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Development and significance of IRS-04 radiometer

Ishikawa Trading Co., Ltd.

Presented by Kazuhiko Ohkubo



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About Ishikawa

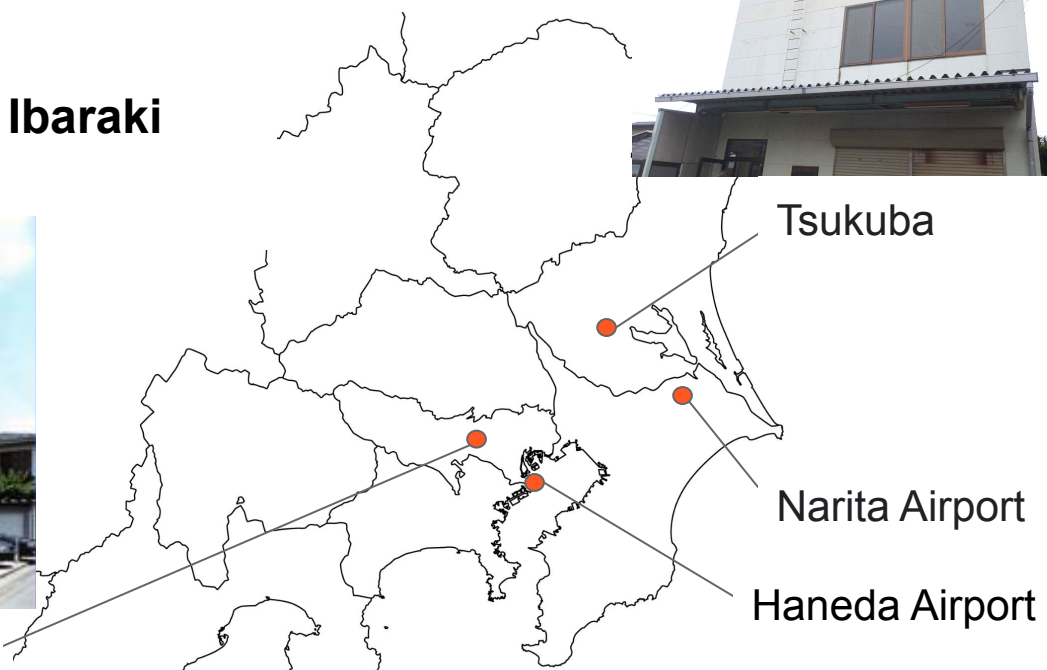
Established in April 1967

Head office in Mitaka, Tokyo

Technical Center in Tsukuba, Ibaraki



Mitaka



Tsukuba

Narita Airport

Haneda Airport



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About Ishikawa

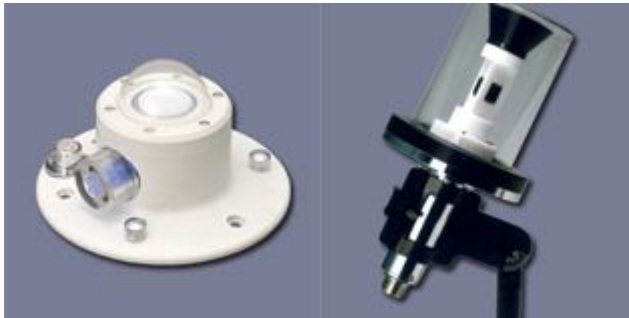
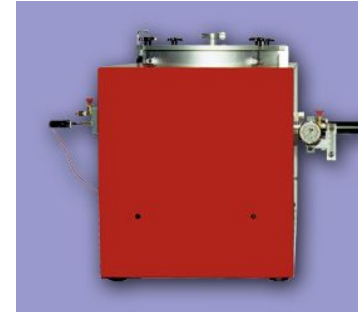
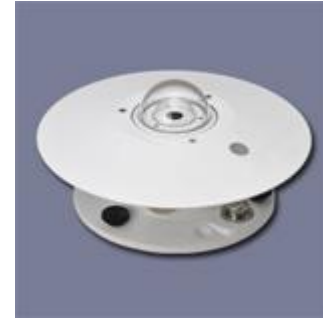
Main business

