

**Reviewers' comments are in bold. Authors' responses are in blue.**

The authors have addressed my comments appropriately and it was an interesting idea to add another experiment to the study. I am fine with the publication of this paper if the following minor comments have been addressed.

**Minor comment:**

**Abstract: One more sentence at the end of the abstract would help to point to the drawbacks of this approach including, the need for research in particular on the impact on ecosystems, and regional climate impacts.**

We added a new sentence at the end of the abstract to summarize pros and cons of the method:

*“However, our assumption that the rate of COS uptake by soils and plants does not vary with increasing COS concentrations will need to be investigated in future works, and more studies are needed on the prolonged exposure effects to higher COS values in humans and ecosystems.”*

**Figure 9, bottom panel legend seems to be wrong and not aligned with the Figure caption.**

Corrected.

**Figure 8: bottom panels all both labeled b) but should be c) and d)**

Corrected.

**Line 217: “for the SG-COS experiment”. Please clarify here that you are only performing comparisons with the surface injection case.**

We included the clarification, and further specified below (see next comment) why we're only comparing against one of the two experiments.

**Line 218: is not clear what “SG-COS-TTL is equivalent SG-COS-SRF” means? It would be helpful to explain that since SAD is almost the same in those two scenarios, SG-COS-TTL is expected to show very similar results, or so.**

*“Figure 7 shows the ozone changes in SG-COS-SRF and SG-SO<sub>2</sub> with respect to the BG case (SG-COS-TTL is equivalent to SG-COS-SRF).”*

Changed in:

*“Figure 7 shows the ozone changes in SG-COS-SRF and SG-SO<sub>2</sub> with respect to the BG case. As expected from the similar value and distribution of the SAD, in SG-COS-TTL ozone changes are equivalent to SG-COS-SRF (and are therefore not shown).”*

**Line 267: comma before “as well as”, also it seems like the COS experiments do not show an increase for SON over Antarctica. Also, in DJF there is some increase in UVB in the Northern Hemisphere. In general, there could be a little more discussion on the seasonality of UV.**

“In all SG experiments, the negative changes of UVB radiation at surface, except in the Antarctic region, are related to the variation in stratospheric ozone, as well as the interannual variation that increases towards the poles, due to the seasonal variation of ozone, as discussed before. ”

We changed it to:

“In all SG experiments, the negative changes of UVB radiation at the surface, except in the Antarctic region, are related to changes in stratospheric ozone, as well as the interannual variations that are larger at the poles, due to the seasonal variability, as discussed before. In the Antarctic Spring (SON) the ozone depletion is enhanced in SG-SO<sub>2</sub> while in SG-COS-SRF it is limited to the month of October, with differences compared to BG of less than -5 DU. Therefore, the UVB change compared to BG for SON over Antarctica remains negative in SG-COS-SRF with a value of -2.7% versus a +5.8% increase in the SG-SO<sub>2</sub> experiment. In DJF, on the other hand, a small increase of UVB is observable at mid to high latitudes in the Northern Hemisphere. This is connected to an observable decrease of stratospheric ozone in the same locations, possibly due to a reduced advection of air from the tropics.”

**Line 312: micrometer?**

Corrected.