

# ***Interactive comment on “Stability of the Regional Brewer Calibration Center for Europe Triad during the period 2005–2016” by Sergio Fabián León-Luis et al.***

**Sergio Fabián León-Luis et al.**

sleonl@aemet.es

Received and published: 14 April 2018

We would like to thank V. Savastiouk for all his constructive suggestions and comments. They have been quite useful to improve the paper. We include as additional information in a zip file which contains:

- 1) Answer-V.Savastiouk: Pdf file with the answers to your questions/suggestions.( We also show them here).
- 2) Stability-diff: Pdf file where all changes are highlighted. Note that it also contains the changes of the other referees.

Printer-friendly version

Discussion paper



- 3) Manuscript-final: Pdf file with all changes introduced (not highlighted)
- 4) Figures have been modified in the manuscript, we included its last version (.eps).

## 1 General Comments

## 2 Figures

In all the figures a colour legend has been introduced. For this reason, these are slightly different to the previous version of the article submitted.

## 3 Grammatical corrections

The authors appreciate the grammatical corrections indicated which have been introduced in the text. A co-worker, who is a native English speaker, has helped us with the use of language. In the new version, some paragraphs and sentences were modified to get a more fluid text.

- We have used both "behavior" and "behaviour" words. In order to have a more consistent article we have replaced "behavior" by "behaviour" in the text. Similarly, "centre" by "center".
- In addition, the expression "ozone concentration" was replaced by "Total ozone column (TOC)".
- The word "lines" was replaced by "bands" to indicate the wavelengths where the brewer measured.

## 4 References

New references have been included in the text where you and the other referees have indicated. However, we think that introducing a reference in the abstract as you suggest in your report is not habitual.

## 5 Abstract

**P1- L9.** This sentence was rewritten taking into account your suggestions. Also, the standard deviation symbol  $\sigma$  has been introduced together with the values reported.

## 6 Introduction

**P2- L5.** The sentence where we suggest that "... several countries agreed to reduce the agents that produces the decrease of ..." was modified and, the number of countries agreed (197) was included.

**P2- L12.** The expression "Brewer is a spectrophotometer" was replaced by "Brewer ozone spectrophotometer". Also, this paragraph were rewritten.

**P2- L21.** 70 degrees as limit for single Brewer observations seems small, as it corresponds to  $\mu$ -values of smaller than 3. We think that is better to say that " The single Brewer presents this problem for large ozone slant column (OSC)".

**P2- L32.** We think that is correct to duplicate the sentence "Since November 2003 and within the World Meteorological Organization (WMO) and the Global Atmosphere Watch ... " because in this paragraph it is used to talk about the history of the RBCC-E and, obviously, you must say: when was created it?, when the brewers were installed

?, which is our travelling Brewer?, etc.

**P3- L11** We say that Izaña has “clean air and clear sky conditions around all the year and offers excellent conditions to perform the Langley-technique”. As you indicate we have not taken into account the dust intrusions. Therefore, the sentence was rewritten: “This ensures clean air and clear sky conditions around all the year and offers excellent conditions to perform the Langley technique, except for some days where the Saharan dust intrusions make difficult to measure the direct solar radiation”.

**P3- L12.** The sentence "Moreover, comparisons with the World Triad reference are carried out regularly..." was rewritten as " Moreover, the traceability between the RBCC-E Triad and the World Triad Reference is checked during the calibration campaigns through the travelling references #185 and #017."

**P3- L19.** The expression "annually alternating" was replaced by "annually, alternating"

**P3- L23.** The sentence "... on the measurements performed by each Brewer in its local station" was rewritten.

**P4- L4.** The sentence "... the precision between the measurements" was rewritten as "how similar are the measurements made by the Brewers "

## 7 Theoretical Approach

All referees have indicated that the section 2 is confused. Therefore, it has been rewritten taking into account all the suggestions about the approach to ozone retrieval (DS routine, slits) and Langley-technique. Also, a new figure has been introduced and the equations were modified, adding the symbol  $\mu$ . In addition, a clearer explanation about the procedure of the Langley technique was written. In it, we relate the Langley with the inverse of  $\mu$ , and also explain how it affects the aerosols in this technique.

Now, we hope that the order of the section will be better.

## 8 Ozone and dataset selected

**P8- L6.** The sentence "Despite this annual behaviour, the ozone is stable during the day, with a low standard deviation for the recorded data." was rewritten as "Despite this annual behaviour, the ozone presents a lower daily variability as indicated by our measurements".

**P8- L17.** The criterion lower than 0.6 under item 4 is not clear: standard deviation of 0.6 DU? Seems to be a very low standard deviation for a day with small ozone variation.

Yes, this condition was introduced in the article by mistake. It was written in a previous version (internal draft) but it was not deleted from the uploaded article.

## 9 Results and discussion

### **P10- L8/9. what does slight mechanical miscalculation mean?**

Sorry, maybe this sentence is not the best translation into English. The text has been modified as follows:

Old version: "... it should be noted that the presence of slight mechanical miscalculations in the instrument. ..."

New Version: "... it should be noted that the presence of small drifts by its continued operation of the instrument. ..."

**P12 -L12.** The equation "mean value" was correct.

**P10- L15.** The expression "our experience suggest" was rewritten as "our experience

suggests".

## 10 Conclusions

Some sentences were rewritten. The standard deviation symbol  $\sigma$  has been introduced to identify the values reported and a new table where all values are summarised is also included.

Please also note the supplement to this comment:

<https://www.atmos-meas-tech-discuss.net/amt-2017-460/amt-2017-460-AC4-supplement.zip>

---

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-460, 2018.