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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Primary and secondary organic aerosol origin by combined gas-particle phase source apportionment" *by* M. Crippa et al.

Anonymous Referee #2

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This paper deals with the investigation of the origin of organic aerosols with special emphasis in SOA. The paper is well written and has an undoubted interest. Source origin of secondary organic aerosols is a topic of high interest in atmospheric aerosols research. Authors present a new application of PMF and ME2 to a combined data set obtained with AMS and PTRMS. This method permitted to separate the SVOOA into a photochemistry driven and a night components applied during the summer period. However, as shown in Figures 6 and SI 1.2, the SVOOA components (day and night) are not clearly differentiated for some days (i.e 27th July), peaking both components simultaneously. Is any explanation for this? Although the methodology proposed permits a better identification of sources of organic aerosols there are some aspects still unclear. Thus, inclusion of PTRMS did not permit to better identify the cooking source.

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Methodology: some information is needed. Indicate in this section instruments and sampling locations used during each campaign. Please, specify height about ground level. Provide some information about meteorology during campaigns; this would help for interpretation. Page 13 L 40-please, delete (SV-OOA day) Page 13 L 40-46. Isoprene may be also emitted by anthropogenic sources such as oil and wood combustion, gasoline, tobacco etc, (Adam T, et al, 2006, Chem Res Toxicol 19(4), 511-520) Section 3.2.2 It is too descriptive. It should be better explained the differences and similarities between the two methods. It is not clearly stated chic AMS database is used for the PMFPTRMS-AMS analysist Page 16-L18. As far as I understand, the SVOOA night component was identified during the summer period but not during the winter period. However, a contribution of 18% was estimated for this source in winter. It is not clear to me how how this value was calculated. Figure 5. Please, improve quality of this figure (y-axis and resolution)

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 8537, 2013.