Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC3
https://doi.org/10.5194/acp-2021-503-RC3, 2021

Comment on acp-2021-503

Anonymous Referee #3

Referee comment on "Impact of stratospheric aerosol intervention geoengineering on surface air temperature in China: a surface energy budget perspective" by Zhaochen Liu et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-503-RC3, 2021

I recommend major revisions, due to the reasons below and the 16 comment on the attached annotated manuscript.

Fundamentally, this paper ignores an important component of climate change, and that is advection of energy. Surface temperature does not just depend on vertical energy fluxes, but also on changes of atmospheric circulation. By ignoring impacts on atmospheric circulation and wind patterns, as well as on storms and cloudiness, it ignores fundamental processes of climate change.

Why does this paper just look at China? With all the data, why don't the authors look at the entire globe?

What is the new science? The results are what one would expect. And there is little diagnosis of the reasons for the changes.

The authors only use three models, due to finding the data on ESGF, but the output from the rest of the models could have been obtained from the modeling groups.

I find the algebra and terms in section 2.3 confusing. What is the difference between R and alpha? They are both reflection.

There is a supplemental file, but it is not referenced at all in the manuscript.

It is great that they evaluate the models first before using them, but although the Taylor diagrams look pretty good, there are still substantial biases.

The manuscript is in quite a small font. In the future, make it larger to make it easier for the reviewers.

Please also note the supplement to this comment:
https://acp.copernicus.org/preprints/acp-2021-503/acp-2021-503-RC3-supplement.pdf