Bulletin Werkgroep Zon — Januari 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 6	Groe	Iden	Jn .9	Jn 4	Kroe	Scho	vSlo	Sp 7	Zans	Zijle	Uccle groups	Uccle spots
1	53	50	41		12		39	46	51	52	29	35	3	11
2														
3														
4	26										15	12		
5											0			
6	0		0		0				11	11			0	0
7			0		0						0		0	0
8														
9			0		0								0	0
10	12		0	0	0		0	24		0		13	0	0
11	13		13	12	0					12	12	26	2	9
12	37				15	27					34		2	17
13	56				14						20			
14											23			
15														
16										49				
17	54		53		12								4	15
18														
19			11		0								4	9
20														
21			0		0		0		25		13			
22	24		0		0				25	11	11		2	2
23														
24		54			26		45		70	70			2	13
25	82	56	30	33	25	26	32		97	92	36			
26	81		30	61	26		46		99	88	66		4	35
27	84		29		26				84	76			3	30
28														
29			17		11				61					
30														
31	37	14	11	13	11		12	24	25	14	11		1	2
observ	13	4	15	5	18	2	7	3	10	11	13	4		
k	0,88	1,07	2,07	1,66	2,86	2,15	1,47	0,60	0,76	1,09	1,47	1,15		
st.dev.	0,42	0,26	0,93	0,70	0,93	1,04	0,53	0,22	0,18	0,46	0,40	0,38		
st.d./k	0,47	0,24	0,45	0,42	0,33	0,49	0,36	0,37	0,24	0,42	0,28	0,33		

Observers		[...] = Refractor, d = ... mm		[Rf...] = Reflector, d = ... mm	
Bals	= H.A.M. Balster [70]	Jn .9	= D. Jannink [9]	vSlo	= B. van Slooten [90]
Gr 6	= Mw G. Gravers [60]	Jn 4	= D. Jannink [40]	Sp 7	= T. Spaninks [75]
Groe	= A. Groenewegen [102]	Kroe	= K. Kroesen [102]	Zans	= W. Zanstra [Rf 155]
Iden	= J.A. Idenburg [70]	Scho	= A. Scholten [60]	Zijle	= W.A. Zijlema [90]

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

1998 JANUARY R_{iM} = 32.3

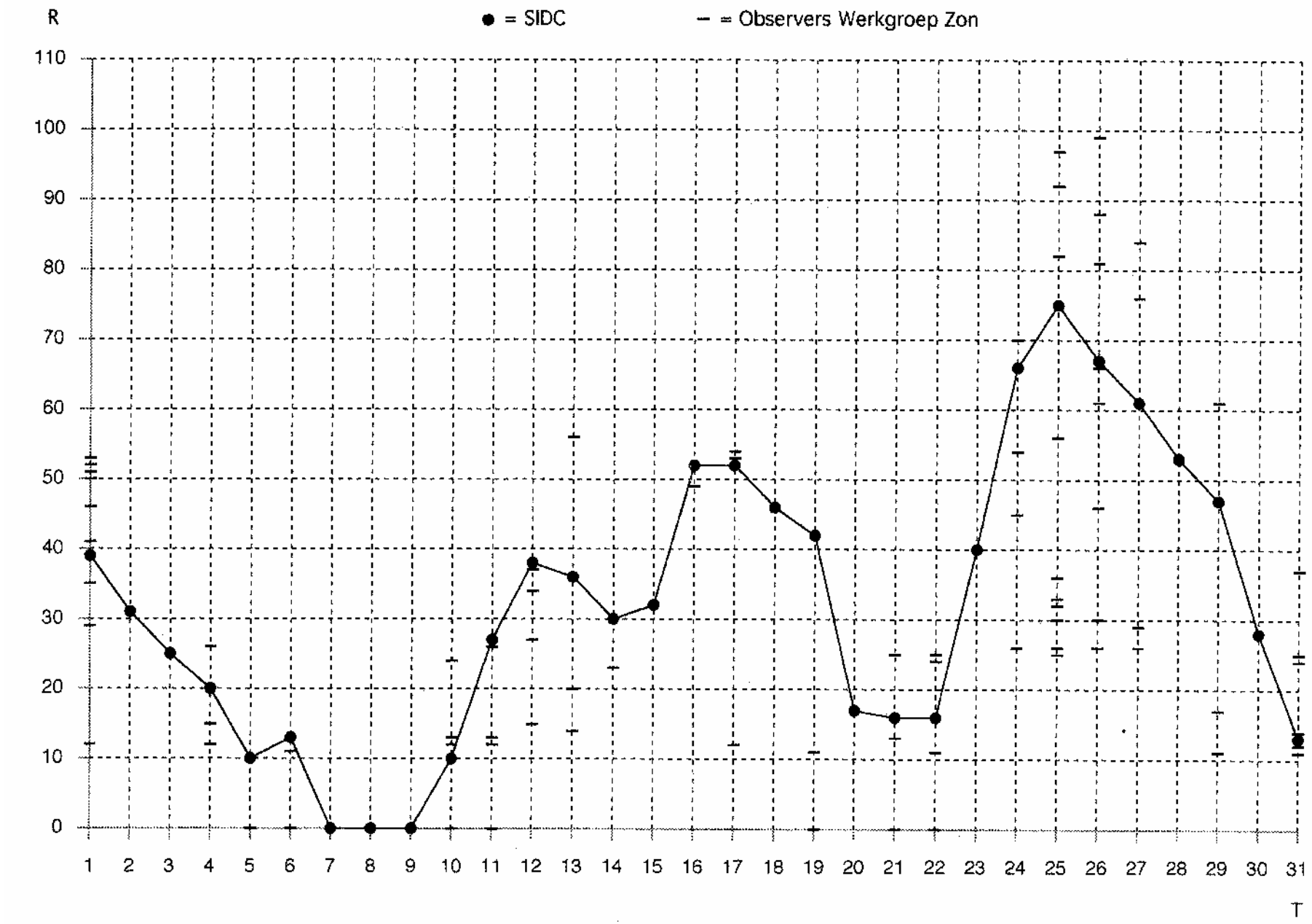
Date	Rj	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
31	45	58	42	105	1002	5	0/0	3		
1	39	35	35	102	1002	3	1/0	4		
2	31	21	34	101	1001	4	1/0	7		
3	25	11	36	101	1011	1	1/0	3		
4	20	5	34	091	1009	0	0/0	3		
5	10	0	35	089	1017	0	0/0	3		
6	13	0	35	088	1018	0	0/0	23		mgst ssc(1416)
7	0	0	33	085	1004	0	0/0	19		
8	0	0	32	082	1011	0	0/0	12		
9	0	0	32	-	1017	-	-	12		
10	10	1	37	081	1011	1	0/0	7		
11	27	4	37	085	1013	0	0/0	6		
12	38	30	40	096	1016	6	0/0	6		
13	36	30	41	090	1022	1	0/0	3		
14	30	32	40	094	1016	7	0/0	4		
15	32	47	40	098	1018	16	1/0	2		
16	52	35	36	098	1018	1	0/0	11		
17	52	22	43	096	1014	2	0/0	10		
18	46	12	42	095	1018	1	0/0	6		
19	42	4	41	094	1013	0	0/0	3		
20	17	3	41	091	1009	0	0/0	20		
21	16	2	43	091	1002	0	0/0	7		
22	16	2	41	093	1003	1	0/0	6		
23	40	8	42	097	1015	2	0/0	3		
24	66	19	43	098	1015	0	0/0	7		
25	75	72	40	108	1002	11	1/0	15		
26	67	39	44	100	1013	8	0/0	4		sn(2219)
27	61	47	44	101	1010	0	0/0	8		
28	53	74	45	097	1011	0	0/0	2		
29	47	26	42	094	1003	1	0/0	10		
30	28	17	42	091	1003	1	0/0	20		
31	13	15	41	089	1000	0	0/0	16		ssc(1643)

