

Title: Verification of the Origins of Rotation in Thunderstorm 2017 Field Campaign
Purdue University Mobile Radiosonde Data Set

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Dataset Overview:

Purdue University operated a mobile radiosonde system to release radiosondes at locations around northern Alabama and southern Tennessee (Figure 1) during VORTEX-SE_2017 Intensive Observation Periods (IOPs). The choices for the locations and times of the releases were made in collaboration with other VORTEX-SE PIs. This data set includes a total of 18 radiosondes during the VORTEX-SE_2017 field season (25 March to 1 May 2017).

Project Overview:

The Verification of the Origins of Rotation in Tornadoes Experiment-Southeast (VORTEX-SE) is a research program to understand how environmental factors characteristic of the southeastern United States affect the formation, intensity, structure, and path of tornadoes in this region. VORTEX-SE will also determine the best methods for communicating forecast uncertainty related to these events to the public, and evaluate public response. For the 2017 field season a large array of fixed and mobile ground instrumentation were deployed around Huntsville, AL from 8 March to 8 May 2017. Further information on VORTEX-SE is available at the VORTEX-SE web site at NSSL (<https://www.nssl.noaa.gov/projects/vortexse/supported-2017/>) and NCAR/EOL: (https://www.eol.ucar.edu/field_projects/vortex-se) and information on the VORTEX-SE_2017 deployments is available at the VORTEX-SE_2017 Field Catalog: http://catalog.eol.ucar.edu/vortex-se_2017.

Instrument Description:

Purdue utilized Sparv Embedded's Windsond S1H3-S radiosondes and 20 gram balloons, along with the RR1 radio receiver. Data were processed using software version 2.80. Reported sensor characteristics indicate air pressure accuracy to 1.0 hPa, temperature to 0.2 °C, wind speed to 5%, and relative humidity to 1.8 % RH. Sensor operating range is between -40 and + 80 °C,

sensor typically fails once temperatures fall below $-40\text{ }^{\circ}\text{C}$. Data were recorded at 1 second vertical intervals and processed by the software every ~ 10 seconds. The surface observations are from the radiosonde.

Manufacturer-stated accuracy for each of the variables sampled by the S1H3-S radiosondes are available from http://windsond.com/windsond_catalog_Dec2016.pdf

Data Collection and Processing:

This was a mobile sounding system. Soundings were generally launched in the vicinity of other in situ instrumentation deployments (Purdue PIPS and Texas Tech Sticknets). The raw sounding data were initially processed using the Windsond software. Data were visually scanned using sharppy (<https://github.com/sharppy/SHARPPy>) plotting software when possible.

Data Remarks:

Time reports should use UTC time only, local time zone setting was incorrect for several of the launches and should be ignored. Temperature and humidity values were not available beyond the altitude where the temperature fell below approximately $-50\text{ }^{\circ}\text{C}$.

Sonde launched on 1557 UTC 25 Mar 2017 may have experienced signal interference with another Windsond sonde on the same frequency (434 MHz) temp/humidity reports below 1500m MSL appear to be uncertain. Data above 420mb were removed due to pressure/height inconsistency.

Sonde launched on 1845 UTC 27 Mar 2017 wind data above 245 mb were removed due to pressure/height inconsistency, temperature sensor failure.

Sonde launched on 0125 UTC 28 Mar 2017 appeared to be ingested into an updraft fairly quickly, these data could not be visually inspected using sharppy and may be of poor quality.

Sonde launched on 1957 UTC 03 Apr 2017 wind data above 218 mb were removed due to pressure/height inconsistency, temperature sensor failure.

Sonde launched on 1554 UTC 05 Apr 2017 wind data above 235 mb were removed due to pressure/height inconsistency, temperature sensor failure.

Sonde launched on 1853 UTC 05 Apr 2017 wind data above 219 mb were removed due to pressure/height inconsistency, temperature sensor failure.

Sonde launched on 1753 UTC 28 Apr 2017 wind data above 249 mb were removed due to pressure/height inconsistency, temperature sensor failure.

Sonde launched on 1449 UTC 30 Apr 2017 wind data above 214 mb were removed due to pressure/height inconsistency, temperature sensor failure.

Sonde launched on 1735 UTC 30 Apr 2017 wind data above 212 mb were removed due to pressure/height inconsistency, temperature sensor failure.

Sonde launched on 1849 UTC 30 Apr 2017 appeared to be ingested into an updraft fairly quickly, these data may be of poor quality.