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Exploration of the atmospheric chemistry of nitrous acid in a coastal city of southeastern China: results from measurements across four seasons

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Supplementary Material

Table S1. Comparison of HONO concentrations and related parameters at this site with other regions.

Site	Country	Type	Seasons	RH (%)	T (°C)	NO/NO_2	HONO (ppb)	Reference
Jinan	China	Urban	Annual	51.42	16.07	15.38/27.92	1.15 ± 1.07	(Li et al. 2018)
			Spring	56.67	16.77	11.33/29.67	1.16 ± 0.90	
			Summer	38.67	26.67	5.67/17.33	1.12 ± 0.93	
			Autumn	53.00	16.33	13.00/23.67	0.78 ± 0.60	
			Winter	59.67	3.00	31.17/36.33	1.71 ± 1.62	
Kathmandu	Nepal	Urban	Winter	—	—	3.16/14.14	1.55	(Yu et al. 2009)
Beijing	China	Urban	Severe haze	—	—	29.35/48.1	1.95	(Hou et al. 2016)
			Clean	—	—	5.2/18.85	0.72	
Guangzhou	China	Urban	Summer	77	31.2	—/30.3	~2.8	(Qin et al. 2009)
Shanghai	China	Urban	Annual	—	—	—/18.78	0.92 ± 0.57	(Wang et al. 2013)
Changzhou	China	Urban	Spring	53.7 ± 19.8	18.7 ± 4.8	8.2/22.9	1.55 ± 1.21	(Shi et al. 2020)
Beijing	China	Urban	Summer	56.79	28.27	6.44/31.70	1.45 ± 0.58	(Spataro et al. 2013)
			Winter	26.02	3.51	25.90/38.76	1.04 ± 0.73	
Xi′an)	China	Urban	Summer	—	—	—/20.9	1.12 ± 0.97	(Huang et al. 2017)
Beijing	China	Urban	Annual	43.34	16.01	—/25.60	1.44 ± 1.33	(Wang et al. 2017a)
			Spring	34.73	18.44	—/25.97	1.05 ± 0.95	
			Summer	55.30	28.11	—/19.21	1.38 ± 0.90	
			autumn	51.11	17.33	—/32.91	2.27 ± 1.82	
			winter	30.48	-3.57	—/19.96	1.05 ± 0.89	
Nanjing	China	Industrial	Winter	68	6.1	7.97/23.9	1.32 ± 0.92	(Zheng et al. 2020)
Touji Island	China	Marine background	Autumn	74	14.2	0.5/5.3	0.20 ± 0.20	(Wen et al. 2019)
The North Atlantic Ocean	—	Marine boundary layer	5 July 2013	—	—	—	0.0113 ± 0.0016	(Ye et al. 2016)
			8 July 2013	—	—	—	0.0088 ± 0.0023	
Cyprus	Mediterranean Sea	Coastal remote	summer	—	18-28	0.02/0.14	0.035 ± 0.025	(Meusel et al. 2016)
Kwangju	Korea	Suburban	Autumn	74.55	15.08	—	0.67 ± 0.60	(Park et al. 2004)

Nanjing	China	Suburban	Annual	72	17.00	5.7/16.4	0.69 ± 0.58	(Liu et al. 2019)
			Spring	73	17.67	2.35/15.15	0.68 ± 0.48	
			Summer	77	28.00	1.2/10.1	0.45 ± 0.37	
			Autumn	72	18.11	5.25/16.15	0.66 ± 0.53	
			Winter	66	4.33	15.58/25.75	1.04 ± 0.75	
Hongkong	China	Suburban	Annual	73	25	10.7/21.7	0.71	(Xu et al. 2015)
			Spring	75	28	5.5/15.5	0.35	
			Summer	71	32	8/19.8	0.65	
			Autumn	67	23	10.1/26.8	0.93	
			Winter	78	17	19.3/24.7	0.91	
Western Yangtze River delta	China	Suburban	Spring	—	—	—	0.76 ± 0.79	(Nie et al. 2015)
Xiamen	China	Suburban	Annual	78.35	22.95	5.80/14.99	0.54 ± 0.47	This work
			Spring	84.21	16.59	8.47/18.10	0.62 ± 0.58	
			Summer	84.12	30.00	4.79/13.39	0.61 ± 0.39	
			Autumn	69.55	24.02	2.18/12.88	0.41 ± 0.30	
			Winter	78.13	18.41	8.86/17.03	0.54 ± 0.47	

Note: "—" means no data found in the corresponding reference.

