Sunspot Index and Long-term Solar Observations

World Data Center supported by the ICSU - WDS

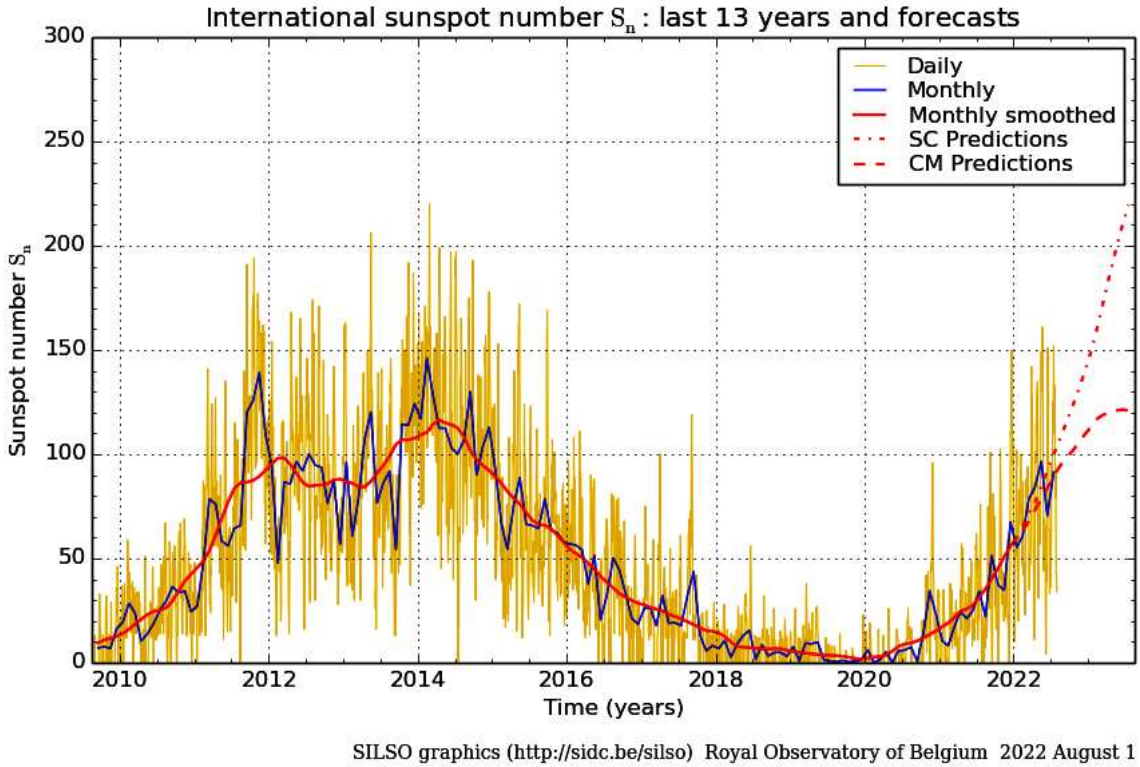
SUNSPOT BULLETIN

2022 n° 07

Provisional international and normalized hemispheric daily sunspot numbers for July 2022

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	58	17	41
2	64	11	53
3	55	19	36
4	59	31	28
5	78	53	25
6	82	71	11
7	95	79	16
8	87	70	17
9	93	73	20
10	106	69	37
11	125	75	50
12	114	63	51
13	117	61	56
14	123	60	63
15	134	63	71
16	152	75	77
17	140	73	67
18	126	68	58
19	110	70	40
20	133	89	44
21	109	72	37
22	99	66	33
23	97	56	41
24	79	42	37
25	86	36	50
26	91	37	54
27	58	13	45
28	42	8	34
29	43	8	35
30	43	0	43
31	34	0	34
Monthly mean	91.4	49.3	42.1
Cooperating stations	67	55	55



Predictions of the monthly smoothed Sunspot Number

using the last provisional value, calculated for January 2022: 60.1 (± 5%)

	SM	CM		SM	CM		SM	CM
2022 Feb	66	63	2022 Aug	108	95	2023 Feb	161	117
Mar	72	68	Sep	115	98	Mar	174	119
Apr	77	74	Oct	123	102	Apr	186	120
May	85	79	Nov	131	106	May	198	121
Jun	93	84	Dec	140	110	Jun	210	121
Jul	100	90	2023 Jan	150	113	Jul	220	121

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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Editors: Frédéric Clette and Laure Lefèvre
3, avenue Circulaire, B1180 Bruxelles, Belgium
Fax: ../32/(0)2/374.98.22 Tel: ../32/(0)2/373.02.33 Email: silso.info@oma.be

Web: http://sidc.oma.be/silso
FTP anonymous : omaftp.oma.be, directory: dist/astro/sidcdata

Summary of the URSIGRAMs from S.I.D.C.

