ARM Aerosol Measurement Activities

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2021 ARM/ASR Joint Meeting

AOS Actions from 2018 Implementation Plan

► Add ozone analyzer to SGP AOS to complete that system – In place since Feb 2020

► Perform analysis of ENA site for local impacts – Analysis complete (Gallo et al., ACP, 2020)

► Implement an inlet drying system
- A drying system has been developed and implemented at the SGP & AMF1 (Uin)
- Applies to instruments in-line with the impactor

► Combine coarse-mode APS with SMPS to get full size distribution, initially for CACTI
- Implemented for CACTI and investing in additional SMPS and coarse mode instruments (Kuang)

► Comparable size distribution representation across instruments
- New b1-level product provides uniform naming and units (Shilling)
- https://www.arm.gov/news/data/post/67700

► Determine PSAP filter media and possible instrument migration path
- The E70 filter has been replaced with the EMFAB. Evaluation of new filter in progress.

► Implement improved quality controls in ACSM data products
- Assessment documented in technical report (Watson et al., 2020)
- New data product provides improved collection efficiency (Shilling): https://www.arm.gov/news/data/post/67763

Recent and Upcoming Instrument Additions and Upgrades

► Deployed 2-λ (532/1064 nm) HSRL to SGP and preparing to upgrade second system (**Ray Bambha**)

► Collecting Ice Nucleating Particle (INP) filter on routine basis. SGP + Oliktok (→ TRACER in 2021) (Jessie Creamean and **Tom Hill**)

► Aerosol size distributions (Chongai Kuang)

- SMPS for AMF2, AMF3, planning ENA in FY22
- OPC (coarse mode) 3 systems: 2 for TRACER & 1 for SAIL **(Ashish Singh)**

► ToF-ACSM for AMF2 **(Maria Zawadowicz)**

► EMSL Size/time-resolve filter sampler (STAC) for tethered balloon system and joint ARM/EMSL call for proposals

► Instrument refresh activities including:

- Version2 (circa 2000) AERIs
- Microwave Radiometers
- Wind profilers
- Doppler lidars
- Broadband radiometers
- Need to assess status of all instruments including AOS components and radars

Other Recent and On-going Work

► Implement inlet drying
  ■ Next steps: review and (likely) extension to other sites
► SP2 processing code has been ported to Python (thanks to Bobby Jackson), meaning much more efficient processing (expect processing from MOSAiC and recent NSA deployment to be uploaded this week)
► With procurement of new optical particle counters, 2nd phase of AOS inlet characterization is underway with focus on particles with sizes > 1 μm
► Evaluation of correction factors initiated for new Pall EMFAB filters used in PSAP
► Preparing to undertake tests of multiple HTDMA scan modes at SGP
► A calibration system is under development for the ACSM and CCN

Developing Plans to Advance ARM Aerosol Measurements

► Topics in this session

- Chemistry measurements
- Measurements at NSA/Utqiagvik
- Coordinated intensive operation periods

► Other topics

- Continued work on comprehensive size distributions
- Priority locations for ice nucleating particles and tethered balloon flights

► Engaging with the Aerosol Measurements and Science Group (AMSG) to develop a plan to move forward ideas from the last workshop report and the decadal vision