

Supplement of Atmos. Chem. Phys., 18, 6241–6258, 2018
<https://doi.org/10.5194/acp-18-6241-2018-supplement>
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Supplement of

Detection of critical PM_{2.5} emission sources and their contributions to a heavy haze episode in Beijing, China, using an adjoint model

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Figure S1 illustrates comparisons of the adjoint sensitivity coefficients (red line with triangle symbols) and the finite difference results (blue line with circular symbols). For the finite difference tests, the primary PM_{2.5} sources are reduced by 5%, 10%, 20%, 30%, 50%, 70% and 90% accordingly, and the Y-axis indicates the decreased PM_{2.5} concentrations due to corresponding emission reductions. For the adjoint sensitivity results, Y-axis indicates the time cumulated adjoint sensitivity results summed over the entire simulation domain multiply by emission reduction ratios on the corresponding X-axis. According to the adjoint sensitivity coefficients defined in Section 3.1, Y-axis for the adjoint sensitivity results indicates the changes in PM_{2.5} concentration due to certain proportion of perturbations (on the X-axis) in primary PM_{2.5} emissions.

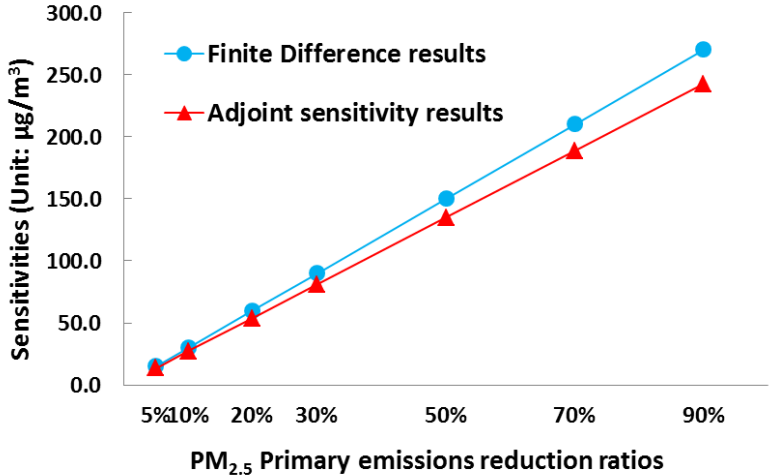


Figure S1. Comparisons of the adjoint sensitivity coefficients and the finite difference results for PM_{2.5} primary emission reduction ratios at 5%, 10%, 20%, 30%, 50%, 70% and 90% over simulation domain for the Nov. 21 05:00, 2012 PM_{2.5} peak.