

Interactive comment on “Global Distribution and 14-Year Changes in Erythemal Irradiance, UV Atmospheric Transmission, and Total Column Ozone 2005–2018 Estimated from OMI and EPIC Observations” by Jay Herman et al.

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Interactive comment on “Global Distribution and 14-Year Changes in Erythemal Irradiance, UV Atmospheric Transmission, and Total Column Ozone 2005–2018 Estimated from OMI and EPIC Observations” by Jay Herman et al. Anonymous Referee #1

Reply: The article has been rewritten and reorganized, The OMI and EPIC data are in separate sections. Aerosol absorption has been added. Multivariate linear regression has also been added. Table A4 has been expanded. The OMI LER calibration

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correction is now shown in the appendix as is a map of site locations

**** General Comments Note Yellow are replies to the reviewer and grey is for text included in the manuscript

This paper focuses on the analysis of the global distribution and changes (2005-2018) of UV erythemal irradiance (also UV Index) retrieved from OMI and EPIC satellite data. Overall, it is a good and useful paper. Nevertheless, the next two specific points must be carefully revised before publication: Specific comments: 1. The manuscript must be reduced because in my opinion it is too long.

Reply: The manuscript is still long. Combining the results from 2 satellites makes a long paper necessary

This reviewer proposes some suggestions but the authors should perform a great synthesis exercise in order to lead the manuscript to a smaller size (and more readable) than the current one: - In Section 2 “Erythemal Time Series and LS Linear Trends” which reports results from OMI, Figures 2A, 2B, 6A and 6B can be removed together with their discussions because of they are related to EPIC. Additionally, the comparison between Northern and Southern sites (Lines 322-331 and Figure 7) is within Subsection 2.3 “Southern Hemisphere”. Please removed it or add to a new subsection.

Reply: EPIC results have been moved to their own subsection

- In Section 3 “Global view of E distribution from EPIC”, the analysis of Everest data could be removed (Lines 393-405 and Figures 10A-10B).

Reply: The Everest figure has been removed

In addition, the subsection 3.5 “Zonal average E and 14-years trends” shows results from OMI data instead of EPIC (see captions Figures 16, 17, 18 and 19).

Reply: Zonal averages have been calculated for EPIC but not OMI. For OMI the latitude dependence is derived for 191 cities and 60 ocean sites, the latter with no snow

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2. The results reported in this manuscript derived all from satellite instruments, mainly the UV radiation trend, must be compared with results derived from ground-based stations. This reviewer misses this type of comparison in the discussion of the results which could clarify the quality of the satellite data. The authors should add to the discussion more references about papers with analysis of UV trends using well-calibrated and well-maintained instrumentation at surface. Here some possible works to cite in the manuscript:

Reply: A comparison with ground-based stations is included for the magnitude of the erythemal irradiance, but not long-term trends. I added more references where appropriate and have included ground-based comparisons (see Table 2) to verify the amount of erythemal irradiance. Long-term noontime data from most Brewer sites is not readily available.

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