



Sunspot Index and Long-term Solar Observations

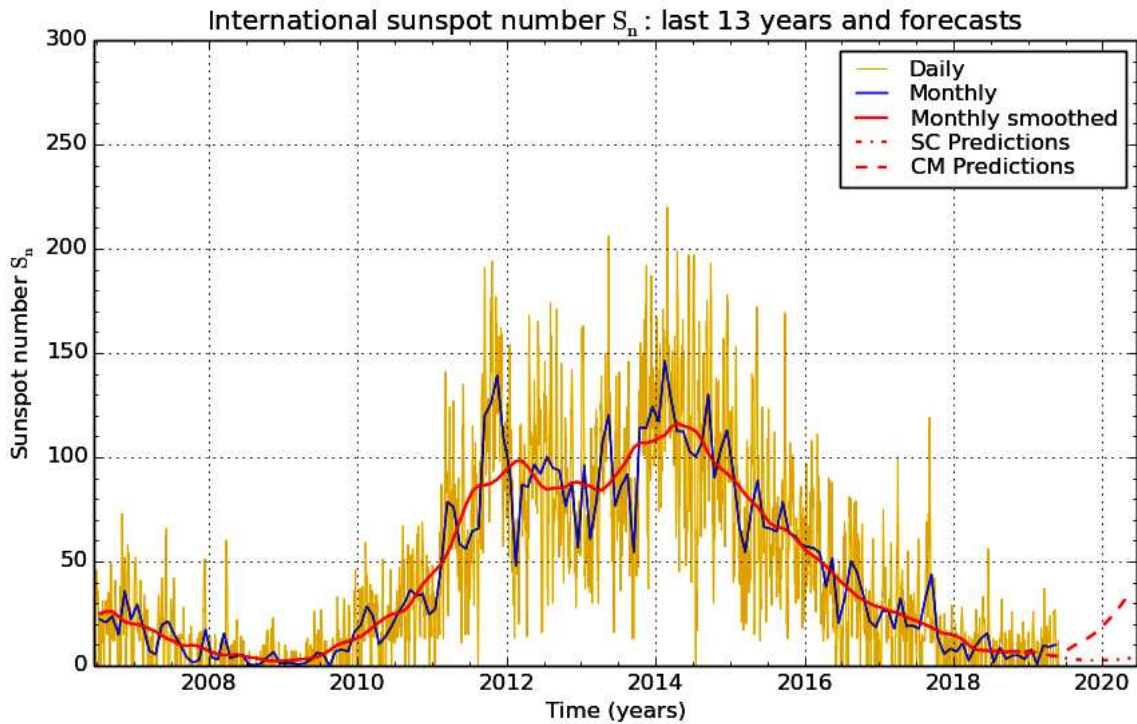
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SUNSPOT BULLETIN 2019 n° 5

Provisional international and normalized hemispheric daily sunspot numbers for May 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	12	12	0
5	12	12	0
6	16	16	0
7	26	26	0
8	25	25	0
9	26	26	0
10	26	26	0
11	27	27	0
12	26	26	0
13	24	24	0
14	24	24	0
15	18	18	0
16	13	13	0
17	13	13	0
18	12	12	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	12	12	0
30	0	0	0
31	0	0	0
Monthly mean	10.1	10.1	0.0
Cooperating stations	67	54	54



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

Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for November 2018: 6.7 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2018 Dec	6	7	2019 Jun	4	6	2019 Dec	3	18
2019 Jan	6	7	Jul	3	8	2020 Jan	3	21
Feb	6	6	Aug	3	10	Feb	3	24
Mar	6	6	Sep	3	11	Mar	3	27
Apr	5	5	Oct	3	13	Apr	3	31
May	4	5	Nov	3	15	May	4	36

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	-	///	////	///	///	(//)
1	0	0	-	68	////	0	0/0	18
2	0	0	-	69	////	0	0/0	14
3	0	0	-	70	////	0	0/0	8
4	12	2	-	72	////	1	0/0	10
5	12	4	-	74	////	5	0/0	4
6	16	11	-	76	////	20	0/0	6
7	26	18	-	79	////	16	0/0	6
8	25	19	-	75	////	0	0/0	2
9	26	27	-	76	////	2	0/0	8
10	26	32	-	76	////	0	0/0	10
11	27	25	-	78	////	0	0/0	27
12	26	25	-	76	////	0	0/0	5
13	24	19	-	75	////	1	0/0	8
14	24	12	-	74	////	0	0/0	33
15	18	8	-	74	////	2	0/0	8
16	13	12	-	74	////	0	0/0	10
17	13	6	-	72	////	0	0/0	4
18	12	1	-	71	////	0	0/0	4
19	0	0	-	68	////	0	0/0	4
20	0	0	-	69	////	0	0/0	8
21	0	0	-	68	////	0	0/0	4
22	0	0	-	67	////	0	0/0	5
23	0	0	-	67	////	0	0/0	6
24	0	0	-	66	////	0	0/0	7
25	0	0	-	67	////	0	0/0	6
26	0	0	-	68	////	0	0/0	4
27	0	0	-	68	////	0	0/0	14
28	0	0	-	68	////	0	0/0	12
29	12	0	-	68	////	0	0/0	18
30	0	0	-	69	////	0	0/0	10
31	0	0	-	69	////	0	0/0	4

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 MAY 2019

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH			
1	635	0	0	0	0	0	0.0	3	SB
4	710	1	1	11	11	0	4.5	2	SB
5	820	1	2	12	12	0	9.5	2	SB
6	1100	1	5	15	15	0	17.2	3	OB
7	745	2	8	28	28	0	22.1	3	BB
9	605	2	15	35	35	0	46.6	3	FC
10	900	2	17	37	37	0	54.3	3	OB
11	845	2	12	32	32	0	30.3	3	OB
12	1100	2	6	26	26	0	32.5	2	OB
13	730	2	8	28	28	0	31.6	3	OL
14	755	2	4	24	24	0	2.3	2	OL
15	740	2	5	25	25	0	1.8	3	OL
16	755	1	3	13	13	0	1.3	3	OL
18	850	1	1	11	11	0	0.4	2	OL
19	1245	0	0	0	0	0	0.0	1	OL
21	910	0	0	0	0	0	0.0	2	SB
22	710	0	0	0	0	0	0.0	3	SB
23	650	0	0	0	0	0	0.0	3	SB
24	630	0	0	0	0	0	0.0	2	SB
25	1225	0	0	0	0	0	0.0	2	SB
26	925	0	0	0	0	0	0.0	3	SB
27	900	0	0	0	0	0	0.0	3	OB
28	1245	0	0	0	0	0	0.0	3	OB
29	750	1	2	12	12	0	1.5	3	OB
30	1000	0	0	0	0	0	0.0	3	OL
31	1032	0	0	0	0	0	0.0	3	OL

The relative mean sunspot number is 11.9.

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

$K' = 1.105 (*)$

1	0	7	31	13	31	19	0	25	0
2	***	8	***	14	27	20	***	26	0
3	***	9	39	15	28	21	0	27	0
4	12	10	41	16	14	22	0	28	0
5	13	11	35	17	***	23	0	29	13
6	17	12	29	18	12	24	0	30	0
								31	0

The normalised relative monthly mean sunspot number is 13.

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

The Sun has been observed 26 days on 31 possible.