

Center

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SUNSPOT BULLETIN

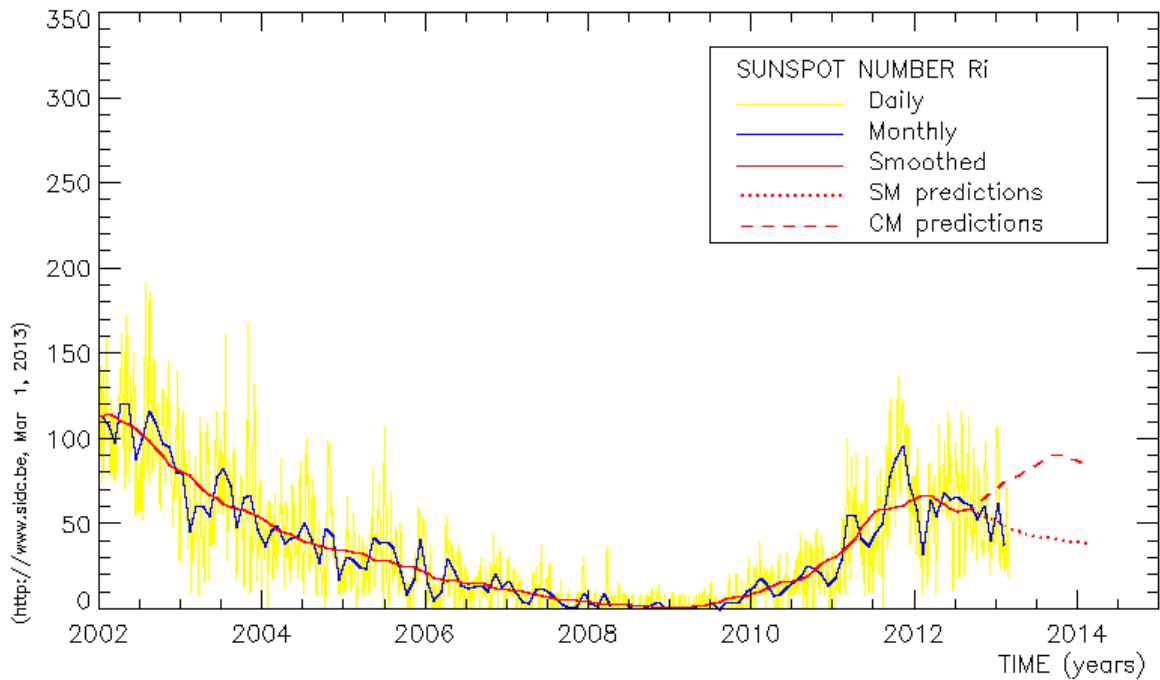
2013

n° 2

Provisional international and normalized hemispheric daily sunspot numbers for February 2013

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

Date	R' _I	R' _N	R' _S
1	40	25	15
2	45	29	16
3	50	38	12
4	24	24	0
5	26	26	0
6	27	27	0
7	39	39	0
8	37	37	0
9	38	38	0
10	30	30	0
11	35	27	8
12	40	33	7
13	24	17	7
14	22	22	0
15	26	18	8
16	25	17	8
17	45	24	21
18	68	33	35
19	71	37	34
20	67	33	34
21	49	29	20
22	42	23	19
23	31	15	16
24	19	9	10
25	32	8	24
26	33	9	24
27	36	9	27
28	44	9	35
Monthly mean	38.0	24.5	13.5
Cooperating stations	67	59	59



Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for August 2012: 58.1 ($\pm 5\%$)

		SM	CM			SM	CM			SM	CM
2012	Sep	59	59	2013	Mar	48	77	2013	Sep	42	91
	Oct	58	62		Apr	46	79		Oct	41	91
	Nov	55	65		May	45	81		Nov	41	90
	Dec	54	69		Jun	44	83		Dec	40	88
2013	Jan	52	72		Jul	43	86	2014	Jan	40	87
	Feb	50	75		Aug	43	89		Feb	39	86

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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 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	32	27	-	103	////	1	0/0	3	
1	40	33	-	104	////	3	0/0	5	
2	45	37	-	112	////	1	0/0	10	
3	50	47	-	111	////	8	0/0	6	
4	24	38	-	107	////	0	0/0	6	
5	26	38	-	105	////	1	0/0	3	
6	27	22	-	104	////	11	0/0	1	
7	39	28	-	103	////	0	0/0	6	
8	37	26	-	104	////	1	0/0	8	
9	38	27	-	108	////	1	0/0	3	
10	30	28	-	106	////	0	0/0	6	
11	35	32	-	105	////	1	0/0	6	
12	40	26	-	102	////	1	0/0	5	
13	24	20	-	100	////	0	0/0	16	
14	22	18	-	100	////	0	0/0	16	
15	26	15	-	100	////	1	0/0	6	
16	25	50	-	103	////	0	0/0	10	
17	45	15	-	106	////	7	1/0	10	
18	68	45	-	105	////	3	0/0	6	
19	71	54	-	112	////	1	0/0	8	
20	67	58	-	114	////	3	0/0	8	
21	49	38	-	109	////	2	0/0	9	
22	42	26	-	107	////	0	0/0	17	
23	31	12	-	100	////	1	0/0	12	
24	19	5	-	95	////	0	0/0	4	
25	32	9	-	95	////	0	0/0	5	
26	33	24	-	99	////	0	0/0	6	
27	36	29	-	102	////	1	0/0	5	
28	44	38	-	106	////	3	0/0	11	

- 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 : $1 \times \text{Sn} + 10 \times \text{"1"} + 100 \times \text{">1"}$).
- XI** : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams – UGEOR, UGEOI).
- Ak** : geomagnetic index from Wingst, Germany (origin : Ursigrams).
- 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 FEBRUARY 2013

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
2	1300	4	9	49	38	11	11	35.2	2	OB
4	1504	3	9	39	39	0	11	43.4	2	OL
5	900	3	11	41	41	0	11	43.7	2	OL
6	1200	3	9	39	39	0	14	6.9	3	OL
7	1330	4	14	54	54	0	17	11.7	2	OL
8	1000	4	16	56	56	0	13	25.6	2	OL
9	1110	3	23	53	53	0	30	24.8	3	OL
10	900	2	13	33	33	0	22	21.4	2	OL
12	900	5	11	61	49	12	0	22.1	2	AE
13	845	3	7	37	26	11	0	15.7	2	AE
15	1400	3	3	33	22	11	11	2.8	2	AE
18	845	8	32	112	59	53	37	26.3	3	OL
19	1245	6	24	84	42	42	31	27.4	2	SV
20	830	5	30	80	41	39	37	23.7	1	SV
21	900	5	16	66	40	26	26	14.0	3	SV
22	910	4	6	46	35	11	11	9.4	2	SV
26	1220	3	11	41	11	30	17	2.9	2	OB

The relative mean sunspot number is 54.4.

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

$K' = 0.926$ (*)

1	***	7	50	13	34	19	78	25	***
2	45	8	52	14	***	20	74	26	38
3	***	9	49	15	31	21	61	27	***
4	36	10	31	16	***	22	43	28	***
5	38	11	***	17	***	23	***		
6	36	12	56	18	104	24	***		

The normalised relative monthly mean sunspot number is 50.

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

The Sun has been observed 17 days on 28 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR FEBRUARY 2013
E AND F BRUNNER'S TYPE GROUPS

NONE

PROBABLE RETURN OF MAJOR GROUPS FOR MARCH 2013

NONE