



## Center

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**SUNSPOT BULLETIN**

2011

n°11

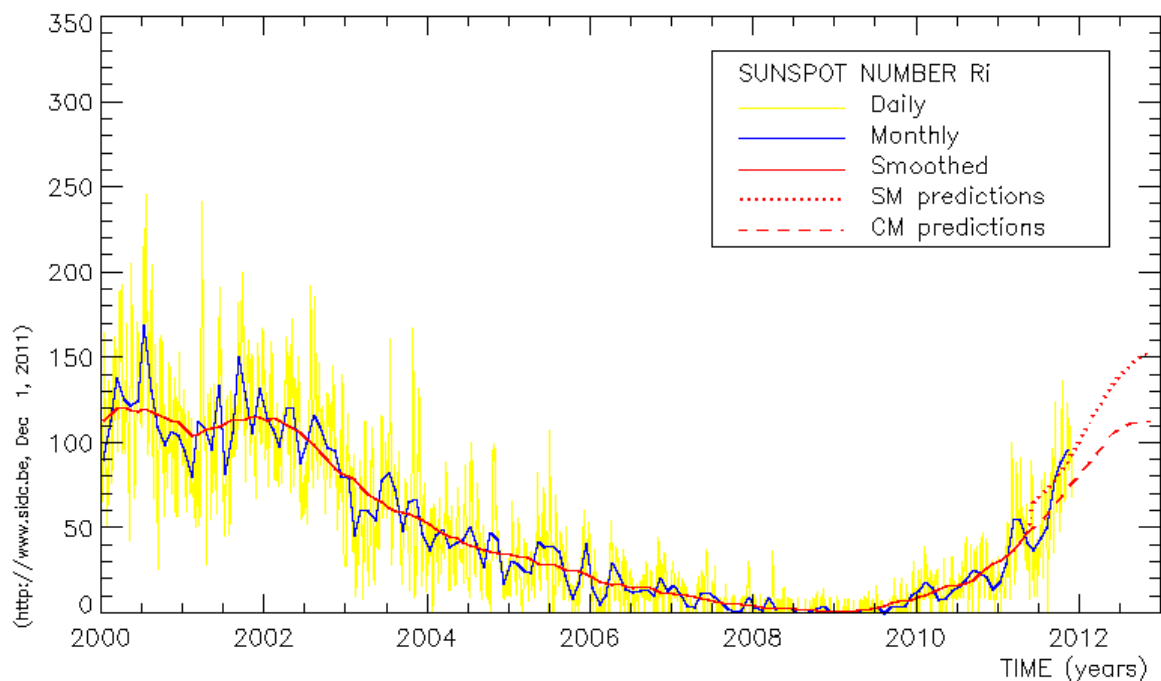
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**Provisional international and normalized hemispheric daily sunspot numbers for November 2011**


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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	87	74	13
2	89	71	18
3	87	67	20
4	69	52	17
5	79	55	24
6	101	69	32
7	120	86	34
8	119	79	40
9	123	76	47
10	118	69	49
11	113	59	54
12	109	51	58
13	113	60	53
14	114	76	38
15	98	74	24
16	87	56	31
17	84	53	31
18	92	43	49
19	89	38	51
20	95	49	46
21	88	51	37
22	96	62	34
23	99	74	25
24	91	71	20
25	110	92	18
26	91	77	14
27	86	78	8
28	68	68	0
29	94	78	16
30	92	74	18
<b>Monthly mean</b>	<b>96.7</b>	<b>66.1</b>	<b>30.6</b>
<b>Cooperating stations</b>	<b>70</b>	<b>64</b>	<b>64</b>



**Predictions of the monthly smoothed Sunspot Number**  
using the last provisional value, calculated for May 2011: 47.6 ( $\pm 5\%$ )

		SM	CM		SM	CM		SM	CM		
2011	Jun	54	50	2011	Dec	79	79	2012	Jun	119	107
	Jul	59	54		Jan	85	83		Jul	125	109
	Aug	61	59		Feb	90	88		Aug	131	111
	Sep	66	64		Mar	97	93		Sep	137	112
	Oct	70	69		Apr	105	98		Oct	142	113
	Nov	74	74		May	112	103		Nov	146	113

**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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**(top right of Web page; Product code is "mobu").**

