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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 #3

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The manuscript "Elemental analysis of Oxygenated Organic Coating on Black Carbon Particles using a Soot-Particle Aerosol Mass Spectrometer" by Mutian Ma et al. presents fundamental work on the use of electron-ionization mass spectra for estimates of elemental analysis (EA) organic compounds. The manuscript focusses on the differences between the laser vaporizer in the SP-AMS and the thermal vaporizer in the predecessor AMS. The main goal of the manuscript is to present a revised parameterization for EA estimation.

The work is excellent, and the presentation is outstandingly clear. I have a few short comments on the statistical presentation of the results which the authors should be

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Discussion paper

able to address easily. I recommend publication after these minor comments.

First, the major result of this manuscript is the I-A,SP parameterization from laboratory work. The graph which truly illustrates this result is Figure S3. Figure 4 shows the "old" method. I recommend that the authors combine Figures 4 and S3 into one 6 panel figure.

Second, the abstract discusses the "relative error of O:C" for the compounds measured in the lab. The manuscript explains that this is the "average relative error". I am not entirely clear how the average was calculated, but I believe this is the Root Mean Squared Error (RMSE) or Mean Absolute Error (MAE). The authors should specify this precisely.

The RMSE or MAE is a measure of the bias of the calibration. The authors should also report the precision of the calibration. An excellent example of this is found in Reggente, Dillner, and Takahama (Atmos Meas Tech 2016, https://doi.org/10.5194/amt-9-441-2016), but the authors may prefer some other formulation. My first comment also addresses the importance of precision, because the scatter in Figures S3 and 4 shows this precision.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-303, 2020.