Reviewers' comments are in blue. **Responses are in black**. New additions to the text are reported in *Italics*.

CC1

Comment: There is one point of contention I have with the paper, which is the use of the term "preindustrial" in declaring the target of these runs to be "PI+1.5degC". The paper specifies that PI is defined here as the 2020-2039 GMST average. Given that in 2025 temperatures have already warmed by ~1.2degC since the mid 1800's the 2030 average is likely to be even higher than that, so the target is really closer to 2.7+degC above the true pre-industrial. While the definition of "preindustrial" being used here is specified, the reality is that results are likely to be conveyed in a way that this detail is lost. Given that the effects of SRM depend on background climate I think it is important to use terminology that is not misleading. As such, I strongly recommend that these runs are not referred to as targeting "preindustrial + 1.5degC" but rather something like "present-day + 1.5degC".

We thank Dr. Doherty for her comments and feedback. After her comment, we had some time to discuss this with her in person and clarified in depth the misunderstanding. We do clarify now when the "preindustrial + 1.5degC" is first presented that it is intended to be "*a time period as close to ``present day'' as possible*".

Comment: In Section 3.4 it is specified that "MCB is applied by increasing injected sea salt aerosol emissions". While the size of sea salt to be injected is mentioned elsewhere, it would be good to again note here that this sea salt would be of a different size than the naturally emitted sea salt. This is not the same as just increasing sea salt emissions, and "increasing injected sea salt aerosol emissions" could be read to mean just increase the model's natural sea salt emissions. Given the strong size-dependence of cloud responses on aerosol size, increasing natural sea salt emissions will have very different effects than adding sea salt aerosol that is mostly or all in the coarse mode, as is the case for natural sea salt emissions.

Good point! We add 'We recommend that the injected sea salt aerosols have approximate effective dry radii of 30 nm to 50 nm if possible, though this may vary depending on the activation parameterization and natural sea salt aerosol representation, as discussed in section 2.2.'

Comment: lines 341-342: The Rasch et al. (2025) paper should be cited here in and the sentences that follow, as their runs were also focused on low latitude MCB.

Good point! We assume you mean Rasch et al. (2024) 'A protocol for model intercomparison of impacts of MCB'. We have added the citation in L.341-2, and it was already in the following sentence.

Comment: lines 457-458: I found this statement odd, as it implies that the equator-to-pole gradient could only be controlled by deploying MCB at polar latitudes, and this may not be the case. Unless there's a basis for this assumption, I'd suggest rewording to a more general

statement that more research would be needed to determine how well the equator-to-pole gradient could be controlled through different MCB deployment patterns.

Fair point! We rephrase as follows: 'While a 3DOF case aligning with SAI may enable clearer inter-method comparison, more research would be required to determine how well the equator-to-pole gradient could be controlled through different MCB deployment patterns.'

Comment: line 531: In the SH much of the area south of 60S is land, as is some of the area north of 60N. Are clouds over land also perturbed in these runs, or only clouds over sea ice?

Response: We agree that this needs clarification.
As stated in the text, "Perturbations were done over the polar ocean domain (including sea-ice) poleward of 60°N and 60°S." We now clarify in the text that clouds over land were not perturbed, to remain consistent with the perturbation strategy of Villanueva et al. (2022), where it was shown that perturbing marine clouds leads to stronger cooling effects.

Comment: line 532: Regarding the specification of winter as "(Nov, Dec, Jan and Feb)": presumably this is May, Jun, Jul, Aug for the SH winter.

Response: Yes, we thank the reviewer for pointing this out. In the Southern Hemisphere, the perturbed season (winter) corresponds to May, June, July, and August. We have clarified this in the revised manuscript by explicitly referring to winter in each hemisphere.

Comment: Finally I'll note that I disagree with the Anonymous Reviewer #1 that Figures 3, 5 7 and 8 should all be moved to a supplemental section. I agree that Figure 3 is rather confusing as to what it's trying to convey but I would encourage perhaps revising that figure rather than (re-)moving it. Figure 5 seems to be a pretty important visualization of the G6-1.5K-MCB protocol. Figure 7 similarly is a helpful demonstration of the MCT protocol -- though Figure 8, I'll agree, is less essential given that this is not a Tier 1 (or even Tier 2) protocol, so could be omitted or moved to a supplemental section but I don't think it necessarily should be.

Thank you for the feedback! We indeed moved only Fig. 3 and 8 over to the Appendix, to streamline the reading.