NATIVE (Nittany Atmospheric Trailer and Integrated Validation Experiment) Remotely Sensed Aerosol Optical Properties: Examples from INTEX-B and WAVES 2006

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NATIVE

Nittany Atmospheric Trailer and Integrated Validation Experiment (*www.meteo.psu.edu/~btaubman/Webpage/native.html*):

mobile research facility designed for:

- Aura validation
- Ground-based complement to NASA based field campaigns
- Mobile IONS station
- air quality monitoring
- pollution transport and deposition

NATIVE Payload

In-situ trace gas instruments:

TeCo 49C O3 Analyzer
TeCo 48C-TLE CO Analyzer
TeCo 43C-TLE SO2 Analyzer
TeCo 42C NO, NOy Analyzer
En-Sci ECC Ozonesonde Ground Station

Meteorological Instruments (10 m tower):

T, RH, P, WS, and WD

Remote Sensing Instruments:

MICROTOPS II O3 Monitor – Sunphotometer
(305, 312, 320, 340, 380 nm)
Cimel Sunphotometer
(340, 380, 440, 500, 675, 870, 1020, 1640 nm)
YES UVMFR-7
(300, 305, 311, 317, 325, 332, 368 nm)
532 nm Aerosol Lidar

NATIVE Schedule

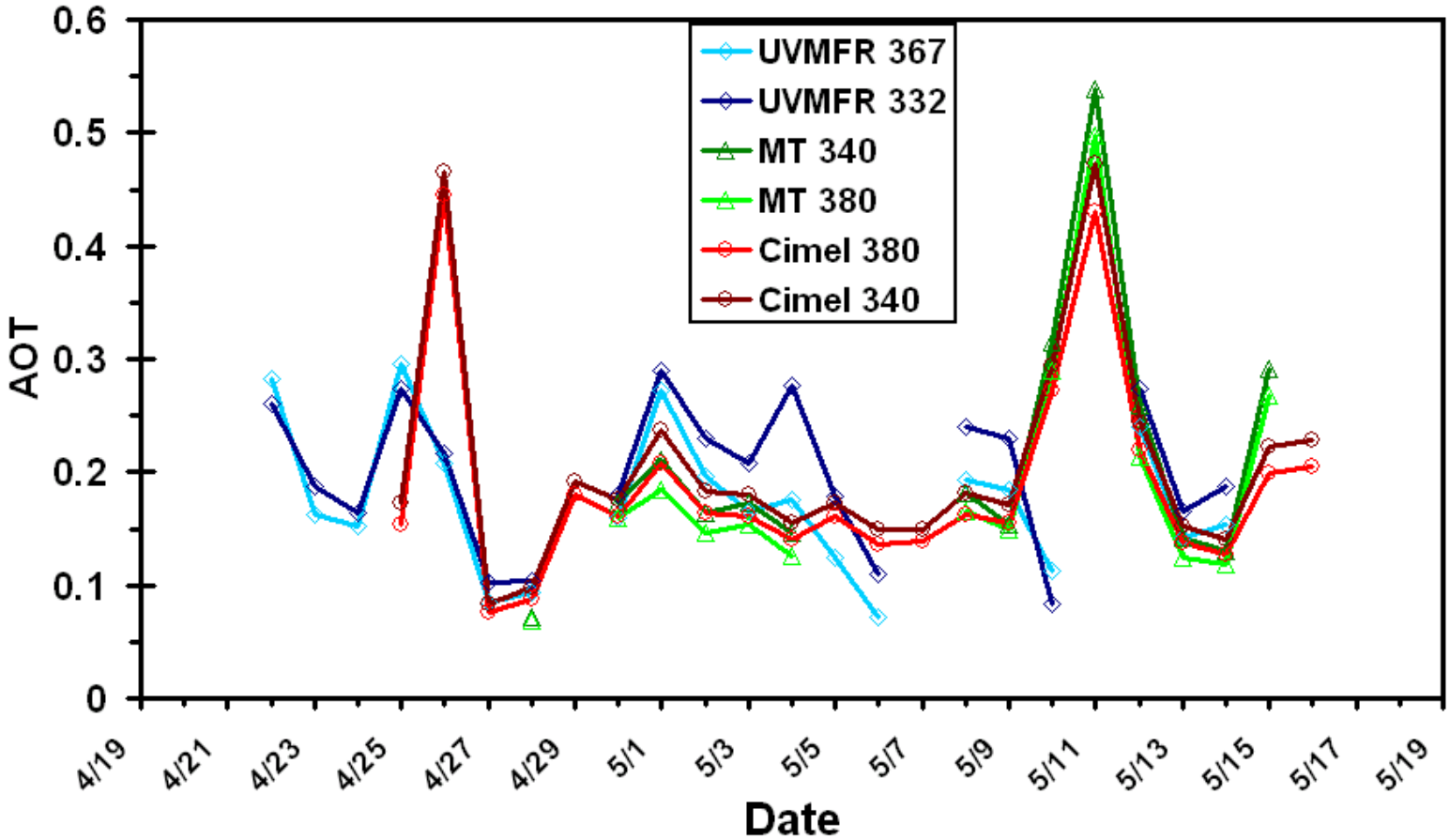
INTEX-B/MILAGRO Phase I
Houston, TX: March 2 - March 20, 2006

