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Supporting Information for

**Revising the Ozone Depletion Potentials Metric for Short-Lived Chemicals such as CF3I and CH3I**

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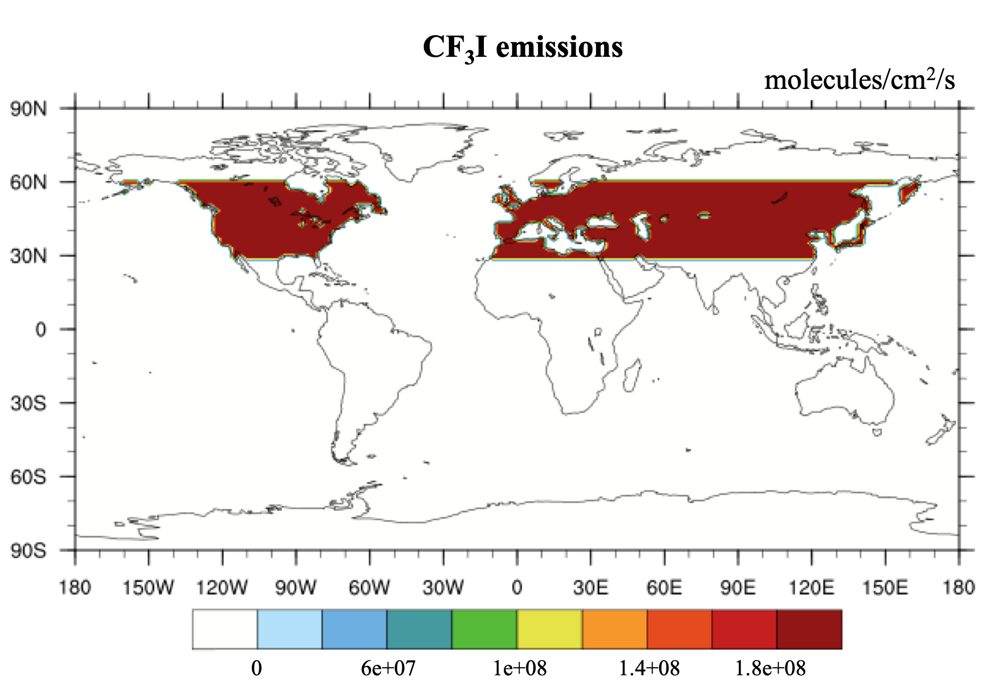
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**Introduction**

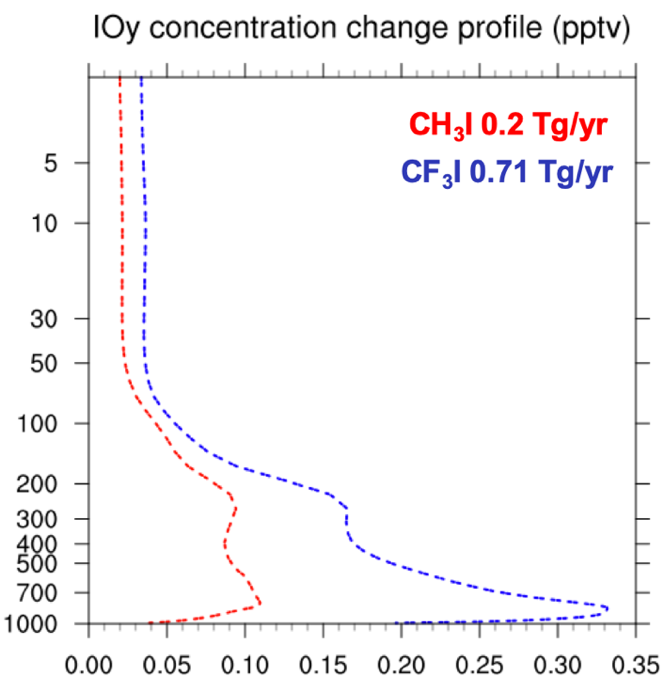
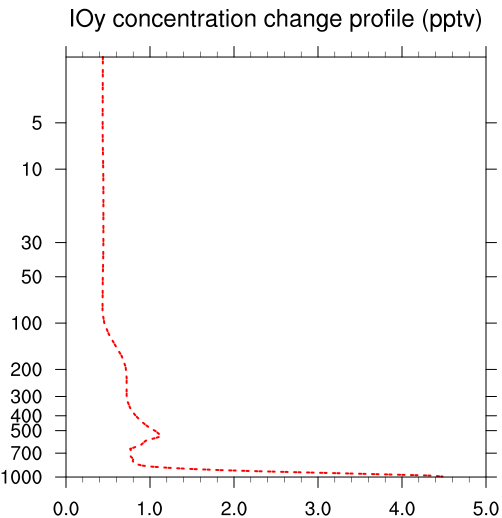
Supporting information includes table and figures to support the discussion in main article.



