1   **Supplementary Information**

2   Characterization of the Sources and Processes of Organic and Inorganic

3   Aerosols in New York City with a High-Resolution Time-of-Flight Aerosol

4   Mass Spectrometer

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18   Table S1. Description of PMF solution

| No. of factors	Q/Q$_{exp}$	Description of solution
2	5.02	Too few factors, large residual, more than one OOA-like factors, MS appear mixed
3	4.32	Too few factors, much higher m/z 44 in HOA factor than source spectra of primary OA, e.g., diesel and gasoline emissions.
4	3.85	HOA, COA, SV-OOA, and LV-OOA factors resolved, but the physically-meaningful NOA factor was not identified.
5	3.57	HOA, COA, SV-OOA, LV-OOA, and NOA factors found.
6-8	3.19-3.38	SV-OOA splitting evident. Similar spectra and time series

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20   Table S2. Summary of mass concentrations of aerosol species for different clusters

|	Cluster 1 Northwest (7.3%)		Cluster 2 West (37.3%)		Cluster 3 Atlantic Ocean (24.5%)		Cluster 4 Southwest (30.8%)	
	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Org	4.78	1.86	6.07	2.34	4.51	2.93	7.80	2.81
SO_4^{2-}	0.56	0.53	2.84	1.42	2.55	1.96	3.57	1.89
NO_3^-	0.13	0.05	0.46	0.50	0.62	0.72	0.49	0.40
NH_4^+	0.22	0.18	1.28	0.62	1.25	0.74	1.54	0.74
Chl	0.00	0.01	0.03	0.03	0.02	0.02	0.04	0.03
EC	0.95	0.72	0.74	0.64	0.66	0.41	0.63	0.30
LV-OOA	0.69	0.41	1.81	0.94	1.80	1.47	2.56	1.63
SV-OOA	1.51	0.57	1.88	1.36	0.90	1.04	2.92	1.72
NOA	0.21	0.31	0.39	0.54	0.33	0.47	0.43	0.48
COA	0.75	0.60	1.13	0.76	0.68	0.75	1.12	0.95
HOA	1.54	1.45	0.82	0.75	0.74	0.53	0.89	0.70