Development & marketing of a weather survey devices

& electric furnace equipment

Distribution of thermocouples

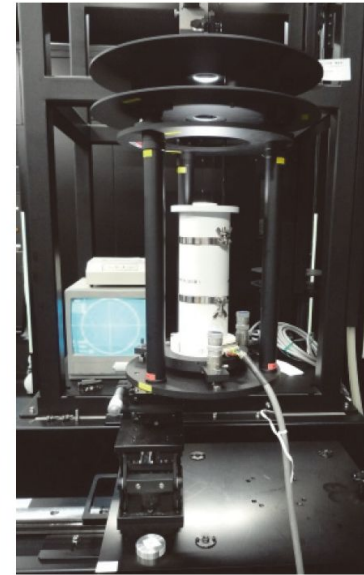
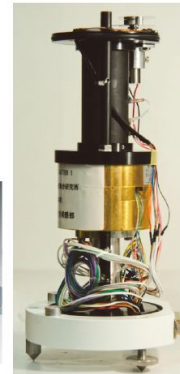
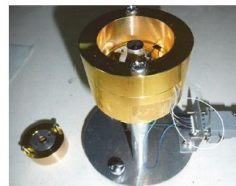
& connectors



Development of PV cells and radiometers

In collaboration with the National Institute of Advanced Industrial Science and Technology (AIST), we have developed a reference photovoltaic cell for the world PV standard.

At the same time, we were also developing an absolute radiometer that can radiate solar simulators.



Solar Simulator Method



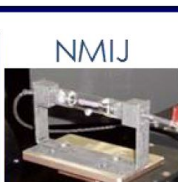
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IEC 60904-4

SI Unit

IEC60904-9 Class A+

Spectral Irradiance Scale



SI Radiometric Scale



World Radiometric Reference



Spectral Irradiance



Spectral Response



Solar Simulator



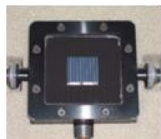
Solar Irradiance



AIST-RCPV

JIS C 8910
IEC 60904-2

ISO/IEC 17025
Accredited



Primary Reference Cell

Secondary Reference Cell

JIS C 8904-2 / IEC 60904-2
Secondary Reference Module

Third Party Certification



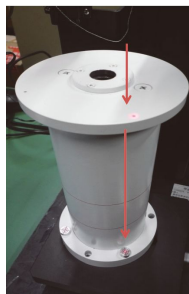
IECEE CB Testing
Laboratories

Development of radiometer

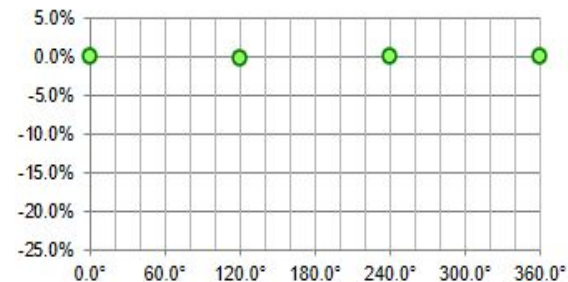
Requirements

Can be used both outdoors and indoors

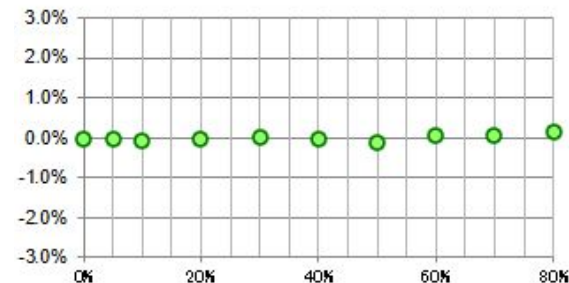
- Supports precise position adjustment
- High reproducibility
- Make it possible to know the position of the light receiving part