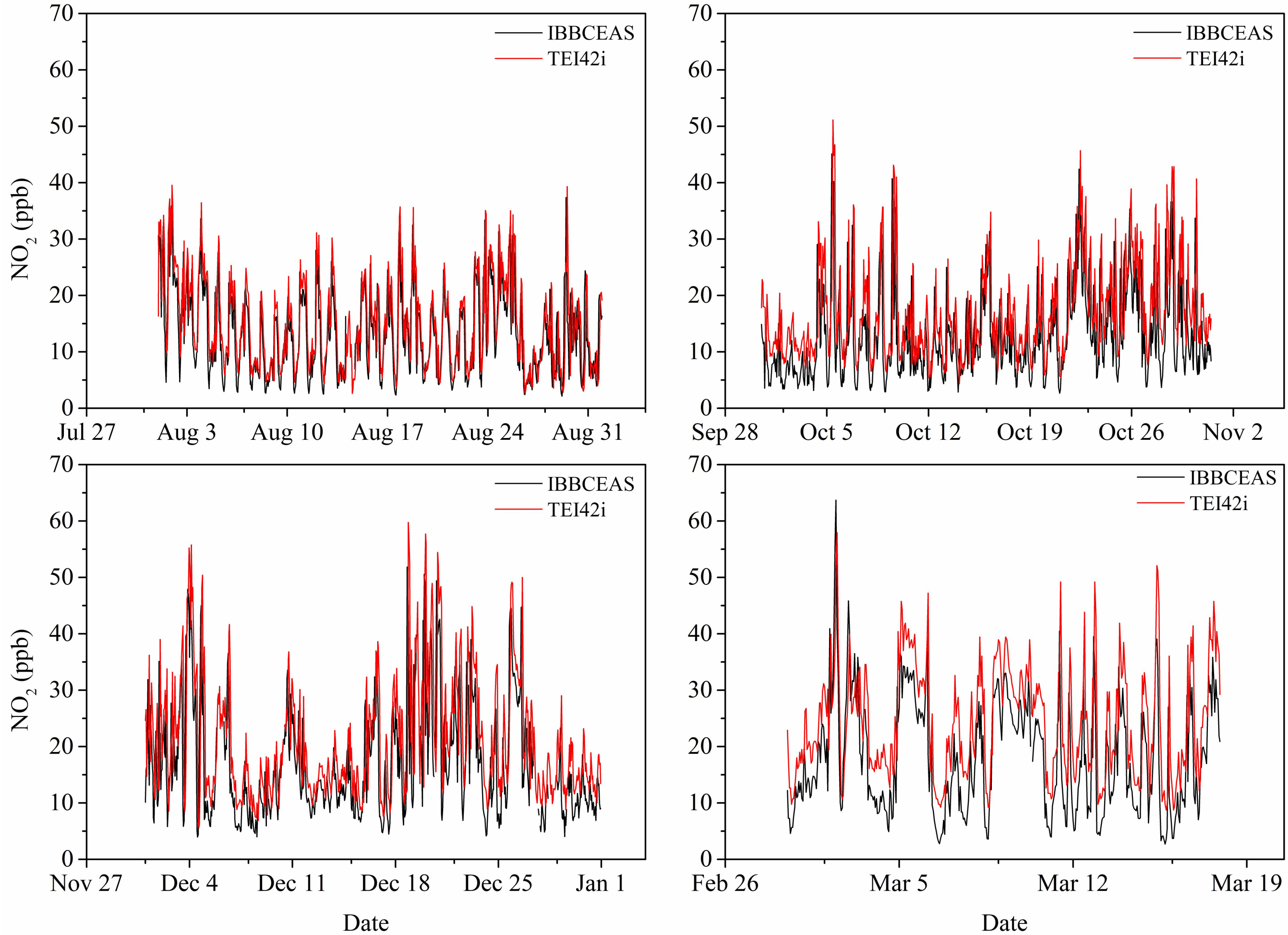

Figure S1. Time series measurements of NO_2 from the IBBCEAS and TEI 42*i*.

