

Center

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SUNSPOT BULLETIN

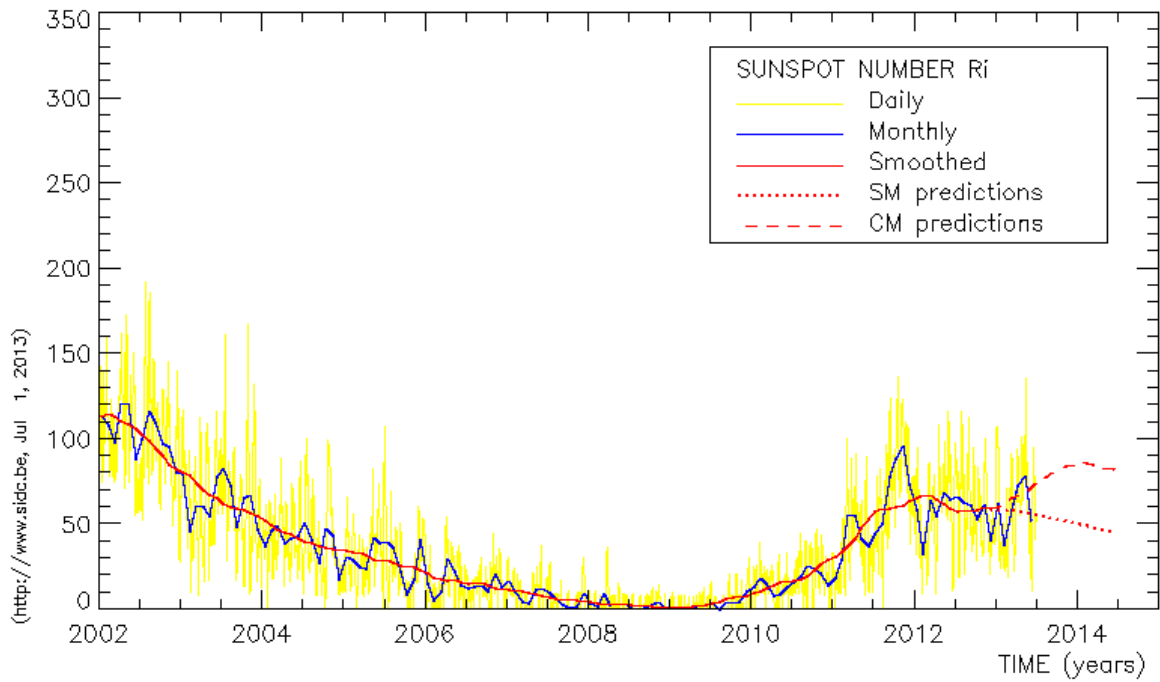
2013

n° 6

Provisional international and normalized hemispheric daily sunspot numbers for June 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	41	9	32
2	53	19	34
3	44	16	28
4	35	10	25
5	54	30	24
6	52	33	19
7	33	22	11
8	18	18	0
9	24	16	8
10	18	18	0
11	11	11	0
12	20	8	12
13	35	0	35
14	44	0	44
15	65	8	57
16	71	9	62
17	76	13	63
18	77	21	56
19	84	31	53
20	88	30	58
21	95	27	68
22	94	28	66
23	81	20	61
24	74	11	63
25	53	14	39
26	41	13	28
27	42	8	34
28	51	17	34
29	47	15	32
30	55	23	32
Monthly mean	52.5	16.6	35.9
Cooperating stations	69	61	61



Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for December 2012: 59.6 ($\pm 5\%$)

		SM	CM			SM	CM			SM	CM
2013	Jan	59	60	2013	Jul	56	75	2014	Jan	51	87
	Feb	58	63		Aug	55	78		Feb	50	86
	Mar	59	65		Sep	54	80		Mar	49	85
	Apr	59	67		Oct	53	83		Apr	48	84
	May	58	69		Nov	52	84		May	47	83
	Jun	57	72		Dec	51	85		Jun	46	82

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

Brussels, July 1, 2013 08:24 UT
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 Web: http://sidc.oma.be, "Sunspots" section in sidebar.

S.I.D.C. SUMMARY OF THE URSIGRAMS

Date	R' _i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
31	33	11	-	102	////	2	1/0	12	
1	41	13	-	106	////	1	0/0	40	
2	53	37	-	111	////	3	0/0	16	
3	44	55	-	112	////	2	0/0	12	
4	35	41	-	110	////	0	0/0	11	
5	54	38	-	109	////	///	///	7	
6	52	27	-	109	////	0	0/0	29	
7	33	31	-	110	////	1	1/0	25	
8	18	31	-	103	////	0	0/0	9	
9	24	29	-	96	////	2	0/0	12	
10	18	15	-	93	////	6	0/0	12	
11	11	5	-	90	////	0	0/0	7	
12	20	10	-	93	////	0	0/0	5	
13	35	13	-	99	////	3	0/0	5	
14	44	42	-	109	////	4	0/0	4	
15	65	30	-	111	////	0	0/0	6	
16	71	31	-	116	////	3	0/0	4	
17	76	64	-	124	////	5	0/0	4	
18	77	91	-	125	////	5	0/0	4	
19	84	104	-	123	////	6	0/0	8	
20	88	99	-	126	////	13	0/0	14	
21	95	104	-	133	////	27	1/0	20	
22	94	125	-	130	////	9	0/0	16	
23	81	76	-	128	////	12	1/0	26	
24	74	64	-	121	////	16	0/0	18	
25	53	42	-	109	////	5	0/0	9	
26	41	35	-	107	////	1	0/0	3	
27	42	35	-	100	////	3	0/0	10	
28	51	31	-	101	////	5	0/0	23	
29	47	28	-	100	////	4	0/0	35	
30	55	25	-	103	////	12	0/0	14	

- 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 JUNE 2013

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	915	5	13	63	13	50	50	11.0	1	AE
2	700	5	19	69	25	44	38	23.5	2	AE
3	1315	3	20	50	16	34	11	22.1	2	OB
4	1115	3	13	43	13	30	0	18.1	2	OB
5	700	4	17	57	38	19	13	14.3	2	OB
6	700	4	31	71	49	22	23	10.6	3	OB
7	700	2	19	39	25	14	25	27.8	2	SV
8	745	1	13	23	23	0	23	22.3	2	OB
10	1020	1	8	18	18	0	0	15.3	1	SV
11	600	1	4	14	14	0	0	3.1	3	SV
13	750	3	23	53	0	53	31	5.9	3	SV
15	1030	5	14	64	11	53	0	6.5	3	SV
16	915	6	21	81	12	69	0	19.9	2	AE
21	1430	8	40	120	35	85	63	82.3	1	AE
30	1000	6	25	85	45	40	34	21.8	3	OL

The relative mean sunspot number is 56.7.

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

$$K' = 0.741 (*)$$

1	47	7	29	13	39	19	***	25	***
2	51	8	17	14	***	20	***	26	***
3	37	9	***	15	47	21	89	27	***
4	32	10	13	16	60	22	***	28	***
5	42	11	10	17	***	23	***	29	***
6	53	12	***	18	***	24	***	30	63

The normalised relative monthly mean sunspot number is 42.

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

The Sun has been observed 15 days on 30 possible.