



Sunspot Index and Long-term Solar Observations

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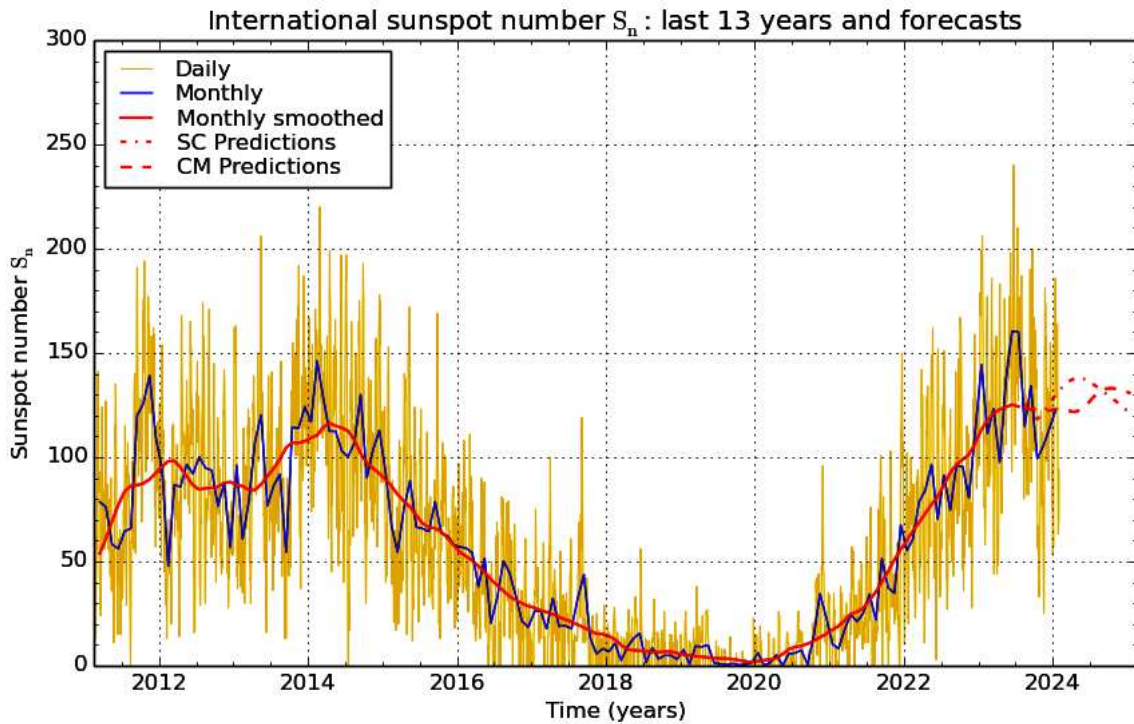
SUNSPOT BULLETIN

2024 n° 01

Provisional international and normalized hemispheric daily sunspot numbers for January 2024

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	54	24	30
2	66	38	28
3	57	52	5
4	98	78	20
5	117	79	38
6	144	94	50
7	164	99	65
8	162	96	66
9	148	79	69
10	164	76	88
11	179	72	107
12	179	69	110
13	186	76	110
14	157	61	96
15	140	45	95
16	131	45	86
17	146	66	80
18	129	63	66
19	141	68	73
20	132	49	83
21	154	64	90
22	164	72	92
23	144	54	90
24	122	49	73
25	92	44	48
26	79	33	46
27	63	28	35
28	68	32	36
29	70	39	31
30	70	34	36
31	94	42	52
Monthly mean	123.0	58.7	64.3
Cooperating stations	63	54	54



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2024 February 1

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for July 2023: 124.3 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2023 Aug	125	124	2024 Feb	134	123	2024 Aug	133	131
Sep	127	123	Mar	136	122	Sep	131	133
Oct	118	123	Apr	138	122	Oct	128	133
Nov	122	122	May	138	123	Nov	126	133
Dec	126	122	Jun	137	125	Dec	123	132
2024 Jan	130	123	Jul	135	129	2025 Jan	121	131

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	53	14	-	146	////	100	1/1	3
1	54	15	-	136	////	14	1/0	14
2	66	13	-	142	////	20	0/0	10
3	57	21	-	140	////	4	0/0	14
4	98	24	-	126	////	103	2/0	7
5	117	33	-	159	////	3	0/0	5
6	144	42	-	159	////	19	0/0	2
7	164	44	-	167	////	28	0/0	0
8	162	42	-	176	////	104	0/0	4
9	148	46	-	176	////	5	0/0	6
10	164	37	-	186	////	3	1/0	7
11	179	55	-	193	////	10	1/0	6
12	179	52	-	186	////	5	1/0	3
13	186	74	-	185	////	5	0/0	2
14	157	59	-	188	////	13	0/0	8
15	140	47	-	183	////	2	0/0	6
16	131	53	-	180	////	3	0/0	6
17	146	53	-	174	////	1	0/0	4
18	129	67	-	162	////	11	0/0	8
19	141	52	-	157	////	0	0/0	8
20	132	48	-	166	////	0	0/0	7
21	154	58	-	179	////	22	0/0	4
22	164	77	-	196	////	33	4/0	10
23	144	73	-	180	////	11	8/0	8
24	122	71	-	172	////	12	4/0	10
25	92	44	-	161	////	2	0/0	6
26	79	28	-	157	////	4	0/0	8
27	63	18	-	148	////	1	0/0	4
28	68	7	-	141	////	1	0/0	10
29	70	7	-	140	////	2	2/0	9
30	70	7	-	135	////	1	0/0	6
31	94	15	-	136	////	5	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 JANUARY 2024

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	1040	4	21	61	29	32	21	29.6	2	JV
3	1135	4	26	66	66	0	27	49.6	2	JV
4	1145	6	57	117	97	20	25	56.7	3	JV
9	1040	10	32	132	74	58	47	74.1	1	SB
10	1035	10	46	146	65	81	41	73.8	2	SB
11	950	11	63	173	58	115	60	90.3	3	SB
15	1000	9	52	142	37	105	59	40.4	2	OL
16	1105	9	45	135	44	91	47	60.4	3	OL
18	1010	9	41	131	60	71	51	137.8	3	SB
19	950	9	39	129	59	70	64	45.9	1	OL
20	1030	9	40	130	41	89	68	64.9	1	OL
22	1200	10	79	179	81	98	94	141.4	3	SB
23	930	6	118	178	70	108	39	127.2	3	OB
26	1100	5	48	98	37	61	0	57.8	3	OB
27	940	5	32	82	36	46	15	29.5	3	OB
28	1010	4	16	56	16	40	26	5.3	2	OB
29	940	6	21	81	45	36	11	8.4	2	CB

The relative mean sunspot number is 119.8.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JANUARY 2024

$K' = 0.977 (*)$

1	60	7	***	13	***	19	126	25	***
2	***	8	***	14	***	20	127	26	96
3	64	9	129	15	139	21	***	27	80
4	114	10	143	16	132	22	175	28	55
5	***	11	169	17	***	23	174	29	79
6	***	12	***	18	128	24	***	30	***
								31	***

The normalised relative monthly mean sunspot number is 117.

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

The Sun has been observed 17 days on 31 possible.