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Supplement of

Particulate matter (PM) episodes at a suburban site in Hong Kong: evolution of PM characteristics and role of photochemistry in secondary aerosol formation

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Text:

Figure S7 shows the variations in the 24-h average of the fitted mode diameters and peak areas (and indicator of mass concentration in that mode) of sulfate and organics during IR episodes. All mode diameters and the peak areas increased from before the episode (the blue shaded area) to during the episode (the orange shaded area). The extent of the peak area increase (mass concentration increase) exceeds what can be explained by the increase in mode diameter alone assuming spherical particles and constant number concentrations. As shown in Table S1, the increases in peak areas are always larger than the increase in the cube of mode diameters for both modes. This suggests an increase in the number concentration of particles during the episodes. The lower number concentrations of pre-existing particles before the episodes renders more rapid increases in size than during the episodes.

Table

Table S1. Mode diameters and peak areas before and during episodic days in each of the three IR episodes.

		Before or During Episode	**Small mode peak area (a.u.)**	**Large mode peak area (a.u.)**	**Small mode diameter (nm)**	**Large mode diameter (nm)**	**Peak area ratio** **During : Before**	**Ratios of cube of mode diameter** **During : Before**
IR-1	Org	Before	312	2621	178	509	2.84 (small mode)	2.10 (small mode)
		During	886	6415	228	603	2.45 (large mode)	1.66 (large mode)
	SO4	Before	67	4051	183	589	6.44 (small mode)	1.88 (small mode)
		During	431	11421	226	671	2.82 (large mode)	1.47 (large mode)
IR-3		Before	255	2051	216	513	1.69 (small mode)	1.09 (small mode)
	Org	During	430	5808	223	531	2.83 (large mode)	1.11 (large mode)
		Before	127	6358	222	570	1.54 (small mode)	1.49 (small mode)
	SO4	During	195	10513	254	582	1.65 (large mode)	1.06 (large mode)
IR-5		Before	165	2778	179	503	1.85 (small mode)	1.54 (small mode)
	Org	During	305	5983	207	555	2.15 (large mode)	1.34 (large mode)
		Before	86	3880	198	585	1.97 (small mode)	1.20 (small mode)
	SO4	During	170	9980	211	593	2.57 (large mode)	1.04 (large mode)

Figures

Figure S1 Summary of species and episodic events (in box) during the 4-month campaign

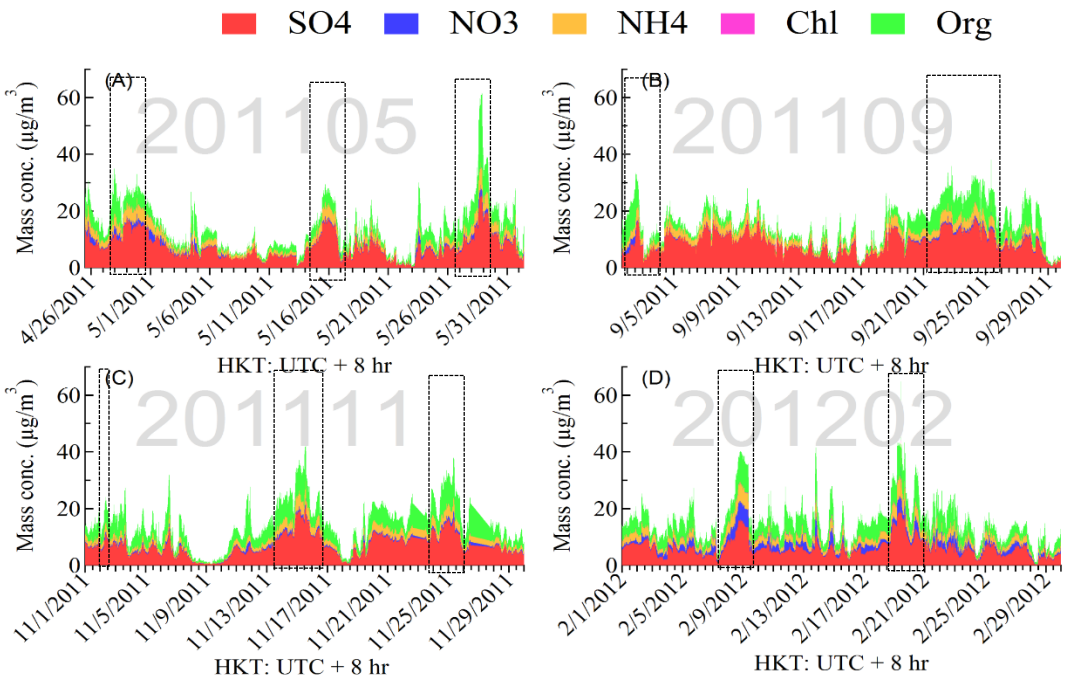

Figure S2 Example of bi-modal log-normal fitting of mass-size distribution of organics during LWC episodes using the Multipeak Fit V2 in Igor Pro. The upper panel shows the fit residual which has been minimized by the algorithm. The middle panel shows the original size distribution (green shade area) as well as the total fit generated by the algorithm (blue dash line). The lower panel shows the shapes, locations and integrated areas of the two fitting modes (small mode and large mode).

