Atmospheric
Chemistry
and Physics
Discussions

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 #2

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General Comments: This manuscript investigates a year of organic aerosol in PM10 at three sites in Estonia. The organic aerosol was characterized by analyzing the water-soluble filter extract with an HR-ToF-AMS. The PM10 samples were 24-hour integrated PM10 quartz fiber filter samples using a high-volume sampler. Source apportionment of the AMS mass spectra was performed using positive matrix factorization. Seven factors were found between the three sites including an oil factor, sulfate-rich factor, summer oxygenated OA, winter oxygenated OA, dust, primary biological OA, and biomass burning OA. The BBOA, PBOA, WOOA, and SOOA factors were all validated with

externally measured organic markers. The dust factors were validated with external measurements of Ca2+. A bootstrap analysis is used to analyze the results and factor uncertainties. The paper thorough in its investigation and very well written. With some minor changes I suggest this paper be accepted.

Specific Comments: 4.1. For the estimation of traffic contribution to EC calculation what are the EC/WSOA values used? The ratio of EC/OC measured in biomass burning emissions highly variable (Pokhrel et al., 2016), as is SOA formation in biomass burning plumes (Jolleys et al., 2012; May et al., 2015). Given this range of possible EC/WSOA values, language as to uncertainties regarding this analysis should be added.

4.4. How many samples per season per site were there?

Fig 7. The colors of the two bars are very similar and hard to distinguish.

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