



Sunspot Index and Long-term Solar Observations

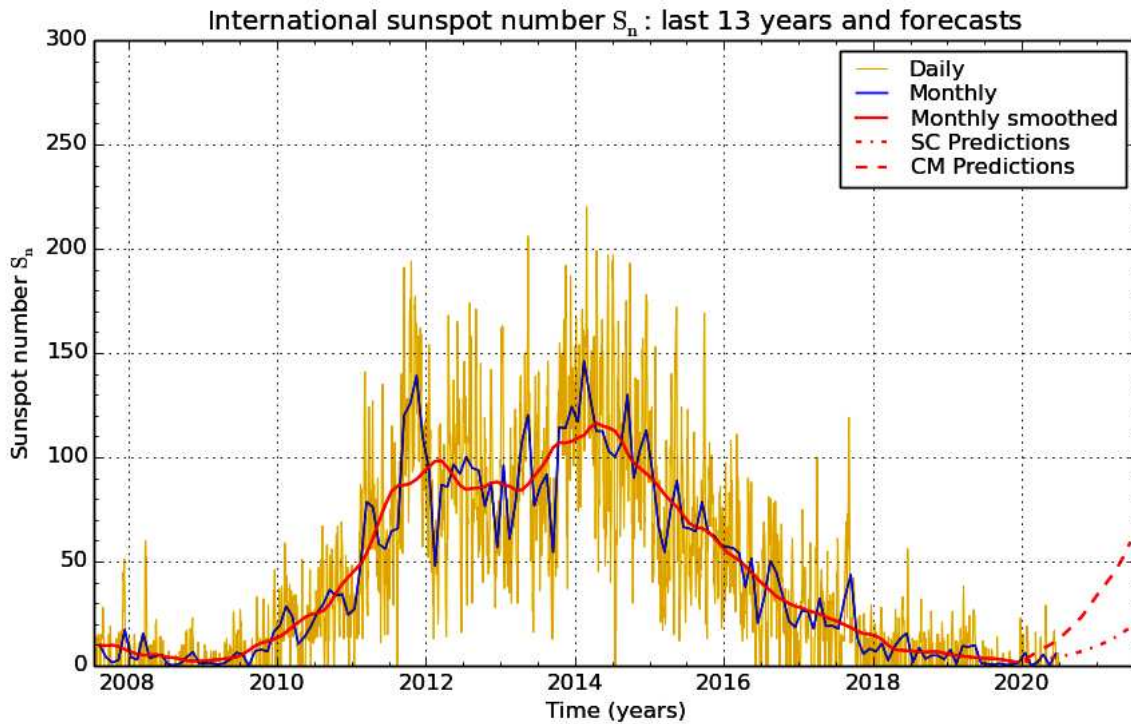
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SUNSPOT BULLETIN 2020 n° 6

Provisional international and normalized hemispheric daily sunspot numbers for June 2020

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	5	0
2	0	0	0
3	9	0	9
4	11	0	11
5	13	0	13
6	16	0	16
7	16	0	16
8	17	0	17
9	14	0	14
10	11	0	11
11	11	0	11
12	11	0	11
13	11	0	11
14	11	0	11
15	8	0	8
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	6	6	0
27	4	0	4
28	0	0	0
29	0	0	0
30	0	0	0
Monthly mean	5.8	0.4	5.4
Cooperating stations	70	55	55



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2020 July 2

Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for December 2019: 1.9 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2020 Jan	2	3	2020 Jul	5	14	2021 Jan	10	36
Feb	2	5	Aug	5	17	Feb	11	39
Mar	3	7	Sep	6	20	Mar	13	43
Apr	3	8	Oct	7	23	Apr	14	48
May	4	10	Nov	8	27	May	16	53
Jun	4	12	Dec	9	31	Jun	19	59

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	2	999	-	71	////	0	0/0	4
1	5	0	-	69	////	0	0/0	8
2	0	0	-	70	////	0	0/0	8
3	9	0	-	70	////	0	0/0	4
4	11	2	-	70	////	0	0/0	6
5	13	4	-	71	////	0	0/0	5
6	16	7	-	72	////	0	0/0	3
7	16	6	-	73	////	1	0/0	12
8	17	6	-	71	////	0	0/0	5
9	14	5	-	72	////	0	0/0	9
10	11	4	-	71	////	0	0/0	9
11	11	4	-	72	////	0	0/0	4
12	11	3	-	71	////	0	0/0	4
13	11	2	-	69	////	0	0/0	4
14	11	1	-	70	////	0	0/0	2
15	8	0	-	70	////	0	0/0	4
16	0	0	-	69	////	0	0/0	9
17	0	0	-	69	////	0	0/0	6
18	0	0	-	68	////	0	0/0	5
19	0	0	-	69	////	0	0/0	6
20	0	0	-	68	////	0	0/0	8
21	0	0	-	68	////	0	0/0	4
22	0	0	-	68	////	0	0/0	3
23	0	0	-	67	////	///	///	4
24	0	0	-	67	////	0	0/0	5
25	0	0	-	69	////	0	0/0	5
26	6	0	-	68	////	0	0/0	9
27	4	0	-	69	////	0	0/0	10
28	0	0	-	69	////	0	0/0	4
29	0	0	-	69	////	0	0/0	3
30	0	0	-	68	////	0	0/0	5

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 JUNE 2020

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	715	1	1	11	11	0	0	0.1	3	SB
2	650	0	0	0	0	0	0	0.0	3	SB
3	640	1	1	11	0	11	0	0.2	3	SB
4	1545	1	1	11	0	11	0	0.7	2	SB
5	1240	1	3	13	0	13	0	2.6	2	SB
6	735	1	6	16	0	16	0	13.2	3	SB
7	820	1	6	16	0	16	0	4.5	3	SB
8	850	1	8	18	0	18	18	5.2	2	OB
10	845	1	3	13	0	13	13	5.3	3	OB
11	940	1	1	11	0	11	0	1.8	2	OB
12	755	2	2	22	11	11	0	1.8	3	FC
13	810	1	1	11	0	11	0	1.0	3	OB
14	740	1	1	11	0	11	0	0.7	2	SB
15	745	1	1	11	0	11	0	0.3	3	CB
16	755	0	0	0	0	0	0	0.0	3	CB
17	753	0	0	0	0	0	0	0.0	3	CB
18	752	0	0	0	0	0	0	0.0	2	CB
19	745	0	0	0	0	0	0	0.0	3	CB
20	945	0	0	0	0	0	0	0.0	1	CB
21	811	0	0	0	0	0	0	0.0	2	CB
22	730	0	0	0	0	0	0	0.0	3	OL
23	720	0	0	0	0	0	0	0.0	3	OL
24	750	0	0	0	0	0	0	0.0	3	OL
25	800	0	0	0	0	0	0	0.0	3	OL
26	715	1	1	11	11	0	0	0.2	3	OL
27	840	0	0	0	0	0	0	0.0	3	OL
28	905	0	0	0	0	0	0	0.0	3	OL
29	720	0	0	0	0	0	0	0.0	3	CB
30	905	0	0	0	0	0	0	0.0	3	FC

The relative mean sunspot number is 6.4.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JUNE 2020

$K'= 1.039 (*)$

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

The normalised relative monthly mean sunspot number is 7.

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

The Sun has been observed 29 days on 30 possible.