

## Sunspot Relative Numbers and Sunspot Areas

2008

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; BARNES AUCKLAND NEW-ZEALAND; BORTOLOTTI MAURO ITALIA; BROXTON TONY UK; BULLON VALENCIA SPAIN; CAMAGUEY CUBA; CATANIA ITALY - USSPS code 31405-; 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; 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; GERMAN MORALES COCHABAMBA BOLIVIA; HANS COECKELBERGHS BELGIUM; HAVANA SOLAR STATION CUBA; HELWAN EGYPT; HOLLOMAN U.S.A; 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; Ken Hall (UK); Ken Medway(UK); KISLOVODSK RUSSIA; KLADNO CZECH-REPUBLIC; LARISSA OBSERVATORY GREECE; LEARMOUTH AUSTRALIA - USSPS code 81202-; LIEVE MEEUS BELGIUM; LOCARNO SWITZERLAND; MAC KENZIE DOVER UNITED-KINGDOM; Michael Boschat(CANADA); 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; PETER MEADOWS (UK); PHILIPPE WITTELSHEIM FRANCE; ROBERTO de MANZANO ITALIA; SAN MIGUEL ARGENTINA; SAN VITO ITALY; SAUDI ARABIA JEDDAH; SCHOTT LUTZ GERD GERMANY; Sjoerd Dufoer BELGIUM; SKALNATE SLOVAKIA; SMITH MARLIN UK; SOBOTA SLOVAKIA; SPANINKS TILBURG NETHERLANDS; STEFANIKS OBS. PRAGUE CZECH-REP.; SUZUKI JAPAN; THOMAS TEAGUE UNITED KINGDOM; TONY TANTI (MALTA); 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; Arthur Bowyer; ASTRO. DE REUX CINEY BELGIUM; BORTOLOTTI MAURO ITALIA;; BROXTON TONY UK; BULLON VALENCIA SPAIN; CATANIA ITALY ; CENTRAL WEATHER BUREAU REPUBLIC OF CHINA; CRIMEAN OBSERVATORY UKRAINE; DE BACKER BOOM BELGIUM; EBRO ROQUETES SPAIN; Franck GOBET FRANCE; Freddy Doncel Observatorio Astronomico Facultad Politecnica Universidad Nacional de Asuncion PARAGUAY; FUJIMORI NAGANO JAPAN; GERMAN MORALES COCHABAMBA BOLIVIA; HAVANA SOLAR STATION CUBA; HELWAN EGYPT; HOLLOMAN U.S.A; HVEZDAREN KYSUCKE SLOVAKIA; HVEZDAREN PRESOV SLOVAKIA; JEFFREY CARELS BELGIUM; JORGE LUIS GARCIA SPAIN; KANDILLI TURKEY; KAWAGUCHI JAPAN; Ken Hall (UK); Ken Medway(UK); KISLOVODSK RUSSIA; LARISSA OBSERVATORY GREECE; LEARMOUTH AUSTRALIA - USSPS code 81202-; LIEVE MEEUS BELGIUM; LOCARNO SWITZERLAND; Michael Boschat(CANADA); 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; Peter Meadows (UK); RAMEY PUERTO-RICO; SAN VITO ITALY ; SAUDI ARABIA JEDDAH; Sjoerd Dufoer BELGIUM; SKALNATE SLOVAKIA; SMOLYAN BULGARIA; 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 quantifies 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 2008						FEBRUARY 2008					
2008 JAN.	Ri	Ric	Ac	Ar	Ai	2008 FEB.	Ri	Ric	Ac	Ar	Ai
1	7	0	-	-	0	1	11	12	-	50	13
2	7	0	68	34	18	2	9	8	-	-	9
3	7	0	-	-	3	3	9	9	-	-	7
4	10	0	36	-	4	4	8	8	-	-	1
5	8	9	-	-	0	5	0	0	-	-	0
6	11	8	-	-	0	6	0	0	-	-	0
7	11	10	74	-	8	7	0	0	-	-	0
8	9	10	26	-	2	8	0	0	-	-	0
9	0	0	-	-	0	9	0	0	-	-	0
10	8	7	-	-	0	10	0	0	-	-	0
11	8	7	-	-	0	11	0	0	-	-	0
12	0	0	-	-	0	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	0	0	-	-	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	8	0	-	-	1
26	0	0	-	-	0	26	8	0	-	-	9
27	0	0	-	-	0	27	8	0	-	-	3
28	0	0	-	-	0	28	0	0	-	-	5
29	0	0	-	-	0	29	0	0	-	-	0
30	8	0	-	-	11						
31	8	10	-	-	11						
MEAN	3.3	2.0	51.0	34.0	1.8	MEAN	2.1	1.3	-	50.0	1.7

