Calibration Report: Absolute Cavity Radiometers S.N. 31041 and 31105

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SUMMARY

Calibration date: 2001 October 1.
Next calibration due: 2003 October 1.

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	Controller	WRR	U95%
31041	34970A	0.99793	0.33
31041	406	0.99830	0.35
31105	34970A	1.00327	0.34

Application:

$$I = WRR*(Io) \pm U95\%$$

Where:

I = WRR corrected irradiance, Watt/meter^2.
Io = Irradiance output of the cavity-controller system, Watt/meter^2.
U95% = the 95 % confidence interval.

ABSTRACT

Calibration data from Absolute Cavity Radiometers were collected at NREL in September 2001. The serial numbers of these sensors are 31041 and 31105. 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 are as reported in the NPC2001 reference.

CALIBRATION HISTORY

	Test Cavity Serial Number	Controller	WRR	U95% wrt SI
NPC2001	31041	34970A	0.99793	0.33
NPC2001	31041	406	0.99830	0.35
IPC-IX (2000)	31041	406	0.99799	0.55
NPC1999	31041	406	0.99827	0.39
NPC1998	31041	406	0.99833	0.37
NPC1997	31041	406	0.99961	0.42
NPC2001	31105	34970A	1.00327	0.34

Calibrations labeled NPCyear took place at the National Renewable Energy Laboratory in Golden, Colorad. The calibrations labeled IPC took place at the World Radiation Center in Davos, Switzerland.

DISCUSSION

The calibration of the Absolute Cavity Radiometers, serial number 31041 and 31105 were completed. The new WRR number with associated uncertainties with-respect-to SI units have been reported.

REFERENCE

Reda, I., Stoffel, T., "Results of NREL Pyrheliometer Comparisons NPC2001", National Renewable Energy Laboratory, Center for Renewable Energy Resources, Measurements & Instrumentation Team, 2001.

Swiss Meteorological Institute, (May 2001). "International Pyrheliometer Comparison IPC-IX." Working Report No. 197, Davos and Zurich.

Reda, I., Stoffel, Wilcox, S., "Results of NREL Pyrheliometer Comparisons NPC1999", National Renewable Energy Laboratory, Center for Renewable Energy Resources, Measurements & Instrumentation Team, 21 September 1999.

Reda, I., Stoffel, T., Treadwell, J., "Results of NREL Pyrheliometer Comparisons NPC1998", National Renewable Energy Laboratory, Center for Renewable Energy Resources, Measurements & Instrumentation Team, 11 November 1998.

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.

Reda, Ibrahim, Stoffel, Tom, “Results of the NREL Pyrheliometer Comparisons NPC1996, 1-5 October 1996”, National Renewable Energy Laboratory, Renewable Energy Resources Center, Measurements and Instrumentation Team.