

Table 4. Characteristics of the CH₄ and O₃ perturbations, and their associated radiative forcings (including stratospheric adjustment, and normalized for a 1 Tg(NO₂) emission pulse). The O₃ perturbation is split into the initial (short-term) positive phase, and the (long-term) negative phase. Results are compared with Wild et al. [2001], and our earlier work [Derwent et al., 2001].

| Emission pulse | ΔCH_4 | | | ΔO_3 (short-term) | | ΔO_3 (long-term) | | Net |
|-------------------------------------------------|---------------------|--------------------|----------------------------|------------------------------------|----------------------------|-----------------------------------|----------------------------|----------------------------|
| | e-fold / years | Total / ppbv-yr | RF / mW m ⁻² yr | Total / ppbv-yr | RF / mW m ⁻² yr | Total / ppbv-yr | RF / mW m ⁻² yr | RF / mW m ⁻² yr |
| January | 11.13 | -10.32 | -3.83 | 0.24 | 4.61 | -0.041 | -0.90 | -0.11 |
| April | 11.05 | -10.82 | -4.00 | 0.23 | 5.30 | -0.041 | -0.89 | +0.41 |
| July | 11.09 | -11.92 | -4.42 | 0.19 | 5.14 | -0.046 | -0.99 | -0.26 |
| October | 10.99 | -10.23 | -3.76 | 0.26 | 5.17 | -0.040 | -0.89 | +0.50 |
| Mean | 11.07 | -10.82 | -4.00 | 0.23 | 5.06 | -0.042 | -0.92 | +0.14 |
| Lifetime corrected ^a | 11.53 | -11.3 | -4.2 | 0.23 | 5.06 | -0.044 | -0.95 | -0.09 |
| Wild (year) | 14.2 | -14.7 | -5.5 | 0.36 | 11.5 | -0.081 | -2.6 | +3.4 |
| Lifetime/O ₃ corrected ^{ab} | 11.8 ^a | -12.2 ^a | -4.6 ^a | 0.36 | 7.9 ^b | -0.067 ^a | -1.5 ^{ab} | +1.8 |
| Derwent (January) | 12.3 | -15.9 | -6.9 | 0.52 | 36.0 ^d | -- | -- | +29 |
| Re-worked | 12.3 | -14.8 | -5.5 ^c | 0.40 | 10.9 ^d | -0.04 ^e | -1.4 ^e | +4.0 |
| Lifetime/O ₃ corrected ^{ab} | 10.4 ^a | -12.5 ^a | -4.6 ^{ac} | 0.40 | 8.6 ^{bd} | -0.03 ^{ac} | -0.7 ^{abc} | +3.3 |

^a The 'lifetime corrected' rows have been adjusted assuming values for the CH₄ soil and stratospheric sinks as reported in Prather et al. (2001). For this work, the IPCC lifetimes have been substituted for the model derived values; Wild et al. [2001] and Derwent et al. [2001] only used the OH derived lifetime.

^b The Wild et al. [2001] and Derwent et al. [2001] O₃ forcings have been recalculated using the annual mean value from this study of 22 mW m⁻² ppbv⁻¹.

^c Derwent et al. [2001] calculated CH₄ forcings using a value of 0.43 mW m⁻² ppbv⁻¹, rather than the value of 0.37 mW m⁻² ppbv⁻¹ used in this study – the latter value is used for the reworked values.

^d Derwent et al. [2001] mistakenly reported O₃ forcings normalized to 1 Tg(N) rather than 1 Tg(NO₂): the originally reported values need reducing by a factor of (46/14).

^e Values for the negative phase of the O₃ anomaly were not reported by Derwent et al [2001] – these values are estimates.