



Sunspot Index and Long-term Solar Observations

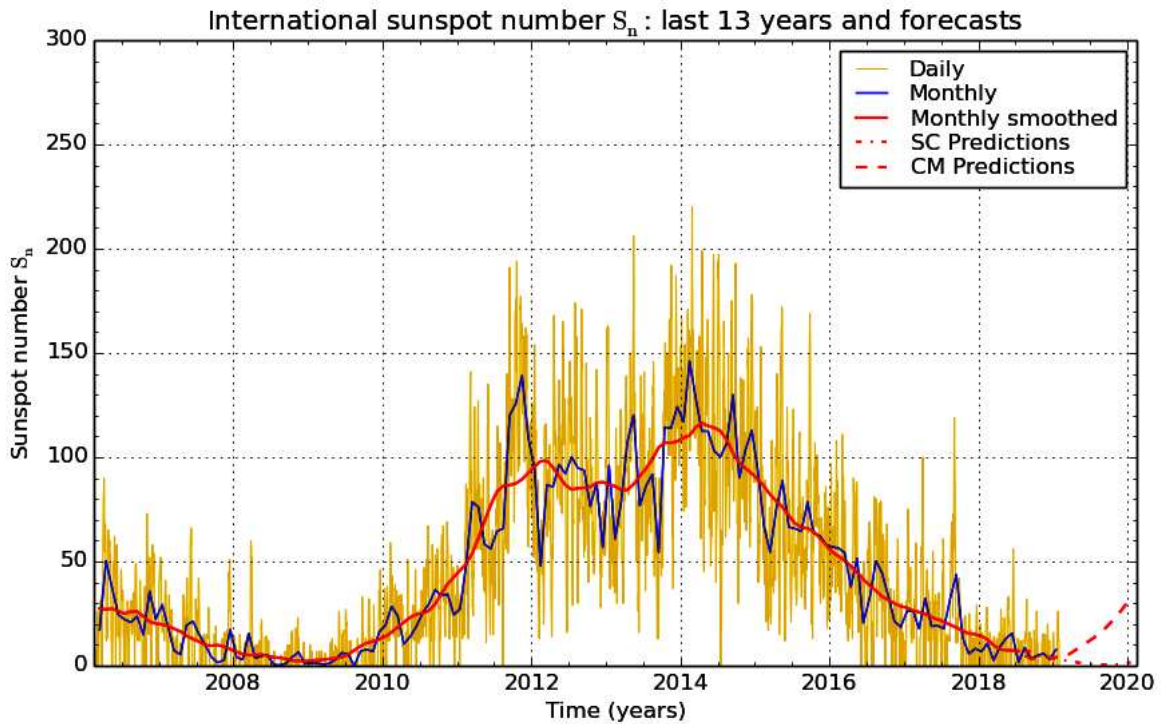
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SUNSPOT BULLETIN 2019 n° 1

Provisional international and normalized hemispheric daily sunspot numbers for January 2019

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	13	13	0
2	15	15	0
3	16	16	0
4	13	13	0
5	12	12	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	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	10	10	0
22	16	16	0
23	19	19	0
24	21	21	0
25	23	23	0
26	26	26	0
27	19	19	0
28	16	16	0
29	13	13	0
30	11	11	0
31	0	0	0
Monthly mean	7.8	7.8	0.0
Cooperating stations	65	50	50



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2019 February 1

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for July 2018: 7.1 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2018 Aug	7	5	2019 Feb	3	4	2019 Aug	1	15
Sep	7	3	Mar	2	5	Sep	0	18
Oct	5	3	Apr	2	7	Oct	0	21
Nov	4	4	May	1	9	Nov	1	25
Dec	4	4	Jun	1	11	Dec	1	28
2019 Jan	3	4	Jul	1	13	2020 Jan	2	33

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 _n	PPSI	600	2800	COS	SFI	XI	Ak
31	0	0	-	69	////	0	0/0	7
1	13	1	-	72	////	0	0/0	4
2	15	3	-	75	////	1	0/0	2
3	16	5	-	73	////	0	0/0	1
4	13	2	-	72	////	0	0/0	12
5	12	1	-	71	////	0	0/0	22
6	0	0	-	72	////	0	0/0	10
7	0	0	-	72	////	0	0/0	7
8	0	0	-	71	////	0	0/0	6
9	0	0	-	72	////	0	0/0	5
10	0	0	-	70	////	0	0/0	3
11	0	0	-	68	////	0	0/0	7
12	0	0	-	70	////	0	0/0	2
13	0	0	-	69	////	0	0/0	3
14	0	0	-	70	////	0	0/0	10
15	0	0	-	70	////	0	0/0	7
16	0	0	-	70	////	0	0/0	8
17	0	0	-	69	////	0	0/0	8
18	0	0	-	69	////	0	0/0	6
19	0	0	-	70	////	0	0/0	7
20	0	0	-	69	////	0	0/0	4
21	10	0	-	70	////	0	0/0	4
22	16	1	-	71	////	0	0/0	4
23	19	3	-	72	////	0	0/0	17
24	21	3	-	72	////	0	0/0	21
25	23	6	-	75	////	0	0/0	14
26	26	6	-	77	////	1	0/0	8
27	19	4	-	74	////	1	0/0	6
28	16	3	-	76	////	1	0/0	1
29	13	1	-	73	////	1	0/0	2
30	11	0	-	74	////	0	0/0	2
31	0	0	-	72	////	0	0/0	18

S_n : 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^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 : $1 \times S_n + 10 \times \text{"1"} + 100 \times \text{">1"}$).

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 JANUARY 2019

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH			
8	1115	0	0	0	0	0	0.0	2	SB
9	1220	0	0	0	0	0	0.0	2	BB
14	1215	0	0	0	0	0	0.0	3	OB
15	1010	0	0	0	0	0	0.0	3	OB
17	1415	0	0	0	0	0	0.0	3	OB
19	1000	0	0	0	0	0	0.0	3	OB
20	1030	0	0	0	0	0	0.0	3	OB
21	1020	1	1	11	11	0	0.2	2	OL
23	1210	1	10	20	20	0	21.9	2	OL
24	1350	1	11	21	21	0	23.0	2	OL
28	1005	1	7	17	17	0	10.3	2	FC
29	1050	1	5	15	15	0	1.5	2	SB
31	1340	0	0	0	0	0	0.0	2	SB

The relative mean sunspot number is 6.5.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JANUARY 2019

$K' = 1.194 (*)$

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

The normalised relative monthly mean sunspot number is 8.

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

The Sun has been observed 13 days on 31 possible.