



Sunspot Index and Long-term Solar Observations

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SUNSPOT BULLETIN

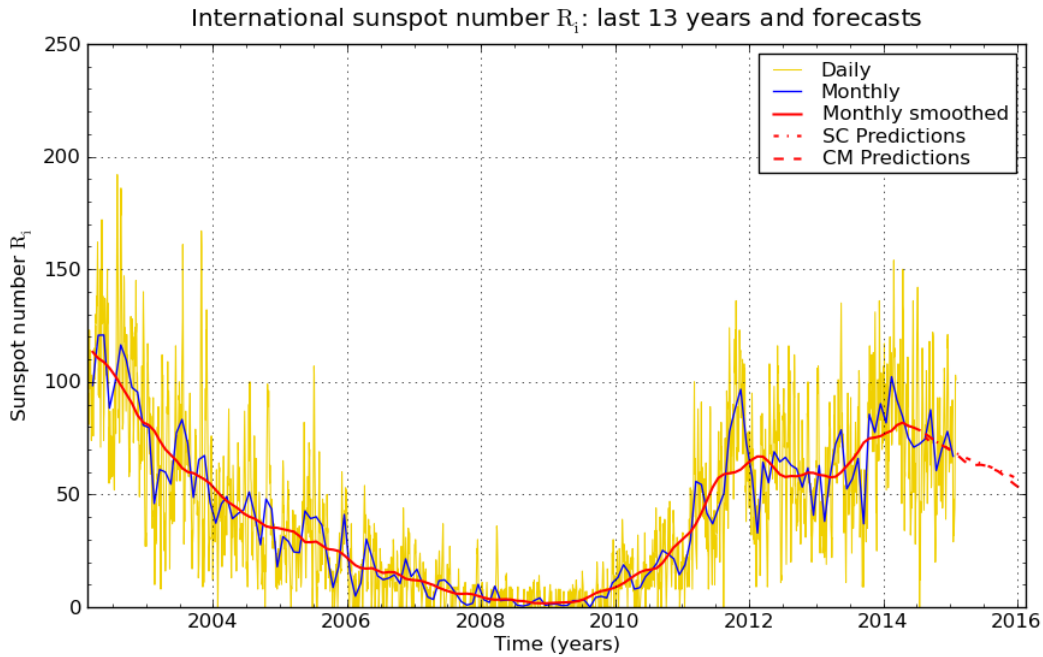
2015

n° 1

Provisional international and normalized hemispheric daily sunspot numbers for January 2015

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	75	8	67
2	89	8	81
3	74	0	74
4	74	0	74
5	66	0	66
6	64	0	64
7	74	22	52
8	74	33	41
9	81	41	40
10	81	40	41
11	88	33	55
12	92	31	61
13	72	27	45
14	58	16	42
15	43	17	26
16	38	15	23
17	29	8	21
18	47	0	47
19	48	14	34
20	38	9	29
21	32	7	25
22	37	7	30
23	42	16	26
24	41	18	23
25	44	21	23
26	80	34	46
27	91	31	60
28	98	36	62
29	103	40	63
30	102	44	58
31	101	49	52
Monthly mean	67.0	20.2	46.8
Cooperating stations	70	61	61



SILSO graphics (<http://sidc.be>) Royal Observatory of Belgium 2015 February 1

Predictions of the monthly smoothed Sunspot Number
using the last provisional value, calculated for July 2014: 78.6 ($\pm 5\%$)

		SM	CM			SM	CM			SM	CM
2014	Aug	75	77	2015	Feb	68	67	2015	Aug	62	62
	Sep	73	75		Mar	67	65		Sep	61	60
	Oct	73	73		Apr	66	63		Oct	60	59
	Nov	72	72		May	65	63		Nov	59	57
	Dec	71	71		Jun	64	63		Dec	58	55
2015	Jan	69	69		Jul	63	63	2016	Jan	56	53

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
31	65	90	-	134	////	39	0/0	8	
1	75	82	-	138	////	9	0/0	6	
2	89	127	-	146	////	7	0/0	16	
3	74	170	-	149	////	23	1/0	14	
4	74	156	-	150	////	113	1/0	25	
5	66	113	-	142	////	118	0/0	21	
6	64	94	-	142	////	13	0/0	13	
7	74	68	-	147	////	15	0/0	21	
8	74	60	-	157	////	12	0/0	13	
9	81	112	-	151	////	12	0/0	9	
10	81	100	-	152	////	7	0/0	10	
11	88	78	-	154	////	14	0/0	11	
12	92	93	-	159	////	18	0/0	8	
13	72	70	-	145	////	105	2/0	8	
14	58	45	-	142	////	10	1/0	8	
15	43	33	-	131	////	1	0/0	5	
16	38	27	-	125	////	8	0/0	6	
17	29	15	-	122	////	5	0/0	8	
18	47	23	-	126	////	2	0/0	4	
19	48	39	-	130	////	2	0/0	6	
20	38	32	-	126	////	1	0/0	2	
21	32	27	-	124	////	1	0/0	13	
22	37	24	-	120	////	0	1/0	13	
23	42	28	-	121	////	6	0/0	8	
24	41	46	-	125	////	12	0/0	7	
25	44	47	-	127	////	0	0/0	7	
26	80	82	-	147	////	12	0/0	14	
27	91	116	-	158	////	16	0/0	14	
28	98	118	-	159	////	117	2/0	8	
29	103	145	-	165	////	50	1/0	13	
30	102	129	-	159	////	4	3/0	14	
31	101	126	-	154	////	2	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 : $1 \times \text{Sn} + 10 \times "1" + 100 \times ">1"$).
- 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).

SOLAR PHYSICS DEPARTMENT

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR JANUARY 2015

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	950	7	24	94	11	83	50	43.6	2	OL
2	1240	8	34	114	11	103	68	85.4	2	AE
4	1410	6	31	91	0	91	41	92.1	3	OB
5	945	4	26	66	0	66	28	92.5	1	AE
7	915	7	26	96	27	69	27	81.9	2	AE
11	1115	8	28	108	46	62	47	49.8	1	AE
13	1510	7	20	90	40	50	38	44.6	1	AM
14	1230	5	19	69	13	56	45	28.7	1	AM
16	1215	3	16	46	14	32	32	34.1	2	AM
17	935	3	11	41	13	28	11	17.4	3	AM
18	1145	7	23	93	22	71	70	27.8	2	AM
21	1320	3	9	39	11	28	17	21.4	1	OB
24	1100	3	19	49	16	33	16	56.8	1	LL
27	1405	7	83	153	46	107	117	119.6	2	OL
29	900	9	41	131	52	79	53	139.6	1	AE
31	910	7	58	128	77	51	12	100.8	2	OL

The relative mean sunspot number is 88.0.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR JANUARY 2015

$K' = 0.882$ (*)

1	83	7	85	13	79	19	***	25	***
2	101	8	***	14	61	20	***	26	***
3	***	9	***	15	***	21	34	27	135
4	80	10	***	16	41	22	***	28	***
5	58	11	95	17	36	23	***	29	116
6	***	12	***	18	82	24	43	30	***
								31	113

The normalised relative monthly mean sunspot number is 78.

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

The Sun has been observed 16 days on 31 possible.