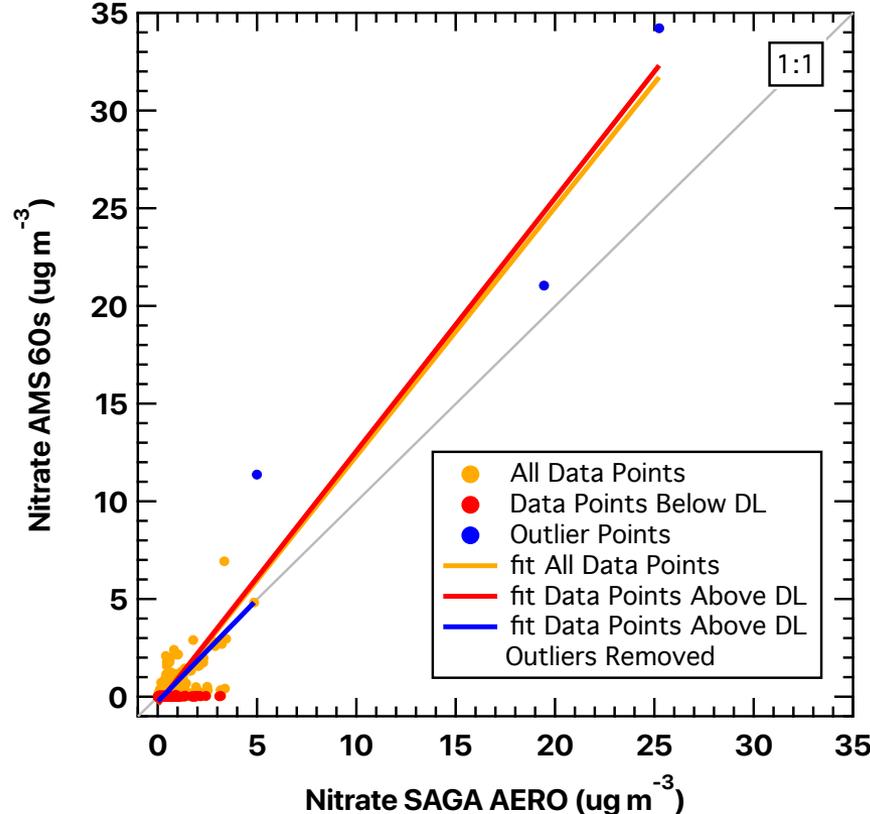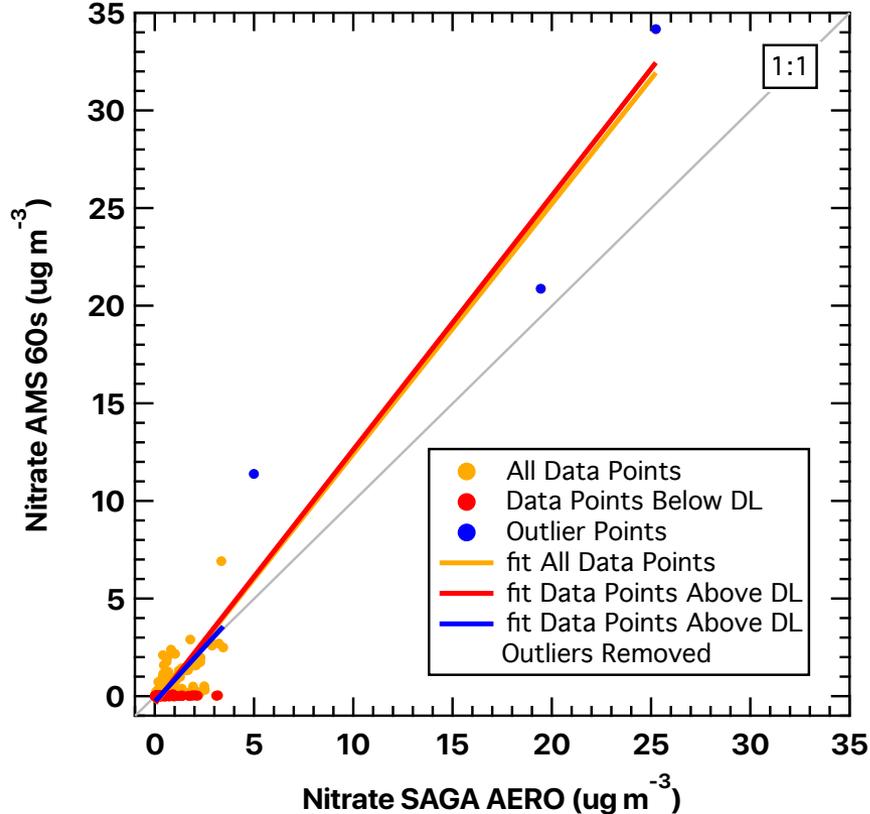# Nitrate – AMS 60s vs SAGA-AERO

