Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

Supplementary information for: Seasonal variation in aerosol composition and concentration upon transport from the outdoor to indoor environment

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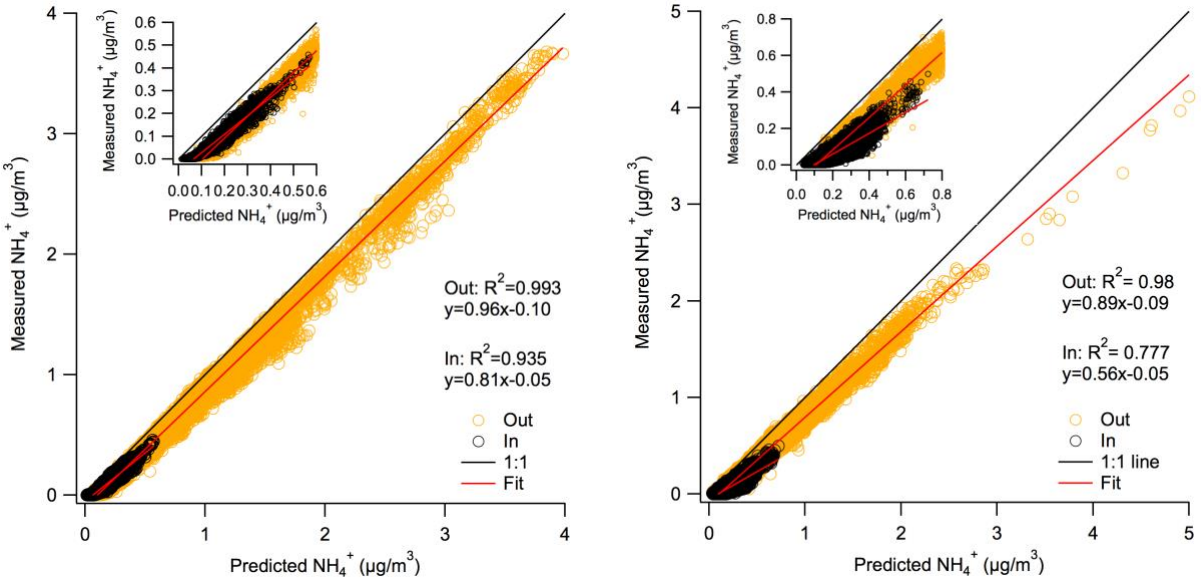

Figure S1. Predicted vs Measured ammonium in winter (left) and summer (right). The slope is lower indoors in both seasons, although in both seasons, the observed ratios are within the range observed outdoors.

Table S1. The effect of the aerosol shift on the $(I/O)_{i/SO4}$ data.

Species or Factor	Percentiles for $(I/O)_{i/SO4}$ Winter			Percentiles for Unshifted $(I/O)_{i/SO4}$ Winter			Percent change
	25th	50th	75th	25th	50th	75th	50th
NO_3	0.24	0.35	0.49	0.24	0.35	0.50	0%
Org	0.88	1	1.17	0.87	1.01	1.18	1%
HOA	0.94	1.24	1.77	0.89	1.28	1.84	3%
COA	1	1.24	1.7	0.97	1.23	1.78	-1%
OOA	0.71	0.82	0.91	0.70	0.83	0.95	1%

Species or Factor	Percentiles for $(I/O)_{i/SO4}$ Summer			Percentiles for Unshifted $(I/O)_{i/SO4}$ Summer			Percent change
	25th	50th	75th	25th	50th	75th	50th
NO_3	0.59	0.75	0.93	0.56	0.74	0.97	-1%
Org	1.07	1.17	1.29	1.05	1.17	1.31	0%
HOA	1.36	1.96	2.89	1.42	2.01	3.08	2%
COA	0.66	0.75	0.88	0.64	0.77	0.93	2%
OOA	0.41	0.51	0.59	0.42	0.52	0.61	3%

