

Sunspot Relative Numbers and Sunspot Areas

2005

Cooperating Observatories to the International Sunspot Number :

AMATEUR SOUTHERN CROSS OBSERVATORY (BOLIVIA); ANDRIES SON (BELGIUM); ASTRO. DE REUX CINEY (BELGIUM); AUSTRALIAN OBS. COONABARABRAN (AUSTRALIA); BARNES AUCKLAND (NEW-ZEALAND); BORTOLOTTI MAURO (ITALIA); BULLON VALENCIA (SPAIN); CAMAGUEY (CUBA); CAPRICORNO CAMPINAS (BRASIL); CATANIA (ITALY); CENTRAL WEATHER BUREAU REPUBLIC OF (CHINA); CLAEYS VEDRIN (BELGIUM); COURDURIE MARCQ EN BAROEUL (FRANCE); CULGOORA NARRABRI (AUSTRALIA); DE BACKER BOOM (BELGIUM); DRAGESCO JEAN (FRANCE); DUBOIS LANGEMARK (BELGIUM); EBRO ROQUETES (SPAIN); EUROPLANETARIUM (BELGIUM); EVANS INVERCAGILL (NEW-ZEALAND); FERNANDEZ RUIS SANTANDER (SPAIN); FUJIMORI NAGANO (JAPAN); GEMA ARAUJO (SPAIN); GERARD DINANT (BELGIUM); GERMAN MORALES COCHABAMBA (BOLIVIA); GUILLERY PULLIGNY (FRANCE); GYSEL LUC (BELGIUM); HAVANA SOLAR STATION (CUBA); HAZEL COLLETT (UNITED-KINGDOM); HELWAN (EGYPT); HOLLOMAN (U.S.A.); HURBANOVO (SLOVAKIA); HVEZDAREN KYSUCKE (SLOVAKIA); HVEZDAREN PRESOV (SLOVAKIA); ISEO (ITALIA); JAVIER ALONSO SANTIAGO (SPAIN); JOHNSTON GWYNEDD (ENGLAND); JURI GAGARIN EILENBURG (GERMANY); KANDILLI (TURKEY); KANZELHOHE TREFFEN (AUSTRIA); KAWAGUCHI (JAPAN); KISLOVODSK (RUSSIA); KLADNO (CZECH-REPUBLIC); LARISSA OBSERVATORY (GREECE); LEARMOUTH (AUSTRALIA); LIEVE MEEUS (BELGIUM); LOCARNO (SWITZERLAND); MAC KENZIE DOVER (UNITED-KINGDOM); MAHMOUD S MOSQUE SOCIETY (EGYPT); MILANO (ITALY); MIRA GRIMBERGEN (BELGIUM); MITAKA (JAPAN); MOCHIZUKI URAWA SAITAMA (JAPAN); MURMANSK (RUSSIA); NIJMEGEN (NETHERLANDS); OBSERV. PAUL AHNERT COTTBUS (GERMAN); OBSERVATORY FRANTISKA (CZECH-REP.); OBSERVATORY PROSTEJOV CZECH (REPUBL); ONDREJOV OBSERV. (CZECH-REPUBLIC); PASTERNAK BERLIN (GERMANY); PASTERNAK LEER (GERMANY); PHILIPPE WITTELSHEIM (FRANCE); QUEZON (PHILIPPINES); RAUL ROBERTO PODESTA (U.S.A.); ROBERTO de MANZANO (ITALIA); SAN MIGUEL (ARGENTINA); SAN VITO (ITALY); SANTIAGO (CHILE); SAUDI ARABIA (JEDDAH); SCHOTT LUTZ GERD (GERMANY); SKALNATE (SLOVAKIA); SMOLYAN (BULGARIA); SOBOTA (SLOVAKIA); SPANINKS TILBURG (NETHERLANDS); STEFANIKS OBS. PRAGUE (CZECH-REP.); SUZUKI (JAPAN); TAIPEI (REP OF CHINA); THOMAS TEAGUE (UNITED KINGDOM); UCCLE (BELGIUM); (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 AMATEUR SOUTHERN CROSS OBSERVATORY (BOLIVIA); ASTRO. DE REUX CINEY BELGIUM; CAPRICORNO CAMPINAS BRASIL; CATANIA ITALY; CENTRAL WEATHER BUREAU REPUBLIC OF CHINA; CLOSSET BELGIUM; CRIMEAN; OBSERVATORY UKRAINE; EVANS INVERCAGILL NEW-ZEALAND; FUJIMORI; NAGANO JAPAN; GERMAN MORALES COCHABAMBA BOLIVIA; HOLLOMAN; HURBANOVO SLOVAKIA; HVEZDAREN KYSUCKE SLOVAKIA; HVEZDAREN PRESOV SLOVAKIA; KANDILLI TURKEY; KAWAGUCHI JAPAN; KISLOVODSK RUSSIA; LARISSA OBSERVATORY GREECE; LEARMOUTH AUSTRALIA; MIRA GRIMBERGEN BELGIUM; MITAKA JAPAN; MOCHIZUKI URAWA SAITAMA JAPAN; NIJMEGEN NETHERLANDS; OBSERVATORY FRANTISKA CZECH-REP.; OBSERVATORY PROSTEJOV CZECH REPUBL; ONDREJOV OBSERV. CZECH-REPUBLIC RAMEY PUERTO-RICO; SAN VITO ITALY; SKALNATE SLOVAKIA; SMOLYAN BULGARIA; SPANINKS TILBURG NETHERLANDS; STEFANIKS OBS. PRAGUE CZECH-REP.; SUZUKI JAPAN; UCCLE BELGIUM

