

**NREL**

National Renewable Energy Laboratory

**Memo**

To: Daryl Myers and Thomas Stoffel  
From: Afshín M. Andreas  
Date: 18 March 2008

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 26 October 2007 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 calibrated against NREL's National Institute of Standards and Technology (NIST) Standard of spectral irradiance F597 on 26 October 2007.

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. October 26, 2007 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
12:23	33.05574	1.171282	28.2219	-0.63499	-52.0571
12:25	33.11005	1.163824	28.4494	-0.63098	-52.474
12:27	32.98804	1.159221	28.4571	-0.62878	-52.4633
12:29	33.05163	1.153761	28.6469	-0.62582	-52.813
12:31	33.25483	1.157258	28.7359	-0.628	-52.9535
12:33	33.02355	1.147802	28.7711	-0.62296	-53.0108
		<b>Avg.</b>	<b>28.547</b>		<b>-52.629</b>
		<b>Sigma</b>	<b>0.2094</b>		<b>0.3643</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 26 Oct 2007

