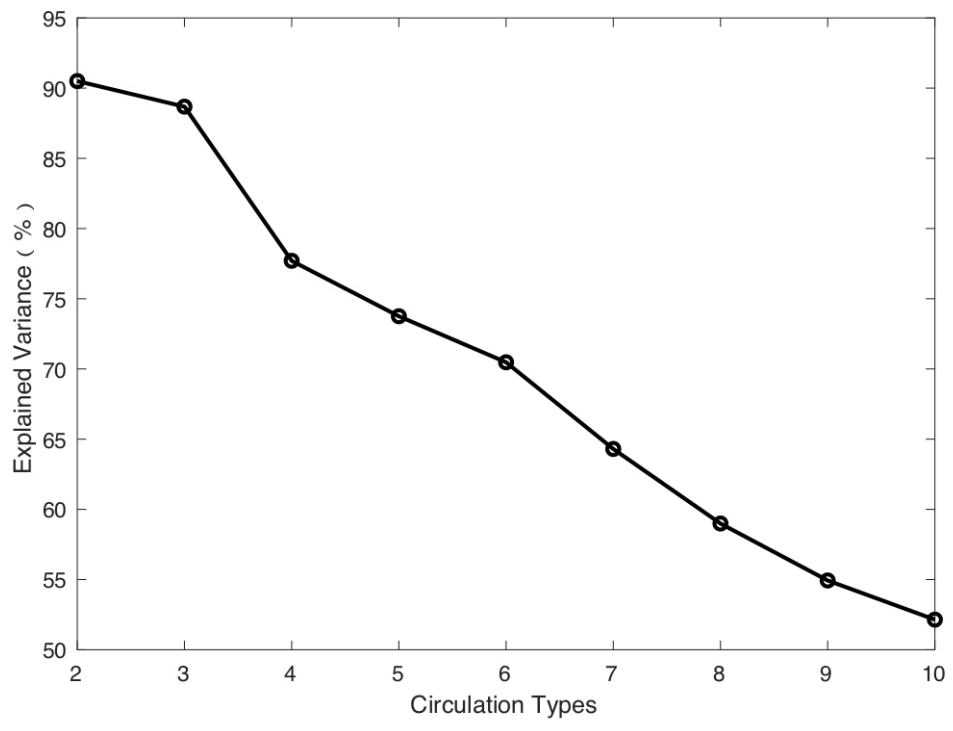Atmospheric
Chemistry
and Physics

Supplement of

Effects of atmospheric circulations on the interannual variation in PM$_{2.5}$ concentrations over the Beijing–Tianjin–Hebei region in 2013–2018

