

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

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This is an interesting manuscript. It is very encouraging that the high potential of the application of PMF for AMS spectra could also be shown for an U.S.-American site, with similar findings as in our paper (Lanz et al., 2007). I appreciate especially that the authors discuss - as we did (Lanz et al., 2007) - possible caveats of such PMF analyses, in even more detail.

At this point, I have 3 specific comments:

1) On p. 6740, lines 11-14, there is a misconception:

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We did not use the rotmat matrix to derive the optimum solution. If we stuck to this criterion, we would have selected the 2-factorial solution (local minimum $\max(\text{rotmat})$ vs. number of factors) as can be derived from Fig. 2c, p. 1509 (Lanz et al., 2007). We characterized the different solutions by different mathematical diagnostics (such as the maximum rotmat element).

We stated very carefully (Lanz et al., 2007; p. 1510): “The rotmat values should however only be interpreted qualitatively (Paatero, 2000) and are not suited as a unique criterion for the determination of the number of factors as it appears that no general validity may be inherent to such an approach (Paatero, 2007).”

2) Lanz et al. (2006) should not be cited (p. 6740): in view of Lanz et al. (2007), the ACPD-version is obsolete.

1+2) We therefore suggest to delete the citation (Lanz et al., 2006) on p. 6740, line 13, and to put the (Lanz et al., 2007) on p. 6740, line 14, so that the sentence reads: “Some have argued that a solution with the least rotation may be best and have used the maximum value of Rotmat as a metric for making the determination of the number of factors (Lee et al., 1999), while others argue that it is best to use this output only as a qualitative metric (Paatero, 2000, Lanz et al., 2007).”

3) On p. 6743, line 3, there is another misconception:

For several data sets we found that defining a too large number of factors, single m/z 's may partly be represented by one single factor. This behaviour can be observed for matrices estimated by different versions of the AMS data analysis software (also for v1.36 or later). Therefore, the reference Lanz et al. (2007) is not appropriate at this instance. Therefore we suggest to delete “Lanz et al., 2007” on p. 6743, line 3.

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