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Insights into the significant increase in ozone during COVID-19 in a typical urban city of China

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Table S1 R^2 of the deweathered model with different choices of n_{tree} and n_{sample}.

n_{tree}\n_{sample}	100	200	300	400	500
100	0.852	0.853	0.853	0.852	0.852
200	0.855	0.855	0.856	0.855	0.855
300	0.856	0.857	0.858	0.856	0.856
400	0.857	0.857	0.857	0.857	0.856
500	0.857	0.857	0.857	0.857	0.857

Table S2 Influence of the choice of minimum node size on R^2 of the deweathered model.

minimal node size	1	2	3	4	5
R^2	0.860	0.857	0.858	0.858	0.859
minimal node size	6	7	8	9	10
R^2	0.855	0.853	0.852	0.851	0.849

Table S3 Z value and Q values of each VOC

Compounds	Z value	Q*10000 (ppbv h^{-1})	Compounds	Z value	Q*10000 (ppbv h^{-1})
Formaldehyde	20.71	12.78	Heptanal	-4.63	-0.09
Methanol	14.09	6.35	Indene	-8.51	-0.34
Acetonitrile	-8.95	-0.61	Methyl styrene Indene	-17.38	-2.09
Acetaldehyde	-10.31	-3.95	Trimethyl benzene	-13.03	-1.80
Ethanol	-5.48	-3.09	Trimethyl cyclohexene	6.99	0.55
Methanethiol	15.15	0.14	Nitrobenzene	-16.66	-0.55
Propionitrile	26.68	0.17	Dihydronapthalene	-24.02	-0.37
3-Buten-1-yne	1.03	0.08	Tetrahydonapthalene	-9.65	-0.16
Acrylonitrile	3.50	0.04	Cymene	-10.44	-0.34
Acrolein	-15.48	-2.76	α/β-Pinene	-19.77	-1.07
Acetone	-1.07	-0.68	Methyl iodide	7.40	0.03
Acetic acid	-6.79	-4.12	Methylnapthalene	-17.60	-0.20
Dimethyl sulfide	-23.25	-1.51	Acenapthylene	-4.09	-0.02
Cyclopentadiene	-7.08	-0.39	Acenapthene	-14.83	-0.05
Isoprene	-6.13	-0.78	Methyl caprylate	-20.48	-0.09
MVK	-14.07	-0.83	Phenethyl acetate	-7.64	-0.02
MEK	-5.23	-1.39	Fluorene	-2.52	-0.01
DMF	-1.93	-0.08	Phenanthrene	-4.60	-0.02
Butanol	-10.42	-2.83	Methyl decanoate	-3.86	-0.02
Benzene	-9.65	-7.36	Ethyl caprate	-1.69	0.00
Pyridine	-4.82	-0.80	Sesquiterpene	-2.05	0.00
Pentanenitrile	5.44	0.06	β-Caryophyllene	6.36	0.00
1-Hexene	-2.84	-0.27	D4Siloxane	8.98	0.00
Vinyl acetate	-26.32	-2.76	D5Siloxane	9.04	0.00
Ethyl acetate	-18.53	-5.20	Styrene	-9.42	-0.95

Diethyl sulfide	-9.15	-3.16	m/p-Xylene	-12.38	-7.20
Toluene	-14.02	-7.73	Cresol	25.73	3.67
Phenol	-7.58	-1.39	Methyl furfural	-1.91	-0.04
Furfural	1.34	0.04	Hexanol	-8.77	-0.36
Methyl pyrrolidinone	9.64	0.06			

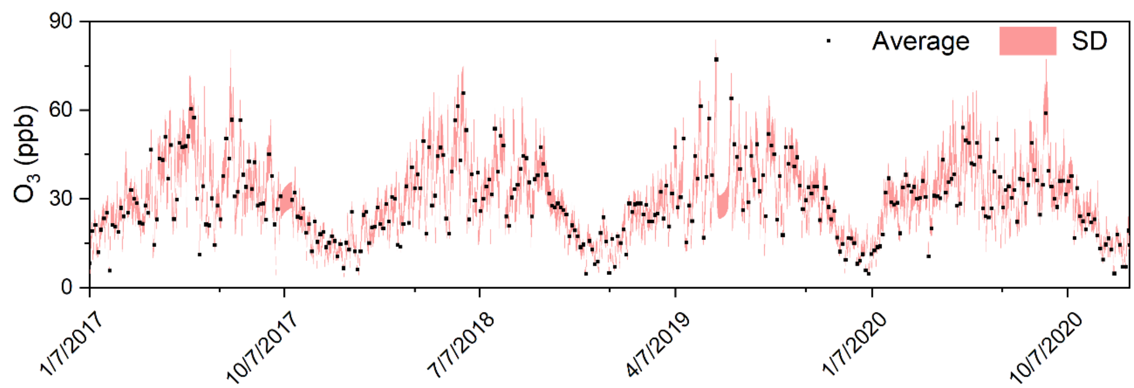

Figure S1. The mean and standard error of predicted O_3 concentrations.

