Title: VORTEX-SE 2018 UAH MoDLS Surface Station Dataset

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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. Please note this data is limited. See section 5 for details.

IOP 1
Time Period: 2018/03/19 1643Z to 2018/03/20 0014Z
Location: 34.367, -86.889

IOP 2A
Time Period: 2018/03/28 0000Z to 2018/03/39 0000Z
Location: 34.725, -86.657 (UAH)

IOP 2B - 2018/03/29 1643Z to 2018/03/30 1735 Z
Location: 34.367, -86.889

IOP 3
Time Period: 2018/04/03 2100Z to 2018/04/04 0356Z
Location: 34.943, -87.121

IOP 4 - Did not deploy

UFO 1
Time Period: 2018/04/09 2130Z to 2018/04/10 0145Z
Location: 34.625, -86.996

IOP 5
Time Period: 2018/04/14 1615Z to 2018/04/14 2054Z
Location: 34.725, -86.657 (UAH)

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

The surface station that accompanies the MoDLS trailer is mounted on a vehicle that pulls the trailer. This surface station is powered by a generator that attaches to the vehicle. Often times, this vehicle is not used to pull the trailer or the generator is unavailable during the IOP. For these reasons, surface data from this platform is limited. Therefore, surface data for 2018 only contains IOP 1. For IOPS where the MoDLS trailer was located at UAH, the UAH berm surface data can be used as the surface station is located within a few meters of where the trailer was often parked.