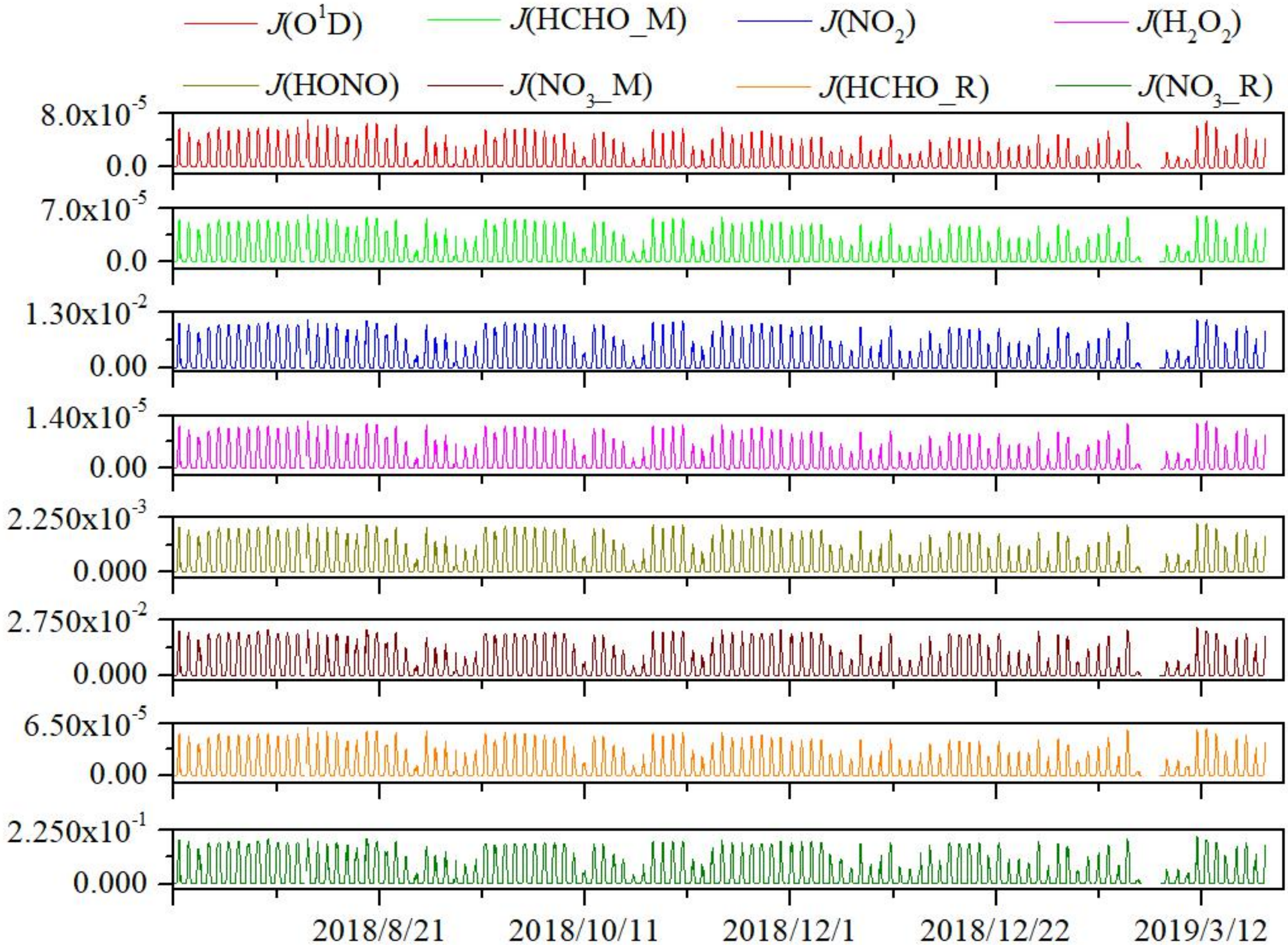

Figure S2. Time series of photolysis rate constants.

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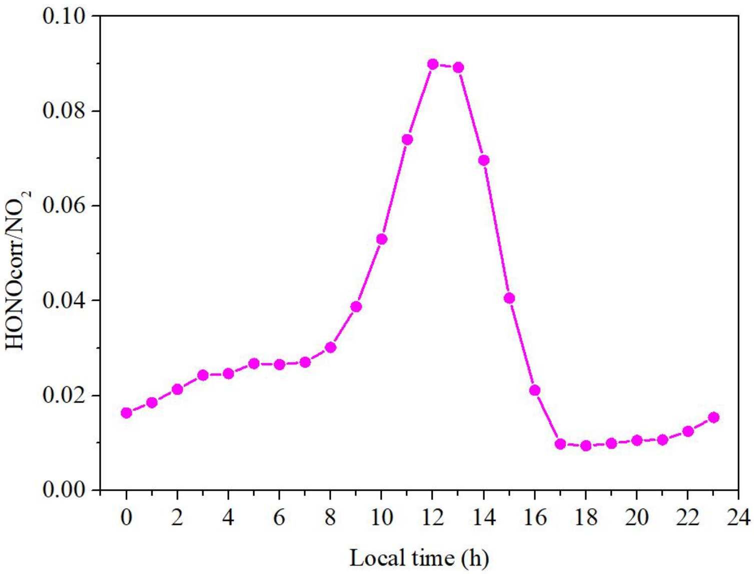

Figure S3. Diurnal variations of $HONO_{corr}/NO_2$.

