



Bulletin Werkgroep Zon

januari 1990

NWWS Werkgroep Zon, Sekretariaat: Yerenburg 36, 2804 WZ Gouda, tel: 01820-39082.

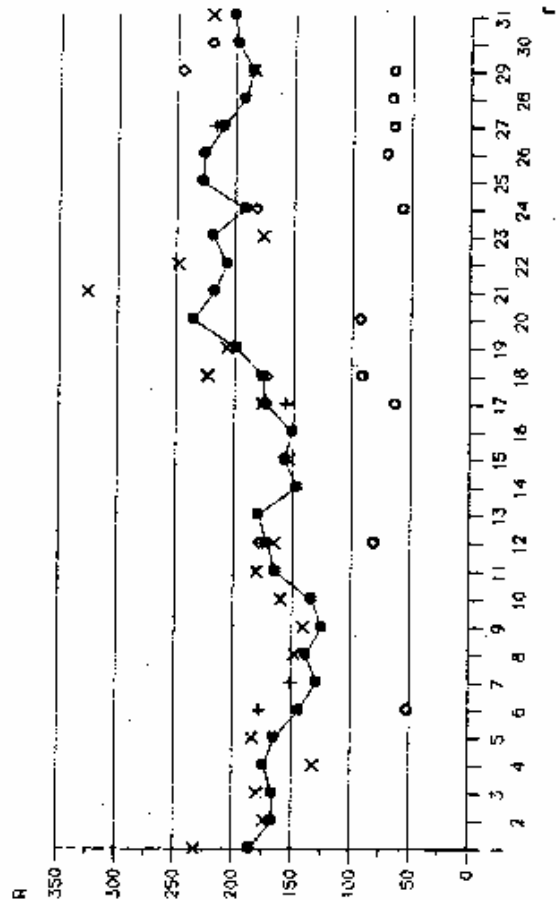
Zonnewetgevingen

Dag	SIDC	Bais	Idenb.	Jann	vSloot	Dag	SIDC	Bais	Idenb.	Jann	vSloot
1	186	177	174	224	91	18	177	174	224	91	
2	166	173				19	199		207		
3	166	180				20	236				
4	174	133				21	217		327		
5	164	184				22	208		248		
6	144					23	219		177		
7	129					24	191		182		
8	138					25	228				
9	128					26	227		70		
10	134					27	211		63		218
11	161					28	193		66		
12	172	180	166	81	177	29	185	246	186	65	
13	179					30	198	221			
14	147					31	201		220		
15	157		154			Aantel. wrn.	6	19	10	5	
16	152					k-factor	0.94	0.94	2.77	0.94	
17	174	175	177	63	158	strooiing	0.10	0.14	0.44	0.10	

● SIDC
○ H. Balster

⊗ J.A. Idenburg (Zwitserl.)
⊠ D. Jannink (r - 9 mm)

⊕ B. van Slooten



Sunspot Index Date Center

SUNSPOT BULLETIN

S.I.D.C. SUMMARY OF THE URSIGRAMS

1990 JANUARY Rix = 179.4

Date	Rz	PPSI	600	2800	COS	XFI	XI	AK	SEA
31	186	273	--	246	809	120	0/1	27	0931 ten(1600)
1	186	220	65	216	815	30	1/0	15	
2	166	183	51	212	824	14	0/0	23	
3	166	190	50	207	833	20	1/0	16	
4	174	114	51	194	836	2	0/0	12	
5	164	115	48	191	829	7	1/0	22	1150
6	144	116	46	187	833	16	0/0	10	
7	129	83	45	183	837	9	0/0	6	
8	138	87	46	177	829	19	1/0	13	SSC(1432)
9	125	86	44	165	834	31	2/0	14	1431
10	134	112	44	172	836	37	2/0	18	ten(0240)ssc(0835)
11	164	112	44	177	845	5	0/0	18	
12	172	91	44	173	850	26	2/0	18	2107(?)
13	179	63	43	173	848	10	0/0	12	
14	147	54	43	173	853	15	0/0	6	ten(1004)+flare m2,8/1f
15	157	80	44	189	849	6	0/0	10	
16	152	75	46	192	848	6	1/0	15	
17	174	114	47	198		13	0/0	17	
18	177	122	49	226	850	22	1/0	10	
19	199	137	50	242	849	20	1/0	40	low geo. mag. ect.
20	236	132	52	245	845	42	3/0	19	1141+1237+1324
21	217	111	53	265	846	50	2/0	18	
22	208	104	55	242	845	53	2/0	22	1150
23	219	125	55	243	847	28	1/0	22	
24	191	168	55	250	847	23	1/0	29	
25	228	241	53	241	848	14	0/0	18	
26	227	229	54	245	849	14	0/0	12	
27	211	213	50	237	854	15	1/0	5	
28	193	219	51	239	841	12	0/0	10	2b(0257)+sid
29	125	265	50	229	848	23	1/0	23	ssc(0055)
30	198	195	--	219	851	21	0/0	32	ln(0407)
31	201	174	--	213	848	20	0/0	20	2b(0931)

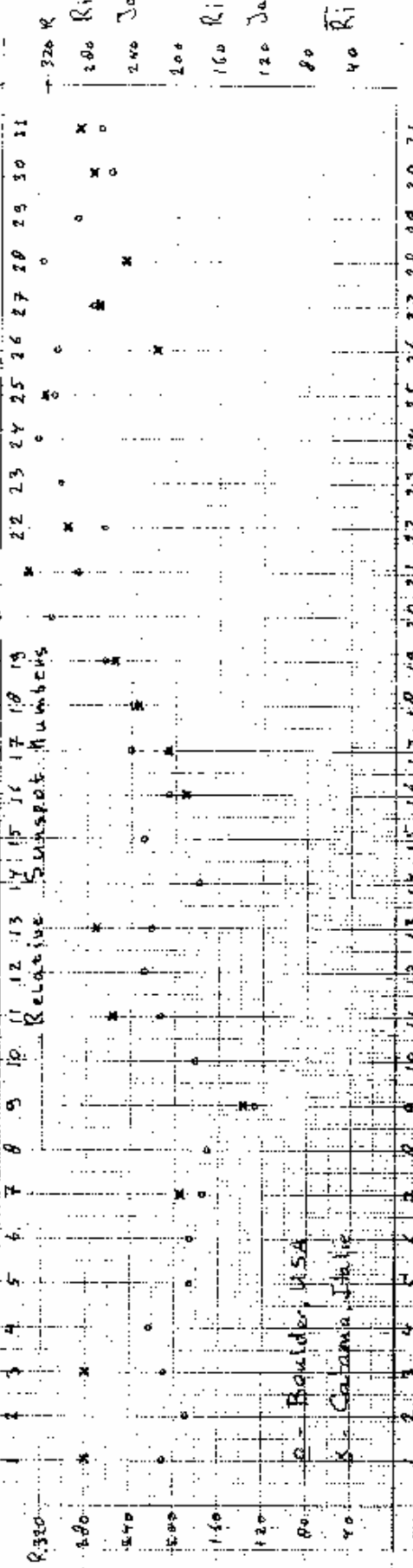
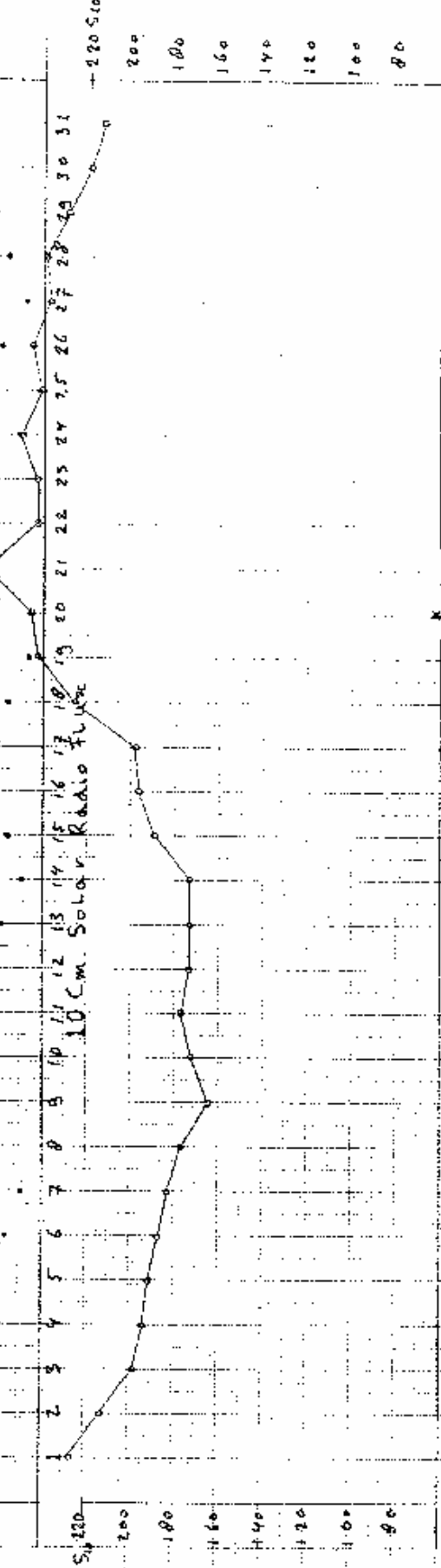
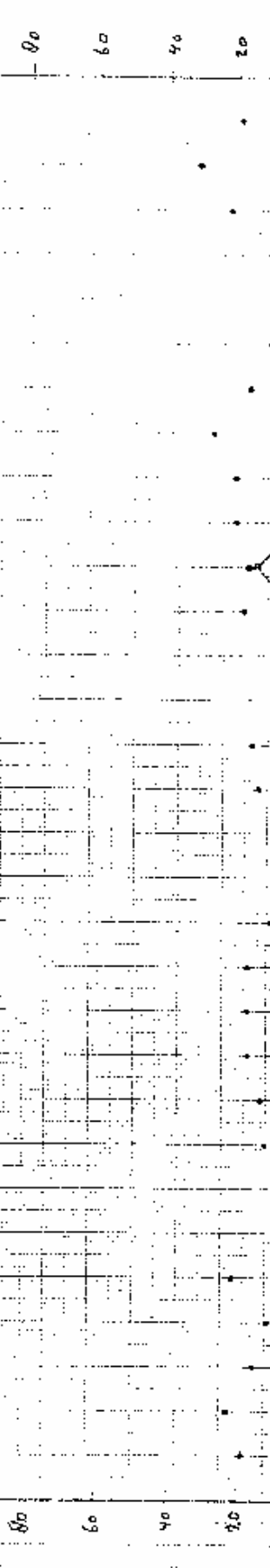
Rz, Rix: provisional international sunspot-numbers from the S.I.D.C.
 PPSI: prompt photometric sunspot-index from the S.I.D.C. in 10-5 w.m-2: the quantity to subtract at the mean solar constant.
 600: 600 Mhz solar flux from Kunitz station (Belgium).
 2800: 2800 Mhz solar flux from Ottawa (origin: Ursigrans).
 COS: thousands of the cosmic ray counts (origin: Ursigrans).
 XFI: X-flares index from the S.I.D.C. (origin: Ursigrans).
 XI: X-flares index from the Ursigrans (M-flares/X-flares).
 AK: planetary geomagnetic index from Wangsat (Germany from Ursigrans).
 SEA: sudden enhancements of atmospheric ionospheric disturbance from Uccle & Human (Belgium).
 Remarks: sid(sudden ionospheric disturbance); ssc(sudden storm commencement);
 mst(magnetic storm); sf(solar flare effect); s-1-2-3-4(class of flares).
 II-IV radio-burst: ten(cm radio-burst); P(proton flare); p(proton event); glie(ground level event; neutron event).

Januari 1930
100AK

A.K. Index

Geomagnetic

A.K. 100



0 - Boulder, USA
5 - Catania, Italy

Ri max = 236
240 Jan. 20
Ri min = 125
120 Jan. 9
80
40 Ri = 1794



Bulletin Werkgroep Zon

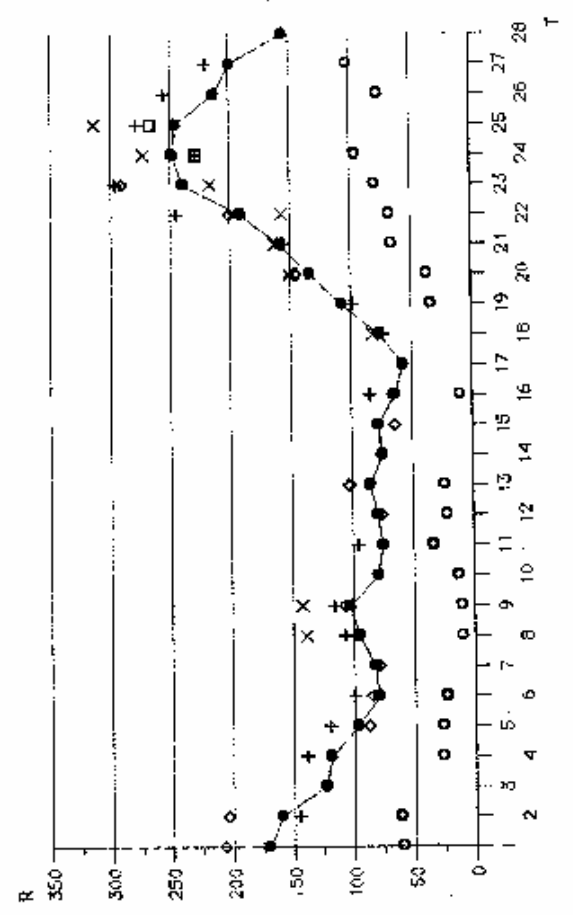
februari 1990

NWWS Werkgroep Zon, Sekretariaat: Veerburg 36, 2804 WZ Gouda, tel: 01820-39062.

