

GENERAL COMMENTS

This paper addresses an important issue for the Brewer users and ozone communities, since an accurate assessment of the Brewer temperature dependence is essential to ensure reliable TOC measurements. It is also generally well written. However, some issues should be solved prior to publication.

SPECIFIC COMMENTS

1. The main issue, from my point of view, is the reliability of the measurements in the frame of the experimental setups. For example, the authors state that “The analysis of the internal lamp measurements in PTB1 shows a very marked nonlinear behaviour when using slit 5 and 6 relative to slit 2” (p. 9) and ascribe this behaviour to the internal halogen lamp. However, also the external lamp (slit 5-6) charts in Fig. 7 show some curvature above 40°C, which cannot be ascribed to the halogen lamp. Furthermore, looking at Fig. 6, I cannot understand the inconsistency of the results at PTB2 (internal lamp measurements show hysteresis, while external lamp measurements do not) and K&Z (vice-versa). It would be desirable for the reader to have these issues explained better, in order to trust the results of the experiments (were the external lamps stable? Were temperatures measured reliably? Etc.)

2. I could have missed this information, but was the wavelength alignment (“hg tests”) checked during the chamber experiments? It should be explained whether the final temperature sensitivity takes the wavelength shifts into account;

3. I cannot understand why tau_R6 (linear combination) is much more stable than the relative coefficients. Does this mean that F(306.3) is not a good reference? Or that noise is lower when combining the irradiances at 4 wavelengths compared to only 2 wavelengths?

4. It is stated that “The conclusions of this work cannot be extended to MkII and MkIV models” due to presence of NiSO₄ filter. I agree with the authors that the temperature coefficients may vary between MkIII and other Brewer types, but why the main outcome of the paper (i.e. that the standard lamp can be effectively used to track the Brewer sensitivity to temperature changes) should be compromised?

5. Regarding the very last paragraph, recommending a change of the reference temperature, I am not sure whether this would reduce the uncertainty of the temperature correction. Indeed, since the correction is assessed based on experimental data, small measurement errors at ~22-23°C would result in lower deviations of the angular coefficient if the reference point is farther (0°C) from the reference. Instead, some issues could arise if the temperature dependence is locally linear about ~22-23°C, but globally not linear. In that case, I agree that changing the reference temperature would be a benefit.

6. Finally, according to the data usage rules of EUBREWNET, an acknowledgement to the PI’s providing the data used in the paper (e.g., Fig. 1) should be included. I would suggest the authors to include the statement recommended on the EUBREWNET website: “We thank the European Brewer Network (<http://rbcce.aemet.es/eubrewnet/>) for providing access to the data and the PI investigators and their staff for establishing and maintaining the “#” sites used in this investigation”.

TECHNICAL CORRECTIONS

- check usage of “internal lamp” vs more rigorous “internal halogen lamp” or “standard lamp” throughout the paper. Indeed, two internal lamps are available in the Brewer (mercury and halogen);

- p. 1 line 18, “temperature-compensated” is not clear here, but the concept is explained in the following lines. Simply remove “temperature-compensated”;

- p.2 line 28, “studied by different authors”: please add bibliographic references;

- p. 3 line 20-24: rewrite this paragraph splitting the two points: 1) the weightings are chosen to minimise influence of SO₂, linear effects and constant term; 2) the wavelengths are chosen to maximise sensitivity to ozone and to minimise small shifts in wavelengths (sun scan test);
- p. 4 Eq. 8: it is a common error. To comply with the Lambert-Beer-Bouguer equation, either Eq. 1 should read $ETC - R_6$ or the cross section should be $-\sum(w_i \alpha_i)$. Since the Brewer weightings give a negative differential cross section, it would look better if Eq. 8 had a “minus” sign;
- p. 6 line 1: “it” → “they”;
- p. 6 line 17: define “Cte” (did you mean “constant”?)
- p. 6 line 18, “constant” → “constant over all wavelengths” (not in time);
- p. 7 line 17 and line 28: “Figure” → “Fig.”
- p. 10 line 20: why the diurnal, and not the annual, variation was chosen to provide an idea of the internal temperature changes?