# Impacts of short-term mitigation measures on PM$_{2.5}$ and radiative effects: a case study from a regional background site near Beijing, China

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**Table S1.** Linear regression ($y = a + bx$) between the observed and PMF-predicted mass concentrations of each chemical species in $PM_{2.5}$.

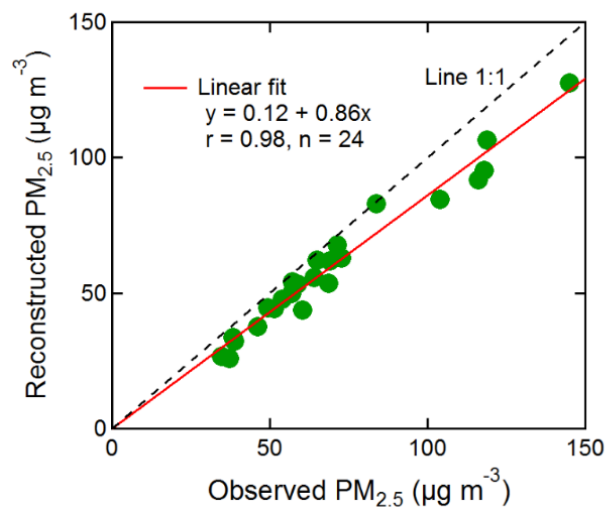| Species | Intercept | Slope | r |
|---|---|---|---|
| OC | 0.92 | 0.88 | 0.97 |
| EC | -0.05 | 1.01 | 0.98 |
| $Cl^-$ | 0.54 | 0.67 | 0.96 |
| $NO_3^-$ | -0.10 | 0.99 | 0.98 |
| $SO_4^{2-}$ | 0.33 | 0.89 | 0.88 |
| $NH_4^+$ | 0.002 | 0.99 | 0.99 |
| $K^+$ | -0.001 | 1.00 | 0.99 |
| Al | 0.11 | 0.72 | 0.75 |
| Si | 0.09 | 0.88 | 0.97 |
| Ca | -0.002 | 1.00 | 0.99 |
| Ti | 0.005 | 0.83 | 0.87 |
| Cr | 0.002 | 0.75 | 0.76 |
| Mn | 0.003 | 0.94 | 0.95 |
| Fe | 0.02 | 0.98 | 0.99 |
| Cu | 0.007 | 0.78 | 0.84 |
| Zn | 0.0004 | 0.99 | 0.99 |
| As | 0.001 | 0.54 | 0.68 |
| Br | 0.003 | 0.49 | 0.80 |
| Pb | 0.01 | 0.86 | 0.90 |

**Figure S1.** Scatter-plot of the reconstructed and observed PM$_{2.5}$ mass concentrations.
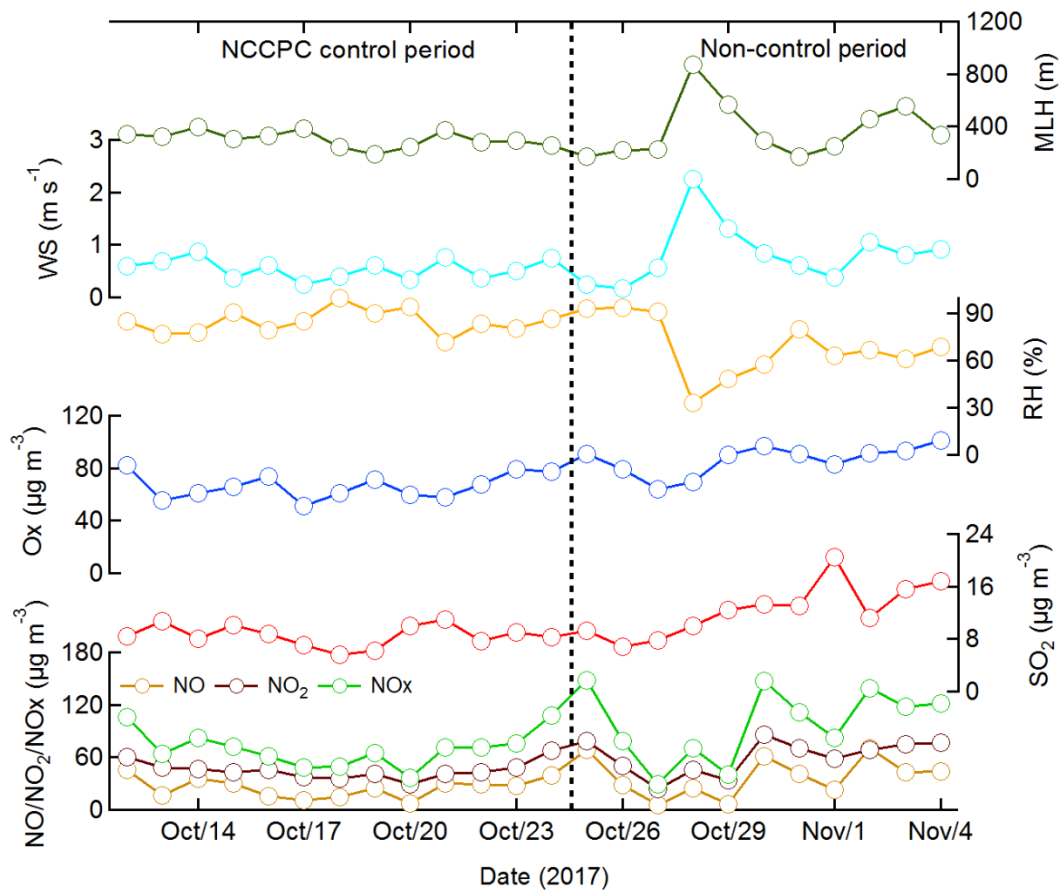
**Figure S2.** Daily variations of the concentrations of NOx (NO + NO$_2$), SO$_2$, Ox (NO$_2$ + O$_3$), relative humidity (RH), wind speed (WS), and mixed layer height (MLH).
