

Surface UV Radiation Products Derived from Satellite Data

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The solar ultraviolet (UV) radiation reaching the Earth's surface affects air quality, climate, ecosystems, human health as well as ageing of various materials. Detailed information on surface UV at one location is obtained using ground-based instrumentation while satellite data provides global coverage. Several satellite instruments operating at UV and visible wavelengths can be used to derive estimates of UV radiation at the surface level, which depends on the extraterrestrial solar irradiance, atmospheric ozone, clouds, aerosols and surface albedo. In this presentation, the following two global surface UV datasets derived from satellite measurements are introduced.

The UV products from the Dutch-Finnish Ozone Monitoring Instrument (OMI) have been available since the launch of NASA's EOS-Aura satellite in 2004. The products include UV irradiance at selected wavelengths (305, 310, 324, 380 nm), erythemally weighted (290-400 nm) dose rate and erythemal daily dose. Real-time OMI UV products are available at the SAMPO service (Satellite Measurements from Polar Orbit, sampo.fmi.fi) where satellite overpass data over Northern Europe are available.

Surface UV products based on the measurements of the Global Ozone Monitoring Experiment 2 (GOME-2) instrument on EUMETSAT's Metop satellites have been derived since June 2007. The products include dose rates and daily doses weighted by several different action spectra. The satellite-derived UV products have been validated against ground-based UV measurements. For most validation sites, the relative difference between the two datasets is within 10-20 %.