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Retrieving tropospheric NO_2 vertical column densities around the city of Beijing and estimating NO_x emissions based on car MAX-DOAS measurements

Xinghong Cheng et al.

Correspondence to: Xinghong Cheng (cxingh@cma.gov.cn) and Jianzhong Ma (majz@cma.gov.cn)

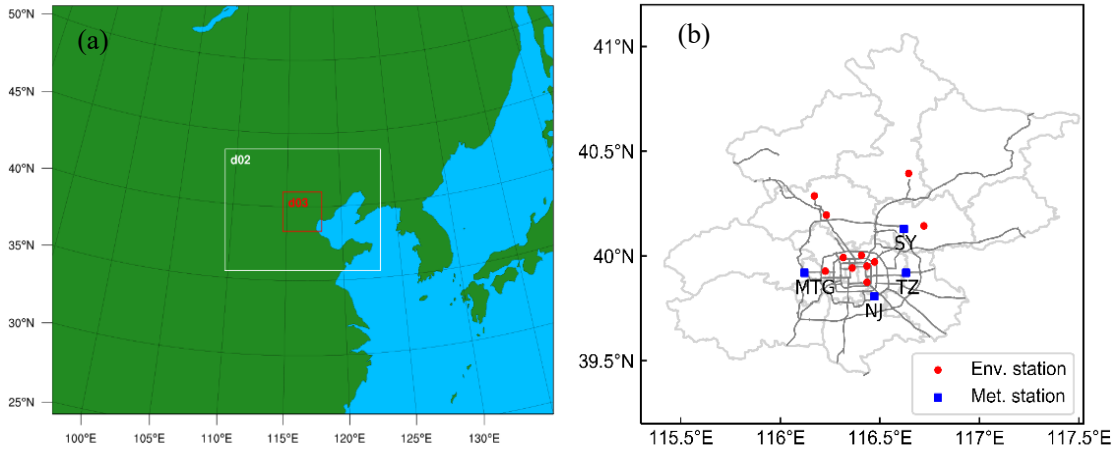

Figure S1. Triple-nested domains of **(a)** the LAPS-WRF-CMAQ model system and **(b)** the distribution of meteorological/environmental monitoring stations.

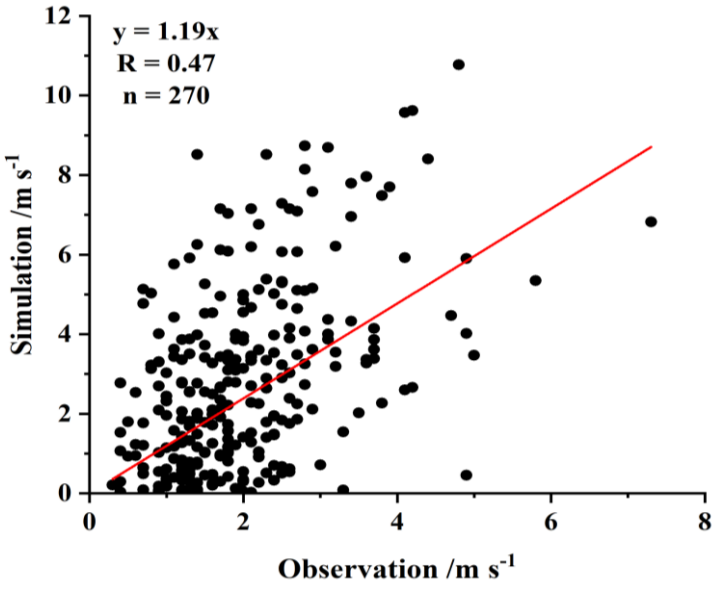

Figure S2. Scatterplot of simulated wind speed and observations at four stations in Beijing. The standard deviation of the slope is 0.002.

