



# Sunspot Index and Long-term Solar Observations

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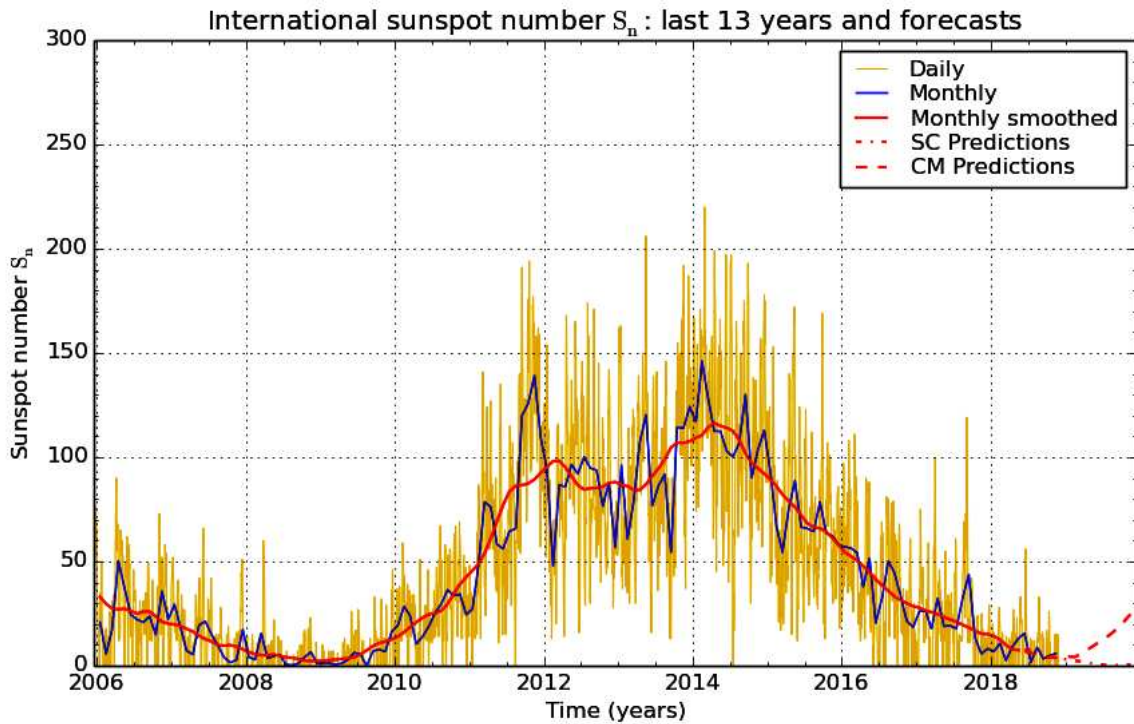
## ***SUNSPOT BULLETIN*** 2018 n° 11

Provisional international and normalized hemispheric daily sunspot numbers for November 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 <sub>n</sub>	S <sub>n</sub> (N)	S <sub>n</sub> (S)
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	11	11	0
9	11	11	0
10	11	11	0
11	0	0	0
12	15	15	0
13	11	11	0
14	11	11	0
15	13	13	0
16	15	15	0
17	15	15	0
18	14	14	0
19	12	12	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	15	15	0
25	14	14	0
26	10	10	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
Monthly mean	5.9	5.9	0.0
Cooperating stations	70	54	54



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

**Predictions of the monthly smoothed Sunspot Number**  
 using the last provisional value, calculated for May 2018: 7.5 ( $\pm 5\%$ )

	SM	CM		SM	CM		SM	CM
2018 Jun	8	7	2018 Dec	4	4	2019 Jun	1	11
Jul	8	6	2019 Jan	3	4	Jul	0	13
Aug	7	5	Feb	2	4	Aug	0	16
Sep	6	4	Mar	2	6	Sep	0	18
Oct	5	4	Apr	2	8	Oct	0	21
Nov	4	4	May	1	10	Nov	1	25

**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
31	0	0	-	68	////	0	0/0	5
1	0	0	-	67	////	0	0/0	5
2	0	0	-	68	////	0	0/0	5
3	0	0	-	67	////	0	0/0	4
4	0	0	-	67	////	0	0/0	32
5	0	0	-	68	////	0	0/0	29
6	0	0	-	69	////	0	0/0	7
7	0	0	-	69	////	0	0/0	10
8	11	1	-	70	////	0	0/0	12
9	11	0	-	69	////	0	0/0	15
10	11	0	-	69	////	0	0/0	16
11	0	2	-	69	////	0	0/0	9
12	15	2	-	68	////	0	0/0	12
13	11	1	-	67	////	0	0/0	3
14	11	1	-	68	////	0	0/0	4
15	13	2	-	68	////	0	0/0	1
16	15	2	-	71	////	0	0/0	2
17	15	4	-	73	////	0	0/0	1
18	14	8	-	72	////	0	0/0	2
19	12	1	-	71	////	0	0/0	6
20	0	0	-	71	////	0	0/0	6
21	0	0	-	69	////	0	0/0	4
22	0	0	-	69	////	0	0/0	3
23	0	0	-	69	////	0	0/0	3
24	15	2	-	70	////	0	0/0	3
25	14	2	-	70	////	0	0/0	2
26	10	1	-	69	////	0	0/0	1
27	0	0	-	68	////	0	0/0	7
28	0	0	-	68	////	0	0/0	2
29	0	0	-	68	////	0	0/0	2
30	0	0	-	68	////	0	0/0	3

**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  $10^{-5}$  w/m<sup>2</sup> : 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 NOVEMBER 2018

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
2	850	0	0	0	0	0	0.0	2	OL	
3	900	0	0	0	0	0	0.0	2	SB	
4	930	0	0	0	0	0	0.0	2	SB	
5	940	0	0	0	0	0	0.0	3	BB	
6	950	0	0	0	0	0	0.0	2	BB	
8	939	1	1	11	11	0	11	0.3	3	SB
13	1045	1	1	11	11	0	11	0.4	2	BB
14	900	1	1	11	11	0	11	0.3	3	OL
15	1030	1	3	13	13	0	13	1.5	3	OB
17	940	1	5	15	15	0	0	4.8	2	SB
18	945	1	4	14	14	0	0	13.1	3	LL
19	1444	0	0	0	0	0	0	0.0	3	OL
21	945	0	0	0	0	0	0	0.0	3	BB
22	945	0	0	0	0	0	0	0.0	3	OL
23	1025	0	0	0	0	0	0	0.0	3	OL
27	1330	0	0	0	0	0	0	0.0	1	SB
29	1315	0	0	0	0	0	0	0.0	2	SB
30	1220	0	0	0	0	0	0	0.0	3	SB

The relative mean sunspot number is 4.2.

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

$K'= 1.137 (*)$

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

The normalised relative monthly mean sunspot number is 5.

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

The Sun has been observed 18 days on 30 possible.