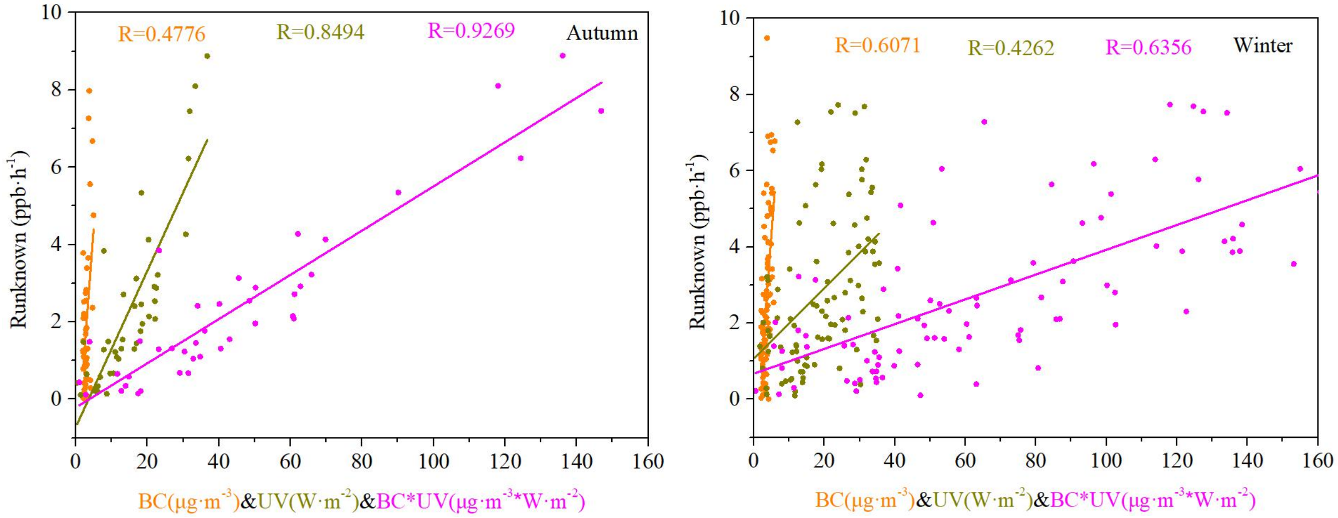

Figure S4. Correlations between the strength of Runknown and BC (colored by orange), UV (colored by dark yellow), and BC*UV (colored by magenta) in autumn and winter, respectively

