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Supplement of

The impact of sea spray aerosol on photochemical ozone formation over eastern China: heterogeneous reaction of chlorine particles and radiative effect

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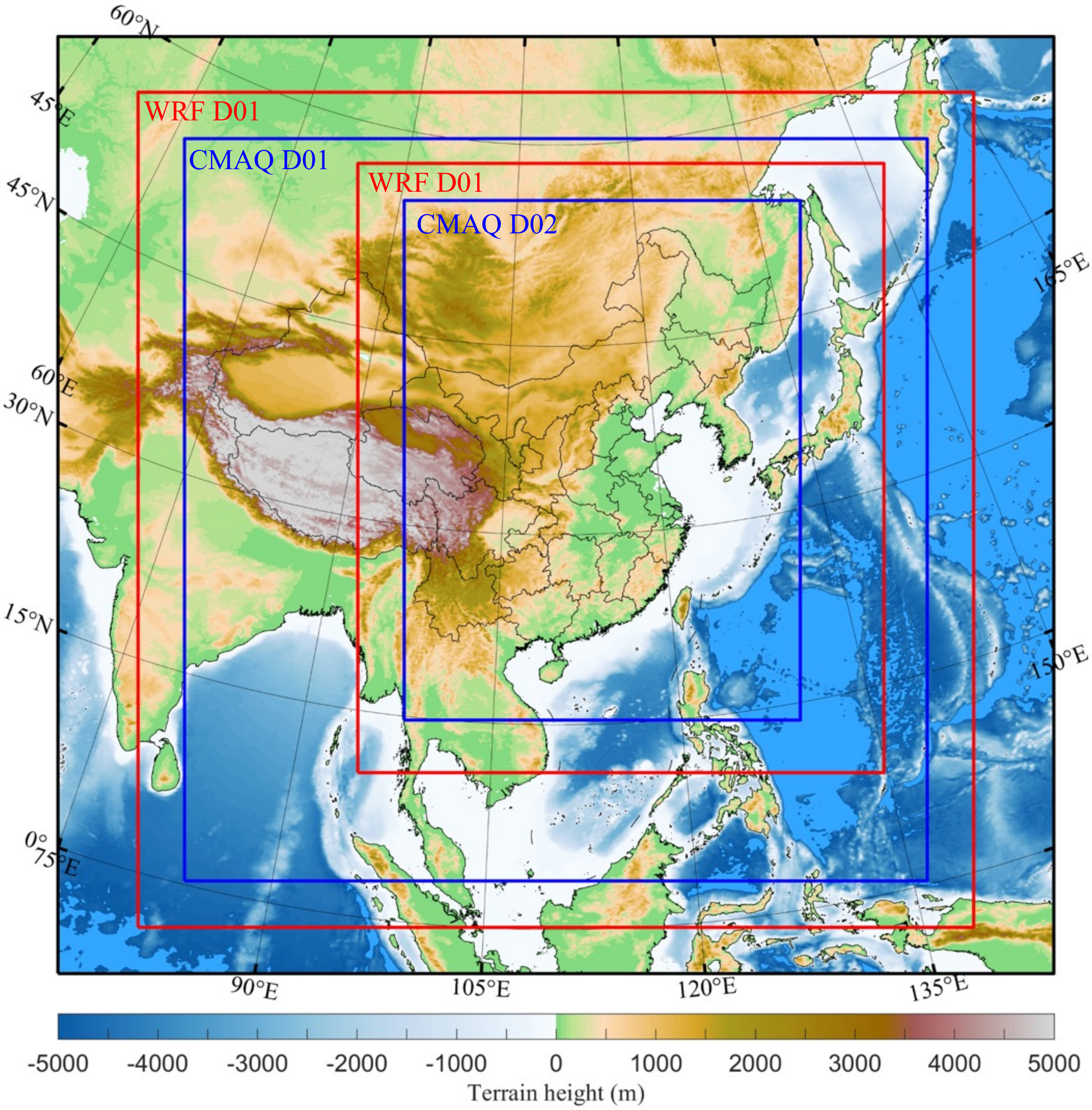

Figure S1: Model domains for the WRF (red box) and CMAQ (blue box) models.

