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Comparison of total ozone and erythemal UV data from OMI with ground-based measurements at Rome station

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Abstract. Ground-based total ozone and surface UV irradiance measurements have been collected since 1992 using Brewer spectrophotometer at Rome station. Erythemal Dose Rates (EDRs) have been also determined by a broad-band radiometer (model YES UVB-1) operational since 2000. The methodology to retrieve the EDR and the Erythemal Daily Dose (EDD) from the radiometer observations is described. Ground-based measurements were compared with satellite-derived total ozone and UV data from the Ozone Monitoring Instrument (OMI). OMI, onboard the NASA EOS Aura spacecraft, is a nadir viewing spectrometer that provides total ozone and surface UV retrievals. The results of the validation exercise showed satisfactory agreement between OMI and Brewer total ozone data, for both OMI-TOMS and OMI-DOAS ozone algorithms (biases of -1.8% and -0.7% , respectively). Regarding UV data, OMI data overestimate ground based erythemally weighted UV irradiances retrieved from both Brewer and YES Radiometer (biases about 20%). The effect of aerosols on UV comparisons was investigated in terms of Aerosol Optical Depth (AOD), showing medium-large correlation at SZA larger than 55° . Further sources of uncertainty, such as the difference in the atmospheric conditions between local noon and OMI overpass time and the OMI spatial resolution, were also discussed.

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