

Solar and Infrared Radiation Measurements

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Features

- Describes the strengths and weaknesses of irradiance instruments
- Provides detailed information on how to assess uncertainty in measurements
- Contains information on how to install, operate, and maintain a radiation measurement station
- Offers comprehensive background information needed to understand the use of solar instrumentation
- Makes recommendations on choosing pyranometers for photovoltaic monitoring stations
- Includes chapter-end summaries, questions, references, and useful links

Summary

The rather specialized field of solar and infrared radiation measurement has become more and more important in the face of growing demands by the renewable energy and climate change research communities for data that are more accurate and have increased temporal and spatial resolution. Updating decades of acquired knowledge in the field, **Solar and Infrared Radiation Measurements** details the strengths and weaknesses of instruments used to conduct such solar and infrared radiation measurements. Topics covered include:

- Radiometer design and performance
- Equipment calibration, installation, operation, and maintenance
- Data quality assessment
- Methods to use measured data to estimate irradiance for any surface

With a broad range of content that will benefit students and more experienced readers alike, this resource serves as a primer and technical reference that presents the basic terminology and fundamentals for resource assessment. It explores the history of solar radiation instruments and addresses direct normal, global, diffuse, and tilted measurements, as well as the characteristics of instruments used for these measurements. The authors consider methods of assessing the uncertainty of solar measurements and then cover albedo, infrared, net, and spectral irradiance measurements and instrumentation. The book devotes a section to other meteorological instruments, and another to the basics for installing and operating a solar monitoring station. Appendices include information on solar resource assessment modeling and satellite-derived irradiance, along with other useful material.

This book's authors are experts who each have more than 30 years of experience developing and operating multiple measurement stations, working with industry to improve radiometry, and conducting various research projects.

Contents

Acknowledgments.....	xiii
Author Biographies.....	xv
Preface.....	xvii
Chapter 1 Measuring Solar and Infrared Radiation.....	1
Questions.....	5
Reference.....	5
Chapter 2 Solar Resource Definitions and Terminology.....	7
2.1 Introduction.....	7
2.2 The Sun.....	7
2.3 Extraterrestrial Radiation.....	8
2.4 Solar Coordinates.....	9

2.5 Zenith, Azimuth, and Hour Angles.....	14
2.6 Solar, Universal, and Local Standard Time.....	16
2.7 Solar Position Calculation.....	17
2.8 Sunrise and Sunset Times.....	20
2.9 Global, Direct Normal, and Diffuse Irradiance.....	22
2.10 Solar Radiation on Tilted Surfaces.....	25
2.11 Spectral Nature of Solar Radiation.....	25
2.12 Fundamentals of Thermodynamics and Heat Transfer.....	28
2.12.1 Conduction.....	29
2.12.2 Convection.....	30
2.12.3 Radiative Heat Transfer.....	30
2.13 Photodiodes and Solar Cell Prerequisites.....	31
2.14 Models.....	32
Questions.....	33
References.....	33
Chapter 3 Historic Milestones in Solar and Infrared Radiation	
Measurement.....	35
3.1 Introduction.....	35
3.2 Earliest Observations of the Sun and the Nature of Light.....	35
3.3 Nineteenth-Century Radiometers.....	36
3.3.1 Pouillet's Pyrheliometer (1837).....	36
3.3.2 Campbell–Stokes Sunshine Recorder (1853, 1879).....	39
3.3.3 Ångström Electrical Compensation Pyrheliometer (1893).....	41
3.3.4 Callendar Pyranometer (1898).....	43
3.3.5 Ångström Tulipan Pyrgeometer (1899).....	44
3.4 Operational Radiometers of the Twentieth Century.....	44
3.4.1 Abbot Silver-Disk Pyrheliometer (1906).....	44
3.4.2 Smithsonian Water-Flow Pyrheliometer (1910).....	46
3.4.3 Marvin Pyrheliometer (1910).....	47
3.4.4 Ångström Pyranometer (1919).....	47
3.4.5 Kipp & Zonen Solarimeter (1924).....	47
3.4.6 Robitzsch Bimetallic Actinograph (1932).....	49
3.4.7 Eppley 180° Pyrheliometer (1930).....	50
3.4.8 Eppley Model PSP (1957).....	52
3.4.9 Yanishevsky Pyranometer (1957).....	53
3.4.10 Eppley Model NIP (1957).....	56
3.4.11 Eppley Model PIR (1968).....	58
3.4.12 Primary Absolute Cavity Radiometer (PACRAD) (1969).....	59
3.4.13 Eppley Model 8-48 (1969).....	61
3.4.14 LI-COR Model LI-200SA (1971).....	62
3.4.15 Rotating Shadowband Radiometer (1975).....	63
3.4.16 World Standard Group (1979).....	67
3.5 Recent Advances in Solar Measurements.....	67
3.5.1 Automatic Hickey-Frieden Cavity Radiometer.....	67
3.5.2 Total Irradiance Monitor (TIM).....	69
3.5.3 PMOD Model 8 (PMO8).....	71
Summary.....	71
Questions.....	72
References.....	72
Chapter 4 Direct Normal Irradiance.....	77
4.1 Overview of Direct Normal Irradiance.....	77
4.2 Pyrheliometer Geometry.....	80
4.3 Operational Thermopile Pyrheliometers.....	82
4.4 Absolute Cavity Radiometers.....	86
4.5 Uncertainty Analysis for Pyrheliometer Calibration.....	88