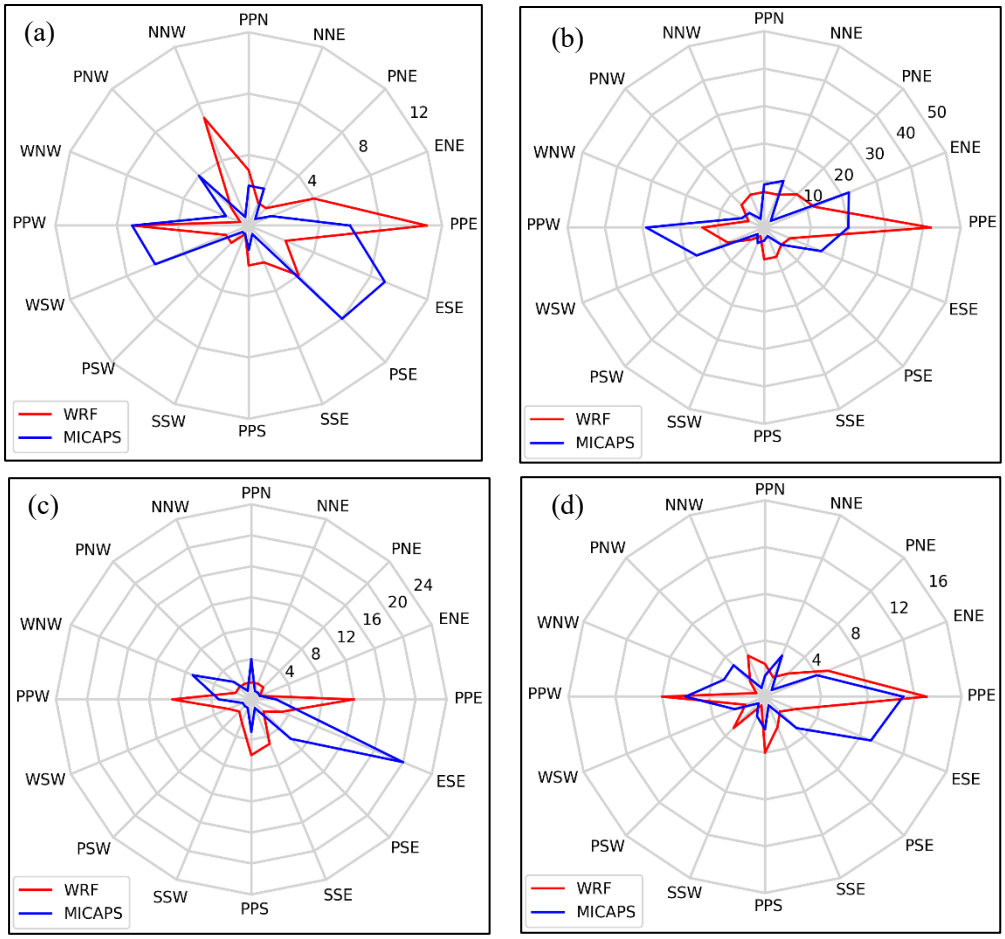

Figure S3. Wind rose of simulated wind direction and observations from MICAPS datasets at **(a)** TZ, **(b)** NJ, **(c)** MTG, and **(d)** SY station in Beijing.

