Supplement for

Exploring the inconsistent variations in atmospheric primary and secondary pollutants during the G20 2016 Summit in Hangzhou, China: implications from observation and model

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Figure captions

Fig. S1. The topography of National Reference Climatological Station (NRCS) (30.22 ^{o}N, 120.17 ^{o}E, 41.7 m a.s.l) in Hangzhou, China. The pentagram represents the location of NRCS.

Fig. S2. Profiles of meteorological parameters and atmospheric pollutants observed at NRCS before, during, and after G20.

Fig. S3. The clusters analysis of 24 h air masses back trajectories starting at 300 m from NRCS site before, during, and after G20, respectively.

Fig. S4. Mean hourly variations of atmospheric O_3 before G20, during the phase I and II G20, and after G20 period.

Fig. S5. Fire spots derived from the Fire Inventory NCAR version-1.5 (FINNV1.5)(Wiedinmyer et al., 2011) in eastern China before (a), during (b), and after (c) the period of 2016 G20. The alphabets of a, b, and c represent the period of 10-23 August, 24 August-6 September, and 7-20 September, respectively.

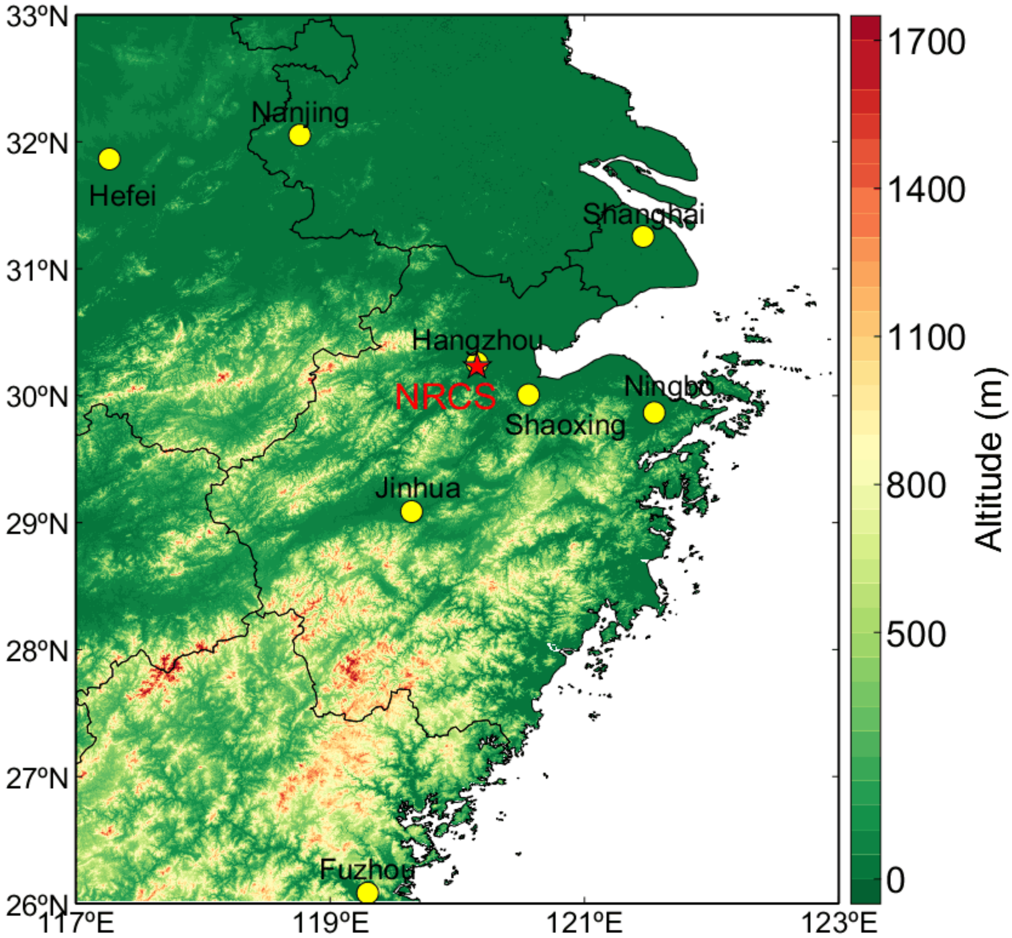
Table captions

Table S1. Mean concentrations of trace gases and particulate matter in the identified trajectories clusters before, during, and after G20, together with the percentages of each trajectory cluster. The units are $\mu g/m^3$ for $PM_{2.5}$ and PM_{10}, ppmv for CO, and ppbv for the other trace gases.

