

We thank the editor for the comments. Corrections have been made accordingly except for the following two.

For the comment “If I interpret Figure 15 correctly the graph indicates that only 9 ensembles are necessary (instead of 11 indicated in the paper) to satisfy the condition of RMS error < 0.58 W m<sup>-2</sup>”

As we mentioned in the manuscript, the minimum ensemble number is determined when the 90<sup>th</sup> percentile of RMSE is smaller than a threshold RMSE (indicated by the grey line). Here we use the 90<sup>th</sup> percentile of RMSE (indicated by the shaded area) instead of the median RMSE (indicated by the blue line). For this criterion, 11 is the minimum number required. Therefore, the original manuscript remains unchanged.

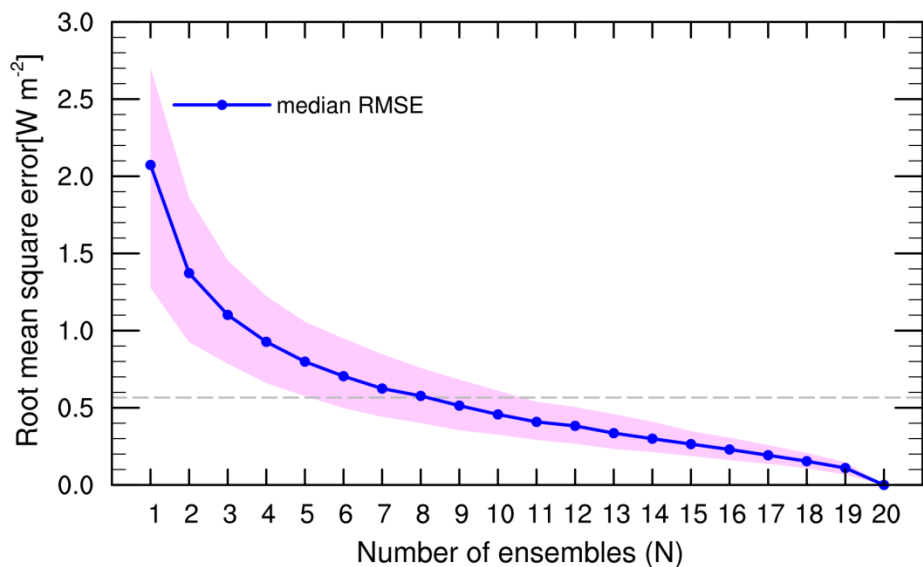


Figure 15 Root mean square errors (RMSE) of the ensemble mean of the regional mean fire aerosol SCRE during April 1-10 over Southern Mexico in simulations with different total number of ensemble members (N). The blue line represents the median RMSE of the 1000 groups (each group has N members/simulations). The grey line represents the threshold RMSE. Shaded area denotes the range between the 10<sup>th</sup> and 90<sup>th</sup> percentiles.

For the comment Change "For the selected region and period in this study, larger scaler factors are needed to make simulated AOD in agreement with the NRL and MACC reanalysis data." to “For the selected region and period in this study, larger scaling factors are needed to make simulated AOD in agreement with the NRL and MACC reanalysis data.”

Change "Therefore, the conclusion of a scale factor from 1-3 to match observations still holds in Southern Mexico, but a much larger scale factor of about 10 is needed in the Central U.S."

to "Therefore, the conclusion of a scale factor from 1-3 to match observations still holds in Southern Mexico, but a much larger scaling factor of about 10 is needed in the Central U.S."

The two sentences appeared in author's "response to comment" instead of the manuscript. The wording error of "scaling factor" elsewhere in the manuscript has been corrected.