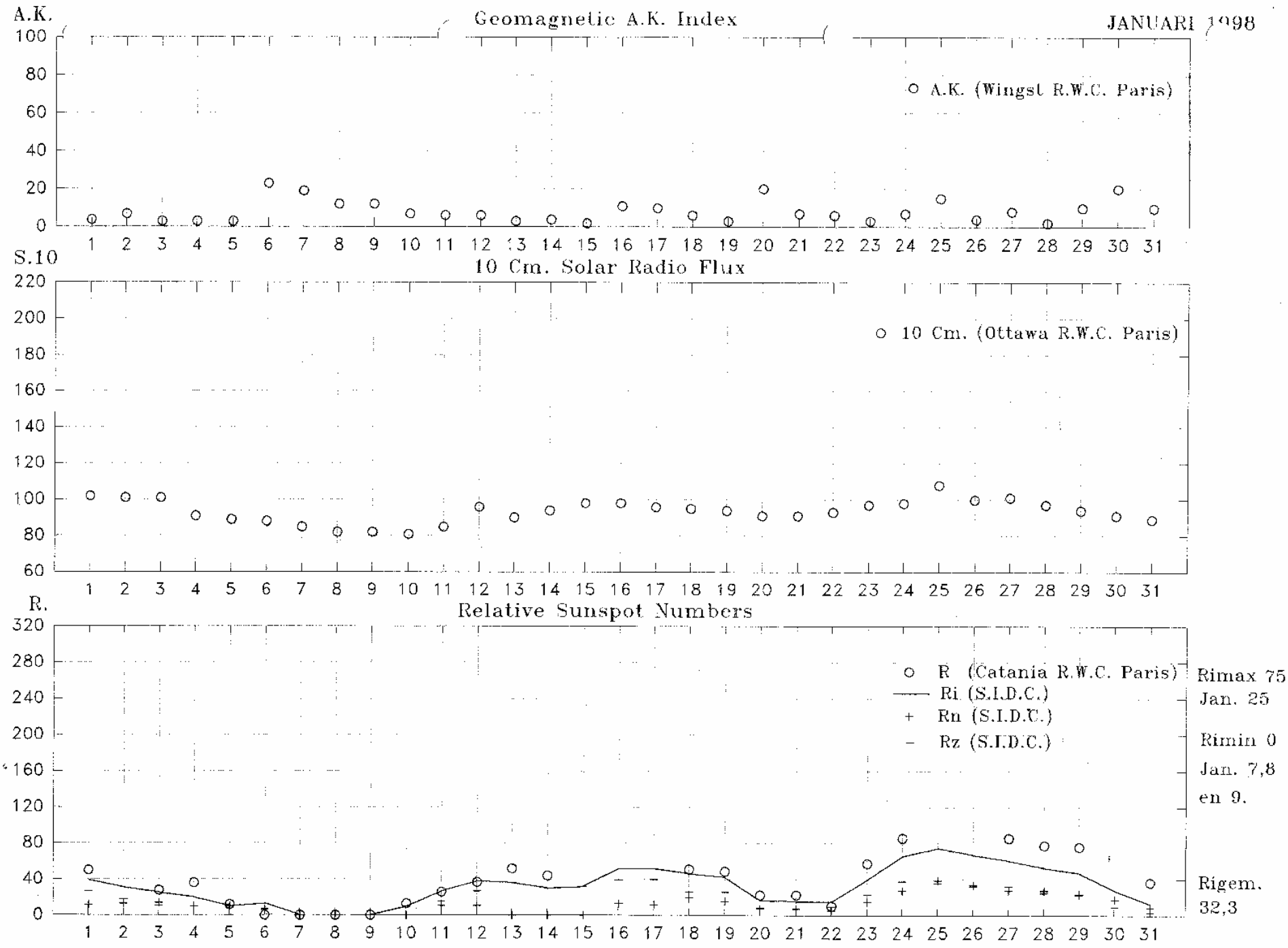
gem: 90,8

Low to moderate solar activity, low geomagnetic activity.

