

## Title: VORTEX-SE 2017 UAH MoDLS Surface Station Dataset

### Authors:

Preston Pangle	<a href="mailto:ptp0001@uah.edu">ptp0001@uah.edu</a>	University of Alabama In Huntsville
Kevin Knupp(PI)	<a href="mailto:kevin.knupp@uah.edu">kevin.knupp@uah.edu</a>	University of Alabama In Huntsville
Dustin Phillips	<a href="mailto:phillips@nsstc.uah.edu">phillips@nsstc.uah.edu</a>	University of Alabama in Huntsville

### 1.0 Dataset Overview

The UAH Mobile Operated Doppler Lidar System (MoDLS) is housed within a trailer that also contains a Microwave Profile Radiometer. The main vehicle that pulls this system has a mobile surface station that is mounted on top of the vehicle. Occasionally, the trailer is pulled by another vehicle which does not have an accompanying surface station. Therefore, surface datasets for this platform is often limited. Please see section 5 for which dates datasets are available.

### 2.0 Instrument Description

This vehicle-mounted surface station contains a combination of 5 instruments attached to a Campbell Scientific CR1000 data logger:

- Vaisala PTB Pressure Sensor
- Campbell Scientific HMP45CL Temperature and Relative Humidity Sensor
- RM Young Wind Monitor
- Eppley Labs PSP Pyranometer
- Texas Instruments Tipping Rain Gauge

### 3.0 Data Collection and Processing

All data is raw data with no processing. Data is collected every 1 second.

### 4.0 Data Format

The UAH MoDALS surface station data files are named modls\_YYYYMMDD\_sfc.dat, where:

YYYY -> year

MM -> month

DD -> day

sfc.dat -> sfc station data

A sample data line is given below:

(Column #)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	101	,2017	,255	,957	,29	,11.12	,98.52815	,75.7	,44.64	,4.41	,145.8	,0,0	,193	,0,0	,50.79	
	101	,2017	,255	,957	,30	,11.12	,98.52462	,75.7	,44.57	,5.292	,146.8	,0,0	,193	,0,0	,50.79	
	101	,2017	,255	,957	,31	,11.12	,98.52109	,75.76	,44.54	,6.174	,134.7	,0,0	,193	,0,0	,50.79	
	101	,2017	,255	,957	,32	,11.04	,98.52815	,75.7	,44.64	,5.88	,143.4	,0,0	,193	,0,0	,50.39	
	101	,2017	,255	,957	,33	,11.11	,98.52815	,75.76	,44.61	,5.586	,156.6	,0,0	,193	,0,0	,50.79	

The data file records, column by column, are:

COLUMN	VARIABLE
0	-> Program Constant
1	-> Year
2	-> Julian Day
3	-> Hour & minute (UTC)
4	-> Second.fraction-of-second (UTC)
5	-> Battery Voltage
6	-> Pressure kPa
7	-> Air Temperature (F)
8	-> RH
9	-> Wind Speed (m/s)
10	-> Wind Direction (deg)
11	-> Wind Speed_2 (m/s)
12	-> Wind Direction_2 (deg)
13	-> Rain Total (mm)
14	-> Rain Total_2 (mm)
15	-> Solar Radiation (kW)

### 5.0 Data Remarks

-Due to the MoDLS trailer either being pulled by another vehicle or being stationed in Huntsville, AL at UAH, surface data for 2017 only contains IOP 3B and 4C. For IOPS where the MoDLS trailer was located at UAH, the UAH berm surface data can be used as the accompanying surface station data as the surface station is located within a few meters of where the trailer was often parked.