



Sunspot Index and Long-term Solar Observations

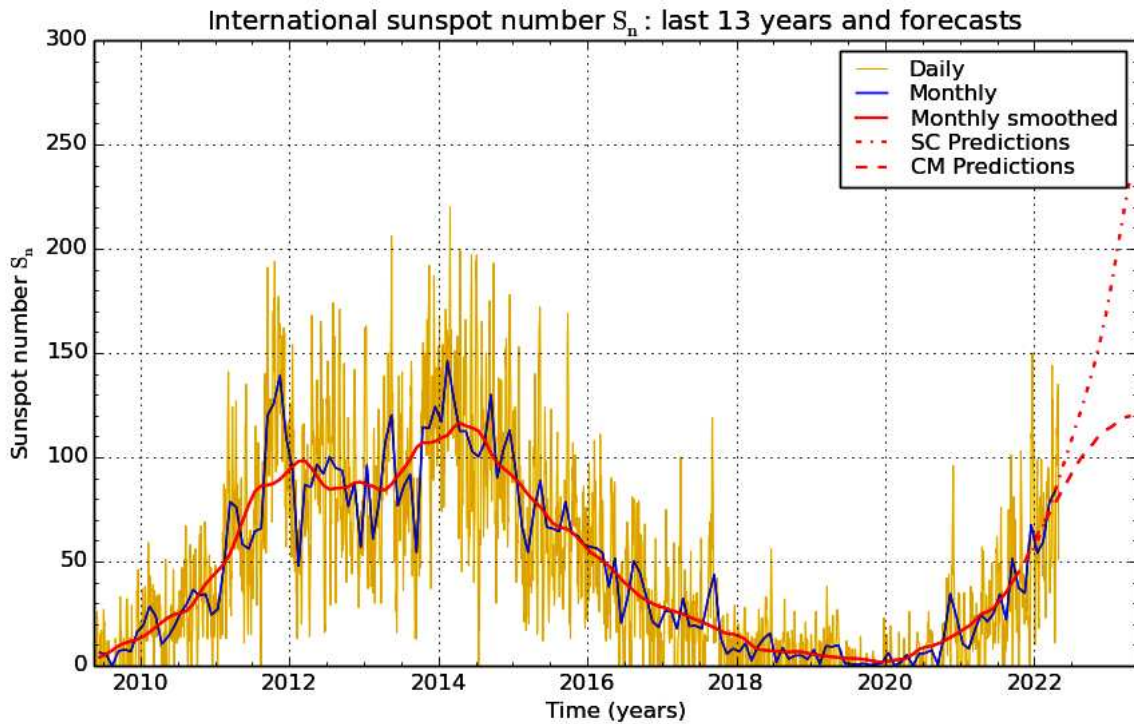
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SUNSPOT BULLETIN 2022 n° 04

Provisional international and normalized hemispheric daily sunspot numbers for April 2022

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	128	63	65
2	121	52	69
3	118	38	80
4	81	20	61
5	86	21	65
6	74	17	57
7	58	4	54
8	52	14	38
9	38	15	23
10	21	14	7
11	11	11	0
12	14	14	0
13	33	29	4
14	41	28	13
15	47	31	16
16	64	48	16
17	85	54	31
18	101	64	37
19	96	81	15
20	99	86	13
21	114	98	16
22	110	96	14
23	128	109	19
24	127	106	21
25	118	102	16
26	132	95	37
27	132	88	44
28	135	86	49
29	107	50	57
30	51	18	33
Monthly mean	84.0	51.7	32.3
Cooperating stations	73	62	62



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2022 May 1

Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for October 2021: 45.0 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2021 Nov	49	50	2022 May	95	84	2022 Nov	154	111
Dec	55	57	Jun	104	89	Dec	168	113
2022 Jan	59	63	Jul	113	95	2023 Jan	184	115
Feb	67	69	Aug	122	100	Feb	202	117
Mar	76	73	Sep	132	103	Mar	219	119
Apr	85	79	Oct	143	107	Apr	235	120

