Protocol of the solar UV intercomparison at INTA, El Arenosillo, Spain from June 15 to 27, 2025, with the travelling reference spectroradiometer QASUME from PMOD/WRC

Report prepared by Gregor Hülsen

Operator: Franz Zeilinger and Gregor Hülsen

The purpose of the visit was the comparison of spectral global solar irradiance measurements between the 20 spectrophotometers participating at the 20th Regional Brewer Calibration Center – Europe (RBCC-E) Campaign and the travel reference spectroradiometer QASUME. In addition, 8 BTS spectroradiometers from Gigahertz Optik GmbH participated to the campaign. Three BTS recorded global UV irradiance and five direct solar irradiance. One day was selected to measure global irradiance for all BTS.
The measurement site is located at El Arenosillo; Latitude 37.10 N, Longitude 6.73 W and altitude 50 m a.s.l.
The horizon of the measurement site is free down to at least 85° solar zenith angle (SZA). Measurements between 6:00 UT and 19:00 UT have been analysed.

QASUME arrived at INTA in the morning of June 15, 2025. The spectroradiometer was installed in line to the Brewer spectrophotometers with the entrance optic of QASUME between 2 and 20 m away from the other instruments. The measurement campaign lasted 13 days, from noon of June 15 to the afternoon of June 27.

QASUME was calibrated several times during the intercomparison period using a portable calibration system. Four lamps (T61251, T68523, T153061 and T153062) were used to obtain an absolute spectral irradiance calibration traceable to the primary reference held at PMOD/WRC, which is traceable to PTB. The daily mean responsivity of the instrument based on these calibrations varied by less than 1 % during the intercomparison period. The internal temperature of QASUME was 31.2±0.1 °C and the diffuser head was heated to a temperature of 29.1±0.7 °C.
The wavelength shifts relative to the QASUMEFTS (Gröbner et al., 2017) spectrum as retrieved from the MatSHIC analysis were between ±50 pm in the spectral range 290 to 400 nm.

Table 1: Participating Brewer spectrophotometers; 12 single and 8 double monochromators. Instruments in *Italic* are not used for UV measurements and don't require are UV calibration.

Instrument ID	Institution	Operator	Country
#001-MKIV	Academy of Athens	Ilias Fountoulakis	Greece
#033-MKII	AEMET Santa Cruz	Jose Maria San Atanasio	Spain
#063-MKII	*Felice Dipace*	*Centro Aeronautica Militare di Montagna*	*Italy*
#070-MKIV	AEMET Coruna	Jose Maria San Atanasio	Spain
#071-MKIV	*Kenya Meteorol.l Dep.*	*Syprose Nyadida*	*Keny*
#075-MKIV	*UKMO*	*Richard Kift*	*U.K.*
#109-MKIV	*IOS*	*Volodia Savastiok*	*Canada*
#117-MKIV	AEMET MURCIA	Jose Maria San Atanasio	Spain
#126-MKII	*UKMO*	*Richard Kift*	*U.K.*
#143-MKIV	EGY	Ayman	Egipty
#150-MKIII	INTA HUELVA	Jose Manuel Vilaplana	Spain
#151-MKIV	AEMET Madrid	Jose Maria San Atanasio	Spain
#166-MKIV	AEMET Zargoza	Jose Maria San Atanasio	Spain
#172-MKIII	UKMO	Richard Kift	U.K.
#185-MKIII (IZ3)	AEMET IZAÑA	Alberto Redondas	Spain
#186-MKIII	AEMET Madrid	Jose Maria San Atanasio	Spain
#201-MKIII	Sida Lamine BAIKA	MeteoAlgerie	Algerie
#202-MKIII	DNK	Nils	Denmark
#228-MKIII	*DNK*	*Nils*	*Denmark*
#257-MKIII	AEMET IZAÑA	Alberto Redondas	Spain

Table 2: Participating BTS spectrophotometers.

Instrument SN	Mode	Institution	Operator	Country
40557	Direct	PMOD/WRC	Luca Egli	Switzerland
45633	Direct	INTA	Jose Manuel Vilaplana	Spain
58887	Global	AEMET IZAÑA	Alberto Redondas	Spain
62602	Direct	UKMO	Richard Kift	U.K.
63783	Global	CIEMAT	Jose Balenzategui	Spain
63784	Direct	CIEMAT	Jose Balenzategui	Spain
66639	Global	WMO	Voltaire Velasco	Germany
71187	Direct	AEMET IZAÑA	Alberto Redondas	Spain

Figure 1: Roof setup at INTA

Protocol:

The measurement protocol was to measure one solar irradiance spectrum every 30 minutes from 290 to 400 nm, every 0.5 nm, and 3 seconds between each wavelength increment. The official UV days were scheduled from Monday, 23rd to Friday, 27th June. However, UV scans were performed throughout the campaign.

DOY	Date	DAY	Weather	Comment (time in UT)
166	15-Jun	Sunday	Mix of sun & clouds	Installed at 09:00
			Clear sky in the evening	Calibrated: 14:43 using T153061
167	16-Jun	Monday	Mix of sun & clouds	
			Mostly clear sky in the afternoon	
168	17-Jun	Tuesday	Mostly clear sky	
169	18-Jun	Wednesday	Mostly diffuse sky	
			Some direct sun around noon	
170	19-Jun	Thursday	Mostly clear sky	
			Diffuse sky (morning)	
171	20-Jun	Friday	Clear sky	Calibrated: 14:33 using T153061
172	21-Jun	Saturday	Clear sky with few cumulus clouds	Calibrated: 10:15 using T68523
				Calibrated: 14:23 using T153061
173	22-Jun	Sunday	Clear sky	Calibrated: 08:14 using T68523
			Some clouds around noon	Calibrated: 08:29 using T153062
				Calibrated: 08:43 using T153061
174	23-Jun	Monday	Mostly diffuse sky	Calibrated: 10:14 using T153061
				Calibrated: 10:44 using T61251
175	24-Jun	Tuesday	Diffuse sky in the morning	Calibrated: 15:15 using T153062
			Clear sky after 15:00	
176	25-Jun	Wednesday	Clear Sky	Calibrated: 11:12 using T153061
177	26-Jun	Thursday	Clear Sky	Calibrated: 14:57 using T153062
178	27-Jun	Friday	Clear Sky in the morning	Calibrated: 08:35 using T153062
				End of Campaign 13:42

Brewer Intercomparison Results:

Up to 156 synchronised simultaneous spectra from QASUME and the Brewer spectrophotometers are available from the measurement period. Measurements between 6:30 and 18:00 UT have been analysed (SZA smaller than 90°).

Brewer Data Processing:

- The data of all Brewers were processed with Eubrewnet Level 2.0, however because of missing input data some are only processed to Level 1.0.
- The data from Brewers #117, #151, #166, 185, 186 and 257 were correct for cosine error (Eubrewnet L 1.6).

Table 3: UV corrections applied in the Eubrewnet processing (median over all scans)

Instrument ID	UVflag	Cosine	Temperature	Straylight	Shicrivm
#001-MKIV	1	0	0	1	0
#033-MKII	33	0	0	1	1
#070-MKIV	33	0	0	1	1
#117-MKIV	41	1	0	1	1
#143-MKIV	1	0	0	1	0
#150-MKIII	36	0	1	0	1
#151-MKIV	41	1	0	1	1
#166-MKIV	41	1	0	1	1
#172-MKIII	32	0	0	0	1
#185-MKIII (IZ3)	40	1	0	0	1
#186-MKIII	40	1	0	0	1
#201-MKIII	0	0	0	0	0
#202-MKIII	32	0	0	0	1
#257-MKIII	40	1	0	0	1

More information can be found here:
https://eubrewnet.aemet.es/dokuwiki/doku.php?id=codes:uvaccess

https://eubrewnet.aemet.es/dokuwiki/doku.php?id=codes:uvaccess#process_uvl1

https://eubrewnet.aemet.es/dokuwiki/doku.php?id=codes:uvaccess#uv_corrections_flag

https://drive.google.com/file/d/1RitZadF38CQhpnoA3vFugaHFSlaDys4p/view?usp=sharing

https://drive.google.com/file/d/1ZaLHi5eGPvdadnCkE84Idp8_5V1I1B4Z/view?usp=sharing

Brewer Intercomparison Conclusion:

The comparison between the Brewers and QASUME was very successful, and consistent with the results obtained in previous visits (see Figure 2-X of the Annex).

The angular response correction was applied to the solar UV spectra of six Brewers and show a considerably improvement to the comparison to QASUME. Remaining uncertainties are the stray-light for single monochromator brewers and the temperature dependence.

BTS (UV global) Intercomparison Results:

All participating six BTS were compared to Qasume, however only BTS 45633 and 63783 of them measured global UV irradiance throughout the campaign. The four BTS measuring direct solar irradiance were put into global mode only for 1-2 days.

Between 6 to 182 synchronised simultaneous spectra from QASUME and the BTS spectrophotometers are available from the measurement period. Measurements between 6:30 and 18:00 UT have been analysed (SZA smaller than 90°).

BTS Data Processing:

The data of all BTS were processed by the individual operators.

BTS Intercomparison Conclusion:

The comparison between the BTS and QASUME was only successful for the two global BTS. The alignment of the direct BTS was too unprecise to gain comparable data (62602, 63784 and 71187).
The timing of the BTS 45633 and 63783 were operated by older software needed an adjustment scan time stamp as shown in the following table:

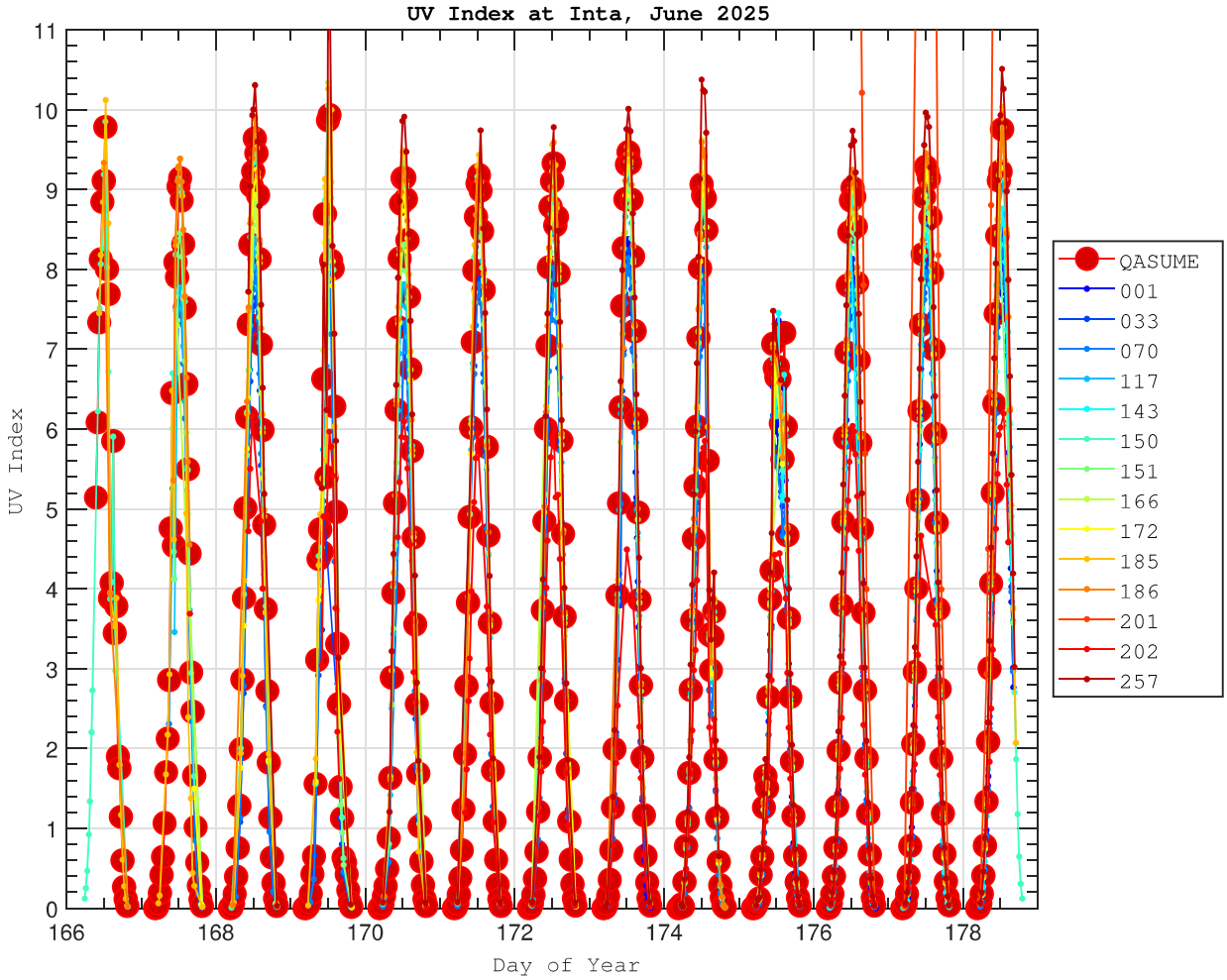
BTS	Time shift (UVB-Range) in seconds	Time shift (UVA-Range) in seconds
45633	2	3
63783	1	3

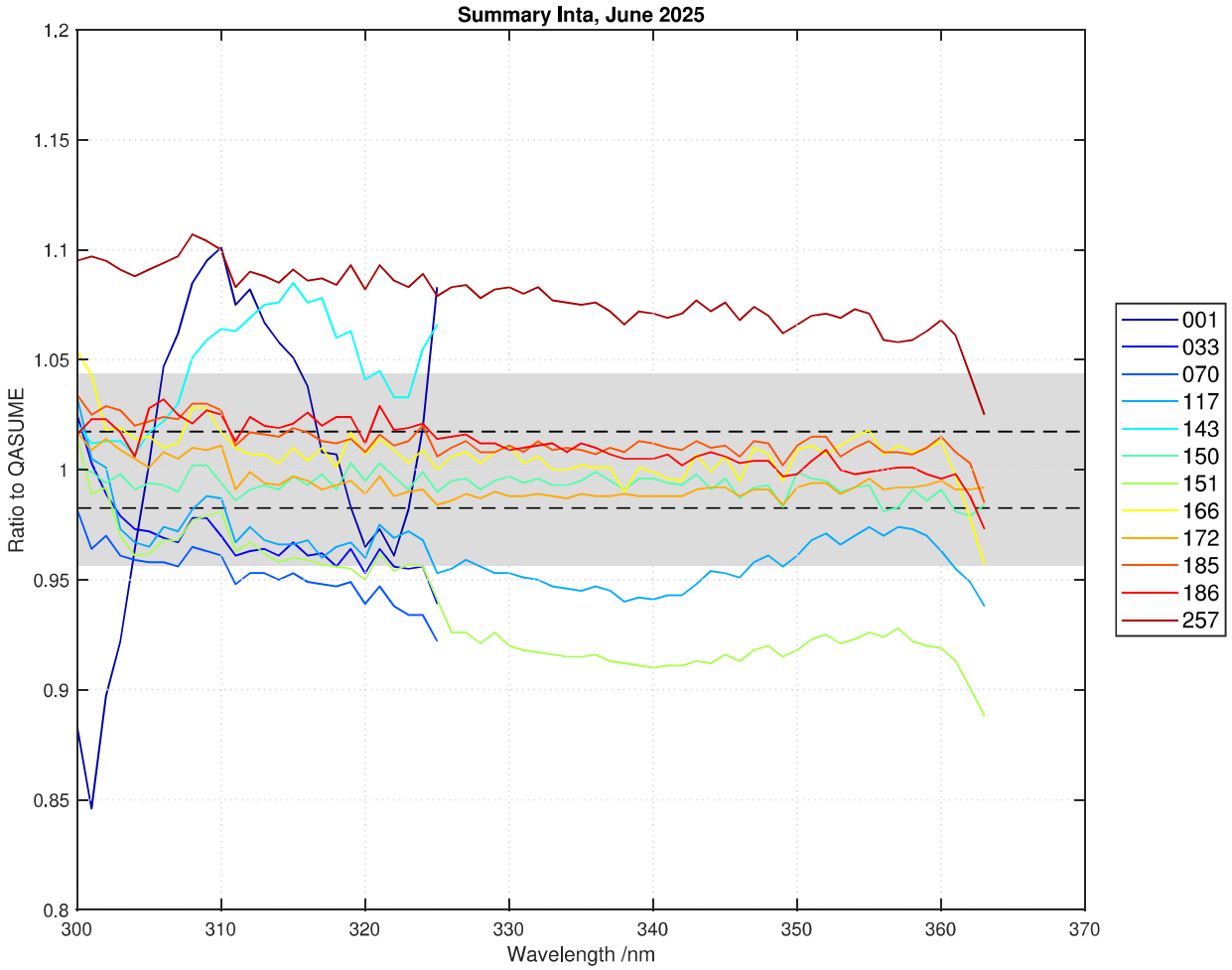
References:

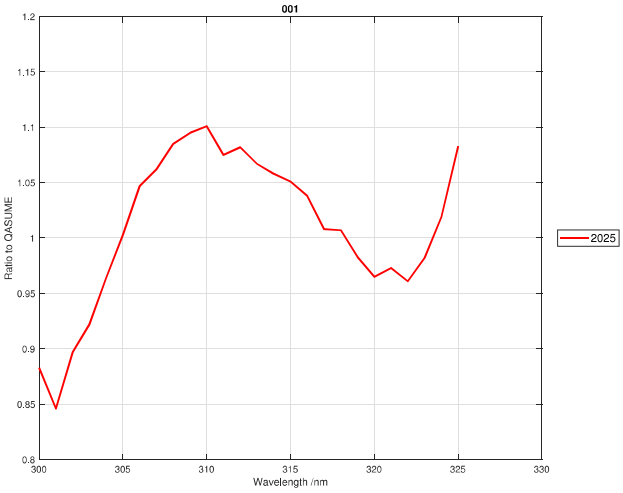
Gröbner, J., Kröger, I., Egli, L., Hülsen, G., Riechelmann, S., and Sperfeld, P.: The high-resolution extraterrestrial solar spectrum (QASUMEFTS) determined from ground-based solar irradiance measurements, Atmos. Meas. Tech., 10, 3375-3383, https://doi.org/10.5194/amt-10-3375-2017, 2017.

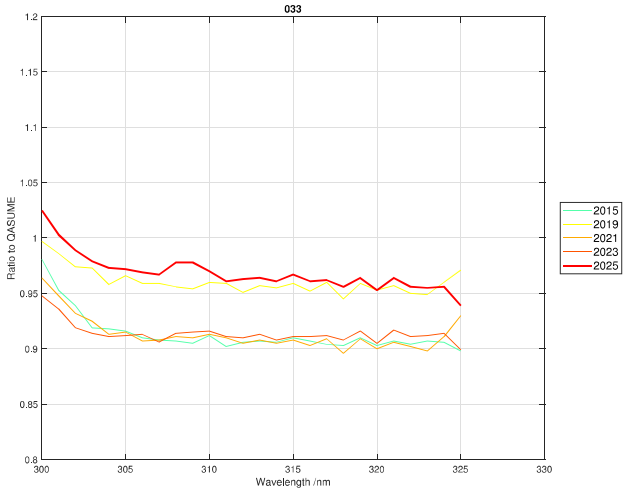
Appendix

Detailed results for all Brewer spectrophotometers with respect to the reference spectroradiometer QASUME


UV Index at Inta, June 2025
UV Index
Day of Year
QASUME
001
033
070
117
143
150
151
166
172
185
186
201
202
257


Summary Inta, June 2025
Ratio to QASUME
Wavelength /nm
001
033
070
117
143
150
151
166
172
185
186
257


001
Ratio to QASUME
Wavelength /nm
2025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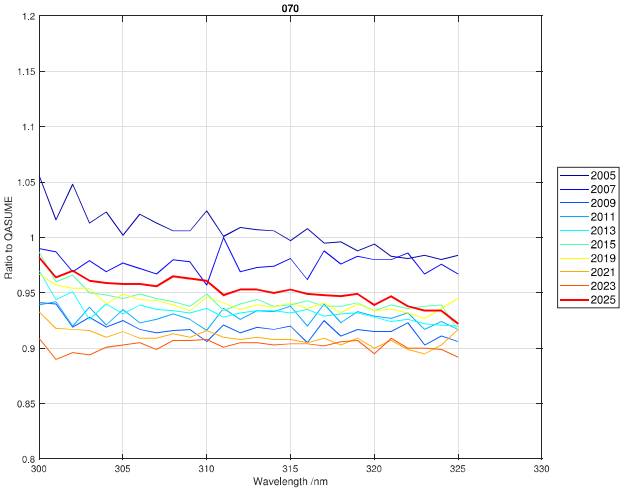
Ratio to QASUME
Wavelength /nm
2015
2019
2021
2023
2025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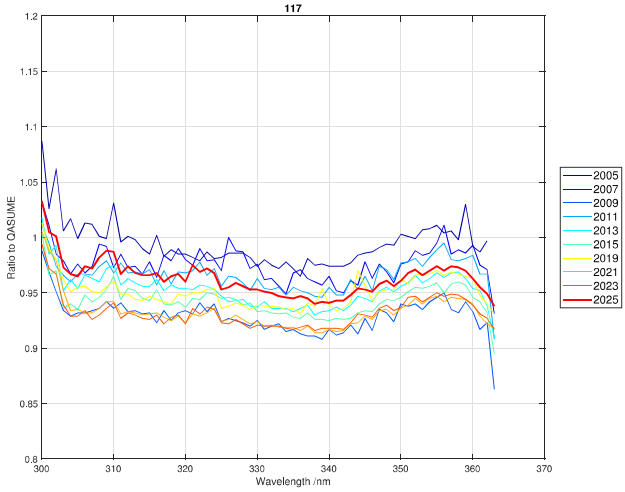
Ratio to QASUME
Wavelength /nm
2005
2007
2009
2011
2013
2015
2019
2021
2023
2025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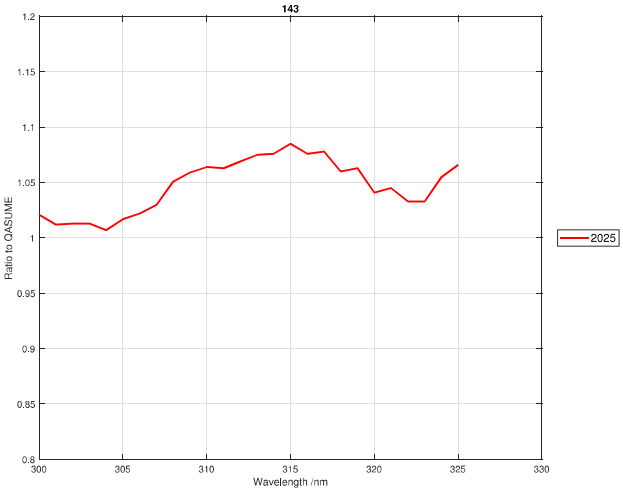
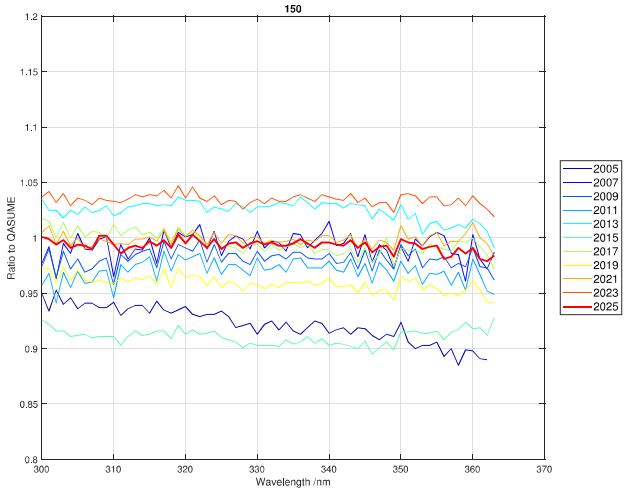
Ratio to QASUME
Wavelength /nm
2005
2007
2009
2011
2013
2015
2019
2021
2023
2025


143
Ratio to QASUME
Wavelength /nm
2025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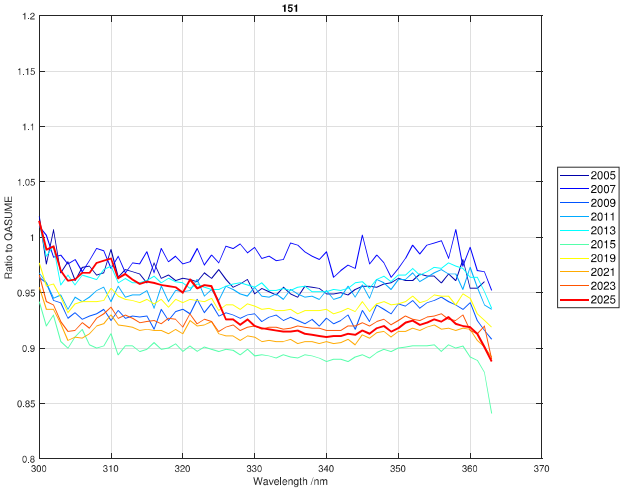
Ratio to QASUME
Wavelength /nm
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025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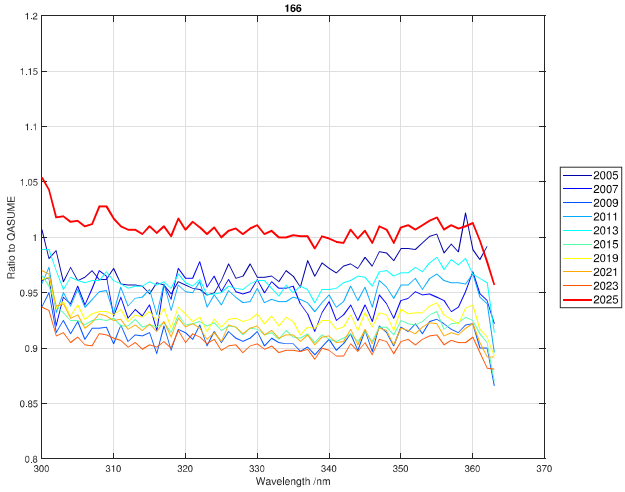
Ratio to QASUME
Wavelength /nm
2005
2007
2009
2011
2013
2015
2019
2021
2023
2025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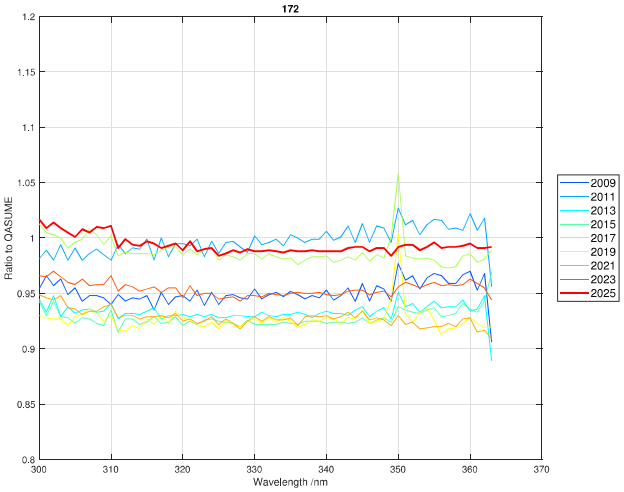
Ratio to QASUME
Wavelength /nm
2005
2007
2009
2011
2013
2015
2019
2021
2023
2025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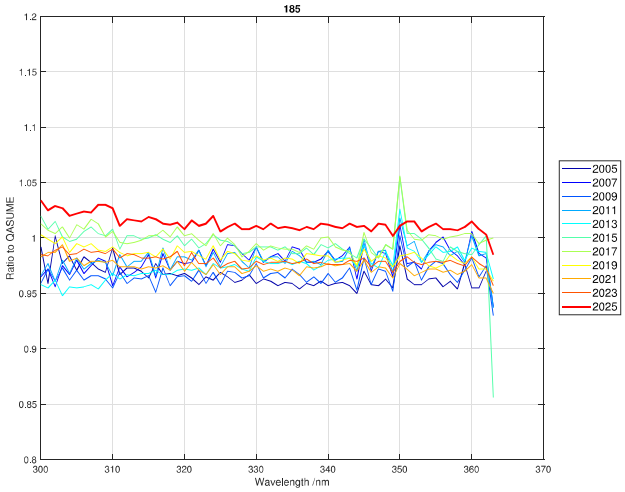
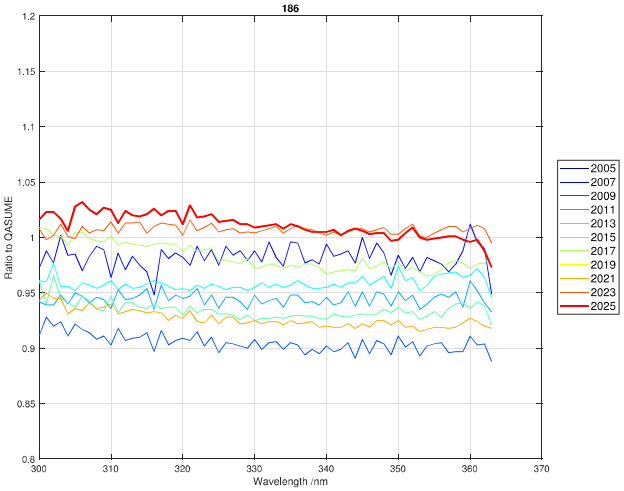
Ratio to QASUME
Wavelength /nm
2009
2011
2013
2015
2017
2019
2021
2023
2025