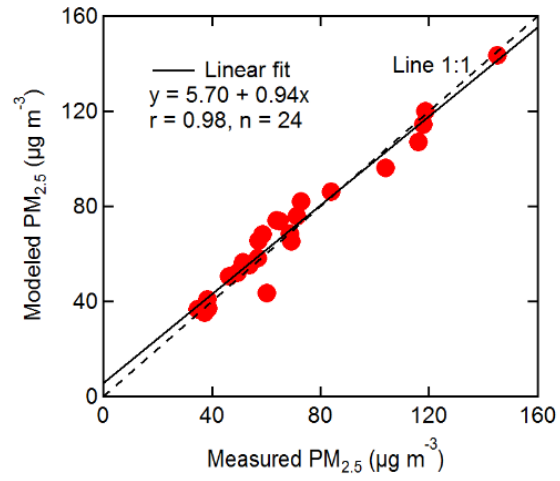
**Figure S3.** Relationship between the mass concentrations of PM$_{2.5}$ estimated from the positive factorization model and the measured values.
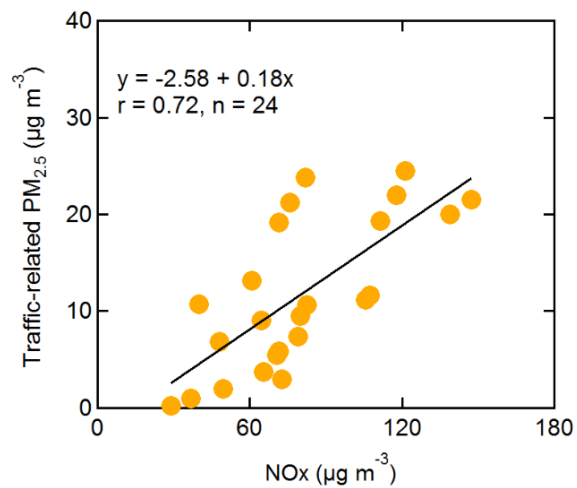
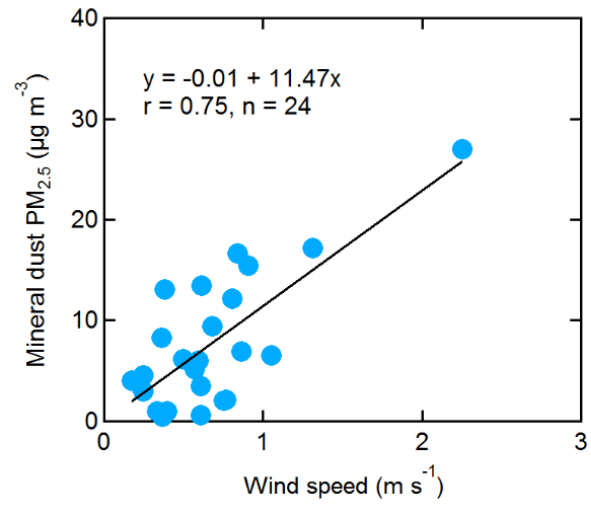**Figure S4.** Relationship between the traffic-related PM$_{2.5}$ mass concentration and the NOx concentration.

