Figure S1. a) Emissions monthly profile for East China from HTAP 2010, in Mt b) emissions monthly profile molar ratio compared to NH3 emissions, from HTAP 2010.
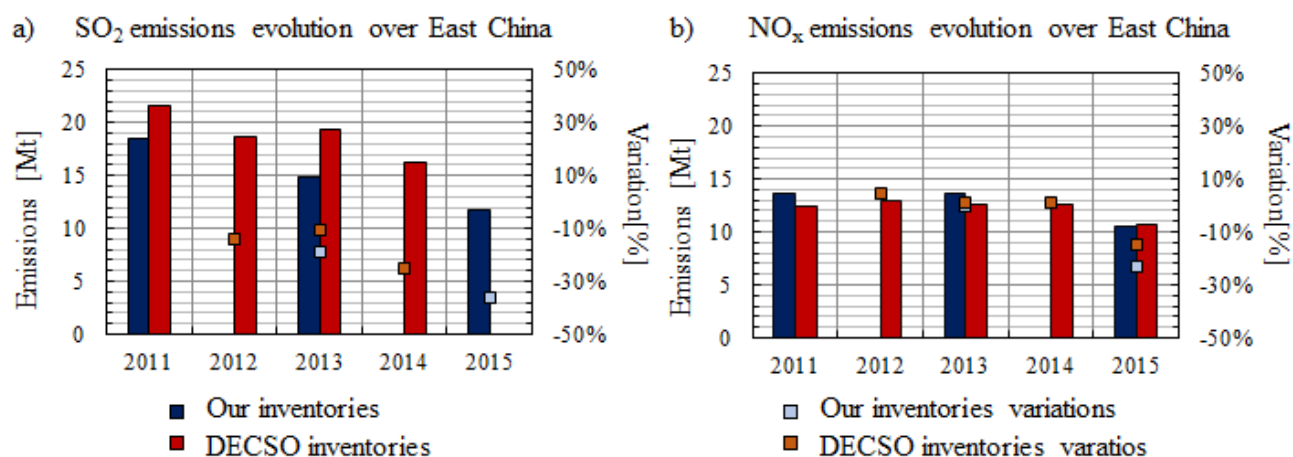
Figure S2. a) SO₂ and b) NOₓ emission inventories comparison between our updated inventory