Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "Constructing a data-driven receptor model for organic and inorganic aerosol – a synthesis analysis of eight mass spectrometric data sets from a boreal forest site" *by* Mikko Äijälä et al.

Anonymous Referee #1

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Review for Constructing a data-driven receptor model for organic and inorganic aerosol - a synthesis analysis of eight mass spectrometric data sets from a boreal forest site by Mikko Äijälä et al.

This paper describes the development of a new way to perform source apportionment, analysing eight different mass spectrometric datasets. The topic of this paper is interesting to the community and will help on improving future source apportionment studies. I recommend this paper for publication after the authors address the following comments.

Specific comments.

Introduction. The factorization tools used in this study are PMF and ME-2. However, the authors do not mention ME-2 in the introduction. It would be good to read how ME-2 helps on separating profiles when PMF struggles to do so.

Page 3 line 25. I think the authors want to stress the importance of local anthropogenic sources in the last paragraph. If that is the case, rephrase the last paragraph for something like: While previous studies have found biogenic SOA and long-range transport from industrial regions to be important, local anthropogenic aerosol sources are also present. At the moment that paragraph is confusing, please rephrase it.

Section 2.3.1. When describing ME2, the method used to constrain solutions should be explained as well. Page 16 Second paragraph. When talking about BBOA and COA, one of the main differences between these factors is the diurnal profile, COA usually shows a small peak at lunch time and then increases in the evening. Do the authors had a look at diurnal profiles to differentiate between COA and BBOA? Diurnal profiles provide interesting information about the different profiles identified.

Technical corrections

A number of typos were found in the manuscript. I suggest to go through the document again and correct the typos. These are a few minor comments I would like to provide.

Page 2 line 2. Change effects for properties Page 2 line 3. Change almost for near. Page 3 line 2. Provide the references to the previous literature. Page 4 line 2. Delete the word "to" before 2008. Page 4 table 1. Perhaps add a column with the number of months for an easier comparison. Page 4 line 10. Please define if it was a compact or a high resolution AMS. Page 6 line 30. Provide references where ME-2 has been used to partially constrain solutions. Page 9 line 4. Change: 'There exist' for 'There are' Page 21. "F57:f57 fractions", it should be f55:f57.

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