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The relatively long delay for the publication of the QBSA has conducted us to publish presently the preprint of the part of the QBSA prepared by the SIDC :the definitive Sunspot Relative Numbers and Sunspot Areas for 1986.

A. KOECKELENBERGH

Sunspot Relative-Numbers and Sunspot Areas

1986

Cooperating Observatories for Sunspot Relative-Numbers :

Altavira (Venezuela), Ankara (Turkey), Athens Nat. Obs. (Greece), Attikis Nat. Obs. (Greece), Auckland (New-Zealand), Baghdad (Iraq), Basrah (Iraq), Berlin (West-Germ.), Beyazit (Turkey), Boon (Belgium), Boulder (U.S.A.), Bruxelles-Uccle (Belgium), Bruxelles-Univ. (Belgium), Bucharest (Rumania), Buenos Aires (Argentina), Campinas (Cap. Obs. Brasil), Campinas (Brasil), Caracas (Venezuela), Carapachay (Argentina), Catania (Italy), Cochabamba (Bolivia), Cuzco (Australia), Dinant (Belgium), Dover (U.K.), Godella (Spain), Gornicza (Poland), Holloman (U.S.A.), Huancayo (Peru), Hurdanovo (Czechoslovakia), Helwan (Egypt), Inzernhagen (West-Germ.), Jeddah (Saudi Arabia), Kandilli (Turkey), Kanzelhöhe (Austria), Katowice (Poland), Kevlinge (Sweden), Kawaguchi-Saitama (Japan), Koyewe (Venezuela), Kiev (U.R.S.S.), Langemark (Belgium), Learmonth (Australia), Locarno (Switzerland), Lunping (Taiwan), Agr. Madrid (Spain), Madrid (Spain), Manila (Philippines), Mosta (Malta), Museros (Spain), Naxxar (Malta), Nijmegen (Netherlands), Mie-Ken (Japan), Oakland (U.S.A.), Oostende (Belgium), Potsdam (East-Germ.), Palea Penteli (Greece), Palenue (Hawaii), Praoes (France), Puerto-Montt (Chile), Pulligny (France), Pyong Yang (North Korea), Quezon City (Philippines), Ramey (Puerto-Rico), Roma (Italy), Ronse-Renaix (Belgium), Roquetas-Tortosa (Spain), Rotenburg (West-Germ.), San Jose (Argentina), San Miguel (Argentina), Santiago (Chile), Sao de Francisco de Oliveira (Brasil), Sao Quirino (Brasil), Sivry (Belgium), Skalnaté-Pleso (Czechoslovakia), Sonneberg (East-Germ.), Staoen O.N.K. (Belgium), Suwa City (Japan), Taipei Obs. (Taiwan), Taipei Weather Bureau (Taiwan), Tangjunghari (Indonesia), Tashkent (U.R.S.S.), Tokyo-Mitaka (Japan), Tokyo Nat. Science Museum (Japan), Trieste (Italy), Urawa-Saitama (Japan), Valencia (Spain), Vivy (Belgium).

The first column gives the definitive international Sunspot-Numbers for whole disk of the sun (R_i) established by the Sunspot Index Data Center-Brussels on the basis of the observations of Locarno station as reference, the second that for the central zone (R_{cz}) on the basis of the observations of Athens (Nat. Obs.), Bruxelles-Uccle, Inzernhagen, Kawaguchi-Saitama, Kiev, Kislovodsk, Mie-Ken, Nijmegen, Roquetas-Tortosa, Skalnaté-Pleso, Suwa-City, Taipei-Obs., Tashkent, Tokyo-Sc. Mus., Urawa-Saitama.

The diameter of the central zone is half that of sun's disk.

The Sunspot-Areas A_c are determined at Catania, A_w at Ross and A_s are evaluated by the Sunspot Index Data Center-Brussels on the observations of Athens Nat. Obs., Basrah, Lunping, Helwan, Manila, Roma, Taipei Obs. and Taipei Weather Bureau attached 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.

