

Interactive comment on “Climate response to imposed solar radiation reductions in high latitudes” by M. C. MacCracken et al.

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This paper builds on previous work and emphasises the importance of the choice of the spatial distribution as well as the magnitude and type of the forcing used for SRM.

My main gripe is that the arguments aren't well supported by the figures because the figures are so difficult to read. They are small and fuzzy. The shading in the maps is visible, but only with careful scrutiny. I would suggest increasing both the size and resolution. I appreciate that the study is mostly concerned with the gross features of changes in temperature and precipitation, but I still find the maps difficult to read.

Also, there is a title error in Figs. 1(a) and 6(a). The top right panel titles currently read '[N71p25]-[1xCO2]', when they should read '[GSRM]-[1xCO2]'.

C281

A few other gripes about wording:

P726, L16-17 states there is 'virtually no response to reductions in NH solar radiation' for the SH sea ice. Fig. 3 shows there is no ice at all! Most people would interpret this as a response because they think of today's climate as a baseline. This sentence should make it clear that by 'no response' it means no response compared to the 2xCO₂ case.

P727, L14-15 reads: 'the counter-balancing of the CO₂-induced temperature increase is generally closest at low latitudes and not as complete at high latitudes'. The figure shows cooling at the Equator and warming at the poles. It would be more precise to say this.

P728, L6. Make it clear that the 'latitudinal extent' here is the latitudinal extent of the solar irradiance reduction.

P731, L13-17. I had to read this sentence again to make sure I understood that it was referring to the case with solar irradiance reductions at both poles. One could change this to, e.g. 'When solar irradiance is reduced at both poles, both the Northern and Southern Hemispheres share the excess solar energy accumulating in the low-latitude oceans, leading to roughly similar latitudinal cooling in both hemispheres'.

P731, L18. This paragraph doesn't make it immediately clear that the feedbacks are considered for the region over which solar irradiance is reduced, not the whole planet.

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