Minor revisions by editor

Dear editor, we have applied the changes you requested. We are also in the process of uploading the remaining missing data, and this might take 24-48h from the admin side to reflect on the DOI landing page. Since I (the main author) would need to have the paper published as soon as possible for graduation purposes, I hope you don't mind that we submitted this revision before the changes in the uploaded data might have happened. We assure you they are on their way. Best, Ilaria.

1. I checked the DOI you provided and found the 2-D and 3-D data files from the model outputs. However, I was not able to find "the processed data displayed on key figures (for both model and observations)". Please provide the <u>processed</u> data displayed on all figures for both model and observations (including figures in the supplement) and list them clearly in the readme file.

We have uploaded the processed data and explained in the ReadMe file their structure. They should be available in 1 or 2 days.

2. L51: You changed 7 Tg-S to 14 Tg. Is this 14 Tg for sulfuric acid mentioned at the beginning of the sentence? If yes, should be 7 Tg-S = ~7*98/32=21.4 Tg H2SO4

The "7 Tg-S" in the previous version was wrong, then we changed it to "14 Tg" that refers to Tg of sulfate aerosols.

3. L61: You mentioned here "below the lower limit". Could you provide the exact values used in the cited studies?

We provided the value (10 Tg of SO2).

4. L77: What is "volc-long-eq"? Didn't find it in other places in the text and in the replies to comments.

We removed the reference to the specific experiments as it is irrelevant.

5. L78: Add some relevant references after "set up".

 We added the reference to Marshall et al., (2018).

6. L87-88: Could you provide values or range of simulated aerosol burden mentioned here?

Added.

7. L131, L134: Put cited author name out of ( )?

Corrected.

8. L152: EMAC simulations.

Changed to "the EMAC simulation".

9. L159: Please eruption time and injection amount for Spurr and Lascar mentioned here.

Added.

10. L335-336: What is "H2SO4 density"? Sulfate particle number density?

Changed to "H2SO4 particle number density".

11. L345: please provide a unit for column density. Do you refer to the mass column density?

Changed to "column number density of sulfuric acid aerosols".

12. L417: " e " a typo?

Corrected.

13. L454-455: Please briefly explain how global mean SAODs were calculated, especially for AVHRR with lots of missing data (Fig 2i).

We explained this at the beginning of the section. We added a reference to the previous explanation.

14. L566: fig. Fig.

Corrected.

15. L630: Was any weight applied for the average calculation?

We added that the stratospheric effective radius is weighted by the SAD as explained in Appendix A2 (see L627).