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Subject: Calibration of SRRL Baseline Measurement System (BMS) Direct UVB Radiometers
Instruments: Kipp & Zonen CUVB2 s/n 953001

NREL PV Radiometric Measurements Task monitored the millivolt output of one (1) BMS Direct UVA Radiometer while measuring the spectral distribution of natural sunlight in direct normal incidence mode on 4 April 2008 from 280 nm and 400 nm at 2nm steps using an Optronic Laboratories OL-756 (double monochromator UV spectroradiometer).

The OL-756 spectrometer calibrated against NREL's National Institute of Standards and Technology (NIST) Standard of spectral irradiance F597 on 4 April 2008. Spectral data was corrected based on measurements of the EKO portable light source made outdoors just prior to BMS calibration and just after OL756 calibration, which showed the OL756 was reading 3.5% high across all wavelengths. A calibration multiplier of 13.37 was used to take into account the use of the Optronic Labs Direct Normal Tube. The final correction factor used was 12.9021.

The spectra were integrated between 280 nm and 315 nm to produce the total power under each spectral distribution. All data were used to compute the calibration factors shown in Table 1.

Table 1. April 4, 2008 NREL Direct UVB Calibration Summary

Time (MST)	Spectrum W/m ²	CUVB2 V (avg.)	W/m ² /V
11:31	0.7415837	-0.23826	-3.1125
11:33	0.7387999	-0.23806	-3.1034
11:35	0.7373323	-0.23805	-3.0974
11:37	0.7459267	-0.23964	-3.1127
11:39	0.7454443	-0.23983	-3.1082
11:41	0.7462405	-0.24002	-3.1091
11:43	0.7508874	-0.24188	-3.1044
11:45	0.7529791	-0.24178	-3.1144
		Avg.	-3.108
		Sigma	0.0057

UNCERTAINTY

The estimated uncertainty in the OL-756 spectral irradiance calibration is $\pm 4.0\%$ from 300 nm to 400nm. The accuracy of the CR23X data logger was about 0.8%. Estimated uncertainty in the derived calibration factor is $\pm 4.8\%$ (limit of error). Spectral data is plotted on the back of this sheet.

Figure 1. Measured Spectral Distributions indicated by OL-756 UV Spectroradiometer 4 April 2008