**Figure S1.** Land-based surface emission fluxes of CF3I over 30oN to 60oN in the unit of molecules cm-2 s-1. These are the emissions used in Youn et al. (2010). These postulated emissions are inputs to the CF3I ODP perturbation model run.

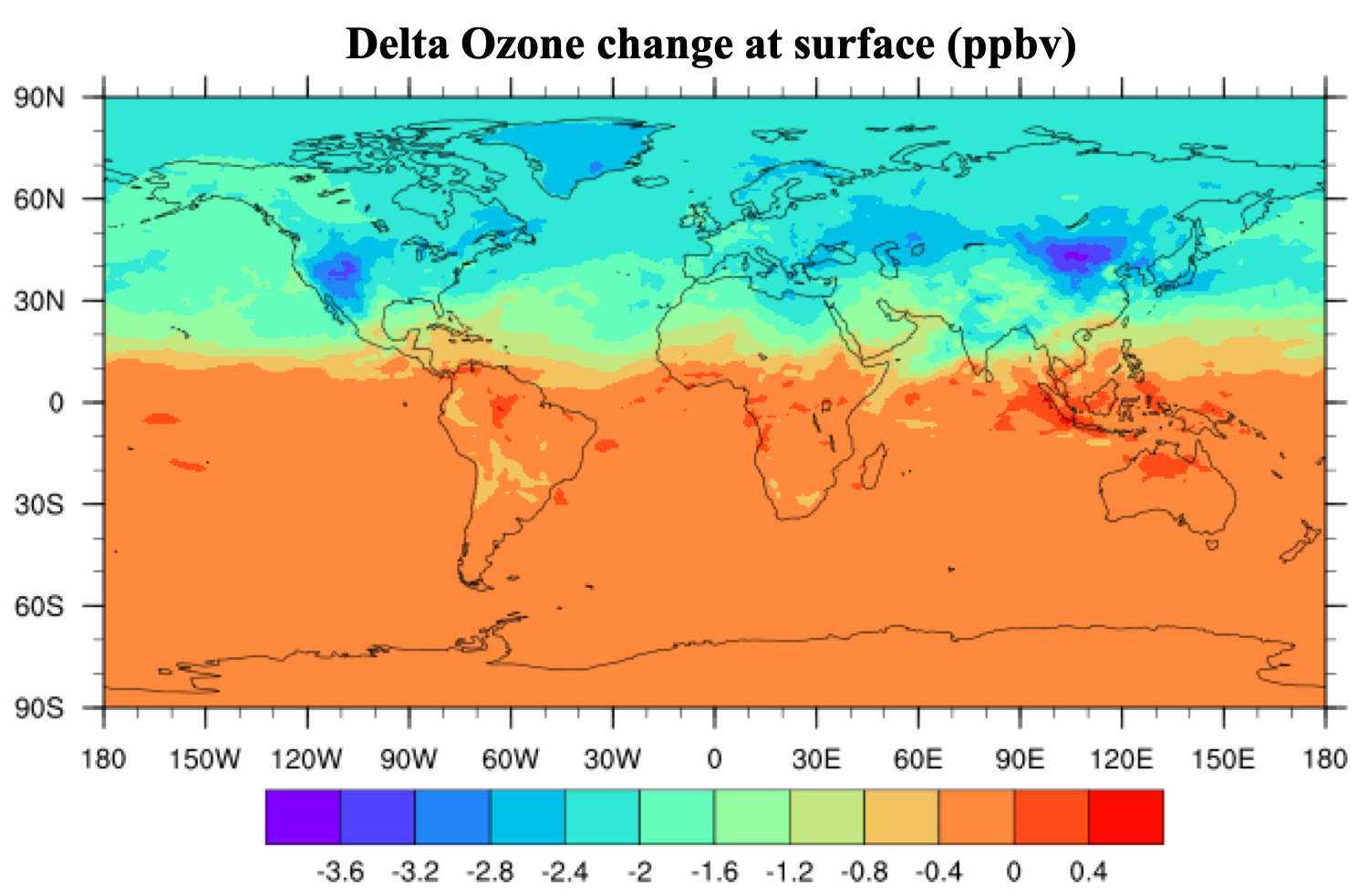
**Table S1**. Iodine chemistry scheme in CAM4-Chem (adopted from Saiz-Lopez et al. (2014) and Saiz-Lopez et al. (2015)).

