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*Supplement of*

## **Characteristics of PM<sub>2.5</sub> mass concentrations and chemical species in urban and background areas of China: emerging results from the CARE-China network**

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Table S1 Configuration of PM<sub>2.5</sub> measurements for the forty stations in this study

Station/Code	Measurement method	Online measurement period	Filter sampling period
Beijing/BJC	TEOM and Gravimetric	Jan. 2012 - Dec. 2014	Apr. 2012 - Dec. 2013
Cele/CLD	TEOM	Jan. 2012 - Dec. 2014	
Changbai Mountain/CBM	TEOM and Gravimetric	Jan. 2012 - Dec. 2014	May 2012 - Jun. 2013
Changsha/CSC	TEOM	Jan. 2012 - Dec. 2014	
Chengdu/CDC	Beta attenuation	Jan. 2012 - Dec. 2014	
Chongqing/CQC	TEOM and Gravimetric	Jan. 2012 - Dec. 2014	Apr. 2012 - May 2013
Dinghu Mountain/DHM	TEOM and Gravimetric	Jan. 2012 - Dec. 2014	Dec. 2012 - Oct. 2013
Dunhuang/DHD	TEOM	Jan. 2012 - Dec. 2014	
Fukang/FKZ	TEOM	Jan. 2012 - Dec. 2014	
Gongga Mountain/GGM	TEOM and Gravimetric	May 2012 - Dec. 2014	Apr. 2012 - Mar. 2013
Guangzhou/GZC	Beta attenuation and Gravimetric	Apr. 2012 - Dec.2014	Jun. 2013 - Apr. 2014
Hailun/HLA	TEOM	Jan. 2012 - Dec. 2014	
Hefei/HFC	TEOM	Apr. 2012 - Dec. 2014	
Ji'nan/JNC	TEOM	Jan. 2012 - Dec. 2014	
Kunming/KMC	TEOM	Mar. 2012 - Dec. 2014	
Lhasa/LSZ	TEOM and Gravimetric	Mar.2012 - Mar. 2014	Apr.2012 - Jul. 2013
Lin'an/LAZ	TEOM and Gravimetric	Jan. 2012 - Dec. 2014	Dec. 2014 - Nov. 2015
Mount Everest/ZFM	TEOM	Mar. 2012 - Jan. 2014	
Namtso/NMT	TEOM and Gravimetric	Jan.2012 - Mar. 2014	May 2012 - Mar. 2013
Nagri/ALZ	TEOM	Apr. 2012 - Sep. 2012	
Qianyanzhou/QYZ	TEOM	Feb.2012 - Dec. 2014	
Qinghai Lake/QHL	Beta attenuation	Jan. 2012 - Oct. 2014	
Sanya/SYB	TEOM	Jan. 2012 - Oct. 2013	
Shanghai/SHC	Beta attenuation and Gravimetric	Jan. 2012 - Dec. 2014	Dec. 2011 - Nov. 2012
Shapotou/SPD	TEOM	Jan. 2012 - Dec. 2014	
Shenyang/SYC	TEOM and Gravimetric	Jan. 2012 - Dec. 2014	May 2012 - Jan. 2013
Shijiazhuang/SJZ	TEOM	Jan. 2012 - Dec. 2014	
Taipei/TBC	TEOM	Jan. 2012 - Dec. 2014	
Taiyuan/TYC	TEOM	Mar. 2012 - Dec. 2014	
Tianjin/TJC*	TEOM	Jan. 2012 - Dec. 2014	
Tongyu/TYZ	TEOM	Feb. 2012 - May 2014	
Urumchi/URC	Beta attenuation	Jan.2012 - Dec.2014	
Wuxi/WXC	TEOM	Feb. 2012 - Dec. 2014	
Xi'An/XAC	Beta attenuation	Jan. 2012 - Dec. 2014	
Xianghe/XHZ	TEOM	Jan. 2012 - Dec. 2014	
Xinglong/XLZ	TEOM and Gravimetric	Jan. 2012 - Dec. 2014	Aug. 2012 - Oct. 2014
Xishuangbanna/BNF	TEOM	Apr.2012 - Apr.2014	
Yantai/YTZ	TEOM	Mar.2012 - Dec. 2014	
Yucheng/YCA	TEOM	Jan. 2012 - Dec. 2014	
Zangdongnan/ZDN	TEOM	Mar. 2012 - Mar. 2014	

