Calibration Report: Absolute Cavity Radiometer

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SUMMARY

Calibration date: October 1998.
Next calibration due: October 2000.

The calibration and analysis of one Absolute Cavity Radiometer sensor has been completed. The World Radiation Reference (WRR) the associated uncertainty wrt SI units (U95%) is as follows:

Absolute Cavity Radiometer	Serial Number	WRR	U95%
1	31041	0.99833	+/- 0.37%

Application:

$$I = WRR((mV\ output) / Sman) \pm U95\%$$

Where:

I = the radiance measured by the radiometer, Watt/meter^2
(mV output) = output of the radiometer, milli-volt.
Sman = Manufactured radiometer sensitivity, milli-volt / Watt / meter^2 .
U95% = the 95 % confidence interval.

ABSTRACT

Calibration data from one Absolute Cavity Radiometer sensor was collected at NREL in October 1998. The serial number of this sensor is 31041. The calibration standards used were those kept at NREL. These calibration data were analyzed to produce a new World Radiation Reference (WRR) factor with 95-percent uncertainty bounds, (wrt SI units). These coefficients are compared to prior calibration results. The instrument setup, data collection, data analysis and uncertainty calculation were as reported in the NPC1997 reference.

CALIBRATION HISTORY

	Test Cavity Serial Number	WRR	U95% Watt / meter^2
Current	31041	0.99833	0.37%
NPC1997	31041	0.99961	0.42%

DISCUSSION

The calibration of the Absolute Cavity Radiometer, serial number 31041 was completed. The new WRR number with associated uncertainties with-respect-to SI units have been reported. An improvement in the ability to operate the instrument is indicated by a reduction in the uncertainty.

REFERENCE

Reda, I., Stoffel, T., Treadwell, J., Results of NREL Pyrheliometer Comparisons NPC1997, National Renewable Energy Laboratory, Center for Renewable Energy Resources, Measurements & Instrumentation Team, 11 November 1997.