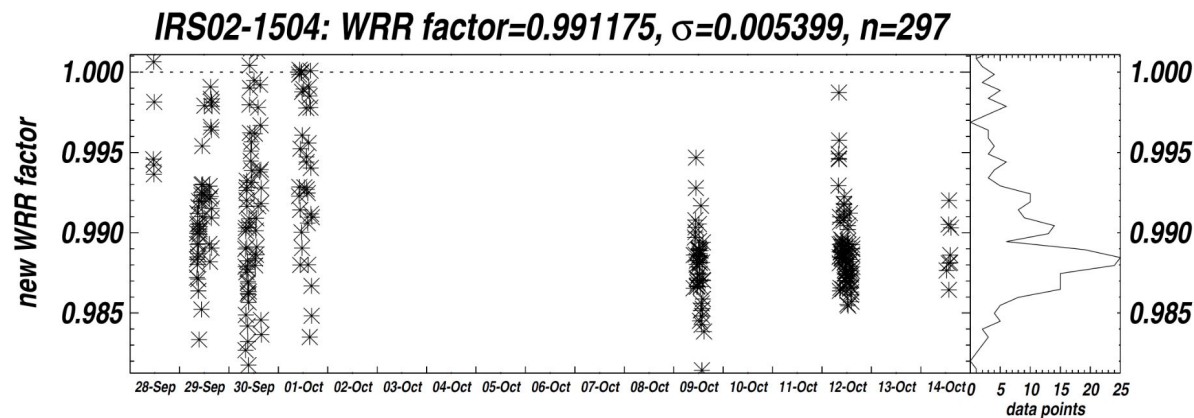
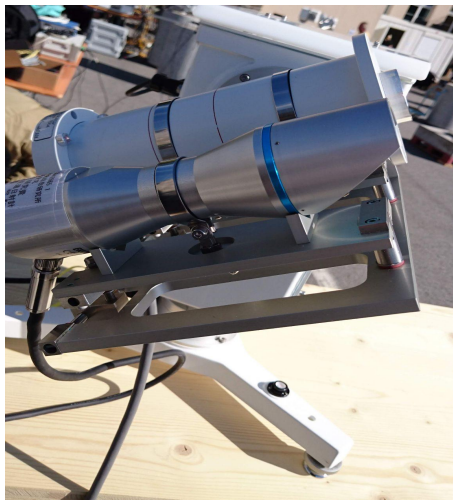
Angle characteristics
(the horizontal direction)



Linearity of the intensity
(The difference between the PV cell)



Participation in IPCXII and problems



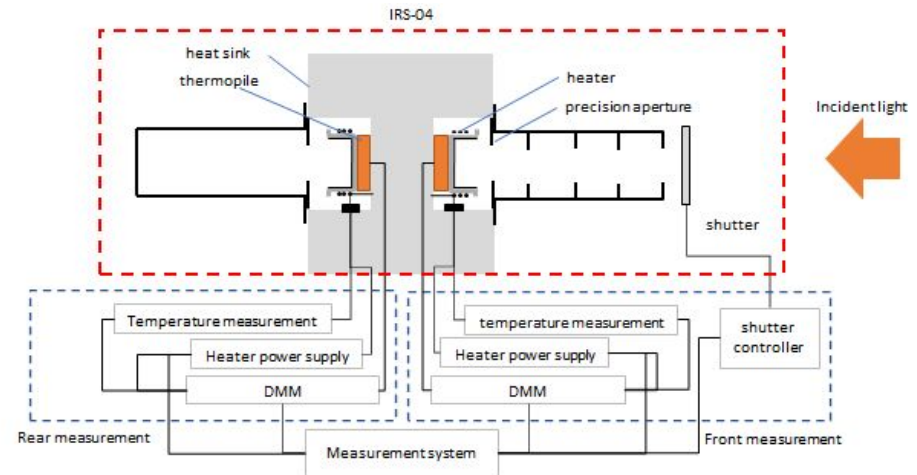
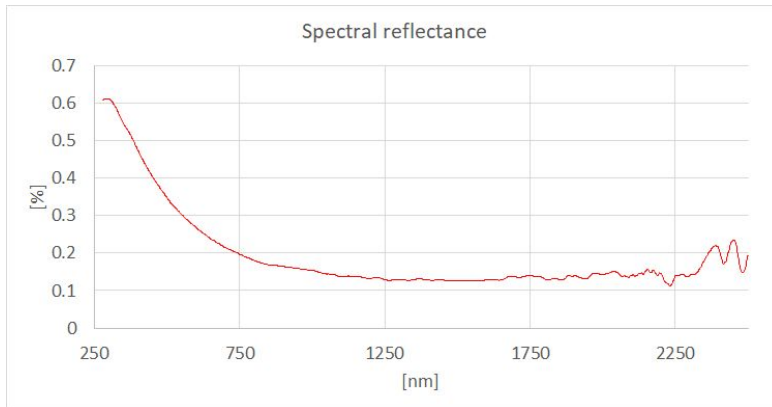
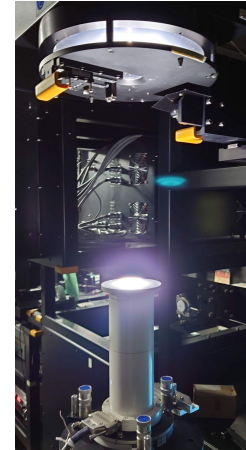
Problem

