Supplement of Geosci. Model Dev., 15, 199–218, 2022
https://doi.org/10.5194/gmd-15-199-2022-supplement

Geoscientific Model Development
Open Access

Supplement of

The sensitivity of simulated aerosol climatic impact to domain size using regional model (WRF-Chem v3.6)

Xiaodong Wang et al.

Correspondence to: Chun Zhao (chunzhao@ustc.edu.cn)

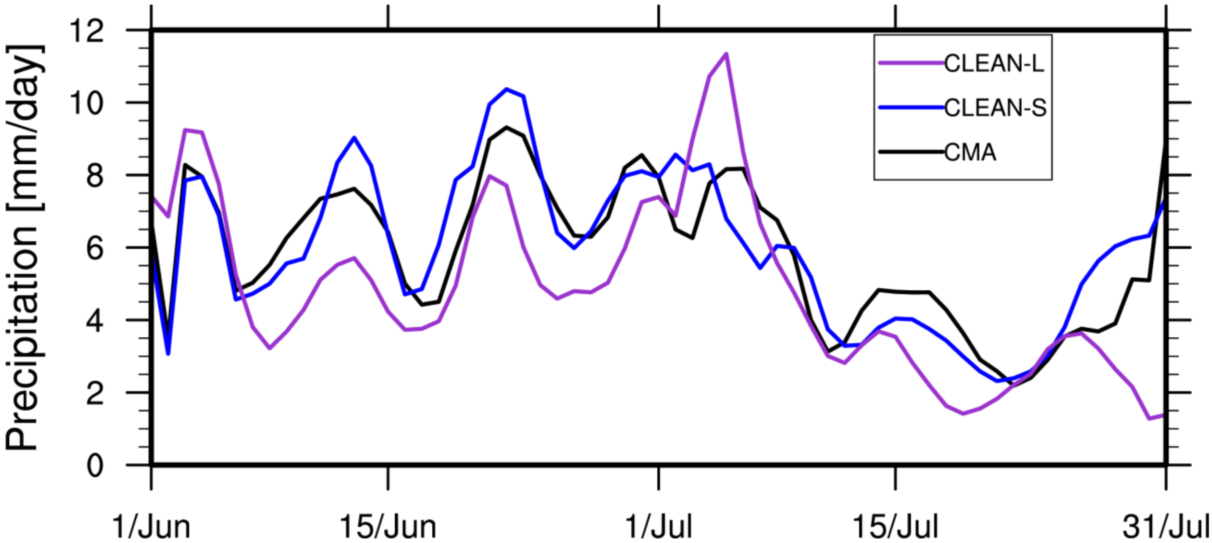

Figure S1. Daily mean time series of precipitation (5-day moving average) in eastern China (20°N-42°N, 105°E-122°E). The simulated data are interpolated to the CMA stations by the nearest-neighbor method.

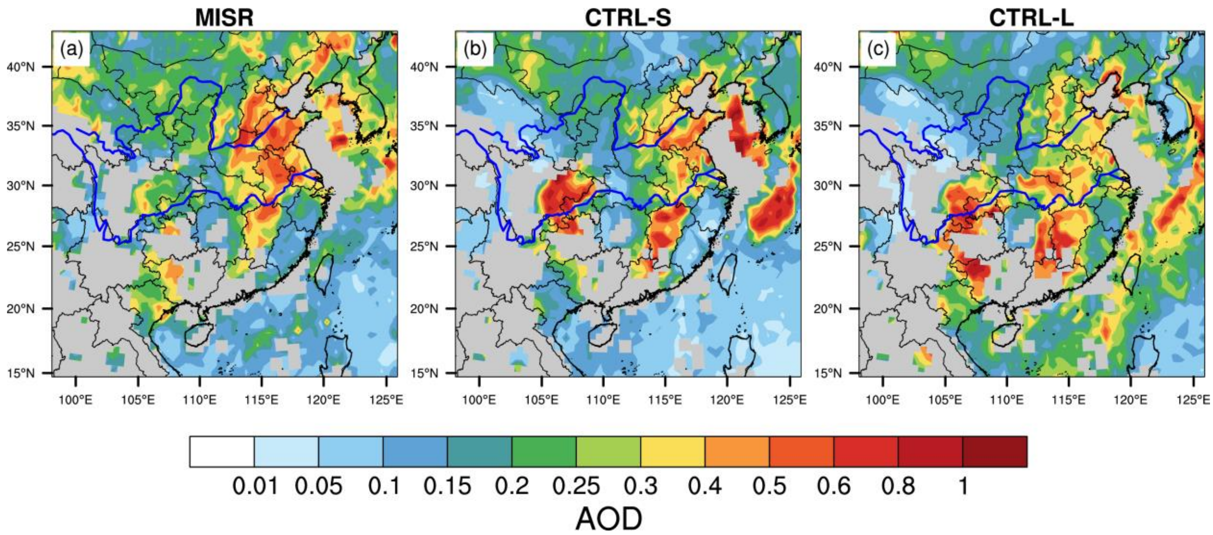

Figure S2 Two-month mean AOD from June to July 2017 from the (a) MISR, (b) CTRL-S and (c) CTRL-L simulation.