Archive 10s Merge

10s Merge with 70% Data

All Data Points
(660 pts)
y = a + bx
a = -0.384 ± 0.029
b = 1.272 ± 0.020
R^2 = 0.847

Data Points > DL
(434 pts)
y = a + bx
a = -0.361 ± 0.036
b = 1.295 ± 0.021
R^2 = 0.891

Data Points > DL
Outliers Removed
(431 pts)
y = a + bx
a = -0.22 ± 0.038
b = 1.044 ± 0.048
R^2 = 0.398

All Data Points
(586 pts)
y = a + bx
a = -0.374 ± 0.030
b = 1.28 ± 0.02
R^2 = 0.868

Data Points > DL
(383 pts)
y = a + bx
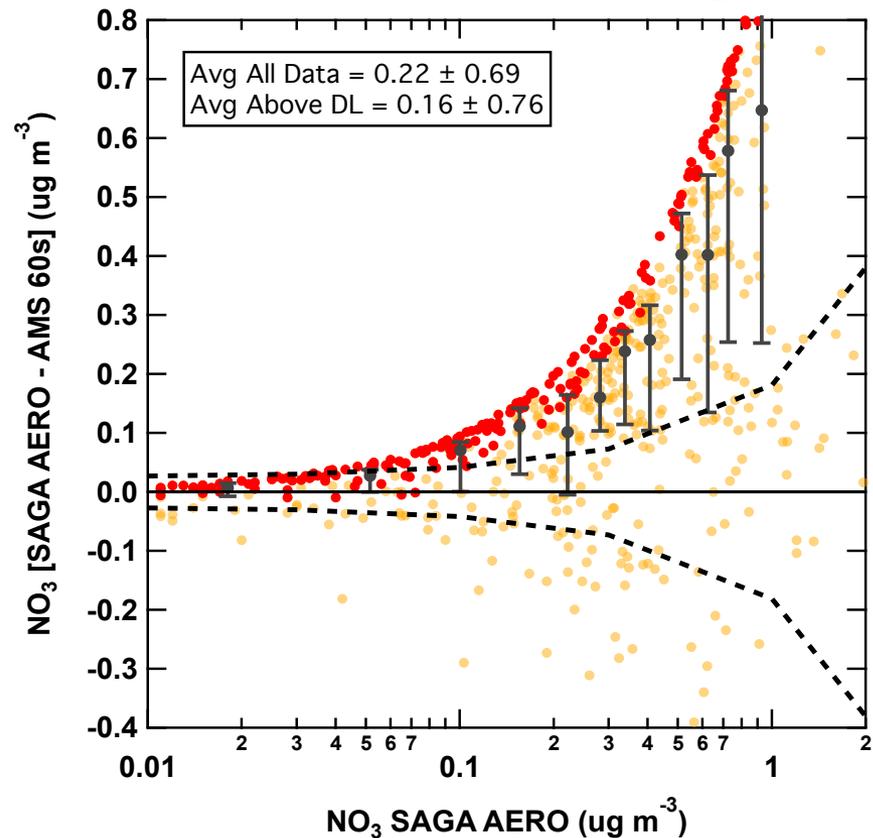a = -0.351 ± 0.037
b = 1.301 ± 0.021
R^2 = 0.908

