

**Plains Elevated Convection at Night (PECAN)
Micropulse Lidar MPL-111
A Component of
Millersville University Atmospheric Research and Aerostat Facility (MARAF)**

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1.0 Data Set Overview:

This data set contains images compiled from the 30-second averages for the Millersville University MPL located at 38.9361°N, 99.5592° W at 646 meters above sea level from 01 June 2015 to 15 July 2015.

2.0 Daily Reports:

01 June 2015: Above 2 km, data has slight breaks due to Lidar's temperature controlled enclosure. Data starts at 1623 Z.

02 June 2015: Around 0930 Z, there is a break in the data until 1630Z due to condensation issues with the glass on the Lidar enclosure.

03 June 2015: From 0645 Z until 1830Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

04 June 2015: From 0245 Z until 1445 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

05 June 2015: From 0530 Z until 1730 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

06 June 2015: From 0415 Z until 1445 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

07 June 2015: From 0615 Z until 1445 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

08 June 2015: From 0145 Z until 1500 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

09 June 2015: From 0245 Z until 1430 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

10 June 2015: Nothing unusual to report.

11 June 2015: From 0400 Z until 1430 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure. The glass on the Lidar enclosure was off from 1130Z until 0200Z.

12 June 2015: From 0230 Z until 1900 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

13 June 2015: There are small breaks in the data due to issues with the Lidar's temperature controlled enclosure.

14 June 2015: From 0245 Z until 1445 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

15 June 2015: From 0000 Z until 1600 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure.

16 June 2015: From 0230 Z until 1530 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure. The Lidar was off from 1616 Z until 1648 Z.

17 June 2015: There is only data from 0000 Z until 0046 Z due to system malfunction.

18 June 2015: There are small breaks in the data due to issues with the Lidar's temperature controlled enclosure. The glass on the Lidar enclosure was off from 2142 Z until 2359 Z. The Lidar was restarted at 0140 Z.

19 June 2015: From 0800 Z until 1500 Z, there is insufficient data due to condensation issues with the glass on the Lidar enclosure. The glass on the Lidar enclosure was off from 0000 Z until 0216 Z and 2201 Z until 2359 Z.

20 June 2015: The glass on the Lidar enclosure was off from 0000 Z until 1319 Z.

21 June 2015: Nothing unusual to report.

22 June 2015: The glass on the Lidar enclosure was off from 0048 Z until 1212 Z.

23 June 2015: There are small breaks in the data due to issues with the Lidar's temperature controlled enclosure

24 June 2015: Nothing unusual to report.

25 June 2015: Nothing unusual to report.

26 June 2015: There are small breaks in the data due to issues with the Lidar's temperature controlled enclosure.

27 June 2015: Nothing unusual to report.

28 June 2015: Nothing unusual to report.

29 June 2015: Nothing unusual to report.

30 June 2015: Nothing unusual to report.

01 July 2015: Nothing unusual to report.

02 July 2015: There are breaks in the data after 1200 Z due to condensation problems and the Lidar's temperature controlled enclosure.

03 July 2015: There are small breaks in the data due to the Lidar's temperature controlled enclosure.

04 July 2015: Nothing unusual to report.

05 July 2015: Nothing unusual to report.

06 July 2015: The data is insufficient after 1400 Z due to condensation problems.

07 July 2015: The data is insufficient after 0100 Z due to a system malfunction.

08 July 2015: The data is insufficient until 0100 Z due to a system malfunction.

09 July 2015: There are small breaks in the data due to the Lidar's temperature controlled enclosure.

10 July 2015: There are small breaks in the data due to the Lidar's temperature controlled enclosure.

11 July 2015: Nothing unusual to report.

12 July 2015: There are small breaks in the data due to the Lidar's temperature controlled enclosure.

13 July 2015: There are small breaks in the data due to the Lidar's temperature controlled enclosure.

14 July 2015: There are small breaks in the data due to the Lidar's temperature controlled enclosure.

15 July 2015: There is insufficient data after 0530 Z due to a system malfunction. The Lidar was shut off at 1501 Z.

3.0 Products:

The raw, R^2 , and Normalized Relative Backscatter images were created using hourly files which were compiled using 30-second averages for each UTC day. Each individual parameter is in .jpg format as daily files.

The files were saved using this name:

Lidar.FP3_Millersville_MPL.yyyymmddhhmm.backscatter_raw

This is the raw data where yyyymmddhhmm is the UTC year, month, day, hour, and minute

Lidar.FP3_Millersville_MPL.yyyymmddhhmm.backscatter_rsq

This is the R^2 data where yyyymmddhhmm is the UTC year, month, day, hour, and minute

Lidar.FP3_Millersville_MPL.yyyymmddhhmm.backscatter_NRB

This is the normalized relative backscatter data where yyyymmddhhmm is the UTC year, month, day, hour, and minute

4.0 Instrument Description:

MPL		
PERFORMANCE	range resolution	15/30/75 m (software programmable)
	minimum range	150 m
	accumulation time	1 sec - 15 min
	detection range	up to 25 km
	polarization	optional
	scanning	optional
OPTICS	laser wavelength	532 nm
	laser pulse energy	6-10 μ J @ 2500 Hz
	eye-safety	ANSI Z136.1 2000, IEC 60825
	receiver diameter	178 mm
	pump laser diode	fiber coupled, user replaceable
	detector	fiber coupled, user replaceable
DIMENSIONS	size (mm)	300x350x850
	weight (portability)	25+2 kg (2 persons)
DATA	operating system	Windows XP/Vista/7
	computer interface	USB
	data transfer	LAN Ethernet
ENVIRONMENT	temperature	Operating -10° to 40° C with NEMA 4 enclosure
	humidity	Operating 0-100% with NEMA 4 enclosure
POWER	supply	100/240V AC 50-60 Hz
	consumption	500W

Maximum Range: 45 km

Multichannel Scalar: Two-channel photon counting, A/D converters for temperature and energy monitors, USB interface to computer

This data was collected by the Sigma MPL program using 30 m bin resolution and 30 s averages.

6.0 References:

<http://www.micropulselidar.com/images/stories/technical.PNG>

<http://www.micropulselidar.com/images/products/MPL-Product.jpg>

5.0 Data Collection and Processing:

Transmitter

Laser Wavelength: 532nm

Pulse Repetition Frequency: 2500 Hz

Pulse Energy: 6-8 μ J

Computer Interface/Control: RS-232

Laser Product Compliance: ANSI: Z136.1-2000

IEC: EN60825

USFDA/CDRH: 21 CFR 1040.10/.11

Receiver

Telescope Type: Maksutov Cassegrain

Focal Length: 2400 mm

Diameter: 178 mm

Field Of View: 100 μ rad

Data System

Detector: Avalanche APD, photon counting mode

Range Resolution: 5/15/30/75 m