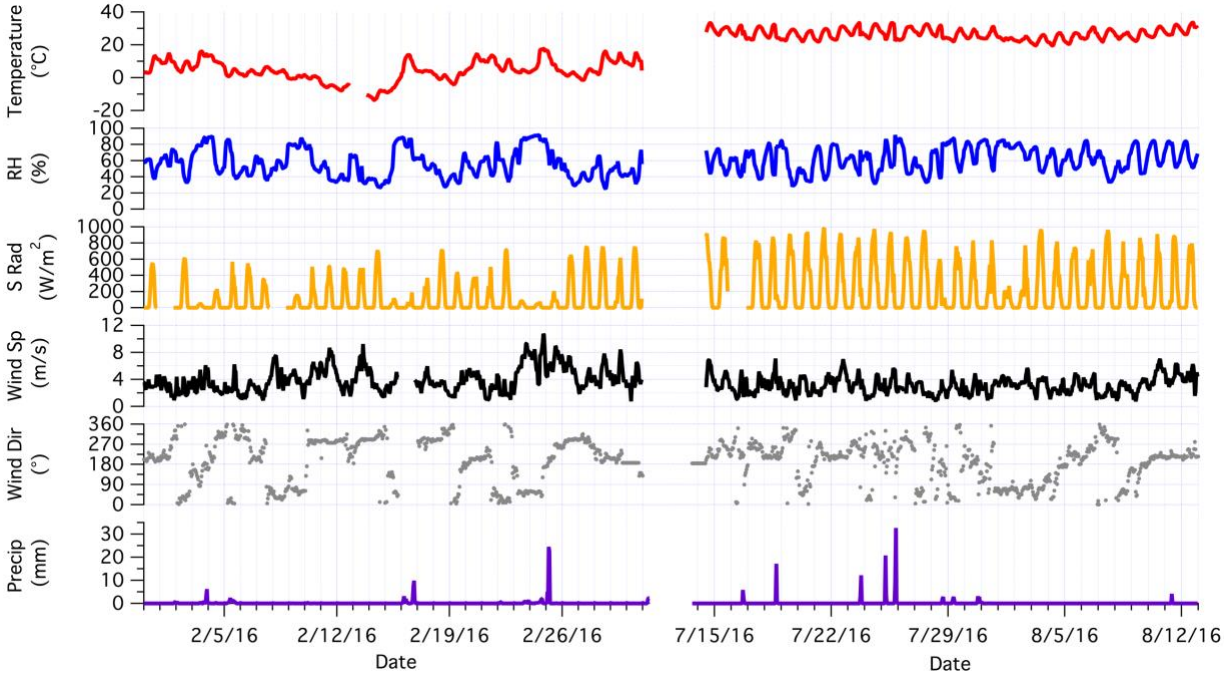

Figure S2. Full meteorological data from winter (left) and summer (right).

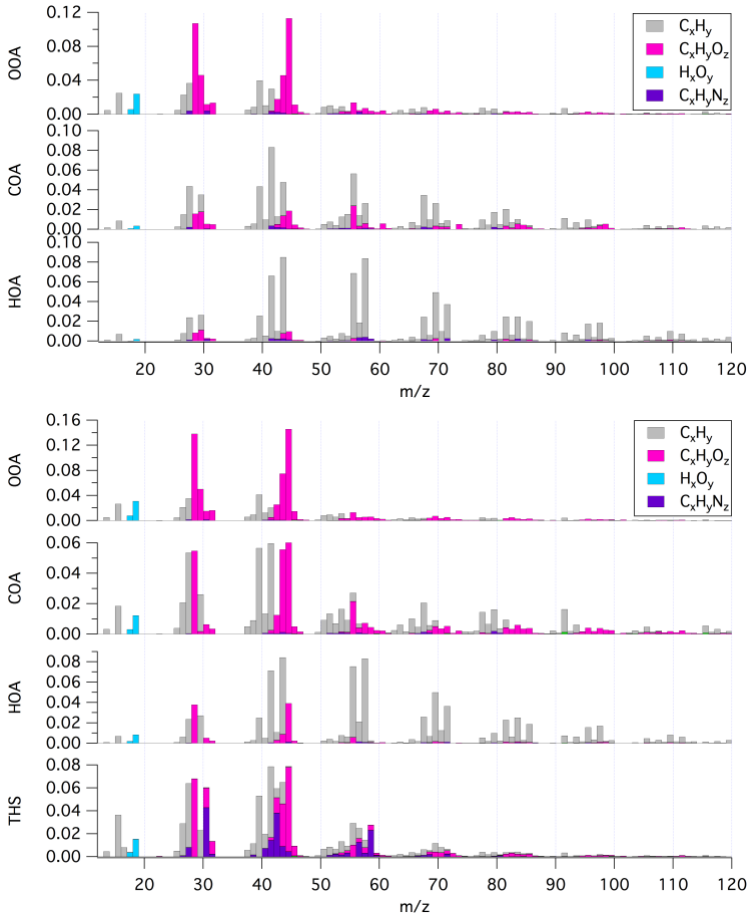

Figure S3. PMF mass spectra results for winter (top) and summer (bottom). OOA, COA, and HOA were common between the seasons, with similar spectral characteristics; THS was unique to summertime.

