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Atmospheric Measurement Techniques Discussions

Interactive comment on "The TROPOMI surface UV algorithm" *by* Anders V. Lindfors et al.

Anonymous Referee #1

Received and published: 18 September 2017

The TOMS and OMI instruments installed on a series of NASA satellites have been of utmost importance for monitoring changes in ozone and UV radiation from space. OMI became operational in 2004 and is now near the end of its lifetime. Because TROPOMI is one of the replacement instruments, it is important that the instrument's characteristics and the methods for processing raw data from the instrument are well defined so that the long time-series of ozone and UV data products from the legacy instruments can be continued without breaks in radiometric scale and accuracy. The manuscript by Lindfors et al. is important and should be published because it documents the algorithm that will be used to calculate UV dose rates and doses from TROPOMI observations. The manuscript is scientifically sound, well structured, and well written, and should be published with only minor changes. My main suggestion is to also include a short paragraph summarizing the difference between the UV algorithm currently used for the processing of OMI observations and the new algorithm to be used for TROPOMI. For

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example, the first sentence on page 4 could be expanded to a paragraph. This would make it easier for the reader to grasp the changes implemented for the new instrument.

Specific comments

P2, L5: Include reference for Montreal Protocol

P6, L14-18: Much of the information on total ozone is common knowledge (at least for readers interested in the paper) and could be removed. Also the following subsections on albedo, aerosols, and altitude could be reduced in lengths.

P7, L26: High latitude profiles are quite different for the northern and southern hemispheres. Are different profiles being used for the two regions in the algorithm?

P8, L2: "AI" in "taken from the TROPOMI AI L2 output" presumably stands for Aerosol Index. It is a bit surprising that cloud optical depth is estimated from the Aerosol Index. Please clarify.

P8, L12: I don't understand "flat-top response curve with a half-gaussian with a Half-Width-Half-Maximum". Please simply!

P9, L9: Please describe how values in the look up tables are interpolated (e.g., linear, spline, etc.)

P12, L2: Regarding "For the UV irradiances at selected wavelengths (i.e, 305, 310, 324, and 380 nm), we apply a wavelength-specific aerosol correction." Does the aerosol climatology by Kinne mentioned earlier provide aerosol properties at these wavelengths, and if not, how is the climatology interpolated and extrapolated to these wavelengths?

Figure 5: Please indicate the time of the satellite overpass in these figures.

Technical corrections / language

P9, L23: I don't understand "a measure of the effectiveness of radiation as regards a

specific effect". Please reword.

P11, L9 "valid the whole day" > "valid for the whole day"

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