185
Ratio to QASUME
Wavelength /nm
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025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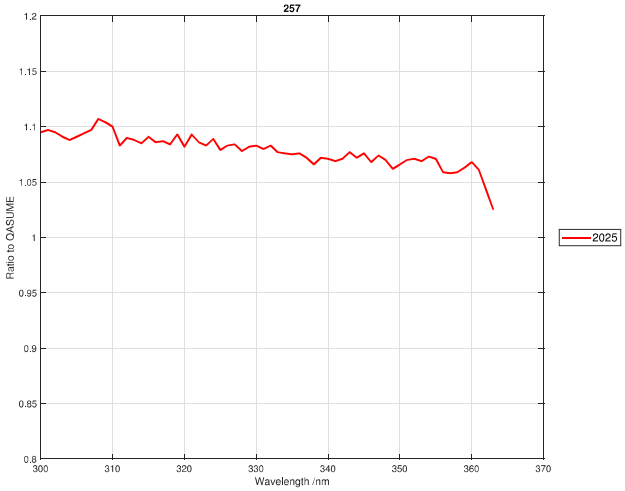
Ratio to QASUME
Wavelength /nm
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025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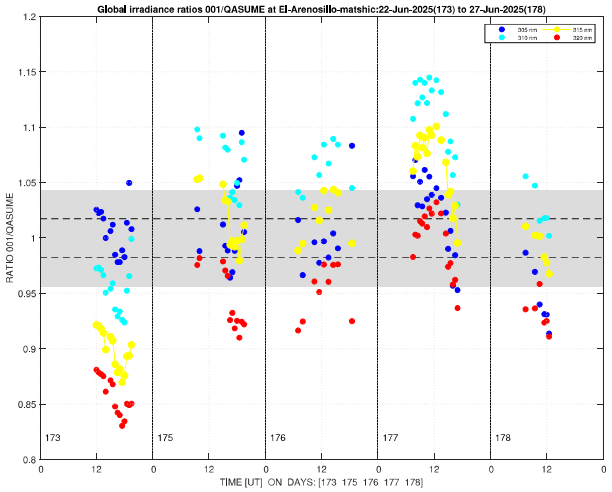
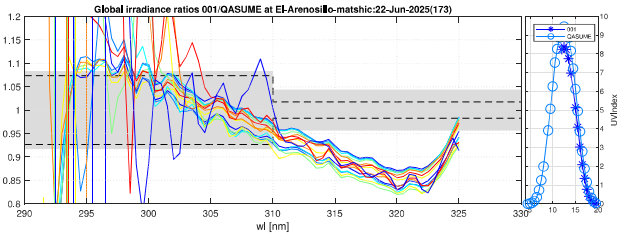
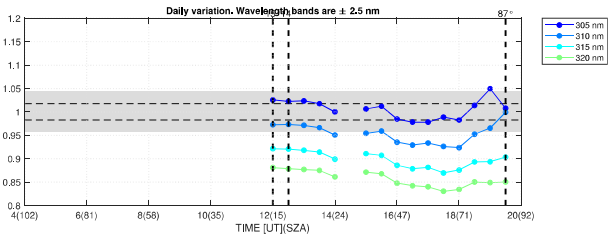
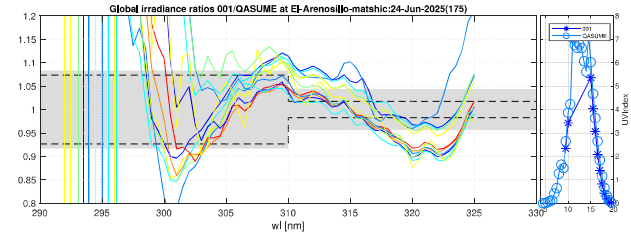
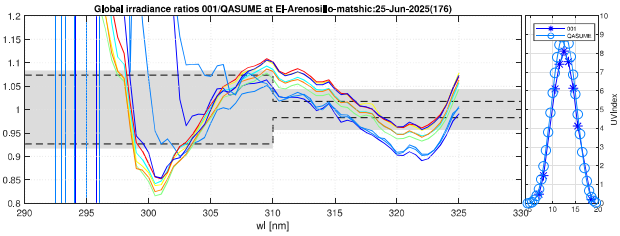
Ratio to QASUME
Wavelength /nm
2025

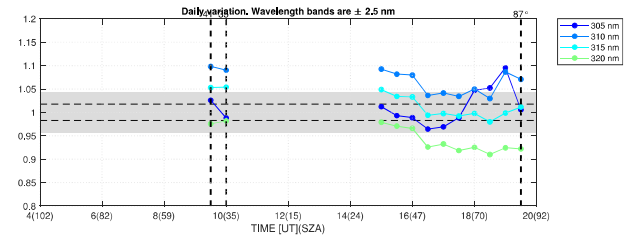

Global irradiance ratios 001/QASUME at El-Arenosillo-matshic:22-Jun-2025(173) to 27-Jun-2025(178)
RATIO 001/QASUME
TIME [UT] ON DAYS: [173 175 176 177 178]
173
175
176
177
178

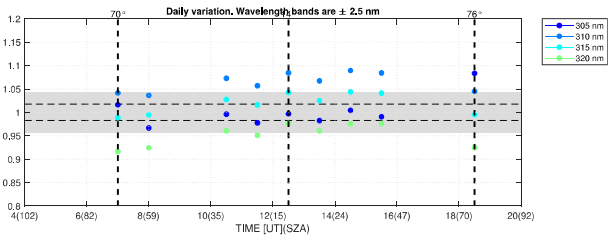

Global irradiance ratios 001/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

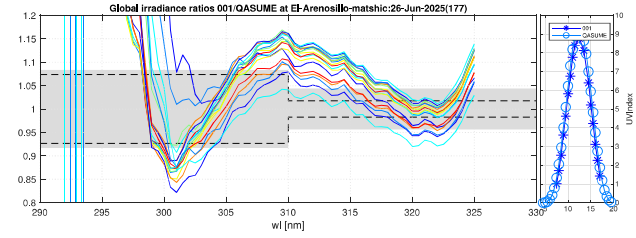

Daily variation. Wavelength bands are ± 2.5 nm
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

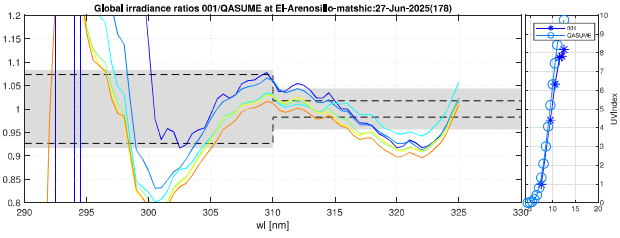

Global irradiance ratios 001/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

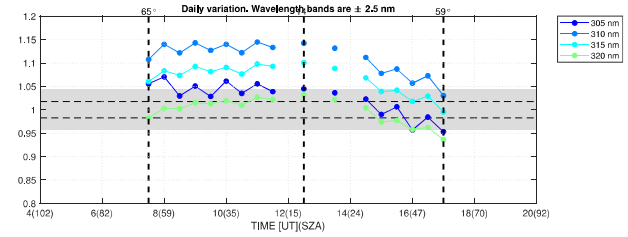

Global irradiance ratios 001/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

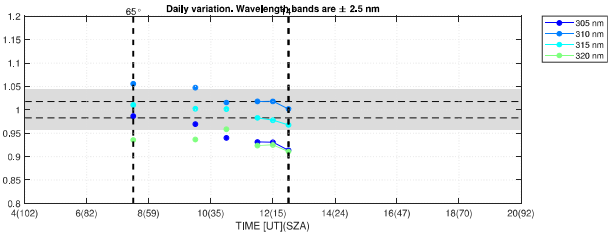

Daily variation. Wavelength bands are ± 2.5 nm
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

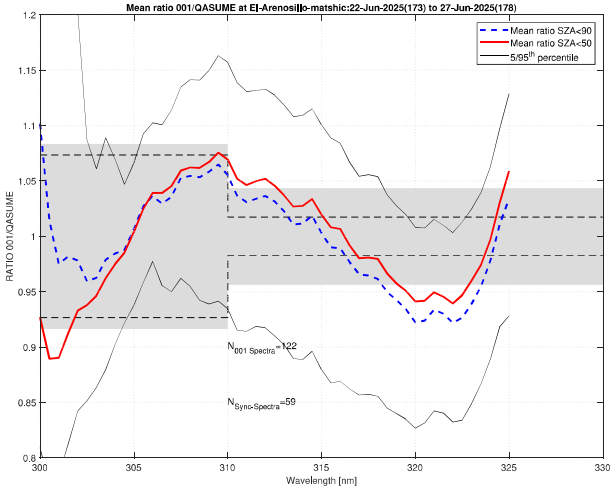

Daily variation. Wavelength bands are ± 2.5 nm
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

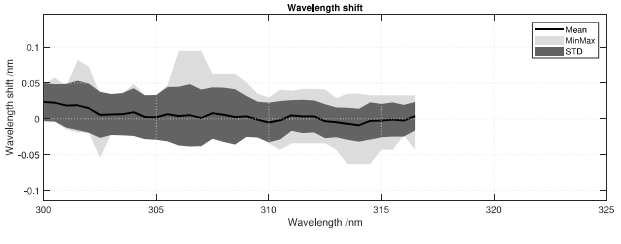

Global irradiance ratios 001/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

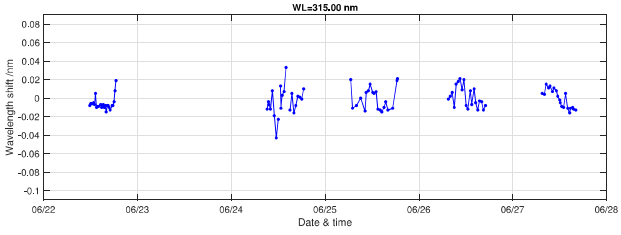

Global irradiance ratios 001/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

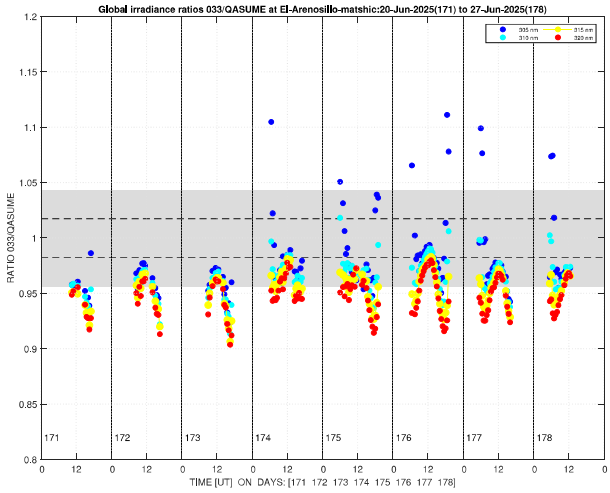

Daily variation. Wavelength bands are ± 2.5 nm
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

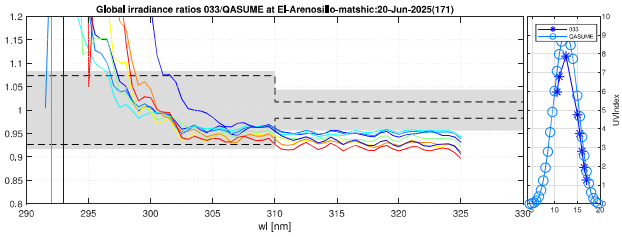

Daily variation. Wavelength bands are ± 2.5 nm
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

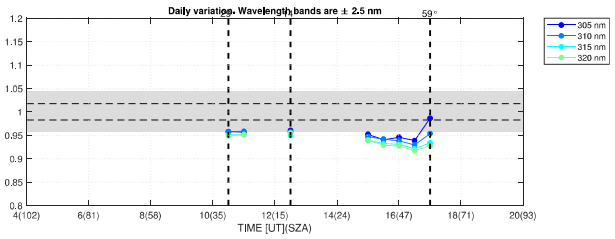

Mean ratio 001/QASUME at El-Arenosillo-matshic:22-Jun-2025(173) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 001/QASUME
N001 Spectra=122
NSync-Spectra=59
Wavelength [nm]

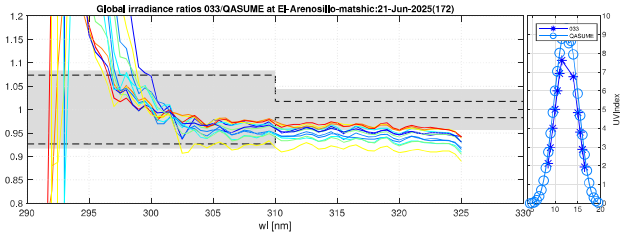

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

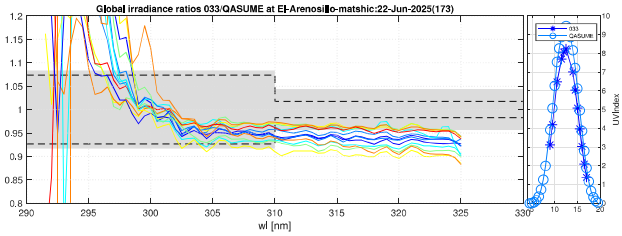

WL=315.00 nm
Wavelength shift /nm
Date & time

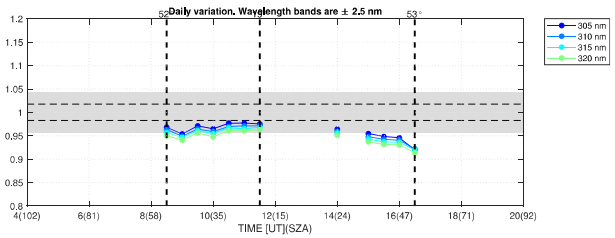

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
305 nm
310 nm
315 nm
320 nm
RATIO 033/QASUME
171
172
173
174
175
176
177
178
TIME [UT] ON DAYS: [171 172 173 174 175 176 177 178]

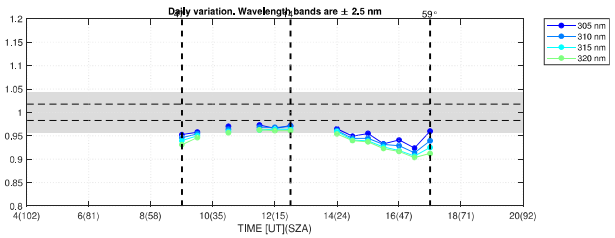

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
033
QASUME
UVIndex
wl [nm]

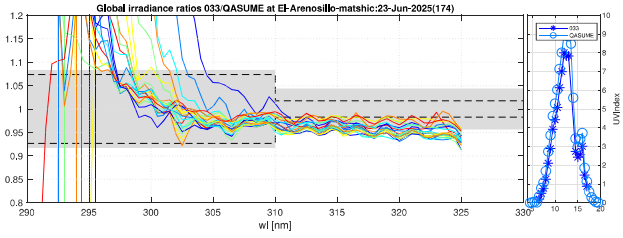

Daily variation. Wavelength bands are ± 2.5 nm
59°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

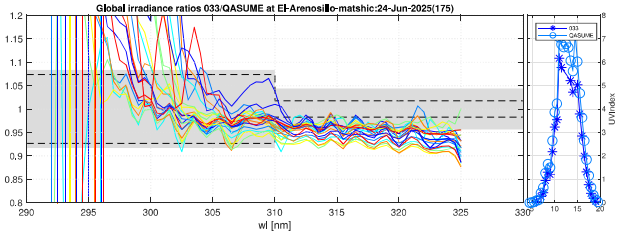

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
033
QASUME
UVIndex
wl [nm]

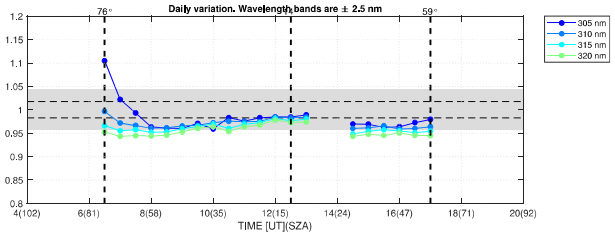

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
033
QASUME
UVIndex
wl [nm]

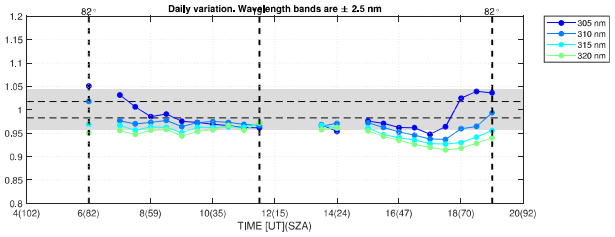

Daily variation. Wavelength bands are ± 2.5 nm
52°
53°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

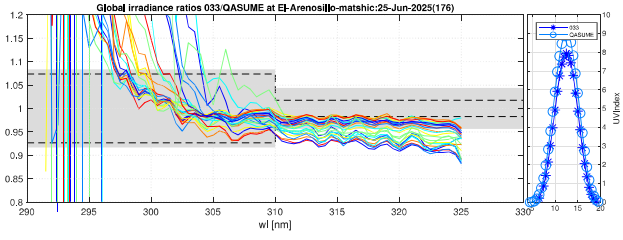

Daily variation. Wavelength bands are ± 2.5 nm
59°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

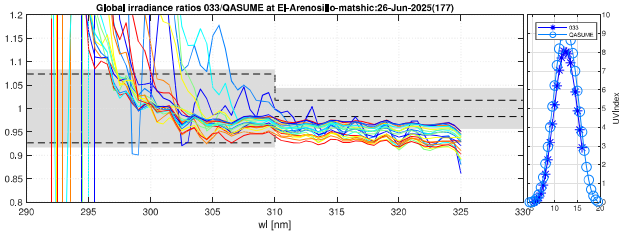

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:23-Jun-2025(174)
033
QASUME
UVIndex
wl [nm]

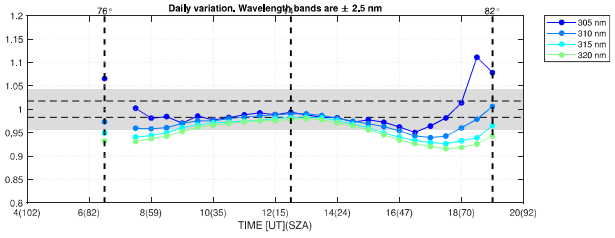

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
033
QASUME
UVIndex
wl [nm]

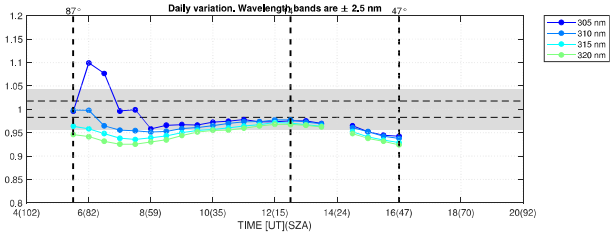

Daily variation. Wavelength bands are ± 2.5 nm
76°
59°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

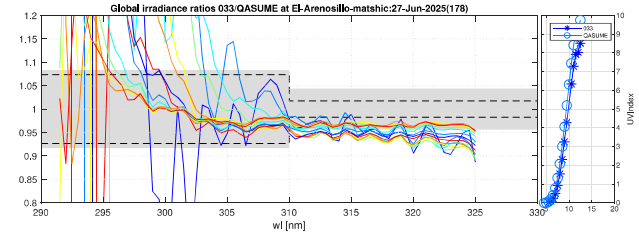

Daily variation. Wavelength bands are ± 2.5 nm
82°
82°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

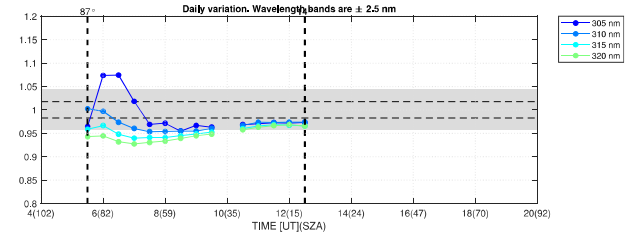

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
033
QASUME
UVIndex
wl [nm]

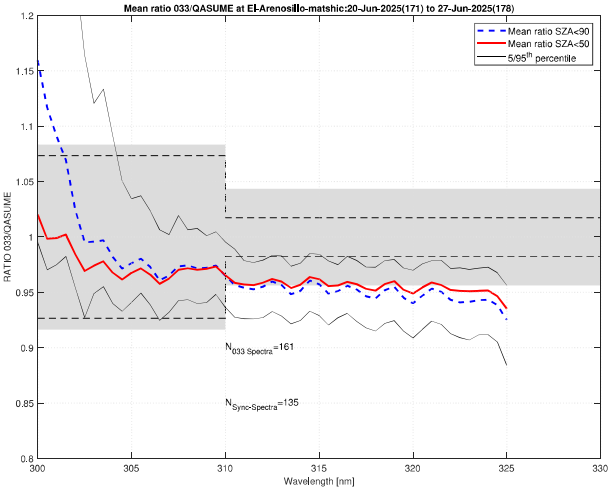

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
033
QASUME
UVIndex
wl [nm]

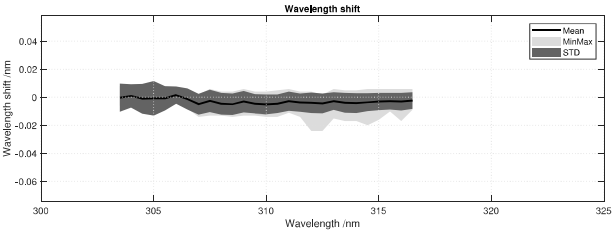

Daily variation. Wavelength bands are ± 2.5 nm
76°
82°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

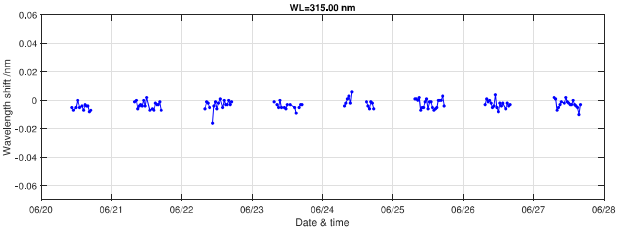

Daily variation. Wavelength bands are ± 2.5 nm
87°
47°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

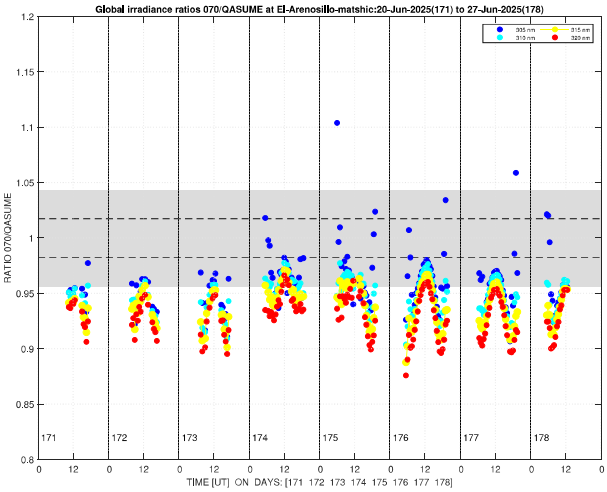

Global irradiance ratios 033/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex
033
QASUME

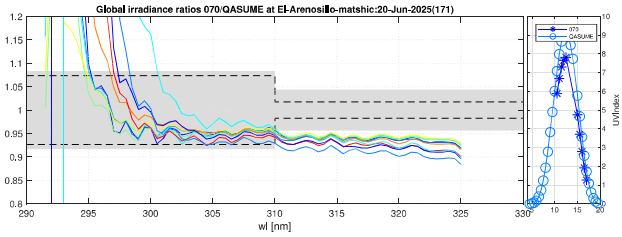

Daily variation. Wavelength bands are ± 2.5 nm
87°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

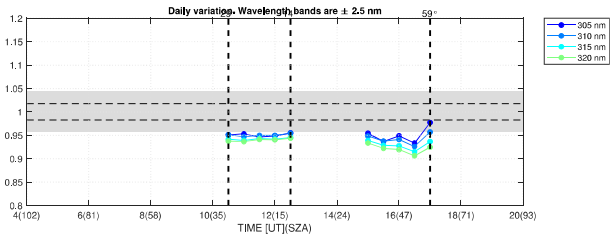

Mean ratio 033/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 033/QASUME
N033 Spectra=161
NSync-Spectra=135
Wavelength [nm]

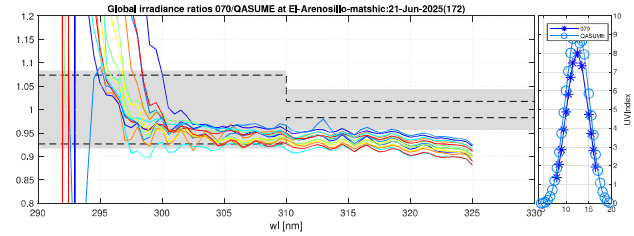

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

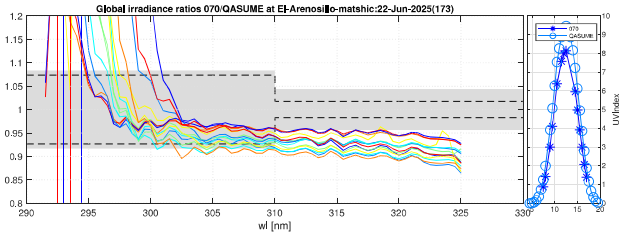

WL=315.00 nm
Wavelength shift /nm
Date & time

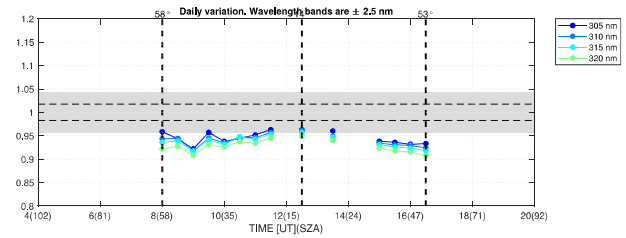

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
305 nm
310 nm
315 nm
320 nm
RATIO 070/QASUME
171
172
173
174
175
176
177
178
TIME [UT] ON DAYS: [171 172 173 174 175 176 177 178]

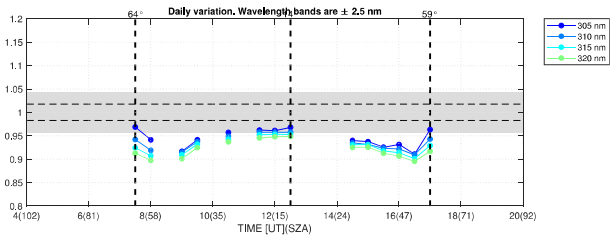

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
070
QASUME
UVIndex
wl [nm]

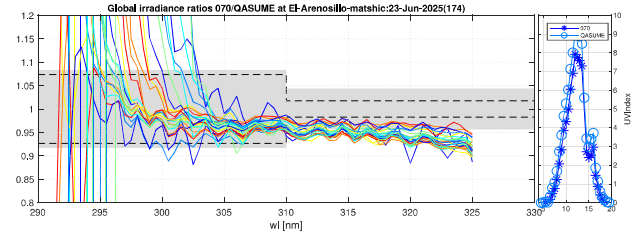

Daily variation. Wavelength bands are ± 2.5 nm
59°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

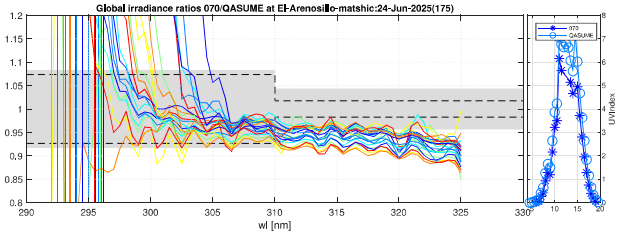

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
070
QASUME
UVIndex
wl [nm]

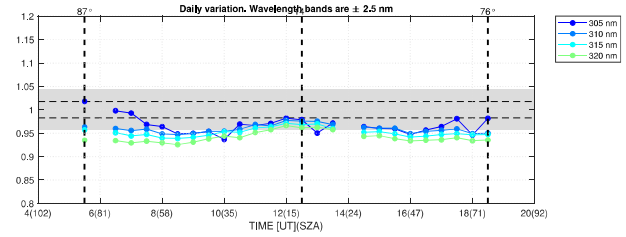

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
070
QASUME
UVIndex
wl [nm]