MARCH 2008						APRIL 2008					
2008 MAR.	Ri	Ric	Ac	Ar	Ai	2008 APR.	Ri	Ric	Ac	Ar	Ai
1	0	0	-	-	0	1	16	0	-	363	98
2	0	0	-	-	0	2	9	0	-	-	32
3	7	9	-	-	0	3	9	0	-	97	33
4	0	0	-	-	0	4	7	0	-	-	0
5	0	0	-	-	0	5	0	0	-	-	0
6	8	0	-	-	0	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	9	0	-	-	9	10	0	0	-	-	0
11	0	0	-	-	0	11	0	0	-	-	0
12	0	0	-	-	0	12	0	0	-	-	0
13	0	0	-	-	0	13	7	0	-	-	0
14	0	0	-	-	0	14	7	0	-	-	1
15	7	0	-	-	3	15	0	0	-	-	0
16	7	0	-	-	5	16	0	0	-	-	0
17	7	0	-	-	0	17	0	0	-	-	0
18	0	0	-	-	0	18	0	0	-	-	0
19	0	0	-	-	0	19	8	0	-	-	0
20	0	0	-	-	0	20	0	0	-	-	0
21	0	0	-	-	0	21	0	0	-	-	0
22	0	0	-	-	0	22	8	8	-	-	5
23	0	0	-	-	5	23	8	10	-	85	20
24	19	0	-	-	18	24	7	7	-	-	1
25	32	13	-	1099	269	25	0	0	-	-	0
26	36	17	-	-	79	26	0	0	-	-	0
27	35	27	-	-	92	27	0	0	-	-	0
28	34	25	-	1497	369	28	0	0	-	-	0
29	30	30	-	1088	283	29	0	0	-	-	0
30	31	21	-	-	41	30	0	0	-	-	0
31	25	10	-	517	128						
MEAN	9.3	4.9	-	1050.2	42.0	MEAN	2.9	-	-	181.7	6.3

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MAY 2008						JUNE 2008					
2008 MAY	Ri	Ric	Ac	Ar	Ai	2008 JUN.	Ri	Ric	Ac	Ar	Ai
1	7	0	-	-	0	1	0	0	-	-	0
2	0	0	-	-	0	2	0	0	-	-	0
3	0	0	-	-	0	3	0	0	-	-	0
4	7	0	-	-	5	4	0	0	-	-	0
5	8	0	-	-	5	5	9	9	-	-	1
6	0	0	-	-	0	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	9	0	-	29	12
11	0	0	-	-	0	11	8	0	-	-	5
12	0	0	-	-	0	12	7	8	-	-	3
13	8	0	-	-	0	13	8	8	-	-	1
14	0	0	-	-	0	14	0	0	-	-	0
15	9	0	-	26	5	15	7	0	-	-	0
16	14	7	-	-	3	16	7	0	-	-	5
17	12	9	-	-	1	17	7	0	-	-	5
18	15	9	-	-	5	18	8	0	-	51	13
19	11	13	-	-	11	19	7	7	-	70	15
20	7	9	-	-	5	20	8	8	-	61	13
21	0	0	-	-	0	21	8	7	-	-	1
22	0	0	-	-	0	22	8	8	-	-	1
23	0	0	-	-	0	23	0	0	-	-	0
24	0	0	-	-	0	24	0	0	-	-	0
25	0	8	-	-	1	25	0	0	-	-	0
26	0	0	-	-	1	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	3.2	1.8	-	26.0	1.4	MEAN	3.4	1.8	-	52.8	2.5

