



Sunspot Index and Long-term Solar Observations

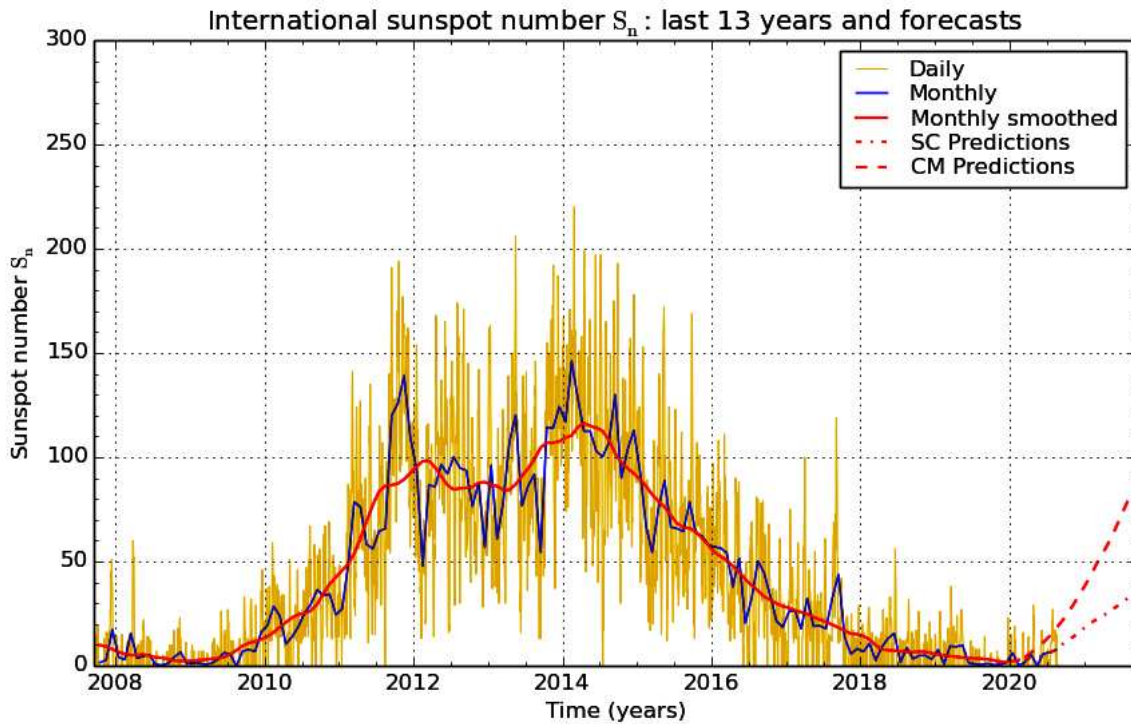
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SUNSPOT BULLETIN 2020 n° 8

Provisional international and normalized hemispheric daily sunspot numbers for August 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	27	16	11
2	17	7	10
3	12	12	0
4	12	12	0
5	13	13	0
6	13	13	0
7	17	14	3
8	12	12	0
9	13	13	0
10	13	13	0
11	12	12	0
12	17	10	7
13	10	0	10
14	5	5	0
15	0	0	0
16	0	0	0
17	0	0	0
18	13	13	0
19	15	15	0
20	13	13	0
21	3	3	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
31	0	0	0
Monthly mean	7.6	6.3	1.3
Cooperating stations	72	58	58



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

Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for February 2020: 2.8 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2020 Mar	3	4	2020 Sep	10	22	2021 Mar	23	52
Apr	4	6	Oct	12	26	Apr	25	56
May	4	9	Nov	14	30	May	27	62
Jun	5	11	Dec	17	35	Jun	29	69
Jul	6	14	2021 Jan	19	40	Jul	31	75
Aug	8	18	Feb	21	46	Aug	33	82

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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Editor: Frédéric Clette

