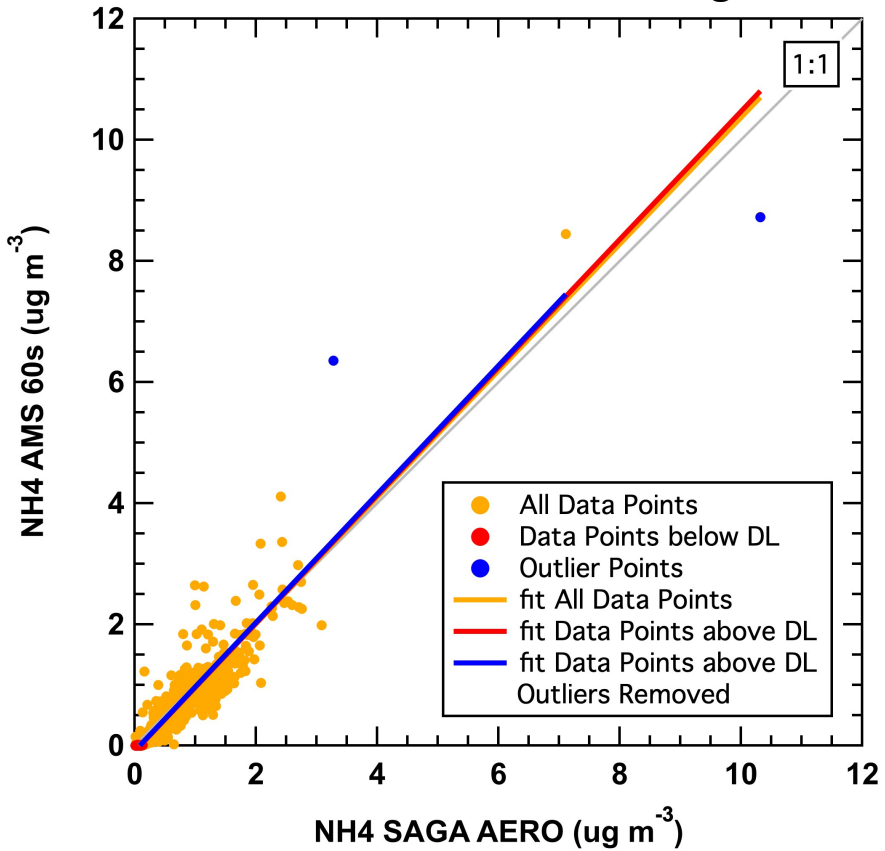
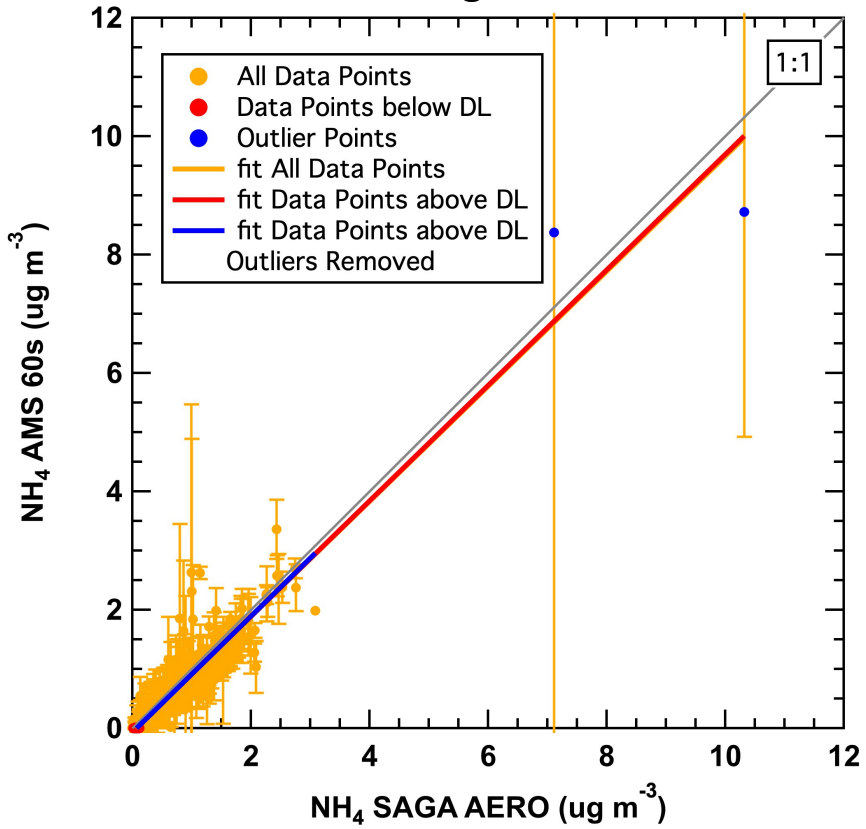


