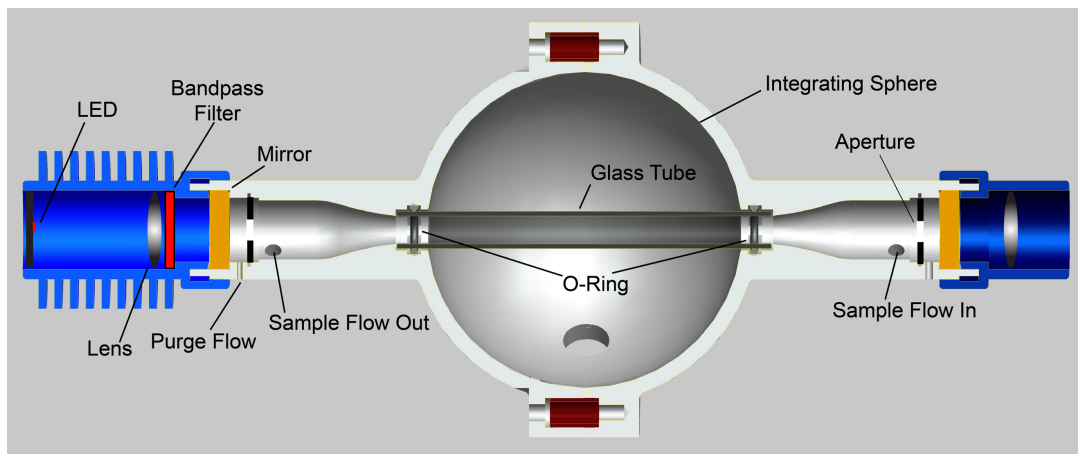


AERODYNE RESEARCH, Inc.

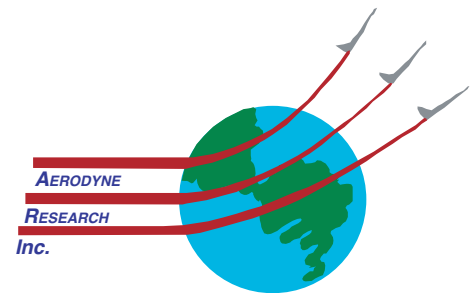
45 Manning Road
Billerica, MA 0181-3976 U.S.A.
<http://www.aerodyne.com>

Test Certificate

CAPS PM_{SSA} Monitor



April 2021



Certified by: A. Freedman

Tested Device: **CAPS PM_{SSA} Serial Number 321001**

Wavelength = **660 nm**

Tests Conditions:

1. Extinction and Scattering
 - a. Temperature = 300 K (28 °C)
 - b. Pressure = 760 Torr
 - c. Aerosols 300, 500, 600 nm PSL
250 nm Ammonium Sulfate

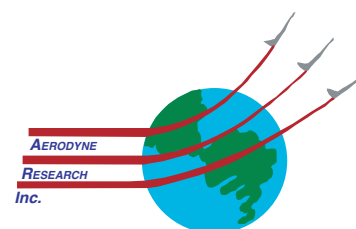
2. Allan Analysis
 - a. Temperature = 300-302 K
 - b. Pressure = 760 Torr
 - c. RH <1%
 - d. NO₂-free Air [NO₂] < 1 ppb

Total Sample Flow Rate: 0.9 lpm (volumetric flow)

Baseline Loss: ~ 450 Mm⁻¹

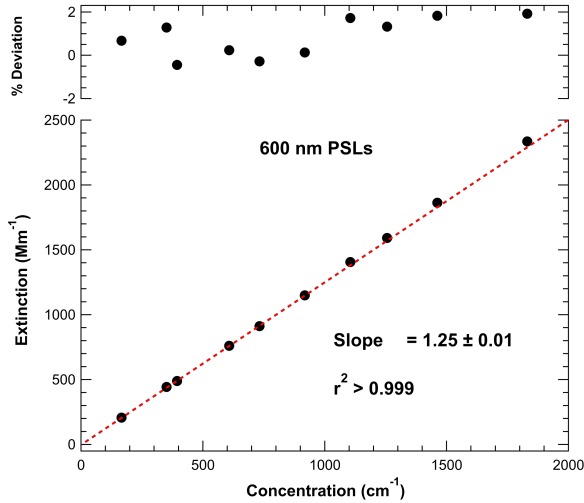
Detector – R645 (LVPD)

