Instruments and Observing Methods
Report No. 145

Fifth WMO Regional Pyrheliometer Comparison of RA II, held jointly with RA V

(Tsukuba, Japan, 16–27 January 2023)

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FOREWORD

The World Meteorological Organization (WMO) prepares and implements its strategic plans to support the Members in their responsibilities to provide weather, climate, water and related environmental services to protect lives, property and livelihoods and contribute to the sustainable development of nations.

Observations are an essential component of the value chain. Therefore, high quality, fit for purpose and traceable measurements are needed to develop and provide the services demanded for several areas of application.

For radiation measurements, WMO has established a cascading system of World and Regional Radiation Centres to support their traceability to the World Radiometric Reference (WRR) that is the global reference. The regional standard instruments, held by the Regional Radiation Centres, are calibrated by being subjected to an intercomparison at the World Radiation Centre. Subsequently, those regional standard instruments are being used at regional pyrheliometer comparison activities to calibrate national standard instruments. Finally, the national standard instruments are used to calibrate the instruments of the national networks.

The intercomparison presented in this report is a key activity to ensure the traceability of radiation measurements to the World Radiation References.

This report presents the results of the Fifth WMO Regional Pyrheliometer Comparison (RPC-V) of Regional Association II (RA II, Asia) jointly held with Regional Association V (RA V, South-West Pacific) in Tsukuba, Japan, from 16 to 27 January 2023. The aim of this activity is to check the stability of individual regional reference instruments and to calibrate national reference instruments of RA II and RA V Members. Although it was not possible for all National Radiation Centres (NRCs) to delegate a representative in this comparison due to ongoing COVID-19 restrictions, pyrheliometers sent from National Radiation Centres without operators were handled by the Regional Radiation Centre (RRC) staff, resulting in 19 pyrheliometers from 9 institutions (1 World Radiation Centre (WRC), 2 RRCs, 5 NRCs and 1 manufacturer) representing 7 countries and regions participating in the comparison.

The comparison enabled the traceability of participating instruments. It also serves as a capacity development activity, allowing the participants to exchange and share scientific and technological information on radiation measurements through country reports, technical visits and training courses.

I wish to express my sincere appreciation to all those who contributed to the success of this pyrheliometer comparison, and in particular to the staff of the RRC Tokyo and RRC Melbourne for organizing this intercomparison and ensuring a safe environment for all participants.

President of the Infrastructure Commission

Michel Jean

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Part I

FIFTH WMO REGIONAL PYRHELIOMETER COMPARISON OF RA II, HELD JOINTLY WITH RA V

(Tsukuba, Japan, 16–27 January 2023)

1. INTRODUCTION

The fifth Regional Pyrheliometer Comparison (RPC-V) of the World Meteorological Organization (WMO) Regional Association (RA) II was conducted together with the RPC of RA V in Tsukuba, Japan, from 16 to 27 January 2023. The RPC-V was delayed by a year matching the same delay of the 13th International Pyrheliometer Comparison (IPC-XIII) due to international travel restrictions imposed in response to the COVID-19 pandemic. Attendees included experts from Regional and National Radiation Centres in RA II and in RA V, and the World Radiation Centre (WRC) in Davos, Switzerland.

The Japan Meteorological Agency (JMA) and the Australian Bureau of Meteorology (BoM) serve as WMO Regional Radiation Centres (RRCs) in RA II and RA V in their roles as RRC Tokyo and RRC Melbourne, each maintaining a group of regional standard pyrheliometers to ensure the traceability of solar radiation measurements to the World Radiometric Reference (WRR). Due to COVID-19 travel restrictions, RRC Tokyo and RRC Melbourne could not attend IPC-XIII in person. Instead, RRC Tokyo sent a regional standard pyrheliometer to the IPC-XIII and WRC staff kindly operated and calibrated the pyrheliometer to be traceable to the WRR (WMO, 2023). Due to instrument incompatibility, it was not feasible for WRC staff to operate the RA V standards on behalf of RRC Melbourne. Fortunately, the joint RPC-IV of RA II and RA V held in January 2017 extended valid traceability for RA V through to January 2022. Traceability to the WRR was restored to RRC Melbourne at RPC-V after a 12-month outage. The COVID-19 pandemic highlighted the value in exceeding minimum requirements and conducting WMO recommended interregional comparisons between IPC events, bringing improved resilience, strengthened traceability, as well as collaboration and knowledge exchange between RRCs.

The RPC-V of RA II held jointly with RA V took place to compare the regional standard pyrheliometers held by RRC Tokyo, RRC Melbourne and transfer standards from WRC. The comparison served to meet WMO requirements for traceability to the WRR and to check the stability of individual regional reference instruments. It also provided the necessary outdoor facilities for simultaneous comparison of national standard pyrheliometers from RA II/V as specified in WMO-No. 8 (WMO, 2018 and 2021). Experts from Hong Kong, China and the Republic of Korea in RA II and from Indonesia in RA V participated in the comparison. WRC sent an expert to operate the World Standard Group (WSG) transfer references and support related activities. In addition, national standard pyrheliometers from China and New Zealand participated in the RPC and one manufacturer, Davos Instruments AG, sent experts and instruments to participate in the RPC.

The campaign was successful, producing positive results thanks to the close collaboration and hard work of the participants. Traceability to the WRR was disseminated to participating national standard instruments in RA II and RA V and was restored to the RA V standard group following the COVID-related outage. This report presents the results of intercomparisons conducted over a period of five days with good weather conditions.

2. LOCATION OF COMPARISON SITE

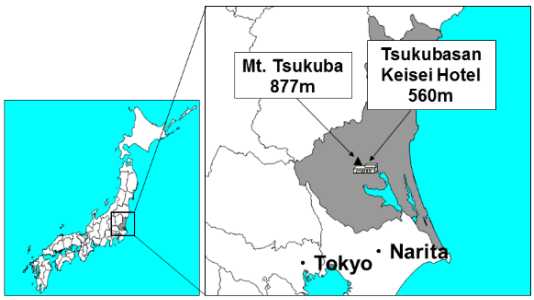
RPC activities took place at the Tsukubasan Keisei Hotel located halfway up the southeast side of Mt. Tsukuba in Japan's Ibaraki Prefecture. This is an isolated 877-meter-high mountain about 70 km northeast of Tokyo. The site was selected as the venue for the first RPC of RA II/V (RPC-I) in 1989 (WMO, 1989) after consideration of the conditions necessary for pyrheliometer intercomparison by WMO experts.

Address: 1 Tsukuba, Tsukuba-City, Ibaraki, Japan

Longitude: 140° 7.5′ E

Latitude: 36° 12.9′ N

Altitude: 560 m above sea level



3. PARTICIPANTS

The following experts from two RA II members, two RA V members, Switzerland, and JMA staff participated in the comparison.

Mr Chau Hak Ming Tony	(Hong Kong Observatory, Hong Kong, China)
Mr Kim Gi Chang	(Korea Meteorological Administration, Republic of Korea)
Mr Lee Yong Joo	(Korea Meteorological Institute, Republic of Korea)
Mr Lee Won Chul	(Korea Meteorological Institute, Republic of Korea)
Mr Michael Milner	(RRC Melbourne, Australia)
Mr Agus Sail	(Badan Meteorologi, Klimatologi, dan Geofisika, Indonesia)
Mr Roni Dwi Saputro	(Badan Meteorologi, Klimatologi, dan Geofisika, Indonesia)
Dr Wolfgang Finsterle	(WRC, Switzerland)
Dr Markus Suter	(Davos Instruments AG, Switzerland)

Mr Jon Buchli	(Davos Instruments AG, Switzerland)
Mr Takanori Mizuno	(Director, RRC Tokyo/JMA Headquarters, Japan)
Mr Atsushi Saito	(Staff, RRC Tokyo/JMA Headquarters, Japan)
Mr Jun Ohtake	(Staff, RRC Tokyo/JMA Headquarters, Japan)
Mr Shun Sasaki	(Staff, RRC Tokyo/JMA Headquarters, Japan)
Mr Takuto Usuda	(Staff, RRC Tokyo / JMA Headquarters, Japan)
Mr Masaki Adachi	(Aerological Observatory, JMA, Japan)
Mr Osamu Ijima	(Aerological Observatory, JMA, Japan)
Mr Genki Tsuda	(Aerological Observatory, JMA, Japan)
Mr Takayuki Nojima	(Aerological Observatory, JMA, Japan)
Mr Nozomu Ohkawara	(Meteorological Research Institute, JMA, Japan)

A list of main participants and contact addresses is shown in ***Appendix A***.

4. INSTRUMENTS

Due to the ongoing COVID-19 restrictions not all National Radiation Centres (NRC) were able to delegate a representative to the RPC-V. Instead, pyrheliometers sent from NRCs without operators were operated by RRC staff, resulting in 19 pyrheliometers from 9 institutions (1 WRC, 2 RRCs, 5 NRCs and 1 manufacturer) representing 7 countries and regions participating in the comparison. The model names, serial numbers, owners and instrument types were as follows:

PMO6-LINARD	No. 0401(WRC)	Absolute cavity radiometer (active type)
PMO6-CC	No. 0803(WRC)	Absolute cavity radiometer (active type)
PMO8	No. F201-007A(WRC)	Absolute cavity radiometer (active type)
AHF	No. 32455(WRC)	Absolute cavity radiometer (passive type)
PMO6-CC	No. 1603(Japan)	Absolute cavity radiometer (active type)
PMO6-CC	No. 0403(Japan)	Absolute cavity radiometer (active type)
PMO6-CC	No. 1107(Japan)	Absolute cavity radiometer (active type)
AHF	No. 32446(Japan)	Absolute cavity radiometer (passive type)
AHF	No. 37815(Japan)	Absolute cavity radiometer (passive type)
HF	No. 27160(Australia)	Absolute cavity radiometer (passive type)
TMI Kendall Mk-VI	No. 69137(Australia)	Absolute cavity radiometer (passive type)
PMO6-CC	No. 0102(Hong Kong, China)	Absolute cavity radiometer (active type)
PMO6-CC	No. 0809(Hong Kong, China)	Absolute cavity radiometer (active type)
PMO6	No. 951202(Republic of Korea)	Absolute cavity radiometer (active type)
AHF	No. 36014(Republic of Korea)	Absolute cavity radiometer (passive type)
PMO6-CC	No. 1610(Indonesia)	Absolute cavity radiometer (active type)
PMO6-CC	No. 0806(China)	Absolute cavity radiometer (active type)
CHP1	No. 160399(New Zealand)	Pyrheliometer
PMO8	No. F211-008 (Davos Instruments AG, Switzerland)	Absolute cavity radiometer (active type)

During the comparison, ancillary data (air temperature, relative humidity, atmospheric pressure, and wind speed/direction) were obtained from an automatic weather station (AWS). A sky radiometer (POM-02) was operated to monitor the aerosol optical depth (AOD) at 500nm. These data were used for screening in data evaluation procedures. The auxiliary instruments are listed below.

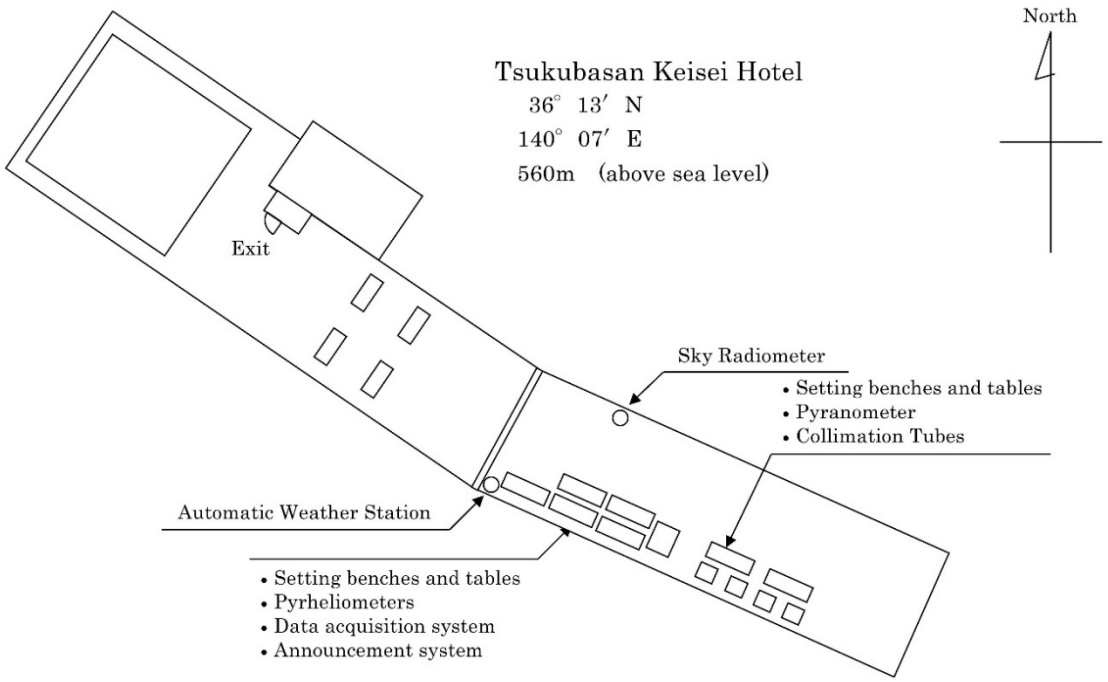
Auxiliary instruments

MetPak II	1723-PK-100	AWS
POM-02	PS2815704	Sky Radiometer

5. OUTLINE OF COMPARISON

5.1. Equipment and facilities

Flat benches, automatic active sun trackers, a data acquisition system, a voice-announcement and buzzer system (to indicate the start and end of measurements), an AWS (consisting of a thermometer, a hygrometer, a barometer and an ultrasonic anemometer), a sky radiometer on a sun tracker and some power supplies (100/220 V, 50 Hz) were set up on the rooftop of the venue. The pyrheliometer sensors were mounted on six sun trackers.



Layout of the Equipment and Facilities (Rooftop of the Tsukubasan Keisei Hotel)

Figure 1. Layout of the equipment and facilities

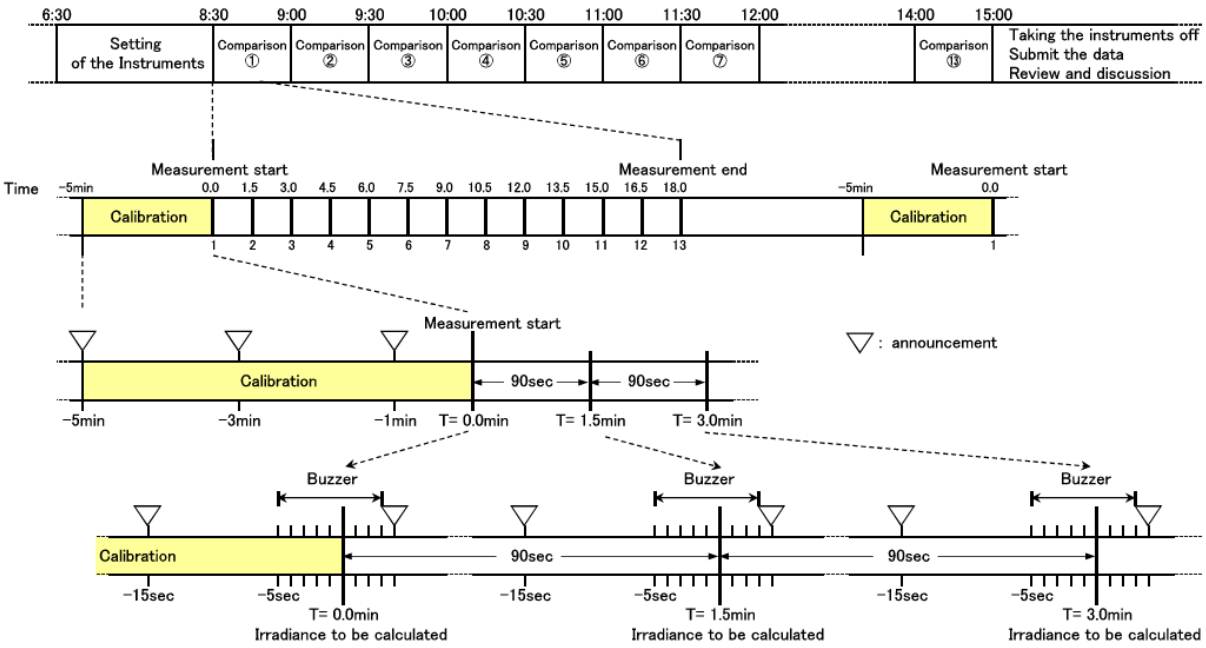
5.2. Data acquisition method

Digital data from the radiometer controllers were acquired by all members via a dedicated personal computer. Each member converted the data into the set format after daily observations and stored them on USB flash memory.

Analog signals from the controller of one PMO6#951202 were acquired and stored immediately on a dedicated personal computer with a multi-channel analog data logger by JMA staff.

5.3. Measurement procedures

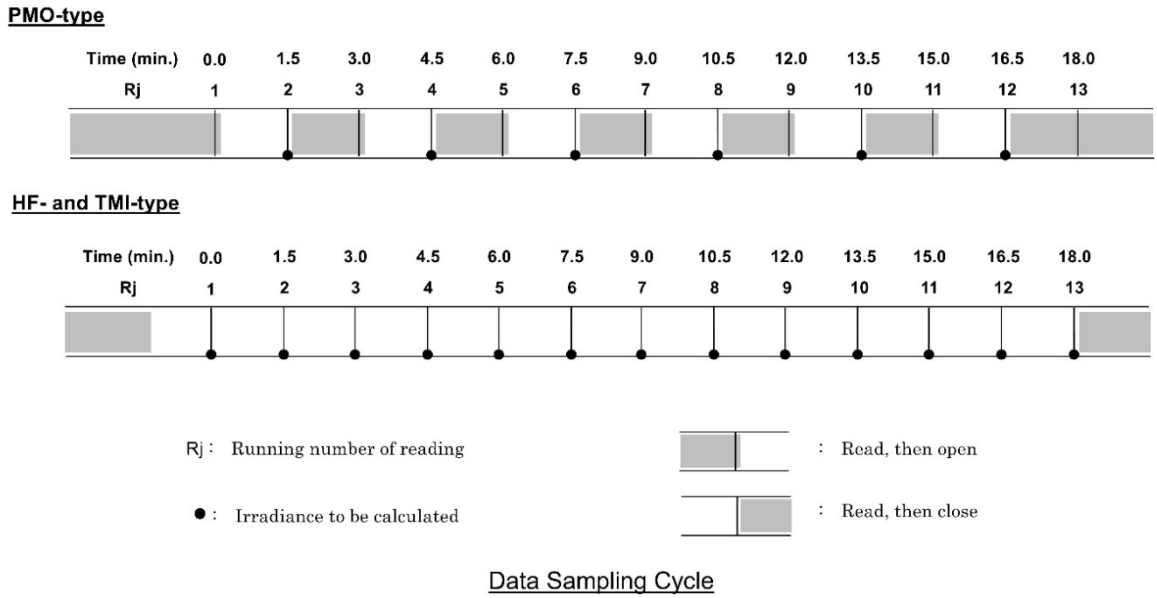
The sequence of measurements of a sample day is shown below.



Measurement Sequence

Figure 2. Measurement sequence

Each set of measurements, referred to as a series, was composed of 13 data readings taken at 90-second intervals. Accordingly, the collection of one series took 18 minutes. The data sampling cycle for each instrument is shown below.



Data Sampling Cycle

Figure 3. Data sampling cycle

The synchronization of measurements was performed by voice announcements and buzzers from a computer as shown below.

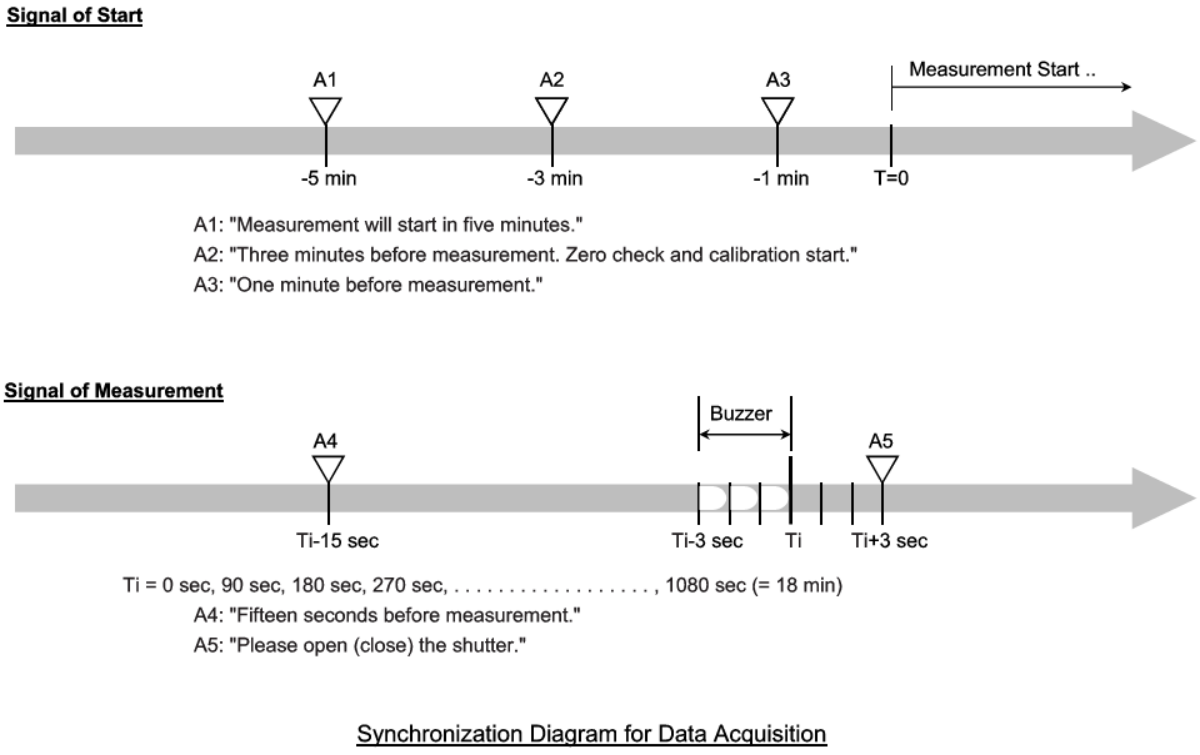


Figure 4. Synchronization diagram for data acquisition

The instruments were controlled and operated independently by the participants as described below.

(a) PMO-type absolute pyrheliometers (PMO6, PMO6-CC, PMO6-LINARD and PMO8)

Each series started with the shutter closed, and PMO-type absolute pyrheliometer measurement was then carried out by opening and closing the shutter every 90 seconds. The PMO6#951202 was operated using a controller to open and close the shutter automatically in synchronization with announcements and buzzers. PMO6-CC, PMO6-LINARD and PMO8 were synchronized at the beginning of data series measurement and operated automatically from that point onward.

Irradiance data were acquired from measurements taken at both ends of the closed phase and the end of the open phase. Six sets of data taken at intervals of three minutes were therefore acquired in one series.

(b) HF- and TMI-type absolute pyrheliometers (HF, AHF and TMI)

Zero adjustment and self-calibration were carried out before each series. A zero-point reading was taken with the shutter closed and heater off. The heater was turned on with the shutter closed for self-calibration. The heater voltage was selected manually or automatically beforehand to match approximately the expected level of solar irradiance. Before the end of the calibration period, the heater voltage, heater current and thermopile output were measured in order to estimate the sensitivity for the following measurement series. After the self-calibration, the heater was turned off and the shutter was opened for measurement. The thermopile output was read every 90 seconds, and 13 sets of irradiance data were acquired in each series. These operations were performed automatically via programme control.

5.4. Daily comparison schedule

Generally, the daily schedule was as follows:

06:30–08:30	Instruments were taken from the storage room to the rooftop, set up and connected. After inspection of the automatic active sun trackers, pyrheliometer alignment and the connection of the observation instruments to the data logger and computers, etc., the instruments were allowed to warm up for at least 30 minutes.
08:30–15:30	Depending on suitable weather conditions, measurements were taken (see Section 5.3.). Pyrheliometer alignment was checked on an ongoing basis and fine adjustments were made using screws or similar where necessary.
15:30–	Measurements concluded and the instruments were returned to the storage room. The participants processed and submitted measurement data, and the RRC distributed the preliminary measurement results to the participants. The results were monitored daily to check the status of the instruments and the measurement procedures.

On cloudy days, participants gave country reports, went on technical visits to JMA's Meteorological Instrument Centre and Aerological Observatory and attended training sessions in radiation measurement.

6. IRRADIANCE CALCULATION

The procedure used to calculate the irradiance of each instrument type is described below. The notations are as follows:

Symbols

S	direct solar irradiance [W m^{-2}]
V_{th}	output of thermopile [V]
U_H or U_I	voltage across the heater (H) or across the shunt resistor (I) [V]
R_N	precision shunt resistor to measure electric current [Ω]
R_C	correction resistance for heater leads [Ω]
C_1	calibration factor
P	electrical power in the active cavities [W]
F	tentative mean irradiance ratio
K	sensitivity

Subscripts

irrad	value during irradiance measurement phase
cal	value during calibration phase
zero	value during zero adjustment in calibration phase
open	value during shutter-open phase
closed	value during shutter-closed phase

(a) MO-type absolute pyrheliometers (PMO6, PMO6-CC, POM6-LINARD, PMO8)

PMO-type absolute pyrheliometers have a primary black body cavity for measurement under conditions of exposure to the sun and a secondary black body cavity for compensation. These cavities are thermally interconnected via a heat sink, and the difference in temperature between them is kept constant by an electrical heater attached to the cavity for measurement regardless of open or closed shutter status.

When the shutter is opened for exposure to the sun, the electrical power needed to maintain the temperature difference decreases because of irradiance heating. The irradiance is in proportion to the difference between the open and closed shutters, and is calculated using the following formula:

$$S = C_1 \ (P_{(\text{closed})} - P_{(\text{open})})$$

$P_{(\text{closed})}$ is averaged from the closed values recorded before and after the open phase. Power calculation was performed using the following formulas:

$$P = U_H \, U_I \, / \, R_N$$

(b) HF- and TMI-type absolute pyrheliometers (HF, AHF, TMI)

HF- and TMI-type absolute pyrheliometers have a black body cavity for measurement under conditions of exposure to the sun, as well as a thermopile and an electric heater.

Before each series, the shutter is closed, the heater current is turned on, and the voltage $U_{H(\text{cal})}$ across the heater system, the voltage $U_{I(\text{cal})}$ across the precision shunt resistor R_N and the thermopile output $V_{th(\text{cal})}$ are then measured. The zero value of $V_{th(\text{zero})}$ is also determined with the detector shaded and the heater switched off. After these procedures (namely self-calibration and zero adjustment) the thermopile is exposed to continuous solar irradiance. The irradiance is determined by the proportional relationship between the known quantity of heat added by the electrical heater and the thermopile output, and the heat generated by solar irradiance and the related thermopile output V_{th} according to the following formula:

$$S = C_1 \frac{V_{th(irrad)} - V_{th(zero)}}{V_{th(cal)} - V_{th(zero)}} \frac{U_{I(cal)}}{R_N} \left(U_{H(cal)} - \frac{U_{I(cal)}}{R_N} \right) R_C$$

(c) CHP1 thermoelectric pyrheliometer

Irradiance is directly calculated from thermopile output using:

$$S = K \, V_{\text{th(irrad)}}$$

7. DATA EVALUATION PROCEDURES

The data evaluation procedures were essentially the same as those used at the previous RPC of RA II (WMO, 2018), the details of which can be found in WMO technical documents (WMO, 1985). Below is a summary of the comparison procedures.