Zaamlevingscommissie

Dag	SIDC	Bale	Idenb	Jenn	vs100	Zijle
1	171	207	50			
2	161	204	52	146		
3	124					
4	119	88	27	140		
5	97	88	26	120		
6	80	88	24	109		
7	82	79				
8	95	139	11	198		
9	103	107	143	111	116	
10	79		13			
11	75		34	96		
12	80	77	22			
13	85	103	24			
14	75					
15	78	65				
16	64	66			11	86

- Spoc
- J.A. Idenburg (Zwitserland)
- P. Balster
- B. van Slooten
- D. Jennink (d - 9 mm)
- W.A. Zijlema



Sunspot Index



Data Center

SUNSPOT BULLETIN

S.I.D.C. SUMMARY OF THE URSIGRAMS

1990 FEBRUARY R_{sum} = 12B. 4

Date	R _s	PPSI	600	2800	COS	XFI	XI	AK	SEA
51	201	174	49	213	848	20	0/0	20	2b(0931)
1	171	134	49	206	852	10	0/0	21	
2	161	113	44	181	846	7	0/0	22	1321
3	124	87	--	163	849	25	1/0	11	flare m6.9/2f(0107)+ten (0108)+sid+ssc(1011)
4	119	72	42	160	847	9	0/0	30	
5	97	50	43	155	855	13	0/0	22	
6	80	34	42	151	853	8	0/0	19	
7	92	31	41	148	850	4	0/0	23	
8	95	26	41	146	849	4	1/0	6	low solar activity
9	103	37	42	145	855	2	0/0	5	
10	79	52	43	151	856	5	0/0	8	
11	75	60	42	138	863	7	0/0	12	
12	80	65	35	145	862	6	0/0	6	
13	85	84	41	146	855	7	0/0	11	tens(0044 and 0134)+ ssc(17.16)+rgzat ten(0321) minor flares
14	75	78	42	153	850	5	0/0	21	
15	78	70	44	152	846	95	0/0	32	
16	64	50	43	152	849	1	0/0	41	
17	57	37	43	154	845	12	0/0	34	
18	77	30	45	164	840	16	0/0	25	
19	107	35	49	161	833	22	0/0	31	
20	134	68	51	191	836	14	0/0	37	minor flares
21	159	116	53	213	840	15	0/0	20	
22	191	198	55	217	846	32	1/0	26	minor flares
23	239	225	53	219	847	--	2/0	36	1253
24	249	244	56	232	849	43	1/0	24	
25	245	321	55	224	855	--	--	24	
26	213	233	54	218	846	13	0/0	--	
27	200	239	51	228	848	34	1/0	22	
28	156	210	--	--	--	--	--	--	1542

R_s, R_{sum}: provisional international sunspot-numbers from the S.I.D.C.
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 XI: X-flares index from the Ursigrans (M-flares/X-flares).
 AK: planetary geomagnetic index from Wingst (Germany from Ursigrans).
 SEA: sudden enhancements of atmospheric absorption from Uccle & Humain (Belgium).
 Remarks: sid(sudden ionospheric disturbance); ssc(sudden storm commencement);
 mgst(magnetic storm); sfs(solar flare effect); s-1-2-3-4(class of flares);
 II-IV radio-burst; ten(ten cm radio-burst); P(proton flare); p(proton event); g(a(ground level event); neutron event)

AK100

Gepmagalis

A.K. Impact

Technical Report
No. AK 100

80

60

40

20

S1020

200

180

160

140

120

100

80

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

10 Km Spary Rain Flux

R320

280

240

200

160

120

80

40

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

Relative Summit Numbers

WVA (Boulder USA)

Catania (Italy)

300-R

400 R limit 269

500 Feb 24

600

800 R limit 57

1000

1200

1400

1600

1800

2000

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28



Bulletin Werkgroep Zon

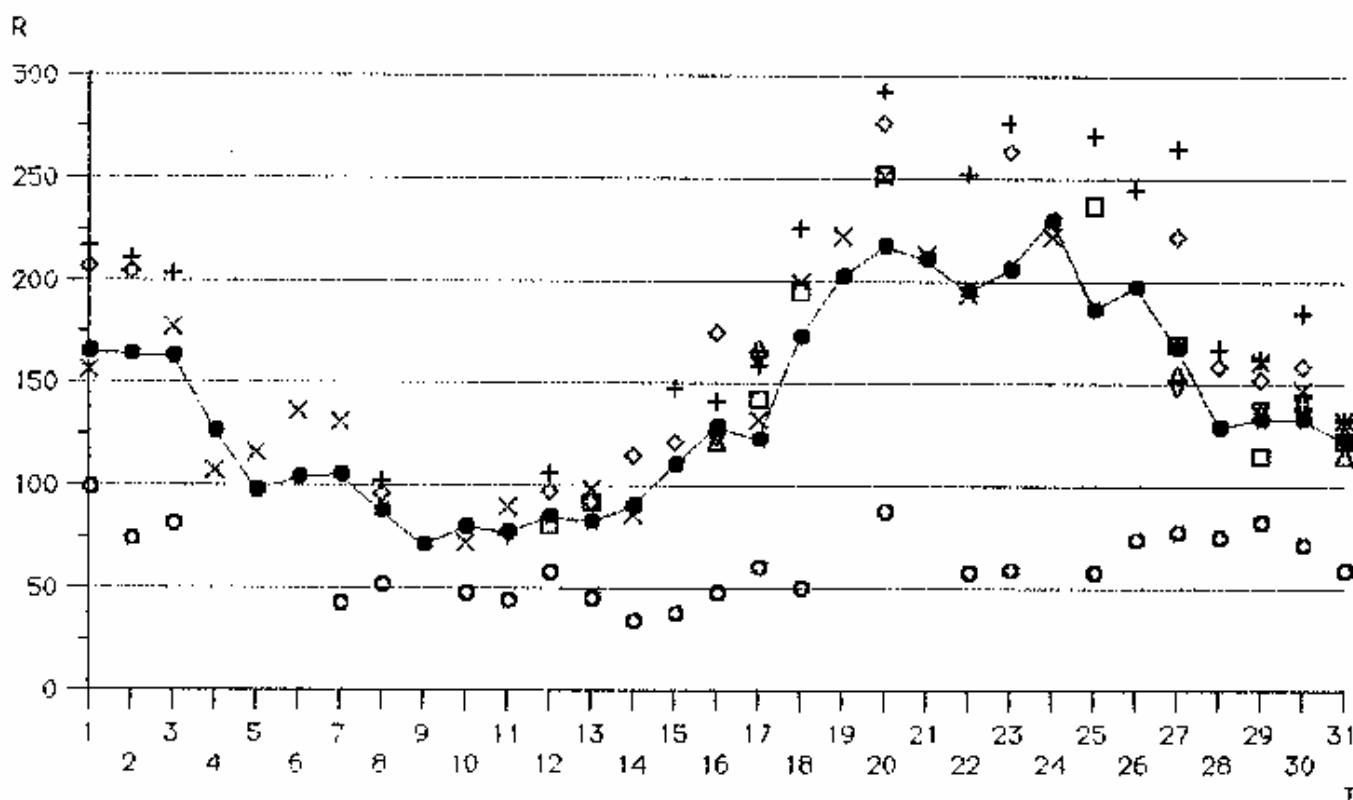
maart 1990

NVWS Werkgroep Zon. Sekretariaat: Veenenburg 36, 2804 WZ Gouda, tel: 01820-39082.

Zonnevlekkengetallen.

Dag	SIDC	Bals	Idenb	Jann	Mk 8	Mk13	vSloo	Zijle	Dag	SIDC	Bals	Idenb	Jann	Mk 8	Mk13	vSloo	Zijle
1	165	207	156	99			217		18	173		200	50			226	195
2	164	205		74			211		19	202		223					
3	163		178	81			204		20	217	278	251	87			292	252
4	126		108						21	211		214					
5	98		116						22	195		194	57			252	
6	104		136						23	206	264		59			278	
7	105		131	42					24	230		222					
8	88	96		51			103		25	186			57			271	238
9	71								26	198			74			245	
10	80		73	47					27	168	222		77	155	149	265	170
11	77	78	90	44			76		28	129	159		75			168	
12	85	97		57			106	81	29	132	152	161	83	136	138	162	115
13	83	93	99	45				92	30	133	159	147	71	141	141	185	
14	90	115	86	34					31	123		133	59	115	130	133	122
15	110	121		38			148		Aantal wrn.		15	20	24	6	6	20	9
16	129	175		48	121	124	141		k-factor		0,84	0,93	2,31	0,98	0,96	0,79	0,94
17	123		133	60	167	163	159	142	spreiding		0,07	0,11	0,62	0,12	0,11	0,08	0,11

- SIDC
- ⊗ J.A. Idenburg (Zwitserl.)
- ▲ A. Mak, 80 mm fluorit
- ⊕ B van Slooten
- ◇ H. Balster
- D. Jannink (d = 9 mm)
- ▽ A. Mak, 130 mm
- W.A. Zijlema

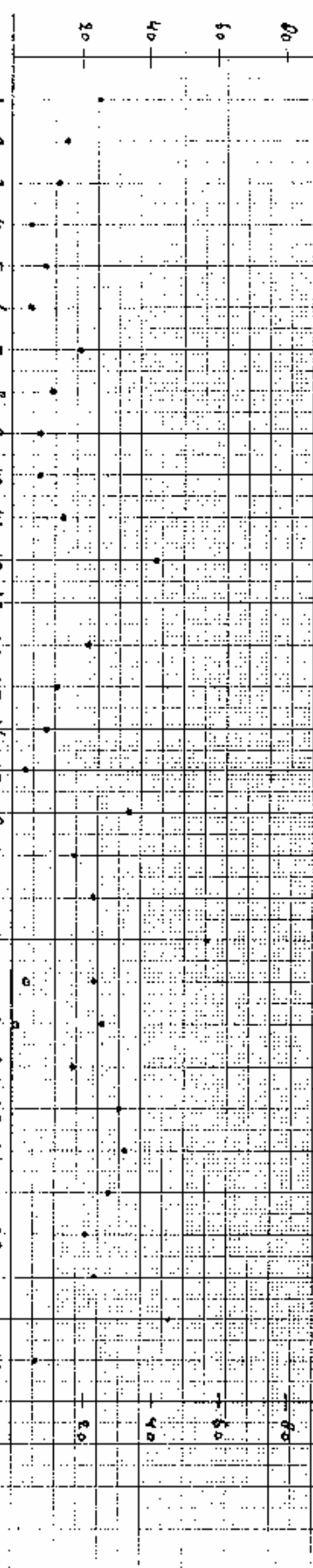


A.K.100

Germany Metric

A.K. 100

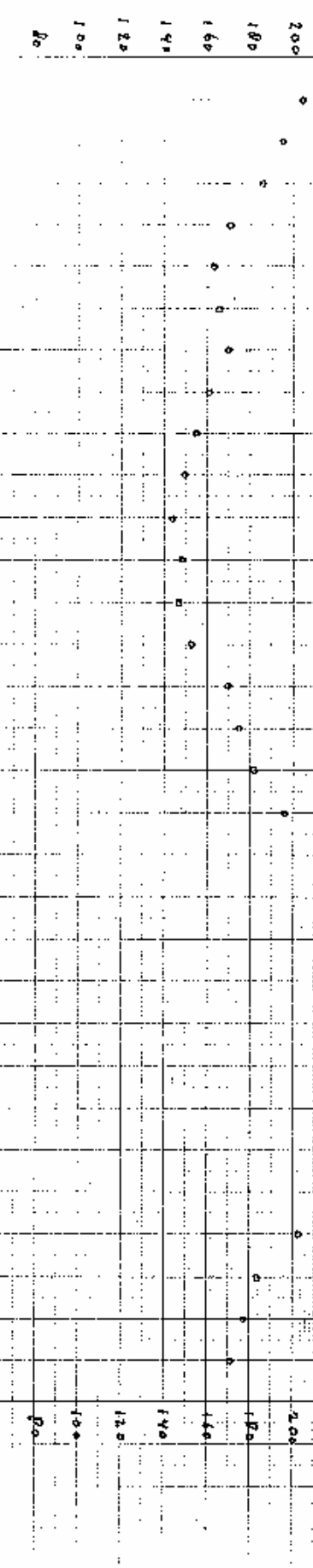
Max: 1000



S10120

10 Cm. Solar Radiation

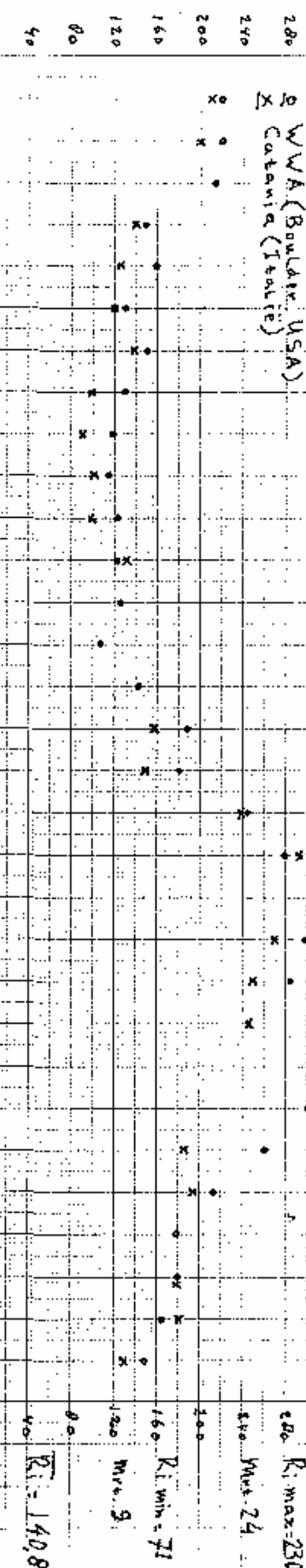
Max: 220



R320

Relative Humidity

Max: 70



WVA (Boulder, USA)
Catania (Italy)

Max: 230
Min: 24

Max: 1408



Bulletin Werkgroep Zon

april 1990

NWWS Werkgroep Zon. Sekretariaat: Veeneburg 36, 2804-WZ Gouda, tel: 01820-39082.

