



Center

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SUNSPOT BULLETIN

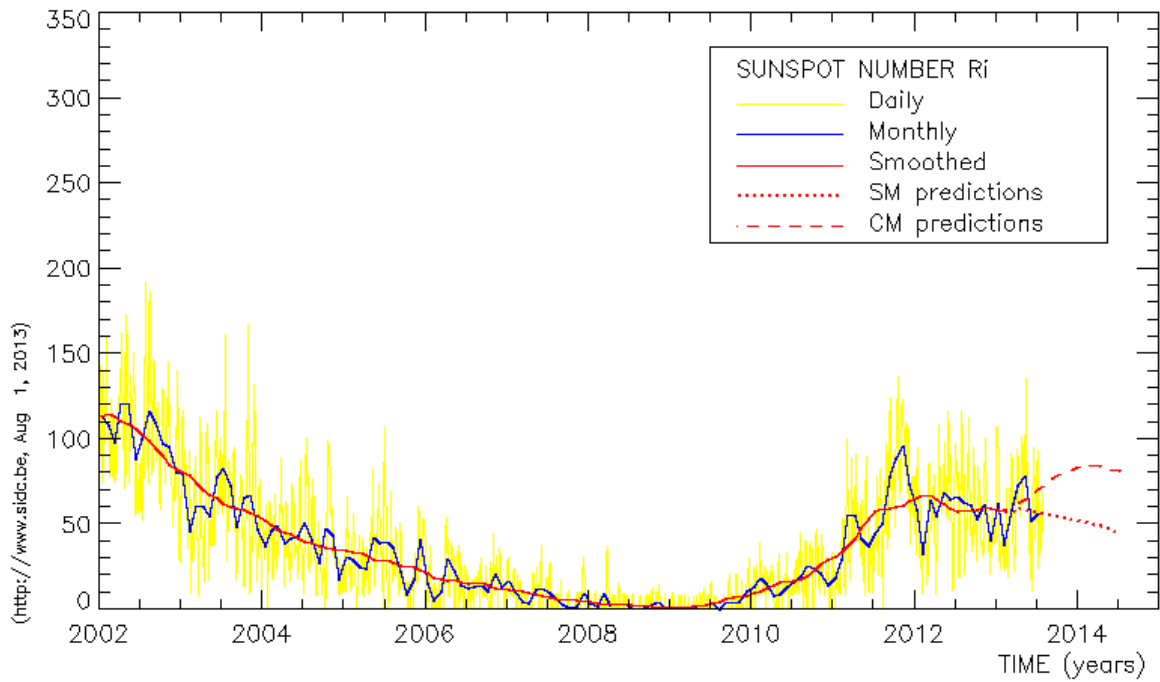
2013

n° 7

Provisional international and normalized hemispheric daily sunspot numbers for July 2013

computed at the *Royal Observatory of Belgium* using observations from an international network with the *Locarno Specola Solare* as reference station.

Date	R' ₁	R' _N	R' _S
1	51	27	24
2	74	19	55
3	72	10	62
4	80	7	73
5	72	0	72
6	82	0	82
7	93	0	93
8	81	0	81
9	73	0	73
10	53	0	53
11	52	0	52
12	48	7	41
13	24	0	24
14	40	9	31
15	51	27	24
16	51	27	24
17	48	15	33
18	63	15	48
19	56	22	34
20	39	22	17
21	35	20	15
22	38	16	22
23	53	26	27
24	46	16	30
25	56	18	38
26	47	16	31
27	45	8	37
28	48	8	40
29	68	27	41
30	59	31	28
31	68	39	29
Monthly mean	57.0	13.9	43.1
Cooperating stations	69	60	60



Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for January 2013: 58.7 ($\pm 5\%$)

		SM	CM		SM	CM		SM	CM		
2013	Feb	58	58	2013	Aug	56	74	2014	Feb	51	86
	Mar	58	61		Sep	55	77		Mar	50	85
	Apr	60	63		Oct	54	80		Apr	49	84
	May	59	65		Nov	54	81		May	48	83
	Jun	58	68		Dec	53	82		Jun	47	82
	Jul	57	71	2014	Jan	52	84		Jul	46	81

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, due to 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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S.I.D.C. SUMMARY OF THE URSIGRAMS

