

Interactive comment on “A more representative “best representative value” for daily total column ozone reporting” by Andrew R. D. Smedley et al.

Anonymous Referee #2

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The manuscript presents a new methodology to calculate the best representative daily value (BRDV) of total ozone column measured with Brewer spectrophotometers by using a combination of direct sun and zenith sky observations. The new methodology will clearly have an advantage at some observation sites, because significant ozone variations on a time scale of hours in combination with a limited number of clear sky conditions are better represented with the new method. However, it needs a very good characterisation of the instrument in order to establish the relation between direct sun and zenith sky observations with a small uncertainty.

In general, I think one has to have in mind also, what the purpose of the reported BRDV is. If it is used for validation of satellite estimates of total ozone, then it is more important to focus on the time of the overpass of the satellite. That could reduce the standard

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deviation of the results, although when using a large number of observations then the average might be unchanged. On p.6, ln. 9-19, this aspect is already discussed, although not shown in detail because ‘the results were very similar’ to the daily mean values. If the BRDV is used to calculate UV exposure, then the value of the ozone column around local noon would be most significant. Furthermore, the ‘daily mean’ is anyway biased systematically by the different day length throughout the year, whereas the ozone variations on an hourly time scale are in general independent of daylight or night time.

The manuscript is very well written and clearly structured with clear figures. I suggest only one specific point to be clarified by the authors prior to final publication:

p.5, ln. 29: the mean difference between old and new method constitutes 2.79 DU. This should be discussed a bit more detailed as it seems to be significant, due the very high number of samples. It is stated that this is in the order of the ‘calibration uncertainty’; does this mean the calibration of the zenith sky relative to the direct sun observations has this significant bias? On the example day shown in Fig. 1 one can also see such a bias (even considering the standard deviations of the individual measurements). A similar bias is also found in the comparison with satellite data (p. 6, ln. 12/13).

Overall I think the manuscript is worthwhile to be published in AMT, as it will stimulate an important discussion in the Brewer community. I suggest publication after minor revision.

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