

***Interactive comment on “Development of a versatile source apportionment analysis based on positive matrix factorization: a case study of the seasonal variation of organic aerosol sources in Estonia” by Athanasia Vlachou et al.***

**Anonymous Referee #1**

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This article presents source apportionment of OA contained in PM10 in Estonia using PMF technique on off-line AMS data sets. It also estimate the uncertainty of the PMF solution by a bootstrap analysis. Overall, this manuscript is well written, and the findings of the study are in agreement with previous studies. I have minor concerns for the manuscript as listed in the following: 1. Number of samples: The author collected only 39 samples from KJ. I am afraid that only 10 samples/ season is not enough to present for the seasonal variation of organic aerosols. It would be more useful if the author could describe in more details of sampling time for 150 samples. Do those

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samples collected from three sites in same sampling days/ time? 2. PMF techniques: The bootstrap techniques were commonly used to check uncertainty of PMF solutions for decades. I do not think it is "novel technique" as the author state in Page 3, Line 10. Could the author explain more the novelty of their bootstrap techniques? 3. In equation 3, do the authors assume the EC/WSOA ratio for each source is constant? If yes, please provide any references for that. In addition, the author should provide the correlation between measured EC and modeled EC concentration based on equation (3).

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