R_j, R_{ix} : 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/m² : 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 - UGEOI group 2)."The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect); s-1-2-3-4 (class of flares); II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); SFI Evaluation (1 x Sn+10 x "1"+100 x ">1").

gemeten gemiddl 21 cm = 32,3 → F = 90,8 / 32,3 = 2,24


R
● = SIDC
– = Observers Werkgroep Zon
110
100
90
80
70
60
50
40
30
20
10
0
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 31
T


A.K.
Geomagnetic A.K. Index
JANUARI 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimax 75
Jan. 25
Rimin 0
Jan. 7,8
en 9.
Rigem.
32,3

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

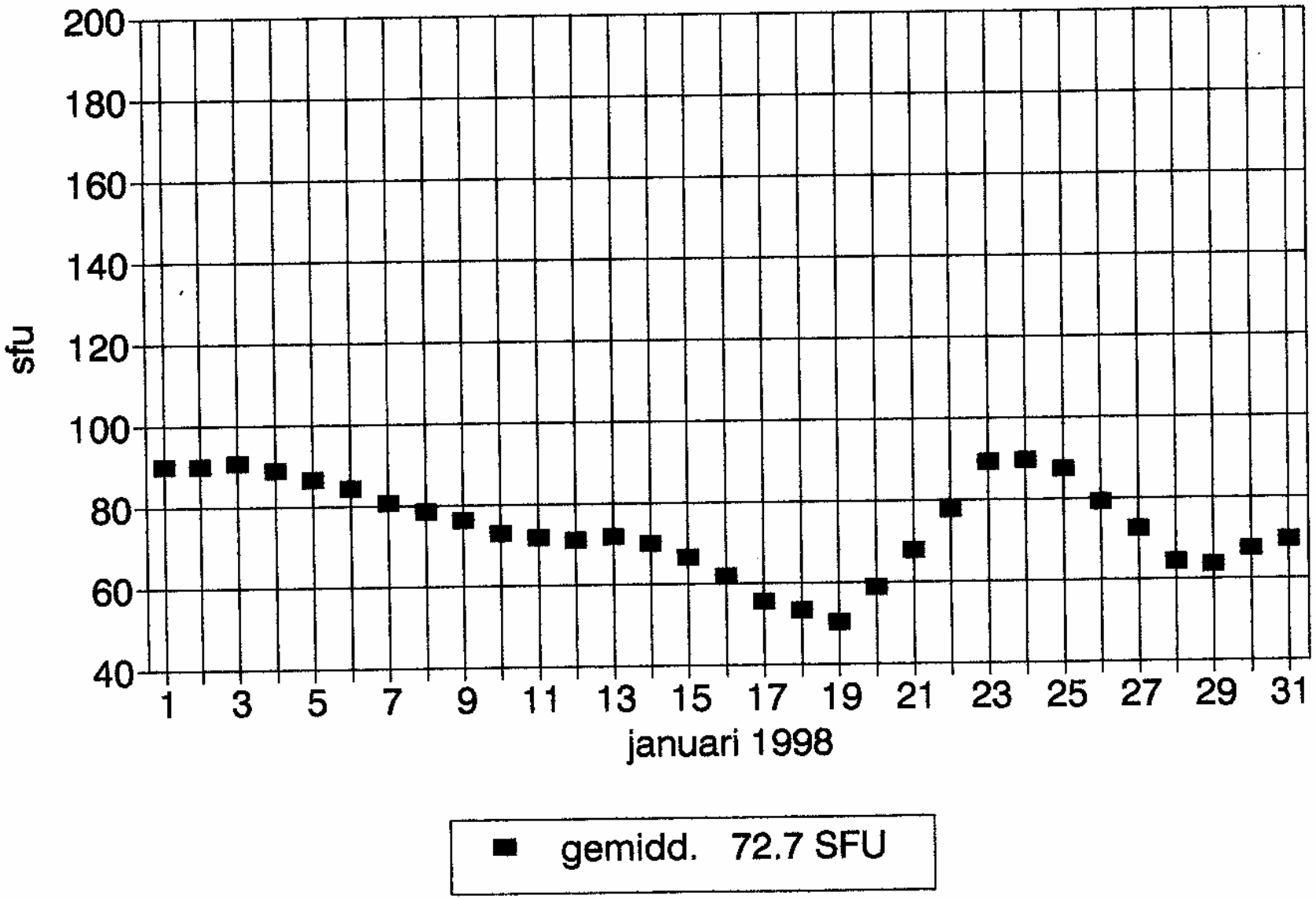
(Hemispheric sunspot numbers)

januari 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		Scholten		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	12	27	18	35	13	28					16	30	15	36	17	35	15	14
2	13	18																
3	14	11																
4	10	10	26	0														
5	10	0															15	0
6	6	7	0	0	0	0							0	11	0	11	0	0
7	0	0			0	0												
8	0	0															0	0
9	0	0			0	0												
10	0	10	0	12	0	0	0	0			11	13			0	0		
11	11	16	0	13	0	13	0	12	0	27					0	12	0	12
12	11	27	0	37													0	34
13	0	36	0	56													0	20
14	0	30															0	23
15	0	32																
16	13	39													16	33		
17	12	40	13	41	12	41												
18	20	26																
19	16	26			0	11												
20	8	9																
21	8	8			0	0							14	11			13	0
22	6	10	11	13	0	0							11	14	11	0	11	0
23	16	24																
24	28	38											24	46	25	45		
25	39	36	37	45	0	30	0	33	0	26			46	51	37	55	0	36
26	34	33	39	45	0	30	24	37					44	55	43	45	28	38
27	28	33	37	47	0	29							33	51	28	48		
28	28	25																
29	24	23			0	17							29	32				
30	18	10																
31	9	4	23	14	0	11	0	13			11	13	12	13	0	14	0	11