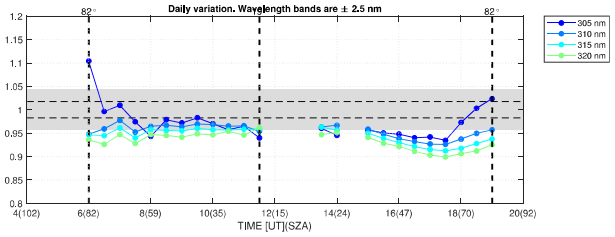

Daily variation. Wavelength bands are ± 2.5 nm
58°
53°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

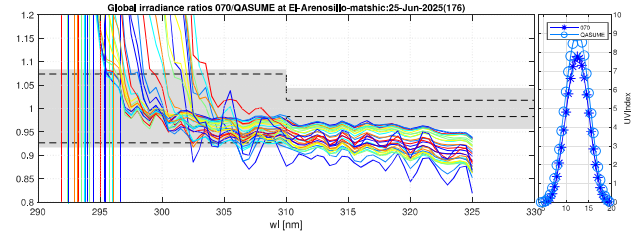

Daily variation. Wavelength bands are ± 2.5 nm
64°
59°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

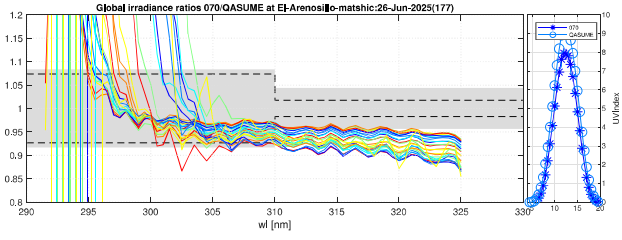

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:23-Jun-2025(174)
070
QASUME
UVIndex
wl [nm]

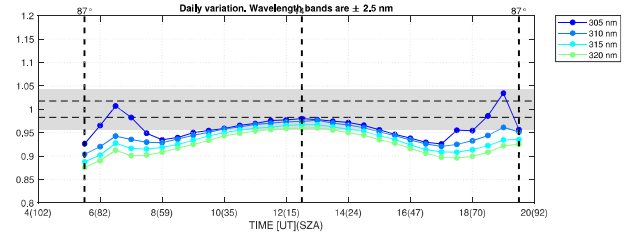

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
070
QASUME
UVIndex
wl [nm]

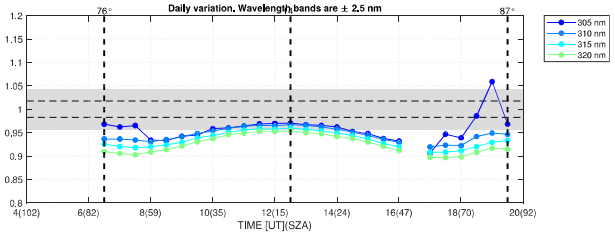

Daily variation. Wavelength bands are ± 2.5 nm
87°
76°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

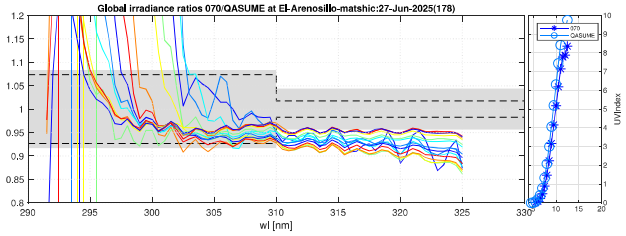

Daily variation. Wavelength bands are ± 2.5 nm
82°
82°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

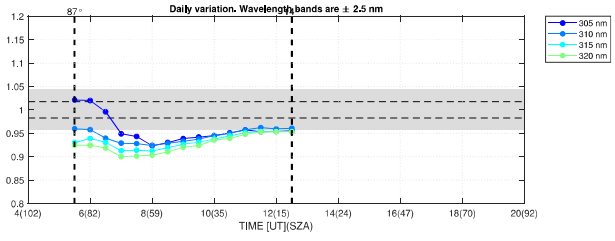

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
070
QASUME
UVIndex
wl [nm]

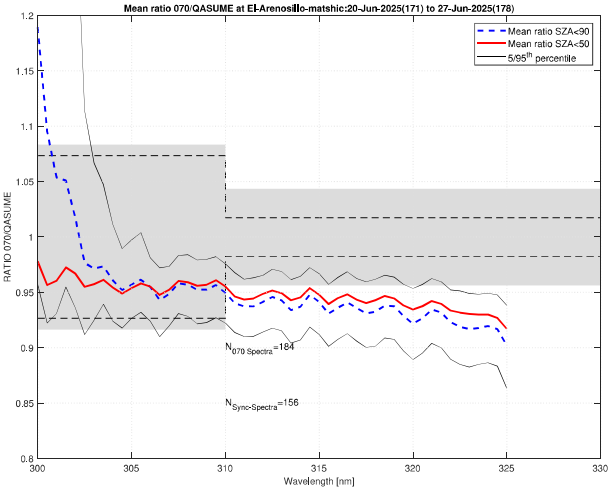

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
070
QASUME
UVIndex
wl [nm]

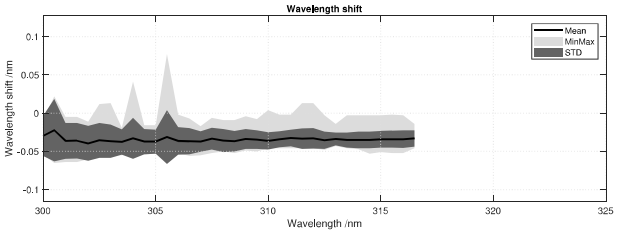

Daily variation. Wavelength bands are ± 2.5 nm
87°
87°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

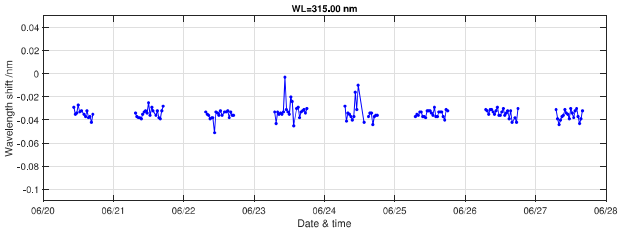

Daily variation. Wavelength bands are ± 2.5 nm
76°
87°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

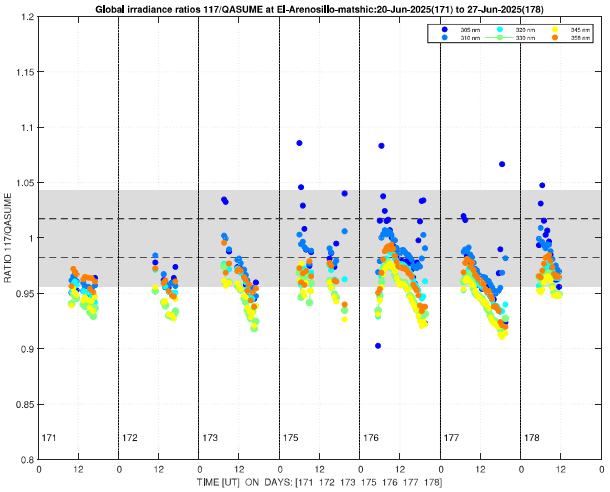

Global irradiance ratios 070/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
070
QASUME
wl [nm]
UVIndex

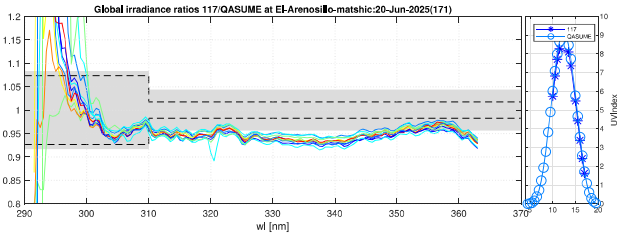

Daily variation. Wavelength bands are ± 2.5 nm
87°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

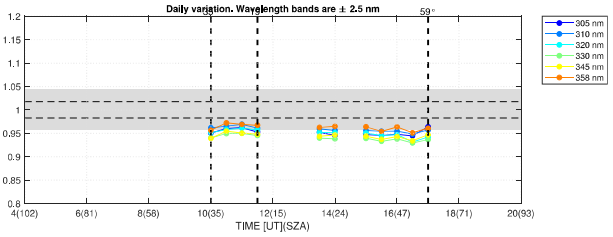

Mean ratio 070/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 070/QASUME
N070 Spectra=184
NSync-Spectra=156
Wavelength [nm]

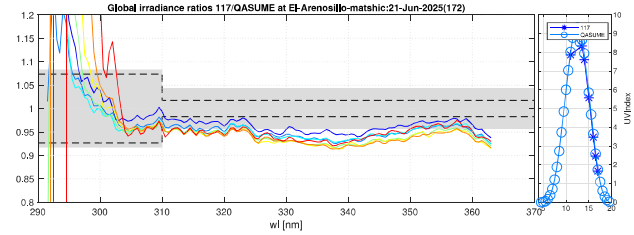

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

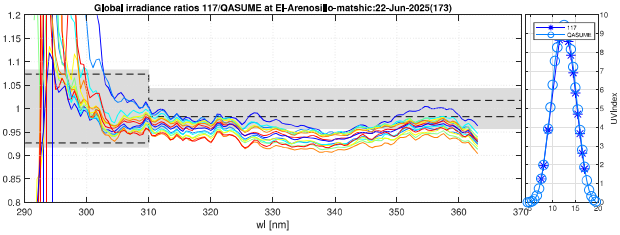

WL=315.00 nm
Wavelength shift /nm
Date & time

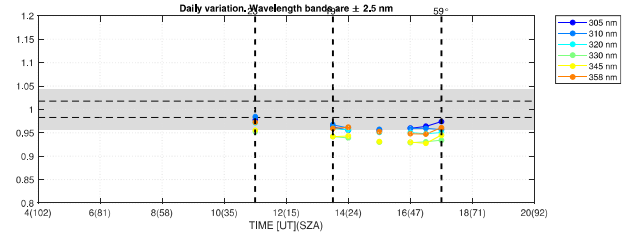

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
RATIO 117/QASUME
TIME [UT] ON DAYS: [171 172 173 175 176 177 178]
171
172
173
175
176
177
178

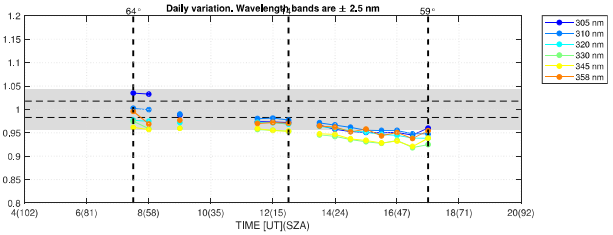

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

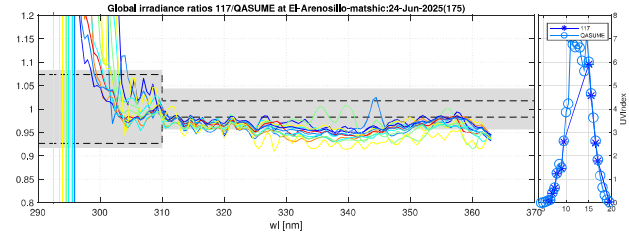

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

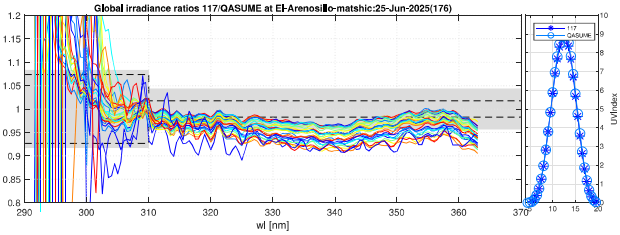

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

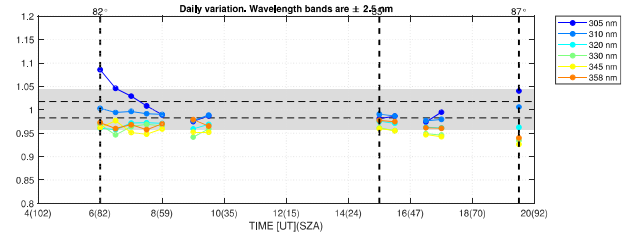

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

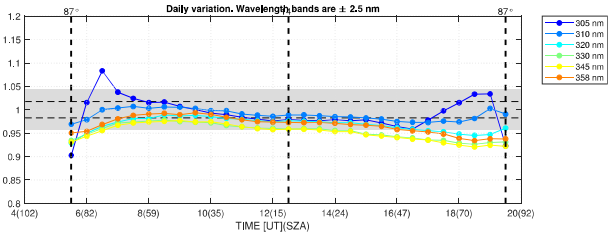

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

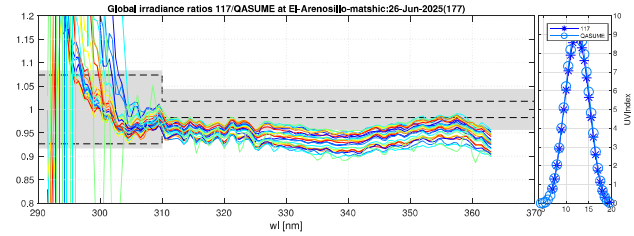

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

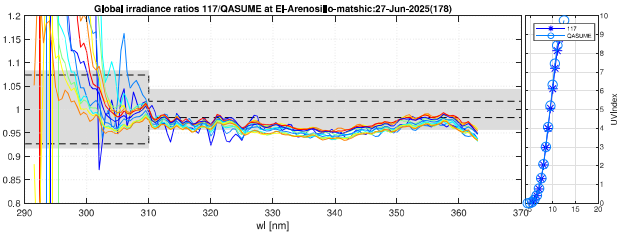

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

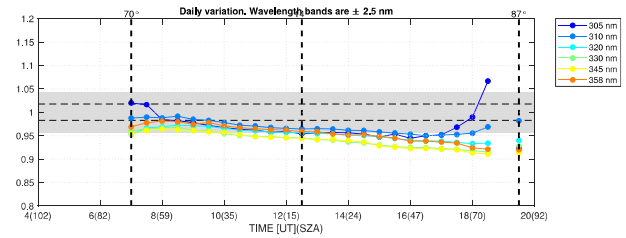

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

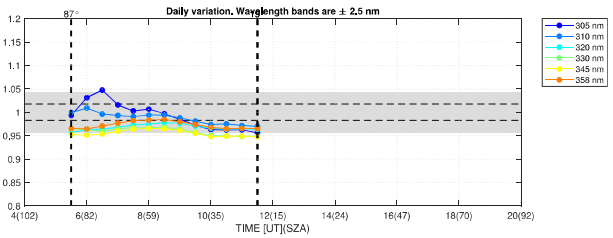

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

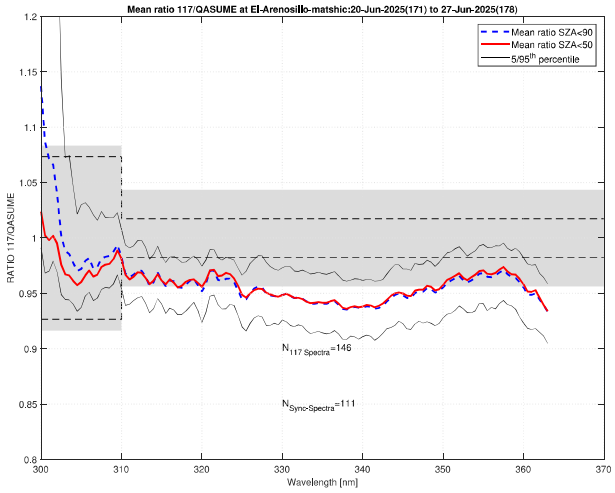

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

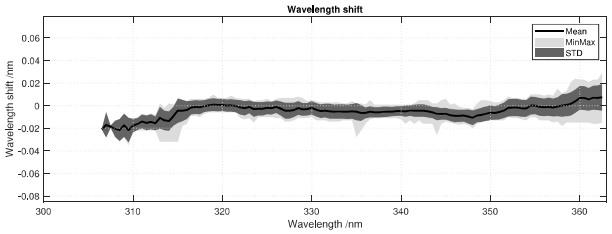

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

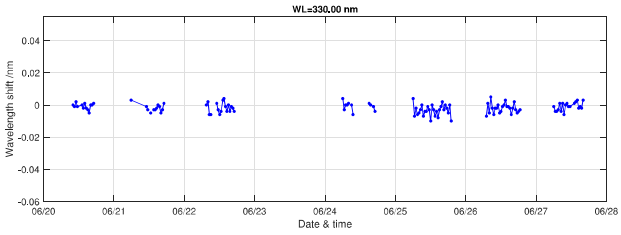

Global irradiance ratios 117/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

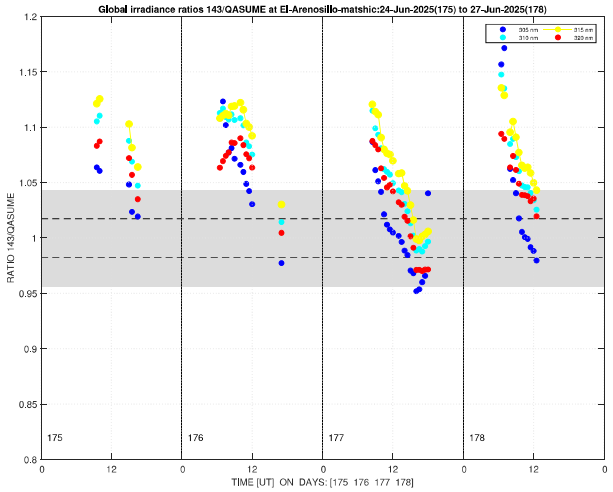

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

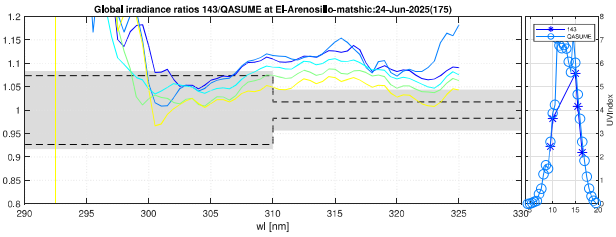

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

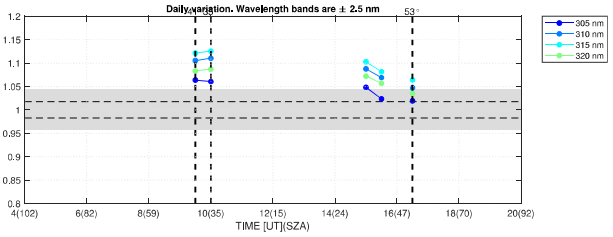

Mean ratio 117/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 117/QASUME
Wavelength [nm]
N117 Spectra=146
NSync-Spectra=111

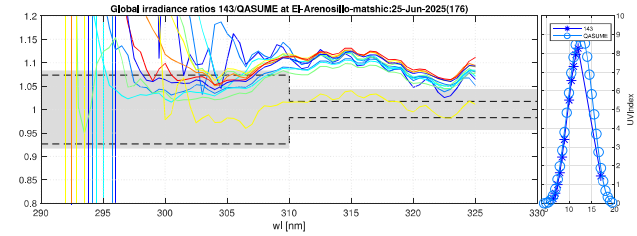

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

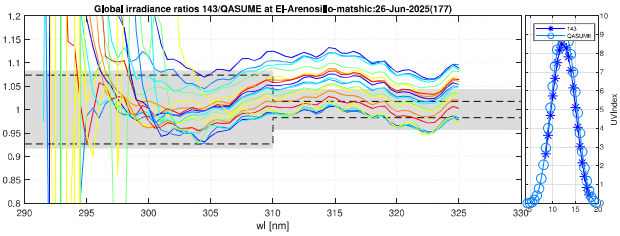

WL=330,00 nm
Wavelength shift /nm
Date & time

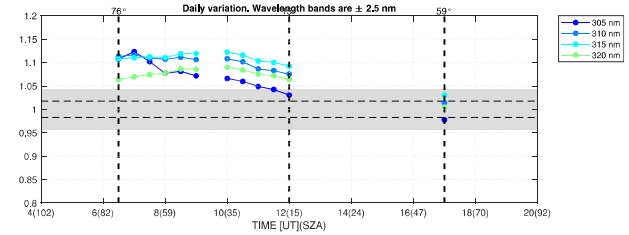

Global irradiance ratios 143/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 27-Jun-2025(178)
305 nm
310 nm
315 nm
320 nm
RATIO 143/QASUME
175
176
177
178
TIME [UT] ON DAYS: [175 176 177 178]

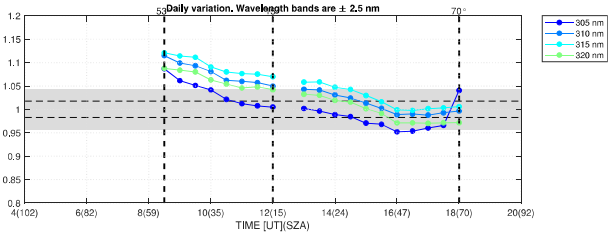

Global irradiance ratios 143/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
143
QASUME
UVIndex
wl [nm]

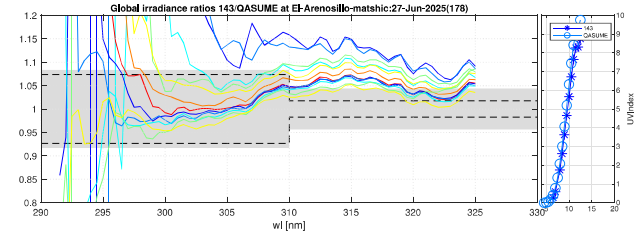

Daily variation. Wavelength bands are ± 2.5 nm
53°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

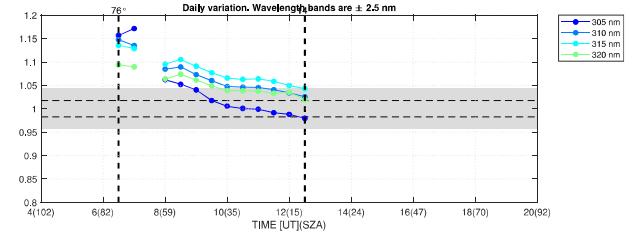

Global irradiance ratios 143/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
143
QASUME
UVIndex
wl [nm]

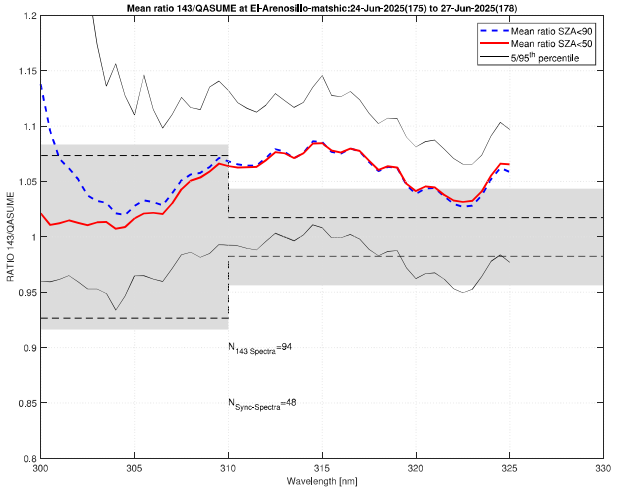

Global irradiance ratios 143/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
143
QASUME
UVIndex
wl [nm]

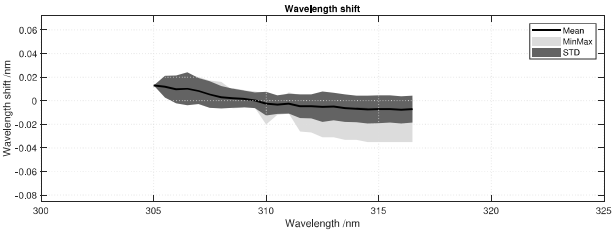

Daily variation. Wavelength bands are ± 2.5 nm
76°
59°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

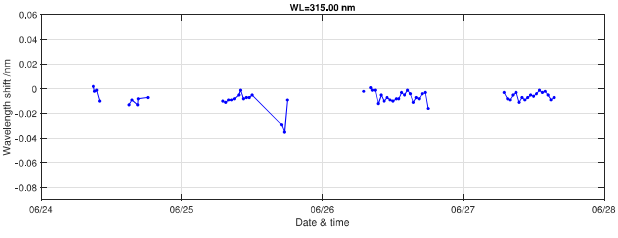

Daily variation. Wavelength bands are ± 2.5 nm
53°
70°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

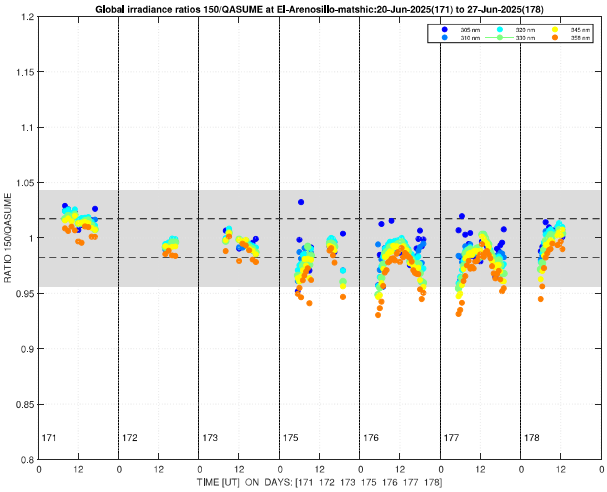

Global irradiance ratios 143/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
143
QASUME
UVIndex
wl [nm]

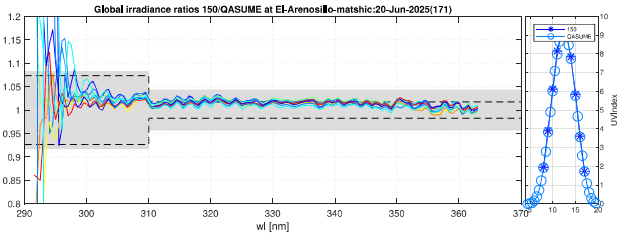

Daily variation. Wavelength bands are ± 2.5 nm
76°
305 nm
310 nm
315 nm
320 nm
TIME [UT](SZA)

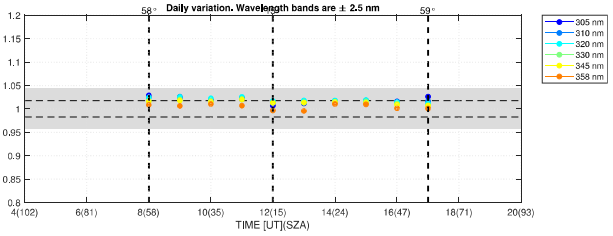

Mean ratio 143/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 143/QASUME
N143 Spectra=94
NSync-Spectra=48
Wavelength [nm]

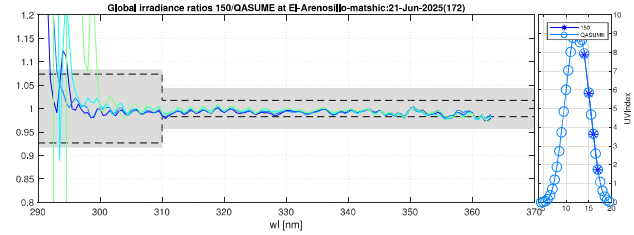

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

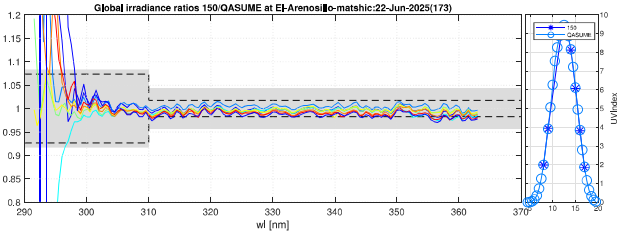

WL=315.00 nm
Wavelength shift /nm
Date & time

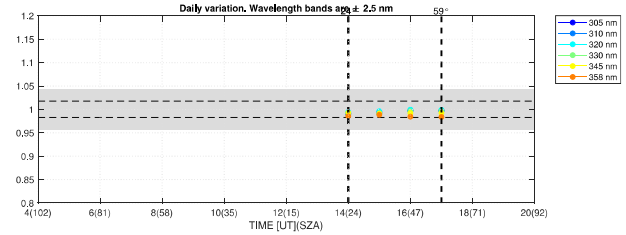

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
RATIO 150/QASUME
TIME [UT] ON DAYS: [171 172 173 175 176 177 178]
171
172
173
175
176
177
178