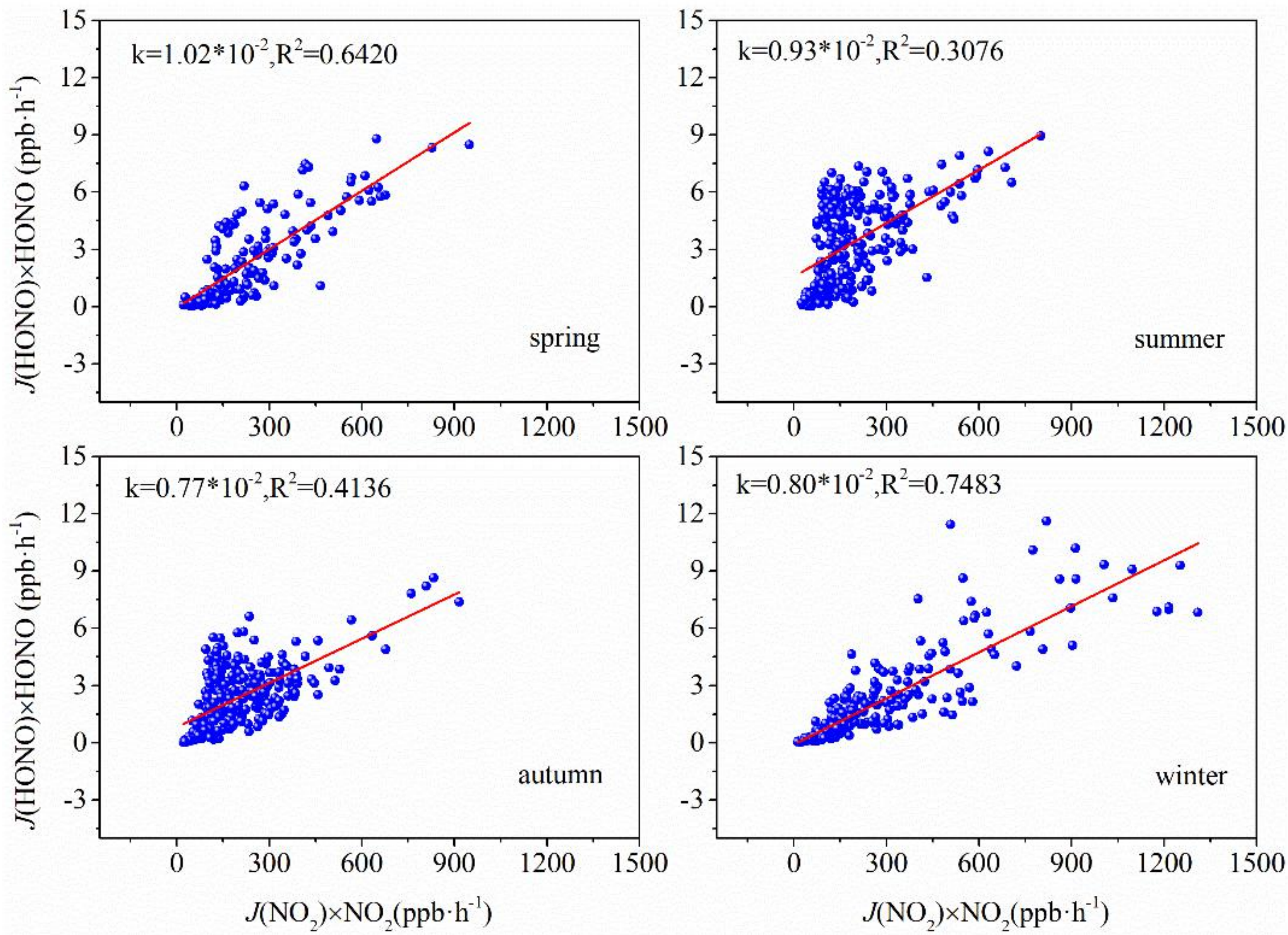

Figure S5. Correlations between J(HONO)×HONO and $J(NO_2)\times NO_2$.

