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*Supplement of*

## **Attributions of meteorological and emission factors to the 2015 winter severe haze pollution episodes in China's Jing-Jin-Ji area**

**Tingting Liu et al.**

*Correspondence to:* Sunling Gong ([sunling@camsma.cn](mailto:sunling@camsma.cn))

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Table 1 Performance statistics of near surface meteorological parameters.

	IOA	R	STD <sub>O</sub>	STD <sub>F</sub>	RMSE	MB	ME
T <sub>2</sub> <sup>a</sup>	0.83	0.88	3.7 K	4.8	3.6	-2.8	3.0
Q <sub>2</sub> <sup>a</sup>	0.52	0.73	0.5 g kg <sup>-1</sup>	0.6	1.0	1.0	1.0
WD <sub>10</sub> <sup>a</sup>	0.66	0.41	111.6	88.8	119.8	47.1	74.8
WS <sub>10</sub> <sup>a</sup>	0.74	0.62	1.6 m s <sup>-1</sup>	1.4	1.5	0.7	1.2
T <sub>2</sub> <sup>b</sup>	0.82	0.84	3.2 K	4.5	3.4	-2.3	2.8
Q <sub>2</sub> <sup>b</sup>	0.76	0.79	0.7 g kg <sup>-1</sup>	0.7	0.7	0.6	0.6
WD <sub>10</sub> <sup>b</sup>	0.61	0.29	118.7	109.1	139.7	32.1	93.7
WS <sub>10</sub> <sup>b</sup>	0.81	0.68	1.5 m s <sup>-1</sup>	1.4	1.2	0.3	0.9

<sup>a</sup> and <sup>b</sup> represent December 2014 and 2015 respectively.

Table 2 Performance statistics of hourly NO<sub>2</sub> and PM<sub>2.5</sub> concentrations in December 2014 and 2015.

	IOA	R	STD <sub>O</sub>	STD <sub>F</sub>	RMSE	MB	ME
PM <sub>2.5</sub> <sup>a</sup>	0.66	0.52	91.9 µg m <sup>-3</sup>	76.3 µg m <sup>-3</sup>	87.3 µg m <sup>-3</sup>	-18.8 µg m <sup>-3</sup>	59.3 µg m <sup>-3</sup>
PM <sub>2.5</sub> <sup>b</sup>	0.66	0.48	113.0 µg m <sup>-3</sup>	108.7 µg m <sup>-3</sup>	112.2 µg m <sup>-3</sup>	-16.5 µg m <sup>-3</sup>	83.2 µg m <sup>-3</sup>

<sup>a</sup> and <sup>b</sup> represent December 2014 and 2015 respectively.

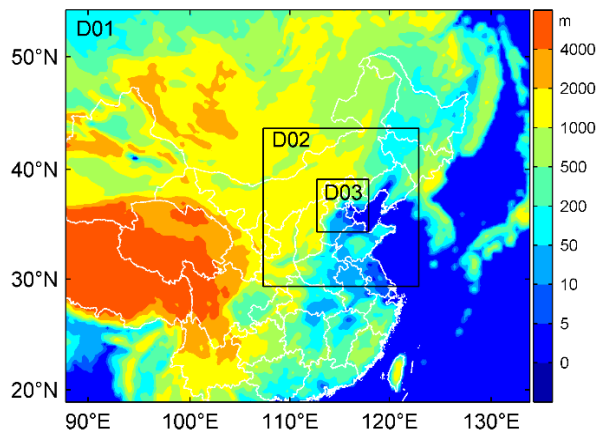


Figure S1 The three nested domains for simulation with horizontal resolutions of 27 km, 9 km and 3 km. The colour bar represents altitude, the white line represents the administrative boundaries of province.

