CAPS PM$_{ssa}$ Monitor

Accurate and Precise Continuous Monitoring of Particle Extinction, Scattering and Single Scattering Albedo (SSA=Scattering/Extinction)

**APPLICATIONS**

- Climate Change Research
- Optical Properties Closure
- Roadside Monitoring
- Combustion Plume Analysis
- Aircraft Engine Exhaust Monitoring
- Air Quality Monitoring

**ADVANTAGES**

- Inverse nephelometer incorporated into CAPS extinction cell
- Measurement of optical extinction and scattering at the 1 Mm$^{-1}$ level
- Choice of 1 of 5 Wavelengths:
  - Far Blue (405 nm)
  - Blue (450 nm)
  - Green (525 nm)
  - Red (630 nm)
  - Far Red (660 nm)
  - Near IR (780 nm)
- Autonomous Operation

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Allan analysis of monitor noise in both extinction and scattering channels at a wavelength of 530 nm (green). Note that the scattering channel has minimal baseline drift.

Correlation plot of measured scattering versus extinction for 250 nm diameter ammonium sulfate particles at a wavelength of 630 nm.
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SPECIFICATIONS:

- **Sensitivity (S/N =3)**
  - $3.0 \text{ Mm}^{-1} (1 \text{ s}), 0.5 \text{ Mm}^{-1} (60 \text{ s})$ both channels
  - SSA $\pm 0.03 \text{ (30 s)}$

- **Response Time (10-90%)**
  - 1 s

- **Sample Flow**
  - $0.85 \text{ l min}^{-1}$ (volumetric flow), Internal Pump

- **Operating Pressure**
  - Ambient

- **Materials Exposed to Sample:**
  - Conductive Urethane, Stainless Steel, Conductive Silicone, and Aluminum

- **Data Output:**
  - RS-232, USB, Ethernet (Data Acquisition Program Included)
  - On-board Data Storage (5 yrs)
  - Front Panel Display

- **Size/Weight:**
  - 24” x 19” x 9” (5U), 35 lbs
  - [61 cm x 43 cm x 23 cm, 16 kg]

- **Electric Power:**
  - 50 W; 100-250 VAC (50-60 Hz)

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REFERENCES