Ammonium– AMS 60s vs SAGA-AERO

Archive SAGA-AERO Merge



SAGA-AEROMerge with 70% Data



All Data Points
 (836 pts)
 $y = a + bx$
 $a = -0.081 \pm 0.012$
 $b = 1.045 \pm 0.013$
 $R^2 = 0.874$

Data Points > DL
 (647 pts)
 $y = a + bx$
 $a = -0.098 \pm 0.017$
 $b = 1.057 \pm 0.017$
 $R^2 = 0.853$

Data Points > DL
Outliers Removed
 (645 pts)
 $y = a + bx$
 $a = -0.117 \pm 0.016$
 $b = 1.081 \pm 0.017$
 $R^2 = 0.845$

All Data Points
 (718 pts)
 $y = a + bx$
 $a = -0.056 \pm 0.010$
 $b = 0.972 \pm 0.012$
 $R^2 = 0.902$

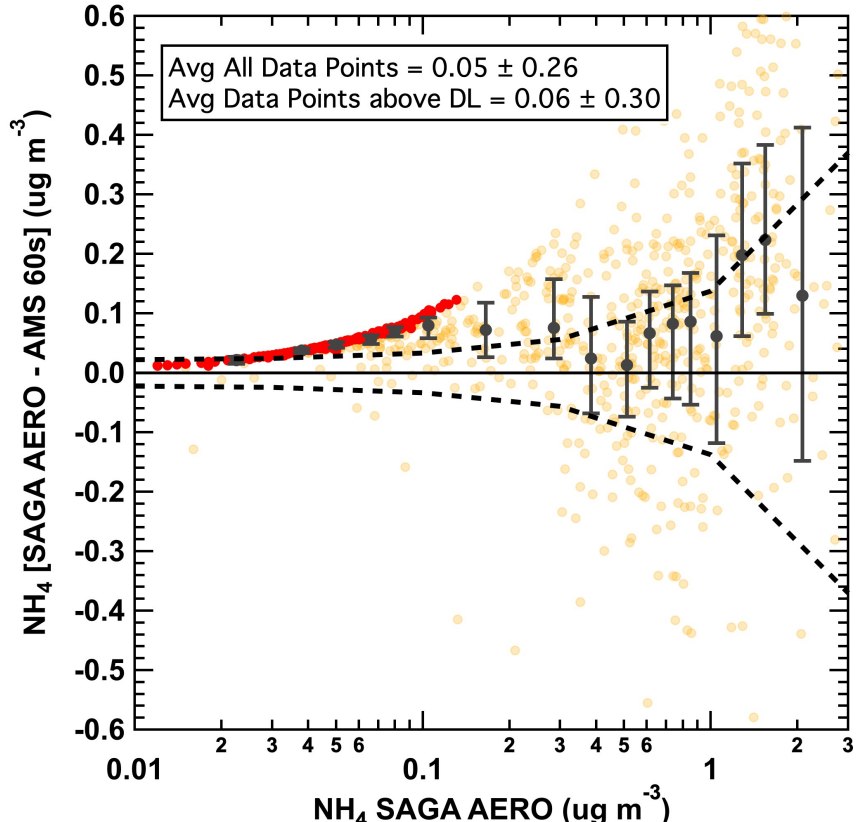
Data Points > DL
 (548 pts)
 $y = a + bx$
 $a = -0.062 \pm 0.015$
 $b = 0.976 \pm 0.015$
 $R^2 = 0.885$