Xiaoyan Wang and Renhe Zhang

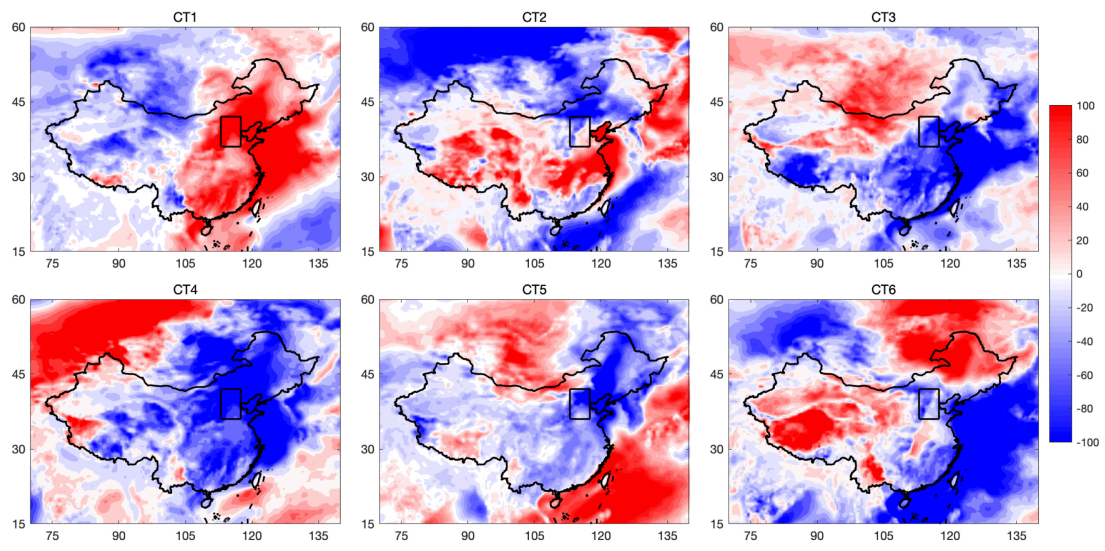*Correspondence to:* Xiaoyan Wang (wangxyfd@fudan.edu.cn)
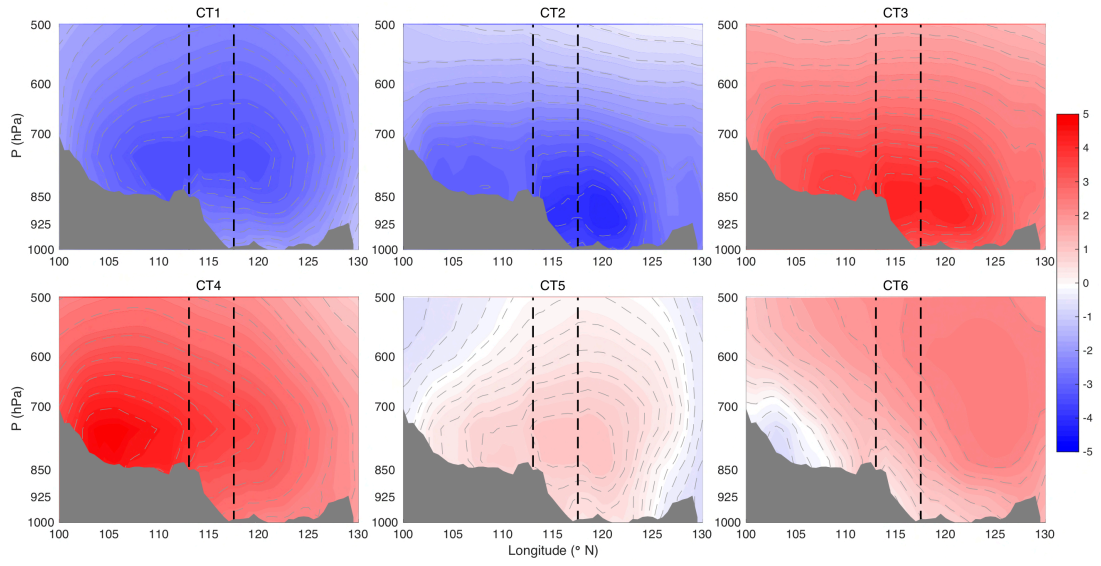
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2

3   Figure S1. Explained variance of circulation classification varies with the circulation types.

4

5   Figure S2. The distribution of boundary layer height (BLH) in each circulation type (unit: m). The anomaly values

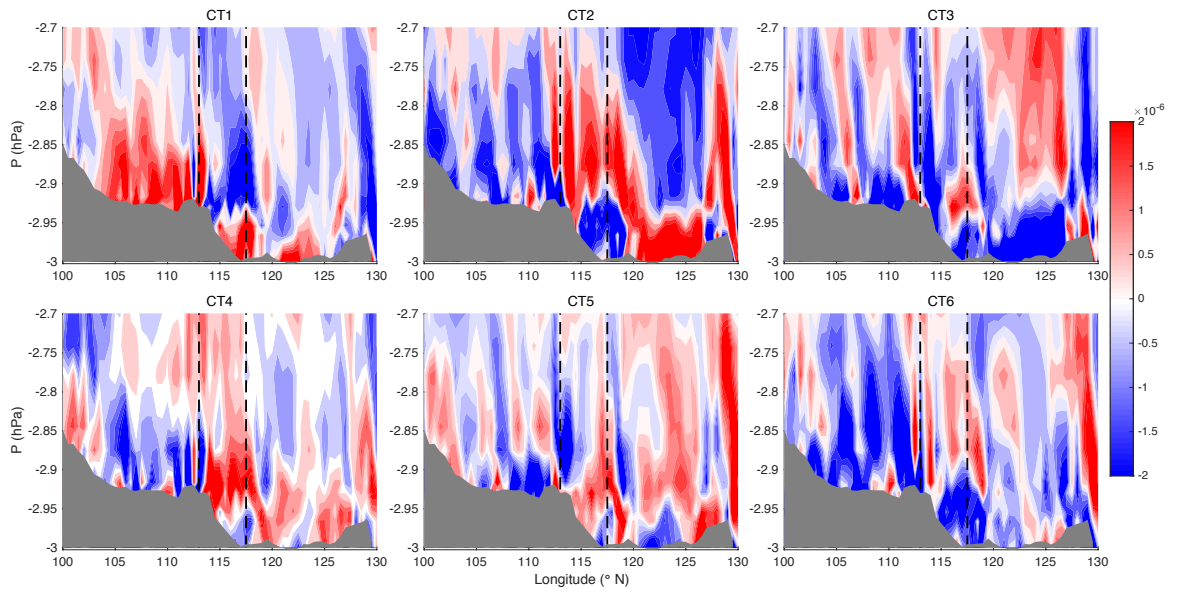6   are with respect to the mean of 1980-2010.