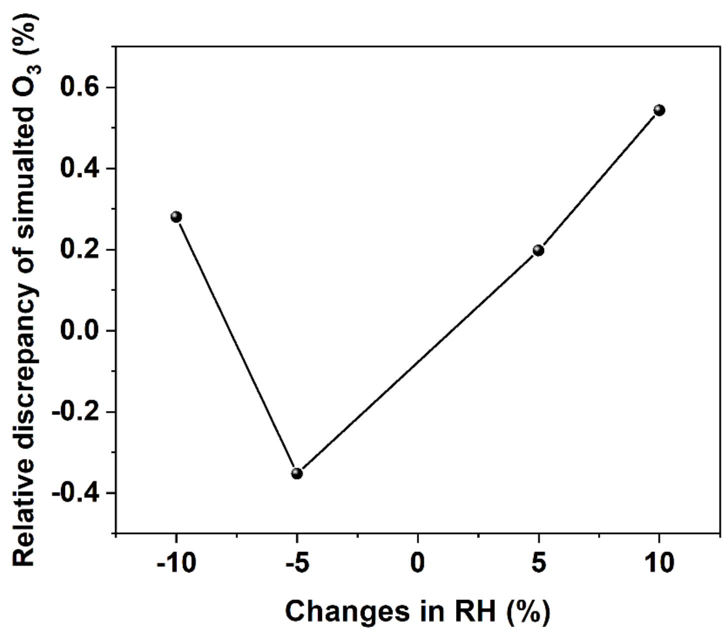

Figure S2. Sensitivity analysis of the influence of RH on simulated O_3

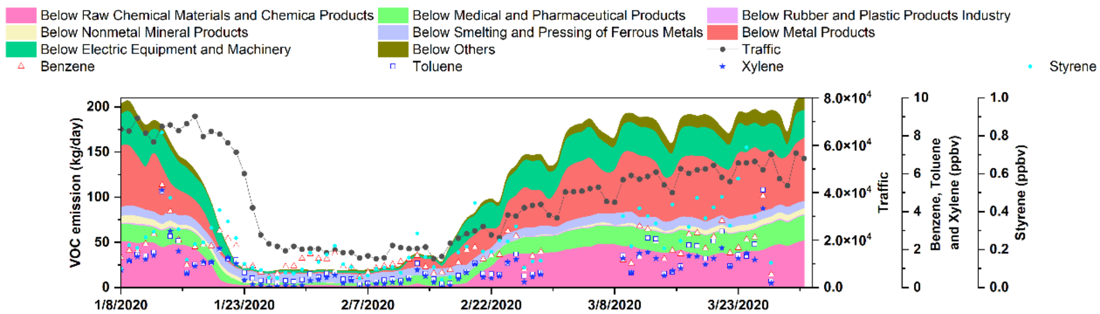

Figure S3. Time series of industrial-derived VOCs emissions, traffic volume, and key VOC tracers.