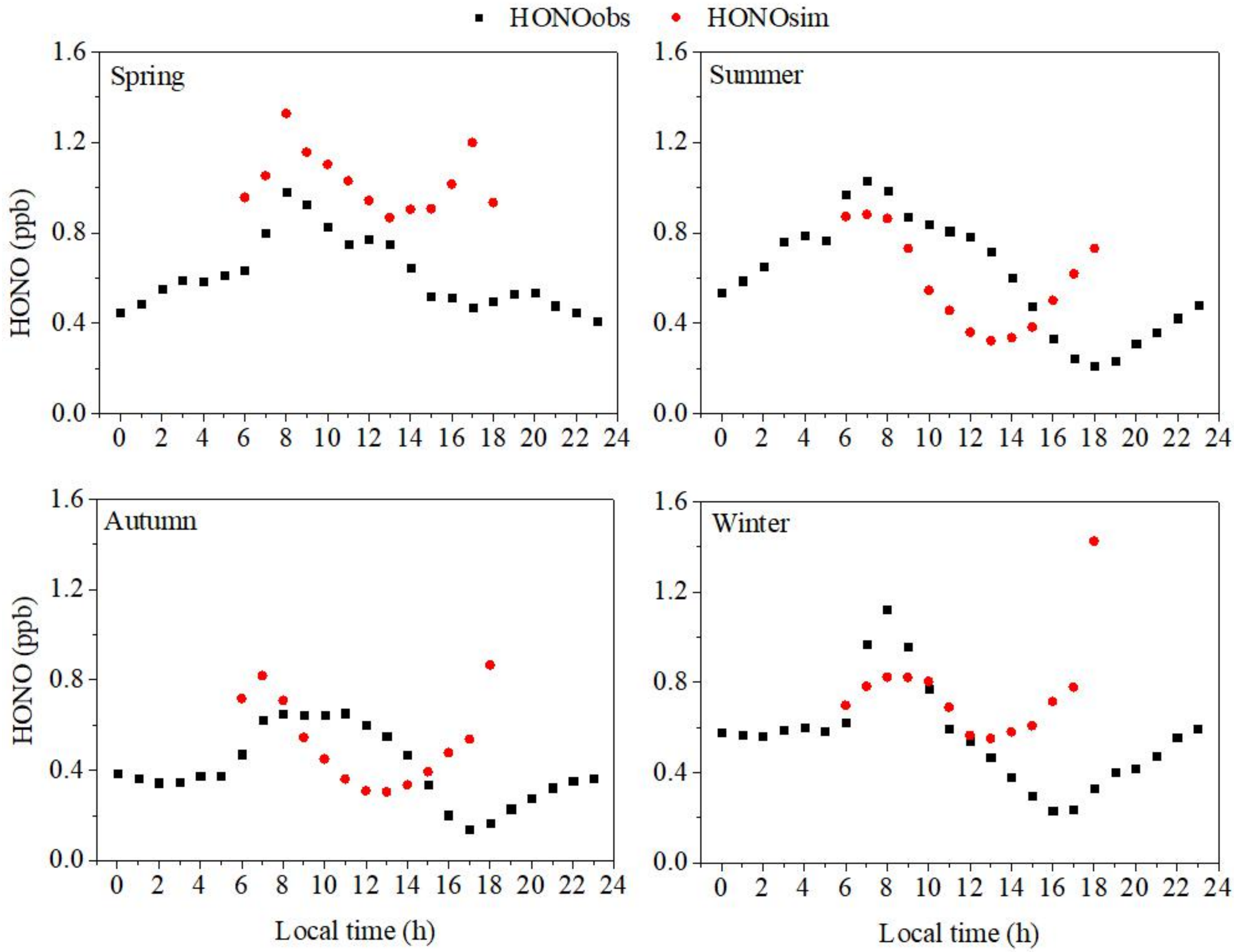

Figure S6. Diurnal profile of the measured values of HONO and the value estimated using the parameterized formula Eq. (10).

