

## ***Interactive comment on “Processing of biomass burning aerosol in the Eastern Mediterranean during summertime” by A. Bougiatioti et al.***

**Anonymous Referee #3**

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The manuscript, “Processing of biomass burning aerosol in the Eastern Mediterranean during summertime,” by Bougiatioti et al., describes measurements performed by an Aerosol Chemical Speciation Monitor (ACSM) and aethalometer during summer 2012 in Finokalia, Crete. This period was characterized by several plume impacts from nearby wildfires. The chemical signatures of the biomass burning aerosols from these wildfires that were observed at the Finokalia site are the main foci of this manuscript. Overall, the manuscript is well-written. The presentation and analysis of the observations is logically organized, and most of the conclusions are well supported by data. This is also a unique study, since during a single observation period five different biomass burning plumes were observed. I have few concerns about this manuscript, and recommend its publication after consideration of the following points.

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A few questions/concerns (page#/line#):

25980/28: This sentence seems to infer that all five biomass burning plumes arrive at the Finokalia site during the early morning hours. This also seems to be demonstrated in Fig. 5c. Is this, in fact, the case for all events? If it is, why do you think these plumes all appear to impact the site at the same approximate time of day? Is it merely a coincidence?

25983/22: I am not very comfortable with this sentence: “Based on the results it can be seen that biomass burning may contribute almost half of the organic aerosol in the area during summertime.” Does this mean that: (a) When averaged over the entire summertime, half the organic aerosol are derived from biomass burning? (b) At any given instant, half the organic aerosol may originate from biomass burning? (c) Are the authors attempting to state what they repeat at 25984/23 in the Summary and conclusions section: “This suggests that the biomass-burning contribution to OA can be misidentified as OOA contribution, therefore underestimating the importance of BBOA.”? I don’t believe that they have shown (a) or (b) to be true, so I think you are trying to say (c) . . . and I like the way this is said in the Summary and conclusions section a lot more than on this line because it’s much clearer. Please review this and correct it or make it clearer.

Minor corrections (page#/line#):

Please review all references in the text to the Supplemental Information. In some cases (e.g., 25976/10) the incorrect figure number is given, and in other cases (e.g., 25978/lines 4 and 16) it would be good if the authors could make reference to the actual section in the SI to eliminate any confusion.

25972/24: “trimer”

25973/20: “wavelength”

25977/12: “(Fig. 3)”

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25979/10: "Hildebrandt"

25982/21: Might it be helpful to refer to SI-4.4 when discussing the similarities between mass spectra? As suggested above, please review the main text and add references to the SI where helpful.

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 25969, 2013.

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