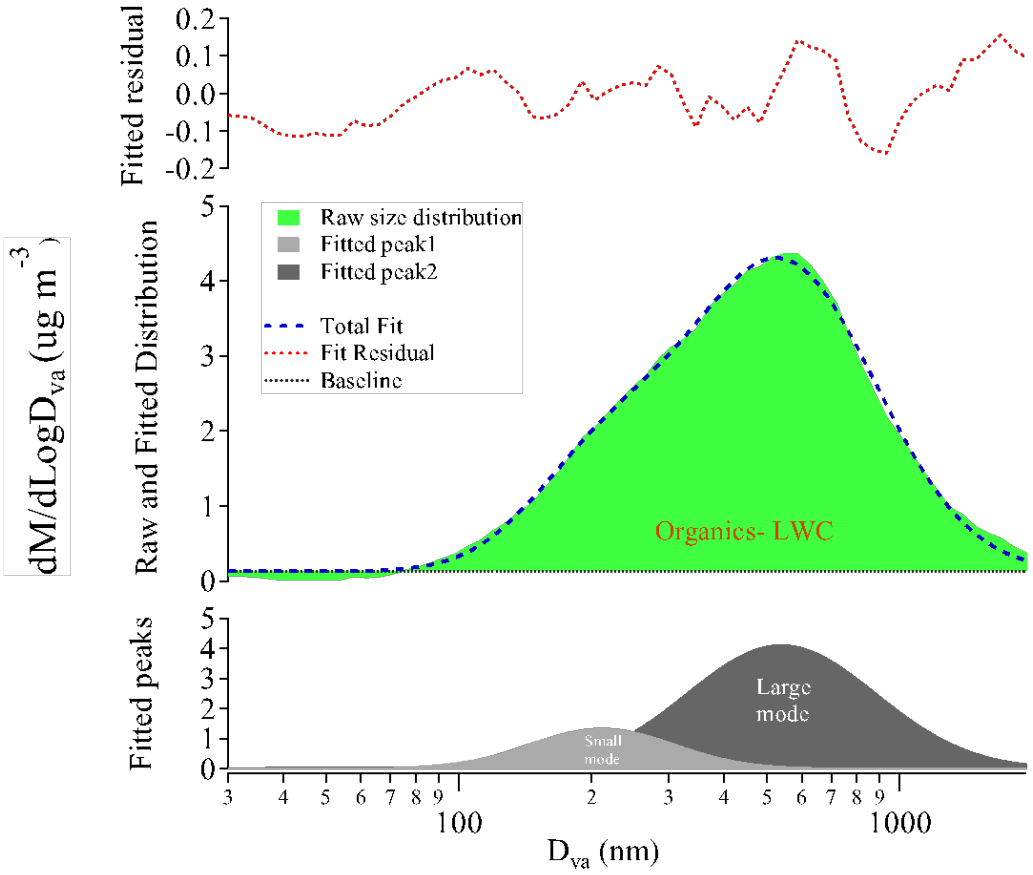

Figure S3 Time series of benzene and toluene during 02 Sep. 2011

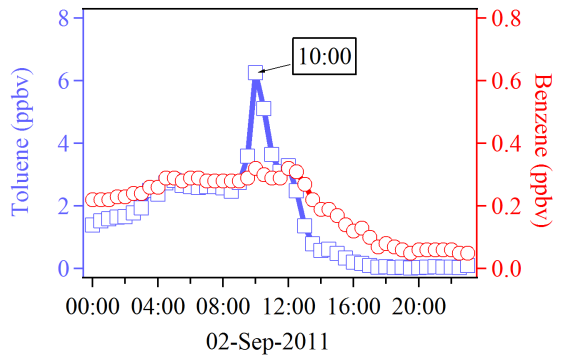

Figure S4 The 72-h back trajectories arriving at HKUST supersite (22°20'N, 114°16'E) at an elevation of 300 m during the episodic events

