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The Austrian UVB monitoring network: 12 years of observations and 25 years of reconstructed data

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Since the discovery of anthropogenic ozone depletion in the early 1970s (e.g. Molina and Rowland, 1974; Farman et al., 1985) the interest in stratospheric ozone trends and solar UV-B increased within the scientific community and the general public because of the link between reduced total column ozone and increased UV-radiation doses. In 1996, the setup of an Austrian UVB monitoring network was initiated by the Federal Department of Environment (Blumthaler and Schauberger, 2001). Now it consists of 12 broadband detectors for measuring erythemally weighted solar UV irradiance at locations between 153 m and 3106 m above sea level. The locations of the stations were selected by objective criteria as spatial coverage and cover the whole altitude range of Austria. With that inter-stational correlation is close to 0.9 (Schmalwieser and Schauberger, 2001). All detectors are calibrated each year in the laboratory of the Division for Biomedical Physics, Innsbruck Medical University. First the relative spectral response of each detector is determined. Then by comparison with a double monochromator spectroradiometer the absolute calibration function is derived in dependence on solar zenith angle and on total atmospheric ozone (Blumthaler, 2004). The uncertainty of the calibration is about $\pm$7% (at 95% confidence level) for solar zenith angles <75°, which is dominated by the uncertainty of the calibration lamp for the spectroradiometer ($\pm$4%). During routine operation, the measurements of all detectors are transmitted in near real time to the laboratory and then converted to UV-Indices, the internationally agreed unit for erythemally weighted solar irradiance. The results are then published on the internet (www.uv-index.at) every 15 minutes, together with a regional map showing the distribution of the UV-Index over Austria by combining the information from the measurement detectors with cloud information from Meteosat Second Generation. Recently reconstructed UV-data became available for two stations from the Austrian UVB monitoring network (Hoher Sonnblick and Vienna) (Rieder et al., 2008). An overview about the UVB monitoring network as well as studies on short and long-term trends and the influence of total ozone, surface albedo and cloudiness on erythemal UV (Weihs et al., 1999; Rieder et al., 2008; Simic et al., 2008) are presented. Results from a recent field campaign (Weihs et al., 2008) showed that maintenance of ground based measurements is very important as satellites so far do not satisfactorily represent ground UV.

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