

Response to comments

Dear Editor

Thanks very much for the comments regarding our manuscript. We have now addressed these comments point-by-point below with original comments in *Italics*. Please check the manuscript with tracked changes.

Line 40, average times to "average time".

Reply: Done

It should be more clearly shown that how the calculation of "coating time" may have been affected by the boundary layer development, as it will affect the concentration of rBC, while the rBC concentration has been used in the correlation analysis.

Reply: Yes, we agree that the rBC diurnal pattern could be affected by the changes of boundary layer (PBL) height. In particular, the nighttime concentrations might be elevated due to lowered PBL height. Therefore, we used the mass ratios of the species to rBC rather than mass concentration of the species to perform the calculation. The relative variations of secondary species to rBC might be a better way to reduce the impacts of PBL, and better reflect the "coating process" of the species. Of course, this is still a rough estimate of the coating process. This point is now made clear in the main text.

I would suggest to tidy up the figures. 15 figures may be too many for this article. For example, Fig.14 could be the first figure and merged with Fig. 1. Fig. 4 - Fig. 6 could be merged as one figure but the less important information could go to supplement (also remove the duplication). Does Fig. 7 have some duplicated information with Fig. 2 and Fig. 3? Fig. 8 and Fig. 9 both conveyed RH information which may be merged. Fig. 15 contained meteorological information again. These may help the whole article look tight.

Reply: Thanks for the suggestion, we agree that some figures might be redundant and should be in the supplement. Per your suggestion, Figure 14 is now directly moved into the supplement (it will be too busy to merge with Fig. 1). Figure 4 is put into the supplement. Figure 7a has some duplicated information (time series of POA factors) with Figure 3, and is now moved into the supplement too. As Figures 8 and 9 both contains multiple panels and it seems to be too busy to merge them together without reducing the space therefore we keep them. At last, Figure 15 contains repeated meteorological data and now the panels a and b are removed (as well as those of Figure S13). We have updated those figures and carefully checked and changed the corresponding texts. The supplement figures are renewed as well and their relevant reminders in the main text.