The diameter of the central zone is half size 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 Roma, Helwan, Jeddah 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 millionths of the solar disk.

I - 2 (2005)

JANUARY 2005						FEBRUARY 2005					
2005 JAN.	Ri	Ric	Ac	Ar	Ai	2005 FEB.	Ri	Ric	Ac	Ar	Ai
1	32	21	513	-	99	1	19	11	249	-	27
2	32	24	417	-	112	2	17	11	-	238	67
3	24	23	439	400	80	3	11	8	106	103	22
4	14	15	148	215	39	4	15	9	105	75	32
5	11	12	74	123	21	5	16	0	211	188	38
6	12	0	99	-	16	6	38	0	443	-	49
7	11	0	26	-	2	7	38	8	-	274	41
8	10	0	74	-	21	8	35	8	-	571	125
9	14	0	185	-	36	9	39	12	-	799	160
10	19	0	248	478	89	10	48	19	-	961	193
11	27	16	386	655	98	11	52	33	1719	1669	493
12	40	14	916	-	101	12	56	44	1588	-	314
13	41	27	2326	-	258	13	48	26	1546	-	319
14	54	47	3461	4791	1098	14	48	36	1704	-	189
15	59	54	-	5244	974	15	52	50	1451	-	296
16	65	59	3619	-	828	16	45	36	1499	-	291
17	64	31	3291	4552	1031	17	43	27	1408	1733	385
18	61	9	3062	4366	955	18	37	14	1101	1379	323
19	45	0	-	-	0	19	31	9	693	1175	261
20	42	0	1498	-	511	20	27	0	603	-	156
21	45	13	910	-	313	21	20	0	535	-	129
22	31	16	470	764	117	22	20	0	391	-	130
23	26	15	-	-	0	23	16	16	120	-	16
24	28	8	417	-	82	24	11	13	37	-	8
25	32	19	545	-	60	25	8	0	-	-	0
26	23	14	381	604	110	26	12	0	100	-	11
27	20	13	434	-	48	27	8	0	-	-	0
28	20	12	-	-	0	28	7	0	-	-	0
29	19	11	120	-	37						
30	22	18	296	-	32						
31	26	18	328	516	114						
MEAN	31.3	16.4	914.2	1892.3	234.9	MEAN	29.2	13.9	780.5	763.8	145.5

MARCH 2005						APRIL 2005					
2005 MAR.	Ri	Ric	Ac	Ar	Ai	2005 APR.	Ri	Ric	Ac	Ar	Ai
1	0	0	-	-	0	1	16	10	31	32	9
2	8	9	37	52	9	2	20	12	-	-	2
3	9	8	10	-	1	3	28	12	-	-	30
4	8	0	74	-	8	4	33	26	-	648	93
5	9	0	100	179	26	5	35	8	-	-	35
6	10	0	228	-	25	6	29	9	-	404	80
7	18	0	337	168	59	7	28	8	412	314	111
8	33	14	270	114	63	8	27	8	391	349	91
9	38	14	486	623	135	9	27	19	312	-	34
10	41	14	676	1004	220	10	27	13	-	-	25
11	43	28	793	1468	313	11	13	14	233	-	39
12	42	22	1589	-	291	12	21	13	307	-	60
13	42	33	1664	-	308	13	29	19	274	411	98
14	40	27	1504	-	308	14	35	11	337	508	108
15	37	27	1234	1861	415	15	36	9	358	511	116
16	28	12	1187	1568	357	16	28	20	348	-	64
17	25	12	1022	1406	324	17	26	22	333	-	79
18	25	0	884	1192	296	18	26	21	407	468	109
19	26	11	720	852	215	19	26	19	280	-	64
20	25	14	747	-	136	20	24	12	179	-	38
21	30	14	646	525	137	21	16	8	153	253	41
22	28	14	342	-	47	22	16	8	184	153	37
23	32	13	429	-	74	23	14	9	114	66	28
24	41	25	423	-	67	24	9	7	10	-	1
25	34	29	497	846	127	25	10	8	306	-	34
26	26	26	333	-	37	26	11	0	540	661	237
27	22	9	248	-	27	27	17	8	959	1318	357
28	10	0	111	-	27	28	30	12	1733	2348	595
29	9	0	42	-	13	29	35	32	1802	2633	422
30	7	0	5	-	0	30	34	30	2077	2728	579
31	15	7	42	28	6						
MEAN	24.5	12.3	556.0	792.4	131.3	MEAN	24.2	13.6	503.3	812.1	120.51