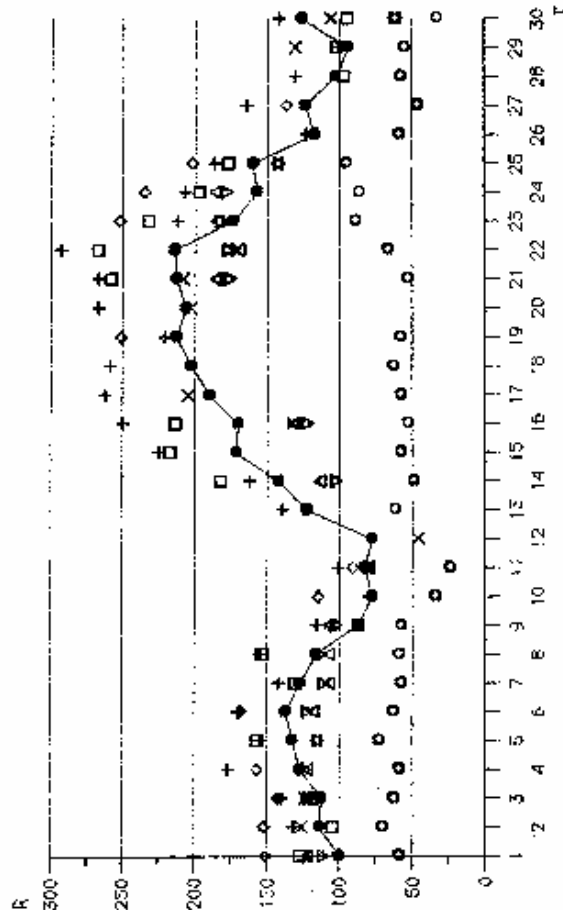
Zonnewetkenngetallen.

Deag.	SIDC	Bas	Idemb.	Jenn.	Mik. 8	Mik. 13	W. Stou	Zille
1	100	151	53	122	113	121	127	262
2	114	153	70	126	133	105		259
3	113	142	62	122	121	140	117	221
4	127	158	59	123	128	77		248
5	132		72	116	115	155	158	
6	138	169	62	119	122	170		259
7	128		58	107	111	143	131	267
8	116		59	108	112	155	154	233
9	88	103	57	107	103	116	88	197
10	77	115	34			80		177
11	83	91	24	80	80	101		124
12	77		46					158
13	123		61			140		97
14	142		49	114	102	183	133	102
15	171		57			225	217	95
16	170		133	53	133	123	250	18

Deag.	SIDC	Bas	Idemb.	Jenn.	Mik. 8	Mik. 13	W. Stou	Zille		
17	190		171	190	57			262		
18	203		181	203	63			259		
19	213	251			57			221		
20	206		204					248		
21	212		209	52	186	176	268	259		
22	214		174	66	170	177	294	267		
23	174	283			89	185	182	212	233	
24	157	238			86	186	179	207	197	
25	160	203			95	144	142	188	177	
26	118				59			124		
27	124	138			46			158		
28	99				58			131	97	
29	64				131	55		101	102	
30	176				106	33	62	61	143	95

Annual tot.: 13 19 20 17 17 29 18
 K-factor: 0.78 1.09 2.54 1.12 1.14 0.64 0.96
 spreading: 0.06 0.26 1.56 0.27 0.28 0.14 0.15

● SIDC
 ○ H. Beijster
 △ A. Idenburg (Zwitserl.)
 ○ D. Janiak (d = 9 mm)
 + A. Mik. 80 mm flux-t
 □ A. Mik. 130 mm
 + B. van Slooten
 □ W.A. Zijlstra



Sunspot Index

SUNSPOT

Date Center

BULLETIN

S.I.D.C. SUMMARY OF THE URSIGRAMS

1990 APRIL RZM = 139. 6

Date	Rz	PPSI	600	2800	COS	XFI	XI	AK	SEA
31	123	103	45	172	794	2	0/0	7	1108 sid(1116)
1	100	115	42	159	825	1	1/0	8	
2	114	132	41	153	824	19	1/0	12	1794 ssc(2250)
3	113	147	41	151	823	123	2/1	14	0831+1716 3(0816);1n(1703)
4	127	156	42	150	825	17	1/0	14	sn(1311)+tentaid
5	132	253	41	156	830	23	1/0	9	1342
6	138	142	41	149	836	17	0/8	B	
7	126	91	40	155	850	2	0/0	9	1508 1n(1501)+I:P(2240)
8	116	80	40	151	850	18	1/0	8	1313
9	88	67	40	144	823	3	0/0	28	
10	77	50	40	147	793	15	1/0	92	II(1147)+//
11	83	56	41	159	803	8	0/0	57	1650 p(2120)
12	77	58	42	168	749	3	1/0	69	ssc(0325)
13	123	81	45	196	801	21	1/0	31	
14	142	142	48	211	812	51	2/0	37	1223
15	171	207	48	218	818	131	1/1	21	1147 2b(0228)
16	170	219	48	232	826	127	1/1	14	2b(0627)+p+ten
17	190	258	48	240	820	23	1/0	32	1428 p(0500);ssc(0719)
18	203	254	48	236	825	34	2/0	20	
19	213	272	53	247	829	12	0/0	11	
20	206	269	54	249	827	27	1/0	19	
21	212	249	52	236	815	39	2/0	13	1n(0643)
22	214	247	53	227	816	20	0/0	15	
23	174	177	50	219	808	21	1/0	33	ssc(0339)
24	157	128	50	212	803	21	0/0	23	ssc(0519)
25	160	282	46	193	812	13	0/0	17	
26	118	101	48	187	809	14	0/0	10	1350
27	124	119	44	167	815	13	0/0	18	
28	103	101	45	148	815	9	0/0	17	
29	94	90	44	138	810	6	0/0	24	
30	126	75	42	133	806	3	0/0	17	p(1005);ssc(1301)

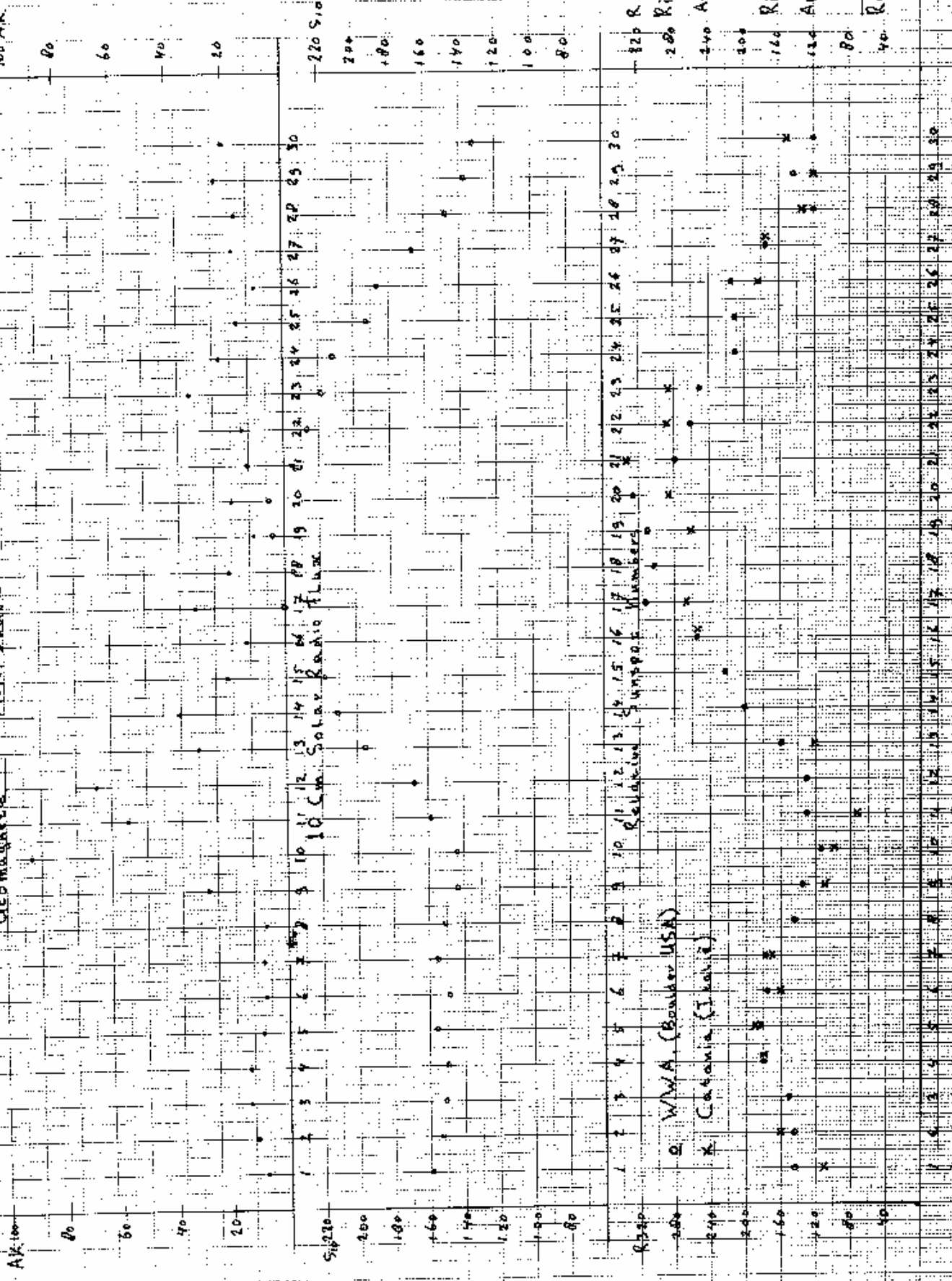
Important growing of the activity. Slight increase of the smoothed sunspot number for 1989 October.

Rz, Rzm: provisional international sunspot-numbers from the S.I.D.C.
 PPSI: prompt photometric sunspot-index from the S.I.D.C. in 10-5 w.m-2: the quantity to subtract from the mean solar constant.
 600: 600 Mhz solar flux from Hamain station (Belgium).
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 AK: planetary geomagnetic index from Wingst (Germany from Ursigrama).
 SEA: sudden enhancements of atmospheric ionospheric disturbance; ssc (sudden storm commencement).
 Remarks: sid (sudden ionospheric disturbance); ssc (sudden storm commencement); magst (magnetic storm); sfs (solar flare effect); s-1-2-3-4 (class of flares); II-IV (radio-burst); ten (ten cm radio-burst); p (proton flare); p (proton event); gl (ground level event); neutron event).

