I. SUNSPOT

Sunspot Relative-Numbers and Sunspot-Areas

Cooperating Observatories for Sunspot Relative-Numbers :
Altamira(Venezuela),ankara, athens(Nat.Obs.), Attikis(Nat.Obs.Greece) Beyazit, Boom(Belgium), Boulder(USA), Bruxelles-Uccle, Bruxelles-Univ., Bucarest, Campinas(Capric.Obs.Brazil), Campinas, Catania, Chung-li (Telecom.Taiwan), Cochabamba(Bolivia), Dinant(Belgium), Dover (UK), Holloman(USA), Huancayo, Hurbanovo, Helwan, Inzenhagen(West-Germ.), Jeddah, Kandilli, Kanzelhoehe, Kawagushi-Saitamal, Kayeme(Japan),Kiev, Kislovodsk, Locarno, Lunping(Taiwan), Madrid, Manila, Mercedes(Uruguay), Mie-Ken(OAA Japan), Nogales(Orion-Mexico), Nymegen(Netherland),Oakland (USA), Oostende(Belgium), Potsdam, Palehua(Hawaï), Puerto Montt(Chili), Querzon City(Mexico), Rambouillet(France), Ramey(Puerto-Rico), Roma, Ronse-Renaix(Belgique), Roquetas-Tortosa, Rudolstadt(East-Germ.), San Miguel, Santiago, Sao Francisco de Oliveira(Brazil), Skalnaté-Pleso, Sonneberg(East-Germ.), Suwa-City, Taipei(Observatory), Taipei(Weather-Bureau), Tashkent, Tokyo-Mitaka, Tokyo(Nat.Science Museum), Trieste (Italia), Urawa-Saitama, Valencia(Spain), Valparaiso, Vivy(Belgium).

The first colum gives the definitive international Sunspot-Numbers for whole disk of the sun (R_I) established by the Sunspot Index Data Centre-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 Bruxelles-Uccle station with a cooperating network(Athenes(Nat.Obs), Bruxelles-Uccle, Inzenhagen, Kawagushi-Saitama, Kiev, Kislovodsk, Mie-Ken, NIJmegen, Rambouillet, Roquetas-Tortosa, Skalnaté Pleso, Suwa-City, Taipei-Obs., Tashkent, Tokyo-Sc.Mus., Urawa-Saitama).

The diameter of the central Zone is half that of the 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 Athènes(Nat.Obs.), Chung-li, Helwan, Jeddah, Manila, Rambouillet, Taipeï(Obs.) and Taipeï (Weath.Bur.) rattached 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.

1983 JAN.	R_I	R_{IC}	A_C	A_R	A_I
1	60	25	882	-	991
2	65	31	653	-	746
3	55	43	872	-	896
4	63	42	845	-	818
5	82	38	1171	945	998
6	103	45	1620	-	1558
7	109	52	1157	1906	1504
8	126	64	1666	-	1567
9	100	64	-	-	1277
10	83	76	953	563	941
11	90	80	731	143	765
12	77	40	610	534	628
13	89	29	727	536	727
14	92	15	926	-	1106
15	77	30	-	-	1186
16	89	22	1597	-	1304
17	102	60	1482	1870	1540
18	86	70	1524	-	1470
19	93	64	1854	-	1771
20	81	61	1399	1761	1482
21	74	55	1256	-	1334
22	73	33	873	1578	1127
23	59	12	763	-	790
24	58	0	469	547	781
25	75	11	431	324	637
26	77	29	1287	1184	1234
27	75	42	1650	1695	1414
28	89	80	1667	-	1359
29	99	60	1434	-	1490
30	101	75	1865	-	1733
31	110	53	2196	1423	1924
MEAN	84.3	45.2	1192	1072.0	1197

