

Sunspot Relative Numbers and Sunspot Areas

2007

Cooperating Observatories to the International Sunspot Number :

AMATEUR SOUTHERN CROSS OBSERVATORY (BOLIVIA); ANDRE GABRIEL BELGIUM; ANDRIES SON BELGIUM; ARILLE VIGNERON BELGIUM; ASTRO. DE REUX CINEY BELGIUM; AUSTRALIAN OBS. COONABARABRAN AUSTRALIA; BARNES AUCKLAND NEW-ZEALAND; BORTOLOTTI MAURO ITALIA; BULLON VALENCIA SPAIN; CAMAGUEY CUBA; CATANIA ITALY; CENTRAL WEATHER BUREAU REPUBLIC OF CHINA; CLAEYS VEDRIN BELGIUM; COURDURIE MARCQ EN BAROEUL FRANCE; CRIMEAN OBSERVATORY UKRAINE; CULGOORA NARRABRI AUSTRALIA; DE BACKER BOOM BELGIUM; DEMAN BELGIUM; DUBOIS LANGEMARK BELGIUM; EBRO ROQUETES SPAIN; EUROPLANETARIUM BELGIUM; EVANS INVERCAGILL NEW-ZEALAND; FERNANDEZ RUIS SANTANDER SPAIN; Franck GOBET FRANCE; Freddy Doncel Observatorio Astronomico Facultad Politecnica Universidad Nacional de Asuncion PARAGUAY; FUJIMORI NAGANO JAPAN; GEMA ARAUJO SPAIN; GERARD DINANT BELGIUM; GERMAN MORALES; COCHABAMBA BOLIVIA; HANS COECKELBERGHS BELGIUM; HAVANA SOLAR STATION CUBA; HAZEL COLLETT UNITED-KINGDOM; HELWAN EGYPT; HOLLOMAN U.S.A; HUGO TRIGOSO PERU; HURBANOVO SLOVAKIA; HVEZDAREN KYSUCKE SLOVAKIA; HVEZDAREN PRESOV SLOVAKIA; JEF CLAES BELGIUM; JEFFREY CARELS BELGIUM; JOHNSTON GWYNEDD ENGLAND; JORGE LUIS GARCIA SPAIN; JURI GAGARIN EILENBURG GERMANY; KANDILLI TURKEY; KANZELHOHE TREFFEN AUSTRIA; KAREL DEWAELE BELGIUM; KAWAGUCHI JAPAN; KISLOVODSK RUSSIA; KLDADNO CZECH-REPUBLIC; LARISSA OBSERVATORY GREECE; LEARMOUTH AUSTRALIA; LIEVE MEEUS BELGIUM; LOCARNO SWITZERLAND; MAC KENZIE DOVER UNITED-KINGDOM; MILANO ITALY; MIRA GRIMBERGEN BELGIUM; MITAKA JAPAN; MOCHIZUKI URAWA SAITAMA JAPAN; MONTE MOR Walter Maluf (BRASIL); MURMANSK RUSSIA; NIJMEGEN NETHERLANDS; OBSERVATORY FRANTISKA CZECH-REP.; OBSERVATORY PROSTEJOV CZECH REPUBL.; ONDREJOV OBSERV. CZECH-REPUBLIC; PASTERNAK BERLIN GERMANY; PASTERNAK LEER GERMANY; PHILIPPE WITTELSHEIM FRANCE; QUEZON PHILIPPINES; ROBERTO de MANZANO ITALIA; RODRIGO F. DIAZ ARGENTINA; RUBEN VERBOVEN BELGIUM; SAN MIGUEL ARGENTINA; SAN VITO ITALY; SAUDI ARABIA JEDDAH; SCHOTT LUTZ GERD GERMANY; Sjoerd Dufoer BELGIUM; SKALNATE SLOVAKIA; SOBOTA SLOVAKIA; SPANINKS TILBURG NETHERLANDS; STEFANIKS OBS. PRAGUE CZECH-REP.; STUDENTS SAN HERMENEGILDO SPAIN; SUZUKI JAPAN; THOMAS TEAGUE UNITED KINGDOM; UCCLE BELGIUM; 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); ANDRIES SON BELGIUM; ASTRO. DE REUX CINEY BELGIUM; CAMAGUEY CUBA; CENTRAL WEATHER BUREAU REPUBLIC OF CHINA; CRIMEAN OBSERVATORY UKRAINE; DE BACKER BOOM BELGIUM; EBRO ROQUETES SPAIN; EVANS INVERCAGILL NEW-ZEALAND; Franck GOBET FRANCE; FUJIMORI NAGANO JAPAN; GERMAN MORALES COCHABAMBA BOLIVIA; HELWAN EGYPT; HOLLOMAN U.S.A; HVEZDAREN KYSUCKE SLOVAKIA; HVEZDAREN PRESOV SLOVAKIA; JEFFREY; CARELS BELGIUM; JORGE LUIS GARCIA SPAIN; KANDILLI TURKEY; KAWAGUCHI JAPAN; KISLOVODSK RUSSIA; LARISSA OBSERVATORY GREECE; LIEVE MEEUS BELGIUM; LOCARNO SWITZERLAND; MILANO ITALY; MIRA GRIMBERGEN BELGIUM; MITAKA JAPAN; MOCHIZUKI URAWA SAITAMA JAPAN; MONTE MOR Walter Maluf (BRASIL); NIJMEGEN NETHERLANDS; OBSERVATORY; FRANTISKA CZECH-REP.; OBSERVATORY PROSTEJOV CZECH REPUBL.; ONDREJOV OBSERV. CZECH-REPUBLIC; SAN MIGUEL ARGENTINA; Sjoerd Dufoer BELGIUM; SKALNATE SLOVAKIA; SOBOTA SLOVAKIA; SPANINKS TILBURG NETHERLANDS; STEFANIKS OBS. PRAGUE CZECH-REP.; SUZUKI JAPAN; UCCLE BELGIUM; ZAGORA BULGARIA

