

Interactive comment on “Optical Characterization of Three Reference Dobsons in the ATMOZ Project – Verification of G. M. B. Dobson’s Original Specifications” by Ulf Köhler et al.

Anonymous Referee #2

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1 Introduction

This paper describes the measurements of the slit function for three traveling reference Dobson instruments. These accurate measurements performed at two National Metrology Institutes are very important to characterize the optical path of these instruments which are transferring to the stations the calibration scale of the global Dobson network. A systematic measure of the Dobson at the different stations could potentially improve the homogeneity of the network as well as improving the accuracy and precision estimations for the Dobson instruments data.

This paper presents interesting and relevant pieces of information within the scope of

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2 General comments

- The text is very "Dobson-Brewer community" oriented with the risk of reducing the impact of this paper. I suggests to the authors to step back a little bit from their research field and adapt parts of the manuscript to gain the interest of a larger community for these interesting results. The absence of a simple form of the total ozone column calculation equation is indicative of this "community approach".
- A comparison with earlier measurements from Komhyr (1993) and Evans (2012) mentioned at lines 17-18 of the introduction is missing.
- The discussion of some results is not precise enough. Sentences like "...differences ... are not too large..." (abstract line 23) or " ...deviate more or less significant ..." (section 3.2 line 25) need to be quantified.
- The three figures 7 a), b) and c) are very similar considering the extended wavelength range. Even though from different instruments, Fig 7b) and c) do not add much information. A plot of the ozone cross-section as an alternative to fig 7 b) would add useful information to the reader. Another possibility would be adding the cross-section to Fig. 4 to 6 to emphasise the importance of the slit function.
- A comment on the consequence (if any !) of having instrument specific EACs on the calibration procedure should be added.
- The paper refers to "Dobson original specifications" for the Dobson slits functions (e.g. first column of table 1). The present ozone absorption coefficients in use in the Dobson network (A : 1.806, C : 0.833, D : 0.374) were first reported in Komhyr et al. (1993) and confirm by Bernhard et al. (2005). The slits functions

used in these two publications for their calculations were indeed those measured by Komhyr et al. as reported in table 1 of Bernhard et al. Please comment on your choice to refer primarily to the "original specifications" and not to the measurements of Komhyr et al. (1993) which are much closer to the measurements presented in this paper.

3 Specific suggestions

Abstract:

- - lines 15-17: The presence of multiple parenthesis is annoying ! These details should be moved in the main text as they are already partly replicated in the first paragraph of page 3.
- line 23: ... D-wavelength pair.
- line 24: ... ones are not too large in ... : what would be considered as large or small ? please quantify
- line 25: ... to improvements of significantly less ... : is it straightforward being an improvement or just a change ?

Introduction:

- line 31: ... stations (...
- line 6: Evans (2008) not in the list of references

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- line 6: "Fundamental constants" is not the appropriate word if these are instrument dependent.
- line 8: ETCs are determined by comparison with reference instruments. What about the ETC of the references ? A sentence on the absolute calibration procedure is needed here.
- line 24: Köhler (1988) not in the list of references
- line 33: ... have been partly traced back to uncharacterised instrumental features ... : is it a hypothesis ? If not, adding a reference would be useful.

Measurement procedures in the laboratories

- line 30: change Fig. 3 to Fig. 2 and Fig. 4 to Fig. 3
- line 31: ...F number equal to $\#f/4,5$... : is this information useful ? If yes, explain this notation.
- line 4: vertical plane
- line 11: ... The measured signals were processed ... : which signal, how is it processed ?

Results:

- (page 4) line 31: ... Daumont, Brion and Malicet ... : reference needed.
- (page 5) line 30: ... EACs already defined in the abstract.
- (page 6) line 6 : ... less than $\pm 1\%$

Summary

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- line 20 : ... less than $\pm 1\%$

Reference

- Paur and Bass : this reference is not in the alphabetic order

Figure:

- Figure 2: remove the symbols ¶