Sunspot Index Data Center

SUNSPOT BULLETIN

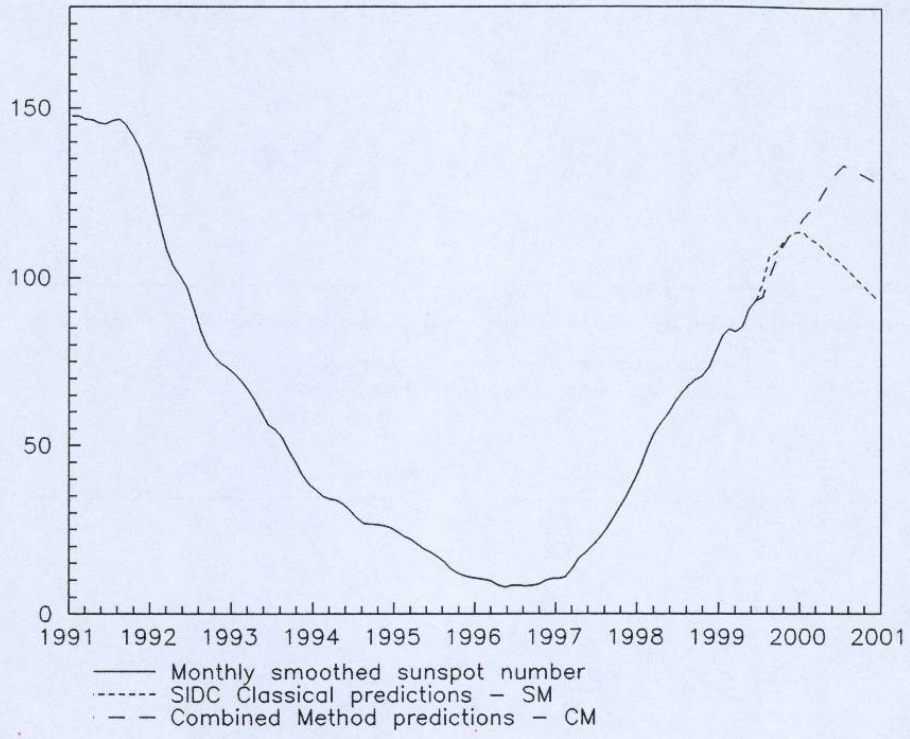
Data Analysis Service supported by the FAGS

2000 n° 2

Provisional international and normalized hemispheric daily sunspot numbers for February 2000

computed at the *Observatoire Royal de Belgique*
using observations from an international network
with the *Locarno Specola Solare* as reference station.

Date	R'_I	R'_N	R'_S
1	71	26	45
2	64	26	38
3	81	29	52
4	99	45	54
5	104	56	48
6	129	59	70
7	130	62	68
8	128	62	66
9	109	37	72
10	122	44	78
11	114	30	84
12	113	21	92
13	108	18	90
14	119	29	90
15	118	24	94
16	131	16	115
17	109	8	101
18	104	16	88
19	89	15	74
20	76	17	59
21	92	31	61
22	100	35	65
23	102	48	54
24	123	68	55
25	131	69	62
26	144	73	71
27	150	69	81
28	143	61	82
29	153	82	71
Monthly mean :	112.3	40.6	71.7
Cooperating stations :	38	32	32



Predictions of the monthly smoothed Sunspot Number
using the last provisional value, calculated for August 1999 : 97.5 (± 5%)

		SM	CM			SM	CM			SM	CM
1999	Sep	104	97	2000	Mar	99	113	2000	Sep	88	131
	Oct	104	102		Apr	97	116		Oct	87	130
	Nov	100	105		May	96	120		Nov	85	129
	Dec	101	107		Jun	94	123		Dec	83	128
2000	Jan	101	109		Jul	92	125	2001	Jan	82	126
	Feb	100	111		Aug	90	127		Feb	81	124

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 idea 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
The **SIDC adjusted method**, a linear algorithm applied to **SM** predictions of which the purpose was to produce predictions taking more into account the trend observed is no more proposed, because of its poor efficiency.

Brussels, March 1, 2000 11:40 UT.
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DEPARTEMENT DE RADIOASTRONOMIE ET PHYSIQUE SOLAIRE

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR FEBRUARY 2000

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBERS TOTAL	NORTH	SOUTH	CENTRAL	PPSI 10-3 WM-2	QUAL	OBS
2	1335	4	11	51	18	33	11	56.5	3	ST
4	940	8	28	108	49	59	12	110.8	3	ST
5	850	7	33	103	57	46	11	141.8	3	PC
7	915	8	44	124	58	66	25	213.5	3	ST
9	945	9	39	129	40	89	38	160.2	3	ST
10	849	6	12	72	24	48	34	108.0	2	ST
11	1155	9	38	128	30	98	84	123.6	3	ST
12	1030	9	31	121	26	95	58	115.3	3	DB
13	1050	11	45	155	25	130	77	118.0	2	FC
14	1210	12	37	157	23	134	46	106.1	3	ST
16	840	14	37	177	23	154	56	83.1	4	ST
17	910	10	47	147	11	136	70	111.4	3	ST
19	1330	7	48	118	22	96	38	101.1	3	DB
20	1030	5	65	115	23	92	27	86.1	4	EV
21	945	7	34	104	46	58	17	59.9	3	ST
22	1155	8	30	110	46	64	0	54.9	2	ST
23	950	7	41	111	59	52	14	47.3	3	ST
25	1040	9	60	150	78	72	61	96.4	3	ST
26	920	11	69	179	89	90	106	130.9	2	DB
27	847	11	73	183	83	100	77	213.6	3	VI