and DECSO inventory, Over East China, not including maritime traffic.
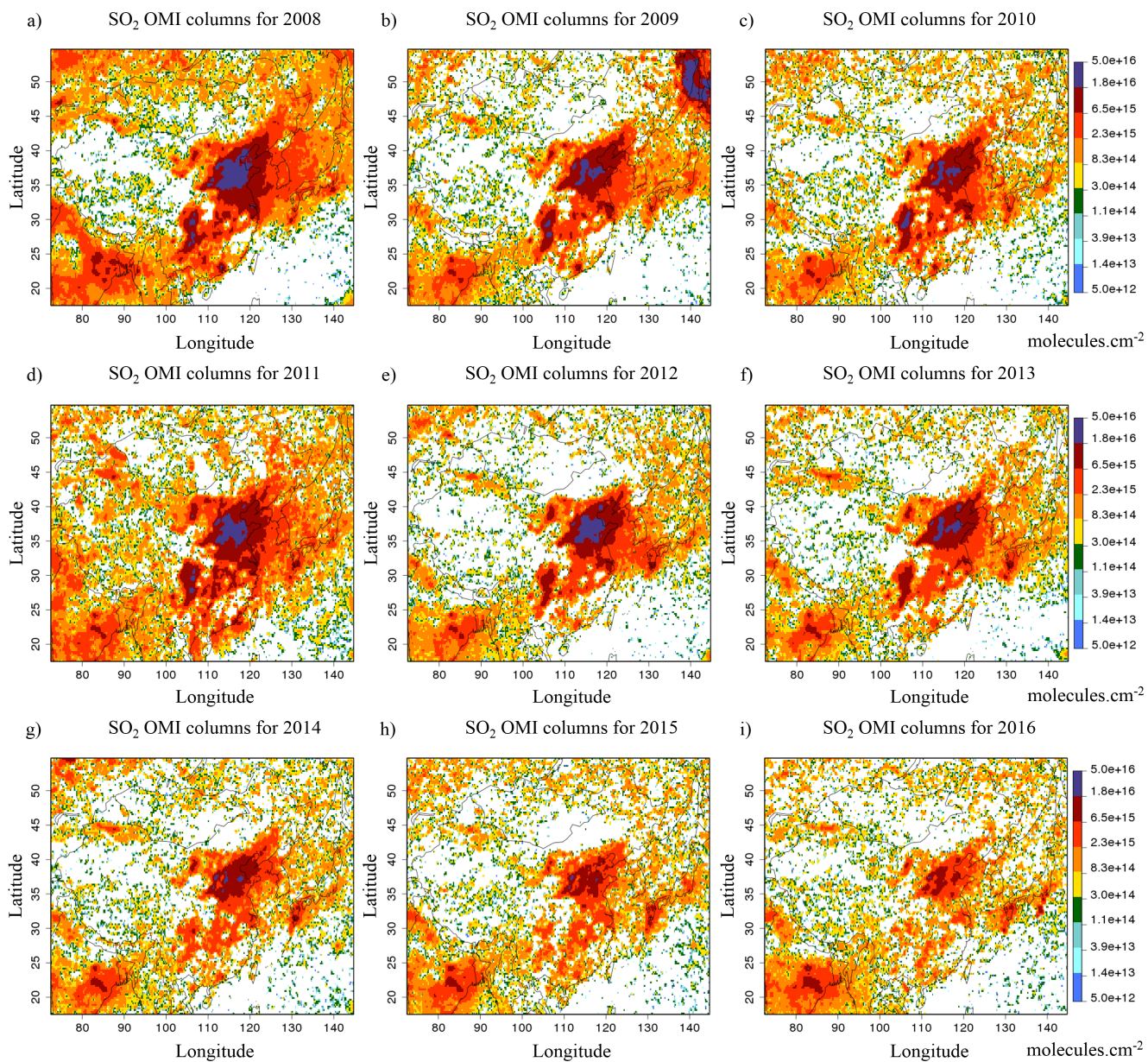
Figure S3. SO$_2$ columns evolution from OMI satellite, from 2008 to 2016, in molecules.cm^{-2}.
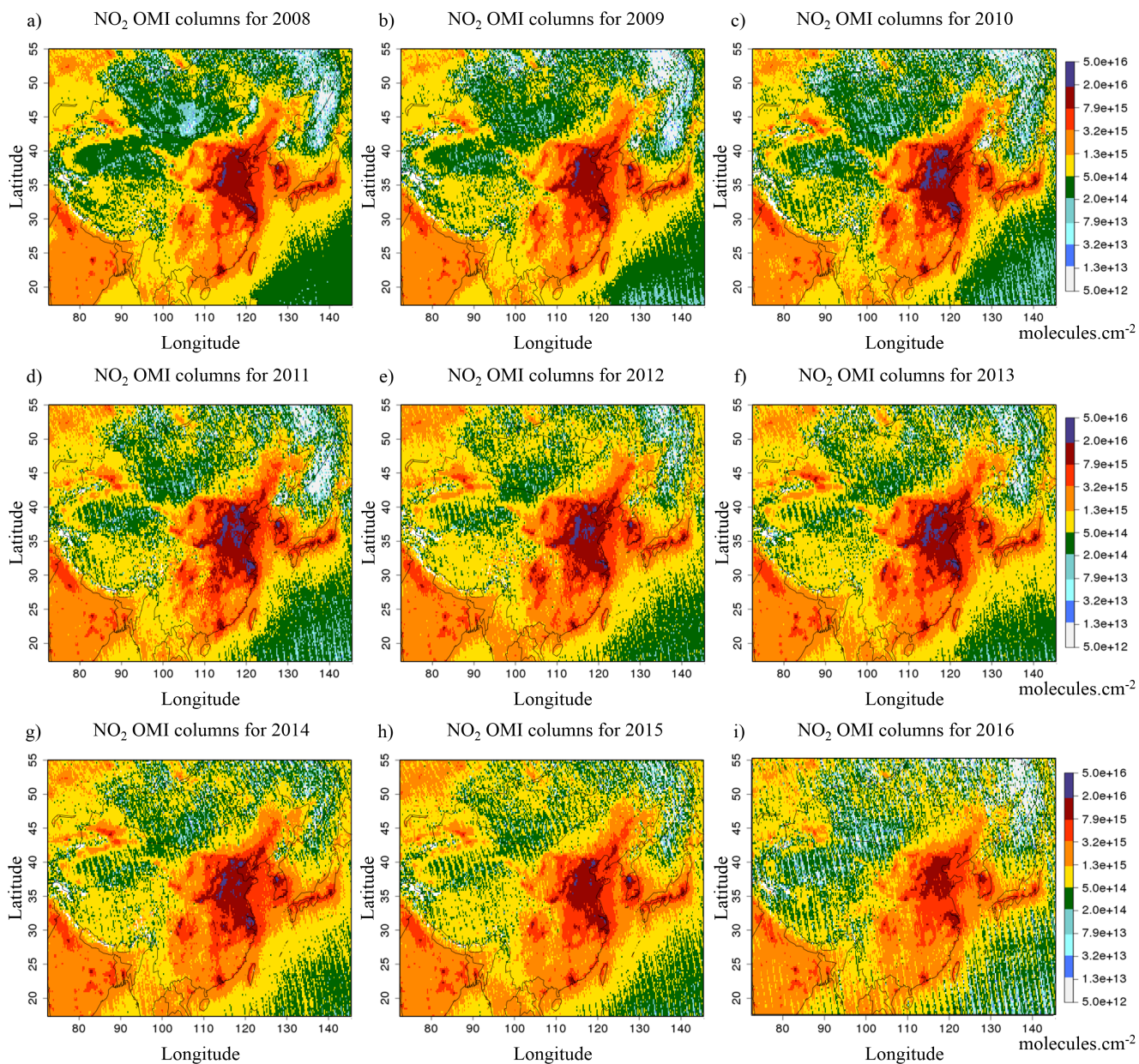
Figure S4. NO_2 columns evolution from OMI