APRIL 1950
100 AK

AK Index

Geomagnetic



AK 100

80

60

40

20

220 S10

200

180

160

140

120

100

80

820 R

200 Ri = 1398

240 Apr. 12

200

160 Ri = 77

120 Apr. 10, 12

80

40 Ri = 1398

1

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Bulletin Werkgroep Zon

mei 1990

NMWS Werkgroep Zon, Sekretariaat: Veenburg 36, 2804 WZ Gouda, tel: 01620-39082

Zonnewetkengedaten

Day	SIDC	Bals	Jann.	Mk.8	Mk.13ivStoo	ZNile	
1	70	70	44	59	57	76	98
2	59	74	44	58	57	62	74
3	51	76	44	59	60	68	
4	86	96	56	69	67	104	112
5	80		36	60	60	95	99
6	106		62			145	147
7	122	148	50	110	109	142	
8	138	155	63	97	104	193	
9	133		51			188	
10	139		63			170	
11	126	165	47			173	
12	46						
13	148		47				
14	141	129	43			103	
15	144	152	45			146	210
16	157	175	51			197	
17	167	169	53	123	111	243	

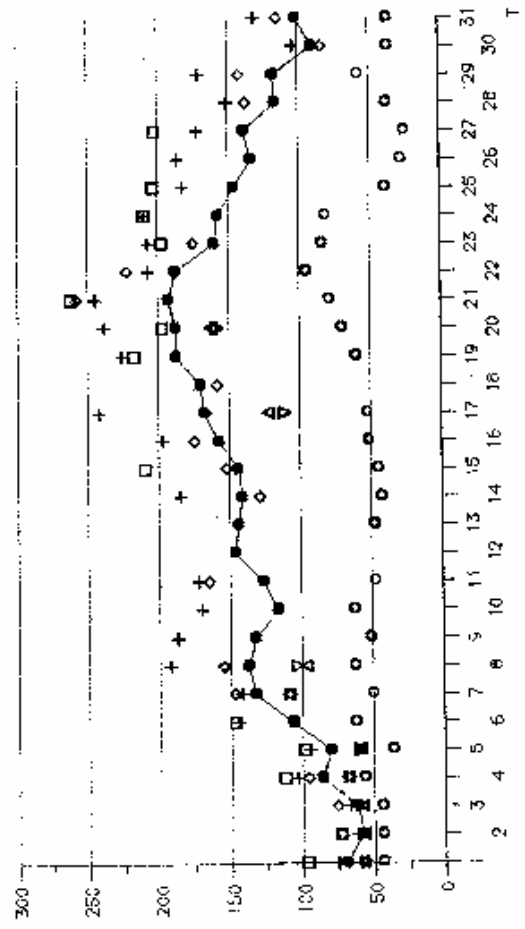
Day	SIDC	Bals	Jann.	Mk.8	Mk.13ivStoo	ZNile	
18	170	159					
19	187		60			226	218
20	187		70	163	159	239	197
21	193	259	79			245	263
22	167	222	98			208	
23	160	175	84			207	197
24	158		81			210	210
25	146		39			182	204
26	134		27			186	
27	139		25			172	203
28	116	138	37			151	
29	118	142	58			171	
30	90	84	36			104	
31	101	115	36			131	

Correctie Bulletin april:

D. Jannink: k-factor = 2,46 ; spreiding = 0,76.

Legend for Sunspot Data:

- SIDC
- ◊ H. Balster
- △ A. Mak, 80 mm fluorit
- ◻ B. van Slooten
- ◻ A. Mak, 130 mm
- ◻ W.A. Z'heva



Sunspot Index

Data Center

SUNSPOT

BULLETIN

S.I.D.C. SUMMARY OF THE URSIGRAMS

1990

MAY

RIM = 132.0

Date R: PPSI 600 2800 COS XPI XI AK SEA

30	126	103	45	132	806	3	0/0	21
1	70	79	41	127	819	3	0/0	10
2	59	43	39	126	821	0	0/0	11
3	61	54	39	122	820	5	0/0	14
4	86	45	39	121	821	9	0/0	14
5	80	55	39	128	827	5	0/0	10
6	106	99	42	146	825	14	0/0	6
7	132	88	41	151	831	22	0/0	10
8	138	94	43	164	824	46	2/0	14
9	133	77	41	169	818	21	1/0	17
10	116	94	45	188	---	9	2/1	13
11	126	49	45	199	804	118	0/2	23
12	146	56	48	210	815	121	1/1	6
13	144	88	50	216	818	53	2/0	18
14	141	106	50	220	813	29	1/0	4
15	144	186	56	235	810	135	1/1	6
16	157	213	55	243	---	41	1/0	4
17	167	297	57	232	819	39	2/0	6
18	170	341	56	256	822	17	1/0	32
19	187	375	65	268	809	39	1/0	20
20	187	347	56	260	797	46	2/0	23
21	192	250	55	249	802	145	2/1	24
22	187	226	56	236	804	26	1/0	28
23	150	185	53	228	797	40	3/0	14
24	158	154	47	220	803	133	2/1	8
25	146	100	44	183	817	19	0/0	18
26	134	81	46	160	803	18	1/1	37
27	139	77	40	157	807	10	1/0	32
28	116	55	38	154	812	15	1/0	9
29	118	49	41	138	794	11	0/0	13
30	90	41	---	140	789	7	0/0	24
31	101	43	---	140	788	10	0/0	13

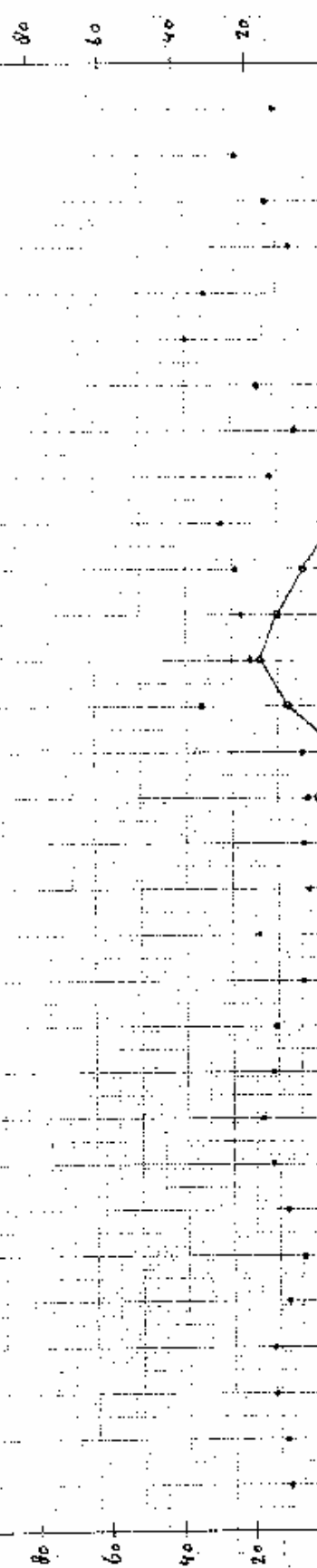
R.I.R: provisional international sunspot-numbers from the S.I.D.C.
 PPSI: prompt photometric sunspot-index from the S.I.D.C. in 10-5 w.b.-2:the quantity to subtract from the mean solar constant.
 600: 600 Mhz solar flux from Humain station (Belgium).
 2800: 2800 Mhz solar flux from Ottawa (origin: Ursigrams).
 COS: thousands of the cosmic ray counts (origin: Ursigrams).
 XPI: X-flares index from the Ursigrams (M-flares/X-flares).
 XI: planetary geomagnetic index from Wingst (Germany from Ursigrams).
 AK: sudden enhancements of atmospheric ionospheric disturbance from Uccle & Humain (Belgium).
 SEA: sudden enhancements of atmospheric ionospheric disturbance from Uccle & Humain (Belgium).
 Remarks: sid(sudden ionospheric disturbance); ssc(sudden storm commencement); ii-iv radio-burst; ten(ten cm radio-burst); P(proton flare); p(proton event); g(ground level event); neutron event)

GEOMAGNETIC

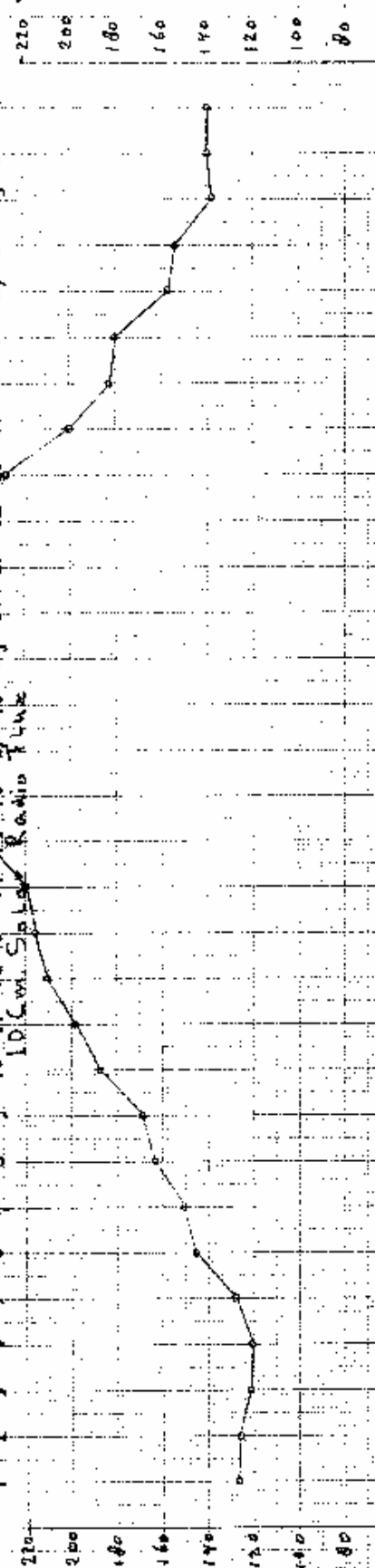
A. K. Inder

Mei 100 A/c 1990

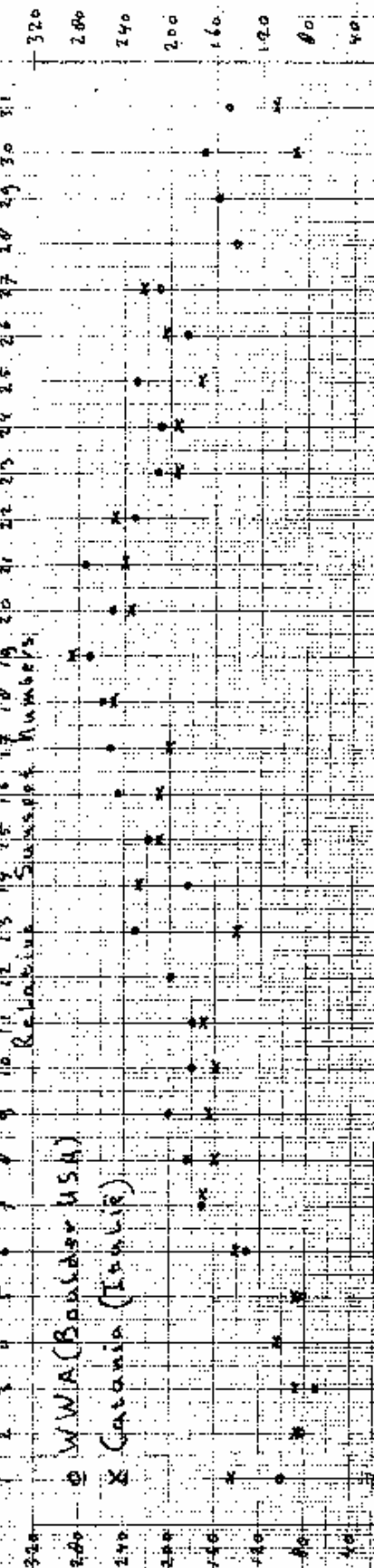
A.K.100



Sip 220

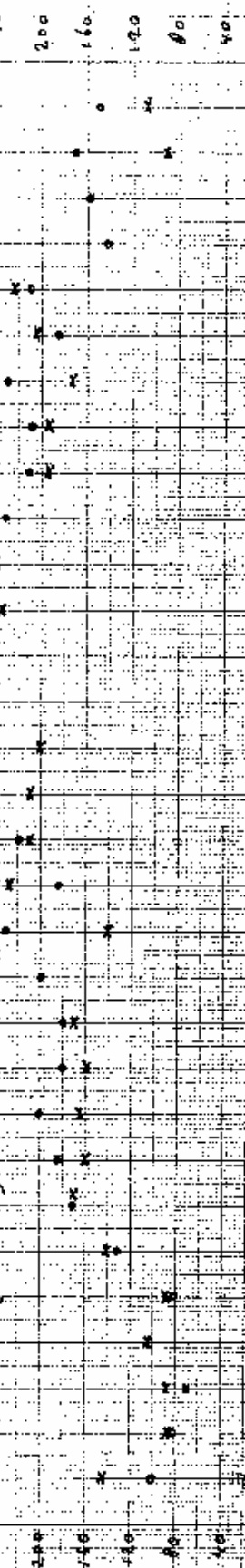


R1224



WWA (Boulder USA)

Gatania (Itzehar)