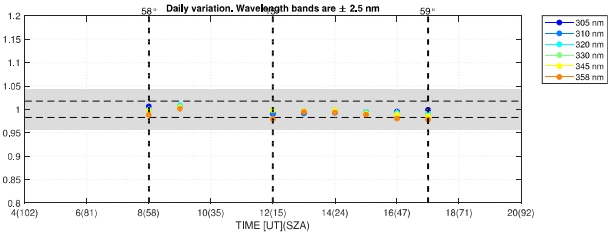

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

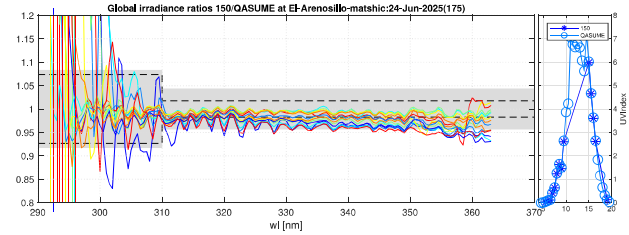

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

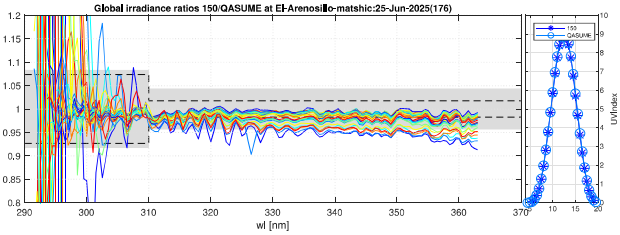

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

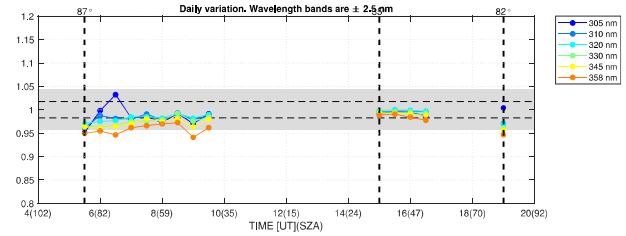

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

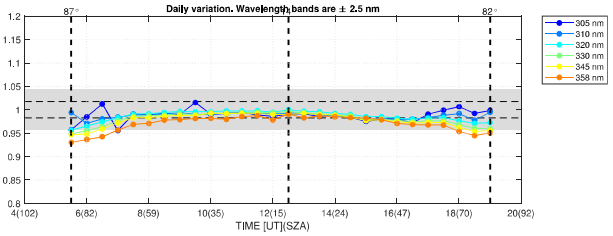

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

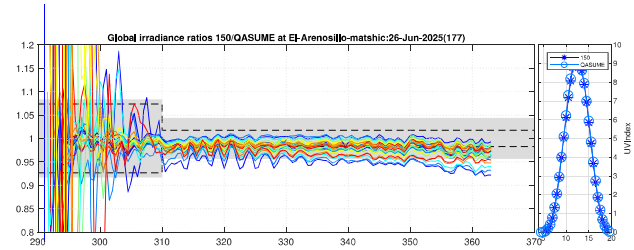

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

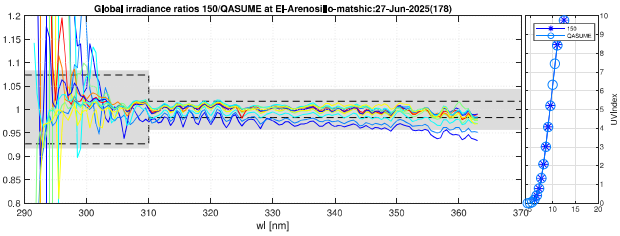

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

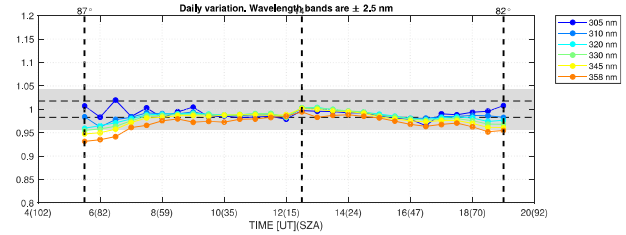

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

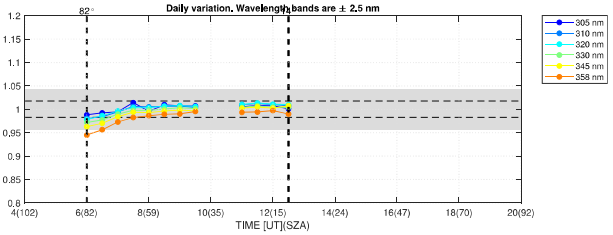

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

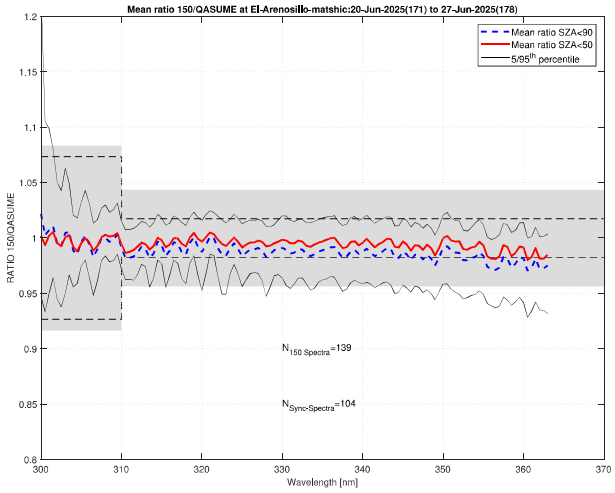

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

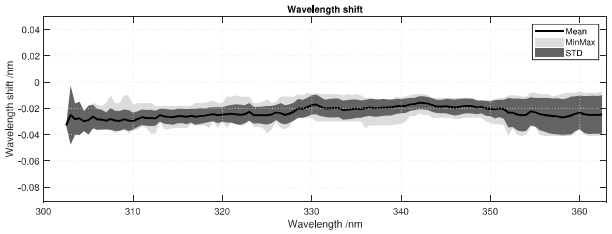

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

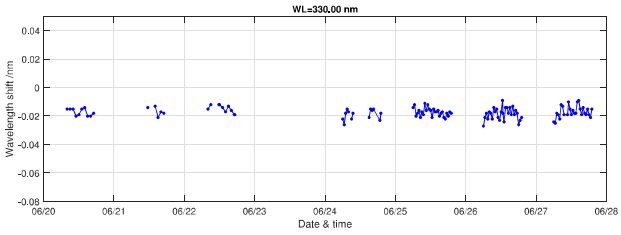

Global irradiance ratios 150/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

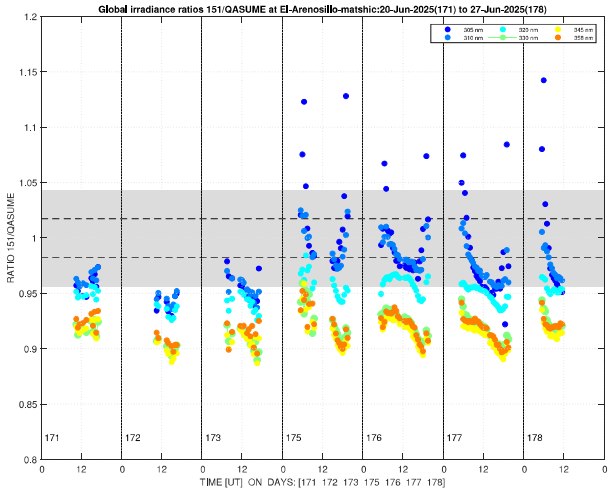

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

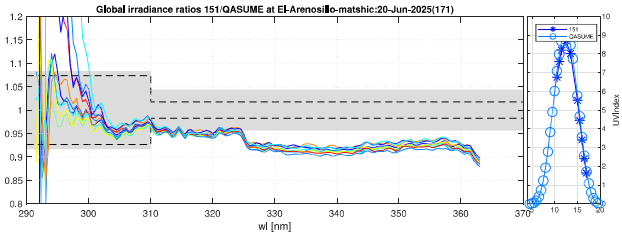

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

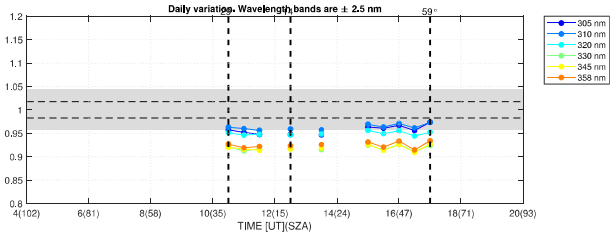

Mean ratio 150/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 150/QASUME
Wavelength [nm]
N150 Spectra=139
NSync-Spectra=104

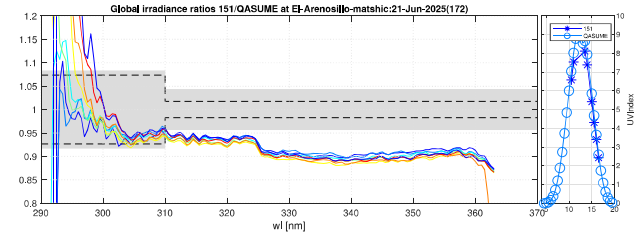

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

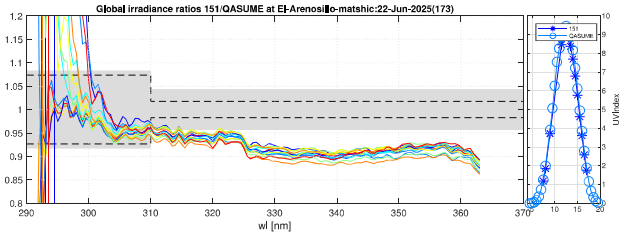

WL=330,00 nm
Wavelength shift /nm
Date & time

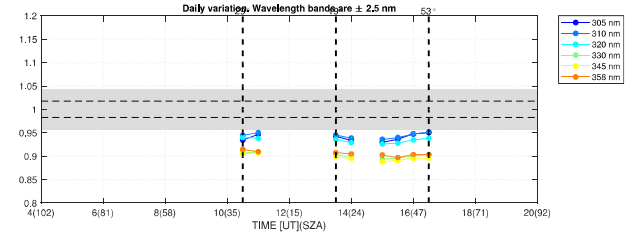

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
RATIO 151/QASUME
TIME [UT] ON DAYS: [171 172 173 175 176 177 178]
171
172
173
175
176
177
178

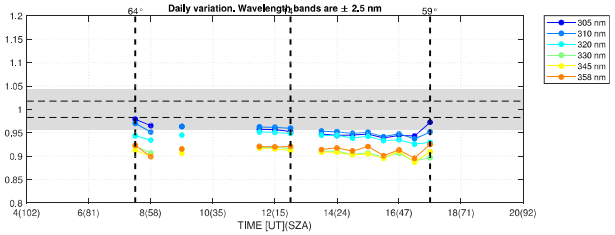

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

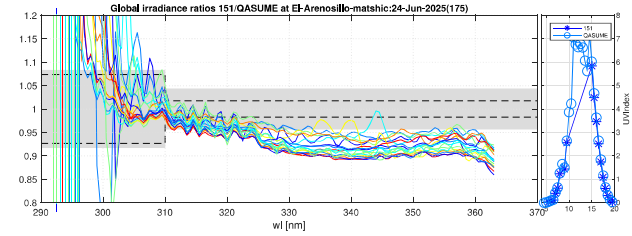

Daily variation. Wavelength bands are ± 2.5 nm
59°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

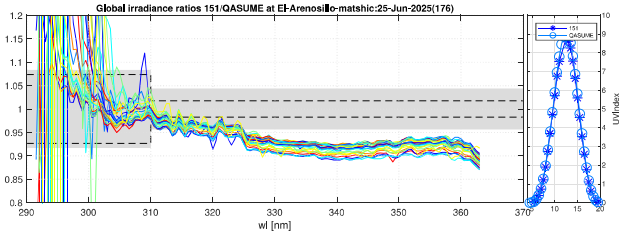

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

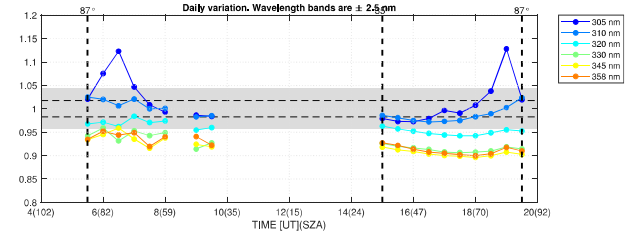

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

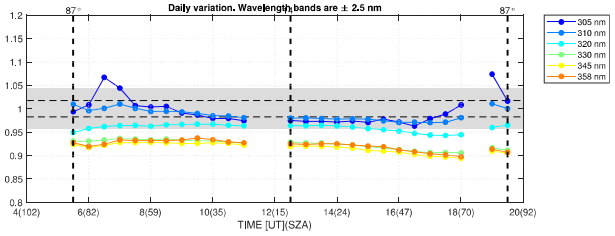

Daily variation. Wavelength bands are ± 2.5 nm
53°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

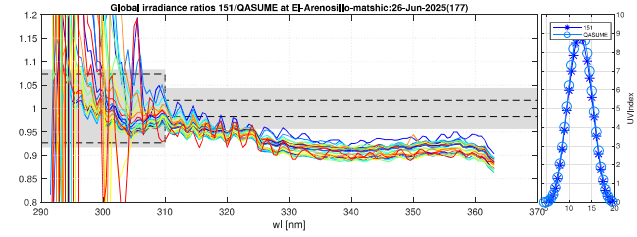

Daily variation. Wavelength bands are ± 2.5 nm
64°
59°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

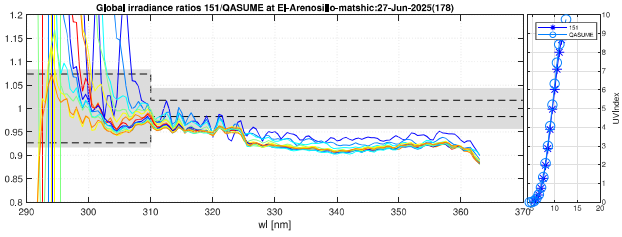

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

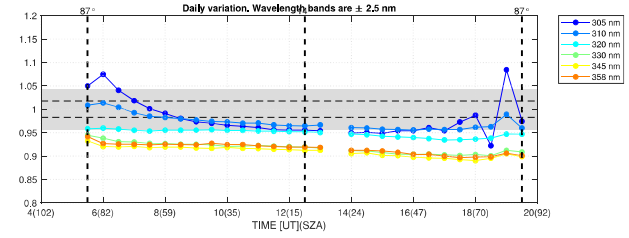

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

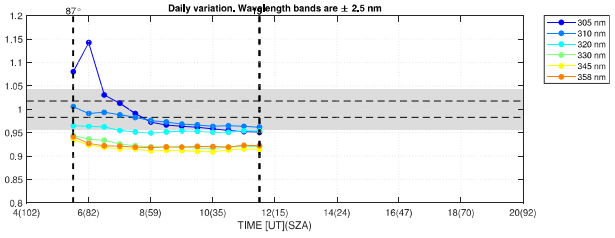

Daily variation. Wavelength bands are ± 2.5 nm
87°
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

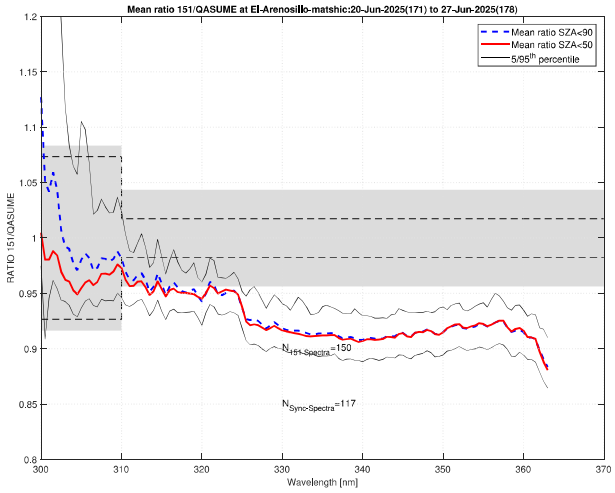

Daily variation. Wavelength bands are ± 2.5 nm
87°
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

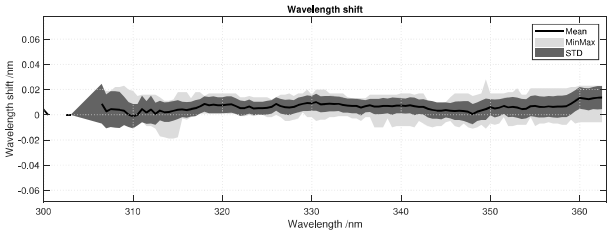

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

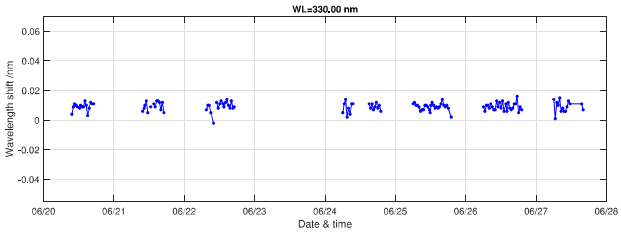

Global irradiance ratios 151/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

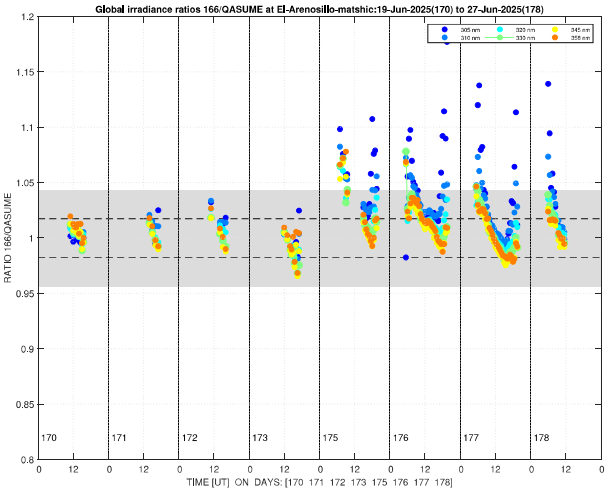

Daily variation. Wavelength bands are ± 2.5 nm
87°
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

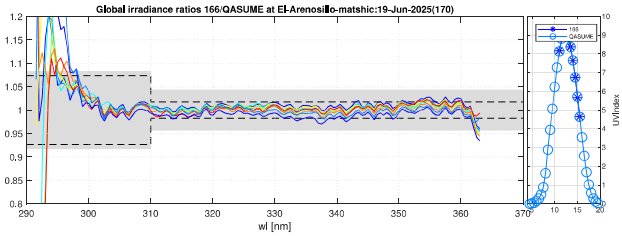

Daily variation. Wavelength bands are ± 2.5 nm
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

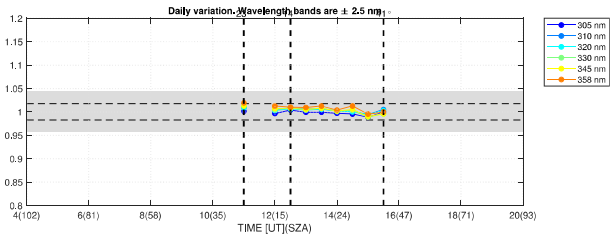

Mean ratio 151/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 151/QASUME
Wavelength [nm]
N151-Spectra=150
NSync-Spectra=117

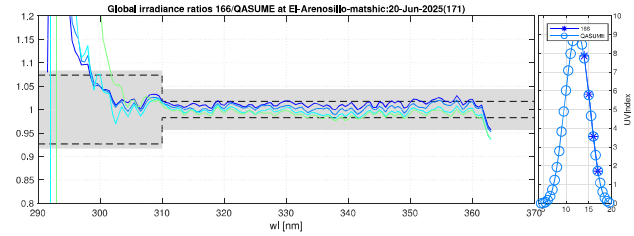

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

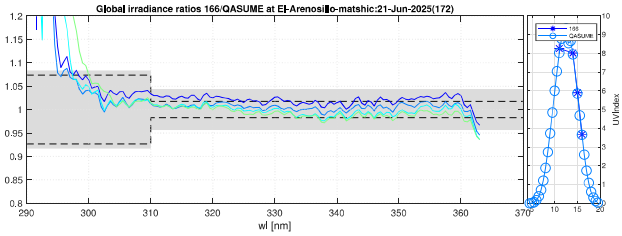

WL=330,00 nm
Wavelength shift /nm
Date & time

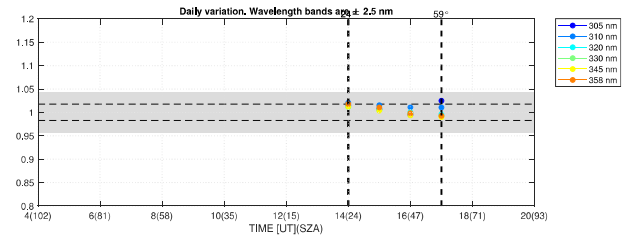

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:19-Jun-2025(170) to 27-Jun-2025(178)
RATIO 166/QASUME
TIME [UT] ON DAYS: [170 171 172 173 175 176 177 178]
170
171
172
173
175
176
177
178

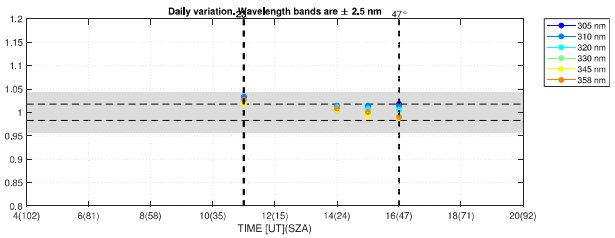

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:19-Jun-2025(170)
wl [nm]
UVIndex

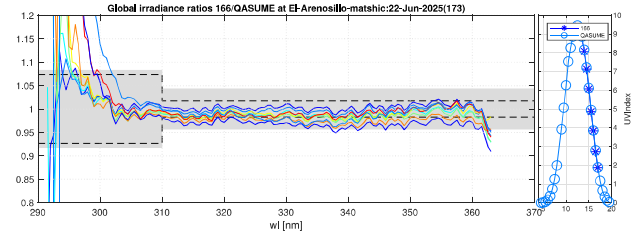

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

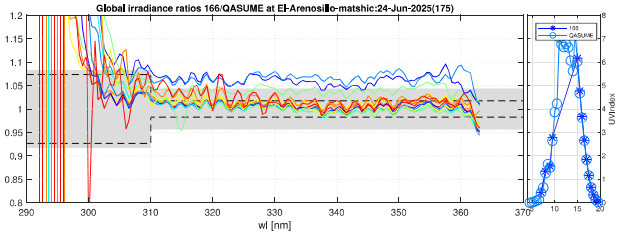

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

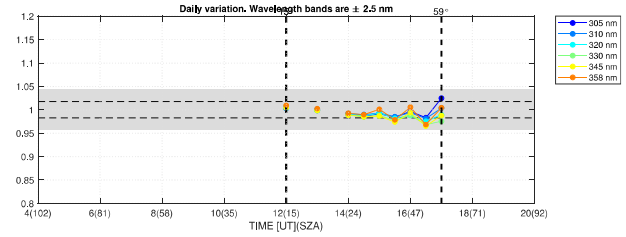

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

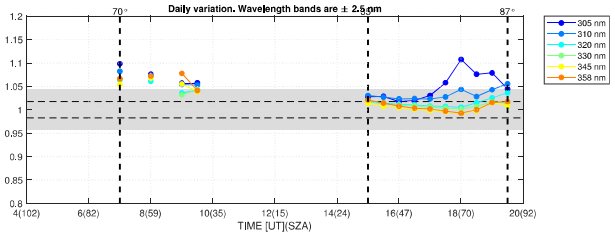

Daily variation. Wavelength bands are ± 2.5 nm
59°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

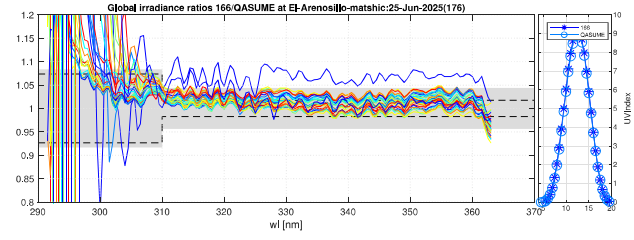

Daily variation. Wavelength bands are ± 2.5 nm
47°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

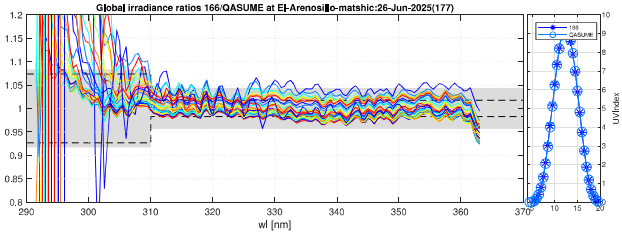

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

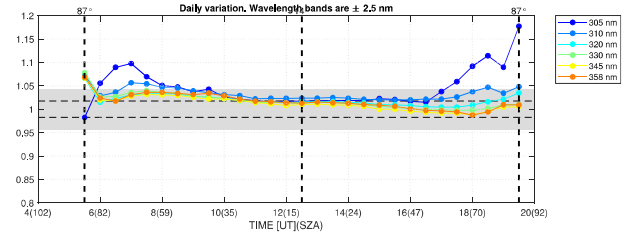

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

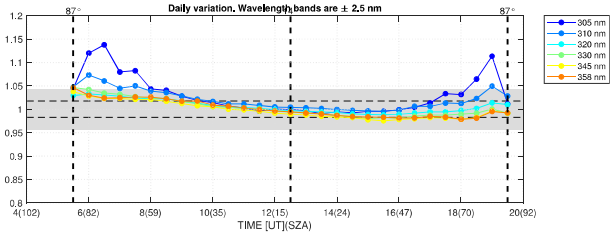

Daily variation. Wavelength bands are ± 2.5 nm
59°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

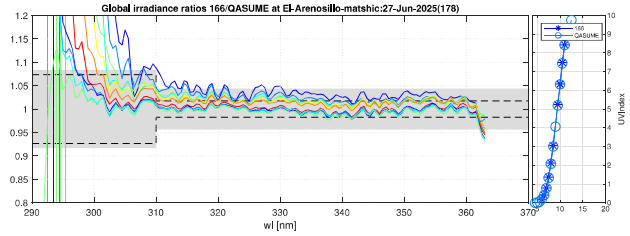

Daily variation. Wavelength bands are ± 2.5 nm
70°
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

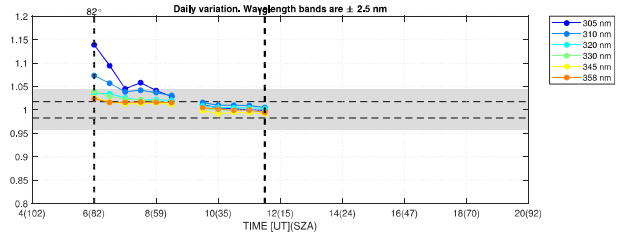

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

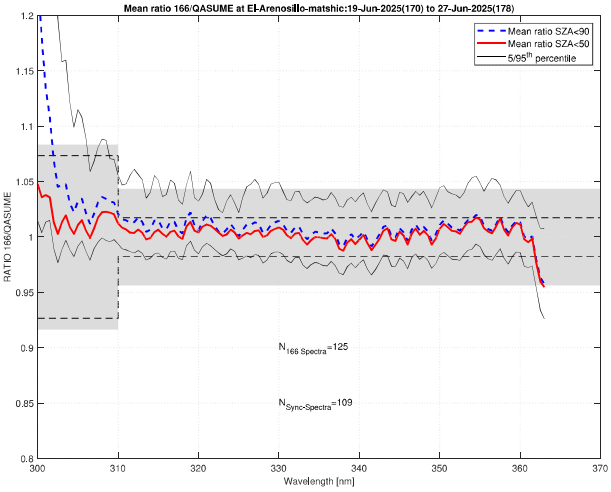

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

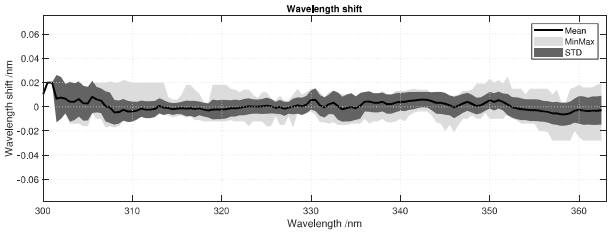

Daily variation. Wavelength bands are ± 2.5 nm
87°
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

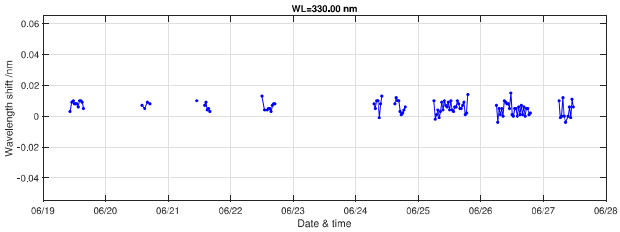

Daily variation. Wavelength bands are ± 2.5 nm
87°
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

