Preliminary results from the Tiny TWIRL 2019 tornado low-level wind study

*Karen Ann Kosiba[1], Joshua Wurman[1]

1. The Center for Severe Weather Research

The Tiny TWIRL (tTWIRL) tornado field study was ongoing as this was being written. Data from DOW mobile radars and ruggedized “Tornado Pod” weather stations are expected to be combined to map the structure of the near-surface wind field in tornadoes below 20 m AGL.

On 17 May 2019, tTWIRL collected data in a tornado near McCook, NE. The DOW radar collected shallow volumes every ~30s with 12.5 m gating at a range of 2-4 km from the tornado. Four Tornado Pods were deployed within proximal DOW radar coverage providing 1-meter measurements in or near the tornado core flow. Data from a previous projects found the maximum winds near 5 m AGL in one tornado. In addition to the McCook observations, tTWIRL collected data on 20 May 2019 in the potentially violent Mangum, OK tornado, where DOW radar-measured ground-relative winds were ~80 m/s. The tTWIRL projects plans to collect data in additional tornadoes to work towards characterizing the low-level wind distribution in tornadoes, including whether the 5-m AGL result is typical or exceptional, how wind structure varies with tornado intensity, size, and vortex structure, and how these winds correspond to observed damage.

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