I - 3 (2005)

MAY 2005						JUNE 2005					
2005 MAY	Ri	Ric	Ac	Ar	Ai	2005 JUN.	Ri	Ric	Ac	Ar	Ai
1	42	34	2072	-	230	1	53	0	315	436	127
2	42	22	2057	2630	447	2	40	14	-	-	76
3	47	19	2041	2377	422	3	33	14	640	704	152
4	43	16	1860	2002	370	4	49	30	1069	899	263
5	40	0	1293	1763	291	5	62	32	1297	-	230
6	45	0	-	1296	132	6	64	37	1520	2109	474
7	37	24	540	480	98	7	73	21	1642	2431	610
8	46	32	773	-	85	8	68	28	2214	3111	704
9	63	39	1398	1700	296	9	67	49	-	-	233
10	77	40	1625	-	180	10	70	42	-	3263	554
11	82	26	2012	2961	473	11	55	37	2188	-	440
12	80	34	-	2975	303	12	52	39	1733	-	365
13	62	35	1627	-	180	13	31	15	1097	1794	387
14	51	24	1287	-	143	14	33	0	1027	-	214
15	39	30	1070	-	118	15	40	15	931	-	207
16	43	34	879	1492	323	16	43	21	952	1621	334
17	33	24	843	-	175	17	48	24	1097	1422	374
18	26	14	444	-	145	18	32	18	-	1615	251
19	23	11	291	361	110	19	29	0	774	-	191
20	15	0	127	-	47	20	31	16	656	-	136
21	13	0	21	-	2	21	34	19	471	681	170
22	24	0	179	-	36	22	27	17	413	200	122
23	25	10	349	148	64	23	11	14	147	-	26
24	25	0	455	341	76	24	11	13	26	-	2
25	30	28	365	544	107	25	12	0	15	-	1
26	44	31	508	702	129	26	0	0	-	-	0
27	44	38	826	1099	237	27	8	0	-	-	0
28	37	29	544	1379	237	28	9	0	63	-	20
29	43	33	794	-	113	29	28	11	216	-	33
30	46	12	698	928	188	30	67	25	883	-	177
31	58	11	580	457	163						
MEAN	42.7	21.0	950.3	1349.2	191.0	MEAN	39.3	18.4	891.1	1560.5	229.1

JULY 2005						AUGUST 2005					
2005 JULY	Ri	Ric	Ac	Ar	Ai	2005 AUG.	Ri	Ric	Ac	Ar	Ai
1	78	42	1423	-	254	1	63	18	903	1585	372
2	95	61	2010	-	587	2	69	33	1741	-	193
3	101	54	2190	-	514	3	48	23	1058	1489	242
4	107	55	2566	3887	762	4	40	31	1132	1396	241
5	103	57	2545	-	513	5	40	38	942	1509	232
6	84	70	2478	3689	779	6	33	26	921	1271	208
7	75	35	2298	3661	743	7	39	22	1000	-	111
8	64	39	2808	3037	725	8	37	11	729	1023	166
9	57	41	2098	2108	403	9	34	9	640	629	121
10	42	23	1059	-	117	10	16	0	380	365	71
11	41	15	757	-	84	11	22	0	137	-	15
12	38	13	777	1044	173	12	27	0	152	76	22
13	41	17	703	759	223	13	22	8	275	280	53
14	30	0	363	162	54	14	26	17	482	-	53
15	21	0	148	245	50	15	27	24	402	-	69
16	11	0	196	75	74	16	24	17	487	572	133
17	8	0	63	-	7	17	20	22	413	377	98
18	0	0	-	-	0	18	19	12	227	252	52
19	9	0	15	-	1	19	44	18	1069	1132	260
20	0	0	-	-	0	20	48	16	1228	1639	390
21	0	0	-	-	0	21	39	16	1578	-	299
22	8	0	10	-	10	22	38	21	1298	-	324
23	16	0	100	-	26	23	36	22	853	-	311
24	11	8	195	-	46	24	42	33	1033	929	308
25	12	13	259	374	83	25	41	25	851	-	181
26	15	16	403	491	108	26	37	8	783	646	170
27	11	14	296	405	87	27	42	11	693	-	105
28	18	11	301	363	99	28	46	12	512	-	115
29	34	22	598	745	199	29	43	13	-	-	43
30	43	21	757	-	203	30	37	13	-	376	68
31	69	22	1200	-	252	31	29	13	216	311	2145
MEAN	40.1	20.9	1022.0	1403.0	231.5	MEAN	36.4	17.2	763.3	834.6	231.3

