



Sunspot Index Data Center
SUNSPOT BULLETIN

Data Analysis Service supported by the FAGS

1991 n° 3
 Provisional Sunspot numbers for March 1991

From observations at the Locarno Specola Solare
 completed with data from an international network,
 computed at the Observatoire Royal de Belgique
 35 cooperating stations on April 1st, 10 UT

Day	Rt	Day	Rt
1	120	16	188
2	93	17	167
3	71	18	168
4	55	19	142
5	74	20	166
6	88	21	167
7	131	22	171
8	146	23	179
9	167	24	162
10	159	25	128
11	167	26	164
12	163	27	130
13	145	28	122
14	161	29	128
15	182	30	141
		31	115

Mean = 140.6

Predictions of the smoothed monthly Sunspot Numbers

Classical Method		SIDC Adjusted values	
1991 Apr. 127(± 30)	1991 Oct. 114(± 36)	1991 Apr. 118(± 28)	
May 125	Nov. 112	May 116	
Jun. 123	Dec. 109	Jun. 114	
Jul. 121	1992 Jan. 107	Jul. 113	
Aug. 118	Feb. 104	Aug. 111	
Sep. 116	Mar. 102	Sep. 110	

forecasted on the basis of the most recent provisional monthly smoothed
 Sunspot Number calculated for 1990 September : 141.8 (± 5%)

Provisional smoothed values :

1990 Oct. 140(± 20)	1990 Dec. 136	1991 Feb. 131
Nov. 138	1991 Jan. 133	Mar. 129

Brussels, 1991 April 01 A. KOECKELENBERGH and P. CUGNON
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S.I.D.C. SUMMARY OF THE URSIGRAMS

1991 MARCH R'IM = 140.6

Date	R'i	PPSI	600	2800	COS	XFI	XI	Ak	SEA
28	134	150	--	233	910	9	0/0	18	
1	120	93	53	218	906	19	1/0	14	
2	93	70	54	211	902	13	2/0	11	1341 T(1346)
3	71	30	52	211	-	16	3/0	10	1304 + 1425
4	55	26	53	233	903	25	6/1	12	1738 2b(2359)+T
5	74	21	53	213	892	318	4/3	18	1717 3b(0908);2b(1715)
6	88	39	53	209	887	33	4/0	29	
7	131	57	59	213	887	470	9/2	26	0746 3b(0613)+II+IV+T; 1b(1715);2b(2215)
8	146	81	55	214	890	150	3/1	18	1143 T(1142);2b(2024)
9	167	109	62	217	885	55	4/0	9	1242 ssc(2245)
10	159	156	55	225	870	15	0/0	10	1508
11	167	150	56	223	866	25	1/0	5	T(0731)
12	163	179	57	231	865	256	0/1	19	1243 ssc(0453);2b(1240)+T+sid
13	145	159	55	241	852	236	2/2	23	1526 2b(0800)+T+sid;2n(1542)
14	161	136	53	244	832	133	1/1	7	1737 1b(1811)+T+sid
15	182	145	53	244	829	68	4/0	6	T(2222)
16	188	177	57	257	831	163	4/1	7	1047 2b(0044);1b(1043); 2b(2152)+SEA
17	167	138	57	250	832	210	7/1	15	1433 2b(2123)+T+SEA
18	168	119	60	276	820	57	6/0	8	1729 1b(1728);2b(2303)
19	142	162	60	262	823	43	5/0	12	1b(0156)+II+T;ssc(1404)
20	166	193	58	250	828	47	6/0	2	2b(0530)
21	167	214	59	252	845	188	7/1	23	1237 ssc(0601);ssc(0940); 1b(2235)+IV
22	171	218	59	258	840	184	5/1	18	1146 1b(0833);P3b(2248)+II +IV+T
23	179	283	60	233	836	109	9/0	12	1228 2b(0243);pca(0931);2b(2303)
24	162	320	61	260	761	78	5/0	144	1410 ssc(0148);mgst(0342)
25	128	312	65	237	761	235	1/2	76	0805 1b(0802);SEA(1119)
26	164	289	61	230	777	129	1/1	71	2028 3b(2026)
27	130	209	59	204	773	22	1/0	24	1b(2200)
28	122	136	55	199	782	6	0/0	17	3b(0641)+T;end of pca
29	128	86	53	191	789	119	1/1	3	0643 p(2120)>10Mev
30	141	67	50	199	791	22	1/0	16	
31	115	86	50	192	785	145	3/1	9	1649 sf(1907)

High flares activity. Probably decreasing phase of the second maximum of the cycle.

