## Impacts of Meteorological Uncertainties on the Haze Formation in Beijing-Tianjin Hebei (BTH) during Wintertime: A case study

Naifang Bei<sup>1</sup>, Jiarui Wu<sup>2</sup>, Tian Feng<sup>2</sup>, Junji Cao<sup>2</sup>, Rujin Huang<sup>2</sup>, Xin Long<sup>2</sup>, Li Xing<sup>2</sup>, Shuyu Zhao<sup>2</sup>, Xuexi Tie<sup>2</sup>, and Guohui Li<sup>2\*</sup>

<sup>1</sup>School of Human Settlements and Civil Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi, China

<sup>2</sup>Key Lab of Aerosol Chemistry and Physics, SKLLQG, Institute of Earth Environment, Chinese Academy of Sciences, Xi'an, China

Hebei (BTH) during Wintertime: A cas
Naifang Bei<sup>1</sup>, Jiarui Wu<sup>2</sup>, Tian Feng<sup>2</sup>, Junji Cao<sup>2</sup>,
and Guohui Li<sup>2\*</sup>
<sup>1</sup>School of Human Settlements and Civil Enginee
<sup>2</sup>Key Lab of Aerosol Chemistry and Physics, SI
Sciences, Xi'an, China
<sup>\*</sup>Correspondence to: Guohui Li (ligh@ieecas.cn)

11 12

13

14

16		Supplementary Figure Captions
17		
18 19	Figure s1	Geopotential heights and wind vectors at the surface level from 13 to 20 January 2014. The red rectangle denotes the Beijing-Tianjin-Hebei area.
20	Figure s2	Same as Figure s1, but for 850 hPa.
21	Figure s3	Same as Figure s1, but for 500 hPa.
22 23 24	Figure s4	Temporal evolution of the ensemble spread for the surface (a) U component, (b) V component, (c) temperature and (d) relative humidity at the meteorological site, and (e) the PBL height at IRSDE from 13 to 20 January 2014.
25 26 27	Figure s5	Temporal evolution of the RESM for (a) POA, (b) SOA, (c) sulfate, (d) nitrate, and (e) ammonium mass concentrations at IRSDE in Beijing from 13 to 20 January 2014.
28 29 30	Figure s6	Temporal evolution of the RESM for (a) $PM_{2.5}$ , (b) $O_3$ , (c) $NO_2$ , (d) $SO_2$ , and (e) CO mass concentrations averaged over monitoring sites in BTH from 13 to 20 January 2014.
31 32	Figure s7	Temporal evolution of the RESM for the PM <sub>2.5</sub> mass concentrations averaged in (a) Beijing, (b) Tianjin, (c) Baoding, and (d) Shijiazhuang from 13 to 20 January 2014.
33 34 35 36 37		





Figure s1 Geopotential heights and wind vectors at the surface level from 13 to 20 January 2014. The red rectangle denotes the Beijing-Tianjin-Hebei area.





Figure s2 Same as Figure s1, but for 850 hPa.



Figure s3 Same as Figure s1, but for 500 hPa.



Figure s4 Temporal evolution of the ensemble spread for the surface (a) U component, (b) V component, (c) temperature and (d) relative humidity at the meteorological site, and (e) the PBL height at IRSDE from 13 to 20 January 2014.



(e) ammonium mass concentrations at IRSDE in Beijing from 13 to 20 January 2014.





Figure s7 Temporal evolution of the RESM for the PM<sub>2.5</sub> mass concentrations averaged in (a)
Beijing, (b) Tianjin, (c) Baoding, and (d) Shijiazhuang from 13 to 20 January 2014.