satellite, from 2008 to 2016, in molecules.cm^{-2}.
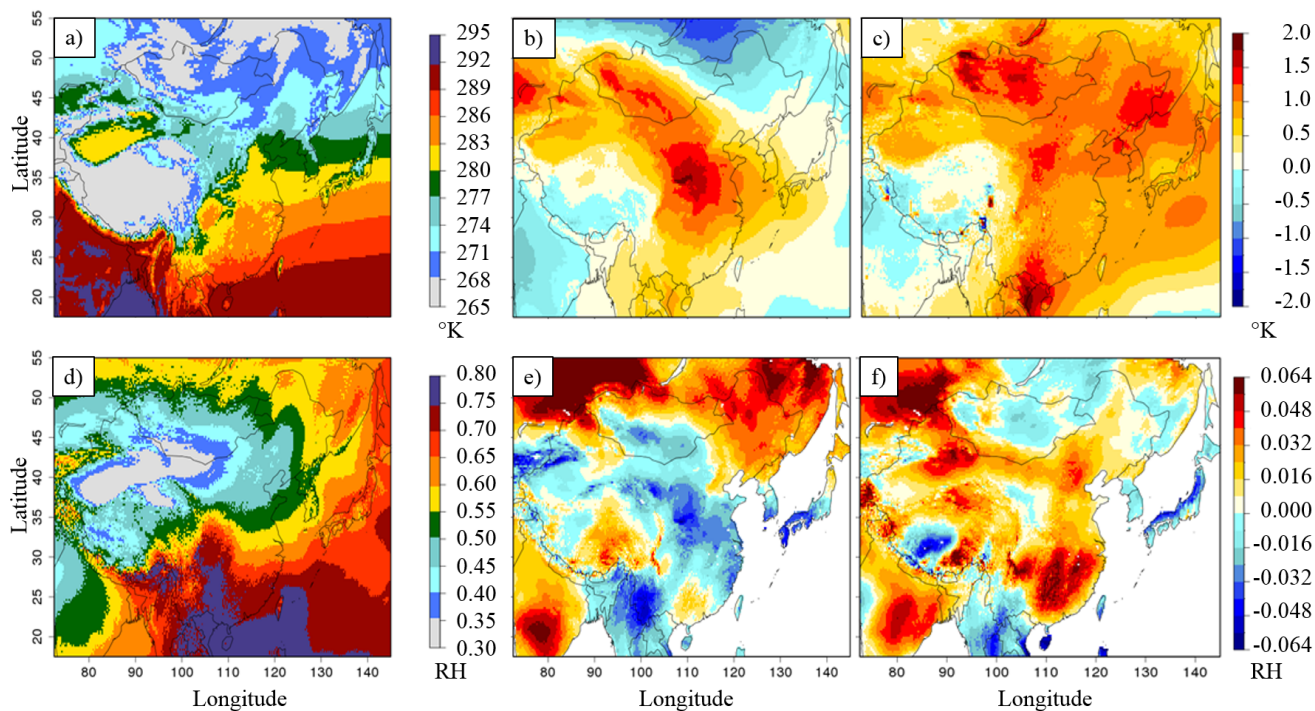
Figure S5. a) Annual mean temperature for 2011, b) annual mean temperature differences (2013-2011), c) annual mean temperature differences (2015-2011), d) annual mean RH for 2011, e) annual mean RH