

Interactive comment on “On the compatibility of Brewer total column ozone measurements in two adjacent valleys (Arosa and Davos) in the Swiss Alps” by René Stübi et al.

Anonymous Referee #2

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The manuscript presents a very important study which is necessary to justify the relocation of the historic total ozone station of Arosa to Davos. The authors have made a very detailed analysis which fully supports the derived conclusion. Obviously the comparison of the data at the two locations is very good and any differences observed are minor and arise mostly from the instruments' uncertainty. The paper is well presented; hence I recommend to be accepted for publication in AMT. The comments below are mainly for improving the quality and readability of the paper.

General comments:

The discussion section could well stand for “conclusions” as it summarizes the findings

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of the study. Therefore, the conclusions section is a more brief repetition of the discussions section. I suggest to consider the possibility of merging the two sections as “Discussion and conclusions”.

Some of the figures show markers with error bars but not in all of them is defined whether they correspond to one or two standard deviations. This becomes confusing when in Fig. 10 the error bars represent 2 standard deviations. Please make figures consistent.

Specific comments:

4, 19-21: This sentence is not well written and could confuse the inexperienced reader. Also confusing is the use of two SC values (1000 and 1200). I am not sure if the introduction of the “slant column” makes any sense here. I would suggest to move it later to page 10 where SC is actually used and rephrase the sentence to something like:

“However, the longer sun exposure of Arosa is not important as the observations are limited to air mass values $\mu \leq 4$ (Christodoulakis et al., 2015) in order to reduce the effect of the stray light interference in the single monochromator Brewer instruments. “

4, 32: Please clarify “a-six week interruption end of January 2013”: Is it “a six-week interruption starting at the end of January 2013” or something different?

5, 8: Please specify briefly what other (except the ETC) minor corrections have been necessary.

11, 3-4: I miss some discussion on the effect of stray light. This section discusses the problem and presents a method to determine the stray light effect, but it ends without addressing the importance of this effect on the comparison results.

11, 9: Can you elaborate on the causes of observed seasonal component in the differences and standard deviation of B072?

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15, 7-8: This is the first time that the effect of neutral density filters is mentioned. I would suggest to expand briefly the discussion so that an inexperienced reader can understand the topic.

Technical comments:

1, 17: Replace "From the 1920s onwards" to "Since the 1920s"

1, 21: Replace "low polluted" to "low-pollution"

2, 9: Replace "have" to "has" (assuming that "series" refers to one series)

2, 12: Replace "The ozone hole problem" with "The depletion of stratospheric ozone"

2, 13: Replace "of the total ozone" with "in the total ozone"

2, 14: Replace "consequences" with "effects", as consequences implies a negative effect which is not true for the MP.

3, 2: Replace "before the 1970s, respectively after the 1997s." with "before 1970 and after 1997, respectively."

3, 14: Replace "section 4 and followed" with "section 4, followed"

4, 11: Replace "12'500" with "12,500"

4, 19-21: Slant columns (~ 1000 and ~ 1200) are not unitless; please use DU.

5, 3: Remove "one"

5,6: Replace "instruments" with "instruments"

5,7: Insert "the" before "ETC"

6,1: Delete "Parameters"

7, last line: Replace "were operated" with "was operating"

9, 19: Replace "extrema" with "extremes"

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9, 20: Replace "instruments" with "instrument"

10, 5: Replace "are" with "is"

10, 13: There are no "red lines" in Figure 8.

11, 9: Replace "location" with "locations"

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