

Supplement of Atmos. Chem. Phys., 18, 2899–2911, 2018
<https://doi.org/10.5194/acp-18-2899-2018-supplement>
© Author(s) 2018. This work is distributed under
the Creative Commons Attribution 4.0 License.



Supplement of

Chemical and climatic drivers of radiative forcing due to changes in stratospheric and tropospheric ozone over the 21st century

Antara Banerjee et al.

Correspondence to: Antara Banerjee (ab4283@columbia.edu)

The copyright of individual parts of the supplement might differ from the CC BY 4.0 License.

	$\Delta[\text{CH}_4]_{\text{ss}}^1$ [ppmv]	RF-CH ₄ _{ss} ² [W m ⁻²]	RF-O ₃ _{ss} ³ [W m ⁻²]
$\Delta\text{CC4.5}$	-0.25	-0.10	0.07 (-0.02)
$\Delta\text{CC8.5}$	-0.54	-0.22	0.02 (-0.05)
ΔODS	0.09	0.03	0.07 (0.01)
ΔO3pre	0.08	0.03	-0.09 (0.01)

Table S1. Estimates of changes in the global abundance of tropospheric CH₄ ($\Delta[\text{CH}_4]_{\text{ss}}$) from its imposed concentration of 1.75 ppmv to steady state after accounting for adjustments through changes in the CH₄ lifetime. Also reported (to 2 decimal places) are the associated tropospheric RF due to CH₄ (RF-CH₄_{ss}) and ozone (RF-O₃_{ss}).

¹ $\Delta[\text{CH}_4]_{\text{ss}}$ [ppmv] has been estimated following the methodology detailed in Banerjee et al. (2014, 2016) (and references therein) using the model-specific feedback factor of 1.52.

²RF-CH₄_{ss} [Wm⁻²] corresponds to the direct RF of CH₄ that would result from $\Delta[\text{CH}_4]_{\text{ss}}$ relative to a baseline concentration of 1.75 ppmv, and is calculated using the simple expression in Myhre et al. (1998) (using [N₂O] = 327 ppbv).

³RF-O₃_{ss} [Wm⁻²] is the estimate of the tropospheric ozone RF that would result at steady state (bracketed values indicate the difference from Table 2 in the main text where CH₄ feedbacks are neglected). This is obtained by first scaling $\Delta[\text{CH}_4]_{\text{ss}}$ as in Banerjee et al. (2014, 2016) on a gridbox and monthly mean basis to obtain the corresponding change in ozone abundance. A steady state ozone field ([O₃]_{ss}) is calculated as the sum of this change and the simulated ozone. RF-O₃_{ss} is then calculated by applying [O₃]_{ss} as a perturbation within the offline RTM.