

1 **Response to Jens-Uwe Grooß – Key drivers of ozone change and its radiative**
2 **forcing over the 21st century**

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4 We are grateful for the feedback of Jens-Uwe Grooß. We hope his comments and
5 concerns are addressed below. Our responses (i.e. changes and information) follow
6 each comment in **blue**.

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8 **Specific comments:**

9 **a)** In the abstract you mention the different contributions to O3 RF numbered by (1)
10 (2), and (3) for (1) you mention "with and without lightning feedback" but you give
11 only one number [corresponding to the sum of the first two lines of table3]. EITHER
12 you may leave out the info "with and without lightning feedback" (the interplay
13 between lightning-produced ozone and enhanced ozone destruction is explained later)
14 OR you may clarify this point in the abstract.

15 **Response:** We agree this is indeed a good observation. We have now left out the
16 "lightning feedback" comment and explained the uncertainty range provided. The
17 sentence has now been rewritten:

18 "Using year 2100 conditions from the Representative Concentration Pathways 8.5
19 (RCP8.5) scenario, we quantify the individual contributions to ozone radiative forcing
20 of (1) climate change, (2) reduced concentrations of ozone depleting substances
21 (ODSs), and (3) methane increases. We calculate future ozone radiative forcings **and**
22 **their standard error (associated with interannual variability of ozone)** relative to
23 year 2000 of..."

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25 **b)** Figure 3 caption: you likely mean "black dashed line" for the chemical tropopause.

26 **Response:** Fixed thanks.

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