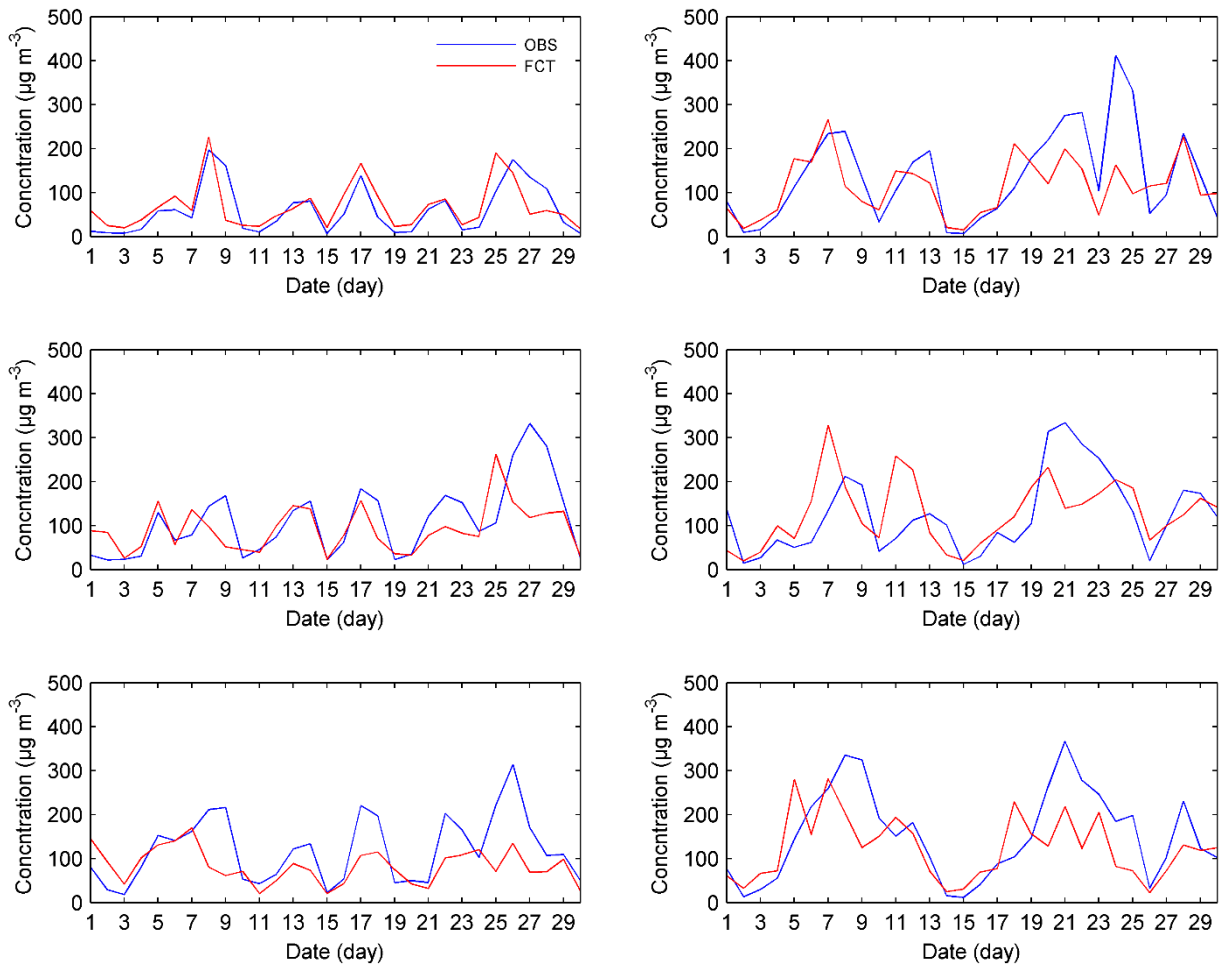


Figure S2. Comparison between observed (OBS) and simulated (FCT) daily average PM<sub>2.5</sub> concentration in Beijing (a-b), Tianjin (c-d), and Shijiazhuang (e-f) for December 2014 and 2015 respectively.

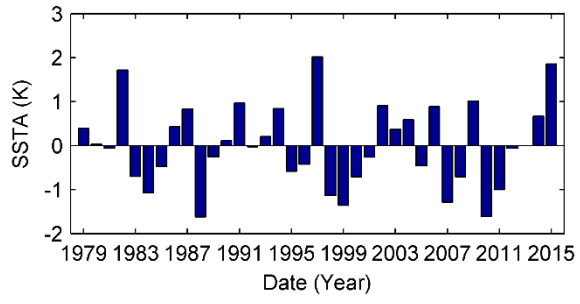


Figure S3 Time series of monthly averaged SSTA over the Niño3 region in December 1979-2015.

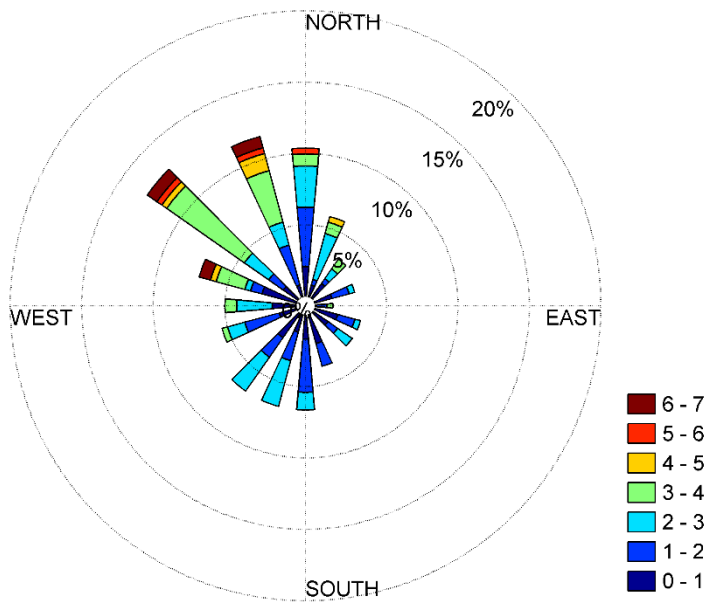


Figure S4 The observed and simulated wind frequency and directions averaged in December 2015.