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — Februari 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 6	Gr 5*	Groe	Iden	Jn .9	Jn 4	Kroe	Scho	vSlo	Sp 7	Vers	Zans	Zijle
1	24	14		11		11				12	12	11	11	11
2						11				11		11		
3	41			11	0	0		11		37	38		22	
4	32			26	35	0		11		31	32	24	11	
5	25					11				37				
6														
7				25		11				30	30	11		
8	37					11	11			36	36		11	
9	38			34		11		23		38		34	11	
10	48			34		11		23		37		34		
11	38			35		11				47				
12	41			38		25					57		28	
13				53		26	26			79	58			
14					33	16			63	79	82	68	45	53
15	45	63				18				74	62			
16	62			47		14				58	66		49	
17				43		16				43	50		48	
18	53			42	31	16		25	48	48	59	31	48	
19	37					15		36		42	35			
20	18			16	13	12		23	18	27	16			
21													11	
22	37	14		11								13	11	37
23	48			27		11	12	41	42	39	44		13	
24				28		26								
25											82			
26			36											
27														
28	70		61	53		0		51		61		40	56	55
observ	17	3	2	17	5	22	3	9	4	20	16	10	14	4
k	0,96	1,42	1,07	1,45	1,70	2,89	2,72	1,62	1,21	0,97	0,98	1,48	1,89	1,18
st.dev.	0,24	0,51	0,26	0,52	0,71	1,01	0,87	0,60	0,25	0,23	0,27	0,43	0,76	0,37
st.d./ k	0,25	0,36	0,24	0,36	0,42	0,35	0,32	0,37	0,20	0,24	0,28	0,29	0,41	0,32

Uccle	
groups	spots
1	1
1	1
3	8
2	6
2	3
3	4
3	7
2	3
3	11
3	18
3	19
2	26
3	26
3	21
3	20
1	10
1	1
4	17
3	12

Observers	[...] = Refractor, d = ... mm	[Rf...] = Reflector, d = ... mm
Bals = H.A.M. Balster [70]	Jn .9 = D. Jannink [9]	Sp 7 = T. Spaninks [75]
Gr 6 = Mw G. Gravers [60]	Jn 4 = D. Jannink [40]	Vers = D. Verschuuren [Rf 80]
Gr 5* = idem [50], Curaçao	Kroe = K. Kroesen [102]	Zans = W. Zanstra [Rf 155]
Groe = A. Groenewegen [102]	Scho = A. Scholten [60]	Zijle = W.A. Zijlema [90]
Iden = J.A. Idenburg [70]	vSlo = B. van Slooten [90]	

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

1998 FEBRUARY R_{IM} = 40.7

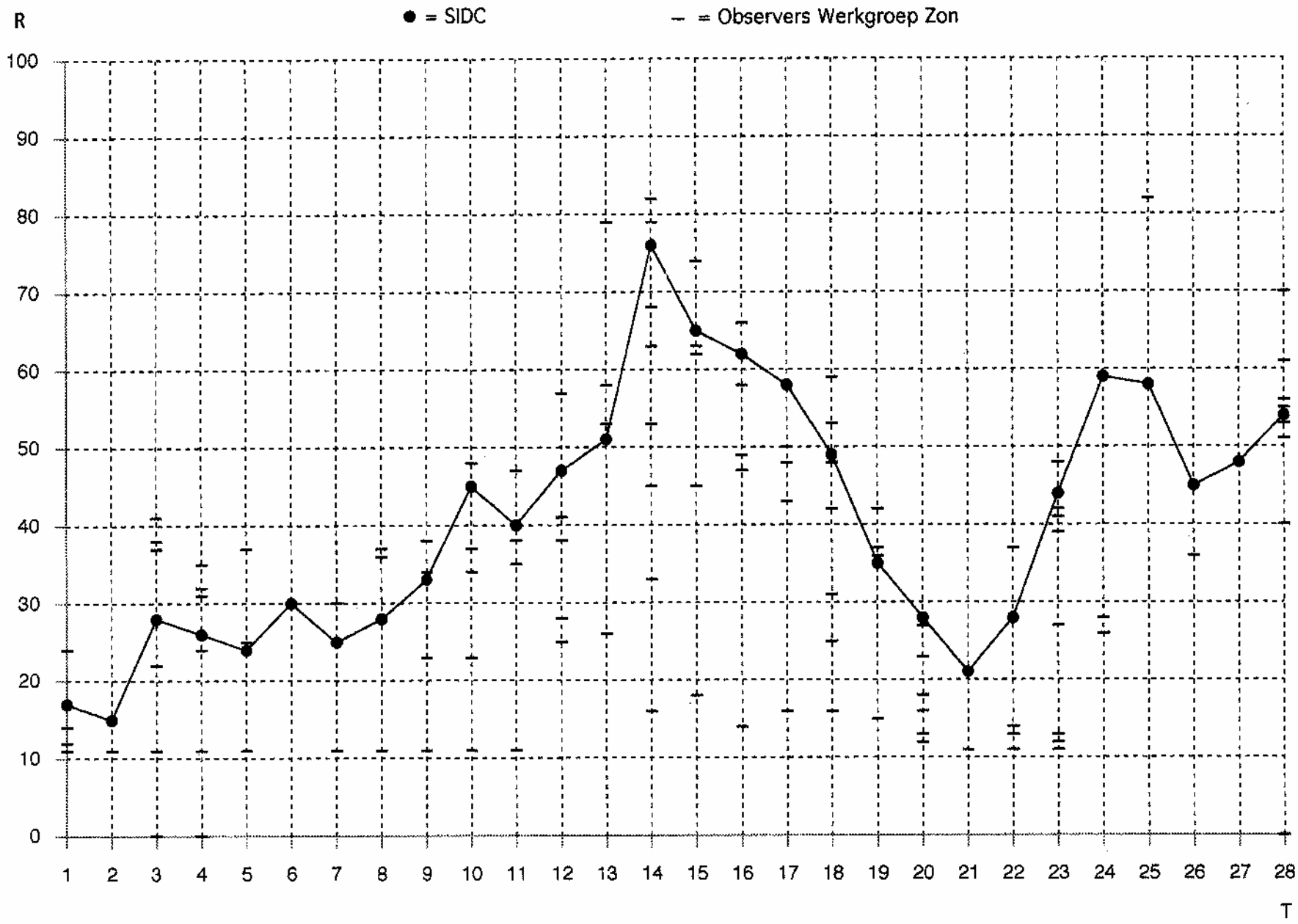
Date	R_I	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
31	13	15	41	089	1000	0	0/0	16		ssc (1643)
1	17	13	41	091	1010	0	0/0	8		
2	15	7	42	089	1013	0	0/0	-		
3	28	7	41	089	1016	0	0/0	4		
4	26	12	40	089	1005	0	0/0	8		
5	24	10	40	086	1006	0	0/0	4		
6	30	13	40	084	1010	3	0/0	3		
7	25	11	41	083	1013	0	0/0	4		
8	28	13	41	084	1007	0	0/0	13		
9	33	19	40	084	1005	0	0/0	14		
10	45	25	40	084	1016	0	0/0	12		
11	40	16	40	086	1015	3	0/0	25		
12	47	35	40	091	1018	3	0/0	12		
13	51	57	40	095	1021	1	0/0	9		
14	76	88	42	105	1019	3	0/0	9		
15	65	102	43	107	1023	8	0/0	2		
16	62	129	47	107	1019	0	0/0	4		
17	58	113	47	105	1017	2	0/0	17		mgst ssc (1106)
18	49	89	48	103	1010	13	0/0	42		
19	35	76	44	099	1008	7	0/0	7		
20	28	42	42	096	1014	6	0/0	12		
21	21	28	42	095	1020	0	0/0	6		
22	28	8	43	096	1016	0	0/0	8		
23	44	9	43	099	1013	2	0/0	10		
24	59	23	44	099	1011	6	0/0	3		
25	58	48	43	095	1017	0	0/0	5		
26	45	55	42	093	1010	1	0/0	2		
27	48	32	42	090	1012	0	0/0	6		
28	54	20	42	094	1009	2	0/0	15		

