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 91×91, 121×121, 211×241, and 241×301, 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).
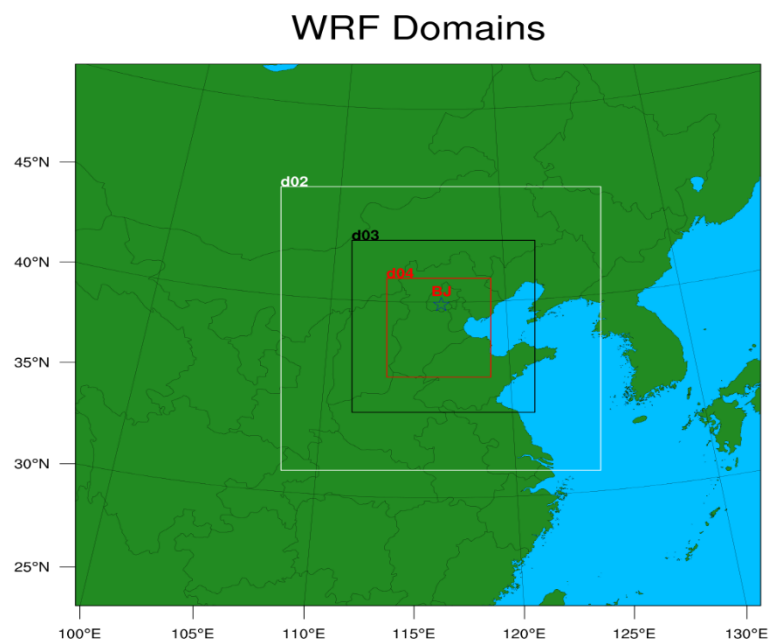
Fig. S1. WRF Domains 1, 2, 3 and 4.
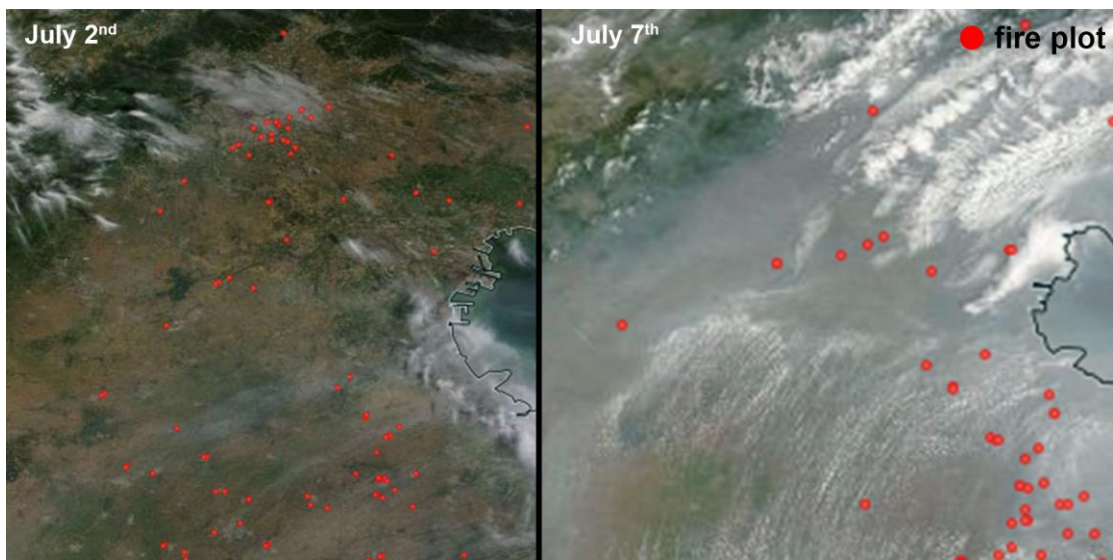
Fig. S2. Fire plots in the NCP in July 2 and July 7 from EOSDIS Worldview.
