

Interactive comment on “Organic aerosol source apportionment by offline-AMS over a full year in Marseille” by Carlo Bozzetti et al.

Anonymous Referee #3

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The authors demonstrate the use of positive matrix factorization (PMF) to the water-soluble, offline AMS spectra to reveal the contribution of the different organic aerosol (OA) sources (hydrocarbon-like OA (HOA), cooking OA (COA), biomass burning OA (BBOA), oxygenated OA (OOA), and an industry-related OA (INDOA) in Marseille, France. They also make comparison between online AMS and offline AMS source apportionment to further show the application of offline AMS measurements for OA source analysis. The paper is very well written, the experimental approach and the data analysis are very clear. I only have one question about the definition of water-soluble, offline AMS spectra.

The authors have a detailed description of how they extract the filters in the experimental section, page 5, line 11” One punch per filter 12 sample (from 5 to 25 mm diameter depending on the filter loading and on the number of 13 punches per composite sam-

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ple) was prepared for analysis. Punches from the same composite 14 sample were extracted together in 15 mL of ultrapure water (18.2 M Ω cm, total organic carbon < 5ppb, 25°C) in an ultrasonic bath for 20 min at 30°C. After extraction, filters were vortexed for 1 min, and the resulting liquids were filtered with 0.45 μ m nylon membrane 17 syringe filters.”

My questions are: How do we define water soluble AMS spectra? Will the water soluble AMS spectra strongly depend on the filter extraction method (e.g, the volume of water and the temperature used for extraction, and sonication time)? How would these factors affect the composition of aqueous extracts and the water soluble AMS spectra? Without applying the same filter extraction approach, how could we compare the water soluble AMS spectra and source apportionment analysis in different studies? There is a possibility that the filters could be extracted in different ways in different studies. Since the offline AMS measurements could be a very useful tool for OA source apportionment, as demonstrated in this work, the authors further elaborate and address these issues in the manuscript.

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