FEBRUARY 1986

JANUARY 1986

1986 FEB.	R I	R IC	A C	A R	A I	1986 JAN.	R I	R IC	A C	A R	A I
1	18	0	360	-	411	1	0	0	0	-	0
2	33	0	953	-	831	2	0	0	0	-	0
3	52	29	1537	157	1236	3	0	0	0	-	0
4	55	27	-	1527	1194	4	0	0	0	-	0
5	53	28	1600	-	1059	5	0	0	0	-	0
6	47	30	1017	-	1112	6	0	0	0	-	0
7	52	56	943	-	790	7	0	0	0	-	0
8	54	45	455	-	436	8	0	0	0	-	0
9	47	27	784	-	667	9	0	0	0	-	0
10	35	26	747	-	868	10	0	0	0	-	0
11	37	0	911	-	909	11	0	0	0	-	5
12	25	0	806	-	850	12	0	0	0	-	5
13	22	0	710	890	973	13	13	0	63	111	66
14	16	0	-	-	666	14	16	0	116	-	109
15	11	0	0	-	177	15	13	0	63	-	67
16	0	0	0	-	0	16	10	0	0	-	39
17	0	0	0	-	0	17	0	0	0	-	0
18	0	0	0	-	0	18	0	0	0	-	0
19	0	0	0	-	0	19	0	0	0	-	0
20	10	0	21	-	20	20	0	0	0	-	0
21	10	0	21	-	27	21	0	0	0	-	0
22	10	0	21	-	17	22	0	0	0	-	0
23	10	0	5	-	14	23	0	0	0	-	1
24	8	0	5	-	2	24	0	0	-	-	1
25	11	0	21	0	4	25	0	0	0	-	1
26	9	8	0	0	6	26	7	0	0	-	0
27	15	15	-	29	18	27	0	0	0	-	0
28	10	12	-	-	6	28	0	0	0	-	0
29	0	-	-	-	-	29	0	0	0	-	0
30	10	-	-	-	-	30	10	0	0	-	9
31	10	-	-	-	-	31	10	0	212	-	187
MEAN	23.2	10.8	455	434	439	MEAN	2.5	0.0	15	10	16

MARCH 1986

APRIL 1986

1986 MAR.	R	A	R	A	1986 APR.	R	A	R	A
	I	C	IC	IC		I	C	IC	I
1	16	-	0	-	1	9	0	0	0
2	33	699	15	-	2	10	14	0	0
3	34	636	16	-	3	10	13	0	0
4	32	763	12	-	4	0	0	0	0
5	33	795	32	573	5	0	0	0	0
6	33	795	41	-	6	0	0	0	0
7	38	-	44	-	7	0	0	0	0
8	29	-	37	-	8	9	12	0	0
9	22	456	26	-	9	9	0	0	0
10	20	-	0	264	10	9	0	15	4
11	18	74	0	-	11	13	0	15	10
12	13	42	0	-	12	14	12	53	39
13	8	0	0	0	13	13	17	21	37
14	0	0	0	0	14	26	13	78	123
15	10	0	10	0	15	25	2	105	198
16	0	0	0	0	16	21	10	195	159
17	0	0	0	-	17	13	0	169	159
18	0	9	9	0	18	15	13	253	179
19	0	-	0	0	19	13	17	189	193
20	12	-	13	0	20	16	21	233	140
21	13	-	13	-	21	22	28	168	142
22	10	0	0	-	22	20	12	84	91
23	15	0	0	-	23	42	29	369	376
24	14	0	0	-	24	58	38	879	811
25	10	5	0	-	25	43	51	1012	725
26	10	0	0	-	26	43	60	784	655
27	11	0	0	-	27	33	33	699	694
28	13	0	15	25	28	23	0	530	572
29	11	5	12	9	29	28	15	306	508
30	11	0	13	-	30	27	0	147	296
31	0	0	0	-					
MEAN	15.1	186	9.6	79	MEAN	18.5	13.7	209	204