R1224



320 R
 280 R (max=193)
 240 Mei 21
 200 R (min=59)
 160 Mei 2
 120
 80
 40
 $\bar{R}_i = 132.0$

Geoplaguette

Aki Index

June 1990

Aki

80

60

40

20

Site

200

180

160

140

120

100

80

Site

200

180

160

140

120

100

80

100

60

40

20

Site

200

180

160

140

120

100

80

Site

200

180

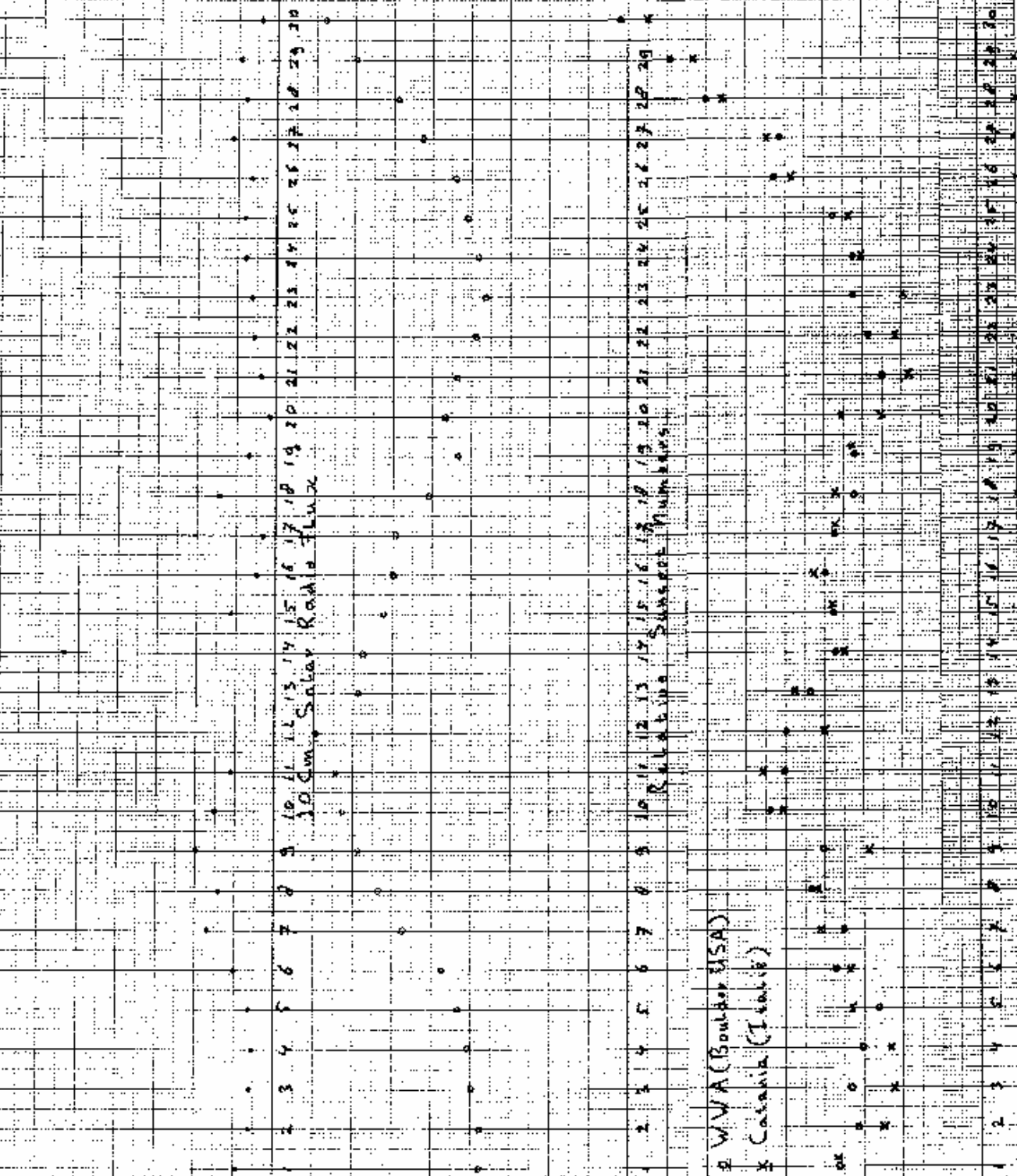
160

140

120

100

80



WVA (Boulder USA)

Casahua (Ishik)

Site 2

Site 1

Site

Site

Site

Site

Site

Site

Site

Site

Site

Site

Site



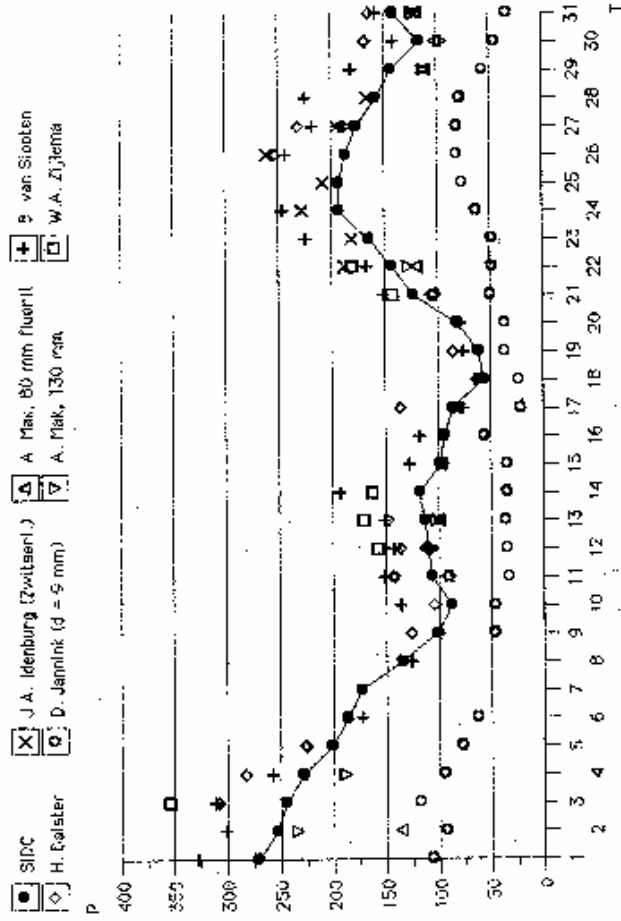
Bulletin Werkgroep Zon

juli 1990

NMWS Werkgroep Zon, Sekretariat: Veerburg 36, 2804 WZ Gouda, tel. 01820-39082.

Zonnevlekgetallen

Dag	SIDC	ale	Identi	Jann	Mk 8	Mk 13	vStro	Zijle	Dag	SIDC	ale	Identi	Jann	Mk 8	Mk 13	vStro	Zijle
1	272	363	107	64	328			24	18	57	64					65	
2	255	404	94	61	301			36	19	61	67					76	
3	245	367	180	81	371	385		37	20	81						80	
4	229	284	95		190	255		50	21	123						141	
5	202	228	78					49	22	143	189	48	120	28	168	182	
6	166	166	64		173			229	23	155	182					225	
7	173	186						63	24	194						245	
8	135	119	46		126			76	25	194	208					244	
9	102	127	46		100			81	26	186	253	261	81	193	187	219	
10	80	105	46		136			79	27	177	231	195	81	193	187	219	
11	106	144	33		90	152		56	28	159						225	
12	110	137	35		114	144	156	56	29	144						225	
13	114	161	37		100	103	51	172	30	117	168					225	
14	118	149	35		100	103	51	172	31	142	155					225	
15	98	49	35		99	96	129	34	31	142	155					225	
16	95	56	35		99	96	129	29	32	142	155					225	
17	81	56	22		84	84	77	118	33	142	155					225	
Aantal wrm 15 7 29 12 13 28 6																	
K-factor 0.78 0.86 2.66 1.17 1.12 0.83 0.73																	
Spreidings 0.07 0.09 0.59 0.23 0.09 0.12 0.07																	



Sunspot Index

Date Center

SUNSPOT BULLETIN

S.I.D.C. SUMMARY OF THE URSIGRAMS

1990 JULY R' = 147.0

Date	R'	PPSI	600	COS	XFI	XI	AK	SEA
30	224	232	44	216	833	56	0/0	5
1	272	363	46	235	---	42	1/0	6
2	255	404	47	252	848	18	0/0	9
3	245	367	49	224	853	41	2/0	10
4	229	284	48	219	831	29	1/0	14
5	202	228	48	209	---	15	1/0	10
6	166	166	46	204	845	11	0/0	7
7	173	186	46	182	846	23	2/0	12
8	135	119	46	163	841	8	0/0	10
9	102	69	44	157	835	17	0/0	20
10	88	57	44	157	835	17	0/0	20
11	106	50	43	153	830	19	0/0	10
12	110	66	45	154	---	15	1/0	10
13	114	61	46	153	843	20	1/0	19
14	118	60	44	149	841	2	0/0	16
15	98	49	44	143	834	7	0/0	11
16	95	37	44	141	834	6	0/0	6
17	87	26	43	143	831	5	0/0	6
18	57	36	42	137	848	18	1/0	10
19	61	61	42	136	859	4	0/0	17
20	81	101	42	147	857	9	0/0	20
21	123	152	42	153	849	9	0/0	8
22	143	197	42	161	848	9	0/0	6
23	165	183	44	172	843	16	0/0	6
24	194	236	45	180	845	9	0/0	4
25	194	270	55	204	838	24	0/0	4
26	186	215	55	201	840	30	1/0	15
27	177	193	56	194	843	14	0/0	14
28	159	142	52	183	820	13	0/0	74
29	144	107	50	173	824	6	0/0	51
30	117	77	56	161	837	13	1/0	14
31	142	71	49	176	838	13	0/0	9

R', R' = provisional international sunspot numbers from the S.I.D.C.
 PPSI: prompt photometric sunspot-index from the S.I.D.C. in 10-5 w.m-2: the quantity to subtract from the mean solar constant.
 600: 600 Mhz solar flux from Ottawa origin: Ursigrams.
 COS: thousands of the cosmic ray counts (origin: Ursigrams).
 XFI: X-flares index from the S.I.D.C. (origin: Ursigrams).
 XI: X-flares index from the Ursigrams (M-flares/X-flares).
 AK: planetary geomagnetic index from Wingst (Germany from Ursigrams).
 SEA: sudden enhancements of atmospheric from Uccle & Human (Belgium).
 Remarks: sid (sudden ionospheric disturbance); ssc (sudden storm commencement); magst (magnetic storm); sfl (solar flare effect); s-1-2-3-4 (class of flares); II-IV radio-burst; ten (ten ca radio-burst); P (proton flare); p (proton event); gis (ground level event); neutron event.

July 1930

100 A.K.

Geometrisch A.K. Index

A.K. 100

80

60

40

20

500 20

200

160

140

120

100

80

60

40

20

0

-20

-40

-60

-80

-100

-120

-140

-160

-180

80

60

40

20

220 5.10

200

180

160

140

120

100

80

60

40

20

0

-20

-40

-60

-80

-100

100 A.K.

272

01

57

1.8

147.0

1000 Solar Radiation

Relative Sunspot Maximum

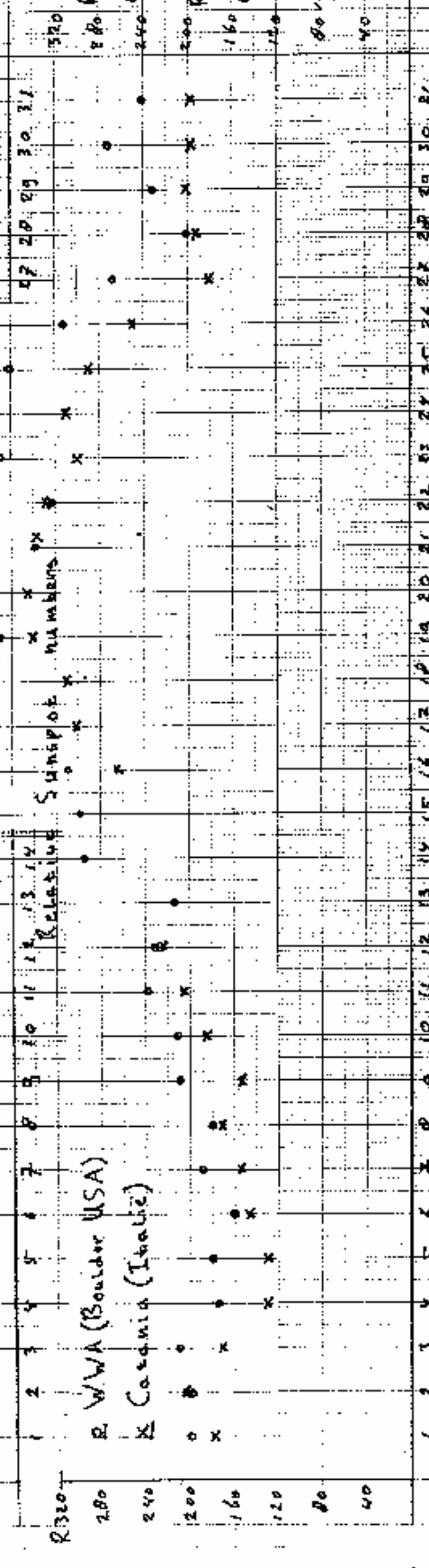
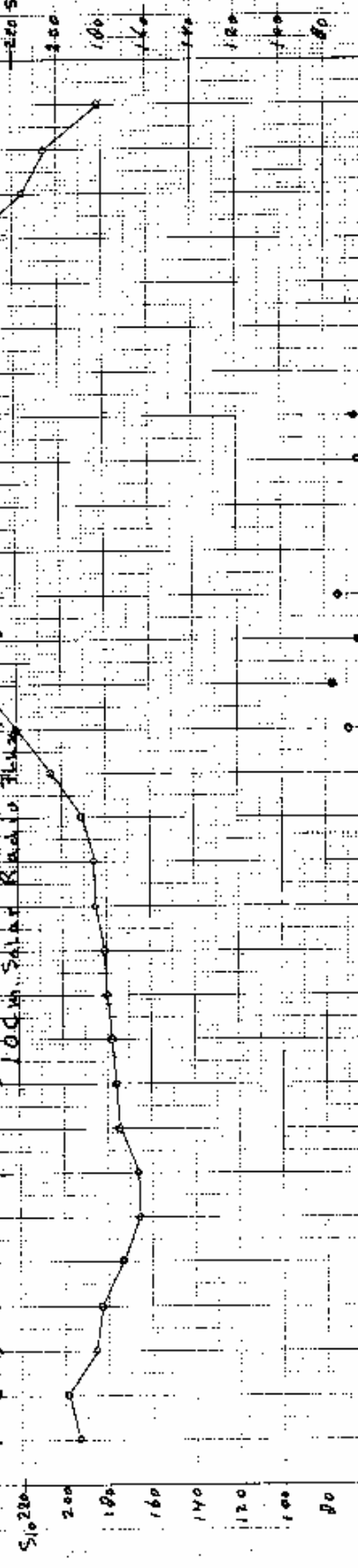
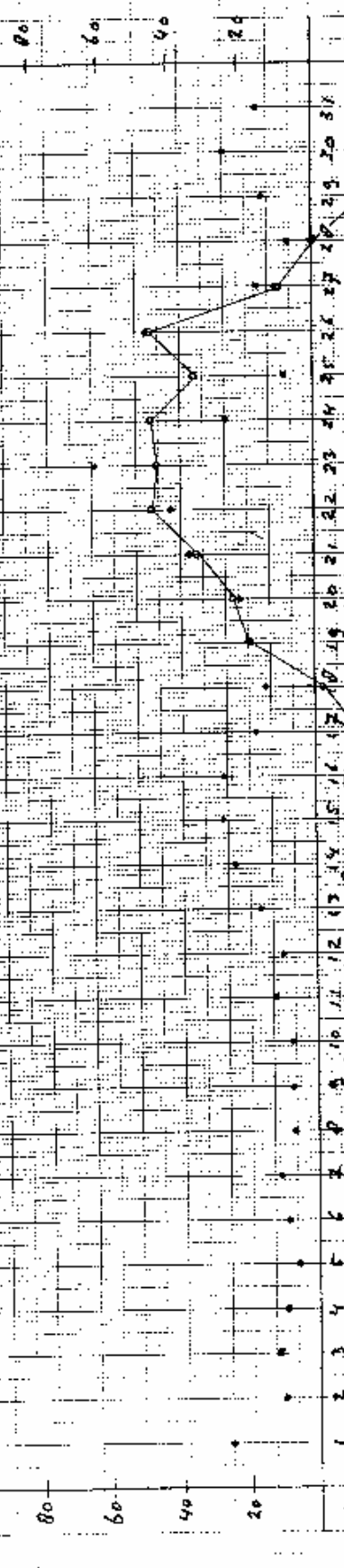
WVA (Barometer)

Barometer (Barometer)

Augustus 1990
100 A.K.