INTEX-B/MILAGRO Phase II
Richland, WA: April 21 - May 15, 2006
*Aura validation with WSU MF-DOAS

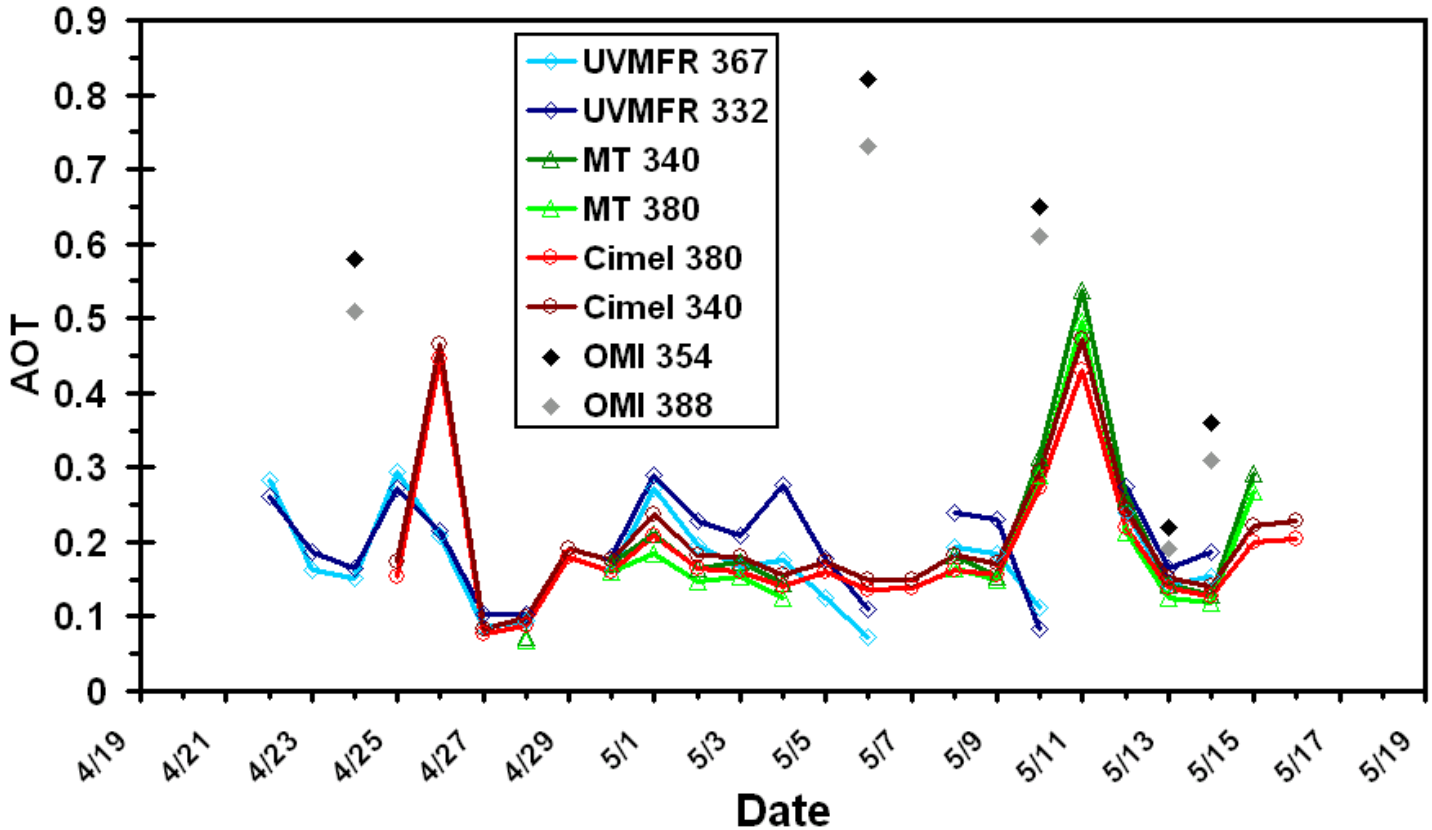
WAVES 2006
Beltsville, MD: July 7 - August 3, 2006

Home
University Park, PA: June 9 - June 29, 2006
University Park, PA: August 24, 2006 - Present

Richland NATIVE AOT



Richland NATIVE/OMI AOT Comparison



- Spatial averaging resulted in cloud contamination
- Work with OMI team to optimize data

