



Sunspot Index and Long-term Solar Observations

World Data Center supported by the ICSU - WDS

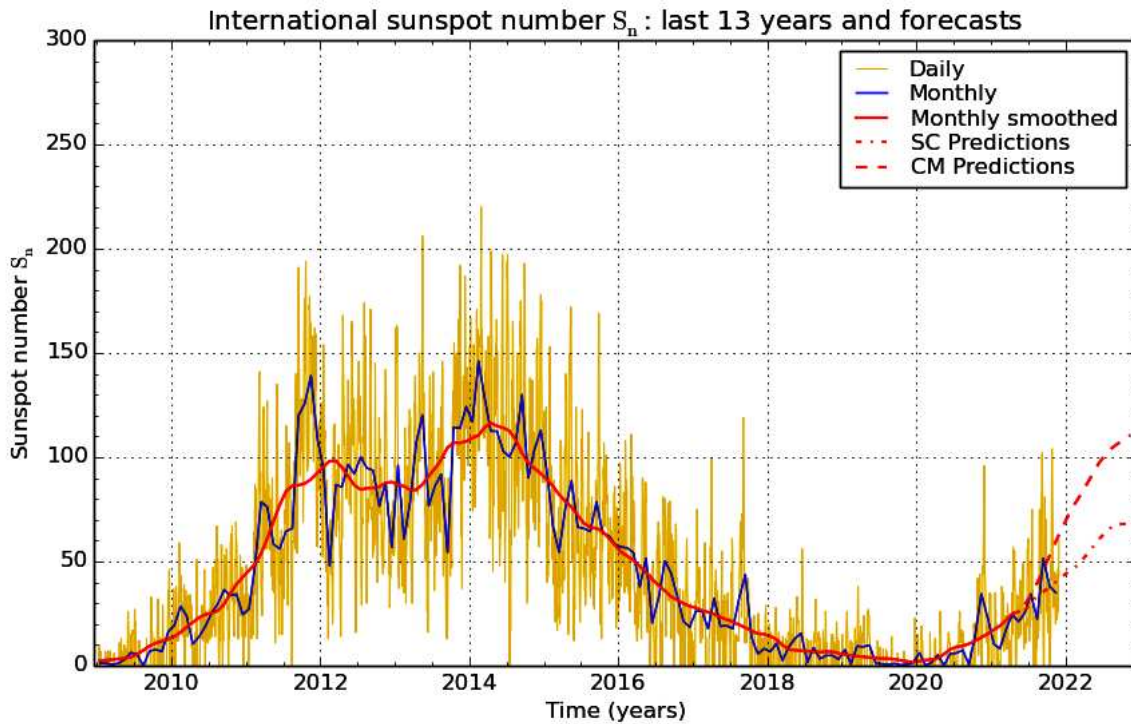
SUNSPOT BULLETIN

2021 n° 11

Provisional international and normalized hemispheric daily sunspot numbers for November 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	53	37	16
2	43	32	11
3	34	30	4
4	28	28	0
5	36	25	11
6	35	23	12
7	31	15	16
8	39	26	13
9	45	33	12
10	41	29	12
11	44	30	14
12	36	23	13
13	25	10	15
14	20	1	19
15	24	0	24
16	33	10	23
17	30	12	18
18	23	11	12
19	23	11	12
20	22	11	11
21	23	11	12
22	23	12	11
23	33	12	21
24	43	10	33
25	26	0	26
26	46	4	42
27	42	0	42
28	47	11	36
29	43	12	31
30	60	25	35
Monthly mean	35.1	16.5	18.6
Cooperating stations	69	56	56



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2021 December 1

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for May 2021: 25.9 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2021 Jun	27	29	2021 Dec	43	66	2022 Jun	61	98
Jul	30	34	2022 Jan	45	72	Jul	64	101
Aug	33	40	Feb	47	78	Aug	67	104
Sep	36	46	Mar	50	82	Sep	68	107
Oct	38	53	Apr	53	87	Oct	68	108
Nov	40	60	May	57	92	Nov	68	111

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, December 1, 2021 10:10 UT
 Reproduction permitted if source mentioned.

Editors: Frédéric Clette and Laure Lefèvre
 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	68	29	-	103	////	5	0/0	17
1	53	32	-	98	////	12	1/0	9
2	43	24	-	97	////	12	1/0	18
3	34	23	-	89	////	1	0/0	28
4	28	19	-	94	////	0	0/0	43
5	36	16	-	93	////	0	0/0	14
6	35	16	-	82	////	1	0/0	22
7	31	13	-	88	////	0	0/0	4
8	39	29	-	88	////	2	0/0	6
9	45	35	-	92	////	1	0/0	7
10	41	25	-	88	////	0	0/0	8
11	44	23	-	85	////	0	0/0	4
12	36	11	-	83	////	0	0/0	2
13	25	9	-	81	////	1	0/0	2
14	20	6	-	78	////	0	0/0	3
15	24	3	-	79	////	0	0/0	14
16	33	///	-	80	////	0	0/0	14
17	30	5	-	79	////	1	0/0	14
18	23	4	-	82	////	0	0/0	4
19	23	4	-	79	////	0	0/0	6
20	22	4	-	80	////	0	0/0	12
21	23	3	-	79	////	0	0/0	16
22	23	3	-	78	////	0	0/0	10
23	33	4	-	80	////	0	0/0	10
24	43	6	-	83	////	0	0/0	5
25	26	8	-	94	////	0	0/0	6
26	46	14	-	92	////	0	0/0	3
27	42	20	-	92	////	0	0/0	3
28	47	19	-	92	////	0	0/0	11
29	43	20	-	90	////	///	///	11
30	60	19	-	90	////	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 NOVEMBER 2021

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	849	3	15	45	31	14	20	39.5	2	CB
2	1505	3	11	41	30	11	19	24.2	3	SB
3	1340	2	8	28	28	0	16	27.6	2	OB
5	915	3	7	37	26	11	13	13.7	3	OB
7	910	2	3	23	12	11	12	3.2	1	CB
8	950	3	11	41	29	12	14	38.6	3	OB
9	920	3	9	39	27	12	0	57.3	3	OB
10	1000	3	8	38	26	12	0	20.5	3	OB
12	945	3	9	39	25	14	14	3.6	4	OB
17	1500	2	2	22	11	11	0	2.7	2	FC
18	955	2	4	24	12	12	0	5.9	2	FC
22	1025	2	2	22	11	11	11	4.0	2	JV
23	1440	4	7	47	11	36	0	1.5	2	JV
27	1217	2	17	37	0	37	21	10.4	2	JV
29	1035	3	13	43	11	32	0	17.6	3	OB

The relative mean sunspot number is 35.1.

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

$K' = 1.034 (*)$

1	47	7	24	13	***	19	***	25	***
2	42	8	42	14	***	20	***	26	***
3	29	9	40	15	***	21	***	27	38
4	***	10	39	16	***	22	23	28	***
5	38	11	***	17	23	23	49	29	44
6	***	12	40	18	25	24	***	30	***

The normalised relative monthly mean sunspot number is 36.

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

The Sun has been observed 15 days on 30 possible.