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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Interpretation of organic components from positive matrix factorization of aerosol mass spectrometric data" *by* I. M. Ulbrich et al.

**Anonymous Referee #1**

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This paper is an important contribution to the field. Positive matrix factorization for Aerodyne aerosol mass spectrometry data has so far only been used by Lanz et al. (2007, see reference in paper). However one can expect a much extended use of PMF by this aerosol mass spectrometer community, especially when an easy applicable code like the one presented here becomes available. Both this paper and the paper by Lanz et al., (2007) emphasize the necessity to carefully use the method and the need for as much evaluation of the results as possible. I think that both examples should be a role model for some of the future work in source apportionment using aerosol mass spectrometer data.

The case study of Pittsburgh is very well described and it seems very important to show that very similar factors, especially OOA1 and OOA2 correlating with sulfate and nitrate respectively as found by Lanz et al. (2007). It would be very nice to discuss how well the OOA1s and OOA2s from both studies compare. This might be done also in a future paper including data from more stations.

In general, it should be mentioned here that also with this paper, only two field campaigns (Pittsburgh and Zürich) have been assessed with PMF in detail. It should be emphasized that this should be done for more stations and campaigns in future before drawing too many general conclusions about the general applicability of the PMF method.

The part regarding the synthetic dataset seems to be less convincing so far. There are different ways how one could produce the synthetic dataset .. so it might be dangerous again to draw too many too general conclusions. I would strongly support the opinion of Paatero to split the paper in two parts. I also agree with Paatero that most figures are not easily legible. The reduction to the Pittsburgh study here and an extension to the discussions of the synthetic datasets in a second paper would aid to increase figure size and clarity in the individual papers.

Specific comments:

- p. 6746: The method, using R for m/z>44 was introduced in Alfarra et al., (2006) not in Alfarra et al., (2007). See reference below.

- p. 6747: I would also recommend to discuss in somewhat more detail, the differences between the results using the robust and non-robust mode.

- p. 6750 line 27: This is true for both OOA-I and OOA-II

- p. 6752 line 10; Also the OOA-I spectrum might vary with oxidation time. It also might be different at different stations..

Alfarra et al., A mass spectrometric study of secondary organic aerosols formed from



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the photooxidation of anthropogenic and biogenic precursors in a reaction chamber, Atmos. Chem. Phys., 6, 5279-5293, 2006.

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Interactive comment on Atmos. Chem. Phys. Discuss., 8, 6729, 2008.