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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Fine-mode organic mass concentrations and sources in the Amazonian wet season (AMAZE-08)" *by* Q. Chen et al.

Anonymous Referee #3

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The paper of Chen et al. describes the sources of submicron organic particulate material in Amazon during the wet season. Authors utilized positive matrix factorization (PMF) to extract the sources/processes of organic material and found four factors; hydrocarbon-like organic aerosol (HOA) and three different types of oxygenated organic aerosols (OOA-1, OOA-2 and OOA-3). Two of the OOAs were related to the production of secondary organic material (SOM), one associated with particulate phase SOM production and the other one with gas-to-particle conversion.

In my opinion the significance of this paper is that different SOM production pathways can be found by using the PMF. This paper addresses relevant scientific questions, however, the main issue is that a substantial portion of the results (and conclusions) presented in this paper have already been published in Chen et al. (2009) even though

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the data analysis was different. Therefore my main concern regards the novelty of the paper. Overall, this paper is well written and the structure of paper is clear and easy to follow. I think this paper merits publication after addressing the issues listed below.

General comments

As mentioned above, a large part of the results and following conclusions have been published earlier. Therefore I'd suggest making a clear difference which results are novel in this paper and which ones have already been published. That would be fair to the readers.

Specific comments

1. Abstract: page 16153, line 7; "Ammonium was present in sufficient quantities to partially neutralize sulfate". Later it was said that: "there was insufficient ammonium to neutralize sulfate" (page 16161). I understand that the meaning is same but I prefer using the latter for clarity.

2. Abstract and throughout the manuscript; make sure that when the abbreviations are used for the first time, you also write the whole definition e.g. HOA and OOA in abstract, IEPOX, MVK and MACR in results and discussion.

3. Site and instrument description: page 16157, lines 25- ; PMF was conducted on medium-resolution V-mode data but reported in unit mass resolution. Why?

4. Results and discussion; I suggest keeping the discussion on inorganic species as short as possible as the title of the paper is "Fine mode organic mass concentrations. . .". Only if they are relevant to organics they should be discussed.

5. Results and discussion: page 16163, lines 26-28; you said that species correlated but R2 values were 0.35-0.52. To me these were only moderate correlations.

6. Results and discussion, page 16166, lines 27- ; you talk about the different fractional contributions of OOA-2 and OOA-3 during different periods. Have you found any

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reasons why the fractions differed so much?

7. Results and discussion; I guess you also measured particle size distributions with the AMS. Could you get any support for the PMF factors from the pToF data?

8. Conclusions; This section is mostly summarizing the results. Only the last paragraph concludes. Maybe the title should be summary and conclusions?

9. Figure 5, page 16182; Figure is a bit unclear. I suggest using dots only to PMF-factors and lines to all the other components, or something similar.

References: Chen, Q., Farmer, D. K., Schneider, J., Zorn, S. R., Heald, C. L., Karl, T. G., Guenther, A., Allan, J. D., Robinson, N., Coe, H., Kimmel, J. R., Pauliquevis, T., Borrmann, S., Poschl, U., Andreae, M. O., Artaxo, P., Jimenez, J. L., and Martin, S. T.: Mass spectral characterization of submicron biogenic organic particles in the Amazon Basin, Geophys. Res. Lett., 36, L20806, 2009.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 16151, 2014.