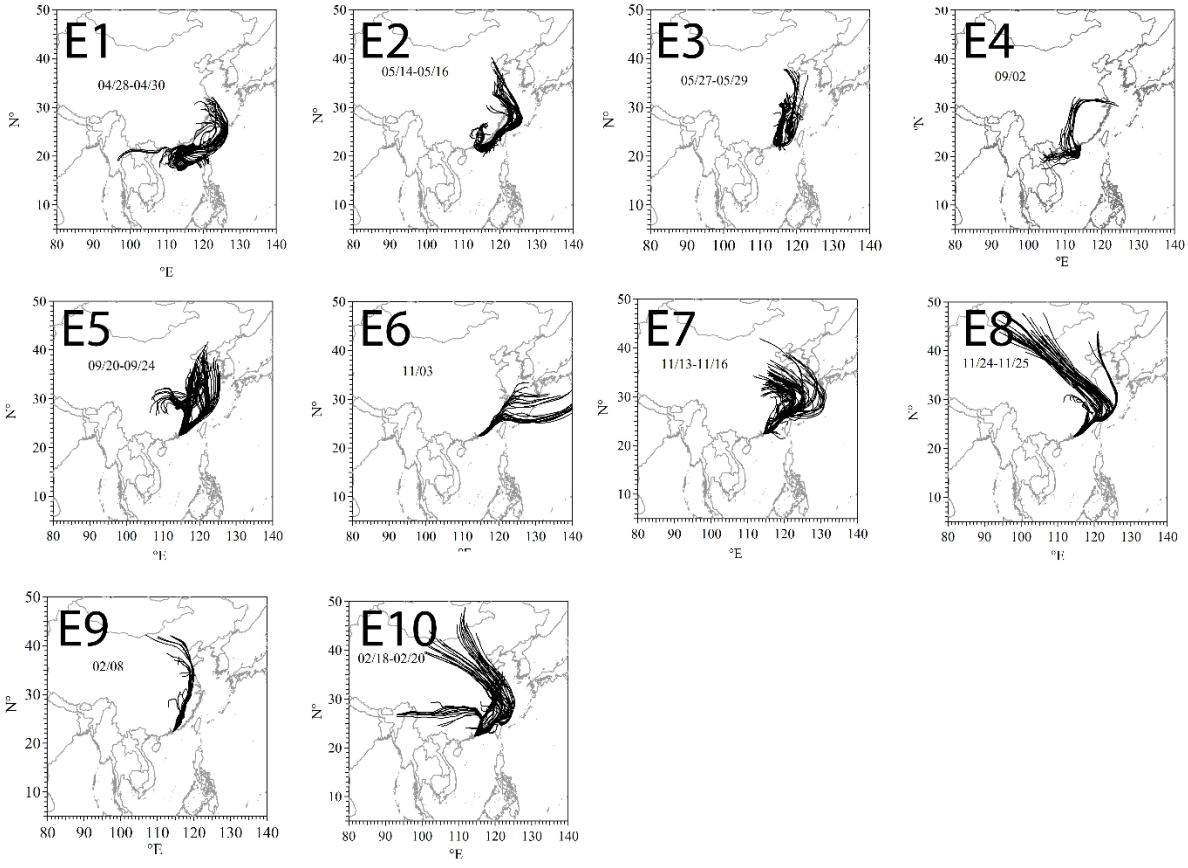

Figure S5 Time series of meteorological conditions with chemical characteristics in episodes

