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Dr. Yafang Cheng

Dear Dr. Cheng,

Thank you very much for your comments. Following your suggestions, we revised the manuscript again.

- 1) We further expanded the discussions on the uncertainties of HOA and CCOA factors (page 11, line 244 – 252). *“Considering that the mass spectra and time series of HOA and CCOA are overall similar in this study, the PMF analysis may still have uncertainties in differentiation of the two factors. Particularly, ACSM does not measure high  $m/z$ 's ( $> 150$ ) which are crucial (e.g., PAH signals) for distinguishing HOA and CCOA. Because we didn't have more external tracers to further validate these two factors, it is the best solution that we can get based on the current available data. Future work, such as performing high-resolution time-of-flight AMS measurements or PMF analysis with the multi-linear engine (ME-2) algorithm (Paatero, 1999) are needed for a better investigation of HOA and CCOA in urban Beijing during wintertime.”*
- 2) Other explanations for the large increase of particles in the size range of 1 – 2.5  $\mu\text{m}$  were added (page 14, line 327 – 329). *“It is also possible that coagulations and VOCs condensation on the aerosol phase during FW period played a role.”*

Thank you very much for your consideration, and I am looking forward to hearing from you.

Sincerely,

Yele Sun

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