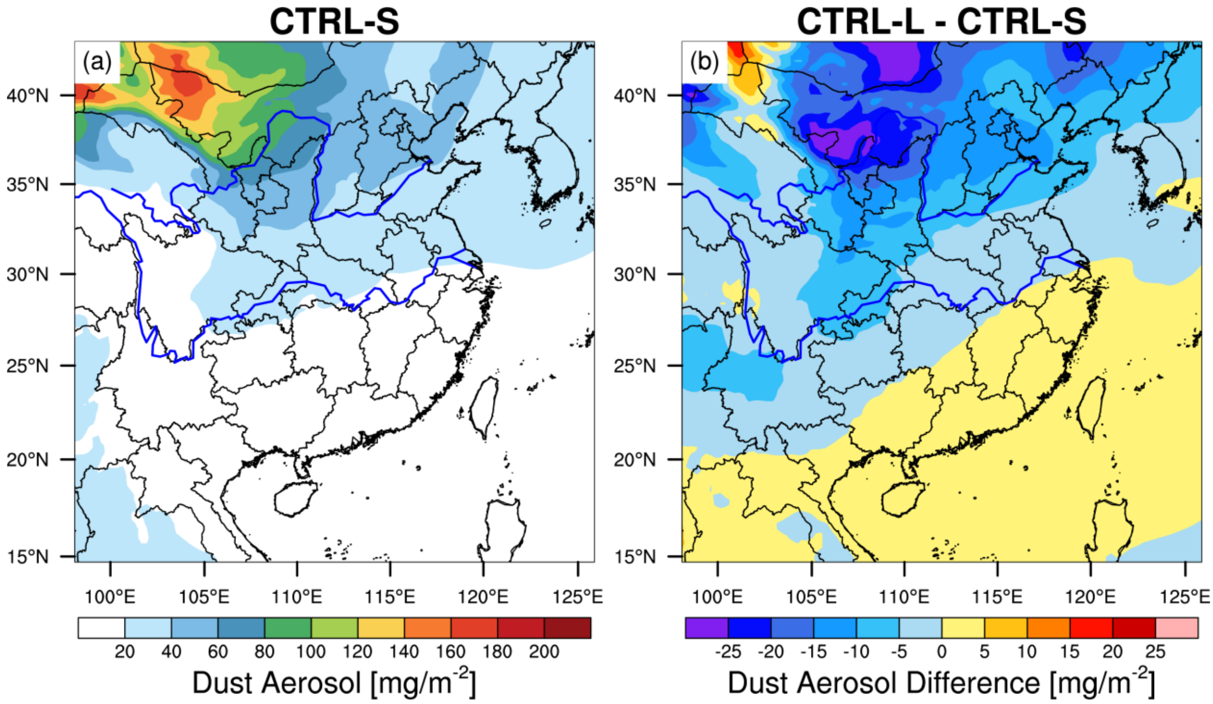

Figure S3. Spatial distributions of (a) column integrated total $PM_{2.5}$ dust concentration averaged for June and July of 2017 from the CTRL-S simulation, and (b) the difference between CTRL-L and CTRL-S.

