

Title: PERiLS 2023 UAH MAPNet Mobile Alabama X-Band (MAX) Radar Surface Meteorological Data

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1.0 Dataset Overview

The UAH Mobile Atmospheric Profiling Network (MAPNet) Mobile Alabama X-Band radar (MAX) is a mobile X-Band radar. Surface data is collected via a 10-meter, retractable meteorological tower. When high winds or lightning is in the vicinity, the tower is often lowered. Logbooks have been provided to help the user determine if/when the tower was lowered among other references. This data has undergone preliminary quality control and should be considered final.

IOP 1

Time Period: 2023/02/16 1440 to 2023/02/17 0145Z

Location: 32.89008, -88.34295 elevation: 68 m

IOP 2

Time Period: 2022/03/03 0025Z to 2022/03/03 12Z

Location: 34.62544, -90.90049 elevation: 58 m

IOP 3

Time Period: 2022/03/24 1713Z to 2022/03/25 0236Z

Location: 33.580853, -91.061535 elevation: 43 m

IOP 4

Time Period: 2022/03/31 1858Z to 2022/04/01 0831Z

Location: 34.655203, -87.349702 elevation: 177 m

IOP 5

Time Period: 2022/04/05 1123Z to 2022/04/05 1849Z

Location: 35.792799, -90.584331 elevation: 70 m

2.0 Instrument Description:

The surface station is mounted on a tower that is raised to 10m above ground level. The tower is outfitted with the following instruments:

- Campbell Scientific CR800 Data Logger
- RM Young 05103 Wind Monitor
- Campbell Scientific HMP45AC Temperature and relative humidity sensor
- Vaisala WXT520 Weather Transmitter (5m AGL)
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The WXT 520 Transmitter provides:

- Pressure
- Temperature
- relative humidity
- 2-D sonic wind (4-Hz samples used to produce 1 Hz measurement)
- precipitation rate/type

For detailed information regarding MAX, see the link below:

<https://www.nsstc.uah.edu/mapnet/facilities/max.php>

3.0 Data Collection and Processing

Data is collected at 1 second intervals. Data have been quality controlled to remove erroneous data using subjective sanity checks. Although the orientation of the anemometer relative to true North should have been set for each IOP, orientation corrections of the anemometers were applied when necessary.

4.0 Data Format

Two data files per day are available (one for the measurements at 10m and one for the measurements at 5m via the WXT520).

10 m measurements

The 10m data files are named max_YYYYMMDD_sfc.dat, where:

YYYY -> year

MM -> month

DD -> day

sfc.dat -> sfc station data

COLUMN VARIABLE

0 -> Program Constant
1 -> Year
2 -> Julian Day
3 -> Hour (UTC)
4 -> Minute (UTC)
5 -> Second (UTC)
6 -> Wind Speed at 10m (m/s)
7 -> Wind Direction at 10m (deg)
8 -> Relative Humidity at 10 m (%)
9 -> Temperature at 10m (C)

WXT520 measurements

The WXT data files are named max_YYYYMMDD_wxt.dat, where:

YYYY -> year

MM -> month

DD -> day

wxt.dat -> wxt520 station data

COLUMN VARIABLE

0 -> Year
1 -> Julian Day
2 -> Hour, Minute, Seconds (UTC)
3 -> Data Flag
5 -> wind direction (deg)
6 -> wind speed (m/s)
7 -> air temperature (F)
8 -> Humidity (%)
9 -> pressure (hPa)
10 -> Rain accumulation (mm)
11 -> Rain Intensity (mm/hr)
12 -> hail accumulation (hits/cm^2)
13 -> hail Intensity (hits/cm^2/hr)
14 -> Heater Temperature (F)
15 -> Heater Voltage (V)
16 -> Sensor voltage (V)