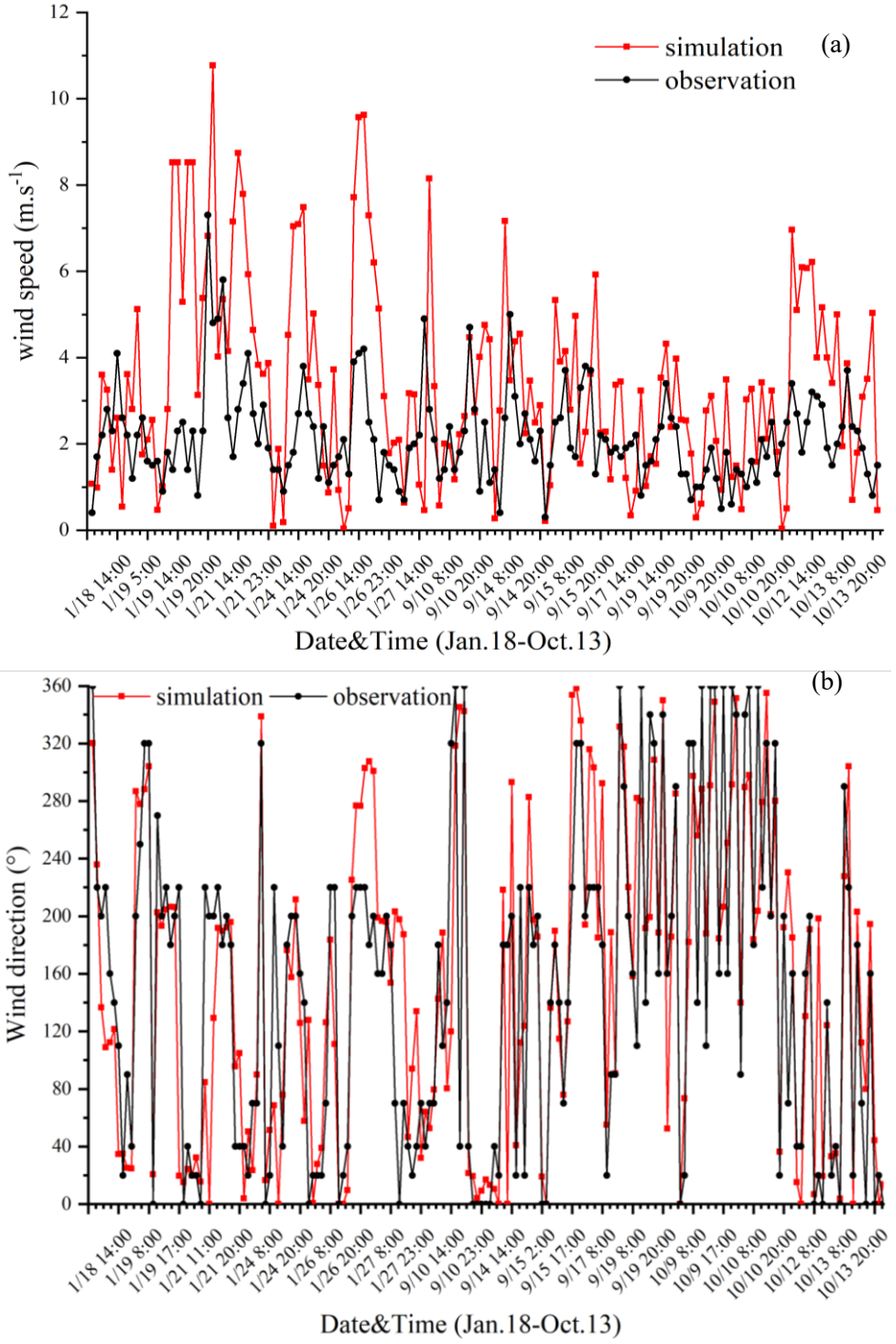

Figure S4. Time serial of simulated **(a)** wind speed and **(b)** direction, and observations during car MAX-DOAS experiments at four weather stations in Beijing.

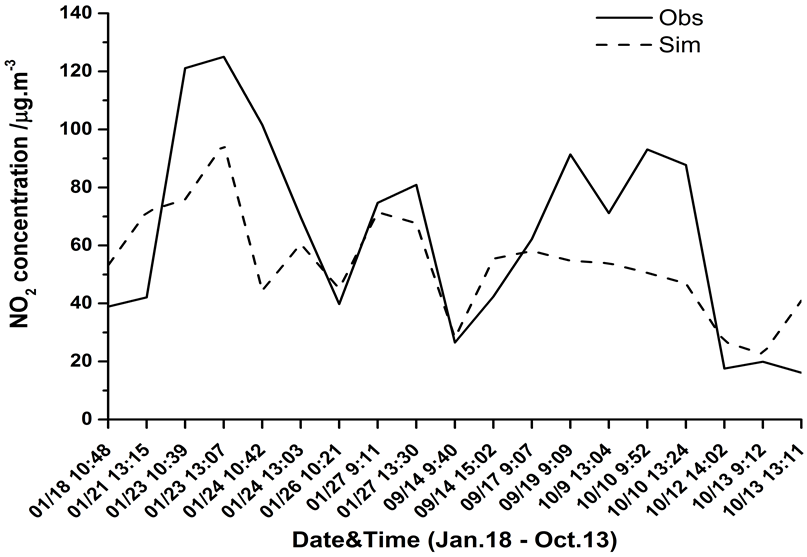

Figure S5. Time series of regional average simulation and in situ observation of NO_2 concentration at 12 stations in Beijing.

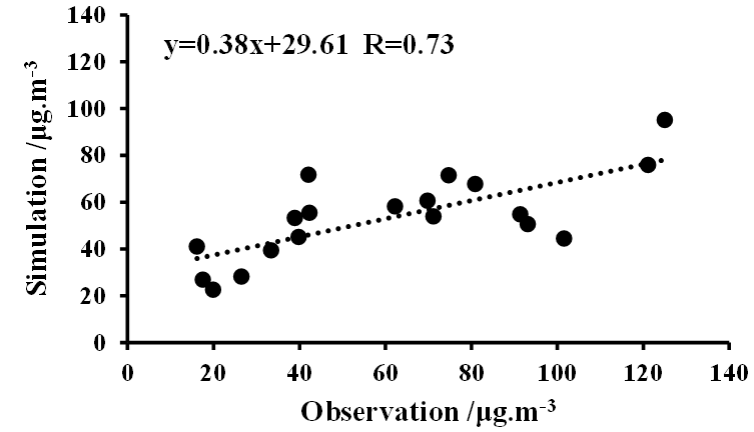

Figure S6. Scatter plot between regional average simulation and observation of NO_2 concentration at 12 stations in Beijing.

