



Sunspot Index and Long-term Solar Observations

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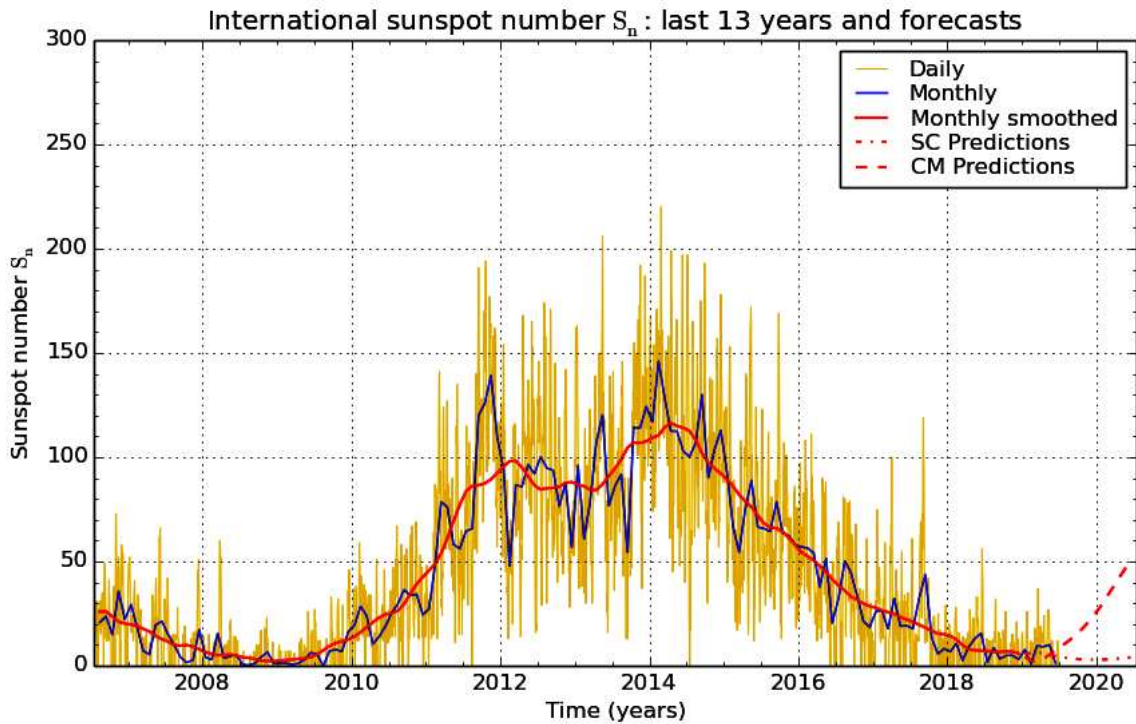
SUNSPOT BULLETIN

2019 n° 6

Provisional international and normalized hemispheric daily sunspot numbers for June 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	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	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	0	0	0
23	0	0	0
24	11	11	0
25	12	12	0
26	7	7	0
27	0	0	0
28	0	0	0
29	5	5	0
30	0	0	0
Monthly mean	1.2	1.2	0.0
Cooperating stations	69	55	55



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

Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for December 2018: 6.0 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2019 Jan	6	4	2019 Jul	4	10	2020 Jan	3	28
Feb	6	2	Aug	4	12	Feb	3	32
Mar	7	2	Sep	3	14	Mar	3	37
Apr	6	3	Oct	3	17	Apr	3	42
May	5	5	Nov	3	20	May	4	46
Jun	5	8	Dec	3	24	Jun	4	51

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	4
1	0	0	-	70	////	0	0/0	4
2	0	0	-	70	////	0	0/0	6
3	0	0	-	70	////	0	0/0	5
4	0	0	-	70	////	0	0/0	10
5	0	0	-	70	////	0	0/0	5
6	0	0	-	69	////	0	0/0	2
7	0	0	-	69	////	0	0/0	5
8	0	0	-	68	////	0	0/0	26
9	0	0	-	68	////	0	0/0	8
10	0	0	-	69	////	0	0/0	4
11	0	0	-	70	////	0	0/0	2
12	0	0	-	70	////	0	0/0	5
13	0	0	-	68	////	0	0/0	12
14	0	0	-	68	////	0	0/0	7
15	0	0	-	67	////	0	0/0	4
16	0	0	-	66	////	0	0/0	4
17	0	0	-	66	////	0	0/0	3
18	0	0	-	67	////	0	0/0	4
19	0	0	-	68	////	0	0/0	4
20	0	0	-	68	////	0	0/0	8
21	0	0	-	67	////	0	0/0	8
22	0	0	-	66	////	0	0/0	6
23	0	0	-	67	////	0	0/0	4
24	11	1	-	68	////	0	0/0	6
25	12	0	-	68	////	0	0/0	4
26	7	0	-	68	////	0	0/0	6
27	0	0	-	67	////	0	0/0	6
28	0	0	-	68	////	0	0/0	6
29	5	0	-	68	////	0	0/0	5
30	0	0	-	67	////	0	0/0	6

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/m² : 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 JUNE 2019

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	730	0	0	0	0	0	0.0	3	FC	
2	705	0	0	0	0	0	0.0	3	FC	
3	711	0	0	0	0	0	0.0	1	SB	
4	640	0	0	0	0	0	0.0	2	SB	
5	1330	0	0	0	0	0	0.0	1	SB	
6	715	0	0	0	0	0	0.0	3	SB	
7	630	0	0	0	0	0	0.0	2	SB	
8	1235	0	0	0	0	0	0.0	3	SB	
9	835	0	0	0	0	0	0.0	2	OL	
10	750	0	0	0	0	0	0.0	2	SB	
11	655	0	0	0	0	0	0.0	2	SB	
12	1305	0	0	0	0	0	0.0	3	SB	
13	730	0	0	0	0	0	0.0	2	SB	
14	745	0	0	0	0	0	0.0	2	SB	
15	1120	0	0	0	0	0	0.0	2	SB	
16	955	0	0	0	0	0	0.0	2	SB	
17	840	0	0	0	0	0	0.0	3	OL	
18	935	0	0	0	0	0	0.0	3	OL	
19	1235	0	0	0	0	0	0.0	2	OL	
20	850	0	0	0	0	0	0.0	3	OL	
21	855	0	0	0	0	0	0.0	3	OL	
22	905	0	0	0	0	0	0.0	3	OL	
23	855	0	0	0	0	0	0.0	3	OL	
24	850	2	3	23	23	0	11	0.6	2	SB
25	715	1	1	11	11	0	0	0.2	2	SB
26	845	1	1	11	11	0	0	0.1	3	OL
27	710	0	0	0	0	0	0	0.0	2	SB
28	725	0	0	0	0	0	0	0.0	3	SB
29	800	0	0	0	0	0	0	0.0	3	OB
30	1010	0	0	0	0	0	0	0.0	3	OL

The relative mean sunspot number is 1.5.

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

$K'= 1.089 (*)$

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