I - 4 (2005)

SEPTEMBER 2005						OCTOBER 2005					
2005 SEP.	Ri	Ric	Ac	Ar	Ai	2005 OCT.	Ri	Ric	Ac	Ar	Ai
1	17	18	141	238	49	1	9	8	53	47	9
2	14	12	169	217	48	2	8	0	10	-	1
3	9	10	111	176	35	3	10	0	47	-	5
4	9	10	90	-	13	4	14	0	217	164	45
5	8	0	143	-	18	5	17	11	286	591	100
6	8	0	63	-	13	6	15	12	270	342	76
7	14	0	52	-	16	7	14	13	254	-	28
8	20	0	328	-	112	8	12	10	243	-	27
9	28	0	-	-	373	9	10	11	67	-	7
10	35	19	1972	2341	616	10	16	8	35	-	10
11	34	10	249	-	187	11	14	8	77	-	12
12	37	33	2704	-	451	12	14	11	52	-	7
13	50	60	2846	-	316	13	0	7	-	-	0
14	41	53	2974	3204	592	14	8	0	63	-	13
15	39	40	1612	2837	539	15	8	0	-	83	19
16	33	23	1357	2175	446	16	8	0	63	-	13
17	35	0	1123	-	213	17	8	8	68	-	13
18	33	12	677	-	202	18	8	8	-	-	5
19	26	0	561	583	199	19	16	13	-	-	10
20	14	0	450	591	99	20	9	9	-	-	2
21	13	15	482	-	93	21	8	7	37	-	5
22	14	16	456	-	100	22	7	8	-	-	0
23	19	14	508	646	145	23	8	0	-	-	0
24	17	9	603	717	154	24	0	0	-	-	0
25	16	9	392	-	84	25	0	0	-	-	0
26	22	10	369	555	121	26	0	0	10	-	1
27	16	9	349	451	104	27	0	0	5	-	0
28	15	9	222	274	82	28	0	0	-	-	0
29	14	8	105	-	47	29	8	0	5	-	0
30	7	8	21	23	37	30	9	0	37	-	10
						31	12	0	116	114	32
MEAN	21.9	13.6	728.6	1001.9	183.5	MEAN	8.7	4.9	96.0	223.5	14.5

NOVEMBER 2005						DECEMBER 2005					
2005 NOV.	Ri	Ric	Ac	Ar	Ai	2005 DEC.	Ri	Ric	Ac	Ar	Ai
1	18	22	180	-	34	1	49	27	-	1207	123
2	19	19	116	32	14	2	54	30	1563	2096	438
3	11	9	47	28	8	3	60	55	1562	-	279
4	12	15	30	-	3	4	55	46	1450	-	257
5	12	16	68	-	13	5	55	36	1075	-	119
6	14	9	164	-	27	6	45	25	698	606	172
7	25	19	194	88	27	7	23	8	317	462	96
8	8	11	52	-	5	8	25	8	216	-	46
9	8	0	31	-	9	9	23	8	-	-	0
10	0	0	-	-	0	10	39	9	-	376	38
11	0	0	5	-	0	11	38	10	-	-	0
12	10	0	-	-	30	12	33	0	725	779	185
13	12	0	-	-	30	13	38	11	-	-	0
14	19	0	689	-	201	14	38	24	-	-	0
15	20	0	1007	1437	390	15	36	28	673	-	142
16	23	23	1478	-	164	16	31	23	513	-	57
17	24	32	1490	-	281	17	28	34	460	-	89
18	26	34	1071	1978	289	18	28	12	407	-	45
19	26	29	986	1903	392	19	43	33	851	1162	234
20	33	23	1049	-	262	20	39	22	756	-	144
21	27	17	1054	1609	338	21	42	21	517	-	129
22	27	0	1092	-	121	22	41	10	353	-	39
23	24	0	688	988	240	23	36	11	444	-	103
24	27	14	475	-	129	24	53	14	597	-	123
25	20	22	201	-	38	25	43	14	-	-	55
26	15	19	-	-	17	26	52	21	856	-	95
27	16	11	-	-	15	27	51	16	862	-	129
28	17	11	195	177	55	28	44	26	862	-	148
29	16	17	174	-	31	29	45	23	857	-	95
30	30	24	-	-	0	30	46	30	708	873	187
						31	41	33	640	-	71
MEAN	18.0	13.2	522.3	915.6	105.4	MEAN	41.1	21.5	748.4	945.1	117.4