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.

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JANUARY 2007						FEBRUARY 2007					
2007 JAN.	Ri	Ric	Ac	Ar	Ai	2007 FEB.	Ri	Ric	Ac	Ar	Ai
1	22	0	-	-	47	1	22	13	842	1257	251
2	24	0	915	-	187	2	24	22	-	1440	189
3	25	10	-	1319	233	3	21	19	879	1299	241
4	25	17	1017	-	202	4	17	7	-	-	69
5	28	17	1027	1530	230	5	16	7	-	926	135
6	27	22	-	-	87	6	15	7	466	-	122
7	24	16	-	-	87	7	15	0	338	459	72
8	30	16	1012	-	112	8	8	0	190	-	45
9	27	15	974	1381	212	9	7	0	127	-	14
10	24	7	672	-	177	10	7	0	84	-	9
11	23	9	491	-	89	11	0	0	-	-	0
12	16	0	275	438	101	12	0	0	-	-	0
13	17	0	174	-	77	13	0	0	-	-	0
14	11	0	-	-	7	14	0	0	-	-	0
15	11	0	222	-	31	15	0	0	-	-	0
16	11	10	106	-	17	16	0	0	-	-	0
17	9	9	53	-	7	17	8	0	42	-	4
18	10	15	79	54	12	18	8	0	-	-	0
19	14	14	-	21	1	19	20	8	-	-	0
20	11	11	104	103	29	20	17	17	-	-	0
21	11	11	-	-	17	21	10	13	68	-	11
22	12	11	456	-	68	22	16	8	-	-	0
23	10	0	635	-	70	23	15	8	-	-	24
24	11	7	328	-	64	24	8	0	-	-	24
25	8	0	-	-	7	25	8	0	-	-	24
26	7	0	-	-	0	26	15	0	275	312	53
27	7	0	201	-	56	27	15	8	264	332	54
28	8	0	-	-	42	28	8	7	270	-	44
29	18	8	551	-	120						
30	20	9	779	1208	244						
31	20	13	1086	1265	270						
MEAN	16.8	8.0	531.3	813.2	93.6	MEAN	10.7	5.1	320.4	860.7	49.5

MARCH 2007						APRIL 2007					
2007 MAR.	Ri	Ric	Ac	Ar	Ai	2007 APR.	Ri	Ric	Ac	Ar	Ai
1	7	9	206	-	34	1	10	12	-	-	4
2	7	12	212	-	36	2	0	0	-	-	0
3	7	7	212	-	36	3	0	0	-	-	2
4	8	0	-	-	14	4	0	0	-	-	0
5	17	10	105	105	33	5	0	0	-	-	0
6	14	0	36	-	4	6	0	0	-	-	0
7	0	0	-	-	0	7	0	0	-	-	0
8	0	0	-	-	0	8	0	0	-	-	0
9	0	0	-	-	0	9	0	0	-	-	0
10	0	0	-	-	0	10	0	0	-	-	0
11	9	0	-	-	7	11	0	0	-	-	0
12	8	0	26	-	9	12	0	0	-	-	0
13	0	0	-	-	0	13	0	0	-	-	0
14	0	0	-	-	0	14	0	0	-	-	0
15	0	0	-	-	0	15	0	0	-	-	0
16	0	0	-	-	0	16	0	0	-	-	0
17	0	0	-	-	0	17	7	0	15	-	5
18	0	0	-	-	0	18	0	0	-	-	0
19	0	0	-	-	0	19	0	0	-	-	0
20	0	0	-	-	0	20	0	0	-	-	2
21	0	0	-	-	0	21	0	0	-	-	0
22	0	0	-	-	0	22	0	0	-	-	0
23	8	0	42	-	6	23	0	0	-	-	0
24	8	0	53	-	9	24	0	0	-	-	0
25	0	0	-	-	0	25	8	0	-	-	22
26	9	0	84	99	19	26	10	0	572	-	63
27	8	0	21	-	2	27	11	0	636	777	200
28	8	0	21	-	2	28	14	0	678	1048	218
29	8	0	-	-	0	29	20	14	-	-	99
30	7	0	31	-	3	30	21	17	725	-	162
31	7	0	-	-	0						
MEAN	4.5	1.2	87.4	102.0	6.9	MEAN	3.4	1.4	525.2	912.5	25.9

