Atmospheric
Measurement
Techniques

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Discussions

Interactive comment on "Quality assessment of Dobson spectrophotometers for ozone column measurements before and after automation at Arosa and Davos" *by* René Stübi et al.

Anonymous Referee #2

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General comments:

- The content of the paper is a very interesting and important contribution to the issue of data quality in the Dobson spectrophotometer network and its improvement. The content and structure of the publication is very complex and it is sometimes not easy to follow the presentation of the results and to understand the presented differences in the various scenarios. Its objective fits in any case the AMT requirements and therefore it is important and worth being published with some minor, few major and some technical corrections.

Specific comments:

i. Minor Issues:

- P1: The results of the AAD-scenario is not addressed in the Abstract

- Introduction P2 L2: not only use is banned, but production too

- The slight decrease of variability (p2 l13) is not obvious in figure 2, and if it really exists it might have been caused by atmospheric reasons too.

- P2 LL16 – 19: It would be good to explain, that the already seen recovery in high altitudes is driven by chemical reasons, and the still existing ambiguity in the lower stratosphere probably comes from dynamical effects (due to climatic change?)

- P3 L11: wavelengths range starts below 310 nm (Ashort = 305.5 nm)

- P4 L8: logarithmic differences

- P4 LL20 – 23: it is correct, that the application of effective slit functions / absorption coefficients on the historical data will not be possible, but what about the effective temperature of the ozone layer. Might there be a chance for such a correction?

- P4 LL24 – 27: the Dobson calibration system consists of 1 World Dobson Calibration Center WDCC (with 1 primary standard Dobson and one traveling primary standard Dobson) and 5 Regional Dobson Calibrations Centers RDCC (with 6 secondary standard Dobsons, among them 2 in Europe)

- P 5, table 1: the listing of Dobsons ICs after 2012 is not complete and what about the installation of new electronics in 2005/2006 (D051 in 2006 and not in 2011?)

- P6, figure2: European regional standard instead of travelling

- Table 2 and 3: headlines for the second and third column should be identical: reference Dobson and redundant Dobson

- What is the difference between D101 (blue/light-blue) in figures 6 and 7?

- P18 L10: the term trend is not a correct one

ii. Major issues:

- Introduction P2: it is not mentioned (e.g. in l10) that the Arosa long term Dobson record started in 1926, the earliest mentioned date is 1948. Figure 1 clearly shows this early start

- The leveling off (P2 L11 and in figure 1) starts obviously already at the end of the nineties and not in 21st century

- It is generally a pity, that the relocation of the observations from Arosa to Davos is explained only in a short statement (p3 l1), as this is very important to understand, that the Davos record will be appropriate to continue the famous Arosa record. It should be mentioned already here, that corresponding investigations are planned to confirm the homogeneity of a combined Arosa/Davos record, as it is done later under Discussion on pp19/20.

- P9 and P11, tables 2 and 3: I have problems to understand, why some of the signs of the median values of the differences are reversed. If this comes from different calculation methods (differences of coincident data and of polynomial fit) it should be explained. Moreover the mentioned time periods in the text and in the two tables (AAD 2016 – 2019 and AAD 2014 – 2019, respectively) are not consistent and therefore confusing

- P11 text and P13, Figure 5: The statement, that calibration campaigns did not induce noticeable breaks is in contrast to published reports. The campaign in 1999 revealed (official report GAW No. 138) that D101 was more than 1% too low, whereas D062 was less than 1% too low. Thus D101 was corrected, but not D062.

- Some of the figures (6, 7, 8 and 9) truncate shaded areas and/or curves. The y-axes should adjusted correspondingly to avoid truncation

- Figure 8: The continuous shading of time periods with gaps (blue and red) is not consistent (black is ínterrupted); moreover the colours black and dark blue can hardly

be distinguished.

- PP16-17 and figure 9: Is there any explanation, why the 2019-differences are close to zero for some months

- P18, section 4.5: can the statements of OSP-depending biases, revealed during the 2018 intercomparison be confirmed by some graphs or so? Are there differences between initial and final data (improvements?)?

Technical corrections:

- P2 L9: German instead of german and Lichtklimatisches instead of Lichtklimatsches

- P4 L16 and later in P20 L17: ATMOZ 2018 is cited, but 2018 is missing in the reference list

- There are two cited publication Stübi et al 2017 on different pages, they should be different 2017a and 2017b.

- P11, L9: panel instead of panle

- P15 L3: covers instead cover

- References, P23: Sergio Fabian Leon-Luis should be Leon-Luis, Sergio Fabian as it is cited in the text; moreover the year of publication of the SPARC/IO3C/GAW-report should be set to end to be consistent with the other references.