

We would like to thank Alberto Redondas for his valuable comments and suggestions.

Most of the datasets used are not available and will difficult the reproducibility of the results, this include, ozone cross-section of the EMPR-ATMOZ, line Spread functions, and the Brewer /Dobson Ozone datasets.

The Brewer and Dobson measurements will eventually be submitted to the World Ozone and UV database of the WMO. As this could take some time, we have collected and submitted the relevant data used in this publication to an open-access repository and added the DOI to the manuscript to provide access for interested scientists: <https://doi.org/10.5281/zenodo.4559802>

Straylight correction is applied to the single brewer, this should be detailed in the methodology section. Also, the straylight on Dobson can be explained Can be estimated by TUPS measurements?

We will add the information on the stray-light correction of the single Brewers in the revised manuscript. The TuPS measurements only provide information of the line spread function over about one order of magnitude and only over a narrow spectral range, as shown in Figure 1. Unfortunately, this does not allow to estimate the stray-light contribution.

Section 2.1 Total ozone measurements: Aerosol term and its cancelation is missing from the discussion.

As already mentioned by reviewer #1, we will mention the aerosol and NO₂ terms in section 2.1. Both can be considered negligible for Arosa and Davos due to their altitudes of 1800 m and 1590 m respectively as well as their location in the mountains, far distant from urban pollution.

line 130: Please explain the normalization of the ozone sounding.

We will clarify the ozone sounding normalisation in the paper. It is done by using the ozone sounding readings of ozone and temperature one kilometer below its burst altitude, and extending the ozone and temperature profiles using the US standard atmosphere to extend both profiles to 100 km, normalised to the readings at the selected altitude.

line 138: please correct the link (the correct one ends in .php)

We will correct the link to the updated location of the ECMWF effective ozone temperature datasets and add also the following reference, which describes how this dataset is obtained:

van der A, R. J., Allaart, M. A. F., and Eskes, H. J.: Multi sensor reanalysis of total ozone, Atmos. Chem. Phys., 10, 11277–11294, <https://doi.org/10.5194/acp-10-11277-2010>, 2010.

line 150: Brewer and Dobson use different ozone effective heights on the operational procedure for the air mass calculation the effect of the ozone height is different, even if the effect is reduced due to the horizon minor please clarify.

For our calculations we have used the same constant ozone layer height of 22 km for the Brewer and Dobson ozone calculations. We will adapt the text in the manuscript accordingly.

line 275: Explanation for the large difference on the offset of ACS dataset.

The ozone retrieved by Dobson with the ACS dataset shows large discrepancies when compared to the ozone retrieved by other cross-sections investigated in this manuscript (see Figure 5). Similar features can be seen with the DBM dataset when applied to the Brewer. We will modify the text in the last paragraph of Section 3.1 to clarify this point.

line 325: To explicit the straylight, could usefully use a common calibration for both instruments, Brewer is calibrated against the Dobson or vice versa, using low OSC

conditions and then see the comparison at high OSC conditions. We have to take into account that the Dobson has a considerably bigger FOV (Dobson nominal from FOV 7° to 8 ° whereas the Brewer is around 2°-3°) and is more affected by atmospheric straylight.

The final suggestion concerning the possibility of straylight coming from the larger field of view of the Dobson spectroradiometer is interesting. Even though the effect is probably quite small at Arosa and Davos due to the low aerosol optical depth, it could still cause a bias at large ozone slant path which could be misinterpreted as coming from the spectral stray light of the monochromator.

The contribution of forward scattered radiation in a 10° field of view, compared to a field of view of the Brewer was investigated in Gröbner & Kerr, 2001, and was found to be very small at the high altitude location of Mauna Loa, Hawaii (Gröbner, J., and J. Kerr, Ground-based determination of the spectral ultraviolet extraterrestrial solar irradiance: Providing a link between space-based and ground-based solar UV measurements, J. Geophys. Res., 106, 7211-7217, 2001.).

We will discuss this possibility in our revised manuscript. We will consider how to address this issue in a future experiment.