

Sunspot Relative Numbers and Sunspot Areas

1997

Cooperating Observatories to the International Sunspot Number :

Athens Nat. Obs. (Greece); Athens by ussps 32404 (Greece); Attikis Nat. Obs. (Greece); Auckland (New-Zealand); Australian Obs. (Australia); Bedizzole (Italy); Berlin (Germany); Beyazit (Turkey); Boom (Belgium); Bruxelles-Uccle (Belgium); Bucharest (Rumania); Budapest (Hungary), Camaguey (Cuba); Campinas (Brazil); Caracas (Venezuela); Catania (Italy); Ciney (Belgium); Cochabamba (2 stat. Bolivia); Cottbus (Germany); Culgoora (Australia); Dimitrograd (Bulgaria); Dinant (Belgium); Dover (U.K.); Eilenburg (Germany); Etalle (Belgium); Grimbergen (Belgium); Gwynedd (U.K.); Hancharia (Italy); Helwan (Egypt); Holloman by ussps 21305 (U.S.A.); Hurbanovo (Slovakia); Hvezdaren (2stat. Slovakia); Invercargill (New-Zealand); Inzernhagen (Germany); Iseo (Italy); Jambol (Bulgaria); Jordanston (North Ireland); Jeddah (Saudi Arabia); Kandilli (Turkey); Kanzelohe (Austria); Kawaguchi-Saitama (Japan); Kislovodsk (Russia); Kladno (Czech Republic); Langemark (Belgium); Larissa Obs.(Greece); Learmonth by ussps 81202 (Australia); Locarno (Switzerland); Luning (Taiwan); Marcq en Baroeul (France); Milano (Italy); Mosta (Malta); Murmansk (Russia); Naxxar (Malta); Nijmegen (The Netherlands); Mie-Ken (Japan); Ondrejov (Czech Republic); Potsdam (Germany); Prague (Czech Republic); Pulligny (France); Pyong Yang (North Korea); Quezon-City (Philippines); Ramey by ussps 17201 (Puerto-Rico); Rokicany (2 stat. Czech Republic); Roma (Italy); Roquetes-Tortosa (Spain); Rudolstadt (Germany); Sao Francisco (Brazil); San Miguel (Argentina); Santander (Spain); Santiago (Chile); Sezimovo (Czech Republic); Skalnate (Slovakia); Sliven (Bulgaria); Smolian (Bulgaria); Sobota (Slovakia); Suwa City (Japan); Taipei Obs.(Taiwan); Taipei Weather Bureau (Taiwan); Teneriffe (Spain); Tilburg (The Netherlands); Tokyo-Mitaka (Japan); Urawa-Saitama(Japan); Valencia (2 stat. Spain); Varna (Bulgaria); Vedrin (Belgium), Wittelsheim (France); Watukosek (Indonesia); Zagora (Bulgaria).

The first column gives the definitive International Sunspot Numbers for the whole disk of the sun (R_I) established by the Sunspot Index Data Center Brussels on the basis of Locarno as reference station, the second gives the same quantity for the central zone (R_{IC}) on the basis of the observations of Athens (Nat.Obs.); Athens 32404; Uccle; Catania by ussps 31405; Grimbergen; Holloman; Hvezdaren; Izernhagen; Kawaguchi-Saitama, Kislovodsk; Learmonth; Mie-Ken; Nijmegen; Palea Penteli; Palehua; Ramey; Roquetes-Tortosa; Smolian; Sobota; Suwa-city; Taipei Obs.; Tilburg; Urawa-Saitama.

The diameter of the central zone is half that of the solar disk.

The Sunspot areas A_C are from Catania, A_R from Roma and A_I , are mean quantities calculated by the Sunspot Index Data Center on the basis of observations of Athens (Nat. Obs.), Roma, Helwan, Jeddah, Palea Penteli, Taipei Obs. and rattached to Catania by a monthly scaling factor. The apparent total area of the umbra plus penumbra is uncorrected for foreshortening and expressed in millonths of the solar disk.