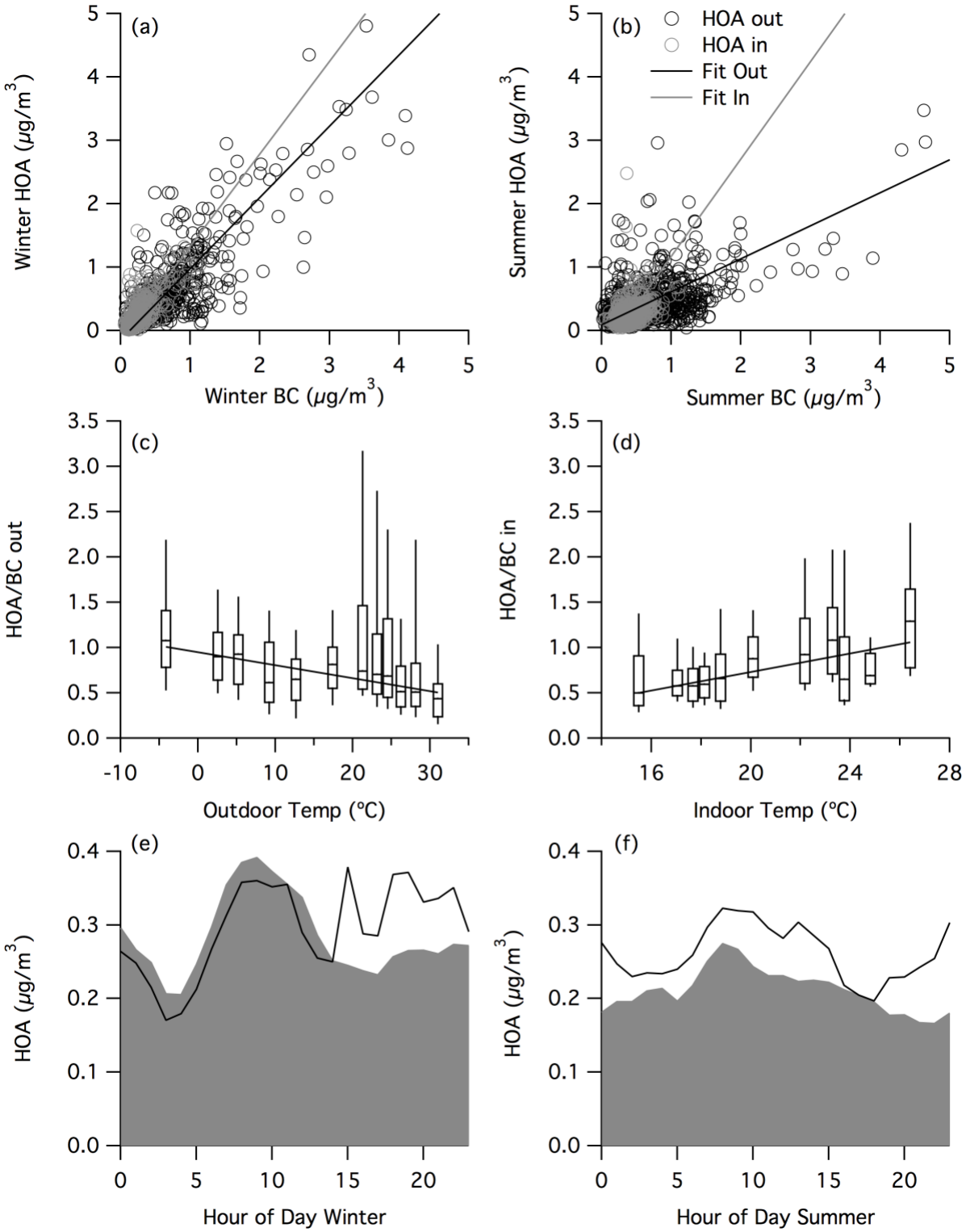

Figure S4. Hydrocarbon-like organic aerosol (HOA) to black carbon (BC) ratios in for outdoor (black) and indoor (gray) in winter (a) and summer (b); HOA/BC ratios for outdoor-only (c) and indoor-only (d) in both seasons for corresponding temperatures; BC-attributable HOA (gray background) and measured HOA (line) for winter (e) and summer (f), showing most HOA is attributable to BC-associated outdoor sources.

