



Sunspot Index and Long-term Solar Observations

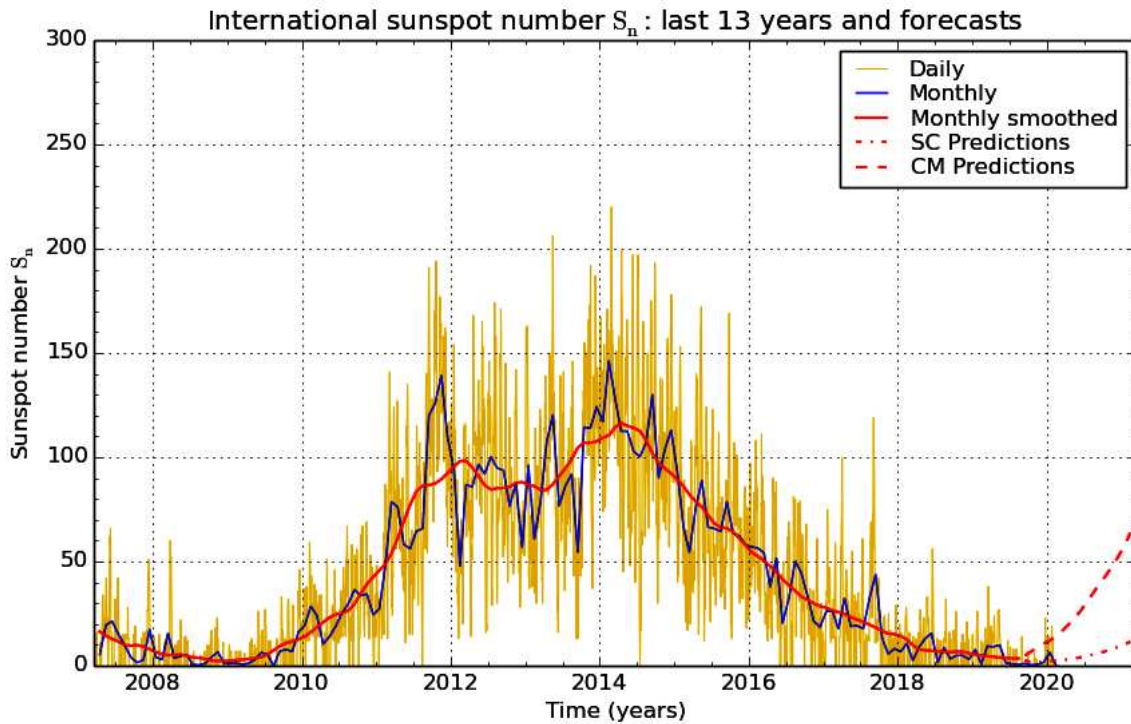
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SUNSPOT BULLETIN 2020 n° 2

Provisional international and normalized hemispheric daily sunspot numbers for February 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	11	11	0
2	0	0	0
3	0	0	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
Monthly mean	0.4	0.4	0.0
Cooperating stations	66	53	53



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

Predictions of the monthly smoothed Sunspot Number
using the last provisional value, calculated for August 2019: 3.5 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2019 Sep	3	5	2020 Mar	3	17	2020 Sep	6	39
Oct	2	7	Apr	3	20	Oct	7	43
Nov	2	9	May	4	23	Nov	8	48
Dec	2	11	Jun	4	26	Dec	9	52
2020 Jan	2	12	Jul	5	31	2021 Jan	10	57
Feb	2	14	Aug	5	35	Feb	12	64

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, March 1, 2020 09:27 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	1	-	74	////	0	0/0	7
1	11	///	-	73	////	0	0/0	10
2	0	0	-	72	////	0	0/0	8
3	0	0	-	72	////	0	0/0	4
4	0	0	-	70	////	0	0/0	8
5	0	0	-	71	////	0	0/0	5
6	0	0	-	71	////	0	0/0	20
7	0	0	-	71	////	0	0/0	16
8	0	0	-	72	////	0	0/0	7
9	0	0	-	71	////	0	0/0	8
10	0	0	-	70	////	0	0/0	4
11	0	0	-	71	////	0	0/0	7
12	0	0	-	72	////	0	0/0	5
13	0	0	-	71	////	0	0/0	3
14	0	0	-	71	////	0	0/0	2
15	0	0	-	71	////	0	0/0	5
16	0	0	-	71	////	0	0/0	2
17	0	0	-	71	////	0	0/0	10
18	0	0	-	71	////	0	0/0	14
19	0	0	-	71	////	0	0/0	14
20	0	0	-	71	////	0	0/0	9
21	0	0	-	71	////	0	0/0	15
22	0	0	-	72	////	0	0/0	8
23	0	0	-	70	////	0	0/0	6
24	0	0	-	70	////	0	0/0	5
25	0	0	-	71	////	0	0/0	2
26	0	0	-	70	////	0	0/0	5
27	0	0	-	71	////	0	0/0	3
28	0	0	-	71	////	0	0/0	7
29	0	0	-	70	////	0	0/0	14

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 FEBRUARY 2020

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH			
5	1135	0	0	0	0	0	0.0	2	SB
6	1015	0	0	0	0	0	0.0	3	OL
7	1055	0	0	0	0	0	0.0	2	SB
8	1000	0	0	0	0	0	0.0	2	SB
10	1030	0	0	0	0	0	0.0	2	OB
11	1210	0	0	0	0	0	0.0	1	OB
12	1010	0	0	0	0	0	0.0	2	OB
13	1220	0	0	0	0	0	0.0	2	OB
14	1045	0	0	0	0	0	0.0	2	OB
17	919	0	0	0	0	0	0.0	3	CB
19	910	0	0	0	0	0	0.0	2	CB
20	1500	0	0	0	0	0	0.0	3	OL
21	915	0	0	0	0	0	0.0	2	CB
25	900	0	0	0	0	0	0.0	3	OL
26	1430	0	0	0	0	0	0.0	3	OL
28	1030	0	0	0	0	0	0.0	1	OB

The relative mean sunspot number is 0.0.

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

$K'= 1.183 (*)$

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

The normalised relative monthly mean sunspot number is 0.

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

The Sun has been observed 16 days on 29 possible.