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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Use of satellite erythemal UV products in analysing the global UV changes" *by* I. Ialongo et al.

Anonymous Referee #1

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This is a review of the work of Ialongo et al.

The paper deals with a very important scientific subject. There are only few publications dealing with UV global changes using satellite derived products, so the publication is a very significant contribution for the UV and ozone community.The authors happen to be the major satellite UV data providers and such a sensitivity, trend analysis study is very important for the UV/ozone community.

Technical comments

The first paragraph of the abstract seems more fitting for the introduction section. It can be limited to a few words as an introduction to the results that are presented in the second paragraph.

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Interactive Discussion

Discussion Paper

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Line 9 Products - > product

Line 15 used in the retrieval -> used in the retrieval,

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line 25: needs a reference

There are various places in the document that the 50X50 Km and the 60X60Km are mentioned. Also the satellite gaps and measurement periods. All these sections have to be deleted from the discussion and clarified in the satellite data description section.

Figure 3 captions are difficult for the reader to be read.

General Comments

Synchronous GOME 2 and OMI synchronous satellite products comparison has to be expanded in order to explain if the per cent decadal changes are significant. And also to explain the differences due to clouds, aerosols and surface reflectance inputs to the two satellite algorithms. Pixels or larger areas that are “suspicious” of such differences could be further analyzed. Figure 3 is interesting but conclusions from these plots are difficult to be justified.

The statistical treatment of UV trends using three different satellite data with some gaps is not an easy task. So this treatment has to be more clear.

Some things that could be clarified:

a. Have you used absolute EDR values for each grid/month or de-seasonalized (taking into account the annual cycle) data? If so did you use different annual cycles for each satellite UV product ?

b. How have you statistically treated the gaps between the 3 satellite missions/periods in order to calculate the final trends per decade?

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c. Inter-satellite differences can add more uncertainty that the one presented in figure 4 while discussing about UV trend analysis errors.

d. To discard data at latitudes higher than 35 degrees North makes the analysis weaker and generally raises questions about satellite UV data quality and the need for homogenization actions. As the authors of this paper are the main GOME2 and OMI UV data providers it would be useful for the UV/Ozone community to comment on this issue. For my point of view UV satellite data are not used so far in a high number of scientific papers and such comments would be helpful in order for this hopefully to change.

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Figure 4 shows, SH trends from -5% to -6% per decade for January and February with very high correlation coefficients and statistically significant. The possible reasons for this have to be discussed.

Large differences of GOME2 and OMI are attributed to snow cover, different aerosol approach and cloud approach. It would be very informative for the readers to include a paragraph mentioning some basic algorithm differences of the two satellite retrievals in order to explain such issues more clearly.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 16439, 2011.