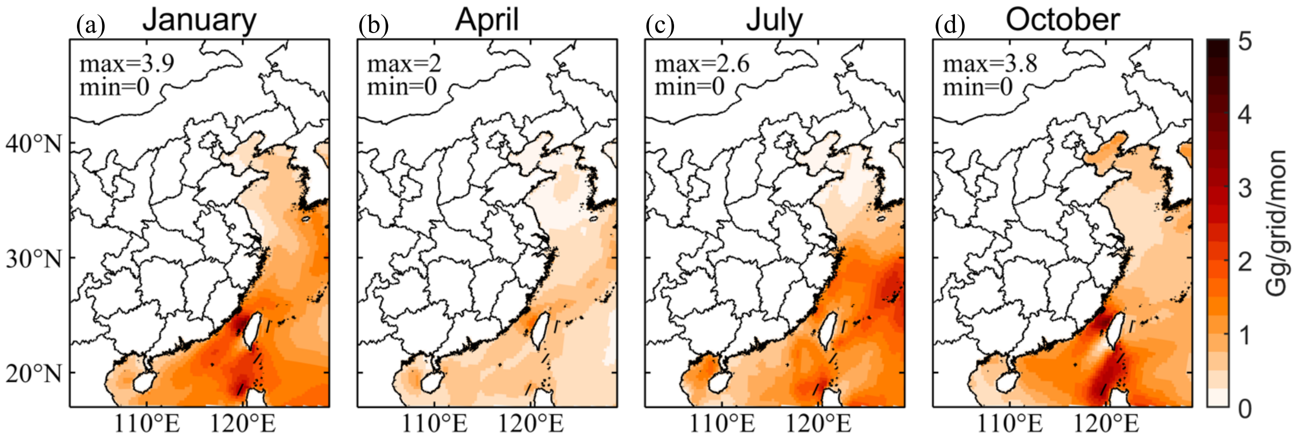

Figure S2: Spatial distributions of dry sea-spray aerosol emissions in January (a), April (b), July (c) and October (d), 2015.