JUNE 1986

1986 JUNE	R I	R IC	A C	A R	A I
1	7	0	5	-	1
2	0	0	0	-	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	9	0	0	-	0
9	0	0	0	0	0
10	8	0	0	0	0
11	0	0	0	0	0
12	0	0	0	-	0
13	0	0	0	-	0
14	0	0	0	-	0
15	0	0	0	-	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	-	0
21	0	0	0	0	0
22	0	0	0	-	0
23	0	0	0	0	0
24	0	0	0	0	0
25	8	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	-	0
30	0	0	0	0	0
MEAN	1.1	0.0	0	0	0

MAY 1986

1986 MAY	R I	R IC	A C	A R	A I
1	15	0	164	-	86
2	26	0	95	6	139
3	15	0	15	0	48
4	12	0	-	-	13
5	10	0	0	-	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	-	0
12	0	0	0	0	2
13	0	0	0	0	0
14	0	0	0	0	0
15	10	0	21	0	45
16	12	0	31	41	46
17	13	0	31	57	43
18	22	0	78	-	78
19	27	13	105	108	127
20	27	11	100	25	122
21	30	11	79	28	74
22	27	12	129	-	70
23	24	30	95	-	58
24	24	22	100	-	77
25	22	20	147	-	113
26	28	34	100	197	177
27	19	14	132	108	105
28	18	9	41	-	38
29	19	0	36	-	36
30	13	0	26	6	19
31	12	0	10	0	21
MEAN	13.7	5.7	51	29	50

JULY 1986

AUGUST 1986

1986 JULY				1986 AUG.									
R	I	R	A	R	I	R	A	R	I	R	A	R	A
		IC	C	IC	C	IC	C	IC	C	IC	C	IC	C
1	0	0	0	0	0	12	339	12	339	12	339	12	339
2	0	0	0	0	0	11	296	12	296	11	296	12	296
3	11	11	0	0	0	11	275	11	275	11	275	11	275
4	14	15	15	0	3	11	296	11	296	11	296	11	296
5	18	20	53	86	69	11	233	9	233	11	233	9	233
6	29	0	121	-	136	10	233	0	233	10	233	0	233
7	29	0	169	70	212	8	84	0	84	8	84	0	84
8	29	0	211	-	218	9	0	0	0	9	0	0	0
9	17	0	159	-	169	8	0	0	0	8	0	0	0
10	36	21	222	531	255	0	0	0	0	0	0	0	0
11	39	21	254	410	292	0	0	0	0	0	0	0	0
12	36	20	211	86	176	0	0	0	0	0	0	0	0
13	25	17	158	-	184	0	0	0	0	0	0	0	0
14	16	18	42	-	78	0	0	0	0	0	0	0	0
15	28	11	52	29	66	0	0	0	0	0	0	0	0
16	26	0	52	22	79	9	21	10	21	9	21	10	21
17	28	0	78	44	63	8	0	8	0	8	0	8	0
18	14	14	47	51	41	0	0	0	0	0	0	0	0
19	13	13	0	-	27	0	0	0	0	0	0	0	0
20	18	13	25	-	18	11	0	10	0	11	0	10	0
21	21	12	36	-	26	12	42	12	42	12	42	12	42
22	22	18	52	0	19	12	37	12	37	12	37	12	37
23	14	14	0	0	1	14	46	9	46	14	46	9	46
24	0	0	0	0	0	9	84	0	84	9	84	0	84
25	0	0	0	0	0	9	127	0	127	9	127	0	127
26	0	0	0	0	2	9	159	0	159	9	159	0	159
27	12	0	42	-	17	9	159	8	159	9	159	8	159
28	13	0	74	118	145	9	169	8	169	9	169	8	169
29	17	0	281	261	229	9	201	8	201	9	201	8	201
30	19	0	265	344	298	9	190	8	190	9	190	8	190
31	17	17	296	366	229	9	180	8	180	9	180	8	180

