

egusphere-2022-125 Submitted on 30 Mar 2022

**Assessing Responses and Impacts of Solar climate intervention on the Earth system with stratospheric aerosol injection (ARISE-SAI): protocol and initial results from the first simulations**

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**Response to Editor's Comments:**

Thank you for your careful consideration!

I think that your manuscript is almost ready to be published pending two technical corrections.

- First, please, it would be great if you can store a copy of cesm2.1.4-rc.08 in Zenodo and include the link and DOI in the Code Availability Section.

We have now uploaded tag cesm2.1.4-rc.08 to Zenodo and provided a link in the Code Availability Section of the manuscript.

- Second, address this comment by the reviewer adding a small modification to the text if needed:

"At lines 226 – 229, the authors state that the temperature targets T0, T1 and T2 are defined based on the reference SSP2-4.5 simulation with WACCM. Does that mean that each group participating in ARISE-SAI-1.5 should define a separate set of temperature targets based on the particular temperature distribution over 2020 – 2039 from their control simulation? My apologies if this is already mentioned in the manuscript, but I do not remember seeing a recommendation."

We added comments in two places to clarify this:

L126 – 131:

We acknowledge that different climate models, with different baseline temperatures and rates of warming, might have different time periods in which they reach 1.5. Nonetheless, we recommend that the best way to achieve a meaningful and easy comparison between different models would be to use always their own model's 2020-2039 SSP2-4.5 period as a baseline over which to calculate the targets their ARISE-SAI-1.5 simulations. This way, the reference period is the same between models and the 2035 start date remains meaningful in every case.

And 234 – 236:

As noted in section 2.3, we recommend that T0, T1, and T2 targets for other models reproducing ARISE-SAI-1.5 simulations are based on the 2020 – 2039 average from their SSP2-4.5 simulations.

We hope that you find the manuscript acceptable now for publication – let us know please if we can answer any more questions.

Thank you!

Jadwiga