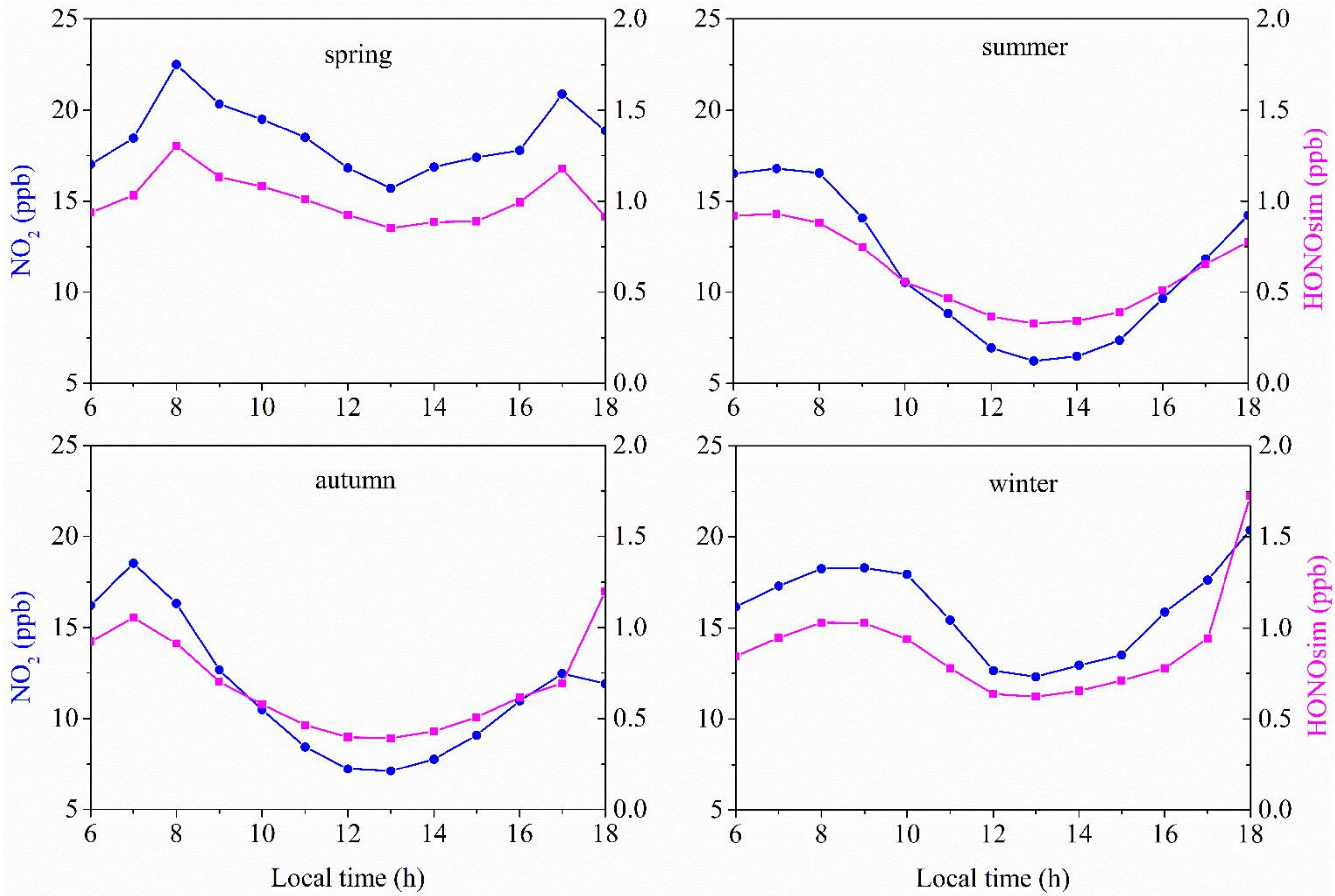

Figure S7. Diurnal variation of NO_2 concentration and HONO concentration simulated by Eq. (10).