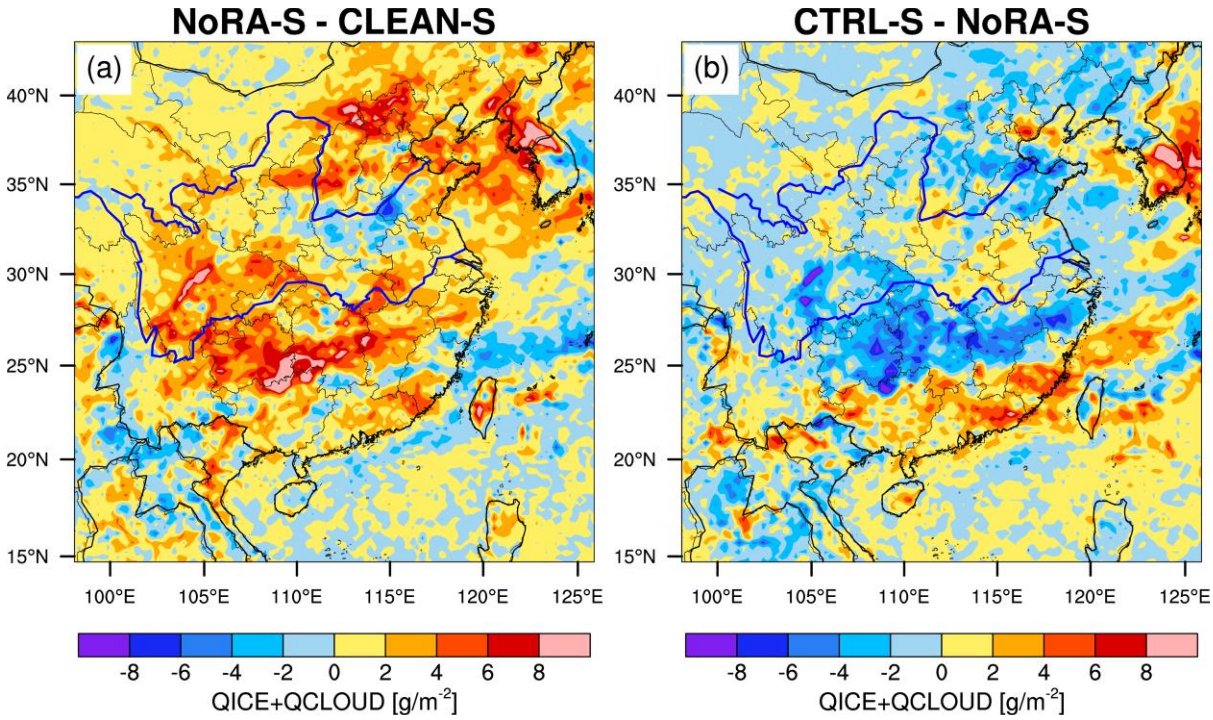

Figure S4. The spatial distributions of cloud amount changes due to (a) aerosol-cloud interactions and (b) aerosol-radiation interactions, respectively.

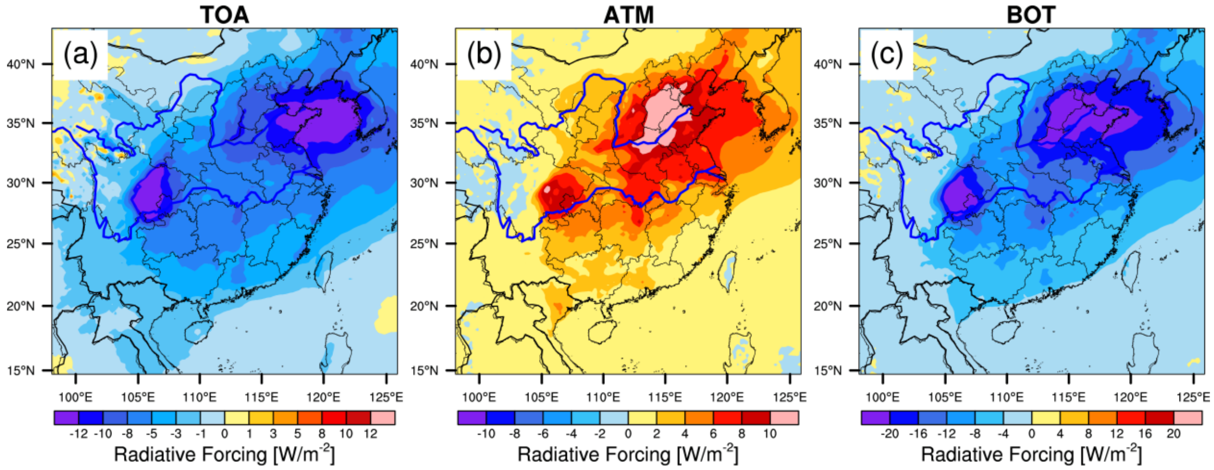

Figure S5. Spatial distributions of aerosol-induced changes of radiative forcing (a) at the top of atmosphere, (b) in the atmosphere and (c) at the bottom of atmosphere, averaged for June and July of 2017 from the small domain simulation.

