



Sunspot Index and Long-term Solar Observations

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SUNSPOT BULLETIN

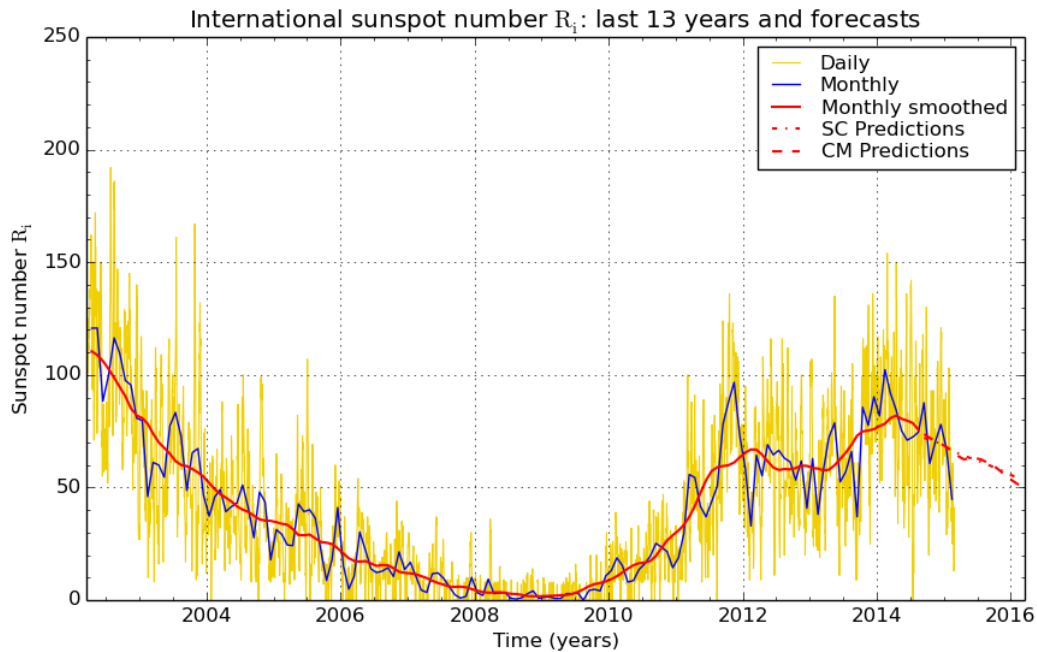
2015

n° 2

Provisional international and normalized hemispheric daily sunspot numbers for February 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	76	50	26
2	64	39	25
3	59	34	25
4	68	50	18
5	63	48	15
6	59	35	24
7	52	34	18
8	53	34	19
9	59	42	17
10	58	45	13
11	41	30	11
12	35	26	9
13	41	41	0
14	35	35	0
15	42	27	15
16	27	18	9
17	25	19	6
18	59	33	26
19	61	38	23
20	43	25	18
21	39	23	16
22	28	28	0
23	31	23	8
24	28	20	8
25	13	13	0
26	16	16	0
27	38	23	15
28	41	24	17
Monthly mean	44.8	31.2	13.6
Cooperating stations	76	67	67



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

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for August 2014: 75.6 ($\pm 5\%$)

		SM	CM		SM	CM		SM	CM		
2014	Sep	72	74	2015	Mar	65	64	2015	Sep	60	60
	Oct	71	72		Apr	64	63		Oct	59	59
	Nov	71	71		May	63	63		Nov	57	57
	Dec	69	69		Jun	63	63		Dec	56	55
2015	Jan	68	68		Jul	62	63	2016	Jan	55	53
	Feb	66	66		Aug	61	62		Feb	54	51

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	101	126	-	154	////	2	0/0	11	
1	76	94	-	142	////	106	0/0	31	
2	64	74	-	144	////	8	0/0	26	
3	59	72	-	149	////	30	0/0	17	
4	68	87	-	145	////	113	1/0	10	
5	63	63	-	142	////	14	0/0	14	
6	59	55	-	143	////	9	0/0	5	
7	52	48	-	153	////	7	0/0	8	
8	53	60	-	153	////	36	0/0	10	
9	59	67	-	146	////	8	1/0	10	
10	58	51	-	141	////	11	0/0	9	
11	41	44	-	131	////	3	0/0	6	
12	35	36	-	128	////	14	0/0	5	
13	41	33	-	125	////	3	0/0	2	
14	35	36	-	120	////	1	0/0	2	
15	42	39	-	120	////	0	0/0	7	
16	27	28	-	118	////	0	0/0	9	
17	25	17	-	119	////	1	0/0	21	
18	59	16	-	121	////	15	0/0	22	
19	61	21	-	119	////	5	0/0	12	
20	43	13	-	120	////	0	0/0	6	
21	39	10	-	116	////	0	0/0	6	
22	28	7	-	118	////	0	0/0	8	
23	31	17	-	117	////	0	0/0	18	
24	28	9	-	114	////	1	0/0	27	
25	13	12	-	111	////	///	///	9	
26	16	9	-	111	////	0	0/0	4	
27	38	23	-	118	////	3	0/0	3	
28	41	35	-	123	////	7	0/0	12	

- 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 FEBRUARY 2015

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-5 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
2	930	5	31	81	54	27	38	33.2	2	AE
3	1215	4	20	60	35	25	35	21.7	1	AE
4	900	4	36	76	60	16	46	104.8	2	AE
5	1315	4	26	66	48	18	35	47.1	2	AE
6	1030	5	29	79	44	35	24	47.7	2	AE
7	930	4	25	65	42	23	23	29.6	2	AE
8	1145	5	30	80	54	26	46	47.5	2	AE
12	945	4	8	48	35	13	35	5.4	2	OB
13	1020	4	12	52	52	0	41	8.4	2	OB
14	1205	3	25	55	55	0	41	12.4	2	AM
15	925	5	19	69	42	27	57	26.3	2	AM
16	845	3	9	39	26	13	13	7.1	3	AM
17	1510	2	2	22	22	0	0	2.6	1	AM
18	910	6	19	79	37	42	0	4.5	2	AM
19	1020	7	21	91	57	34	20	28.3	3	AM
22	1030	3	13	43	43	0	11	2.7	2	OB
23	1200	3	27	57	43	14	26	23.7	3	OL
24	1445	2	20	40	26	14	26	6.3	3	OL
27	1050	3	33	63	36	27	27	28.3	3	OL
28	1131	3	33	63	35	28	52	41.8	3	OL

The relative mean sunspot number is 61.4.

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

$$K' = 0.926 (*)$$

1	***	7	60	13	48	19	84	25	***
2	75	8	74	14	51	20	***	26	***
3	56	9	***	15	64	21	***	27	58
4	70	10	***	16	36	22	40	28	58
5	61	11	***	17	20	23	53		
6	73	12	44	18	73	24	37		

The normalised relative monthly mean sunspot number is 57.

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

The Sun has been observed 20 days on 28 possible.