



## Center

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**SUNSPOT BULLETIN**

2012

n° 4

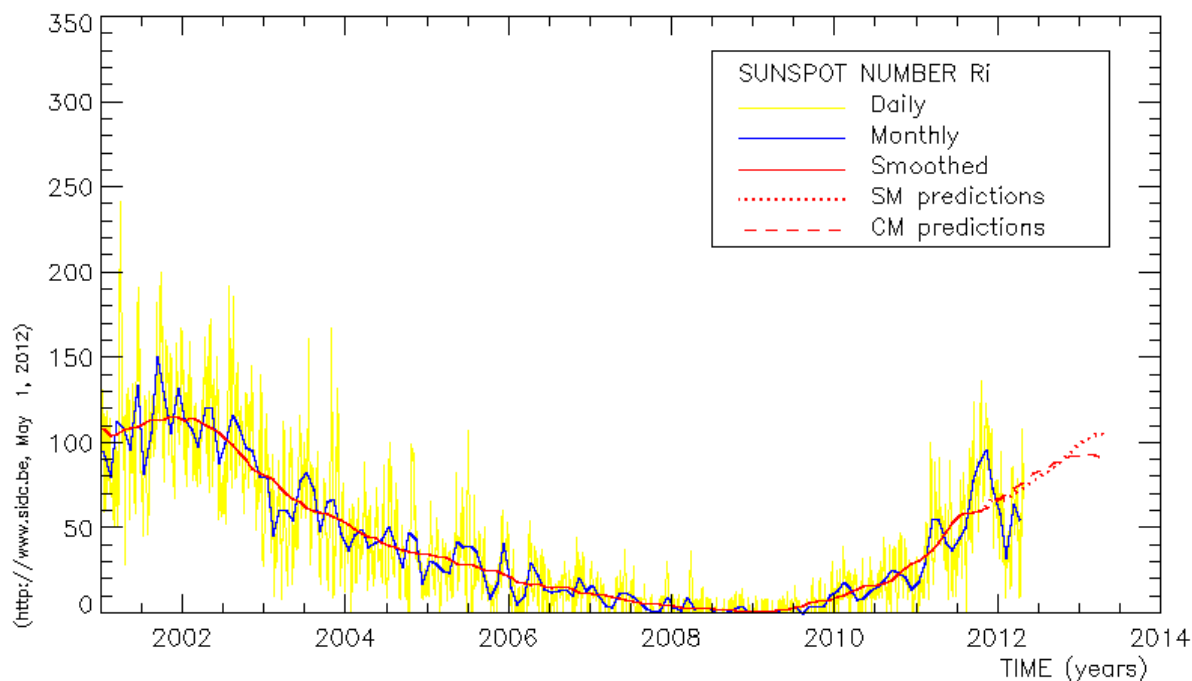
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**Provisional international and normalized hemispheric daily sunspot numbers for April 2012**


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

Date	R' <sub>1</sub>	R' <sub>N</sub>	R' <sub>S</sub>
1	42	19	23
2	51	24	27
3	46	26	20
4	41	27	14
5	34	34	0
6	34	34	0
7	19	19	0
8	16	16	0
9	9	9	0
10	10	10	0
11	19	11	8
12	37	16	21
13	35	27	8
14	33	33	0
15	58	37	21
16	39	23	16
17	51	32	19
18	72	26	46
19	95	35	60
20	108	35	73
21	104	31	73
22	94	31	63
23	89	28	61
24	86	38	48
25	81	41	40
26	75	35	40
27	68	36	32
28	72	30	42
29	71	21	50
30	67	15	52
<b>Monthly mean</b>	<b>55.2</b>	<b>26.6</b>	<b>28.6</b>
<b>Cooperating stations</b>	<b>70</b>	<b>65</b>	<b>65</b>



**Predictions of the monthly smoothed Sunspot Number**  
 using the last provisional value, calculated for October 2011: 59.9 ( $\pm 5\%$ )

		SM	CM			SM	CM			SM	CM
2011	Nov	63	62	2012	May	75	79	2012	Nov	94	92
	Dec	68	64		Jun	78	82		Dec	97	93
2012	Jan	66	67		Jul	81	84	2013	Jan	101	93
	Feb	68	71		Aug	84	86		Feb	103	94
	Mar	70	73		Sep	86	88		Mar	105	93
	Apr	73	76		Oct	90	90		Apr	105	92