differences (2013-2011), f) annual mean RH differences (2015-2011).
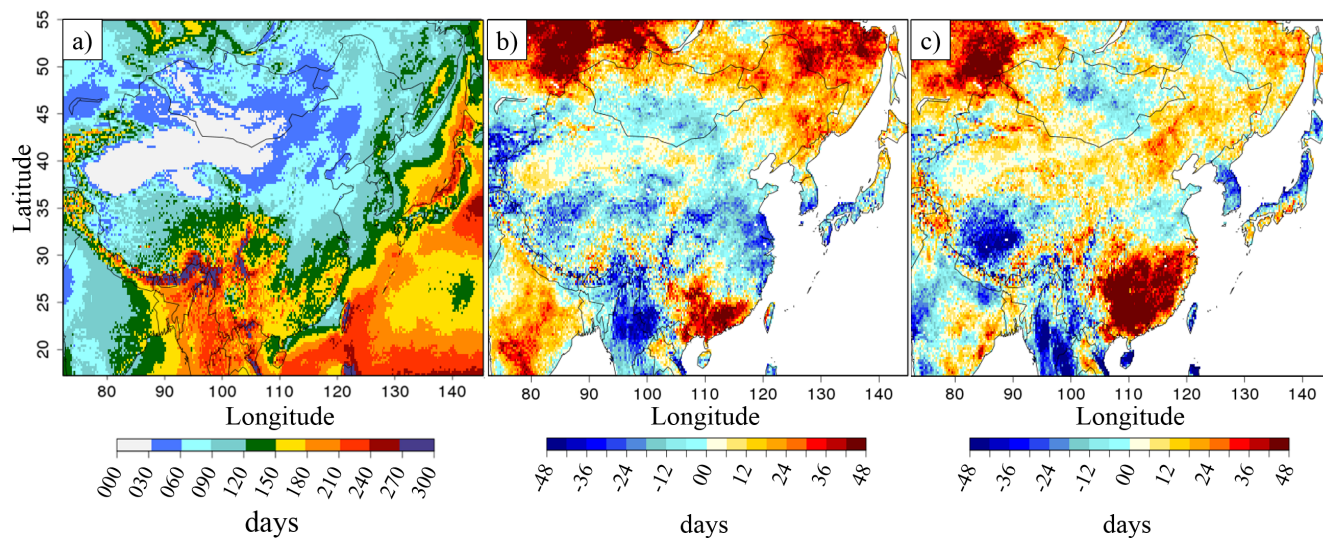
Figure S6. a) Annual rainfall frequencies (Rainfal>1mm.day^{-1}) for 2011, b) annual rainfall frequencies differences (2013-2011), c) annual rainfall frequencies differences (2015-2011).