Date	S_n	PPSI	600	2800	COS	SFI	XI	Ak
30	42	9	-	96	////	0	0/0	4
1	58	8	-	98	////	100	0/0	9
2	64	14	-	100	////	0	0/0	20
3	55	13	-	102	////	1	0/0	10
4	59	20	-	104	////	11	0/0	22
5	78	20	-	115	////	14	0/0	4
6	82	39	-	115	////	1	0/0	6
7	95	42	-	121	////	3	0/0	18
8	87	54	-	130	////	2	1/0	24
9	93	79	-	137	////	25	0/0	9
10	106	88	-	153	////	16	1/0	8
11	125	139	-	161	////	36	1/0	18
12	114	129	-	165	////	13	0/0	20
13	117	134	-	165	////	9	0/0	6
14	123	135	-	169	////	23	2/0	4
15	134	110	-	171	////	31	0/0	12
16	152	107	-	176	////	53	2/0	8
17	140	112	-	166	////	21	0/0	5
18	126	62	-	152	////	3	0/0	10
19	110	43	-	144	////	10	0/0	31
20	133	49	-	133	////	3	0/0	8
21	109	39	-	122	////	8	0/0	28
22	99	28	-	114	////	5	0/0	13
23	97	40	-	111	////	5	0/0	20
24	79	33	-	107	////	3	0/0	11
25	86	19	-	102	////	0	0/0	8
26	91	18	-	99	////	///	///	12
27	58	12	-	98	////	0	0/0	16
28	42	7	-	93	////	0	0/0	9
29	43	11	-	93	////	9	0/0	5
30	43	11	-	91	////	0	0/0	10
31	34	13	-	94	////	0	0/0	16

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 JULY 2022

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBERS TOTAL	NORTH	SOUTH	CENTRAL	PPSI 10-5 WM-2	QUAL	OBS
1	827	6	15	75	23	52	25	13.3	2	GV
4	624	6	33	93	36	57	34	40.7	3	CB
5	615	6	22	82	55	27	25	51.3	3	CB
6	640	7	21	91	69	22	49	50.5	2	CB
7	745	7	47	117	90	27	45	67.8	3	FC
8	632	6	45	105	84	21	47	76.8	3	CB
9	645	5	48	98	78	20	49	84.2	2	CB
10	745	5	43	93	65	28	40	122.9	1	CB
11	1020	7	62	132	73	59	78	144.8	3	SB
12	635	6	106	166	86	80	102	151.6	3	FC
13	1040	5	100	150	73	77	87	149.8	3	FC
14	955	6	91	151	73	78	39	140.2	3	FC
15	800	6	85	145	65	80	64	108.4	2	FC
16	645	7	95	165	77	88	89	144.0	3	JV
17	730	7	86	156	80	76	74	81.5	3	FC
18	720	6	58	118	58	60	44	78.5	3	OB
19	730	5	49	99	61	38	38	34.3	3	OB
20	1220	7	43	113	72	41	56	58.8	3	OB
22	1400	6	12	72	39	33	50	9.4	1	OB
23	750	6	36	96	53	43	44	111.2	3	LL
24	830	6	33	93	52	41	40	105.9	4	LL
25	1520	9	35	125	48	77	34	14.5	2	GV
26	928	6	27	87	26	61	18	12.4	2	GV
27	641	5	17	67	14	53	17	10.3	3	GV
28	708	4	9	49	14	35	12	4.1	2	GV
29	758	4	18	58	12	46	12	13.5	2	GV
30	900	3	14	44	0	44	13	15.7	2	OL
31	830	2	9	29	0	29	18	18.9	2	OL

The relative mean sunspot number is 102.5.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR JULY 2022

K'= 0.906 (*)

1	68	7	106	13	136	19	90	25	113
2	***	8	95	14	137	20	102	26	79
3	***	9	89	15	131	21	***	27	61
4	84	10	84	16	149	22	65	28	44
5	74	11	120	17	141	23	87	29	53
6	82	12	150	18	107	24	84	30	40
								31	26

The normalised relative monthly mean sunspot number is 93.

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

The Sun has been observed 28 days on 31 possible.