Step 1: The reference irradiances used to calibrate the national standard pyrheliometers were calculated from the four WRC instruments (PMO6-LINARD: No. 0401; PMO6-CC: No. 0803; PMO8: No. F201-007A; AHF: No. 32455) and the one regional standard instrument (RA II: PMO6-CC: No. 1603) which participated in IPC-XIII (WMO, 2023).

Step 1-1: Data selection for the reference instruments

In each comparison series, six potential reference irradiances were obtained at even running numbers of readings (i.e. j = 2, 4, 6, 8, 10 and 12) when irradiances could be measured by 3 or more reference instruments were used for reference irradiance calculation. Although it is preferable that reference irradiances are measured by multiple reference instrument types, this condition was not strictly followed for RPC-V in order to ensure a minimum 100 data points for each evaluated pyrheliometer so that the comparison results would be statistically significant. The vast majority of reference irradiances, 130 out of 156, were realized by multiple instrument types.

All of the irradiance values obtained were inspected carefully, and those that deviated from the average of other irradiance values in the same series measured by the same reference instrument by more than 2 sigma due to instability of the instrument or other influences were removed.

The following criteria were additionally applied to the selected data to get the final results in RPC-V:

(1) No cloud or haze in or around the direction of the sun by eye observation

(2) A solar elevation angle equal to or greater than 25 degrees

(3) A wind speed equal to or less than 4.5 m/s

(4) An AOD value at 500 nm equal to or less than 0.120

As for the wind speed, the criterion adopted at RPC-III of RA II (WMO, 2013) was applied so that the number of selected data was large enough and irradiance variability of them was small enough to produce reliable comparison results. For AOD, the criterion adopted at IPC-XIII and RPC-IV was applied. Scatter plots showing the relationship between wind speeds and standard deviations of reference irradiances with and without application of the AOD criterion for every reading time are shown in ***Appendix E***.

Step 1-2: Data selection for individual reference instruments in each series

If effective irradiances satisfying the condition of Step 1-1 were obtained from three or more reference instruments in a series, all data were averaged into tentative reference irradiances at all measurement times. The measurement time in a series was not included in the following calculation when the effective irradiances available were two or less.

All of the irradiance data were treated independently regardless of the measuring reference instruments, data were selected for the following calculation only if those from each instrument were within 2% of the tentative reference irradiance values for each measurement time.

Step 1-3: Series selection to obtain reference irradiances.

All effective data satisfying the condition of Step 1-1 and Step 1-2 were averaged again into tentative reference irradiances at every measurement time. The data measured using the reference instrument in a series were selected for the following calculation only if all such measurement data in the series were within 0.2% from the tentative reference irradiance at each measurement time.

Step 1-4: Calculation of reference irradiances.

The individual reference irradiances of the selected series at every measurement time were the unweighted arithmetic mean of the effective reference instruments.

Step 2: The instruments used were calibrated according to the reference irradiances.

Step 2-1: Calculation of tentative mean irradiance ratios for the instruments used.

Firstly, those irradiance data judged as doubtful by the participants were rejected when they could not confirm the reference irradiance values. The ratios of individual irradiances to the reference value were then calculated for all instruments. Using these ratios, tentative mean ratios were calculated as follows:

$S_R(1)$,	$S_R(2)$,	$S_R(3)$,	⋯	$S_R(n)$	selected data group of reference irradiances
$S_a(1)$,	$S_a(2)$,	$S_a(3)$,	⋯	$S_a(n)$	selected data group of irradiances for instrument *a*
$F_a = \frac{1}{n}\sum_{i=1}^{n} S_a(i)/S_R(i)$					tentative mean irradiance ratio F_a for instrument *a* The number of measurements (n) depended on the instrument.

Step 2-2: Data selection for the instruments used.

Individual data that differed by more than 0.2% from the tentative mean were rejected. It was considered that data deviations greater than 0.2% were excessive and that the instrument was not stable enough in the series for comparison.

Step 3: Calculation of new WRR reduction factors for the instruments used.

The final mean irradiance ratio was calculated from the data selected as described above for each instrument used. The new WRR reduction factor $WRRf_{NEW}(a)$ should be equivalent to the inverse of the final irradiance ratio.

WRR reduction factors were calculated from the following formula:

$$WRRf_{NEW}(a) = WRR / S_a$$

where

WRR: World Radiometric Reference

S_a: irradiance measured using instrument *a*

8. COMPARISON RESULTS

A total of 50 series of measurements with 300 reference irradiances were obtained over a period of eight days. By applying the data selection criteria defined in Section 7 (Step 1) for reference values, 156 irradiances (38 series) representing the WRR were finally used. The comparison results including the new WRR factors for all participating instruments are summarized in the following table. The detailed comparison results are shown in ***Appendix B***, which lists observation times, irradiances by reference pyrheliometer group, reference irradiances (i.e. averages for each observation time), irradiance values and ratios of irradiances by each instrument to the reference irradiances for each national and regional standard pyrheliometer. Data in parentheses represent those rejected as described in Step 1 and 2 of Section 7, or not used because of the absence of reference irradiance.

Plot figures for the comparison results are shown in ***Appendix C.*** The scatter plots show the ratios to the reference irradiances, and the histograms show the distribution of these ratios for each national and regional standard pyrheliometer. The number of data along with the average and standard deviations of the ratios are also shown.

Auxiliary data for each series of measurements are given in ***Appendix D***.

As for Japan's PMO-6CC#1107, the new WRR reduction factor has changed by more than 2% from the result in previous RPC-IV of RA II although the instrument was repaired at the manufacturer due to the malfunctioning of its internal resistance units after RPC-IV. JMA decided, therefore, to continue excluding PMO-6CC#1107 from the regional standard reference group of RA II.

Table 1. Results of pyrheliometer comparison (summary)

Instrument	Current WRR Reduction Factor	Ratio (F_a)	Standard Deviation (σ)	Number of Data (n)	New WRR Reduction Factor	Change in WRR Reduction Factor (ppm)
PMO6-LINARD No. 0401 WRC	1.021649 C_1:50000m^{-2} (IPC-XIII, 2021)	1.000034	0.000482	144	-	-
PMO6-CC No. 0803 WRC	1.000287 C_1:51221m^{-2} (IPC-XIII, 2021)	1.000018	0.000523	145	-	-
PMO8 No. F201-007A WRC	1.006331 C_1:51400m^{-2} (IPC-XIII, 2021)	1.000115	0.000414	114	-	-
AHF No. 32455 WRC	1.001471 C_1:20009.2m^{-2} (IPC-XIII, 2021)	0.999762	0.000465	130	-	-
PMO6-CC No. 1603 Japan	0.999802 C_1:51178m^{-2} (IPC-XIII, 2021)	1.000066	0.000510	154	-	-
PMO6-CC No. 0403 Japan	0.999753 C_1:50489.5m^{-2} (IPC-XII, 2015)	0.999816	0.000494	151	1.000184	431
PMO6-CC No. 1107 Japan	1.024131 C_1:51214m^{-2} (PMOD/WRC, 2022)	0.999625	0.000934	107	1.000357	-23774
AHF No. 32446 Japan	0.999992 C_1:19986.9m^{-2} C_2:0.066Ω (4^{th} RPC-RAII, 2017)	1.000860	0.000535	144	0.999140	-852
AHF No. 37815 Japan	0.998679 C_1:20011m^{-2} C_2:0.066Ω (IPC-XII, 2015)	1.000751	0.000521	136	0.999250	571
HF No. 27160 Australia	0.997425 C_1:20030m^{-2} C_2:0.66Ω (IPC-XII, 2015)	1.002327	0.000635	150	0.997679	254
TMI No. 69137 Australia	1.002150 C_1:10020m^{-2} (IPC-XII, 2015)	0.997530	0.000722	133	1.002476	326
PMO6-CC No. 0102	0.997070 C_1:51213.4m^{-2}	1.002910	0.000704	129	0.997098	28

Instrument	Current WRR Reduction Factor	Ratio (F_a)	Standard Deviation (σ)	Number of Data (n)	New WRR Reduction Factor	Change in WRR Reduction Factor (ppm)
Hong Kong, China	(4th RPC-RAII, 2017)					
PMO6-CC No. 0809 Hong Kong, China	0.998632 C_1:50752.0m^{-2} (4th RPC-RAII, 2017)	1.001267	0.000655	133	0.998735	103
PMO6 No. 951202 Republic of Korea	0.996658 C_1:51669.5m^{-2} (4th RPC-RAII, 2017)	1.003072	0.000746	137	0.996938	280
AHF No. 36014 Republic of Korea	0.999132 C_1:1.99452m^{-2} (4th RPC-RAII, 2017)	0.997525	0.000658	139	1.002481	3349
PMO6-CC No. 1610 Indonesia	0.999805 C_1:50917m^{-2} (IPC-XIII, 2021)	1.000222	0.000719	111	0.999778	-27
PMO6-CC No. 0806 China	0.999586 C_1:51279.2m^{-2} (4th RPC-RAII, 2017)	1.000150	0.000458	147	0.999850	264
CHP1 No. 160399 New Zealand	- 8.00×10^{-6} V/Wm^{-2}	1.009521	0.000886	151	0.990569	-
PMO8 No. F211-008 Davos Instruments AG	- C_1:51432m^{-2}	1.000286	0.000489	137	0.999714	-

9. CONCLUSIONS

The results of the Regional Pyrheliometer Comparison can be summarized as follows:

(1) Within a given period, five days' worth of measurement data were acquired in favourable weather conditions, which led to the successful determination of reduction factors.
(2) It was confirmed that the pyrheliometers involved in the comparison were appropriately maintained and showed high accuracy while one instrument (PMO-6CC#1107) exhibited a large change in its WRR factor compared to the RPC-IV of RA II and is excluded from the regional standard reference group of RA II.
(3) New WRR reduction factors for regional standard pyrheliometers, which could not participate in IPC-XIII due to restrictions in place during the COVID-19 pandemic, and national standard instruments were determined as necessary to ensure the traceability of solar radiation measurements in each Member country/region.
(4) During the comparison, participants exchanged and shared scientific and technological information on radiation measurement through country reports, technical visits and training courses.

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Table 2. Measurement values for each instruments

Date	Time	PMO6 0401 WRC (W/m^2)	PMO6 0803 WRC (W/m^2)	PMO8 F201-007A WRC (W/m^2)	AHF 32445 WRC (W/m^2)	PMO6 1603 JMA (W/m^2)	reference irradiance (W/m^2)
yyyy/mm/dd	hh:mm:ss						
2023/1/18	10:31:30						
2023/1/18	10:34:30						
2023/1/18	10:37:30	886.211	886.074	886.147		885.725	886.039
2023/1/18	10:40:30	891.586	891.576	891.894		891.643	891.675
2023/1/18	10:43:30	889.480	889.815	889.889		889.054	889.560
2023/1/18	10:46:30	891.006	891.176	891.075		891.094	891.087
2023/1/18	11:01:30	894.620	894.447	895.098		895.003	894.792
2023/1/18	11:04:30	896.165	896.247	896.248		897.402	896.516
2023/1/18	11:07:30	897.908	899.408	898.049		898.312	898.419
2023/1/18	11:10:30	894.763	895.297	894.491		894.543	894.774
2023/1/18	11:13:30	899.513	900.198	899.039		899.842	899.648
2023/1/18	11:16:30	902.078	901.629	902.088		901.721	901.879
2023/1/18	11:31:30	899.148	898.658			899.502	899.103
2023/1/18	11:34:30	901.828	901.889	902.360		901.671	901.937
2023/1/18	11:37:30	903.691	902.419	901.868		901.901	902.470
2023/1/18	11:40:30	900.309	900.258			900.142	900.236
2023/1/18	11:43:30	901.781	902.959	901.996		901.441	902.044
2023/1/18	11:46:30	897.194	896.607	897.743		897.102	897.162
2023/1/18	12:01:30	879.866	878.552	878.823	878.799	878.796	878.967
2023/1/18	12:04:30	888.900	890.856	890.189	889.605	889.044	889.719
2023/1/18	12:07:30	887.754	887.625	887.904	887.056	888.004	887.668
2023/1/18	12:10:30	894.375	895.967	894.649	894.550	895.273	894.963
2023/1/18	12:13:30	893.161	892.576	893.539	892.875	893.493	893.129
2023/1/18	12:16:30	895.170	894.437	895.476	894.827	895.363	895.054
2023/1/18	12:31:30	889.501	889.865	891.136	889.845	889.814	890.032
2023/1/18	12:34:30	876.796	876.151	877.267	876.013	877.386	876.723
2023/1/18	12:37:30	874.965	874.251	874.097	873.414	875.077	874.361
2023/1/18	12:40:30	875.288	874.431		873.797	875.107	874.656
2023/1/18	12:43:30	862.581	862.768	862.767	861.993	862.509	862.524
2023/1/18	12:46:30						
2023/1/19	10:01:30	871.625	871.450	871.904	870.970	872.037	871.597
2023/1/19	10:04:30	884.307	883.153	884.196	883.283	883.025	883.593
2023/1/19	10:07:30	880.980	879.852		879.056	880.796	880.171
2023/1/19	10:10:30	866.453	864.808		865.292	864.749	865.325
2023/1/19	10:13:30	859.001	858.156		858.086	859.010	858.563
2023/1/19	10:16:30	861.258	860.457		860.536	861.309	860.890
2023/1/19	12:01:30						
2023/1/19	12:04:30						
2023/1/19	12:07:30						
2023/1/19	12:10:30						
2023/1/19	12:13:30	866.606	867.629	866.724	867.104	866.188	866.850
2023/1/19	12:16:30	865.090	865.658	865.111	865.201	864.669	865.146
2023/1/19	12:31:30	873.924	873.331	873.780	873.626	874.337	873.799
2023/1/19	12:34:30	872.423	872.640	872.821	872.178	872.867	872.586
2023/1/19	12:37:30	870.644	871.110	870.470	870.493	870.328	870.609
2023/1/19	12:40:30	870.292	870.590	870.528	870.417	869.988	870.363
2023/1/19	12:43:30	871.422	871.450	871.692	871.451	871.557	871.514
2023/1/19	12:46:30	866.981	866.139		866.327	867.068	866.629
2023/1/19	13:01:30	859.066	859.637	859.107	859.469	858.730	859.202
2023/1/19	13:04:30	866.537	866.249	866.875	865.884	866.428	866.395
2023/1/19	13:07:30	869.586	869.239	869.430	868.995	869.498	869.349
2023/1/19	13:10:30						
2023/1/19	13:13:30						
2023/1/19	13:16:30						

Date	Time	PMO6 0401 WRC (W/m^2)	PMO6 0803 WRC (W/m^2)	PMO8 F201-007A WRC (W/m^2)	AHF 32445 WRC (W/m^2)	PMO6 1603 JMA (W/m^2)	reference irradiance (W/m^2)
yyyy/mm/dd	hh:mm:ss						
2023/1/19	13:31:30						
2023/1/19	13:34:30						
2023/1/19	13:37:30						
2023/1/19	13:40:30	830.283	829.388		829.625	829.976	829.818
2023/1/19	13:43:30	828.003	827.808	828.015	827.992	828.646	828.093
2023/1/19	13:46:30	832.039	831.238	831.653	831.057	830.865	831.371
2023/1/20	9:31:30						
2023/1/20	9:34:30	828.674	830.128		830.463	829.606	829.718
2023/1/20	9:37:30						
2023/1/20	9:40:30		835.180		835.208	836.664	835.684
2023/1/20	9:43:30	851.832	850.114	851.369	850.652	851.071	851.008
2023/1/20	9:46:30						
2023/1/20	10:01:30	845.332	845.002		845.123	844.413	844.968
2023/1/20	10:04:30						
2023/1/20	10:07:30						
2023/1/20	10:10:30		857.026		857.964	857.800	857.597
2023/1/20	10:13:30	866.928	868.349	867.078	868.080	867.978	867.683
2023/1/20	10:16:30	883.975	883.914	884.075	884.316	885.015	884.259
2023/1/20	11:01:30						
2023/1/20	11:04:30						
2023/1/20	11:07:30	906.595	906.330		906.286	905.491	906.175
2023/1/20	11:10:30	896.035	895.437		895.891	896.802	896.041
2023/1/20	11:13:30						
2023/1/20	11:16:30	884.339	884.454	883.990	884.676	883.255	884.143
2023/1/20	11:31:30	899.638	899.098	899.843	898.645	899.512	899.347
2023/1/20	11:34:30	910.541	910.511	910.648	910.125	910.720	910.509
2023/1/20	11:37:30	908.737	908.411	908.445	908.668	908.960	908.644
2023/1/20	11:40:30	907.818	907.850	907.458	907.687	908.160	907.795
2023/1/20	11:43:30	910.074	912.082	909.999	911.514	911.300	910.994
2023/1/20	11:46:30	911.316	911.251	910.452	910.437	911.030	910.897
2023/1/20	12:01:30						
2023/1/20	12:04:30	910.574		910.441		910.230	910.415
2023/1/20	12:07:30	915.152		914.485		914.449	914.695
2023/1/20	12:10:30	910.824		910.906		911.270	911.000
2023/1/20	12:13:30	906.187		905.880		906.341	906.136
2023/1/20	12:16:30	908.712		908.629		908.630	908.657
2023/1/20	12:31:30	926.490		925.960		926.367	926.272
2023/1/20	12:34:30	926.399		926.115		926.037	926.184
2023/1/20	12:37:30	939.717		939.807		939.914	939.813
2023/1/20	12:40:30	930.105		929.796		930.266	930.055
2023/1/20	12:43:30						
2023/1/20	12:46:30	928.930		928.659		928.926	928.839
2023/1/20	13:01:30	920.067	920.064	920.552	919.647	920.588	920.184
2023/1/20	13:04:30	920.906	920.644	921.611	920.875	921.458	921.099
2023/1/20	13:07:30	928.058	928.416	928.323	928.173	928.456	928.285
2023/1/20	13:10:30	927.796	928.076	927.212	927.727	927.656	927.694
2023/1/20	13:13:30	930.264	929.747		929.657	930.686	930.088
2023/1/20	13:16:30	935.172	935.879	935.854	935.308	936.045	935.651
2023/1/20	13:31:30	949.981	950.283	949.043	949.421	950.542	949.854
2023/1/20	13:34:30	945.821	946.722	946.715	946.251	946.513	946.404
2023/1/20	13:37:30	951.375	951.213	951.287	950.705	950.942	951.104
2023/1/20	13:40:30	949.792	950.233	949.261	949.294	948.902	949.496
2023/1/20	13:43:30	946.618	946.051	946.646	945.474	946.413	946.240
2023/1/20	13:46:30	948.824	949.452		949.181	948.482	948.985
2023/1/20	14:01:30	924.827	924.745	925.283	924.025	925.597	924.895
2023/1/20	14:04:30	928.101	928.286		928.756	929.416	928.640
2023/1/20	14:07:30						
2023/1/20	14:10:30						
2023/1/20	14:13:30						
2023/1/20	14:16:30						

Date	Time	PMO6 0401 WRC (W/m^2)	PMO6 0803 WRC (W/m^2)	PMO8 F201-007A WRC (W/m^2)	AHF 32445 WRC (W/m^2)	PMO6 1603 JMA (W/m^2)	reference irradiance (W/m^2)
yyyy/mm/dd	hh:mm:ss						
2023/1/21	9:31:30						
2023/1/21	9:34:30	943.388	942.570	943.008	942.188	943.183	942.867
2023/1/21	9:37:30	945.392	945.951	945.367	945.468	946.093	945.654
2023/1/21	9:40:30	948.524	947.852	949.041	947.016	947.912	948.069
2023/1/21	9:43:30	949.253	950.213	949.138	948.784	950.002	949.478
2023/1/21	9:46:30	950.828	950.603	951.168	949.742	950.742	950.617
2023/1/21	10:01:30	960.257	959.935	960.387	959.273	961.190	960.208
2023/1/21	10:04:30	961.746	961.876	962.388	961.293	961.790	961.818
2023/1/21	10:07:30	959.497	960.626	959.850	960.360	960.050	960.076
2023/1/21	10:10:30	964.434	963.186	964.071	963.410	963.599	963.740
2023/1/21	10:13:30	964.740	963.476	964.906	963.702	963.949	964.155
2023/1/21	10:16:30		957.005		956.238	956.041	956.428
2023/1/21	10:31:30						
2023/1/21	10:34:30	972.251	972.619	972.759	972.285	971.738	972.330
2023/1/21	10:37:30						
2023/1/21	10:40:30	977.341	974.950		974.920	974.407	975.404
2023/1/21	10:43:30						
2023/1/21	10:46:30	971.464	971.509	971.599	971.942	971.058	971.514
2023/1/21	11:01:30	982.960	983.192	983.667	981.966	983.545	983.066
2023/1/21	11:04:30		982.312		982.613	982.145	982.357
2023/1/21	11:07:30	988.393	989.554	988.662	987.444	990.474	988.905
2023/1/21	11:10:30						
2023/1/21	11:13:30						
2023/1/21	11:16:30						
2023/1/21	11:31:30						
2023/1/21	11:34:30	991.235	990.894		990.707	992.473	991.327
2023/1/21	11:37:30		966.497				
2023/1/21	11:40:30	996.272	996.436		995.554	996.953	996.304
2023/1/21	11:43:30	996.262	996.076	997.100	996.323	996.503	996.453
2023/1/21	11:46:30	996.800	997.596	996.939	997.195	997.322	997.171
2023/1/21	12:01:30	994.005	995.576	994.285	993.907	994.553	994.465
2023/1/21	12:04:30	995.513	994.765	995.355	994.547	994.953	995.027
2023/1/21	12:07:30	997.974	998.486	998.308	998.139	997.912	998.164
2023/1/21	12:10:30	998.309	998.436	998.787	998.185	998.132	998.370
2023/1/21	12:13:30	996.657	995.146		995.869	995.513	995.796
2023/1/21	12:16:30		979.601		978.489		
2023/1/21	12:31:30	991.601	991.384	992.218	992.046	992.263	991.903
2023/1/21	12:34:30	990.277	990.504	990.214	990.084	989.754	990.167
2023/1/21	12:37:30	987.568	987.723	987.593	987.866	987.434	987.637
2023/1/21	12:40:30	982.843	984.272		983.850	983.725	983.673
2023/1/21	12:43:30	980.711	979.721		980.864	979.956	980.313
2023/1/21	12:46:30	977.266	976.130	977.383	976.485	977.116	976.876
2023/1/21	13:01:30	973.527	974.690	974.038	973.864	973.247	973.873
2023/1/21	13:04:30	972.121	969.948		970.380	970.818	970.817
2023/1/21	13:07:30		965.267		963.361	962.549	963.726
2023/1/21	13:10:30		957.515		957.751		
2023/1/21	13:13:30		946.151		946.326	946.932	946.470
2023/1/21	13:16:30	970.864	970.578	970.939	970.652	971.178	970.842
2023/1/21	13:31:30	962.458	961.506		961.888	962.269	962.030
2023/1/21	13:34:30	961.054	961.296	961.412	961.755	961.949	961.493
2023/1/21	13:37:30	955.621	956.064	956.912	955.180	955.411	955.838
2023/1/21	13:40:30	953.737	954.764	953.448	953.715	954.051	953.943
2023/1/21	13:43:30	955.529	955.934		955.799	955.271	955.633
2023/1/21	13:46:30	955.375	955.054	954.776	955.677		955.220
2023/1/21	14:01:30	938.179			937.151	938.484	937.938
2023/1/21	14:04:30	933.428				933.135	
2023/1/21	14:07:30		931.657		932.051	933.345	932.351
2023/1/21	14:10:30						
2023/1/21	14:13:30						
2023/1/21	14:16:30						