Figure S3. Zonal profile of temperature anomaly over BTH region (36º-42ºN) (unit: K). The grey region indicates the average altitude over 36º-42ºN. The region between two dashed line is the horizontal location of BTH (113º-117.5ºE).
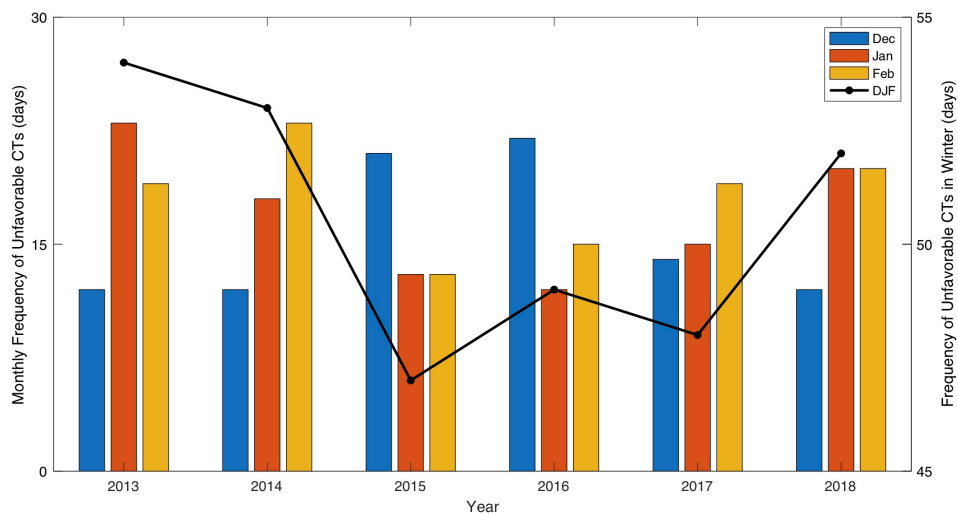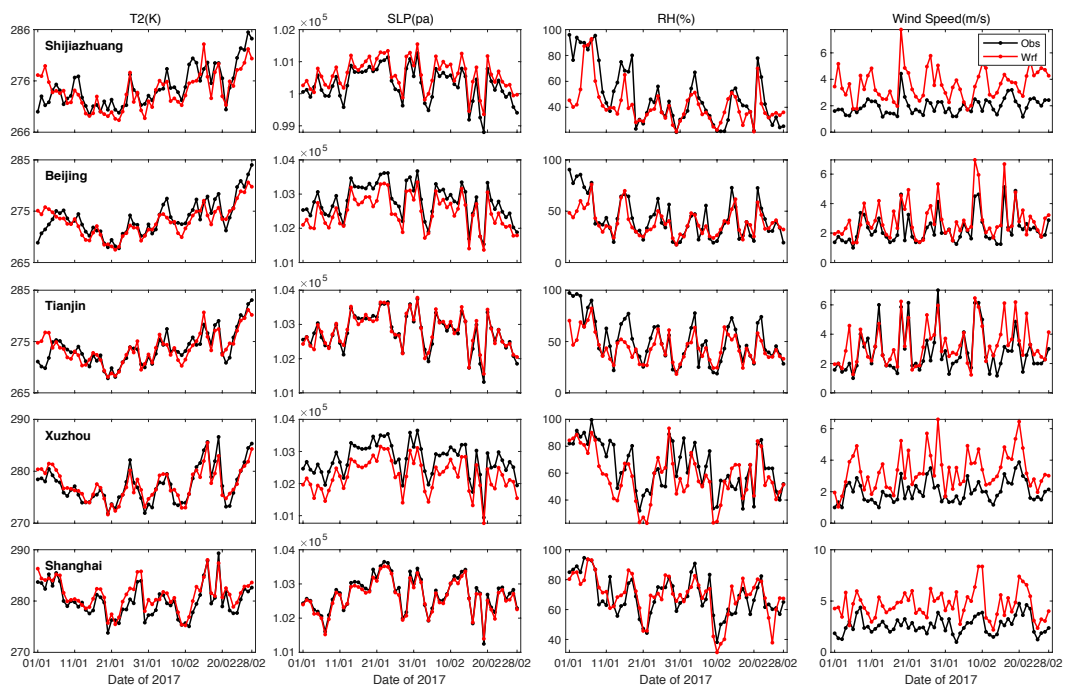

Figure S4. Zonal profile of divergence anomaly over BTH region (36º-42ºN) (unit: s^{-1}).

