

Response to reviewers

We are happy that the reviewer feels that the manuscript is improved after the previous revisions, including the additional figures and tables in the supplement.

Reviewer #1

• In the Post-processing analyses section, the years are confusing, for example, page 4 L6-7': In the above section, it is mentioned that, G4cdnc experiment is run for 50 Years, (2020-2069), after which cloud brightening experiment is terminated. However, here it is mentioned that, "we base our analyses on years 2020-2060" Please explain, why the base years are not 2020- 2069?

We appreciate that the reviewer points out this discrepancy in our choice of analyses years. The choice to end the data period in 2060 stems from an early point in our analyses where data was lacking in the years after 2060 from some of the few models we had achieved data from. This changed, but in the process we forgot to change the analysis period. This has now been done consistently throughout the manuscript, so that the years 2020-2069 as used as a base for calculating changes. The results do not change at all qualitatively, and quantitatively only very little (the values of change in Table 3 do not change much). For instance, the model-median temperature reduction changes from -0.95 to -0.96 K. New figures are now used in the tables, and in the text.

Again in the same section page 4 L16-17, The annual average is also confusing, more explanation is needed.

We agree that our choice to use annual values in the first part of the time series, and decadal values in the latter, when performing the Gregory regressions, was not well explained in the text. We have now elaborated and clarified the text to read:

"To estimate the effective radiative forcing of increasing CDNC by 50% in the different models, we use the method of Gregory et al. (2004), whereby the **global mean** top of atmosphere radiative flux imbalance is regressed against the globally averaged surface air temperature change compared to the RCP4.5 simulations. **Because of the time scales of the adjustments to the applied forcing, we follow Williams et al. (2008) and Gregory et al. (2004), and use annual means for the first decade, and decadal means thereafter; the period of 2030 - 2069. This allows more weight to the years when the rapid adjustments dominate, before the slow feedbacks have more impact in the later part of the simulation"**. ~~To apply the greatest weight to the initial changes, we use annually averaged values for years 2020-2030, but decadal mean values for years 2031-2070 for the regression."~~

The following sentence has also been added to the caption of Fig. 3:

"Each box represent global annual mean for each of the first ten years and decadal means for the remaining part of the simulations (i.e. last four decades, 2030 - 2069)."

• Page 3. L33-34: "Note also that in BNU-ESM, the 50% increase in CDNC had to be obtained through a direct alteration of liquid droplet size, which means that its experiment set-up is slightly different from the other models", More information regarding liquid cloud droplet modification could be worthwhile.

The different model set-up of BNU-ESM did indeed merit a bit more explanation. We have now changed the last sentence of section 2.1 to the following:

“Note also that for BNU-ESM, the model design precluded a direct change in the CDNC. Therefore, instead of multiplying 50% increase in CDNC by 1.5 to obtain the 50% increase, they had to approximate ~~be obtained~~ the cloud seeding through a direct alteration of liquid droplet sizes (droplet radii are multiplied by the factor $1.5^{1/3}$), which means that its experiment set-up is slightly different from the other models.”

- *Page1. L39: 2015 21st, Please add comma.*

The comma is now added.

- *page6. L30: expand ITCZ.*

ITCZ is expanded as requested.

- *Page9. L4: add space between “ofCDNC”.*

We were not able to find this error, but have at least checked and made sure that “ofCDNC” does not occur anywhere in the manuscript.

- *Figure 3b, Please include in the figure caption, “Dashed line indicate the termination period”.*

We thank the reviewer for this suggestion – we chose to add the following text to the caption “Dotted vertical line indicates the onset of the termination period”.

- *Please make use of the abbreviations throughout the manuscript, for example LWP.*

We have done as the reviewer requests, and the manuscript is now more consistent in its use of abbreviations, such as LWP, TOA and CDNC.