



Sunspot Index and Long-term Solar Observations

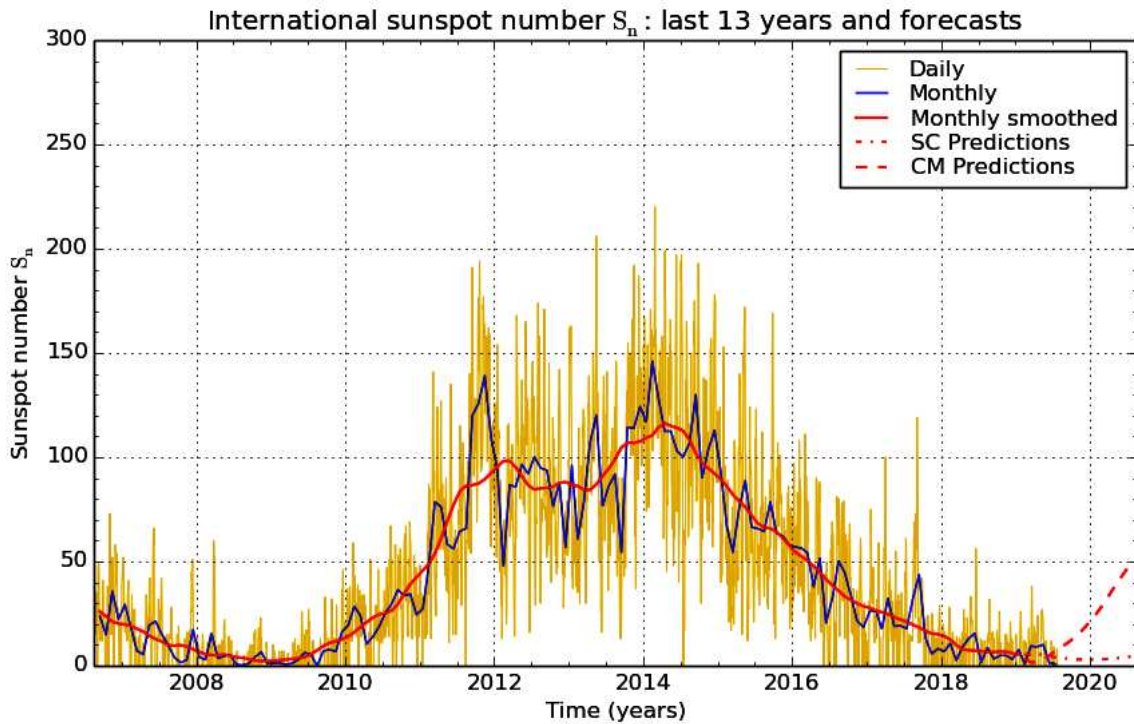
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SUNSPOT BULLETIN 2019 n° 7

Provisional international and normalized hemispheric daily sunspot numbers for July 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	5	0	5
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	9	0	9
8	5	0	5
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	0	0	0
22	8	8	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	0.9	0.3	0.6
Cooperating stations	70	56	56



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

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for January 2019: 5.4 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2019 Feb	5	3	2019 Aug	4	9	2020 Feb	3	27
Mar	6	2	Sep	3	11	Mar	3	31
Apr	6	2	Oct	3	14	Apr	3	36
May	5	3	Nov	3	16	May	4	41
Jun	5	5	Dec	3	20	Jun	4	45
Jul	4	7	2020 Jan	3	23	Jul	4	49

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
30	0	0	-	67	////	0	0/0	6
1	5	1	-	68	////	0	0/0	11
2	0	0	-	67	////	0	0/0	7
3	0	0	-	67	////	0	0/0	6
4	0	0	-	68	////	0	0/0	7
5	0	0	-	67	////	0	0/0	5
6	0	0	-	67	////	0	0/0	2
7	9	0	-	67	////	0	0/0	6
8	5	0	-	67	////	0	0/0	11
9	0	0	-	68	////	0	0/0	18
10	0	0	-	68	////	0	0/0	15
11	0	0	-	67	////	0	0/0	8
12	0	0	-	67	////	0	0/0	6
13	0	0	-	66	////	0	0/0	8
14	0	0	-	67	////	0	0/0	8
15	0	0	-	67	////	0	0/0	11
16	0	0	-	67	////	0	0/0	6
17	0	0	-	68	////	0	0/0	7
18	0	0	-	67	////	0	0/0	4
19	0	0	-	67	////	0	0/0	5
20	0	0	-	67	////	0	0/0	3
21	0	0	-	68	////	0	0/0	10
22	8	1	-	67	////	0	0/0	10
23	0	0	-	67	////	0	0/0	9
24	0	0	-	68	////	0	0/0	7
25	0	0	-	68	////	0	0/0	4
26	0	0	-	68	////	0	0/0	2
27	0	0	-	67	////	0	0/0	6
28	0	0	-	67	////	0	0/0	6
29	0	0	-	66	////	0	0/0	6
30	0	0	-	66	////	0	0/0	11
31	0	0	-	67	////	0	0/0	10

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 : $1 \times S_n + 10 \times ">1" + 100 \times ">1"$).

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 JULY 2019

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	740	1	4	14	0	14	14	1.4	3	OB
2	815	0	0	0	0	0	0	0.0	3	OB
3	810	0	0	0	0	0	0	0.0	3	OB
4	820	0	0	0	0	0	0	0.0	3	OB
5	840	0	0	0	0	0	0	0.0	3	OB
6	655	0	0	0	0	0	0	0.0	3	OL
7	1050	1	1	11	0	11	0	0.2	3	OL
8	855	1	1	11	0	11	0	0.3	2	SB
9	645	0	0	0	0	0	0	0.0	2	SB
10	700	0	0	0	0	0	0	0.0	3	SB
11	1430	0	0	0	0	0	0	0.0	3	OB
12	700	0	0	0	0	0	0	0.0	3	SB
13	1200	0	0	0	0	0	0	0.0	2	SB
14	1440	0	0	0	0	0	0	0.0	2	SB
16	1130	0	0	0	0	0	0	0.0	2	OB
17	640	0	0	0	0	0	0	0.0	4	FC
18	630	0	0	0	0	0	0	0.0	3	FC
19	730	0	0	0	0	0	0	0.0	3	FC
20	1010	0	0	0	0	0	0	0.0	3	FC
21	705	0	0	0	0	0	0	0.0	3	FC
22	705	1	3	13	13	0	13	1.4	4	FC
23	620	1	2	12	12	0	0	0.3	4	FC
24	635	0	0	0	0	0	0	0.0	3	FC
25	715	0	0	0	0	0	0	0.0	3	OL
26	715	0	0	0	0	0	0	0.0	3	OL
29	715	0	0	0	0	0	0	0.0	3	OB
30	615	0	0	0	0	0	0	0.0	3	OB
31	830	0	0	0	0	0	0	0.0	3	OL

The relative mean sunspot number is 2.2.

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

$K'= 1.117 (*)$

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

The normalised relative monthly mean sunspot number is 2.

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

The Sun has been observed 28 days on 31 possible.