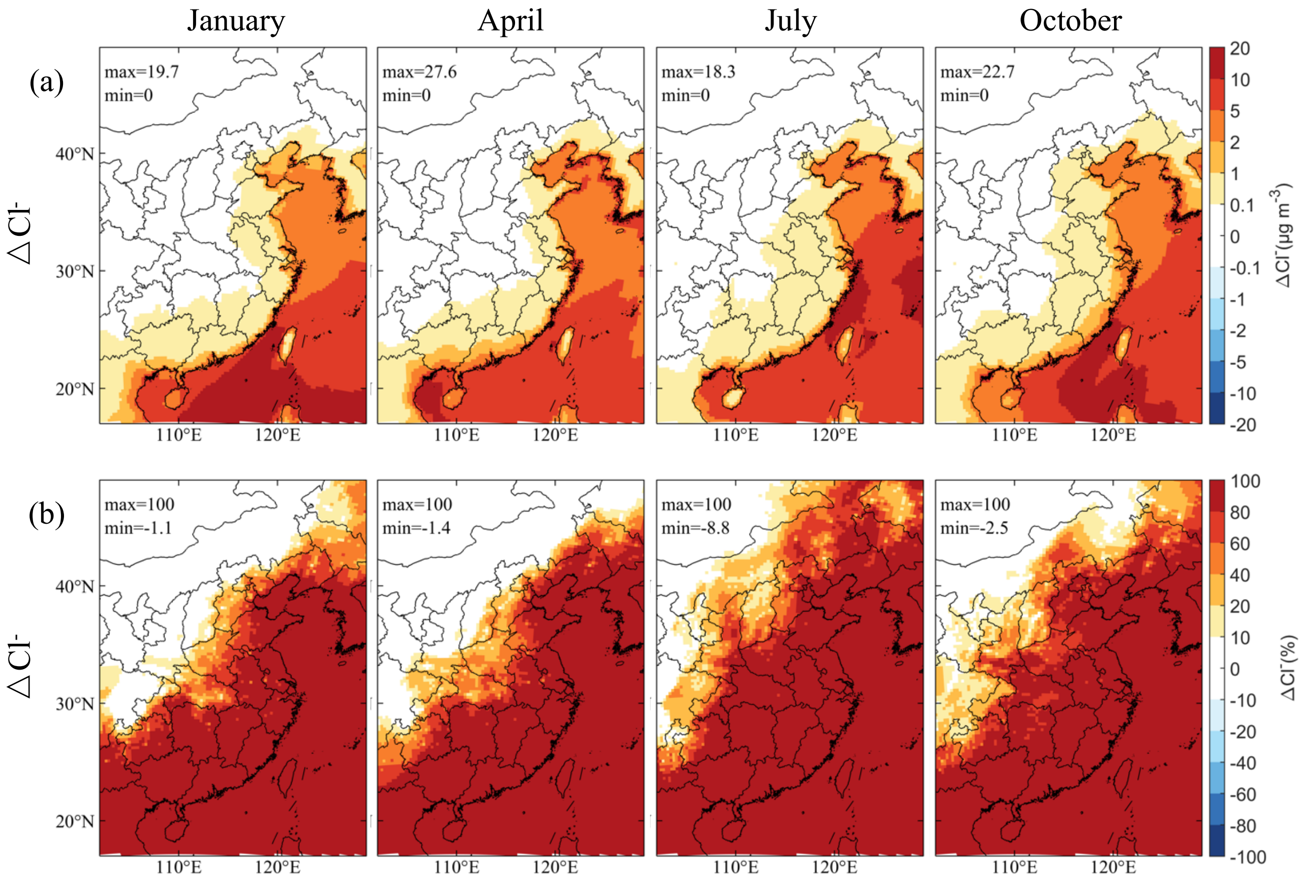

Figure S3: Spatial distribution of (a) changes and (b) percentage changes in simulated monthly mean concentrations of particulate Cl^- caused by SSA emissions (BASE minus NOSA) during January, April, July and October 2015.

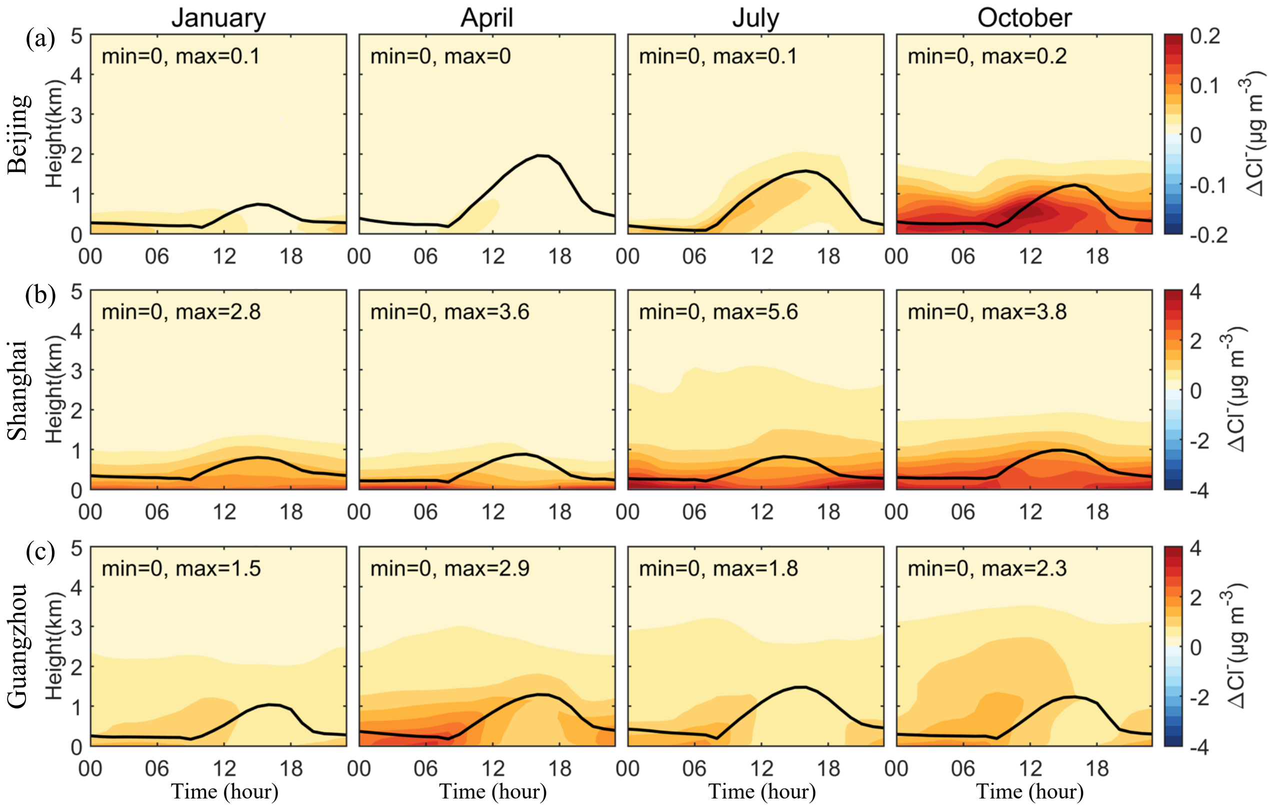

Figure S4: Vertical-diurnal variations of changes in simulated monthly mean concentrations of particulate Cl^- caused by SSA emissions (BASE minus NOSA) in (a) Beijing, (b) Shanghai, and (c) Guangzhou during January, April, July and October 2015.