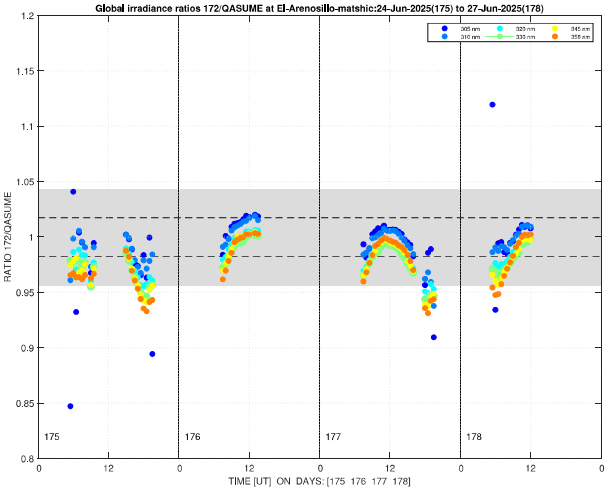

Global irradiance ratios 166/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
166
QASUME
UVIndex
wl [nm]

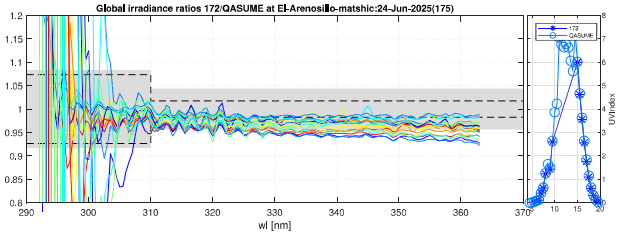

Daily variation. Wavelength bands are ± 2.5 nm
82°
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm
TIME [UT](SZA)

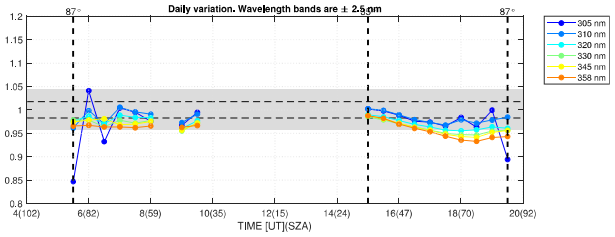

Mean ratio 166/QASUME at El-Arenosillo-matshic:19-Jun-2025(170) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N166 Spectra=125
NSync-Spectra=109
RATIO 166/QASUME
Wavelength [nm]

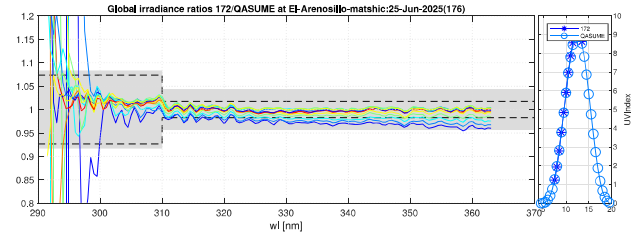

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

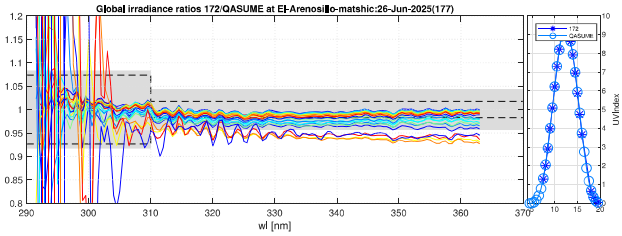

WL=330.00 nm
Wavelength shift /nm
Date & time

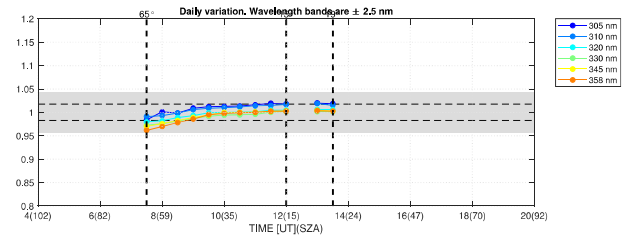

Global irradiance ratios 172/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 27-Jun-2025(178)
RATIO 172/QASUME
TIME [UT] ON DAYS: [175 176 177 178]
175
176
177
178

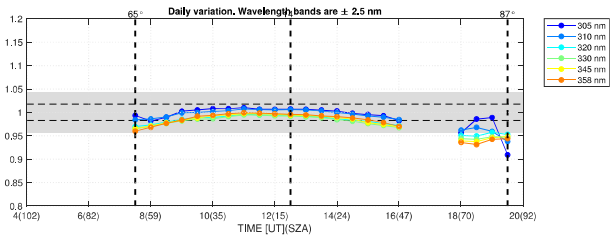

Global irradiance ratios 172/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

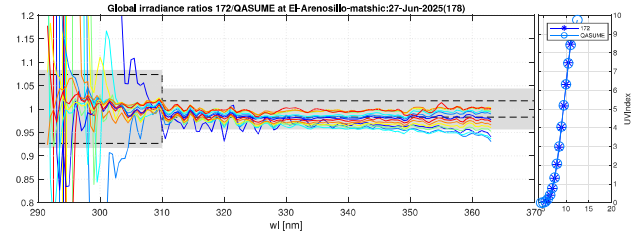

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

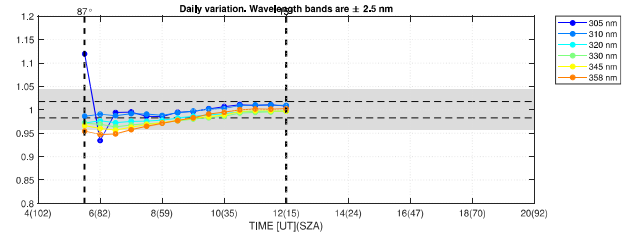

Global irradiance ratios 172/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

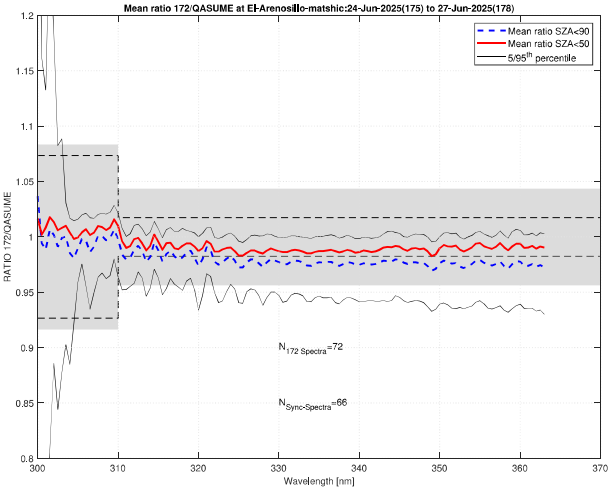

Global irradiance ratios 172/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

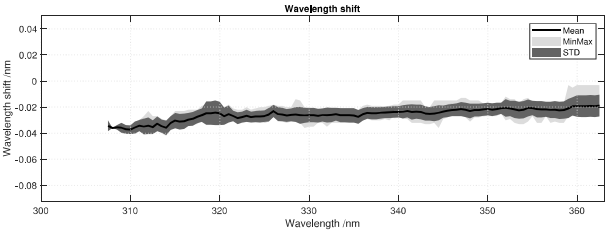

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

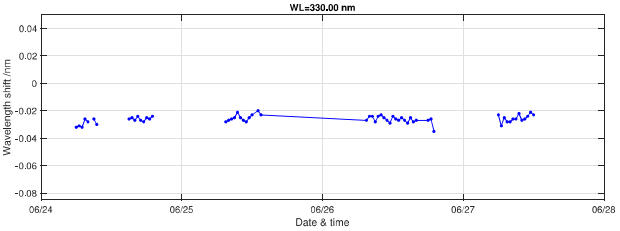

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

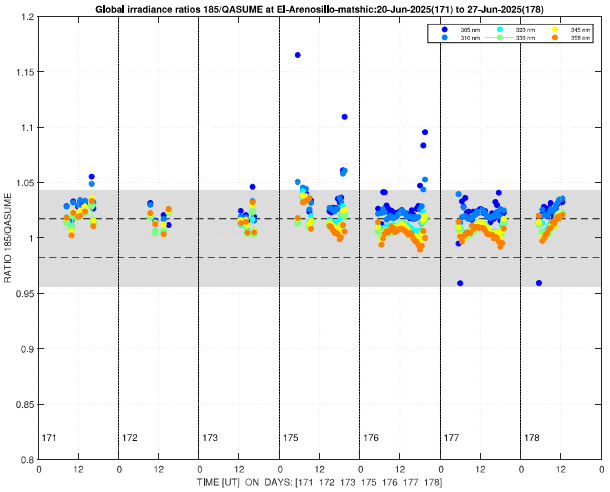

Global irradiance ratios 172/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

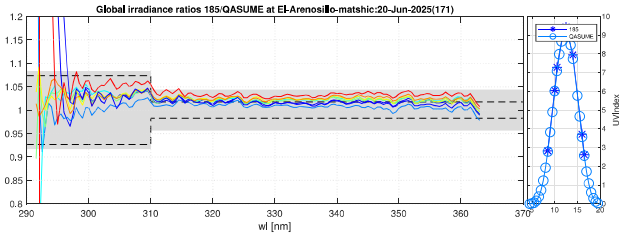

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

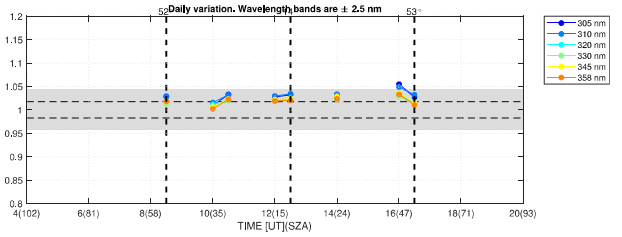

Mean ratio 172/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 172/QASUME
N172 Spectra=72
NSync-Spectra=66
Wavelength [nm]

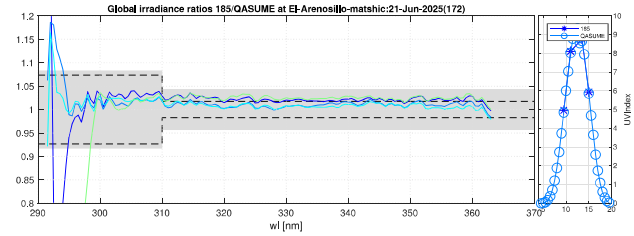

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

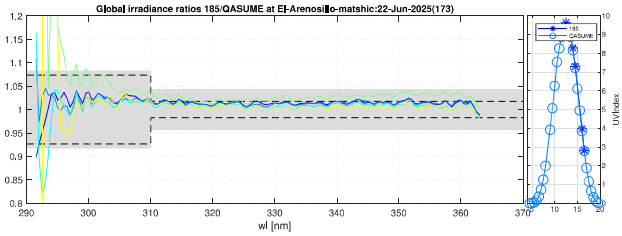

WL=330.00 nm
Wavelength shift /nm
Date & time

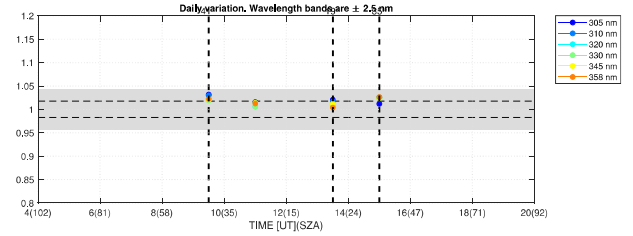

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
RATIO 185/QASUME
TIME [UT] ON DAYS: [171 172 173 175 176 177 178]
171
172
173
175
176
177
178

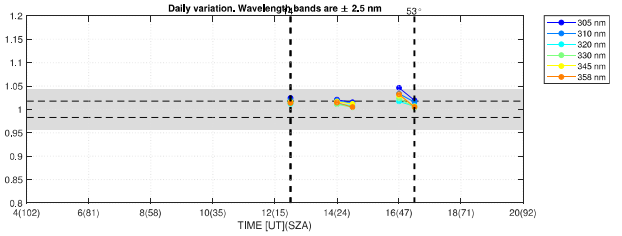

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

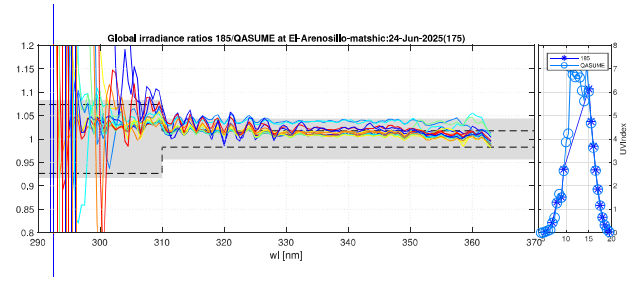

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

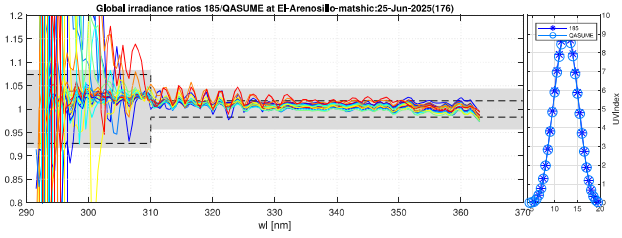

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

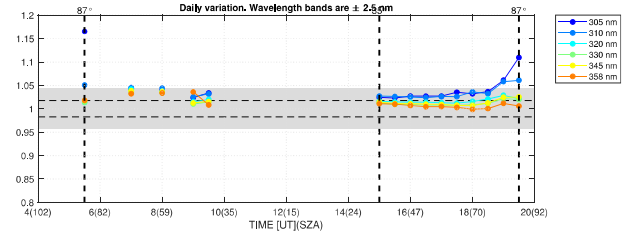

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

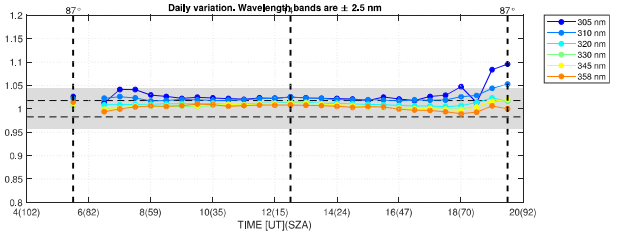

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

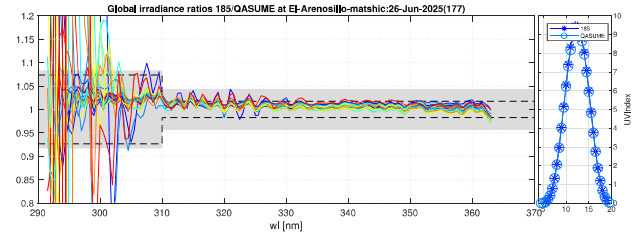

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

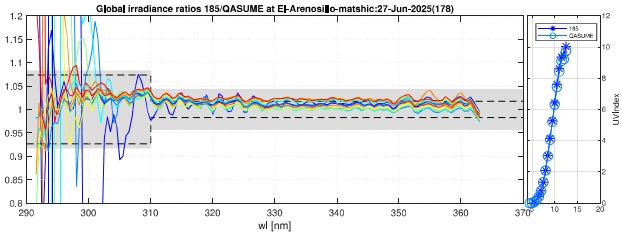

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

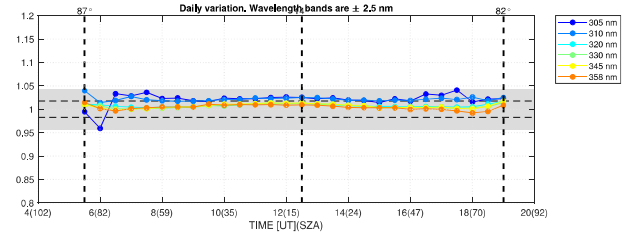

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

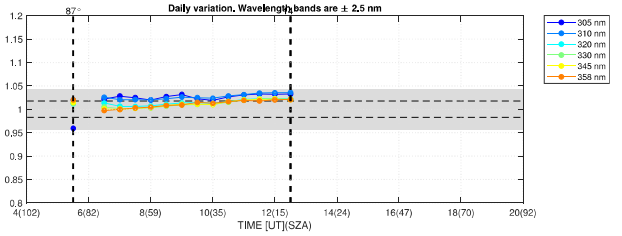

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

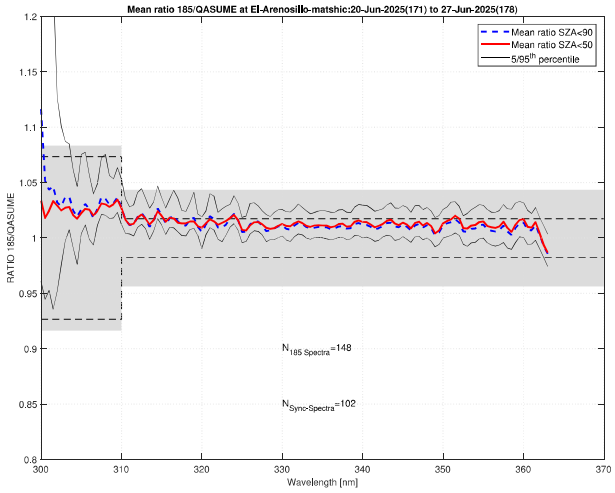

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

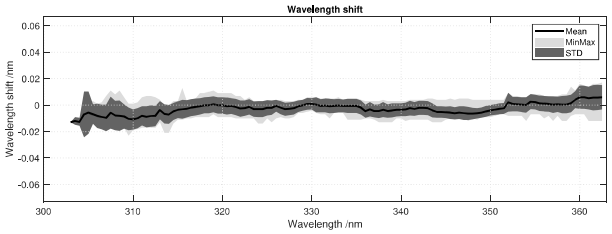

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

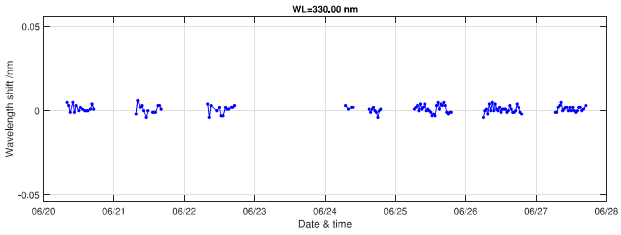

Global irradiance ratios 185/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

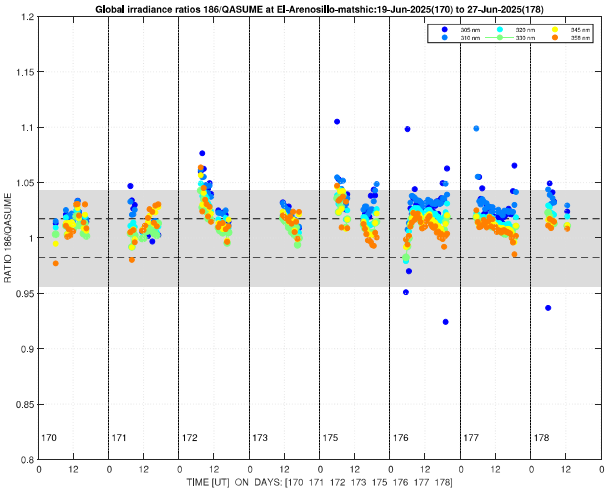

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

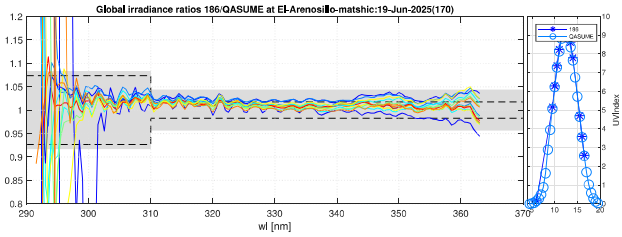

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

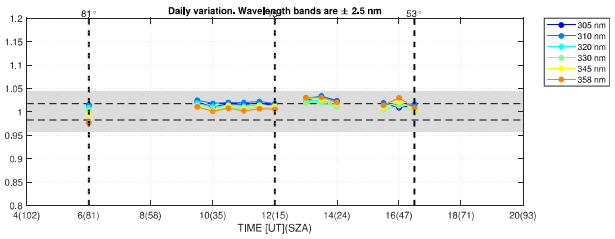

Mean ratio 185/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 185/QASUME
Wavelength [nm]
N185 Spectra=148
NSync-Spectra=102

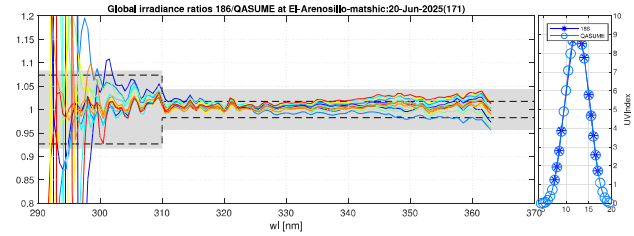

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

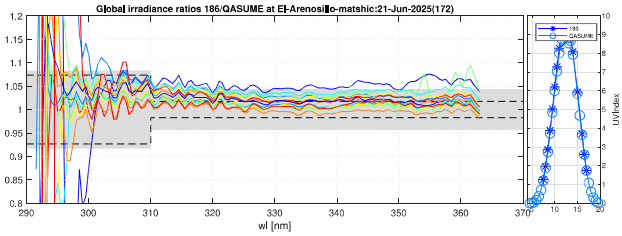

WL=330,00 nm
Wavelength shift /nm
Date & time

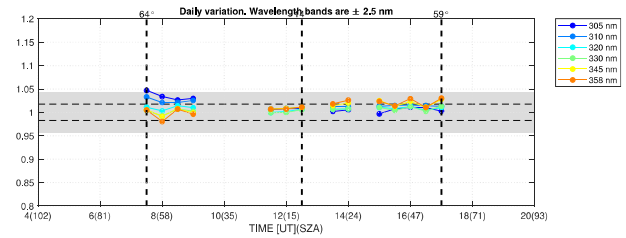

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:19-Jun-2025(170) to 27-Jun-2025(178)
RATIO 186/QASUME
TIME [UT] ON DAYS: [170 171 172 173 175 176 177 178]
170
171
172
173
175
176
177
178

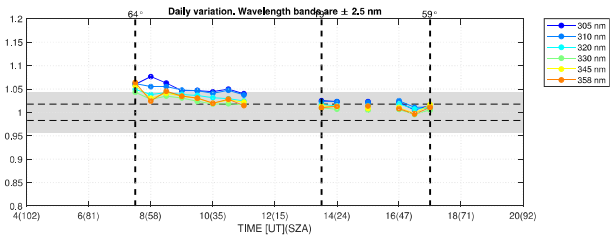

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:19-Jun-2025(170)
wl [nm]
UVIndex

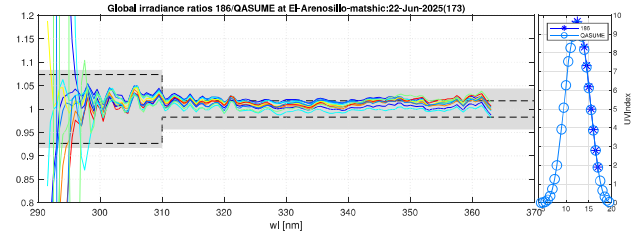

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

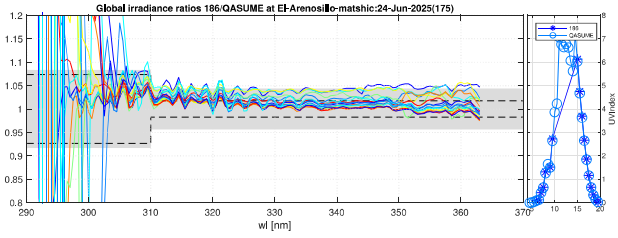

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

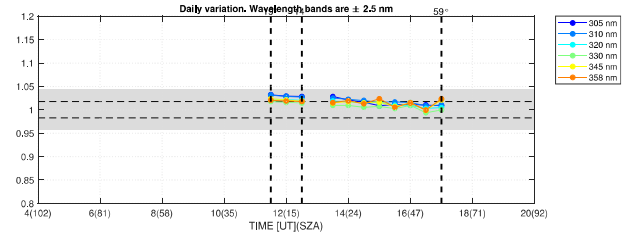

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

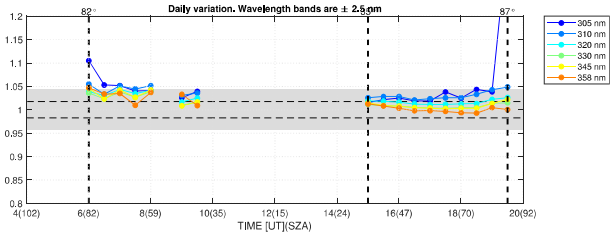

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

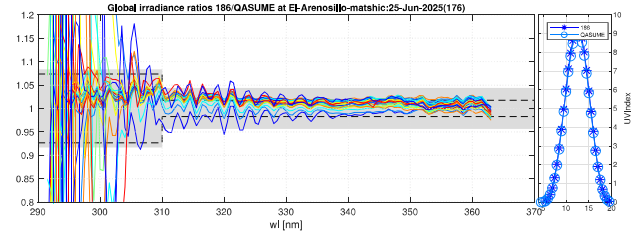

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

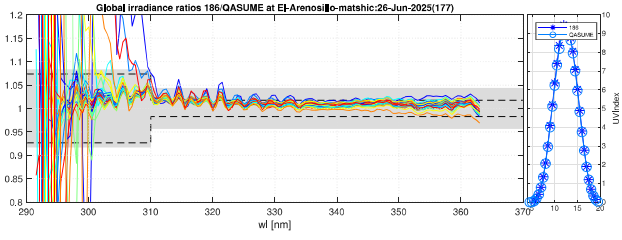

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

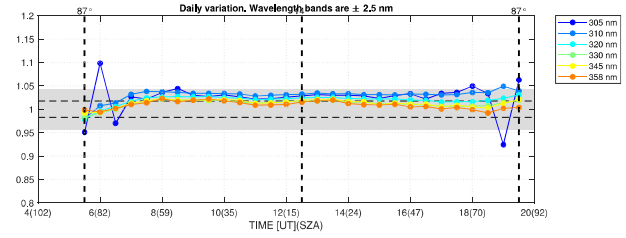

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

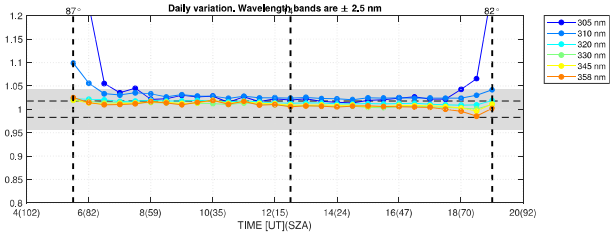

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

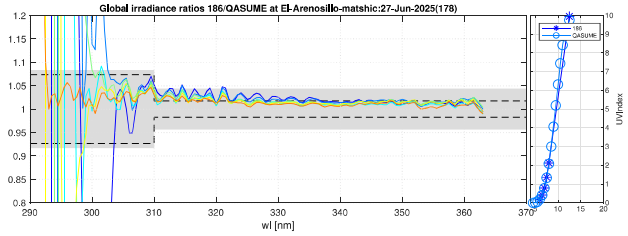

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

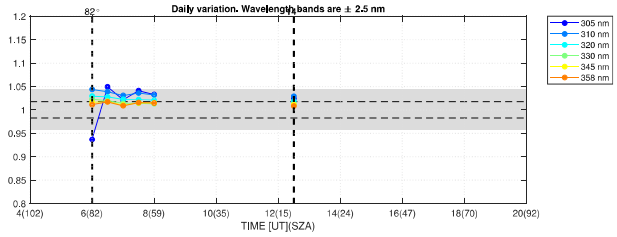

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

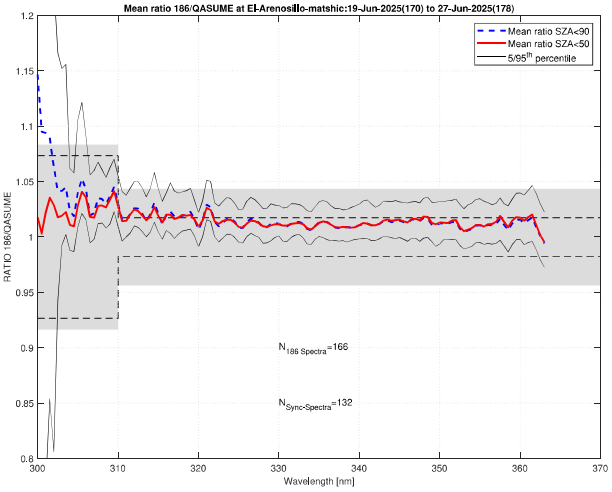

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

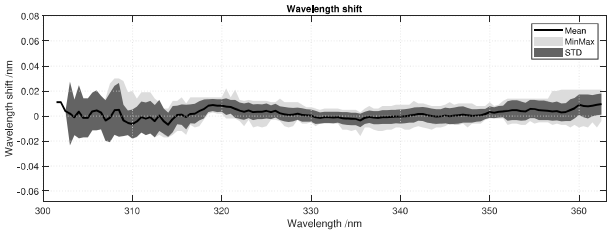

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

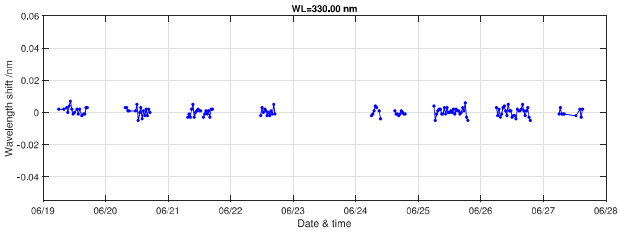

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

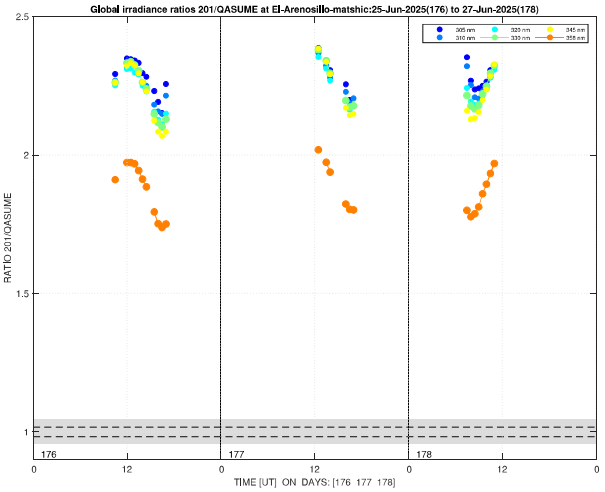

Global irradiance ratios 186/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
186
QASUME
UVIndex
wl [nm]