Date	Time	PMO6 0401 WRC (W/m^2)	PMO6 0803 WRC (W/m^2)	PMO8 F201-007A WRC (W/m^2)	AHF 32445 WRC (W/m^2)	PMO6 1603 JMA (W/m^2)	reference irradiance (W/m^2)
yyyy/mm/dd	hh:mm:ss						
2023/1/26	9:31:30						
2023/1/26	9:34:30	928.790	929.337	929.070	928.174		928.843
2023/1/26	9:37:30	926.401	926.666	926.782	926.014	926.257	926.424
2023/1/26	9:40:30	924.881	924.895	925.456	923.100	924.657	924.598
2023/1/26	9:43:30						
2023/1/26	9:46:30	922.717	922.935	922.974	922.001	922.937	922.713
2023/1/26	10:01:30	929.953	929.967	930.464	929.396	929.456	929.847
2023/1/26	10:04:30	926.881	926.356	927.246	926.086	926.696	926.653
2023/1/26	10:07:30						
2023/1/26	10:10:30	930.987	931.507	931.295	930.867	930.756	931.082
2023/1/26	10:13:30						
2023/1/26	10:16:30	939.819	939.360		938.845	939.624	939.412
2023/1/26	10:31:30						
2023/1/26	10:34:30	968.359	969.418	969.059	969.025	969.238	969.020
2023/1/26	10:37:30	967.679	968.838	967.995	967.825	968.538	968.175
2023/1/26	10:40:30						
2023/1/26	10:43:30						
2023/1/26	10:46:30	967.877	967.238	968.093	967.497	968.028	967.747
2023/1/26	11:01:30	974.992	975.530	975.691	975.637	974.757	975.322
2023/1/26	11:04:30	974.874	975.260	975.292	975.329	974.477	975.046
2023/1/26	11:07:30	973.695	974.930	974.289	975.498	974.457	974.574
2023/1/26	11:10:30	973.982	973.819	974.294	974.497	973.367	973.992
2023/1/26	11:13:30						
2023/1/26	11:16:30						
2023/1/26	11:31:30		(886.644)		(886.206)	(888.844)	(887.230)
2023/1/26	11:34:30						
2023/1/26	11:37:30						
2023/1/26	11:40:30	944.497	945.751		946.004	944.863	945.279
2023/1/26	11:43:30						
2023/1/26	11:46:30		933.408		932.821	932.475	932.901
2023/1/26	12:31:30						
2023/1/26	12:34:30						
2023/1/26	12:37:30						
2023/1/26	12:40:30						
2023/1/26	12:43:30						
2023/1/26	12:46:30		921.474		921.823	921.468	921.588
2023/1/26	13:01:30						
2023/1/26	13:04:30						
2023/1/26	13:07:30	912.646	912.692	913.334	913.190	912.809	912.934
2023/1/26	13:10:30						
2023/1/26	13:13:30						
2023/1/26	13:16:30	914.890	915.243		915.838	916.009	915.495
2023/1/26	13:31:30						
2023/1/26	13:34:30	890.368	890.696		890.377	891.653	890.774
2023/1/26	13:37:30						
2023/1/26	13:40:30		875.321		874.543	873.497	874.454
2023/1/26	13:43:30						
2023/1/26	13:46:30		881.483		882.061	882.425	881.990
2023/1/26	14:01:30						
2023/1/26	14:04:30						
2023/1/26	14:07:30		(787.626)		(788.683)	(789.944)	(788.750)
2023/1/26	14:10:30						
2023/1/26	14:13:30		805.411		806.541	807.710	806.554
2023/1/26	14:16:30						

		reference irradiance (W/m^2)	PMO6		PMO6		AHF	
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yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/18	10:31:30		(882.980)		(881.400)		(883.909)	
2023/1/18	10:34:30		(884.500)		(884.900)		(885.942)	
2023/1/18	10:37:30	886.039	885.470	0.999358	884.530	0.998297	886.661	1.000702
2023/1/18	10:40:30	891.675	891.100	0.999355	(893.050)		892.476	1.000899
2023/1/18	10:43:30	889.560	889.030	0.999404	890.630	1.001203	890.519	1.001078
2023/1/18	10:46:30	891.087	891.310	1.000250	890.220	0.999027	892.585	1.001681
2023/1/18	11:01:30	894.792	894.700	0.999897	894.480	0.999651	895.666	1.000977
2023/1/18	11:04:30	896.516	896.070	0.999503	896.040	0.999469	896.905	1.000434
2023/1/18	11:07:30	898.419	899.380	1.001069	(901.510)		898.885	1.000518
2023/1/18	11:10:30	894.774	894.910	1.000152	894.020	0.999158	895.395	1.000694
2023/1/18	11:13:30	899.648	899.450	0.999780	898.680	0.998924	900.268	1.000689
2023/1/18	11:16:30	901.879	901.540	0.999624	900.720	0.998715	902.502	1.000691
2023/1/18	11:31:30	899.103	899.140	1.000042	898.870	0.999741	900.097	1.001106
2023/1/18	11:34:30	901.937	901.620	0.999649	902.830	1.000990	902.323	1.000428
2023/1/18	11:37:30	902.470	901.610	0.999047	902.610	1.000155	902.518	1.000053
2023/1/18	11:40:30	900.236	901.200	1.001071	901.160	1.001026	899.584	0.999275
2023/1/18	11:43:30	902.044	901.900	0.999840	901.690	0.999607	(900.936)	
2023/1/18	11:46:30	897.162	896.740	0.999530	896.610	0.999385	897.703	1.000604
2023/1/18	12:01:30	878.967	878.640	0.999628	878.870	0.999890	880.007	1.001183
2023/1/18	12:04:30	889.719	889.970	1.000282	890.340	1.000698	890.626	1.001020
2023/1/18	12:07:30	887.668	887.650	0.999979	887.270	0.999551	888.442	1.000871
2023/1/18	12:10:30	894.963	894.650	0.999650	893.940	0.998857	895.178	1.000240
2023/1/18	12:13:30	893.129	893.060	0.999923	891.870	0.998590	893.259	1.000146
2023/1/18	12:16:30	895.054	894.310	0.999168	(892.460)		895.300	1.000274
2023/1/18	12:31:30	890.032	889.600	0.999514	889.370	0.999256	890.419	1.000435
2023/1/18	12:34:30	876.723	877.030	1.000350	877.150	1.000487	878.520	1.002050
2023/1/18	12:37:30	874.361	873.920	0.999496	872.570	0.997952	875.873	1.001730
2023/1/18	12:40:30	874.656	874.260	0.999548	(871.590)		875.953	1.001483
2023/1/18	12:43:30	862.524	862.970	1.000518	863.390	1.001005	863.857	1.001546
2023/1/18	12:46:30		(840.100)		(840.580)		(841.449)	
2023/1/19	10:01:30	871.597	871.800	1.000233	870.670	0.998936	872.415	1.000938
2023/1/19	10:04:30	883.593	883.400	0.999782	(880.320)		884.464	1.000986
2023/1/19	10:07:30	880.171	880.080	0.999897	(881.370)		880.787	1.000700
2023/1/19	10:10:30	865.325	864.470	0.999011	(862.400)		866.570	1.001438
2023/1/19	10:13:30	858.563	858.320	0.999717	858.690	1.000147	859.522	1.001117
2023/1/19	10:16:30	860.890	860.660	0.999733	(856.970)		861.839	1.001102
2023/1/19	12:01:30						(851.720)	
2023/1/19	12:04:30						(851.024)	
2023/1/19	12:07:30		(853.190)		(850.140)		(854.319)	
2023/1/19	12:10:30		(862.500)		(861.470)		(863.478)	
2023/1/19	12:13:30	866.850	866.570	0.999677	(867.650)		867.184	1.000385
2023/1/19	12:16:30	865.146	864.140	0.998837	(862.290)		865.620	1.000548
2023/1/19	12:31:30	873.799	874.360	1.000642	874.110	1.000355	874.277	1.000547
2023/1/19	12:34:30	872.586	872.630	1.000051	872.850	1.000303	872.920	1.000383
2023/1/19	12:37:30	870.609	871.140	1.000610	(872.970)		871.141	1.000611
2023/1/19	12:40:30	870.363	870.080	0.999675	869.900	0.999468	870.783	1.000483
2023/1/19	12:43:30	871.514	870.980	0.999387	871.570	1.000064	871.377	0.999842
2023/1/19	12:46:30	866.629	866.710	1.000094	(868.020)		867.341	1.000822
2023/1/19	13:01:30	859.202	859.100	0.999882	858.770	0.999498	859.537	1.000390
2023/1/19	13:04:30	866.395	866.290	0.999879	866.950	1.000641	867.036	1.000740
2023/1/19	13:07:30	869.349	869.270	0.999909	868.740	0.999299	869.818	1.000539
2023/1/19	13:10:30		(150.680)		(154.430)		(188.603)	
2023/1/19	13:13:30		(865.190)		(864.900)		(865.644)	
2023/1/19	13:16:30		(861.830)		(860.710)		(857.392)	
2023/1/19	13:31:30		(29.310)		(41.460)		(52.930)	
2023/1/19	13:34:30		(866.910)		(832.050)		(831.154)	
2023/1/19	13:37:30		(670.600)		(650.800)		(669.726)	
2023/1/19	13:40:30	829.818	829.730	0.999894	830.270	1.000545	830.721	1.001088
2023/1/19	13:43:30	828.093	828.360	1.000323	827.930	0.999804	829.267	1.001418
2023/1/19	13:46:30	831.371	831.450	1.000095	(833.700)		832.223	1.001025

		reference irradiance (W/m^2)	PMO6		PMO6		AHF	
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yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/20	9:31:30		(847.790)		(847.800)		(848.491)	
2023/1/20	9:34:30	829.718	829.480	0.999713	830.390	1.000810	830.489	1.000930
2023/1/20	9:37:30		(709.320)		(693.120)		(716.915)	
2023/1/20	9:40:30	835.684	835.470	0.999744	(832.390)		836.683	1.001196
2023/1/20	9:43:30	851.008	850.540	0.999451	850.450	0.999345	851.917	1.001069
2023/1/20	9:46:30		(814.710)		(790.110)		(790.165)	
2023/1/20	10:01:30	844.968	844.590	0.999553	843.910	0.998748	845.243	1.000326
2023/1/20	10:04:30		(832.540)		(830.540)		(833.915)	
2023/1/20	10:07:30		(796.660)		(797.910)		(793.218)	
2023/1/20	10:10:30	857.597	857.450	0.999829	857.850	1.000295	858.106	1.000594
2023/1/20	10:13:30	867.683	868.630	1.001092	(870.190)		869.086	1.001617
2023/1/20	10:16:30	884.259	884.900	1.000725	885.230	1.001098	885.412	1.001304
2023/1/20	11:01:30		(895.940)		(894.980)		(896.128)	
2023/1/20	11:04:30		(885.590)		(888.300)		(887.740)	
2023/1/20	11:07:30	906.175	906.000	0.999806	905.940	0.999740	907.117	1.001039
2023/1/20	11:10:30	896.041	896.260	1.000244	896.810	1.000858	897.537	1.001669
2023/1/20	11:13:30		(882.320)		(882.390)		(883.293)	
2023/1/20	11:16:30	884.143	883.350	0.999103	884.990	1.000958	884.711	1.000642
2023/1/20	11:31:30	899.347	899.390	1.000048	898.460	0.999014	900.277	1.001034
2023/1/20	11:34:30	910.509	910.630	1.000133	910.210	0.999672	911.134	1.000687
2023/1/20	11:37:30	908.644	908.390	0.999720	907.730	0.998994	909.437	1.000872
2023/1/20	11:40:30	907.795	907.590	0.999775	907.710	0.999907	908.304	1.000561
2023/1/20	11:43:30	910.994	911.220	1.000248	909.440	0.998295	911.788	1.000872
2023/1/20	11:46:30	910.897	910.920	1.000025	909.990	0.999004	911.715	1.000898
2023/1/20	12:01:30		(917.050)		(917.440)		(918.000)	
2023/1/20	12:04:30	910.415	909.890	0.999423	910.250	0.999819	911.026	1.000671
2023/1/20	12:07:30	914.695	914.490	0.999775	915.210	1.000563	915.490	1.000869
2023/1/20	12:10:30	911.000	910.700	0.999671	909.210	0.998036	911.635	1.000697
2023/1/20	12:13:30	906.136	906.340	1.000225	906.720	1.000645	907.402	1.001397
2023/1/20	12:16:30	908.657	908.470	0.999794	907.640	0.998881	909.059	1.000442
2023/1/20	12:31:30	926.272	925.130	0.998767	925.310	0.998961	927.114	1.000909
2023/1/20	12:34:30	926.184	926.000	0.999802	925.940	0.999737	927.030	1.000914
2023/1/20	12:37:30	939.813	939.780	0.999965	939.700	0.999880	940.573	1.000809
2023/1/20	12:40:30	930.055	929.800	0.999725	(931.830)		930.649	1.000638
2023/1/20	12:43:30		(916.700)		(915.530)		(917.449)	
2023/1/20	12:46:30	928.839	929.330	1.000529	929.460	1.000669	930.055	1.001310
2023/1/20	13:01:30	920.184	920.350	1.000181	918.980	0.998692	920.973	1.000858
2023/1/20	13:04:30	921.099	920.740	0.999611	(909.900)		921.716	1.000670
2023/1/20	13:07:30	928.285	927.730	0.999402	926.210	0.997764	928.900	1.000662
2023/1/20	13:10:30	927.694	927.340	0.999619	927.600	0.999899	928.115	1.000454
2023/1/20	13:13:30	930.088	930.180	1.000099	929.060	0.998895	930.793	1.000758
2023/1/20	13:16:30	935.651	935.040	0.999347	934.750	0.999037	936.716	1.001138
2023/1/20	13:31:30	949.854	949.390	0.999512	(940.990)		950.234	1.000400
2023/1/20	13:34:30	946.404	945.670	0.999224	944.920	0.998432	947.732	1.001403
2023/1/20	13:37:30	951.104	950.920	0.999806	950.250	0.999102	951.589	1.000510
2023/1/20	13:40:30	949.496	949.150	0.999635	949.420	0.999920	949.981	1.000510
2023/1/20	13:43:30	946.240	946.330	1.000095	947.460	1.001289	947.420	1.001247
2023/1/20	13:46:30	948.985	948.860	0.999868	(953.230)		949.547	1.000592
2023/1/20	14:01:30	924.895	925.320	1.000459	(920.030)		925.939	1.001128
2023/1/20	14:04:30	928.640	929.070	1.000463	(929.110)		929.110	1.000506
2023/1/20	14:07:30		(931.750)		(931.810)		(932.678)	
2023/1/20	14:10:30		(930.360)		(928.110)		(931.266)	
2023/1/20	14:13:30		(933.190)		(929.890)		(934.975)	
2023/1/20	14:16:30		(930.510)		(931.240)		(931.375)	

		reference irradiance (W/m^2)	PMO6		PMO6		AHF	
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yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/21	9:31:30		(132.930)		(939.230)		(939.991)	
2023/1/21	9:34:30	942.867	943.240	1.000395	942.340	0.999441	943.003	1.000144
2023/1/21	9:37:30	945.654	946.280	1.000662	946.660	1.001063	945.862	1.000220
2023/1/21	9:40:30	948.069	947.700	0.999611	948.240	1.000180	948.127	1.000061
2023/1/21	9:43:30	949.478	950.550	1.001129	(950.770)		949.531	1.000056
2023/1/21	9:46:30	950.617	950.270	0.999635	950.490	0.999867	950.687	1.000074
2023/1/21	10:01:30	960.208	960.470	1.000272	960.550	1.000356		
2023/1/21	10:04:30	961.818	961.750	0.999929	961.590	0.999763		
2023/1/21	10:07:30	960.076	960.550	1.000493	(961.960)			
2023/1/21	10:10:30	963.740	963.940	1.000207	962.900	0.999128		
2023/1/21	10:13:30	964.155	964.210	1.000057	961.890	0.997651		
2023/1/21	10:16:30	956.428	955.320	0.998842	955.880	0.999427		
2023/1/21	10:31:30		(699.950)		(636.540)			
2023/1/21	10:34:30	972.330	972.390	1.000061	972.520	1.000195		
2023/1/21	10:37:30		(457.590)		(451.250)			
2023/1/21	10:40:30	975.404	974.000	0.998560	974.510	0.999083	976.218	1.000834
2023/1/21	10:43:30		(878.470)		(861.850)		(879.370)	
2023/1/21	10:46:30	971.514	971.270	0.999749	971.650	1.000140	972.934	1.001461
2023/1/21	11:01:30	983.066	982.990	0.999922	981.990	0.998905		
2023/1/21	11:04:30	982.357	982.110	0.999749	(984.520)		982.650	1.000299
2023/1/21	11:07:30	988.905	(991.470)		989.540	1.000642	989.140	1.000237
2023/1/21	11:10:30		(915.520)		(887.530)		(922.261)	
2023/1/21	11:13:30		(817.140)		(827.810)		(829.224)	
2023/1/21	11:16:30		(899.440)		(915.250)		(875.117)	
2023/1/21	11:31:30		(763.780)		(834.590)		(918.371)	
2023/1/21	11:34:30	991.327	990.690	0.999357	(993.440)		992.261	1.000942
2023/1/21	11:37:30		(971.300)		(960.460)		(971.069)	
2023/1/21	11:40:30	996.304	995.960	0.999655	996.090	0.999785	997.562	1.001263
2023/1/21	11:43:30	996.453	995.460	0.999004	(989.530)		997.816	1.001368
2023/1/21	11:46:30	997.171	996.950	0.999779	995.200	0.998024	997.965	1.000797
2023/1/21	12:01:30	994.465	995.570	1.001111	995.800	1.001342	995.609	1.001150
2023/1/21	12:04:30	995.027	995.180	1.000154	996.230	1.001209	995.864	1.000842
2023/1/21	12:07:30	998.164	997.910	0.999746	998.370	1.000207	999.234	1.001072
2023/1/21	12:10:30	998.370	998.580	1.000210	999.200	1.000831	999.386	1.001018
2023/1/21	12:13:30	995.796	995.340	0.999542	993.880	0.998076	996.992	1.001201
2023/1/21	12:16:30		(976.920)		(978.420)		(974.596)	
2023/1/21	12:31:30	991.903	991.660	0.999755	991.740	0.999836	993.212	1.001320
2023/1/21	12:34:30	990.167	989.550	0.999377	989.820	0.999650	991.241	1.001085
2023/1/21	12:37:30	987.637	987.600	0.999963	(983.010)		988.146	1.000515
2023/1/21	12:40:30	983.673	983.490	0.999814	983.710	1.000038	984.716	1.001061
2023/1/21	12:43:30	980.313	979.920	0.999599	979.200	0.998865	981.377	1.001086
2023/1/21	12:46:30	976.876	976.980	1.000107	975.770	0.998868	977.958	1.001108
2023/1/21	13:01:30	973.873	974.210	1.000346	(973.730)		974.310	1.000448
2023/1/21	13:04:30	970.817	970.130	0.999292	(966.560)		972.119	1.001341
2023/1/21	13:07:30	963.726	962.090	0.998303	(967.850)		963.346	0.999606
2023/1/21	13:10:30		(958.740)		(956.030)		(961.570)	
2023/1/21	13:13:30	946.470	(943.430)		(948.030)		(951.408)	
2023/1/21	13:16:30	970.842	970.540	0.999689	(972.890)		971.992	1.001184
2023/1/21	13:31:30	962.030	961.680	0.999636	959.940	0.997827	962.998	1.001006
2023/1/21	13:34:30	961.493	960.940	0.999425	961.850	1.000371	961.149	0.999642
2023/1/21	13:37:30	955.838	955.380	0.999521	(952.400)		957.020	1.001237
2023/1/21	13:40:30	953.943	954.180	1.000248	953.370	0.999399	955.850	1.001999
2023/1/21	13:43:30	955.633	955.700	1.000070	956.300	1.000698	955.694	1.000064
2023/1/21	13:46:30	955.220	(952.320)		953.630	0.998335	954.976	0.999744
2023/1/21	14:01:30	937.938	936.700	0.998680	938.070	1.000141	939.140	1.001281
2023/1/21	14:04:30		(934.350)		(932.580)		(934.809)	
2023/1/21	14:07:30	932.351	931.870	0.999484	932.300	0.999945	933.646	1.001389
2023/1/21	14:10:30		(930.850)		(930.220)		(930.531)	
2023/1/21	14:13:30		(923.670)		(925.140)		(924.573)	
2023/1/21	14:16:30		(918.980)		(919.020)		(920.370)	

		reference irradiance (W/m^2)	PMO6		PMO6		AHF	
			0403		1107		32446	
Date	Time		JAPAN		JAPAN		JAPAN	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/26	9:31:30		(931.600)		(929.430)		(933.008)	
2023/1/26	9:34:30	928.843	928.920	1.000083	(921.760)		928.751	0.999901
2023/1/26	9:37:30	926.424	926.240	0.999802	(925.720)		927.795	1.001480
2023/1/26	9:40:30	924.598	924.380	0.999764	(919.410)		924.172	0.999539
2023/1/26	9:43:30		(923.390)		(920.690)		(924.705)	
2023/1/26	9:46:30	922.713	922.400	0.999661	(919.440)		923.852	1.001235
2023/1/26	10:01:30	929.847	929.830	0.999982	927.790	0.997788	931.167	1.001420
2023/1/26	10:04:30	926.653	926.650	0.999997	(917.930)		927.649	1.001075
2023/1/26	10:07:30		(930.070)		(926.950)		(930.523)	
2023/1/26	10:10:30	931.082	931.010	0.999922	930.490	0.999364	932.450	1.001469
2023/1/26	10:13:30		(939.060)		(931.440)		(939.104)	
2023/1/26	10:16:30	939.412	938.830	0.999381	(941.690)		940.740	1.001414
2023/1/26	10:31:30		(966.570)		(963.750)		(967.895)	
2023/1/26	10:34:30	969.020	968.730	0.999701	969.580	1.000578	970.159	1.001176
2023/1/26	10:37:30	968.175	967.710	0.999520	(972.290)		970.050	1.001937
2023/1/26	10:40:30		(966.570)		(964.150)		(968.724)	
2023/1/26	10:43:30		(965.920)		(959.370)		(967.747)	
2023/1/26	10:46:30	967.747	967.040	0.999270	968.090	1.000355	969.727	1.002046
2023/1/26	11:01:30	975.322	974.920	0.999588	973.050	0.997671	976.500	1.001208
2023/1/26	11:04:30	975.046	974.770	0.999717	973.020	0.997922	976.155	1.001137
2023/1/26	11:07:30	974.574	974.000	0.999411	(971.150)		975.985	1.001448
2023/1/26	11:10:30	973.992	973.590	0.999587	(976.590)		975.382	1.001427
2023/1/26	11:13:30		(968.540)		(966.320)		(970.416)	
2023/1/26	11:16:30		(967.550)		(963.730)		(969.206)	
2023/1/26	11:31:30		(887.930)		(879.180)		(885.751)	
2023/1/26	11:34:30		(912.200)		(900.370)		(914.099)	
2023/1/26	11:37:30		(955.470)		(957.960)		(956.311)	
2023/1/26	11:40:30	945.279	945.460	1.000192	945.230	0.999948	946.592	1.001389
2023/1/26	11:43:30		(899.120)		(894.220)		(904.176)	
2023/1/26	11:46:30	932.901	931.870	0.998894	932.260	0.999313	932.932	1.000033
2023/1/26	12:31:30		(871.450)		(873.150)		(871.951)	
2023/1/26	12:34:30		(930.320)		(903.930)		(931.691)	
2023/1/26	12:37:30		(730.680)		(747.480)		(776.402)	
2023/1/26	12:40:30		(767.200)		(745.450)		(795.598)	
2023/1/26	12:43:30		(783.040)		(792.120)		(769.728)	
2023/1/26	12:46:30	921.588	(922.210)		(922.570)		(922.909)	
2023/1/26	13:01:30		(863.150)		(843.420)		(876.809)	
2023/1/26	13:04:30		(873.310)		(878.200)		(875.786)	
2023/1/26	13:07:30	912.934	912.560	0.999590	(912.820)		914.447	1.001657
2023/1/26	13:10:30		(860.770)		(839.600)		(870.319)	
2023/1/26	13:13:30		(902.420)		(888.140)		(901.955)	
2023/1/26	13:16:30	915.495	915.330	0.999820	(913.020)		916.829	1.001457
2023/1/26	13:31:30		(906.090)		(906.690)		(906.154)	
2023/1/26	13:34:30	890.774	890.590	0.999794	(896.380)		891.999	1.001376
2023/1/26	13:37:30		(895.590)		(893.850)		(896.749)	
2023/1/26	13:40:30	874.454	873.770	0.999218	(871.530)		874.204	0.999714
2023/1/26	13:43:30		(870.900)		(872.630)		(871.221)	
2023/1/26	13:46:30	881.990	882.870	1.000998	(879.420)		883.310	1.001497
2023/1/26	14:01:30		(761.980)		(756.660)		(762.799)	
2023/1/26	14:04:30		(801.270)		(804.690)		(802.868)	
2023/1/26	14:07:30		(787.770)		(790.780)		(790.688)	
2023/1/26	14:10:30		(785.980)		(800.680)		(786.947)	
2023/1/26	14:13:30	806.554	(807.490)		(800.360)		(808.954)	
2023/1/26	14:16:30		(788.500)		(789.390)		(788.564)	

		reference irradiance (W/m^2)	AHF		HF		TMI	
			37815		27160		69137	
Date	Time		JAPAN		AUSTRALIA		AUSTRALIA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/18	10:31:30		(883.386)		(885.127)		(880.381)	
2023/1/18	10:34:30		(885.183)		(886.734)		(882.392)	
2023/1/18	10:37:30	886.039	886.268	1.000258	887.593	1.001754	883.308	0.996918
2023/1/18	10:40:30	891.675	891.493	0.999796	893.319	1.001844	888.387	0.996313
2023/1/18	10:43:30	889.560	890.239	1.000764	891.138	1.001774	887.617	0.997816
2023/1/18	10:46:30	891.087	891.609	1.000585	893.761	1.003000	889.030	0.997691
2023/1/18	11:01:30	894.792	895.613	1.000918	896.235	1.001613	891.264	0.996057
2023/1/18	11:04:30	896.516	896.833	1.000354	898.091	1.001757	894.156	0.997368
2023/1/18	11:07:30	898.419	899.099	1.000757	900.402	1.002207	896.624	0.998002
2023/1/18	11:10:30	894.774	894.844	1.000079	897.356	1.002886	892.978	0.997993
2023/1/18	11:13:30	899.648	899.851	1.000226	902.299	1.002947	897.658	0.997788
2023/1/18	11:16:30	901.879	902.305	1.000472	903.278	1.001551	898.782	0.996566
2023/1/18	11:31:30	899.103	900.986	1.002095	902.321	1.003580	896.828	0.997470
2023/1/18	11:34:30	901.937	902.214	1.000307	903.043	1.001226	899.019	0.996765
2023/1/18	11:37:30	902.470	903.124	1.000725	904.418	1.002159	900.259	0.997550
2023/1/18	11:40:30	900.236	901.202	1.001073	(904.681)		898.758	0.998358
2023/1/18	11:43:30	902.044	901.991	0.999941	903.756	1.001898	899.337	0.996999
2023/1/18	11:46:30	897.162	897.543	1.000425	899.684	1.002812	895.116	0.997720
2023/1/18	12:01:30	878.967	879.932	1.001098	881.220	1.002563	875.431	0.995977
2023/1/18	12:04:30	889.719	890.314	1.000669	891.682	1.002206	888.356	0.998468
2023/1/18	12:07:30	887.668	888.696	1.001158	890.411	1.003090	885.800	0.997895
2023/1/18	12:10:30	894.963	895.603	1.000715	896.323	1.001520	892.002	0.996692
2023/1/18	12:13:30	893.129	893.695	1.000634	895.126	1.002236	890.445	0.996995
2023/1/18	12:16:30	895.054	896.058	1.001121	897.272	1.002478	892.429	0.997067
2023/1/18	12:31:30	890.032	890.857	1.000927	891.745	1.001924	887.664	0.997339
2023/1/18	12:34:30	876.723	877.868	1.001306	878.619	1.002163	874.711	0.997705
2023/1/18	12:37:30	874.361	874.883	1.000597	875.975	1.001846	871.988	0.997286
2023/1/18	12:40:30	874.656	875.583	1.001060	876.649	1.002279	872.606	0.997657
2023/1/18	12:43:30	862.524	863.145	1.000720	864.993	1.002863	861.471	0.998780
2023/1/18	12:46:30		(841.127)		(842.665)		(839.936)	
2023/1/19	10:01:30	871.597	872.462	1.000992	873.845	1.002579	869.364	0.997438
2023/1/19	10:04:30	883.593	883.895	1.000342	884.857	1.001431	(879.371)	
2023/1/19	10:07:30	880.171	880.163	0.999991	880.977	1.000916	(871.475)	
2023/1/19	10:10:30	865.325	865.804	1.000553	866.928	1.001852	863.814	0.998253
2023/1/19	10:13:30	858.563	859.082	1.000604	860.318	1.002044	855.102	0.995968
2023/1/19	10:16:30	860.890	861.333	1.000514	862.594	1.001979	(856.548)	
2023/1/19	12:01:30		(851.703)		(853.129)		(848.470)	
2023/1/19	12:04:30		(850.252)		(851.788)		(847.681)	
2023/1/19	12:07:30		(853.984)		(855.328)		(851.043)	
2023/1/19	12:10:30		(862.847)		(865.035)		(860.930)	
2023/1/19	12:13:30	866.850	867.768	1.001059	870.180	1.003841	866.363	0.999438
2023/1/19	12:16:30	865.146	865.878	1.000846	867.583	1.002817	864.077	0.998765
2023/1/19	12:31:30	873.799	875.098	1.001486	876.465	1.003051	871.082	0.996890
2023/1/19	12:34:30	872.586	873.792	1.001382	874.804	1.002542	869.376	0.996322
2023/1/19	12:37:30	870.609	871.749	1.001309	873.788	1.003651	869.531	0.998762
2023/1/19	12:40:30	870.363	871.224	1.000990	872.179	1.002087	867.622	0.996851
2023/1/19	12:43:30	871.514	872.284	1.000883	873.530	1.002313	868.314	0.996328
2023/1/19	12:46:30	866.629	867.944	1.001518	869.121	1.002876	864.154	0.997145
2023/1/19	13:01:30	859.202	859.825	1.000726	861.329	1.002476	857.372	0.997871
2023/1/19	13:04:30	866.395	867.023	1.000725	868.189	1.002071	864.359	0.997651
2023/1/19	13:07:30	869.349	869.787	1.000503	871.215	1.002146	868.076	0.998535
2023/1/19	13:10:30		(189.764)		(161.281)		(174.929)	
2023/1/19	13:13:30		(865.355)		(866.702)		(861.920)	
2023/1/19	13:16:30		(854.509)		(856.867)		(782.506)	
2023/1/19	13:31:30		(58.530)		(59.721)		(246.471)	
2023/1/19	13:34:30		(821.831)		(815.737)		(681.504)	
2023/1/19	13:37:30		(660.111)		(635.924)		(464.662)	
2023/1/19	13:40:30	829.818	830.644	1.000996	832.010	1.002642	828.025	0.997840
2023/1/19	13:43:30	828.093	828.865	1.000933	829.807	1.002070	826.113	0.997609
2023/1/19	13:46:30	831.371	831.561	1.000229	833.039	1.002007	(827.121)	

