

Sunspot Index Data Center

SUNSPOT BULLETIN

Data Analysis Service supported by the FAGS

1993

n° 10

Provisional Sunspot numbers for October 1993

From observations at the *Locarno Specola Solare*,
completed with data from an international network and
computed at the *Observatoire Royal de Belgique*.
33 cooperating stations on November 1, 10 UT

Day	R' _i	Day	R' _i
1	64	16	56
2	95	17	38
3	87	18	37
4	100	19	44
5	90	20	63
6	71	21	66
7	65	22	61
8	64	23	61
9	76	24	52
10	58	25	39
11	65	26	55
12	56	27	39
13	35	28	29
14	29	29	21
15	52	30	24
		31	25

Mean = 55.4

Predictions of the smoothed monthly Sunspot Numbers :

Classical Method		SIDC Adjusted values	
1993 Nov.	49(± 11)	1994 May	37(± 11)
Dec.	47	Jun.	35
1994 Jan.	45	Jul.	33
Feb.	43	Aug.	31
Mar.	41	Sep.	29
Apr.	39	Oct.	27
		1993 Nov.	30(± 6)
		Dec.	28
		1994 Jan.	25
		Feb.	23
		Mar.	21
		Apr.	19

forecasted on the basis of the most recent provisional monthly smoothed
Sunspot Number calculated for 1993 April : 63.4 (± 5%)

Provisional smoothed values :

1993 May	61(± 8)	1993 Jul.	57	1993 Sep.	53
Jun.	59	Aug.	55	Oct.	51

Brussels, 1993 November 01

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

1993 OCTOBER $R'_{IM} = 55.4$

Date	R' _I	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
30	40	80	29	121	961	7	0/0	22		2143 ssc
1	64	124	29	117	969	23	0/0	27		
2	95	164	29	127	973	25	1/0	10	1211	T(0628)
3	87	191	29	125	975	38	0/0	7	1240	T(0930) SEA(0926)
4	100	234	30	121	973	16	0/0	7		
5	90	215	30	124	974	6	0/0	8		
6	71	161	29	118	972	4	0/0	14	1326	1312 ssc
7	65	136	29	117	964	16	0/0	4		T(1359)
8	64	99	29	113	969	11	0/0	15	1412	
9	76	58	29	110	962	105	2/0	40	0809	1543;3b(1905)
10	58	53	30	107	956	2	0/0	32		
11	65	52	29	103	967	2	0/0	29		
12	56	47	28	98	975	1	0/0	17		
13	35	39	27	95	985	1	0/0	12		
14	29	35	28	91	988	0	0/0	8		
15	52	37	28	94	991	0	0/0	4		
16	56	37	28	91	996	3	0/0	8		
17	38	27	28	90	1000	1	0/0	10		
18	37	18	28	87	995	1	0/0	8		
19	44	15	29	89	999	5	0/0	13		
20	63	23	29	94	999	5	0/0	7		
21	66	46	29	95	995	1	0/0	6		
22	61	39	29	92	990	0	0/0	16	1244	1224 ssc;mgst(0040)
23	61	35	28	92	983	1	0/0	13	1551	?
24	52	23	28	92	974	1	0/0	12		
25	39	18	26	87	966	11	0/0	35		
26	55	6	26	89	-	13	0/0	-		
27	39	7	26	87	970	2	0/0	38		
28	29	1	26	-	967	-	-	21	0809	?
29	21	5	27	92	969	1	0/0	14		
30	24	12	26	91	969	1	0/0	4		
31	25	41	26	91	974	2	0/0	12		

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/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).

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 - UGEOI group 3).

XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOI 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);

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); si (sudden impulse); F (Forbush); SFI Evaluation (1 x S_n+10 x "1"ⁿ+100 x ">1").