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	124	61	-	149	////	16	1/0	28
1	128	79	-	147	////	3	0/0	16
2	121	86	-	143	////	26	3/0	20
3	118	68	-	140	////	3	0/0	8
4	81	52	-	128	////	0	0/0	11
5	86	43	-	122	////	1	0/0	7
6	74	27	-	117	////	1	0/0	6
7	58	22	-	111	////	1	0/0	10
8	52	10	-	109	////	2	0/0	9
9	38	11	-	107	////	0	0/0	18
10	21	1	-	101	////	0	0/0	26
11	11	0	-	99	////	0	0/0	9
12	14	1	-	96	////	0	0/0	15
13	33	2	-	99	////	0	0/0	8
14	41	5	-	103	////	0	0/0	36
15	47	14	-	110	////	0	0/0	25
16	64	19	-	122	////	0	1/0	10
17	85	38	-	135	////	7	3/1	14
18	101	36	-	135	////	4	2/0	10
19	96	80	-	135	////	3	2/0	8
20	99	99	-	160	////	23	2/0	10
21	114	135	-	164	////	30	1/0	10
22	110	121	-	163	////	102	2/0	8
23	128	119	-	160	////	5	0/0	14
24	127	114	-	159	////	2	0/0	5
25	118	105	-	157	////	7	2/0	6
26	132	78	-	150	////	3	0/0	3
27	132	60	-	142	////	3	0/0	21
28	135	54	-	132	////	2	0/0	14
29	107	38	-	124	////	2	1/0	15
30	51	19	-	120	////	0	0/0	20

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 - UGEOI, evaluation : $1 \times S_n + 10 \times "1" + 100 \times ">1"$).

XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin: Ursigrams - UGEOI, UGEOI).

Ak : geomagnetic index from Wingst, Germany (origin: Ursigrams).

SOLAR PHYSICS DEPARTMENT

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR APRIL 2022

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
2	840	6	48	108	44	64	53	46.8	2	OL
3	705	7	69	139	37	102	90	33.5	3	OL
4	716	5	16	66	22	44	33	30.3	1	CB
7	933	5	16	66	11	55	25	32.1	2	CB
9	652	4	12	52	16	36	25	25.7	2	CB
10	705	2	3	23	12	11	11	1.0	2	CB
11	745	1	1	11	11	0	0	0.1	1	JV
12	1015	1	4	14	14	0	0	0.9	1	JV
14	920	3	7	37	26	11	0	2.0	2	JV
15	640	4	16	56	31	25	0	21.0	4	OL
16	1353	6	12	72	49	23	16	24.2	2	JV
17	640	5	19	69	44	25	15	29.0	3	JV
18	655	6	33	93	55	38	26	19.9	3	SB
19	655	5	32	82	71	11	11	71.4	2	SB
20	820	5	51	101	90	11	11	94.9	3	SB
21	705	5	64	114	100	14	50	117.8	3	SB
22	720	6	53	113	99	14	76	75.5	3	SB
23	845	6	69	129	106	23	76	77.2	2	SB
24	750	8	56	136	113	23	66	82.8	3	SB
25	830	6	40	100	88	12	12	82.6	2	OL
26	900	8	51	131	93	38	31	62.8	3	OL
27	730	10	37	137	90	47	18	25.4	3	OL
28	710	10	33	133	84	49	35	40.8	3	OL
29	1255	6	10	70	34	36	25	32.8	1	OL
30	710	3	16	46	13	33	22	8.0	3	OL

The relative mean sunspot number is 83.9.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR APRIL 2022

$K'= 0.974$ (*)

1	***	7	64	13	***	19	80	25	97
2	105	8	***	14	36	20	98	26	128
3	135	9	51	15	55	21	111	27	133
4	64	10	22	16	70	22	110	28	130
5	***	11	11	17	67	23	126	29	68
6	***	12	14	18	91	24	132	30	45

The normalised relative monthly mean sunspot number is 82.

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

The Sun has been observed 25 days on 30 possible.