

Anonymous Referee #2

The author would like to thank the reviewer for constructive comments and suggestions that were taken into account. Please find our response to your comments (in bold). The responses are listed below each question. We have made changes to the original manuscript and the changes were written in italics in the revised manuscript.

General comments

The article provides a comparative study of the main public software packages for Brewer data processing. The paper is well structured, but the language is probably too much technical for readers outside the Brewer spectrophotometer users community. A very nice set of Brewer data is used, with an impressive calibration history. The methodology is well explained, but the results needs a better analysis in order to explain the main differences found in each software. The results are very useful for the evaluation of ozone trends, once most part of the Brewer data available is processed by one of these software packages, allowing significant differences for the same measurements.

We decided to rework the paper performing additional analysis taking into account both daily means and individual calculated ozone values to better investigate the differences found among the three processing software.

Specific comments

Line 117: It should be mentioned that each single count rate is set after a number of scan cycles (nominally 20) for slits 1 to 6.

In the revised manuscript (section 2.1) the following statement was included: *“The wavelengths are selected by a rapidly rotating slit-mask and raw photon counts for each slit-mask wavelength position are registered by a photomultiplier. Each run cycles the slit-mask through a number of oscillations (nominally 20) accumulating photon counts for each slit”*

Line 123: “ F_i ” must be defined as the instrumental count rate (counts per second) measured during the direct sun spectral irradiance observation for the slit number “ i ”. The meaning of “ i ” is the slit number corresponding to each one of the 4 wavelengths referred on lines 117 and 118.

In the revised manuscript (section 2.1) the following statement was included: *“A linear combination (F) of the count rates (F_i) measured during the direct sun spectral irradiance observations for the i -th slit is computed ...”*

Line 125: The weighting coefficients w_i were chosen in order to minimize not only the effect of the aerosol scattering but also its absorption. So the best sentence should be “in order to minimize the effect of aerosol attenuation” or “in order to minimize the effect of the aerosol optical depth”.

In the revised manuscript it was reported that: *“The weighting coefficients are chosen in order to minimize the effect of the aerosol extinction and eliminate the effect of the sulphur dioxide absorption”*

Line 190: The HG test “ensures the correct wavelength alignment of the Brewer”, could be completed with “, due to the internal temperature changes”

In the revised manuscript it was specified that: *“This test ensures the correct wavelength alignment of the Brewer due to the internal temperature changes.*

Line 471: The “excellent” agreement with OMI is mainly due to the seasonality of TOC. A more interesting analysis could be if seasonality and trend were removed from the series.

In the revised manuscript the agreement between OMI and Brewer data was assessed by calculating the scaled correlation (RHO) which excludes the possibility that the source of the correlation is a common cycle (e.g. the annual cycle). That calculation is performed splitting the series of the ozone daily values in short intervals (here $K=30$ days) and for each interval RHO coefficient is determined. In this way the high frequency component (<30 days) common to Brewer and OMI series are revealed.

An additional paragraph was included in the section 2.5 (statistical metrics) of the revised manuscript and the results were included in Table 4. We found that *“In general, the scaled correlation is, for both sites, on average $RHO_s = 0.8$ which represents how the series are well connected in the short term.”*