		reference irradiance (W/m^2)	AHF		HF		TMI	
			37815		27160		69137	
Date	Time		JAPAN		AUSTRALIA		AUSTRALIA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/20	9:31:30		(847.819)		(850.050)		(844.283)	
2023/1/20	9:34:30	829.718	829.865	1.000177	(833.490)		(831.124)	
2023/1/20	9:37:30		(713.474)		(754.052)		(704.766)	
2023/1/20	9:40:30	835.684	836.540	1.001025	839.200	1.004208	(827.626)	
2023/1/20	9:43:30	851.008	850.836	0.999798	851.830	1.000966	(848.776)	
2023/1/20	9:46:30		(789.840)		(736.967)		(665.367)	
2023/1/20	10:01:30	844.968	844.819	0.999824	847.909	1.003481	(845.046)	
2023/1/20	10:04:30		(832.351)		(835.374)		(827.866)	
2023/1/20	10:07:30		(792.526)		(786.031)		(793.101)	
2023/1/20	10:10:30	857.597	856.690	0.998943	858.952	1.001580	856.558	0.998789
2023/1/20	10:13:30	867.683	868.055	1.000429	868.160	1.000550	867.154	0.999391
2023/1/20	10:16:30	884.259	884.449	1.000215	886.791	1.002864	882.672	0.998206
2023/1/20	11:01:30		(896.789)		(897.957)		(890.138)	
2023/1/20	11:04:30		(888.190)		(893.149)		(891.628)	
2023/1/20	11:07:30	906.175	907.151	1.001077	909.145	1.003277	903.292	0.996818
2023/1/20	11:10:30	896.041	898.128	1.002329	897.725	1.001879	894.263	0.998015
2023/1/20	11:13:30		(883.615)		(882.904)		(875.415)	
2023/1/20	11:16:30	884.143	884.621	1.000541	887.738	1.004066	882.429	0.998061
2023/1/20	11:31:30	899.347	900.301	1.001061	901.555	1.002455	896.554	0.996894
2023/1/20	11:34:30	910.509	911.632	1.001234	912.881	1.002605	907.228	0.996397
2023/1/20	11:37:30	908.644	909.325	1.000749	910.495	1.002037	905.715	0.996776
2023/1/20	11:40:30	907.795	908.561	1.000844	910.781	1.003290	905.637	0.997623
2023/1/20	11:43:30	910.994	911.940	1.001039	914.141	1.003455	908.442	0.997199
2023/1/20	11:46:30	910.897	911.937	1.001142	913.078	1.002394	(906.581)	
2023/1/20	12:01:30		(918.483)		(919.332)		(913.656)	
2023/1/20	12:04:30	910.415	911.018	1.000662	912.978	1.002815	908.779	0.998203
2023/1/20	12:07:30	914.695	914.816	1.000132	917.301	1.002849	912.513	0.997614
2023/1/20	12:10:30	911.000	911.401	1.000441	913.703	1.002968	908.007	0.996715
2023/1/20	12:13:30	906.136	907.855	1.001897	909.239	1.003424	904.888	0.998623
2023/1/20	12:16:30	908.657	909.211	1.000610	910.835	1.002397	906.117	0.997205
2023/1/20	12:31:30	926.272	926.696	1.000458	928.317	1.002208	923.410	0.996910
2023/1/20	12:34:30	926.184	926.734	1.000594	928.934	1.002970	924.793	0.998499
2023/1/20	12:37:30	939.813	940.397	1.000622	942.194	1.002534	938.426	0.998524
2023/1/20	12:40:30	930.055	930.823	1.000825	932.227	1.002335	927.752	0.997523
2023/1/20	12:43:30		(917.213)		(917.642)		(912.522)	
2023/1/20	12:46:30	928.839	929.691	1.000918	931.625	1.003000	927.402	0.998453
2023/1/20	13:01:30	920.184	921.111	1.001008	921.785	1.001740	917.683	0.997282
2023/1/20	13:04:30	921.099	922.069	1.001053	923.180	1.002260	918.099	0.996743
2023/1/20	13:07:30	928.285	929.034	1.000806	931.394	1.003349	926.215	0.997770
2023/1/20	13:10:30	927.694	928.710	1.001096	930.594	1.003126	925.454	0.997586
2023/1/20	13:13:30	930.088	931.338	1.001344	932.914	1.003038	927.419	0.997130
2023/1/20	13:16:30	935.651	936.311	1.000705	938.180	1.002703	932.818	0.996972
2023/1/20	13:31:30	949.854	950.580	1.000764	952.169	1.002437	946.941	0.996933
2023/1/20	13:34:30	946.404	946.572	1.000177	949.309	1.003069	944.346	0.997825
2023/1/20	13:37:30	951.104	951.337	1.000245	953.272	1.002279	949.096	0.997889
2023/1/20	13:40:30	949.496	949.592	1.000101	951.597	1.002212	946.553	0.996900
2023/1/20	13:43:30	946.240	946.721	1.000508	948.981	1.002896	944.304	0.997954
2023/1/20	13:46:30	948.985	948.612	0.999607	951.634	1.002792	947.021	0.997931
2023/1/20	14:01:30	924.895	926.126	1.001330	927.692	1.003024	922.025	0.996896
2023/1/20	14:04:30	928.640	929.727	1.001171	931.199	1.002756	927.249	0.998502
2023/1/20	14:07:30		(932.767)		(933.813)		(929.302)	
2023/1/20	14:10:30		(931.757)		(932.262)		(927.676)	
2023/1/20	14:13:30		(934.421)		(935.771)		(931.338)	
2023/1/20	14:16:30		(931.166)		(934.157)		(929.017)	

		reference irradiance (W/m^2)	AHF		HF		TMI	
			37815		27160		69137	
Date	Time		JAPAN		AUSTRALIA		AUSTRALIA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/21	9:31:30				(941.939)		(937.325)	
2023/1/21	9:34:30	942.867			944.436	1.001664	939.860	0.996810
2023/1/21	9:37:30	945.654			947.534	1.001988	943.656	0.997887
2023/1/21	9:40:30	948.069			949.786	1.001811	945.936	0.997750
2023/1/21	9:43:30	949.478			950.969	1.001570	946.790	0.997169
2023/1/21	9:46:30	950.617			952.035	1.001492	947.772	0.997008
2023/1/21	10:01:30	960.208			962.064	1.001933	957.049	0.996710
2023/1/21	10:04:30	961.818			964.086	1.002358	959.924	0.998031
2023/1/21	10:07:30	960.076			962.342	1.002360	958.376	0.998229
2023/1/21	10:10:30	963.740			965.871	1.002211	961.258	0.997425
2023/1/21	10:13:30	964.155			965.830	1.001737	962.380	0.998159
2023/1/21	10:16:30	956.428			959.409	1.003117	(960.758)	
2023/1/21	10:31:30				(671.666)		(503.554)	
2023/1/21	10:34:30	972.330			974.257	1.001981	969.542	0.997132
2023/1/21	10:37:30				(473.591)		(511.145)	
2023/1/21	10:40:30	975.404	975.293	0.999886	977.408	1.002054	(967.180)	
2023/1/21	10:43:30		(875.794)		(869.829)		(843.833)	
2023/1/21	10:46:30	971.514	971.853	1.000349	973.869	1.002424	969.886	0.998324
2023/1/21	11:01:30	983.066			984.646	1.001607	(974.737)	
2023/1/21	11:04:30	982.357	982.701	1.000350	985.225	1.002920	(981.172)	
2023/1/21	11:07:30	988.905	988.760	0.999853	989.838	1.000943	(974.547)	
2023/1/21	11:10:30		(918.384)		(912.714)		(872.937)	
2023/1/21	11:13:30		(831.192)		(829.971)		(868.625)	
2023/1/21	11:16:30		(875.854)		(897.062)		(880.722)	
2023/1/21	11:31:30		(921.510)		(930.451)		(959.983)	
2023/1/21	11:34:30	991.327	992.140	1.000820	993.474	1.002166	989.635	0.998293
2023/1/21	11:37:30		(969.766)		(970.183)		(950.436)	
2023/1/21	11:40:30	996.304	997.307	1.001007	999.488	1.003196	994.852	0.998543
2023/1/21	11:43:30	996.453	997.779	1.001331	999.811	1.003370	994.301	0.997841
2023/1/21	11:46:30	997.171	998.164	1.000996	999.945	1.002782	993.604	0.996423
2023/1/21	12:01:30	994.465	996.384	1.001929	996.773	1.002321	991.880	0.997400
2023/1/21	12:04:30	995.027	995.665	1.000642	996.719	1.001701	992.624	0.997585
2023/1/21	12:07:30	998.164	998.667	1.000504	1000.292	1.002132	995.622	0.997453
2023/1/21	12:10:30	998.370	998.851	1.000482	1000.649	1.002283	996.275	0.997902
2023/1/21	12:13:30	995.796	996.493	1.000700	998.000	1.002213	993.044	0.997236
2023/1/21	12:16:30		(977.473)		(980.421)		(978.376)	
2023/1/21	12:31:30	991.903	993.109	1.001216	994.278	1.002395	989.462	0.997539
2023/1/21	12:34:30	990.167	990.790	1.000630	992.271	1.002125	988.045	0.997857
2023/1/21	12:37:30	987.637	988.467	1.000840	989.533	1.001920	984.848	0.997176
2023/1/21	12:40:30	983.673	984.156	1.000491	986.395	1.002768	981.946	0.998245
2023/1/21	12:43:30	980.313	980.782	1.000479	981.826	1.001544	977.582	0.997214
2023/1/21	12:46:30	976.876	977.502	1.000641	978.766	1.001935	973.840	0.996892
2023/1/21	13:01:30	973.873	974.840	1.000993	976.617	1.002817	970.748	0.996791
2023/1/21	13:04:30	970.817	972.036	1.001256	972.263	1.001490	967.040	0.996110
2023/1/21	13:07:30	963.726	964.431	1.000732	965.797	1.002149	(963.863)	
2023/1/21	13:10:30		(961.481)		(960.355)		(953.188)	
2023/1/21	13:13:30	946.470	(952.066)		948.231	1.001860	(951.654)	
2023/1/21	13:16:30	970.842	971.428	1.000603	973.060	1.002284	967.846	0.996914
2023/1/21	13:31:30	962.030	963.806	1.001846	964.300	1.002359	959.320	0.997183
2023/1/21	13:34:30	961.493	961.815	1.000335	963.422	1.002006	959.728	0.998164
2023/1/21	13:37:30	955.838	956.709	1.000912	957.608	1.001852	953.598	0.997657
2023/1/21	13:40:30	953.943	955.536	1.001670	956.311	1.002482	953.233	0.999256
2023/1/21	13:43:30	955.633	955.671	1.000040	958.111	1.002593	953.862	0.998147
2023/1/21	13:46:30	955.220	954.600	0.999351	957.152	1.002022	952.844	0.997512
2023/1/21	14:01:30	937.938	939.169	1.001312	940.789	1.003040	935.270	0.997155
2023/1/21	14:04:30		(935.504)		(934.783)		(931.197)	
2023/1/21	14:07:30	932.351	933.531	1.001265	935.282	1.003143	930.366	0.997871
2023/1/21	14:10:30		(930.457)		(933.291)		(928.491)	
2023/1/21	14:13:30		(925.030)		(927.188)		(922.158)	
2023/1/21	14:16:30		(921.456)		(922.127)		(917.263)	

		reference irradiance (W/m^2)	AHF		HF		TMI	
			37815		27160		69137	
Date	Time		JAPAN		AUSTRALIA		AUSTRALIA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/26	9:31:30		(931.714)		(933.884)		(929.077)	
2023/1/26	9:34:30	928.843	(927.162)		930.972	1.002292	926.734	0.997730
2023/1/26	9:37:30	926.424	927.385	1.001038	928.161	1.001875	924.543	0.997970
2023/1/26	9:40:30	924.598	(921.798)		926.423	1.001974	922.123	0.997323
2023/1/26	9:43:30		(924.489)		(925.227)		(921.136)	
2023/1/26	9:46:30	922.713	923.457	1.000807	923.842	1.001224	919.872	0.996921
2023/1/26	10:01:30	929.847	931.010	1.001251	932.071	1.002392	927.142	0.997091
2023/1/26	10:04:30	926.653	927.260	1.000655	928.779	1.002294	924.344	0.997508
2023/1/26	10:07:30		(930.101)		(931.936)		(927.659)	
2023/1/26	10:10:30	931.082	932.406	1.001422	933.087	1.002153	928.765	0.997511
2023/1/26	10:13:30		(938.329)		(941.243)		(936.364)	
2023/1/26	10:16:30	939.412	940.532	1.001192	941.322	1.002033	936.706	0.997120
2023/1/26	10:31:30		(966.850)		(968.674)		(963.063)	
2023/1/26	10:34:30	969.020	969.352	1.000343	971.075	1.002121	966.266	0.997158
2023/1/26	10:37:30	968.175	968.763	1.000607	970.334	1.002230	966.265	0.998027
2023/1/26	10:40:30		(967.271)		(968.326)		(963.793)	
2023/1/26	10:43:30		(966.162)		(967.359)		(964.461)	
2023/1/26	10:46:30	967.747	968.517	1.000796	969.321	1.001627	964.427	0.996570
2023/1/26	11:01:30	975.322	975.933	1.000627	976.745	1.001459	972.184	0.996783
2023/1/26	11:04:30	975.046	975.258	1.000217	976.666	1.001661	972.797	0.997693
2023/1/26	11:07:30	974.574	974.797	1.000229	976.475	1.001951	973.278	0.998670
2023/1/26	11:10:30	973.992	974.553	1.000576	975.650	1.001702	971.497	0.997438
2023/1/26	11:13:30		(969.692)		(970.691)		(966.986)	
2023/1/26	11:16:30		(967.400)		(969.712)		(965.078)	
2023/1/26	11:31:30				(890.514)		(875.899)	
2023/1/26	11:34:30				(914.509)		(895.935)	
2023/1/26	11:37:30				(960.427)		(954.210)	
2023/1/26	11:40:30	945.279			(951.152)		(946.684)	
2023/1/26	11:43:30				(905.278)		(894.611)	
2023/1/26	11:46:30	932.901			(937.716)		(934.240)	
2023/1/26	12:31:30		(870.978)		(873.426)		(859.863)	
2023/1/26	12:34:30		(926.368)		(928.482)		(900.038)	
2023/1/26	12:37:30		(765.694)		(750.228)		(811.451)	
2023/1/26	12:40:30		(780.987)		(767.235)		(760.728)	
2023/1/26	12:43:30		(782.623)		(794.194)		(833.611)	
2023/1/26	12:46:30	921.588	(922.616)		(923.850)		(917.968)	
2023/1/26	13:01:30		(877.489)		(868.018)		(868.713)	
2023/1/26	13:04:30		(875.540)		(875.552)		(877.232)	
2023/1/26	13:07:30	912.934	914.055	1.001228	914.717	1.001953	(912.131)	
2023/1/26	13:10:30		(869.906)		(859.293)		(831.807)	
2023/1/26	13:13:30		(903.765)		(906.006)		(901.125)	
2023/1/26	13:16:30	915.495	916.505	1.001104	917.123	1.001779	(910.604)	
2023/1/26	13:31:30		(906.125)		(908.069)		(903.373)	
2023/1/26	13:34:30	890.774	892.015	1.001394	892.503	1.001941	889.711	0.998807
2023/1/26	13:37:30		(897.144)		(898.768)		(895.771)	
2023/1/26	13:40:30	874.454	875.312	1.000982	876.910	1.002809	(879.596)	
2023/1/26	13:43:30		(871.653)		(873.056)		(870.929)	
2023/1/26	13:46:30	881.990	883.148	1.001313	884.243	1.002555	878.902	0.996499
2023/1/26	14:01:30		(762.967)		(762.199)		(757.987)	
2023/1/26	14:04:30		(802.851)		(803.857)		(801.632)	
2023/1/26	14:07:30		(790.784)		(790.374)		(791.432)	
2023/1/26	14:10:30		(786.587)		(788.472)		(787.684)	
2023/1/26	14:13:30	806.554	(808.959)		(808.133)		(802.956)	
2023/1/26	14:16:30		(787.932)		(790.511)		(784.851)	

		reference irradiance (W/m^2)	PMO6		PMO6		PMO6	
			0102		0809		951202	
Date	Time		HONG KONG, CHINA		HONG KONG, CHINA		REPUBLIC OF KOREA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/18	10:31:30		(885.640)		(884.240)		(885.616)	
2023/1/18	10:34:30		(887.130)		(885.620)		(887.370)	
2023/1/18	10:37:30	886.039	887.790	1.001976	886.710	1.000757	888.638	1.002933
2023/1/18	10:40:30	891.675	893.270	1.001789	892.220	1.000611	893.556	1.002110
2023/1/18	10:43:30	889.560	892.310	1.003092	890.860	1.001462	892.121	1.002879
2023/1/18	10:46:30	891.087	893.650	1.002876	892.290	1.001350	893.858	1.003109
2023/1/18	11:01:30	894.792	896.840	1.002289	895.400	1.000680	897.448	1.002968
2023/1/18	11:04:30	896.516	898.910	1.002671	897.260	1.000830	899.109	1.002893
2023/1/18	11:07:30	898.419	901.020	1.002895	899.730	1.001459	901.885	1.003857
2023/1/18	11:10:30	894.774	897.510	1.003058	896.480	1.001907	897.953	1.003553
2023/1/18	11:13:30	899.648	902.570	1.003248	901.360	1.001903	902.160	1.002793
2023/1/18	11:16:30	901.879	903.950	1.002296	902.410	1.000589	904.016	1.002370
2023/1/18	11:31:30	899.103	901.490	1.002655	900.100	1.001109	902.643	1.003938
2023/1/18	11:34:30	901.937	904.150	1.002454	902.500	1.000624	904.621	1.002976
2023/1/18	11:37:30	902.470	904.760	1.002538	903.350	1.000975	903.900	1.001584
2023/1/18	11:40:30	900.236	902.310	1.002304	901.120	1.000982	902.854	1.002907
2023/1/18	11:43:30	902.044	904.130	1.002312	902.820	1.000860	904.156	1.002341
2023/1/18	11:46:30	897.162	900.060	1.003231	898.240	1.001202	899.892	1.003044
2023/1/18	12:01:30	878.967	(879.200)		878.780	0.999787	881.427	1.002798
2023/1/18	12:04:30	889.719	892.640	1.003283	891.400	1.001890	892.157	1.002741
2023/1/18	12:07:30	887.668	889.280	1.001816	888.220	1.000621	890.863	1.003599
2023/1/18	12:10:30	894.963	897.000	1.002276	896.040	1.001204	(900.053)	
2023/1/18	12:13:30	893.129	895.280	1.002408	893.800	1.000751	896.486	1.003759
2023/1/18	12:16:30	895.054	897.430	1.002654	895.910	1.000956	896.849	1.002005
2023/1/18	12:31:30	890.032	892.850	1.003166	890.870	1.000941	892.462	1.002730
2023/1/18	12:34:30	876.723	879.170	1.002791	877.620	1.001023	879.208	1.002834
2023/1/18	12:37:30	874.361	876.460	1.002401	875.160	1.000914	876.061	1.001945
2023/1/18	12:40:30	874.656	876.820	1.002475	875.690	1.001183	878.556	1.004460
2023/1/18	12:43:30	862.524	866.540	1.004657	864.690	1.002512	865.556	1.003516
2023/1/18	12:46:30		(845.580)		(843.520)		(844.920)	
2023/1/19	10:01:30	871.597	874.330	1.003135	872.770	1.001346	874.247	1.003041
2023/1/19	10:04:30	883.593	(883.070)		(882.300)		886.593	1.003395
2023/1/19	10:07:30	880.171	(872.210)		(874.560)		(880.709)	
2023/1/19	10:10:30	865.325	868.550	1.003726	865.510	1.000213	866.907	1.001828
2023/1/19	10:13:30	858.563	(858.020)		(857.830)		860.766	1.002565
2023/1/19	10:16:30	860.890	(861.370)		861.640	1.000871	865.041	1.004821
2023/1/19	12:01:30		(853.120)		(852.190)		(854.289)	
2023/1/19	12:04:30		(851.270)		(849.940)		(852.352)	
2023/1/19	12:07:30		(855.520)		(853.720)		(855.119)	
2023/1/19	12:10:30		(865.000)		(863.640)		(865.431)	
2023/1/19	12:13:30	866.850	(871.190)		(869.780)		871.188	1.005004
2023/1/19	12:16:30	865.146	(868.200)		(866.590)		868.145	1.003466
2023/1/19	12:31:30	873.799	876.210	1.002759	874.730	1.001065	875.910	1.002416
2023/1/19	12:34:30	872.586	874.230	1.001884	872.830	1.000280	874.686	1.002407
2023/1/19	12:37:30	870.609	874.080	1.003987	872.830	1.002551	874.550	1.004526
2023/1/19	12:40:30	870.363	872.970	1.002996	871.740	1.001582	874.148	1.004349
2023/1/19	12:43:30	871.514	873.670	1.002473	872.370	1.000982	874.704	1.003660
2023/1/19	12:46:30	866.629	869.910	1.003786	868.110	1.001709	869.137	1.002894
2023/1/19	13:01:30	859.202	862.370	1.003688	860.710	1.001756	862.157	1.003440
2023/1/19	13:04:30	866.395	869.300	1.003354	867.720	1.001530	869.333	1.003391
2023/1/19	13:07:30	869.349	872.720	1.003877	870.970	1.001864	872.184	1.003260
2023/1/19	13:10:30		(198.330)		(197.000)		(175.712)	
2023/1/19	13:13:30		(868.150)		(867.220)		(868.141)	
2023/1/19	13:16:30		(762.180)		(823.850)		(878.763)	
2023/1/19	13:31:30		(380.230)		(267.060)		(89.009)	
2023/1/19	13:34:30		(559.600)		(558.810)		(714.474)	
2023/1/19	13:37:30		(320.800)		(402.370)		(577.301)	
2023/1/19	13:40:30	829.818	833.020	1.003859	831.260	1.001738	831.709	1.002279
2023/1/19	13:43:30	828.093	831.770	1.004441	830.080	1.002400	830.364	1.002743
2023/1/19	13:46:30	831.371	(831.980)		(830.480)		834.534	1.003805

		reference irradiance (W/m^2)	PMO6		PMO6		PMO6	
			0102		0809		951202	
Date	Time		HONG KONG, CHINA		HONG KONG, CHINA		REPUBLIC OF KOREA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/20	9:31:30		(847.860)		(847.600)		(847.271)	
2023/1/20	9:34:30	829.718	(835.860)		(832.940)		(834.120)	
2023/1/20	9:37:30		(643.630)		(648.710)		(704.000)	
2023/1/20	9:40:30	835.684	(835.940)		(834.330)		839.187	1.004192
2023/1/20	9:43:30	851.008	(852.460)		(850.990)		852.328	1.001551
2023/1/20	9:46:30		(619.020)		(652.390)		(733.568)	
2023/1/20	10:01:30	844.968	(849.730)		847.570	1.003080	847.896	1.003466
2023/1/20	10:04:30		(833.770)		(831.400)		(834.383)	
2023/1/20	10:07:30		(808.290)		(806.240)		(800.362)	
2023/1/20	10:10:30	857.597	861.380	1.004412	859.430	1.002138	859.670	1.002418
2023/1/20	10:13:30	867.683	(872.680)		870.510	1.003258	870.212	1.002915
2023/1/20	10:16:30	884.259	886.720	1.002783	885.390	1.001279	887.835	1.004044
2023/1/20	11:01:30		(893.730)		(893.690)		(898.199)	
2023/1/20	11:04:30		(895.010)		(892.210)		(892.221)	
2023/1/20	11:07:30	906.175	(906.770)		905.910	0.999707	908.278	1.002321
2023/1/20	11:10:30	896.041	899.240	1.003570	898.080	1.002275	898.873	1.003160
2023/1/20	11:13:30		(878.320)		(878.840)		(883.116)	
2023/1/20	11:16:30	884.143	886.650	1.002836	885.890	1.001976	887.917	1.004268
2023/1/20	11:31:30	899.347	901.240	1.002105	899.680	1.000370	901.754	1.002677
2023/1/20	11:34:30	910.509	911.750	1.001363	911.050	1.000594	912.955	1.002686
2023/1/20	11:37:30	908.644	910.770	1.002339	909.070	1.000469	911.329	1.002955
2023/1/20	11:40:30	907.795	911.560	1.004148	909.690	1.002088	911.371	1.003940
2023/1/20	11:43:30	910.994	914.190	1.003509	912.810	1.001994	914.625	1.003986
2023/1/20	11:46:30	910.897	912.390	1.001639	910.790	0.999882	912.634	1.001906
2023/1/20	12:01:30		(918.390)		(917.280)		(919.654)	
2023/1/20	12:04:30	910.415	913.220	1.003081	911.010	1.000654	912.856	1.002682
2023/1/20	12:07:30	914.695	916.930	1.002443	915.780	1.001186	917.839	1.003436
2023/1/20	12:10:30	911.000	912.520	1.001669	911.560	1.000615	914.248	1.003566
2023/1/20	12:13:30	906.136	909.450	1.003657	907.990	1.002046	910.493	1.004808
2023/1/20	12:16:30	908.657	911.600	1.003239	910.120	1.001610	911.272	1.002877
2023/1/20	12:31:30	926.272	929.010	1.002956	927.570	1.001401	929.094	1.003047
2023/1/20	12:34:30	926.184	929.940	1.004056	927.930	1.001886	929.369	1.003439
2023/1/20	12:37:30	939.813	942.980	1.003370	941.570	1.001870	943.613	1.004043
2023/1/20	12:40:30	930.055	933.370	1.003564	931.900	1.001983	932.776	1.002925
2023/1/20	12:43:30		(917.050)		(915.830)		(917.851)	
2023/1/20	12:46:30	928.839	932.210	1.003630	930.850	1.002166	932.314	1.003742
2023/1/20	13:01:30	920.184	922.890	1.002941	920.990	1.000876	923.970	1.004115
2023/1/20	13:04:30	921.099	922.640	1.001673	920.980	0.999871	922.232	1.001231
2023/1/20	13:07:30	928.285	931.130	1.003064	929.930	1.001772	932.364	1.004394
2023/1/20	13:10:30	927.694	930.340	1.002853	929.240	1.001667	931.211	1.003792
2023/1/20	13:13:30	930.088	932.600	1.002701	931.700	1.001733	933.200	1.003346
2023/1/20	13:16:30	935.651	938.570	1.003120	936.520	1.000929	938.063	1.002578
2023/1/20	13:31:30	949.854	952.720	1.003017	951.470	1.001701	952.479	1.002764
2023/1/20	13:34:30	946.404	949.020	1.002764	947.340	1.000989	948.766	1.002496
2023/1/20	13:37:30	951.104	953.600	1.002624	952.150	1.001100	954.261	1.003319
2023/1/20	13:40:30	949.496	951.610	1.002226	950.070	1.000604	952.138	1.002782
2023/1/20	13:43:30	946.240	949.170	1.003096	947.710	1.001553	949.434	1.003376
2023/1/20	13:46:30	948.985	952.170	1.003356	950.430	1.001523	951.572	1.002726
2023/1/20	14:01:30	924.895	927.370	1.002675	926.400	1.001627	927.171	1.002460
2023/1/20	14:04:30	928.640	931.920	1.003532	930.420	1.001917	931.215	1.002773
2023/1/20	14:07:30		(934.760)		(933.480)		(935.042)	
2023/1/20	14:10:30		(932.710)		(931.260)		(933.254)	
2023/1/20	14:13:30		(936.180)		(934.660)		(936.837)	
2023/1/20	14:16:30		(933.800)		(932.470)		(934.294)	