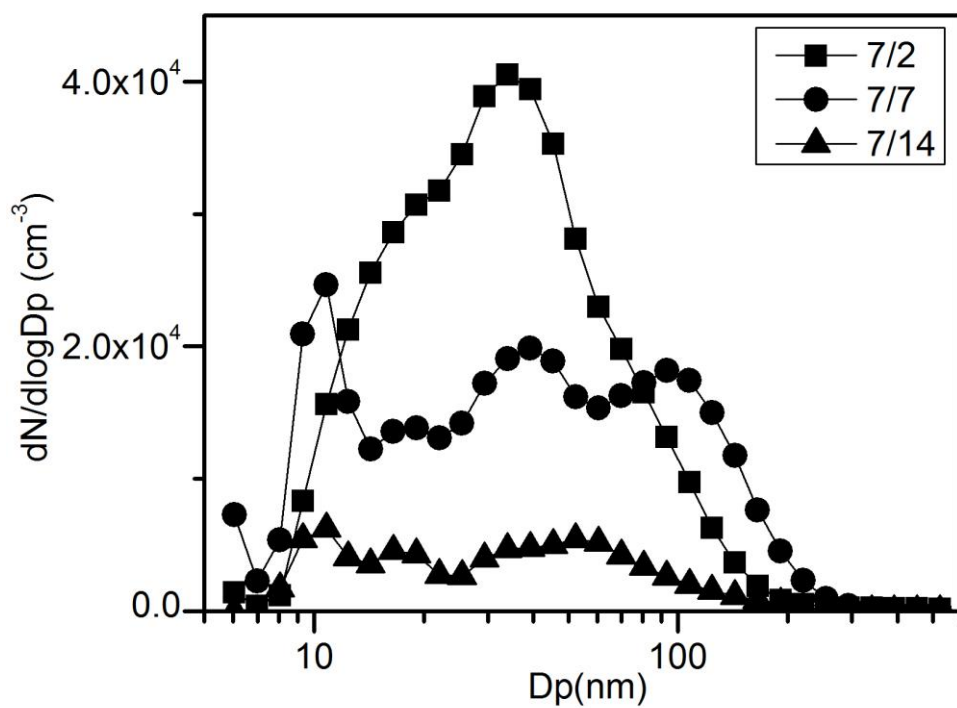
Fig. S3. Particle number size distributions of the plumes in July 2, July 7 and July 14.
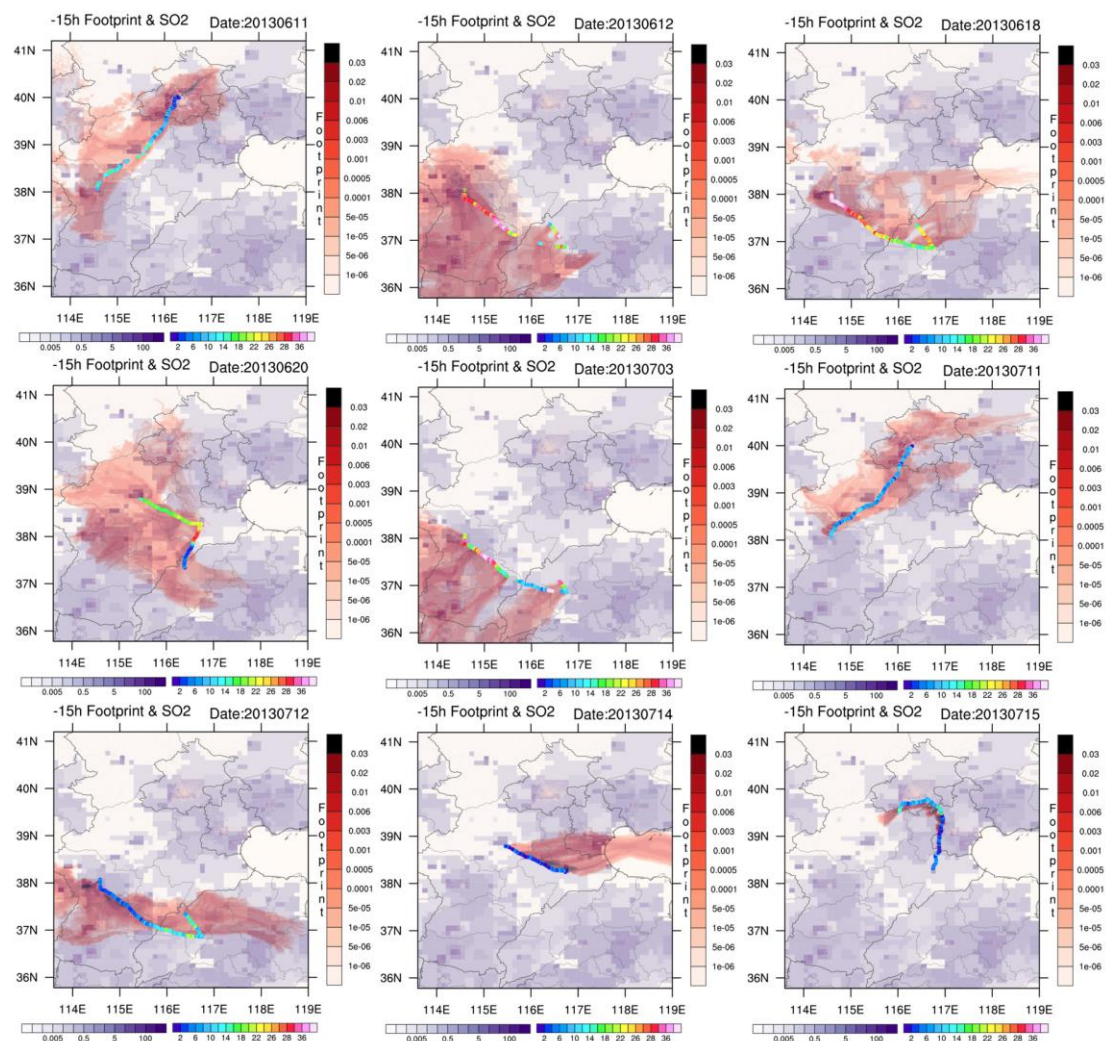
Fig. S4. The back trajectories of observed air masses in June 11, June 12, June 18, June 20, July 3, July 11, July 12, July 14 and July 15.