1983 FEB.	R_I	R_{IC}	A_C	A_R	A_I
1	103	82	2521	2293	2386
2	85	58	2532	2561	2541
3	88	51	2079	2619	2329
4	94	77	1912	2800	2149
5	82	35	1958	2564	2178
6	71	45	2520	-	2414
7	72	72	2085	-	2201
8	63	57	1771	-	2023
9	39	14	866	-	1160
10	26	0	635	-	778
11	21	0	389	-	550
12	18	0	105	0	284
13	11	10	58	-	128
14	10	12	42	0	22
15	24	9	68	0	39
16	17	12	43	-	94
17	22	13	116	-	140
18	32	16	236	-	358
19	33	16	-	-	605
20	32	14	310	-	350
21	39	24	541	-	545
22	33	21	436	531	491
23	40	17	-	388	664
24	50	20	647	381	835
25	67	37	782	1044	964
26	70	44	-	-	1145
27	88	39	1440	-	1645
28	98	39	1142	1415	1213
MEAN	51.0	29.8	1009	1277	1080

1983 MAR.	R_I	R_{IC}	A_C	A_R	A_I
1	109	57	1621	1686	1470
2	93	60	2196	1924	1443
3	86	53	1659	1998	1333
4	93	85	1761	-	1664
5	113	86	2177	2526	1676
6	88	84	2037	-	1475
7	77	57	1472	1875	1447
8	68	20	1056	1096	1250
9	74	19	773	1035	839
10	55	18	699	-	1064
11	49	0	394	-	571
12	32	15	127	38	113
13	12	17	21	-	30
14	24	10	106	-	167
15	44	14	494	-	532
16	63	13	-	-	796
17	74	21	1329	-	1221
18	88	48	1675	1438	1240
19	82	69	1150	1894	1212
20	82	90	2169	-	1775
21	87	80	1513	-	1422
22	70	48	510	-	1211
23	66	48	1024	-	1067
24	60	22	563	-	760
25	48	18	341	-	667
26	70	9	305	-	534
27	72	21	369	-	774
28	48	16	259	-	363
29	44	32	-	-	197
30	54	39	263	-	223
31	37	47	-	-	223
MEAN	66.5	39.2	1002	1551.0	928

1983 APR.	R_I	R_{IC}	A_C	A_R	A_I
1	53	36	357	-	273
2	70	61	515	-	401
3	61	42	442	-	383
4	53	12	362	-	411
5	36	7	179	-	376
6	49	15	153	-	224
7	64	32	369	-	356
8	59	30	600	-	489
9	59	43	731	-	532
10	64	48	615	-	541
11	69	41	567	509	439
12	65	41	368	-	384
13	64	35	353	-	366
14	64	19	353	310	267
15	53	22	195	-	219
16	54	23	269	95	236
17	63	33	494	-	482
18	75	33	1188	-	825
19	110	45	-	-	1234
20	90	32	1092	932	1082
21	87	41	684	-	1076
22	83	35	-	-	952
23	91	39	1078	1136	1106
24	92	34	-	-	1127
25	123	38	1890	-	1533
26	118	43	1802	-	1677
27	126	83	1708	1618	1514
28	146	114	1551	1989	1460
29	142	112	1858	1996	1548
30	137	81	2202	1891	1596
MEAN	80.7	42.3	814	1164.0	770

1983 MAY	R_I	R_{IC}	A_C	A_R	A_I
1	114	49	-	-	1491
2	104	28	-	983	1401
3	94	28	1408	-	1448
4	85	45	1272	-	1173
5	95	64	-	-	1001
6	88	60	604	557	669
7	92	52	899	-	949
8	98	39	1003	-	1057
9	110	26	1366	-	1170
10	114	46	1644	1733	1453
11	101	84	2909	2975	2196
12	114	77	3365	4168	2911
13	132	80	1184	3913	2706
14	125	76	2678	2653	2541
15	130	51	2091	-	2373
16	99	42	1523	1639	1355
17	93	35	1319	1401	1425
18	99	24	1053	939	1310
19	88	21	1271	385	1235
20	105	25	1718	1750	1455
21	110	44	923	-	1473
22	104	65	1686	-	1538
23	102	71	1502	-	1410
24	111	48	1451	1298	1190
25	98	77	1564	-	1227
26	100	90	1083	1107	949
27	85	50	830	-	816
28	68	40	447	855	692
29	88	31	610	-	746
30	68	20	716	789	900
31	60	16	1507	1247	1220
MEAN	99.2	48.5	1415	1670	1402