		reference irradiance (W/m^2)	PMO6		PMO6		PMO6	
			0102		0809		951202	
Date	Time		HONG KONG, CHINA		HONG KONG, CHINA		REPUBLIC OF KOREA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/21	9:31:30		(943.330)		(941.450)		(943.106)	
2023/1/21	9:34:30	942.867	944.570	1.001806	943.090	1.000236	944.662	1.001904
2023/1/21	9:37:30	945.654	947.910	1.002385	946.630	1.001032	948.776	1.003301
2023/1/21	9:40:30	948.069	951.030	1.003123	949.150	1.001140	950.293	1.002346
2023/1/21	9:43:30	949.478	951.500	1.002130	949.990	1.000539	952.300	1.002972
2023/1/21	9:46:30	950.617	952.530	1.002013	951.480	1.000908	953.407	1.002935
2023/1/21	10:01:30	960.208	962.260	1.002137	960.910	1.000731	963.416	1.003341
2023/1/21	10:04:30	961.818	965.340	1.003662	963.390	1.001634	964.816	1.003117
2023/1/21	10:07:30	960.076	963.390	1.003451	962.020	1.002024	963.265	1.003321
2023/1/21	10:10:30	963.740	965.910	1.002252	964.180	1.000456	965.586	1.001915
2023/1/21	10:13:30	964.155					966.196	1.002117
2023/1/21	10:16:30	956.428					(963.212)	
2023/1/21	10:31:30		(375.740)		(463.540)		(562.615)	
2023/1/21	10:34:30	972.330	974.700	1.002437	973.040	1.000730	974.886	1.002629
2023/1/21	10:37:30		(523.960)		(501.500)		(463.662)	
2023/1/21	10:40:30	975.404	(974.390)		976.210	1.000826	(980.601)	
2023/1/21	10:43:30		(820.870)		(804.000)		(835.501)	
2023/1/21	10:46:30	971.514	975.700	1.004309	973.160	1.001694	973.837	1.002391
2023/1/21	11:01:30	983.066	985.600	1.002577	983.360	1.000299	986.514	1.003507
2023/1/21	11:04:30	982.357	986.770	1.004493	984.800	1.002487	986.143	1.003854
2023/1/21	11:07:30	988.905	(964.950)		(970.370)		(985.867)	
2023/1/21	11:10:30		(852.610)		(862.740)		(888.674)	
2023/1/21	11:13:30		(914.680)		(892.140)		(847.290)	
2023/1/21	11:16:30		(901.580)		(878.950)		(898.959)	
2023/1/21	11:31:30		(983.940)		(972.300)		(949.993)	
2023/1/21	11:34:30	991.327	994.860	1.003564	992.870	1.001556	994.276	1.002975
2023/1/21	11:37:30		(945.350)		(943.770)		(960.848)	
2023/1/21	11:40:30	996.304	999.370	1.003078	997.870	1.001572	999.001	1.002707
2023/1/21	11:43:30	996.453	999.100	1.002657	997.260	1.000810	1000.091	1.003651
2023/1/21	11:46:30	997.171	998.490	1.001323	997.900	1.000732	1000.693	1.003533
2023/1/21	12:01:30	994.465	997.140	1.002690	995.480	1.001020	997.961	1.003515
2023/1/21	12:04:30	995.027	997.980	1.002968	995.960	1.000938	998.199	1.003188
2023/1/21	12:07:30	998.164	1000.860	1.002701	999.230	1.001068	1001.440	1.003282
2023/1/21	12:10:30	998.370	1000.740	1.002374	999.610	1.001242	1001.725	1.003360
2023/1/21	12:13:30	995.796	998.650	1.002866	996.860	1.001068	998.852	1.003069
2023/1/21	12:16:30		(985.370)		(983.250)		(983.129)	
2023/1/21	12:31:30	991.903	995.540	1.003667	993.760	1.001873	995.634	1.003762
2023/1/21	12:34:30	990.167	993.090	1.002952	991.310	1.001155	993.864	1.003734
2023/1/21	12:37:30	987.637	990.000	1.002393	988.410	1.000783	990.338	1.002735
2023/1/21	12:40:30	983.673	987.150	1.003535	985.290	1.001644	987.800	1.004196
2023/1/21	12:43:30	980.313	983.190	1.002935	981.530	1.001242	983.491	1.003242
2023/1/21	12:46:30	976.876	979.360	1.002543	978.100	1.001253	979.497	1.002683
2023/1/21	13:01:30	973.873	975.520	1.001691	975.350	1.001516	977.598	1.003825
2023/1/21	13:04:30	970.817	973.800	1.003073	971.130	1.000323	973.472	1.002735
2023/1/21	13:07:30	963.726	(969.530)		(968.910)		967.652	1.004074
2023/1/21	13:10:30		(959.650)		(960.430)		(960.697)	
2023/1/21	13:13:30	946.470	(964.790)		(962.370)		(954.861)	
2023/1/21	13:16:30	970.842	973.400	1.002635	971.740	1.000925	973.731	1.002976
2023/1/21	13:31:30	962.030	964.420	1.002484	962.780	1.000779	963.336	1.001358
2023/1/21	13:34:30	961.493	964.240	1.002857	962.200	1.000735	963.551	1.002140
2023/1/21	13:37:30	955.838	958.550	1.002838	956.780	1.000986	958.855	1.003157
2023/1/21	13:40:30	953.943	957.650	1.003886	956.180	1.002345	957.615	1.003850
2023/1/21	13:43:30	955.633	957.760	1.002226	956.520	1.000928	958.427	1.002924
2023/1/21	13:46:30	955.220	957.420	1.002303	956.180	1.001005	957.831	1.002733
2023/1/21	14:01:30	937.938	940.930	1.003190	940.280	1.002497	940.856	1.003111
2023/1/21	14:04:30		(936.400)		(934.290)		(936.535)	
2023/1/21	14:07:30	932.351	935.550	1.003431	934.160	1.001940	934.997	1.002838
2023/1/21	14:10:30		(933.340)		(931.650)		(932.653)	
2023/1/21	14:13:30		(927.900)		(926.410)		(927.434)	
2023/1/21	14:16:30		(922.750)		(921.230)		(922.542)	

		reference irradiance (W/m^2)	PMO6		PMO6		PMO6	
			0102		0809		951202	
Date	Time		HONG KONG, CHINA		HONG KONG, CHINA		REPUBLIC OF KOREA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/26	9:31:30		(934.590)		(932.900)		(937.869)	
2023/1/26	9:34:30	928.843	931.850	1.003238	930.120	1.001375	(935.267)	
2023/1/26	9:37:30	926.424	929.830	1.003677	927.940	1.001637	929.246	1.003046
2023/1/26	9:40:30	924.598	927.080	1.002684	925.560	1.001041	927.510	1.003150
2023/1/26	9:43:30		(926.030)		(924.420)		(925.798)	
2023/1/26	9:46:30	922.713	925.190	1.002685	923.520	1.000875	(921.742)	
2023/1/26	10:01:30	929.847	932.560	1.002918	931.330	1.001595	(934.931)	
2023/1/26	10:04:30	926.653	929.990	1.003601	928.260	1.001734	928.422	1.001909
2023/1/26	10:07:30		(932.380)		(931.060)		(932.221)	
2023/1/26	10:10:30	931.082	934.230	1.003381	932.890	1.001941	933.400	1.002489
2023/1/26	10:13:30		(941.790)		(940.570)		(942.355)	
2023/1/26	10:16:30	939.412	942.200	1.002968	940.930	1.001616	(940.022)	
2023/1/26	10:31:30		(968.670)		(967.090)		(967.163)	
2023/1/26	10:34:30	969.020	971.670	1.002735	970.150	1.001167	(969.547)	
2023/1/26	10:37:30	968.175	971.260	1.003186	969.880	1.001761	970.905	1.002819
2023/1/26	10:40:30		(969.040)		(967.680)		(970.369)	
2023/1/26	10:43:30		(970.090)		(968.290)		(972.457)	
2023/1/26	10:46:30	967.747	969.890	1.002215	968.260	1.000531	971.172	1.003539
2023/1/26	11:01:30	975.322	978.050	1.002798	976.080	1.000778	977.320	1.002049
2023/1/26	11:04:30	975.046	977.820	1.002845	976.300	1.001286	978.075	1.003106
2023/1/26	11:07:30	974.574	978.720	1.004254	976.830	1.002315	977.195	1.002689
2023/1/26	11:10:30	973.992	976.320	1.002390	974.800	1.000830	976.236	1.002304
2023/1/26	11:13:30		(972.430)		(970.730)		(969.853)	
2023/1/26	11:16:30		(969.890)		(968.390)		(970.919)	
2023/1/26	11:31:30		(869.440)		(875.560)		(889.770)	
2023/1/26	11:34:30		(890.870)		(887.660)		(905.245)	
2023/1/26	11:37:30		(959.930)		(956.820)		(955.991)	
2023/1/26	11:40:30	945.279	(953.610)		(949.820)		946.394	1.001179
2023/1/26	11:43:30		(898.820)		(900.270)		(900.055)	
2023/1/26	11:46:30	932.901	(942.580)		(941.280)		937.009	1.004403
2023/1/26	12:31:30		(847.660)		(875.940)		(889.672)	
2023/1/26	12:34:30		(904.680)		(896.300)		(907.459)	
2023/1/26	12:37:30		(876.020)		(862.010)		(768.900)	
2023/1/26	12:40:30		(770.170)		(763.560)		(757.714)	
2023/1/26	12:43:30		(870.810)		(850.740)		(802.088)	
2023/1/26	12:46:30	921.588	(923.800)		(919.650)		(921.106)	
2023/1/26	13:01:30		(897.840)		(884.310)		(857.260)	
2023/1/26	13:04:30		(887.070)		(880.790)		(876.053)	
2023/1/26	13:07:30	912.934	(919.550)		(916.130)		(912.809)	
2023/1/26	13:10:30		(844.910)		(843.910)		(846.531)	
2023/1/26	13:13:30		(908.800)		(903.590)		(908.951)	
2023/1/26	13:16:30	915.495	(913.950)		(913.830)		(918.554)	
2023/1/26	13:31:30		(908.070)		(907.730)			
2023/1/26	13:34:30	890.774	895.050	1.004801	(893.820)			
2023/1/26	13:37:30		(901.490)		(899.990)			
2023/1/26	13:40:30	874.454	(890.040)		(886.840)			
2023/1/26	13:43:30		(877.240)		(874.520)			
2023/1/26	13:46:30	881.990	883.630	1.001860	(880.970)			
2023/1/26	14:01:30		(761.590)		(755.040)			
2023/1/26	14:04:30		(808.850)		(808.250)			
2023/1/26	14:07:30		(798.960)		(797.090)			
2023/1/26	14:10:30		(792.410)		(793.630)			
2023/1/26	14:13:30	806.554	(804.720)		(803.140)			
2023/1/26	14:16:30		(787.620)		(788.440)			

		reference irradiance (W/m^2)	AHF		PMO6		PMO6	
			36014		1610		0806	
Date	Time		REPUBLIC OF KOREA		INDONESIA		CHINA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/18	10:31:30		(881.553)		(883.140)		(882.610)	
2023/1/18	10:34:30		(883.284)		(885.610)		(884.310)	
2023/1/18	10:37:30	886.039	884.041	0.997745	885.470	0.999358	885.740	0.999662
2023/1/18	10:40:30	891.675	890.433	0.998607	891.560	0.999871	891.400	0.999692
2023/1/18	10:43:30	889.560	887.902	0.998136	889.140	0.999528	889.670	1.000124
2023/1/18	10:46:30	891.087	889.927	0.998698	892.050	1.001080	891.720	1.000710
2023/1/18	11:01:30	894.792	893.339	0.998376			894.290	0.999439
2023/1/18	11:04:30	896.516	894.341	0.997574			896.130	0.999570
2023/1/18	11:07:30	898.419	897.137	0.998573			898.300	0.999867
2023/1/18	11:10:30	894.774	892.527	0.997489			895.280	1.000566
2023/1/18	11:13:30	899.648	897.965	0.998129			899.340	0.999658
2023/1/18	11:16:30	901.879	900.462	0.998429			900.790	0.998792
2023/1/18	11:31:30	899.103	898.628	0.999472	900.180	1.001198	898.770	0.999630
2023/1/18	11:34:30	901.937	899.921	0.997765	902.180	1.000269	901.750	0.999793
2023/1/18	11:37:30	902.470	901.067	0.998445	902.710	1.000266	901.900	0.999369
2023/1/18	11:40:30	900.236	898.789	0.998392	902.130	1.002104	899.750	0.999460
2023/1/18	11:43:30	902.044	899.497	0.997176	900.670	0.998476	(900.130)	
2023/1/18	11:46:30	897.162	896.490	0.999251	896.740	0.999530	897.110	0.999943
2023/1/18	12:01:30	878.967	878.020	0.998923	880.020	1.001198	879.650	1.000777
2023/1/18	12:04:30	889.719	888.573	0.998712	890.570	1.000957	889.890	1.000192
2023/1/18	12:07:30	887.668	885.599	0.997669	886.970	0.999213	887.720	1.000058
2023/1/18	12:10:30	894.963	893.049	0.997861	894.330	0.999293	894.520	0.999505
2023/1/18	12:13:30	893.129	892.078	0.998823	893.140	1.000012	893.110	0.999979
2023/1/18	12:16:30	895.054	893.884	0.998692	895.250	1.000219	895.180	1.000140
2023/1/18	12:31:30	890.032	887.143	0.996754	890.030	0.999997	890.370	1.000379
2023/1/18	12:34:30	876.723	874.696	0.997688	876.870	1.000168	877.290	1.000647
2023/1/18	12:37:30	874.361	872.175	0.997500	873.980	0.999565	874.890	1.000605
2023/1/18	12:40:30	874.656	873.391	0.998554	875.150	1.000565	874.330	0.999628
2023/1/18	12:43:30	862.524	860.901	0.998119	862.700	1.000205	862.680	1.000181
2023/1/18	12:46:30		(838.456)		(840.540)		(841.070)	
2023/1/19	10:01:30	871.597			871.900	1.000347	871.990	1.000451
2023/1/19	10:04:30	883.593			883.280	0.999646	884.160	1.000642
2023/1/19	10:07:30	880.171			880.140	0.999965	880.690	1.000590
2023/1/19	10:10:30	865.325			864.660	0.999231	865.260	0.999924
2023/1/19	10:13:30	858.563			858.660	1.000113	858.920	1.000415
2023/1/19	10:16:30	860.890			861.140	1.000290	861.730	1.000975
2023/1/19	12:01:30		(848.763)		(850.820)			
2023/1/19	12:04:30		(847.870)		(849.890)			
2023/1/19	12:07:30		(851.885)		(853.100)		(853.290)	
2023/1/19	12:10:30		(861.516)		(863.060)		(863.200)	
2023/1/19	12:13:30	866.850	864.938	0.997794	867.650	1.000923	866.940	1.000104
2023/1/19	12:16:30	865.146	863.138	0.997679	865.170	1.000028	864.850	0.999658
2023/1/19	12:31:30	873.799	871.602	0.997485	874.140	1.000390	874.380	1.000664
2023/1/19	12:34:30	872.586	870.492	0.997600	872.600	1.000016	873.010	1.000486
2023/1/19	12:37:30	870.609	868.576	0.997665	871.630	1.001173	871.010	1.000461
2023/1/19	12:40:30	870.363	868.093	0.997392	870.500	1.000158	870.320	0.999951
2023/1/19	12:43:30	871.514	869.625	0.997832	871.490	0.999972	871.150	0.999582
2023/1/19	12:46:30	866.629	865.448	0.998638	867.030	1.000463	866.620	0.999990
2023/1/19	13:01:30	859.202	856.630	0.997007	859.220	1.000021	859.570	1.000429
2023/1/19	13:04:30	866.395	863.859	0.997073	866.290	0.999879	866.920	1.000607
2023/1/19	13:07:30	869.349	866.892	0.997173	869.430	1.000093	869.350	1.000001
2023/1/19	13:10:30		(241.746)		(158.480)		(154.880)	
2023/1/19	13:13:30		(862.310)		(865.680)		(865.830)	
2023/1/19	13:16:30		(854.434)		(861.750)		(861.880)	
2023/1/19	13:31:30		(52.637)		(35.700)		(38.290)	
2023/1/19	13:34:30		(822.631)		(829.580)		(819.750)	
2023/1/19	13:37:30		(687.322)		(665.980)		(648.980)	
2023/1/19	13:40:30	829.818	827.502	0.997209	830.000	1.000220	829.630	0.999774
2023/1/19	13:43:30	828.093	825.509	0.996880	827.930	0.999804	828.880	1.000951
2023/1/19	13:46:30	831.371	828.925	0.997058	831.770	1.000480	830.840	0.999362

		reference irradiance (W/m^2)	AHF		PMO6		PMO6	
			36014		1610		0806	
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yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/20	9:31:30		(845.741)		(848.080)		(847.730)	
2023/1/20	9:34:30	829.718	828.341	0.998341	830.420	1.000846	830.030	1.000376
2023/1/20	9:37:30		(768.789)		(757.220)		(707.400)	
2023/1/20	9:40:30	835.684	(835.913)		837.360	1.002006	836.230	1.000654
2023/1/20	9:43:30	851.008	848.793	0.997398	850.170	0.999016	851.280	1.000320
2023/1/20	9:46:30		(755.769)		(753.200)		(803.760)	
2023/1/20	10:01:30	844.968	842.893	0.997545	845.510	1.000642	844.350	0.999269
2023/1/20	10:04:30		(831.252)		(834.340)		(833.150)	
2023/1/20	10:07:30		(779.960)		(783.150)		(795.500)	
2023/1/20	10:10:30	857.597	854.404	0.996277	857.340	0.999701	857.230	0.999573
2023/1/20	10:13:30	867.683	864.927	0.996824	867.100	0.999328	868.000	1.000366
2023/1/20	10:16:30	884.259	882.474	0.997982	884.640	1.000431	884.520	1.000295
2023/1/20	11:01:30		(893.702)		(896.410)		(895.730)	
2023/1/20	11:04:30		(886.992)		(889.740)		(886.970)	
2023/1/20	11:07:30	906.175	904.744	0.998420	906.910	1.000811	906.450	1.000303
2023/1/20	11:10:30	896.041	894.398	0.998166	895.400	0.999284	896.280	1.000266
2023/1/20	11:13:30		(879.276)		(881.160)		(883.350)	
2023/1/20	11:16:30	884.143	883.039	0.998751	885.090	1.001071	883.900	0.999725
2023/1/20	11:31:30	899.347	897.387	0.997821	899.640	1.000326	899.670	1.000359
2023/1/20	11:34:30	910.509	908.319	0.997595	910.550	1.000045	910.860	1.000386
2023/1/20	11:37:30	908.644	906.414	0.997546	908.010	0.999302	908.320	0.999643
2023/1/20	11:40:30	907.795	905.733	0.997729	907.980	1.000204	907.880	1.000094
2023/1/20	11:43:30	910.994	908.568	0.997337	911.350	1.000391	911.370	1.000413
2023/1/20	11:46:30	910.897	908.565	0.997440	910.770	0.999860	911.410	1.000563
2023/1/20	12:01:30		(915.004)		(917.490)		(918.030)	
2023/1/20	12:04:30	910.415	908.353	0.997735	910.690	1.000302	910.500	1.000093
2023/1/20	12:07:30	914.695	912.728	0.997849	914.920	1.000245	915.460	1.000836
2023/1/20	12:10:30	911.000	908.432	0.997182	911.320	1.000352	911.120	1.000132
2023/1/20	12:13:30	906.136	904.253	0.997922	907.270	1.001252	906.330	1.000214
2023/1/20	12:16:30	908.657	906.618	0.997756	908.550	0.999882	908.600	0.999937
2023/1/20	12:31:30	926.272	923.311	0.996803	926.670	1.000430	926.990	1.000775
2023/1/20	12:34:30	926.184	923.597	0.997207	927.010	1.000892	926.610	1.000460
2023/1/20	12:37:30	939.813	936.981	0.996987	940.310	1.000529	940.760	1.001008
2023/1/20	12:40:30	930.055	926.989	0.996703	930.250	1.000209	930.280	1.000241
2023/1/20	12:43:30		(913.850)		(915.910)		(916.870)	
2023/1/20	12:46:30	928.839	926.790	0.997795	929.450	1.000658	929.490	1.000701
2023/1/20	13:01:30	920.184	917.603	0.997195			920.630	1.000485
2023/1/20	13:04:30	921.099	919.060	0.997787			921.290	1.000208
2023/1/20	13:07:30	928.285	925.954	0.997489			928.790	1.000544
2023/1/20	13:10:30	927.694	925.533	0.997671			927.880	1.000201
2023/1/20	13:13:30	930.088	928.007	0.997762			930.180	1.000099
2023/1/20	13:16:30	935.651	933.508	0.997709			935.690	1.000041
2023/1/20	13:31:30	949.854	947.674	0.997705	950.150	1.000312	949.530	0.999659
2023/1/20	13:34:30	946.404	943.533	0.996966	946.610	1.000217	946.080	0.999657
2023/1/20	13:37:30	951.104	948.503	0.997265	951.030	0.999922	951.160	1.000059
2023/1/20	13:40:30	949.496	946.418	0.996758	949.520	1.000025	949.670	1.000183
2023/1/20	13:43:30	946.240	943.327	0.996921	946.390	1.000158	946.500	1.000274
2023/1/20	13:46:30	948.985	945.986	0.996840	948.890	0.999900	949.670	1.000722
2023/1/20	14:01:30	924.895	923.174	0.998139	925.130	1.000254	925.240	1.000373
2023/1/20	14:04:30	928.640	926.285	0.997464	928.830	1.000205	928.900	1.000280
2023/1/20	14:07:30		(929.138)		(932.430)		(932.670)	
2023/1/20	14:10:30		(928.274)		(930.680)		(931.710)	
2023/1/20	14:13:30		(932.127)		(934.050)		(933.870)	
2023/1/20	14:16:30		(928.188)		(932.050)		(931.170)	

		reference irradiance (W/m^2)	AHF		PMO6		PMO6	
			36014		1610		0806	
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yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/21	9:31:30		(938.405)		(941.140)		(939.910)	
2023/1/21	9:34:30	942.867	940.436	0.997421	942.890	1.000024	942.880	1.000013
2023/1/21	9:37:30	945.654	942.866	0.997051	945.800	1.000154	945.460	0.999795
2023/1/21	9:40:30	948.069	945.723	0.997526	948.420	1.000370	947.960	0.999885
2023/1/21	9:43:30	949.478	946.285	0.996637			950.270	1.000834
2023/1/21	9:46:30	950.617	948.075	0.997326			951.230	1.000645
2023/1/21	10:01:30	960.208	957.721	0.997410			960.310	1.000106
2023/1/21	10:04:30	961.818	959.318	0.997400			962.520	1.000730
2023/1/21	10:07:30	960.076	957.432	0.997246			960.140	1.000066
2023/1/21	10:10:30	963.740	961.549	0.997726			963.540	0.999792
2023/1/21	10:13:30	964.155	961.641	0.997393			964.270	1.000119
2023/1/21	10:16:30	956.428	(947.492)				956.330	0.999898
2023/1/21	10:31:30		(764.550)		(808.100)		(699.890)	
2023/1/21	10:34:30	972.330	969.984	0.997587	972.720	1.000401	972.010	0.999671
2023/1/21	10:37:30		(513.028)		(511.310)		(469.490)	
2023/1/21	10:40:30	975.404	973.103	0.997641	976.210	1.000826	975.190	0.999780
2023/1/21	10:43:30		(866.686)		(881.310)		(872.410)	
2023/1/21	10:46:30	971.514	969.691	0.998123	970.840	0.999306	970.660	0.999121
2023/1/21	11:01:30	983.066	980.173	0.997057	983.690	1.000634	983.610	1.000553
2023/1/21	11:04:30	982.357	978.305	0.995876	981.210	0.998833	982.440	1.000085
2023/1/21	11:07:30	988.905	985.238	0.996291	990.540	1.001653	(991.150)	
2023/1/21	11:10:30		(919.657)		(930.370)		(911.430)	
2023/1/21	11:13:30		(813.517)		(813.630)		(827.360)	
2023/1/21	11:16:30		(863.172)		(863.870)		(892.800)	
2023/1/21	11:31:30		(913.950)		(907.880)		(926.720)	
2023/1/21	11:34:30	991.327	989.325	0.997980	991.540	1.000215	990.970	0.999640
2023/1/21	11:37:30		(970.378)		(975.270)		(969.120)	
2023/1/21	11:40:30	996.304	993.233	0.996918	996.380	1.000077	996.970	1.000669
2023/1/21	11:43:30	996.453	994.925	0.998467	996.760	1.000308	996.740	1.000288
2023/1/21	11:46:30	997.171	994.966	0.997789	997.550	1.000381	997.770	1.000601
2023/1/21	12:01:30	994.465	991.912	0.997433			995.610	1.001151
2023/1/21	12:04:30	995.027	991.843	0.996800			994.480	0.999451
2023/1/21	12:07:30	998.164	995.785	0.997617			998.220	1.000056
2023/1/21	12:10:30	998.370	995.803	0.997429			998.770	1.000401
2023/1/21	12:13:30	995.796	993.687	0.997882			995.320	0.999522
2023/1/21	12:16:30		(972.001)				(977.320)	
2023/1/21	12:31:30	991.903	989.015	0.997089			991.910	1.000007
2023/1/21	12:34:30	990.167	987.291	0.997096			990.850	1.000690
2023/1/21	12:37:30	987.637	984.861	0.997189			987.910	1.000276
2023/1/21	12:40:30	983.673	980.670	0.996948			984.060	1.000394
2023/1/21	12:43:30	980.313	977.751	0.997387			980.210	0.999895
2023/1/21	12:46:30	976.876	974.154	0.997214			976.870	0.999994
2023/1/21	13:01:30	973.873	971.270	0.997327	974.340	1.000479	974.460	1.000602
2023/1/21	13:04:30	970.817	969.037	0.998167	972.100	1.001322	969.890	0.999045
2023/1/21	13:07:30	963.726	961.453	0.997642	963.610	0.999880	964.390	1.000689
2023/1/21	13:10:30		(961.013)		(963.820)		(958.060)	
2023/1/21	13:13:30	946.470	(953.682)		(954.100)		945.770	0.999260
2023/1/21	13:16:30	970.842	968.797	0.997893	971.560	1.000739	970.210	0.999349
2023/1/21	13:31:30	962.030	959.808	0.997690	962.120	1.000093	961.930	0.999896
2023/1/21	13:34:30	961.493	958.413	0.996796	960.250	0.998707	961.660	1.000173
2023/1/21	13:37:30	955.838	952.435	0.996440	956.610	1.000808	956.020	1.000191
2023/1/21	13:40:30	953.943	951.303	0.997233	954.570	1.000657	954.860	1.000961
2023/1/21	13:43:30	955.633	952.403	0.996620	955.340	0.999693	955.510	0.999871
2023/1/21	13:46:30	955.220	951.080	0.995666	954.580	0.999330	954.710	0.999466
2023/1/21	14:01:30	937.938	934.680	0.996526	938.590	1.000695	938.340	1.000429
2023/1/21	14:04:30		(930.479)		(933.760)		(934.380)	
2023/1/21	14:07:30	932.351	931.102	0.998660	934.070	1.001843	932.930	1.000621
2023/1/21	14:10:30		(928.565)		(930.460)		(929.680)	
2023/1/21	14:13:30		(921.994)		(924.640)		(924.020)	
2023/1/21	14:16:30		(917.630)		(920.160)		(920.640)	