Septomargetic
A.K. 304120

A.K. 1007



270 R
 280 R. Marc = 295
 290 Q. 2.2
 200 R. Min = 120
 160 Q. 3.7
 120
 80
 40
 $R_i = 199.9$

270 R
 280 R. Marc = 295
 290 Q. 2.2
 200 R. Min = 120
 160 Q. 3.7
 120
 80
 40
 $R_i = 199.9$

270 R
 280 R. Marc = 295
 290 Q. 2.2
 200 R. Min = 120
 160 Q. 3.7
 120
 80
 40
 $R_i = 199.9$

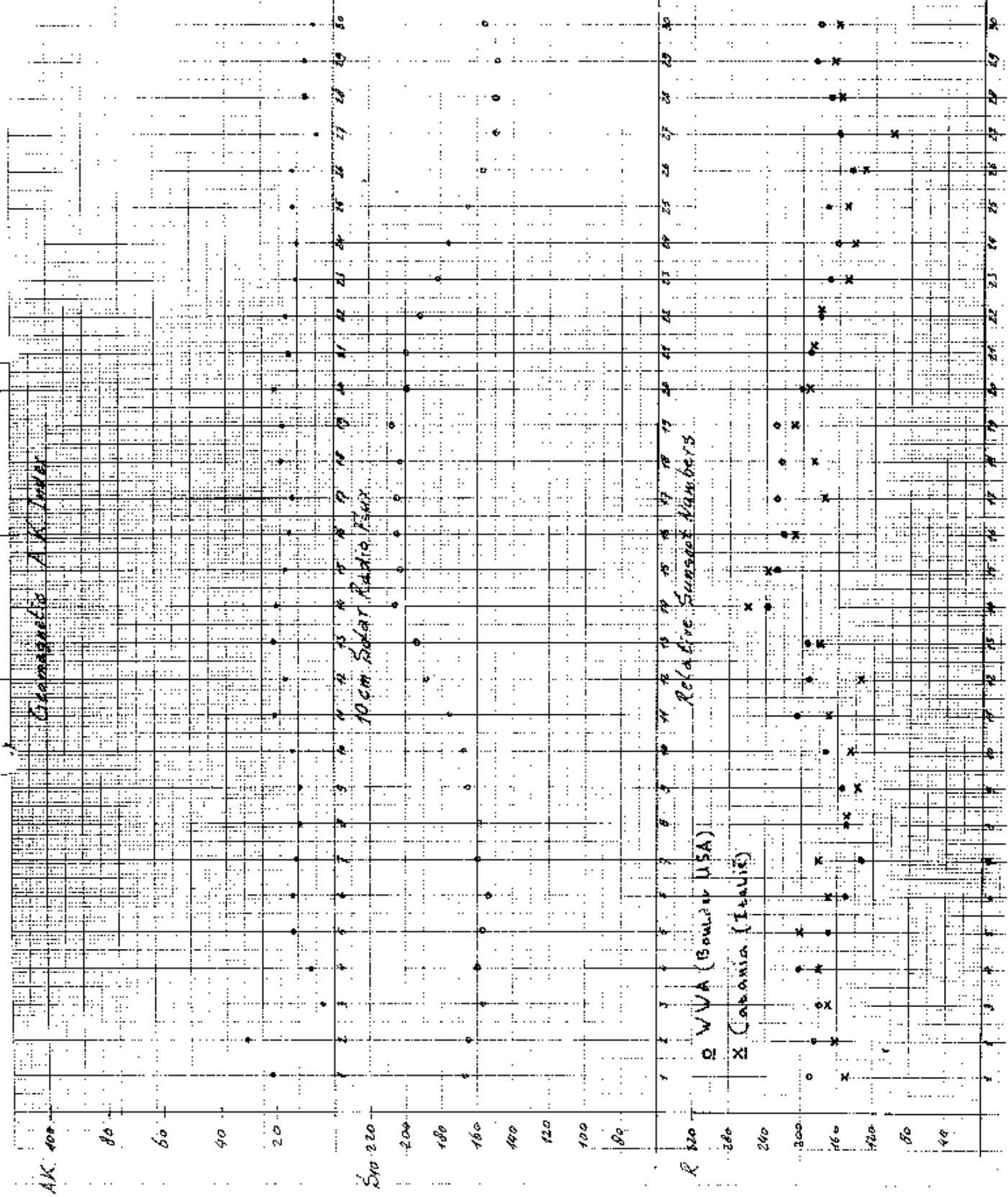
270 R
 280 R. Marc = 295
 290 Q. 2.2
 200 R. Min = 120
 160 Q. 3.7
 120
 80
 40
 $R_i = 199.9$

270 R
 280 R. Marc = 295
 290 Q. 2.2
 200 R. Min = 120
 160 Q. 3.7
 120
 80
 40
 $R_i = 199.9$

270 R
 280 R. Marc = 295
 290 Q. 2.2
 200 R. Min = 120
 160 Q. 3.7
 120
 80
 40
 $R_i = 199.9$

270 R
 280 R. Marc = 295
 290 Q. 2.2
 200 R. Min = 120
 160 Q. 3.7
 120
 80
 40
 $R_i = 199.9$

September 1990
100 A.K.



R_{max} = 178
Sept. 14
R_{min} = 77
Sept. 27
Σ = 124.7

AK 100
80
60
40
20

S10 220
200
180
160
140
120
100
80

R 320
300
280
260
240
220
200
180
160
140
120
100
80
60
40

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



Bulletin Werkgroep Zon

oktober 1990

NWS Werkgroep Zon, Sekretariaat: Voerenburg 36, 2804 WZ Gouda, tel: 01820-39082.

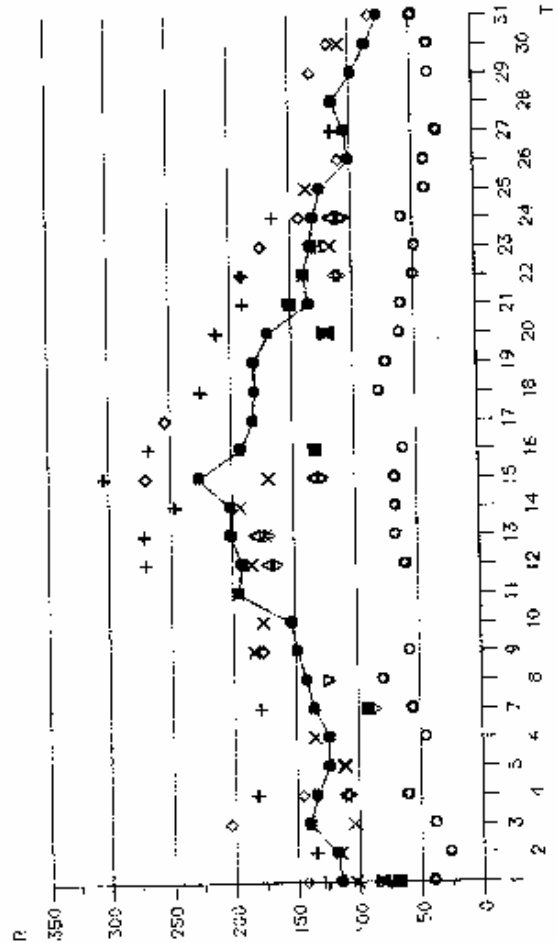
Zonnevlekgetallen

Day	SIDC-Bals	Udenb	Jenb	Mk 8	Mk 13	U100	Z11	6
1	115	143	103	79	92	82	130	69
2	117	116	27	79	79			225
3	140	205	105	73				
4	134	146	61	62	120	123	212	
5	124		12	60				189
6	124	136	46	50	114	110	189	
7	135		56	48	134	121	132	
8	141		80	59	117	107	165	
9	148	176	164	39				
10	153	177		39				
11	195	197		29				116
12	192	186	91	36				
13	201	173	68	36				
14	204	194	66	49				
15	227	270	170	49				
16	192		511	26	10	11	16	4

Day	SIDC-Bals	Udenb	Jenb	Mk 8	Mk 13	U100	Z11	6
17	182	181		39				
18	181			39				
19	181			39				
20	169			39				
21	136			39				
22	140	191	140	50	114	110	189	
23	134	175	118	48	134	121	132	
24	131	142		59	117	107	165	
25	125	126	137	39				
26	102	110		39				
27	104			29				116
28	114			36				
29	98	132		36				
30	67	117	109	36				
31	77	84		49				

Day	Udenb	Jenb	Mk 8	Mk 13	U100	Z11	6
1	14	16	26	10	11	16	4
2	14	16	26	10	11	16	4
3	14	16	26	10	11	16	4
4	14	16	26	10	11	16	4
5	14	16	26	10	11	16	4
6	14	16	26	10	11	16	4
7	14	16	26	10	11	16	4
8	14	16	26	10	11	16	4
9	14	16	26	10	11	16	4
10	14	16	26	10	11	16	4
11	14	16	26	10	11	16	4
12	14	16	26	10	11	16	4
13	14	16	26	10	11	16	4
14	14	16	26	10	11	16	4
15	14	16	26	10	11	16	4
16	14	16	26	10	11	16	4
17	14	16	26	10	11	16	4
18	14	16	26	10	11	16	4
19	14	16	26	10	11	16	4
20	14	16	26	10	11	16	4
21	14	16	26	10	11	16	4
22	14	16	26	10	11	16	4
23	14	16	26	10	11	16	4
24	14	16	26	10	11	16	4
25	14	16	26	10	11	16	4
26	14	16	26	10	11	16	4
27	14	16	26	10	11	16	4
28	14	16	26	10	11	16	4
29	14	16	26	10	11	16	4
30	14	16	26	10	11	16	4
31	14	16	26	10	11	16	4

● SIDC
 ◊ h. Balster
 △ J.A. Isenburg (Zwitserl.)
 □ D. Jannink, d = 3 mm
 + A. Mik, 80 mm fluorit
 ■ A. Mik, 130 mm
 B. van Sluiken
 W.A. Zijlstra, 80 mm