JULY 2008						AUGUST 2008					
2008 JULY	Ri	Ric	Ac	Ar	Ai	2008 AUG.	Ri	Ric	Ac	Ar	Ai
1	0	0	-	-	0	1	0	0	-	-	0
2	0	0	-	-	0	2	0	0	-	-	0
3	0	0	-	-	0	3	0	0	-	-	0
4	0	0	-	-	0	4	0	0	-	-	0
5	0	0	-	-	0	5	0	0	-	-	0
6	0	0	-	-	0	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	0	0	-	-	0	11	0	0	-	-	0
12	0	0	-	-	0	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	0	0	-	-	0
18	8	0	-	-	1	18	0	0	-	-	0
19	9	8	-	20	7	19	0	0	-	-	0
20	8	7	-	-	0	20	0	0	-	-	0
21	0	0	-	-	0	21	7	0	-	-	1
22	0	0	-	-	0	22	8	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	-	-	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	31	0	0	-	-	0
MEAN			-	20.0	0.3	MEAN			-	-	0.0

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SEPTEMBER 2008						OCTOBER 2008					
2008 SEP.	Ri	Ric	Ac	Ar	Ai	2008 OCT.	Ri	Ric	Ac	Ar	Ai
1	0	0	-	-	0	1	0	0	-	-	0
2	0	0	-	-	0	2	0	0	-	-	0
3	0	0	-	-	0	3	0	0	-	-	0
4	0	0	-	-	0	4	7	0	-	-	3
5	0	0	-	-	0	5	0	0	-	-	0
6	0	0	-	-	0	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	-	-	1
10	0	0	-	-	0	10	7	7	-	-	1
11	7	0	-	-	3	11	9	0	-	125	33
12	0	0	-	-	0	12	11	0	-	-	11
13	0	0	-	-	0	13	9	9	-	109	26
14	0	0	-	-	0	14	9	10	-	80	21
15	0	0	-	-	0	15	8	8	-	-	5
16	0	0	-	-	0	16	12	9	-	-	5
17	0	0	-	-	0	17	8	7	-	-	5
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	8	9	-	-	5	22	0	0	-	-	0
23	9	0	-	-	5	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	-	-	0	27	0	0	-	-	0
28	0	0	-	-	0	28	0	0	-	-	0
29	8	0	-	-	0	29	0	0	-	-	0
30	0	0	-	-	1888	30	0	0	-	-	0
MEAN	1.1	-	-	-	63.4	MEAN	2.9	2.0	-	104.7	3.7

  

NOVEMBER 2008						DECEMBER 2008					
2008 NOV.	Ri	Ric	Ac	Ar	Ai	2008 DEC.	Ri	Ric	Ac	Ar	Ai
1	9	0	-	-	0	1	0	0	-	-	0
2	11	0	-	-	15	2	0	0	-	-	0
3	11	0	-	181	49	3	0	0	-	-	0
4	10	0	-	-	7	4	0	0	-	-	0
5	8	0	-	31	9	5	0	0	-	-	0
6	7	0	-	-	0	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	9	0	-	-	7
11	12	13	-	223	58	11	8	0	-	-	0
12	14	0	-	-	13	12	9	0	-	-	0
13	9	0	-	-	0	13	0	0	-	-	0
14	8	0	-	83	21	14	0	0	-	-	0
15	8	0	-	-	0	15	0	0	-	-	0
16	8	0	-	-	7	16	0	0	-	-	0
17	7	0	-	-	0	17	0	0	-	-	0
18	0	0	-	-	0	18	0	0	-	-	0
19	0	0	-	-	0	19	0	0	-	-	0
20	0	8	-	-	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	-	-	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
MEAN	4.1	-	-	129.5	6.0	MEAN	-	-	-	-	0.2