. EDUCE- flagging report for spectral data from Thessaloniki, Greece flag_GRT

Authors/evaluators: JE Williams, PN den Outer and H Slaper (RIVM)

FP4 : Flagging results for Thessaloniki, Greece:

Measurements details :

Location : Thessaloniki, Greece
Elevation (m) : 60
Instrument name : Brewer #086
Instrument type : Double Brewer MKIII
Wavelength range (nm) : 280-380
Lat, Long : 40.517, 22.967
Date on which data was extracted : 07.11.02 (*1993*), 18.01.02 (*1994*), 23.01.02 (*1995, 1996*), 06.11.02/28.01.02 (*1997*), 15.07.02 (*1998, 1999, 2000*)
Date on which slit function was extracted/received : 15.12.98
Years of submitted data : 8
No spectra (per year) : 2108 (*1993*), 3284 (*1994*), 5447 (*1995*), 4324 (*1996*), 3571 (*1997*) , 6805 (1998), 6105(1999), 5674 (2000)
No spectra (total submitted) : 37318
Slit width (FWHM) (nm) :0.55
SHIC version for analysis : 3_093

Special comments: In general, an extensive dataset of potential high quality with high annual coverage. For the year 1997 the data analysed here is corrected data which will appear at the database in due course.

Responsible operator/PI: Alkis Bais ; abais@auth.gr

Operator comments: The original dataset submitted for 1997 contained errors introduced by an update of the control software associated with the instruument. The operator submitted the following statement regarding this :

Justification of revisions applied to spectral data of Thessaloniki

In the beginning of 1997, a new version of the control software was installed in Brewer MKIII #086 which operates in Thessaloniki. During the installation some errors occurred with regard to the dispersion coefficients of the instrument. These coefficients are used to calculate the position to which the gratings are set for measuring each specific wavelength. Two different types of errors were discovered for two subsequent periods which imposed the need for revising all spectral measurements collected during these periods.

Period: 7/2/1997 to 19/6/1997

It was found that during this period the registered wavelength scale of the spectra was wrong. The reason for this error was the use of an old set of instrument's dispersion coefficients. To correct the spectra for this error, the actual wavelength that corresponds to each measurement was calculated, according to the dispersion coefficients that were used. This new wavelength scale is different from the nominal scale and the wavelengths are not equidistant. Following a deconvolution procedure, these spectra were transformed to high resolution and then they were re-convoluted with the slit function of the

instrument. The uncertainty in the revised spectra is expected to be higher due to the deconvolution/convolution procedures.

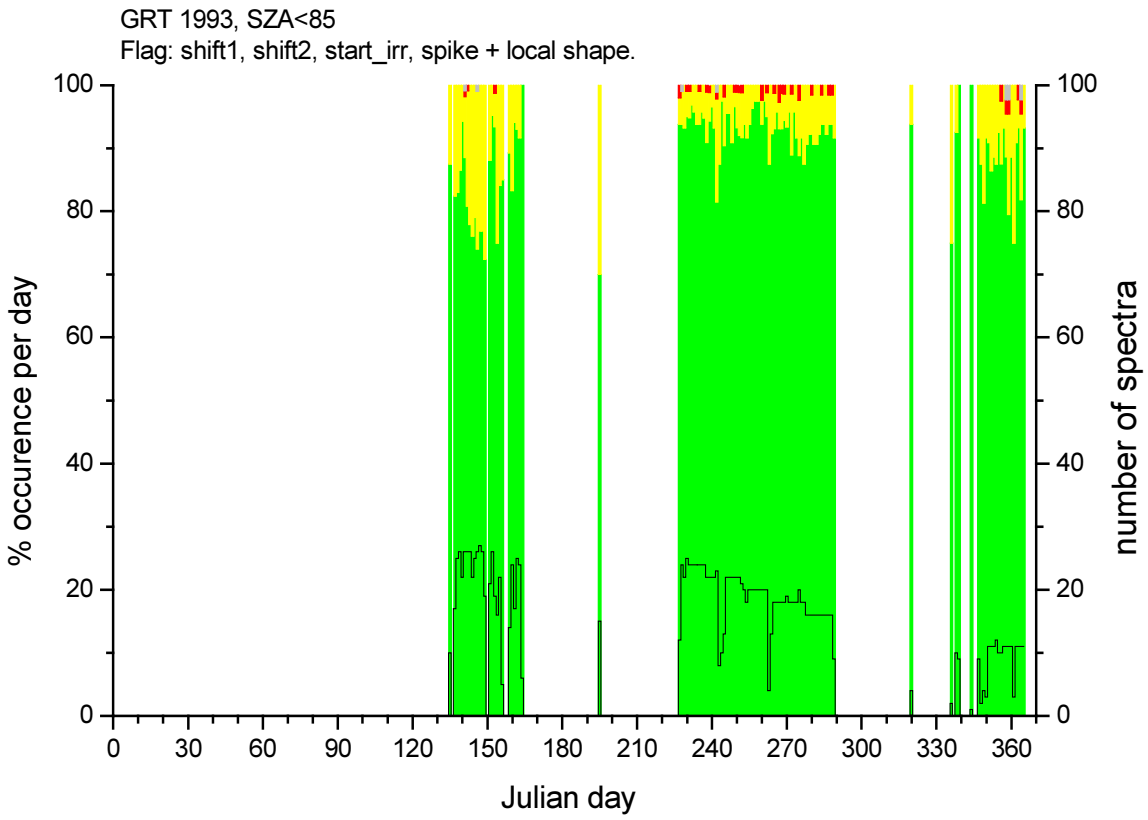
Period 20/1/1997 to 6/2/1997:

Brewer MKIII uses a second exit slit to measure the wavelength range from 355 to 366 nm. An error in the new control software resulted in using for the second slit the dispersion coefficients of the first slit. Consequently for this period the only useful spectral region for these spectra is the one measured by the first slit only, i.e. up to wavelength 354.5 nm.

Alkis Bais, personal communication, Dec 2002

Tables of flagging statistics:

1993:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging*	99.6	0.2	0	0	0.3	0	1932	3	0	0	5	0	1940
Shift2_flagging*	99.7	0.2	0	0	0.1	0	1935	3	0	0	2	0	1940
start_irradiance_flag*	98.7	1.3	0.1	0	0	0	1914	25	1	0	0	0	1940
Spike+ local_shape*	63	35.2	1.8	0	0	0.1	1223	683	34	0	0	1	1941
Transmission_2	99.5	0.5	0.1	0	0	0	1930	9	1	0	0	0	1940

Comments:

Limited annual coverage (approximately 35%); some potential value for use in climatological studies.

Overall data-quality impression : very high fraction of potential high quality spectra

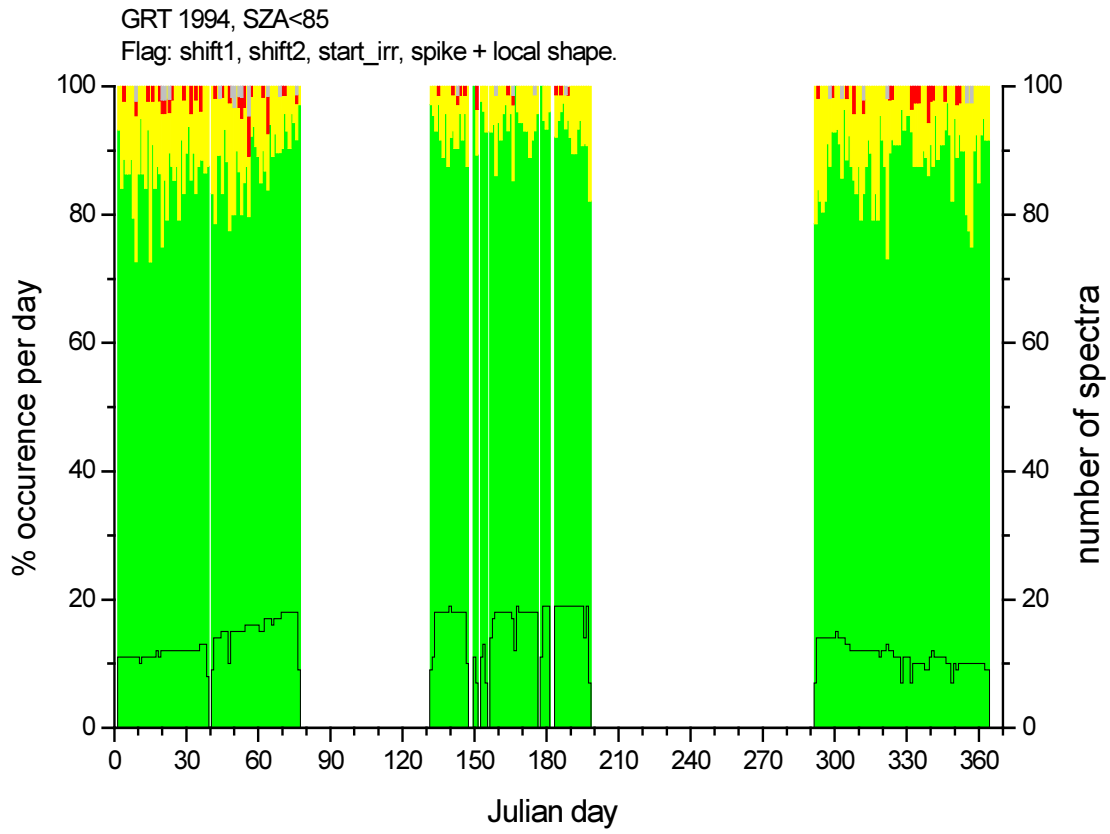
No black flags occur in any of the chosen flagging categories (with red flags < 2%).

