

Center

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SUNSPOT BULLETIN

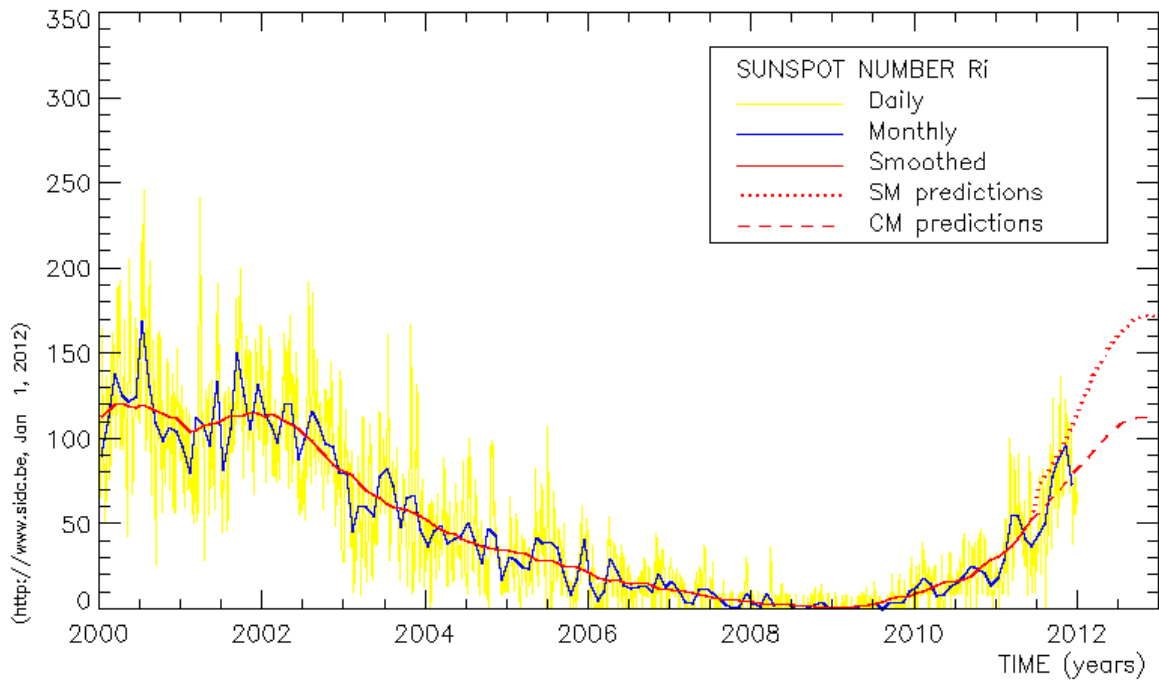
2011

n°12

Provisional international and normalized hemispheric daily sunspot numbers for December 2011

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	86	62	24
2	85	58	27
3	103	71	32
4	108	69	39
5	101	52	49
6	101	52	49
7	88	50	38
8	106	59	47
9	76	45	31
10	68	38	30
11	62	34	28
12	51	32	19
13	54	33	21
14	52	37	15
15	38	23	15
16	50	24	26
17	60	28	32
18	67	26	41
19	77	28	49
20	72	30	42
21	73	37	36
22	69	34	35
23	69	30	39
24	56	23	33
25	65	21	44
26	78	24	54
27	76	17	59
28	73	19	54
29	75	18	57
30	62	18	44
31	62	18	44
Monthly mean	73.0	35.8	37.2
Cooperating stations	70	66	66



Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for June 2011: 53.2 ($\pm 5\%$)

		SM	CM			SM	CM			SM	CM
2011	Jul	60	57	2012	Jan	92	84	2012	Jul	145	109
	Aug	62	61		Feb	100	88		Aug	152	111
	Sep	69	66		Mar	110	93		Sep	158	112
	Oct	74	70		Apr	120	97		Oct	163	113
	Nov	80	75		May	129	102		Nov	167	113
	Dec	86	80		Jun	137	106		Dec	170	114

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., Hiraio 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
30	92	68	-	144	////	4	0/0	12	
1	86	79	-	155	////	2	0/0	8	
2	85	76	-	157	////	0	0/0	9	
3	103	134	-	160	////	3	0/0	12	
4	108	166	-	164	////	1	0/0	5	
5	101	111	-	158	////	5	0/0	3	
6	101	103	-	151	////	0	0/0	1	
7	88	102	-	149	////	2	0/0	1	
8	106	84	-	145	////	0	0/0	3	
9	76	73	-	///	////	3	0/0	4	
10	68	58	-	140	////	1	0/0	12	
11	62	52	-	134	////	2	0/0	8	
12	51	46	-	132	////	2	0/0	8	
13	54	45	-	133	////	1	0/0	4	
14	52	44	-	132	////	0	0/0	4	
15	38	40	-	124	////	0	0/0	0	
16	50	42	-	121	////	0	0/0	0	
17	60	28	-	120	////	0	0/0	1	
18	67	31	-	128	////	3	0/0	1	
19	77	52	-	128	////	0	0/0	8	
20	72	72	-	137	////	7	0/0	6	
21	73	96	-	145	////	18	0/0	7	
22	69	110	-	146	////	6	0/0	6	
23	69	119	-	138	////	1	0/0	1	
24	56	85	-	143	////	2	0/0	3	
25	65	83	-	144	////	3	1/0	2	
26	78	116	-	146	////	20	2/0	0	
27	76	135	-	140	////	19	0/0	0	
28	73	90	-	145	////	16	0/0	4	
29	75	72	-	147	////	23	2/0	10	
30	62	85	-	141	////	6	1/0	8	
31	62	90	-	133	////	13	2/0	7	

- 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 DECEMBER 2011

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
2	1100	6	22	82	53	29	19	41.8	1	SV
5	1030	9	63	153	74	79	100	90.1	2	FC
6	930	10	54	154	71	83	82	77.1	3	FC
7	945	10	37	137	73	64	62	61.1	3	FC
9	945	8	28	108	58	50	30	65.9	3	FC
10	925	7	27	97	56	41	28	58.4	2	FC
11	1245	7	20	90	51	39	15	34.1	1	FC
12	1000	6	24	84	54	30	33	33.3	2	OB
13	1045	5	16	66	38	28	30	32.6	1	OL
15	1215	4	14	54	36	18	29	20.7	2	OL
17	945	6	25	85	44	41	48	11.5	2	OL
18	1242	7	40	110	45	65	34	27.8	3	OL
19	930	7	26	96	46	50	39	63.6	2	AE
20	1100	5	26	76	41	35	24	83.9	1	AE
24	1000	5	35	85	40	45	53	25.4	3	OB
29	905	8	34	114	40	74	21	37.7	2	OL
30	910	6	27	87	27	60	32	29.4	1	OL

The relative mean sunspot number is 98.7.

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

K'= 0.868 (*)

1	***	7	119	13	57	19	83	25	***
2	71	8	***	14	***	20	66	26	***
3	***	9	94	15	47	21	***	27	***
4	***	10	84	16	***	22	***	28	***
5	133	11	78	17	74	23	***	29	99
6	134	12	73	18	95	24	74	30	76
								31	***

The normalised relative monthly mean sunspot number is 86.

(*) 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 DECEMBER 2011
E AND F BRUNNER'S TYPE GROUPS

Uccle Nø	East Limb Date	Date and type 1st obs	West Limb Date
7-2118	12 14.2	18 D 12 20.9	24 C 12 27.7

PROBABLE RETURN OF MAJOR GROUPS FOR JANUARY 2012
NONE

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").