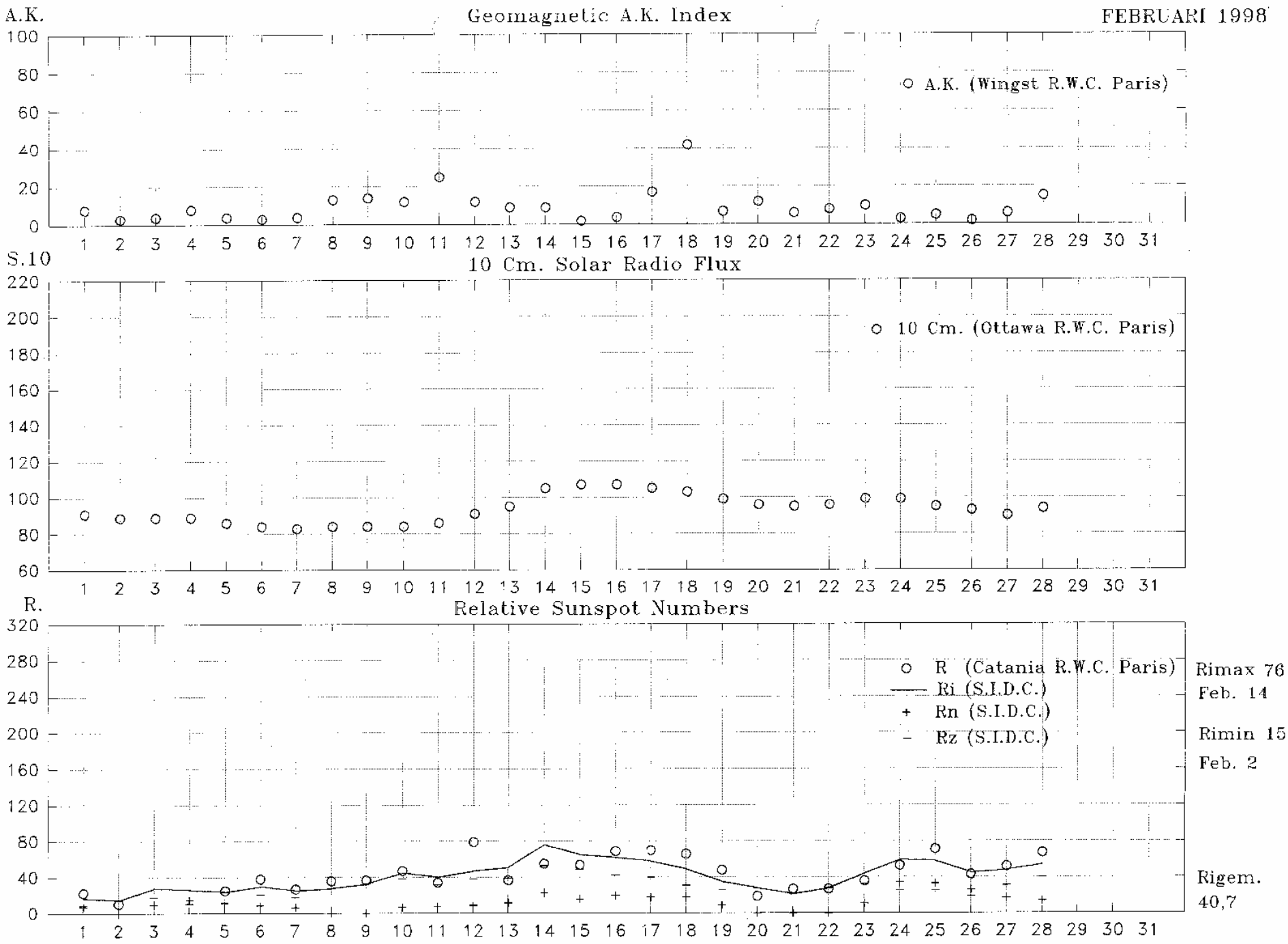
gemiddeld: 93,5

Low solar activity, increasing slightly around the 14th, very low to moderate geomagnetic activity.