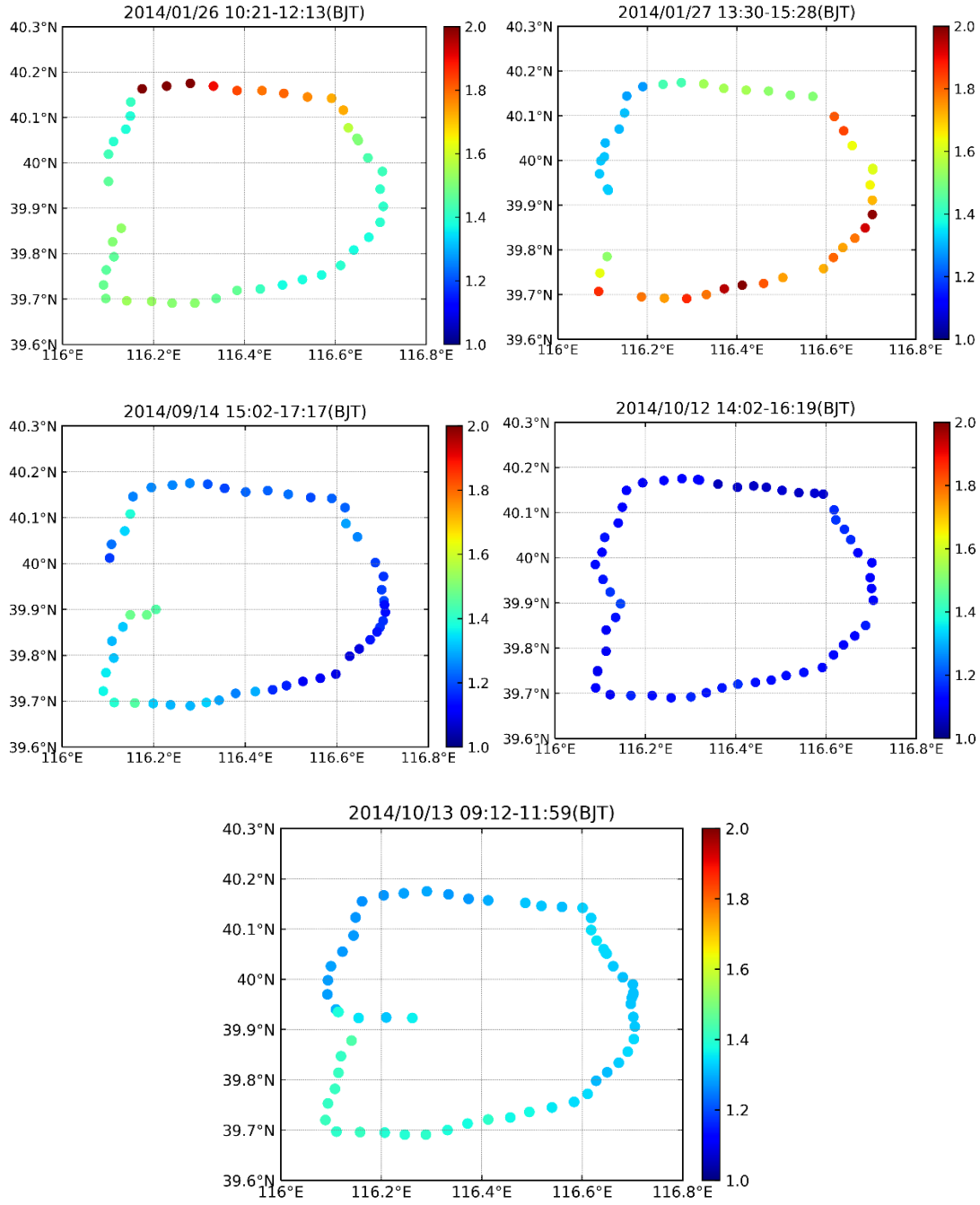

Figure S7. Distributions of the ratio of NOx and NO_2 on the 6th Ring Rd of Beijing during five journeys.

