

Unmanned Aircraft in Storm-scale and Mesoscale Research

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ABSTRACT

Unmanned aerial vehicles (UAV) can provide observations of atmospheric phenomena that are either difficult or impossible to attain with existing platforms. It is for this reason that facilitating the maturation of this relatively new technology has become a high priority in the atmospheric sciences. Because many scientific applications of unmanned aircraft systems (UAS; the UAV along with the communications and logistics infrastructure required for their operation) require operation beyond the visual line of sight of the controller, the autonomous UAV is a more versatile aircraft configuration. Autonomy requires a significantly more complex command and control system and elicits more scrutiny by airspace regulatory agencies. Therefore, while the potential utility of UAS for atmospheric science applications may be obvious, the engineering and regulatory hurdles that must be surmounted for their use are significant.

This presentation will detail the promise, challenges, and preliminary successes using UAS for sampling storm-scale and mesoscale phenomena. Focus will be placed on the collaborative work of the University of Nebraska and University of Colorado that culminated in two field projects using UAS: the Collaborative Colorado-Nebraska UAS Experiment (CoCoNUE) and the second Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX-2).