SUNSPOT BULLETIN

Date Center

S.I.D.C. SUMMARY OF THE URSIGRAMS
 1990 OCTOBER R_{IM} = 145.2

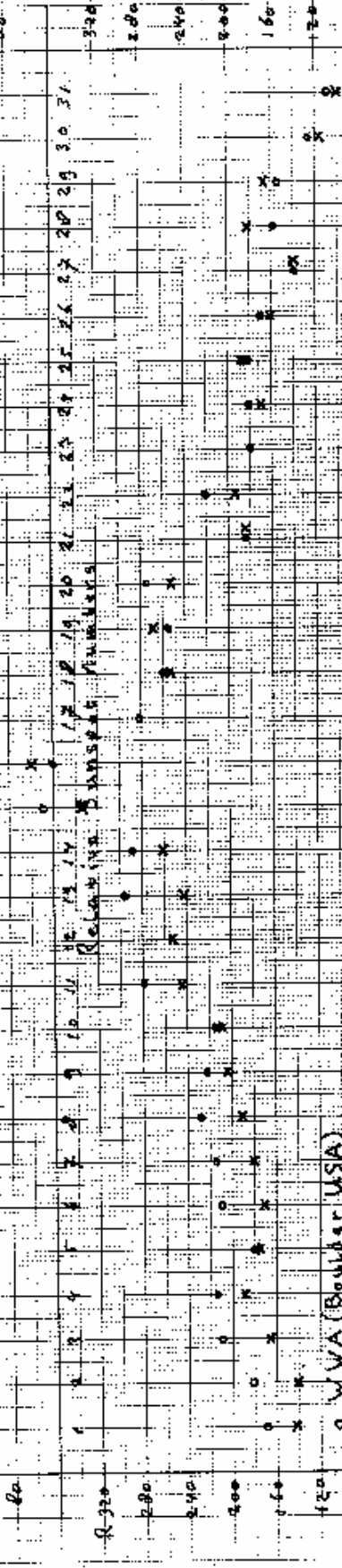
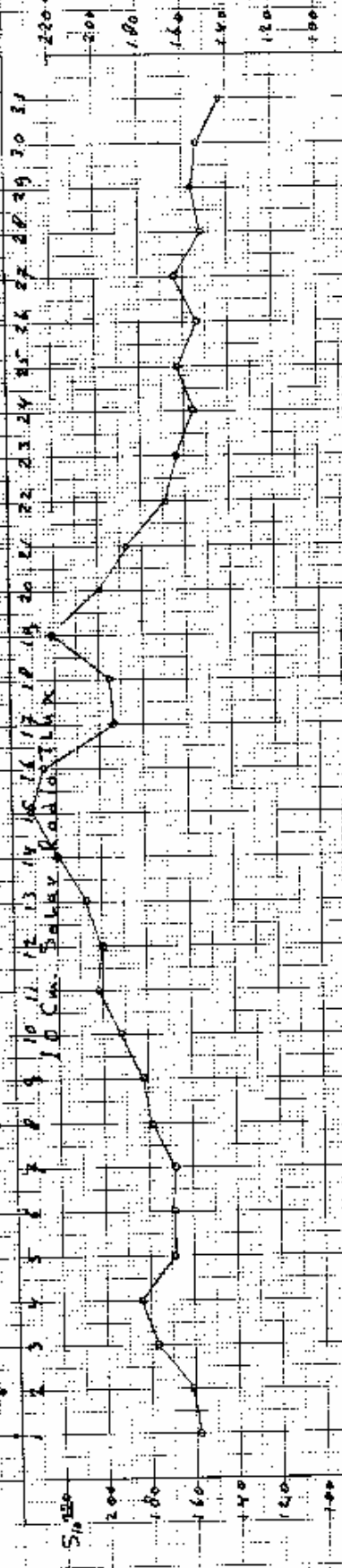
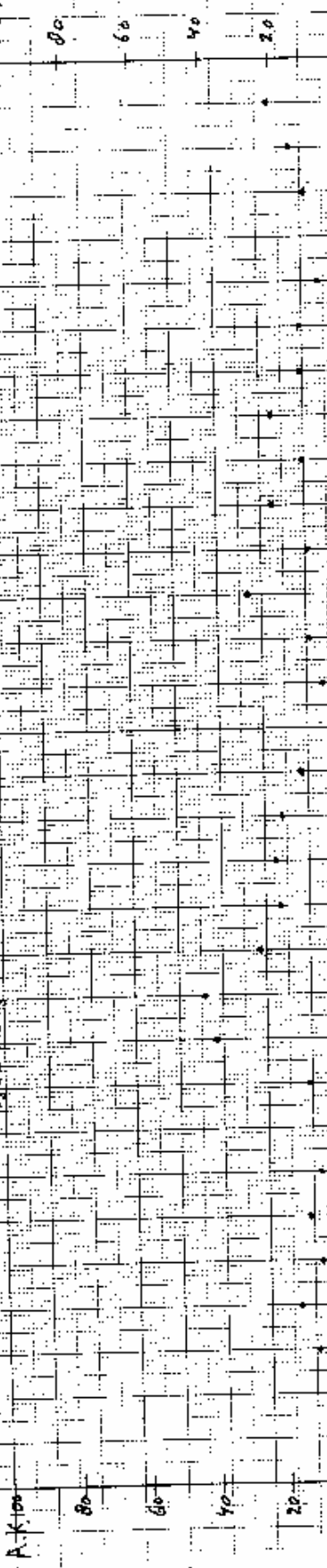
Date	R	PPI	500	2800	COS	XFI	XI	AK	SEA
30	124	114	42	156	861	15	0/0	7	ten(0736)+ten+sid
1	115	99	43	158	876	9	0/0	2	
2	117	115	43	161	881	22	0/0	6	
3	140	111	44	177	871	22	0/0	12	
4	134	90	46	184	860	16	0/0	17	0953
5	123	94	44	169	866	10	0/0	10	
6	124	84	43	169	867	7	0/0	14	
7	135	73	43	168	866	10	0/0	10	
8	141	105	44	179	864	11	1/0	5	
9	148	126	45	182	865	26	1/0	13	
10	153	150	45	192	851	28	1/0	4	
11	195	194	47	202	847	23	1/0	43	0737
12	192	209	49	200	847	21	0/0	27	
13	201	209	47	207	859	22	0/0	21	
14	202	222	48	220	853	22	0/0	22	
15	227	241	50	222	867	46	1/0	21	
16	192	175	50	226	862	35	1/0	14	
17	182	165	49	193	864	26	0/0	6	1330
18	181	156	50	195	867	15	0/0	8	
19	181	131	49	221	870	24	0/0	12	
20	169	108	46	200	870	18	1/0	29	in(1753)+ten+sid
21	136	93	46	187	873	24	3/0	12	
22	140	74	45	169	881	23	1/0	22	
23	134	78	44	164	876	13	0/0	13	
24	131	66	43	157	868	12	0/0	22	
25	125	84	43	163	872	20	0/0	13	
26	102	79	40	154	865	16	0/0	13	ssc(1134)
27	104	71	44	164	852	7	0/0	8	
28	114	76	40	152	857	9	0/0	3	
29	98	83	38	156	855	9	0/0	12	
30	87	79	40	154	---	10	0/0	16	
31	77	82	39	143	851	10	0/0	22	

R_{IM}: Provisional international sunspot-numbers from the S.I.D.C.
 PPI: prompt photometric sunspot-index from the S.I.D.C. in 10-5 w.m-2; the quantity to subtract from the mean solar constant.
 500: 600 Mhz solar flux from Ottawa (origin: Ursigrans).
 2800: 2800 Mhz solar flux from Humain station (Belgium).
 COS: thousands of the cosmic ray counts (origin: Ursigrans).
 XFI: X-flares index from the S.I.D.C. (origin: Ursigrans).
 XI: X-flares index from the Ursigrans (W-flares/X-flares).
 AK: planetary geomagnetic index from Wigt (Germany from Ursigrans).
 SEA: sudden enhancements of atmospherics from Uccle & Huisin (Belgium).
 Remarks: sid(sudden ionospheric disturbance); ssc(sudden storm commencement); magt(magnetic storm); sfl(solar flare effect); s-1-2-3-4(class of flares); li-iv radio-burst; ten(ten cm radio-burst); p(proton flare); p(proton event); glt(ground level event); neutron event)

Oktober 1990
100 Ak

A.K. Index

Geop magnitic



R max = 227
 Oct. 15
 R min = 77
 Oct. 31
 R = 145.2



Bulletin Werkgroep Zon

november 1990

NVWS Werkgroep Zon. Sekretariaat: Veerendaalweg 36, 2804 WZ Gouda, tel: 01820-39082.

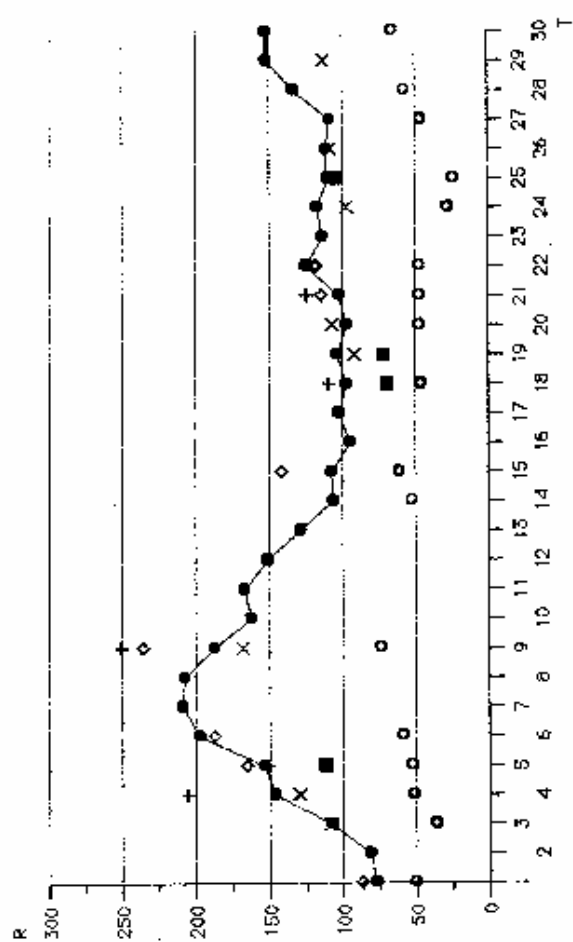
Zonnewetstekingenlijsten.

Daag	SDC	Bals	Idenb	Jenn	vs	Slo	Zijle
1	77	87		50			
2	81			36		46	110
3	108		109	36		92	73
4	146		130	51	206		
5	154	166		52	151	47	125
6	197	187		59			
7	209						
8	208			98	28		
9	188	236	169	74	251		104
10	163					109	
11	167					46	
12	151					57	
13	129					14	
14	106				53		
15	107	142			61		
16	95						

Daag	SDC	Bals	Idenb	Jenn	vs	Slo	Zijle
17	103						
18	97						
19	104						
20	98						
21	102	115					
22	125	113					
23	114						
24	118						
25	110						
26	111						
27	109						
28	134						
29	152						
30	153						

Maand	Wrd	7	8	17	5	4
k-factor	0.91	1.16	2.64	0.84	1.31	
spread	0.11	0.12	0.79	0.11	0.15	

● SIDC
 ◊ F. Balster
 ⊕ B. van Blaaten
 ■ W.A. Zylfema, d = 60 mm
 ○ D. Jannink, d = 9 mm



