



# Sunspot Index and Long-term Solar Observations

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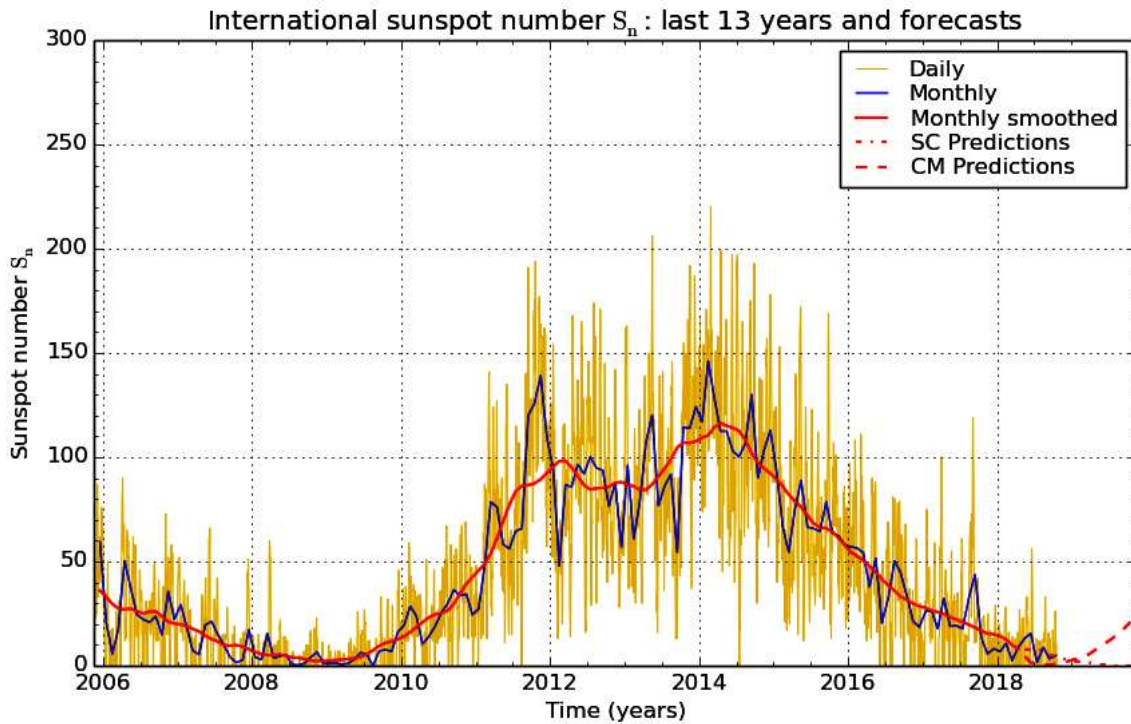
## ***SUNSPOT BULLETIN*** 2018 n° 10

Provisional international and normalized hemispheric daily sunspot numbers for October 2018

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Computed at the *Royal Observatory of Belgium* using observations from an international network with the *Specola Solare Ticinese Locarno* as reference station.

Date	$S_n$	$S_n(N)$	$S_n(S)$
1	17	0	17
2	14	0	14
3	12	0	12
4	11	0	11
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	5	0	5
12	13	2	11
13	26	0	26
14	23	0	23
15	17	0	17
16	0	0	0
17	11	0	11
18	0	0	0
19	0	0	0
20	0	0	0
21	3	0	3
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
Monthly mean	4.9	0.1	4.8
Cooperating stations	74	56	56



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2018 November 1

**Predictions of the monthly smoothed Sunspot Number**  
 using the last provisional value, calculated for April 2018: 7.9 ( $\pm 5\%$ )

	SM	CM		SM	CM		SM	CM
2018 May	8	4	2018 Nov	3	1	2019 May	1	9
Jun	8	1	Dec	3	2	Jun	0	11
Jul	8	1	2019 Jan	2	3	Jul	0	13
Aug	7	0	Feb	2	4	Aug	0	15
Sep	5	1	Mar	2	5	Sep	0	18
Oct	4	1	Apr	1	7	Oct	0	21

**SM : SIDC classical method** : based on an interpolation of Waldmeier’s standard curves. The estimated error ranges from 7% (first month) to 35% (last month)

**CM : Combined method** : the combined method is a regression technique coupling a dynamo-based estimator with Waldmeier’s method of standard curves, designed by K. Denkmayr.

Ref.: K. Denkmayr, P. Cugnon, 1997 : “About Sunspot Number Medium-Term Predictions”, in “Solar-Terrestrial Prediction Workshop V”, eds. G.Heckman et al., Hiraiso Solar Terrestrial Research Center, Japan, 103.

