

Interactive comment on “Predicting ambient aerosol thermal-optical reflectance (TOR) measurements from infrared spectra: extending the predictions to different years and different sites” by M. Reggente et al.

Anonymous Referee #1

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General Comments:

The authors present results of a comparison of FTIR and TOR analysis of OC/EC for filter samples collected for the IMPROVE network. Previous work by this group has indicated that FTIR analysis provides similar results as TOR for OC/EC analysis, but that it is also cheaper and easier and can provide additional composition information on OC through functional group analysis. Here the authors expand on their earlier studies by analyzing a larger set of ~2500 samples from 17 sites across the US (and one in Korea) and two different years (2011 and 213). They conduct a very thorough and

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comprehensive statistical analysis to compare the methods and to evaluate the best approaches for FTIR calibration. The results are impressive and indicate that FTIR can be used instead of TOR for routine OC/EC analysis and that it has a number of advantages. This represents a major advance in the aerosol composition data that will be available in the future from this network. The paper is concise, very well organized, and clearly written, and I think is certainly suitable for publication in AMT. I have only a few very minor Specific and Technical Comments.

Specific Comments:

1. In practice how will you make sure that if the composition of the aerosol changes at a site over time that the calibration is still valid? It seems that you might be able to tell this from changes in functional group composition. Is this part of the long-term plan? Would you then conduct periodic comparisons of FTIR and TOC to verify that the calibration is still valid? It might be worth mentioning this.

Technical Comments:

1. P. 12434, line 8: I suggest deleting the “or” between PTFE and Teflon. PTFE is a type of Teflon, but there are others such as FEP that is used for most smog chambers.
2. P. 12434, line 11: I suggest inserting “functional group” before “composition”.
3. P. 12438, line 14: Should be “calibration”.
4. P. 12438, line 20 and P. 12447, line 8, and elsewhere: Should be consistent, “pls” or “PLS”.
5. P. 12439, line 26: Should delete “the” after “measure”.
6. P. 12442, line 21: It seems like this is a “Results and Discussion” section. There is no separate “Discussion” section.
7. P. 12446, line 4 and P. 12450, line 4: Should be “two-thirds”.

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8. P 12447, line 1: Should be “other”.

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