

Title: DELTA 2024 UAH MAPNet RaDAPS Microwave Profiling Radiometer (MPR) Dataset

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1.0 Dataset Overview

The UAH Mobile Atmospheric Profiling Network (MAPNet) Rapidly Deployable Atmospheric Profiling System (RaDAPS) was deployed with the MPR for IOP 1 of DELTA. This dataset contains all level II (profiles) radiometer data collected by the RaDAPS radiometer mounted to the RaDAPS platform. Logbooks are provided for the user's reference for any data collection issues, etc.

IOP 1

Time Period: 2024/02/27 2335 to 2024/02/28 0812Z

Location: 38.038133, -88.084000elevation: 119 m Heading: 179 deg

2.0 Instrument Description

The Rapidly Deployable Atmospheric Profiling System (RaDAPS) facility is a converted medium duty ambulance that is designed to provide high resolution boundary layer (BL) kinematics, thermodynamics, and retrieve aerosol and cloud characteristics. The configuration includes a Radiometrics 915 MHz Radar Wind Profiler (RWP), a Vaisala CL51 lidar ceilometer, Radiometrics 35-channel Microwave Profiling Radiometer (MPR), OTT Hydromet Parsivel disdrometer, Metek Micro Rain Radar, and a telescoping 6-meter surface measurements tower with a Vaisala WXT 520 mounted to it (temperature/RH, pressure, wind, pressure, and precipitation).

RaDAPS 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 2023/08/16. Calibration and brightness temperature data can be provided upon request.

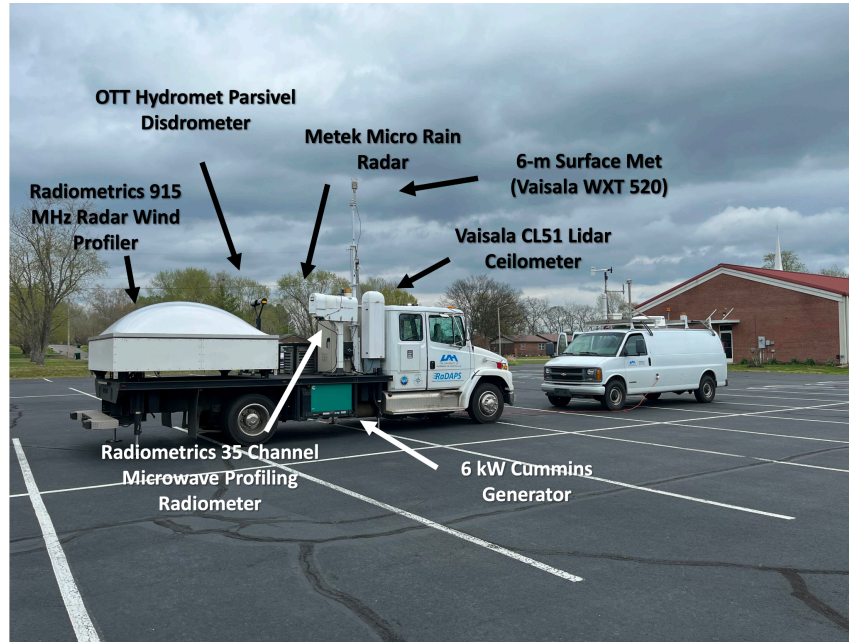


Fig 1. The RaDAPS Platform

3.0 Data Collection and Processing

Data is collected every 1-2 minutes. No additional processing outside of Radiometrics processing has been performed. Observation procedure uses Zenith angle retrivals. 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 |
| relativeHumidity | % | 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 |