



Sunspot Index and Long-term Solar Observations

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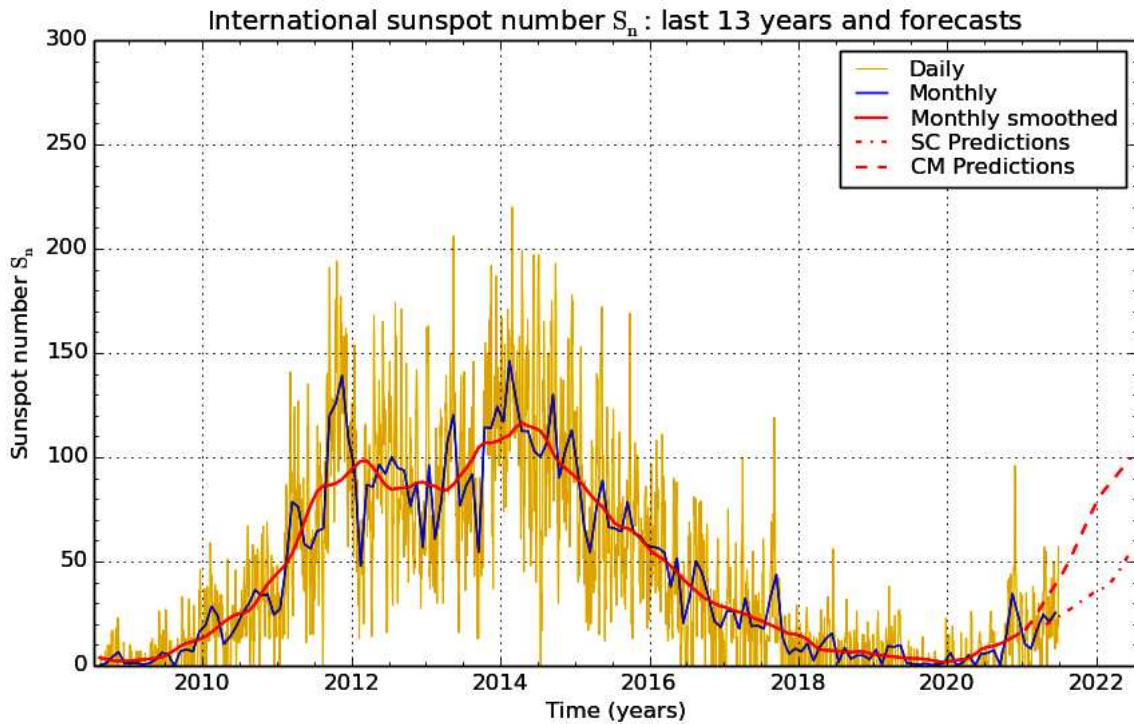
SUNSPOT BULLETIN

2021 n° 06

Provisional international and normalized hemispheric daily sunspot numbers for June 2021

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	22	19	3
2	30	18	12
3	31	17	14
4	35	18	17
5	39	20	19
6	38	11	27
7	50	19	31
8	36	5	31
9	26	11	15
10	27	15	12
11	19	11	8
12	8	8	0
13	15	15	0
14	12	12	0
15	11	11	0
16	12	12	0
17	12	12	0
18	22	22	0
19	15	15	0
20	15	15	0
21	13	13	0
22	16	16	0
23	11	11	0
24	11	11	0
25	23	10	13
26	19	1	18
27	34	3	31
28	46	11	35
29	57	12	45
30	56	14	42
Monthly mean	25.3	12.9	12.4
Cooperating stations	69	57	57



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2021 July 2

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for December 2020: 15.3 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2021 Jan	17	17	2021 Jul	25	44	2022 Jan	37	81
Feb	20	21	Aug	27	50	Feb	38	85
Mar	18	25	Sep	29	56	Mar	41	88
Apr	19	30	Oct	31	62	Apr	45	92
May	21	35	Nov	33	69	May	50	96
Jun	23	39	Dec	35	75	Jun	55	100

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	29	8	-	82	////	2	0/0	2
1	22	10	-	75	////	0	0/0	1
2	30	10	-	76	////	0	0/0	9
3	31	13	-	76	////	0	0/0	7
4	35	10	-	77	////	2	0/0	6
5	39	14	-	74	////	0	0/0	4
6	38	5	-	77	////	0	0/0	6
7	50	14	-	81	////	2	0/0	16
8	36	8	-	80	////	0	0/0	7
9	26	5	-	79	////	0	0/0	4
10	27	8	-	73	////	0	0/0	6
11	19	2	-	77	////	0	0/0	12
12	8	1	-	78	////	0	0/0	15
13	15	2	-	69	////	0	0/0	7
14	12	5	-	77	////	0	0/0	6
15	11	8	-	76	////	0	0/0	22
16	12	12	-	76	////	0	0/0	17
17	12	15	-	75	////	0	0/0	6
18	22	18	-	77	////	0	0/0	9
19	15	16	-	77	////	0	0/0	4
20	15	10	-	76	////	0	0/0	6
21	13	14	-	79	////	0	0/0	5
22	16	12	-	81	////	0	0/0	8
23	11	20	-	80	////	0	0/0	5
24	11	7	-	81	////	0	0/0	6
25	23	2	-	83	////	2	0/0	9
26	19	7	-	82	////	2	0/0	5
27	34	17	-	87	////	0	0/0	4
28	46	33	-	89	////	3	0/0	4
29	57	44	-	93	////	1	0/0	9
30	56	60	-	94	////	3	0/0	17

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 2021

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	735	1	7	17	17	0	17	5.9	3	OL
2	715	2	11	31	18	13	18	6.6	3	OL
3	1145	2	12	32	18	14	18	6.9	3	OL
4	755	2	10	30	14	16	0	9.3	3	OL
6	755	3	11	41	12	29	14	4.2	3	OL
7	715	4	17	57	22	35	22	24.1	3	SB
8	710	3	16	46	12	34	23	5.8	3	SB
9	710	2	9	29	14	15	14	5.9	3	SB
10	715	2	5	25	13	12	13	26.0	3	SB
11	702	2	3	23	12	11	12	2.3	2	CB
12	1150	1	1	11	11	0	0	1.8	2	CB
13	728	2	2	22	22	0	0	0.6	3	CB
14	815	1	1	11	11	0	0	9.9	4	OB
15	830	1	1	11	11	0	0	15.9	4	OB
16	815	1	1	11	11	0	0	20.7	4	OB
17	830	1	1	11	11	0	11	24.8	2	OB
18	800	2	3	23	23	0	11	27.4	3	OB
19	1545	1	4	14	14	0	14	16.3	2	LL
20	745	1	5	15	15	0	15	5.1	3	LL
24	1631	1	1	11	11	0	0	0.5	1	GV
25	740	1	1	11	11	0	0	0.3	1	GV
29	950	3	19	49	11	38	25	25.3	2	OL

The relative mean sunspot number is 24.1.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JUNE 2021

$$K' = 1.027 (*)$$

1	17	7	59	13	23	19	14	25	11
2	32	8	47	14	11	20	15	26	***
3	33	9	30	15	11	21	***	27	***
4	31	10	26	16	11	22	***	28	***
5	***	11	24	17	11	23	***	29	50
6	42	12	11	18	24	24	11	30	***

The normalised relative monthly mean sunspot number is 25.

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

The Sun has been observed 22 days on 30 possible.