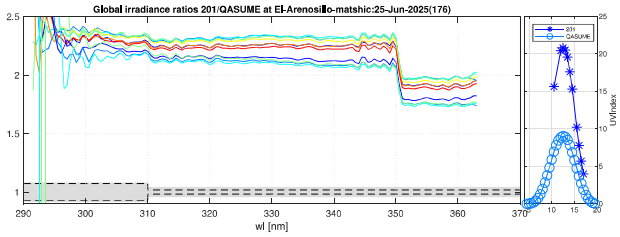

Daily variation. Wavelength bands are ± 2.5 nm
82°
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm
TIME [UT](SZA)

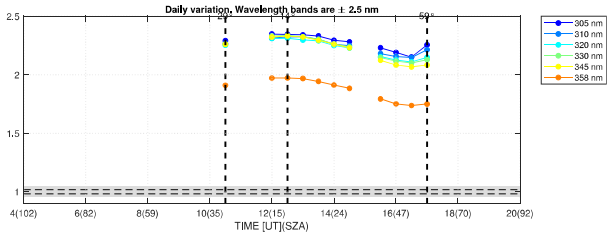

Mean ratio 186/QASUME at El-Arenosillo-matshic:19-Jun-2025(170) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N186 Spectra=166
NSync-Spectra=132
RATIO 186/QASUME
Wavelength [nm]

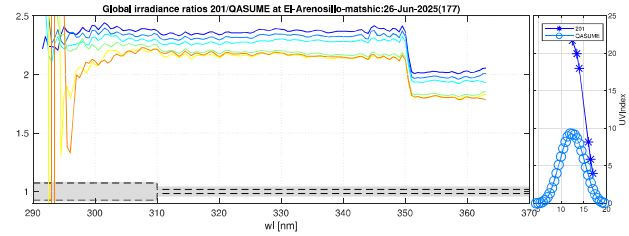

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

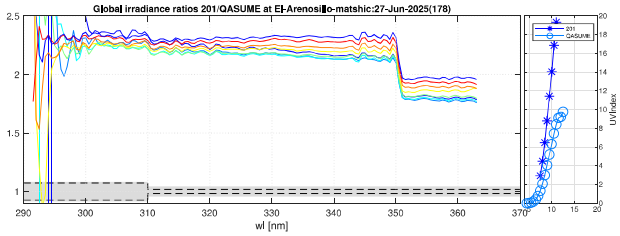

WL=330.00 nm
Wavelength shift /nm
Date & time

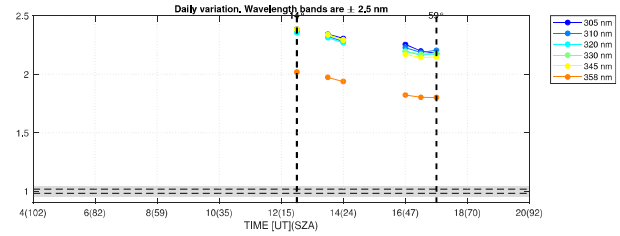

Global irradiance ratios 201/QASUME at El-Arenosillo-matshic:25-Jun-2025(176) to 27-Jun-2025(178)
RATIO 201/QASUME
TIME [UT] ON DAYS: [176 177 178]
176
177
178

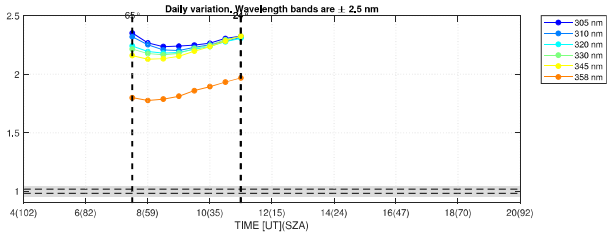

Global irradiance ratios 201/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

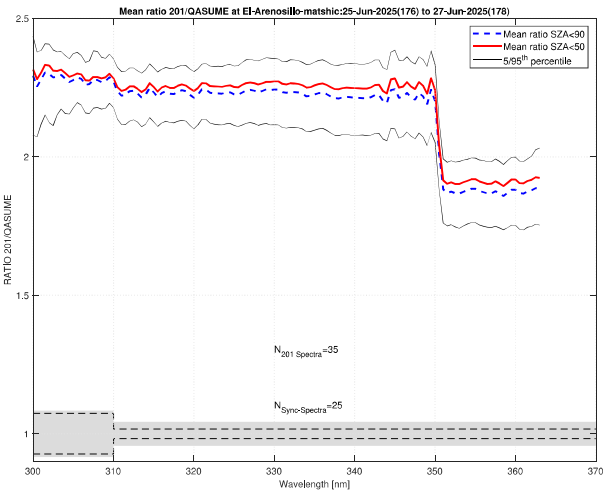

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

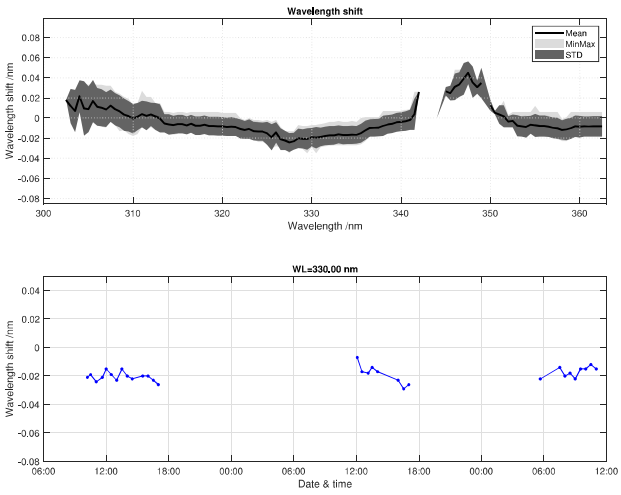

Global irradiance ratios 201/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex


Global irradiance ratios 201/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

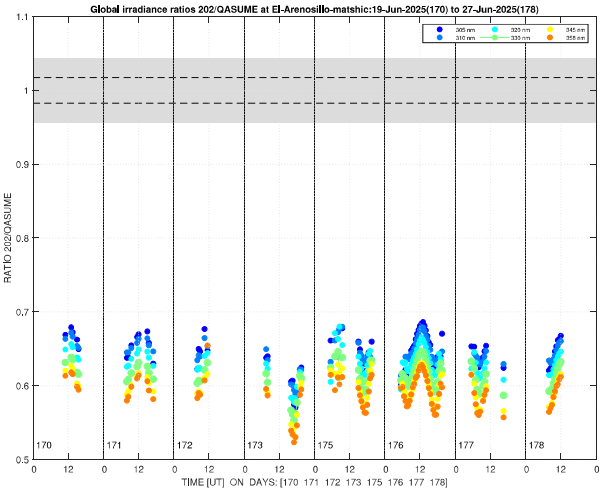

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

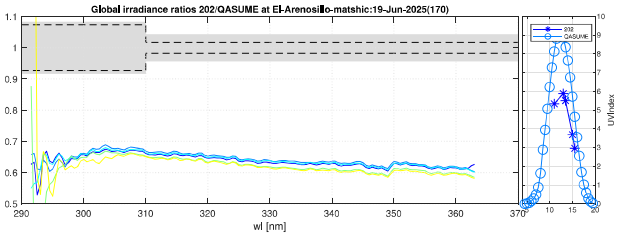

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm

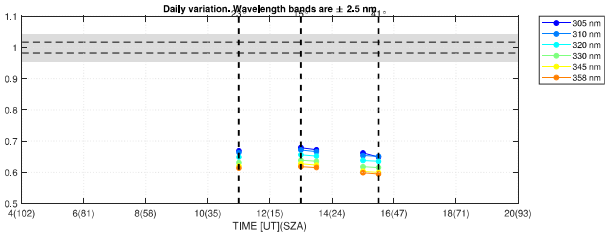

Mean ratio 201/QASUME at El-Arenosillo-matshic:25-Jun-2025(176) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 201/QASUME
N201 Spectra=35
NSync-Spectra=25
Wavelength [nm]

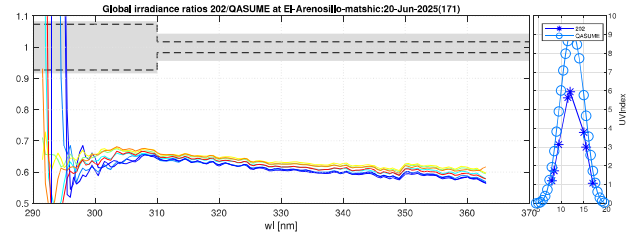

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

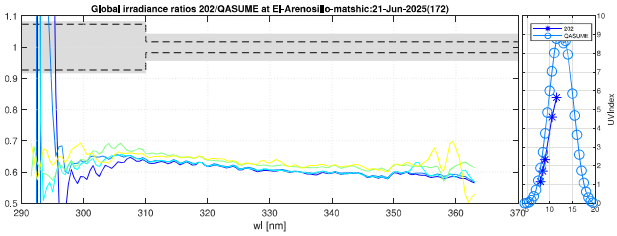
WL=330.00 nm
Wavelength shift /nm
Date & time

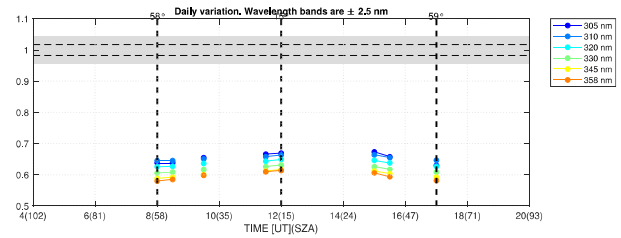

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:19-Jun-2025(170) to 27-Jun-2025(178)
RATIO 202/QASUME
TIME [UT] ON DAYS: [170 171 172 173 175 176 177 178]

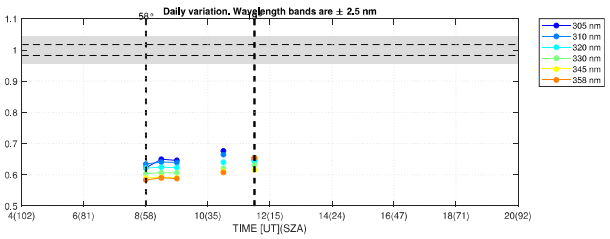

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:19-Jun-2025(170)
wl [nm]
UVIndex

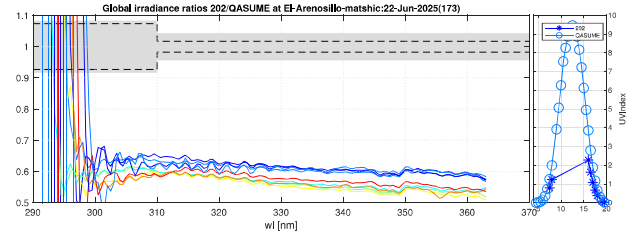

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

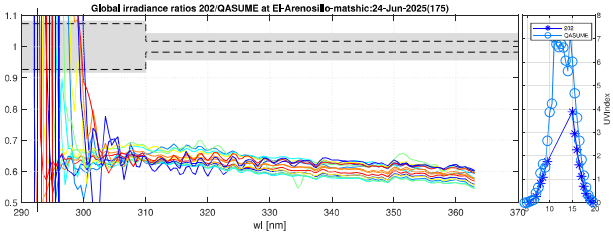

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

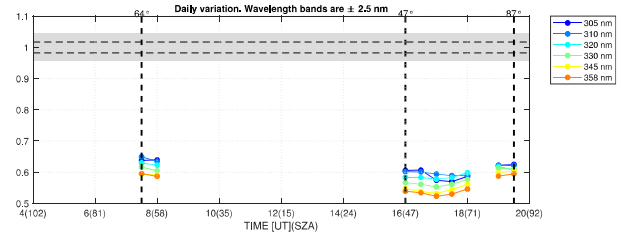

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

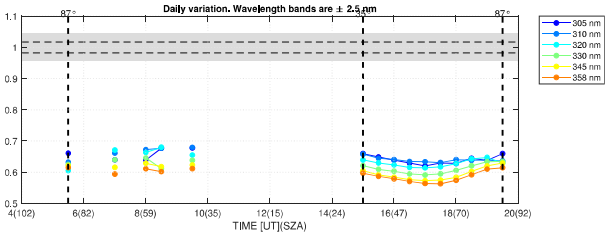

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

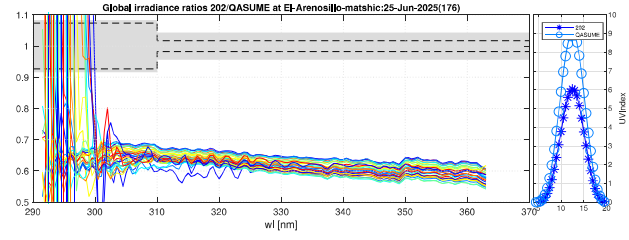

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

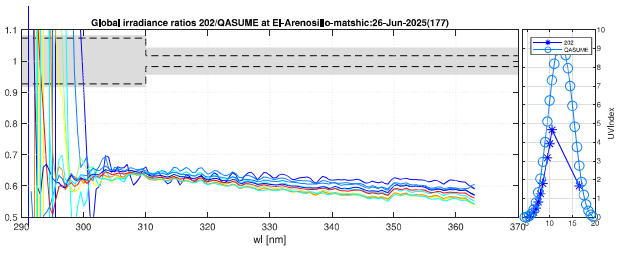

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

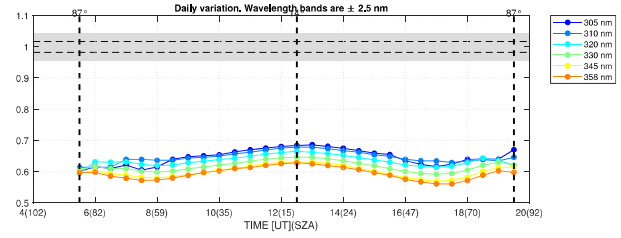

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

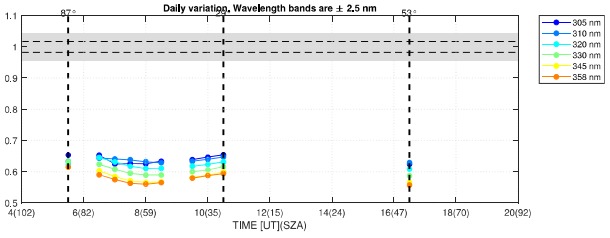

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

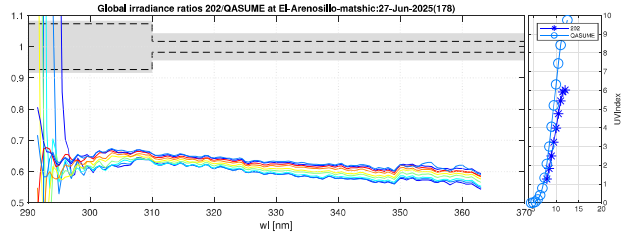

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

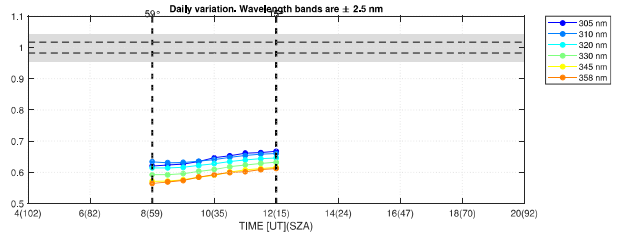

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

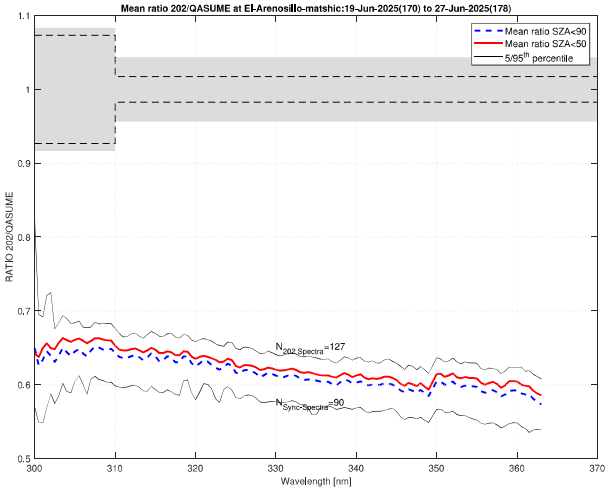

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

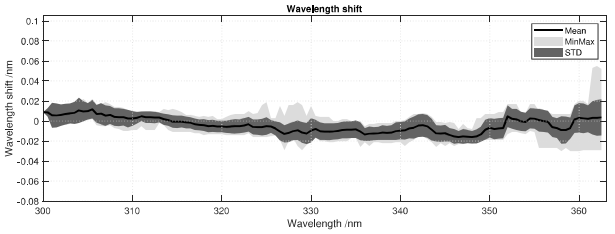

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

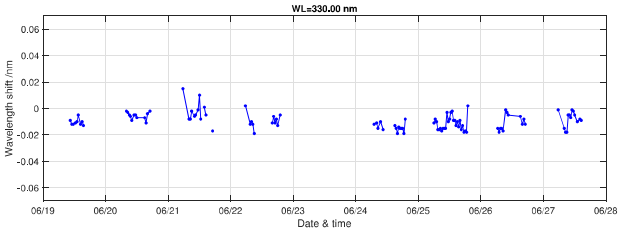

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

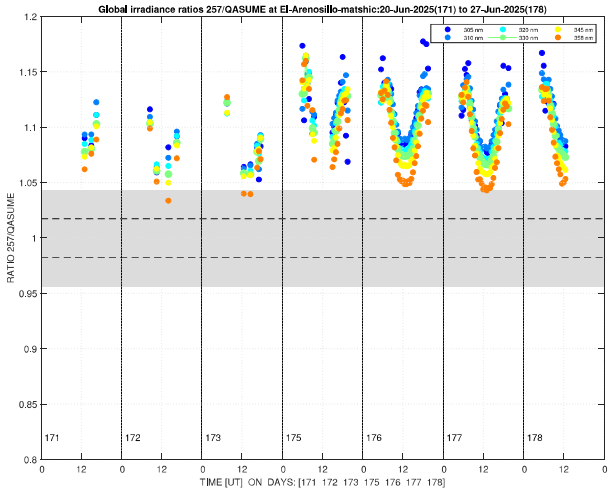

Global irradiance ratios 202/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
202
QASUME
UVIndex
wl [nm]

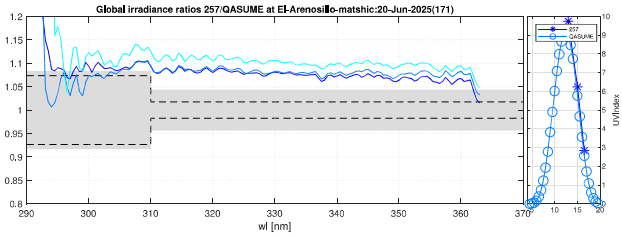

Daily variation. Wavelength bands are ± 2.5 nm
50°
305 nm
310 nm
320 nm
330 nm
345 nm
358 nm
TIME [UT](SZA)

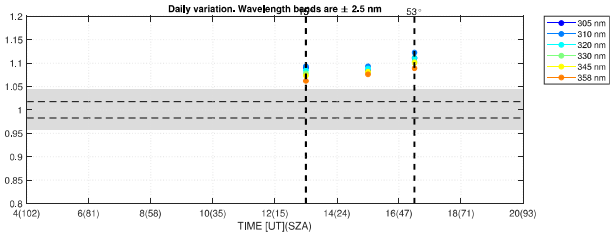

Mean ratio 202/QASUME at El-Arenosillo-matshic:19-Jun-2025(170) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N202 Spectra=127
NSync-Spectra=90
RATIO 202/QASUME
Wavelength [nm]

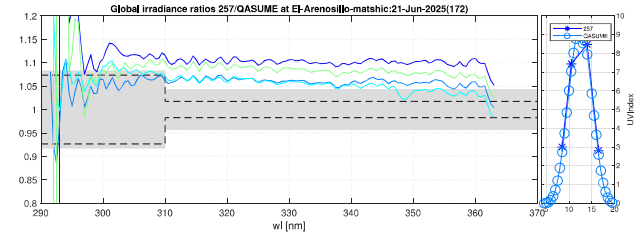

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

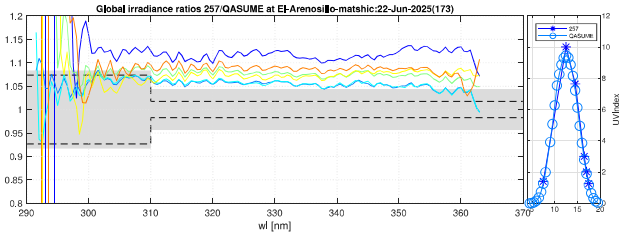

WL=330.00 nm
Wavelength shift /nm
Date & time

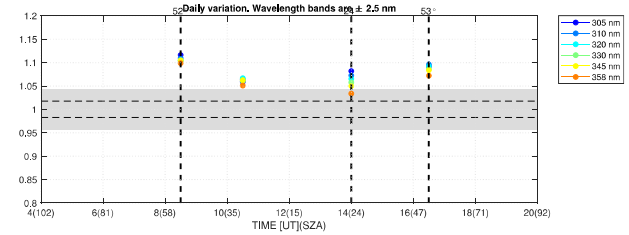

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
RATIO 257/QASUME
TIME [UT] ON DAYS: [171 172 173 175 176 177 178]
171
172
173
175
176
177
178

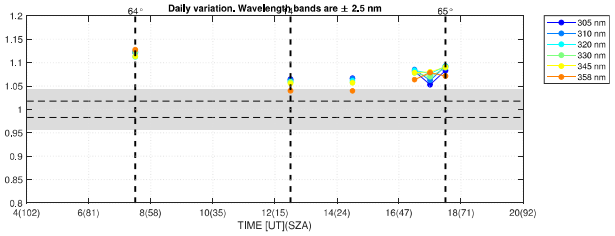

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
wl [nm]
UVIndex

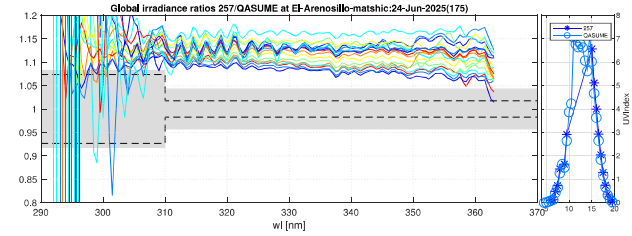

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

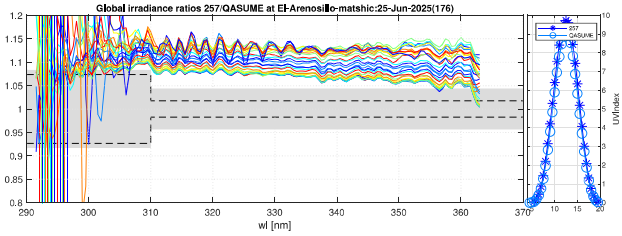

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:21-Jun-2025(172)
wl [nm]
UVIndex

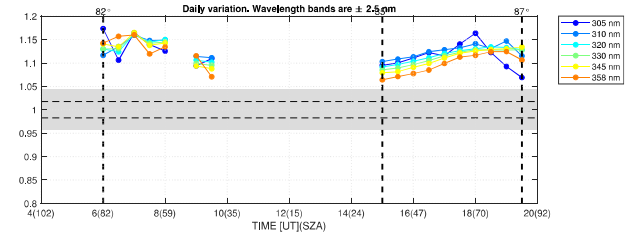

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
wl [nm]
UVIndex

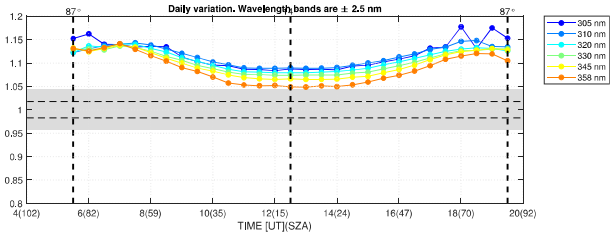

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

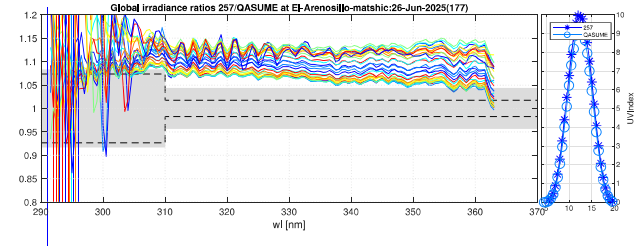

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

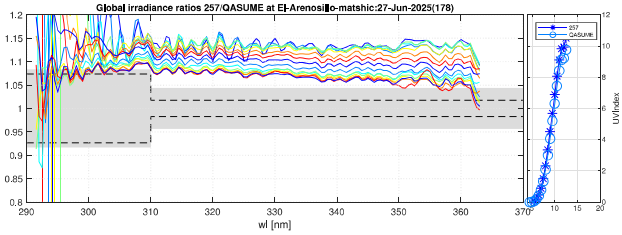

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
wl [nm]
UVIndex

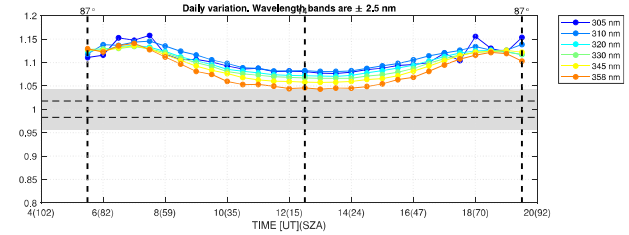

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
wl [nm]
UVIndex

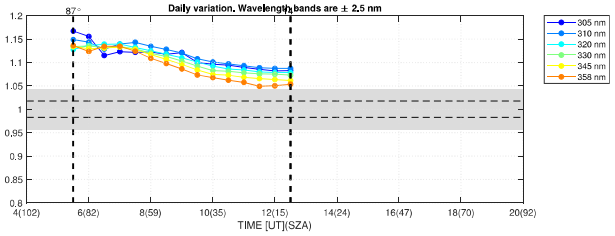

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

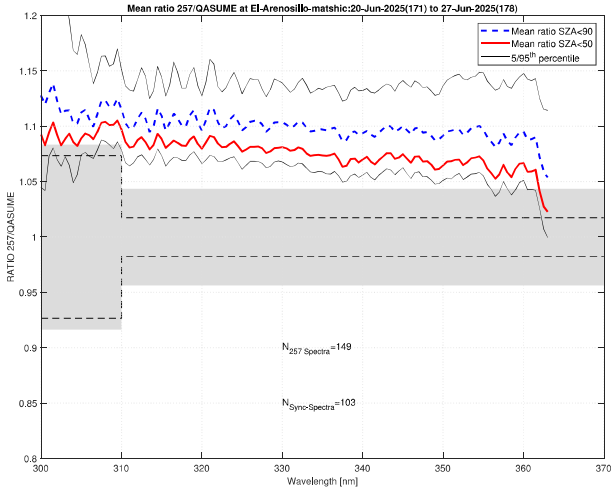

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

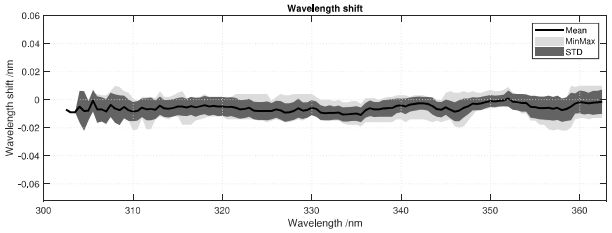

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
wl [nm]
UVIndex

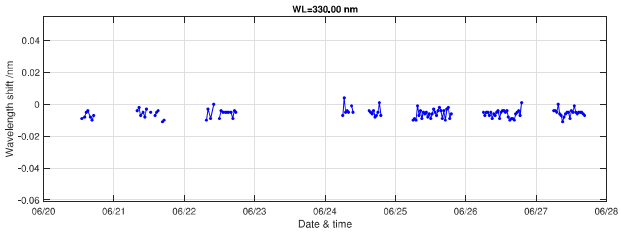

Global irradiance ratios 257/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
wl [nm]
UVIndex

