Langley DC-8 Cloud And Aerosol Measurements

Aerosol Properties

-Number Density

-Size Distributions

-Volatility

-Wavelength/Size/Humidity Dependent Scattering and Absorption

-Size-Resolved CCN

-Elemental/Organic Carbon Mass

Cloud Microphysical Properties

-Number Density

-Size Distributions

-Ice Particle Images

-Liquid Water Content

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Objectives

- Characterize aerosol spatial distributions/properties

- Investigate aerosol/cloud interactions

- Validate remote sensor algorithms/observations

- Provide real-time data for flight planning (aerosol number + scattering)

Operational Requirements

- Base measurement data in real time (T, P, lat, lon, alt, airspeed, etc.)

- Permission to transport small amounts of butanol and acetone onboard DC-8

- Permission to fill CN instruments with butanol prior to each flight

- Cabin temperatures > 0 C to prevent icing of humidifier systems

- Ladder-jack to provide access to clean/maintain wingtip probes

- Moderate to fast airspeeds to provide adequate inlet flow

- Vertical profile ascent/descent rates <1000 fps below 10 kft

- >10 minutes on each level leg to allow time for filter collection

- Periodic flight legs within clouds to sample cloud microphysical properties