

Atmos. Meas. Tech. Discuss., referee comment RC1
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Comment on amt-2022-100

Anonymous Referee #1

Referee comment on "The effect of the averaging period for PMF analysis of aerosol mass spectrometer measurements during offline applications" by Christina Vasilakopoulou et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-100-RC1>, 2022

Thanks to authors for raising an important issue via this article. This is completely true that Off-line AMS measurements have added valuable information to OA chemical speciation and sources when the use of online AMS is not possible especially for the remote sites. However, these offline measurements have low temporal resolution and how this affects the performed source apportionment, it has not been discussed thoroughly in the research community. Results showed here the sources apportionment performed on low and high resolution data retrieves the same number of factors, however their contribution to the total mass is relatively different. Even the resolved factors from the low resolution data introduces more error in the factor profiles. Results are interesting, however I found more discussion is needed for some parts. I have listed the major concern below:

Method section, as I understood PMF was performed on the different resolution dataset. So basically origin high resolution data has been averaged to do this exercise. However, I am wondering, what about uncertainty. The uncertainty matrix is automatically generated for the original data, but then how it was processed for the different time resolution? Did author average the uncertainty for different resolution? Also, is the simple average has been used or weighted average? While averaging, how any spikes or specific events are treated because they all would affect the source apportionment. I would recommend to elaborate this in the manuscript.

The variation in the spectra of various factors has been evaluated using theta angle. Author have referred a paper for this, but it would be nice to provide some details in the given paper. Also, the discussion based on the theta angle is minimal, what about comparing with other approaches to check the variation?

Another concern is the discussion on the percentage change in the contribution of different factors. Yes, I can see a change in the contribution of primary factors to the total OA from

65% to 72% when the resolution moved from 30 min to 24 hour. Is that change in the contribution significant? What about the averaging error? Or any other errors i.e. PMF error? I can't find any detailed discussion on this in the manuscript.

Author have provided the comparison between 30 min and 24 hour factor profiles, and differences between them. But why this differences have been found, what could be the reason for such discrepancies, no discussion on that. Like why COA tends to over predict when it is below 2 ug/m³?

Minor comments:

Please add the reference for HOA mass spectrum.

What about COA diurnal? I would suggest to add that information.

Earlier in the manuscript, degree symbol has been used but later it is written degrees, please be consistent.