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Atmospheric Measurement Techniques Discussions



# *Interactive comment on* "ECOC comparison exercise with identical thermal protocols after temperature offsets correction – instrument diagnostics by in-depth evaluation of operational parameters" *by* P. Panteliadis et al.

**Anonymous Referee #3**

Received and published: 25 November 2014

This manuscript presents an interlaboratory comparison of OC/EC analysis using 2 different thermal protocols and the Sunset carbon analyzer. The study is interesting as it appears to be the first one where all participants use the same thermal protocols. Also discussions on TC/OC/EC quantification in the community are going on for years and any intercomparison is a welcome addition to existing literature and hence I recommend publication of the work after some serious revision. The manuscript is scientifically quite light and reads like a report with very repetitive figures and technical explanations (e.g. leaks) rather than scientific discussions. I also feel that the

manuscript would benefit from clarifications.

Major issues:

A challenge for size selective aerosol collection is that often the filters are not very homogeneously loaded. Hence the filters can show some substantial heterogeneity, which is reflected in the data from the Dutch lab at the beginning of the study. This raises some important questions: 1- Were any precautions taken to have each lab assigned random samples from a same filter or was there any systematic approach i.e. one from the center one form the middle and one form the outside? There could be substantial sampling bias? Please detail how assigning the filter slices was performed and any bias this can introduce (filter loadings especially on Andersen hi-vols have specific loading patterns because of the pre-impaction stage). 2- The reproducibility of the initial lab tests of 6.4% for TC seems awfully close to the arbitrary level of compliance of 8.3%? Could you discuss or justify how you came up with that compliance level?

It is not at all clear even with the reference provided how the robust average was obtained? In particular were the results from the underperforming laboratories excluded in that establishment? Were any values form labs with obvious deficiencies rejected?

The discussion of the results is overly focused on technicalities like: probably a leak, may be a weak laser,... but some interesting more scientific method related discussions are missed. Like the carbon fraction discussion, from the thermograms it is clear that the length of the temperature steps is problematic. In many instances carbon is still evolving when the instrument moves on to the next temperature step. How does this impact results? and relates to temperature calibration issues etc. Because in the end this is what could prompt using variable time steps rather than static ones? And hence would be truly useful information and should be included in the discussion of the variability of carbon fraction.

The manuscript is also missing a clear conclusion both literally in having a clear section



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summary or conclusion, and figuratively with a clear message for the community. What is the point the manuscript is making? What are the main observations and hence resulting conclusions for the community. AMT papers typically have a conclusion.

Some details: Please use only statistically significant numbers, expressing standard deviations with a decimal like in 15.3% is meaningless.

The sucrose calibration results are quite bad even some labs have a baffling spread. Was there really a same protocol used (same pipette or syringe to dispense the solution)? Also in addition to my earlier comment I hope the outlier labs here were excited form finding a true mean? The fact that a wrong volume of sucrose standard is dispenses was never mentioned and is one of the most common sources of problems in analytical interlab tests.

Figures: The figures are too repetitive for a manuscript with repeat overlying thermograms that hardly tell anything as they are way overloaded. For the very least, use shaded areas for the split point, less text and colorful lines in these figures is better. Also in interlaboratory tests it is customary to show Youden plots, may be high and low sample results from all labs. Anything but repeat overlay thermograms over and over.

Finally, please check the language: sometimes you change the tense in a same paragraph.

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Interactive comment on Atmos. Meas. Tech. Discuss., 7, 8697, 2014.