The Sun has been observed 20 days on 29 possible.
The relative mean sunspot number is 127.1.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS U'=K'U FOR FEBRUARY 2000

K'= .942 (*)

1	***	7	116	13	146	19	111	25	141
2	48	8	***	14	147	20	108	26	168
3	***	9	121	15	***	21	97	27	172
4	101	10	67	16	166	22	103	28	***
5	97	11	120	17	138	23	104		
6	***	12	113	18	***	24	***		

The Sun has been observed 20 days on 28 possible.
The normalized relative monthly mean Wolf number is 119.

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

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR FEBRUARY 2000
E AND F BRUNNER'S TYPE GROUPS

Uccle N°	East Limb Date	Date and type 1st obs	CMP	Last obs	West Limb Date
3-1959	1 27.4	2 D	2 3.2	5 F	2 9.9
8-1959	2 2.8	4 B	2 9.6	10 G	2 16.3
13-1959	1 29.2	7 F	2 5.0	10 G	2 11.7
22-1959	2 9.7	11 C	2 16.4	22 F	2 23.2
2-1960	2 20.2	21 C	2 27.0	27 F	3 4.7
7-1960	2 23.4	25 C	3 1.1	27 E	3 7.9
8-1960	2 24.8	25 D	3 2.6	27 F	3 9.3

PROBABLE RETURN OF MAJOR GROUPS FOR MARCH 2000

N°	New East Limb	New CMP	New West Limb
13	2 25.2	3 2.9	3 9.7
22	3 8.1	3 14.9	3 21.6

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

2000 FEBRUARY R^{I}_{IM} = 112.3

Date	R^{I}_{I}	PPSI	600	2800	COS	SFI	XI	Ak	SEA
31	58	37	56	139	-	4	0/0	10	
1	71	49	58	138	-	1	0/0	10	
2	64	47	57	144	-	0	0/0	0	
3	81	58	59	154	-	2	0/0	0	
4	99	101	59	167	-	20	1/0	-	(0911) M3.3,SF,(1919) C7.0,1F
5	104	86	61	168	-	114	0/1	0	(1917) X1.2,3B,II
6	129	67	65	178	-	14	0/0	0	
7	130	115	68	182	-	25	0/0	0	
8	128	97	66	174	-	21	1/0	19	(0842) M1.3,1B,III-II, CME
9	109	100	66	199	-	7	0/0	16	
10	122	90	67	176	-	12	0/0	12	
11	114	91	67	170	-	6	0/0	20	
12	113	87	67	163	-	10	1/0	44	(0351) M1.7,1N,II-IV, CME
13	108	89	62	160	-	4	0/0	16	
14	119	80	60	159	-	2	0/0	40	
15	118	64	61	156	-	11	0/0	18	
16	131	84	61	160	-	6	0/0	-	
17	109	88	59	168	-	112	2/0	7	(1841) M2.5,1B,II (2017) M1.3,2N, II-III, HALO CME
18	104	69	59	141	-	5	0/0	1	
19	89	79	55	145	-	28	1/0	3	(1539) M1.3,1N
20	76	83	54	153	-	16	1/0	6	(0052) C8.5,1N (2200) M2.4,III-II
21	92	90	57	152	-	2	2/0	21	(0826) M1.8 (2313) M1.2,2B
22	100	87	56	164	-	3	3/0	6	(0842) M1.1,SF (1123) M1.2,SF (1954) M1.1
23	102	101	58	185	-	6	0/0	10	
24	123	153	60	192	-	1	1/0	29	(0103) M1.1
25	131	185	65	210	-	9	0/0	0	
26	144	252	64	215	-	7	0/0	0	
27	150	380	-	227	-	28	0/0	0	
28	143	440	68	219	-	2	0/0	17	
29	153	649	70	219	-	26	0/0	6	

The solar activity was low to moderate, reaching on 5 a higher level. The geomagnetic activity was generally quiet to minor storm levels, reaching however a major storm level on 12.

R^{I}_{I}, R^{I}_{IM} : 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/m² : the quantity to subtract from the mean solar constant.
600 : 600 Mhz solar flux from Humain station (Belgium).
2800 : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UGEOI group 2)."The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : **sid** (sudden ionospheric disturbance); **ssc** (sudden storm commencement); **mgst** (magnetic storm); **sfe** (solar flare effect); **1-2-3-4** (class of flares); **M,C** Xray flare class; **II-IV** radio-burst; **T** (ten cm radio-burst); **P** (proton flare); **p** (proton event); **gle** (ground level event : neutron event); **si** (sudden impulse); **F** (Forbush); **CME** (coronal mass ejection); **SFI** Evaluation (1 x Sn+10 x "1"+100 x ">1").