Table S2. VOCs mixing ratios (ppbv) at NRCS station in Hangzhou

Table S3. Average mixing ratios (ppbv) of VOCs species measured before (B), during (D), and after

G20 (A), respectively.



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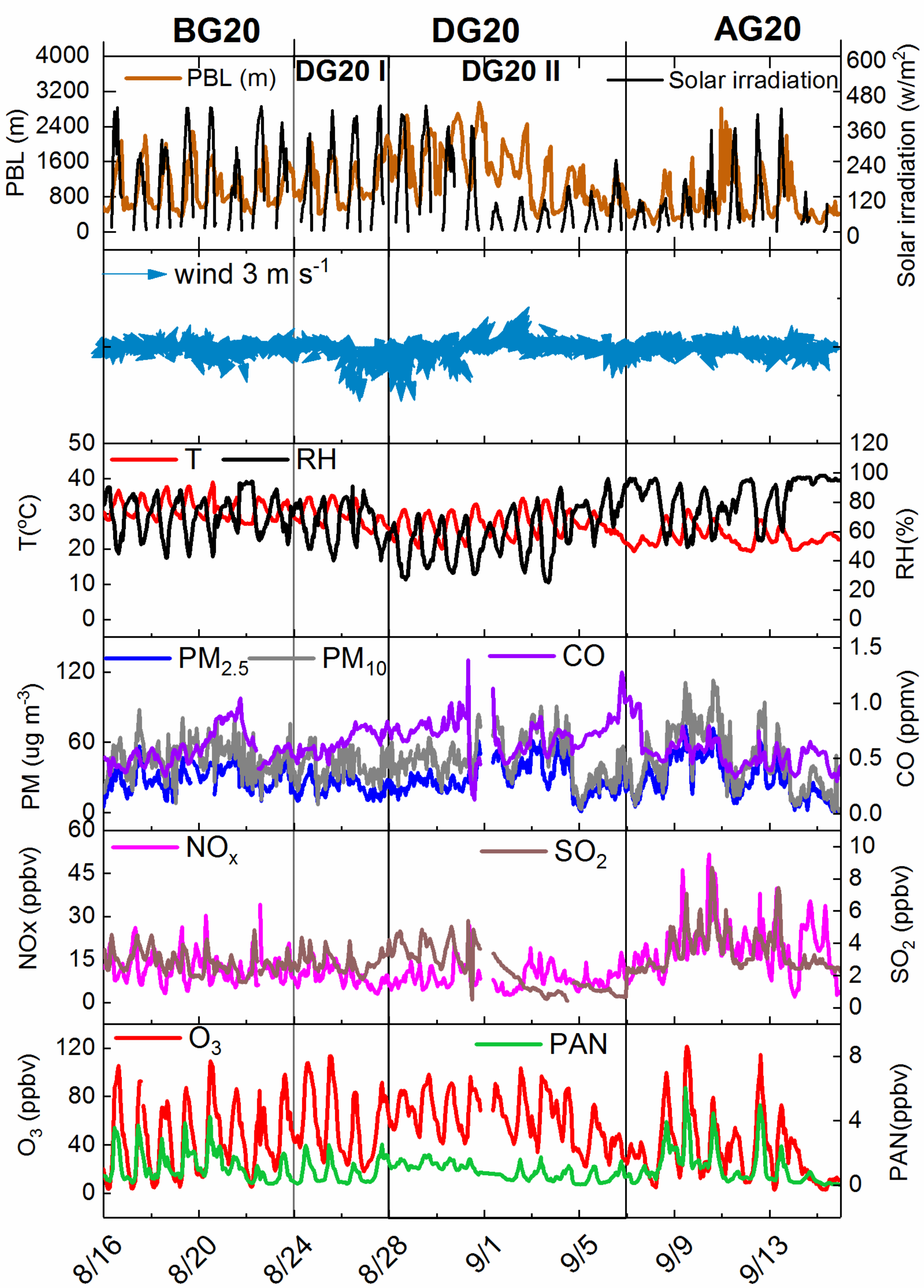