The shift2 flag indicates that some non-critical and undefined calibration error occurs for 0.3% of spectra. when comparing with a extra-terrestial solar spectrum.

1 (0.1%) spectrum with spikes is reported.

The distribution of errors is fairly uniform across the dataset although more spectra are red-flagged in the middle of the dataset.

1994:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging*	99.1	0	0	0	0.9	0	2804	0	0	0	25	0	2829
Shift2_flagging*	99.9	0	0	0	0.1	0	2827	0	0	0	2	0	2829
start_irradiance_flag*	97.9	1.9	0.2	0	0	0	2770	54	5	0	0	0	2829
Spike+ local_shape*	62.1	35.6	2.2	0	0	0.1	1759	1009	61	0	0	2	2831
Transmission_2	98.3	1.6	0.2	0	0	0	2780	44	5	0	0	0	2829

Comments:

Moderate annual coverage (approximately 55%); medium potential value for use in climatological studies.

Overall data-quality impression : a high fraction of potential high quality spectra

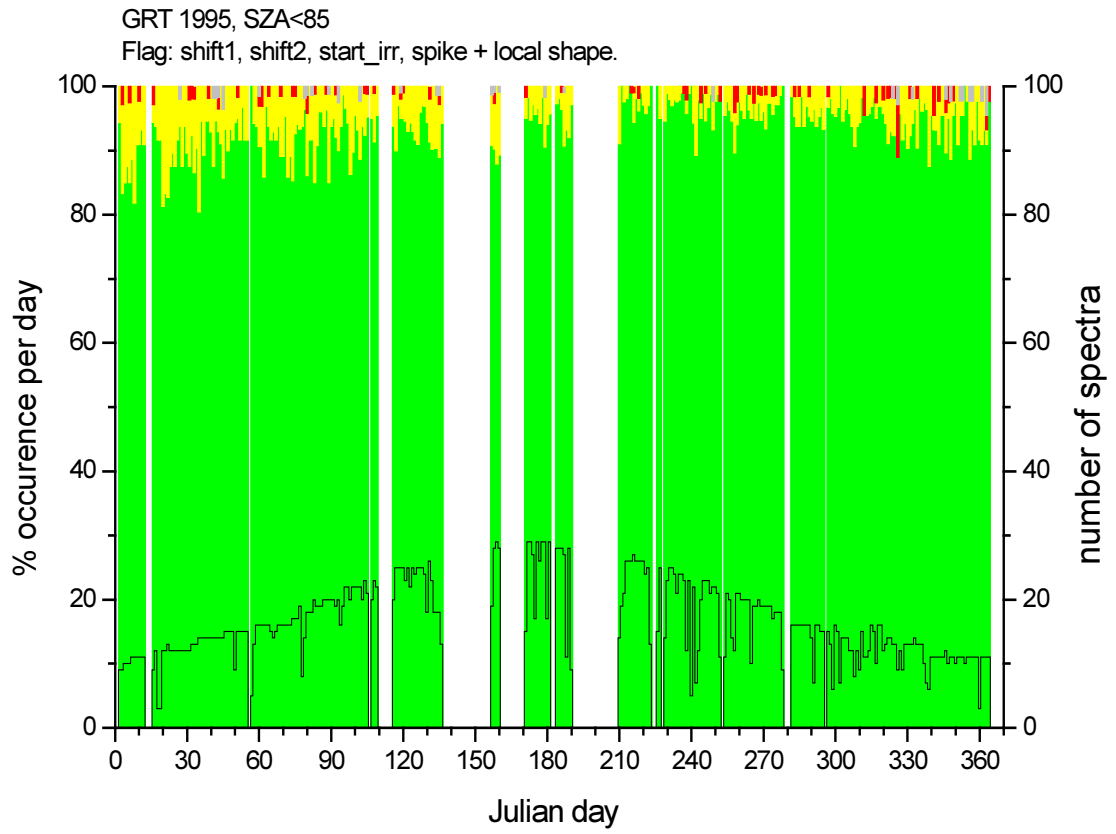
No black flags occur in any of the chosen flagging categories (with red flags < 2.5%). The spike + local_shape flag has some non-critical flags associated with a third of the dataset.

