

## Langley Aerosol Research Group (LARGE)

Science Directorate

NASA Langley Research Center

Hampton, VA, USA

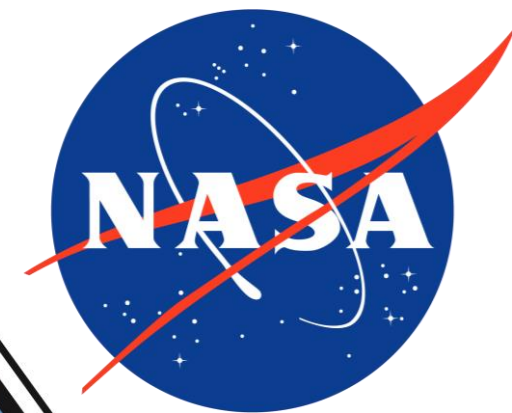
Richard H. Moore ([richard.h.moore@nasa.gov](mailto:richard.h.moore@nasa.gov))

Luke D. Ziemba ([luke.ziemba@nasa.gov](mailto:luke.ziemba@nasa.gov))

Ewan Crosbie ([ewan.c.crosbie@nasa.gov](mailto:ewan.c.crosbie@nasa.gov))

Cloud Measurements Made In Collaboration with

Christiane Voigt ([Christiane.Voigt@dlr.de](mailto:Christiane.Voigt@dlr.de)) at DLR



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

# LARGE In-situ Cloud Measurements for ACTIVATE

*Data Workshop*



# Langley Aerosol Research Group (LARGE) Archived Cloud Parameters:

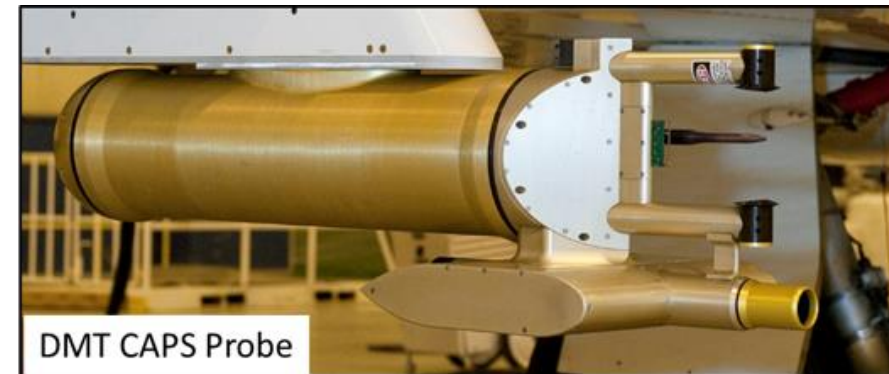
## Cloud Droplet Probe (CDP)

- **Manufacturer Webpage:** [Droplet Measurement Technologies \(DMT\)](#)
- **Size Range:** 2-50  $\mu\text{m}$  diameter
- **Archived Geophysical Variables:**
  - Aerosol and Cloud Droplet Number Size Distribution,  $\text{cm}^{-3}$
  - Integrated Aerosol and Cloud Droplet Number,  $\text{cm}^{-3}$
  - Liquid Water Content,  $\text{g m}^{-3}$
  - Effective Radius,  $\mu\text{m}$
  - Effective Variance,  $\mu\text{m}$



## Cloud and Aerosol Spectrometer (CAS)

- **Manufacturer Webpage:** [Droplet Measurement Technologies \(DMT\)](#)
- **Size Range:** 0.5-50  $\mu\text{m}$  diameter
- **Archived Geophysical Variables:**
  - Aerosol and Cloud Droplet Number Size Distribution,  $\text{cm}^{-3}$
  - Integrated Aerosol and Cloud Droplet Number,  $\text{cm}^{-3}$
  - Liquid Water Content,  $\text{g m}^{-3}$
  - Effective Radius,  $\mu\text{m}$
  - Effective Variance,  $\mu\text{m}$



# Data Use: Best Practices for ACTIVATE Cloud Data

---

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



- Number concentrations and size distributions are reported at *ambient* temperature, pressure, and relative humidity.
- The CDP sample volume is computed using a constant sample area of  $0.323 \text{ mm}^2$  and the measured aircraft true air speed.
- The CAS sample volume is computed using a constant sample area of  $0.25 \text{ mm}^2$  and the measured aircraft true air speed.
- Binned size distribution concentrations are normalized by the log of the bin width ( $dN/d\log D_p$ ).
- Sizing is calibrated assuming the refractive index of water, so differences in the aerosol refractive index for, e.g., coarse-mode dust or sea salt aerosols may lead to sizing biases.
- Generally, the CDP is the best place to start when looking at cloud data. It has several design advantages over the CAS and the sample area is directly measured (less uncertainty).

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