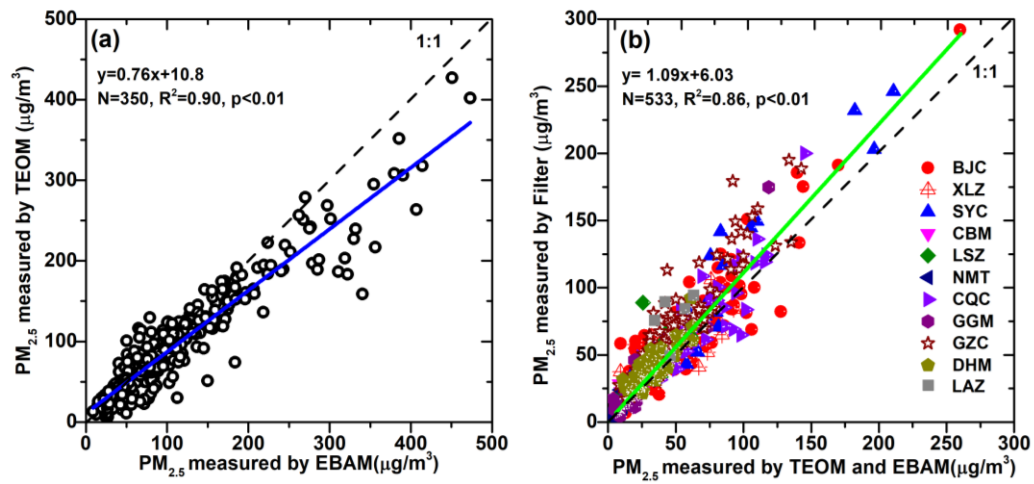


Fig. S1 (a) Intercomparison of PM<sub>2.5</sub> mass concentrations measured by the tapered element oscillating microbalance (TEOM) and the beta gauge instruments (EBAM) conducted at the Beijing site; (b) Intercomparison of PM<sub>2.5</sub> mass concentrations measured by filter sampling and the on-line instruments (TEOM and EBAM) from the 11 sites during the one-year observation period. (the code related to the observation sites could be found in Table S1)

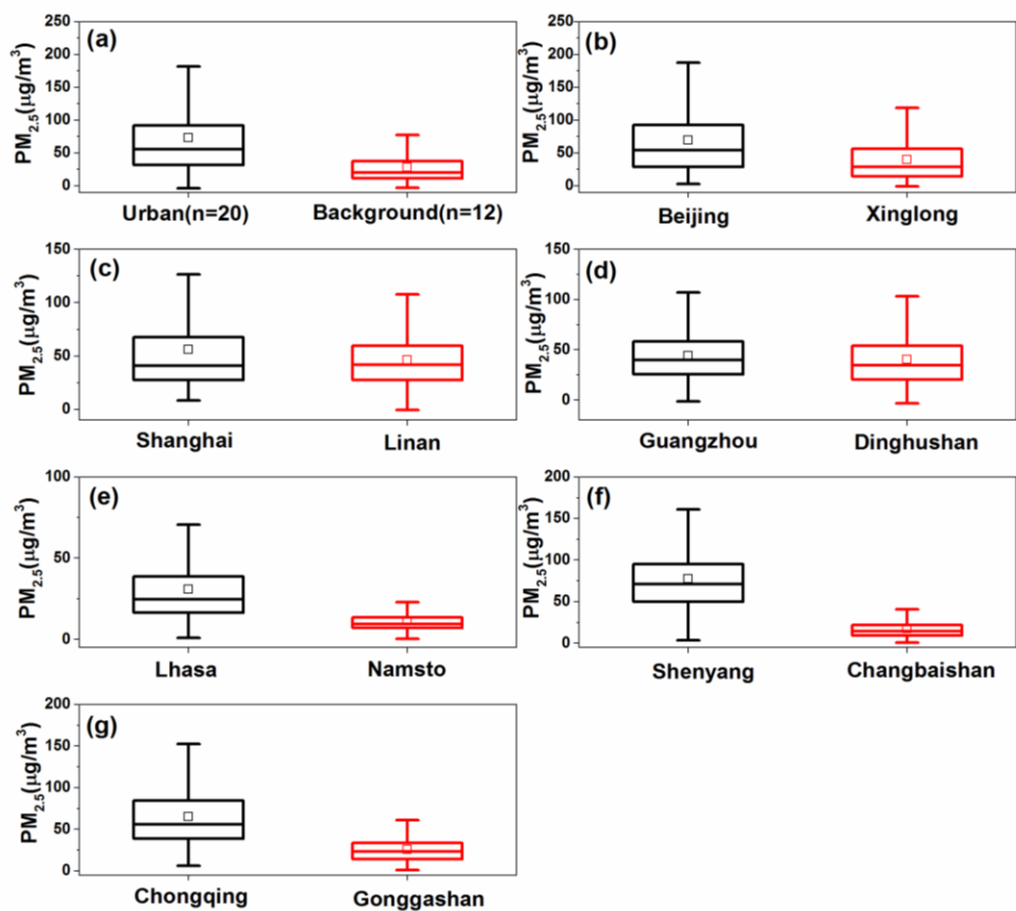


Fig.S2. Summary of PM<sub>2.5</sub> concentration at background (n=12) and urban (n=20) sites. The box shows the median and the upper and lower quartiles, with the mean shown by the square. The lines extending from the box represent the upper and lower bounds of ±standard deviation.

