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Atmospheric Measurement Techniques Discussions

Interactive comment on "Elemental analysis of Oxygenated Organic Coating on Black Carbon Particles using a Soot-Particle Aerosol Mass Spectrometer" *by* Mutian Ma et al.

Anonymous Referee #1

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Ma et al., reported the response of oxygenated organics in the SP laser in the AMS and found that comparing to using a standard tungsten vaporizer, the SP mode generates larger ion fragments. Using laboratory-generated pure organic aerosols, they developed an SP-based improved-ambient method for estimating aerosol elemental ratio. This manuscript addresses an important topic in AMS application, and is within the scope of the journal. I recommend publishing the paper after the authors address the following concerns.

Major comments:

1. How are RIEs of organics affected by LV vs TV? Is it possible that the lower degree

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of fragmentation in LV (thus larger molecular-size species) will generate fragments with lower molecular speed in the ionization region and lead to an increase in RIE?

2. In Figure 4b, some data points show measured O:C that are almost 3 times lower than the true O:C. What are those compounds and what causes such big discrepancies?

3. How would LV vs TV affect the fragmentation of other coating species such as nitrate and more reduced hydrocarbons (e.g. f57)? The authors mentioned that organic coating on BC core appear to be less oxygenated compared to those externally mixed with BC possibly due to the co-emitted POA. It will be important to know if representative POA fragments are different in laser vaporization vs thermal vaporization. In addition, it is important to understand how nitrate fragments (both inorganic and organic nitrates) change in laser vaporization. The difference in NO:NO2 ratio may affect organic nitrate quantification.

Minor comments:

1. Line 11: What is "*their* atmospheric transport and lifetime" referred to? organic coatings? BC particles? Or cloud formation potential? 2. Line 27" A total of . . ., were included. . ."

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