

Langley Aerosol Research Group (LARGE)

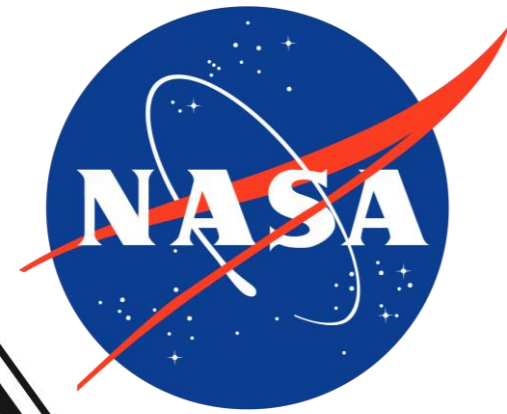
Science Directorate

NASA Langley Research Center

Hampton, VA, USA

Richard H. Moore (richard.h.moore@nasa.gov)

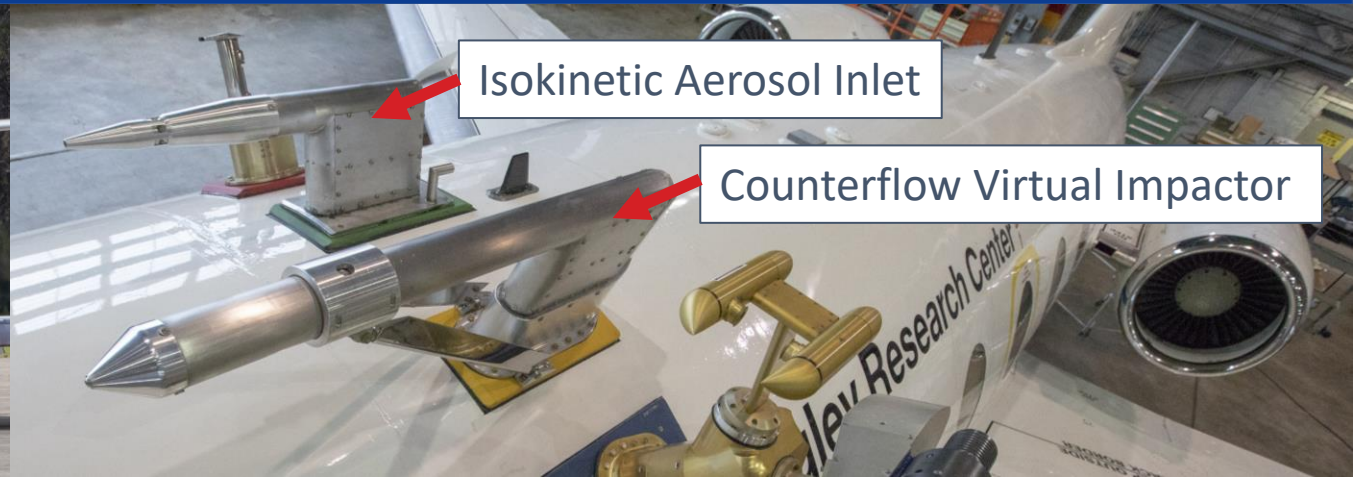
Luke D. Ziemba (luke.ziemba@nasa.gov)



<https://science-data.larc.nasa.gov/large/>

In-situ Aerosol Measurements for ACTIVATE

Data Workshop



Optical

Observable	Technique	Wavelength	Instrument-Manufacturer
Dry Scattering Coefficient	Nephelometry	450, 550, 700nm	Nephelometer – TSI 3563
$f(RH)_{80-20}$ hygroscopicity			Nephelometer – TSI 3563 (with custom Nafion Humidifier at 85% RH)
Dry Absorption Coefficient	Filter Transmission	467, 532, 660nm	PSAP – Radiance Research

Microphysical

Observable	Technique	Size Range	Instrument-Manufacturer
Total Number	Condensation Particle Counters	$D_p > 3\text{nm}$	CPC - TSI 3776
Ultrafine Number (by difference)		$D_p > 10\text{nm}$	CPC - TSI 3772
Non-volatile Number		$D_p > 10\text{nm}$	CPC - TSI 3772 (with 350°C thermodenuder)
Cloud Condensation Nuclei	CCN (and spectra)	$D_p < 1000\text{nm}$	CCN Spectrometer – DMT (w/ scanning flow)
Dry Size Distribution	Optical	$D_p : 100\text{-}5000\text{nm}$	LAS – TSI 3340
	Mobility	$D_p : 3\text{-}100\text{nm}$	nano-SMPS – TSI/Custom (LARGE)

Chemical

Observable	Technique	Size Range	Instrument-Manufacturer
Non-refractory Mass (SO ₄ , NO ₃ , NH ₄ , Chl, Org, m/z)	Mass Spectrometer	$D_p : 60 - 600\text{nm}$	HR-ToF-AMS - Aerodyne
Common Ions WSOC mass	PILS w/IC and TOC	$D_p < 5000\text{nm}$	PILS – BMI



Data Use: Best Practices for ACTIVATE Aerosol Data

***** Please read the ICARTT file headers *****



- Loadings are reported at *standard* T/P. A Factor for converting to *ambient* T/P (stdTP) is provided.
- Cloud droplets produce artifacts for most measurements. These data need to be removed before use (e.g., using $LWC > 0.02 \text{ g/m}^3$).
- “OPTICAL” and “MICROPHYSICAL” files are a great starting point for summary statistics
- Note that additional processing filters are applied for many 1Hz calculated products (e.g., single scattering albedo, ambient extinction coefficient). Care should be taken when averaging ratios.
- Negative values for AMS-mass and scattering/absorption coefficients are “real”.
- AMS data are reported using a collection efficiency = 1, unless noted in the header.
- Only the AMS and LAS instruments operated on the CVI inlet:
 - AMS-CVI data are reported in separate files as relative mass fractions
 - LAS-CVI data require use of the InletFlag (0 = isokinetic; 1 = CVI)

Please contact us for any questions/comments/concerns (michael.shook@nasa.gov)