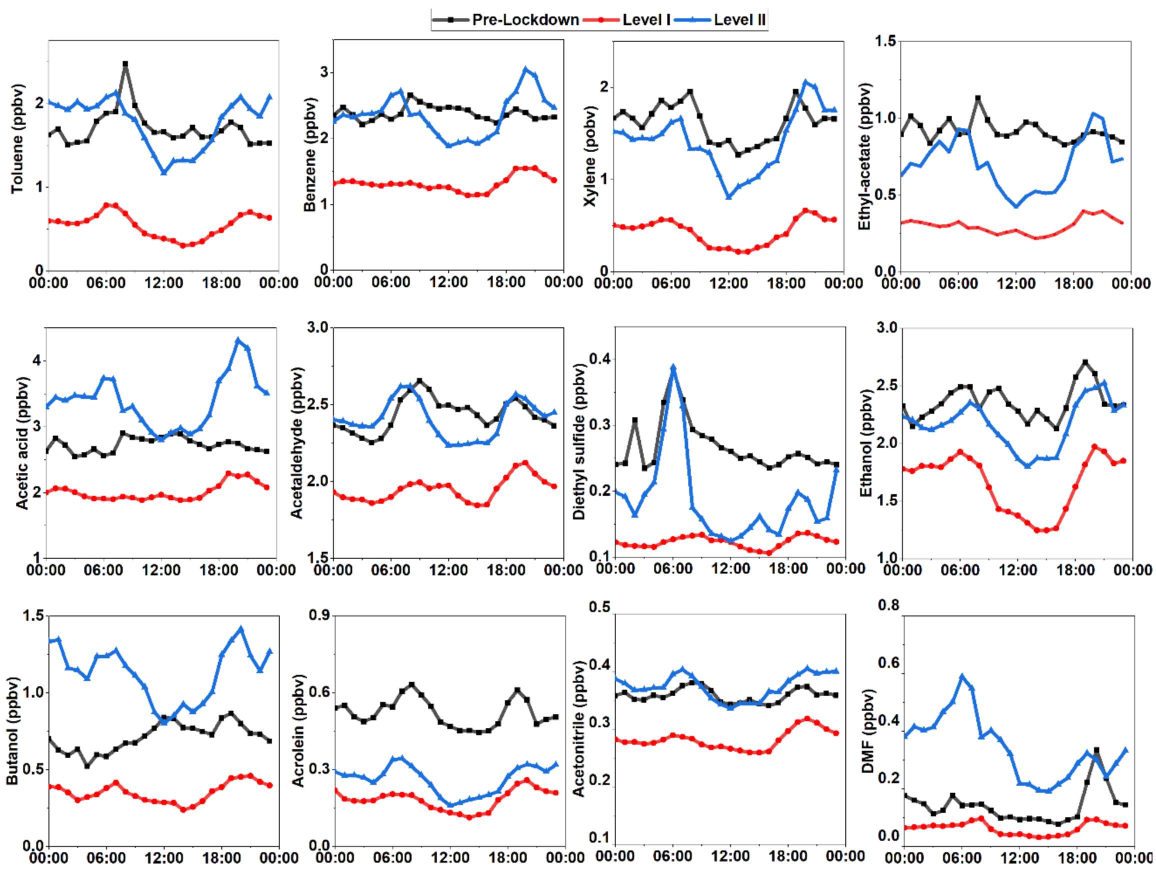

Figure S4. Average diurnal variations of key VOC species.

