DSS for AT_IU

AT_IU: Austrian UV network – Innsbruck Medical University

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Stations:
The Austrian UV network started in 1997/98 with 8 stations in Austria
(latitude[°] longitude[°] altitude[km]):
Dornbirn (47.433 9.7275 0.410)
Graz (47.096 15.418 0.348)
Innsbruck (47.262 11.380 0.577)
Klagenfurt (46.650 14.324 0.448)
Steyregg/Linz (48.290 14.354 0.335)
Mariapfarr (47.153 13.746 1.153)
Sonnblick (47.053 12.959 3.106)
Bad Vöslau (47.967 16.200 0.286)
The network was extended until 2005 to 12 stations:
Wien (48.258 16.433 0.153)
Grossenzersdorf (48.200 16.567 0.156)
Kanzelhöhe/Gerlitzen (46.678 13.907 1.526)
Hafelekar (47.313 11.380 2.275)

Instruments:
UV-Biometer Mod. 501A from Solar Light Co. to measure erythemally weighted irradiance
SN: 2020, 2021, 2022, 2023, 2024, 2706, 2841, 3527, 3858, 3859, 4406, 8875
Due to occasional repair, the individual detectors are not located all the time at the same station.

Operation:
The raw data (voltage) at each station is locally collected continuously. Every 10 minutes they are transmitted by FTP to the central operation unit at Innsbruck Medical University. There the data are converted to absolute units and presented online on the web (www.uv-index.at). Means over 30 minutes are saved.
The individual stations belong to different organisations (Zentralanstalt für Meteorologie und Geodynamik, Umweltbundesamt, Universität Graz, Universität für Bodenkultur, Universität für Veterinärmedizin, Medizinische Universität Innsbruck), and these operators are responsible for local routine maintenance.
The desiccant of all detectors is replaced 3 times every year.

Calibration:
Once every year (usually in late summer) each detector is brought to the central calibration facility at Innsbruck Medical University for calibration. The spectral response function is determined in the laboratory and the absolute calibration is derived from simultaneous measurements over about 4 days outdoor side by side to a calibrated double monochromator spectroradiometer. As a result, a calibration matrix is determined for each detector in dependence on solar zenith angle and on total ozone, according to the guidelines of WMO (Webb et al., 2006). The deviation of the ideal angular response ('cosine error') of each detector is corrected as an average value in dependence on solar zenith angle as determined during the outdoor measurements.
After each annual calibration, the data of the previous year since the last calibration are corrected for a change of the calibration factor be a linear interpolation. Therefore, the final data can be submitted to WOUDC only once a year (usually in autumn).

Uncertainty:
As the calibration is carried out relative to a double monochromator spectroradiometer, the overall uncertainty of the measurements of the broadband detectors is dominated by the uncertainty of the calibration of the double monochromator spectroradiometer. Based on several international intercomparisons, where the double monochromator spectroradiometer of the Innsbruck Medical University took part since 1991, this uncertainty for erythemally weighted irradiance is estimated to be less than about 5% (k=2). This is confirmed in 2010 by an intercomparison with the travelling standard spectroradiometer of the WMO regional calibration centre Davos, where the agreement between the two instruments was on the 3% level. The systematic difference could be traced back to the primary calibration lamps used by the two institutions.
The overall uncertainty of the data of the broadband detectors is estimated to be less than 7% (k=2) for solar zenith angles below 65°.

References:
Blumthaler M. (2004) Quality assurance and quality control methodologies within the Austrian UV monitoring network. Rad Prot Dos 111, 359-362.
Webb A., J. Gröbner, M. Blumthaler (2006) A practical guide to operating broadband instruments measuring erythemally weighted irradiance;
COST office, Brussels, ISBN 92-898-0032-1.

Data use policy:
Data can be used with no restriction, but we kindly ask to
(1) Include the following acknowledgement in publications using these data:
UV data was provided by the Austrian UV Monitoring Network, operated by Innsbruck Medical University under a contract from the Ausatrian Governmental Department for Environment.
(2) Notify us of publications that have used these data and send PDF copies, if possible.