I - 2 (1997)

JANUARY 1997

1997 JAN.	Ri	Ric	Ac	Ar	Ai
1	0	0	-	-	0
2	0	0	-	-	0
3	0	0	-	0	0
4	11	12	-	0	0
5	10	13	-	-	0
6	12	12	-	-	0
7	8	0	-	0	3
8	0	0	-	0	0
9	9	0	-	-	0
10	9	0	-	-	0
11	7	0	-	0	0
12	0	0	-	-	0
13	0	0	-	0	0
14	0	0	-	0	0
15	11	12	-	76	24
16	17	13	-	54	30
17	8	10	-	0	4
18	11	8	-	0	0
19	0	0	-	-	0
20	0	0	-	-	0
21	0	8	-	0	0
22	0	0	-	0	0
23	0	0	-	0	0
24	9	0	-	-	0
25	8	0	-	-	0
26	8	0	-	-	0
27	9	12	-	0	0
28	0	0	-	-	0
29	10	0	-	0	1
30	11	12	-	89	51
31	10	12	-	73	31
MEAN	5.7	4.0	-	16.2	4.6

FEBRUARY 1997

1997 FEB.	Ri	Ric	Ac	Ar	Ai
1	9	12	-	13	9
2	23	15	-	-	0
3	30	31	-	773	353
4	31	17	-	-	0
5	23	13	-	-	91
6	18	10	-	-	157
7	15	0	-	39	25
8	8	0	-	35	15
9	8	0	-	-	0
10	0	0	-	0	0
11	0	0	-	0	0
12	0	0	-	-	0
13	0	0	-	0	0
14	0	0	-	0	0
15	0	0	-	-	0
16	9	0	-	-	0
17	0	0	-	0	0
18	8	0	-	10	3
19	8	0	-	0	0
20	7	0	-	-	0
21	0	0	-	0	0
22	0	0	-	0	0
23	0	0	-	-	0
24	7	0	-	-	7
25	8	0	-	-	15
26	0	0	-	0	3
27	0	0	-	-	4
28	0	0	-	0	0
MEAN	7.6	3.5	-	58.0	24.4

I - 3 (1997)

MARCH 1997

1997 MAR.	Ri	Ric	Ac	Ar	Ai
1	0	0	0	0	0
2	0	0	0	-	0
3	0	0	0	0	0
4	0	0	0	-	0
5	0	0	0	0	0
6	8	0	42	-	8
7	10	0	90	0	104
8	19	0	147	296	162
9	18	0	137	-	82
10	12	12	105	207	93
11	13	18	106	70	62
12	15	19	137	42	64
13	14	15	68	22	38
14	13	14	31	13	28
15	25	11	68	-	23
16	11	0	21	-	12
17	12	0	90	124	63
18	12	12	36	0	7
19	0	0	0	0	0
20	9	11	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	-	-	0
24	0	0	0	-	0
25	0	0	0	0	0
26	0	0	0	0	0
27	10	0	0	0	0
28	14	0	84	111	110
29	18	0	212	318	180
30	20	0	307	-	166
31	17	15	307	-	173
MEAN	8.7	4.1	66.3	57.3	44.4

APRIL 1997

1997 APR.	Ri	Ric	Ac	Ar	Ai
1	17	22	-	-	137
2	31	26	-	178	98
3	37	35	-	543	319
4	27	20	-	283	121
5	25	0	-	201	116
6	20	0	-	-	32
7	11	14	-	61	36
8	10	14	-	35	29
9	21	13	-	-	49
10	24	16	-	404	173
11	23	0	-	452	207
12	12	0	-	-	59
13	22	0	-	-	0
14	24	12	-	408	178
15	28	21	-	0	117
16	26	21	-	0	97
17	13	17	-	-	19
18	9	11	-	22	18
19	11	11	-	0	3
20	0	0	-	-	0
21	0	0	-	-	0
22	0	0	-	-	0
23	9	0	-	-	5
24	9	0	-	-	16
25	8	0	-	-	0
26	17	13	-	-	0
27	11	0	-	-	10
28	12	0	-	-	37
29	8	0	-	-	0
30	0	0	-	-	0
MEAN	15.5	8.9	-	199.0	62.5

I - 4 (1997)