4.6	Uncertainty Analysis for Operational Thermopile Pyrheliometers.....	90
4.6.1	Window Transmittance, Receiver Absorptivity, and Temperature Sensitivity..	91
4.6.2	Solar Zenith Angle Dependence.....	92
4.7	Uncertainty Analysis for Rotating Shadowband Radiometer Measurements of Direct Normal Irradiance.....	93
4.8	Direct Normal Irradiance Models.....	95
4.8.1	Ground-Based Modeling.....	95
4.8.2	Satellite Model Estimates.....	95
4.9	Historical and Current Surface-Measured Direct Normal Irradiance Data.....	97
	Questions.....	100
	References.....	100
Chapter 5	Measuring Global Irradiance.....	103
5.1	Introduction to Global Horizontal Irradiance Measurements.....	103
5.2	Black-Disk Thermopile Pyranometers.....	108
5.2.1	Thermal Offsets.....	113
5.2.2	Nonlinearity.....	115
5.2.3	Spectral Response.....	116
5.2.4	Angle of Incidence Response.....	117
5.2.5	Response Degradation.....	119
5.2.6	Temperature Dependence.....	120
5.2.7	Ice and Snow on Dome—Ventilators.....	121
5.2.8	An Optical Anomaly.....	122
5.3	Black-and-White Pyranometers.....	124
5.3.1	Characteristics of Black-and-White Pyranometers.....	124
5.3.2	Lack of Thermal Offset.....	128
5.4	Photodiode-Based Pyranometers.....	128
5.4.1	Characterizing a Photodiode Pyranometer.....	131
5.4.2	Corrections Made to Photodiode Pyranometers.....	135
5.4.3	Reference Solar Cells.....	142
5.5	Calibration of Pyranometers.....	143
5.5.1	Shade–Unshade Calibration Method.....	144
5.5.2	Summation Method Calibration.....	146
5.6	Pyranometer Calibration Uncertainties.....	149
5.6.1	Uncertainty Analysis Applied to Pyranometer Calibration.....	150
5.6.2	An Example of the <i>GUM</i> Procedure Applied to the Calibration Uncertainties of a Pyranometer.....	153
	Questions.....	156
	References.....	157
	Useful Links.....	159
Chapter 6	Diffuse Irradiance.....	161
6.1	Introduction.....	161
6.2	The Measurement of Diffuse Irradiance.....	162
6.2.1	Fixed Shadowband Measurements of Diffuse Irradiance.....	163
6.2.2	Calculated Diffuse Irradiance versus Shade Disk Diffuse.....	165
6.2.3	Rotating Shadowband Diffuse Measurements.....	166
6.3	Calibration of Diffuse Pyranometers.....	167
6.4	Value of Accurate Diffuse Measurements.....	168
	Questions.....	169
	References.....	170
Chapter 7	Rotating Shadowband Radiometers.....	171
7.1	Introduction.....	171
7.2	The Rotating Shadowband Radiometer.....	173
7.3	The Multifilter Rotating Shadowband Radiometer.....	178
	Questions.....	181
	References.....	182