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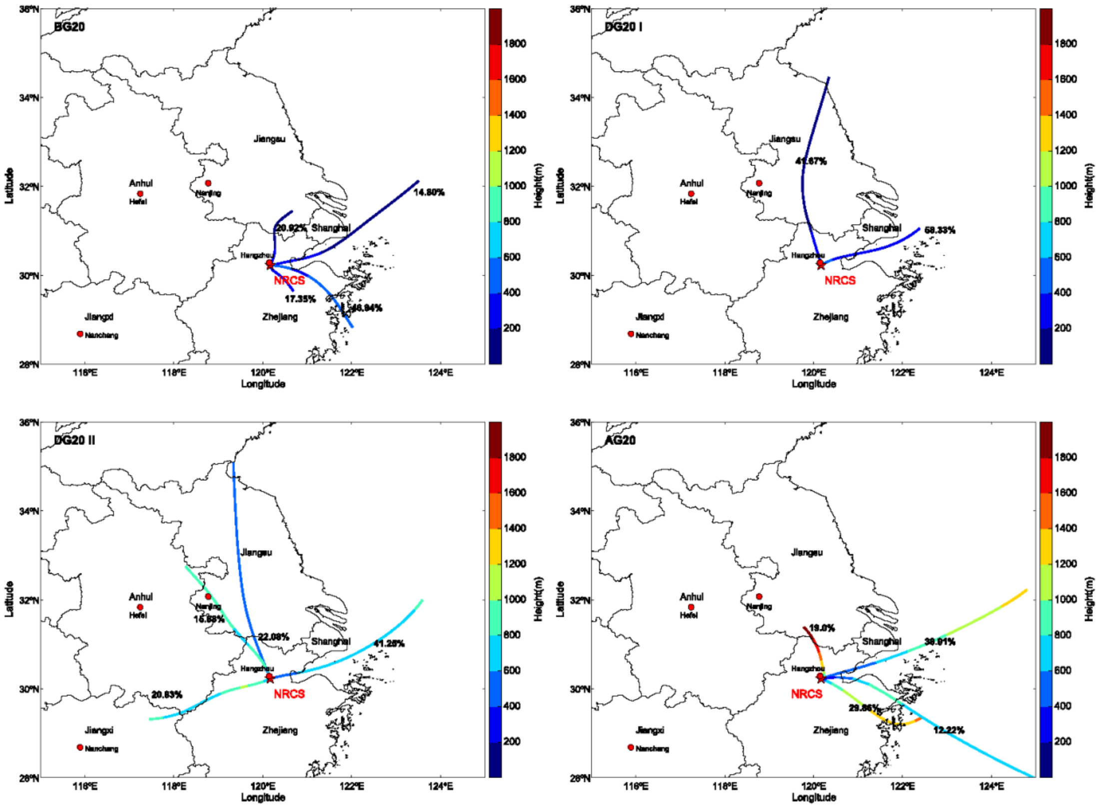