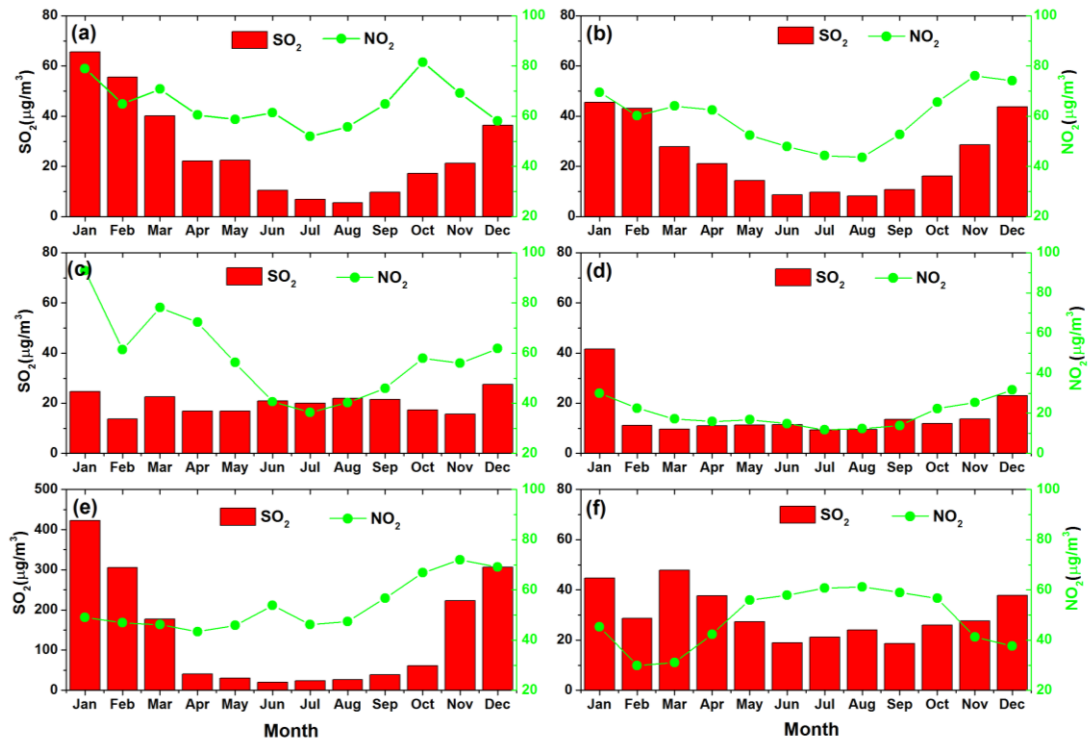


Fig.S3. Monthly average SO<sub>2</sub> concentration (histogram, left coordinate) and the monthly average NO<sub>2</sub> concentration (dotted line, right coordinate) during 2013-2014 in (a)Beijing, (b)Shanghai, (c) Guangzhou, (d)Lhasa , (e) Shenyang and (f) Chongqing.