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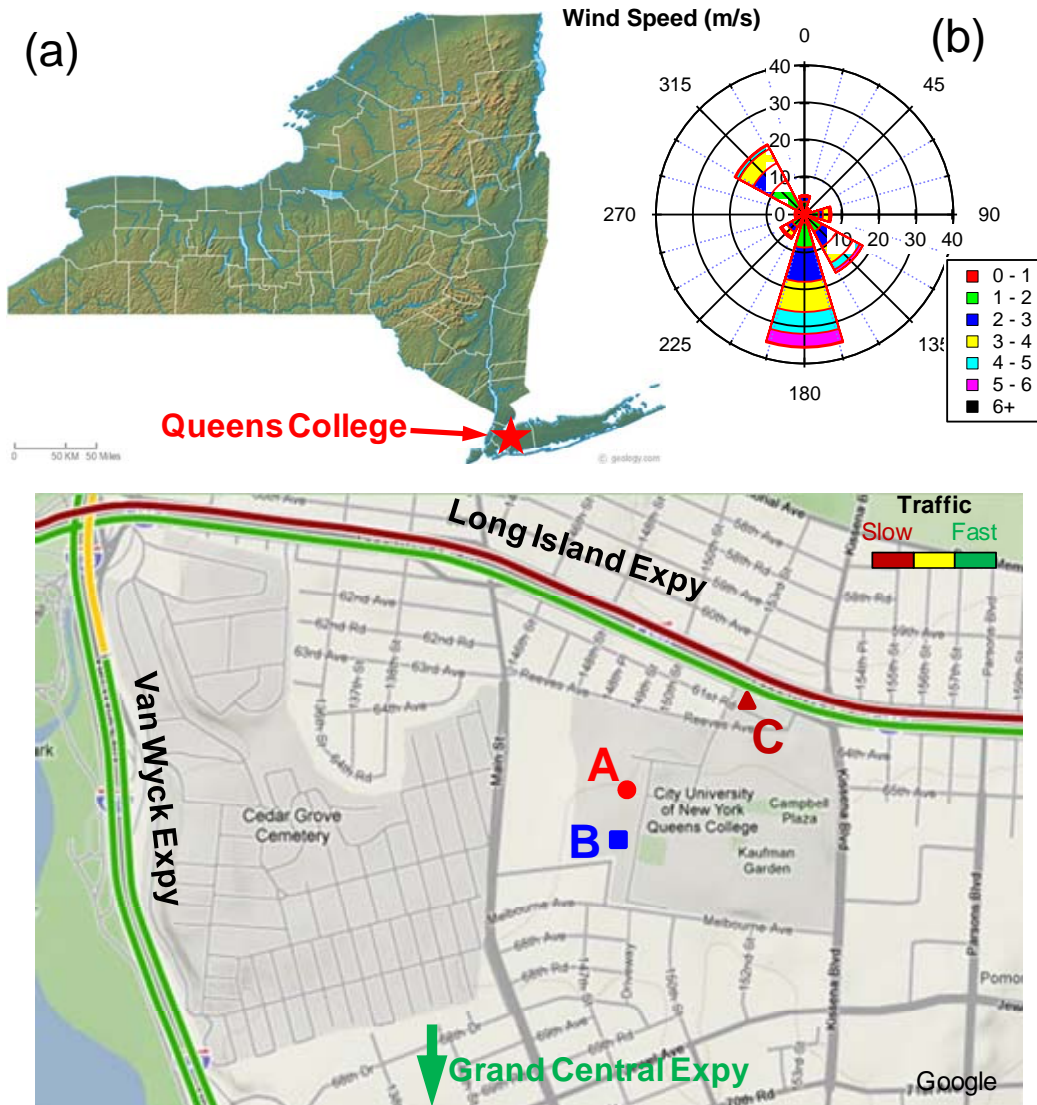
Fig. S1. (a) Map of sampling sites of (A) DEC fixed site, (B) Parking Lot6, and (C) Parking
Lot15; (b) wind roses for the entire study.
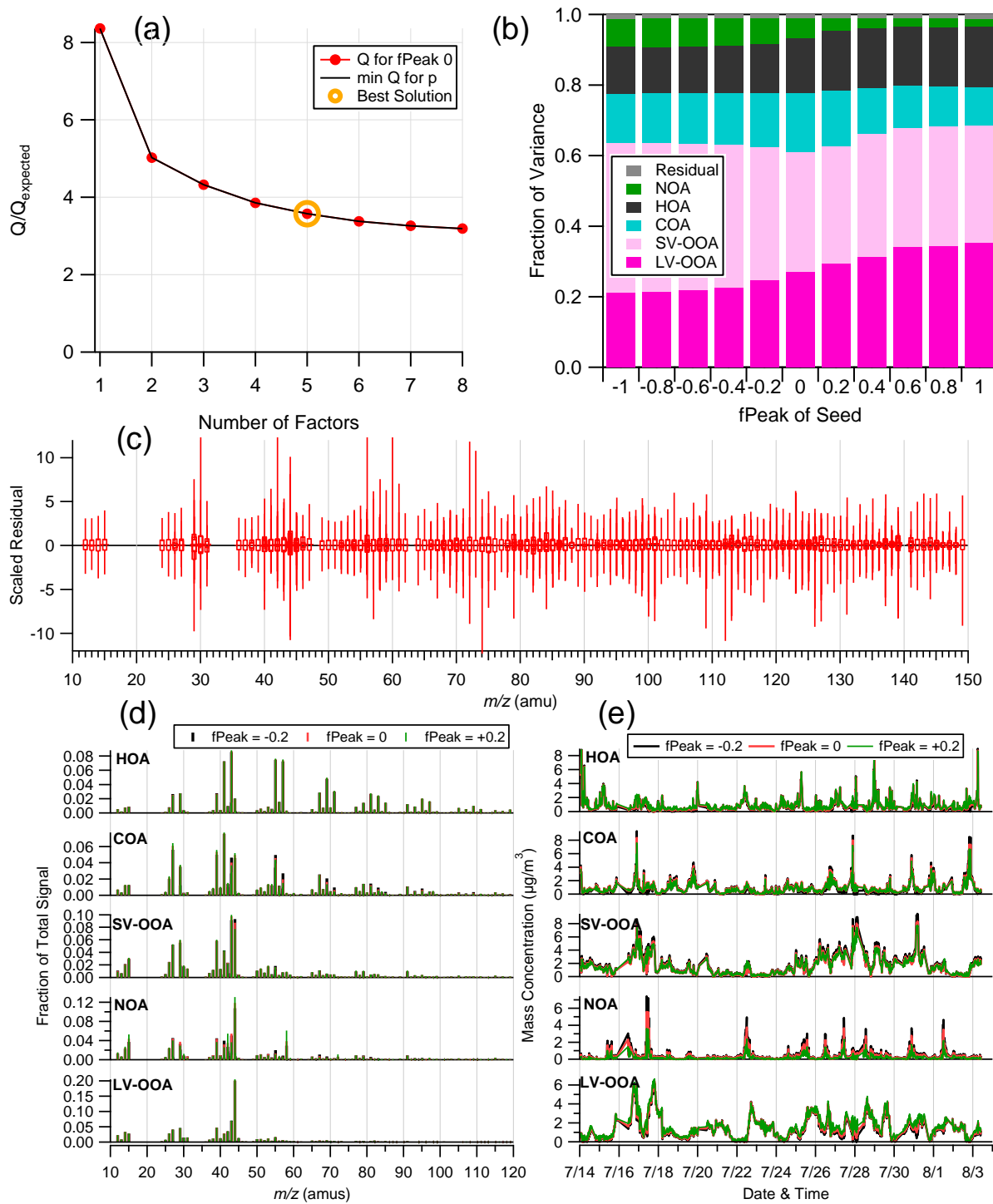
Fig. S2. Q/Q$_{expected}$ as a function of number of factors; (b) fraction of OA components vs. fPeak values for 5-factor solution; (c) scaled residuals