



Sunspot Index and Long-term Solar Observations

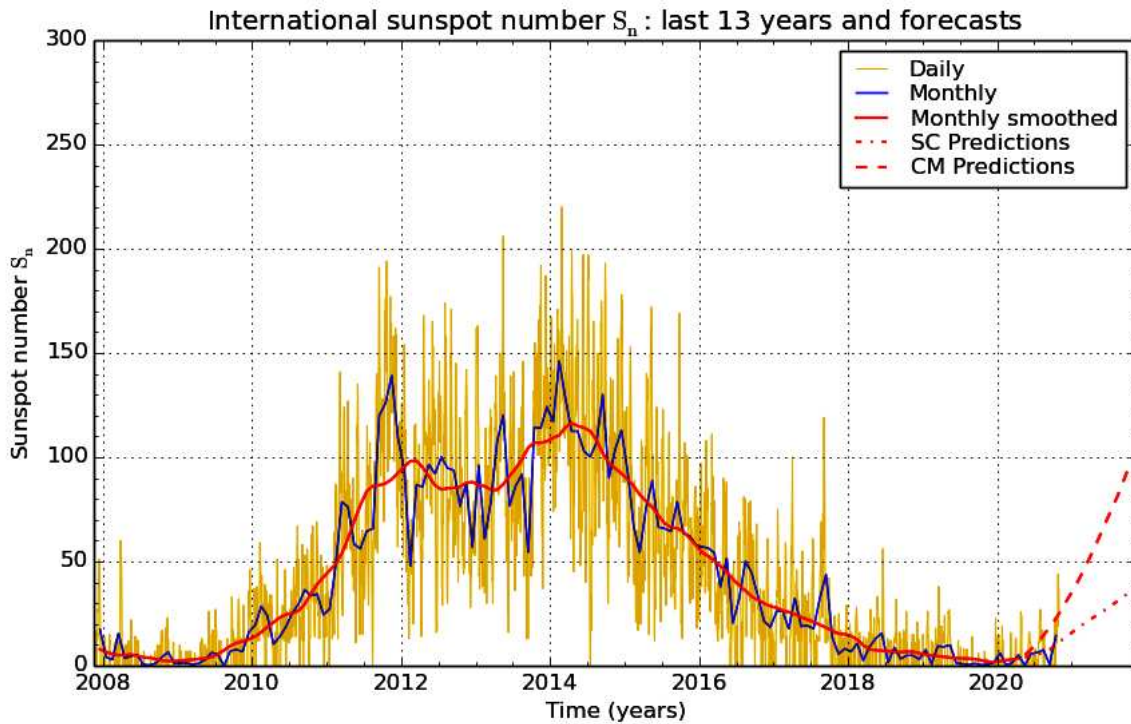
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SUNSPOT BULLETIN 2020 n° 10

Provisional international and normalized hemispheric daily sunspot numbers for October 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	0	0	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	6	0	6
9	23	0	23
10	15	0	15
11	17	0	17
12	16	0	16
13	0	0	0
14	5	0	5
15	13	0	13
16	13	0	13
17	13	0	13
18	23	0	23
19	16	0	16
20	13	0	13
21	11	0	11
22	11	0	11
23	22	11	11
24	21	10	11
25	22	0	22
26	19	0	19
27	44	10	34
28	28	0	28
29	37	0	37
30	31	0	31
31	26	0	26
Monthly mean	14.4	1.0	13.4
Cooperating stations	69	54	54



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

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for April 2020: 3.6 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2020 May	4	5	2020 Nov	13	27	2021 May	25	62
Jun	4	8	Dec	15	33	Jun	27	69
Jul	5	11	2021 Jan	17	38	Jul	29	75
Aug	7	15	Feb	19	43	Aug	31	82
Sep	8	19	Mar	21	49	Sep	33	90
Oct	10	23	Apr	23	55	Oct	36	97

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, November 1, 2020 10:08 UT
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Summary of the URSIGRAMs from S.I.D.C.

Date	S _n	PPSI	600	2800	COS	SFI	XI	Ak
30	0	0	-	73	////	0	0/0	21
1	0	0	-	73	////	0	0/0	12
2	0	0	-	72	////	///	///	11
3	0	0	-	72	////	0	0/0	5
4	0	0	-	71	////	0	0/0	4
5	0	0	-	72	////	0	0/0	15
6	0	0	-	72	////	0	0/0	8
7	0	0	-	71	////	0	0/0	6
8	6	1	-	72	////	0	0/0	3
9	23	3	-	73	////	0	0/0	1
10	15	4	-	74	////	0	0/0	1
11	17	8	-	73	////	0	0/0	3
12	16	5	-	74	////	0	0/0	4
13	0	0	-	72	////	0	0/0	3
14	5	0	-	75	////	0	0/0	0
15	13	1	-	74	////	0	0/0	2
16	13	5	-	75	////	0	0/0	6
17	13	4	-	73	////	0	0/0	5
18	23	9	-	76	////	7	0/0	2
19	16	9	-	75	////	4	0/0	8
20	13	8	-	75	////	0	0/0	6
21	11	5	-	74	////	0	0/0	9
22	11	4	-	75	////	0	0/0	8
23	22	4	-	72	////	0	0/0	16
24	21	2	-	72	////	1	0/0	18
25	22	2	-	74	////	0	0/0	20
26	19	10	-	75	////	0	0/0	19
27	44	11	-	82	////	8	0/0	9
28	28	18	-	88	////	3	0/0	14
29	37	32	-	85	////	11	0/0	14
30	31	9	-	80	////	2	0/0	5
31	26	3	-	77	////	0	0/0	6

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 OCTOBER 2020

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	1440	0	0	0	0	0	0.0	3	SB	
4	1030	0	0	0	0	0	0.0	2	OL	
5	1450	0	0	0	0	0	0.0	2	OB	
6	1015	0	0	0	0	0	0.0	2	OB	
7	1035	0	0	0	0	0	0.0	1	JV	
9	910	2	4	24	0	24	0.6	2	JV	
10	850	1	6	16	0	16	4.8	4	LL	
11	915	1	9	19	0	19	19.4	2	LL	
12	830	1	8	18	0	18	5.0	2	SB	
15	900	1	4	14	0	14	0.4	2	SB	
17	1205	1	5	15	0	15	4.2	2	SB	
19	1010	1	6	16	0	16	16	5.8	2	CB
21	1012	1	2	12	0	12	12	1.9	2	CB
22	1250	1	1	11	0	11	0	1.5	1	OL
23	1245	2	3	23	12	11	12	1.5	3	CB
26	1010	1	12	22	0	22	22	20.1	3	OL
28	925	1	17	27	0	27	0	15.3	3	OL
31	930	2	8	28	0	28	0	1.5	3	OL

The relative mean sunspot number is 13.6.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR OCTOBER 2020

K'= 1.155 (*)

1	0	7	0	13	***	19	18	25	***
2	***	8	***	14	***	20	***	26	25
3	***	9	28	15	16	21	14	27	***
4	0	10	18	16	***	22	13	28	31
5	0	11	22	17	17	23	27	29	***
6	0	12	21	18	***	24	***	30	***
								31	32

The normalised relative monthly mean sunspot number is 16.

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

The Sun has been observed 18 days on 31 possible.