

February 28, 2018

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

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The revised text of the paper addressed many of the concerns raised in the initial review and it reads much better now. I did find other areas where the paper can be improved, some of them are very important.

1. The title sounds as if the paper investigates the Brewer ozone calculation temperature dependence in general, but the content is mostly a comparison of 2 different experiments on 2 different Brewers plus a mentioning of variability of temperature coefficient values among the Brewers in EUBREWNET. I am not sure any general statements can be definitively drawn from this. A title similar to “An investigation of TC determination in EUBREWNET Brewers” can be more precise

P1 L20 Push rod doesn't really control the movement of the diffraction grating. Suggest not going into this details and say “materials used in the monochromator are selected to minimize the effect of the internal temperature changes on the spectrum position relative to the exit slits.”

I will repeat my comment in the initial review: the paper does not clearly differentiate between two completely different temperature effects in the Brewer: the positioning of the spectrum and the changes in the spectral sensitivity. Some paragraphs refer to both effects that is extremely confusing. Moreover, the paper doesn't actually investigate anything relating to the spectral shifts and so it is unclear why the authors even go into this area. A simple statement that is in page 1 is more than enough and I feel that no mentioning of this should be anywhere in the paper after that.

P2 L5 “During the test, the diffraction grating is positioned such that the operating wavelengths are dispersed onto the appropriate exit slits” - please rephrase as this sentence doesn't describe much.

P2 L14 TC are calculated for all operating wavelengths, not just those used for ozone

P2 L25 replace “the” with “some” in “quartz window and the neutral density filters”

P3 L7 remove double “an”

P3 L15 it's not really an “alternative”, it's the same

P3 L19 I refuse to accept your explanation that since you've already used this notation for the slit numbering in another paper and this makes it ok to use it again. It is wrong to use unconventional terminology, Many papers before yours used it correctly.

P6 L10-18 Should not be in this paper.

P7 L18 Have you looked at the fact that Brewers have at least three different PMT types and that can contribute to the differences in the TC? If you did, what was the result? If not, why not?

P7 L22,25 The order filter is not just NiSO₄ crystal, but a combination filter with two UG11 glass filters.

P10 L20 *** An important point!!! *** : did you calculate the slopes and their uncertainties using the averages for each temperature? It very much looks like you did and then your uncertainty is incorrect as you forgot that each point (each average) has an uncertainty associated with it already (a very large standard deviation in fact). You should re-calculate those uncertainties using each point or propagate the uncertainties of the averages to that of the slopes. When you do this you will likely find that the uncertainty is larger than 100% for most of your slopes, which brings back my original point from the initial review: if for each temperature you have a spread of R6 so large that is close to the spread between R6 at extreme temperatures you cannot actually correct or improve such data. Whatever you do you will still have that spread. So, the question then is can you even trust such a data for determining TC?

P11 L1 I am not sure I understand why you are saying "in spite of robustness of the TOC calculation algorithm". The algorithm clearly works. It was the instrument (the hardware) that didn't.

P11 L5 You may consider stating clearly that it is imperative to schedule SL tests throughout the day to cover the different temperatures inside the Brewer.