Chapter 8	Measuring Solar Radiation on a Tilted Surface.....	183
8.1	Introduction.....	183
8.2	Effect of Tilt on Single Black Detector Pyranometers.....	184
8.3	Effect of Tilt on Black-and-White Pyranometers.....	185
8.4	Effect of Tilt on Photodiode Pyranometers.....	187
8.5	Recommendations for Tilted Irradiance Measurements.....	188
8.6	Notes on Modeling PV System Performance with Photodiode Pyranometers.....	189
	Questions.....	191
	References.....	191
Chapter 9	Albedo.....	193
9.1	Introduction.....	193
9.2	Broadband Albedo.....	193
9.3	Spectral Albedo.....	194
9.4	Bidirectional Reflectance Distribution Function.....	200
9.5	Albedo Measurements.....	201
9.5.1	Broadband albedo.....	201
9.5.2	Spectral albedo.....	203
	Questions.....	203
	References.....	204
Chapter 10	Infrared Measurements.....	205
10.1	Introduction.....	205
10.2	Pyrgeometers.....	206
10.3	Calibration.....	209
10.4	Improved Calibrations.....	210
10.5	Other Pyrgeometer Manufacturers.....	212
10.6	Operational Considerations.....	213
	Questions.....	215
	References.....	215
Chapter 11	Net Radiation Measurements.....	217
11.1	Introduction.....	217
11.2	Single-Sensor (All-Wave) Net Radiometers.....	218
11.3	Two-Sensor Net Radiometers.....	220
11.4	Four-Sensor Net Radiometers.....	222
11.5	Accuracy of Net Radiometers.....	223
11.6	A Better Net Radiation Standard.....	223
11.7	Net Radiometer Sources.....	224
	Questions.....	224
	References.....	224
Chapter 12	Solar Spectral Measurements.....	227
12.1	Introduction.....	227
12.2	The Extraterrestrial Solar Spectrum.....	227
12.3	Atmospheric Interactions.....	228
12.3.1	Rayleigh Scattering.....	229
12.3.2	Aerosol Scattering and Absorption.....	229
12.3.3	Gas Absorption.....	231
12.3.4	Transmission of the Atmosphere.....	236
12.4	Broadband Filter Radiometry.....	237
12.4.1	Photometry.....	237
12.4.2	Photosynthetically Active Radiation (PAR).....	240
12.4.3	UVA and UVB.....	241
12.5	Narrow-Band Filter Radiometry.....	242
12.5.1	Aerosol Optical Depth.....	242
12.5.2	Water Vapor.....	245
12.5.3	Sun Radiometers.....	247
12.6	Spectrometry.....	248

12.6.1 Spectrometers.....	249
12.6.2 Spectral Models.....	249
Questions.....	250
References.....	250
Chapter 13 Meteorological Measurements.....	255
13.1 Introduction.....	255
13.2 Ambient Temperature.....	255
13.2.1 Types of Temperature Sensors.....	256
13.2.2 Response Times.....	256
13.2.3 Measuring Temperature.....	256
13.3 Wind Speed and Wind Direction.....	258
13.3.1 Sensor Terminology.....	258
13.3.2 Anemometer.....	260
13.3.3 Cup Anemometers.....	260
13.3.4 Propeller Anemometers.....	261
13.3.5 Sonic Anemometers.....	263
13.3.6 Installing Anemometers.....	263
13.3.7 Wind Vanes.....	264
13.4 Relative Humidity.....	265
13.5 Pressure.....	267
13.5.1 Aneroid Displacement Transducers.....	268
13.5.2 Piezoresistive Barometers.....	268
13.5.3 Piezocapacitance Barometers.....	269
13.6 Recommended Minimum Accuracies for Operational Instruments.....	270
Questions.....	270
References.....	271
Chapter 14 Setting Up a Solar Monitoring Station.....	273
14.1 Introduction.....	273
14.2 Choosing a Site.....	274
14.3 Grounding and Shielding.....	276
14.4 Data Logger and Communications.....	276
14.5 Measurement Interval.....	278
14.6 Cleaning and Maintenance.....	279
14.7 Record Keeping.....	283
14.8 Importance of Reviewing Data.....	283
14.9 Quality Control of Data.....	287
14.10 Field Calibrations.....	290
14.11 Physical Layout of a Solar-Monitoring Station.....	291
Questions.....	294
References.....	294
Appendix A: Modeling Solar Radiation.....	295
Appendix B: Solar Radiation Estimates Derived from Satellite Measurements.....	311
Appendix C: Sun Path Charts.....	321
Appendix D: Solar Position Algorithms.....	341
Appendix E: Useful Conversion Factors.....	349
Appendix F: Sources for Equipment.....	353
Appendix G: BORCAL Report.....	359
Appendix H: Sunshine Duration.....	375
Appendix I: Failure Modes.....	377