



## Supplement of

## Distribution and sources of air pollutants in the North China Plain based on on-road mobile measurements

Yi Zhu et al.

Correspondence to: Tong Zhu (tzhu@pku.edu.cn)

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## S2.1 The Mesoscale meteorological model

The meteorological fields were computed using the WRF model version 3.6.1. The model was configured with four two-way nested domains. The grid dimensions were  $91 \times 91$ ,  $121 \times 121$ ,  $211 \times 241$ , and  $241 \times 301$ , with horizontal resolutions of 36 km, 12 km, 4 km and 2 km, for domains 1, 2, 3 and 4, respectively (Fig. S1). All domains had 41 unevenly spaced terrain-following sigma levels, with the maximum resolution in the boundary layer and the model top at 50 hPa. The National Centers for Environmental Prediction (NCEP) operational Global Forecast System (GFS) analysis data (0.5° horizontal resolution and 6-h temporal interval) were used to provide the initial and boundary conditions for model simulations. The updated high-resolution land use data derived from Moderate Resolution Imaging Spectroradiometer (MODIS) were used to initialize the parameters for the Noah land surface model (Chen et al., 2006).

Table S1. Measurement data and routes in the 5 campaigns

Date	Route 1	Route 2	Route 3	Route 4	Route 5	
June 11–June 15	June 11	June 12	June 13	June 14	June 15	
June 17–June 20	June 17	June 18	June 20	-	-	
June 24–June 25	June 24	June 25	-	-	-	
July 2–July 7	July 2	July 3	July 4	July 6	July 7	
July 11–July 15	July 11	July 12	July 14	July 15	-	

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Date	Start time	End time	Data coverage	Reason for data missing
June 11	10:00	14:00	67%	Computer crashing
June 12	10:23	14:23	92%	Computer crashing
June 13	10:15	14:00	100%	
June 14	9:55	13:55	100%	
June 15	9:58	14:14	99%	Computer crashing
June 17	10:40	14:20	78%	Computer crashing
June 18	9:55	13:35	80%	Computer crashing
June 20	10:15	13:05	85%	Computer crashing
June 24	10:50	14:10	66%	Computer crashing

June 25	10:20	14:20	83%	Computer crashing
July 2	10:23	14:15	72%	Computer crashing
July 3	10:27	13:35	72%	Computer crashing
July 4	10:10	11:46	100%	
July 6	9:58	14:22	98%	Computer crashing
July 7	10:12	14:46	74%	Computer crashing
July 11	10:22	14:30	66%	Computer crashing
July 12	10:10	14:07	84%	Computer crashing
July 14	10:13	11:42	100%	
July 15	10:12	15:05	88%	Computer crashing



WRF Domains

Fig. S1. WRF Domains 1, 2, 3 and 4.



Fig. S2. Calibration curves of gas analyzers in Peking University on June 16 in 2013.



**Fig. S3.** The locations of the mobile platform parked at the parking lots in the service centers Xizhaotong (XZT) and Dezhou (DZ), and their distances to high ways (from Google Map).



Fig. S4. Fire plots in the NCP in July 2 and July 7 from EOSDIS Worldview.



Fig. S5. Particle number size distributions of the plumes in July 2, July 7 and July 14.



**Fig. S6.** The back trajectories of observed air masses in June 11, June 12, June 18, June 20, July 3, July 11, July 12, July 14 and July 15.



**Fig. S7.** Temporal distributions of concentrations of CO and SO<sub>2</sub> near Shijiazhuang in June 12 (a), June 18 (b), June 25 (c) and July 3 (d).

## References

Chen, F., Tewari, M., Kusaka, H., and Warner, T.: Current status of urban modeling in the community Weather Research and Forecast (WRF) model, paper presented at Joint Session with Sixth Symposium on the Urban Environment and AMS Forum: Managing our Physical and Natural Resources: Successes and Challenges, the 86th AMS Annual Meeting, AMS, Atlanta, Georgia, 28 January–3 February 2006.