Title: PERiLS UAH MAPNet MIPS Microwave Profiling Radiometer (MPR) 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 Integrated Profiling System (MIPS) was deployed with the MPR for all 5 PERiLS deployments. This dataset contains the lvl2 radiometer data collected by the MIPS radiometer mounted to the MIPS platform. Logbooks are provided for the user's reference for any data collection issues, etc.

IOP 1
Time Period: 2023/02/16 1430Z to 2023/02/17 0118Z
Location: 32.9137, -87.8689 elevation: 67 m

IOP 2
Time Period: 2022/03/03 0015Z to 2022/03/03 11Z
Location: 34.6038, -91.1962 elevation: 56 m

IOP 3
Time Period: 2022/03/24 1627Z to 2022/03/25 0208Z
Location: 33.123954, -91.381511 elevation: 33 m

IOP 4
Time Period: 2022/03/31 15Z to 2022/04/01 0800Z
Location: 34.724, -86.6463 elevation: 207 m

IOP 5
Time Period: 2022/04/05 1115Z to 2022/04/05 1830Z
Location: 35.799629, -91.140336 elevation: 75 m

2.0 Instrument Description

MIPS 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 MIPS MPR and the MIPS system can be found here: https://www.nsstc.uah.edu/mapnet/facilities/mips.php

3.0 Data Collection and Processing

Data is collected every 1-2 minutes. No 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. Lv1 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