3, avenue Circulaire, B1180 Bruxelles, Belgium

Fax: ..32/(0)2/374.98.22 Tel: ..32/(0)2/373.02.33 Email: silso.info@oma.be

Web: <http://sidc.oma.be/silso>

FTP anonymous : omaftp.oma.be, directory: dist/astro/sidcdata

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

Date	S _n	PPSI	600	2800	COS	SFI	XI	Ak
31	22	3	-	72	////	0	0/0	6
1	27	2	-	72	////	0	0/0	5
2	17	1	-	73	////	0	0/0	12
3	12	0	-	73	////	0	0/0	22
4	12	1	-	73	////	0	0/0	9
5	13	3	-	73	////	0	0/0	7
6	13	4	-	73	////	0	0/0	8
7	17	4	-	74	////	0	0/0	4
8	12	7	-	75	////	1	0/0	6
9	13	3	-	74	////	0	0/0	2
10	13	2	-	74	////	0	0/0	2
11	12	1	-	74	////	2	0/0	4
12	17	1	-	73	////	0	0/0	4
13	10	1	-	72	////	0	0/0	6
14	5	0	-	71	////	0	0/0	6
15	0	0	-	71	////	0	0/0	3
16	0	0	-	71	////	0	0/0	6
17	0	0	-	71	////	0	0/0	4
18	13	2	-	71	////	0	0/0	8
19	15	5	-	71	////	1	0/0	5
20	13	2	-	70	////	1	0/0	4
21	3	0	-	71	////	0	0/0	6
22	0	0	-	70	////	0	0/0	8
23	0	0	-	71	////	0	0/0	11
24	0	0	-	70	////	0	0/0	3
25	0	0	-	71	////	0	0/0	4
26	0	0	-	70	////	0	0/0	8
27	0	0	-	70	////	0	0/0	10
28	0	0	-	70	////	0	0/0	12
29	0	0	-	70	////	0	0/0	18
30	0	0	-	70	////	0	0/0	11
31	0	0	-	70	////	0	0/0	28

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 : $1 \times S_n + 10 \times \text{"1"} + 100 \times \text{">1"}$).

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 AUGUST 2020

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	725	2	2	22	11	11	11	1.0	3	OL
2	1020	1	1	11	0	11	0	0.2	3	LL
3	830	0	0	0	0	0	0	0.0	3	OB
4	815	1	1	11	11	0	0	0.6	3	OB
5	855	1	2	12	12	0	0	2.4	3	OB
6	815	1	2	12	12	0	0	3.6	3	OB
7	840	1	3	13	13	0	0	4.7	3	OB
8	845	1	3	13	13	0	13	27.7	3	OB
9	1110	1	3	13	13	0	13	5.9	3	OB
10	850	1	2	12	12	0	12	2.2	1	CB
11	750	1	2	12	12	0	12	2.0	1	CB
12	726	2	2	22	11	11	0	1.9	3	CB
13	728	1	3	13	0	13	0	0.9	3	CB
14	800	0	0	0	0	0	0	0.0	1	CB
15	709	0	0	0	0	0	0	0.0	1	CB
16	721	0	0	0	0	0	0	0.0	3	CB
17	735	0	0	0	0	0	0	0.0	3	OL
18	630	1	5	15	15	0	15	5.3	2	SB
19	705	1	6	16	16	0	0	16.3	2	SB
20	1350	1	3	13	13	0	0	0.7	1	SB
21	825	0	0	0	0	0	0	0.0	3	SB
22	700	0	0	0	0	0	0	0.0	4	SB
23	1115	0	0	0	0	0	0	0.0	3	SB
24	730	0	0	0	0	0	0	0.0	3	OB
27	910	0	0	0	0	0	0	0.0	2	OB
28	850	0	0	0	0	0	0	0.0	3	OB
30	845	0	0	0	0	0	0	0.0	3	OB

The relative mean sunspot number is 7.8.

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

$K'= 1.106 (*)$

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

The normalised relative monthly mean sunspot number is 9.

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

The Sun has been observed 27 days on 31 possible.