Code Version: CAPS 0.10.3



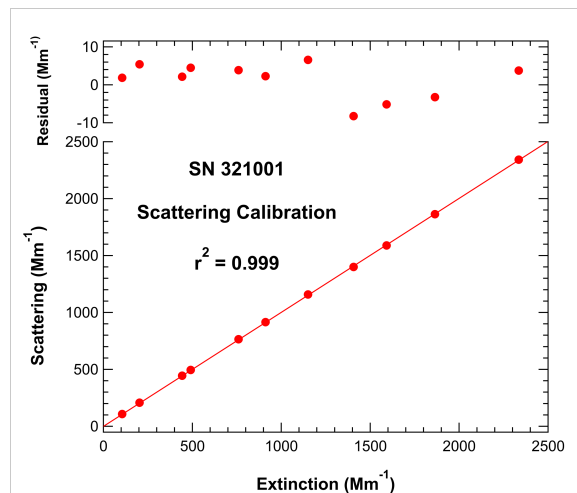
RESULTS

Extinction

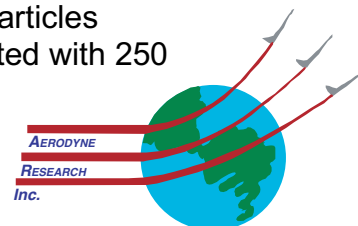


Deviation from linearity is better than $\pm 1\%$ out to 1000 Mm^{-1} and then increases to 2% out to $\sim 2500 \text{ Mm}^{-1}$. The fit was obtained using a linear least squares fit to the data from 0 to 1000 Mm^{-1} and then extended out to 2500 Mm^{-1} .

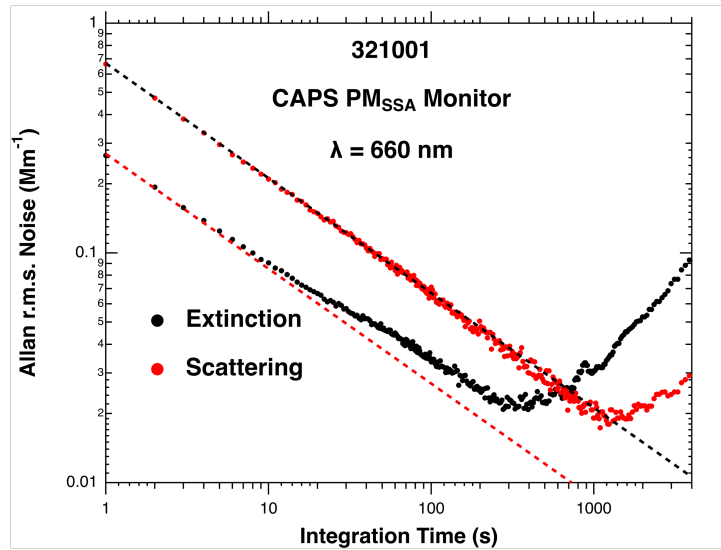
Scattering



Measured scattering versus extinction using 600 nm PSLs particles corrected for truncation. The scattering channel was calibrated with 250 nm diameter ammonium sulfate particles.



Allan Analysis



The r.m.s. noise with 1 second integration in both scattering and extinction channels is $\ll 1 \text{ Mm}^{-1}$. We note that this level of performance was obtained in a relatively well temperature-controlled laboratory using zero air. In other circumstances, baseline drift is expected to increase above the levels seen above.