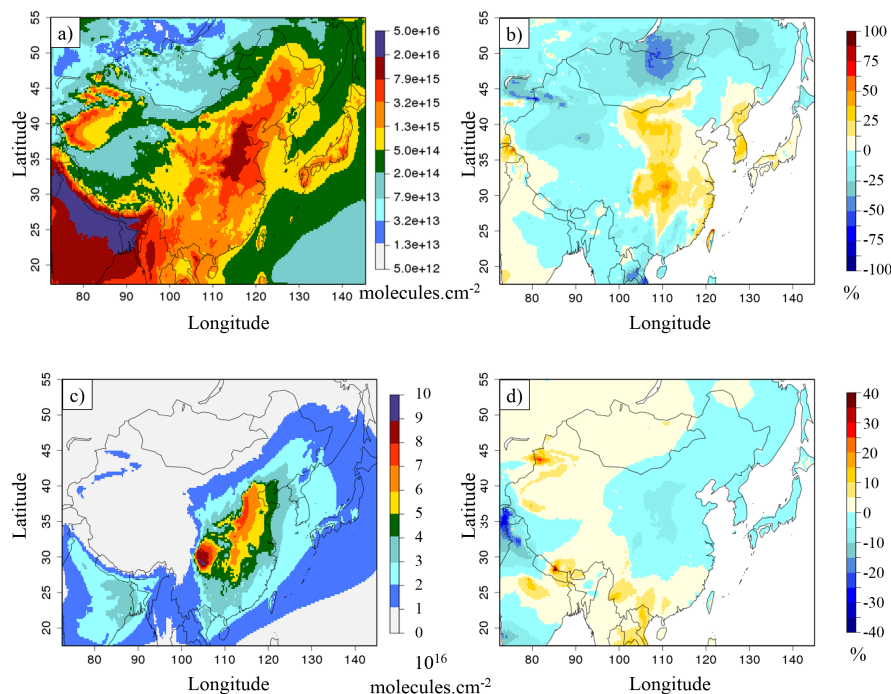
Figure S7. a) Ammonia columns in molecules.cm^{-2} for the simulation 2013A, b) relative differences of ammonium columns between the simulations from 2013C and 2013A, in % c) ammonium columns in molecules.cm^{-2} for the simulation 2013A and d) relative differences of ammonium columns between the simulations from 2013C and 201CA, in %.
