


 Sunspot Index Data Center
SUNSPOT BULLETIN

Data Analysis Service supported by the **FRAGS**

1993 n° 7
 Provisional Sunspot numbers for July 1993

From observations at the Locarno Specola Solare
 completed with data from an international network,
 computed at the Observatoire Royal de Belgique
 34 cooperating stations on August 1st, 9 UT

Day	Rt	Day	Rt
1	58	16	63
2	57	17	67
3	66	18	80
4	80	19	76
5	68	20	69
6	58	21	64
7	45	22	54
8	40	23	68
9	38	24	66
10	31	25	61
11	35	26	55
12	35	27	66
13	51	28	59
14	63	29	47
15	66	30	45
		31	46

Mean = 57.3

Predictions of the smoothed monthly Sunspot Numbers

Classical Method		SIDC Adjusted values	
1993 Aug. 56(± 13)	1994 Feb. 44(± 13)	1993 Aug. 38(± 8)	
Sep. 54	Mar. 42	Sep. 36	
Oct. 52	Apr. 40	Oct. 34	
Nov. 50	May 38	Nov. 32	
Dec. 48	Jun. 36	Dec. 30	
1994 Jan. 46	Jul. 34	1994 Jan. 27	

forecasted on the basis of the most recent provisional monthly smoothed
 Sunspot Number calculated for 1993 January : 71.3 (± 5%)

Provisional smoothed values :			
1993 Feb. 69(± 10)	1993 Apr. 65	1993 Jun. 60	
Mar. 67	May 62	Jul. 58	

Brussels, 1993 August 01 A. KOECKELENBERGH and P. CUGNON
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S.I.D.C. SUMMARY OF THE URSIGRAMS

1993 JULY $R'_{IM} = 57.3$

Date	R'_I	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
30	70	105	35	116	978	1	0/0	16		
1	58	81	34	108	968	5	0/0	27	1401	SEA(1750)
2	57	61	34	110	948	103	1/0	26		2b(1311)+T
3	66	58	34	111	955	15	1/0	24	1041	SEA(1054)
4	80	62	34	107	959	117	2/0	10	0748	SEA(1124), 2b(1102)
5	68	44	32	101	965	5	0/0	6		
6	58	34	29	095	968	6	0/0	6		
7	45	28	28	093	970	3	0/0	12		
8	40	33	28	093	974	1	0/0	21		
9	38	40	29	090	974	0	0/0	20		
10	31	32	29	086	964	0	0/0	17		
11	35	43	28	083	962	0	0/0	21		
12	35	34	28	086	962	1	0/0	12		
13	51	36	28	087	962	1	0/0	12		
14	63	55	28	093	962	8	0/0	4		
15	66	65	29	093	963	1	0/0	5		
16	63	69	30	097	972	0	0/0	6		
17	67	48	30	099	977	3	0/0	4		
18	80	55	31	100	971	2	0/0	7		
19	76	56	31	101	985	2	0/0	8		
20	69	68	31	102	987	3	0/0	21		
21	64	70	32	105	981	1	0/0	18		
22	54	76	32	108	-	1	0/0	13		
23	68	57	32	110	977	16	0/0	8		
24	66	57	34	106	980	4	0/0	8		
25	61	41	34	102	986	5	0/0	6		
26	55	35	34	104	992	2	0/0	5		
27	66	43	33	103	995	23	0/0	16		
28	59	47	34	102	981	0	0/0	10		
29	47	44	34	100	976	0	0/0	24		
30	45	30	-	098	-	1	0/0	-		
31	46	25	-	096	-	3	0/0	-		

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 Humaïn station (Belgium).

2800 : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UGE01 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 - UGEOR group 3).

XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGE01 group 5).

Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).

SEA : sudden enhancements of atmospherics from Uccle & Humaïn (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 ($1 \times \text{Sn} + 10 \times \text{"1"} + 100 \times \text{">1"}$).

