

**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 UV-Total Radiometers  
*Instruments:* Eppler TUVR s/n 33444

NREL PV Radiometric Measurements Task monitored the millivolt output of one (1) BMS Global UV-Total Radiometer while measuring the spectral distribution of natural sunlight in global horizontal incidence mode on 29 August 2005 from 280 nm and 400 nm 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 280 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 UV-Total Calibration Summary

Time (MST)	Spectrum W/m <sup>2</sup>	TUVR mV (avg.)	W/m <sup>2</sup> /mV
11:46	48.88777	7.3460	6.6550
11:48	48.80861	7.3518	6.6390
11:50	48.54966	7.3415	6.6130
11:52	48.16844	7.3213	6.5792
11:54	47.79136	7.3022	6.5448
11:56	47.49454	7.2811	6.5230
		<b>Avg.</b>	<b>6.592</b>
		<b>Sigma</b>	<b>0.0525</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

OL756 Global Horizontal Spectra and TUVR Normalized Spectral Response