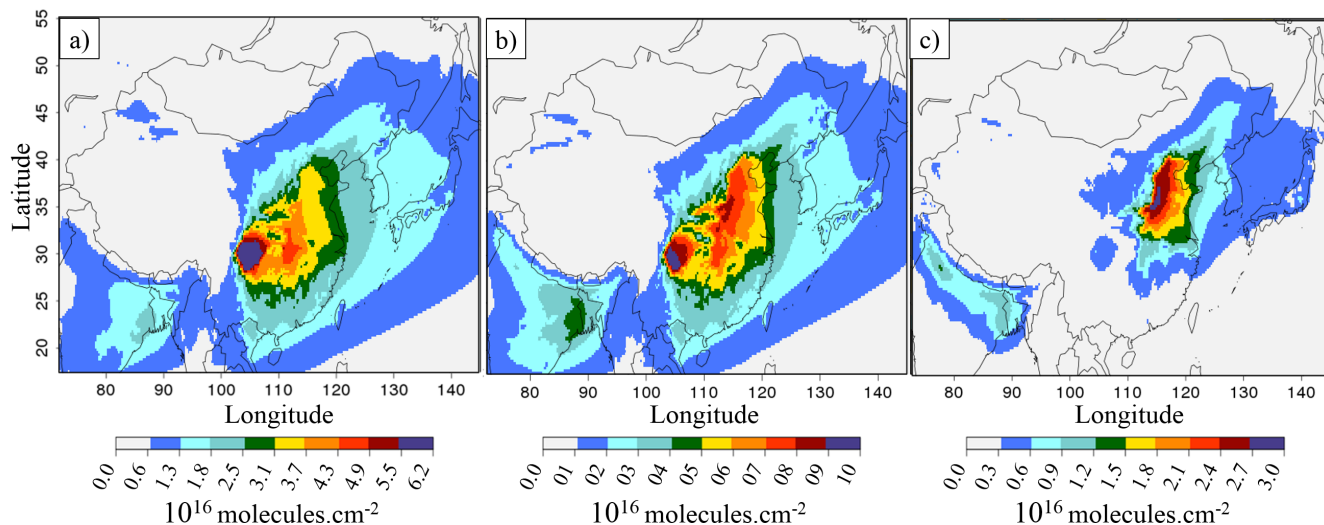
Figure S8. a) 2015A annual mean $SO_{4(p)}^{2-}$ columns, b) 2015A annual mean $NH_{4(p)}^{+}$ columns, c) 2015A annual mean $NO_{3(p)}^{-}$ columns. Units in molecules.cm^{-2}.
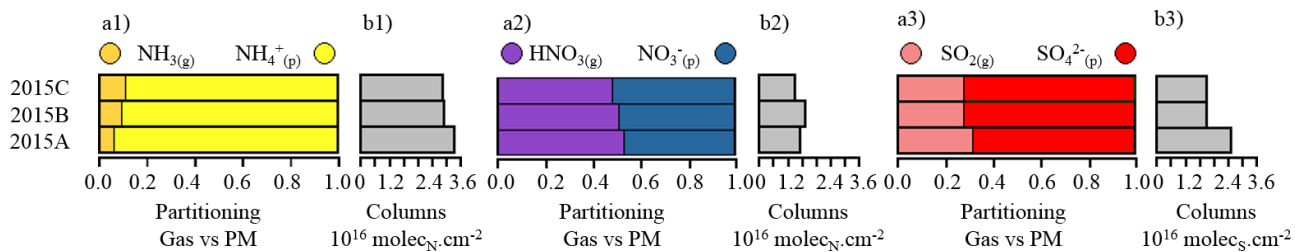
Figure S9. a) Molar partitioning between gas and the particulate phases over East China b) column means over East China in 10^{-9} molecules.cm^{-2}.1) TA, 2) TN, 3) TS.
