

ATS/CIRA Colloquium

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**An Investigation of Tornado Maintenance
and Demise Using VORTEX2 Observations**

Hosted by Sue van den Heever

Friday, April 4, 2014

**ATS room 101; Discussion will begin at 11:15am
Refreshments will be served at 10:45am in the weather lab**

The second Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX2), carried out in 2009 and 2010, was designed to obtain simultaneous observations of wind and thermodynamic fields within tornadic and nontornadic supercells using an armada of instrumented vehicles and mobile radars. In addition to understanding tornado formation, VORTEX2 scientists also hoped to learn more about the processes governing tornado maintenance and demise; such knowledge is important for improving tornado warning precision. A tornadic storm on 5 June 2009 in Goshen County, Wyoming provided VORTEX2 the chance to collect high-quality observations of a long-lived (~30 minutes) tornado, allowing us to examine changes in kinematic and thermodynamic fields over the full tornado lifetime. In particular, dual-Doppler wind fields from the Doppler on Wheels (DOW) radars and the National Oceanic and Atmospheric Administration (NOAA) x-band polarized radar (NOXP) provide a four-dimensional view of kinematic and precipitation fields, including the displacement of the near-surface rotation from the midlevel mesocyclone, interactions between the tornado and smaller vortices, influences of high-reflectivity cores within the rain curtains, and the evolution of divergence and vorticity within the storm's cold pool. In addition, mobile mesonet and StickNet in situ data allow us to characterize important thermodynamic properties within the outflow. Results from this case are compared to current conceptual models of tornado maintenance and demise based on previous observations, theory, and numerical modeling studies.

Link to colloquium videos and announcement page: <http://www.atmos.colostate.edu/dept/colloquia.php>