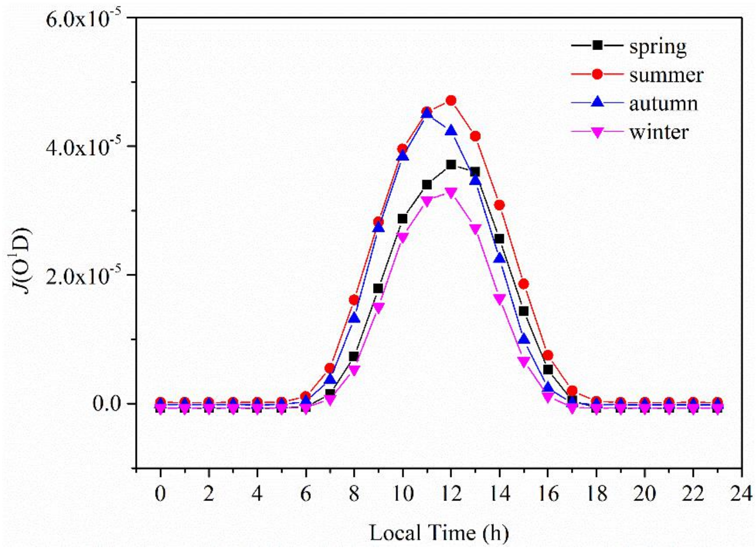

Figure S8. Diurnal variations of $J(O^1D)$.

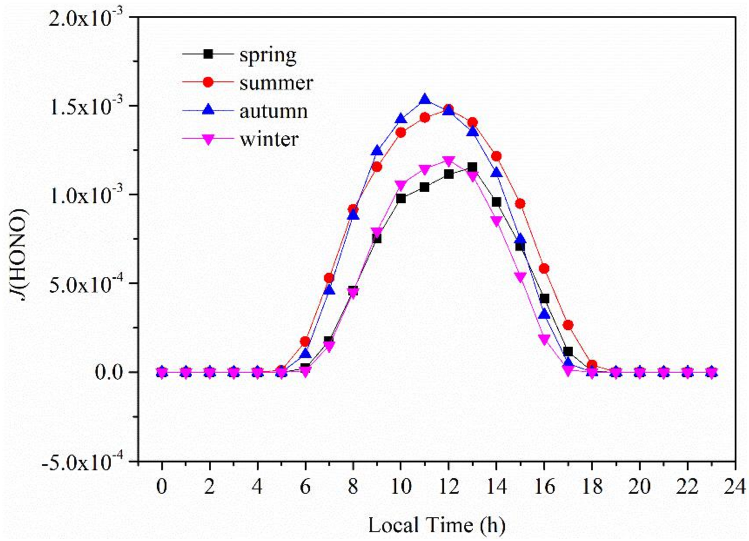

Figure S9. Diurnal variations of *J*(HONO).