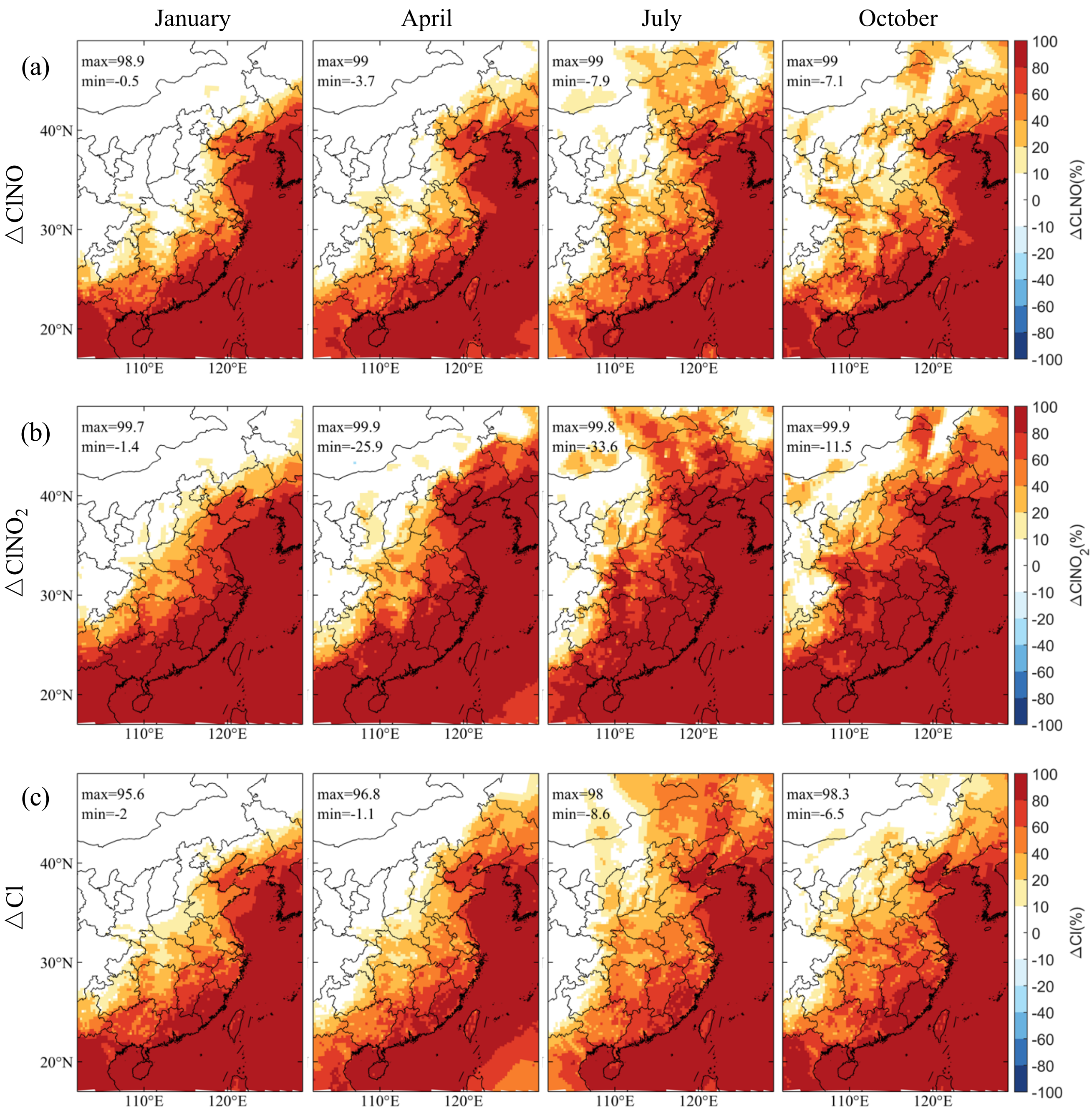

Figure S5: Percentage changes in simulated monthly mean concentrations of (a) ClNO and (b) $ClNO_2$ at 5:00 LST, and (c) daily mean Cl radicals caused by SSA emissions (BASE minus NOSA) during January, April, July and October 2015.