- Sealing of internal structure
- Improved responsiveness

The IRS-04 is an improvement over these.

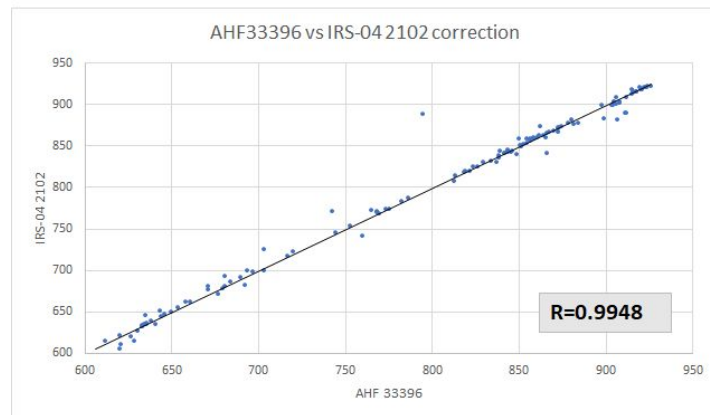
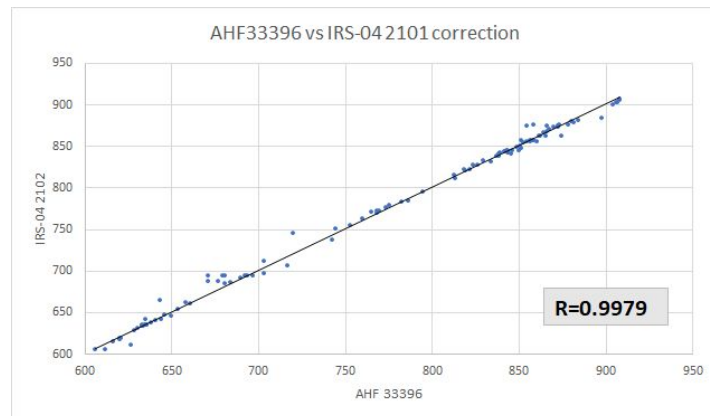
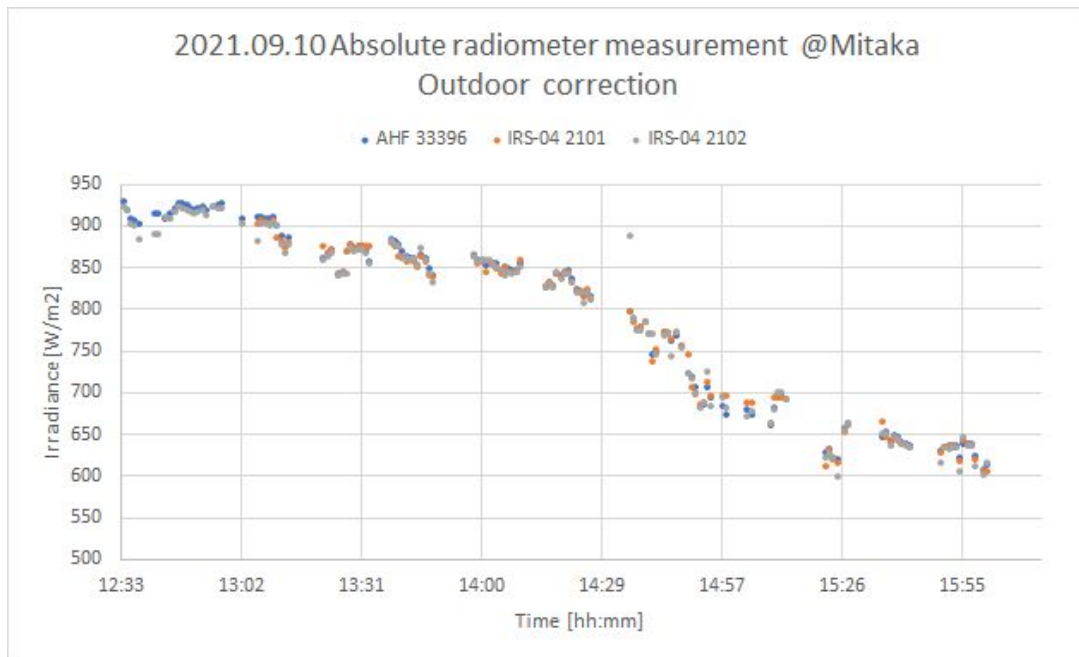
Features of the IRS-04