|  |  |
| --- | --- |
| Reaction types | Reactions |
| Bimolecular, thermal decomposition and termolecular reactions | I+O3 →IO+O2  IO+O3 →OIO+O2  I+HO2 →HI+O2 IO + NO → I + NO2  IO+HO2 →HOI+O2  IO + IO → OIO + I  IO + IO → I2O2 IO + OIO → I2O3 OIO + OIO → I2O4 I2 + O → IO + I IO + O → I + O2 IO + OH → HO2 + I I2O2 →OIO+I I2O2 →IO+IO I2O4 → 2 OIO I2 + OH → HOI + I I2 + NO3 → I + IONO2 I+NO3 →IO+NO2 OH + HI → I + H2O I + IONO2 → I2 + NO3  HOI+OH→IO+H2O IO + DMS → DMSO + I INO2 →I+NO2 IONO2 → IO + NO2 INO + INO → I2 + 2NO INO2 + INO2 → I2 + 2NO2 OIO + NO → IO + NO2  HI+NO3 →I+HNO3 IO + BrO → Br + I + O2 IO + BrO → Br + OIO I + BrO → IO + Br IO + ClO → I + OClO IO + ClO → I + Cl + O2 IO + ClO → ICl + O2 IO + Br → I + BrO IO+NO3 →OIO+NO2  IO+CH3O2 →CH2O+I+HO2 CH3I+OH→I+H2O+HO2  I+NO2 (+M)→INO2 (+M)  IO+NO2 (+M)→IONO2 (+M)  I+NO(+M)→INO(+M)  OIO+OH(+M)→HOIO2 (+M) |
| Photochemical reactions | CH3I + hν → CH3O2 + I  CH2I2+hν→2I  CH2IBr+hν→Br+I  CH2ICl+hν→Cl+I  I2+hν→2I  IO + hν → I + O OIO + hν → I + O2 INO + hν → I + NO  INO2 +hν→I+NO2  IONO2 +hν→I+NO3  HOI + hν → I + OH IBr + hν → I + Br ICl + hν → I + Cl I2O2 +hν→I+OIO  I2O3 +hν→IO+OIO  I2O4 +hν→OIO+OIO |
| Heterogeneous reactions  (on sea salt aerosols and ice crystals) | IONO2 → 0.5 IBr + 0.5 ICl  INO2 → 0.5 IBr + 0.5 ICl  HOI → 0.5 IBr + 0.5 ICl  I2O2 →  I2O3 →  I2O4 → |
| Recycling reactions  (ice-particles) | HOI + HI →I2 + H2O HOI + HCl → ICl + H2O HOI + HBr →IBr + H2O IONO2 → HOI + HNO3 |

