

Interactive comment on “Response to marine cloud brightening in a multi-model ensemble” by Camilla W. Stjern et al.

Anonymous Referee #1

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Reviewer Comments:

Major Revisions:

The authors present the results from Earth System Model simulations from the marine cloud brightening experiment of the Geoengineering Model inter comparison project. Marine cloud brightening (MCB), one of several solar radiation management (SRM) to mitigate the climate change. MCB via 50% increase in the CDNC of low clouds over the global oceans shows an effective radiative forcing of $-1.9Wm^{-2}$, the global temperature decrease of 0.95K, and a significant decrease in global precipitation. Although authors show that the MCB mitigates the surface temperature, the termination effect is not discussed in detail. As far as climate engineering is concerned, termination effect

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has large significance. Also, it would be interesting to see the effect of MCB on climate extremes.

The topic- Response to marine cloud brightening in a multi-model ensemble- is of interest and it fits the scope of ACP. The paper can be accepted with major revision. Please see the major comments below.

Major comments:

- Out of nine models, six models investigated the termination effect, so it would be interesting to see the terminating effect in those models. A similar study which uses sea salt aerosols for MCB reported that termination effect results in an increase in precipitation and extremes (Aswathy et al., 2015). So termination effect, especially on precipitation, cloud cover, and temperature (spatial and zonal averages) could be included in the revised manuscript.
- Also it would be interesting to see the termination effect on polar amplification. A separate section can be included.

Minor comments:

- Page 4. l8: Modeled cloud climatologies, is it Section 2.3.?
- Figure 1. Indicate a reference mark/line for low clouds (at 680 mb).
- Figure 2. Please consider, including observation.

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