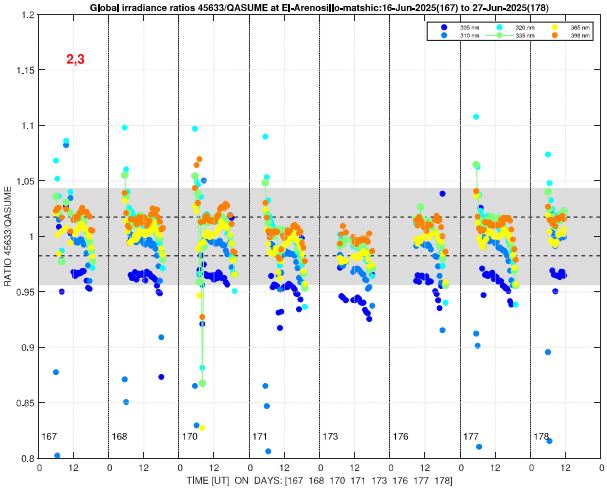

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

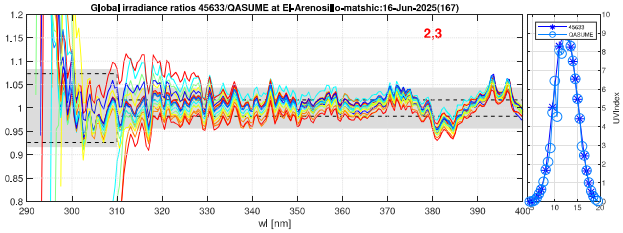

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

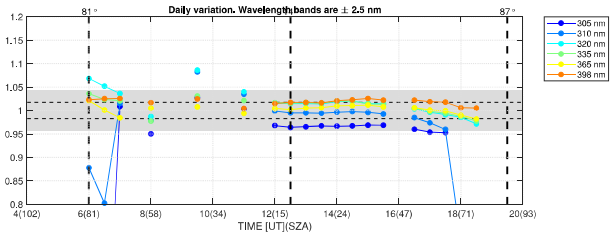

Mean ratio 257/QASUME at El-Arenosillo-matshic:20-Jun-2025(171) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 257/QASUME
N257 Spectra=149
NSync-Spectra=103
Wavelength [nm]

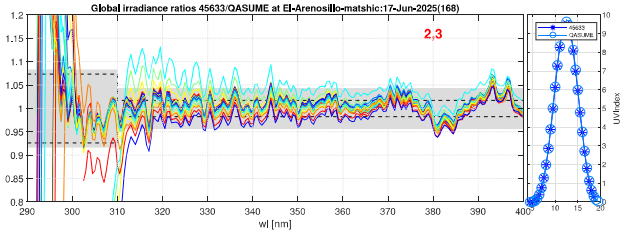

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

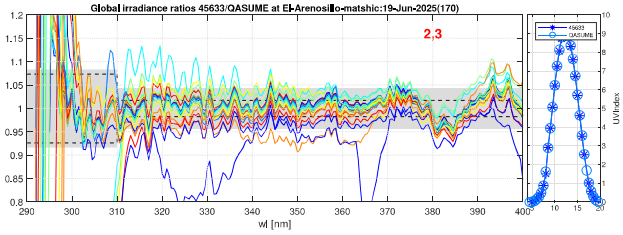

WL=330,00 nm
Wavelength shift /nm
Date & time

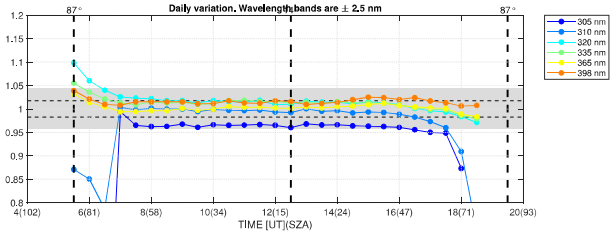

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:16-Jun-2025(167) to 27-Jun-2025(178)
2,3
RATIO 45633/QASUME
TIME [UT] ON DAYS: [167 168 170 171 173 176 177 178]

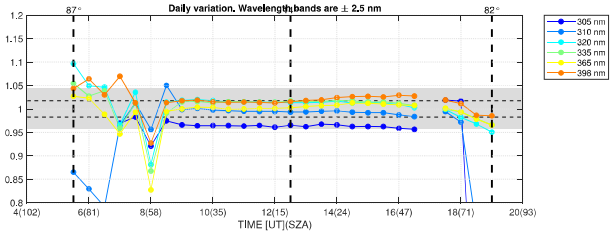

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:16-Jun-2025(167)
2,3
wl [nm]
UVIndex

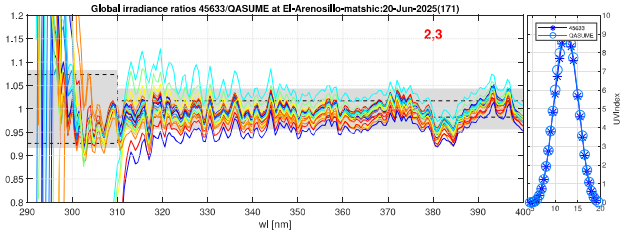

Daily variation. Wavelengths bands are ± 2.5 nm
TIME [UT](SZA)

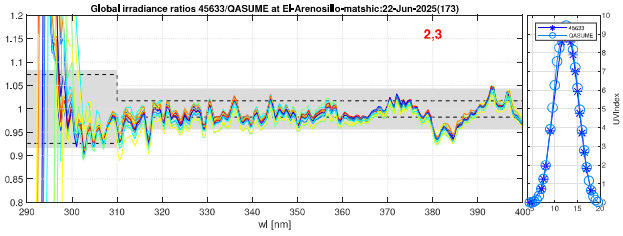

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:17-Jun-2025(168)
2,3
wl [nm]
UVIndex

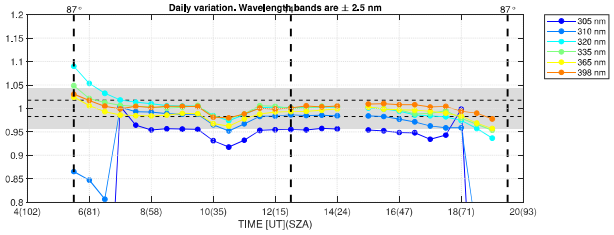

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:19-Jun-2025(170)
2,3
wl [nm]
UVIndex

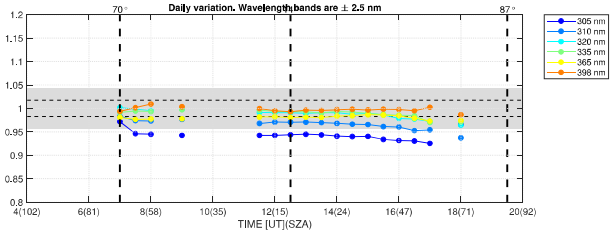

Daily variation. Wavelengths bands are ± 2.5 nm
TIME [UT](SZA)

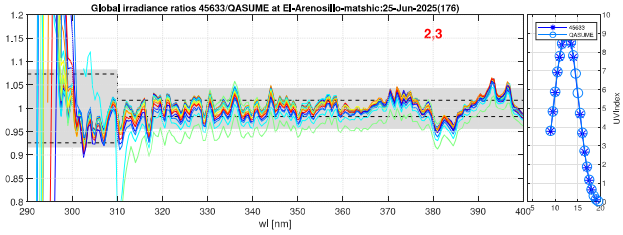

Daily variation. Wavelengths bands are ± 2.5 nm
TIME [UT](SZA)

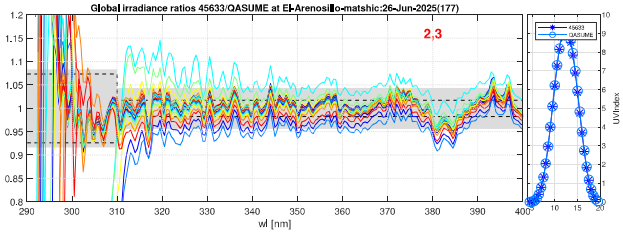

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
2,3
wl [nm]
UVIndex

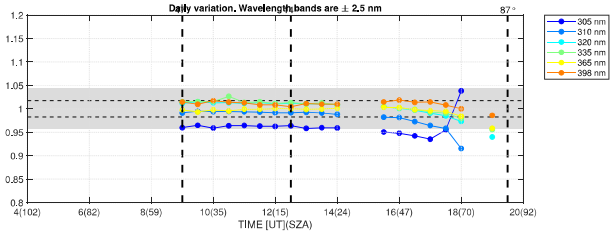

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
2,3
wl [nm]
UVIndex

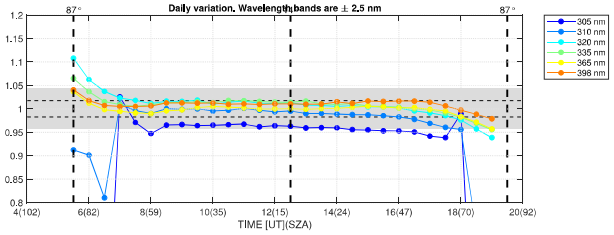

Daily variation. Wavelengths bands are ± 2.5 nm
TIME [UT](SZA)

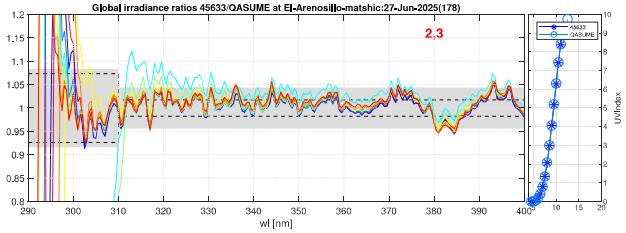

Daily variation. Wavelengths bands are ± 2.5 nm
TIME [UT](SZA)

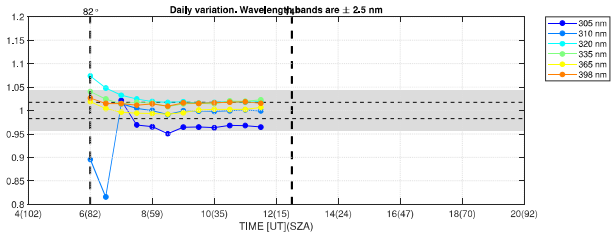

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
2,3
wl [nm]
UVIndex

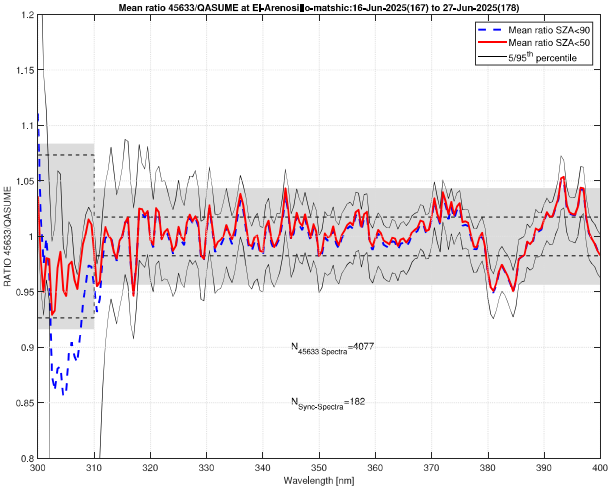

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
2,3
wl [nm]
UVIndex

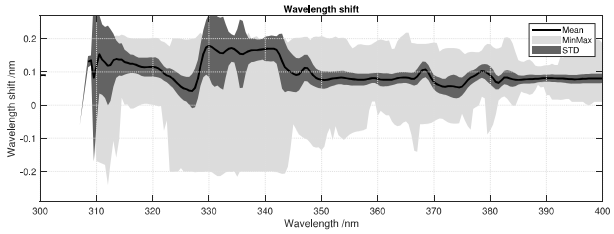

Daily variation. Wavelengths bands are ± 2.5 nm
TIME [UT](SZA)

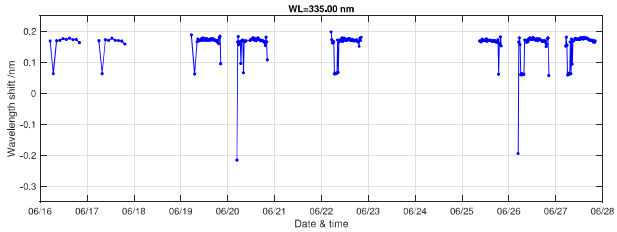

Daily variation. Wavelengths bands are ± 2.5 nm
TIME [UT](SZA)

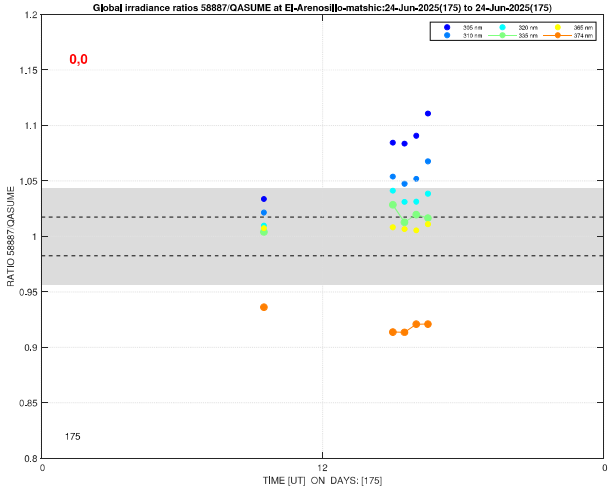

Global irradiance ratios 45633/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
2,3
45633
QASUME
UVIndex
wl [nm]

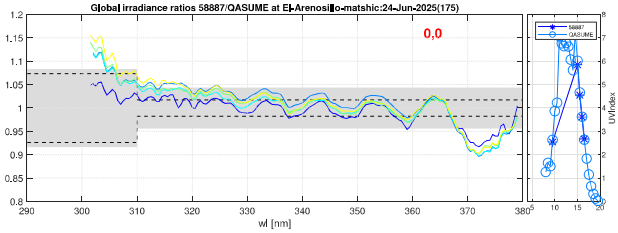

Daily variation. Wavelength bands are ± 2.5 nm
82°
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm
TIME [UT](SZA)

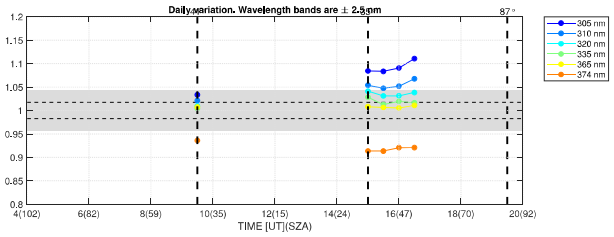

Mean ratio 45633/QASUME at El-Arenosillo-matshic:16-Jun-2025(167) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N45633 Spectra=4077
NSync-Spectra=182
RATIO 45633/QASUME
Wavelength [nm]

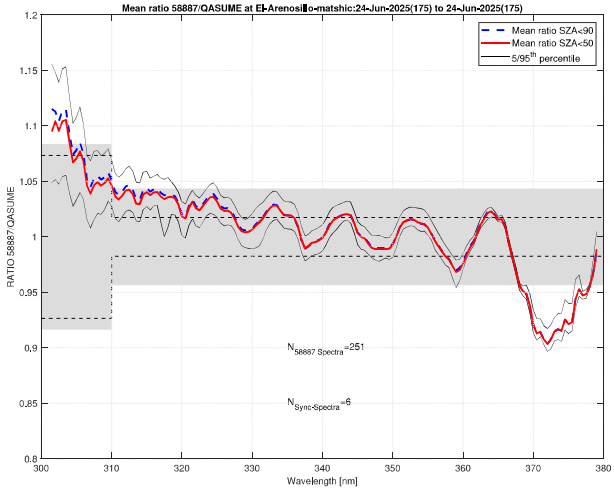

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

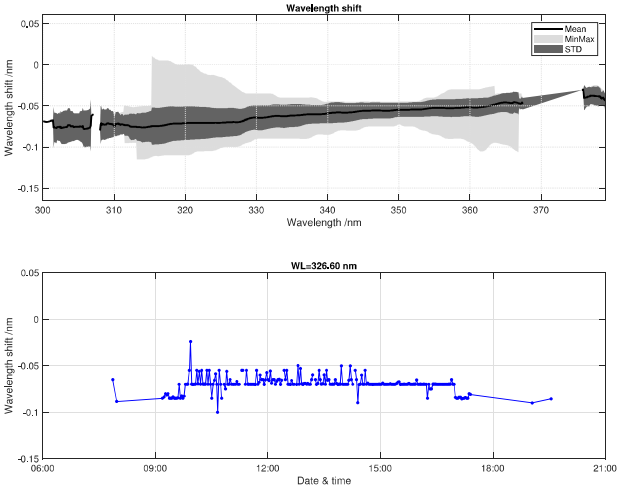

WL=335.00 nm
Wavelength shift /nm
Date & time

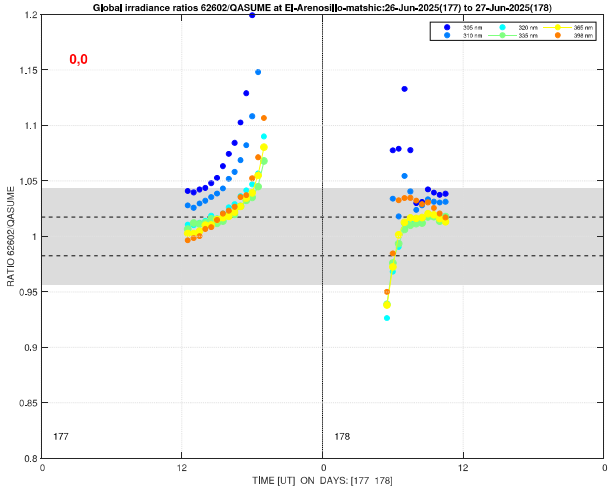

Global irradiance ratios 58887/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 24-Jun-2025(175)
0,0
305 nm
310 nm
320 nm
335 nm
365 nm
374 nm
RATIO 58887/QASUME
175
TIME [UT] ON DAYS: [175]

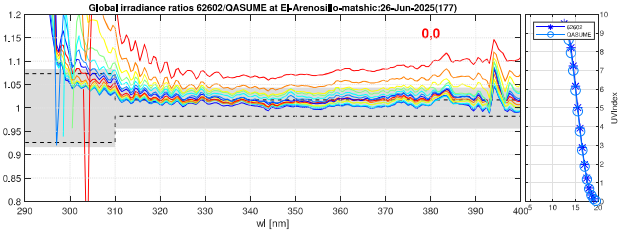

Global irradiance ratios 58887/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
0,0
58887
QASUME
UVIndex
wl [nm]

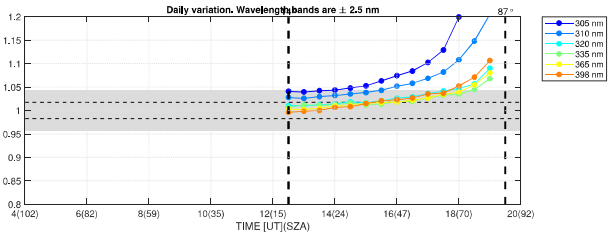

Daily variation. Wavelength bands are ± 2.5 nm
305 nm
310 nm
320 nm
335 nm
365 nm
374 nm
TIME [UT](SZA)

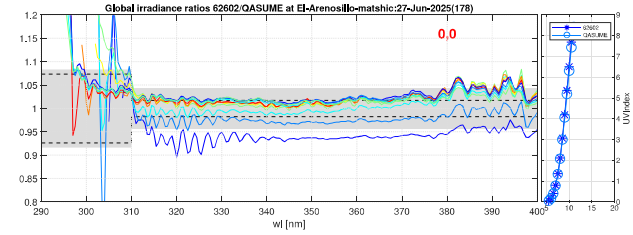

Mean ratio 58887/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 24-Jun-2025(175)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N58887 Spectra=251
NSync-Spectra=6
RATIO 58887/QASUME
Wavelength [nm]

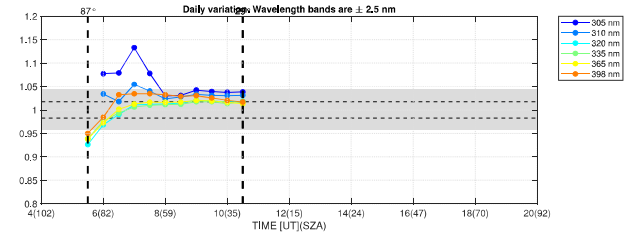

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm
WL=326.60 nm
Wavelength shift /nm
Date & time

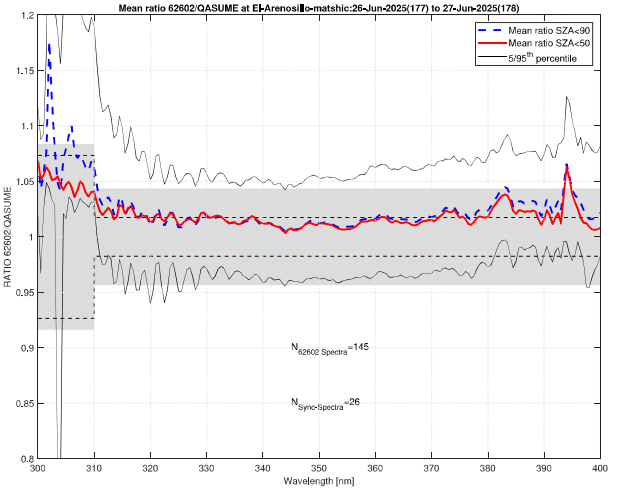

Global irradiance ratios 62602/QASUME at El-Arenosillo-matshic:26-Jun-2025(177) to 27-Jun-2025(178)
0,0
RATIO 62602/QASUME
TIME [UT] ON DAYS: [177 178]
177
178

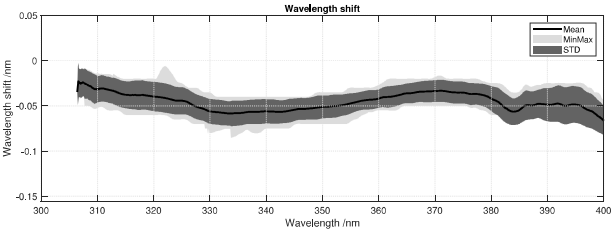

Global irradiance ratios 62602/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
0,0
wl [nm]
UVIndex

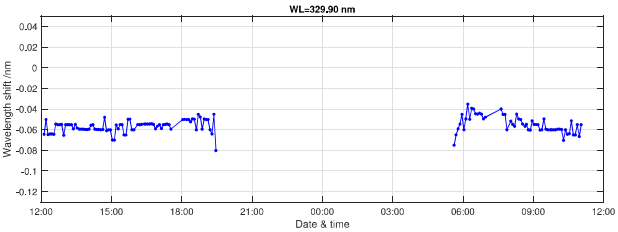

Daily variation. Wavelength bands are ± 2.5 nm
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

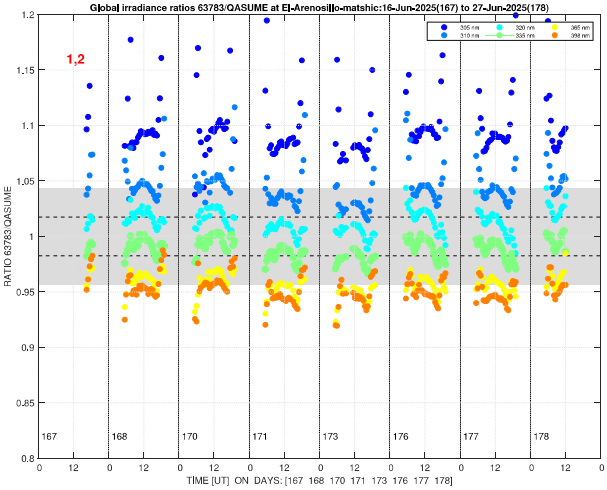

Global irradiance ratios 62602/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
0,0
wl [nm]
UVIndex

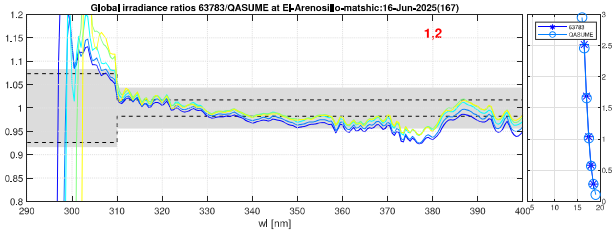

Daily variation. Wavelength bands are ± 2.5 nm
87°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

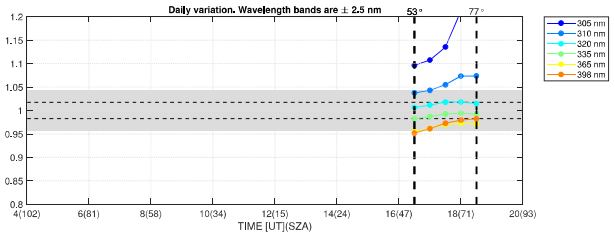

Mean ratio 62602/QASUME at El-Arenosillo-matshic:26-Jun-2025(177) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N62602 Spectra=145
NSync-Spectra=26
RATIO 62602/QASUME
Wavelength [nm]

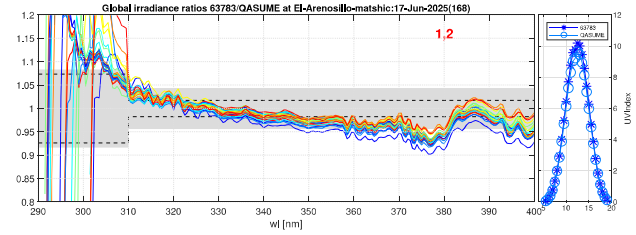

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

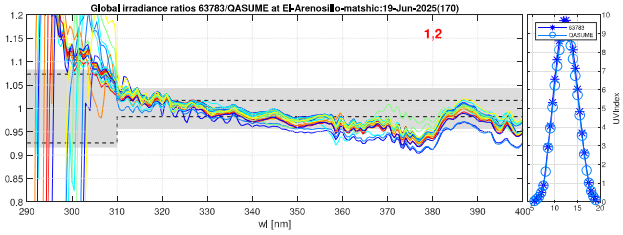

WL=329.90 nm
Wavelength shift /nm
Date & time

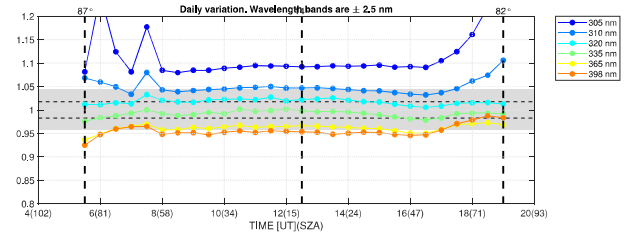

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:16-Jun-2025(167) to 27-Jun-2025(178)
1,2
RATIO 63783/QASUME
TIME [UT] ON DAYS: [167 168 170 171 173 176 177 178]
167
168
170
171
173
176
177
178

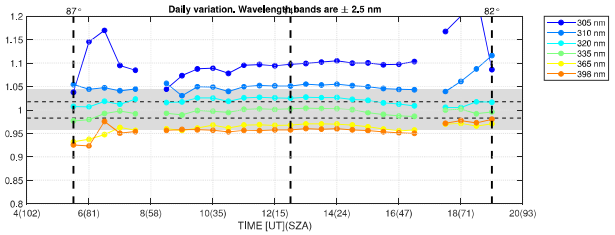

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:16-Jun-2025(167)
1,2
wl [nm]
UVIndex

