



Sunspot Index and Long-term Solar Observations

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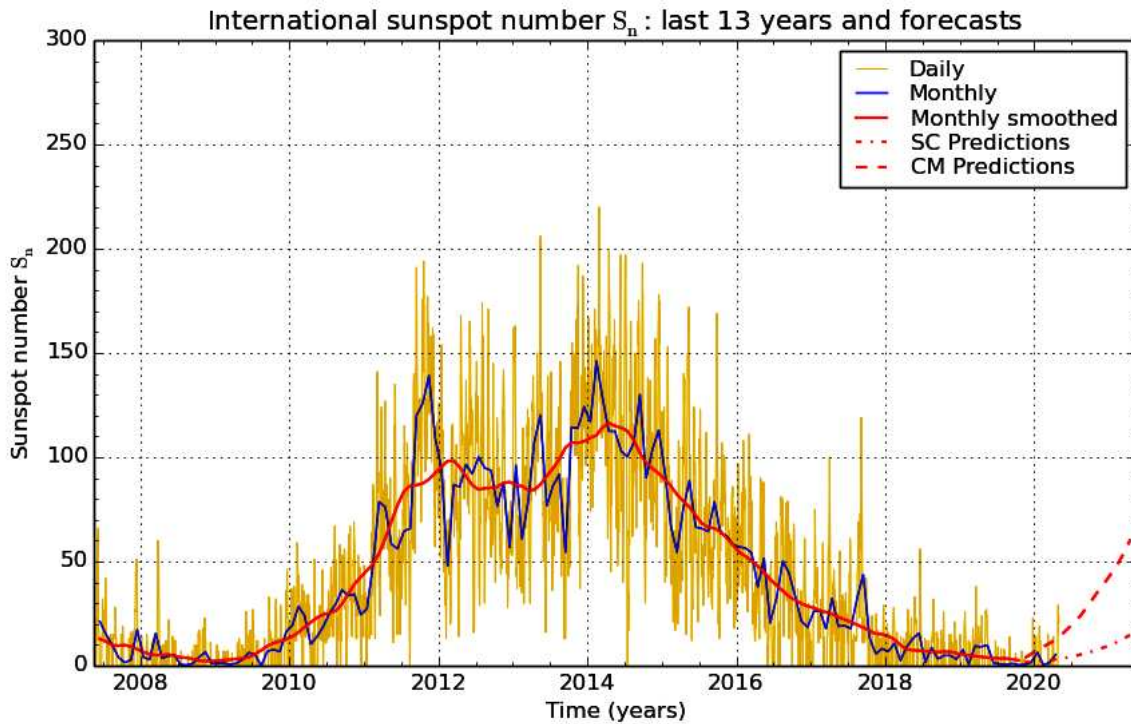
SUNSPOT BULLETIN

2020 n° 4

Provisional international and normalized hemispheric daily sunspot numbers for April 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	13	13	0
2	13	13	0
3	13	13	0
4	14	14	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	6	0	6
26	14	0	14
27	29	0	29
28	15	0	15
29	24	12	12
30	20	8	12
Monthly mean	5.4	2.4	3.0
Cooperating stations	63	50	50



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2020 May 1

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for October 2019: 2.6 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2019 Nov	2	4	2020 May	4	15	2020 Nov	8	37
Dec	2	6	Jun	4	18	Dec	9	40
2020 Jan	2	8	Jul	5	21	2021 Jan	10	45
Feb	2	9	Aug	5	24	Feb	12	49
Mar	3	11	Sep	6	28	Mar	13	54
Apr	3	13	Oct	7	32	Apr	15	61

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

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 APRIL 2020

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	950	1	2	12	12	0	0	0.2	3	OL
2	710	1	3	13	13	0	0	0.2	4	OL
3	700	1	3	13	13	0	0	0.3	4	OL
4	850	1	4	14	14	0	0	1.2	3	OL
5	705	0	0	0	0	0	0	0.0	2	OL
6	620	0	0	0	0	0	0	0.0	3	SB
7	625	0	0	0	0	0	0	0.0	3	SB
8	725	0	0	0	0	0	0	0.0	2	SB
9	625	0	0	0	0	0	0	0.0	3	SB
10	655	0	0	0	0	0	0	0.0	3	SB
11	720	0	0	0	0	0	0	0.0	3	SB
12	740	0	0	0	0	0	0	0.0	3	SB
13	1200	0	0	0	0	0	0	0.0	2	OB
14	730	0	0	0	0	0	0	0.0	2	OB
15	1035	0	0	0	0	0	0	0.0	3	OB
16	710	0	0	0	0	0	0	0.0	3	OB
17	740	0	0	0	0	0	0	0.0	2	OB
18	1410	0	0	0	0	0	0	0.0	3	OB
19	915	0	0	0	0	0	0	0.0	2	OB
20	743	0	0	0	0	0	0	0.0	3	CB
21	753	0	0	0	0	0	0	0.0	3	CB
22	807	0	0	0	0	0	0	0.0	3	CB
23	820	0	0	0	0	0	0	0.0	3	CB
24	655	0	0	0	0	0	0	0.0	3	FC
25	1015	0	0	0	0	0	0	0.0	1	CB
26	830	1	4	14	0	14	0	1.2	3	CB
27	745	2	13	33	0	33	33	2.9	4	OL
29	1020	2	5	25	13	12	12	0.6	3	OL
30	730	2	4	24	11	13	13	1.6	3	OL

The relative mean sunspot number is 5.1.

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

$K' = 1.046 (*)$

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

The normalised relative monthly mean sunspot number is 5.

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

The Sun has been observed 29 days on 30 possible.