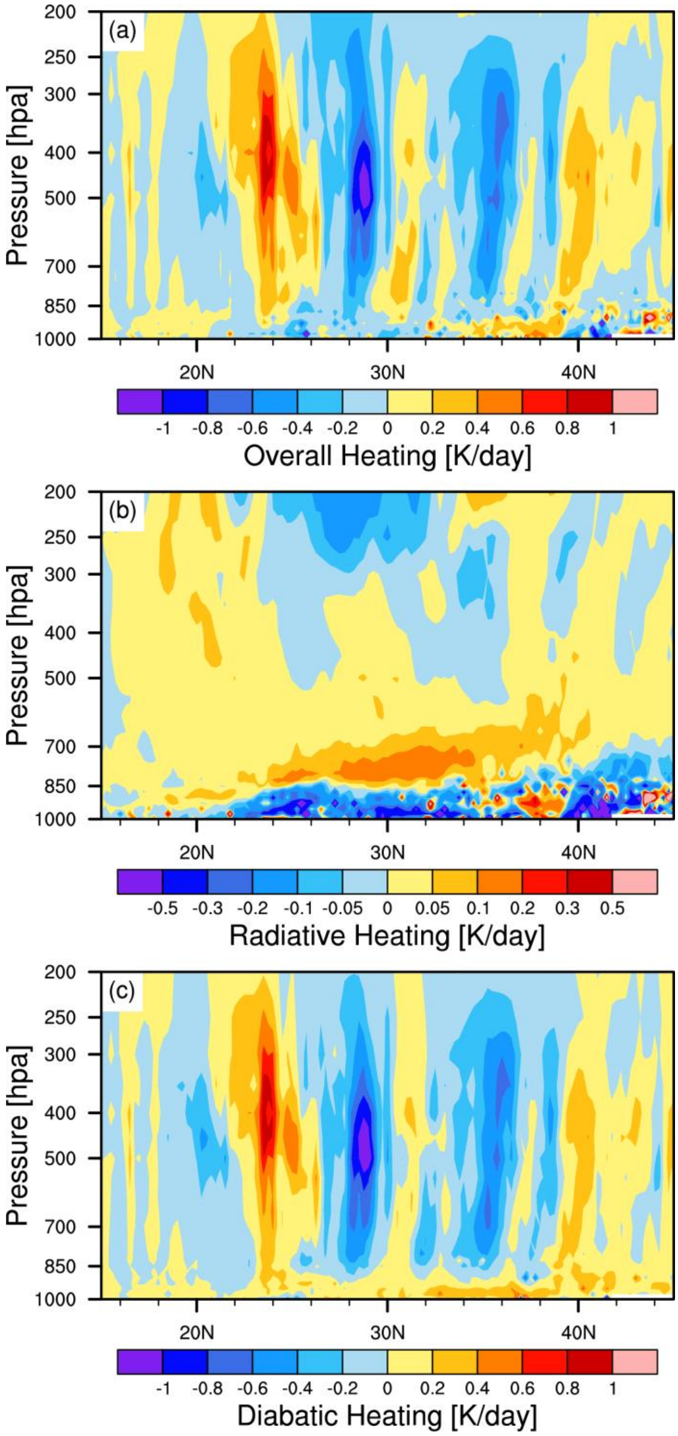

Figure S6. Aerosol induced (a) overall heating, (b) radiative heating, and (c) diabatic heating averaged between 105°E and 122°E for June and July of 2017 from the small domain simulation. The aerosol induced overall heating rate is defined as the aerosol induced changes of heating rate from cloud microphysics, convection, planetary boundary mixing, and radiation processes. The aerosol induced radiative heating rate is defined as the aerosol induced changes of heating rate from radiation and planetary boundary mixing processes. The aerosol induced diabatic heating rate is defined as the aerosol induced changes of heating rate from cloud microphysics and convection.