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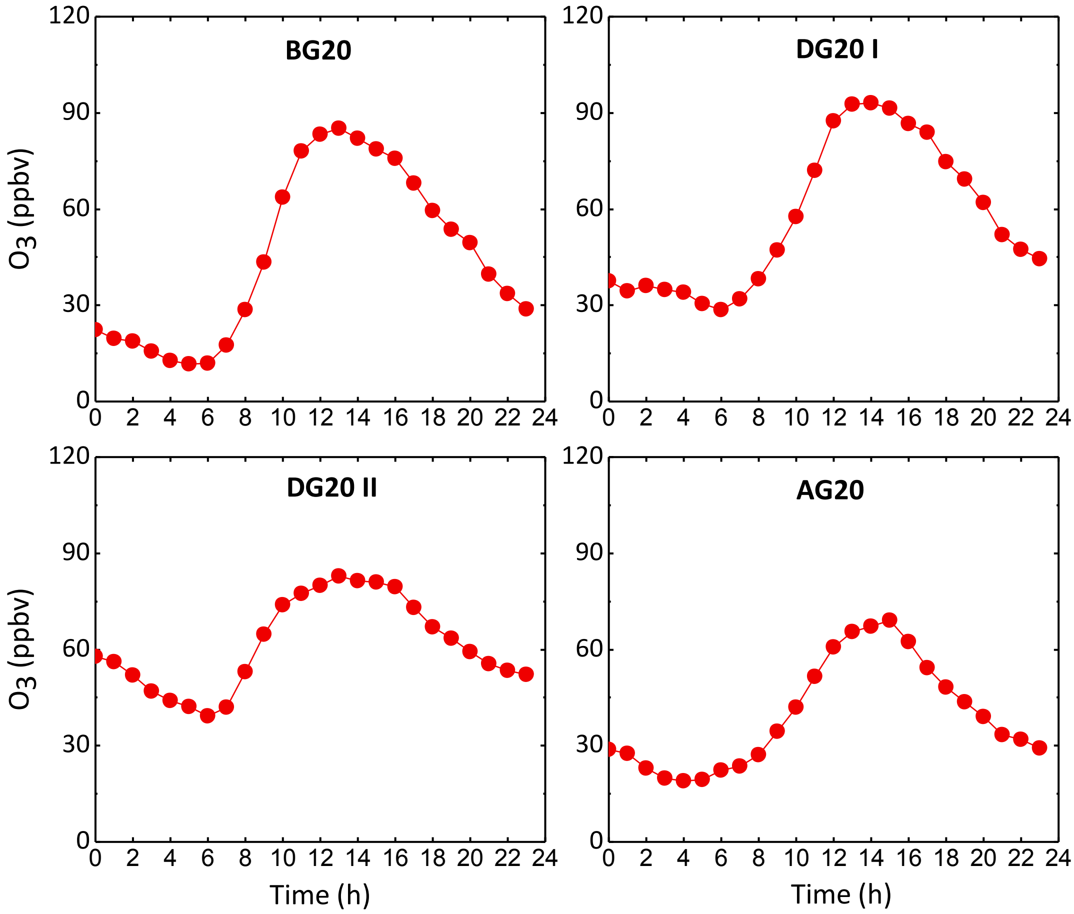

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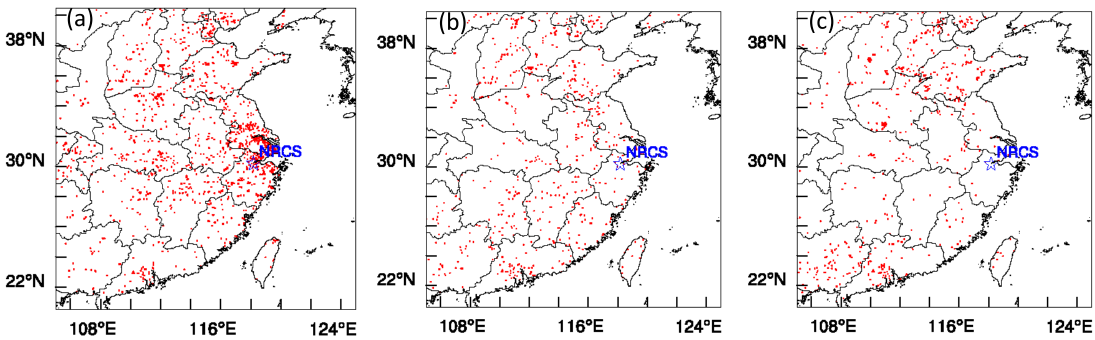