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**Summary of the URSIGRAMs from S.I.D.C.**

Date	S <sub>n</sub>	PPSI	600	2800	COS	SFI	XI	Ak
30	15	5	-	68	////	0	0/0	8
1	17	4	-	70	////	0	0/0	12
2	14	3	-	67	////	0	0/0	10
3	12	2	-	68	////	0	0/0	6
4	11	1	-	67	////	0	0/0	5
5	0	0	-	69	////	0	0/0	12
6	0	0	-	69	////	0	0/0	4
7	0	0	-	68	////	0	0/0	27
8	0	0	-	69	////	0	0/0	18
9	0	0	-	70	////	0	0/0	18
10	0	0	-	70	////	0	0/0	17
11	5	0	-	71	////	0	0/0	12
12	13	0	-	72	////	1	0/0	7
13	26	1	-	72	////	1	0/0	14
14	23	0	-	72	////	0	0/0	8
15	17	1	-	70	////	0	0/0	14
16	0	0	-	70	////	0	0/0	7
17	11	0	-	70	////	0	0/0	2
18	0	0	-	70	////	0	0/0	1
19	0	0	-	70	////	///	///	2
20	0	0	-	70	////	0	0/0	2
21	3	0	-	71	////	0	0/0	6
22	0	0	-	71	////	0	0/0	7
23	0	0	-	72	////	0	0/0	3
24	0	0	-	70	////	0	0/0	4
25	0	0	-	69	////	0	0/0	9
26	0	0	-	69	////	0	0/0	9
27	0	0	-	69	////	0	0/0	2
28	0	0	-	68	////	0	0/0	3
29	0	0	-	69	////	0	0/0	2
30	0	0	-	67	////	0	0/0	4
31	0	0	-	68	////	0	0/0	5

**S<sub>n</sub>** : provisional international sunspot numbers from the S.I.D.C.

**PPSI** : prompt photometric sunspot index from the S.I.D.C. in  $10^{-5} \text{ w/m}^2$  : the quantity to be subtracted from the mean solar constant to account for the sunspot contribution.

**600** : 600 Mhz solar flux from the station at Humain (Belgium).

**2800** : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UGEOI). The 10.7cm Flux data are a service of the National Research Council of Canada.

**COS** : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Terre Adélie).

**SFI** : Solar Flare Index from the S.I.D.C. (origin: Ursigrams - UGEOR, evaluation :  $1 \times S_n + 10 \times "1" + 100 \times ">1"$ ).

**XI** : X-flares index from the Ursigrams (M-flares/X-flares) (origin: Ursigrams - UGEOR, UGEOI).

**Ak** : geomagnetic index from Wingst, Germany (origin: Ursigrams).

SOLAR PHYSICS DEPARTMENT

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR OCTOBER 2018

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	906	1	6	16	0	16	16	1.4	2	OB
3	945	1	2	12	0	12	0	0.8	3	OB
4	745	1	1	11	0	11	0	0.1	3	OB
5	800	0	0	0	0	0	0	0.0	3	OB
6	800	0	0	0	0	0	0	0.0	3	OB
7	945	0	0	0	0	0	0	0.0	2	OB
8	800	0	0	0	0	0	0	0.0	3	OL
9	810	0	0	0	0	0	0	0.0	3	OL
10	800	0	0	0	0	0	0	0.0	3	OL
11	1420	1	1	11	0	11	0	0.1	3	OL
12	810	1	1	11	0	11	0	0.1	3	OL
13	915	2	3	23	0	23	0	0.8	3	OL
14	900	2	2	22	0	22	0	0.5	3	OL
15	1100	2	2	22	0	22	11	0.6	3	SB
16	815	0	0	0	0	0	0	0.0	2	SB
17	750	1	1	11	0	11	11	0.4	3	SB
18	800	0	0	0	0	0	0	0.0	3	SB
19	830	0	0	0	0	0	0	0.0	3	SB
20	840	0	0	0	0	0	0	0.0	2	SB
21	830	0	0	0	0	0	0	0.0	3	SB
22	1125	0	0	0	0	0	0	0.0	4	OB
23	910	0	0	0	0	0	0	0.0	2	OB
27	915	0	0	0	0	0	0	0.0	1	LL
28	910	0	0	0	0	0	0	0.0	1	LL
31	940	0	0	0	0	0	0	0.0	2	BB

The relative mean sunspot number is 5.6.

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NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS  $U'=K'U$  FOR OCTOBER 2018

$K'= 1.176 (*)$

1	19	7	0	13	27	19	0	25	***
2	***	8	0	14	26	20	0	26	***
3	14	9	0	15	26	21	0	27	0
4	13	10	0	16	0	22	0	28	0
5	0	11	13	17	13	23	0	29	***
6	0	12	13	18	0	24	***	30	***
								31	0

The normalised relative monthly mean sunspot number is 7.

(\*)  $K'$  is the mean of the monthly  $K'$  for the last five years.

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The Sun has been observed 25 days on 31 possible.