Sunspot Index and Long-term Solar Observations

World Data Center supported by the ICSU - WDS

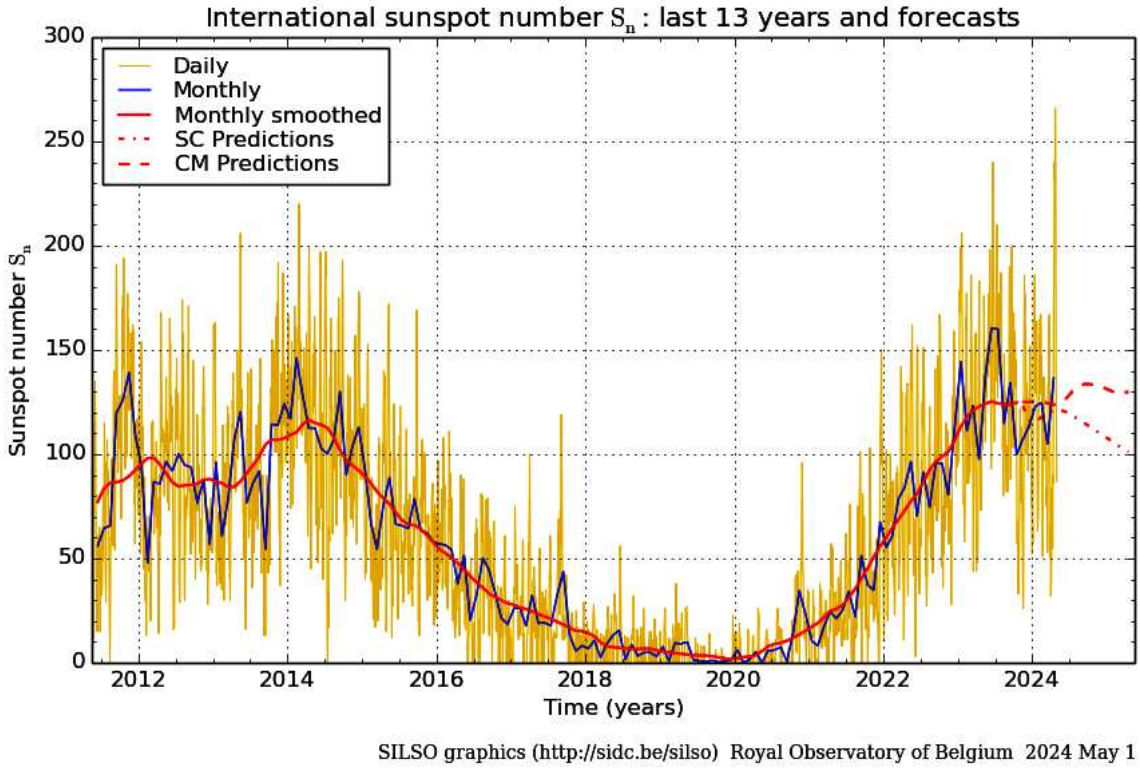
SUNSPOT BULLETIN

2024 n° 04

Provisional international and normalized hemispheric daily sunspot numbers for April 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	32	32	0
2	39	39	0
3	38	37	1
4	48	48	0
5	78	62	16
6	80	52	28
7	84	60	24
8	77	54	23
9	55	38	17
10	55	37	18
11	90	60	30
12	86	58	28
13	120	61	59
14	148	93	55
15	171	99	72
16	181	90	91
17	209	99	110
18	223	100	123
19	240	112	128
20	232	88	144
21	231	94	137
22	265	100	165
23	266	108	158
24	251	97	154
25	209	76	133
26	141	63	78
27	139	62	77
28	119	47	72
29	100	50	50
30	87	35	52
Monthly mean	136.5	68.4	68.1
Cooperating stations	64	56	56



Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for October 2023: 124.8 (± 5%)

	SM	CM		SM	CM		SM	CM
2023 Nov	123	125	2024 May	121	125	2024 Nov	111	133
Dec	117	125	Jun	120	127	Dec	109	132
2024 Jan	115	126	Jul	118	130	2025 Jan	107	131
Feb	118	126	Aug	117	133	Feb	105	129
Mar	120	124	Sep	115	134	Mar	103	130
Apr	121	124	Oct	113	134	Apr	101	130

