MCS contained unusually high precipitable water (PW) and very steep mid-tropospheric lapse rates. Values for some environmental parameters that often are associated with strong MCSs and severe surface winds, like downdraft convective available potential energy (DCAPE), mean winds, and 0-6 km vertical wind shear, were not as anomalously large as the PW and lapse rates. In fact, DCAPE was lower than what is typically found in the environment of developing MCSs. The contributions of these factors to the development and intensity of the MCS are discussed.