



Center

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SUNSPOT BULLETIN

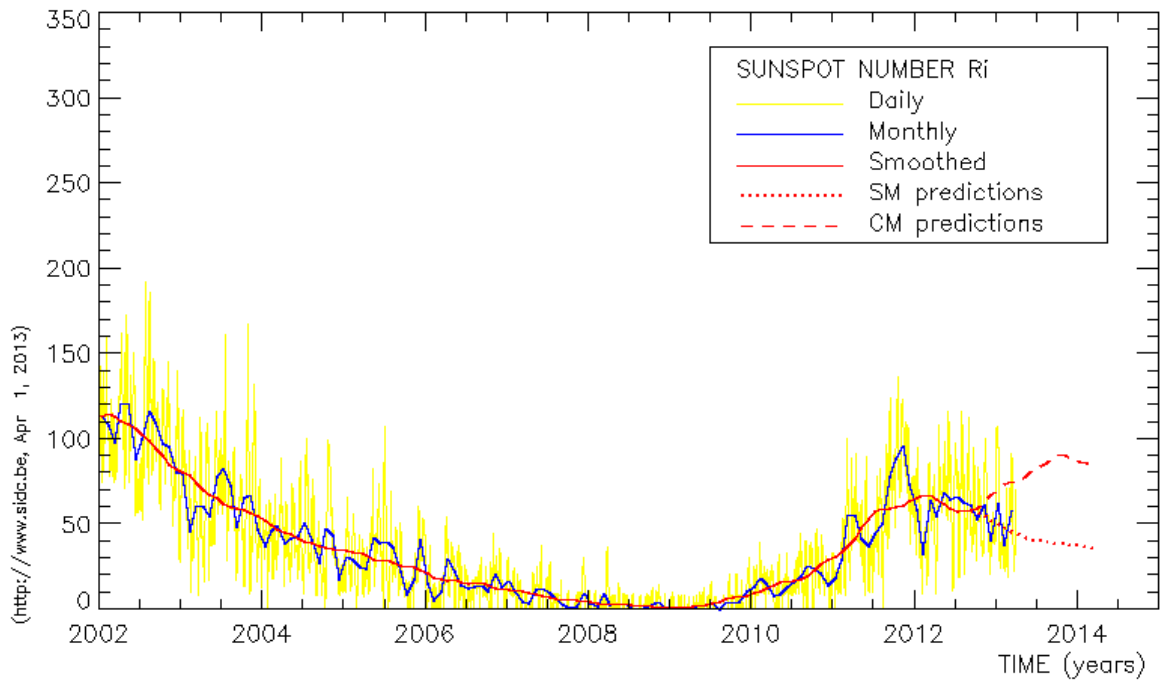
2013

n° 3

Provisional international and normalized hemispheric daily sunspot numbers for March 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	57	15	42
2	71	17	54
3	68	16	52
4	65	0	65
5	61	9	52
6	57	0	57
7	49	15	34
8	54	27	27
9	60	38	22
10	74	49	25
11	75	58	17
12	85	67	18
13	81	69	12
14	91	80	11
15	82	71	11
16	81	66	15
17	88	57	31
18	79	43	36
19	49	33	16
20	38	38	0
21	36	36	0
22	36	25	11
23	36	24	12
24	30	21	9
25	31	20	11
26	22	11	11
27	28	10	18
28	35	22	13
29	53	22	31
30	54	22	32
31	70	30	40
Monthly mean	57.9	32.6	25.3
Cooperating stations	68	60	60



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

		SM	CM		SM	CM		SM	CM		
2012	Oct	58	59	2013	Apr	44	76	2013	Oct	39	91
	Nov	55	63		May	43	78		Nov	39	90
	Dec	53	67		Jun	42	81		Dec	38	88
2013	Jan	51	70		Jul	41	84	2014	Jan	38	87
	Feb	48	73		Aug	40	86		Feb	37	86
	Mar	46	75		Sep	40	89		Mar	37	85

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
28	44	38	-	106	////	3	0/0	11	
1	57	27	-	113	////	2	0/0	33	
2	71	45	-	111	////	0	0/0	18	
3	68	31	-	112	////	0	0/0	11	
4	65	23	-	114	////	0	0/0	5	
5	61	30	-	118	////	2	1/0	6	
6	57	22	-	114	////	0	0/0	3	
7	49	27	-	114	////	0	0/0	3	
8	54	20	-	115	////	0	0/0	2	
9	60	23	-	116	////	0	0/0	9	
10	74	40	-	119	////	0	0/0	5	
11	75	41	-	120	////	1	0/0	7	
12	85	67	-	123	////	11	0/0	8	
13	81	67	-	123	////	2	0/0	4	
14	91	107	-	123	////	1	0/0	4	
15	82	77	-	123	////	22	1/0	6	
16	81	109	-	126	////	5	0/0	12	
17	88	93	-	126	////	1	0/0	56	
18	79	48	-	118	////	0	0/0	8	
19	49	41	-	110	////	1	0/0	8	
20	38	37	-	108	////	1	0/0	11	
21	36	13	-	106	////	0	1/0	14	
22	36	9	-	101	////	2	0/0	7	
23	36	10	-	98	////	1	0/0	12	
24	30	7	-	96	////	0	0/0	6	
25	31	9	-	93	////	2	0/0	3	
26	22	11	-	92	////	0	0/0	3	
27	28	13	-	93	////	0	0/0	27	
28	35	14	-	99	////	0	0/0	11	
29	53	29	-	105	////	0	0/0	29	
30	54	26	-	108	////	0	0/0	19	
31	70	34	-	113	////	0	0/0	6	

- 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 MARCH 2013

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
3	1115	4	17	57	0	57	14	15.5	2	OB
4	820	5	24	74	0	74	23	12.4	3	OL
5	1240	5	27	77	11	66	33	36.6	3	OL
6	1250	4	23	63	0	63	26	12.7	3	OL
8	825	4	26	66	37	29	41	25.2	3	OL
13	845	7	19	89	77	12	33	49.9	1	AE
14	930	8	38	118	106	12	64	141.6	3	AE
18	830	6	23	83	43	40	15	41.4	3	SV
19	1250	4	7	47	35	12	0	20.5	3	SV
21	1420	2	3	23	23	0	0	2.8	1	SV
22	830	2	3	23	23	0	0	1.9	2	SV
25	1200	3	5	35	22	13	13	2.8	2	OB
26	830	2	8	28	13	15	15	2.9	3	OB
27	1230	3	4	34	12	22	22	2.6	3	OB
28	830	2	4	24	12	12	24	3.6	2	OB
30	930	5	19	69	29	40	29	12.9	3	OB
31	905	6	27	87	38	49	33	23.1	3	OL

The relative mean sunspot number is 58.6.

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

$K'=0.811$ (*)

1	***	7	***	13	72	19	38	25	28
2	***	8	54	14	96	20	***	26	23
3	46	9	***	15	***	21	19	27	28
4	60	10	***	16	***	22	19	28	19
5	62	11	***	17	***	23	***	29	***
6	51	12	***	18	67	24	***	30	56
								31	71

The normalised relative monthly mean sunspot number is 48.

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

The Sun has been observed 17 days on 31 possible.

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

Uccle Nø	East Limb		Date and type			West Limb	
	Date		1st obs	CMP	Last obs	Date	
17-2134	3	7.6	13 D	3 14.3	19 J	3	21.1

PROBABLE RETURN OF MAJOR GROUPS FOR APRIL 2013

Nø	New East Limb		New CMP		New West Limb	
17	4	3.2	4	10.0	4	16.7