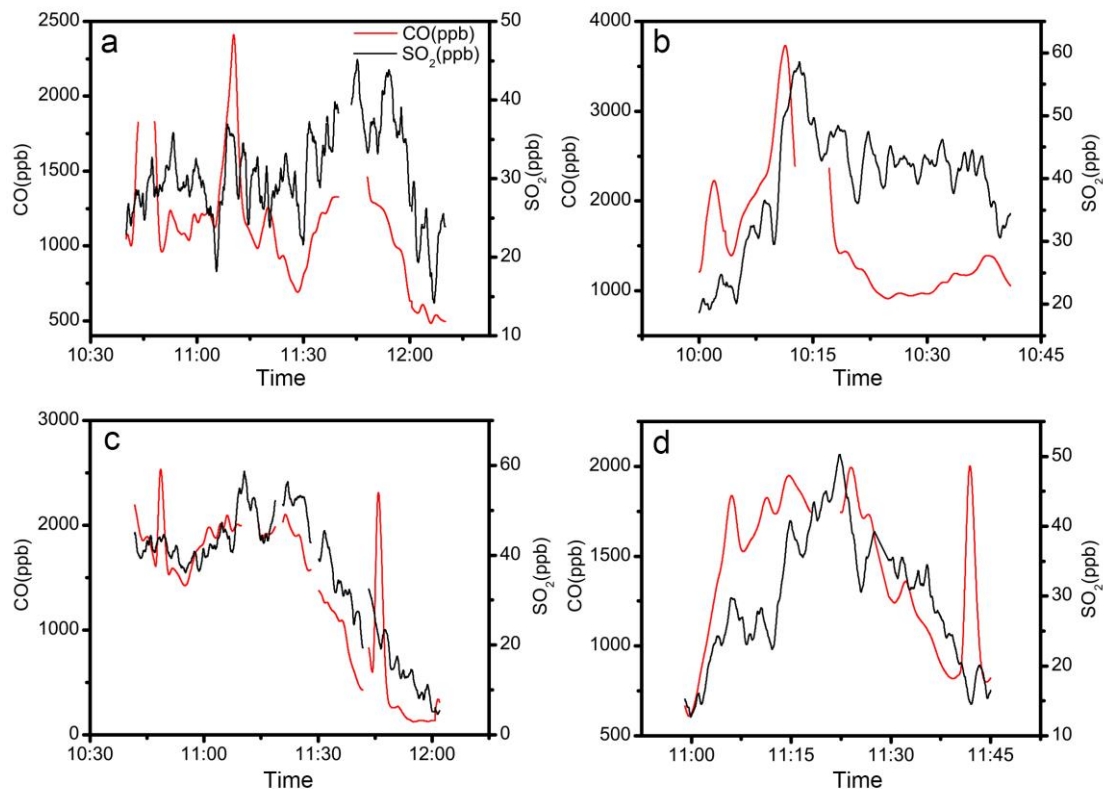
Fig. S5. Temporal distributions of concentrations of CO and SO$_2$ near Shijiazhuang in June 12 (a), June 18 (b), June 25 (c) and July 3 (d) .

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.