

Interactive comment on “Comparing different generations of idealized solar geoengineering simulations in the Geoengineering Model Intercomparison Project (GeoMIP)” by Ben Kravitz et al.

Anonymous Referee #4

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This paper presents an interesting comparison between two generations of models performing a geoengineering experiment where quadrupling of CO₂ is offset by solar reduction. The goal of the study is to assess the consistency of model results between the two generations and the validity of the overall scientific conclusions.

This is attained applying standard statistical methods, in order to derive quantitative figures to support the conclusions. Although this study does not go into the details of specific models, but rather looks at the ensemble perspective, I think the topic is scientifically relevant and makes this study worthy of publication in ACP.

The paper is well written, concise and understandable. I have, however, a few minor remarks and suggestions for improvement that should be taken into account.

Remarks

L4: “This simulation is artificial”, I think every model simulation is somewhat artificial, so maybe you could write “idealized”.

L17: “Climate models remain the most promising tools...”. Aren’t they actually the only tool for that?

L34: What do you mean exactly with “agriculture”? Could you please be more specific?

L52: “unchanged from the baseline”: does this mean that it has the same insolation as the 1850-1860 period of the piControl experiment? Please clarify.

L57-64: the trend in TOA net flux is not mentioned in this paragraph, although Fig. 1 shows it. Moreover, it would be interesting to have some numbers about the trends of the ensemble mean for each variable shown in Fig. 1.

Fig. 2: The legend hides some important parts of the plot, please consider shifting it to a different position.

Fig. 3: The brown line for the TOA net radiative flux change is probably the most interesting results in this figure but it’s hardly visible. You may consider drawing it in the foreground above the other lines.

Text corrections

L35: I would replace “perfect” with “exact”.

L38: I would replace “perfectly” with “completely”.

L43: I would replace “version of Earth System Models” with “version of the participating Earth System Models”.

L58: I would replace “rare events or” with “rare events and”.

L61: “by only analysing 50 years”, do you mean “the first 50 years”?

L135: I think “or has warmer tropics” should be “nor has warmer tropics”.

L199: It looks like punctuation is missing.

Fig. 1: Please add the mean to the legend (as in Fig. 2).

Fig. 3: I would replace “the difference” with “their difference”.

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Discussion paper