DEPARTEMENT 4 RADIOASTRONOMIE ET PHYSIQUE SOLAIRE

DAILY PROVISIONAL

RELATIVE SUNSPOT NUMBERS

STATION UCCLE BELGIUM

OCTOBER 1993

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI 10-3 WM-2	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	1245	2	49	69	56	13	56	59.7	2	DC
2	1046	4	72	112	75	37	75	98.7	2	PC
3	1503	4	83	123	74	49	62	117.5	3	DC
4	1325	4	92	132	79	53	68	147.9	4	DC
5	825	4	59	99	50	49	77	148.0	2	DC
6	835	3	56	86	46	40	40	93.2	3	DC
7	934	2	50	70	33	37	37	114.0	3	VI
8	941	3	40	70	20	50	39	97.1	2	VI
9	930	3	31	61	16	45	0	36.3	1	PC
10	1035	2	32	52	0	52	0	46.1	2	AK
11	850	4	30	70	11	59	13	36.7	2	DC
12	1430	4	30	70	11	59	11	43.6	4	DC
13	829	3	17	47	13	34	34	33.3	3	VI
15	1146	4	15	55	28	27	44	36.4	4	DC
16	933	4	25	65	28	37	28	38.3	4	VI
17	925	3	10	40	15	25	15	40.3	2	DC
18	823	3	7	37	13	24	0	31.8	2	DC
21	1450	5	32	82	24	58	70	35.9	4	DC
22	1105	5	23	73	14	59	73	28.1	2	DC
26	848	5	12	62	39	23	23	2.7	3	DC
28	825	3	7	37	26	11	13	0.6	4	DC
29	1006	1	8	18	18	0	18	1.5	3	AK
30	1125	2	7	27	15	12	15	6.0	3	DC

The Sun has been observed 23 days on 31 possible.
The relative mean sunspot number is 67.7.

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

1993 OCTOBER

$K' = 0.854 (*)$

1	58	7	59	13	40	19	***	25	***
2	95	8	59	14	***	20	***	26	52
3	105	9	52	15	46	21	70	27	***
4	112	10	44	16	55	22	62	28	31
5	84	11	59	17	34	23	***	29	15
6	73	12	59	18	31	24	***	30	23
								31	***

The Sun has been observed 23 days on 31 possible.
The normalized relative monthly mean Wolf number is 57.

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

UCCLE OBSERVATIONAL MAJOR SUNSPOT GROUPS FOR 1993 OCTOBER
E AND F BRUNNER'S TYPE GROUPS

Uccle N°	East Limb		Date and type			West Limb	
	Date		1st obs	CMP	Last Obs	Date	
4-1874	9	26.8	28 E	10 3.6	9 G	10	10.3
6-1874	9	29.9	1 C	10 6.7	12 G	10	13.4
10-1874	10	7.4	8 C	10 14.2	18 H	10	20.9
14-1874	10	8.8	15 B	10 15.5	21 E	10	22.3

PROBABLE RETURN OF MAJOR GROUPS FOR 1993 NOVEMBER

N°	New East Limb		New CMP	New West Limb	
4	10	23.8	10 30.6	11	6.3
6	10	27.2	11 2.9	11	9.7
14	11	4.9	11 11.7	11	18.4

OCTOBER 1993

PROVISIONAL INTERNATIONAL NORMALIZED HEMISPHERIC SUNSPOT NUMBERS

Date	Ri	Rn	Rs
1	64	53	11
2	95	62	33
3	87	44	43
4	100	56	44
5	90	48	42
6	71	37	34
7	65	31	34
8	64	18	46
9	76	18	58
10	58	0	58
11	65	10	55
12	56	10	46
13	35	14	21
14	29	10	19
15	52	23	29
16	56	23	33
17	38	15	23
18	37	12	25
19	44	15	29
20	63	26	37
21	66	15	51
22	61	11	50
23	61	15	46
24	52	17	35
25	39	17	22
26	55	29	26
27	39	16	23
28	29	15	14
29	21	21	0
30	24	13	11
31	25	10	15

MONTHLY MEAN : 55.4 22.7 32.7

COOPERATING STATIONS : 33 20 20

PILOT STATION : Specola Solare Ticinese, Locarno

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