		reference irradiance (W/m^2)	AHF		PMO6		PMO6	
			36014		1610		0806	
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yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/26	9:31:30		(928.981)		(932.720)		(931.870)	
2023/1/26	9:34:30	928.843	(923.855)		(925.380)		928.290	0.999405
2023/1/26	9:37:30	926.424	923.753	0.997117	(926.650)		926.630	1.000223
2023/1/26	9:40:30	924.598	922.391	0.997613	(922.560)		924.780	1.000197
2023/1/26	9:43:30		(921.005)		(923.680)		(923.140)	
2023/1/26	9:46:30	922.713	919.571	0.996595	(924.940)		922.750	1.000040
2023/1/26	10:01:30	929.847	927.681	0.997671	931.220	1.001477	930.340	1.000530
2023/1/26	10:04:30	926.653	924.068	0.997210	926.030	0.999327	926.990	1.000363
2023/1/26	10:07:30		(927.359)		(930.690)		(929.220)	
2023/1/26	10:10:30	931.082	928.223	0.996929	930.410	0.999278	931.710	1.000674
2023/1/26	10:13:30		(936.936)		(940.060)		(939.650)	
2023/1/26	10:16:30	939.412	937.160	0.997603	941.560	1.002287	939.630	1.000232
2023/1/26	10:31:30		(963.792)		(966.700)		(966.850)	
2023/1/26	10:34:30	969.020	966.024	0.996909	967.770	0.998710	969.720	1.000723
2023/1/26	10:37:30	968.175	965.326	0.997057	968.690	1.000532	968.040	0.999860
2023/1/26	10:40:30		(964.062)		(966.860)		(966.900)	
2023/1/26	10:43:30		(963.279)		(965.070)		(965.850)	
2023/1/26	10:46:30	967.747	965.115	0.997281	969.070	1.001368	967.750	1.000004
2023/1/26	11:01:30	975.322	972.361	0.996965	976.220	1.000921	975.280	0.999957
2023/1/26	11:04:30	975.046	971.589	0.996454	(972.460)		975.100	1.000055
2023/1/26	11:07:30	974.574	971.598	0.996947	974.690	1.000119	974.680	1.000109
2023/1/26	11:10:30	973.992	970.546	0.996462	973.630	0.999628	973.910	0.999916
2023/1/26	11:13:30		(965.950)		(967.840)		(969.190)	
2023/1/26	11:16:30		(964.767)		(967.930)		(968.090)	
2023/1/26	11:31:30		(883.715)		(889.000)		(887.630)	
2023/1/26	11:34:30		(917.596)		(941.970)		(909.710)	
2023/1/26	11:37:30		(953.912)		(955.570)		(955.510)	
2023/1/26	11:40:30	945.279	(944.100)		(948.120)		946.070	1.000837
2023/1/26	11:43:30		(908.010)		(930.600)		(899.360)	
2023/1/26	11:46:30	932.901	(928.631)		(929.250)		933.870	1.001038
2023/1/26	12:31:30		(870.127)		(875.130)		(876.100)	
2023/1/26	12:34:30		(928.040)		(934.680)		(920.050)	
2023/1/26	12:37:30		(784.262)		(865.170)		(745.270)	
2023/1/26	12:40:30		(797.886)		(833.630)		(756.380)	
2023/1/26	12:43:30		(767.482)		(783.800)		(795.940)	
2023/1/26	12:46:30	921.588	(920.144)		(922.640)		(921.260)	
2023/1/26	13:01:30		(886.075)		(905.590)			
2023/1/26	13:04:30		(872.843)		(875.080)			
2023/1/26	13:07:30	912.934	910.457	0.997287	914.780	1.002022		
2023/1/26	13:10:30		(883.278)		(914.320)			
2023/1/26	13:13:30		(901.898)		(908.610)			
2023/1/26	13:16:30	915.495	913.137	0.997425	914.160	0.998542		
2023/1/26	13:31:30				(905.590)			
2023/1/26	13:34:30	890.774			(890.090)			
2023/1/26	13:37:30				(895.040)			
2023/1/26	13:40:30	874.454			(871.200)			
2023/1/26	13:43:30				(867.990)			
2023/1/26	13:46:30	881.990			(885.150)			
2023/1/26	14:01:30				(784.140)			
2023/1/26	14:04:30				(802.180)			
2023/1/26	14:07:30				(779.700)			
2023/1/26	14:10:30				(796.140)			
2023/1/26	14:13:30	806.554			(812.600)			
2023/1/26	14:16:30				(788.220)			

		reference irradiance (W/m^2)	CHP1		PMO8	
			160399		F211-008_WRC	
Date	Time		NEW ZEALAND		Davos Instruments	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/18	10:31:30		(891.103)		(883.691)	
2023/1/18	10:34:30		(893.237)		(885.058)	
2023/1/18	10:37:30	886.039	893.741	1.008692	886.306	1.000301
2023/1/18	10:40:30	891.675	899.652	1.008947	891.955	1.000314
2023/1/18	10:43:30	889.560	897.638	1.009081	889.540	0.999978
2023/1/18	10:46:30	891.087	898.429	1.008239	891.712	1.000701
2023/1/18	11:01:30	894.792	903.213	1.009412	895.029	1.000265
2023/1/18	11:04:30	896.516	903.981	1.008327	896.336	0.999800
2023/1/18	11:07:30	898.419	906.954	1.009500	898.465	1.000051
2023/1/18	11:10:30	894.774	902.374	1.008494	894.968	1.000217
2023/1/18	11:13:30	899.648	906.918	1.008081	899.561	0.999903
2023/1/18	11:16:30	901.879	909.269	1.008193	902.001	1.000135
2023/1/18	11:31:30	899.103	907.770	1.009640	899.150	1.000053
2023/1/18	11:34:30	901.937	909.305	1.008169	902.810	1.000968
2023/1/18	11:37:30	902.470	910.504	1.008902	903.023	1.000613
2023/1/18	11:40:30	900.236	908.585	1.009274		
2023/1/18	11:43:30	902.044	908.873	1.007570		
2023/1/18	11:46:30	897.162	904.412	1.008082	897.135	0.999970
2023/1/18	12:01:30	878.967	886.906	1.009033	879.453	1.000553
2023/1/18	12:04:30	889.719	897.986	1.009291	889.953	1.000263
2023/1/18	12:07:30	887.668	894.544	1.007746	887.175	0.999444
2023/1/18	12:10:30	894.963	902.098	1.007973	895.120	1.000176
2023/1/18	12:13:30	893.129	901.151	1.008982	893.797	1.000748
2023/1/18	12:16:30	895.054	902.890	1.008754	894.875	0.999800
2023/1/18	12:31:30	890.032	897.650	1.008559	891.167	1.001275
2023/1/18	12:34:30	876.723	884.317	1.008662	877.034	1.000355
2023/1/18	12:37:30	874.361	881.547	1.008219	874.643	1.000323
2023/1/18	12:40:30	874.656	882.662	1.009154	875.532	1.001002
2023/1/18	12:43:30	862.524	869.880	1.008529	862.870	1.000402
2023/1/18	12:46:30		(847.722)		(840.381)	
2023/1/19	10:01:30	871.597	881.631	1.011512	871.715	1.000135
2023/1/19	10:04:30	883.593	892.662	1.010264		
2023/1/19	10:07:30	880.171	889.209	1.010268		
2023/1/19	10:10:30	865.325	874.065	1.010099		
2023/1/19	10:13:30	858.563	867.650	1.010583	858.702	1.000161
2023/1/19	10:16:30	860.890	869.916	1.010484	860.910	1.000023
2023/1/19	12:01:30		(859.161)		(851.877)	
2023/1/19	12:04:30		(857.446)		(850.567)	
2023/1/19	12:07:30		(861.930)		(854.039)	
2023/1/19	12:10:30		(871.894)		(863.701)	
2023/1/19	12:13:30	866.850	875.803	1.010328	867.530	1.000784
2023/1/19	12:16:30	865.146	873.489	1.009644	865.337	1.000221
2023/1/19	12:31:30	873.799	883.141	1.010691	874.241	1.000505
2023/1/19	12:34:30	872.586	881.535	1.010256	872.871	1.000327
2023/1/19	12:37:30	870.609	880.024	1.010814	871.050	1.000506
2023/1/19	12:40:30	870.363	879.329	1.010301	870.695	1.000382
2023/1/19	12:43:30	871.514	880.420	1.010218	872.044	1.000608
2023/1/19	12:46:30	866.629	876.127	1.010960	866.815	1.000215
2023/1/19	13:01:30	859.202	867.830	1.010042	859.502	1.000350
2023/1/19	13:04:30	866.395	875.288	1.010265	866.645	1.000289
2023/1/19	13:07:30	869.349	877.818	1.009741	869.191	0.999818
2023/1/19	13:10:30		(172.158)			
2023/1/19	13:13:30		(874.077)		(865.923)	
2023/1/19	13:16:30		(865.743)			
2023/1/19	13:31:30		(60.388)			
2023/1/19	13:34:30		(830.132)			
2023/1/19	13:37:30		(661.151)			
2023/1/19	13:40:30	829.818	838.873	1.010912	830.391	1.000691
2023/1/19	13:43:30	828.093	836.295	1.009905	828.824	1.000883
2023/1/19	13:46:30	831.371	840.144	1.010553	831.866	1.000596

		reference irradiance (W/m^2)	CHP1		PMO8	
			160399		F211-008_WRC	
Date	Time		NEW ZEALAND		Davos Instruments	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/20	9:31:30		(857.182)		(848.110)	
2023/1/20	9:34:30	829.718	839.209	1.011439	831.256	1.001854
2023/1/20	9:37:30		(768.549)			
2023/1/20	9:40:30	835.684	(846.451)			
2023/1/20	9:43:30	851.008	858.393	1.008679	851.297	1.000340
2023/1/20	9:46:30		(750.540)			
2023/1/20	10:01:30	844.968	854.472	1.011249	845.039	1.000085
2023/1/20	10:04:30		(841.319)			
2023/1/20	10:07:30		(792.638)			
2023/1/20	10:10:30	857.597	865.204	1.008870	856.272	0.998455
2023/1/20	10:13:30	867.683	875.540	1.009055	867.298	0.999557
2023/1/20	10:16:30	884.259	894.041	1.011062	884.487	1.000258
2023/1/20	11:01:30		(904.305)		(895.042)	
2023/1/20	11:04:30		(898.309)		(888.700)	
2023/1/20	11:07:30	906.175	915.252	1.010016	907.065	1.000982
2023/1/20	11:10:30	896.041	903.537	1.008365	895.496	0.999391
2023/1/20	11:13:30		(888.489)		(881.980)	
2023/1/20	11:16:30	884.143	892.866	1.009866	884.795	1.000737
2023/1/20	11:31:30	899.347	907.818	1.009419	899.872	1.000584
2023/1/20	11:34:30	910.509	918.765	1.009068	910.460	0.999946
2023/1/20	11:37:30	908.644	916.871	1.009053	909.378	1.000808
2023/1/20	11:40:30	907.795	916.475	1.009562	907.815	1.000022
2023/1/20	11:43:30	910.994	919.880	1.009755	911.594	1.000659
2023/1/20	11:46:30	910.897	918.957	1.008848	911.375	1.000525
2023/1/20	12:01:30		(925.156)		(918.059)	
2023/1/20	12:04:30	910.415	918.477	1.008856	910.057	0.999607
2023/1/20	12:07:30	914.695	923.681	1.009824	915.017	1.000352
2023/1/20	12:10:30	911.000	919.149	1.008945	911.099	1.000109
2023/1/20	12:13:30	906.136	915.036	1.009822	907.093	1.001056
2023/1/20	12:16:30	908.657	916.547	1.008683	908.224	0.999523
2023/1/20	12:31:30	926.272	934.448	1.008827	926.044	0.999754
2023/1/20	12:34:30	926.184	934.784	1.009286	926.617	1.000468
2023/1/20	12:37:30	939.813	948.082	1.008798	940.025	1.000226
2023/1/20	12:40:30	930.055	938.333	1.008900	929.457	0.999357
2023/1/20	12:43:30		(923.705)		(916.269)	
2023/1/20	12:46:30	928.839	937.674	1.009512	929.813	1.001049
2023/1/20	13:01:30	920.184	927.734	1.008205	920.558	1.000407
2023/1/20	13:04:30	921.099	928.657	1.008206	921.706	1.000659
2023/1/20	13:07:30	928.285	936.751	1.009119	928.403	1.000127
2023/1/20	13:10:30	927.694	935.743	1.008677	927.773	1.000085
2023/1/20	13:13:30	930.088	938.082	1.008594	930.478	1.000419
2023/1/20	13:16:30	935.651	943.333	1.008210	936.244	1.000634
2023/1/20	13:31:30	949.854	957.710	1.008271	950.735	1.000928
2023/1/20	13:34:30	946.404	954.520	1.008576	946.255	0.999842
2023/1/20	13:37:30	951.104	958.957	1.008256	951.278	1.000183
2023/1/20	13:40:30	949.496	957.650	1.008587	949.357	0.999853
2023/1/20	13:43:30	946.240	954.125	1.008332	946.439	1.000210
2023/1/20	13:46:30	948.985	956.811	1.008246	949.826	1.000886
2023/1/20	14:01:30	924.895	(932.710)		924.793	0.999889
2023/1/20	14:04:30	928.640	(935.540)		929.279	1.000688
2023/1/20	14:07:30		(939.784)		(932.473)	
2023/1/20	14:10:30		(939.029)		(930.379)	
2023/1/20	14:13:30		(941.835)		(934.213)	
2023/1/20	14:16:30		(940.120)		(930.828)	

		reference irradiance (W/m^2)	CHP1		PMO8	
			160399		F211-008_WRC	
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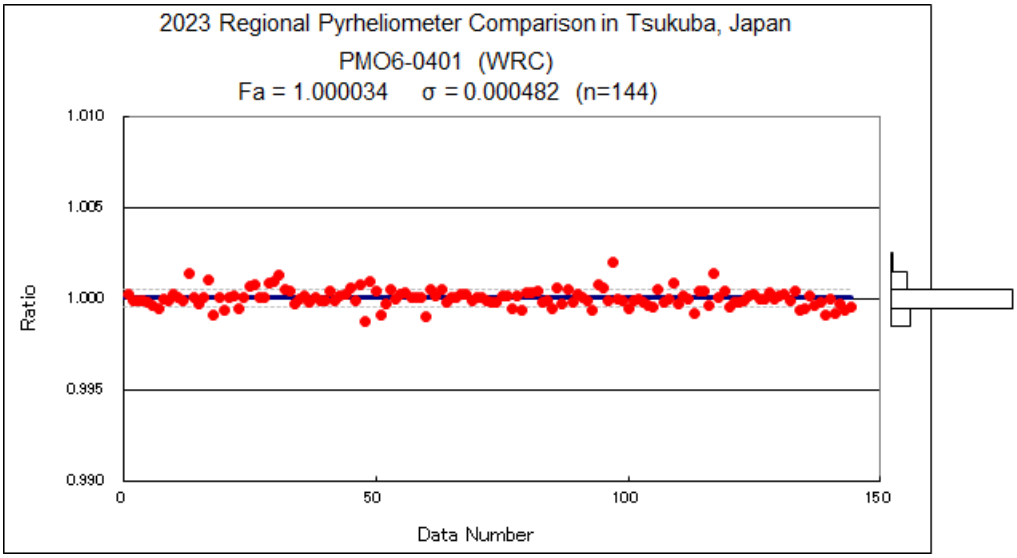
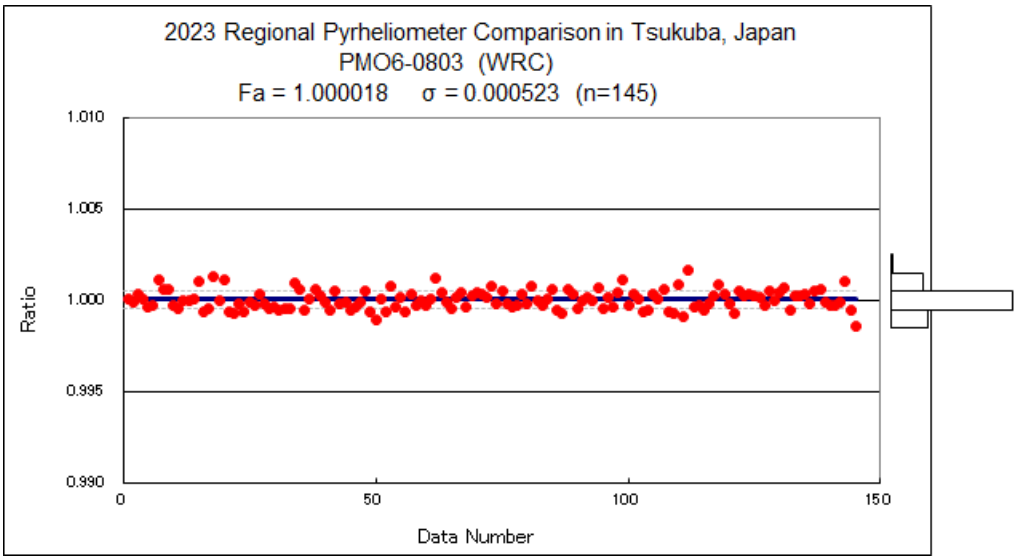
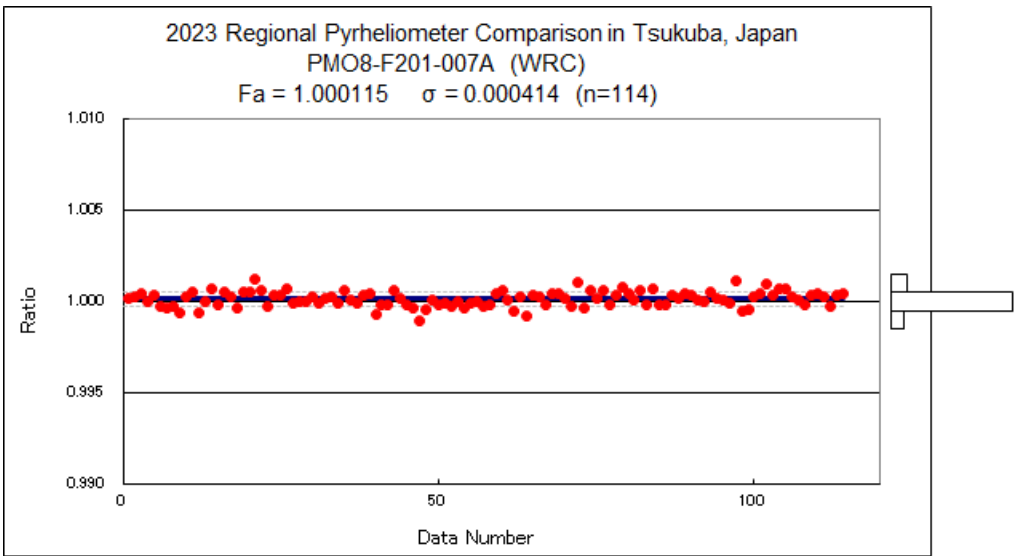
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/21	9:31:30		(948.213)		(940.484)	
2023/1/21	9:34:30	942.867	950.600	1.008201	943.876	1.001070
2023/1/21	9:37:30	945.654	953.825	1.008640	945.743	1.000094
2023/1/21	9:40:30	948.069	955.564	1.007905	948.029	0.999958
2023/1/21	9:43:30	949.478	956.847	1.007761	949.484	1.000006
2023/1/21	9:46:30	950.617	958.753	1.008559	951.691	1.001130
2023/1/21	10:01:30	960.208	969.916	1.010110	961.004	1.000829
2023/1/21	10:04:30	961.818	972.674	1.011287	962.125	1.000319
2023/1/21	10:07:30	960.076	970.324	1.010674	960.889	1.000846
2023/1/21	10:10:30	963.740	973.717	1.010352	964.202	1.000479
2023/1/21	10:13:30	964.155	974.101	1.010316		
2023/1/21	10:16:30	956.428	967.434	1.011508		
2023/1/21	10:31:30		(720.144)			
2023/1/21	10:34:30	972.330	982.158	1.010108	972.560	1.000236
2023/1/21	10:37:30		(498.681)			
2023/1/21	10:40:30	975.404	984.209	1.009026		
2023/1/21	10:43:30		(887.890)			
2023/1/21	10:46:30	971.514	980.947	1.009710	972.296	1.000805
2023/1/21	11:01:30	983.066	992.326	1.009419	983.203	1.000139
2023/1/21	11:04:30	982.357	992.854	1.010686	982.992	1.000647
2023/1/21	11:07:30	988.905	997.386	1.008576	988.989	1.000084
2023/1/21	11:10:30		(929.796)			
2023/1/21	11:13:30		(843.201)			
2023/1/21	11:16:30		(890.528)			
2023/1/21	11:31:30		(931.475)			
2023/1/21	11:34:30	991.327	1000.947	1.009704	990.852	0.999521
2023/1/21	11:37:30		(978.789)			
2023/1/21	11:40:30	996.304	1005.815	1.009547	996.628	1.000325
2023/1/21	11:43:30	996.453	1007.194	1.010780	997.237	1.000787
2023/1/21	11:46:30	997.171	1007.578	1.010437	997.611	1.000442
2023/1/21	12:01:30	994.465	1004.412	1.010003	995.830	1.001372
2023/1/21	12:04:30	995.027	1004.508	1.009529	995.500	1.000476
2023/1/21	12:07:30	998.164	1008.201	1.010056	998.416	1.000253
2023/1/21	12:10:30	998.370	1008.118	1.009763	998.437	1.000067
2023/1/21	12:13:30	995.796	1005.707	1.009953	996.205	1.000410
2023/1/21	12:16:30		(986.906)			
2023/1/21	12:31:30	991.903	1002.002	1.010182	992.070	1.000169
2023/1/21	12:34:30	990.167	1000.156	1.010088	990.727	1.000566
2023/1/21	12:37:30	987.637	997.494	1.009980	987.687	1.000051
2023/1/21	12:40:30	983.673	993.681	1.010175	983.610	0.999936
2023/1/21	12:43:30	980.313	990.084	1.009967	980.999	1.000700
2023/1/21	12:46:30	976.876	986.619	1.009973	977.365	1.000501
2023/1/21	13:01:30	973.873	983.645	1.010034	973.753	0.999877
2023/1/21	13:04:30	970.817	980.252	1.009719		
2023/1/21	13:07:30	963.726	972.206	1.008800		
2023/1/21	13:10:30		(969.580)			
2023/1/21	13:13:30	946.470	956.115	1.010190		
2023/1/21	13:16:30	970.842	980.072	1.009507	971.056	1.000220
2023/1/21	13:31:30	962.030	972.026	1.010391	962.378	1.000362
2023/1/21	13:34:30	961.493	970.995	1.009882	960.889	0.999371
2023/1/21	13:37:30	955.838	964.964	1.009548	956.310	1.000494
2023/1/21	13:40:30	953.943	963.717	1.010246	955.030	1.001140
2023/1/21	13:43:30	955.633	964.736	1.009526	956.244	1.000639
2023/1/21	13:46:30	955.220	965.288	1.010539	956.701	1.001550
2023/1/21	14:01:30	937.938	947.122	1.009792	937.602	0.999642
2023/1/21	14:04:30		(942.518)		(932.752)	
2023/1/21	14:07:30	932.351	942.350	1.010724	931.507	0.999095
2023/1/21	14:10:30		(941.127)			
2023/1/21	14:13:30		(934.604)		(923.977)	
2023/1/21	14:16:30		(929.137)		(920.272)	

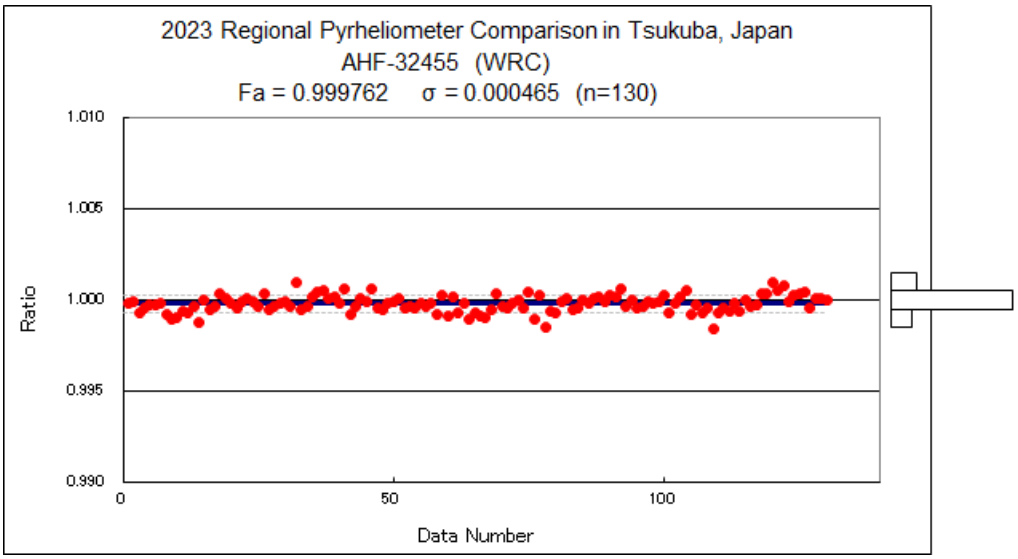
		reference irradiance (W/m^2)	CHP1		PMO8	
			160399		F211-008_WRC	
Date	Time		NEW ZEALAND		Davos Instruments	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO	(W/m^2)	RATIO
2023/1/26	9:31:30		(941.175)		(931.958)	
2023/1/26	9:34:30	928.843	938.537	1.010437	929.003	1.000173
2023/1/26	9:37:30	926.424	935.839	1.010163	926.569	1.000157
2023/1/26	9:40:30	924.598	934.197	1.010382	924.673	1.000081
2023/1/26	9:43:30		(933.094)		(923.534)	
2023/1/26	9:46:30	922.713	931.894	1.009951	922.413	0.999675
2023/1/26	10:01:30	929.847	939.676	1.010571	930.321	1.000510
2023/1/26	10:04:30	926.653	936.535	1.010664	926.834	1.000195
2023/1/26	10:07:30		(939.376)		(929.733)	
2023/1/26	10:10:30	931.082	940.528	1.010144	931.307	1.000241
2023/1/26	10:13:30		(948.873)		(939.682)	
2023/1/26	10:16:30	939.412	949.125	1.010339	939.226	0.999802
2023/1/26	10:31:30		(976.499)		(966.818)	
2023/1/26	10:34:30	969.020	978.849	1.010144	969.008	0.999988
2023/1/26	10:37:30	968.175	977.458	1.009588	968.380	1.000212
2023/1/26	10:40:30		(976.547)		(966.843)	
2023/1/26	10:43:30		(976.151)		(966.465)	
2023/1/26	10:46:30	967.747	977.158	1.009725	967.382	0.999623
2023/1/26	11:01:30	975.322	984.137	1.009038	975.126	0.999800
2023/1/26	11:04:30	975.046	984.376	1.009569	975.053	1.000007
2023/1/26	11:07:30	974.574	983.777	1.009443	974.343	0.999763
2023/1/26	11:10:30	973.992	983.058	1.009308	973.970	0.999977
2023/1/26	11:13:30		(977.974)		(968.501)	
2023/1/26	11:16:30		(977.062)		(967.875)	
2023/1/26	11:31:30		(896.403)			
2023/1/26	11:34:30		(922.002)			
2023/1/26	11:37:30		(964.832)		(955.951)	
2023/1/26	11:40:30	945.279	954.628	1.009891	(945.608)	
2023/1/26	11:43:30		(912.374)			
2023/1/26	11:46:30	932.901	941.715	1.009447		
2023/1/26	12:31:30		(880.659)			
2023/1/26	12:34:30		(938.082)			
2023/1/26	12:37:30		(759.388)			
2023/1/26	12:40:30		(784.784)			
2023/1/26	12:43:30		(792.086)			
2023/1/26	12:46:30	921.588	(930.971)			
2023/1/26	13:01:30		(887.518)			
2023/1/26	13:04:30		(883.345)			
2023/1/26	13:07:30	912.934	921.559	1.009447	912.970	1.000039
2023/1/26	13:10:30		(877.506)			
2023/1/26	13:13:30		(912.974)			
2023/1/26	13:16:30	915.495	924.233	1.009544	915.278	0.999763
2023/1/26	13:31:30		(914.412)		(906.265)	
2023/1/26	13:34:30	890.774	899.652	1.009967	(890.842)	
2023/1/26	13:37:30		(904.868)		(896.143)	
2023/1/26	13:40:30	874.454	882.902	1.009661		
2023/1/26	13:43:30		(879.700)		(870.819)	
2023/1/26	13:46:30	881.990	890.803	1.009993		
2023/1/26	14:01:30		(770.468)			
2023/1/26	14:04:30		(810.252)			
2023/1/26	14:07:30		(798.165)			
2023/1/26	14:10:30		(794.580)			
2023/1/26	14:13:30	806.554	(816.283)			
2023/1/26	14:16:30		(795.995)			