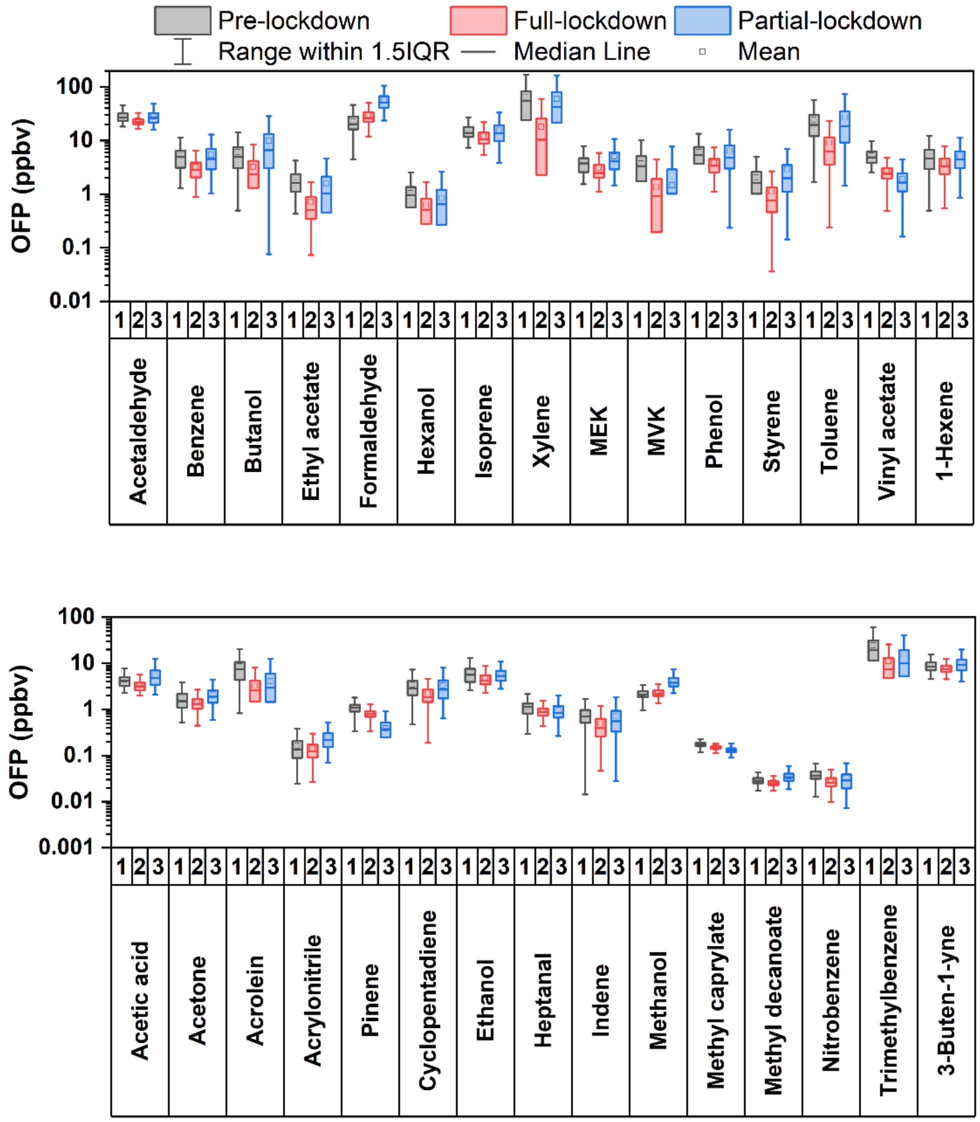

Figure S5. OFP of different VOCs species.

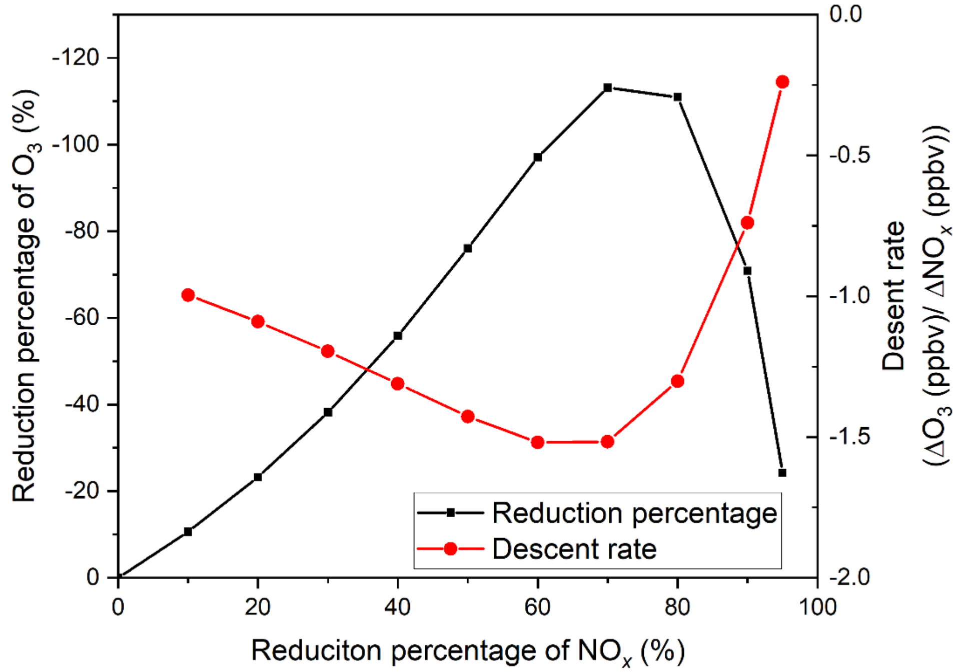

Figure S6. Reduction percentage and descent rate of O_3 as a function of reduction percentage of NO_x.