R_I, R_{IM} : 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/m² : 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 - UGEOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 8).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : **sid** (sudden ionospheric disturbance); **ssc** (sudden storm commencement); **mgst** (magnetic storm); sfe (solar flare effect) s-1-2-3-4 (class of flares); II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); **si** (sudden impulse); F (Forbush); **SFI Evaluation** (1 x Sn+10 x "1"+100 x ">1").

gemeten gemiddeld 21 cm = 20,7 → $F = 0,8 \times \frac{93,5}{20,7} = 2,60$


R
● = SIDC
– = Observers Werkgroep Zon
100
90
80
70
60
50
40
30
20
10
0
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
T


A.K.
Geomagnetic A.K. Index
FEBRUARI 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimax 76
Feb. 14
Rimin 15
Feb. 2
Rigem.
40,7

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

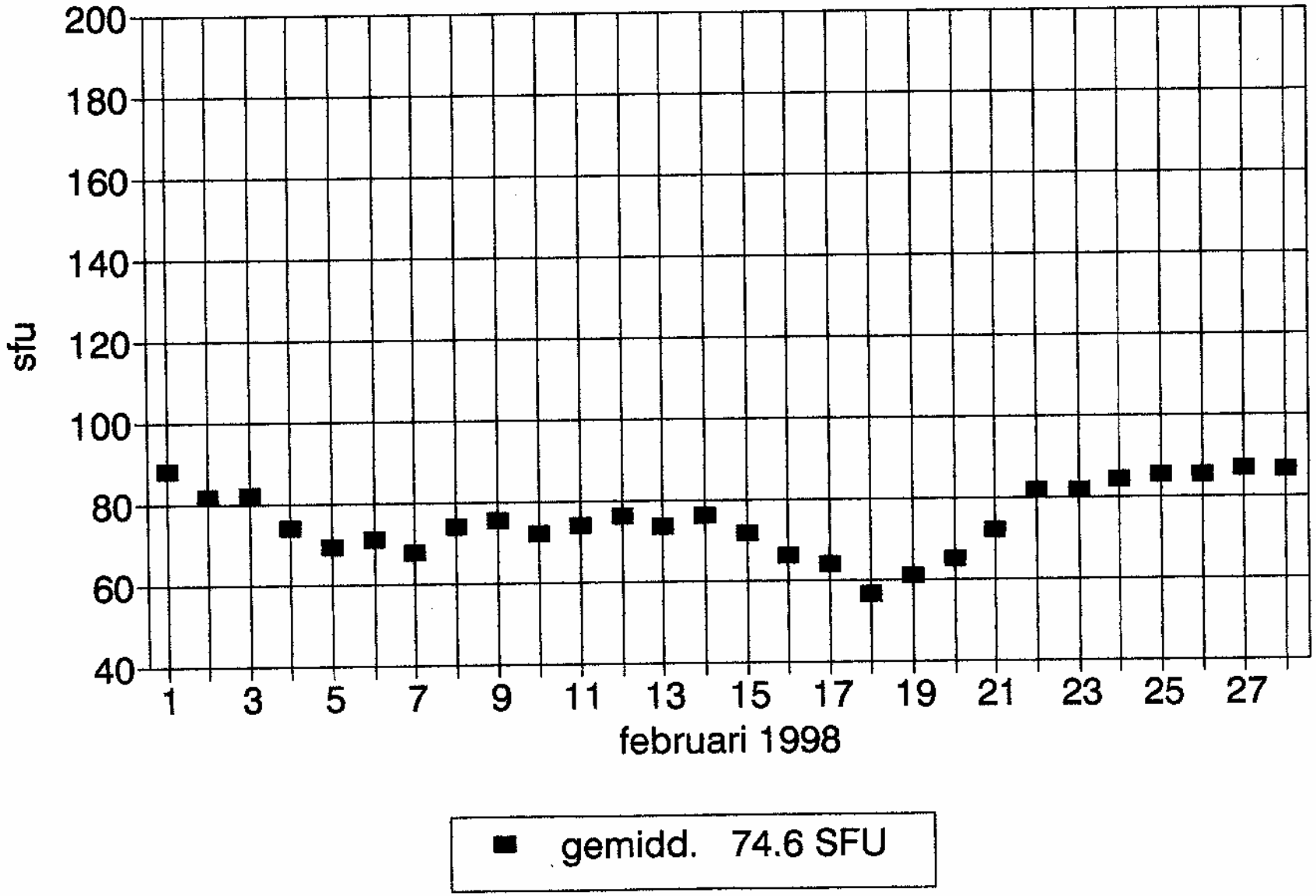
(Hemispheric sunspot numbers)

februari 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		Scholten		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	8	9	11	13	0	11							0	12	0	12	0	11
2	0	15											0	11				
3	10	18	17	24	0	11	0	0					14	23	16	22	0	22
4	15	11	18	14	15	11	24	11					18	13	19	13	0	11
5	12	12	12	13									11	26				
6	9	21																
7	7	18			0	25							0	30	0	30		
8	0	28	0	37					0	11			0	36	0	36	0	11
9	0	33	0	38	0	34							0	38			0	11
10	7	38	0	48	0	34							0	37				
11	8	32	0	38	0	35							0	47				
12	9	38	0	41	0	38									0	57	0	28
13	12	39			0	53			0	26			22	57	0	58		
14	23	53					0	33			12	51	22	57	22	60	0	45
15	16	49	0	45									13	61	0	62		
16	20	42	13	49	13	34							13	45	14	52	14	35
17	18	40			12	31							13	30	13	37	14	34
18	18	31	13	40	13	29	0	31			12	36	13	35	13	46	14	34
19	9	26	0	37									11	31	0	35		
20	0	28	0	18	0	16	0	13			0	18	0	27	0	16		
21	0	21															0	11
22	0	28	0	37	0	11											0	11
23	11	33	13	35	0	27			0	12	11	31	11	28	12	32	0	13
24	34	25			15	13												
25	33	25													49	33		
26	26	19																
27	17	31																
28	14	40	14	56	12	41							15	46			14	42

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — Maart 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonneviekkengetallen (Sunspot numbers)