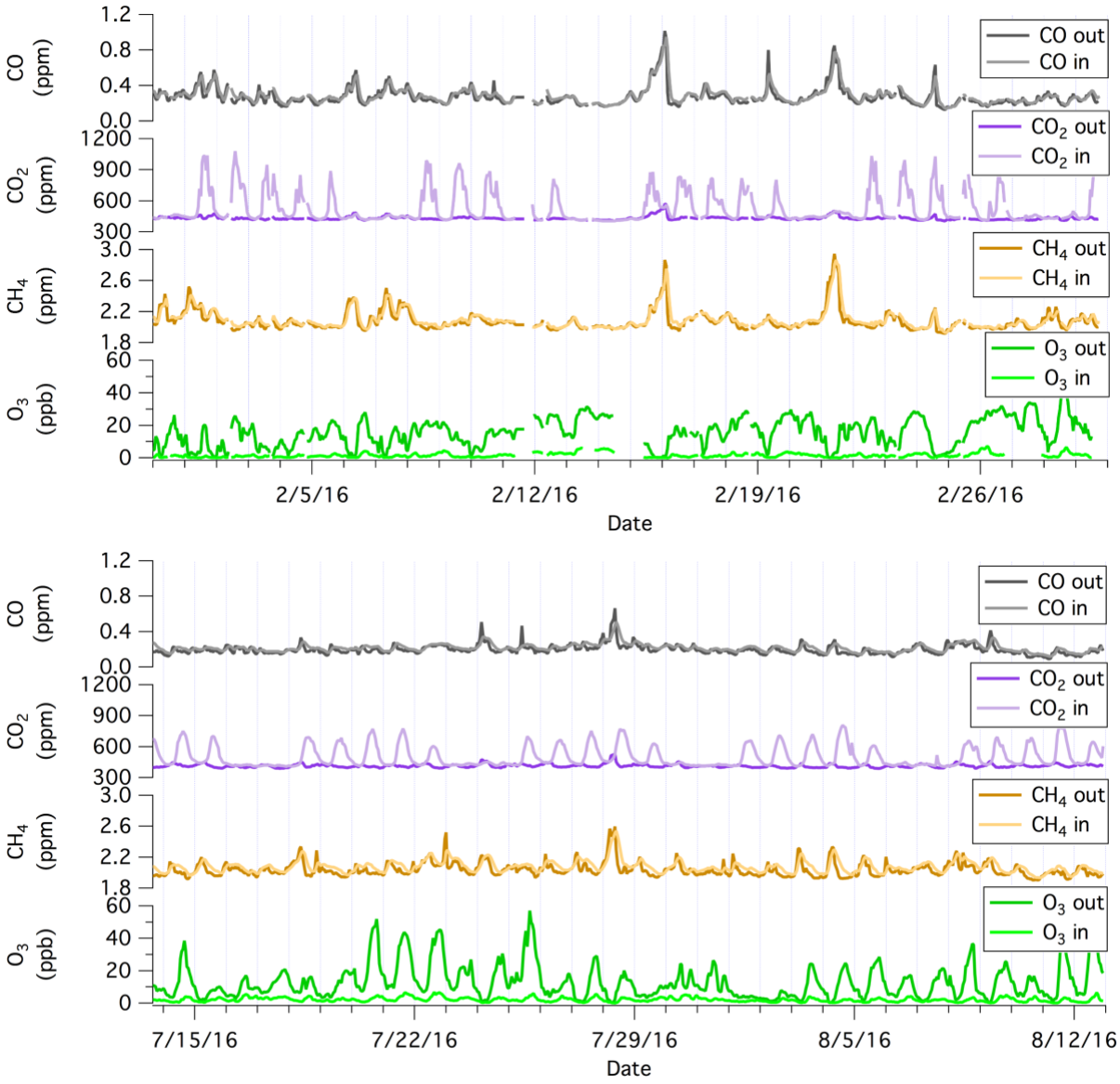

Figure S5. Full time series of each measured gas phase species measured for winter (top) and summer (bottom).

