

# ARM

## Aerosol Life Cycle Working Group

# Highlights from Aerosol Lifecycle WG Value-added Products

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The Aerosol Life Cycle working group (ALWG) occupies a central role within ASR and ARM as the organizing body responsible for furthering our understanding of basic aerosol properties.

We present an overview of ALWG value-added products and highlight results from several current efforts including the MFRSR AOD retrievals from AMF deployments, Aerosol Intensive Properties, Aerosol Best-Estimate, Organic Aerosol Composition, and analyses of aerosol-related field campaigns (for example, currently analyzing CARES data).

### Aerosol Best-Estimate Value-Added Product

Monthly time-series AOD, Angstrom, and vertical profiles of ext, SSA, and g. Batch processed for 2000-2008. Operationally processed 2010 (2011).

#### Recent improvements:

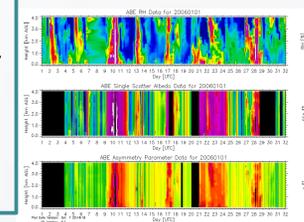
- More complete metadata
- Detailed QC flags
- Detailed source flags
- 3-wavelength scattering and absorption propagated to single scattering albedo and asymmetry parameter profiles.
- Autonomous processing

#### Input data:

- NIMFR/MFRSR AOD and Angstrom exp.
- AOS scat. & absorp.
- AIP f(rh)
- Surface met
- Merge-sonde RH prof

#### Output products:

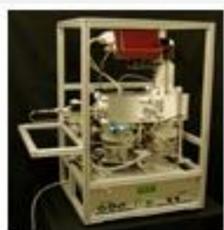
- AOD (500 nm)
- Angstrom exponent
- Ext prof from RL seasonal climatology with AOD.
- SSA(z) for RGB
- g(z) for RGB



Duli Chand, Annette Koontz, Connor Flynn

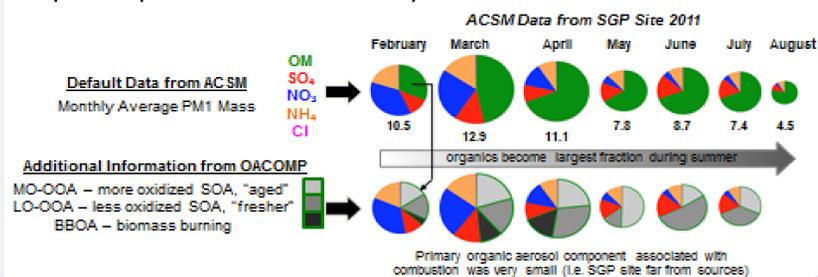
### Organic Aerosol Composition (OACOMP) VAP

Analysis of Aerosol Chemical Speciation Monitor (ACSM)



ACSM deployed at SGP, TWP, MAOS

- Currently testing new QA and pre-treatments of the ACSM data, prior to running the OACOMP script
- Expect implementation later this year



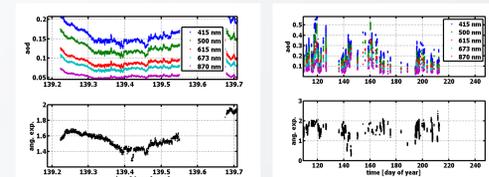
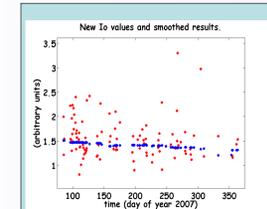
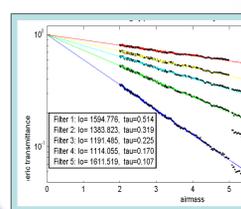
Qi Zhang, Jerome Fast, Tim Shippert

### AOD retrieved for completed AMF Campaigns

AOD and Å for PYE, FBK, HFE, GRW, SBS (NIM previously released)

#### Unique ARM Mobile Facility locations motivated...

- Improved autonomous Langley retrievals
- Increased scrutiny of calibration time series
- New ozone tables from OMI for each site
- Relaxed homogeneity constraints
- Additional Angstrom exponent constraint
- Check of cloud-screen with lidar/ radar / TSI images



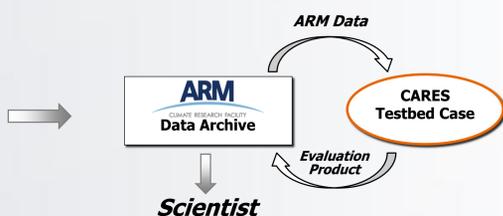
AMF Site	Total Days	To Days	AOD days	Avg. AOD	Min. AOD	Max. AOD	Sdev AOD
PYE							
FBK							
HFE							
GRW							
SBS							

Evgenii Kassianov, Connor Flynn, Annette Koontz

### CARES Dataset for Aerosol Modeling Testbed

Development of an Evaluation Product for ARM Archive

#### ARM IOP: CARES



#### Other Sources



- Integrate CARES data with other valuable data needed by modelers
  - More consistent formats
  - Derived products, e.g. merged data, averages
- CARES testbed case and Aerosol Modeling Testbed software will be available later this spring

Jerome Fast, Manish Shrivastava

### AOS Extensive and Intensive Properties

Complete processing of NOAA-configuration AOS operational for SGP, NSA, AMF1  
Initial processing of BNL-configuration AOS: avg. 1 s to 60 s, in progress

#### Initial AOS optical properties, 60 s:

- Total scattering, low RH, RGB
- Hemisp. bscat., low RH, RGB
- Absorption coef., low RH, RGB\*
- Total scattering, ramp RH, RGB
- Hemisp. bscat., ramp RH, RGB
- Alternating 1 µm / 10 µm impactor
- Wavelengths for scattering and absorption measurements are nominal "RGB" but NOT the same!
- 1 µm only for NOAA AOS suite

#### AOS Corrections:

- Scattering truncation correction
- Absorption spot-size correction
- Absorption filter trans. correction
- Absorption scattering correction
- Absorption flow meter correction
- Report all values adjusted to STP

#### AIP Computations:

- Force common RGB wavelengths
- Scat. Ang. Exp.: 1 µm & 10 µm
- Abs. Ang. Exp.: 1 µm & 10 µm
- Bscat fraction: RGB, 1 µm / 10 µm
- "g": RGB, 1 µm & 10 µm
- SSA: RGB, 1 µm & 10 µm
- In hourly average file only:
  - Submicron fraction, RGB
  - ΔF/δ: forcing efficiency G, 1 µm



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