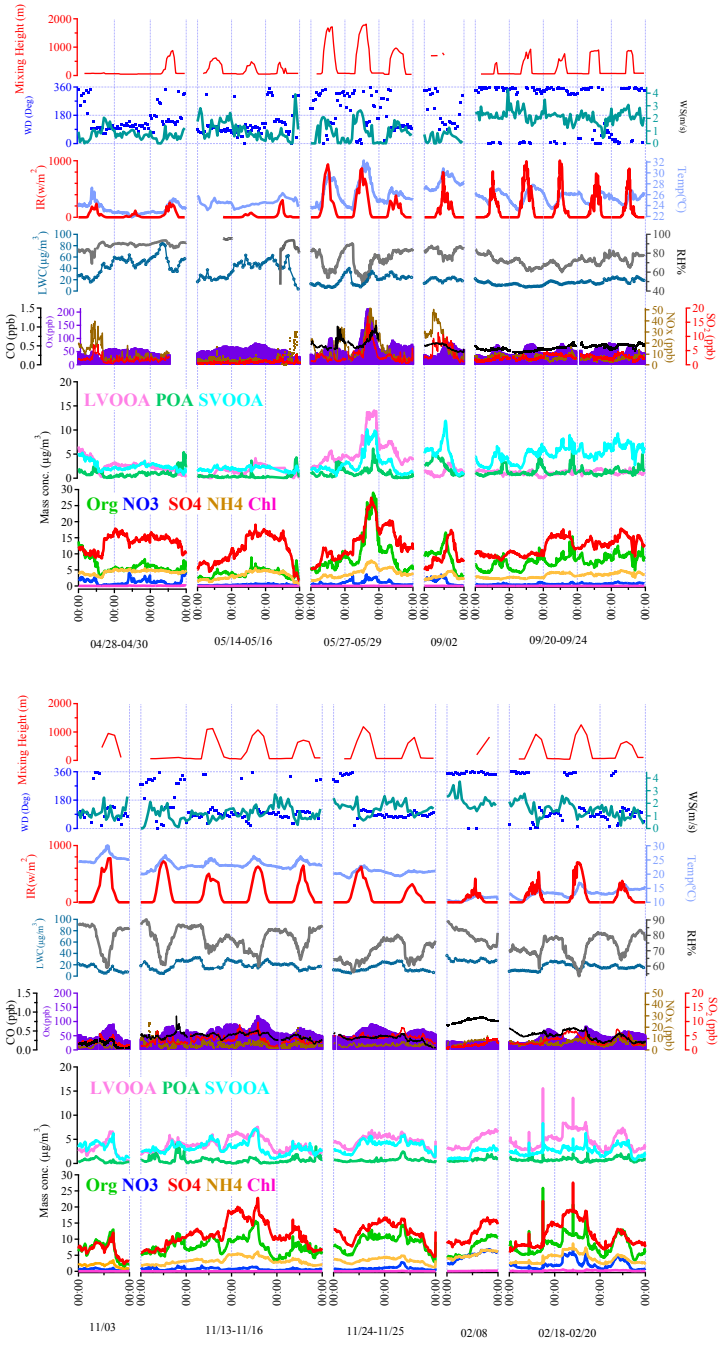

Figure S6 Improved-Ambient method to estimate O:C and H:C values of the September dataset. Recalculating the elemental ratio using the updated software (solid dots) vs. corrected method factor of 1.27 and 1.11 with Aiken-Ambient

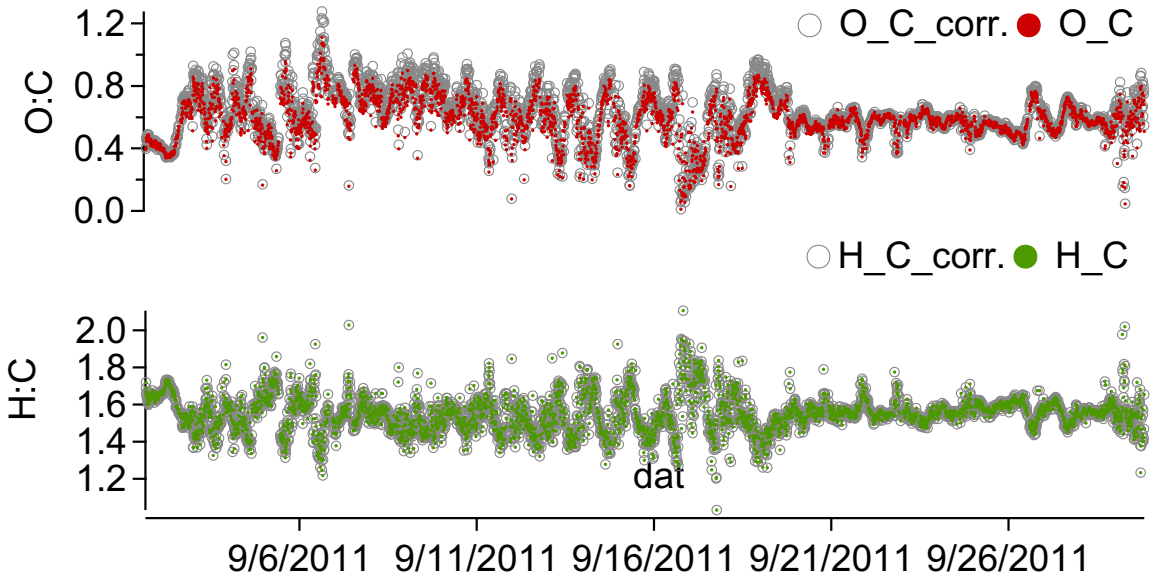

Figure S7 Variations of 24-h averaged of the fitted mode diameters and peak areas of organics (1) and sulfates (2) before (shaded blue) and during (shaded orange) each IR episode.