Plot figures of measurement values








2023 Regional Pyrheliometer Comparison in Tsukuba, Japan
AHF-32455 (WRC)
Fa = 0.999762 σ = 0.000465 (n=130)
Ratio
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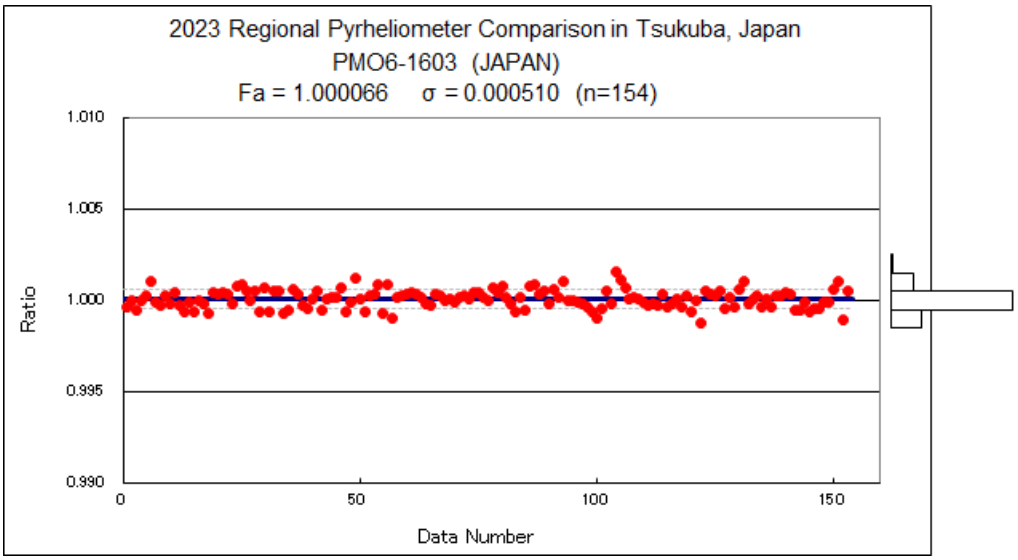
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba, Japan
PMO6-1603 (JAPAN)
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0.995
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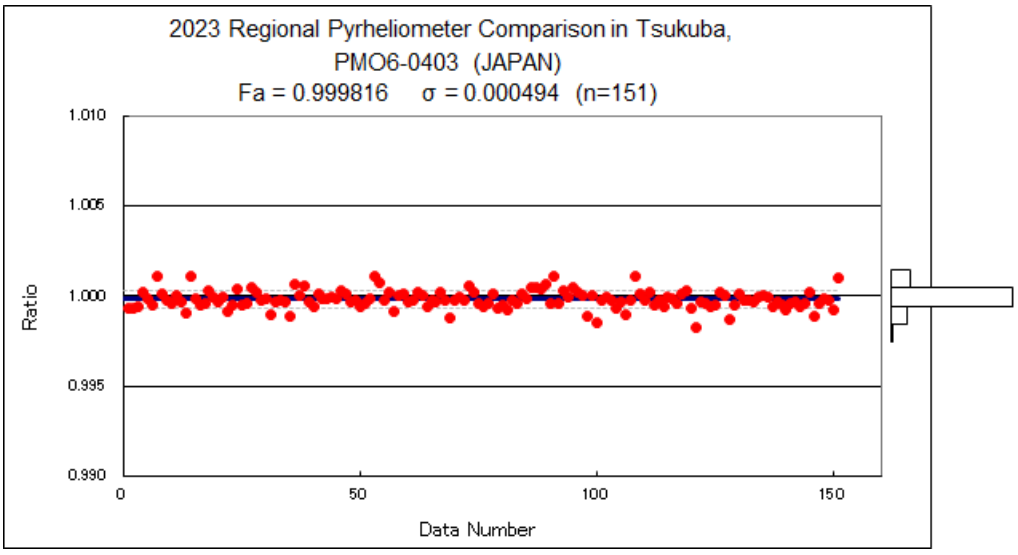
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
PMO6-0403 (JAPAN)
Fa = 0.999816 σ = 0.000494 (n=151)
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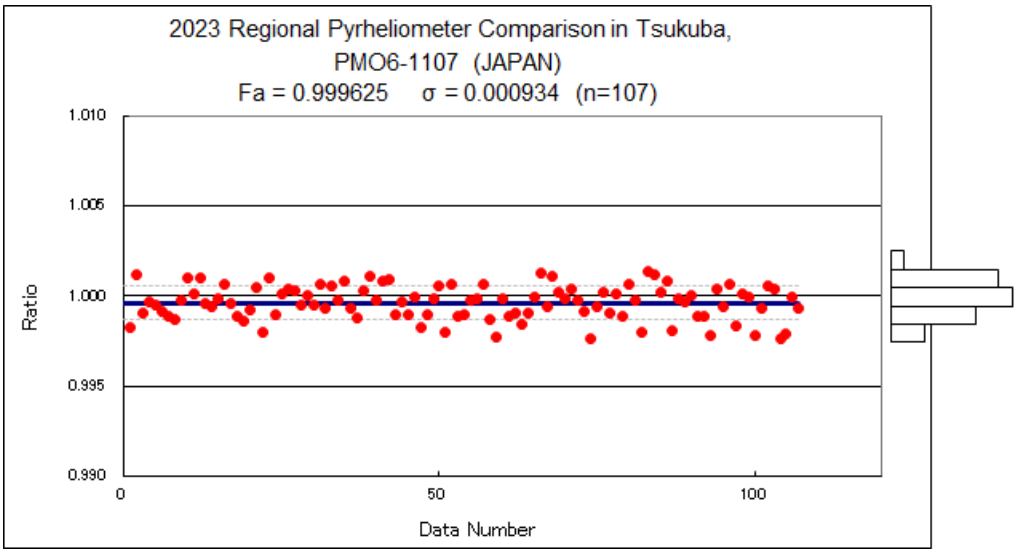
1.000
0.995
0.990
0
50
100
150
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
PMO6-1107 (JAPAN)
Fa = 0.999625 σ = 0.000934 (n=107)
Ratio
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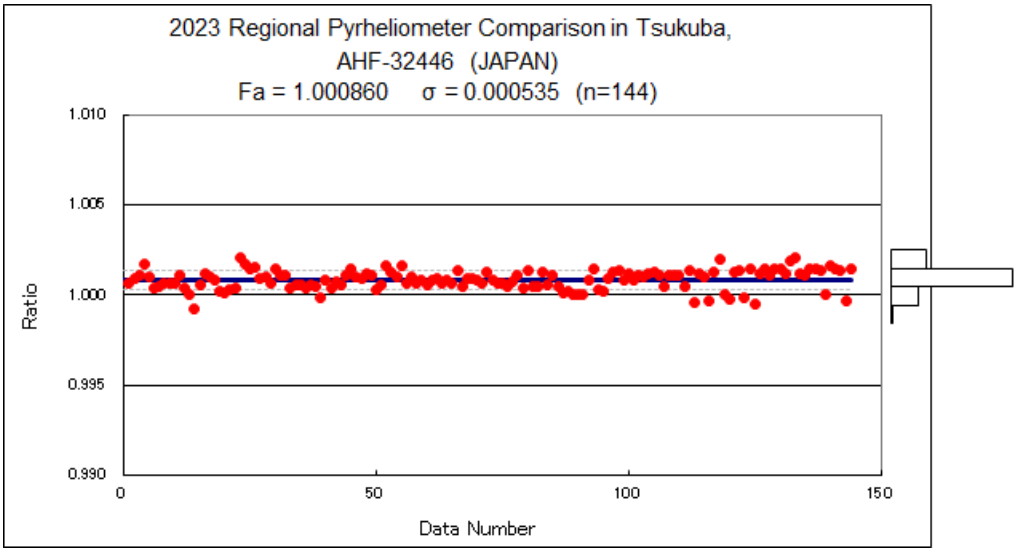
0.995
0.990
0
50
100
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
AHF-32446 (JAPAN)
Fa = 1.000860 σ = 0.000535 (n=144)
Ratio
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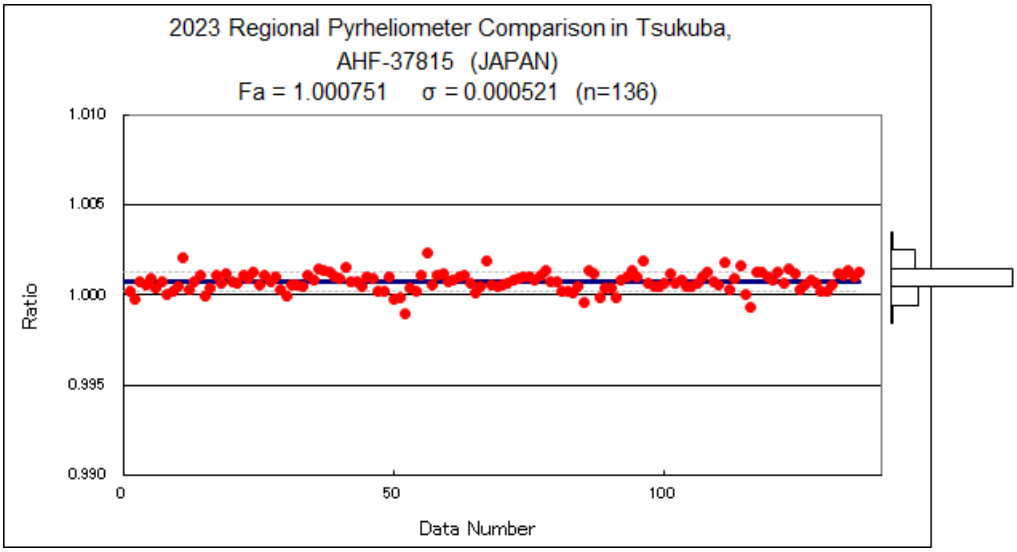
1.000
0.995
0.990
0
50
100
150
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
AHF-37815 (JAPAN)
Fa = 1.000751 σ = 0.000521 (n=136)
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0.990
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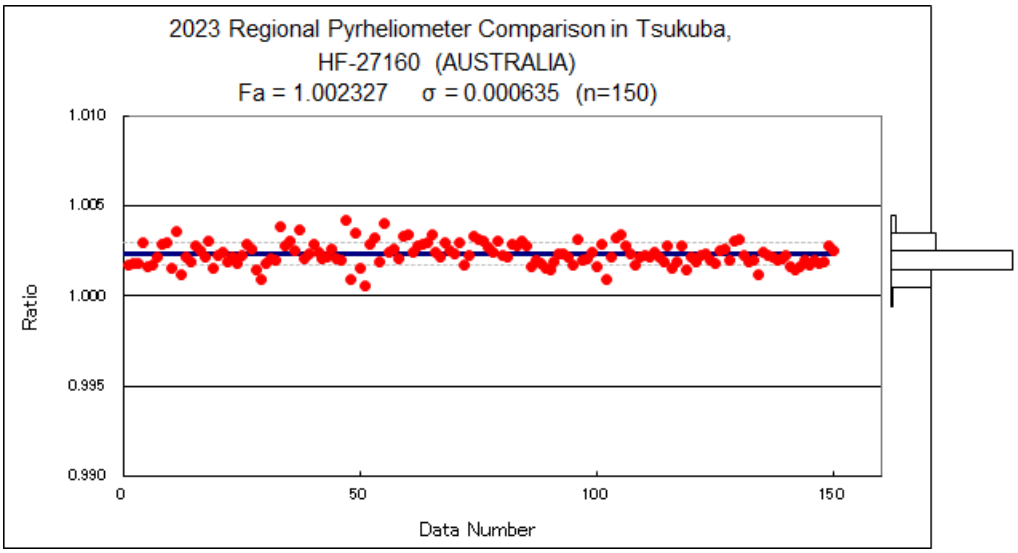
100
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
HF-27160 (AUSTRALIA)
Fa = 1.002327 σ = 0.000635 (n=150)
Ratio
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0.990
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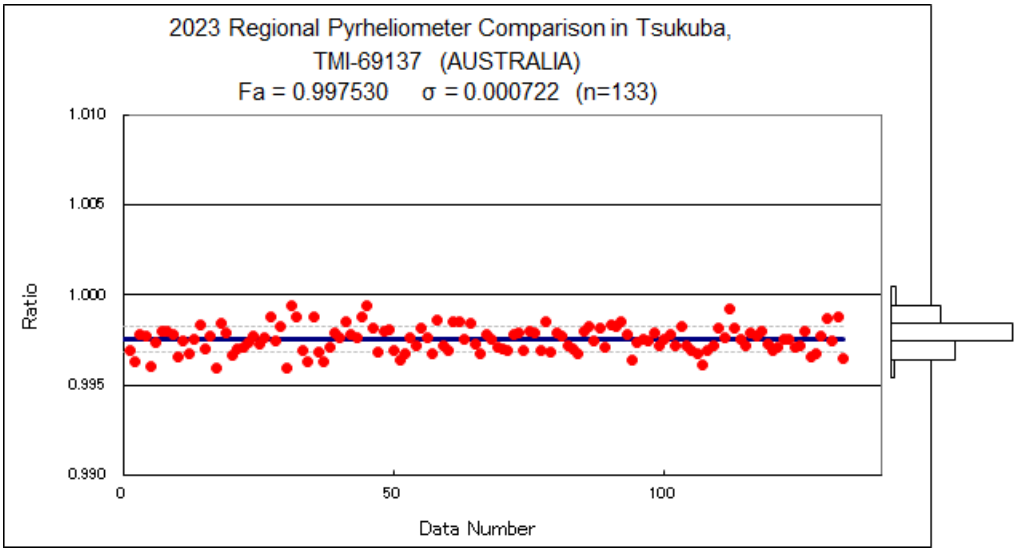
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
TMI-69137 (AUSTRALIA)
Fa = 0.997530 σ = 0.000722 (n=133)
Ratio
1.010
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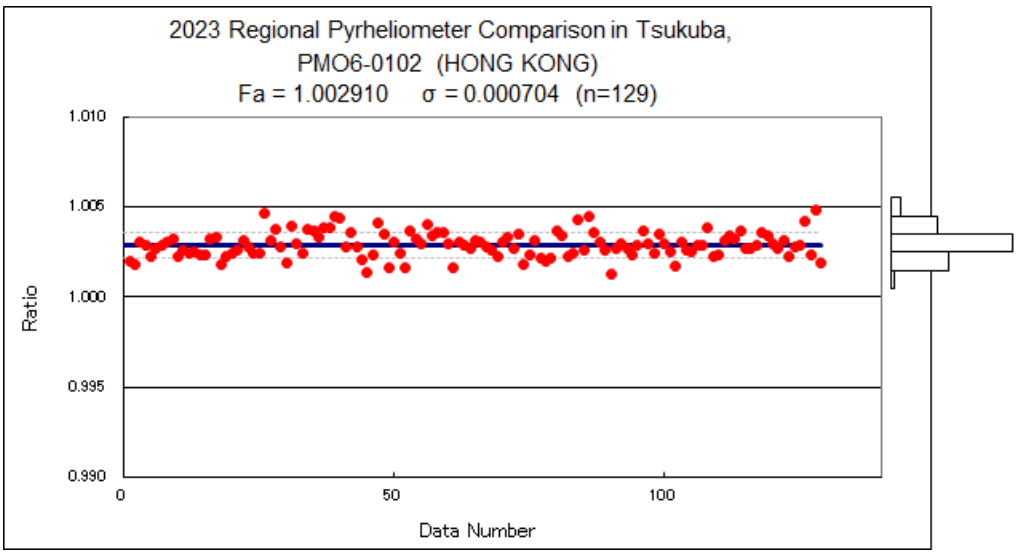
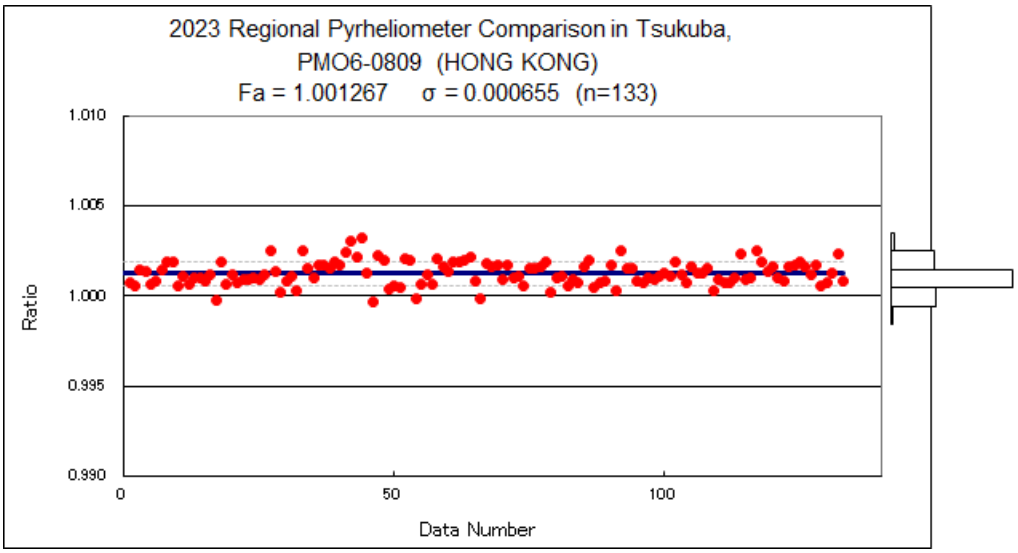
1.000
0.995
0.990
0
50
100
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
PMO6-0102 (HONG KONG)
Fa = 1.002910 σ = 0.000704 (n=129)
Ratio
1.010
1.005
1.000
0.995
0.990
0
50
100
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
PMO6-0809 (HONG KONG)
Fa = 1.001267 σ = 0.000655 (n=133)
Ratio
1.010
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1.000
0.995
0.990
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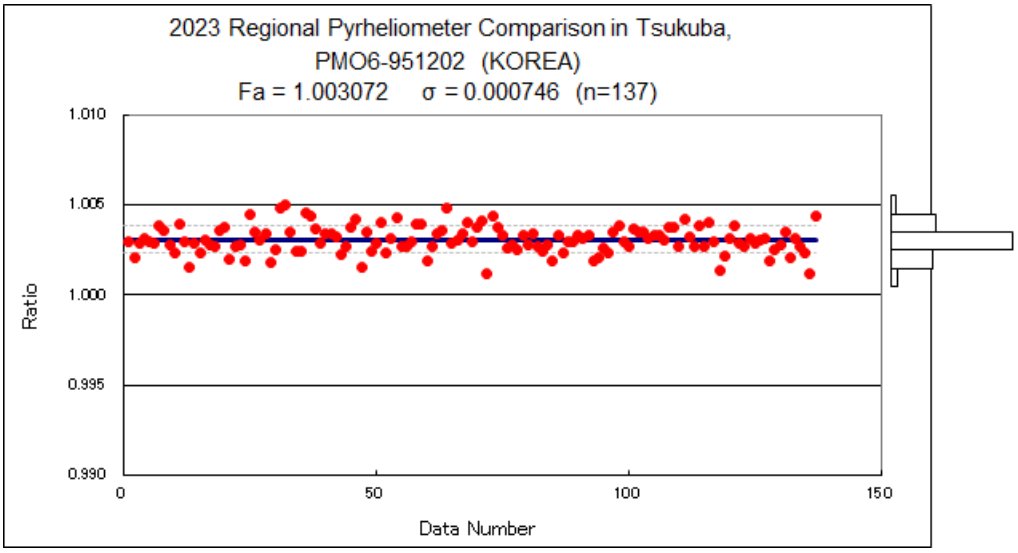
100
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
PMO6-951202 (KOREA)
Fa = 1.003072 σ = 0.000746 (n=137)
Ratio
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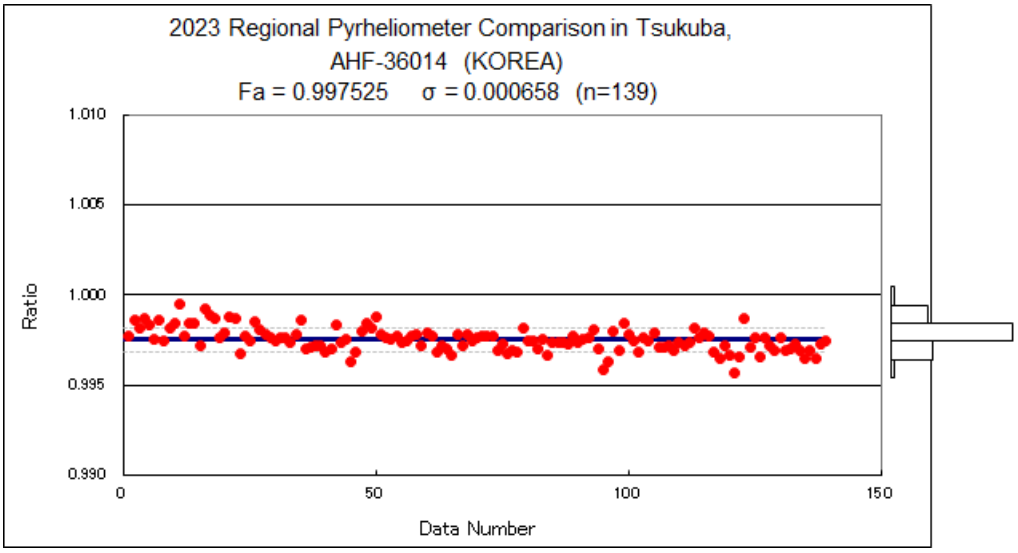
100
150
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
AHF-36014 (KOREA)
Fa = 0.997525 σ = 0.000658 (n=139)
Ratio
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1.000
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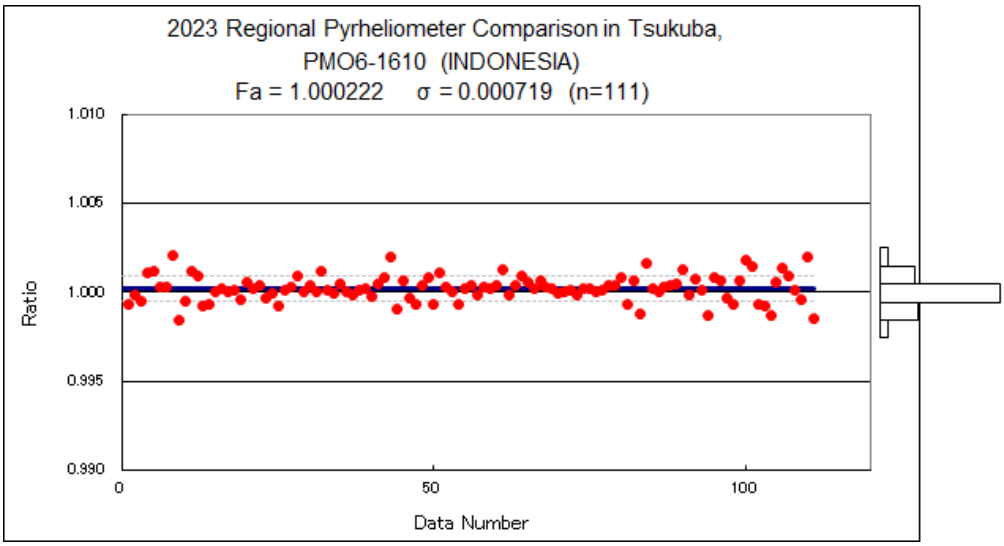
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
PMO6-1610 (INDONESIA)
Fa = 1.000222 σ = 0.000719 (n=111)
Ratio
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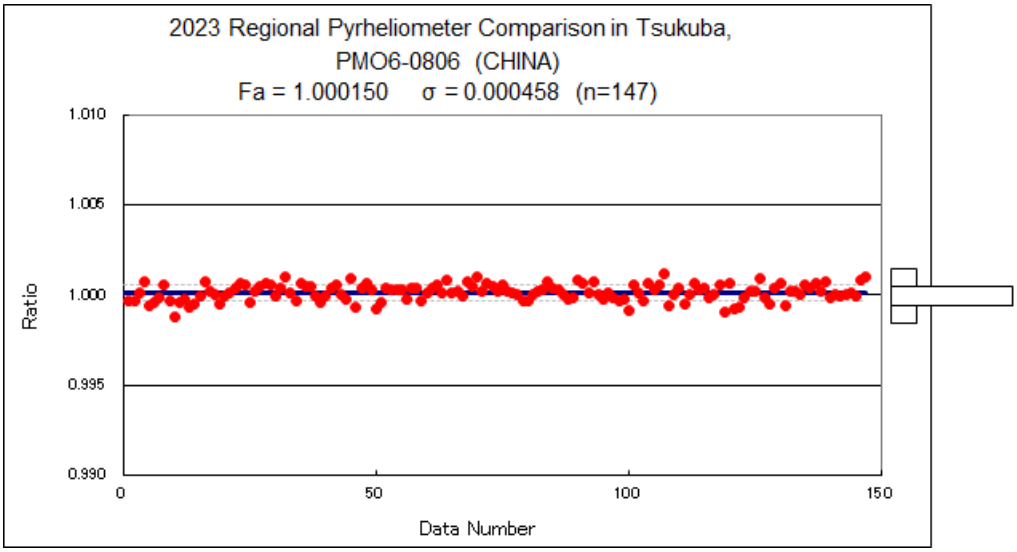
1.005
1.000
0.995
0.990
0
50
100
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
PMO6-0806 (CHINA)
Fa = 1.000150 σ = 0.000458 (n=147)
Ratio
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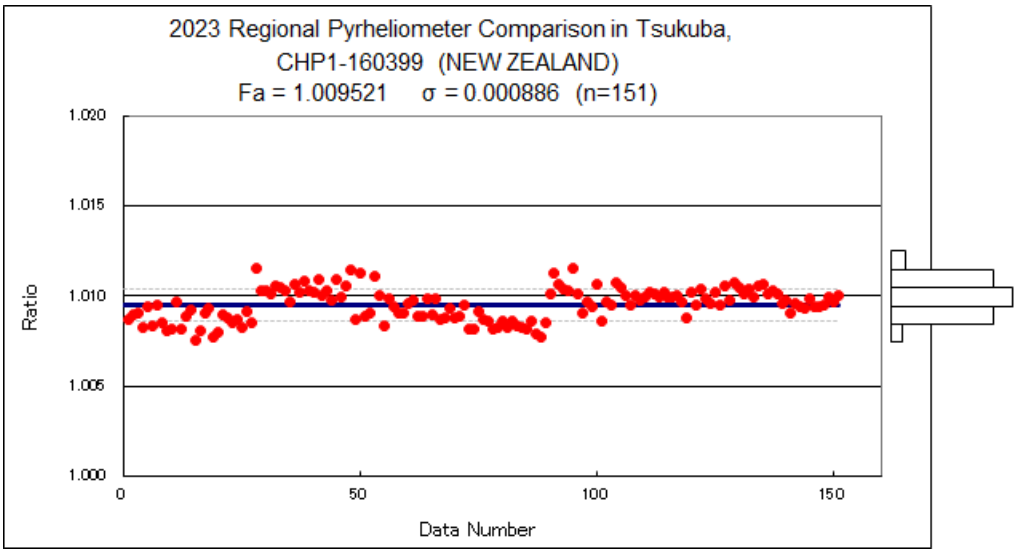
1.005
1.000
0.995
0.990
0
50
100
150
Data Number


2023 Regional Pyrheliometer Comparison in Tsukuba,
CHP1-160399 (NEW ZEALAND)
Fa = 1.009521 σ = 0.000886 (n=151)
Ratio
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1.005
1.000
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50
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150
Data Number

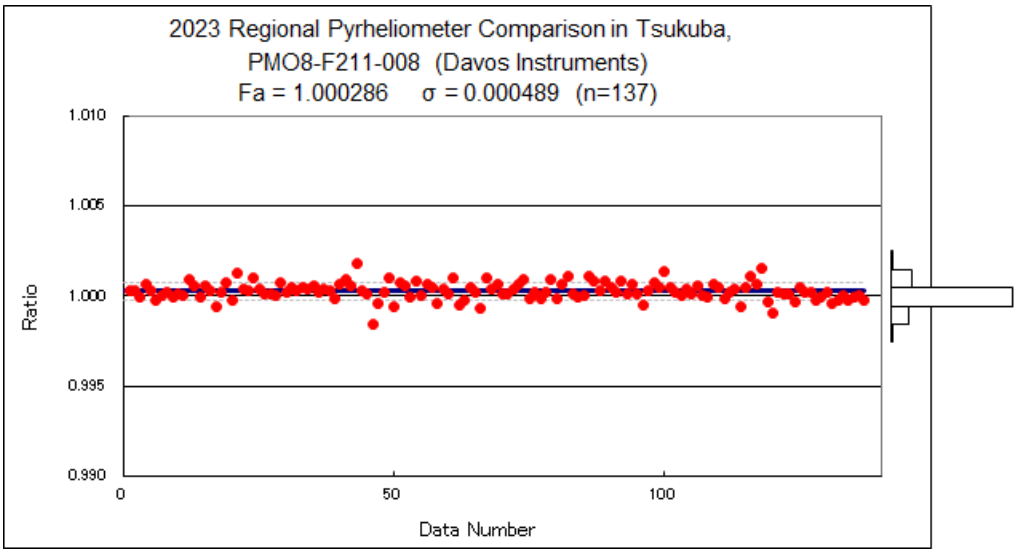


Figure 5. Plot figures of measurement values

METEOROLOGICAL DATA

The table in this appendix shows meteorological data obtained during irradiance measurements.