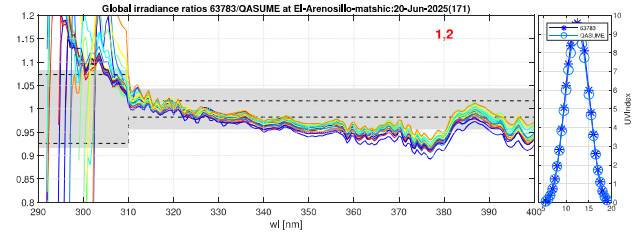

Daily variation. Wavelength bands are ± 2.5 nm
53°
77°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

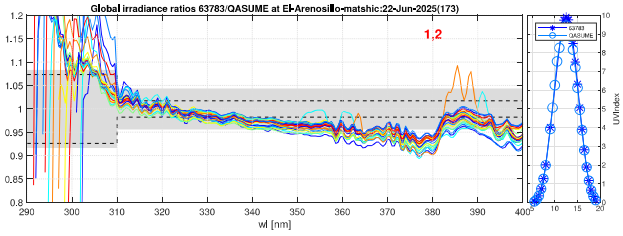

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:17-Jun-2025(168)
1,2
wl [nm]
UVIndex

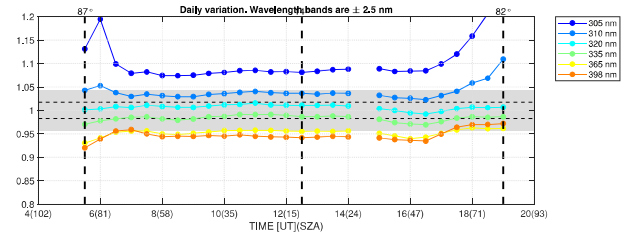

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:19-Jun-2025(170)
1,2
wl [nm]
UVIndex

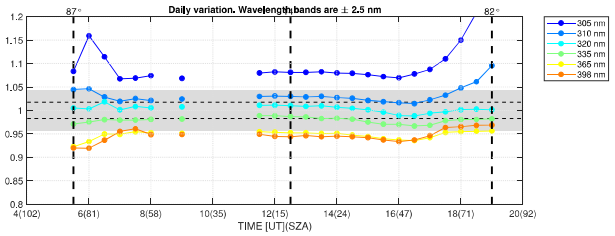

Daily variation. Wavelength bands are ± 2.5 nm
87°
82°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

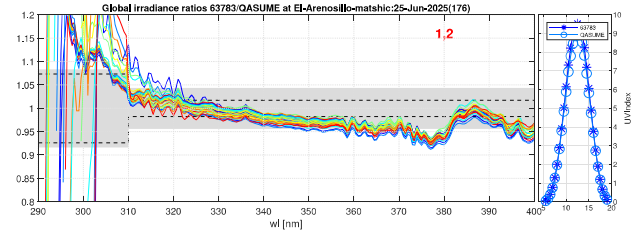

Daily variation. Wavelength bands are ± 2.5 nm
87°
82°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

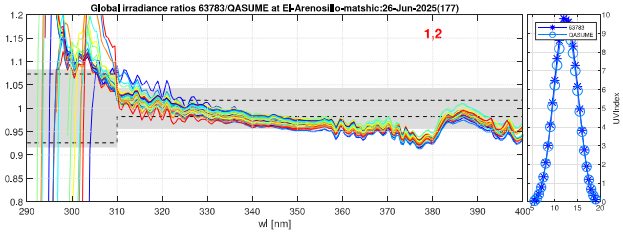

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:20-Jun-2025(171)
1,2
wl [nm]
UVIndex

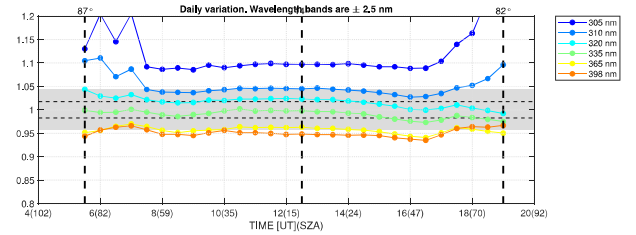

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:22-Jun-2025(173)
1,2
wl [nm]
UVIndex

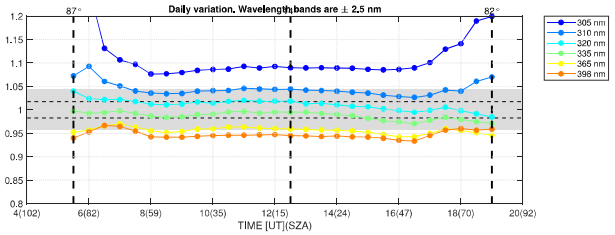

Daily variation. Wavelength bands are ± 2.5 nm
87°
82°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

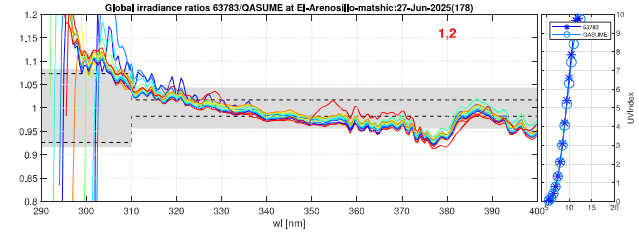

Daily variation. Wavelength bands are ± 2.5 nm
87°
82°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

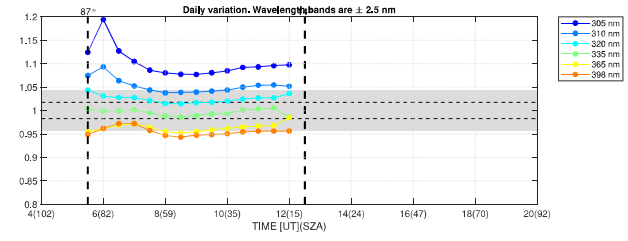

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:25-Jun-2025(176)
1,2
wl [nm]
UVIndex

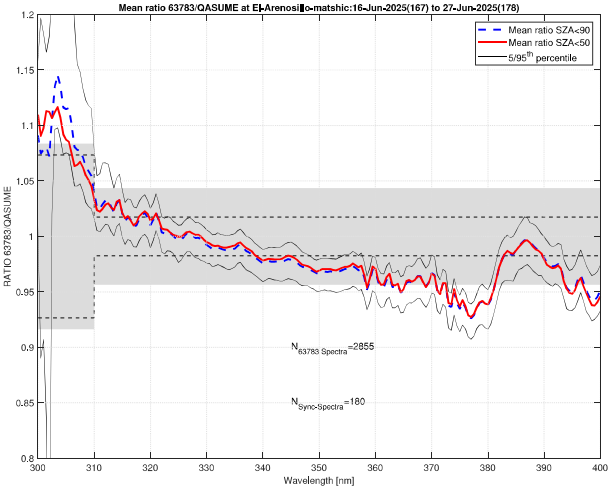

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
1,2
wl [nm]
UVIndex

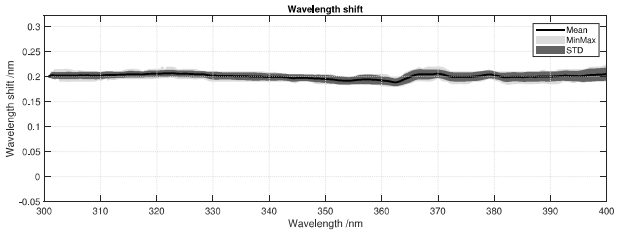

Daily variation. Wavelength bands are ± 2.5 nm
87°
82°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

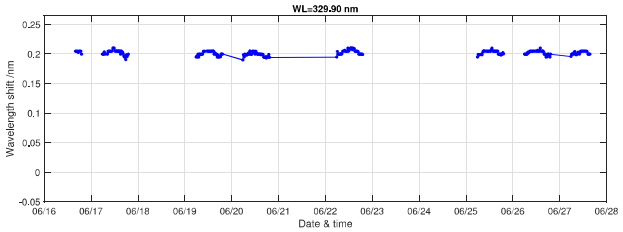

Daily variation. Wavelength bands are ± 2.5 nm
87°
82°
TIME [UT](SZA)
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm

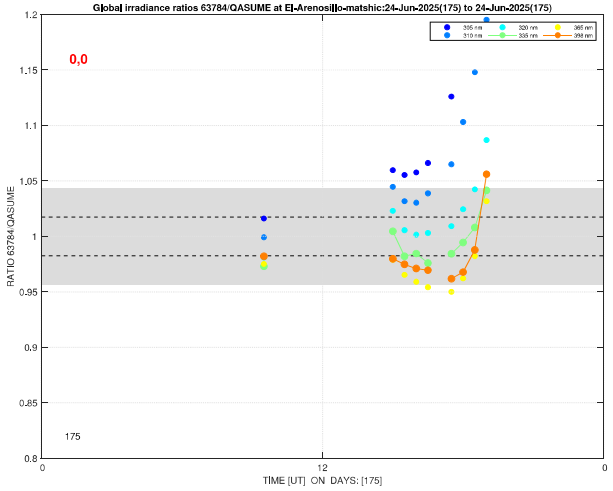

Global irradiance ratios 63783/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
1,2
63783
QASUME
UVIndex
wl [nm]

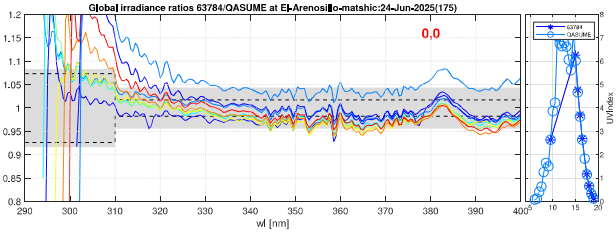

Daily variation. Wavelength bands are ± 2.5 nm
87°
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm
TIME [UT](SZA)

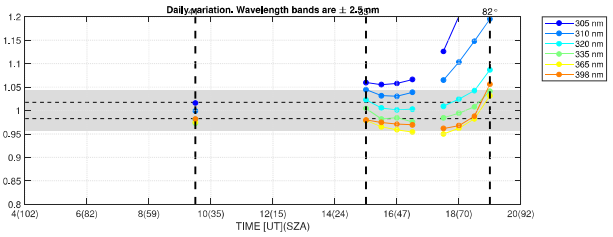

Mean ratio 63783/QASUME at El-Arenosillo-matshic:16-Jun-2025(167) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
RATIO 63783/QASUME
N63783 Spectra=2855
NSync-Spectra=180
Wavelength [nm]

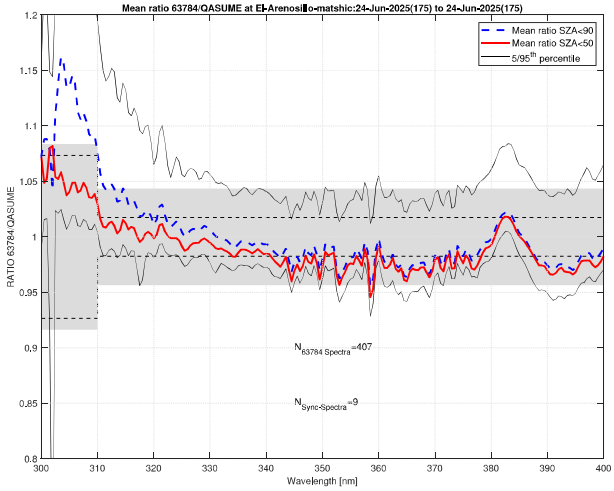

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

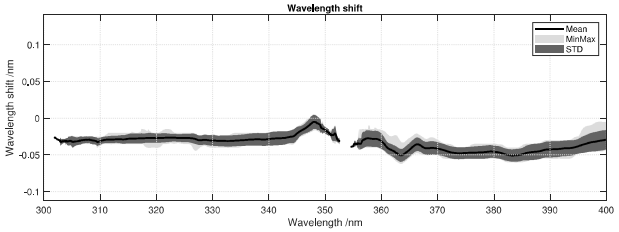

WL=329.90 nm
Wavelength shift /nm
Date & time

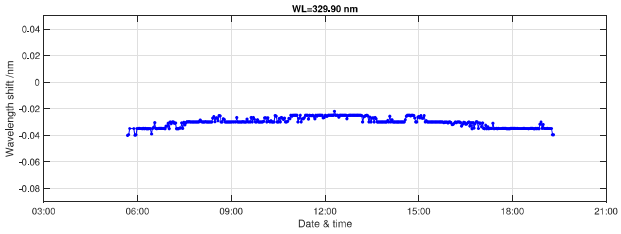

Global irradiance ratios 63784/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 24-Jun-2025(175)
0,0
175
RATIO 63784/QASUME
TIME [UT] ON DAYS: [175]

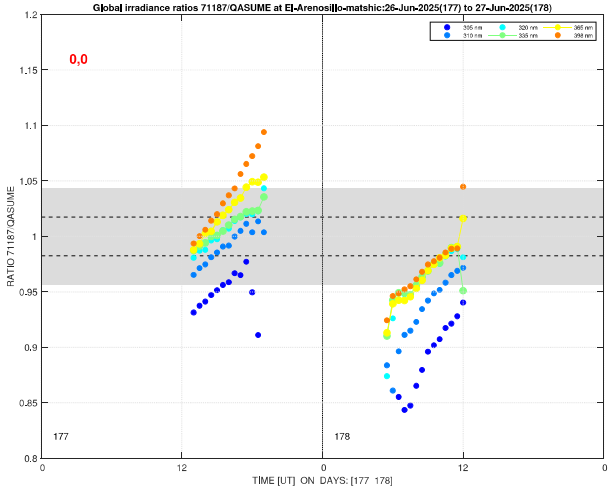

Global irradiance ratios 63784/QASUME at El-Arenosillo-matshic:24-Jun-2025(175)
0,0
wl [nm]
UVIndex

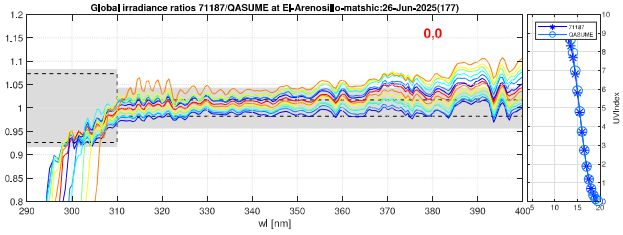

Daily variation. Wavelength bands are ± 2.5 nm
305 nm
310 nm
320 nm
335 nm
365 nm
398 nm
TIME [UT](SZA)

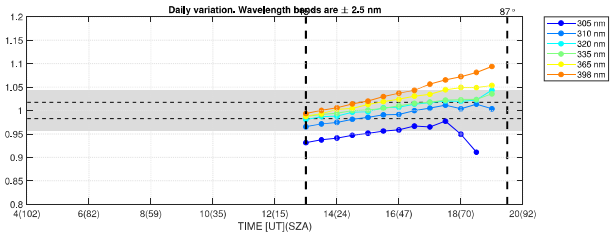

Mean ratio 63784/QASUME at El-Arenosillo-matshic:24-Jun-2025(175) to 24-Jun-2025(175)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N63784 Spectra=407
NSync-Spectra=9
RATIO 63784/QASUME
Wavelength [nm]

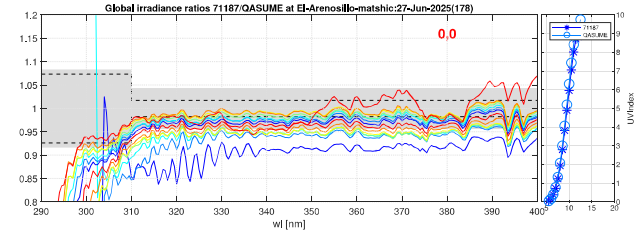

Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

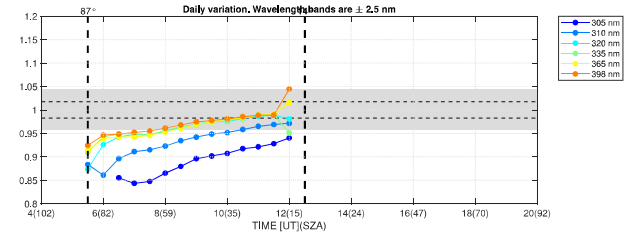

WL=329.90 nm
Wavelength shift /nm
Date & time

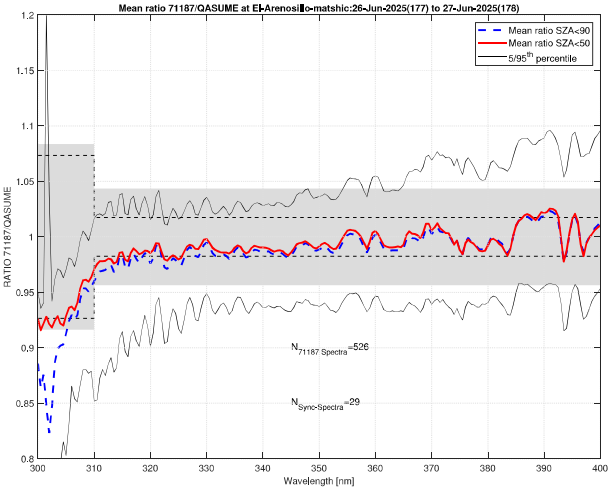

Global irradiance ratios 71187/QASUME at El-Arenosillo-matshic:26-Jun-2025(177) to 27-Jun-2025(178)
0,0
RATIO 71187/QASUME
TIME [UT] ON DAYS: [177 178]
177
178

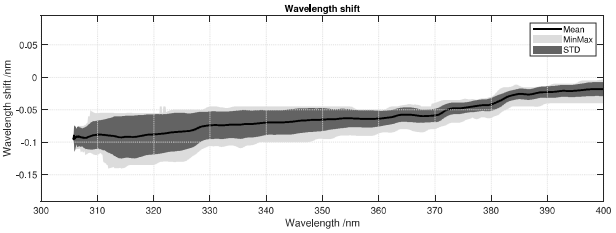

Global irradiance ratios 71187/QASUME at El-Arenosillo-matshic:26-Jun-2025(177)
0,0
wl [nm]
UVIndex

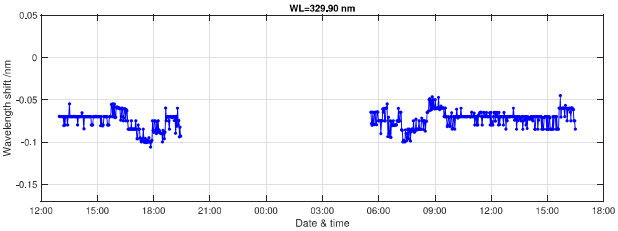

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

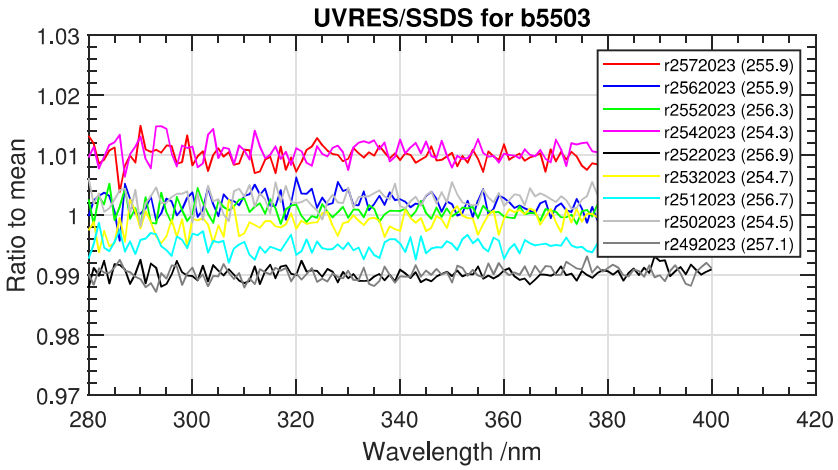

Global irradiance ratios 71187/QASUME at El-Arenosillo-matshic:27-Jun-2025(178)
0,0
wl [nm]
UVIndex

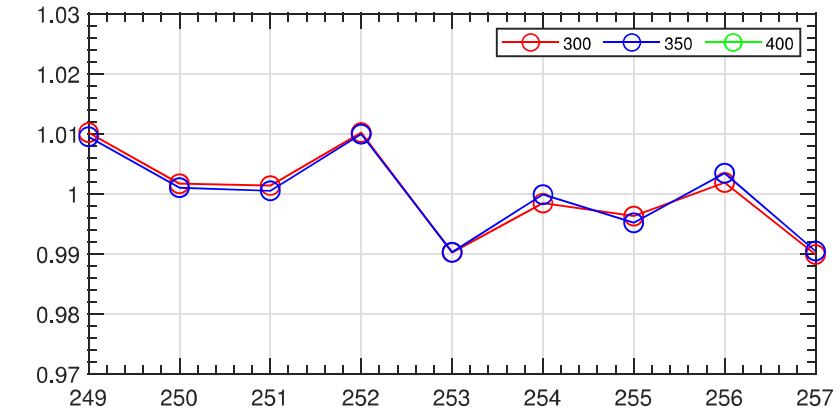

Daily variation. Wavelength bands are ± 2.5 nm
TIME [UT](SZA)

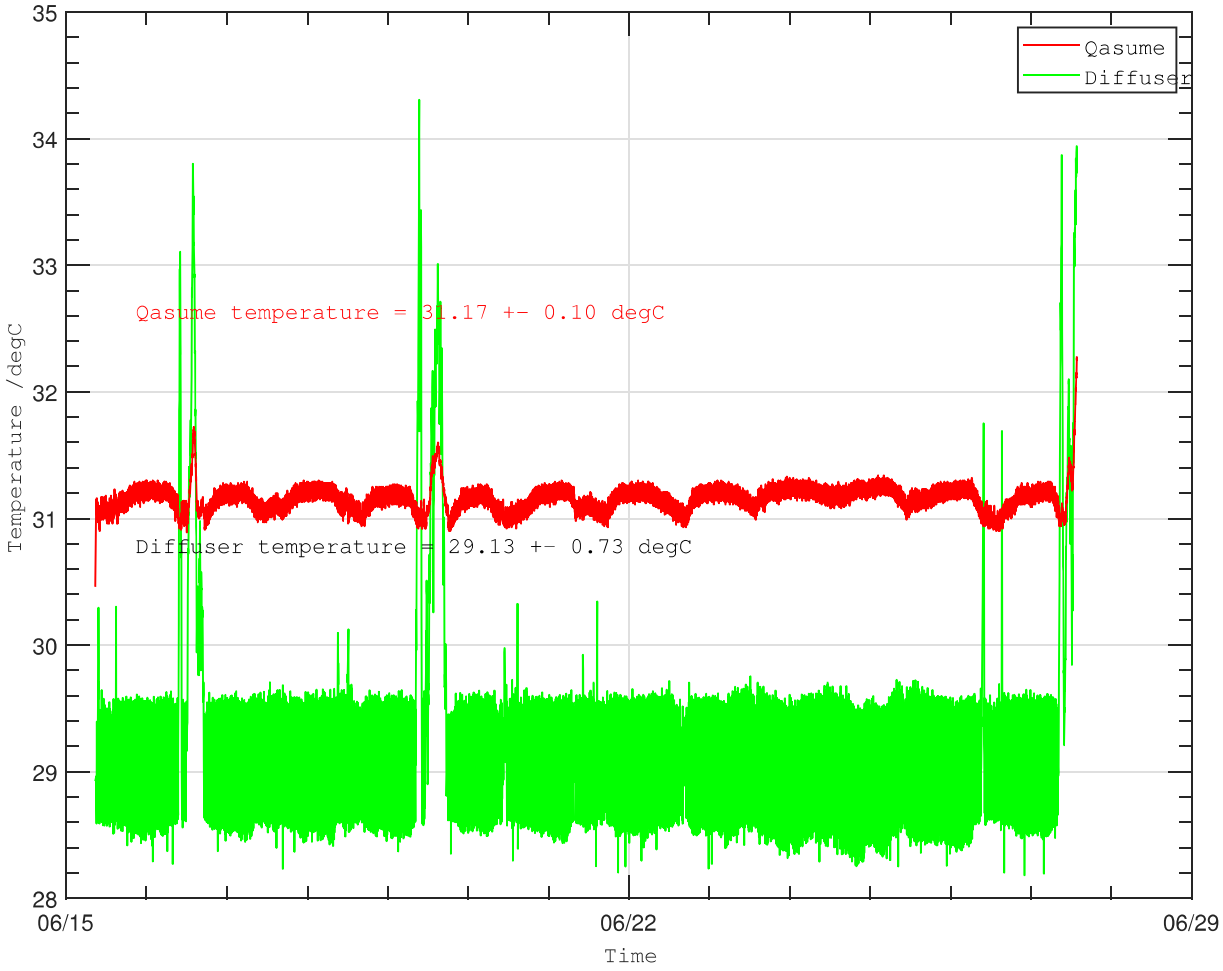

Mean ratio 71187/QASUME at El-Arenosillo-matshic:26-Jun-2025(177) to 27-Jun-2025(178)
Mean ratio SZA<90
Mean ratio SZA<50
5/95th percentile
N71187 Spectra=526
NSync-Spectra=29
RATIO 71187/QASUME
Wavelength [nm]


Wavelength shift
Mean
MinMax
STD
Wavelength shift /nm
Wavelength /nm

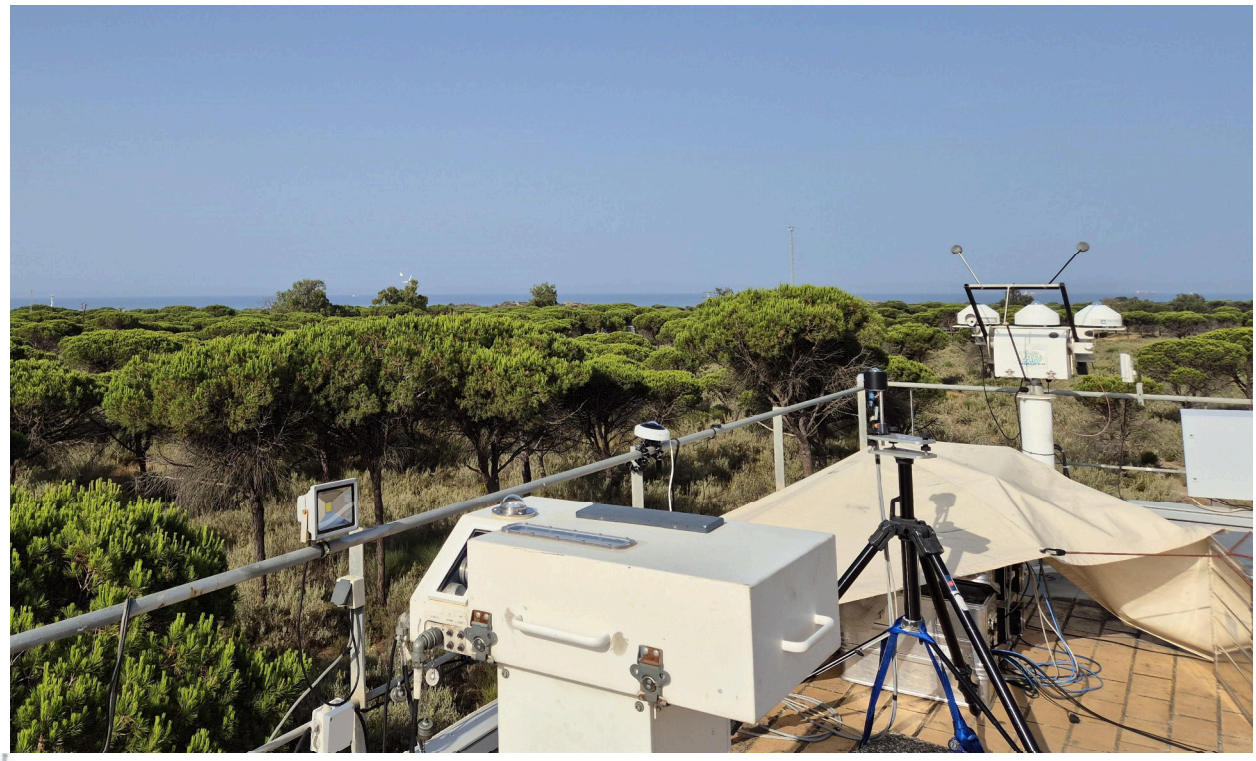

WL=329.90 nm
Wavelength shift /nm
Date & time


UVRES/SSDS for b5503
Ratio to mean
Wavelength /nm
r2572023 (255.9)
r2562023 (255.9)
r2552023 (256.3)
r2542023 (254.3)
r2522023 (256.9)
r2532023 (254.7)
r2512023 (256.7)
r2502023 (254.5)
r2492023 (257.1)


300
350
400


Qasume
Diffuser
Qasume temperature = 31.17 +- 0.10 degC
Diffuser temperature = 29.13 +- 0.73 degC
Temperature /degC
Time
06/15
06/22
06/29


BREWER




JAPAN
日本国