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Review of “Characterization of the instrument temperature dependence of Brewer total ozone column measurements” by Alberto Berjón et al.

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The paper explores an important question related to the Brewer spectrophotometer TOC measurements/calculations: can the internal halogen lamp be trusted for establishing the temperature coefficients (TC) for correcting the TOC derivation? The result of this project confirms what has been an established practice - the internal lamp tests are sufficiently representative for the TC calculations.

General comments:

While the paper implies that the results can be generalized to all Brewers it doesn’t discuss how the presence of the NiSo4+UG11 filter can affect (or not) the results.

It is extremely important in my opinion to clearly distinguish and address separately the two very different effects that temperature has on the Brewer spectrophotometer measurements: 1) a spectrum shift due to difference in temperature coefficient of expansion between glass and metal and 2) changes in the PMT+order filter combination (if one is present) sensitivity/transmission (potentially wavelengths dependent).

A more important comment is about the terminology for the experiments that are described in the paper. The experiments are referred to by the location where they took place, ptb and K&Z, but these two locations/methods were only used for one Brewer each and not for both Brewers mentioned in the paper. This is important when comparing the results: the differences may be due to location/equipment or the Brewer instrument or both.

Also, PTB1 was by all accounts a failed experiment due to poor SL bulb and I do not see any advantage in presenting these results other than mentioning that a stable and reliable SL bulb is needed for TC calculations.

Many scatter plots of R6 vs T show variability for a given temperature greater (often significantly greater) than the difference in R6 at the extremes of the temperature range when using mean values for each temperature. Calculating TC from such data is very questionable as depending on the number of points at each temperature the mean can change if you wait long enough. In other words, TC=0 is all you can say in such situations.

Line-by-line comments:

P2 L4 Strictly speaking, positioning of the grating at the operating wavelength is not part of the HG test, this is done after the test. If you want to be more precise try re-writing this sentence.
P2 L6 “may not be perfect” seems out of place as this is precisely the reason HG test is done. Maybe this sentence was intended to be earlier in the text?

P2 L25 ground quartz filter is used in both DS and SL measurements
P3 L10 maybe it is worth mentioning that the movement of the slit mask is “rapid” to indicate that all wavelengths are measured almost simultaneously.
P3 L18 it is common practice to number slits 0 to 5 with dark count having no slit number (it is not a slit) and numbering slit mask motor positions 0 to 7 with position 1 corresponding to dark count
P3 L19 Rayleigh is also explicitly corrected for
P4 L20 I couldn’t quite figure out what the advantage is in having tau/I vs tau, I just hope readers are smarter than me.
P5 EQ16 and all that leads to it - seems like a very complicated way to show that an addition of a constant doesn’t change the convolution with weighting coefficients that add to zero by themselves
P6 L5 the requirement is same as my previous comment - constant in log space - seems like a more precise definition than “the change of the light source is proportional at all wavelengths”. Please re-phrase.
P7 L32 I happen to know that #233 is now installed in Malaysia and cannot possibly be K&Z reference. Please verify this information or say “it used to be” reference.
P8 Please make clear that #185 was only in PTB and #233 was only at K&Z
P8 L10 There seems to be no results or consequences of having photodiodes. Why mentioning them?
P10 L4 PMT’s dark count is theoretically proportional to the exponent of temperature. This is clearly the case with #233, but not with #185. Is it possible that there was something wrong in the setup of #185?
P11 L16 Maybe it is worth explaining that having reference temperature close to median operational temperature means little to know correction due to temperature is needed most of the time and thus there is slightly more room for TC inaccuracies.