

Interactive comment on “The influence of temperature calibration on the OC-EC results from a dual optics thermal carbon analyzer” by J. Pavlovic et al.

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Responses to Anonymous Referee #2

Referee #2: The MS is a highly useful contribution to the field of OC/EC measurement techniques. There are many papers comparing one thermo-optical protocol to another, or discussing the differences between methods and instruments, but although the necessity of accurate temperature calibration is often acknowledged, very little is known quantitatively on the effect of temperature calibration on EC/OC splits for the different methods. The authors investigate this effect with only one instrument, which,

C1276

however, can be run with different protocols and has the capability for both reflectance and transmittance correction. I suggest publication after a few minor points have been dealt with.

1. Referee #2: p. 3329, lines 13-14: why was only the TOT correction considered for the NIOSH protocol? The instrument automatically gives OC and EC for TOT and TOR anyway?

Author response: In the past NIOSH carbon results have been always TOT corrected and IMPROVE TOR corrected. Therefore, at first we included only NIOSH TOT and IMPROVE TOR results, since these are the 2 mostly applied methods and we wanted to see influence of temperature calibration on these two thermal-optical protocols. However, in this last version of the MS for the IMPROVE method we included both, TOT and TOR results, to be sure that results that we observed are consistent and that selection of optical correction is not reason for significant changes seen in the carbon results. In order to make this clear to the readers we now included new sentence in the MS (line 164-168): “IMPROVE carbon results have been usually TOR corrected. However, in this study for the IMPROVE protocol, both TOT and TOR results were used to evaluate the effect of the oven temperature calibration (TCAL) on the OC-EC fractionation and to be sure that results found are consistent and selection of optical correction is not a reason for possible changes found in the carbon results. For NIOSH 5040, only TOT results were considered since the NIOSH carbon results have been always TOT corrected. “

2. Referee #2: p 3330, lines 17-20: please clarify sentence

Author response: The sentence is now corrected (lines 191-193).

3. Referee #2: p 3332, section 3.2.1: please clarify. If there is no difference in TC and EC concentrations obtained by TOT and TOT before and after TCAL: why should there then be a difference in the OC?

C1277

Author response: That effect is now better explained in the revised MS (lines 236-241): "Significant reduction of OC by 12% and no difference in EC and TC results are explained by the fact that average OC concentration in the samples analyzed by the IMPROVE protocol was two times lower than the average EC concentration in the same samples (Table 1). Therefore, different sample matrix with higher OC/TC ratio, and in particular higher semivolatile OC concentration (susceptible to pyrolysis, as discussed in section 3.3.1.) might result in significant increase of the EC concentration in addition to the decrease of the OC, while keeping TC values the same before and after the TCAL."

4. Referee #2: p 3335, first sentence: why is there a range (10-12 %) instead of a number as in the other instances?

Author response: MS is corrected accordingly (line 284-285).

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 3321, 2014.