

  
**Sunspot Index Data Center**  
**SUNSPOT BULLETIN**

Data Analysis Service supported by the FAGS

1990 n° 11  
 Provisional Sunspot numbers for November 1990

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

Day	R <sub>i</sub>	Day	R <sub>i</sub>
1	77	16	95
2	81	17	103
3	108	18	97
4	146	19	104
5	154	20	98
6	197	21	102
7	209	22	125
8	208	23	114
9	188	24	118
10	163	25	110
11	167	26	111
12	151	27	109
13	129	28	134
14	106	29	152
15	107	30	153

Mean = 130.5

Predictions of the smoothed monthly Sunspot Numbers

Classical Method		SIDC Adjusted values
1990 Dec. 132(± 32)	1991 Jun. 120(± 38)	1990 Dec. 116(± 28)
1991 Jan. 130	Jul. 118	1991 Jan. 114
Feb. 128	Aug. 115	Feb. 112
Mar. 126	Sep. 113	Mar. 110
Apr. 124	Oct. 111	Apr. 108
May 122	Nov. 108	May 106

forecasted on the basis of the most recent provisional monthly smoothed Sunspot Number calculated for 1990 May : 146.7 (± 5%)

Provisional smoothed values :

1990 Jun. 145(± 21)	1990 Aug. 141	1990 Oct. 137
Jul. 143	Sep. 139	Nov. 134

Brussels, 1990 December 01

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

1990 NOVEMBER R'<sub>IM</sub> = 130.5

Date	R' <sub>I</sub>	PPSI	600	2800	COS	XFI	XI	Ak	SEA
31	77	82	39	143	851	10	0/0	22	
1	77	84	38	145	859	8	0/0	12	
2	81	83	40	140	865	2	0/0	12	
3	108	88	41	151	863	2	0/0	8	
4	146	96	41	156	865	29	1/0	4	1007 1b(1736)
5	154	99	43	170	872	35	1/0	2	
6	197	137	48	198	872	48	1/0	3	2b(2040)+ten
7	209	180	49	215	768	13	0/0	7	sfe(1051);forbush?
8	208	183	52	212	874	34	1/0	7	
9	188	163	53	202	874	24	0/0	14	
10	163	192	52	193	877	22	0/0	16	
11	167	133	50	197	875	28	1/0	12	
12	151	126	50	194	874	24	0/0	5	
13	129	104	51	186	871	26	1/0	4	
14	106	117	52	202	877	29	0/0	2	
15	107	157	53	212	882	17	0/0	4	
16	95	233	50	210	---	34	1/0	16	ten(0025)1f(1311)1n(2345)
17	103	299	53	223	888	57	3/0	21	
18	97	332	50	203	883	59	2/0	20	1310 ten(1634)
19	104	342	49	196	885	43	3/0	11	sn(0621);1f(1334)+sid
20	98	343	48	190	886	29	1/0	6	
21	102	301	49	182	885	14	0/0	11	
22	125	242	49	181	882	5	0/0	4	
23	114	190	50	172	885	23	0/0	7	
24	118	135	45	171	878	47	2/0	3	1b(1416)+ten
25	110	91	45	167	878	63	3/0	6	
26	111	74	43	157	871	37	2/0	11	1n(2312)+ssc(2332)
27	109	72	44	157	869	6	1/0	47	1414
28	134	49	44	170	873	7	0/0	19	
29	152	50	46	165	877	10	1/0	6	
30	153	76	47	172	---	--	0/0	7	

R'<sub>I</sub>, R'<sub>IM</sub>: 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;ten(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

## NOMBRES RELATIFS DE WOLF JOURNALIERS

PROVISOIRES

PROVISIONAL

## SUNSPOT RELATIVE NUMBERS

STATION UCCLE BELGIUM

NOVEMBRE 1990

DATE	UT	NOMBRE DE GROUPES	NOMBRE DE TACHES	NOMBRE DE WOLF	NOMB REL ZONE CENTRALE	PSI 10-6 WM-2	QUAL	OBS
1	1010	5	36	86	46	984.	3	AK
3	849	8	60	140	66	1068.	1	VI
4	905	11	102	212	123	1332.	2	FC
5	1110	12	83	203	132	1480.	4	AK
6	1044	15	92	242	101	1093.	2	AK
7	903	13	95	225	37	2060.	3	VI
8	945	14	150	290	108	2317.	3	AK
9	1045	12	77	197	63	1770.	2	VI
11	1026	9	73	163	76	1334.	1	PC
18	1042	4	72	112	88	2187.	3	PC
19	847	5	85	135	110	2394.	2	VI
21	918	4	99	139	92	2311.	3	VI
22	1232	7	109	179	87	2016.	3	VI
27	935	8	43	123	52	872.	3	VI
30	1040	13	35	165	67	1486.	2	VI

LE SOLEIL A ETE OBSERVE 15 JOURS SUR 30 POSSIBLES  
LE NOMBRE RELATIF DE WOLF MOYEN EST DE 174.1

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NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS

U'=K'U FOR 1990 NOVEMBER

K' = 0.797 (\*)

1	68	7	179	13	***	19	107	25	***
2	***	8	231	14	***	20	***	26	***
3	111	9	156	15	***	21	110	27	98
4	168	10	***	16	***	22	142	28	***
5	161	11	129	17	***	23	***	29	***
6	192	12	***	18	89	24	***	30	131
								31	***

THE SUN WAS OBSERVED 15 DAYS ON 30 POSSIBLE  
THE NORMALISED RELATIVE MONTHLY MEAN WOLF NUMBER IS 138

\* K' IS THE MEAN OF THE MONTHLY K'S FOR THE LAST FIVE YEARS

UCCLE OBSERVATIONAL MAJOR SUNSPOTS FOR 1990 NOVEMBER  
E AND F BRUNNER'S TYPE GROUPS

UCCLE NO	EAST LIMB DATE	DATE AND TYPE 1ST OBS	DATE AND TYPE CMP	LAST OBS	WEST LIMB DATE
18-1835	10 29.3	4 A	11 5.0	11 H	11 11.8
31-1835	10 31.3	7 E	11 7.1	11 J	11 13.8
35-1835	11 12.7	18 F	11 19.4	22 F	11 26.2
36-1835	11 13.6	18 F	11 20.3	22 F	11 27.1

PROBABLE RETURN OF MAJOR GROUPS FOR 1990 JANUARY

NO	NEW EAST LIMB	NEW CMP	NEW WEST LIMB
18	11 25.7	12 2.4	12 9.2
31	11 26.8	12 3.5	12 10.3
35	12 9.9	12 16.6	12 23.4
36	12 10.8	12 17.6	12 24.3