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A WRF-DART Study of the Nontornadic and Tornadic Supercells Intercepted by VORTEX2 on 10 June 2010

Alicia Klees (1), Yvette Richardson (1), and Glen Romine (2)

(1) Penn State University, University Park, Pennsylvania, United States, (2) National Center for Atmospheric Research, Boulder, Colorado, United States

On 10 June 2010, the second Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX2) armada collected a rare set of observations of a nontornadic and a tornadic supercell evolving in close proximity to each other near Last Chance, Colorado. An observational study of why one supercell produced no tornadoes while the other produced at least two suggested that a combination of an evolving storm environment and differing impacts of a storm merger on both supercells likely played a significant role.

For this case, real-data simulations using WRF-DART are being conducted to further investigate: (1) the impacts of the merger (through changing baroclinicity and/or convergence) and the evolving storm environment on the tornadic supercell's tornado production, (2) how the merger killed the nontornadic supercell, and (3) if the nontornadic supercell would have produced tornadoes had the merger not occurred. To make the simulations as realistic as possible, we assimilate conventional, radar, and VORTEX2 observations using EnKF techniques. We are exploring the ensemble results of these simulations to gain better insight into the evolution of the storms, their environments, and the production of the tornadoes.