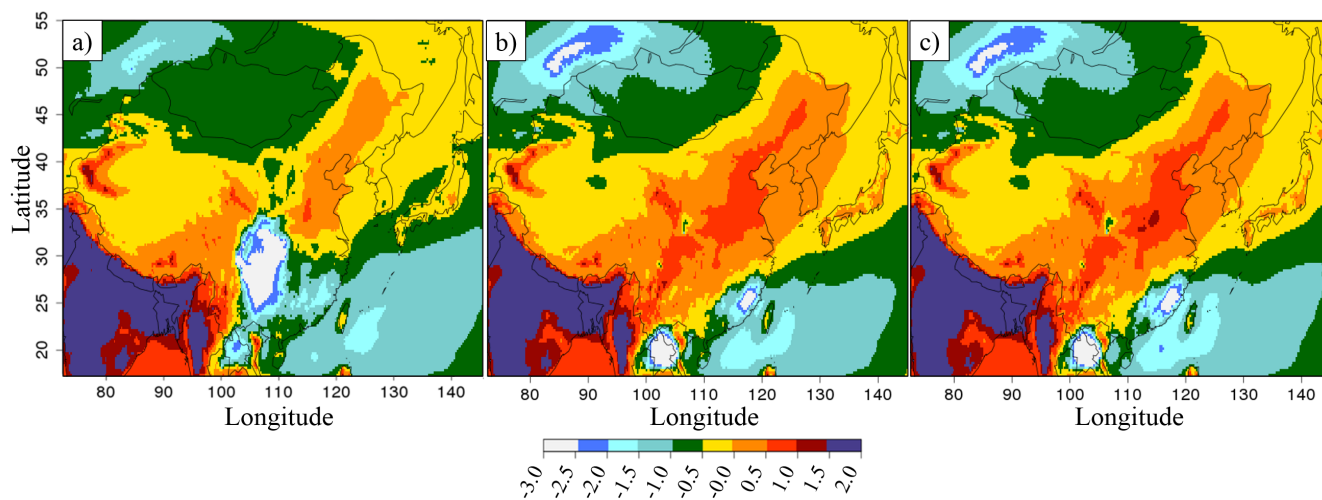
Figure S10. a) Annual G_{ratio} mean for 2015A, b) annual G_{ratio} mean for 2015B, c) annual G_{ratio} mean for 2015C.
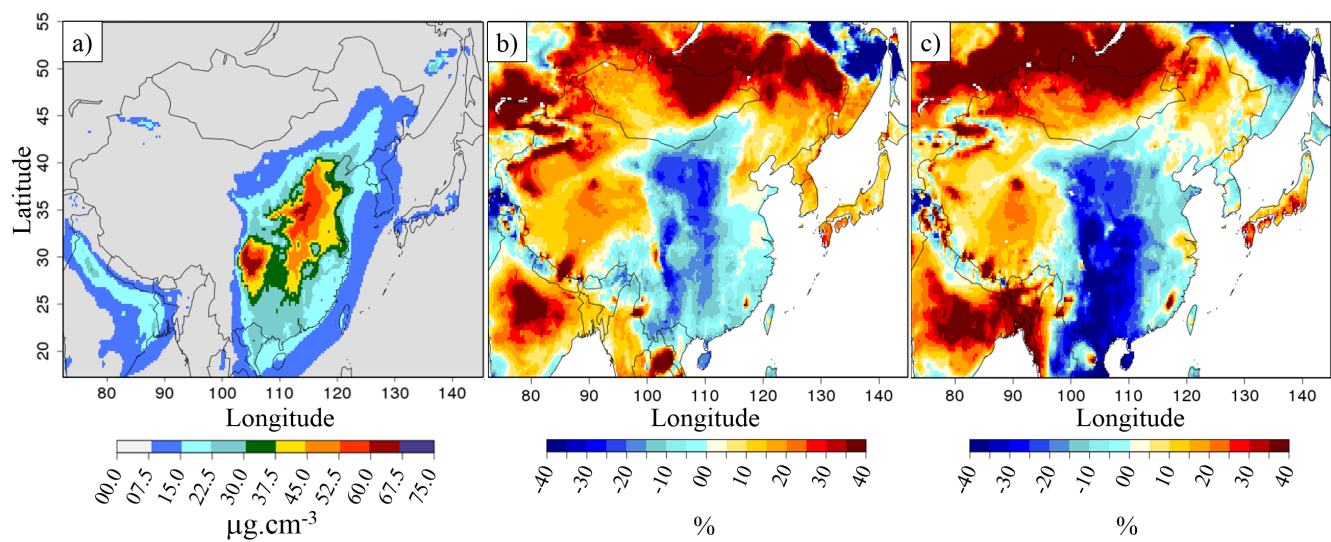
Figure S11. a) $PM_{2.5}$(pSNA) columns in µg.cm^{-2} for 2011A b) relative differences of $PM_{2.5}$(pSNA) columns between 2013C and 2011A, in % and c) relative differences of $PM_{2.5}$(pSNA) columns between 2015C and 2011A, in %.