Data Points > DL
Outliers Removed
(380 pts)
y = a + bx
a = -0.256 ± 0.041
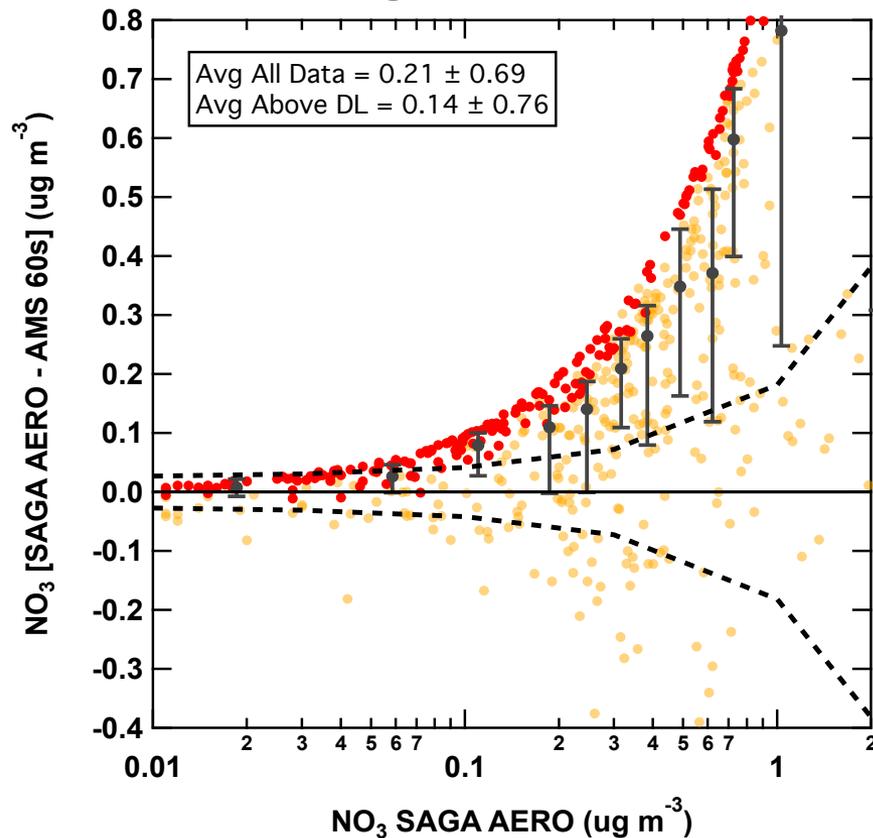b = 1.118 ± 0.056
R^2 = 0.388

Difference dependence on NO$_3$ value

Uncertainty envelopes based on SAGA-AERO time base combined data uncertainty
(AMS 60s calculated from data file, SAGA = $\pm$ (0.02 ug std m-3 + 15%)

Archive SAGA-AERO Merge

Avg All Data = 0.22 ± 0.69
Avg Above DL = 0.16 ± 0.76

Merge with 70% Data

Avg All Data = 0.21 ± 0.69
Avg Above DL = 0.14 ± 0.76

NO$_3$ [SAGA AERO - AMS 60s] (ug m^{-3})

NO$_3$ SAGA AERO (ug m^{-3})

(🟡 All Data Points, 🔴 Data Points < DL)

75th Percentile

Median

25th Percentile

Data:
- seac4rs-mrgSAGA-AERO-dc8_merge_20130806_R5_thru20130923.ict
- seac4rs-AMS-60s_DC8_########_R1.ict (######## = daily files from 20130806 – 20130923)
- seac4rs-SAGA-AERO_DC8_########_R1.ict (######## = daily files from 20130806 – 20130923)

Correlation:
- Merge with 70% data are calculated using 60s AMS data files. Data points removed when flagged for potential inlet artifacts (IceFlag). Each merge interval must contain at least 70% of data for analysis.
- AMS 60s DL: reported in data file, propagated to SAGA-AERO time interval.
- SAGA AERO and AMS 60s data points below the DL are colored red.
- Outliers removed when Cook's Distance > 1.
- Data reported at STP (273 K & 1013 mb).

- Fit lines are derived from orthogonal distance regressions.
- R^2 values are calculated independently, not from orthogonal distance regression.

Uncertainty propagation (Uncertainties provided by PIs).
- AMS 1s precision: reported in data file, propagated to SAGA-AERO time interval using quadrature average.
- SAGA-AERO uncertainty: $\pm$ [15% + 0.02 ug std m-3]

Difference dependence on SO_4 value:
- Relative difference calculated by SAGA-AERO – AMS 60s.
- Median, 25th, and 75th percentiles based on 50 data point bins after data is sorted by SAGA-AERO values.
- Uncertainty envelopes based on uncertainty in data file (SAGA-AERO) and AMS 1s propagated precision.

Summary: Archived SAGA-AERO merge

Data Range	# Points	# Pts within Combined Unc.	# Pts within 2*Combined Unc.
All	660	203 (31%)	331 (50%)

Summary: Merge with 70% data

Data Range	# Points	# Pts within Combined Unc.	# Pts within 2*Combined Unc.
All	586	180 (31%)	297 (51%)