



Sunspot Index and Long-term Solar Observations

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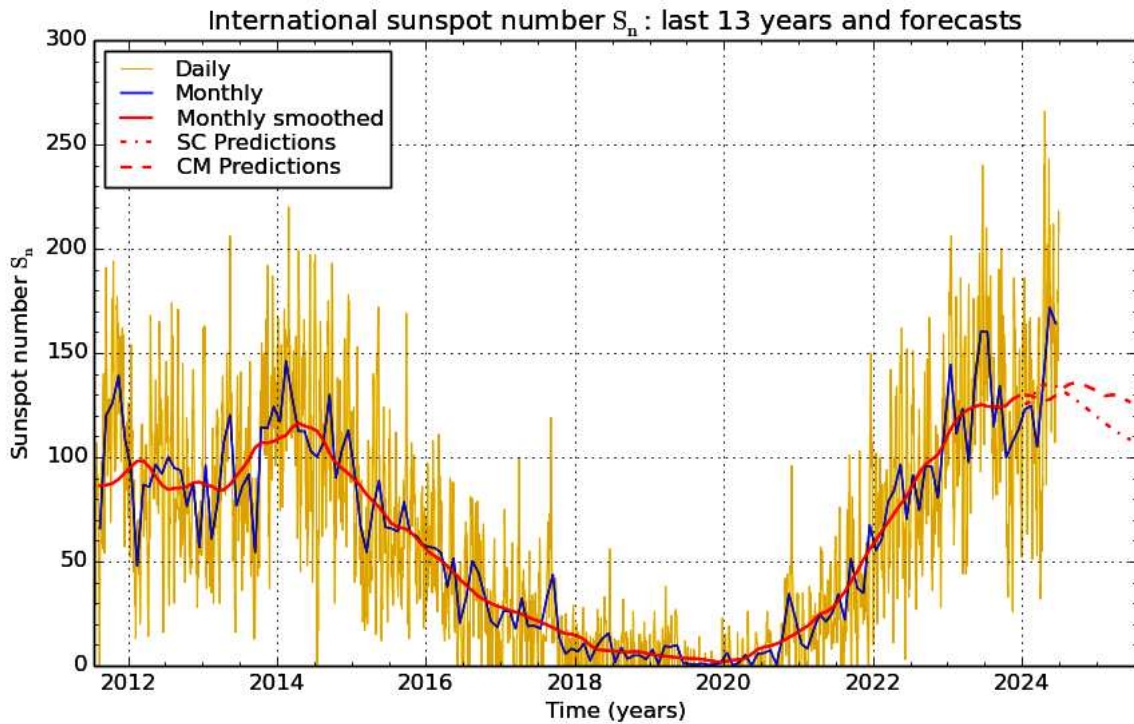
SUNSPOT BULLETIN

2024 n° 06

Provisional international and normalized hemispheric daily sunspot numbers for June 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	181	113	68
2	207	108	99
3	212	93	119
4	211	81	130
5	182	66	116
6	159	40	119
7	163	33	130
8	173	34	139
9	153	16	137
10	123	14	109
11	107	18	89
12	124	23	101
13	151	41	110
14	158	47	111
15	151	44	107
16	152	50	102
17	141	38	103
18	135	38	97
19	150	51	99
20	165	51	114
21	148	41	107
22	160	37	123
23	164	37	127
24	153	24	129
25	146	20	126
26	180	22	158
27	174	19	155
28	177	18	159
29	218	52	166
30	208	64	144
Monthly mean	164.2	44.4	119.8
Cooperating stations	63	57	57



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

Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for December 2023: 129.4 ($\pm 5\%$)

		SM	CM			SM	CM			SM	CM
2024	Jan	126	130	2024	Jul	132	133	2025	Jan	118	131
	Feb	127	130		Aug	130	135		Feb	116	129
	Mar	133	128		Sep	128	136		Mar	114	130
	Apr	135	127		Oct	126	135		Apr	112	130
	May	135	128		Nov	123	134		May	110	128
	Jun	134	130		Dec	121	133		Jun	108	126