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MAY 2007						JUNE 2007					
2007 MAY	Ri	Ric	Ac	Ar	Ai	2007 JUN.	Ri	Ric	Ac	Ar	Ai
1	20	19	-	-	117	1	19	0	157	118	49
2	20	19	859	-	182	2	25	0	911	-	169
3	12	13	684	-	149	3	31	0	751	-	160
4	11	8	567	-	130	4	34	7	-	1051	155
5	10	0	413	-	113	5	35	8	1181	1229	267
6	9	0	-	-	29	6	33	21	858	-	139
7	8	0	259	171	73	7	37	23	529	801	155
8	9	0	10	-	7	8	34	12	439	-	48
9	11	12	116	252	32	9	12	10	222	408	79
10	12	10	238	395	67	10	9	0	159	-	45
11	14	13	222	277	67	11	9	0	84	227	37
12	13	12	164	292	49	12	8	0	63	83	20
13	11	9	-	-	14	13	8	0	63	40	21
14	18	0	137	115	37	14	0	0	-	-	0
15	18	0	169	-	55	15	0	0	-	-	0
16	19	10	285	-	82	16	0	0	-	-	0
17	24	13	429	-	110	17	0	0	-	-	0
18	25	21	460	944	168	18	0	0	-	-	0
19	22	15	779	596	144	19	0	0	-	-	0
20	14	13	-	-	37	20	0	0	-	-	0
21	11	11	291	266	69	21	0	0	-	-	0
22	9	0	127	104	29	22	0	0	-	-	0
23	14	0	47	-	11	23	0	0	-	-	0
24	9	0	-	-	0	24	0	0	-	-	0
25	0	0	-	-	0	25	7	0	84	-	28
26	0	0	-	-	0	26	8	0	84	-	9
27	0	0	-	-	0	27	8	0	169	340	45
28	0	0	-	-	0	28	9	0	249	426	60
29	7	0	26	-	9	29	18	9	253	471	64
30	7	0	21	-	11	30	18	7	424	536	87
31	7	0	-	-	0						
MEAN	11.7	6.4	300.1	341.2	57.8	MEAN	12.1	3.2	371.1	477.5	54.6

JULY 2007						AUGUST 2007					
2007 JULY	Ri	Ric	Ac	Ar	Ai	2007 AUG.	Ri	Ric	Ac	Ar	Ai
1	19	11	-	-	0	1	0	11	-	-	0
2	11	10	355	422	70	2	0	10	-	-	0
3	9	8	296	358	59	3	7	8	-	-	0
4	9	0	169	-	18	4	7	0	26	-	2
5	9	0	127	200	29	5	7	0	-	-	4
6	9	0	84	92	16	6	8	0	58	44	12
7	8	0	63	-	7	7	8	0	53	44	10
8	10	0	-	-	0	8	9	0	100	108	37
9	14	0	445	485	130	9	9	0	74	64	17
10	17	0	588	1038	228	10	9	0	42	-	10
11	17	9	583	1159	194	11	8	9	37	-	5
12	15	13	662	1175	224	12	8	13	-	-	2
13	26	22	1055	1127	267	13	8	22	-	-	7
14	27	14	758	940	183	14	0	14	-	-	9
15	25	14	-	-	57	15	0	14	-	-	0
16	20	10	365	553	113	16	0	10	-	-	0
17	11	0	217	354	81	17	0	0	-	-	0
18	9	0	201	219	65	18	0	0	-	-	0
19	8	0	68	-	33	19	0	0	-	-	0
20	0	0	-	-	0	20	0	0	-	-	0
21	0	0	-	-	0	21	9	0	89	-	22
22	0	0	-	-	0	22	8	0	106	-	33
23	0	0	-	-	0	23	8	0	148	-	30
24	0	0	-	-	0	24	8	0	169	-	28
25	0	0	-	-	0	25	8	0	212	332	68
26	0	0	-	-	0	26	8	0	-	-	19
27	0	0	-	-	0	27	8	0	233	344	67
28	9	7	37	49	11	28	8	7	270	343	55
29	9	8	-	-	4	29	8	8	249	278	64
30	9	8	-	17	10	30	8	8	217	-	44
31	0	7	-	-	0	31	17	7	222	-	46
MEAN	9.7	4.5	357.2	545.9	58.0	MEAN	6.0	4.5	135.6	194.6	19.1

