



Sunspot Index and Long-term Solar Observations

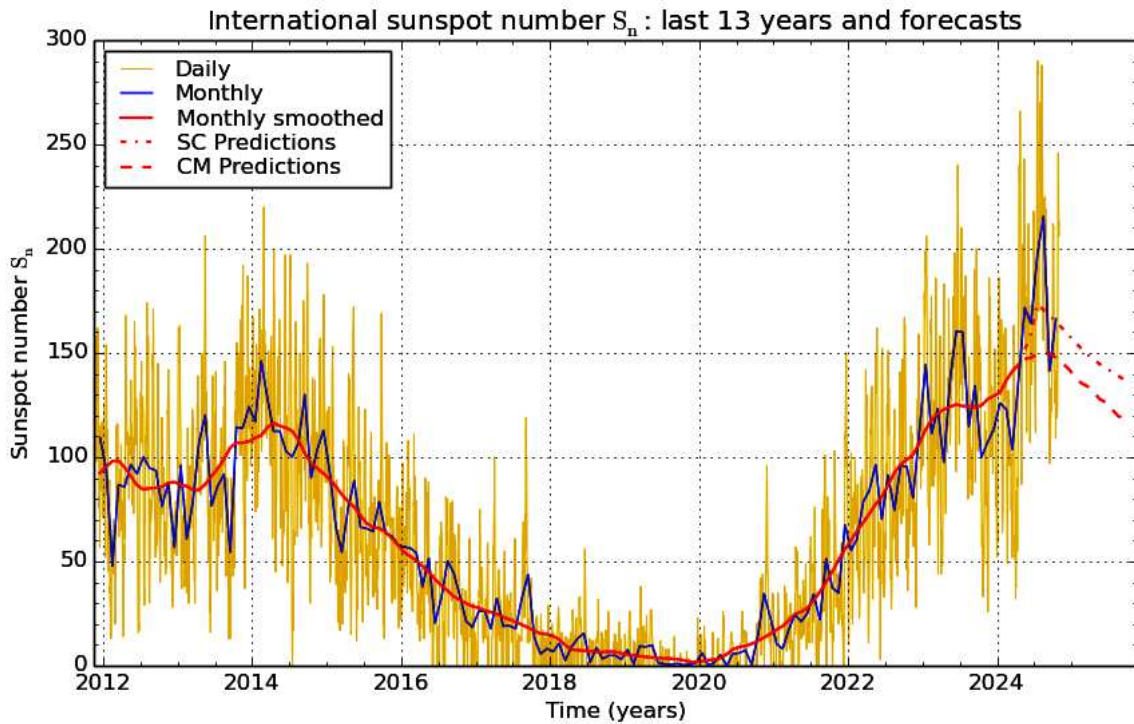
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SUNSPOT BULLETIN 2024 n° 10

Provisional international and normalized hemispheric daily sunspot numbers for October 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	212	47	165
2	210	62	148
3	209	62	147
4	211	62	149
5	182	52	130
6	169	42	127
7	163	40	123
8	142	32	110
9	141	40	101
10	141	41	100
11	136	41	95
12	126	37	89
13	137	44	93
14	136	30	106
15	109	14	95
16	119	26	93
17	141	32	109
18	137	21	116
19	133	19	114
20	132	26	106
21	162	22	140
22	119	8	111
23	122	1	121
24	136	7	129
25	178	38	140
26	220	48	172
27	246	62	184
28	246	61	185
29	224	78	146
30	206	80	126
31	213	85	128
Monthly mean	166.3	40.6	125.7
Cooperating stations	63	57	57



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

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for April 2024: 144.4 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2024 May	152	147	2024 Nov	162	145	2025 May	145	128
Jun	159	148	Dec	159	143	Jun	143	126
Jul	174	150	2025 Jan	155	139	Jul	141	123
Aug	171	150	Feb	152	136	Aug	139	120
Sep	168	150	Mar	150	134	Sep	137	119
Oct	165	148	Apr	147	132	Oct	135	119

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
30	165	56	-	214	////	18	0/0	11
1	212	86	-	245	////	23	2/1	6
2	210	126	-	275	////	41	5/0	6
3	209	156	-	312	////	128	7/1	8
4	211	211	-	291	////	46	4/0	10
5	182	172	-	277	////	23	5/0	8
6	169	162	-	265	////	6	5/0	15
7	163	136	-	277	////	9	1/1	40
8	142	131	-	225	////	18	1/0	41
9	141	121	-	220	////	24	2/2	16
10	141	124	-	216	////	2	0/0	05
11	136	129	-	214	////	4	2/0	84
12	126	118	-	214	////	7	0/0	21
13	137	111	-	195	////	4	0/0	6
14	136	81	-	182	////	8	2/0	8
15	109	51	-	172	////	154	4/0	14
16	119	59	-	168	////	46	6/0	17
17	141	51	-	174	////	1	2/0	10
18	137	50	-	165	////	3	3/0	17
19	133	42	-	162	////	0	2/0	29
20	132	37	-	162	////	2	0/0	6
21	162	31	-	164	////	2	0/0	9
22	119	24	-	176	////	3	0/0	7
23	122	28	-	185	////	16	0/0	9
24	136	42	-	197	////	5	1/1	14
25	178	66	-	209	////	4	1/0	2
26	220	95	-	238	////	307	1/1	12
27	246	135	-	246	////	16	1/0	12
28	246	122	-	255	////	21	3/0	20
29	224	150	-	266	////	11	1/0	15
30	206	134	-	270	////	120	1/0	15
31	213	136	-	270	////	251	7/1	10

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 : $1 \times S_n + 10 \times \text{"1"} + 100 \times \text{">1"}$).

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 OCTOBER 2024

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	1510	11	121	231	58	173	104	98.6	2	OB
2	810	11	132	242	70	172	157	102.3	3	JV
3	910	8	105	185	52	133	86	136.0	2	JV
4	810	9	127	217	62	155	84	189.2	4	JV
5	820	8	116	196	52	144	0	203.9	3	JV
6	1120	7	91	161	41	120	24	144.8	2	JV
7	815	7	120	190	59	131	57	127.0	4	OB
8	830	6	75	135	28	107	80	127.0	3	OB
10	915	8	109	189	54	135	85	139.6	3	OB
11	800	6	87	147	51	96	70	164.5	3	OB
13	910	7	72	142	44	98	90	126.1	2	SB
16	1225	6	31	91	20	71	35	101.1	1	SB
20	1015	9	38	128	27	101	35	38.3	2	OB
22	915	8	28	108	0	108	21	21.0	1	CB
23	935	9	37	127	0	127	32	36.8	3	OB
24	850	10	44	144	0	144	28	36.4	2	OB
25	900	12	76	196	42	154	62	82.4	3	OB
26	900	12	100	220	47	173	102	126.7	3	OB
27	1050	14	143	283	71	212	119	201.3	3	OB
28	900	12	156	276	71	205	206	94.1	3	OL
31	920	11	139	249	99	150	38	151.6	3	OL

The relative mean sunspot number is 183.7.

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

$$K' = 0.975 (*)$$

1	225	7	185	13	138	19	***	25	191
2	236	8	132	14	***	20	125	26	215
3	180	9	***	15	***	21	***	27	276
4	212	10	184	16	89	22	105	28	269
5	191	11	143	17	***	23	124	29	***
6	157	12	***	18	***	24	140	30	***
								31	243

The normalised relative monthly mean sunspot number is 179.

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

The Sun has been observed 21 days on 31 possible.