MAY 1997

1997 MAY	Ri	Ric	Ac	Ar	Ai
1	0	0	-	-	0
2	0	0	-	0	0
3	0	0	-	-	0
4	8	0	-	-	0
5	9	0	-	0	1
6	8	0	-	-	84
7	8	0	-	159	79
8	10	0	-	-	30
9	9	0	-	233	109
10	17	11	-	251	121
11	16	11	-	-	87
12	10	10	-	0	59
13	12	14	-	229	128
14	13	0	-	165	110
15	11	0	-	111	62
16	17	0	-	6	35
17	17	0	-	-	0
18	21	9	-	-	51
19	27	21	-	394	167
20	39	22	-	484	303
21	52	35	-	658	497
22	48	33	-	0	148
23	40	11	-	481	251
24	30	0	-	312	164
25	29	0	-	-	32
26	35	0	-	0	65
27	25	0	-	16	30
28	17	9	-	0	37
29	14	8	-	80	63
30	12	0	-	57	50
31	19	0	-	67	31
MEAN	18.5	6.3	-	168.3	90.1

JUNE 1997

1997 JUN.	Ri	Ric	Ac	Ar	Ai
1	20	10	-	-	101
2	22	11	-	350	167
3	15	18	-	502	201
4	11	13	-	500	250
5	11	11	-	-	119
6	12	0	-	331	209
7	12	0	-	213	89
8	19	9	-	-	42
9	16	0	-	19	42
10	8	0	-	25	31
11	8	0	-	0	11
12	16	9	-	44	40
13	18	10	-	0	20
14	19	18	-	25	19
15	19	16	-	-	35
16	20	19	-	212	86
17	13	16	-	134	58
18	18	10	-	22	40
19	10	0	-	0	29
20	8	11	-	0	6
21	7	9	-	0	0
22	0	12	-	-	5
23	9	12	-	0	2
24	9	12	-	16	19
25	19	22	-	133	58
26	15	19	-	165	66
27	12	0	-	86	48
28	8	0	-	0	3
29	8	0	-	-	0
30	0	0	-	0	0
MEAN	12.7	8.9	-	115.7	59.9

I - 5 (1997)

JULY 1997

1997 JULY	Ri	Ric	Ac	Ar	Ai
1	0	0	-	0	0
2	0	0	-	0	0
3	8	0	-	0	0
4	9	0	-	0	12
5	8	0	-	0	0
6	10	0	-	-	0
7	26	14	-	0	22
8	16	13	-	-	7
9	17	14	-	200	77
10	13	13	-	0	3
11	0	0	-	0	0
12	0	0	-	0	0
13	0	0	-	-	0
14	9	11	-	0	13
15	0	0	-	-	0
16	0	0	-	0	0
17	7	0	-	0	6
18	7	0	-	0	10
19	0	0	-	0	0
20	11	11	-	-	6
21	0	0	-	-	0
22	11	8	-	-	0
23	20	14	-	0	43
24	29	11	-	143	86
25	39	11	-	363	197
26	34	0	-	350	228
27	25	10	-	-	66
28	11	12	-	0	4
29	11	10	-	0	0
30	0	12	-	0	0
31	0	0	-	0	0
MEAN	10.4	5.3	-	45.9	25.2

AUGUST 1997

1997 AUG.	Ri	Ric	Ac	Ar	Ai
1	0	0	-	-	0
2	8	0	-	0	0
3	13	0	-	-	34
4	9	0	-	0	12
5	17	12	-	105	52
6	36	10	-	-	103
7	41	11	-	261	139
8	45	18	-	277	189
9	38	21	-	0	32
10	21	16	-	-	25
11	36	16	-	73	68
12	48	17	-	134	154
13	46	21	-	464	278
14	39	11	-	383	215
15	37	11	-	-	95
16	21	21	-	261	141
17	18	21	-	-	85
18	16	11	-	214	81
19	9	10	-	220	93
20	8	0	-	163	113
21	9	0	-	156	89
22	8	0	-	54	62
23	9	0	-	0	5
24	0	0	-	-	0
25	15	0	-	0	18
26	21	0	-	0	120
27	24	0	-	-	121
28	33	16	-	-	201
29	35	37	-	0	154
30	43	54	-	862	373
31	53	41	-	-	224
MEAN	24.4	12.1	-	172.7	105.7

I - 6 (1997)

