



# Sunspot Index and Long-term Solar Observations

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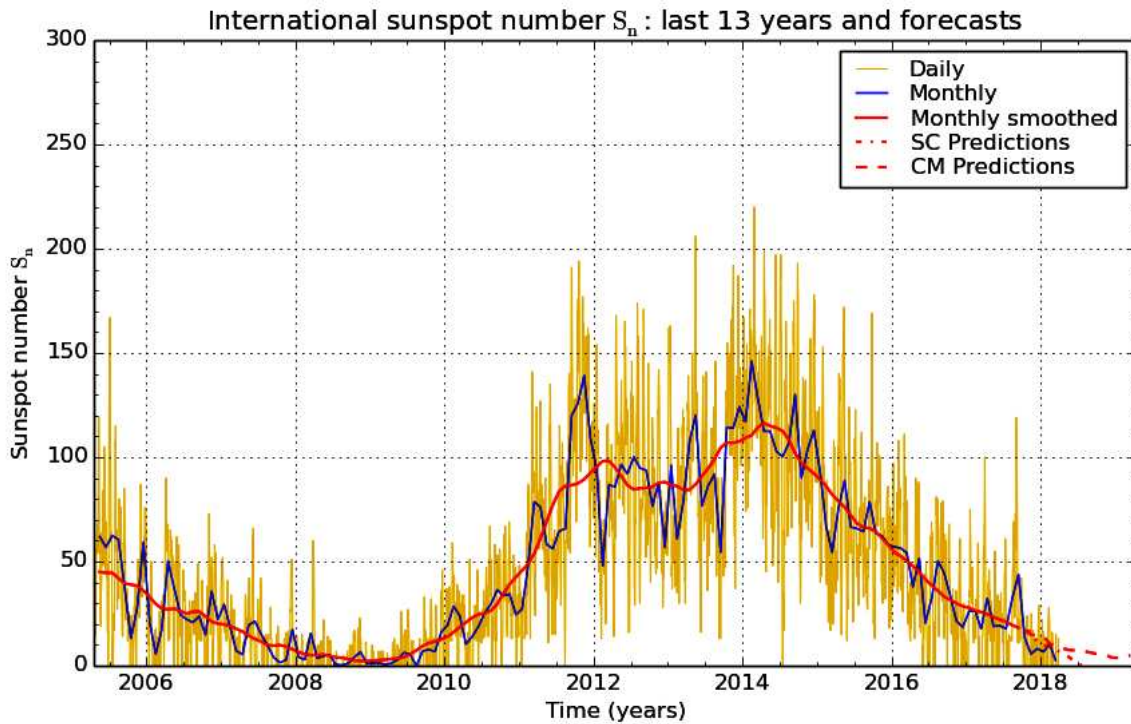
## *SUNSPOT BULLETIN*

2018 n° 3

Provisional international and normalized hemispheric daily sunspot numbers for March 2018

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	12	12	0
2	11	11	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	0	0	0
15	0	0	0
16	0	0	0
17	15	15	0
18	14	14	0
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	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	12	0	12
31	13	0	13
Monthly mean	2.5	1.7	0.8
Cooperating stations	73	58	58



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2018 April 3

**Predictions of the monthly smoothed Sunspot Number**  
 using the last provisional value, calculated for September 2017: 18.3 ( $\pm 5\%$ )

	SM	CM		SM	CM		SM	CM
2017 Oct	17	17	2018 Apr	6	8	2018 Oct	0	6
Nov	16	15	May	4	8	Nov	0	5
Dec	11	15	Jun	2	7	Dec	0	4
2018 Jan	10	14	Jul	0	7	2019 Jan	0	4
Feb	9	11	Aug	0	7	Feb	0	4
Mar	8	10	Sep	0	6	Mar	0	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
28	12	3	-	69	////	1	0/0	8
1	12	1	-	67	////	0	0/0	10
2	11	1	-	68	////	1	0/0	5
3	0	0	-	68	////	0	0/0	6
4	0	0	-	68	////	0	0/0	7
5	0	0	-	68	////	0	0/0	5
6	0	0	-	68	////	0	0/0	6
7	0	0	-	68	////	0	0/0	5
8	0	1	-	67	////	0	0/0	4
9	0	0	-	68	////	0	0/0	14
10	0	0	-	68	////	0	0/0	12
11	0	0	-	68	////	0	0/0	4
12	0	0	-	68	////	0	0/0	3
13	0	0	-	69	////	0	0/0	3
14	0	0	-	68	////	0	0/0	11
15	0	0	-	69	////	0	0/0	16
16	0	0	-	69	////	0	0/0	22
17	15	2	-	70	////	0	0/0	16
18	14	2	-	69	////	0	0/0	25
19	0	0	-	70	////	0	0/0	17
20	0	0	-	69	////	0	0/0	8
21	0	0	-	69	////	0	0/0	6
22	0	0	-	69	////	0	0/0	7
23	0	0	-	68	////	0	0/0	20
24	0	0	-	68	////	0	0/0	10
25	0	0	-	68	////	0	0/0	18
26	0	0	-	68	////	0	0/0	14
27	0	0	-	68	////	0	0/0	7
28	0	0	-	69	////	0	0/0	2
29	0	0	-	69	////	0	0/0	5
30	12	1	-	69	////	4	0/0	4
31	13	1	-	69	////	1	0/0	7

**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 MARCH 2018

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH			
3	910	0	0	0	0	0	0.0	2	OL
4	915	0	0	0	0	0	0.0	3	OL
5	900	0	0	0	0	0	0.0	3	BB
6	1100	0	0	0	0	0	0.0	2	BB
8	1310	0	0	0	0	0	0.0	3	FC
10	1010	0	0	0	0	0	0.0	1	LL
11	1015	0	0	0	0	0	0.0	2	LL
12	1235	0	0	0	0	0	0.0	2	BB
14	800	0	0	0	0	0	0.0	3	SB
16	1130	0	0	0	0	0	0.0	3	SB
18	1020	0	0	0	0	0	0.0	1	SB
19	1220	0	0	0	0	0	0.0	1	BB
20	1400	0	0	0	0	0	0.0	3	OB
21	855	0	0	0	0	0	0.0	2	BB
24	1000	0	0	0	0	0	0.0	3	OB
26	740	0	0	0	0	0	0.0	2	BB
29	815	0	0	0	0	0	0.0	3	OL
30	832	1	1	11	0	11	0.1	2	OL
31	835	1	1	11	0	11	0.2	3	OL

The relative mean sunspot number is 1.2.

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NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR MARCH 2018

K' = 1.172 (\*)

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

The normalised relative monthly mean sunspot number is 1.

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

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The Sun has been observed 19 days on 31 possible.