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Atmospheric Measurement Techniques Discussions

Interactive comment on "Comparison of profile total ozone from SBUV(v8.6) with GOME-type and ground-based total ozone for 16-yr period (1996 to 2011)" *by* E. W. Chiou et al.

Anonymous Referee #1

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Review of the paper by Chiou et al.

The paper presents a comparison study between two new versions of long-term satellite total ozone data (SBUV v8.6 from NASA and GTO from ESA's CCI initiative) and the ground-based total ozone from WOUDC. The new developments for the new versions of the satellite data have already appeared independently in the literature and this paper fills the gap, concerning the consistency between these data sets. The paper is well written and structured and is suitable for publication in AMT. There are however certain issues that should be considered before final acceptance, which are listed below:

Introduction: Reference to previously available merged data sets should be given and briefly discuss where a need for improvements was.

Section 2.1. The authors should provide some summary information concerning comparison results between v8.0 and v8.6 total ozone estimates.

Section 2.3 Line 17. The addition of the zonal climatology, which is based on satellite data, to the zonal deviations of the ground-based data actually removes any possible bias between these two. Is this correct? How independent are then these data sets? Please comment.

Section 3. It would be interesting to show GB-SBUV comparisons for the whole period (1970-2012), since both data sets could be used for trend studies for longer time periods than 1996-2011 and therefore such information would be extremely helpful.

Section 3.1 There are two issues that certainly affect the GB-satellite comparisons. First, the authors mix Dobson, Brewer and M-124 data, known to have different behavior when compared to individual satellite data sets and second the authors do not discuss the fact that the ground-based data use Bass and Paur absorption cross sections, while both merged data sets are based on BDM. They should provide some comment how these two issues could affect the GB-sat comparisons relative to the GTO-SBUV ones.

Section 3.2 What is the usefulness of Figure 5? It just shows again that the levels and the seasonality are consistent but this is well expected. They authors could just show figure 6. However the discussion of Figure 6 could be expanded. For instance in the 50S-30S belt there is a trend in the GTO-SBUV in the second half of the period, in 0-30N there are two periods in GB-SBUV with large deviations. I think that this figure is the key figure of the paper and deserves more discussion, apart from providing some summary statistics.

Section 3.3. What is the added information of this section, compared to section 3.2.?

Please justify. In addition it is not clear, as it is written, which 16-year average is subtracted from each data set. The same average, or simply each time series is de-seasonalized with its own seasonal cycle? In 10092-lines 1-3, the numbers reported are not justified by any figure, or it is not clear to what they correspond as it is written.

Section 3.4. When the authors refer to seasonal zonal means, do the mean annual means?

Table 8. The information on the significance of trends should be somehow included also in the table.

Section 3.6. The part of the paper that reports on the analysis of the deviations from the pre-1980 levels, as it is included in the abstract and in the discussion, seems to be not directly related with the subject of the paper. It is presented very briefly and either it should be removed from the paper or discussed further, since many issues evident in the figures are left without any discussion. For instance there are differences between North and South Hemisphere. In the Southern Hemisphere mainly after 2000 the three data sets seem to slightly diverge. The authors just provide a short summary of the general patterns in page 10094, lines 10-14.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 10081, 2013.