Beltsville WAVES 2006

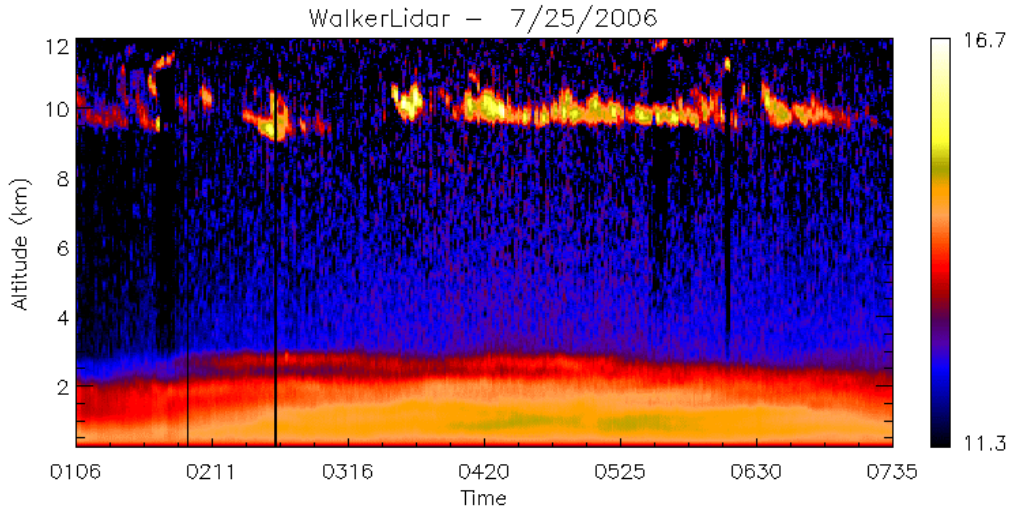
Water Vapor Validation Experiment – Satellite/Sondes
July 7 – August 10, 2006
(http://ecotronics.com/lidar-misc/WAVES.htm)

Aura Validation, Instrument Intercomparison, IONS 06 phase III at the Howard University Beltsville, MD campus

Participating Groups: NASA-GSFC/WFF, Howard U., UVA, PSU, UMBC, NWS, NCAR, CU-Boulder

WAVES data, IONS images available:
http://avdc.gsfc.nasa.gov/Data/WAVES/
http://croc.gsfc.nasa.gov/intexb/ions06.html

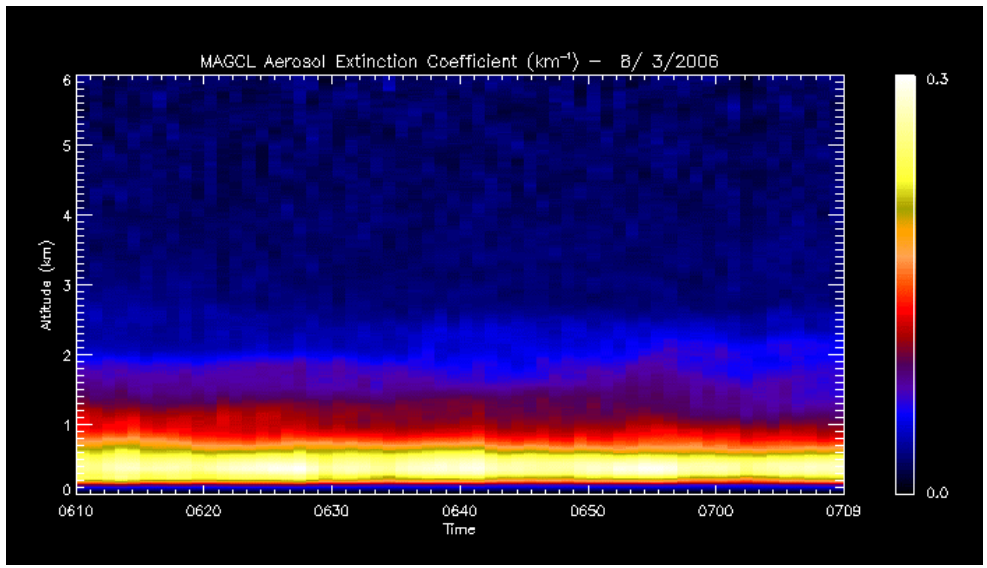
WAVES NATIVE Lidar



532 nm lidar operated nearly continuously during WAVES

Observed clouds and aerosols throughout the troposphere

Data are being calibrated using co-located cimel and radiosonde launches during WAVES



Summary of Initial Results

- Rapidly processing NATIVE aerosol optical property data from multiple campaigns
- WAVES NATIVE/satellite comparisons are in progress – stay tuned for AGU
- Proof of Concept - NATIVE single platform provided multiple measurements (ground-based in-situ and remote sensing) for intercomparison/validation purposes at WAVES – prototype deployment for TC4

Acknowledgements

*Jim Mather and everyone else at PNNL/Battelle
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Visit us at:
http://www.meteo.psu.edu/~btaubman/Webpage/native.html
http://croc.gsfc.nasa.gov/intexb/ions06.html

Data Availability:
http://www-air.larc.nasa.gov/missions/intex-b/intexb.html
http://avdc.gsfc.nasa.gov/Data/WAVES/