MEAN

18.1

8.2

94

110

98

MEAN

7.4

5.0

106

147

102

SEPTEMBER 1986

OCTOBER 1986

1986 SEP.				1986 OCT.									
R	I	R	A	R	I	R	A	R	I	R	A	R	I
		IC	C			IC	C			IC	C		
1	9	0	127	207	107	0	0	1	12	0	127	-	115
2	9	0	116	-	86	0	0	2	14	0	-	-	117
3	8	0	63	118	86	0	0	3	23	13	148	-	159
4	8	0	63	-	48	0	0	4	24	14	90	-	162
5	0	0	0	0	0	0	0	5	24	13	52	-	124
6	11	0	0	0	0	0	0	6	22	21	69	134	87
7	13	0	169	-	85	0	0	7	27	22	148	-	147
8	12	0	42	79	61	0	0	8	20	0	106	-	160
9	10	16	47	35	34	16	0	9	32	18	174	63	183
10	8	12	21	-	23	12	0	10	29	0	116	-	133
11	8	16	0	0	5	16	0	11	23	0	73	-	103
12	0	0	0	0	3	0	0	12	26	0	94	-	122
13	0	0	0	-	2	0	0	13	22	0	0	0	36
14	0	0	0	-	0	0	0	14	0	0	0	0	0
15	0	0	0	0	0	0	0	15	0	0	0	0	0
16	0	0	0	0	0	0	0	16	11	0	0	0	0
17	0	0	0	0	0	0	0	17	16	0	-	-	452
18	0	0	0	0	0	0	0	18	22	0	498	573	575
19	0	0	0	0	0	0	0	19	31	0	615	-	694
20	0	0	0	0	0	0	0	20	39	0	636	1152	669
21	0	0	-	-	0	0	-	21	47	23	901	891	835
22	0	0	0	0	0	0	0	22	57	50	1028	1148	797
23	0	0	0	0	0	0	0	23	71	54	794	947	772
24	0	0	0	0	0	0	0	24	76	51	932	866	855
25	0	0	0	0	0	0	0	25	68	48	905	-	721
26	0	0	0	0	0	0	0	26	60	21	697	-	528
27	0	0	0	0	0	0	0	27	65	12	602	-	501
28	0	0	0	0	0	0	0	28	61	16	-	846	892
29	8	0	-	-	22	0	-	29	63	12	-	669	804
30	9	0	-	-	100	0	-	30	62	14	847	630	731
MEAN	3.8	2.0	24	23	22	2.0	24	31	50	20	688	-	778

MEAN	35.4	13.6	383	566	395
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NOVEMBER 1986

DECEMBER 1986

1986 NOV.				1986 DEC.			
R	R	R	A	R	R	R	A
I	IC	C	R	I	IC	C	R
A	A	A	A	A	A	A	A
I	I	I	I	I	I	I	I
1	44	37	878	1	0	0	0
2	35	41	837	2	0	0	0
3	37	36	508	3	0	0	0
4	37	36	444	4	0	0	0
5	35	26	381	5	0	0	0
6	31	0	360	6	0	0	0
7	24	0	349	7	0	0	0
8	15	0	37	8	0	0	0
9	10	0	21	9	12	0	0
10	9	0	0	10	20	0	34
11	9	0	10	11	23	0	36
12	0	0	0	12	22	10	16
13	14	0	-	13	24	11	42
14	12	0	63	14	13	0	7
15	12	0	74	15	0	0	0
16	12	0	58	16	11	0	0
17	12	0	42	17	9	0	0
18	12	0	42	18	0	0	1
19	12	13	-	19	0	0	0
20	12	14	31	20	0	0	0
21	11	11	20	21	11	0	1
22	10	10	10	22	16	0	70
23	18	0	36	23	16	15	146
24	12	0	-	24	13	63	102
25	0	0	-	25	9	0	21
26	0	0	-	26	0	0	0
27	13	12	20	27	0	0	0
28	0	0	-	28	0	0	0
29	8	0	-	29	0	0	0
30	0	0	-	30	0	0	0
MEAN	15.2	7.5	192	31	11	0	0
MEAN	6.8	1.6	9	24	9	24	9