

Title: PERiLS 2023 UAH MAPNet RaDAPS 915 MHz Radar Wind Profiler (RWP) Dataset

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1.0 Dataset Overview

The UAH Mobile Atmospheric Profiling Network (MAPNet) Rapidly Deployable Profiling Systems (RaDAPS) was deployed with the rwp for all 5 PERiLS deployments. This dataset contains all RaDAPS radar wind profiler consensus data recorded by the radar wind profiler mounted on the RaDAPS platform. Logbooks are provided for the user's reference for any data collection notes, issues, timing, etc.

IOP 1

Time Period: 2023/02/16 1430Z to 2023/02/17 0100Z

Location: 32.6015, -88.1992 elevation: 61 m

IOP 2

Time Period: 2022/03/03 0040 to 2022/03/03 1215Z

Location: 34.21916, -90.95392 elevation: 49 m

IOP 3

Time Period: 2022/03/24 1714Z to 2022/03/25 0245Z

Location: 33.29846, -90.904305 elevation: 36 m

IOP 4

Time Period: 2022/03/31 1840Z to 2022/04/01 0800Z

Location: 35.17621, -87.04821 elevation: 201 m

IOP 5

Time Period: 2022/04/05 1111Z to 2022/04/05 1830Z

Location: 35.77341, -90.34875 elevation: 70 m

2.0 Instrument Overview

RaDAPS utilizes a Radiometrics Raptor XBS-BL 915 MHz radar wind profiler. The radar wind profiler onboard RaDAPS operates by sampling along six beams at 23.5 degrees off-vertical and one vertical beam. Wind profiles are acquired every 5 and 60 minutes to heights from 126 m- 5km. More information regarding the RaDAPS 915 radar wind profiler and RaDAPS system can be found here: <https://www.nsstc.uah.edu/mapnet/facilities/instruments/profiler.php>

3.0 Data Collection and Processing

The data files provided are Radiometrics processed files. Processed data files are created every 5 and 60 minutes. No additional processing has been performed. Although headings are manually entered and checked, users are encouraged to verify headings before using the data.

4.0 Data Format

NetCDF files are provided. There will be one netCDF file for each time resolution even if the instrument operated for multiple days. The netCDF naming convention is as follows: MIPS_915_YYYYMMDD_resolution.nc where:

RaDAPS -> Platform

915 -> Instrument

YYYY -> 4-digit UTC year

MM -> 2-Digit UTC month

DD -> 2-digit UTC day

Resolution -> Time resolution of data (5 minutes or 60 minutes)

NetCDF files include 2-dimensional variables of U, V, W wind components, averaged beam moments, and also includes instrument metadata. The files contain the following parameters:

Identifier	Units	Description
beamElevation	Degrees	Elevation off-Zenith of the beams
number_of_beams	unitless	Number of beams used
decimalTime	hours	UTC decimal time from 00Z
epochTime	seconds	Seconds since 1970/01/01 00Z
Longitude	Degrees	Degrees East
height	meters	Height of record above ground level
latitude	degrees	Latitude of the instrument
longitude	degrees	Longitude of the instrument
altitude	Meters AGL	Elevation of the instrument
lowPRF	microseconds	Low-mode PRF
highPRF	microseconds	High-mode PRF
lowFirstGate	Meters AGL	Height of the first gate for the low mode
highFirstGate	Meters AGL	Height of the first gate of the high mode

lowGateSpace	meters	Gate spacing for the low mode
highGateSpace	meters	Gate spacing for the high mode
u	m/s	U wind component
v	m/s	V wind component
w	m/s	W wind component
qcTag	unitless	Quality control tag for winds, higher is better
Vel_i; i= beam #	m/s	Beams 1-6 radial velocity
SNRI_i; i= beam #	dB	Beams 1-6 radial signal-to-noise ratio
Backscatter_i; i= beam #	unitless	Beams 1-6 radial backscatter
SW_i; i= beam #	m/s	Beams 1-6 radial spectrum width

5.0 Data Remarks

It was noted during PERiLS 2023, the RaDAPS RWP wind data was often subpar. After investigation, it was discovered there was a bug in the manufacturer's software that caused only 2 of the 6 beam moments to be collected and used for wind calculations. Unfortunately, this bug did not consistently omit the same 4 beams. Users are advised to take this into consideration when using the RaDAPS RWP wind data.