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Atmospheric Measurement Techniques Discussions

Interactive comment on "Correcting spaceborne reflectivity measurements for application in solar ultraviolet radiation levels calculations at ground level" *by* P. N. den Outer et al.

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General comments: Consecutive satellite measurements of UV Lambertian Equivalent Reflectivity (LER) from N7 TOMS, EP TOMS (1996-2002) and Aura OMI (2005-2010) are used to estimate cloud effects on surface UV irradiance, derived from the same satellite instruments (i.e., cloud modification factors, CMF=UVallsky/UVclearsky). The CMF estimates based on a single day satellite overpass LER measurements are compared with CMF estimates derived from daily integrated ground based pyranometer and UV spectrometer measurements. The subject is hardly new, since the pioneering paper of Eck et al [1995] first proposed using TOMS LER to estimate surface UV irradiance. Since then, the TOMS UV algorithm has been extensively discussed, improved and validated with ground UV measurements as

documented in peer-review literature. It was shown in early 2000s that the LER method cannot account for spectral and ozone dependence of CMF. Therefore, current operational versions of the TOMS and OMI surface UV algorithms are not using LER, but are based on a model of homogeneous plane-parallel Mie cloud layer, embedded in a multiple scattering Rayleigh atmosphere with realistic ozone profiles: (http://eospso.gsfc.nasa.gov/eos_homepage/for_scientists/atbd/docs/OMI/ATBD-OMI-03.pdf). Therefore, discussion of LER in connection with the satellite UV algorithms is not relevant. The main goal of the paper: "to improve on the spaceborne UV sums, and not understanding the optimal mathematical description of the correlations." - p74, l25 , is not clear and is not justified. I suggest rejecting the paper for publication in AMT. Improvements in retrieval algorithms can be achieved through better understanding of the atmospheric radiative transfer leading to better forward models and inversions.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 61, 2012.