Response to Anonymous Referee #3

We appreciate the Referee's constructive comments on the manuscript, and respond to each point below.

1. page 18623, line 3-5: The projected surface warming is larger than what?

We reworded the relevant paragraph in the abstract as follows, to address both this point and the following one:

"Comparing 13 CMIP5 models, we find a correlation of –0.54 (significant at 5%) between aerosol ERF in the present climate and projected global-mean surface warming in RCP4.5; thus, models that have more negative aerosol ERF in the present climate tend to project stronger warming during 2006–2100. A similar correlation (–0.56) is found between aerosol ERF and projected changes in global-mean precipitation."

2. page 18623, line 5-6: Explain "r" and "p".

Please see previous point.

3. page 18623, line 22: "the" is repeated.

Fixed.

4. Section 2.2: Add horizontal and vertical resolutions in this study.

Done (in Section 2.1, as part of the model description).

5. page 18633, line 2: "to" is repeated.

Fixed.

6. page 18633, line 11: Is it only for the shortwave to call double? According to the description after here, it seems that the aerosol effects in the longwave radiation are also included.

Longwave effects are included only for dust and stratospheric sulfate. This is now clarified in Sec. 2.1 (model description). The issue of the double call to the shortwave radiation can be a source of confusion, because it is relevant only for calculation of the aerosol direct radiative forcing. On the other hand, the aerosol ERF (which includes indirect effects and rapid adjustments) is simply based on the difference in net radiative flux between two runs, so no double call is needed. We have made this more explicit by stating that the "net" flux used to get the aerosol ERF is "shortwave and longwave", and by adding the following: "(Note that the double call is needed only for the shortwave scheme, because longwave direct radiative effects are not treated for aerosols with anthropogenic sources.)"

7. page 18634, line 20: Where is the error range in the figure?

The error range for the year 2000 (only) is stated in the text, as an indication of the uncertainty. To make this clearer, the text it modified to refer to "this indicative error range".

8. Section 4.2: Add observational data in Fig. 7a as same as Fig. 6a and discuss their comparisons in the text although reconstructions of historical precipitation are

uncertain.

A curve has been added to Fig. 7a for global-mean precipitation from the 20CRv2 reanalysis. Although the data are uncertain, the observations that rely on satellite retrievals seem unsatisfactory, since they don't start until 1979. We also prefer not to add a separate figure for land-only precipitation, since the main focus of the paper is not about the 20th century. Some text has been added to discuss comparison of the modelled and reconstructed precipitation time series.

9. page 18642, line 21: Explain "r" and "p" as commented for Abstract.

Done.

10. Fig. 1a: Emission in this figure is annual total, not annual mean.

The caption has been revised to correct the error.