- Can be used indoors and outdoors.
- The light receiving part is flat
(Vantablack is used for the light receiving part)
- Active and passive measurements are possible
- Active measurement can be measured in real time
(Limited to stable incident light)



Outdoor measurement comparison

Results of comparative measurements before participating in IPCXIII



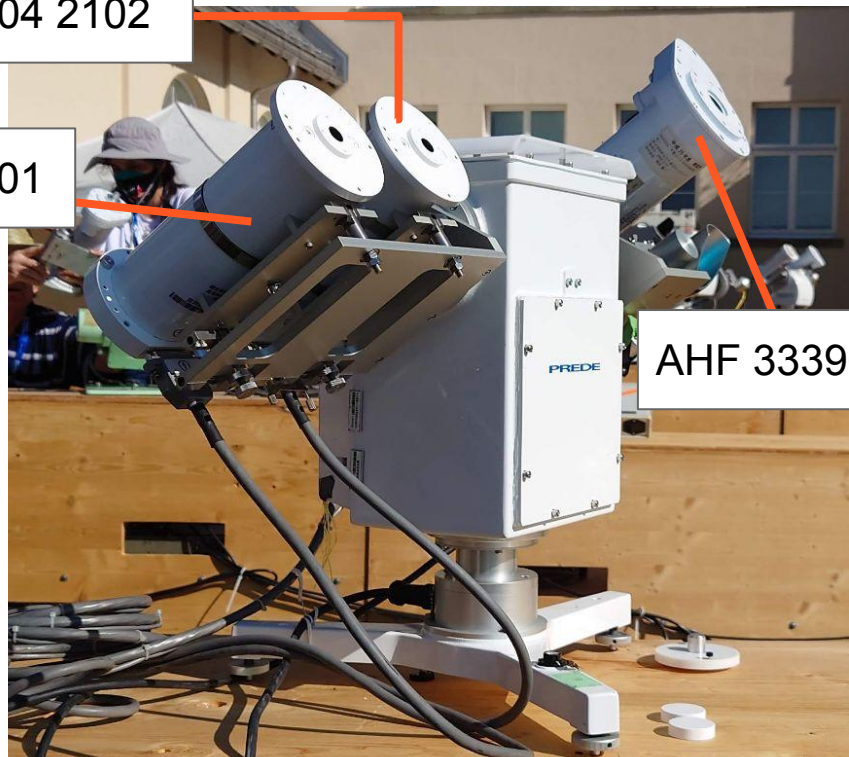


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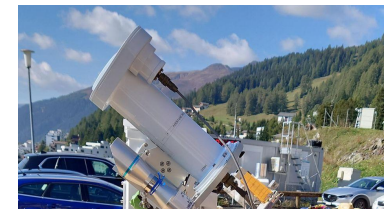
Participation in IPCXIII

