

Referee comment of the manuscript:

AMT-2015-343: The impact of the ozone effective temperature on satellite validation using the Dobson spectrophotometer network - M.E. Koukouli, M. Zara, C. Lerot, K. Fragkos, D. S. Balis, and M. Van Roozendaal

General comments:

- The content of the paper is a very interesting contribution to the issue of data quality in the Dobson spectrophotometer network. The presentation is well structured, thus it is no problem to understand and to follow the intention of the paper and the results of the proposed improvements.

Specific comments:

i. Minor Issues:

- Solar zenith angle dependency often mentioned in the text as known, but no possible explanation given for the remaining dependency after Teff-correction.
- Replace “early 1980s” by “late late 1970s” on page 2, line 11: TOMS on Nimbus 7 already starts measurements in 1978.
- Replace “Since year 1958” by “Since 1957/1958” on page 2, line 15. Reference “Brönnimann et al, (=Staehelin, Farmer, Cain, Svendby and Svenoe), Total ozone observations prior to the IGY I: A history, Q.J.R. Meteorol. Soc. 2003 as related reference would be nice.
- The effect of the Teff-is described as seasonal several times (e.g. on page 6, line 4 – 5), but it can also effect the ozone observations on a daily base (rapid, intense change of weather situation). This time scale should be mentioned too.
- As one example of time series Ny Alesund is shown (page 8). Fortunately only the agreement of the various Teffs in the annual course is shown. However, Thule (Dobson operation recently ceased) or Reykjavik (still active) might be better stations, as Dobson No. 008 at Spitsbergen has been out of operation since many years

ii. Major issues:

- It is nowhere mentioned that the Bass/Paur absorption coefficients are still in use in the Dobson and Brewer Spectrometer algorithms. Planned introduction of ozone new cross sections/absorption coefficients (University Bremen) might change the results. Redondas et al is already mentioned, but not in this context.
- It is also nowhere mentioned which ozone cross sections are used in the satellite algorithms (old???, already new, but not Uni Bremen???)
- Explanation of the Teff effect on ozone values (page 4, lines 19 to 21) is a little bit confusing. Colder temperatures cause reduction in real absorption coefficients, which would give increased ozone. The Dobson however still uses larger absorption coefficients, thus the observed Dobson ozone values are lower and this causes the annual pattern in the Dobson-Brewer difference.

Technical corrections:

- References:
 - Anton et al 2009 is missing in references(cited on page 4, line 2)
 - Labow et al 2013 is missing in references (cited on page 4, line 2)
 - van Roozendael et al. 2008 is missing in references (cited on page 4, line 12/13, van roozendael et al. 1998 in references?)
- Is bottom left panel of Figure 5 (on page 12, line 17 and page 13) not bottom right panel of Figure 5?.