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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Quantification and evaluation of atmospheric pollutant emissions from open biomass burning with multiple methods: A case study for Yangtze River Delta region, China" *by* Yang Yang and Yu Zhao

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1. General comments: This manuscript presents a very comprehensive study of historical trend of OBB emissions in YRD. I am very impressed by the large amounts of work done in this study. The presentation is also of high quality, and the structure is well organized. The constraining method is a little bit weak, but makes the story complete. I would suggest the authors improve the constraining method in future studies. The authors have acknowledged the weakness, which is great. I only have very minor comment for improvements. For constraining method, the correction is based on the

comparisons of PM10, and the correction factor was applied to all other species. The authors should acknowledge this limitation in the method section.

Response and revisions: We appreciate the reviewer's positive remarks on our manuscript. We thank the reviewer's suggestion and will improve the constraining method in future studies from following aspects. The method can be improved incorporating the observed ambient concentrations of multiple pollutants (e.g., PM10, PM2.5, OC and EC) if those concentrations with sufficient temporal and spatial resolution get available. Improvement on the results of constraining method can be expected if more reliable emission factors of biomass burning and improved and the emissions of other sources are obtained and applied in the study. For constraining method, the correction of activity level was based on the comparison between simulated and observed PM10 concentrations, and the emissions of other species were then revised according to the changed activity level. In this method, the emission estimation of other species depends largely on the reliability of emission factors for PM10 and those species. Large uncertainty may exist due to lack of sufficient domestic measurements. We take the reviewer's suggestion and acknowledge this limitation in the method section. Corresponding revision was shown in lines 258-264 of Page 9 in the revised manuscript.

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