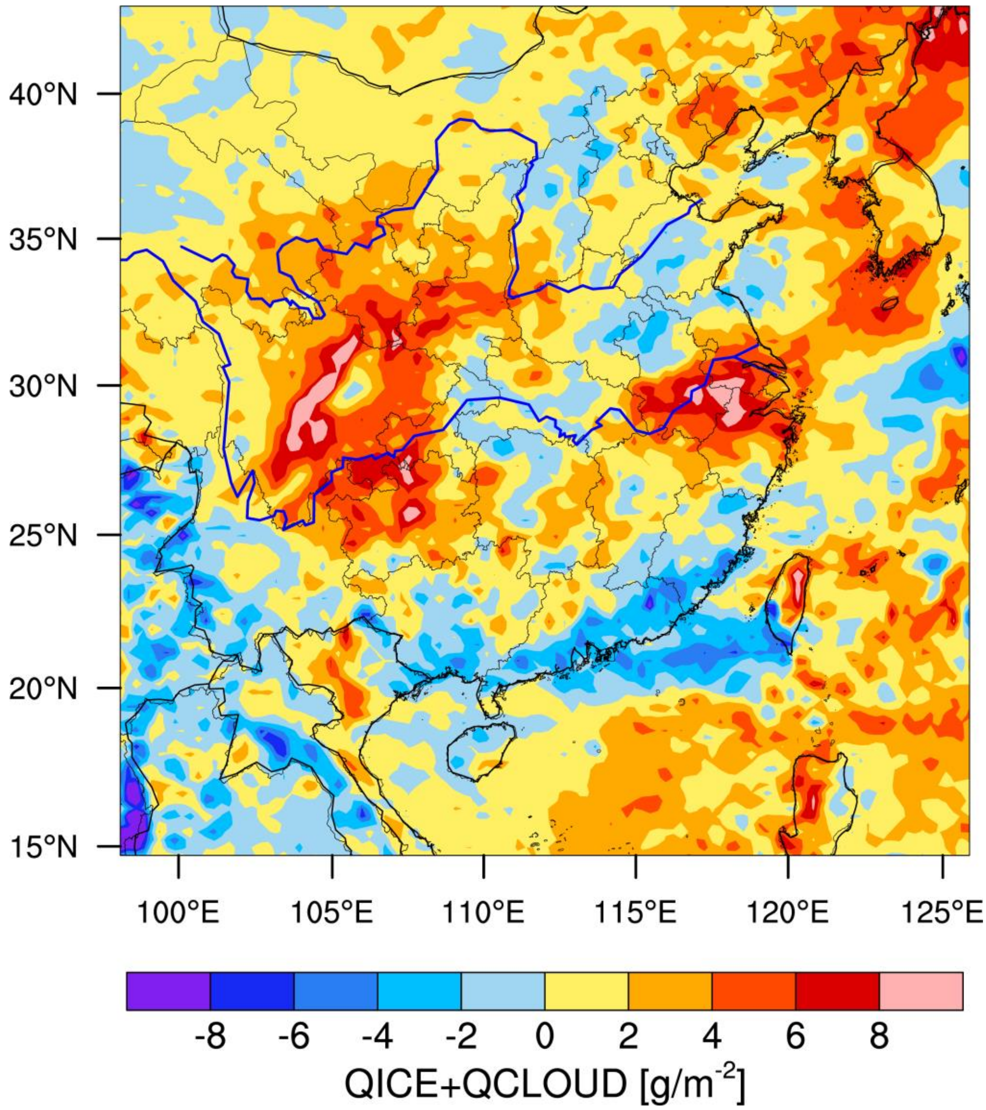

Figure S7. The aerosol-induced cloud amount changes average for June and July 2017 from the large domain simulation.

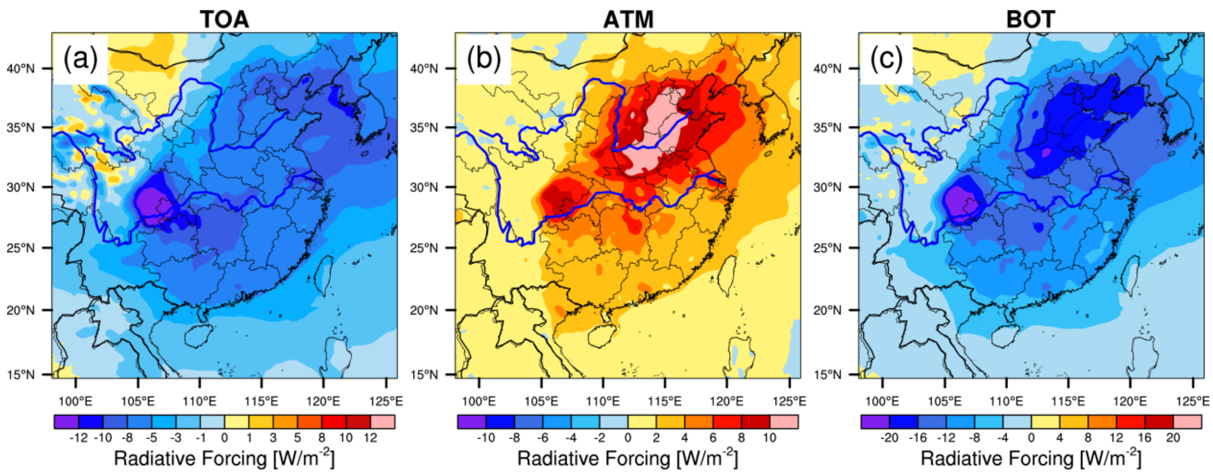

Figure S8. The spatial distributions of aerosol-induced radiative forcing changes of (a) at the top of atmosphere, (b) in the atmosphere and (c) at the bottom of atmosphere averaged for June and July 2017 from the large domain simulation.