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	66	2	-	134	////	0	0/0	10
1	32	3	-	125	////	2	1/0	10
2	39	1	-	113	////	0	0/0	6
3	38	2	-	112	////	0	0/0	6
4	48	7	-	114	////	0	0/0	14
5	78	21	-	121	////	0	0/0	11
6	80	28	-	123	////	0	0/0	12
7	84	28	-	125	////	1	0/0	8
8	77	29	-	125	////	0	0/0	6
9	55	33	-	124	////	0	0/0	10
10	55	34	-	131	////	2	0/0	9
11	90	40	-	144	////	4	0/0	6
12	86	34	-	152	////	6	0/0	5
13	120	36	-	161	////	2	1/0	6
14	148	47	-	178	////	21	1/0	6
15	171	60	-	192	////	62	8/0	8
16	181	57	-	199	////	100	1/0	30
17	209	62	-	217	////	119	1/0	6
18	223	76	-	227	////	31	3/0	4
19	240	109	-	213	////	20	2/0	41
20	232	125	-	210	////	44	0/0	9
21	231	101	-	217	////	24	3/0	20
22	265	101	-	227	////	35	5/0	8
23	266	104	-	219	////	60	3/0	7
24	251	103	-	199	////	121	5/0	3
25	209	58	-	167	////	4	1/0	2
26	141	38	-	153	////	5	0/0	23
27	139	40	-	153	////	10	2/0	14
28	119	37	-	140	////	13	0/0	6
29	100	41	-	138	////	24	2/0	9
30	87	31	-	130	////	109	4/0	17

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 x Sn+10 x "1"+100 x ">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 APRIL 2024

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBERS TOTAL	NORTH	SOUTH	CENTRAL	PPSI 10-5 WM-2	QUAL	OBS
1	1220	3	8	38	38	0	0	9.2	2	JV
3	1143	4	7	47	47	0	12	1.0	3	JV
4	1118	4	11	51	51	0	16	9.0	3	JV
5	1245	6	26	86	69	17	59	61.0	1	JV
6	955	5	22	72	45	27	16	60.7	1	JV
7	724	6	25	85	60	25	35	53.5	2	JV
8	1335	6	32	92	72	20	25	21.7	2	OL
9	900	5	21	71	54	17	19	46.8	2	OB
10	800	4	21	61	43	18	34	53.3	3	OL
11	1100	5	64	114	81	33	17	55.0	2	OB
12	845	5	48	98	71	27	14	44.4	4	OB
13	850	8	48	128	65	63	15	31.2	2	SB
14	1115	9	64	154	106	48	37	77.8	3	OB
15	720	10	69	169	113	56	67	111.6	3	OL
17	740	11	89	199	98	101	79	97.2	3	SB
18	835	13	139	269	109	160	149	77.9	2	OL
20	745	12	101	221	90	131	131	249.7	1	LL
21	1220	12	110	230	100	130	132	198.3	2	LL
22	727	14	179	319	120	199	91	202.6	2	CB
23	720	17	148	318	124	194	102	213.1	3	CB
24	1100	16	142	302	107	195	122	202.4	2	CB
25	1205	13	64	194	71	123	92	109.5	2	SB
27	1330	10	41	141	69	72	57	83.9	1	CB
29	830	7	38	108	59	49	13	53.3	3	OL
30	1245	5	39	89	44	45	0	39.0	3	OB

The relative mean sunspot number is 146.2.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR APRIL 2024

K'= 0.940 (*)

1	36	7	80	13	120	19	***	25	182
2	***	8	86	14	145	20	208	26	***
3	44	9	67	15	159	21	216	27	133
4	48	10	57	16	***	22	300	28	***
5	81	11	107	17	187	23	299	29	102
6	68	12	92	18	253	24	284	30	84

The normalised relative monthly mean sunspot number is 137.

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

The Sun has been observed 25 days on 30 possible.