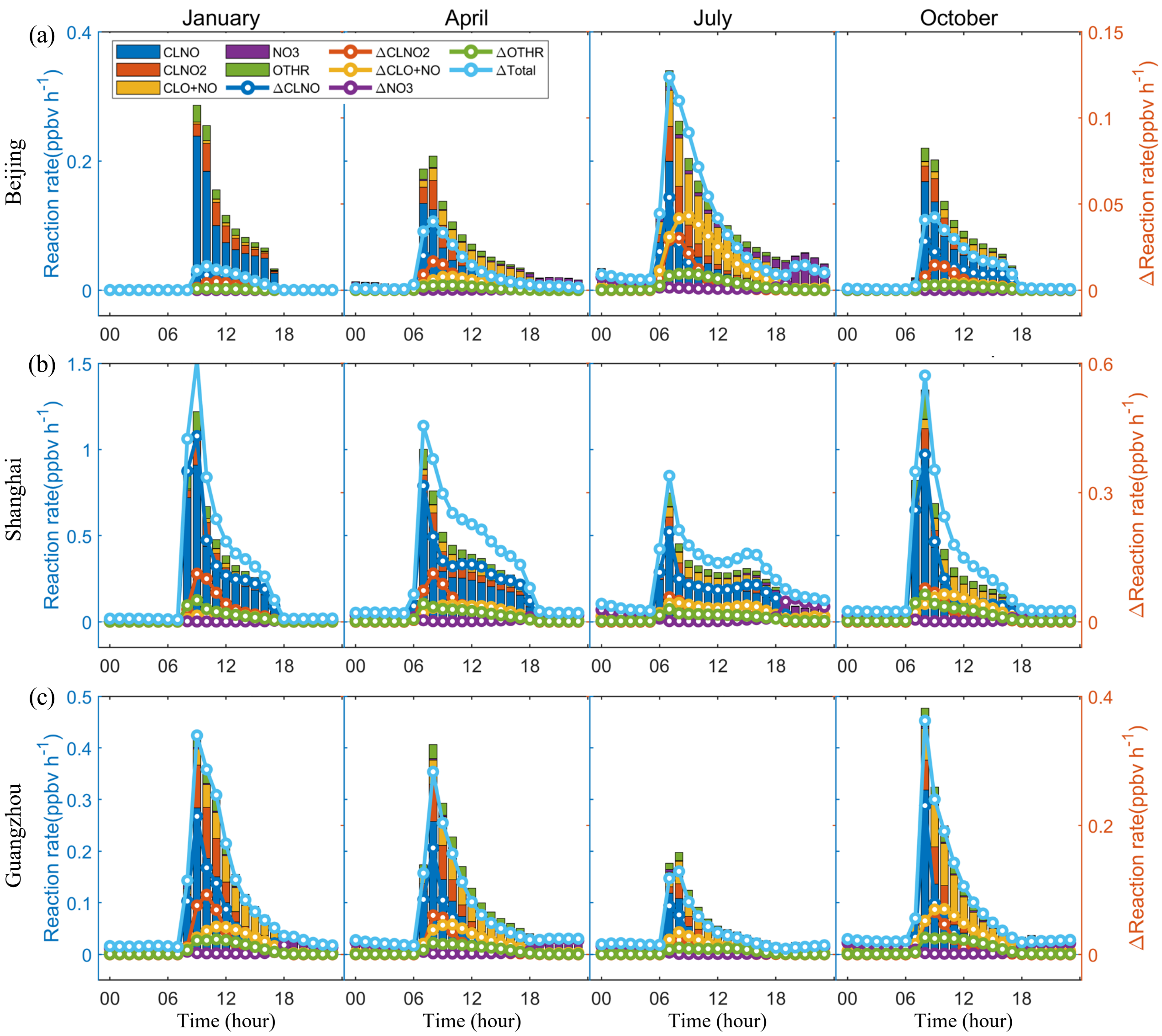

Figure S6: Contribution of different pathways to the Cl radical production and its changes caused by SSA (BASE minus NOSA) in (a) Beijing, (b) Shanghai, and (c) Guangzhou during January, April, July and October 2015. These pathways include ClNO photolysis (CLNO), $ClNO_2$ photolysis (CLNO2), reaction of ClO and NO (CLO+NO), heterogeneous reaction of particulate Cl- with NO_3 (NO3), and others (OTHR, including Cl_2 photolysis, reaction of HCl and OH, and etc.).