Both the shift1 and shift2 flags indicate that the instrument is well calibrated compared with an extraterrestial spectrum across the entire wavelength region

2 (0.1%) spectra with spikes are reported.

The distribution of errors is fairly uniform across the dataset although the spectra taken between Julian days 130-200 are of a slighly better quality in terms of the incidence of red and grey flags.

1995:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging	99.5	0	0	0	0.5	0	4822	0	0	0	24	0	4846
Shift2_flagging	99.7	0	0	0	0.3	0	4831	0	1	0	14	0	4846
start_irradiance_flag	99.2	0.8	0	0	0	0	4807	37	2	0	0	0	4846
Spike+ local_shape	77.9	20.5	1.6	0	0	0	3773	995	78	0	0	0	4846
Transmission_2	99.3	0.5	0.2	0	0	0	4812	26	8	0	0	0	4846

Comments:

High annual coverage (approximately 85%); high potential value for use in climatological studies.

Overall data-quality impression : very high fraction of high quality spectra.

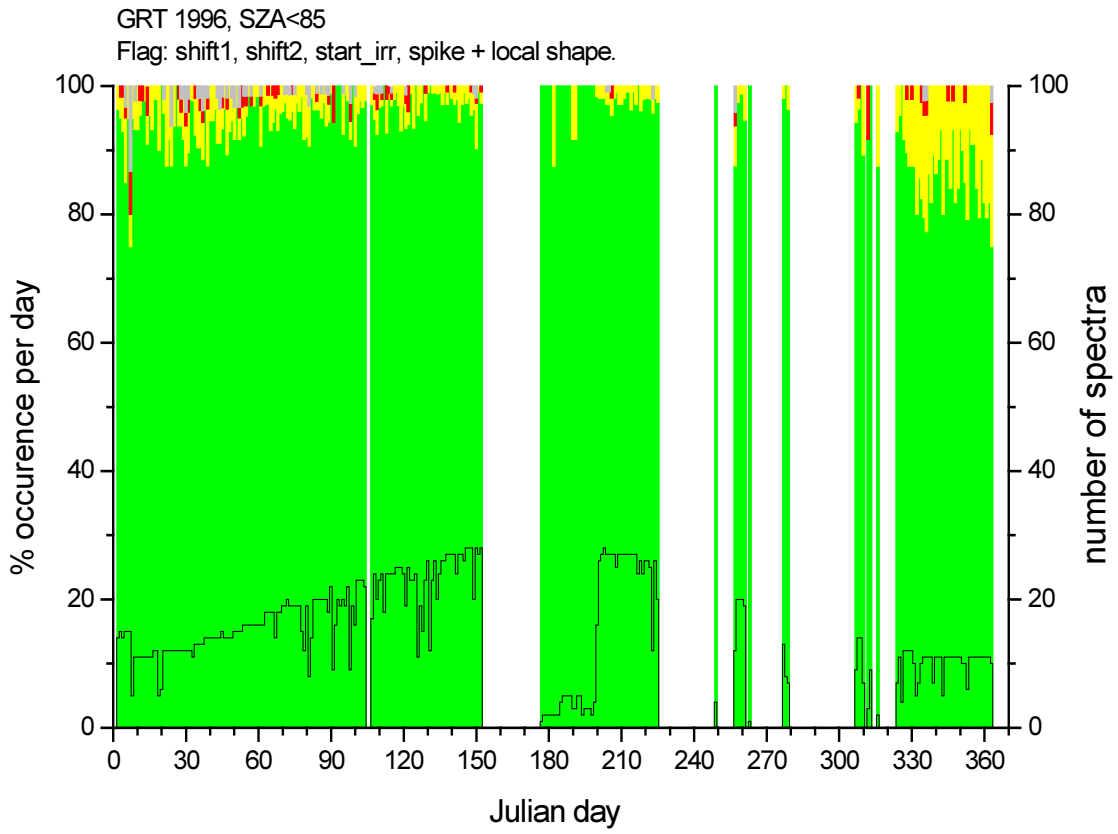
No black flags occur in any of the chosen flagging categories (with red flags < 2.0%). The spike + local_shape flag has some non-critical flags associated with a fifth of the dataset (an improvement on the previous year).

