

Wind and Temperature Profiler provided by Dugway Proving Grounds at the specified coordinates

P449

Author(s):	Regarding data questions contact:
John C. Pace Mailing address: Meteorology Division, West Desert Test Facility, Dugway Proving Grounds, Dugway, Utah Tel./Fax.: 435-831-5101/ , E-mail and web: john.c.pace.civ@mail.mil, http://www.dugway.army.mil/Meteorology.aspx	Dragan Zajic Mailing address: Meteorology Division, West Desert Test Facility, Dugway Proving Grounds, Dugway, Utah Tel./Fax.: 435-831-5359/ E-mail and web: dragan.zajic.civ@mail.mil, http://www.dugway.army.mil/Meteorology.aspx

1.0 Data Set Overview

1.1 Time period covered by the data

May of 2013

1.2 Physical location (latitude, longitude, elevation)

40.196902, -113.16776299999999, 1313

1.3 Instrument type

WP449

1.4 Data provider

Dugway Proving Ground

1.5 Web address references

<http://www3.nd.edu/~dynamics/materhorn/>

https://www.eol.ucar.edu/field_projects/materhorn-x

2.0 Instrument Description

The 449 MHz Raptor Radar wind profiler is a pulse Doppler radar with a horizontal array of antennae. Wind direction and speed at various heights above the ground are detected via the Doppler shift of reflections from small scale turbulent fluctuations drifting in the winds. The 449 MHz transmission frequency has a vertical range of approximately 100m to 15000m. The profiler has an attached Radio Acoustic Sounding System (RASS) in order to provide virtual temperature along with the wind field profile.

2.1 Instrument website

2.2 Table of specifications

Accuracy	Range	Frequency	Resolution
Consult the manufacturer specifications.	Vertical range of approximately 100m to 15000m	Consult the manufacturer specifications.	Consult the manufacturer specifications.

3.0 Data Collection and Processing

3.1 Description of data collection

3.2 Description of derived parameters and processing techniques used

Original data files are provided.

3.3 Description of quality assurance and control procedures

This dataset was not subject to any quality control or processing it has been provided in its original form.

3.4 Data intercomparisons

4.0 Data Format

4.1 Data file structure

Tab delimited ASCII

4.2 File naming convention

dataProvider_instrument[_identifier]_rate_instrumentType_startDateAndTime_endDateAndTime.extension

4.3 Data format

Tab delimited ASCII

4.4 Data layout

All data is in .asd files. The filename starts with a 't' or 'w', 't' for temperature and 'w' for wind. This is followed by the time stamp (yyyy-mm-dd-hh-mm_) and the last two numbers indicate the reporting time interval (06 for 6-minute data and 60 for hourly data).

4.5 List of parameters with units, sampling intervals, frequency, range

RASS virtual temperature files contain a header followed by meteorological data. Header information descriptions are listed by line in Table 1. The meteorological data contains virtual temperature and radial moment parameters.

RASS virtual temperature file data parameters, sequentially listed by column (999.9 for missing data):

- 1 – HT: height [m] above ground level
- 2 – TmpC: virtual temperature value [°C]
- 3 – Conf: internal confidence value, 0 to 1 (used internally by DeTect)
- 4 – TmpRadVel: RASS radial velocity [m/s]
- 5 – AtmRadVel: radial velocity of atmospheric (wind) signal [m/s] (used to adjust TmpRadVel)
- 6 – TmpErr: internal estimation of error in temperature value, for DeTect use only
- 7 – AtmErr: internal estimation for DeTect use only
- 8 – TmpQc: quality indicator for virtual temperature, 0 to 1
- 9 – AtmRadQc: quality indicator for atmospheric radial velocity, 0 to 1 (used to adjust TmpRadVel)
- 10 – TmpPow: power of RASS signal, associated with TmpRadVel [dB]
- 11 – AtmPow: power of atmospheric (wind) signal, associated with AtmRadVel [dB]
- 12 – TmpSnr: signal to noise ratio of RASS signal, associated with TmpRadVel [dB]
- 13 – AtmSnr: signal to noise ratio of the atmospheric signal, associated with AtmRadVel [dB]
- 14 – TmpWid: spectral width of RASS signal, associated with TmpRadVel [m/s]
- 15 – AtmWid: spectral width of the atmospheric signal, associated with AtmRadVel [m/s]

Wind files contain header information followed by the meteorological data for each mode. Modes are changes in any of the operating parameters of the radar. The files contain all wind component data plus the radial moment data for all antennae beam positions. Table 1 contains the description of information provided in the headers.

