This manuscript proposes a new method to determine elemental ratios of microgram level samples using offline AMS technique. Such technique would be quite useful and valuable, and therefore the paper merits publication. The description, justification and discussion of the technique is overall solid, this reviewer has a few comments for the authors to consider before its publication:

We thank the reviewer for their comments/questions/and suggestions and we have made changes to the manuscript to address their concerns as detailed below.

(1) The manuscript aims to do elemental analysis, but as shown in the paper, it seems like you can also do mass quantification by using an internal standard. So why only mention elemental analysis?

We are very interested in the quantification capabilities of the technique. The discussion on quantification in section 3.2 and figure 4 are laying the groundwork for this type of analysis. We have added a note in the conclusions that the SVN will be used to generate aerosol for quantitative and qualitative analysis of environmental samples in the future.

(2) Does the size distribution influence the measured particle composition? Also, for different samples, did you observe different size distributions?

The current model of the SVN is better suited for discrete samples and particle size measurements tend to require a continuous source of aerosol for at least a minute or two. Initial tests were carried out using continuous flow in the SVN and these results are shown in Figures 2 and S1. Figure S1 shows that lower concentrations make smaller sized particles. It also shows that we observe homogenous particles indicating that the size range sampled will not vary the composition measured in the AMS.

We have added a sentence to the caption on Figure S1 to highlight this: "For these samples, the size distribution of the components is fairly uniform consistent with the formation of homogenous particles in the nebulizer."

(3) Dehumidification is not applied in current experiments (although it can be done as you mentioned), therefore there might be extra H2O signals influencing quantification of organics? I think you should add dehumidification procedure.

We agree with the reviewer that care with quantification is very important. The AMS software used to process these data sets limits the organic H_2O signal to 0.225 of the CO_2^+ signal measured in the sample to account for the presence of water in the particles. The addition of a dehumidication procedure may provide valuable insights for some studies which is why it is raised in the paper. However, we caution against the assumption that after the particles have passed through a dehumidifier all the water observed in the AMS is due to organic pyrolysis/fragmentation as this may not be true across all sample types.

(4) You mentioned there might be significant background signals if organic solvent is used to extract the samples. Did you try to use activated carbon to remove organic solvent?

We thank the reviewer for this suggestion. The lead author is currently working on characterizing background signals from organic solvents and is excited to test this idea out as a denuder before sampling into the AMS. This method will likely improve the removal of organic solvent from the particles, which will help characterize lower-volatility organic contaminants present in the solvent.

(5) You mentioned the ultrasonic nebulization may increase the temperature of your sample solution. This may lead to evaporation of some organics and therefore the composition and elemental ratios of your analysis. How to avoid this and how to consider such uncertainty?

We have begun the characterization of this feature by the offline vs. online comparisons. Our initial tests, shown in Figure 5a and 5b show very good reproducibility between the chemical composition measured in the AMS after SVN nebulization and what has not been ultrasonically nebulized. To further reinforce this we have added text to the conclusions (italic = additional text): "A direct comparison between the mass spectra generated by commercial spray atomizers or by real-time aerosol particles sampled directly from the atmosphere showed high degrees of agreement*, indicating minimal composition changes during nebulization*."

(6) Regarding the comparison of AMS mass spectra determined by SVN and online data, you need to be careful that the difference can attribute to a couple of factors: online measurement is for PM1 and can measure both water-soluble and water-insoluble species, while the SVN only determine water-soluble portion and your samples are PM2.5?

We agree that the differences in size distribution and the effects of solubility may influence the composition observed. We address this for both the chamber and the ambient comparisons in section 3.3 and have added text highlighting the size differences for the chamber experiment between what the measured online (PM1) and what is collected on the filters (no cut-off was applied).

(7) Why not use Canagaratna 2015 (Atmos. Chem. Phys. 2015, 15, (1), 253-272.) method to calculate H/C and O/C?

H/C and O/C values for the HR-ToF-AMS data sets were calculated using the above reference. We have clarified this in the manuscript by adding (new text italics): "For samples compared to chamber or ambient online-AMS data sets, house air was the carrier gas, standard empirical estimates were used, *and the improved-ambient method for elemental ratios was applied* (Canagaratna et al., 2015)."

Other typos: Line 307 3.1 mass spectral analysis. It is not 3.1

This has been corrected

Line 316 atomizer (black) and the SVN (green), the colors are inconsistent Line 323 offline (red) vs. online (black) the colors are inconsistent

This has been corrected