Both the shift1 and shift2 flags indicate that the instrument is well calibrated compared with an extraterrestial spectrum across the entire wavelength region

No spectra with spikes are reported.

The distribution of errors is uniform across the dataset.

1996:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging	98.3	0	0	0	1.7	0	3889	0	0	0	67	0	3956
Shift2_flagging	99.9	0	0	0	0.1	0	3953	0	0	0	3	0	3956
start_irradiance_flag	99.3	0.7	0	0	0	0	3930	26	0	0	0	0	3956
Spike+ local_shape	83.1	15.1	1.8	0	0	0	3288	596	72	0	0	1	3957
Transmission_2	97.4	2.1	0.4	0	0.2	0	3852	82	15	0	7	0	3956

Comments:

High annual coverage (approximately 85%); high potential value for use in climatological studies.

Overall data-quality impression : very high fraction of high quality spectra

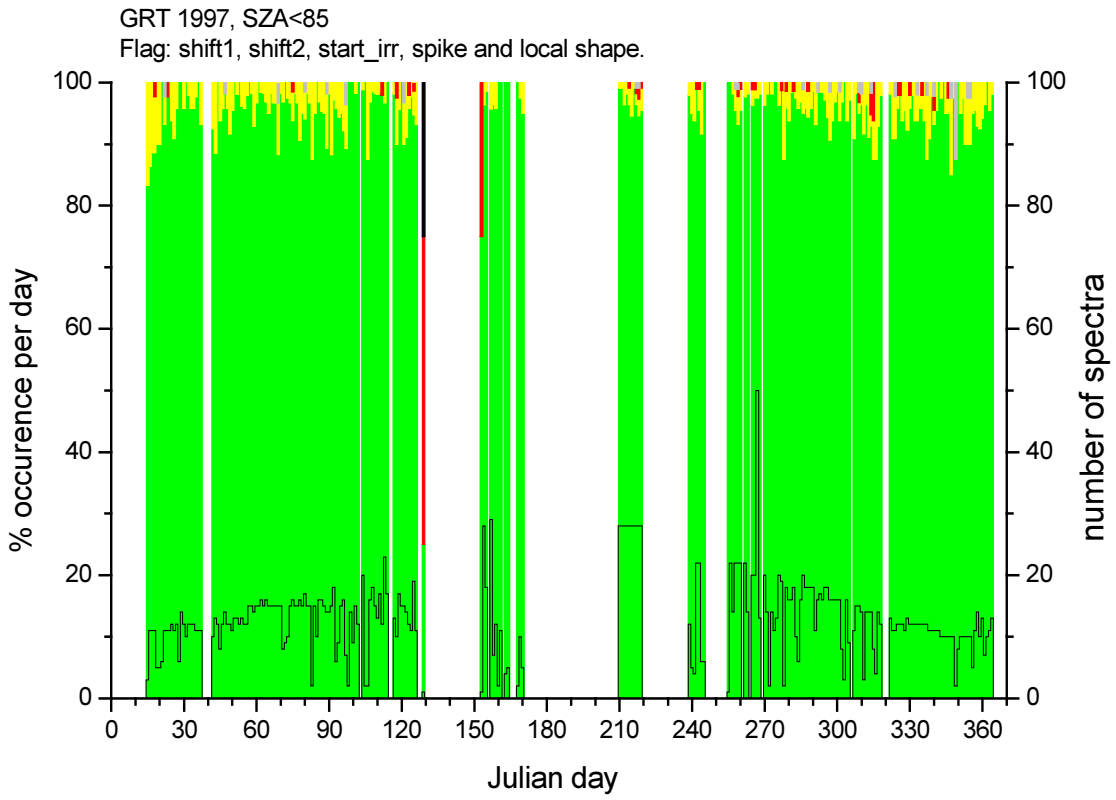
No black flags occur in any of the chosen flagging categories (with red flags < 2.0%). The spike + local_shape flag has non-critical flags associated with a sixth of dataset (an improvement on the previous year)

Both the shift1 and shift2 flags indicate that the instrument is fairly well calibrated compared with an extraterrestial spectrum across the entire wavelength region

1 (<0.1%) spectrum with spikes is reported.

The distribution of errors is fairly uniform across the whole dataset, with the lowest errors occurring during the summer. The incidence of yellow flags increases towards the end of the year.