1983 JUN.	R_I	R_{IC}	A_C	A_R	A_I
1	61	24	1261	1091	1303
2	72	24	1355	1320	1178
3	73	45	1599	1634	1414
4	68	46	2111	1849	1677
5	77	53	2788	-	3383
6	85	54	4189	4741	3790
7	104	55	4684	4366	3908
8	100	19	4242	5084	3783
9	100	41	3796	1693	3173
10	86	41	3276	1521	3218
11	73	60	2038	-	2138
12	66	48	1061	-	1351
13	72	44	783	-	929
14	88	26	982	668	848
15	92	15	701	629	876
16	84	28	816	-	1014
17	79	42	920	1034	999
18	78	67	1130	-	1111
19	103	78	1261	-	1259
20	117	71	1303	977	1284
21	117	58	-	-	1572
22	136	76	1534	-	1796
23	143	83	2310	1591	1760
24	122	84	1440	-	1526
25	122	58	1508	1216	1344
26	110	39	1302	-	1330
27	92	51	1198	-	1519
28	83	26	977	-	1305
29	68	0	856	-	1129
30	63	21	920	820	961
MEAN	91.1	45.9	1805	1890	1763

1983 JUL.	R_I	R_{IC}	A_C	A_R	A_I
1	62	29	756	-	787
2	59	33	789	706	706
3	61	31	851	-	869
4	87	25	1010	1164	974
5	80	17	1192	-	1106
6	79	28	1176	-	1146
7	79	54	1245	1155	1273
8	82	58	1225	1239	1282
9	69	48	1109	1297	1281
10	59	26	1145	-	1139
11	68	15	1019	1208	1211
12	86	31	1135	-	1245
13	85	39	952	-	1192
14	88	30	988	-	1080
15	92	47	993	-	945
16	93	46	-	852	950
17	96	50	759	-	657
18	98	64	532	511	611
19	96	56	564	-	488
20	101	61	643	586	531
21	109	67	989	-	679
22	114	61	1051	-	873
23	95	56	1046	987	1036
24	105	48	987	-	1058
25	85	12	1130	-	1249
26	58	0	667	-	934
27	49	9	536	-	714
28	40	0	395	-	636
29	73	17	1371	-	1644
30	89	21	1769	-	1620
31	110	18	2383	-	1776
MEAN	82.2	35.4	1014	970	1022

1983 AUG.	R_I	R_{IC}	A_C	A_R	A_I
1	131	63	2463	2185	1877
2	128	75	2268	1332	1847
3	105	85	1908	1928	1690
4	103	84	1440	284	1209
5	79	29	1066	1193	1254
6	49	25	908	-	860
7	60	14	883	-	1078
8	70	11	1029	-	1411
9	69	0	725	-	1253
10	63	0	1192	-	1434
11	88	25	1161	-	1184
12	103	63	1298	-	1289
13	104	72	1360	1606	1251
14	97	63	1104	-	1337
15	93	66	1013	-	969
16	80	36	656	812	681
17	72	33	662	-	661
18	71	29	426	-	454
19	54	31	226	118	245
20	40	12	179	104	189
21	52	0	173	-	204
22	50	36	131	-	280
23	51	27	137	-	116
24	35	14	137	-	228
25	52	30	253	-	277
26	53	33	320	-	266
27	51	27	351	334	338
28	55	26	337	-	299
29	63	37	305	-	415
30	59	39	338	280	307
31	45	25	373	371	411
MEAN	71.8	35.8	801	879	817