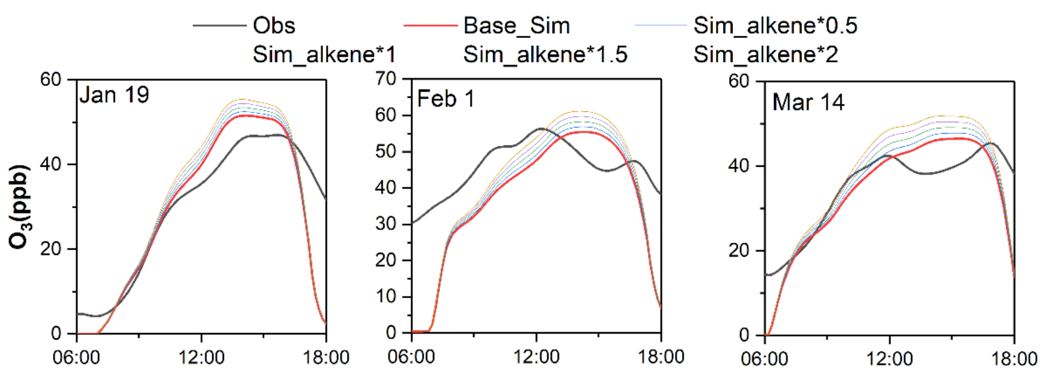

Figure S7. Sensitivity analysis of the influence of C2-C5 alkenes

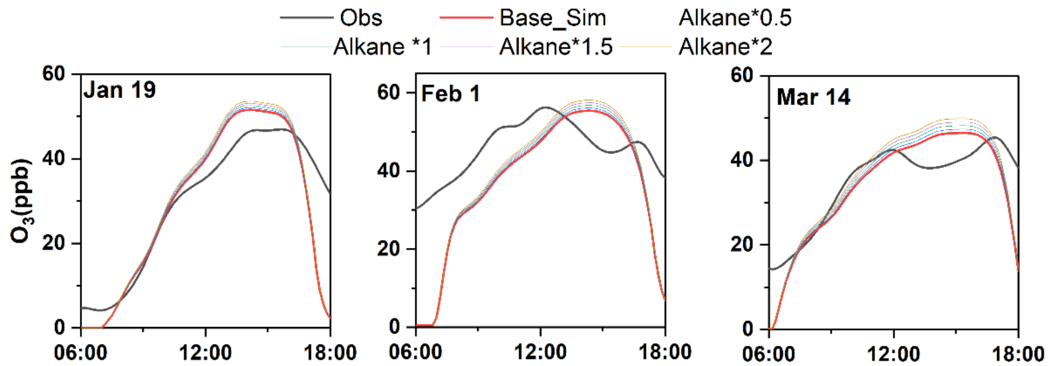

Figure S8. Sensitivity analysis of the influence of C2-C5 alkanes

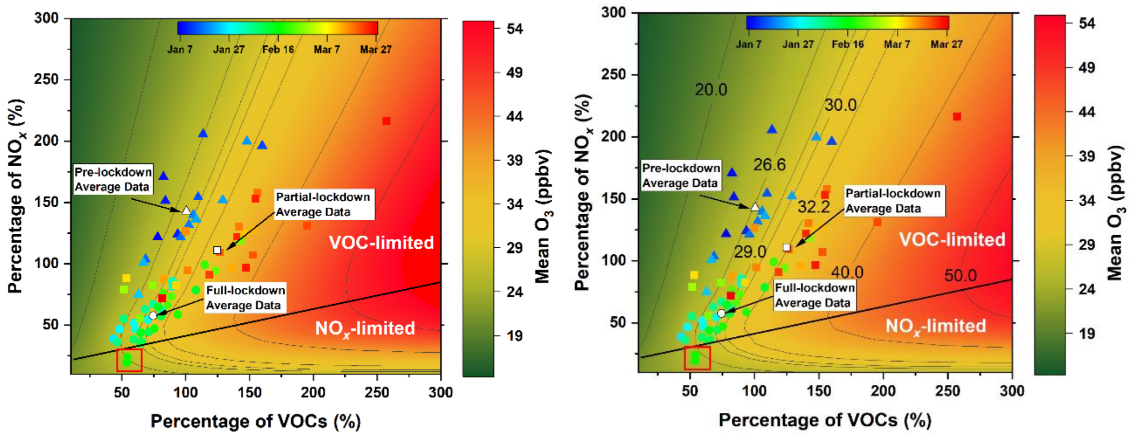

Figure S9. MeanO$_3$ isopleth with (left) and without (right) hypothetical diurnal variation of C2~C5 alkenes and alkanes. The colored circles, triangles, and rectangles represent the daily average

