



Sunspot Index and Long-term Solar Observations

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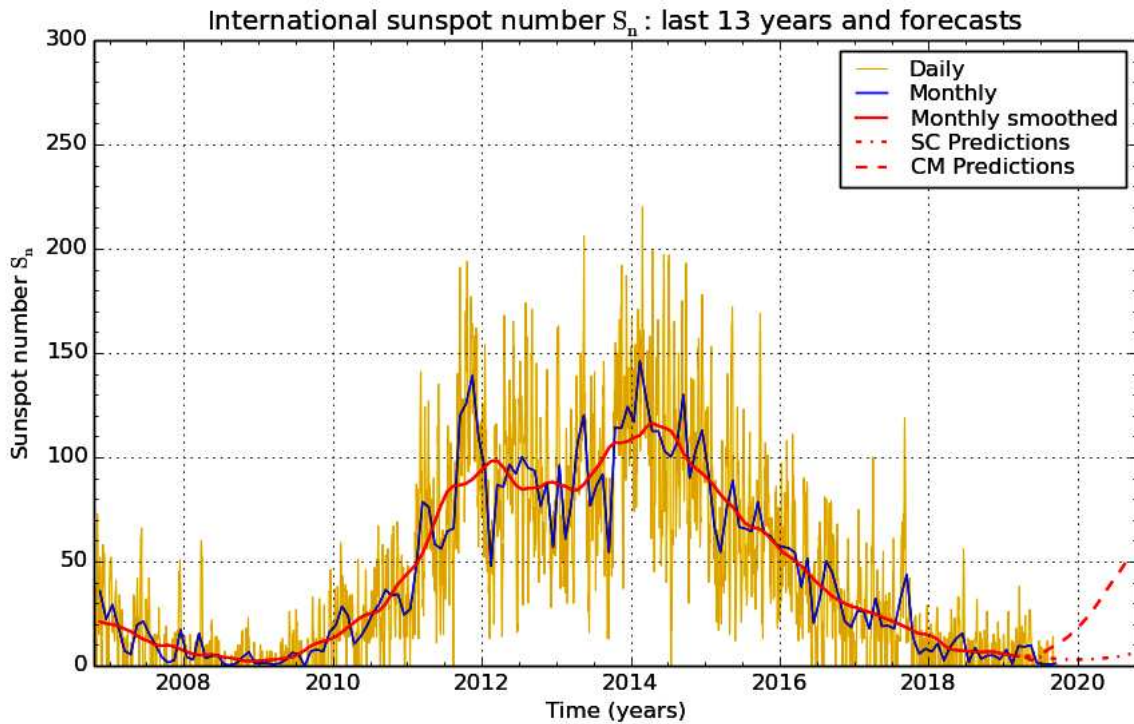
SUNSPOT BULLETIN

2019 n° 9

Provisional international and normalized hemispheric daily sunspot numbers for September 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	14	14	0
2	14	14	0
3	5	5	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	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
Monthly mean	1.1	1.1	0.0
Cooperating stations	70	57	57



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2019 October 2

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for March 2019: 4.6 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2019 Apr	5	4	2019 Oct	3	12	2020 Apr	3	31
May	5	3	Nov	3	14	May	4	36
Jun	5	4	Dec	3	17	Jun	4	40
Jul	4	6	2020 Jan	3	20	Jul	4	44
Aug	4	8	Feb	3	23	Aug	5	49
Sep	3	10	Mar	3	27	Sep	6	53

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	-	66	////	0	0/0	40
1	14	2	-	67	////	0	0/0	40
2	14	2	-	69	////	0	0/0	24
3	5	0	-	69	////	0	0/0	8
4	0	0	-	69	////	0	0/0	16
5	0	0	-	68	////	0	0/0	15
6	0	0	-	69	////	0	0/0	9
7	0	0	-	74	////	0	0/0	8
8	0	0	-	68	////	0	0/0	13
9	0	0	-	69	////	0	0/0	18
10	0	0	-	70	////	0	0/0	5
11	0	0	-	68	////	0	0/0	5
12	0	0	-	69	////	0	0/0	6
13	0	0	-	68	////	0	0/0	9
14	0	0	-	69	////	0	0/0	7
15	0	0	-	68	////	0	0/0	12
16	0	0	-	69	////	0	0/0	14
17	0	0	-	68	////	0	0/0	11
18	0	0	-	66	////	0	0/0	8
19	0	0	-	67	////	0	0/0	4
20	0	0	-	67	////	0	0/0	3
21	0	0	-	68	////	0	0/0	6
22	0	0	-	68	////	0	0/0	4
23	0	0	-	66	////	0	0/0	4
24	0	0	-	67	////	0	0/0	14
25	0	0	-	68	////	0	0/0	4
26	0	0	-	67	////	0	0/0	4
27	0	0	-	66	////	0	0/0	26
28	0	0	-	67	////	0	0/0	27
29	0	0	-	67	////	0	0/0	14
30	0	0	-	///	////	///	///	(//)

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 SEPTEMBER 2019

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	1050	1	3	13	13	0	13	0.3	3	OL
2	755	1	4	14	14	0	14	0.4	3	OL
4	750	0	0	0	0	0	0	0.0	3	OL
5	800	0	0	0	0	0	0	0.0	3	OL
6	800	0	0	0	0	0	0	0.0	3	OL
7	830	0	0	0	0	0	0	0.0	3	OB
8	900	0	0	0	0	0	0	0.0	4	OL
9	735	0	0	0	0	0	0	0.0	3	OB
10	750	0	0	0	0	0	0	0.0	3	OL
12	820	0	0	0	0	0	0	0.0	4	OB
13	1230	0	0	0	0	0	0	0.0	2	OB
14	815	0	0	0	0	0	0	0.0	3	OB
15	830	0	0	0	0	0	0	0.0	2	OB
17	635	0	0	0	0	0	0	0.0	3	FC
18	820	0	0	0	0	0	0	0.0	3	FC
19	645	0	0	0	0	0	0	0.0	2	FC
20	730	0	0	0	0	0	0	0.0	3	FC
21	935	0	0	0	0	0	0	0.0	3	FC
22	800	0	0	0	0	0	0	0.0	3	FC
23	945	0	0	0	0	0	0	0.0	2	SB
27	750	0	0	0	0	0	0	0.0	2	SB
28	1015	0	0	0	0	0	0	0.0	1	SB
30	800	0	0	0	0	0	0	0.0	3	OB

The relative mean sunspot number is 1.2.

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

$K' = 1.158 (*)$

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

The normalised relative monthly mean sunspot number is 1.

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

The Sun has been observed 23 days on 30 possible.