



Sunspot Index Data Center

SUNSPOT BULLETIN

Data Analysis Service supported by the FAGS

1989 , No 12

Provisional Sunspot-Numbers for DECEMBER 1989

Dependent on observations at LOCARNO Specola Solare complemented by an international network and determined at the Observatoire Royal de BELGIQUE. Twenty-seven coop. stations on JANUARY 1990, 1st, 1100UT

Day	R _r	Day	R _r
1	198	16	106
2	196	17	126
3	203	18	108
4	182	19	131
5	192	20	127
6	177	21	111
7	217	22	157
8	167	23	189
9	161	24	183
10	138	25	190
11	104	26	208
12	105	27	240
13	113	28	249
14	100	29	213
15	77	30	264
		31	186

Mean = 165 . 1

Predictions of the smoothed monthly Sunspot Numbers		S.I.D.C. Adjusted values	
Classical Method		S.I.D.C. Adjusted values	
1990 JAN.160(±40)	1990 JUL.137(±34)	1990 JAN.169(±42)	
FEB.155	AUG.134	FEB.163	
MAR.152	SEP.131	MAR.158	
APR.148	OCT.127	APR.153	
MAY.145	NOV.125	MAY.149	
JUN.140(±35)	DEC.122(±30)	JUN.143(±36)	

Forecasted values on the basis of the latest provisional monthly smoothed Sunspot Number: 1989 JUNE = 158 . 3 ±5%
Provisional smoothed values:

Classical		Weighted values	
1989 JUL.165	SEP.172	NOV.167	1989
AUG.170	OCT.170	DEC.164

Brussels, 1990 JANUARY , 1st

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

1989 DECEMBER R_{IM} = 165.1

Date	R _I	PPSI	600	2800	COS	XFI	XI	Ak	SEA
30	182	174	54	249	792	117	1/1	21	1159 P(1154)+ten+sid+p(1345)pa
1	198	173	52	235	803	19	0/0	41	
2	196	136	49	220	808	108	1/0	20	1230 2b(2235)+ten+p(1340)
3	203	124	50	212	812	17	0/0	25	
4	182	114	49	216	810	31	3/0	34	1430 ssc(1119)
5	192	116	50	214	912	25	1/0	13	
6	177	122	49	212	829	5	0/0	5	
7	217	116	49	227	827	26	3/0	10	
8	167	104	50	209	834	11	0/0	6	
9	161	79	49	201	832	12	1/0	4	
10	138	78	48	183	822	4	0/0	2	
11	104	43	47	176	825	9	0/0	6	
12	105	25	48	167	828	3	0/0	10	
13	113	29	48	168	839	4	0/0	9	
14	100	31	46	166	839	19	1/0	13	
15	77	31	45	170	830	8	0/0	11	1356
16	106	47	44	171	834	4	0/0	18	
17	126	85	46	181	829	6	0/0	11	
18	108	96	46	189	837	40	2/0	10	ten(0837-2337)+1b(2336)+ 2n(2335)
19	131	103	49	193	835	24	0/0	5	1253
20	127	95	50	194	835	23	1/0	7	2b(1902)+ten
21	111	99	48	195	834	7	0/0	10	1428
22	157	92	48	209	827	96	1/0	22	ssc(0022)+ten(2300)+sfe
23	189	104	51	221	827	12	3/0	12	1316
24	183	127	50	240	833	36	1/0	27	1331
25	190	162	56	272	834	78	3/0	16	ten(0430)
26	208	194	60	260	830	53	3/0	27	ten(0523)+2b(0521)+1b(1808 +sid
27	240	258	60	285	825	43	3/0	27	
28	249	325	57	255	816	48	4/0	10	ten(0318)
29	213	313	57	269	798	53	5/0	56	1100+1226 ten+flare(1059), +1f(1817)+ten
30	264	258	59	271	---	120	1/1	26	
31	186	273	--	246	---	120	0/1	27	0931 ten(1600)

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 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); 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

DECEMBRE 1989

DATE	UT	NOMBRE DE GROUPES	NOMERE DE TACHES	NOMBRE DE WOLF	NOMB REL ZONE CENTRALE	PPSI 10-6 WM-2	QUAL	OBS
1	1051	16	90	250	119	1715.	2	VI
2	1245	17	94	264	56	1359.	3	AK
3	1050	17	128	298	138	1198.	4	AK
4	1048	12	83	203	71	1604.	2	VI
5	1338	9	90	180	69	954.	1	VI
7	1148	14	119	259	96	1198.	2	VI
9	1100	11	51	161	54	729.	1	CG
11	1026	6	35	95	49	460.	2	VI
16	1100	5	15	65	0	387.	1	CG
21	1255	8	44	124	68	822.	2	VI
23	1130	14	65	205	74	1277.	1	CG
24	1330	12	47	167	36	1431.	1	ST
27	1316	13	101	231	109	2226.	1	PC

LE SOLEIL A ETE OBSERVE 13 JOURS SUR 31 POSSIBLES
LE NOMBRE RELATIF DE WOLF MOYEN EST DE 192.5

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NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS

U* = K*U FOR 1989 DECEMBER

K* = 1.038 (*)

1	259	7	268	13	***	19	***	25	***
2	274	8	***	14	***	20	***	26	***
3	309	9	167	15	***	21	128	27	239
4	210	10	***	16	67	22	***	28	***
5	186	11	98	17	***	23	212	29	***
6	***	12	***	18	***	24	173	30	269
								31	***

THE SUN WAS OBSERVED 13 DAYS ON 31 POSSIBLE
THE NORMALISED RELATIVE MONTHLY MEAN WOLF NUMBER IS 204

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

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

UCCLE NO	EAST LIMB DATE	DATE AND TYPE	WEST LIMB DATE
		IST OBS CMP LAST OBS	
34-1823	12 20.8	23 C 12 27.5 27 E	1 3.3
37-1823	12 22.3	23 E 12 29.1 27 E	1 4.8

PROBABLE RETURN OF MAJOR GROUPS FOR 1989 JANUARY

NO NEW EAST LIMB NEW CMP NEW WEST LIMB

NONE