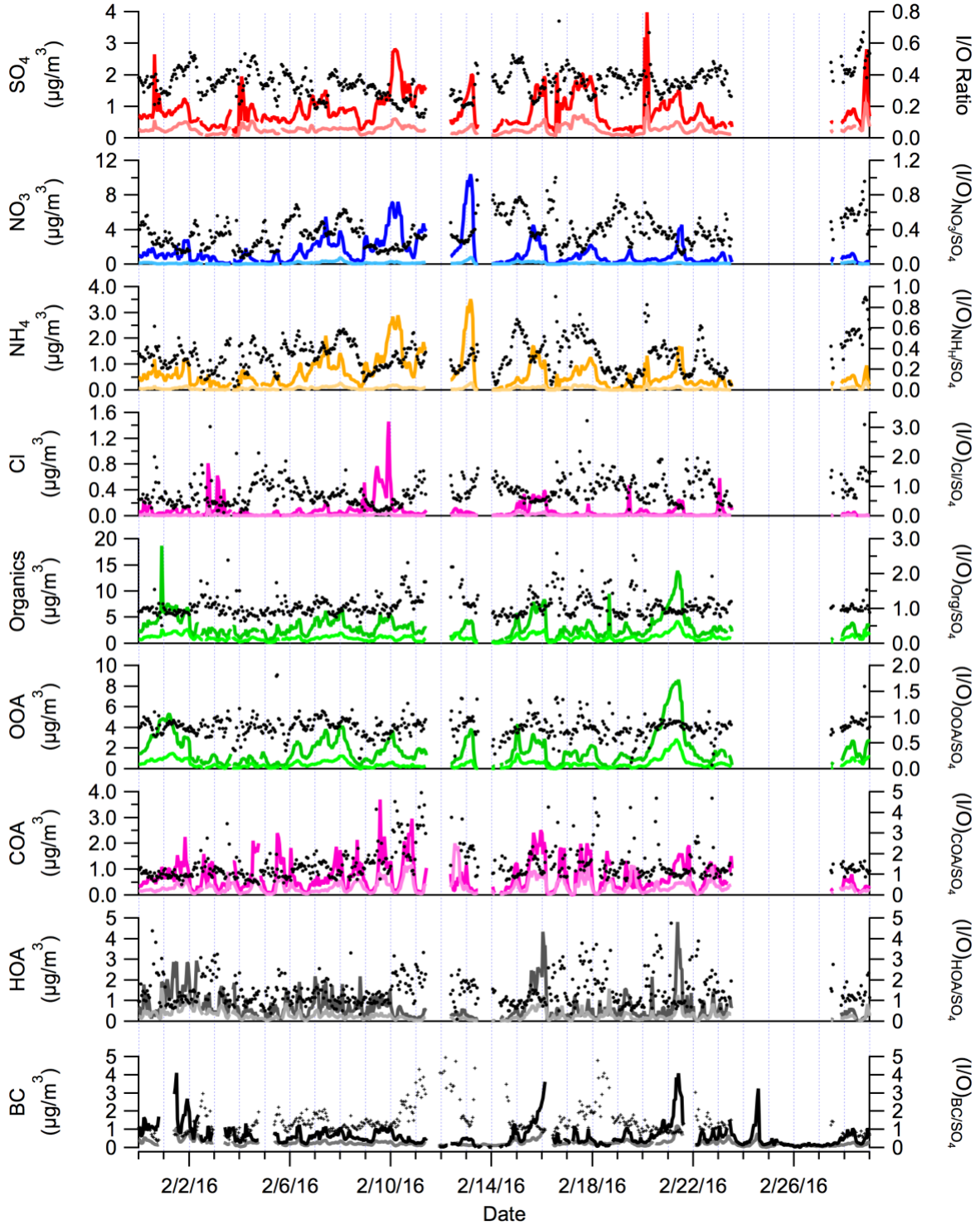

Figure S6a. The measured concentration of outdoor (dark) and indoor (light) of each species and PMF factor, and the $(I/O)_{i/SO4}$ ratio (dots, right) for winter.

