

I. SUNSPOTS

Sunspot Relative-Numbers and Sunspot Areas

Cooperating Observatories for Sunspot Relative-Numbers :

Altamira (Venezuela), Ankara (Turkey), Athens Nat. Obs. (Greece), Attikis Nat. Obs. (Greece), Auckland (New-Zealand), Baghdad (Iraq), Basrah (Iraq), Berlin (West-Germ.), Beyazit (Turkey), Boom (Belgium), Boulder (U.S.A.), Bruxelles-Uccle (Belgium), Bruxelles-Univ. (Belgium), Bucharest (Rumania) Buenos Aires (Argentina), Campinas (Cap. Obs. Brasil), Campinas (Brasil), Caracas (Venezuela), Carapachay (Argentina), Catania (Italy), Cochabamba (Bolivia), Culgaroa (Australia), Dinant (Belgium), Dover (U.K.), Godella (Spain), Gornicza (Poland), Holloman (U.S.A.), Huancayo (Peru), Hurbanovo (Czechoslovakia), Helwan (Egypt), Inzernhagen (West-Germ.), Jeddah (Saudi Arabia), Kandilli (Turkey), Kanzelhöhe (Austria), Katowice (Poland), Kavlinge (Sweden), Kawaguchi-Saitama (Japan), Kayeme (Venezuela), Kiev (U.R.S.S.), Langemark (Belgium), Learmonth (Australia), Locarno (Switzerland), Lunping (Taiwan), Agr. Madrid (Spain), Madrid (Spain), Manila (Philippines), Mosta (Malta), Museros (Spain), Naxxar (Malta), Nijmegen (Netherland), Mie-Ken (Japan), Oakland (U.S.A.), Oostende (Belgium), Potsdam (East-Germ.), Palea Penteli (Greece), Palehua (Hawaii), Prades (France), Puerto-Montt (Chile), Pulligny (France), Pyong Yang (North Korea), Quezon City (Philippines), Ramey (Puerto-Rico), Roma (Italy), Ronse-Renaix (Belgium), Roquetas-Tortosa (Spain), Rotenburg (West-Germ.), San Jose (Argentina), San Miguel (Argentina), Santiago (Chile), Sao de Francisco de Oliveira (Brasil), Sao Quirino (Brasil), Sivry (Belgium), Skalnaté-Pleso (Czechoslovakia), Sonneberg (East-Germ.), Staden O.N.K. (Belgium), Suwa City (Japan), Taipei Obs. (Taiwan), Taipei Weather Bureau (Taiwan), Tangjungsari (Indonesia), Tashkent (U.R.S.S.), Tokyo-Mitaka (Japan), Tokyo Nat. Science Museum (Japan), Trieste (Italy), Urawa-Saitama (Japan), Valencia (Spain), Vivy (Belgium).

The first column gives the definitive international Sunspot-Numbers for whole disk of the sun (R_{I}) established by the Sunspot Index Data Center-Brussels on the basis of the observations of Locarno station as reference, the second that for the central zone (R_{IC}) on the basis of the observations of Athens (Nat. Obs.), Bruxelles-Uccle, Inzernhagen, Kawaguchi-Saitama, Kiev, Kislovodsk, Mie-Ken, Nijmegen, Roquetas-Tortosa, Skalnaté-Pleso, Suwa-City, Taipei-Obs., Tashkent, Tokyo-Sc. Mus., Urawa-Saitama.

The diameter of the central Zone is half that of sun's disk.

The Sunspot-Areas A_{C} are determined at Catania, A_{R} at Roma and A_{I} are evaluated by the Sunspot Index Data Center-Brussels on the observations of Athens Nat. Obs., Basrah, Lunping, Helwan, Manila, Roma, Taipei Obs. and Taipei Weather Bureau rattaché to Catania values by a monthly scaling factor.

The apparent total area of the umbra plus penumbra is uncorrected for foreshortening and expressed in millionths of the solar disk.

I - 2 (1986)

JANUARY 1986

1986 JAN.	R I	R IC	A C	A R	A I
1	0	0	0	-	0
2	0	0	0	-	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	-	0
6	0	0	0	-	0
7	0	0	0	0	0
8	0	0	0	-	0
9	0	0	0	-	0
10	0	0	0	0	0
11	0	0	0	0	5
12	0	0	0	-	5
13	13	0	63	111	66
14	16	0	116	-	109
15	13	0	63	-	67
16	10	0	0	-	39
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	-	0
20	0	0	0	-	0
21	0	0	0	0	0
22	0	0	0	-	0
23	0	0	0	-	1
24	0	0	-	-	1
25	0	0	0	-	1
26	7	0	0	-	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	-	0
30	10	0	0	-	9
31	10	0	212	-	187
MEAN	2.5	0.0	15.	10.	16.

