Inverse modeling of SO_2 and NO_x emissions over China using multi-sensor satellite data: 1. formulation and sensitivity analysis

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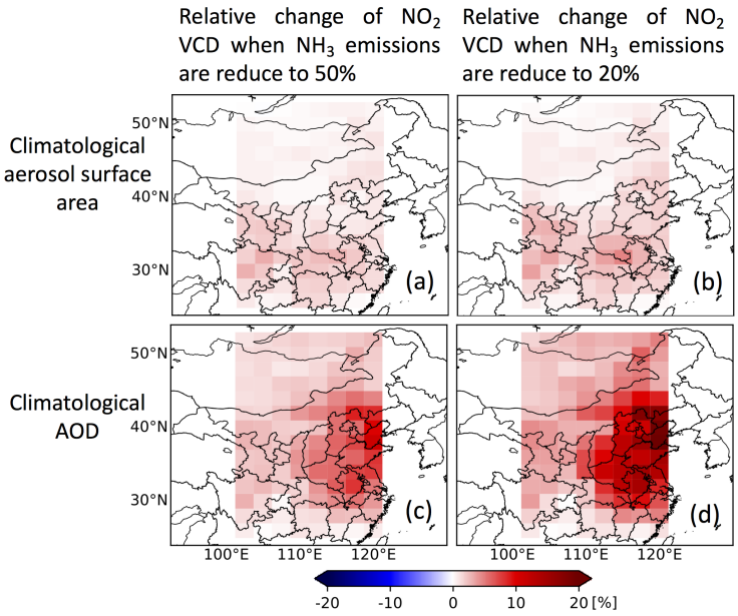

Figure S1. Relative change of GEOS-Chem NO_2 VCDs when NH_3 emissions reduce to 50% (a) and 20% (b), respectively at OMPS overpassing time, and a dataset of climatological aerosol surface area is used, regardless of scenarios of NH_3 emissions. (c) and (d) are similar to (a) and (b), respectively, but a dataset of climatological AOD rather than climatological aerosol surface area is used.

Figure S1 a and b show the relative change GEOS-Chem NO_2 VCDs with NH_3 emissions reducing to 50% and 20%, respectively, in the situation that a dataset of climatological aerosol surface area is used, regardless of scenarios of NH_3 emissions, hence reflecting the impact of photolysis of O_3 and NO_2 on NO_2 lifetime when NH_3 emissions are reduced. The situation that a dataset of climatological AOD is used is shown in Fig. S1 c and d ; thus they are the impact of N_2O_5 chemistry on NO_2 lifetime. Apparently, the impact of photolysis of O_3 and NO_2 on NO_2 lifetime caused by the reduction of NH_3 emissions is negligible compared to that of N_2O_5 chemistry.