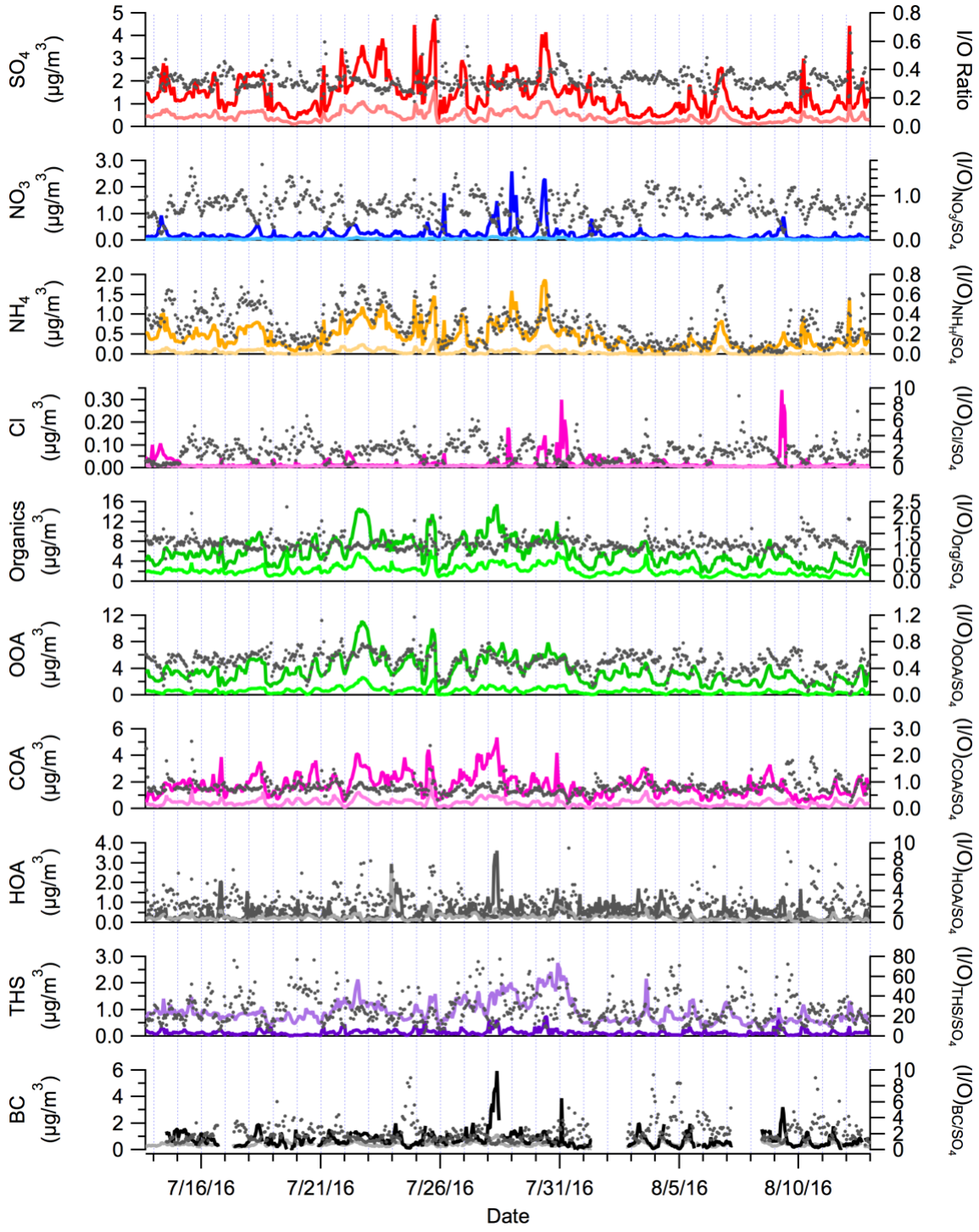

Figure S6b. The measured concentration of outdoor (dark) and indoor (light) of each measured aerosol chemical species and PMF factor, and the $(I/O)_{i/SO4}$ ratio (dots, right) for summer.

