Uncertainties in climate assessment for the case of aviation NO

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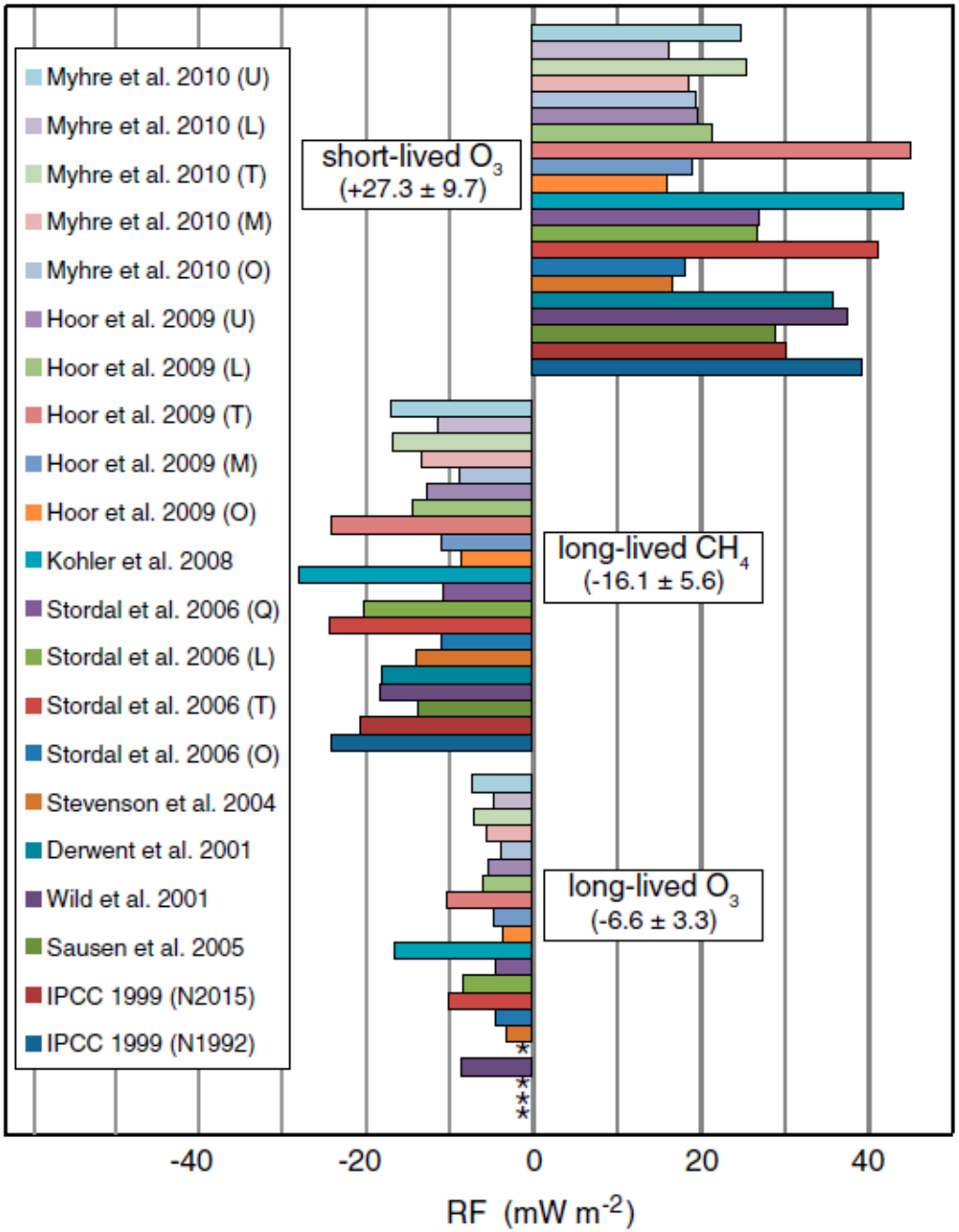
Nitrogen oxides emitted from aircraft engines alter the chemistry of the atmosphere, perturbing the greenhouse gases methane (CH_4) and ozone (O_3). We quantify uncertainties in radiative forcing (RF) due to short-lived increases in O_3, long-lived decreases in CH_4 and O_3, and their net effect, using the ensemble of published