IRS-04 2102

IRS-04 2101



AHF 33396



Measurement PC

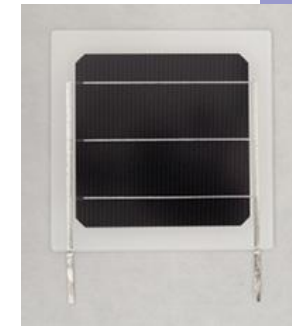
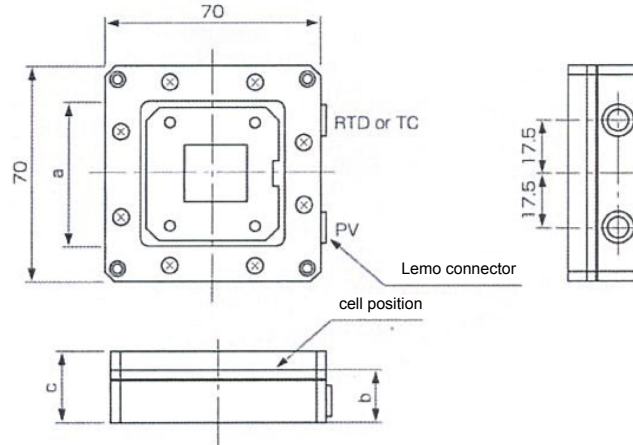


Heater power supply,
DMM



Ishikawa's reference PV cell

In this way, we are contributing to the calibration technology of Japanese photovoltaic cells. Currently, we are the only company in Japan that manufactures and sells PV cells. Most of the primary reference photovoltaic cells used indoors and outdoors are ready-made, but custom-made (supplied cells, filters, etc.) are also available upon request.





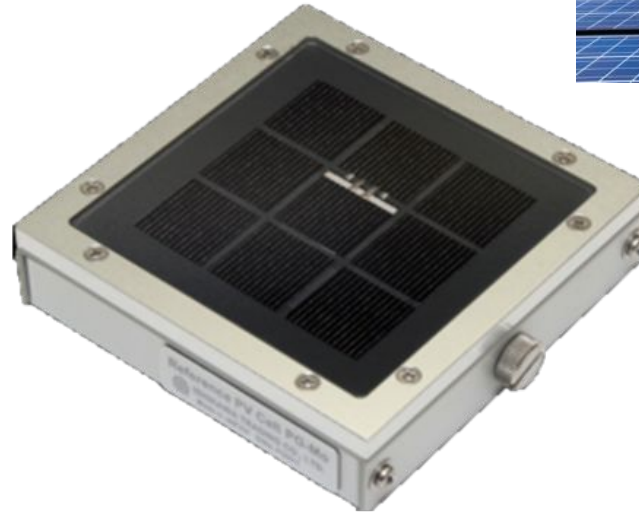
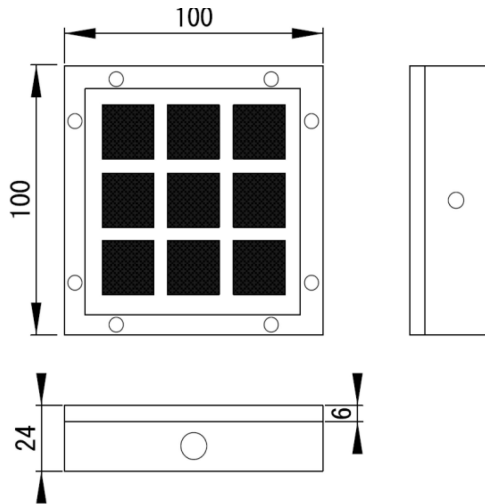
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Ishikawa outdoor evaluation PV cell

Optical characteristics similar to PV modules

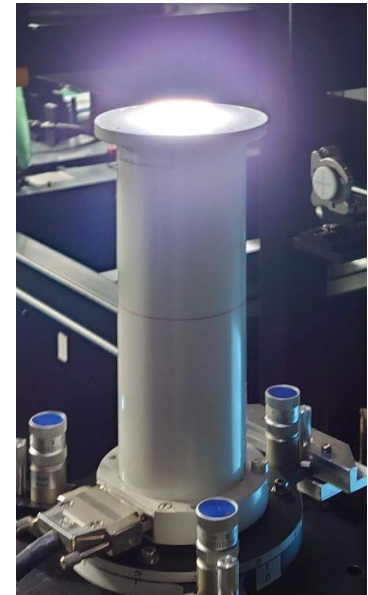
Weatherproof PV cell

Traceable to reference solar cells



Summary

- Absolute radiometer is indispensable for reducing uncertainty of solar simulator method, which is one of the calibration methods of solar cells.
- Ishikawa is a manufacturer of standard solar cells and has also developed an absolute radiometer that can be used indoors.
- We will continue to contribute to solar power generation.





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Thank you for your attention

I would like to answer your question ...

<http://www.ishikawa-sangyo.co.jp>

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