**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' <sub>i</sub>	PPSI	600	2800	COS	SFI	XI	Ak	SEA
31	66	27	-	110	////	0	0/0	6	
1	42	22	-	107	////	1	0/0	8	
2	51	27	-	106	////	1	0/0	10	
3	46	28	-	104	////	1	0/0	6	
4	41	20	-	102	////	1	0/0	7	
5	34	30	-	101	////	13	0/0	16	
6	34	24	-	97	////	1	0/0	4	
7	19	19	-	99	////	0	0/0	10	
8	16	11	-	93	////	3	0/0	6	
9	9	2	-	95	////	0	0/0	5	
10	10	1	-	93	////	0	0/0	10	
11	19	5	-	93	////	2	0/0	7	
12	37	15	-	95	////	1	0/0	16	
13	35	19	-	98	////	0	0/0	20	
14	33	29	-	98	////	0	0/0	12	
15	58	26	-	102	////	2	0/0	6	
16	39	21	-	108	////	2	1/0	6	
17	51	24	-	114	////	1	0/0	10	
18	72	66	-	122	////	16	0/0	9	
19	95	129	-	138	////	4	0/0	5	
20	108	211	-	142	////	19	0/0	8	
21	104	223	-	149	////	17	0/0	8	
22	94	184	-	148	////	10	0/0	10	
23	89	171	-	142	////	2	0/0	24	
24	86	134	-	134	////	3	0/0	34	
25	81	99	-	127	////	3	0/0	25	
26	75	75	-	119	////	0	0/0	15	
27	68	55	-	118	////	18	1/0	8	
28	72	44	-	121	////	12	0/0	10	
29	71	44	-	116	////	5	0/0	6	
30	67	58	-	114	////	8	0/0	3	

**R'<sub>i</sub>** : provisional international sunspot numbers from the S.I.D.C.  
**PPSI** : prompt photometric sunspot index from the S.I.D.C. in  $10^{-5} \text{ w/m}^2$  : 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.**

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR APRIL 2012

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	725	4	16	56	28	28	0	24.4	3	OL
2	1140	5	24	74	34	40	37	30.2	2	FC
3	1500	4	26	66	39	27	38	30.4	3	FC
4	900	3	14	44	33	11	19	10.4	2	SV
6	730	2	12	32	32	0	15	4.5	1	SV
7	1000	2	3	23	23	0	12	14.2	1	SV
8	1230	2	2	22	22	0	0	6.3	1	SV
11	730	2	6	26	14	12	14	1.5	2	AE
12	1200	2	8	28	17	11	17	1.7	2	AE
13	745	3	16	46	35	11	22	6.9	2	AE
14	845	2	17	37	37	0	24	20.2	2	AE
16	715	4	23	63	43	20	0	9.2	3	OB
17	900	4	29	69	43	26	0	16.6	3	OB
18	1400	5	51	101	33	68	36	48.2	2	OB
19	845	6	88	148	65	83	118	51.2	3	OB
20	800	7	52	122	45	77	66	109.8	2	AE
21	1140	7	118	188	43	145	130	136.0	3	OB
22	830	6	107	167	56	111	92	89.2	2	OB
23	700	5	76	126	32	94	97	99.3	3	SV
24	845	5	28	78	38	40	44	106.5	1	SV
25	710	7	40	110	54	56	50	68.9	2	OL
26	1153	7	43	113	54	59	43	59.0	2	OL
27	829	6	33	93	48	45	17	47.2	1	OL
28	1108	7	40	110	47	63	16	34.4	2	OL
29	1215	7	30	100	29	71	32	17.2	2	OL
30	730	6	30	90	25	65	44	24.0	2	OL

The relative mean sunspot number is 82.0.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS  $U'=K'U$  FOR APRIL 2012

$K' = 0.784$  (\*)

1	44	7	18	13	36	19	116	25	86
2	58	8	17	14	29	20	96	26	89
3	52	9	***	15	***	21	147	27	73
4	34	10	***	16	49	22	131	28	86
5	***	11	20	17	54	23	99	29	78
6	25	12	22	18	79	24	61	30	71

The normalised relative monthly mean sunspot number is 64.

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

The Sun has been observed 26 days on 30 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR APRIL 2012  
E AND F BRUNNER'S TYPE GROUPS

Uccle Nø	East Limb		Date and type			West Limb	
	Date		1st obs	CMP	Last obs	Date	
10-2122	4	13.4	16 A	4 20.1	24 D	4	26.9
12-2122	4	14.2	16 D	4 21.0	26 D	4	27.7
15-2122	4	11.0	18 C	4 17.7	23 G	4	24.5

PROBABLE RETURN OF MAJOR GROUPS FOR MAY 2012

Nø	New East Limb		New CMP		New West Limb	
10	5	10.3	5	17.0	5	23.8
12	5	11.6	5	18.3	5	25.1
15	5	8.5	5	15.2	5	22.0