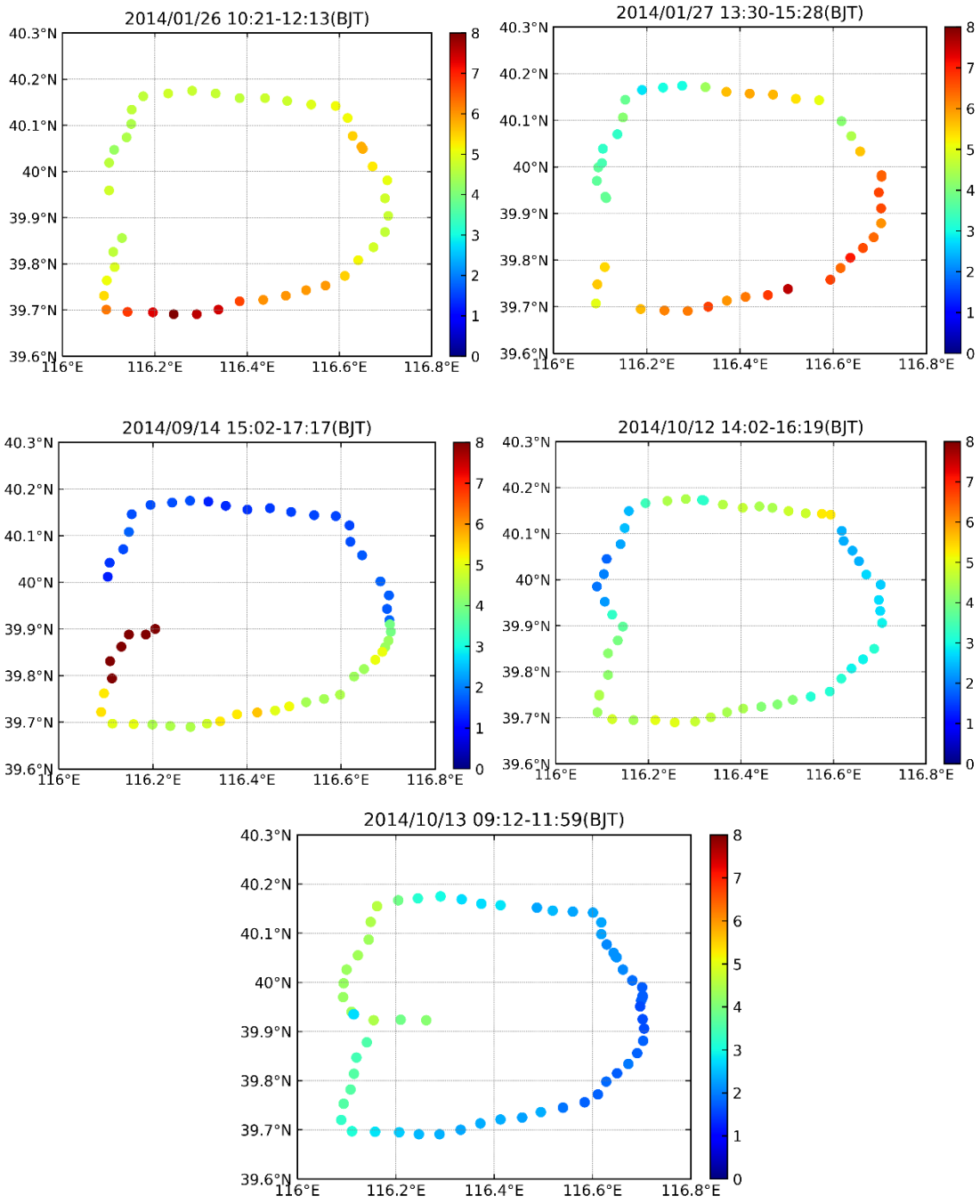

Figure S8. Same to figure S7, except for the lifetime of NOx (h).

Table S1. Four types of monthly E_{NOX} from the MEIC inventory within the 6th Ring Rd of Beijing in January, September, and October 2012, and the ratio of E_{NOX} in Jan. to the average in Sep. and Oct.

	industry	power	resident	transport	total
January	5.78	1.92	1.39	3.94	13.02
September	4.06	1.15	0.25	3.93	9.40
October	4.03	0.93	0.26	3.93	9.15
Ratio	1.43	1.84	5.43	1.00	1.40