as a function of m/z; (d,e) comparison of mass spectra and time series of OA components with different fPeak values (-0.2, 0, and 0.2) for 5-factor solution.
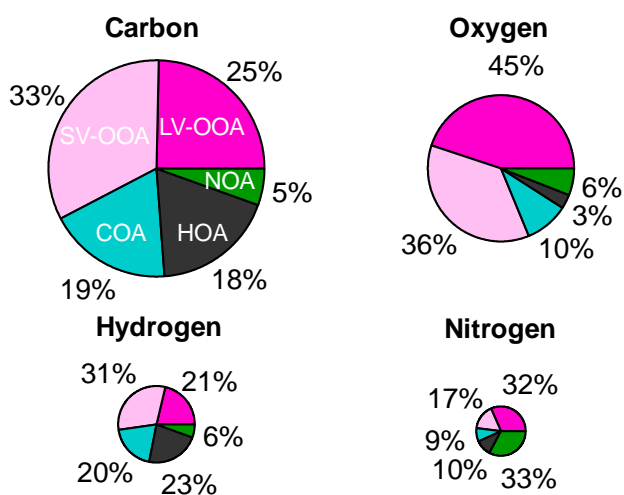
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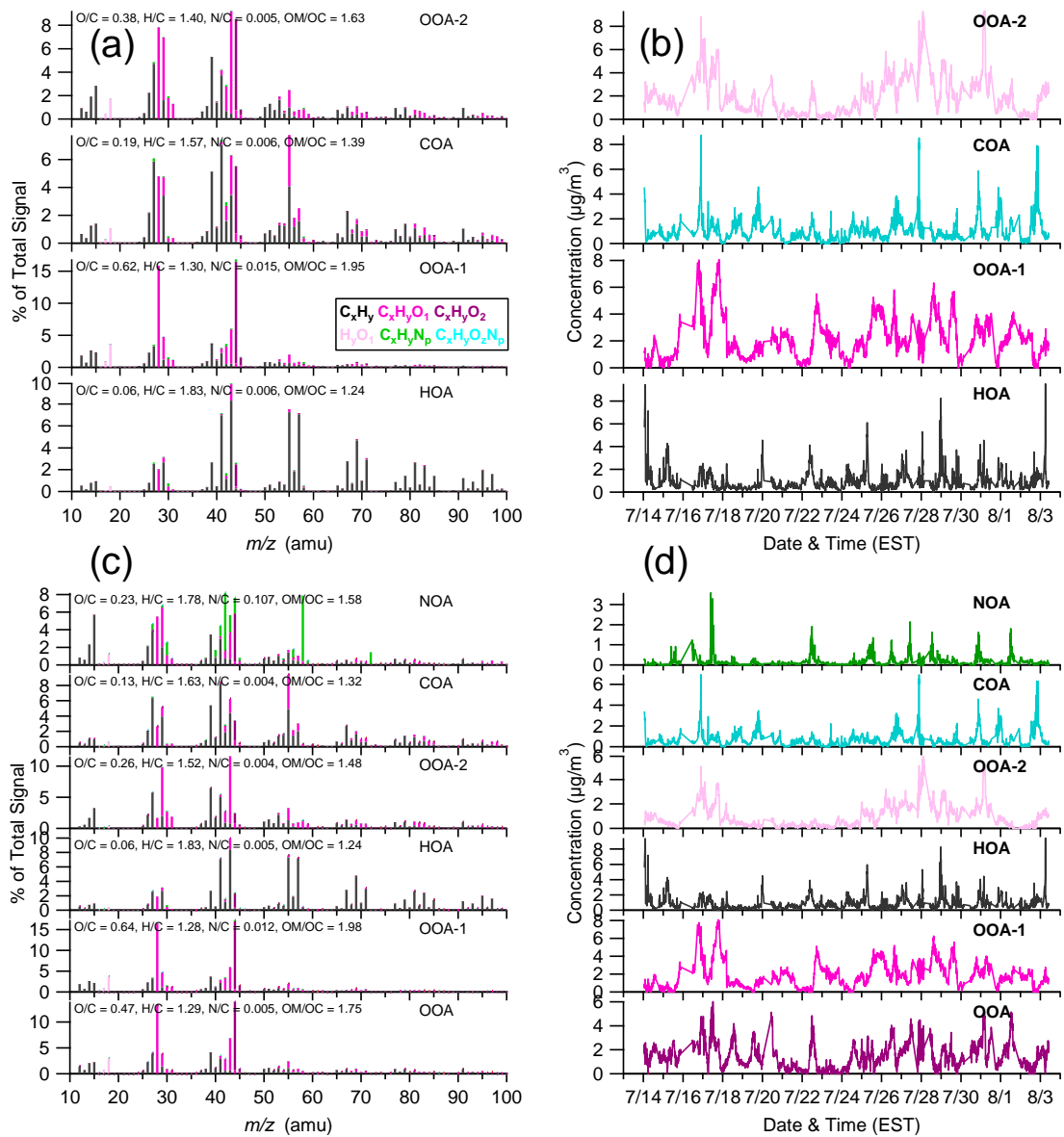
Fig. S3. High resolution mass spectra and time series of OA components of (a,b) 3-factor
solution and (c,d) 6-factor solution.