FEBRUARY 1986

1986 FEB.	R I	R IC	A C	A R	A I
1	18	0	360	-	411
2	33	0	953	-	831
3	52	29	1537	157	1236
4	55	27	-	1527	1194
5	53	28	1600	-	1059
6	47	30	1017	-	1112
7	52	56	943	-	790
8	54	45	455	-	436
9	47	27	784	-	667
10	35	26	747	-	868
11	37	0	911	-	909
12	25	0	806	-	850
13	22	0	710	890	973
14	16	0	-	-	666
15	11	0	0	-	177
16	0	0	0	-	0
17	0	0	0	-	0
18	0	0	0	-	0
19	0	0	0	-	0
20	10	0	21	-	20
21	10	0	21	-	27
22	10	0	21	-	17
23	10	0	5	-	14
24	8	0	5	-	2
25	11	0	21	0	4
26	9	8	0	0	6
27	15	15	-	29	18
28	10	12	-	-	6
MEAN	23.2	10.8	455.	434.	439.

MARCH 1986

1986 MAR.	R I	R IC	A C	A R	A I
1	16	0	-	-	370
2	33	15	699	-	566
3	34	16	636	-	544
4	32	12	763	-	484
5	33	32	795	573	733
6	33	41	795	-	641
7	38	44	-	-	467
8	29	37	-	-	446
9	22	26	456	-	281
10	20	0	-	264	289
11	18	0	74	-	149
12	13	0	42	-	63
13	8	0	0	0	0
14	0	0	0	0	0
15	10	10	0	0	0
16	0	0	0	-	0
17	0	0	0	-	0
18	0	0	0	0	0
19	0	0	-	0	0
20	12	13	-	0	0
21	13	13	-	-	9
22	10	0	0	-	5
23	15	0	0	-	0
24	14	0	0	-	35
25	10	0	5	-	11
26	10	0	0	-	0
27	11	0	0	0	0
28	13	15	-	25	37
29	11	12	5	9	6
30	11	13	0	-	4
31	0	0	0	-	0
MEAN	15.1	9.6	186.	79.	166.

APRIL 1986

1986 APR.	R I	R IC	A C	A R	A I
1	9	0	0	0	0
2	10	14	0	0	2
3	10	13	0	0	5
4	0	0	0	0	0
5	0	0	0	-	0
6	0	0	0	0	0
7	0	0	0	0	0
8	9	12	0	0	2
9	0	0	0	-	0
10	9	0	15	-	4
11	13	0	15	-	10
12	14	12	53	0	39
13	13	17	21	-	37
14	26	13	78	0	123
15	25	2	105	-	198
16	21	10	195	0	159
17	13	0	169	-	159
18	15	13	253	-	179
19	13	17	169	232	195
20	16	21	233	-	140
21	22	28	168	130	142
22	20	12	84	-	91
23	42	29	369	525	376
24	58	38	879	865	811
25	43	51	1012	-	725
26	43	60	784	-	655
27	33	33	699	-	694
28	23	0	530	-	572
29	28	15	306	-	508
30	27	0	147	-	296
MEAN	18.5	13.7	209.	125.	204.

I - 4 (1986)

MAY 1986

1986 MAY	R I	R IC	A C	A R	A I
1	15	0	164	-	86
2	26	0	95	6	139
3	15	0	15	0	48
4	12	0	-	-	13
5	10	0	0	-	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	-	0
12	0	0	0	0	2
13	0	0	0	0	0
14	0	0	0	0	0
15	10	0	21	0	45
16	12	0	31	41	46
17	13	0	31	57	43
18	22	0	78	-	78
19	27	13	105	108	127
20	27	11	100	25	122
21	30	11	79	28	74
22	27	12	129	-	70
23	24	30	95	-	58
24	24	22	100	-	77
25	22	20	147	-	113
26	28	34	100	197	177
27	19	14	132	108	105
28	18	9	41	-	38
29	19	0	36	-	36
30	13	0	26	6	19
31	12	0	10	0	21
MEAN	13.7	5.7	51.	29.	50.

JUNE 1986

1986 JUNE	R I	R IC	A C	A R	A I
1	7	0	5	-	1
2	0	0	0	-	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	-	0
6	0	0	0	0	0
7	0	0	0	0	0
8	9	0	0	-	0
9	0	0	0	0	0
10	8	0	0	0	0
11	0	0	0	0	0
12	0	0	0	-	0
13	0	0	0	-	0
14	0	0	0	-	0
15	0	0	0	-	0
16	0	0	0	0	0
17	0	0	-	0	0
18	0	0	0	-	0
19	0	0	0	0	0
20	0	0	0	-	0
21	0	0	0	0	0
22	0	0	0	-	0
23	0	0	0	0	0
24	0	0	0	0	0
25	8	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	-	0
30	0	0	0	0	0
MEAN	1.1	0.0	0.	0.	0.

JULY 1986

1986 JULY	R I	R IC	A C	A R	A I
1	0	0	0	0	0
2	0	0	0	0	0
3	11	11	0	0	0
4	14	15	15	0	3
5	18	20	53	86	69
6	29	0	121	-	136
7	29	0	169	70	212
8	29	0	211	-	218
9	17	0	159	-	169
10	36	21	222	531	255
11	39	21	254	410	292
12	36	20	211	86	176
13	25	17	158	-	184
14	16	18	42	-	78
15	28	11	52	29	66
16	26	0	52	22	79
17	28	0	78	44	63
18	14	14	47	51	41
19	13	13	0	-	27
20	18	13	25	-	18
21	21	12	36	-	26
22	22	18	52	0	19
23	14	14	0	0	1
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	2
27	12	0	42	-	17
28	13	0	74	118	145
29	17	0	281	261	229
30	19	0	265	344	298
31	17	17	296	366	229
MEAN	18.1	8.2	94.	110.	98.

