Title: PERiLS UAH MAPNet MoDLS Microwave Profiling Radiometer (MPR) Dataset

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1.0 Dataset Overview

The UAH Mobile Atmospheric Profiling Network (MAPNet) Mobile Doppler Lidar and Soundings (MoDLS) was deployed with the MPR for all 5 PERiLS deployments. This dataset contains the lvl2 radiometer data collected by the MoDLS radiometer. Lvl2 data include the vertical profiles of temperature and moisture profiles derived from the brightness temperatures. Logbooks are provided for the user's reference for any data collection issues, etc.

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

MoDLS utilizes a Radiometrics MP-3000A microwave profiling radiometer which has 35 brightness temperature channels. Calibration of the MPR utilizing a LN2 target was performed prior to PERiLS on 2023/02/09. Calibration and brightness temperature data can be provided upon request.

More information regarding the MoDLS MPR and the MoDLS system can be found here:
https://www.nsstc.uah.edu/mapnet/facilities/modls.php

3.0 Data Collection and Processing

Data is collected every 1-2 minutes. No additional data processing outside of Radiometrics processing has been performed. Observation procedure uses Zenith angle retrivels. Following the completion of an observation period, the radiometer automatically performs a tip calibration to calibrate the noise diode temperatures of the moisture channel when under clear skies.

4.0 Data Format

NetCDF files are provided of the operational lv2 data. Lvl1 data containing brightness temperatures can be provided upon request. File naming convention is as follows:

UAH_platform_MPR_YYYYmmDD_HHMM.nc where:
UAH   -> UAH dataset
platform   -> platform data was recorded on
MPR   -> MPR data
YYYY   -> 4-digit UTC year data was collected
mmDD   -> 2-digit UTC month and day data was collected
HHMM   -> UTC time data was collected

NetCDF files include the following parameters:

Identifier	Units	Description
epochTime	seconds	Seconds Since 00 UTC 1970 01 01
height	Meters	Height Above ground level
latitude	Degrees	Degrees North
Longitude	Degrees	Degrees West
Altitude	Meters AGL	Altitude of the Instrument
temperature	Kelvin	Temperature Profile
vaporDensity	g/m^3	Water Vapor Density Profile
liquidWater	g/m^{-3}	Liquid Water Content Profile
relativeHumidty	%	Relative Humidity Profile
intergratedLiquidWater	mm	Column integrated liquid water Profile
integratedWaterWaterVapor	cm	Column integrated water vapor Profile
cloudBaseHeight	km	Cloud Base Height

surfaceTemp	K	Surface Temperature
SurfacePressure	mb	Surface Pressure
irTemp	K	Surface IR Temperature
sfcRh	%	Surface Relative Humidity
rainTag	Binary	Flag for Rain
dataQualityTag	Binary	Data Quality Flag