1. Temperature (T), Relative Humidity (RH), Station Pressure (SP), Wind Speed (WS) and Wind Direction (WD)

Temperature, relative humidity, station pressure and wind speed/direction (instantaneous values) measured initially via an AWS.

2. Irradiance (S) and Standard Deviation (σ)

Mean values calculated from reference irradiances for each measurement series and the related standard deviation

3. Elevation Angle (θ), Optical Air Mass (m)

Mean values for each measurement series

4. Aerosol Optical Depth (AOD)

Mean values calculated from the AOD at 500 nm in each measurement series based on data from a sky radiometer (POM-02).

Mean values from the AOD at 500 nm

Date	Time (start)		Time (end)	T (℃)	RH (%)	SP (hPa)	WS (m/s)	WD (degree)	S ± σ (W/m²)			θ (degree)	m	AOD
18 Jan 2023	9:30	–	9:48	–	–	–	–	–	–	±	–	25.3	–	–
	10:00	–	10:18	–	–	–	–	–	–	±	–	28.4	–	–
	10:30	–	10:48	6.8	43.7	955.7	1.4	298	889.6	±	2.3	30.7	1.82	0.08
	11:00	–	11:18	7.1	43.6	955.5	0.8	16	897.7	±	2.7	32.3	1.76	0.08
	11:30	–	11:48	7.7	39.0	955.0	0.8	262	900.6	±	2.1	33.1	1.73	0.09
	12:00	–	12:18	8.3	40.6	954.3	1.0	162	889.9	±	5.7	33.0	1.72	0.10
	12:30	–	12:48	8.1	46.9	953.5	1.5	320	875.7	±	9.1	32.0	1.75	0.10
	13:00	–	13:18	8.3	47.6	953.2	1.4	14	–	±	–	30.2	1.83	0.18
	13:30	–	13:48	9.1	48.7	953.0	0.5	169	–	±	–	27.6	1.96	0.43
	14:00	–	14:18	9.7	49.2	952.9	0.6	56	–	±	–	24.3	2.17	0.15
19 Jan 2023	9:30	–	9:48	1.7	51.9	961.5	2.7	6	–	±	–	25.4	2.20	0.27
	10:00	–	10:18	2.3	52.2	961.4	2.4	50	870.6	±	9.6	28.5	1.98	0.10
	10:30	–	10:48	3.2	51.5	961.4	0.7	108	–	±	–	30.9	1.84	0.34
	11:00	–	11:18	5.3	46.2	961.0	0.3	30	–	±	–	32.5	1.76	0.16
	11:30	–	11:48	4.8	47.8	960.4	2.0	94	–	±	–	33.3	1.72	0.18
	12:00	–	12:18	4.9	47.7	960.0	0.4	58	866.0	±	1.0	33.2	1.73	0.12
	12:30	–	12:48	4.1	48.7	959.6	1.5	45	871.1	±	2.2	32.2	1.77	0.11
	13:00	–	13:18	4.3	47.3	959.6	0.6	108	865.0	±	4.4	30.4	1.87	0.19
	13:30	–	13:48	4.2	46.5	959.5	1.8	52	829.8	±	1.5	27.8	2.02	0.20
	14:00	–	14:18	4.1	47.3	959.5	2.0	75	–	±	–	24.5	2.27	0.28
20 Jan 2023	9:30	–	9:48	5.0	73.1	955.2	0.6	325	840.1	±	10.0	25.6	2.17	0.11
	10:00	–	10:18	5.7	71.0	954.9	1.1	53	865.4	±	15.1	28.7	1.96	0.10
	10:30	–	10:48	6.9	70.2	954.1	0.3	88	–	±	–	31.1	1.82	0.16
	11:00	–	11:18	6.5	72.9	953.3	2.8	215	894.6	±	9.5	32.7	1.74	0.11
	11:30	–	11:48	6.5	68.0	952.8	1.1	198	908.0	±	4.2	33.5	1.70	0.09
	12:00	–	12:18	7.1	65.0	952.0	2.3	205	910.2	±	2.9	33.4	1.70	0.09
	12:30	–	12:48	7.7	61.0	951.2	0.9	348	930.2	±	5.2	32.4	1.75	0.07
	13:00	–	13:18	7.7	58.1	950.9	1.3	202	927.1	±	5.5	30.6	1.84	0.07
	13:30	–	13:48	8.4	51.0	950.6	1.5	224	948.7	±	1.9	28.0	1.99	0.04
	14:00	–	14:18	8.8	46.2	950.4	2.7	226	926.6	±	2.0	24.8	2.23	0.04
21 Jan 2023	9:30	–	9:48	2.1	33.5	960.2	0.6	189	947.3	±	2.9	25.7	2.17	0.03
	10:00	–	10:18	2.4	34.5	960.3	0.8	194	961.4	±	2.5	28.9	1.96	0.04
	10:30	–	10:48	3.0	33.3	960.3	0.5	154	972.9	±	1.8	31.3	1.82	0.11
	11:00	–	11:18	3.0	33.8	960.1	2.7	168	985.1	±	3.2	32.9	1.74	0.08
	11:30	–	11:48	3.5	30.9	959.7	4.1	156	994.0	±	7.0	33.7	1.70	0.04
	12:00	–	12:18	3.7	29.3	959.3	1.2	187	995.1	±	5.0	33.6	1.71	0.04
	12:30	–	12:48	4.4	28.3	959.2	1.4	181	985.3	±	5.6	32.6	1.75	0.04
	13:00	–	13:18	4.5	28.4	959.1	0.6	304	966.0	±	9.3	30.8	1.84	0.04
	13:30	–	13:48	4.6	28.2	959.2	0.8	211	957.3	±	3.3	28.2	1.99	0.04
	14:00	–	14:18	3.7	30.2	959.5	0.9	116	935.1	±	3.1	25.0	2.23	0.04
26 Jan 2023	9:30	–	9:48	−1.0	29.7	956.0	5.5	239	925.5	±	2.3	26.6	2.10	0.05
	10:00	–	10:18	−0.8	35.1	955.9	1.5	348	931.3	±	4.6	29.8	1.89	0.06
	10:30	–	10:48	−0.1	37.1	955.4	3.7	232	968.3	±	0.7	32.3	1.76	0.05
	11:00	–	11:18	1.1	33.3	955.0	5.7	271	974.7	±	0.7	34.0	1.68	0.06
	11:30	–	11:48	1.7	29.9	954.2	7.7	252	924.2	±	26.1	34.9	1.64	0.09
	12:00	–	12:18	2.6	31.8	953.8	3.1	227	–	±	–	34.8	1.64	0.22
	12:30	–	12:48	2.8	32.7	953.5	1.7	337	921.6	±	0.2	33.9	1.68	0.12
	13:00	–	13:18	3.3	31.0	953.3	6.8	260	914.1	±	1.4	32.0	1.77	0.10
	13:30	–	13:48	3.8	28.8	953.2	1.4	19	883.2	±	7.2	29.4	1.91	0.09
	14:00	–	14:18	3.9	29.0	953.2	1.9	227	797.7	±	9.8	26.2	2.13	0.12

Relationship between reference irradiances and auxiliary data

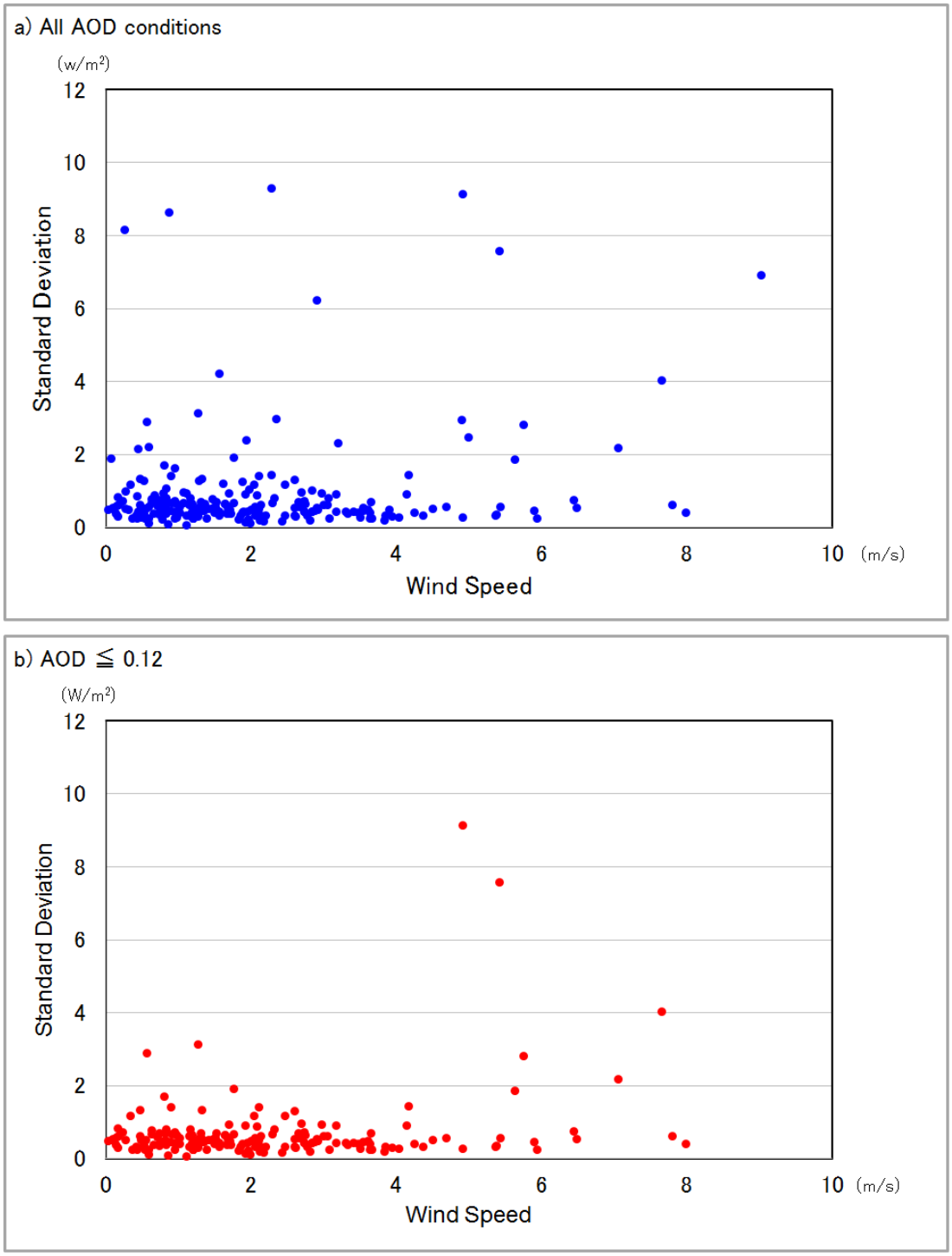


Figure 6. Relationship between reference irradiances and auxiliary data

The graphs show standard deviations of reference irradiances plotted against wind speed. Top: standard deviations of reference irradiances for all AOD conditions; bottom: cases in which AOD values were equal to or less than the adopted AOD criteria of 0.120 for calculation of reference irradiances.

Group Photo of Participants

Photo 1. Participants in the Fifth WMO Regional Pyrheliometer Comparison of RA II, held jointly with RA V (Tsukuba, Japan)

(Back row left to right)

Mr Genki Tsuda, Mr Osamu Ijima, Mr Roni Dwi Saputro, Mr Lee Yong Joo, Mr Kim Gi Chang, Mr Takuto Usuda, Dr Markus Suter, Mr Agus Sail, Mr Jon Buchli, Mr Lee Won Chul, Mr Chau Hak Ming Tony, Mr Shun Sasaki,

(Front row left to right)

Mr Masaki Adachi, Mr Atsushi Saito, Dr Wolfgang Finsterle, Mr Takanori Mizuno, Mr Michael Milner, Mr Jun Ohtake, Mr Nozomu Ohkawara.

Activities of the Regional Radiation Centre, Tokyo

1964	Pyrheliometer Intercomparison: India – Japan (Pune, India)
1965	**Regional Radiation Centre Established (RA II Res.20, CIMO IV Rec.1,3,9)**
1968	Pyrheliometer Intercomparison: Thailand – Japan (Tsukuba, Japan)
1970	Attendance at IPC-III (WRC/Davos, Switzerland)
1975	Attendance at IPC-IV (WRC/Davos, Switzerland) Pyrheliometer Intercomparison: China – Japan (Tsukuba, Japan)
1980	Attendance at IPC-V (WRC/Davos, Switzerland)
1983	Pyrheliometer Intercomparison: Hong Kong, China – Japan (Tsukuba, Japan)
1985	Attendance at IPC-VI (WRC/Davos, Switzerland)
1989	**RPC-I: Regional Pyrheliometer Comparison: RA II & RA V (Tsukuba, Japan)**
1990	Join in IPC-VII (WRC/Davos, Switzerland)
1994	Reference Pyranometer Calibration: Thailand (Tsukuba, Japan)
1995	Pyrheliometer Intercomparison: China – Japan (Tsukuba, Japan) Reference Pyranometer Calibration: Republic of Korea (Tsukuba, Japan) Attendance at IPC-VIII (WRC/Davos, Switzerland)
1996	Pyrheliometer calibration training: Republic of Korea (Tsukuba, Japan)
1997	Pyrheliometer Intercomparison: Hong Kong, China & Republic of Korea – Japan (Tsukuba, Japan) Reference Pyranometer Calibration training: Philippines (Tsukuba, Japan)
2000	Attendance at IPC-IX (WRC/Davos, Switzerland)
2002	Pyrheliometer Intercomparison: Hong Kong, China & Republic of Korea – Japan (Tsukuba, Japan)
2005	Attendance at IPC-X (WRC/Davos, Switzerland)
2007	**RPC-II: Regional Pyrheliometer Comparison: RA II (Tsukuba, Japan)**
2010	Attendance at IPC-XI (WRC/Davos, Switzerland)
2012	**RPC-III: Regional Pyrheliometer Comparison: RA II (Tsukuba, Japan)**
2015	Attendance at IPC-XII (WRC/Davos, Switzerland)
2017	**RPC-IV: Regional Pyrheliometer Comparison: RA II and RA V (Tsukuba, Japan)**
2022	Attendance at IPC-XIII (WRC/Davos, Switzerland, instruments only due to COVID-19)
2023	**RPC-V: Regional Pyrheliometer Comparison: RA II and RA V (Tsukuba, Japan)**

Part II

CALIBRATION OF REFERENCE PYRANOMETERS

1. INTRODUCTION

Calibration of the Republic of Korea's pyranometer (CMP22, No. 090081) and Hong Kong, China's pyranometers (CMP22, No. 160505 and No. 190657) was carried out jointly during the period of the Regional Pyrheliometer Comparison of RA II and RA V (21–26 January 2023).

2. METHOD OF CALIBRATION AND DATA ACQUISITION

Calibration was performed using the collimation tube method, in which the target pyranometer is attached to the bottom end of a collimation tube (i.e. a long tube with diaphragms) mounted on an automatic sun tracker (see Photo 1). As the optical geometry of the combined system involving the pyranometer and the collimation tube are adjusted to match that of an absolute cavity radiometer (a half opening angle of 2.5 degrees), both instruments can be compared directly using a common radiation source. Voltages from the pyranometer were measured every second. Values measured with the same timing as the reference irradiance were taken as output data for sensitivity calculation. In each series, six sets of output data were acquired with these time intervals.

3. PYRANOMETER CALIBRATION FACTOR DEFINITION

In this study, the pyranometer calibration factor was defined as the irradiance sensitivity based on the following formula:

$S = V_{th} / K$

where:

S irradiance [W m^{-2}]

V_{th} output of pyranometer [mV]

K calibration factor (0.00981 mV W^{-2} m^2)

4. DATA EVALUATION PROCEDURE

The WRR reduction factor for the pyranometer was determined by applying the same evaluation procedures for pyrheliometers described in Section 7, Part I.

5. CALIBRATION RESULTS

Table 3. Calibration results

Instrument	Current WRR Reduction Factor	Ratio (Fa)	Standard Deviation (σ)	Number of Data (n)	New WRR Reduction Factor	Change Value of WRR Reduction Factor (ppm)
CMP22 No. 090081 Republic of Korea	1.000343 (4th RPC-RA II, 2017)	0.999492	0.000596	50	1.000508	165

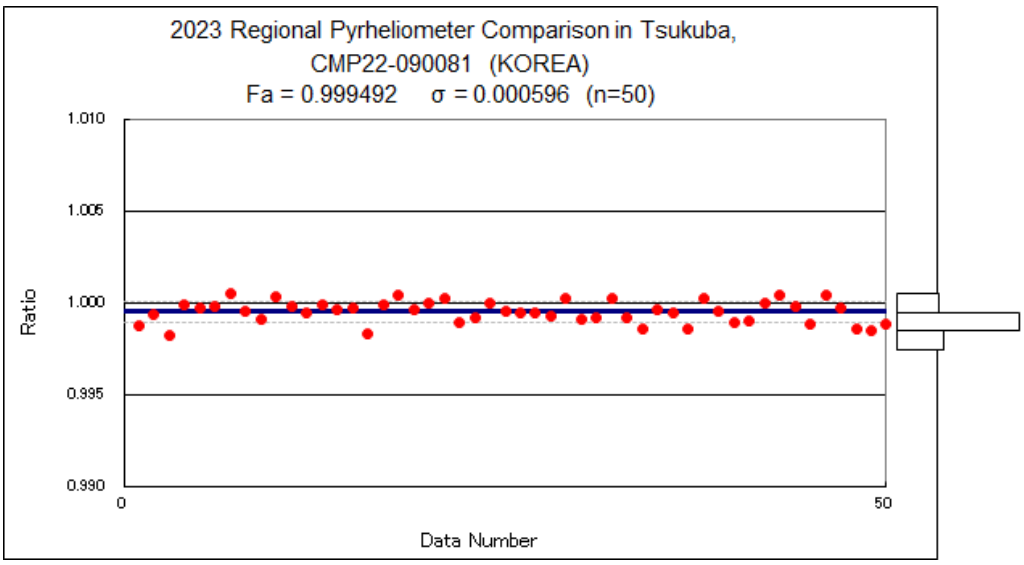
The measurement values for each instrument are listed in ***Appendix H***. A plot of the calibration results is also shown in ***Appendix H***. The scatter plots show the sensitivities to the reference irradiances, and the histograms show the distribution of these sensitivities for each pyranometer. The number of data along with the average and standard deviations of the sensitivities are also shown. Unfortunately, because of doubtful measurements of output voltage due to malfunction of instruments or a data logger for Hong Kong, China's two pyranometers during the calibration, the WRR reduction factors were not calculated for these instruments.

Photo 2. The collimation tube/pyranometer combination. A pyranometer was attached to the bottom end of the tube.

Measurement Values and Plots for a Reference Pyranometer

Date	Time	reference irradiance (W/m^2)	CMP22 090081 REPUBLIC OF KOREA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO
2023/1/21	9:31:30		(940.353)	
2023/1/21	9:34:30	942.867	941.702	0.9988
2023/1/21	9:37:30	945.654	(946.484)	
2023/1/21	9:40:30	948.069	947.496	0.9994
2023/1/21	9:43:30	949.478	947.799	0.9982
2023/1/21	9:46:30	950.617	950.507	0.9999
2023/1/21	10:01:30	960.208	959.908	0.9997
2023/1/21	10:04:30	961.818	961.586	0.9998
2023/1/21	10:07:30	960.076	960.532	1.0005
2023/1/21	10:10:30	963.740	963.261	0.9995
2023/1/21	10:13:30	964.155	963.255	0.9991
2023/1/21	10:16:30	956.428	956.754	1.0003
2023/1/21	10:31:30		(654.813)	
2023/1/21	10:34:30	972.330	972.119	0.9998
2023/1/21	10:37:30		(464.002)	
2023/1/21	10:40:30	975.404	974.853	0.9994
2023/1/21	10:43:30		(865.773)	
2023/1/21	10:46:30	971.514	971.410	0.9999
2023/1/21	11:01:30	983.066	982.731	0.9997
2023/1/21	11:04:30	982.357	982.050	0.9997
2023/1/21	11:07:30	988.905	987.186	0.9983
2023/1/21	11:10:30		(906.152)	
2023/1/21	11:13:30		(825.112)	
2023/1/21	11:16:30		(906.150)	
2023/1/21	11:31:30		(933.072)	
2023/1/21	11:34:30	991.327	991.201	0.9999
2023/1/21	11:37:30		(966.262)	
2023/1/21	11:40:30	996.304	996.724	1.0004
2023/1/21	11:43:30	996.453	996.062	0.9996
2023/1/21	11:46:30	997.171	997.101	0.9999
2023/1/21	12:01:30	994.465	994.661	1.0002
2023/1/21	12:04:30	995.027	993.955	0.9989
2023/1/21	12:07:30	998.164	997.350	0.9992
2023/1/21	12:10:30	998.370	998.384	1.0000
2023/1/21	12:13:30	995.796	995.337	0.9995
2023/1/21	12:16:30		(979.291)	
2023/1/21	12:31:30	991.903	991.314	0.9994
2023/1/21	12:34:30	990.167	989.631	0.9995
2023/1/21	12:37:30	987.637	986.932	0.9993
2023/1/21	12:40:30	983.673	983.881	1.0002
2023/1/21	12:43:30	980.313	979.448	0.9991
2023/1/21	12:46:30	976.876	976.048	0.9992

Date	Time	reference irradiance (W/m^2)	CMP22 090081 REPUBLIC OF KOREA	
yyyy/mm/dd	hh:mm:ss		(W/m^2)	RATIO
2023/1/21	13:01:30	973.873	974.139	1.0003
2023/1/21	13:04:30	970.817	970.049	0.9992
2023/1/21	13:07:30	963.726	(964.926)	
2023/1/21	13:10:30		(956.402)	
2023/1/21	13:13:30	946.470	945.150	0.9986
2023/1/21	13:16:30	970.842	970.457	0.9996
2023/1/21	13:31:30	962.030	961.455	0.9994
2023/1/21	13:34:30	961.493	960.129	0.9986
2023/1/21	13:37:30	955.838	956.072	1.0002
2023/1/21	13:40:30	953.943	(954.735)	
2023/1/21	13:43:30	955.633	(956.118)	
2023/1/21	13:46:30	955.220	954.764	0.9995
2023/1/26	9:31:30		(932.979)	
2023/1/26	9:34:30	928.843	(929.546)	
2023/1/26	9:37:30	926.424	925.428	0.9989
2023/1/26	9:40:30	924.598	923.711	0.9990
2023/1/26	9:43:30		(924.736)	
2023/1/26	9:46:30	922.713	922.680	1.0000
2023/1/26	10:01:30	929.847	930.212	1.0004
2023/1/26	10:04:30	926.653	(927.124)	
2023/1/26	10:07:30		(928.152)	
2023/1/26	10:10:30	931.082	930.885	0.9998
2023/1/26	10:13:30		(937.044)	
2023/1/26	10:16:30	939.412	(940.445)	
2023/1/26	10:31:30		(968.261)	
2023/1/26	10:34:30	969.020	967.893	0.9988
2023/1/26	10:37:30	968.175	968.560	1.0004
2023/1/26	10:40:30		(966.141)	
2023/1/26	10:43:30		(965.449)	
2023/1/26	10:46:30	967.747	967.498	0.9997
2023/1/26	11:01:30	975.322	973.952	0.9986
2023/1/26	11:04:30	975.046	973.589	0.9985
2023/1/26	11:07:30	974.574	(976.311)	
2023/1/26	11:10:30	973.992	972.858	0.9988
2023/1/26	11:13:30		(968.022)	
2023/1/26	11:16:30		(967.977)	


2023 Regional Pyrheliometer Comparison in Tsukuba,
CMP22-090081 (KOREA)
Fa = 0.999492 σ = 0.000596 (n=50)
1.010
1.005
1.000
0.995
0.990
Ratio
0
50
Data Number