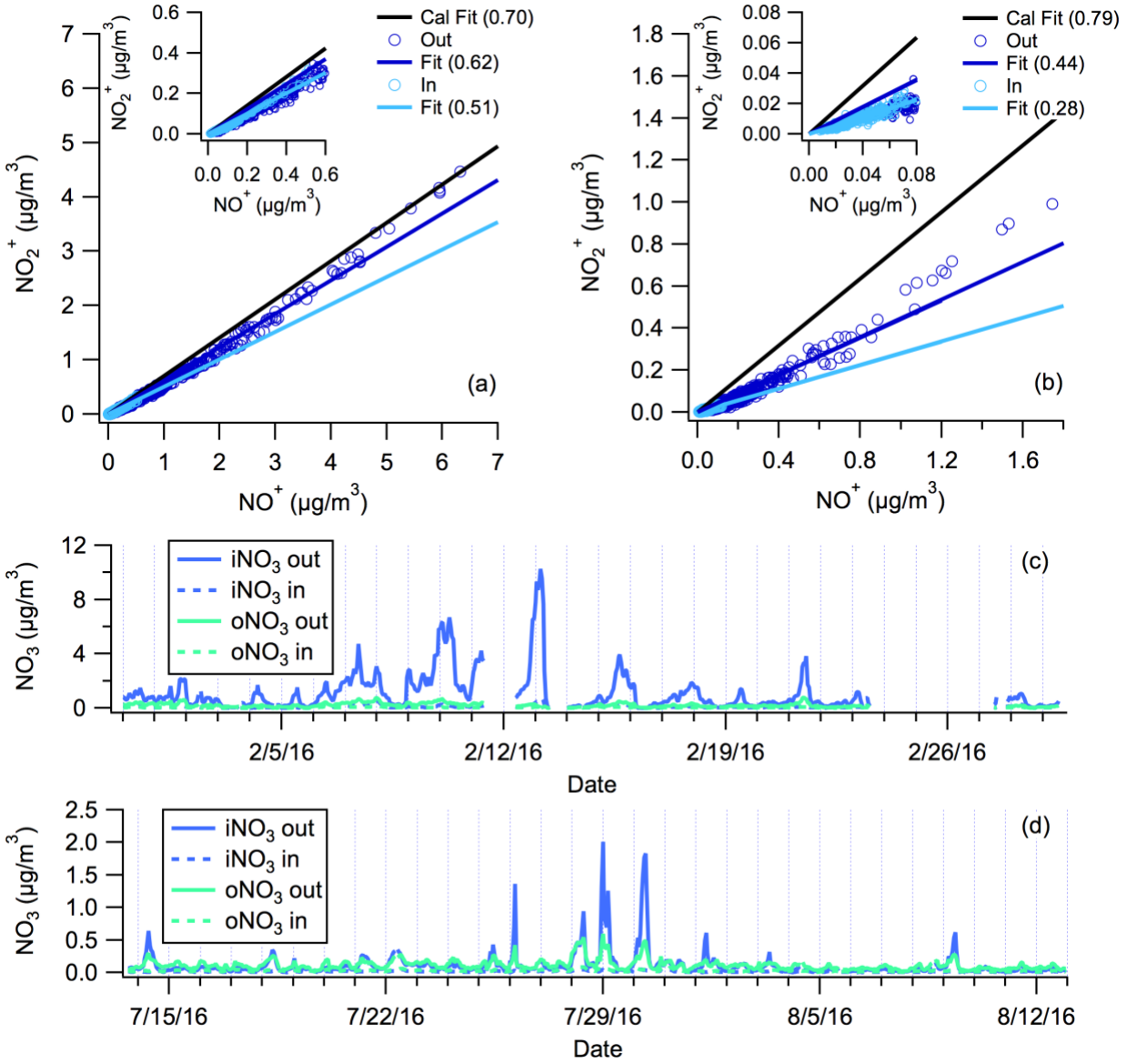

Figure S7. Measured concentration of the $NO2^+$ ion vs the NO^+ ion in winter (a) and summer (b). Ammonium Nitrate calibration relationship for NO_2^+ vs NO^+ is given by the black lines. Outdoor data points and regression lines are given in dark blue, with indoor data and regression lines give in lighter blue colors. R^2 values for all are $R^2>0.96$ except for indoor summer $R^2=0.88$. Time series of the inorganic nitrate (iNO_3) and organic nitrate (oNO_3) in winter (c) and summer (d).

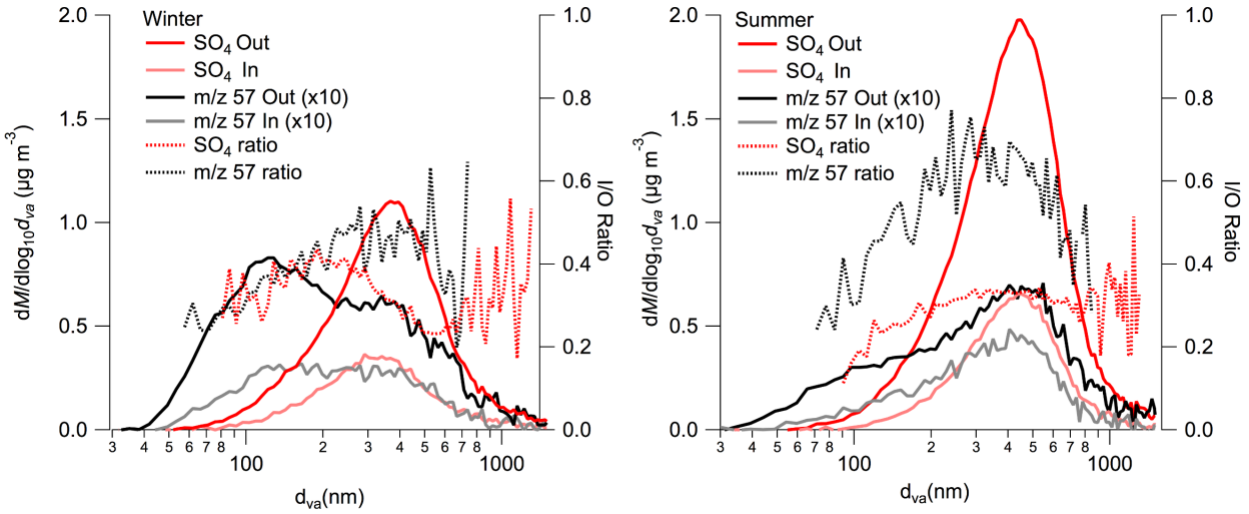

Figure S8. Season-averaged size distributions for sulfate (reds) and m/z 57 (black/gray) and the I/O ratio (right). This indicates sulfate and traffic-related (m/z 57) particles are externally mixed and that the filtration is species- and size-dependent.

