

Title: PERiLS UAH MAPNet MoDLS Surface Measurements Dataset

Authors:

Preston Pangle	preston.pangle@uah.edu	University of Alabama In Huntsville
Kevin Knupp (PI)	kevin.knupp@uah.edu	University of Alabama In Huntsville

1.0 Dataset Overview

The UAH Mobile Atmospheric Profiling Network (MAPNet) Mobile Doppler Lidar and Soundings (MoDLS) was deployed 2 of the 4 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 has undergone preliminary quality control and should be considered final.

IOP 1

Time Period: 2022/03/22 1350Z to 2022/03/22 2200Z

Location: 32.799110,-88.162043

IOP 2: Deployed but no MPR data

Time Period: 2022/03/30 1405Z to 2022/03/31 0130Z

Location: 33.2336933, -88.5707833 Elevation: 98 m

IOP 3: Not Deployed

IOP 4: Not Deployed

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-m
- Gill GMX-600 Weather Sensor at 4-m at all times

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

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

5.0 Data Remarks

The radiometer had a V-band failure between IOPs 1 and 2. As a result, no radiometer data is available after IOP 1. In addition, the MoDLS lidar was removed from the platform for repairs prior to PERiLS. Repairs were not completed until after PERiLS. Therefore no lidar data is available for PERiLS from the MoDLS platform.