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

Date	R' <sub>i</sub>	PPSI	600	2800	COS	SFI	XI	Ak	SEA
31	67	76	-	138	////	0	2/0	16	
1	87	56	-	139	////	0	0/0	18	
2	89	57	-	154	////	8	1/0	9	
3	87	141	-	160	////	120	2/1	4	
4	69	159	-	164	////	4	1/0	4	
5	79	182	-	172	////	21	3/0	3	
6	101	246	-	177	////	8	2/0	2	
7	120	324	-	182	////	2	0/0	5	
8	119	266	-	181	////	2	0/0	6	
9	123	267	-	180	////	1	1/0	1	
10	118	221	-	179	////	13	0/0	4	
11	113	182	-	174	////	3	0/0	3	
12	109	126	-	169	////	4	0/0	3	
13	113	124	-	155	////	3	0/0	2	
14	114	65	-	161	////	7	0/0	1	
15	98	55	-	148	////	15	3/0	6	
16	87	57	-	142	////	13	0/0	4	
17	84	46	-	148	////	3	0/0	4	
18	92	41	-	144	////	9	0/0	3	
19	89	46	-	140	////	3	0/0	0	
20	95	60	-	140	////	24	0/0	2	
21	88	75	-	141	////	4	0/0	7	
22	96	81	-	142	////	12	0/0	8	
23	99	86	-	140	////	6	0/0	7	
24	91	18	-	137	////	1	0/0	12	
25	110	102	-	135	////	15	0/0	5	
26	91	90	-	133	////	1	0/0	5	
27	86	78	-	135	////	6	0/0	7	
28	68	42	-	138	////	15	0/0	4	
29	94	70	-	141	////	4	0/0	12	
30	92	68	-	144	////	4	0/0	12	

**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 :  $1 \times \text{Sn} + 10 \times \text{"1"} + 100 \times \text{">1"}$ ).  
**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 NOVEMBER 2011

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	835	8	31	111	99	12	30	17.8	2	OL
2	830	8	27	107	91	16	22	16.4	3	OL
4	830	4	40	80	60	20	13	67.2	2	OL
5	940	6	46	106	74	32	45	89.7	3	OL
9	1150	8	76	156	104	52	115	121.7	3	OB
10	830	8	78	158	100	58	77	81.6	3	OB
12	910	9	41	131	59	72	46	57.2	2	OB
14	930	12	28	148	102	46	12	35.0	2	AE
15	920	9	17	107	83	24	23	19.3	3	SV
16	900	9	19	109	73	36	38	30.5	2	AE
18	1300	8	37	117	47	70	38	15.8	2	AE
19	900	7	22	92	34	58	36	38.4	2	AE
20	945	9	38	128	62	66	25	47.9	2	AE
21	1045	10	58	158	93	65	102	73.0	3	OB
22	900	9	51	141	94	47	88	71.7	3	OB
26	1100	7	21	91	80	11	39	79.5	2	AE
28	930	5	15	65	65	0	16	39.7	3	SV
30	920	7	27	97	73	24	34	44.1	2	SV

The relative mean sunspot number is 116.8.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR NOVEMBER 2011

$$K' = 0.876 (*)$$

1	97	7	***	13	***	19	81	25	***
2	94	8	***	14	130	20	112	26	80
3	***	9	137	15	94	21	138	27	***
4	70	10	138	16	95	22	124	28	57
5	93	11	***	17	***	23	***	29	***
6	***	12	115	18	102	24	***	30	85

The normalised relative monthly mean sunspot number is 102.

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

The Sun has been observed 18 days on 30 possible.

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR NOVEMBER 2011  
E AND F BRUNNER'S TYPE GROUPS

Uccle Nø	East Limb		Date and type			West Limb	
	Date		1st obs	CMP	Last obs	Date	
19-2116	11	1.3	2 D	11 8.1	14 D	11	14.8
12-2117	11	19.4	20 D	11 26.1	28 G	12	2.9

PROBABLE RETURN OF MAJOR GROUPS FOR DECEMBER 2011

Nø	New East Limb	New CMP	New West Limb
19	11 28.9	12 5.7	12 12.4

**Notice:** Starting with the October 2011 issue of the Sunspot Bulletin, the "Monthly Summary of Solar and Geophysical Activity" section contributed by the Regional Warning Center – Brussels has been discontinued. Equivalent information can now be obtained electronically as Weekly Bulletins at URL: <http://www.sidc.be/products/bul/index.php>. You can also have those Weekly Bulletins sent to you automatically by e-mail, by registering on <http://www.sidc.be>, in section "be involved"/"receive product" (top right of Web page; Product code is "bul").