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SEPTEMBER 2007						OCTOBER 2007					
2007 SEP.	Ri	Ric	Ac	Ar	Ai	2007 OCT.	Ri	Ric	Ar	Ac	Ai
1	14	11	-	-	4	1	0	0	-	-	0
2	8	10	-	-	7	2	0	0	-	-	0
3	8	8	95	-	16	3	0	0	-	-	0
4	8	0	26	-	9	4	0	0	-	-	0
5	8	0	74	-	18	5	0	0	-	-	0
6	0	0	5	-	0	6	11	10	84	-	9
7	0	0	-	-	0	7	9	10	-	-	0
8	0	0	-	-	0	8	7	0	15	-	1
9	0	0	-	-	0	9	0	0	-	-	0
10	0	0	-	-	0	10	0	0	-	-	0
11	0	9	-	-	0	11	0	0	-	-	0
12	0	13	-	-	0	12	0	0	-	-	0
13	0	22	-	-	0	13	0	0	-	-	0
14	0	14	-	-	0	14	0	0	-	-	0
15	0	14	-	-	0	15	0	0	-	-	0
16	0	10	-	-	0	16	0	0	-	-	0
17	0	0	-	-	0	17	0	0	5	-	0
18	0	0	-	-	0	18	0	0	-	-	0
19	0	0	-	-	0	19	0	0	-	-	0
20	0	0	-	-	0	20	0	0	-	-	0
21	0	0	-	-	0	21	0	0	-	-	0
22	0	0	-	-	0	22	0	0	-	-	0
23	0	0	-	-	0	23	0	0	-	-	0
24	0	0	-	-	0	24	0	0	-	-	0
25	0	0	-	-	0	25	0	0	-	-	0
26	0	0	-	-	0	26	0	0	-	-	0
27	0	0	-	-	2	27	0	0	-	-	0
28	9	7	79	-	16	28	0	0	-	-	0
29	9	8	74	-	14	29	0	0	-	-	0
30	9	8	-	-	9	30	0	0	-	-	0
						31	0	0	-	-	0
MEAN	2.4	4.5	58.8	-	3.2	MEAN			34.7	-	0.3

NOVEMBER 2007						DECEMBER 2007					
2007 NOV.	Ri	Ric	Ac	Ar	Ai	2007 DEC.	Ri	Ric	Ar	Ac	Ai
1	0	0	-	-	0	1	10	0	-	29	9
2	0	0	-	-	0	2	9	0	-	-	0
3	0	0	-	-	0	3	7	0	37	-	4
4	0	0	-	-	0	4	9	0	68	60	18
5	0	0	-	-	0	5	8	9	-	35	7
6	8	0	26	-	4	6	16	8	132	-	35
7	0	0	-	-	0	7	15	0	392	-	52
8	0	0	-	-	0	8	25	0	-	-	32
9	0	0	-	-	0	9	26	0	-	-	72
10	0	0	-	-	0	10	24	22	1012	-	161
11	0	0	-	-	0	11	24	22	705	821	181
12	0	0	-	-	0	12	28	27	1071	-	147
13	0	0	-	-	0	13	30	27	1230	1502	315
14	0	0	-	-	0	14	24	26	1039	-	216
15	0	0	-	-	0	15	22	0	-	463	123
16	10	8	-	-	0	16	18	0	-	-	0
17	9	9	26	-	2	17	11	0	201	-	22
18	0	7	-	-	0	18	7	0	-	-	0
19	0	0	-	-	0	19	0	0	-	-	0
20	0	0	-	-	0	20	0	0	-	-	0
21	0	0	-	-	0	21	0	0	-	-	0
22	0	0	-	-	0	22	0	0	-	-	0
23	0	0	-	-	0	23	0	0	-	-	0
24	10	9	37	-	4	24	0	0	-	-	0
25	8	7	-	-	0	25	0	0	-	-	0
26	7	0	5	-	2	26	0	0	-	-	0
27	0	0	-	-	0	27	0	0	-	-	0
28	0	0	-	-	0	28	0	0	-	-	0
29	0	0	-	-	0	29	0	0	-	-	0
30	0	0	-	-	0	30	0	0	-	-	0
						31	0	0	-	-	0
MEAN	1.7	1.3	23.5	-	0.4	MEAN	10.1	4.5	588.7	485.0	45.0