1997:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging	99	0.1	0	0	0.9	0	3139	3	1	0	27	0	3170
Shift2_flagging	99.9	0	0	0	0	0	3168	0	0	1	1	0	3170
start_irradiance_flag	99.7	0.3	0	0	0	0	3161	8	1	0	0	0	3170
Spike+ local_shape	85.3	13.6	1.1	0	0	0	2704	432	34	0	0	0	3170
Transmission_2	98.2	1.5	0.3	0	0	0	3113	48	9	0	0	0	3170

Comments:

Moderate annual coverage (approximately 75%); medium potential value for use in climatological studies.

Overall data-quality impression : a very high fraction of potential high quality spectra.

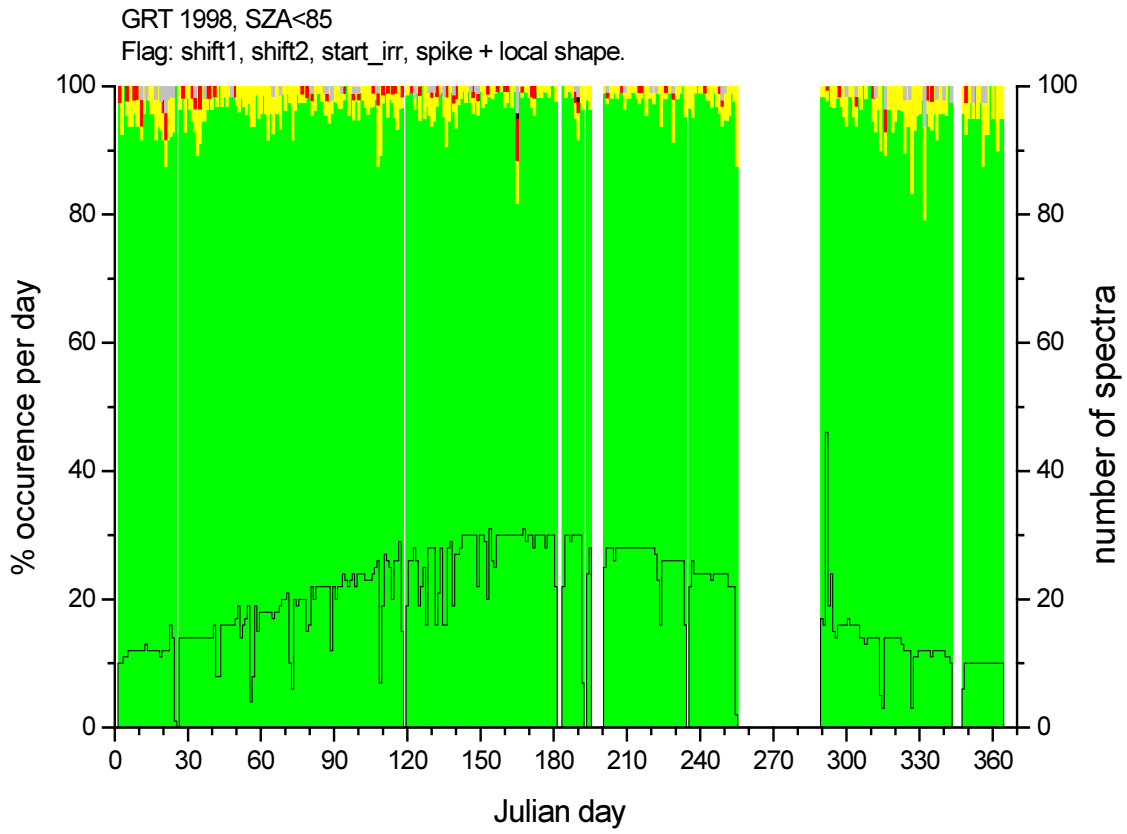
One black flag occurs for the Shift2 category (with red flags < 1.5%).

Both the shift1 and shift2 flags indicate that the instrument is well calibrated compared with an extraterrestial solar spectrum across the entire wavelength region

No spectra with spikes are reported.

The distribution of errors is non uniform across dataset, with the highest number of red and grey flags occuring towards the end of the year.

1998:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging	99	0	0	0	1	0	6132	3	0	0	62	0	6197
Shift2_flagging	99.9	0	0	0	0.1	0	6192	1	0	0	4	0	6197
start_irradiance_flag	99.7	0.2	0	0	0	0	6180	13	2	2	0	0	6197
Spike+ local_shape	88.7	10	1.3	0	0	0	5499	617	81	0	0	0	6197
Transmission_2	99	0.9	0.1	0	0	0	6133	57	7	0	0	0	6197

Comments:

High annual coverage (approximately 85%); high potential value for use in climatological studies.