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	155	80	-	179	////	128	1/1	12
1	181	123	-	188	////	110	1/2	8
2	207	127	-	180	////	18	2/0	7
3	212	94	-	186	////	141	4/0	13
4	211	93	-	192	////	29	2/0	8
5	182	94	-	195	////	49	2/0	8
6	159	70	-	191	////	112	1/0	7
7	163	65	-	184	////	10	2/0	38
8	173	51	-	190	////	28	7/0	17
9	153	59	-	181	////	2	3/0	8
10	123	36	-	178	////	4	5/1	11
11	107	25	-	165	////	4	0/0	13
12	124	32	-	165	////	19	1/0	5
13	151	40	-	170	////	30	1/0	4
14	158	47	-	169	////	16	1/0	6
15	151	82	-	171	////	45	1/0	23
16	152	96	-	167	////	71	0/0	18
17	141	122	-	180	////	43	3/0	18
18	135	119	-	193	////	30	2/0	14
19	150	135	-	196	////	28	1/0	14
20	165	117	-	203	////	40	2/0	9
21	148	111	-	197	////	14	0/0	4
22	160	78	-	196	////	50	2/0	4
23	164	49	-	196	////	33	3/0	13
24	153	50	-	199	////	33	2/0	6
25	146	57	-	194	////	8	1/0	9
26	180	61	-	181	////	3	0/0	12
27	174	77	-	183	////	5	0/0	12
28	177	73	-	181	////	10	0/0	61
29	218	68	-	186	////	1	0/0	18
30	208	71	-	174	////	6	0/0	15

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/m² : 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 2024

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
3	1605	10	85	185	76	109	103	187.9	2	OB
4	830	11	119	229	84	145	108	171.9	3	OB
5	900	9	93	183	60	123	99	185.0	3	OB
6	800	8	104	184	43	141	54	155.3	3	OB
7	715	9	83	173	30	143	57	129.5	4	OB
8	800	12	79	199	41	158	39	66.5	3	OB
9	830	9	54	144	11	133	39	124.0	3	OB
10	1247	8	51	131	13	118	30	57.2	2	JV
11	724	6	33	93	11	82	56	17.0	4	JV
12	911	8	49	129	23	106	75	43.6	2	JV
13	717	11	89	199	65	134	118	67.0	4	JV
14	1527	9	77	167	51	116	60	102.1	3	JV
15	647	8	86	166	42	124	66	100.1	3	JV
16	1505	8	78	158	59	99	105	147.6	3	JV
17	953	6	77	137	38	99	101	150.3	3	JV
19	1115	7	97	167	46	121	96	135.6	3	SB
20	920	7	65	135	34	101	12	89.1	2	OL
22	1230	7	111	181	39	142	0	65.1	3	OL
23	810	8	90	170	31	139	23	46.8	3	OL
24	725	11	64	174	34	140	57	48.6	3	SB
25	635	8	59	139	12	127	56	55.9	4	SB
26	635	9	76	166	14	152	81	81.7	3	SB
27	630	10	83	183	27	156	77	108.4	4	OB
28	740	9	41	131	14	117	54	95.3	1	SB
29	840	13	64	194	52	142	93	108.5	3	SB
30	820	13	58	188	56	132	91	90.1	1	SB

The relative mean sunspot number is 165.6.

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

$K' = 0.900 (*)$

1	***	7	156	13	179	19	150	25	125
2	***	8	179	14	150	20	122	26	149
3	167	9	130	15	149	21	***	27	165
4	206	10	118	16	142	22	163	28	118
5	165	11	84	17	123	23	153	29	175
6	166	12	116	18	***	24	157	30	169

The normalised relative monthly mean sunspot number is 149.

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

The Sun has been observed 26 days on 30 possible.