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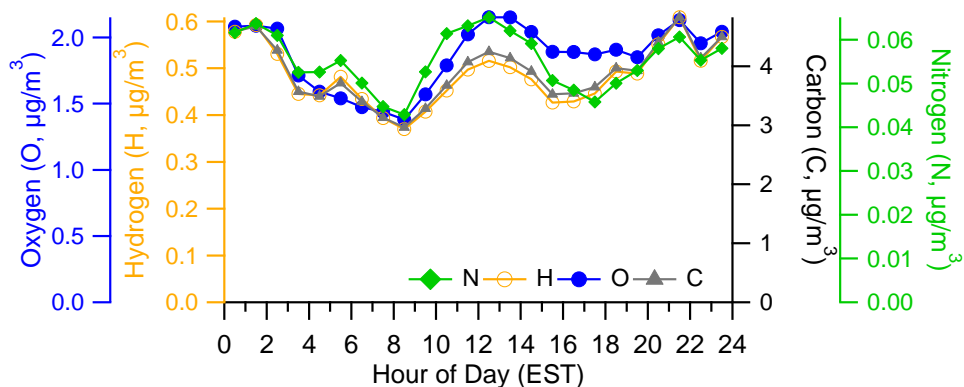
Fig. S4. Diurnal cycles of the elements (C, O, H, and N)

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Fig. S5. Average contribution of OA components to each element for the entire study. The area of each pie is proportional to the mass concentration of the corresponding element. The area of nitrogen pie is increased by a factor of 4 for clarification.