

Paper review of “G6-1.5K-SAI and G6sulfur: changes in impacts and uncertainty depending on stratospheric aerosol injection strategy in the Geoengineering Model Intercomparison Project”

Lee et al., 2025

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This paper presents initial results from four different Earth system models, comparing the updated G6-1.5K-SAI strategy against the previous GeoMIP experiment, G6sulfur. The findings indicate that while all models successfully meet the target global mean temperature (2020-2039 SSP2-4.5 average), they show significant variations in injection efficiency, aerosol distribution, and regional impacts on precipitation and Arctic temperatures.

Overall this paper is very well written, thorough and explains each step very clearly. In particular I would like to commend the authors for their detailed explanations of previous works and the presentation and explanation of figures 5 onwards. The description of the three time periods and how they relate within each figure, especially compared to the G6sulfur results, is a great way for readers to understand the differences in results.

I only have a few very minor comments, otherwise I recommend this study for publication.

Section 2.1 - I think it would be helpful to have the 2020-2039 average temperature relative to pre-industrial for each model and/or the difference in warming by 2065-2084. This could also be well placed in section 3.1.

Table 1 - The UKESM atmospheric resolution is 1.25° *lat* vs 1.875° *lon*. I also had a question regarding the MIROC and E3SM atm. resolution - are they the same for both lat and lon?

Figure 2 - (c) is difficult to see all the ensemble means here, is it possible to have all the ensemble means on top of the individual ensemble members? Or reduce the alpha of the individual members?

Line 213 - “is the *only* G6-1.5K-SAI model to show...”

Line 235 - “In all four models,...” the authors should clarify that the first half of this sentence refers to the warming scenario to make it more clear for readers.

Figure 6 - It would be useful to include the G6sulfur models in the figure caption, similar to Figure 2, it would be useful for readers to easily find which models have been included.

Lines 302-303 - It would be worth naming the warming scenarios for G6sulfur and G6-1.5K-SAI in these sentences.