15

16 Figure S5. Monthly and seasonal occurrence frequency of unfavorable circulation types (unit: days). The occurrence

17 of CT3 to CT6 are collectively called unfavorable CTs.

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19

20 Figure S6. The observed and simulated air temperature (T2), sea level pressure (SLP), relative humidity (RH) and

21 10 m wind speed (wind speed) over Shijiazhuang, Beijing, Tianjin, Xuzhou and Shanghai during Jan. to Feb. of

22 2017. The meteorological variables come from the Intergrated Surface Database of National Climate Data Center

23 (https://www.ncdc.noaa.gov/isd).

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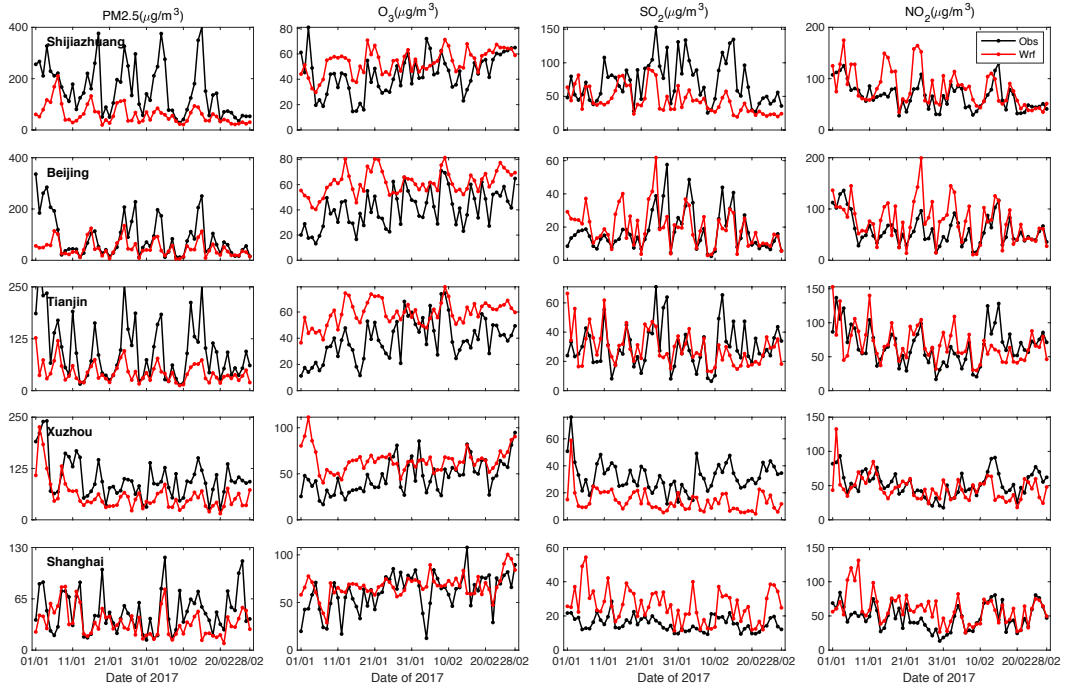
Figure S7. The observed and simulated PM$_{2.5}$, O$_3$, SO$_2$, NO$_2$ concentrations over Shijiazhuang, Beijing, Tianjin, Xuzhou and Shanghai during Jan. to Feb. of 2017.

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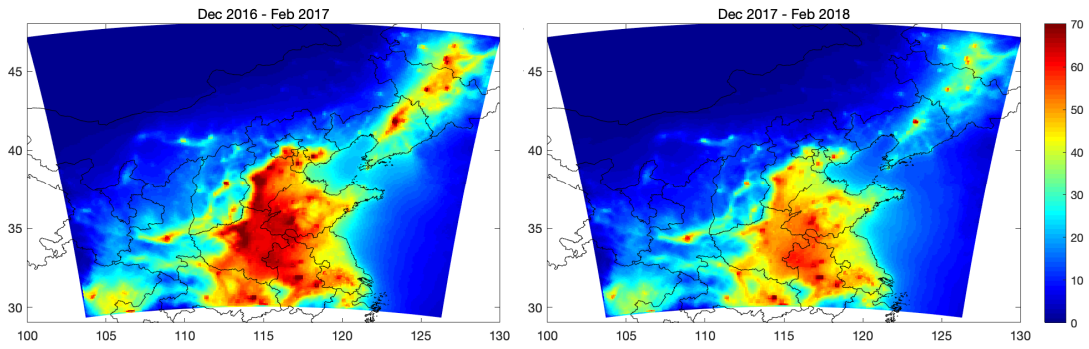
Figure S8. The simulated seasonal mean PM$_{2.5}$ concentrations during the winters of 2016 and 2017 (unit: μg/m^3).

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