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Interactive comment on "**Atmospheric particulate matter characterization by Fourier Transform Infrared spectroscopy: a review of statistical calibration strategies for carbonaceous aerosol quantification in US measurement networks**" *by* **Satoshi Takahama et al.**

Anonymous Referee #1

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General comments: "Atmospheric particulate matter characterization by Fourier Transform Infrared spectroscopy: a review of statistical calibration strategies for carbonaceous aerosol quantification in US measurement networks" addresses the need for accurate calibration models to interpret Fourier Transform Infrared (FT-IR) spectra, which can provide quantification of multiple species in complex atmospheric particulate matter (PM) mixtures. This review focuses on using models to facilitate quantitative predictions of organic carbon (OC) and elemental carbon (EC). The manuscript contributes

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Discussion paper

substantial data thoroughly exploring several quantitative models for interpreting FT-IR spectra. The approaches and methods are valid and balanced, and maintain consistent self-checks for validity and bias.

Specific comments: 1. The scope of the manuscript is very ambitious and covers detailed ground ranging from sample collection to model calibration maintenance. Potentially, the paper could be divided into two manuscripts. The manuscript starting from Background to the end of Section 3 could be its own review paper of methods and data-driven model-building, and Section 4 might be another review paper on operational phase models calibration and error prediction. 2. The manuscript might benefit from a table that presents/overviews all the components explored in model building, evaluation, and interpretation. 3. The figures in general can be made larger to read the text more clearly. In particular, Figures 7 and 13 have very small text. Additionally, symbols can be used in Figure 10 to ensure readability in greyscale.

Technical corrections: 1. Page 9 line 23 manufacturer of the PTFE filters should probably say "Whatman". 2. Page 19 line 3 abbreviation is "SAFOX" but Figure 6 uses the abbreviation "SAFO". 3. Page 23 line 9 should say, "A formal comparison... has not been performed, ...". 4. Page 24 line 12 should probably say "Wrappers operate under the implicit assumption..." 5. Page 28 line 26 should probably say "While the large number of LVs used by the IMPROVE calibration models precluded attempts at identifying individual components..."

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-70, 2018.