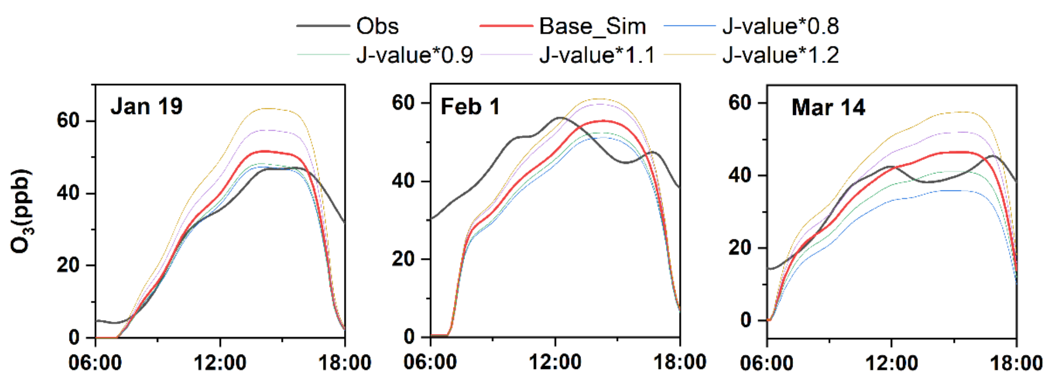

Figure S10. Uncertainty analysis of J-value

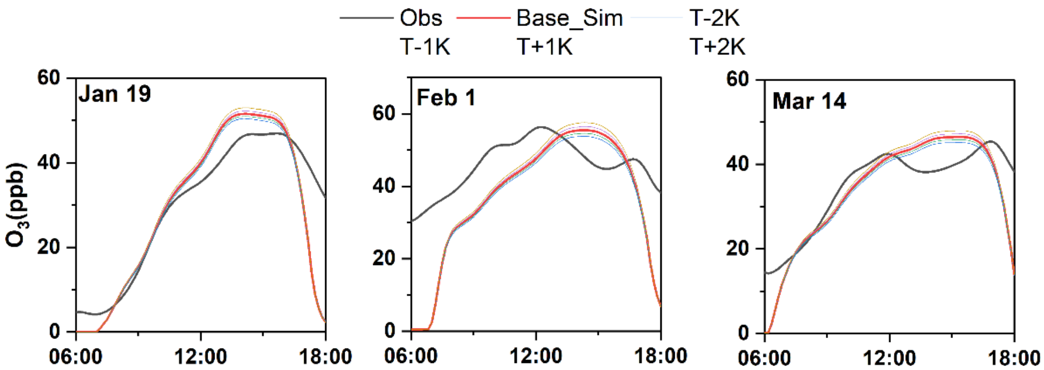

Figure S11. Uncertainty analysis of temperature

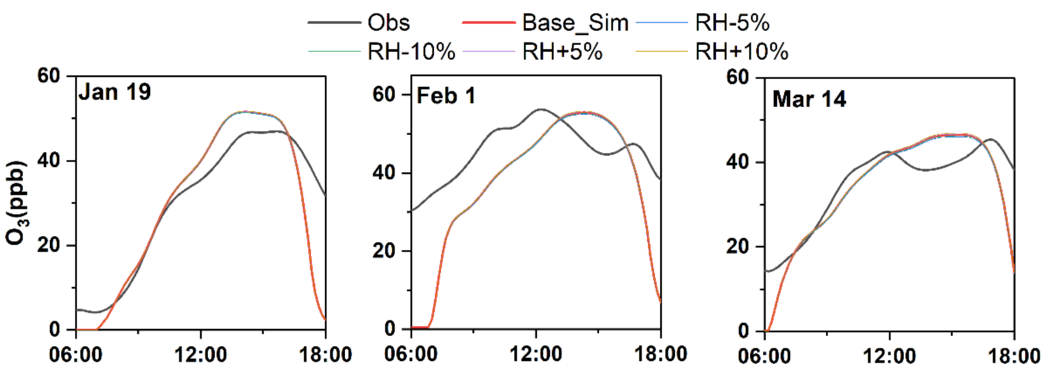

Figure S12. Uncertainty analysis of relative humidity

Text S1 Calculation of industrial VOC emissions.

We summarized the electricity consumption of key industries in Changzhou during our observation, and calculated the corresponding VOC emissions using the following equation:

$$E_o = \sum_{i=1}^{n} \frac{E_{pi}}{S_{pi}} \times S_{oi}$$

where E_o (unit: t) is the total daily VOC emission of from industrial sources during the observation; E_{pi} (unit: t) and S_{pi} is the daily VOC emissions and electricity consumption of the i_{th} industry during the second national pollution census, respectively; S_{oi} is the daily electricity consumption during our observation; n is the number of industry types.