

Title: VORTEX-SE 2018 UAH MoDLS Microwave Profile Radiometer 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 lidar and MPR were operated each IOP often co-located with a sounding system. The locations for the MoDLS MPR is as follows:

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 2018/03/29 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: 34.367, -86.889

2.0 Instrument Description

UAH MoDLS utilizes a Radiometrics 12-channel Microwave Profile Radiometer.

3.0 Data Collection and Processing

Data was collected for each IOP at 1 minute intervals. No data processing was completed.

4.0 Data Format

There is 1 MPR data file for each day. The filename format is YYYY-MM-DD_HH-mm-SS_v2.csv where:

YYYY -> 4-digit year
MM -> Month
DD -> Day
HH -> Hour of file creation
mm -> Minute of file creation
SS -> Seconds of file creation
lv2 -> MPR Data Type
csv -> file extension

An example is given below:

```
Record,Date/Time,10,Tamb(K),Rh(%),Pres(mb),Tir(K),Rain,Vint(cm),Lqint(mm), 0.00, 0.10,
0.20, 0.30, 0.40, 0.50, 0.60, 0.70, 0.80, 0.90, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25, 2.50, 2.75, 3.00,
3.25, 3.50, 3.75, 4.00, 4.25, 4.50, 4.75, 5.00, 5.25, 5.50, 5.75, 6.00, 6.25, 6.50, 6.75, 7.00, 7.25,
7.50, 7.75, 8.00, 8.25, 8.50, 8.75, 9.00, 9.25, 9.50, 9.75,10.00
1,03/13/06 00:02:20,11,302.3, 13.3, 802.9,223.2,N, 0.89,
0.04,302.3,298.7,299.2,299.0,298.0,297.2,296.4,295.5,294.5,294.1,293.5,291.9,289.8,286.7,28
2.7,277.9,272.0,267.0,264.9,263.7,262.8,261.8,259.4,258.8,258.3,257.3,256.4,254.6,253.3,252.
0,249.9,247.9,246.0,244.1,242.6,241.9,240.4,238.1,236.2,234.3,232.4,230.7,228.2,226.0,223.5,
220.8,218.6
2,03/13/06 00:02:20,12,302.3, 13.3, 802.9,223.2,N, 0.89, 0.04, 3.74, 0.45, 0.37, 0.30,
0.25, 0.21, 0.18, 0.16, 0.15, 0.14, 0.16, 0.17, 0.38, 0.92, 1.65,
3.92,12.67,24.60,32.22,42.66,46.71,48.58,49.31,46.09,46.34,48.43,48.61,48.47,47.04,45.50,44.
27,40.11,35.63,15.16, 2.46, 0.63, 0.23, 0.07, 0.02, 0.01, 0.03, 0.02, 0.01, 0.01, 0.00, 0.02, 0.02
```

The data, column by column, is as follows:

Column

0 -> identifies the record number
1 -> measurement date and time (UTC)

- 2 -> identifies profile as profile as
temperature (T) -> 11
water vapor (V) -> 12
relative humidity (R) -> 13
cloud liquid water (L) -> 14

3-5 -> surface conditions as measured at/by the MPR (temperature, relative humidity and pressure).

6 -> T_{ir} : Infrared thermometer temperature (cloud base temp) (K)

7 -> the presence or absence of rain: reported as Y (yes) or N (no)

8 -> V_{int} : integrated vapor (cm)

9 -> L_{qint} : integrated liquid (mm)

10-56 -> profile data at each height (km): 100m spacing to 1 km, 250m spacing above, to 10 km.