Data Points > DL
Outliers Removed
 (546 pts)
 $y = a + bx$
 $a = -0.067 \pm 0.016$
 $b = 0.982 \pm 0.018$
 $R^2 = 0.823$

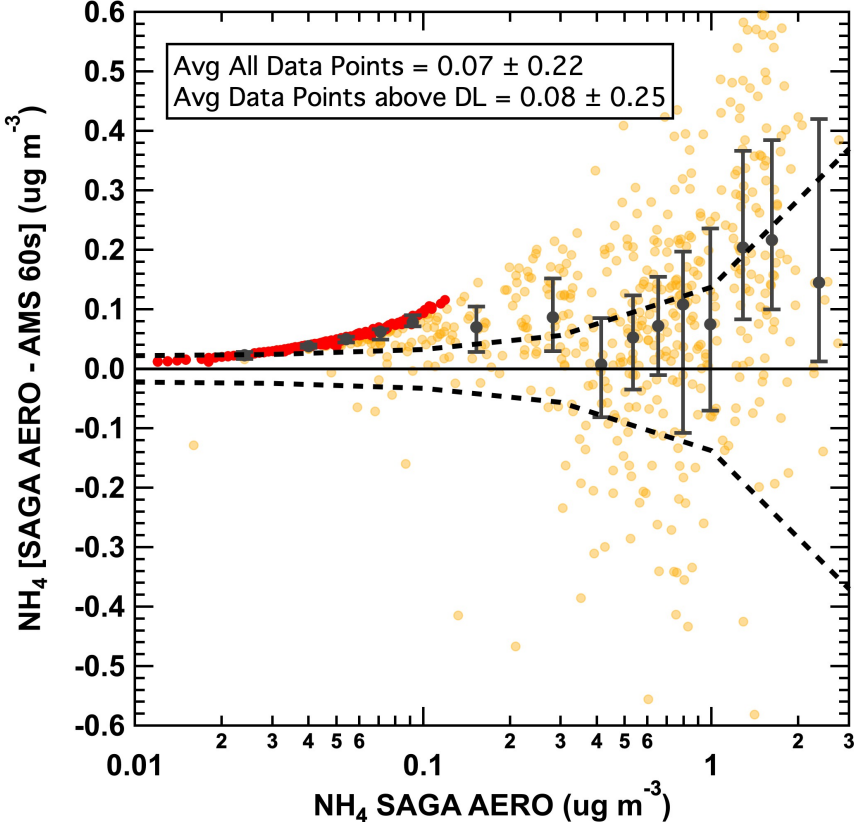
Difference dependence on NH_4 value

Uncertainty envelopes based on combined data uncertainty
(AMS 60s calculated from data file, SAGA-AERO = $\pm (0.02 \text{ ug/m}^3 + 11\%)$)

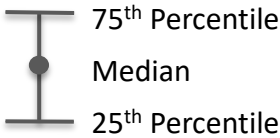
Archive SAGA-AERO Merge



SAGA-AERO Merge with 70% Data



(● All Data Points, ● Data Points < DL)



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 :

- SAGA-AERO merge with 70% data are calculated using archive PI data files. Each merge interval must contain at least 70% of data for analysis.
- AMS 60s detection limit (DL) data propagated to SAGA AERO time interval.
- Outliers removed when Cook's Distance > 1 (https://en.wikipedia.org/wiki/Cook%27s_distance).
- Data reported at STP (273 K & 1013 mb)
- Fit lines are derived from orthogonal distance regressions.
- R² values are calculated independently, not from orthogonal distance regression.

Uncertainty propagation (Uncertainties provided by PIs).

- AMS 60s uncertainty: reported in data file; SAGA-AERO time interval uncertainty: calculated from 1s precision quadrature average + 34% accuracy.
- SAGA-AERO uncertainty: ± 0.02 ug/m³ +11%.

Difference dependence on NH₄ value:

- Absolute 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 SAGA-AERO data uncertainty.

Summary: Archived SAGA-AERO merge

Data Range	# Points	# Pts within Combined Unc.	# Pts within 2*Combined Unc.
All	836	432 (50%)	662 (79%)

Summary: Merge with 70% data

Data Range	# Points	# Pts within Combined Unc.	# Pts within 2*Combined Unc.
All	719	358 (50%)	568 (79%)