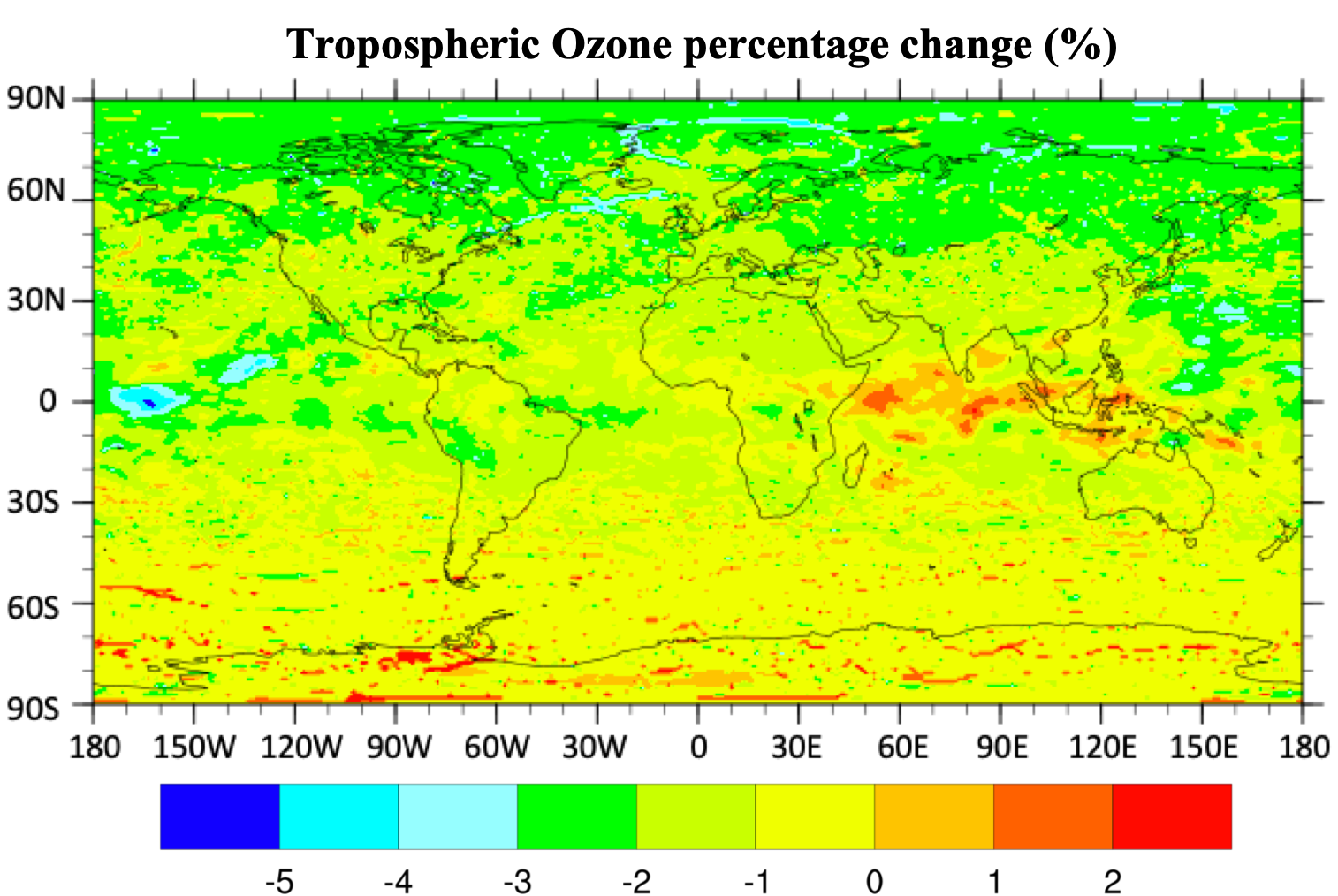
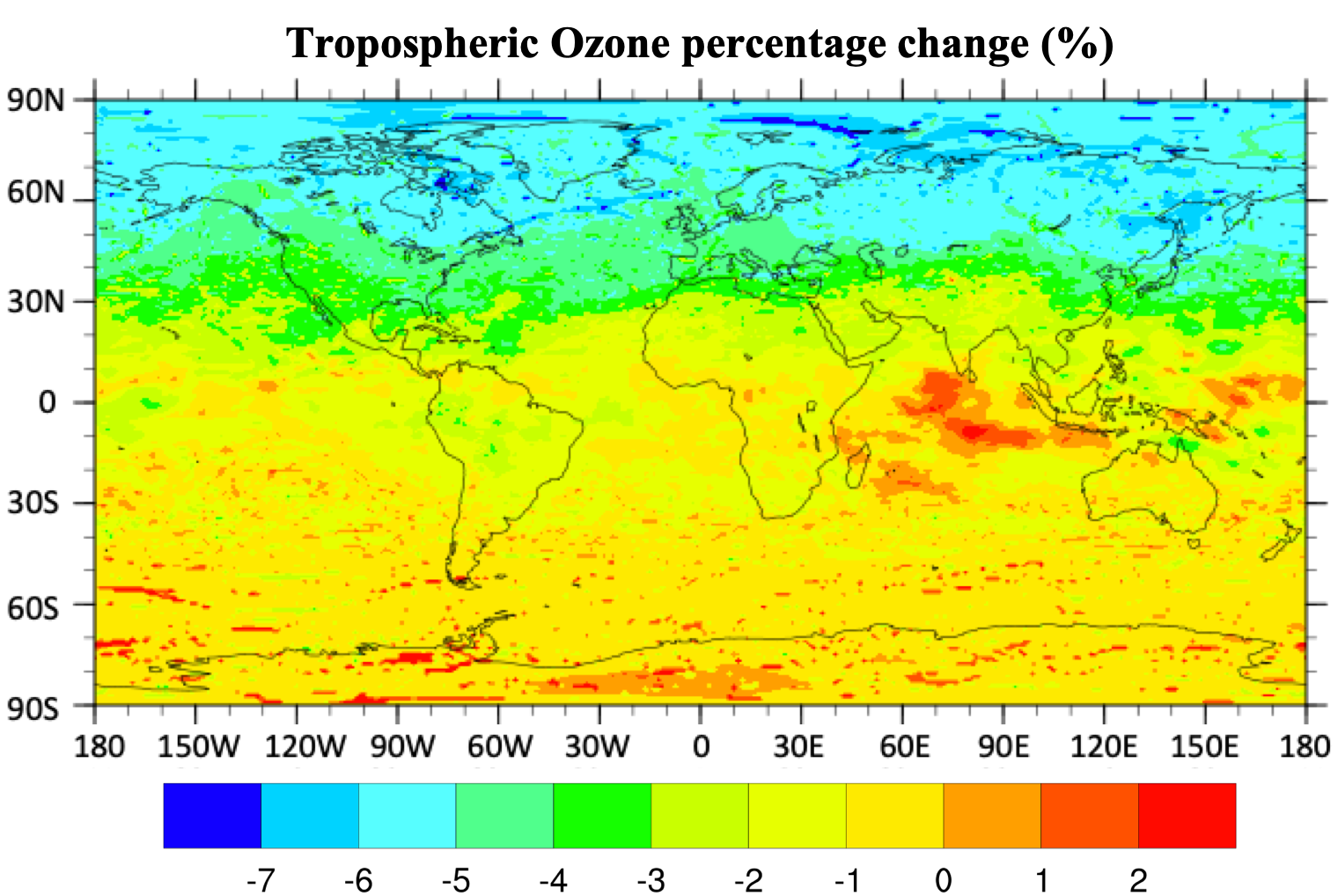


(a) (b)

**Figure S2.** Vertical distribution of IOy mixing ratio (pptv) averaging within the tropics (20°S–20°N) (a) from reference background simulation and (b) from delta change relative to the reference run (perturbation – reference) for CF3I and CH3I emission Scenario 1. Blue dashed line is for CF3I perturbation while red dashed line is for CH3I perturbation.



**Figure S3.** Annual average distribution of delta ozone changes from CF3I emission Scenario 1 at the surface (992.5 hPa) in units of ppbv.



1. (b)

**Figure S4.** Annual average distribution of (a) tropospheric integrated column ozone percentage change from CF3I emission Scenario 1; (b) is the same but for CH3I emission Scenario 1.