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Period	Cluster	Percentage	$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	O_3	PAN
BG20	1	46.9%	27.9	46.4	2.91	11.6	0.54	43.7	1.21
	2	17.4%	32.9	52.6	2.59	13.8	0.56	34.6	1.46
	3	14.8%	27.0	40.7	2.84	13.2	0.53	55.6	0.68
	4	20.9%	34.3	52.5	2.68	11.3	0.72	52.2	1.45
DG20 I	1	58.3%	23.8	40.5	2.89	10.8	0.57	61.2	0.76
	2	41.7%	20.7	37.7	2.71	7.15	0.75	51.1	0.93
DG20 II	1	23.2%	24.8	45.9	3.82	7.97	0.77	71.9	1.36
	2	43.4%	29.1	44.0	1.02	9.21	0.75	53.1	0.56
	3	16.7%	36.1	54.1	2.93	7.62	0.6	69.4	0.84
	4	16.7%	29.0	45.7	2.48	8.44	0.67	64.9	0.92
AG20	1	29.5%	42.0	63.6	4.20	22.0	0.64	42.6	1.53
	2	39.1%	24.6	37.8	3.51	18.6	0.47	38.0	0.95
	3	12.3%	12.0	22.1	2.71	19.7	0.49	7.98	0.18
	4	19.1%	29.4	45.5	2.91	15.3	0.60	38.7	1.47

Table S2. VOCs mixing ratios (ppbv) at NRCS station in Hangzhou

VOCs group	BG20		DG20		AG20	
	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range
Total VOCs	9.24±2.79	4.06-16.06	7.39 ± 2.59	3.12-16.57	15.10 ± 4.69	6.41-25.17
Alkanes	5.11 ± 1.75	2.22-10.43	4.10 ± 1.66	1.76-9.85	8.38 ± 2.79	3.29-14.60
Alkenes	1.64 ± 0.36	0.88-2.57	2.04 ± 0.71	0.68-4.24	3.45 ± 0.88	1.92-5.64
Aromatics	2.49 ± 0.89	0.92-4.61	1.25 ± 0.58	0.35-3.39	3.26 ± 1.23	1.02-5.40

Table S3. Average mixing ratios (ppbv) of VOCs species measured before (B), during (D), and after G20 (A), respectively.

Species	B	D	A	Species	B	D	A
Ethane	1.18	1.63	2.11	3-Methylheptane	0.03	0.04	0.07
Propane	0.61	0.46	1.16	*n*-Octane	0.20	0.09	0.28
n-butane	0.42	0.32	0.69	Ethylene	1.04	1.59	2.57
Isobutane	0.42	0.28	0.68	Propene	0.26	0.19	0.46
Isopentane	0.31	0.39	0.55	*trans*-2-Butene	0.05	0.02	0.07
Pentane	0.35	0.03	0.44	1-pentene	0.01	0.00	0.04
2,2-Dimethylbutane	0.06	0.03	0.20	*trans*-2-pentene	0.01	0.00	0.04
2,3-Dimethylbutane	0.03	0.01	0.32	Isoprene	0.23	0.22	0.17
2-Methylpentane	0.45	0.27	0.50	*cis*-2-pentene	0.04	0.01	0.10
3-Methylpentane	0.34	0.13	0.44	Benzene	0.49	0.35	0.66
n-Hexane	0.37	0.26	0.39	Toluene	0.97	0.49	1.31
2,4-Dimethylpentane	0.03	0.01	0.05	Ethylbenzene	0.27	0.09	0.35
Cyclohexane	0.08	0.04	0.13	*m/p*-Xylene	0.43	0.12	0.50
2,3-Dimethylpentane	0.07	0.05	0.09	*o*-Xylene	0.11	0.03	0.13
3-Methylhexane	0.03	0.01	0.08	Styrene	0.06	0.07	0.15
2,2,4-Trimethylpentane	0.05	0.04	0.07	*m*-Ethyltoluene	0.11	0.06	0.11
n-Heptane	0.03	0.01	0.06	*o*-Ethyltoluene	0.01	0.01	0.01
2,3,4-Trimethylpentane	0.05	0.02	0.09	1,2,4-Trimethylbenzene	0.02	0.02	0.04

References

Wiedinmyer, C., Akagi, S. K., Yokelson, R. J., Emmons, L. K., Al-Saadi, J. A., Orlando, J. J., and Soja, A. J.: The Fire INventory from NCAR (FINN): a high resolution global model to estimate the emissions from open burning, Geosci. Model Dev., 4, 625-641, 2011.