Table S2. Fit results from the non-parametric LOESS fit across temperature and humidity bins for each species and PMF factor

Temp	-14.0	-11.6	-9.7	-8.2	-6.5	-4.9	6.4	14.0	16.8	19.3	21.1	24.4
NO_3	0.90	0.81	0.75	0.70	0.65	0.61	0.42	0.35	0.36	0.38	0.41	0.47
iNO_3	0.86	0.73	0.65	0.58	0.52	0.47	0.28	0.26	0.29	0.32	0.35	0.42
oNO_3	0.92	0.85	0.80	0.76	0.72	0.69	0.58	0.54	0.56	0.60	0.63	0.71
Org	1.19	1.18	1.17	1.16	1.15	1.14	1.00	1.00	0.99	0.98	0.97	0.95
OOA	0.54	0.51	0.50	0.50	0.50	0.51	0.79	0.85	0.84	0.81	0.79	0.73
COA	0.82	0.78	0.75	0.75	0.74	0.75	1.03	1.24	1.30	1.35	1.38	1.44
HOA	2.69	2.33	2.09	1.91	1.74	1.60	1.19	1.24	1.22	1.20	1.19	1.15
BC	2.10	1.99	1.91	1.83	1.75	1.67	0.96	0.92	1.19	1.56	1.89	2.62

RH	-13.2	-3.5	3.6	10.2	14.7	18.4	21.1	24.2	27.2	30.5	37.0	53.0
NO_3	1.03	0.87	0.76	0.65	0.58	0.54	0.51	0.48	0.46	0.43	0.37	0.24
iNO_3	0.99	0.81	0.68	0.55	0.48	0.43	0.40	0.37	0.35	0.32	0.27	0.17
oNO_3	1.00	0.89	0.80	0.72	0.67	0.65	0.64	0.63	0.63	0.62	0.60	0.53
Org	1.19	1.19	1.17	1.13	1.11	1.09	1.08	1.07	1.07	1.07	1.06	1.05
OOA	0.56	0.54	0.55	0.57	0.58	0.59	0.61	0.63	0.66	0.69	0.73	0.79
COA	0.86	0.81	0.80	0.81	0.83	0.85	0.88	0.92	0.97	1.02	1.15	1.59
HOA	2.73	2.32	2.03	1.77	1.59	1.48	1.41	1.34	1.33	1.31	1.27	1.29
BC	2.70	2.08	1.78	1.64	1.59	1.52	1.47	1.41	1.34	1.28	1.21	1.23

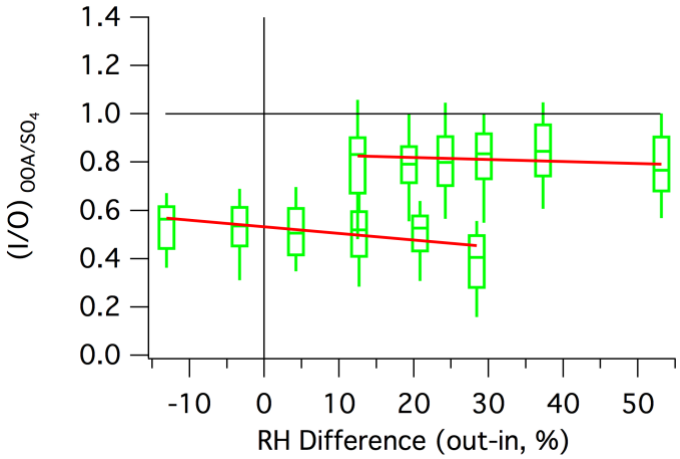

Figure S9. Dependence of $(I/O)_{OOA/SO4}$ on differences in humidity between environments for each season. Data have been binned by humidity differences, and the regression is of the median value of each bin. Summer (lower) is better correlated ($y=-0.00276x+0.53$, $R^2=0.61$), while winter is mostly invariant ($y=-0.00083x+0.836$, $R^2=0.15$).