

**Title:** PERiLS UAH MAPNet MoDLS Surface Measurements Dataset

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### **1.0 Dataset Overview**

The UAH Mobile Atmospheric Profiling Network (MAPNet) Mobile Doppler Lidar and Soundings (MoDLS) was deployed on all 5 PERiLS deployments. Data is collected via an 8-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 have undergone preliminary quality control and should be considered final.

IOP 1

Time Period: 2023/02/16 1356 to 2023/02/17 0130Z

Location: 32.8334, -88.143 elevation: 26 m

IOP 2

Time Period: 2022/03/02 2350Z to 2022/03/03 11Z

Location: 34.43138, -90.73124 elevation: 60 m

IOP 3

Time Period: 2022/03/24 1705Z to 2022/03/25 0225Z

Location: 33.5592711, -90.8057507 elevation: 81 m

IOP 4

Time Period: 2022/03/31 1917Z to 2022/04/01 0800Z

Location: 34.7969441, -87.1527087 elevation: 239 m

IOP 5

Time Period: 2022/04/05 1115Z to 2022/04/05 1830Z

Location: 35.3876997, -90.2712585 elevation: 66 m

### **2.0 Instrument Description**

The MoDLS surface tower rises to a total height of 8 meters AGL. The tower is outfitted with:

- RM Young 81000 3-D sonic anemometer at 8-m
- Temperature Sensor at 8 meters
- Gill GMX-600 Weather Sensor at 4 meters

The GMX-600 Sensor measures:

- Temperature
- Relative Humidity
- 2-D Sonic Wind Speed
- Pressure
- Precipitation rate/total
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The Sonic anemometer records at 10-Hz:

- U, V, W wind
- Sonic Temperature
- Speed of Sound

For detailed information regarding MoDLS, see the link below:

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

### **3.0 Data Collection and Processing**

Tower data is collected at 1 second intervals. Sonic anemometer data is recorded at 10 Hz. Data have been quality controlled to remove erroneous data. Orientation corrections were also applied when necessary.

### **4.0 Data Format**

There are two data files per day: one for the GMX and temperature measurements and one for the sonic anemometer.

The data files are named modls\_YYYYMMDD\_sfc.dat, where:

YYYY -> year  
MM -> month  
DD -> day

The data file records, column by column, for GMX and temperature measurements are:

COLUMN VARIABLE

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- 0 -> Program Constant
- 1 -> Year
- 2 -> Julian Day
- 3-4 -> Hour & minute, Seconds(UTC)
- 3 -> 2-M Temperature (C)
- 5 -> 8-M Temperature (C)
- 6 -> Relative Humidity (%)
- 7 -> 2-M wind direction (deg)
- 8 -> 2-M Compass wind direction (deg)

- 9 -> 2-M Wind Speed (m/s)
- 10 -> Pressure (hPa)
- 11 -> Precip Total (mm)
- 12 -> Precip Intensity (mm/hr)

The data file records, column by column, for sonic anemometer measurements are:

COLUMN VARIABLE

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- 0 -> epoch Time (Seconds since 0000Z 1970/1/1)
  - 1 -> U Wind Component (m/s)
  - 2 -> V Wind Component (m/s)
  - 3 -> W Wind Component (m/s)
  - 4 -> Sonic Speed of Sound (m/s)
  - 5 -> Sonic Temperature (C)
  - 6 -> Error Flag