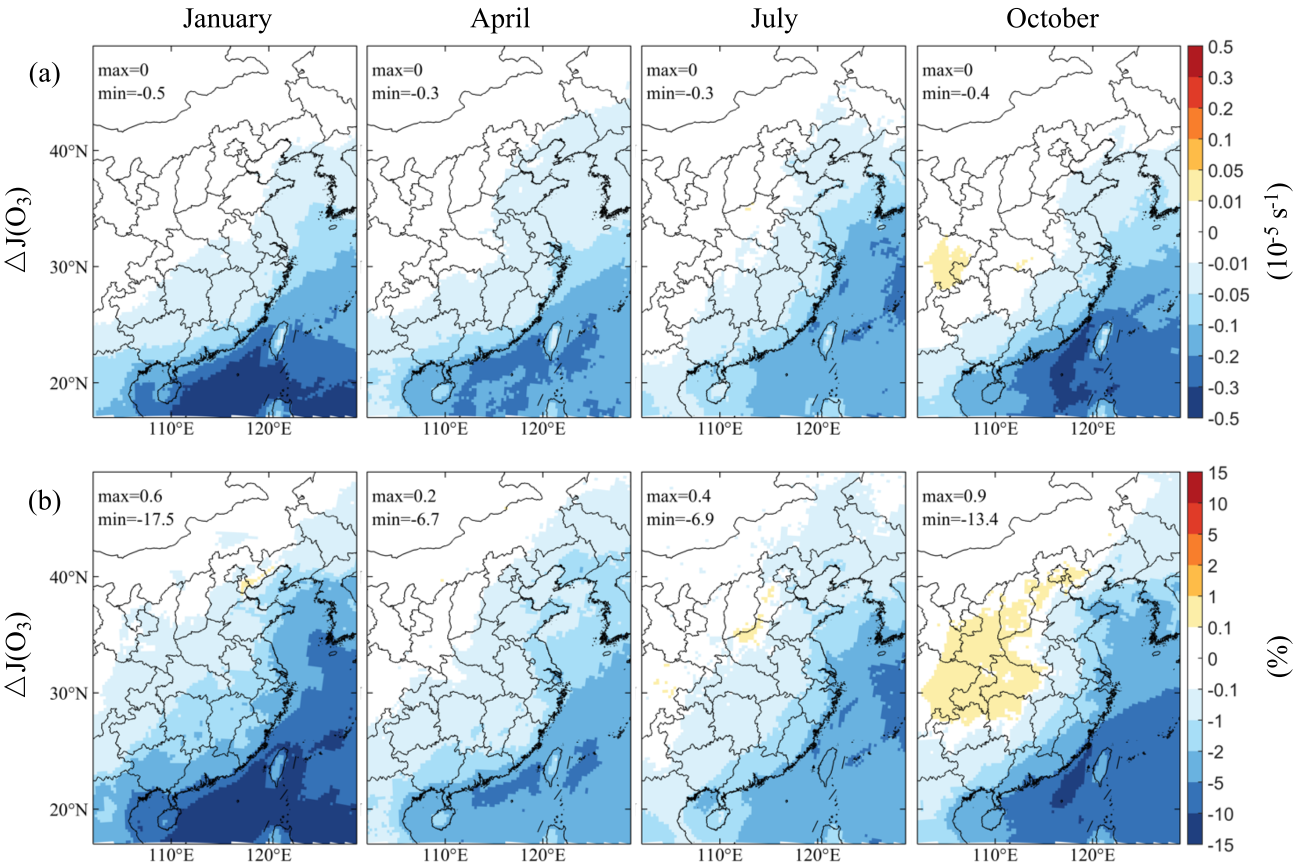

Figure S7: The same as Fig. S3 but for the simulated monthly mean photolysis rate of O3 (J(O3)) at 12:00 LST.

