

Interactive comment on “A new method for long-term source apportionment with time-dependent factor profiles and uncertainty assessment using SoFi Pro: application to one year of organic aerosol data” by Francesco Canonaco et al.

Anonymous Referee #2

Received and published: 13 August 2020

General Comments: The manuscript by Canonaco et al. developed a new method for long-term source apportionment with time-dependent factor profiles, which is a necessary piece of work for long-term field campaigns data. The seasonal variations of OA factors in urban background station were investigated. Overall, the paper is well written. I recommend acceptance for publication on AMT after minor revisions.

We thank the reviewer for this very positive feedback. We are also convinced that this study will be of help for future long-term source apportionment studies.

Specific Comments:

1, line 125: Why has the authors re-averaged the data into half-an-hour resolution instead of using the original one? If the reason is the amount of data, then why not just averaging the data into two-hour(or three-hour) resolution? Please elaborate.

Averaging the data to 30 minutes represents a trade-off between a better signal to noise ratio and the presence of a sufficiently resolved diurnal cycle (here one-hour resolution), crucial for the source validation step.

2, line 391: What is the difference between the mass spectra of COA in May 2011-September 2011 (likely due to local barbecuing events) and the general mass spectra of COA in this study? Has other studies discussed the characterization of mass spectra of different cooking styles? Please compare it.

The ratio of m/z 55 to 57 as well as m/z 43 and 44 vary in the range of a few percentages, but there are no systematic or seasonal changes. Hence, for this study not much can be concluded for the temporal variability of the COA fingerprint. The largest seasonal change reported in this study is mainly for OOA, SV-OOA in particular.

3, LV-OOA was only identified before 1/11/2011 in Fig. 3, but why did the f44 in LV-OOA appear throughout the sampling time in Fig.2? In addition, there is no (c) in Fig. 2.

f44 in Figure 2 is for both, i.e., LV-OOA and OOA. Hence, during the warm seasons f44 in Figure 2 is for the LV-OOA factor, whereas in winter it is for OOA only. In Fig. 2 the y axis reads now: "f44 in LV-OOA/OOA".

c) has been corrected in Fig. 2

4, "Spring 11/Fall 11" in table2 should be "Spring 2011/Fall 2011".

Corrected

Please also note the supplement to this comment:

<https://amt.copernicus.org/preprints/amt-2020-204/amt-2020-204-RC1-supplement.pdf>

The supplement contained the exact same review as already reported here.