OBSERVATOIRE ROYAL DE BELGIQUE

DEPARTEMENT 4 RADIOASTRONOMIE ET PHYSIQUE SOLAIRE

DAILY PROVISIONAL

RELATIVE SUNSPOT NUMBERS

STATION UCCLE BELGIUM

JULY 1993

DATE	UT	NUMBER OF GROUPS	NUMBER OF SPOTS	RELATIVE SUNSPOT NUMBERS			PPSI 10-3 WM-2	QUAL	OBS	
				TOTAL	NORTH	SOUTH				CENTRAL
1	710	3	44	74	0	74	59	92.9	5	DC
2	1022	5	30	80	13	67	55	90.1	5	DC
3	905	4	40	80	15	65	15	88.3	3	AK
4	725	6	41	101	41	60	15	76.2	5	PC
5	722	7	39	109	49	60	0	68.8	3	DC
6	838	5	22	72	36	36	16	50.0	4	DC
7	746	3	11	41	11	30	15	54.4	3	VI
8	1043	6	17	77	35	42	29	61.8	5	DC
9	710	4	12	52	27	25	30	55.0	3	DC
10	1140	3	7	37	24	13	11	30.8	4	AK
11	1054	3	16	46	33	13	33	32.9	4	DC
12	1005	3	17	47	33	14	47	33.0	5	DC
13	711	4	32	72	57	15	60	51.0	5	DC
16	754	4	28	68	49	19	23	70.5	5	DC
17	810	6	17	77	39	38	28	68.4	3	AK
18	1049	7	33	103	32	71	40	90.5	4	DC
19	751	7	23	93	31	62	14	88.5	2	DC
20	1205	6	24	84	26	58	13	86.2	4	DC
21	926	5	25	75	14	61	26	79.4	2	DC
23	711	6	28	88	28	60	66	59.2	4	DC
24	750	6	20	80	25	55	55	46.0	1	PC
25	709	6	18	78	24	54	30	43.7	3	PC
26	815	5	10	60	24	36	13	42.4	2	DC
28	1246	5	14	64	36	28	41	74.4	1	DC
29	841	4	24	64	35	29	40	74.4	2	PC
31	912	4	14	54	39	15	39	31.1	2	VI

The Sun has been observed 26 days on 31 possible.
The relative mean sunspot number is 72.2.

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

1993 JULY

$K' = 0.858$ (*)

1	63	7	35	13	61	19	79	25	66
2	68	8	66	14	***	20	72	26	51
3	68	9	44	15	***	21	64	27	***
4	86	10	31	16	58	22	***	28	54
5	93	11	39	17	66	23	75	29	54
6	61	12	40	18	88	24	68	30	***
								31	46

The Sun has been observed 26 days on 31 possible.
The normalized relative monthly mean Wolf number is 61.

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

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

Uccle N°	East Limb Date	Date and type			West Limb Date
		1st obs	CMP	Last Obs	
11-1870	6 24.6	25 C	7 1.4	7 D	7 8.1

PROBABLE RETURN OF MAJOR GROUPS FOR 1993 AUGUST

N°	New East Limb	New CMP	New West Limb
11	7 21.8	7 28.5	8 4.3

JULY 1993

PROVISIONAL INTERNATIONAL NORMALIZED HEMISPHERIC SUNSPOT NUMBERS

Date	Ri	Rn	Rs
1	58	0	58
2	57	11	46
3	66	13	53
4	80	26	54
5	68	31	37
6	58	29	29
7	45	24	21
8	40	17	23
9	38	15	23
10	31	16	15
11	35	24	11
12	35	24	11
13	51	39	12
14	63	28	35
15	66	40	26
16	63	40	23
17	67	35	32
18	80	26	54
19	76	23	53
20	69	20	49
21	64	11	53
22	54	12	42
23	68	22	46
24	66	20	46
25	61	19	42
26	55	16	39
27	66	33	33
28	59	59	0
29	47	22	25
30	45	0	45
31	46	34	12

MONTHLY MEAN : 57.3 23.5 33.8

COOPERATING STATIONS : 34 22 22

PILOT STATION : Specola Solare Ticinese, Locarno

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