

**NREL**

National Renewable Energy Laboratory

**Memo**

To: Daryl Myers and Thomas Stoffel  
From: Afshín M. Andreas  
Date: 29 September 2005

Subject: Calibration of SRRL Baseline Measurement System (BMS) Global UVA Radiometers  
Instruments: Kipp & Zonen UV-S-A-T s/n 010536 and CUVA1 s/n 950006

NREL PV Radiometric Measurements Task monitored the millivolt output of two (2) BMS Global UVA Radiometers while measuring the spectral distribution of natural sunlight in global horizontal incidence mode on 29 August 2005 from 280 nm and 400 nm at 2nm steps using an Optronic Laboratories OL-756 (double monochromator UV spectroradiometer). The millivolt output from the BMS Radiometers were recorded by the BMS CR23X datalogger.

The OL-756 spectrometer was calibrated against NREL's National Institute of Standards and Technology (NIST) Standard of spectral irradiance F571 on 9 August 2005.

The spectra were integrated between 315 nm and 400 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. August 29, 2005 NREL Global UVA Calibration Summary

Time (MST)	Spectrum W/m <sup>2</sup>	UV-S-A-T V (avg.)	W/m <sup>2</sup> /V	CUAV1 V (avg.)	W/m <sup>2</sup> /V
11:46	47.43993	1.7842	26.5886	-0.9742	-48.6985
11:48	47.36164	1.7855	26.5260	-0.9749	-48.5790
11:50	47.10786	1.7833	26.4160	-0.9741	-48.3615
11:52	46.73874	1.7786	26.2785	-0.9715	-48.1115
11:54	46.37078	1.7738	26.1426	-0.9691	-47.8506
11:56	46.08088	1.7686	26.0551	-0.9666	-47.6721
		<b>Avg.</b>	<b>26.334</b>		<b>-48.212</b>
		<b>Sigma</b>	<b>0.2126</b>		<b>0.4064</b>

#### 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 29 Aug 2005