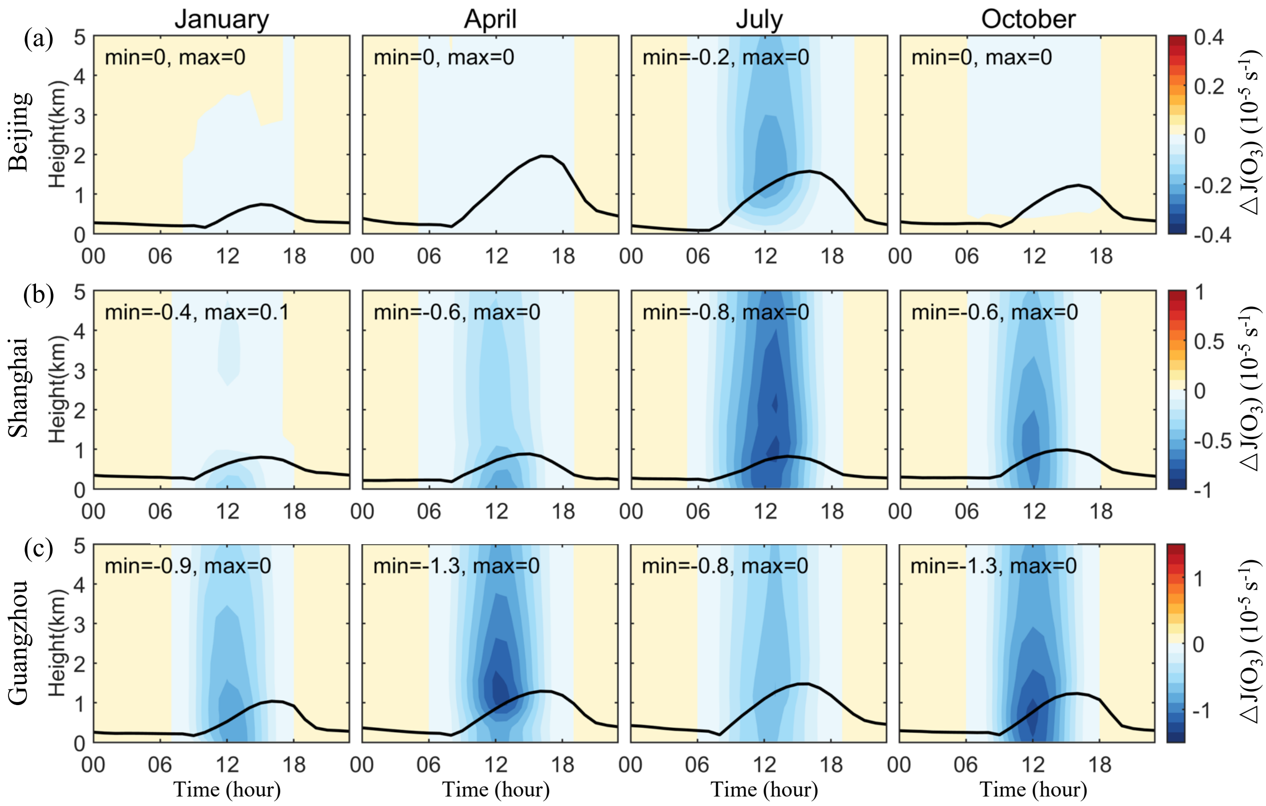

Figure S8: The same as Fig. S4 but for the simulated monthly mean photolysis rate of O_3 ($J(O_3)$).