Day	Bals	Gr 6	Gr 5*	Groe	Iden	Jn .9	Jn 4	Kroe	vSlo	Sp 7	Vers	Zans	Zijle
1			94			14			74			56	72
2	75		42			16			76				
3													
4													
5	41			29		13			44		30	33	
6													
7				39		0				51			
8						12		35	56	42		14	53
9	39			24	58	11	11	48	45	43	40	40	
10	60			52	62	23	37	41	75	61	50	56	
11													
12	104					27		76	86	111	77	82	
13													
14	86					41			114				
15													
16												61	
17	79				39	30	41			77	66	58	
18						29			86			36	
19	87					28		45	72	101	58	63	
20												61	
21	107	91			73	35			101	86	74	70	69
22													
23						39			75		50	57	52
24	79			34	34	39	26	64	79	73	49	52	
25	77			36	39	28		62	74	92		42	
26	62					28			55		48	36	
27												44	
28	51												
29	62					11		49		82		22	49
30	48					23		49	62		34	34	46
31	65			38		27		87	62		34		
observ	16	1	2	7	6	20	4	10	17	11	12	19	6
k	0,84	0,76	1,11	1,30	1,16	2,53	2,06	0,99	0,77	0,74	1,10	1,26	0,95
st.dev.	0,13	—	0,68	0,31	0,44	1,01	0,85	0,25	0,10	0,08	0,21	0,49	0,20
st.d./k	0,16	—	0,62	0,24	0,38	0,40	0,41	0,25	0,13	0,11	0,19	0,39	0,21

Aanvulling jan: Verschuuren: observ: 9; k = 1,24; st. dev. = 0,50; st. dev./k = 0,40

Uccle	
groups	spots
2	13
3	11
3	10
4	22
5	32
3	34
5	16
4	33
5	44
3	14
6	21
4	33

Observers	[...] = Refractor, d = ... mm	[Rf...] = Reflector, d = ... mm
Bals = H.A.M. Balster [70]	Jn .9 = D. Jannink [9]	Sp 7 = T. Spaninks [75]
Gr 6 = Mw G. Gravers [60]	Jn 4 = D. Jannink [40]	Vers = D. Verschuuren [Rf 80]
Gr 5* = idem [50], Curaçao	Kroe = K. Kroesen [102]	Zans = W. Zanstra [Rf 155]
Groe = A. Groenewegen [102]	vSlo = B. van Slooten [90]	Zijle = W.A. Zijlema [90]
Iden = J.A. Idenburg [70]		

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

1998 MARCH R_{IM} = 54.8

Date	Rf	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
28	54	20	42	094	1009	2	0/0	15		
1	59	32	42	098	1008	4	0/0	18		
2	67	39	42	098	1011	11	0/0	20		
3	35	39	42	097	1020	17	0/0	5		
4	36	50	-	102	1019	8	0/0	12		
5	32	32	-	097	1018	22	0/0	10		
6	29	11	40	092	1011	1	0/0	8		
7	36	7	39	092	989	0	0/0	4		
8	33	10	40	091	1021	1	0/0	2		
9	35	14	40	090	1020	6	0/0	2		
10	50	22	41	096	1021	0	0/0	43	0758	
11	56	37	41	101	1014	4	0/0	23		
12	72	41	42	102	1016	0	0/0	14		
13	74	67	41	105	1016	3	0/0	16		
14	79	72	43	120	1007	7	0/0	12		
15	63	160	46	133	1018	41	3/0	18	1607	
16	60	167	45	124	1021	22	1/0	12		
17	59	147	45	126	1024	9	0/0	8		
18	64	131	-	127	1028	4	1/0	4		
19	67	79	-	125	1020	43	1/0	5		
20	62	56	-	127	1029	0	0/0	12		
21	69	28	45	126	1011	2	0/0	32		
22	72	35	46	128	1013	16	1/0	15		
23	55	59	46	122	1010	1	1/0	8		
24	59	88	46	121	1005	6	0/0	9		
25	54	95	46	115	999	5	0/0	14		
26	52	106	46	110	996	101	1/0	14	1247	s-2B 1247
27	51	101	46	108	1000	102	1/0	18		s-3N 2153
28	60	79	43	104	1005	3	0/0	12		
29	58	76	43	100	1006	0	0/0	28		
30	46	64	-	108	1016	3	0/0	10		
31	55	60	42	108	1024	11	0/0	9		

