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Discussions

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Interactive comment on "Source identification of atmospheric organic vapors in two European pine forests: Results from Vocus PTR-TOF observations" *by* Haiyan Li et al.

Anonymous Referee #2

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This paper reports on data collected by a VOCUS PTR-ToF-MS at two forest sites. The VOCUS PTR-ToF is a powerful tool to characterize both biogenic and anthropogenic emissions due to it's high sensitivity and broad range of detectable organic compounds. For the first time, the binned positive matrix factorization (binPMF) algorithm has been applied to VOCUS data. Applying PMF to binned data with subsequent high-resolution peak fitting and identification of peaks found to be relevant is a clever way of data reduction in rich datasets as obtained by modern non-selective CIMS techniques.

The paper is technically sound; the authors describe individual PMF factors in great detail, but, unfortunately, the paper does not go beyond a description of observations,

and I agree with Referee #1 that it feels unfinished at this stage. I therefore recommend that this paper be published only after major revisions.

Comments:

I think that the paper does not identify oxidation processes as stated in the abstract, nor does it provide a more comprehensive understanding of gas-phase organic chemistry.

The authors divided the mass spectra into two regions: 51 to 200 Th and 201 to 320 Th. Furthermore, they excluded two masses with high signal intensities (m81 and m137) from the PMF analysis, since these peaks were dominating the mass profiles. As far as I understand, both actions are necessary due to the fact that ambient concentrations of organic species and oxidaion products vary by many orders of magnitude, and the PMF method cannot resolve small signals. Maybe it's worth coming up with either a peak-by-peak normalization method prior to PMF analysis or feed the algorithm with logarithmized signal intensities. Please see this comment being made out of curiosity rather than critical.

Specific comments: Figures 4,7,9 and 12: the y-axis' unit is 'ions/bin' - I think that should be changed into something like 'ions/factor'.

line 62 and 307: replace "complicated" with "complex" line 182: please specifiy what 'high' means. line 293: "much higher intensities" - please rephrase