# NASA Langley Aerosol Research Group Experiment (LARGE)

| | Primary Product | Secondary Products | Measurement Technique | Size Range (µm) |
|---|---|---|---|---|
| Optical Properties | Scattering Coefficient (3λ) | Single-Scattering Albedo (3λ)<br>Scattering Angstrom Exponent<br>Absorption Angstrom Exponent<br>Scattering sub/super-micron Fraction<br>Scattering Hygroscopicity | Nephelometer | < 5 (aerodynamic) |
| | Absorption Coefficient (3λ) | | Particle soot absorption photometer (PSAP) | < 5 (aerodynamic) |
| Microphysical Properties | Aerosol Size Distribution | Integrated Volume<br>Integrated Surface Area<br>Ultrafine Number Concentration | Mobility/Optical/Aerodynamic Sizers | 0.01 – 5 |
| | Number Concentration | | CPCs | 0.01 – 5 |
| | Non-volatile Size Distribution | Sea-salt/BC mixing state | Heated mobility and Optical Sizers (350C) | 0.01 – 1 |
| | Fluorescent Biological Aerosol Particle (FBAP) Number and Size Distribution | FBAP mixing state<br>FBAP fluorescence typing (2λ) | Wideband Integrated Bioaerosol Spectrometer (WIBS-4A) | 0.6 – 5 |
| | Cloud Condensation Nuclei (CCN) Number Concentration | f(supersaturation) | Dual (Scanning-flow and Stepping) CCN spectrometers | < 5 |
| Chemical Composition | Organic, Sulfate, Nitrate, Ammonium Mass Concentrations | O/C ratio, OC/OM, m/z markers | Aerodyne HR-ToF-AMS | 0.06 - 0.8 |
| | Water soluble Organic Carbon (WSOC), Inorganic Ions | --- | Filter Collection, WSOC and Ion-chromatographic analysis | < 5 (aerodynamic) |
| | Black Carbon Mass Concentration | BC mixing state, coating thickness | Single Particle Soot Photometer (SP2) | 0.08 – 0.5 |
| Cloud Properties | Cloud Particle Size Distribution | Cloud LWC, effective radius | WCM-2000, CDP, CAPS | 0.5 – 1,550 |
| Gas-Phase Tracers | NOx, CO, CO2 | --- | LGR Cavity Ring Down | NA |
| Fast Flux Measurements | CO2, particle number concentration | --- | Licor, CPC<br>5-port FADS | < 5 (aerodynamic) |