



SUNSPOT BULLETIN

Supported by UNESCO and ICSU through the FASS

1989 , N° 2

Provisional Sunspot-Numbers for FEBRUARY 1989

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Dependent on observations at LOCARNO Specola Solare
 complemented by an international network and
 determined at the Observatoire Royal de Belgique.
 Thirty six coop. stations on MARCH 1989, 1st, 1000UT
 The definitive sunspot numbers for 1988 are published
 in SIDC-NEWS n° 1-89(included)

Day	R' i	Day	R' i
1	141	16	195
2	144	17	201
3	164	18	163
4	133	19	157
5	127	20	169
6	127	21	149
7	132	22	142
8	161	23	134
9	172	24	153
10	192	25	189
11	190	26	176
12	216	27	147
13	210	28	128
14	208	-	-
15	185	-	-

Mean = 164 . 5

Predictions of the smoothed monthly Sunspot Numbers

Classical Method		S.I.D.C Adjusted values	
1989 Mar.159(±38)	1989 Sep.184(±60)	1989 Mar.150(±36)	
Apr.165	Oct.184	Apr.157	
May 171	Nov.182	May 165	
Jun.176	Dec.179	Jun.171	
Jul.182	1990 Jan.176	Jul.178	
Aug.184(±43)	Feb.172(±57)	Aug.186(±43)	

Forecasted values on the basis of the latest provisional
 monthly smoothed Sunspot Number: 1988 August = 113.7 ± 5%

Provisional smoothed values:

1988 Sep.119	1988 Nov.131	1989 Jan.147
Oct.125	Dec.139	Feb.153

Yearly mean value for 1988 is :100.2

Brussels, 1989 MARCH ,1st

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S.I.D.C. SUMMARY OF THE URSIGRAMS										
1989 FEBRUARY R' = 164 . 5										
im										
Date	R'	PPSI	600	2800	COS	XFI	XI	Ak	SEA	
I										
31	154	75	67	195	895	69	5/0	31	2b(1158)+II,IV+ten+	ssc+ sid
1	141	49	65	189	884	41	2/0	23		
2	144	44	66	175	904	25	1/0	22		
3	164	61	66	197	905	16	2/0	44	ten(1003)	
4	133	29	70	192	903	114	0/1	27	0910+0953,X1(0950)+sid	
5	127	27	74	201	902	15	0/0	21		
6	127	73	76	216	903	16	4/0	24	1435	coronal hole
7	132	113	81	218	906	10	2/0	22		
8	161	107	80	248	911	53	4/0	14		
9	172	145	83	277	919	21	1/1	22	1254	2b(1251)+1b(1256)+sid
10	192	252	81	279	906	123	0/1	11	1200	3b(0406)+II+ten+sid 1n(1212)+ten
11	190	266	78	264	917	20	1/0	10	1120	
12	216	308	77	263	905	25	0/0	17		
13	210	257	-	268	898	30	1/0	24		
14	208	283	-	258	892	24	1/0	14		
15	185	241	-	241	893	17	0/0	19	1718	mgst(1619)
16	195	202	-	240	905	44	3/0	13		
17	201	144	-	239	894	13	1/0	6		
18	162	78	81	214	897	7	0/0	8		
19	157	74	81	216	905	17	0/0	10	1346	
20	169	103	77	210	917	32	1/0	21	1b(1354)+ten	
21	149	139	78	222	913	53	5/0	12		
22	142	163	81	218	906	49	3/0	12		
23	134	163	79	222	906	19	1/0	5		
24	153	141	78	221	904	22	0/0	9		
25	189	114	82	211	896	19	0/0	6		
26	176	98	81	200	892	12	0/0	3		
27	147	61	74	173	899	23	1/0	8		
28	128	85	72	167	-	26	1/0	14		

!1-20 high solar activity; after 20 decrease of activity. Possible
!beginning of the maximum phase of the cycle nr.22.

Ri ,Rim: 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 at 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);s-1-2-3/n(class of flares);II-IV radio-burst;
ten(ten cm radio-burst);...

OBSERVATOIRE ROYAL DE BELGIQUE

DEPARTEMENT 4 RADIOASTRONOMIE ET PHYSIQUE SOLAIRE

NOMBRES RELATIFS DE WOLF JOURNALIERS

PROVISOIRES

PROVISIONAL

SUNSPOT RELATIVE NUMBERS

STATION UCCLE BELGIUM

FEVRIER 1989

DATE	UT	NOMBRE DE GROUPES	NOMBRE DE TACHES	NOMBRE DE WOLF	NOMB REL ZONE CENTRALE	PSI 10-6 WM-2	QUAL	OBS
6	0913	9	59	149	37	932.	2	VI
7	0848	9	51	141	42	1199.	3	VI
8	0921	8	74	154	32	1587.	2	ST
9	1001	9	74	164	44	2211.	3	VI
10	0857	8	112	192	28	2093.	3	VI
13	0831	9	140	230	98	2402.	1	VI
14	0859	8	211	291	142	2904.	3	ST
16	0844	10	125	225	60	2110.	1	VI
17	0932	12	111	231	56	1943.	1	VI
20	0845	8	92	172	66	1014.	1	VI
21	1236	7	92	162	109	1289.	2	VI
22	0839	6	147	207	95	1438.	3	ST
23	1405	5	108	158	93	929.	2	ST
24	1013	9	130	220	47	816.	3	ST
25	0846	9	148	238	70	802.	2	ST
27	1206	11	54	164	72	720.	1	VI
28	0953	9	74	164	89	1230.	2	ST

LE SOLEIL A ETE OBSERVE 17 JOURS SUR 28 POSSIBLES
LE NOMBRE RELATIF DE WOLF MOYEN EST DE 191.9

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NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS

U* = K*U FOR 1989 FEBRUARY

K* = .929 (*)

1	***	7	130	13	213	19	***	25	221
2	***	8	143	14	270	20	159	26	***
3	***	9	152	15	***	21	150	27	152
4	***	10	178	16	208	22	192	28	152
5	***	11	***	17	214	23	146	29	***
6	138	12	***	18	***	24	204	30	***
								31	***

THE SUN WAS OBSERVED 17 DAYS ON 28 POSSIBLE
THE NORMALISED RELATIVE MONTHLY MEAN WOLF NUMBER IS 177

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

UCCLE OBSERVATIONAL MAJOR SUNSPOTS FOR 1989 FEBRUARY
E AND F BRUNNER'S TYPE GROUPS

UCCLE NO	EAST LIMB		DATE AND TYPE			WEST LIMB	
	DATE	IST OBS	DATE	TYPE	LAST OBS	DATE	
7-1812	2	4.2	6	F	2	11.0	17 G
10-1812	2	7.4	8	G	2	14.1	17 H
11-1812	2	7.3	8	D	2	14.1	20 G
22-1812	2	13.6	16	C	2	20.4	25 G
26-1812	2	15.7	17	A	2	22.4	28 G
31-1812	2	22.5	24	C	3	1.3	28 E

PROBABLE RETURN OF MAJOR GROUPS FOR 1989 MARCH

UCCLE NO	NEW EAST LIMB		NEW CMP		NEW WEST LIMB	
7	3	4.7	3	11.4	3	18.2
11	3	7.3	3	14.0	3	20.8
22	3	12.6	3	19.3	3	26.1