Table 1: Header information by line number, extracted from Interface Control Document for Wind Profiler Science Data. The header information describes the wind and temperature data files.

Line	Description					
1	Site		Site Identifier			
2	File Data Type		File Format Version			
3	Latitude		Longitude		Elevation	
4	Date of averaging period (end)		24-hour time of averaging period (end)		UTC time difference	
5	Mode Name	Mode Number	Mode TX power	Mode pulse width	Mode number code bits	Mode IPP
6	Mode Zenith angle	Mode number of beam positions, n	Mode Azimuth 1	Mode Azimuth 2...	Mode Azimuth n	
7	Mode number gates	Mode number FFT points	Mode NTDI		Mode NFDI	
8	Mode number of data lines following the header "N"		Mode averaging time		Mode QC interval	
9	Labels for data lines					

Wind file data parameters, sequentially listed by column (999.9 for missing data):

- 1 – HT: height [m] above ground level
- 2 – SPD: wind speed [m/s]
- 3 – DIR: wind direction [°]
- 4 – QC: quality control of winds at the given level, 0 to 1
- 5 – U: zonal wind [m/s]
- 6 – V: meridional wind [m/s]
- 7 – W: vertical wind [m/s]
- 8 – SD_H: standard deviation for SPD [m/s]
- 9 – SD_W: standard deviation for W [m/s]
- 10-13 – VEL: radial velocity [m/s] (all beams)
- 14-17 – NUM: number of measurements averaged in radial velocity (all beams)
- 18-21 – POW: power of atmospheric (ATM) signal associated with VEL [dB] (all beams)
- 22-25 – SNR: signal to noise ration of ATM signal associated with VEL [dB] (all beams)
- 26-29 – WPTH: spectral width of the ATM signal associated with VEL [m/s] (all beams)

4.6 Data version number and date

raw, v1.0, October 2016

4.7 Description of flags, codes used in the data, and definitions

441.12	999.90	0.00	-320.87	999.90	586.73	999.90	0.00
999.90	67.69	999.90	-18.58	999.90	1.74	999.90	
508.99	999.90	0.00	-322.88	999.90	758.79	999.90	0.00
999.90	69.82	999.90	-17.74	999.90	1.74	999.90	

5.0 Data Remarks

5.1 PI's assessment of the data

Potential sources of error include high power lines or tall towers/trees in the vicinity, strong convection and frontal systems, and birds or planes. If present, these will cause clutter or distort the beam.

5.2 Missing data periods

5.3 Software compatibility

6.0 References

- [1] Fernando, H. J. S., E. R. Pardyjak, S. Di Sabatino, F. K. Chow, S. F. J. DeWekker, S. W. Hoch, J. Hacker, J. C. Pace, T. Pratt, Z. Pu, J. W. Steenburgh, C. D. Whiteman, Y. Wang, D. Zajic, B. Balsley, R. Dimitrova, G. D. Emmitt, C. W. Higgins, J. C. R. Hunt, J. G. Kniervel, D. Lawrence, Y. Liu, D. F. Nadeau, E. Kit, B. W. Blomquist, P. Conry, R. S. Coppersmith, E. Creegan, M. Felton, A. Grachev, N. Gunawardena, C. Hang, C. M. Hocut, G. Huynh, M. E. Jeglum, D. Jensen, V. Kulandaivelu, M. Lehner, L. S. Leo, D. Liberzon, J. D. Massey, K. McEnerney, S. Pal, T. Price, M. Sghiatti, Z. Silver, M. Thompson, H. Zhang, T. Zsedrovits, 2015: The MATERHORN – Unraveling the Intricacies of Mountain Weather, BAMS, doi: <http://dx.doi.org/10.1175/BAMS-D-13-00131.1>.