



Sunspot Index and Long-term Solar Observations

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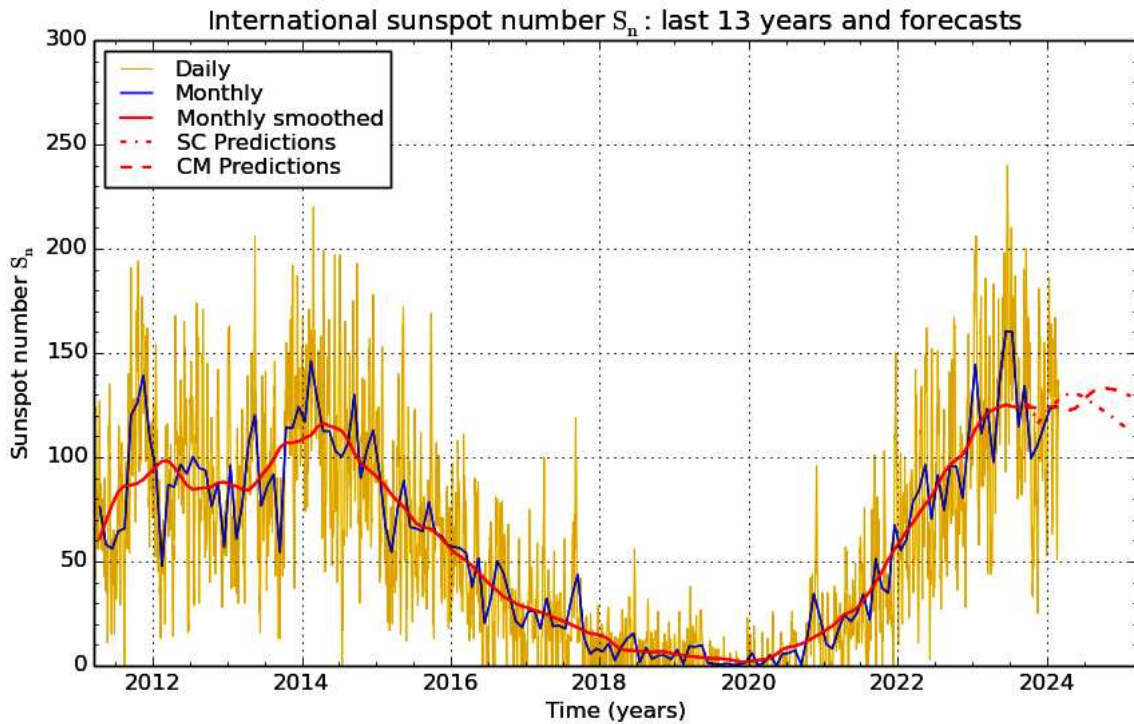
SUNSPOT BULLETIN

2024 n° 02

Provisional international and normalized hemispheric daily sunspot numbers for February 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	118	71	47
2	123	75	48
3	127	71	56
4	137	68	69
5	157	69	88
6	157	57	100
7	150	31	119
8	165	38	127
9	129	29	100
10	150	42	108
11	167	50	117
12	157	66	91
13	138	79	59
14	143	74	69
15	147	74	73
16	145	70	75
17	120	60	60
18	102	49	53
19	73	45	28
20	54	40	14
21	51	51	0
22	58	55	3
23	106	71	35
24	111	83	28
25	115	84	31
26	137	104	33
27	120	92	28
28	131	101	30
29	128	99	29
Monthly mean	124.6	65.4	59.2
Cooperating stations	62	53	53



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

Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for August 2023: 124.0 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2023 Sep	126	124	2024 Mar	129	123	2024 Sep	124	133
Oct	124	124	Apr	130	122	Oct	122	133
Nov	116	124	May	131	123	Nov	119	133
Dec	120	123	Jun	130	126	Dec	117	132
2024 Jan	123	124	Jul	128	129	2025 Jan	115	131
Feb	126	124	Aug	126	132	Feb	113	129

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	94	15	-	136	////	5	0/0	6
1	118	26	-	137	////	3	0/0	6
2	123	26	-	143	////	10	1/0	2
3	127	39	-	156	////	6	0/0	1
4	137	41	-	170	////	8	7/0	8
5	157	60	-	173	////	29	2/0	7
6	157	48	-	190	////	20	3/0	8
7	150	64	-	188	////	22	2/0	4
8	165	73	-	185	////	130	3/0	5
9	129	72	-	183	////	16	2/0	5
10	150	65	-	194	////	14	2/0	5
11	167	78	-	180	////	5	0/0	16
12	157	88	-	208	////	117	3/0	3
13	138	80	-	195	////	2	0/0	15
14	143	73	-	184	////	13	2/0	7
15	147	44	-	178	////	5	1/0	4
16	145	28	-	169	////	1	0/0	4
17	120	26	-	170	////	3	0/0	5
18	102	18	-	157	////	1	0/0	8
19	73	21	-	152	////	1	0/0	2
20	54	24	-	153	////	1	0/0	7
21	51	38	-	170	////	7	0/1	3
22	58	63	-	173	////	208	1/2	5
23	106	73	-	173	////	21	3/0	3
24	111	103	-	179	////	0	4/0	8
25	115	87	-	181	////	14	1/0	11
26	137	104	-	172	////	2	0/0	11
27	120	72	-	168	////	6	0/0	12
28	131	87	-	180	////	3	1/0	6
29	128	68	-	164	////	0	0/0	3

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 FEBRUARY 2024

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	940	11	49	159	82	77	66	76.1	2	CB
10	1325	5	32	82	14	68	60	110.7	1	LL
11	1020	8	83	163	39	124	105	142.9	2	LL
12	1125	8	124	204	86	118	180	177.5	1	GV
13	950	7	97	167	105	62	108	159.7	3	GV
15	1030	9	35	125	56	69	39	108.7	2	LL
17	1225	10	46	146	67	79	57	82.0	2	GV
20	940	3	18	48	37	11	0	28.5	2	SB
23	1415	7	62	132	96	36	0	85.6	2	SB
25	1215	6	73	133	104	29	63	104.6	3	SB
27	1040	6	71	131	104	27	28	86.7	2	OL

The relative mean sunspot number is 135.5.

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

$K' = 0.954 (*)$

1	152	7	***	13	159	19	***	25	127
2	***	8	***	14	***	20	46	26	***
3	***	9	***	15	119	21	***	27	125
4	***	10	78	16	***	22	***	28	***
5	***	11	156	17	139	23	126	29	***
6	***	12	195	18	***	24	***		

The normalised relative monthly mean sunspot number is 129.

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

The Sun has been observed 11 days on 29 possible.