

Title: DELTA 2024 UAH MAPNet Micro Rain Radar (MRR) Dataset

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1.0 Dataset Overview

The UAH Mobile Atmospheric Profiling Network (MAPNet) Rapidly Deployable Atmospheric Profiling System (RaDAPS) MRR was deployed with RaDAPS for IOP 1 of DELTA.

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). The radar specifications are listed below:

Frequency: 24.230 GHz

Antenna Size: 0.6 m

Peak Power: 50 mW

Beam Width: 1.5°

Gate Spacing: Adjustable

First Gate: Adjustable

Range: Depends on Gate Spacing; 30 gates are used

Temporal Resolution: Adjustable (30-3600 seconds)

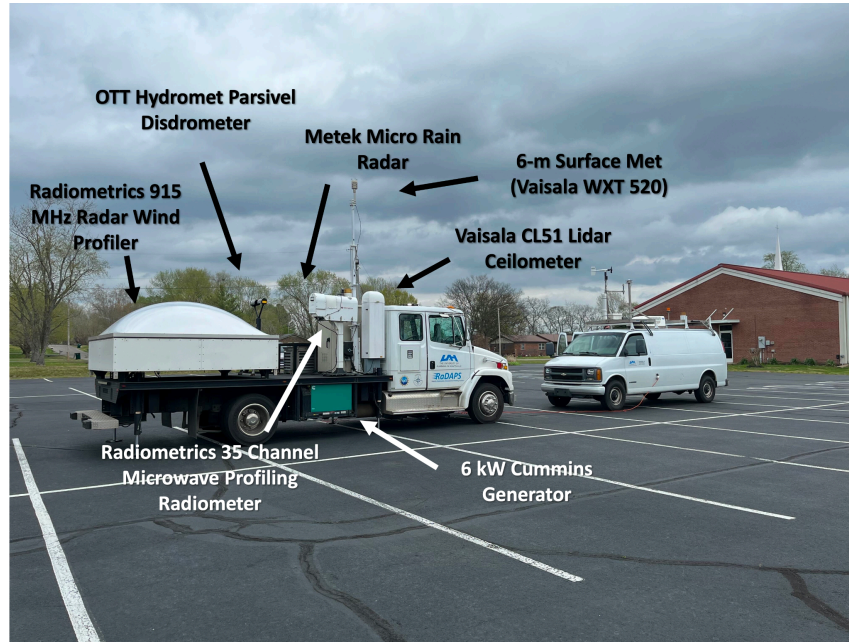


Fig 1. The RaDAPS Platform

3.0 Data Collection and Processing

Data is collected and averaged over 30 seconds. No processing beyond the manufacturer's processing has been completed. Raw spectral moments are recorded by the radar and can be provided upon request.

4.0 Data Format

The UAH RaDAPS MRR data filename convention is MRR_YYYYMMDD.nc where:

YYYY -> year

MM -> month

DD -> day

The file header information is provided below:

Identifier	Meaning	Unit
MRR\ rangegate	height	m
MRR\ spectralclass	Bin # (63 bins total)	none
MRR_H	height	m
MRR_TF	Transfer Function	none
MRR_F	Spectral Reflectivity	dB

MRR_D	Drop Densities	$m^{-3}mm^{-1}$
MRR_N	Number	#
MRR_K	Unused	NA
MRR_Capital_Z	Radar Reflectivity	dBZ
MRR_Small_Z	Attenuated Radar Reflectivity	dBZ
MRR_PIA	Path Integrated Attenuation	dB
MRR_RR	Rain Rate	mm/h
MRR_LWC	Liquid Water Content	gm^{-3}
MRR_W	Fall Velocity	m/s
AVE	Averaging time if applicable	Seconds
STP	Height resolution	meters
ASL	Height of ground level above sea level	meters