

Interactive comment on “The US Dobson Station Network Data Record Prior to 2015, Re-evaluation of NDACC and WOUDC archived records with WinDobson processing software” by Robert D. Evans et al.

Anonymous Referee #2

Received and published: 7 June 2017

General Comments:

This technical note presents the re-evaluation of the total ozone data record derived by Dobson spectroradiometers operating by NOAA. The reprocessed data are compared with the data already deposited to the databases of WOUDC and NDACC. The manuscript includes important information from the history of the different stations and the problems encountered during their long term operation. I think it is a good practice to publish such information which is usually accessible only from the stations' personnel.

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I see two main weaknesses in this paper. First, the WinDobson software package is not described adequately so that the reader cannot assess the differences in processing of the data compared to the traditional methods. The link provided as reference (end of page 3) does not help because it is a very brief slide presentation. Please, either provide a more suitable reference where the methods are described in detail, or include more details in the text.

Second, as the authors have long experience and deep knowledge of the Dobson retrieval algorithms and the instrument details, they tend to present their thoughts very briefly assuming that the reader has the same level of knowledge. I suggest to provide some more details so that even people who are not involved directly in the Dobson measurements can follow the paper easily.

Finally there are some rather minor presentation problems that are mentioned explicitly in my specific comments.

I suggest to accept this technical note for publication in ACP after taking into account the following suggestions in the revised manuscript:

Specific comments by line number:

2: Please change to “... intensity of solar radiation between ...”

32-34: Something is missing in this sentence. The importance of the Dobson could not be demonstrated by “using Dobson units”.

38: This handbook should be included in the References section.

41: Please insert here a reference as the meaning of the R and N values is understandable only from scientists experienced in the Dobson.

43: Would “applicability” be a better choice than “usefulness”?

73: Although traditionally ozone was archived as single daily values, nowadays individual values within a day are also available. Please revise this sentence accordingly.

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73: "In this publication". Please clarify which publication you are referring to.

82: "a wide range". Please specify what "range" refers to.

93-94: Please provide a reference for the "statistical method" and "the set of rules" or include a description in the text.

94: Please specify to what quantity the "representative value" refers; is it "total ozone"?

106: What means "correct any differences"? Which data set was corrected; the old or the new?

118: Is this "multiplying factor" solar zenith angle dependent? Is it possible to provide an estimate of the uncertainty in the CD data after the adjustment?

130-158: The listed reasons for discrepancies between the old and the revised datasets are not always very clear. For example: - it is not clear how the mu-dependency affects the comparison. - is it true that drifts in the wedge calibration were not taken into account in the new dataset although they were considered in the original data? Wouldn't that mean that the new data are less accurate compared to the original?

159: Multiple archives of geophysical data is a concern because in many cases it is unknown if these datasets are the same. Therefore, it would be very useful to discuss differences between the WOUDC and NDACC archives at individual stations and give an indication of how important these differences are. This could be presented, for example, in the form of a probability plot (like those of Figure 2) or just as a number e.g., the percentage of differences smaller than 1%.

171: Table 2 appears after table 3. Please fix the numbering.

174: Figure 2 appears after Figure 3. Please fix the numbering.

186: Reference (Langley, 1984) is missing from the References list.

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289: The conclusions section is very small. I suggest including a brief discussion referring to statistics of Table 2. For example it is mentioned that the trend is very small, but you could at least include the range, or mention in which stations the new dataset would affect the trend.

326: Figures 4 - 17: Please add labels and units in the vertical axes. It would be helpful to draw a light horizontal line at zero in the panels showing differences.

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