Overall data-quality impression : very high fraction of high quality spectra.

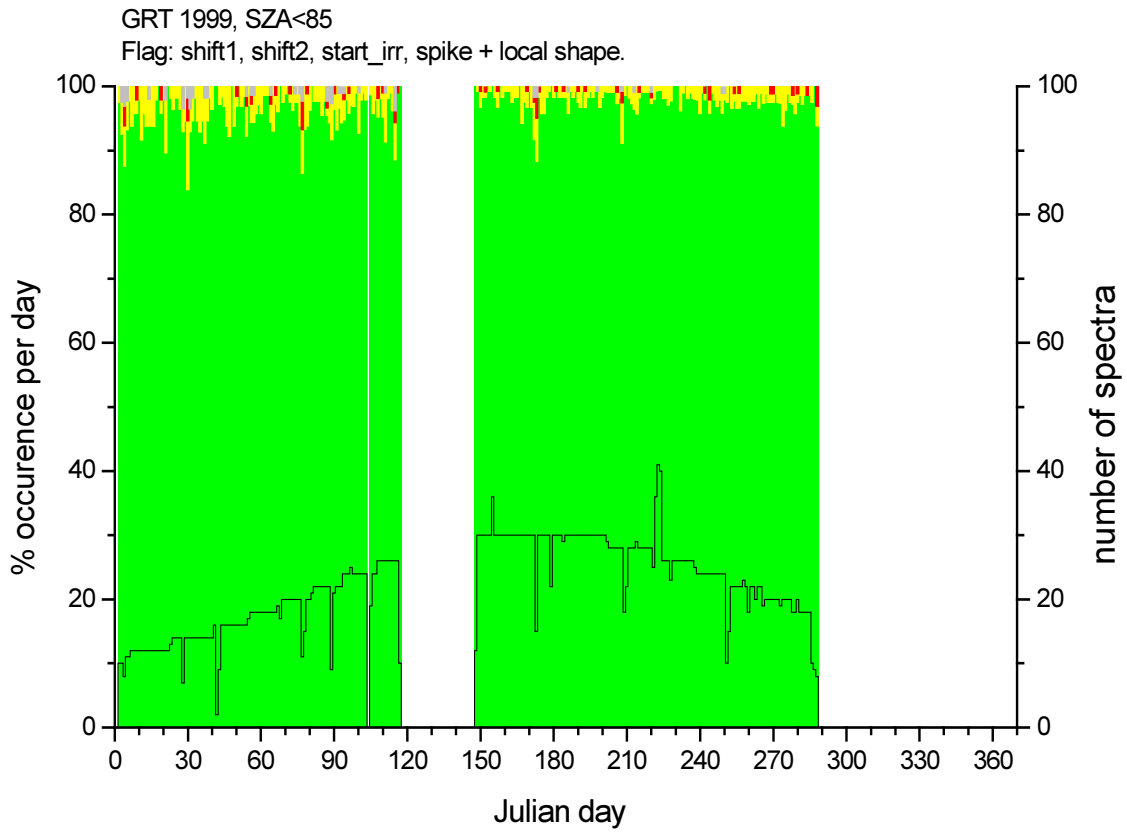
No black flags occur in any of the chosen flagging categories (with red flags < 1.5%). The spike + local shape flag does have non-critical flags associated with a tenth of dataset (an improvement on 1996).

Both the shift1 and shift2 flags indicate that the instrument is well calibrated compared with an extraterrestial solar spectrum across the entire wavelength region

No spectra with spikes are reported.

The distribution of errors fairly uniform across dataset.

1999:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging*	99.2	0	0	0	0.8	0	5556	0	0	0	42	0	5598
Shift2_flagging*	100	0	0	0	0	0	5596	1	0	0	1	0	5598
start_irradiance_flag*	99.8	0.2	0	0	0	0	5587	11	0	0	0	0	5598
Spike+ local_shape	90.2	8.9	0.9	0	0	0	5049	497	52	0	0	0	5598
Transmission_2	99.4	0.4	0.2	0	0	0	5564	21	13	0	0	0	5598

Comments:

Moderate annual coverage (approximately 70%); medium potential value for use in climatological studies.

Overall data-quality impression : very high fraction of high quality spectra.

