Targeted Observation by Radars and UAS of Supercells (TORUS): Summary of the 2019 field campaign

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Targeted Observation by Radars and UAS of Supercells (TORUS) aims to improve the conceptual model of supercells by explicating the relationship of storm-generated boundaries and coherent structures within storm outflow to the generation/amplification of near-surface rotation. New insight will be enabled through coordinated and tightly-focused deployments of new and established remote and in situ instruments tasked to collect thermodynamic and kinematic observations both aloft and at the surface. The TORUS field campaign will be executed across two spring seasons (May-June 2019 and 2020) over an operations domain covering $\sim$1,300,000 km2 of the central US. Observing platforms include four fixed-wing UAS, two mobile ground-based Ka-band radars, one mobile ground-based X-band radar, the NOAA P3 manned aircraft with onboard X-band radar and downward-pointing compact Raman lidar, eight mobile mesonets, three mobile sounding systems, and one mobile ground-based lidar.

A summary of intensive operation periods during the 2019 field season will be presented. Additional discussion points will include lessons learned from the first field season and anticipated adaptations for the 2020 field season. These discussion points will likely address deconfliction of UAS and manned research aircraft, UAS operation in the left-flank of a supercell where thermodynamic observations are particularly challenging to collect, and successful and unsuccessful strategies for executing coordinated deployment of the 20 observing platforms.