Date	R' _i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
30	55	25	-	103	////	12	0/0	14	
1	51	18	-	108	////	0	0/0	10	
2	74	22	-	114	////	26	0/0	4	
3	72	43	-	125	////	16	0/0	5	
4	80	78	-	138	////	31	0/0	6	
5	72	121	-	141	////	65	0/0	14	
6	82	110	-	134	////	17	0/0	24	
7	93	133	-	126	////	17	0/0	7	
8	81	133	-	119	////	1	0/0	4	
9	73	102	-	120	////	13	0/0	15	
10	53	58	-	118	////	16	0/0	31	
11	52	28	-	113	////	0	0/0	21	
12	48	12	-	118	////	3	0/0	11	
13	24	18	-	114	////	2	0/0	14	
14	40	20	-	113	////	1	0/0	28	
15	51	31	-	114	////	10	0/0	21	
16	51	42	-	114	////	3	0/0	6	
17	48	44	-	111	////	5	0/0	4	
18	63	41	-	115	////	0	0/0	20	
19	56	38	-	114	////	1	0/0	20	
20	39	42	-	113	////	3	0/0	5	
21	35	55	-	109	////	18	0/0	6	
22	38	42	-	110	////	0	0/0	9	
23	53	36	-	107	////	0	0/0	6	
24	46	40	-	108	////	4	0/0	6	
25	56	33	-	107	////	4	0/0	16	
26	47	34	-	110	////	3	0/0	12	
27	45	33	-	108	////	2	0/0	14	
28	48	39	-	109	////	14	0/0	9	
29	68	43	-	112	////	6	0/0	6	
30	59	39	-	113	////	2	0/0	7	
31	68	32	-	109	////	0	0/0	7	

- R'_i** : 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** : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams – UGEOR, evaluation : $1 \times \text{Sn} + 10 \times "1" + 100 \times ">1"$).
- XI** : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams – UGEOR, UGEOI).
- Ak** : geomagnetic index from Wingst, Germany (origin : Ursigrams).
- SEA** : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).

Note that due to problems of interferences saturating our receivers, no SEA could be detected this month.

SOLAR PHYSICS DEPARTMENT

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR JULY 2013

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	1200	4	20	60	36	24	0	2.5	2	OB
2	710	6	27	87	17	70	14	4.0	3	OB
6	815	4	87	127	12	115	75	70.6	3	OB
7	830	5	97	147	0	147	103	75.0	3	OB
8	730	4	58	98	0	98	87	90.3	3	OB
9	720	4	60	100	0	100	89	84.7	3	OB
10	745	2	43	63	0	63	25	23.1	3	OB
11	1130	2	16	36	0	36	0	4.3	3	OB
12	1115	3	14	44	0	44	0	2.2	2	OB
13	845	2	7	27	0	27	0	17.7	2	AE
14	815	3	8	38	11	27	16	18.8	2	AE
15	710	5	31	81	45	36	36	39.4	3	OL
16	700	3	11	41	26	15	15	37.4	2	SV
17	915	4	24	64	15	49	36	34.3	2	SV
18	900	4	14	54	16	38	14	33.6	3	SV
19	600	3	13	43	21	22	21	33.7	3	SV
20	805	3	19	49	27	22	38	38.4	3	OL
21	710	2	27	47	25	22	47	55.1	4	OL
22	715	3	20	50	21	29	50	56.0	4	OL
23	720	4	22	62	39	23	23	52.6	3	OL
24	1215	4	20	60	24	36	23	44.4	3	OL
25	715	5	23	73	23	50	38	39.1	3	OL
26	1200	5	20	70	24	46	12	27.2	3	OL
29	700	6	25	85	37	48	26	35.6	3	AE
30	715	5	21	71	37	34	11	23.2	2	AE
31	1330	7	18	88	60	28	16	30.6	3	AE

The relative mean sunspot number is 67.9.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JULY 2013

$K'= 0.755$ (*)

1	45	7	111	13	20	19	32	25	55
2	66	8	74	14	29	20	37	26	53
3	***	9	76	15	61	21	35	27	***
4	***	10	48	16	31	22	38	28	***
5	***	11	27	17	48	23	47	29	64
6	96	12	33	18	41	24	45	30	54
								31	66

The normalised relative monthly mean sunspot number is 51.

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

The Sun has been observed 26 days on 31 possible.