VORTEX2: The Second Verification of the Origins of Rotation in Tornadoes Experiment

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I. INTRODUCTION

The Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX) is a multi-agency field program to investigate tornado genesis, maintenance, and demise; tornado structure and near-ground winds; relationships between tornadic storms and their environments; and numerical prediction of supercells and tornadoes. The first field phase of VORTEX occurred in 1994 and 1995. The second field phase of VORTEX—*VORTEX2*—is taking place in the United States Great Plains region during the spring of 2009 and 2010. The field experiment is being conducted with mobile facilities, without a "home base" per se (Fig. 1). This "fully mobile" strategy is necessary to obtain the needed high-resolution observations in the limited time available for the field phase. VORTEX2 will also benefit from data collection by the fixed observing network in the Great Plains, particularly the rich observing network in Oklahoma.

The Year 1 field phase of VORTEX2 took place from 10 May–13 June 2009. Year 2 activities are slated for 1 May–15 June 2010. The selected time period for operations covers the part of the spring storm season that tends to have slower-moving storms, thereby presenting a better opportunity to obtain the high-resolution observations needed in support of the science objectives (the science objectives of VORTEX2 are discussed in detail in the Scientific Program Overview, available at http://www.eol.ucar.edu/projects/vortex2/documents).

The VORTEX2 fleet of mobile instruments comprises approximately 50 vehicles, including 10 radars (W-, Ka-, X, and C-band radars; also two dual-polarization radars, a phased array radar, and a rapid-scanning radar), 4 mobile sounding units, 8–10 mobile mesonet units, a field coordination vehicle, and teams that can deploy up to 24 StickNet probes, 12 tornado in situ probes, laser disdrometers, video particle probes, and, in some situations, unmanned aircraft systems (UAS). VORTEX2 relies on what might be referred to as "distributed leadership," that is, the coordination and operation philosophy relies largely on field teams carrying out their missions semi-autonomously based upon information assimilated by a field coordination team and distributed to individual team leaders.

II. THE ECSS PRESENTATION

The presentation to be delivered at the ECSS will discuss the science objectives, instrumentation, and highlights from Year 1. Additional information on VORTEX2 is available at http://www.vortex2.org (maintained by the Center for Severe Weather Research), http://www.nssl.noaa.gov/vortex2 (maintained by the National Severe Storms Laboratory), and http://www.eol.ucar.edu/projects/vortex2 (maintained by the National Center for Atmospheric Research).

III. ACKNOWLEDGMENTS

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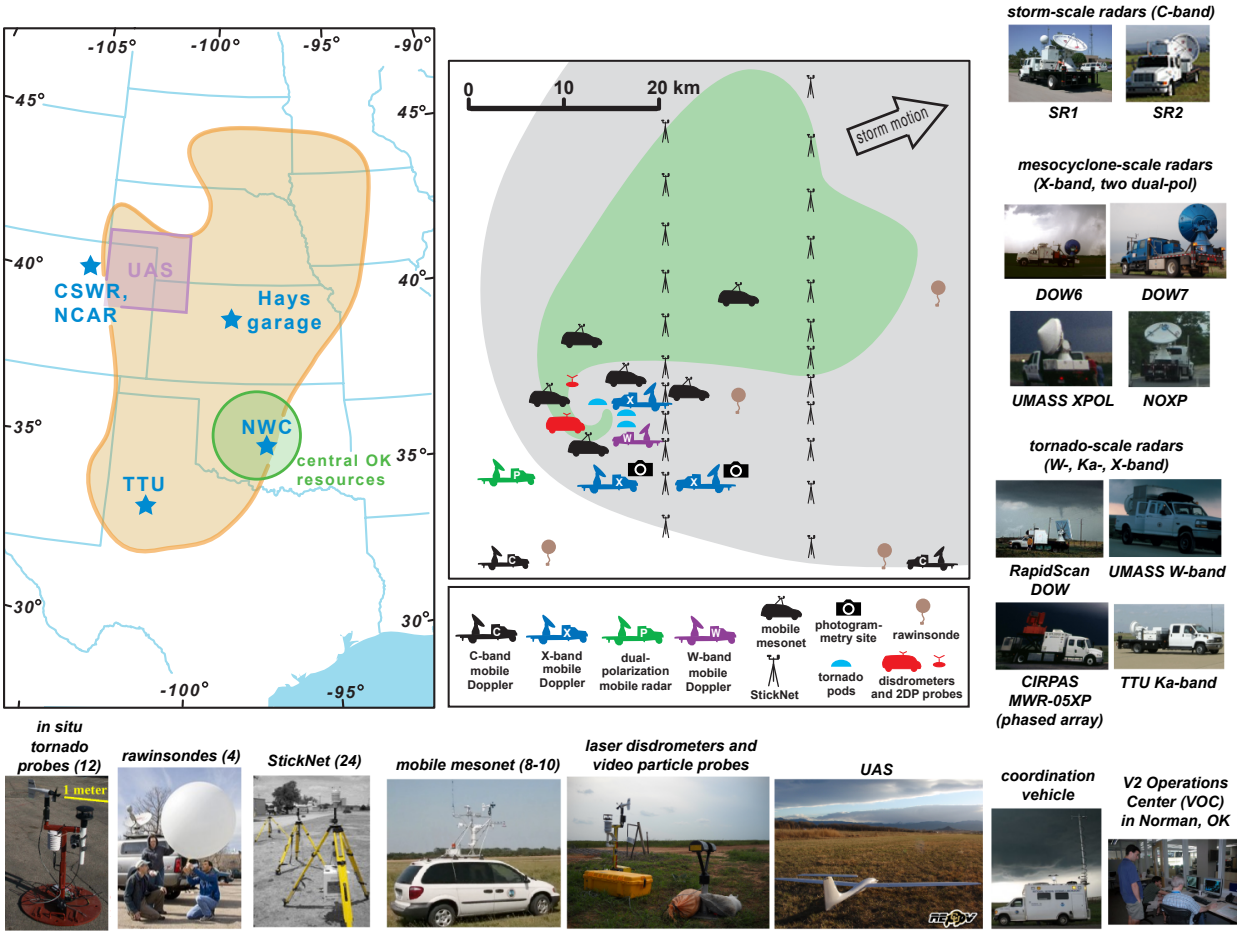

FIG. 1: (Left) The VORTEX2 domain (orange) and other key locations: subdomain of central Oklahoma resources (including the NWRT Multifunction Phased Array Radar); National Weather Center (NWC, including National Severe Storms Laboratory and University of Oklahoma); Lubbock, Texas (Texas Tech University); repair bay in Hays, Kansas; UAS demonstration subdomain; and Boulder, Colorado (Center for Severe Weather Research, National Center for Atmospheric Research, and University of Colorado). (Middle) An idealized deployment of VORTEX2 facilities targeting a slow-moving supercell. (Bottom and right margins) VORTEX2 instrumentation.