

## Responses to reviewers' comments

We would like to thank the reviewers for their valuable and constructive feedbacks and comments, which helped us to improve the manuscript.

Referee comments are given in black, and our responses are in blue. Changes made to the manuscript are marked in underlined blue. The line number referred here is for the new revised manuscript.

### **Anonymous Referee #1**

This manuscript reports a novel “binPMF” method that can be used to improve the deconvolution of organic factors using atmospheric mass spectral data that don't have adequate mass resolution for unambiguous ion speciation. The authors applied this method to both ambient and synthetic data and demonstrated that the combination of mass spectral binning with positive matrix factorization is an effective approach to better resolve chemical information and to improve the separation of different sources and processes. This is an exciting new development in data analysis for real-time mass spectrometry and this work is of very high quality. The manuscript is very well written and the topic is a good fit for AMT. I thus recommend the manuscript be accepted for publication as is.

**Response:** We greatly appreciate this positive feedback on our work.