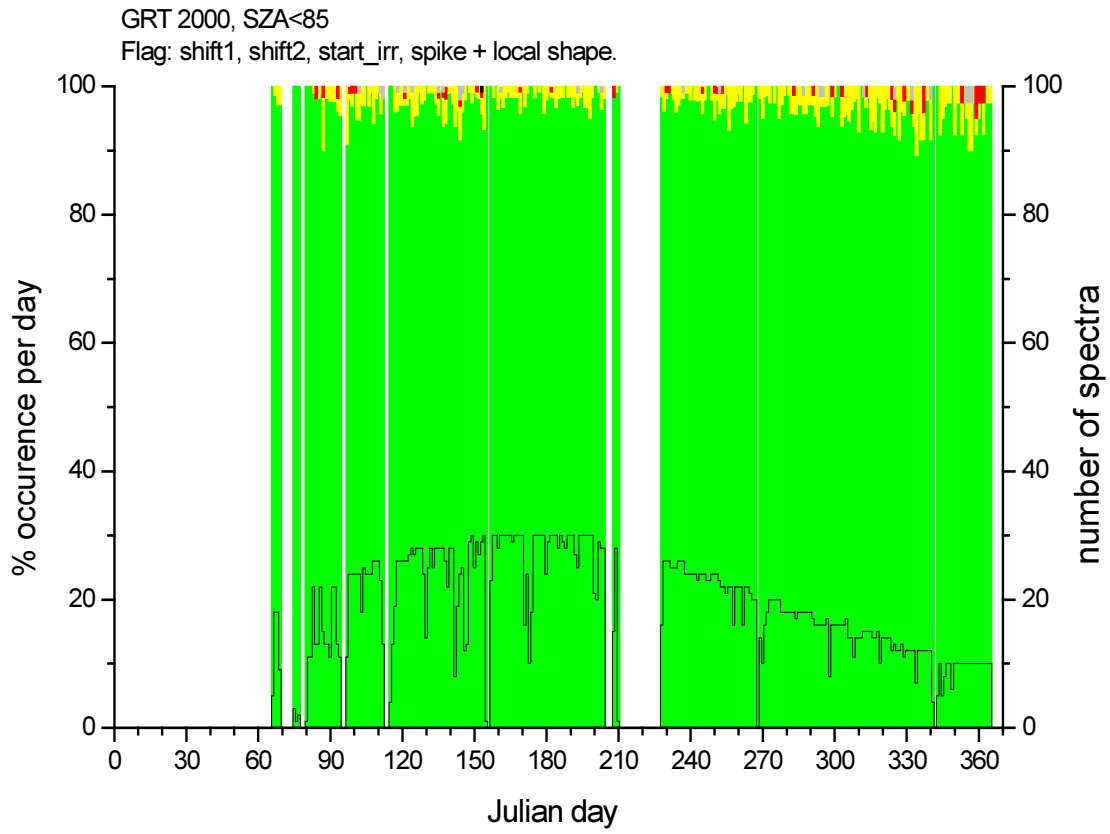
No black flags occur in any of the chosen flagging categories (with red flags < 1.0%). The spike + local shape flag does have non-critical flags associated with approximately a tenth of the dataset (a slight improvement on the previous year).

Both the shift1 and shift2 flags indicate that the instrument is well calibrated compared with an extraterrestial spectrum across the entire wavelength region

No spectra with spikes are reported.

The distribution of error is fairly uniform across the dataset, although less red flags occur towards the end.

2000:



flag	Green %	Yellow %	Red %	Black %	Grey %	Cor. %	Green	Yellow	Red	Black	Grey	Cor.	Num
Shift1_flagging*	99.5	0	0	0	0.5	0	5155	0	0	0	26	0	5181
Shift2_flagging*	100	0	0	0	0	0	5180	1	0	0	0	0	5181
start_irradiance_flag*	99.6	0.4	0	0	0	0	5159	21	0	1	0	0	5181
Spike+ local_shape	90.3	8.9	0.8	0	0	0	4678	462	41	0	0	0	5181
Transmission_2	99.5	0.4	0.1	0	0	0	5154	21	6	0	0	0	5181

Comments:

Moderate annual coverage (approximately 75%); medium potential value for use in climatological studies.

Overall data-quality impression : very high fraction of high quality spectra.

No black flags occur in any of the chosen flagging categories (with red flags < 1.0%). The spike + local shape flag does have non-critical flags associated with approximately a tenth of the dataset (the same as the previous year).

Both the shift1 and shift2 flags indicate that the instrument is well calibrated compared with an extraterrestial spectrum across the entire wavelength region

No spectra with spikes are reported.

The distribution of error is fairly uniform across the dataset, although slightly more red flags occur towards the end of the dataset.