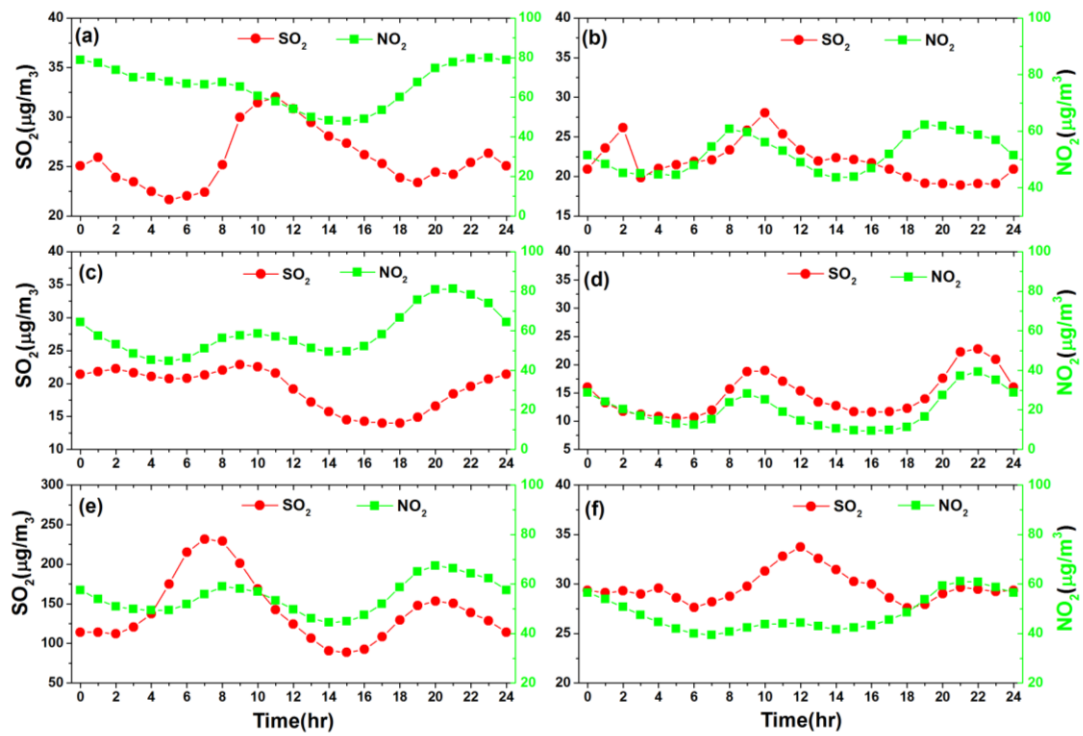


Fig.S4. Diurnal cycles of SO<sub>2</sub> concentration (dotted red line, left coordinate) and NO<sub>2</sub> concentration (dotted green line, right coordinate) during 2013-2014 in (a)Beijing, (b)Shanghai, (c) Guangzhou, (d)Lhasa , (e) Shenyang and (f) Chongqing.

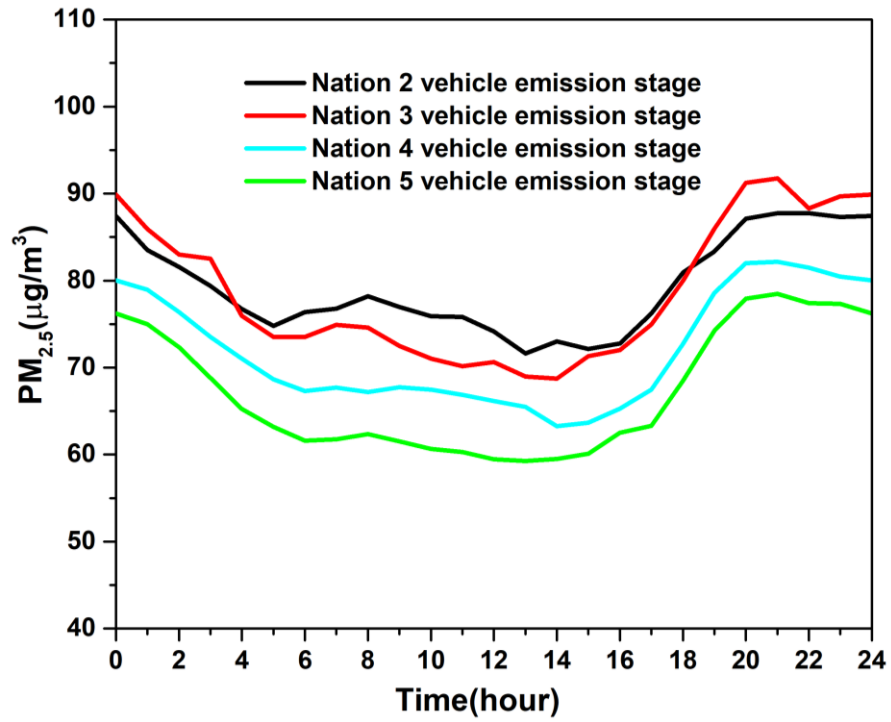


Fig.S5 Diurnal variation of PM<sub>2.5</sub> in Beijing during the four kinds of vehicle emission standard stages. PM<sub>2.5</sub> data obtained during Nation 2 vehicle emission stage (Nation 2) in this study refer to the periods of Jan. 2004 to Nov. 2005. Nation 3 refer to the periods of Dec. 2005 to Feb. 2008. Nation 4 refer to the periods of Mar. 2008 to Jan. 2013. Nation 5 refer to the periods of Feb. 2013 to Dec. 2014.