1983 SEP.	R_I	R_{IC}	A_C	A_R	A_I
1	46	11	472	370	384
2	56	13	520	-	488
3	59	18	300	-	331
4	69	31	446	-	485
5	84	45	614	-	589
6	78	45	747	696	643
7	72	23	721	814	712
8	68	39	689	-	610
9	74	56	642	551	602
10	70	48	405	-	354
11	65	51	190	-	134
12	41	21	53	-	89
13	36	16	91	-	86
14	36	16	247	312	211
15	42	21	379	509	315
16	33	25	577	-	370
17	35	33	420	-	351
18	45	26	399	-	375
19	40	0	194	296	254
20	32	14	190	89	184
21	36	13	158	175	191
22	38	12	278	66	388
23	42	13	577	-	1020
24	46	15	1103	-	982
25	42	14	1198	-	1054
26	50	23	-	-	1083
27	51	37	1507	1552	1300
28	48	37	-	-	1265
29	43	46	-	-	990
30	33	18	1113	-	949
MEAN	50.3	26.0	527	494	560

1983 OCT.	R_I	R_{IC}	A_C	A_R	A_I
1	29	10	1307	-	923
2	51	15	1570	-	1219
3	63	13	1130	-	1688
4	74	15	1240	1171	1514
5	65	9	1586	-	1292
6	75	28	1675	-	1477
7	87	62	1917	-	1553
8	99	82	1948	2017	1636
9	106	81	1933	-	1436
10	121	82	1818	-	1451
11	136	78	1602	-	1429
12	122	54	1534	1590	1623
13	100	22	-	1406	1321
14	80	28	-	1256	1238
15	72	29	1614	1680	1331
16	61	23	1896	-	1323
17	60	25	1265	-	1191
18	63	37	-	-	988
19	46	25	431	162	472
20	26	12	68	134	97
21	18	11	43	54	55
22	22	10	27	-	36
23	22	0	-	-	17
24	20	0	53	-	45
25	18	9	27	0	22
26	20	8	5	-	30
27	12	10	21	9	14
28	15	12	59	-	22
29	16	14	5	-	7
30	15	0	16	-	10
31	16	11	-	-	34
MEAN	55.8	26.3	953	862	822

1983 NOV.	R_I	R_{IC}	A_C	A_R	A_I
1	17	9	26	-	24
2	22	11	79	-	123
3	37	12	-	-	306
4	51	0	552	-	497
5	66	12	636	525	554
6	74	24	814	-	561
7	84	62	-	564	522
8	90	84	499	-	443
9	70	68	-	413	433
10	68	32	373	285	294
11	56	15	332	276	275
12	43	15	105	-	216
13	36	16	-	-	115
14	29	18	115	-	85
15	28	16	106	-	105
16	38	41	352	-	224
17	31	13	200	-	231
18	36	20	295	-	207
19	26	17	-	-	116
20	12	0	11	-	28
21	18	0	-	-	2
22	0	0	0	-	0
23	0	0	-	0	0
24	0	0	-	0	0
25	0	0	0	-	0
26	7	9	5	0	1
27	10	0	0	-	0
28	12	0	42	0	58
29	19	0	58	0	47
30	21	0	68	0	60
MEAN	33.3	16.5	212	188	184

1983 DEC.	R_I	R_{IC}	A_C	A_R	A_I
1	26	17	74	0	67
2	23	18	63	-	59
3	15	13	68	-	37
4	14	13	26	-	15
5	17	8	32	-	47
6	39	0	190	-	208
7	41	17	195	-	252
8	48	17	278	-	302
9	71	51	447	-	462
10	82	54	721	-	672
11	76	50	872	-	609
12	66	44	494	-	496
13	66	38	457	-	387
14	52	18	-	-	302
15	50	16	-	-	178
16	35	21	194	-	248
17	46	13	437	-	370
18	36	32	400	-	331
19	31	24	484	-	408
20	25	28	399	-	261
21	21	24	347	-	299
22	15	8	231	-	205
23	20	0	147	-	354
24	22	14	116	-	127
25	21	13	126	-	171
26	23	15	37	-	46
27	12	0	0	-	2
28	10	0	0	-	7
29	11	9	0	-	5
30	13	12	0	-	10
31	9	10	-	-	5
MEAN	33.4	19.3	244		224