

Calibration Certificate

No. 2008-92-10-2

Calibration Item

UVB Pyranometer

Manufacturer	Yankee Environmental Systems, Inc.
Type	UVB-1
Serial number	010938

Customer

PMOD/WRC
Dorfstrasse 33
7260 Davos Dorf
Switzerland

Calibration Mark

2008-92-10-2

Date of calibration

14 July, 2008

Davos Dorf, 24 September, 2008

Dr. Gregor Hülsen
In charge of calibration

Dr. Julian Gröbner
Head UV Center

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Calibration procedure

The relative spectral response function $SRF(\lambda)$ of the test instrument was obtained by illuminating it with a quasi monochromatic light source of full width at half maximum 1.9 nm and recording the measured signal (Hülsen and Gröbner, 2007). The $SRF(\lambda)$ was normalized to the value obtained at maximum intensity.

Spectral response function $SRF(\lambda)$: – srf_yes010938_1962008.dat –

λ [nm]	$SRF(\lambda)$	λ [nm]	$SRF(\lambda)$	λ [nm]	$SRF(\lambda)$
270	2.733E-01	296	9.761E-01	322	6.206E-02
272	3.356E-01	298	9.977E-01	324	3.944E-02
274	3.978E-01	300	1.000E+00	326	2.463E-02
276	4.575E-01	302	9.765E-01	328	1.546E-02
278	5.163E-01	304	9.216E-01	330	9.564E-03
280	5.735E-01	306	8.306E-01	332	6.062E-03
282	6.316E-01	308	7.105E-01	334	3.694E-03
284	6.881E-01	310	5.722E-01	336	2.237E-03
286	7.440E-01	312	4.382E-01	338	1.388E-03
288	7.982E-01	314	3.157E-01	340	7.681E-04
290	8.538E-01	316	2.176E-01	342	4.323E-04
292	9.032E-01	318	1.462E-01		
294	9.412E-01	320	9.576E-02		

Uncertainty of measurement:

Expanded relative uncertainty of $SRF(\lambda)$

$SRF \geq 5 \cdot 10^{-4}$	10%
$SRF \leq 5 \cdot 10^{-4}$	30%

Wavelength uncertainty: 0.1 nm

The reported expanded uncertainty of measurement u is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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Measurement conditions:

Room temperature	$21.4 \pm 0.8^\circ \text{C}$
Room humidity	$46.3 \pm 1.0 \%$
Dark signal	$-0.000220 \pm 0.000010 \text{ V}$
Maximum intensity	0.116 V

Comments:

The absolute spectral irradiance is traceable to the primary irradiance standard of the Physikalisch-Technische Bundesanstalt (PTB), Germany, through the transfer standards F300, F304, F324, F330, F376 (Gröbner and Sperfeld, 2005).

References

J. Gröbner and P. Sperfeld. Direct traceability of the portable QASUME irradiance scale to the primary irradiance standard of the PTB. *Metrologia*, 42:134–139, 2005.

G. Hülsen and J. Gröbner. Characterization and calibration of ultraviolet broadband radiometers measuring erythemally weighted irradiance. *Appl. Optics*, 46:5877–5886, 2007.

Measurement summary:

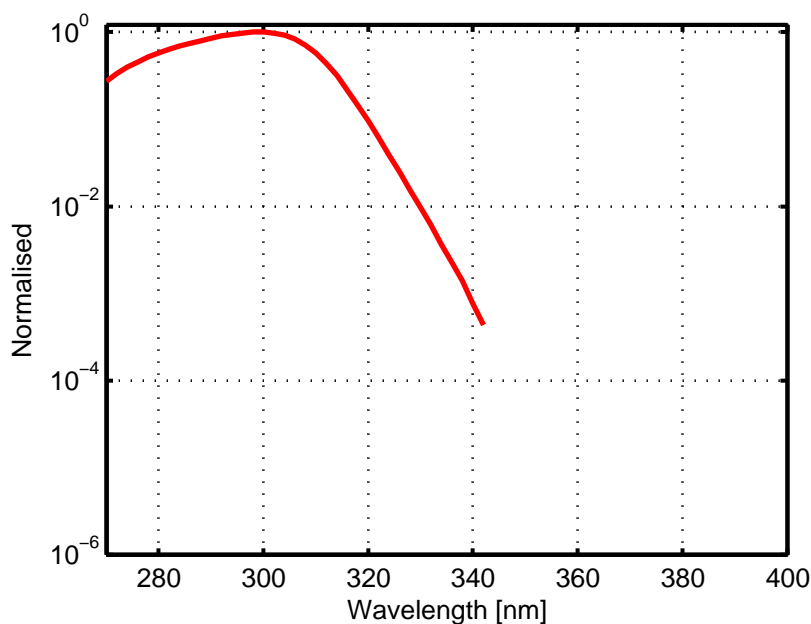


Figure 1: Relative spectral response function $\text{SRF}(\lambda)$