SEPTEMBER 1997

1997 SEP.	Ri	Ric	Ac	Ar	Ai
1	65	33	-	1069	493
2	59	0	-	772	411
3	48	0	-	390	260
4	42	0	-	0	254
5	50	14	-	967	438
6	56	16	-	0	297
7	68	16	-	-	668
8	87	14	-	2038	1269
9	91	34	-	3800	2006
10	93	25	-	4514	2102
11	86	23	-	3745	1937
12	88	26	-	2625	1569
13	85	19	-	2394	1374
14	70	0	-	-	910
15	65	0	-	2015	1041
16	61	17	-	1343	737
17	49	20	-	528	530
18	33	18	-	436	287
19	16	15	-	331	188
20	14	0	-	325	170
21	26	0	-	-	68
22	45	0	-	0	143
23	42	0	-	791	351
24	42	0	-	-	338
25	49	10	-	1186	558
26	26	12	-	579	284
27	30	9	-	821	397
28	18	8	-	-	351
29	16	0	-	388	266
30	19	0	-	-	186
MEAN	51.3	11.0	-	1294.0	662.8

OCTOBER 1997

1997 OCT.	Ri	Ric	Ac	Ar	Ai
1	25	0	-	-	189
2	21	0	-	111	100
3	21	0	-	249	145
4	21	0	-	268	122
5	21	15	-	-	32
6	18	10	-	9	22
7	17	11	-	-	10
8	16	0	-	-	18
9	20	0	-	6	3
10	22	14	-	133	70
11	24	18	-	204	82
12	25	17	-	-	62
13	29	18	-	448	186
14	24	19	-	-	142
15	28	0	-	299	156
16	34	0	-	277	198
17	40	16	-	437	270
18	35	14	-	321	190
19	25	11	-	-	64
20	21	23	-	217	104
21	20	22	-	-	39
22	9	10	-	3	8
23	0	9	-	0	0
24	10	10	-	0	0
25	11	0	-	0	0
26	11	0	-	-	19
27	23	0	-	-	10
28	33	12	-	-	106
29	30	13	-	-	201
30	38	16	-	-	0
31	35	13	-	709	355
MEAN	22.8	9.4	-	205.1	93.6

I - 7 (1997)

NOVEMBER 1997

1997 NOV.	Ri	Ric	Ac	Ar	Ai
1	43	29	-	-	360
2	53	29	439	-	214
3	54	42	1367	2017	1099
4	59	22	1515	2154	1074
5	51	19	1728	-	1517
6	50	21	1770	-	1221
7	43	15	-	-	652
8	37	0	258	99	277
9	25	0	110	-	51
10	19	0	269	-	161
11	29	0	296	-	263
12	20	0	-	-	74
13	26	0	42	-	64
14	38	0	-	140	261
15	30	0	609	-	309
16	29	0	630	-	500
17	44	0	969	1135	715
18	43	15	-	1135	703
19	43	27	768	-	518
20	40	31	529	-	373
21	41	33	535	-	425
22	47	12	-	-	835
23	55	11	439	-	420
24	49	0	443	738	411
25	30	0	-	-	183
26	26	0	153	29	97
27	31	8	-	29	444
28	33	8	954	1590	924
29	39	8	1044	-	1019
30	42	8	1378	-	694
MEAN	39.0	11.3	738.4	906.6	528.6

DECEMBER 1997

1997 DEC.	Ri	Ric	Ac	Ar	Ai
1	46	54	1293	2156	1073
2	41	32	1325	1932	1072
3	33	29	1118	-	753
4	36	31	1103	1275	745
5	32	0	-	-	415
6	38	0	-	852	541
7	40	13	587	-	338
8	58	13	359	-	212
9	67	23	432	-	281
10	57	15	407	662	382
11	61	9	332	764	426
12	68	14	400	-	297
13	53	9	-	-	178
14	42	0	364	-	278
15	41	0	327	588	322
16	35	0	491	585	424
17	34	11	-	-	317
18	20	17	312	548	254
19	15	11	143	-	101
20	19	10	185	-	155
21	22	9	299	-	175
22	32	0	360	99	251
23	45	0	-	-	532
24	52	0	-	932	726
25	42	26	1064	-	609
26	37	23	1155	-	527
27	41	26	-	-	593
28	38	24	762	-	576
29	41	15	726	1301	796
30	45	15	874	1319	847
31	45	24	-	-	738
MEAN	41.2	14.6	626.9	1001.0	481.7