All data normalized to
1 Tg-N /yr aviation NOx

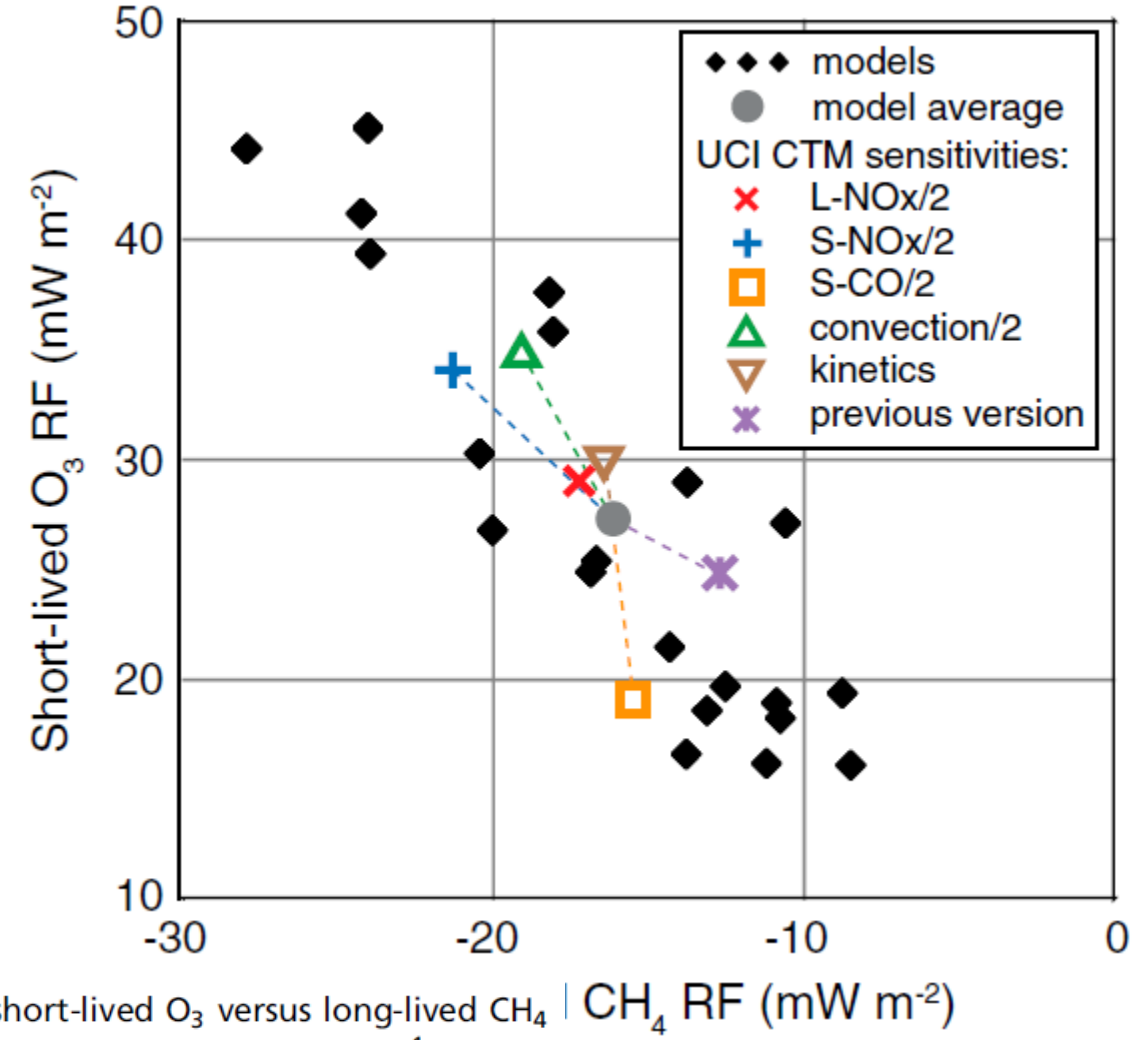


Fig. 3. Steady-state RF (mW m^{-2}) from short-lived O_3 versus long-lived CH_4 caused by aviation NOx emissions. Values are scaled to 1 Tg(N) a^{-1}. Model data (black diamonds) and their mean (gray circle) are from Fig. 1. UCI CTM sensitivity studies show change relative to the mean: lightning NOx emissions [4 Tg(N) a^{-1}] reduced 50% (L-NOx/2), surface NOx emissions (45 Tg(N) a^{-1}) reduced 50% (S-NOx/2), surface CO emissions [983 Tg(CO) a^{-1}] reduced 50% (S-CO/2), convective fluxes reduced 50% (convection/2), kinetics favoring O_3 production (kinetics), and a previous model version. Long-lived CH_4 RF here excludes the impact on stratospheric water vapor.