AUGUST 1986

1986 AUG.	R I	R IC	A C	A R	A I
1	12	12	339	356	307
2	11	12	296	331	284
3	11	11	275	-	260
4	11	11	296	404	289
5	11	9	233	331	266
6	10	0	233	261	223
7	8	0	127	153	187
8	9	0	84	-	137
9	8	0	0	0	32
10	0	0	0	-	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	-	0
16	9	10	21	0	5
17	8	8	0	-	2
18	0	0	0	0	0
19	0	0	0	0	0
20	11	10	0	-	0
21	12	12	42	-	19
22	12	12	37	-	14
23	14	9	46	0	11
24	9	0	84	-	119
25	9	0	127	-	138
26	9	0	159	207	137
27	9	8	159	226	137
28	9	8	169	197	149
29	9	8	201	248	154
30	9	8	190	235	148
31	9	8	180	-	135
MEAN	7.4	5.0	106.	147.	102.

I - 6 (1986)

SEPTEMBER 1986

1986 SEP.	R I	R IC	A C	A R	A I
1	9	0	127	207	107
2	9	0	116	-	86
3	8	0	63	118	86
4	8	0	63	-	48
5	0	0	0	0	0
6	11	0	0	0	0
7	13	0	169	-	85
8	12	17	42	79	61
9	10	16	47	35	34
10	8	12	21	-	23
11	8	16	0	0	5
12	0	0	0	0	3
13	0	0	0	-	2
14	0	0	0	-	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	-	-	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	-	0
28	0	0	0	-	0
29	8	0	-	-	22
30	9	0	-	-	100
MEAN	3.8	2.0	24.	23.	22.

OCTOBER 1986

1986 OCT.	R I	R IC	A C	A R	A I
1	12	0	127	-	115
2	14	0	-	-	117
3	23	13	148	-	159
4	24	14	90	-	162
5	24	13	52	-	124
6	22	21	69	134	87
7	27	22	148	-	147
8	20	0	106	-	160
9	32	18	174	63	183
10	29	0	116	-	133
11	23	0	73	-	103
12	26	0	94	-	122
13	22	0	0	0	36
14	0	0	0	0	0
15	0	0	0	-	0
16	11	0	0	0	0
17	16	0	-	-	452
18	22	0	498	573	575
19	31	0	615	-	694
20	39	0	636	1152	669
21	47	23	901	891	835
22	57	50	1028	1148	797
23	71	54	794	947	772
24	76	51	932	866	855
25	68	48	905	-	721
26	60	21	697	-	528
27	65	12	602	-	501
28	61	16	-	846	892
29	63	12	-	669	804
30	62	14	847	630	731
31	50	20	688	-	778
MEAN	35.4	13.6	383.	566.	395.

I - 7 (1986)

NOVEMBER 1986

1986 NOV.	R I	R IC	A C	A R	A I
1	44	37	878	-	1118
2	35	41	837	-	789
3	37	36	508	-	629
4	37	36	444	454	636
5	35	26	381	347	615
6	31	0	360	-	442
7	24	0	349	-	348
8	15	0	37	-	78
9	10	0	21	-	16
10	9	0	0	0	0
11	9	0	10	0	1
12	0	0	0	0	0
13	14	0	-	0	0
14	12	0	63	-	68
15	12	0	74	-	169
16	12	0	58	-	104
17	12	0	42	127	122
18	12	0	42	-	70
19	12	13	-	-	44
20	12	14	31	38	44
21	11	11	20	-	8
22	10	0	10	-	2
23	18	0	36	-	12
24	12	0	-	0	75
25	0	0	-	0	0
26	0	0	-	0	0
27	13	12	20	0	3
28	0	0	-	-	0
29	8	0	-	-	0
30	0	0	-	-	0
MEAN	15.2	7.5	192.	80.	180.

DECEMBER 1986

1986 DEC.	R I	R IC	A C	A R	A I
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	-	0
8	0	0	0	-	0
9	12	0	0	-	0
10	20	0	-	-	34
11	23	0	-	-	36
12	22	10	-	19	16
13	24	11	53	-	42
14	13	0	26	-	7
15	0	0	-	-	0
16	11	0	0	-	0
17	9	0	0	0	1
18	0	0	0	0	0
19	0	0	0	-	0
20	0	0	0	-	0
21	11	0	5	-	1
22	16	0	74	146	70
23	16	15	63	102	52
24	13	13	-	-	21
25	9	0	0	-	0
26	0	0	0	-	0
27	0	0	0	-	0
28	0	0	0	-	0
29	0	0	0	-	0
30	0	0	-	-	0
31	11	0	0	-	0
MEAN	6.8	1.6	9.	24.	9.