**Figure S5.** Relationship between the $PM_{2.5}$ mass concentration from mineral dust and wind speed.
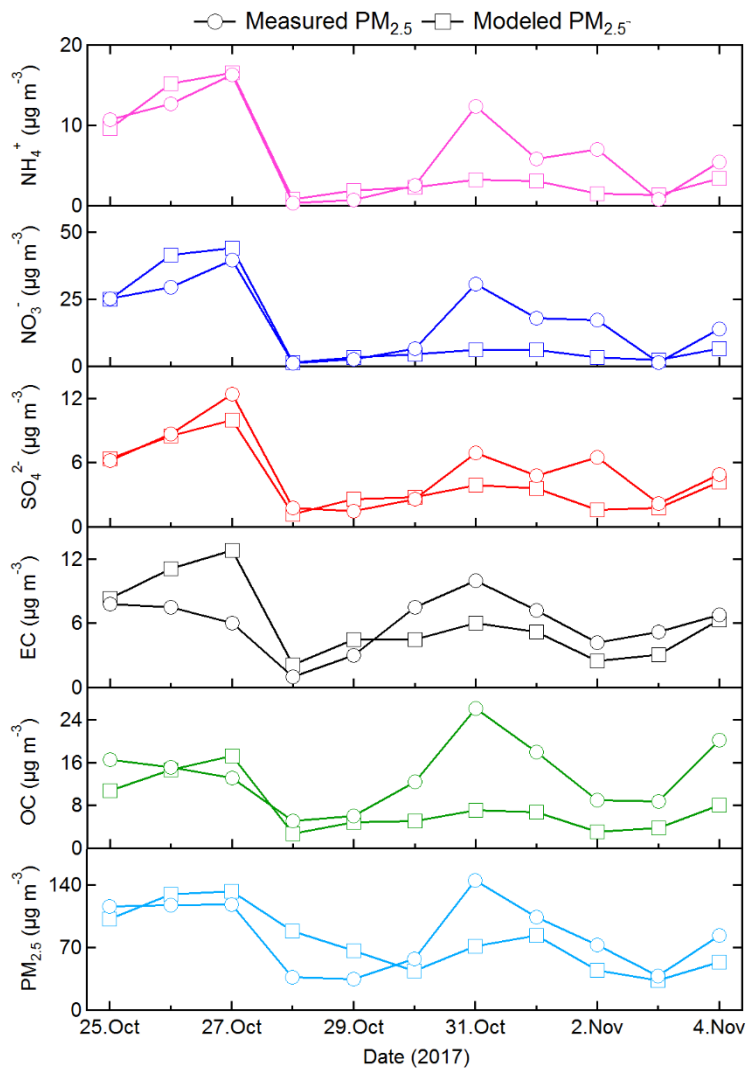
**Figure S6.** Daily variations of the measured mass concentrations of $PM_{2.5}$, organic carbon (OC), elemental carbon (EC), $SO_4^{2-}$, $NO_3^-$, and $NH_4^+$ and their simulated values by the WRF-Chem model.
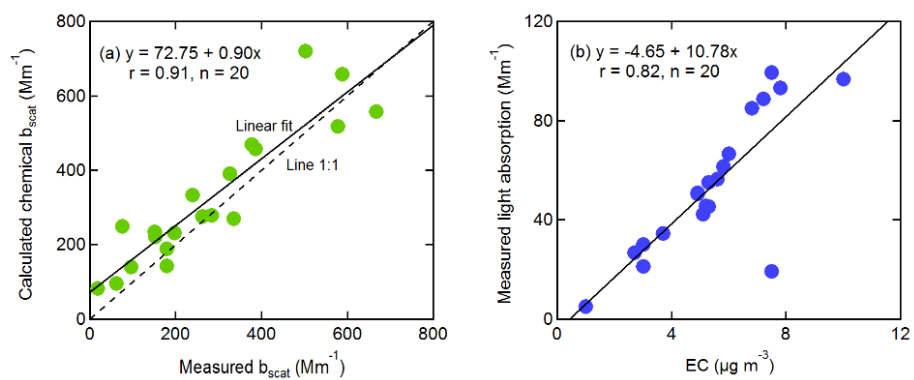
**Figure S7.** Scatter-plots of (a) the calculated chemical light scattering coefficient ($b_{scat}$) and measured $b_{scat}$ and (b) the measured light absorption coefficient and elemental carbon (EC).
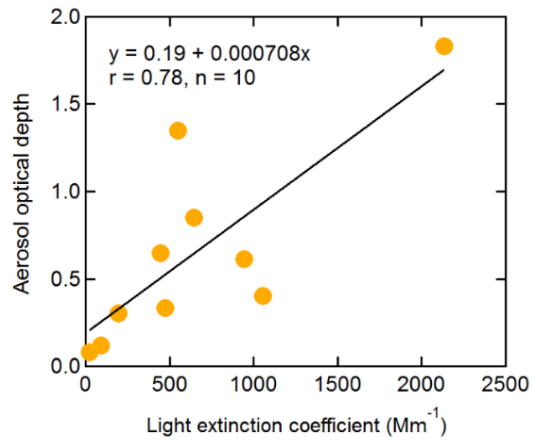
**Figure S8.** Aerosol optical depth versus light extinction coefficient during the campaign.