



# Sunspot Index and Long-term Solar Observations

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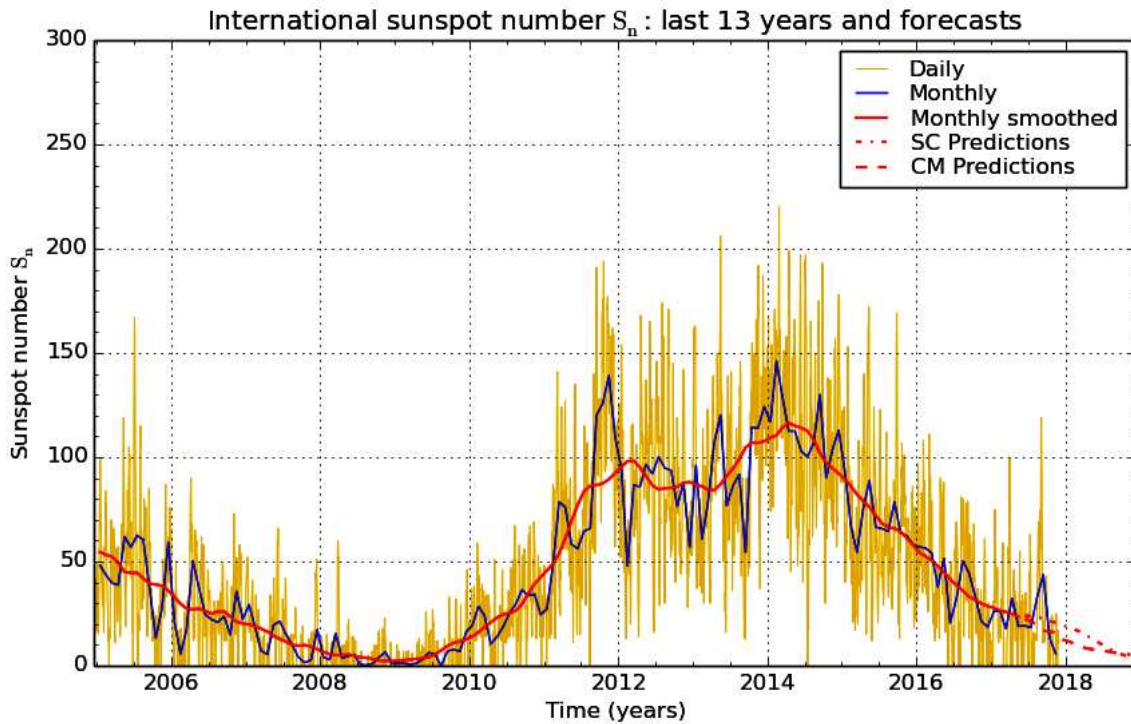
## ***SUNSPOT BULLETIN*** 2017 n° 11

Provisional international and normalized hemispheric daily sunspot numbers for November 2017

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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	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	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	13	0	13
15	15	0	15
16	16	0	16
17	25	10	15
18	15	0	15
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	15	15	0
26	17	17	0
27	16	16	0
28	15	15	0
29	13	13	0
30	11	11	0
Monthly mean	5.7	3.2	2.5
Cooperating stations	74	60	60



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2017 December 1

**Predictions of the monthly smoothed Sunspot Number**  
 using the last provisional value, calculated for May 2017: 23.4 ( $\pm 5\%$ )

	SM	CM		SM	CM		SM	CM
2017 Jun	24	22	2017 Dec	20	13	2018 Jun	11	7
Jul	24	21	2018 Jan	19	12	Jul	9	7
Aug	23	20	Feb	17	11	Aug	8	7
Sep	22	17	Mar	16	9	Sep	6	6
Oct	21	16	Apr	14	8	Oct	5	6
Nov	21	16	May	13	8	Nov	4	5

**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	11	1	-	75	////	///	///	2
1	0	0	-	73	////	///	///	4
2	0	0	-	73	////	0	0/0	9
3	0	0	-	73	////	///	///	11
4	0	0	-	72	////	0	0/0	4
5	0	0	-	71	////	0	0/0	1
6	0	0	-	69	////	0	0/0	1
7	0	0	-	68	////	0	0/0	34
8	0	0	-	68	////	0	0/0	41
9	0	0	-	66	////	0	0/0	25
10	0	0	-	69	////	0	0/0	20
11	0	0	-	67	////	0	0/0	8
12	0	0	-	69	////	0	0/0	7
13	0	0	-	72	////	0	0/0	6
14	13	1	-	74	////	0	0/0	12
15	15	4	-	74	////	0	0/0	13
16	16	8	-	73	////	0	0/0	16
17	25	12	-	76	////	0	0/0	4
18	15	3	-	76	////	0	0/0	8
19	0	1	-	74	////	0	0/0	4
20	0	1	-	74	////	0	0/0	7
21	0	0	-	73	////	0	0/0	29
22	0	0	-	73	////	0	0/0	12
23	0	0	-	72	////	0	0/0	12
24	0	1	-	74	////	0	0/0	14
25	15	4	-	74	////	0	0/0	6
26	17	14	-	76	////	0	0/0	2
27	16	9	-	74	////	0	0/0	6
28	15	5	-	72	////	0	0/0	7
29	13	2	-	73	////	0	0/0	5
30	11	1	-	72	////	0	0/0	12

**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 NOVEMBER 2017

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	905	0	0	0	0	0	0	0.0	2	OL
2	1430	0	0	0	0	0	0	0.0	3	FC
3	1015	0	0	0	0	0	0	0.0	3	OB
4	856	0	0	0	0	0	0	0.0	3	SB
5	915	0	0	0	0	0	0	0.0	3	SB
6	915	0	0	0	0	0	0	0.0	3	BB
7	900	0	0	0	0	0	0	0.0	3	BB
12	1130	0	0	0	0	0	0	0.0	3	OB
13	940	0	0	0	0	0	0	0.0	3	BB
17	1220	2	8	28	12	16	12	5.8	3	OL
18	1115	1	6	16	0	16	16	2.0	3	OL
19	935	0	0	0	0	0	0	0.0	3	OL
22	1240	0	0	0	0	0	0	0.0	3	BB
24	1000	0	0	0	0	0	0	0.0	3	OB
25	1430	1	3	13	13	0	13	6.1	2	OB
26	1050	1	10	20	20	0	20	21.8	1	LL
28	1030	1	2	12	12	0	0	1.5	3	BB
30	1035	1	2	12	12	0	0	0.5	3	FC

The relative mean sunspot number is 5.6.

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NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS  $U'=K'U$  FOR NOVEMBER 2017

$K' = 1.146 (*)$

1	0	7	0	13	0	19	0	25	15
2	0	8	***	14	***	20	***	26	23
3	0	9	***	15	***	21	***	27	***
4	0	10	***	16	***	22	0	28	14
5	0	11	***	17	32	23	***	29	***
6	0	12	0	18	18	24	0	30	14

The normalised relative monthly mean sunspot number is 6.

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

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The Sun has been observed 18 days on 30 possible.