Dry Extinction at 532nm – NOAA CRDS vs LARGE

**Archive 10s Merge**

- All Data Points (22475 pts)
  - $y = a + bx$
  - $a = 3.77 \pm 0.26$
  - $b = 0.936 \pm 0.002$
  - $R^2 = 0.855$

- Data Points > DL (22162 pts)
  - $y = a + bx$
  - $a = 3.86 \pm 0.27$
  - $b = 0.934 \pm 0.003$
  - $R^2 = 0.854$

- Outliers Removed (22159 pts)
  - $y = a + bx$
  - $a = -1.18 \pm 0.11$
  - $b = 1.043 \pm 0.001$
  - $R^2 = 0.972$

**10s Merge with 70% Data**

- All Data Points (17571 pts)
  - $y = a + bx$
  - $a = 5.16 \pm 0.31$
  - $b = 0.907 \pm 0.003$
  - $R^2 = 0.837$

- Data Points > DL (17482 pts)
  - $y = a + bx$
  - $a = 5.21 \pm 0.31$
  - $b = 0.907 \pm 0.003$
  - $R^2 = 0.836$

- Outliers Removed (17478 pts)
  - $y = a + bx$
  - $a = -1.04 \pm 0.11$
  - $b = 1.039 \pm 0.001$
  - $R^2 = 0.978$
Difference dependence on extinction value

Archive 10s Merge

10s Merge with 70% Data

Avg All Data = \(-0.6 \pm 36.2\)
Avg Data > DL = \(-0.6 \pm 36.2\)

Avg All Data = \(-0.4 \pm 38.8\)
Avg Data > DL = \(-0.4 \pm 38.9\)

(\(\bullet\) All Data Points, \(\circ\) Data Points < DL)

75\(^{th}\) Percentile
Median
25\(^{th}\) Percentile
Data:
- **10s Merge**: SEAC4RS-mrg10-dc8_merge_20130806_R5_thru20130923.ict
- **1s LARGE**: SEAC4RS-LARGE-OPTICAL_DC8_##########_R3.ict (######## = daily files from 20130808 – 20130923)
- **1s NOAA ESRL**: seac4rs-NOAA-AeroExt_DC8_##########_R1.ict (######## = daily files from 20130808 – 20130923)

Correlation:
- 10s merge with 70% data are calculated using 1s PI data files. Each 10s interval must contain at least 70% of data for analysis.
- Data points below the DL (LARGE < 1 Mm⁻¹, NOAA < 1 Mm⁻¹) are colored red.
- 10s archive merge outliers removed iteratively when Cook’s Distance > 1 (https://en.wikipedia.org/wiki/Cook%27s_distance).
- Outlier removed from 70% data 10s merge based on largest Cook’s Distance.

- Fit lines are derived from orthogonal distance regressions.
- $R^2$ values are calculated independently, not from orthogonal distance regression.
- Data reported at STP (273 K & 1013 mb).

**Difference dependence on extinction value**:
- Absolute difference calculated by LARGE – NOAA.
- Median, 25th, and 75th percentiles based on 1500 data point bins after data is sorted by LARGE extinction values.