

Interactive comment on “Stratospheric sulfate geoengineering enhances terrestrial gross primary productivity” by L. Xia et al.

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In addition to the two anonymous reviewer comments, the short comment by Erik van Schaik has many useful suggestions, and I would encourage the authors to treat this comment as an additional review.

Many of the comments appear to focus on insufficient descriptions or lack of explanations of the choices the authors made. I recommend that the authors pay particular attention to these areas. Some of the reviewer suggestions to this effect can be addressed by referencing other studies.

All three reviewers recommended that G3S should be run against a background of RCP6.0 instead of RCP4.5. It is computationally expensive to run a sufficient number

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of ensemble members of new simulations, but I suspect that appropriate results could be obtained via linear scaling. The authors should use the existing G3S results to justify why the relevant variables scale approximately linearly with the applied forcings; some relevant citations include Irvine et al., 2010 (I think); Jones et al., 2013, JGR; and Kravitz et al., 2014, ERL. This would provide a more direct comparison between solar reduction and stratospheric aerosols, modulo uncertainties and effects due to nonlinearities. This may not be entirely accurate, but it can provide bounding information that would be useful.

The comment by Erik van Schaik also recommended that ten or more ensemble members be conducted. This is far too burdensome, and the authors are not required to do this. I will recommend that the authors make sure they are reporting uncertainty, error bars, and measures of statistical significance where appropriate.

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