Sunspot Index

Data Center

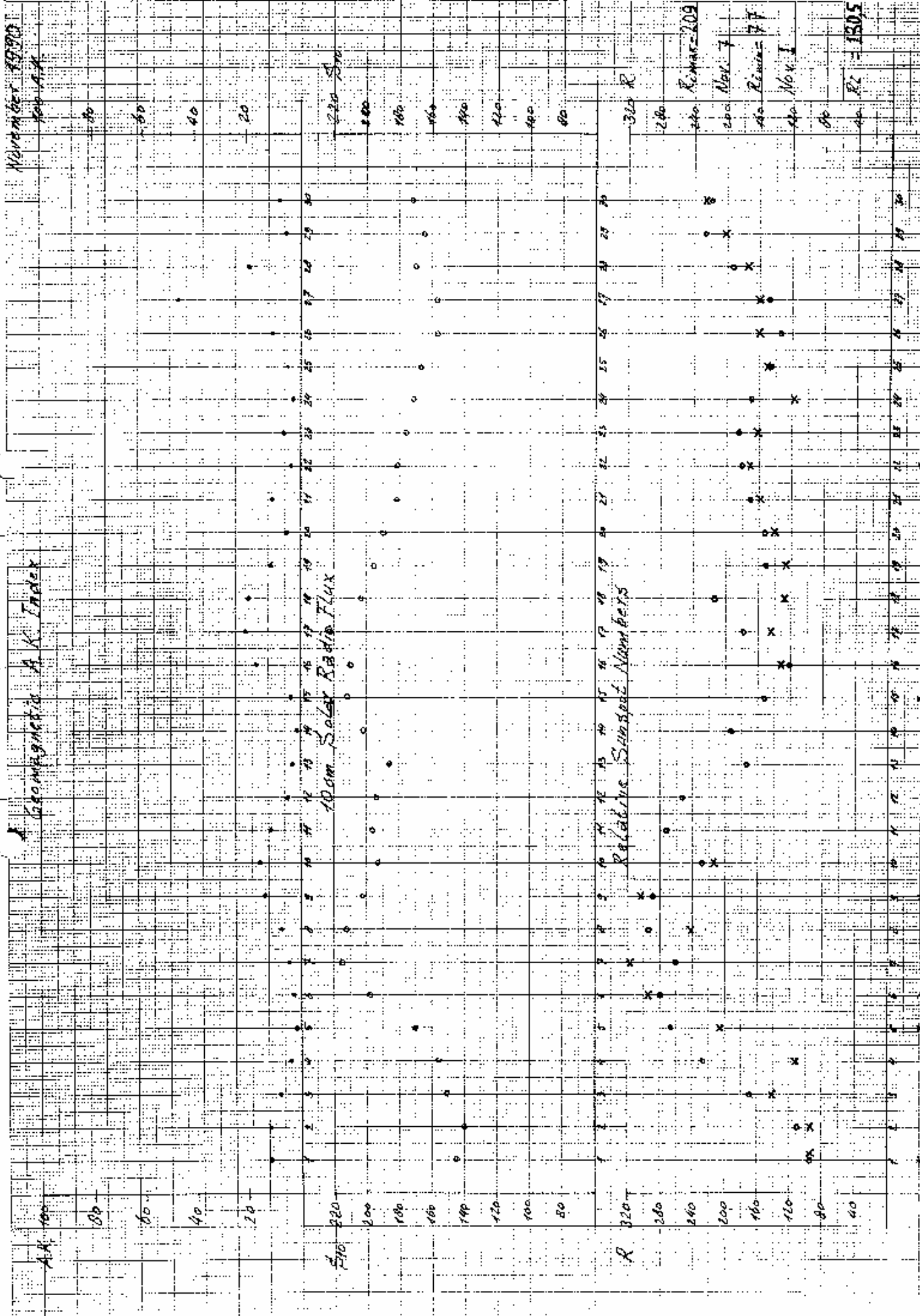
SUNSPOT BULLETIN

S.I.D.C. SUMMARY OF THE URSIGRAMS

1990 NOVEMBER R'yx = 130.5

Date	R'	PPSI	600	2800	COS	XFI	XI	AK	SEA
31	77	82	39	143	851	10	0/0	22	
1	77	84	38	145	859	8	0/0	12	
2	81	83	40	140	865	2	0/0	12	
3	108	88	41	151	863	2	0/0	8	
4	146	96	41	156	865	29	1/0	4	1007 1b(1736)
5	154	99	43	170	872	48	1/0	2	2b(2040)+ten sfe(1051);forbush?
6	197	137	48	198	872	48	1/0	3	
7	209	180	49	215	878	13	0/0	7	
8	208	183	52	212	874	34	1/0	7	
9	188	163	53	202	874	24	0/0	14	
10	163	192	52	193	877	22	0/0	16	
11	167	133	50	197	875	28	1/0	12	
12	151	126	50	194	874	24	0/0	5	
13	129	104	51	186	871	26	1/0	4	
14	106	117	52	202	877	29	0/0	2	
15	107	157	53	212	882	17	0/0	4	
16	95	233	50	210	---	34	1/0	16	ten(0025)1f(1311)1n(2345)
17	103	299	53	223	888	57	3/0	21	1310 ten(1634) sn(0621);1f(1334)+sid
18	97	332	50	203	883	59	2/0	20	
19	104	342	49	196	885	43	3/0	11	
20	98	343	48	190	886	29	1/0	6	
21	102	301	49	182	885	14	0/0	11	
22	125	242	49	181	882	5	0/0	4	
23	114	190	50	172	885	23	0/0	7	
24	118	135	45	171	878	47	2/0	3	1b(1416)+ten
25	110	191	45	167	878	63	3/0	6	1n(2312)+ssc(2332)
26	111	74	43	157	871	37	2/0	11	1414
27	109	72	44	157	869	6	1/0	47	
28	134	49	44	170	873	7	0/0	19	
29	152	50	46	165	877	10	1/0	5	
30	153	76	47	172	---	---	0/0	7	

R'yx: provisional international sunspot-numbers from the S.I.D.C.
 PPSI: prompt photometric sunspot-index from the S.I.D.C. in 10-5 w.m-2; the quantity to subtract from the mean solar constant.
 600: 600 Mhz solar flux from Ottawa (Germany from Ursigrama).
 2800: 2800 Mhz solar flux from Humain station (Belgium).
 COS: thousands of the cosmic ray counts (origin: Ursigrama).
 XFI: X-flares index from the S.I.D.C. (origin: Ursigrama).
 XI: X-flares index from the Ursigrama (M-flares/X-flares).
 AK: planetary geomagnetic index from Wingst (Germany from Ursigrama).
 SEA: sudden enhancements of atmospheric ionospheric disturbance from Uccle & Humain (Belgium).
 Remarks: sid(sudden ionospheric disturbance); ssc(sudden storm commencement) magnet(magnetic storm); sfe(molar flare effect); s-1-2-3-4(classes of flares II-IV radio-burst; ten cm radio-burst); P(proton flare); p(proton event); gle(ground level event; neutron event)



Geomagnetic A K Index

10cm Solar Radio Flux

Relative Sunspot Numbers

November 1990

Nov. I

Rmax=209

Nov. I

Rmin=77

Nov. I

R = 150.5

324 R



Bulletin Werkgroep Zon december 1990

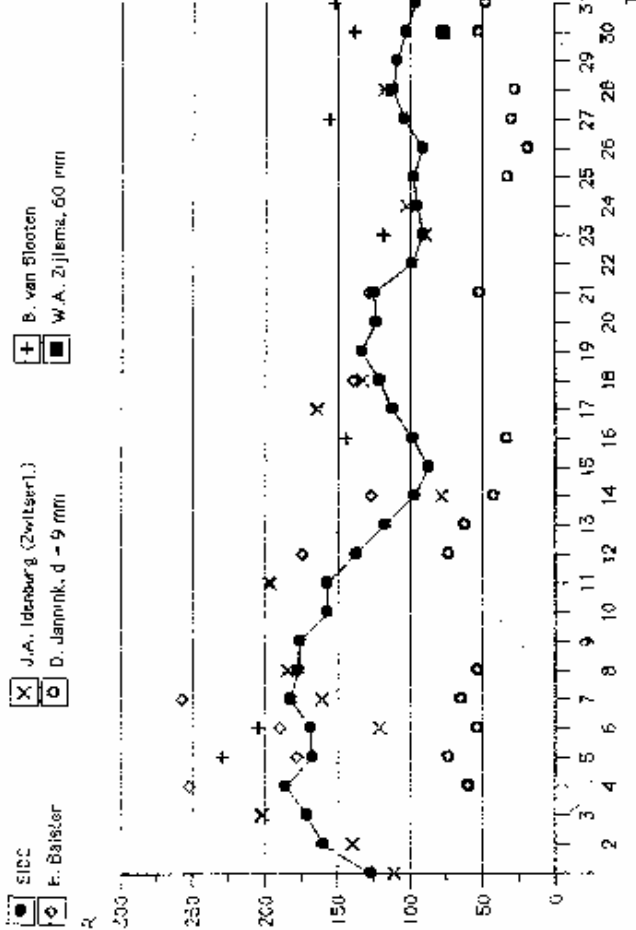
NWWS Werkgroep Zon, Sekretariaat: Veenburg 36, 2804 WZ Gouda, tel: 01820-39082.

Zonievlekkengetal t/m.

dag	SIDC	Bals	Jenn	Zijle	vslo	Zijle
1	127	112	163			
2	164	143	134			
3	171	203				
4	186	252	60			
5	167	174	74	230		
6	159	190	121	54	205	
7	182	257	161	65		
8	177	185	54			
9	176					
10	157					
11	157	198				
12	138	175	74			
13	117		62			
14	96	127	79	43		
15	88					
16	99					

dag	SIDC	Bals	Jenn	Zijle	vslo	Zijle
17	112					
18	121	40	134			
19	134					
20	124					
21	125	129	52			
22	94					
23	91		90			119
24	95		103			
25	98		33			
26	91		19			
27	104		30	156		
28	111		118	28	116	
29	109					
30	103					
31	96					

Mantel w.n.: 8, 13, 16, 8, 1
 k-factor: 0,83, 1,01, 2,82, 0,75, 1,34
 spreiding: 0,09, 0,19, 0,79, 0,10, 0



Sunspot Index

SUMSPOT BULLETIN

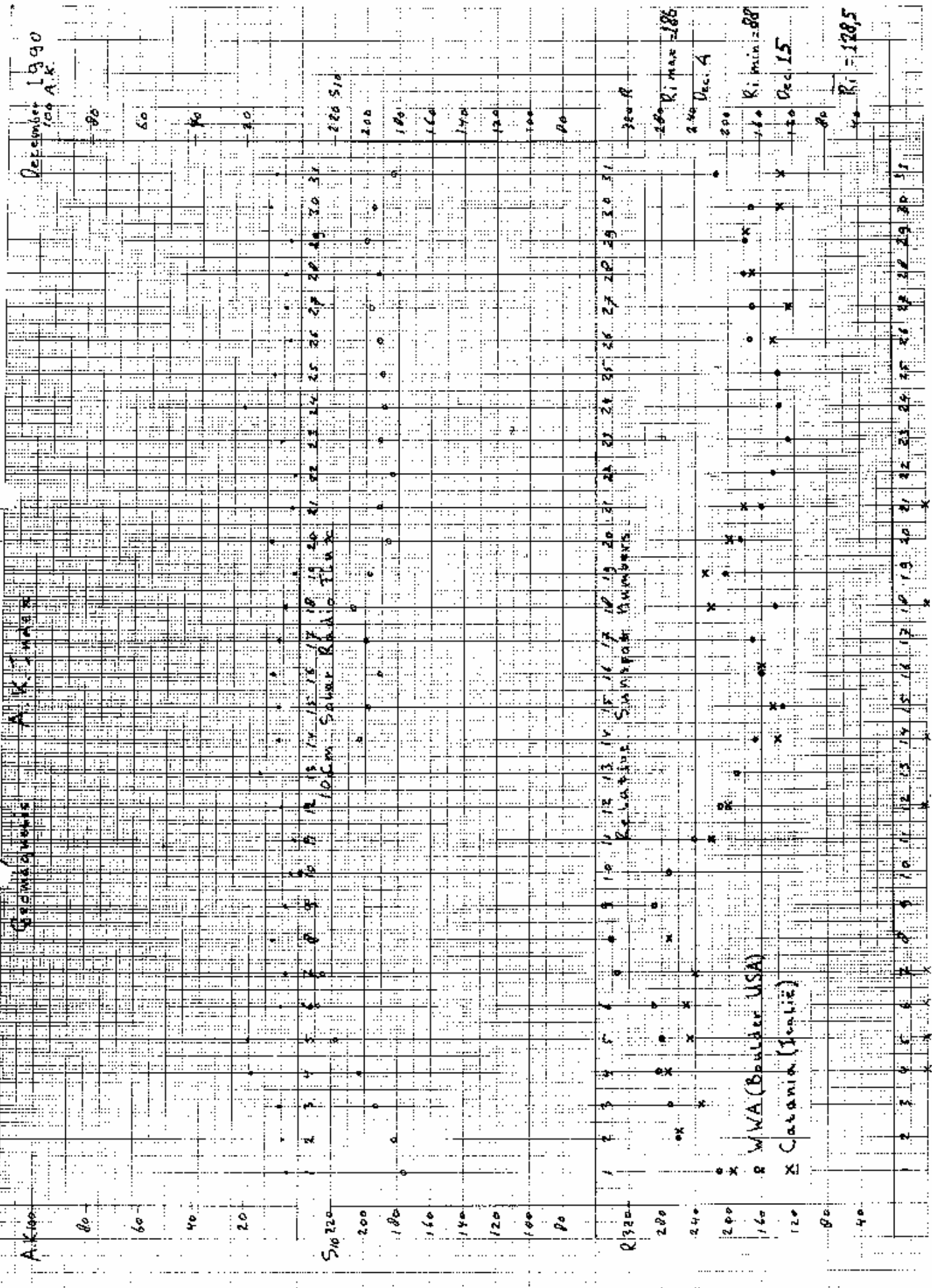
S.I.D.C. SUMMARY OF THE URSIGRAMS

1990 DECEMBER RIM = 128.5

Date	R	PSI	500	2800	COS	XFI	XI	AK	SEA
30	153	76	47	172	878	16	0/0	7	
1	127	75	44	176	886	9	1/0	4	
2	160	81	45	182	880	8	0/0	6	
3	171	113	47	193	880	23	1/0	7	
4	186	136	49	203	886	46	2/0	18	1435
5	167	130	52	218	883	44	1/0	19	
6	169	132	53	228	880	14	0/0	7	
7	182	146	53	236	882	28	1/0	5	
8	177	173	51	230	882	37	0/0	10	
9	176	166	52	235	863	49	2/0	5	0817 in(0813)+ten 2b(0654)+ten(0735)+II
10	157	120	51	239	866	56	1/0	3	
11	157	114	53	239	864	109	5/0	2	
12	138	145	52	236	876	89	7/0	7	1402
13	117	176	57	221	882	42	2/0	15	1f(0951)+ten(1021)
14	98	206	51	204	879	32	2/0	8	1332 sf(1332)+ten
15	88	235	49	198	875	30	1/0	8	
16	99	276	47	191	874	24	0/0	1	
17	112	295	52	200	879	41	2/0	8	
18	121	278	52	208	879	50	3/0	5	1304
19	134	267	47	198	869	59	3/0	2	2b(1449)+mid in(0705)+ten
20	124	173	47	186	876	28	2/0	11	
21	125	138	47	192	882	21	2/0	3	
22	99	107	47	184	882	54	4/0	2	2b(2212);in(2313)+ten+II
23	91	88	48	191	869	116	1/1	7	0938 2b(0939)+ten+II
24	95	83	49	189	872	145	3/1	20	1322 1b(1331)+ten
25	98	94	48	190	868	25	0/0	10	
26	91	108	49	192	878	138	2/1	4	1400 2b(1356)+ten
27	104	118	49	197	884	17	0/0	6	
28	111	119	47	193	887	9	0/0	6	
29	109	120	50	200	890	6	0/0	4	
30	103	97	50	196	890	43	3/0	12	ssc(0411);an(1144)+ten; sb(1318)+ten
31	96	75	50	184	886	11	0/0	9	

R's.R'ix: provisional international sunspot-numbers from the S.I.D.C.
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December 1990
109 A.K.



Geomagnetic

A.K. India

RELATIVE SUNSPOT NUMBERS

WVA (Boulder USA)

Catania (Italy)

Ri = 178.5

A.K. 100

80

60

40

20

S10 220

200

180

160

140

120

100

80

R 320

280

240

200

160

120

80

40

80

60

40

20

220 Sid

200

180

160

140

120

100

80

320 R

280 Ri max = 286

240 Dec. 4

200

160 Ri min = 88

120 Dec. 15

80

40