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***Interactive comment on* “Sources and chemical characterization of organic aerosol during the summer in the eastern Mediterranean” by E. Kostenidou et al.**

Anonymous Referee #1

Received and published: 18 February 2015

The paper titled “Sources and chemical characterization of organic aerosol during the summer in the eastern Mediterranean” by Kostenidou et al. deals with the chemical characterization and organic sources identification in Athens and Patras, highlighting the importance of regional sources in that area. Positive matrix factorization has been performed on high resolution time of flight AMS data identifying both primary and secondary organic aerosol sources. This is a relevant topic in the atmospheric science field and therefore it is suitable for ACP. The overall quality of this work is good and the manuscript is quite well-written. I recommend publishing this work after the authors respond to the following comments.

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General comments

Despite most of the references cited in the introduction are pertinent, this section should be reorganized to give the clear context for this paper. The authors list many topics, like source apportionment techniques, organic sources, studies in the Mediterranean area etc., but this introduction appears to be independent from the topic treated in this paper. I would recommend to explicitly mention how your study is connected to this overview (you reported just one sentence at the end of the introduction).

Did the authors expect to find marine related OA sources at their measurement sites? Being the two sites influenced by marine air masses, the S:C ratio should probably be higher than in continental urban sites. Can the authors further elaborate this concept?

The conclusion section is quite poor. The authors should highlight the importance of their work also at the end of the paper.

Specific and technical comments

-Page 3456, line 15: replace “HR-AMS” with “HR-ToF-AMS” (everywhere in the manuscript)

-Page 3457, line 4: replace “contributes” with constitutes.

-Page 3457, line 10: add the reference to Zhang et al., 2011.

-Page 3457, line 12: add the reference to Canonaco et al., 2013.

-Page 3462, line 9: I would mention that CE is usually around 0.5.

-Page 3464, line 18: reformulate “are not that useful”.

-Page 3466, line 3: replace “types” with “sources”.

-Page 3467: it would be interesting to show some of the PTRMS tracers correlations with the AMS SOA factors. I would also move Table S1 from the supplementary material to the main text.

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Discussion Paper



-Page 3472, line 11: which m/z where so different from the HOA from Crippa et al. 2013b?

-Figure 6 is expected to be used for SOA components. I would put it in the supplementary material.

-Figures S3 and S6: include fitting parameters (slope, intercept).

-Figure S14b: I would also highlight the extremely high contribution of mz44 for HOA-1

-Figure S16b: I would also mention the lower contribution at mz44 for HOA-1

-A general recommendation for the SI: you should report at least few sentences describing the shown graphs to guide the reader, although a more complete description has been already reported in the main text.

References

Canonaco, F., Crippa, M., Slowik, J. G., Baltensperger, U., and Prévôt, A. S. H.: SoFi, an Igor based interface for the efficient use of the generalized multilinear engine (ME-2) for source apportionment: application to aerosol mass spectrometer data, *Atmos. Meas. Tech.*, 6 3649–3661, 2013.

Zhang, Q., Jimenez, J., Canagaratna, M., Ulbrich, I., Ng, N., Worsnop, D., and Sun, Y.: Understanding atmospheric organic aerosols via factor analysis of aerosol mass spectrometry: a review, *Anal. Bioanal.Chem.*, 401, 3045-3067, 2011.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 15, 3455, 2015.

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