



Sunspot Index and Long-term Solar Observations

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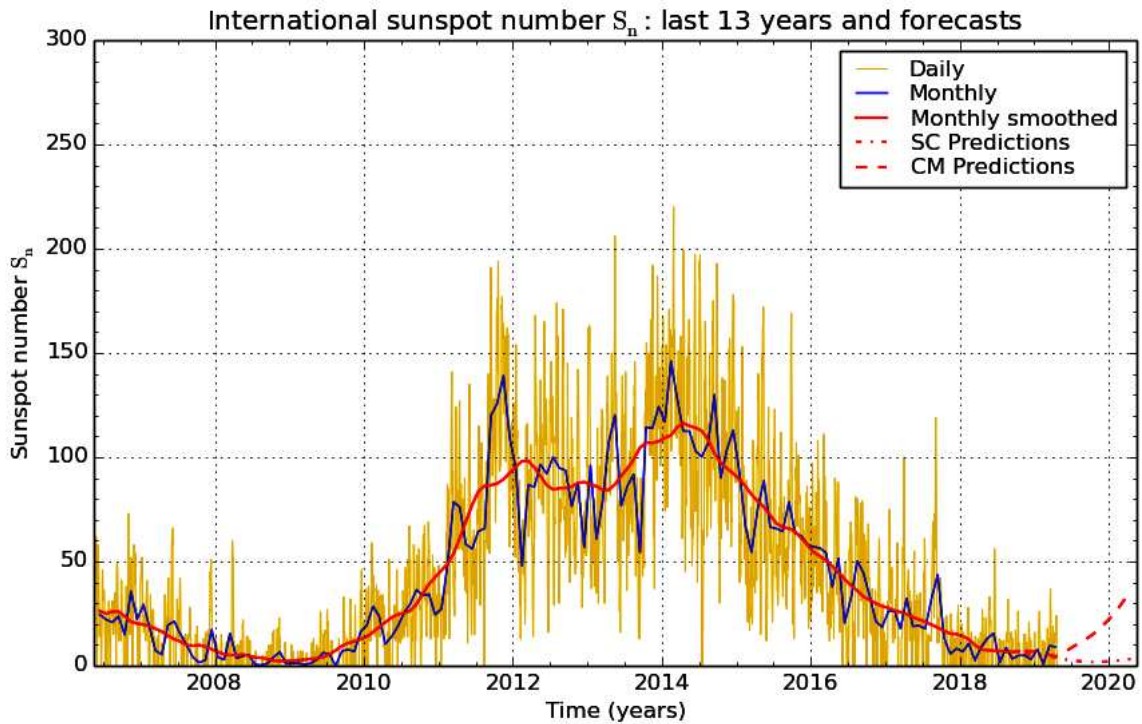
SUNSPOT BULLETIN

2019 n° 4

Provisional international and normalized hemispheric daily sunspot numbers for April 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	17	17	0
3	19	19	0
4	11	11	0
5	5	5	0
6	0	0	0
7	11	11	0
8	12	12	0
9	12	12	0
10	13	13	0
11	12	12	0
12	13	13	0
13	16	16	0
14	14	14	0
15	12	12	0
16	11	11	0
17	16	16	0
18	24	24	0
19	24	24	0
20	11	11	0
21	5	5	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	9.1	9.1	0.0
Cooperating stations	70	55	55



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2019 May 7

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for October 2018: 6.9 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2018 Nov	6	7	2019 May	3	6	2019 Nov	2	18
Dec	5	7	Jun	3	8	Dec	2	21
2019 Jan	6	7	Jul	2	10	2020 Jan	2	24
Feb	5	6	Aug	2	11	Feb	3	27
Mar	5	5	Sep	2	13	Mar	3	32
Apr	4	5	Oct	2	15	Apr	3	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.

Brussels, May 1, 2019 08:14 UT

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Summary of the URSIGRAMs from S.I.D.C.

Date	S _n	PPSI	600	2800	COS	SFI	XI	Ak
31	12	0	-	70	////	0	0/0	12
1	14	2	-	69	////	0	0/0	7
2	17	4	-	71	////	0	0/0	9
3	19	4	-	71	////	0	0/0	11
4	11	1	-	70	////	0	0/0	12
5	5	1	-	72	////	0	0/0	16
6	0	0	-	74	////	0	0/0	8
7	11	2	-	77	////	0	0/0	7
8	12	4	-	79	////	2	0/0	14
9	12	9	-	79	////	1	0/0	10
10	13	10	-	78	////	0	0/0	15
11	12	19	-	77	////	0	0/0	7
12	13	12	-	77	////	1	0/0	8
13	16	22	-	78	////	0	0/0	10
14	14	21	-	75	////	0	0/0	5
15	12	20	-	75	////	1	0/0	(//)
16	11	14	-	74	////	0	0/0	(//)
17	16	12	-	76	////	0	0/0	(//)
18	24	9	-	75	////	0	0/0	(//)
19	24	5	-	73	////	0	0/0	(//)
20	11	1	-	70	////	0	0/0	(//)
21	5	0	-	69	////	0	0/0	(//)
22	0	0	-	69	////	0	0/0	(//)
23	0	0	-	69	////	0	0/0	(//)
24	0	0	-	69	////	0	0/0	(//)
25	0	0	-	68	////	0	0/0	(//)
26	0	0	-	67	////	0	0/0	(//)
27	0	0	-	67	////	0	0/0	(//)
28	0	0	-	68	////	0	0/0	(//)
29	0	0	-	///	////	///	///	(//)
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/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 APRIL 2019

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	800	1	2	12	12	0	0	1.0	2	OB
2	1205	1	4	14	14	0	14	1.3	2	BB
3	1320	1	8	18	18	0	18	1.4	3	BB
4	900	1	5	15	15	0	15	1.4	3	OB
5	810	1	5	15	15	0	15	1.4	3	OB
6	915	0	0	0	0	0	0	0.0	2	OB
7	910	1	1	11	11	0	0	2.7	3	OB
10	740	1	6	16	16	0	0	3.7	3	OL
11	1320	1	3	13	13	0	13	26.2	3	OB
12	800	1	5	15	15	0	15	5.8	4	OB
13	745	1	4	14	14	0	14	30.4	3	OL
14	1315	1	4	14	14	0	14	29.0	3	OB
15	915	1	2	12	12	0	12	25.8	3	SB
16	650	1	3	13	13	0	0	21.4	3	FC
18	740	2	4	24	24	0	12	28.1	2	OL
19	555	2	3	23	23	0	0	19.3	3	FC
20	700	1	2	12	12	0	0	2.8	3	FC
21	705	1	1	11	11	0	0	0.1	3	FC
22	824	0	0	0	0	0	0	0.0	3	OL
23	800	0	0	0	0	0	0	0.0	2	BB
24	730	0	0	0	0	0	0	0.0	3	BB
25	800	0	0	0	0	0	0	0.0	2	OL
26	825	0	0	0	0	0	0	0.0	3	OL
27	905	0	0	0	0	0	0	0.0	2	LL
28	1545	0	0	0	0	0	0	0.0	1	LL
29	900	0	0	0	0	0	0	0.0	3	OB
30	838	0	0	0	0	0	0	0.0	3	BB

The relative mean sunspot number is 9.3.

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

$K'= 1.095 (*)$

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

The normalised relative monthly mean sunspot number is 10.

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

The Sun has been observed 27 days on 30 possible.