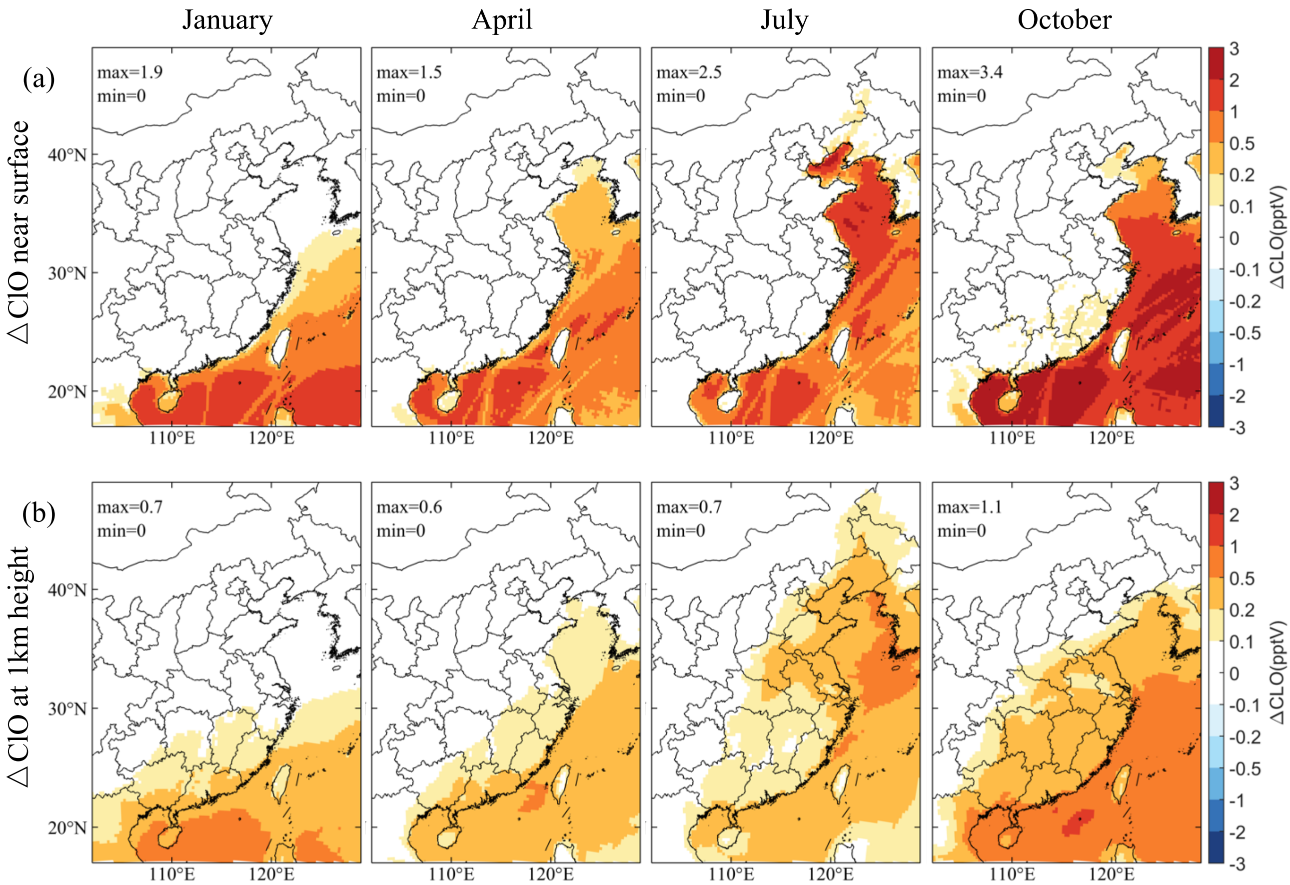

Figure S9: Spatial distribution of changes in simulated monthly mean concentrations ClO mixing ratio (a) near surfaces and (b) at 1km height caused by SSA emissions (BASE minus NOSA) during January, April, July and October 2015.

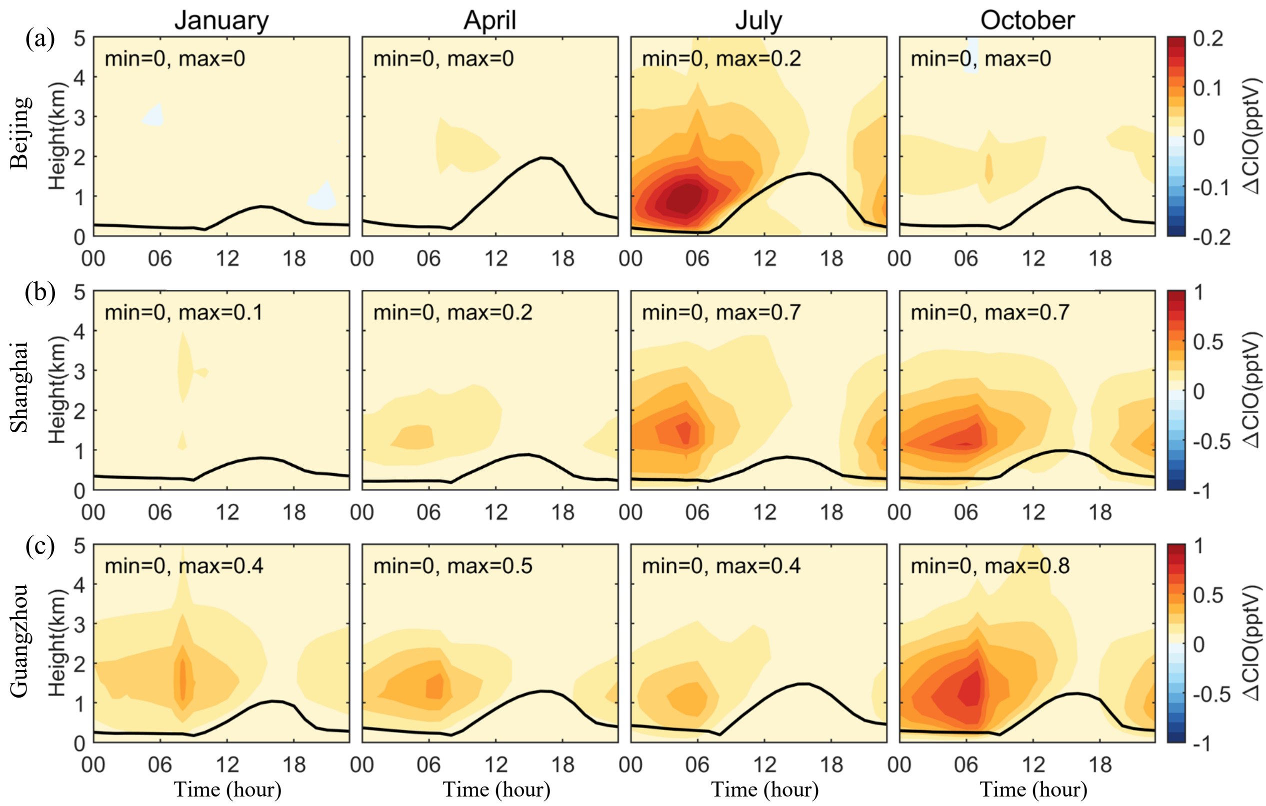

Figure S10: The same as Fig. S4 but for the simulated monthly mean ClO mixing ratio.