R'i,R'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.m-2: 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).
 COS :thousands of the cosmic ray counts (origin:Ursigrams).
 XFI :X-flares index from the S.I.D.C. (origin:Ursigrams).
 XI :X-flares index from the Ursigrams (M-flares/X-flares).
 Ak :planetary geomagnetic index from Wingst (Germany from Ursigrams).
 SEA :sudden enhancements of atmospherics from Uccle & Humain (Belgium).
 Remarks:sid(sudden ionospheric disturbance);ssc(sudden storm commencement)
 mgst(magnetic storm);sfe(solar flare effect);s-1-2-3-4(class of flares);
 II-IV radio-burst;T(ten cm radio-burst);P(proton flare);p(proton event);gle(ground level event:neutron event)

OBSERVATOIRE ROYAL DE BELGIQUE

DEPARTEMENT 4 RADIOASTRONOMIE ET PHYSIQUE SOLAIRE

DAILY PROVISIONAL

RELATIVE SUNSPOT NUMBERS

STATION UCCLE BELGIUM

MARCH 1991

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBER	REL NUMB CENTRAL ZONE	PPSI 10-5 WM-2	QUAL	OBS
2	1250	3	18	48	20	35.5	1	AK
3	935	6	22	82	37	28.4	1	PC
4	1035	3	19	49	0	35.1	1	AK
6	855	6	47	107	0	66.8	2	AK
7	1200	11	67	177	13	83.0	3	PC
8	1225	10	74	174	28	123.3	2	AK
9	1100	6	62	122	19	152.3	1	PC
10	1200	9	175	265	165	225.7	3	AK
11	1509	8	157	237	139	282.3	2	PC
12	834	7	139	209	153	251.5	3	AK
13	840	8	166	246	137	215.6	4	AK
16	1350	10	122	222	86	237.7	2	CG
17	1145	11	85	195	62	131.3	1	PC
22	1250	10	127	227	145	154.6	2	AK
23	810	11	181	291	222	170.7	3	AK
24	1000	10	116	216	168	179.5	2	CG
25	1025	9	196	286	220	230.8	3	AK
27	842	7	122	192	51	223.3	3	VI
28	814	6	93	153	41	109.0	2	VI
29	849	9	79	169	28	62.2	3	VI
30	940	11	79	189	11	45.9	3	AK
31	955	8	62	142	0	88.2	2	PC

The Sun has been observed 22 days on 31 possible.
The relative mean sunspot number is 181.7.

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

1991 MARCH

$K' = 0.745$ (*)

1	***	7	131	13	183	19	***	25	212
2	35	8	129	14	***	20	***	26	***
3	61	9	90	15	***	21	***	27	142
4	36	10	197	16	165	22	169	28	113
5	***	11	176	17	145	23	216	29	125
6	79	12	155	18	***	24	160	30	140
								31	105

The Sun has been observed 22 days on 31 possible.
The normalized relative monthly mean Wolf number is 134.

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

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR 1991 MARCH
E AND F BRUNNER'S TYPE GROUPS

Uccle N°	East Limb Date	Date and type			West Limb Date
		1st obs	CMP	Last Obs	
18-1839	2 17.5	18 E	2 24.3	3 G	3 3.0
23-1839	2 17.9	19 E	2 24.7	3 H	3 3.4
2-1840	3 5.1	6 E	3 11.9	17 G	3 18.6
4-1840	3 6.4	7 D	3 13.2	17 H	3 19.9
6-1840	3 9.8	10 C	3 16.5	22 H	3 23.3
16-1840	3 17.5	22 F	3 24.3	31 G	3 31.0
19-1840	3 21.2	22 G	3 28.0	31 J	4 3.7
29-1840	3 27.4	29 D	4 3.1	31 E	4 9.9

PROBABLE RETURN OF MAJOR GROUPS FOR 1991 APRIL

N°	New East Limb	New CMP	New West Limb
2	4 1.9	4 8.7	4 15.4
16	4 14.6	4 21.3	4 28.1