

***Interactive comment on* “Sensitivity of the radiative forcing by stratospheric sulfur geoengineering to the amount and strategy of the SO₂ injection studied with the LMDZ-S3A model” by Christoph Kleinschmitt et al.**

Anonymous Referee #3

Received and published: 6 September 2017

This manuscript explore several geoengineering scenarios characterized by different injection amounts, altitudes, latitudes, and time of the year using the LMDZ-S3A model, which includes a sectional aerosol module. Several aspects of the simulations are here analyzed, both regarding the evolution of the aerosol and the effects on stratospheric dynamics.

Despite not being particularly innovative, this is an excellent paper that documents the extensive work performed by the author. It is a through analysis of different geoengineering scenarios within the same model framework, and the results are compared

Printer-friendly version

Discussion paper



to previous publications when appropriate. I have only some very minor comments, mostly of technical nature.

1 - Most figures were corrupted when generating the PDF (special characters and the scales of some axis are missing). Please correct them before publication.

2 - Page 6 Line 24: I wonder if also the concentration ($\mu\text{g}/\text{m}^3$) of sulfate peaks well above the injection height.

3 - page 7 line 20: "The region with the largest particles descends towards higher latitudes due to ongoing particle growth and sedimentation during the meridional transport through the BDC." I am not sure I agree with this statement. This would imply that the effective radius at higher latitudes is larger than in the tropics, because particles have grown during the transport via BDC. The figure does not show that, though.

4 - page 8 line 7: Figure 7 shows the absolute value of the forcing efficiency, correct?

5 - page 9: Fig. 9 is not referred to in the text, right? I think it is a very useful figure that should be discussed. It can say something about how appropriate (or not) a modal approach is.

6 - page 9 line 18: ", it appears that the net forcing/AOD decreases for higher injections,". Am I looking at the orange line in Fig. 10b? That line increases with injection height.

7 - page 10 line 4: Are the authors referring to Fig. 12?

8 - page 11 line 13: a difference plot would be useful, as the distributions are relatively similar.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-722>, 2017.

Printer-friendly version

Discussion paper