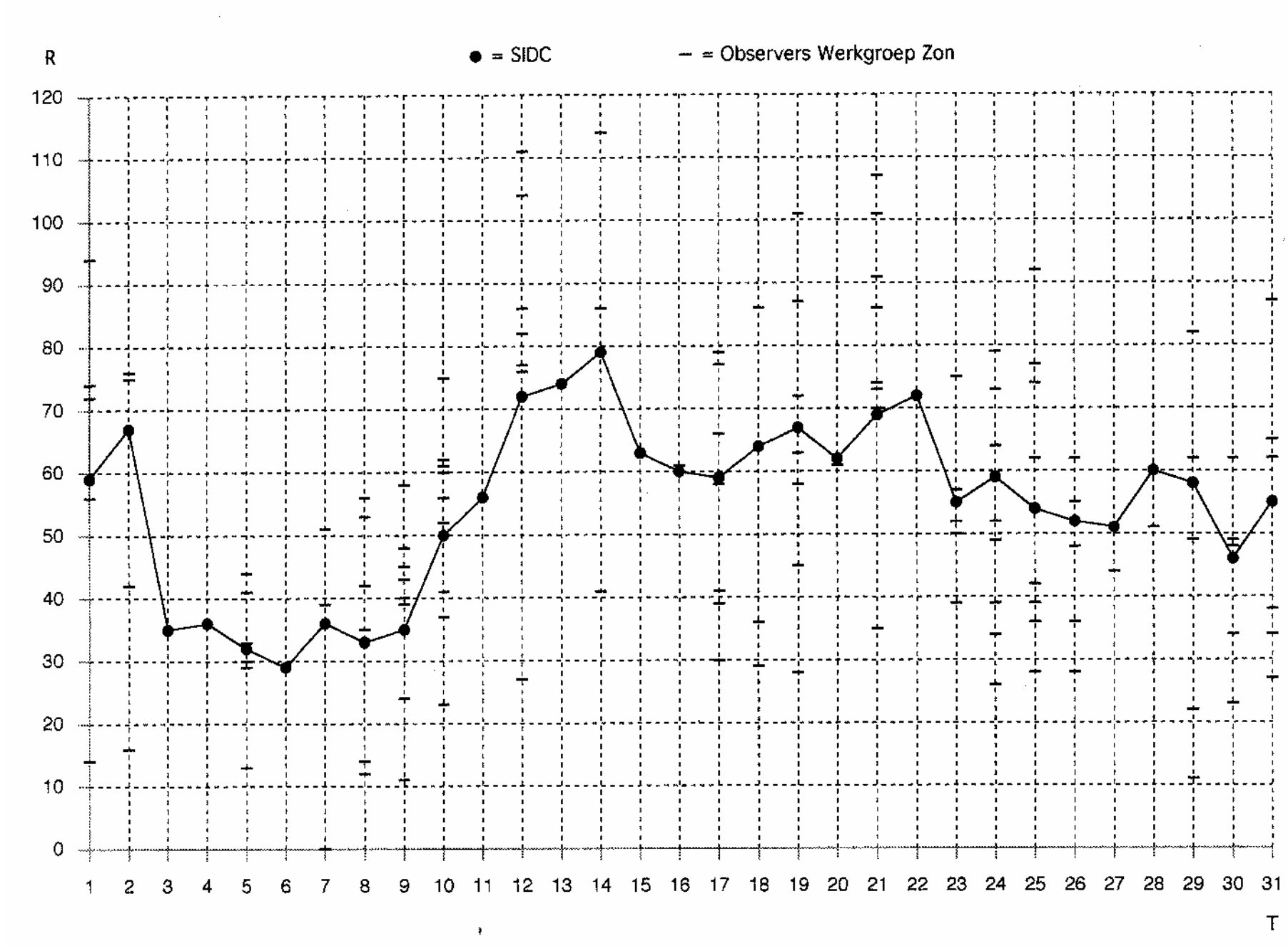
gemiddeld 110,5

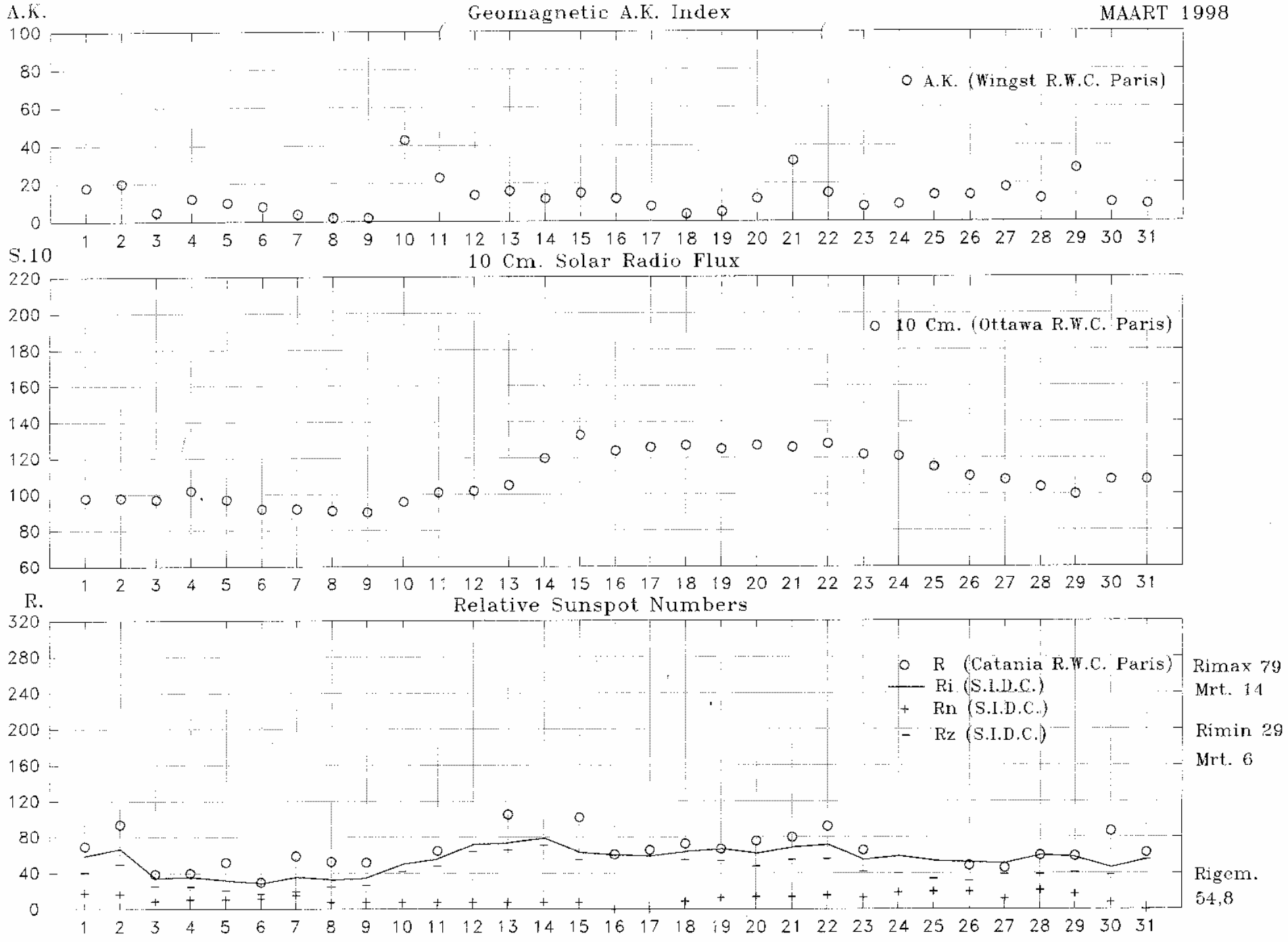
Very low to moderate solar and geomagnetic activity.

R_f, R_{IM} : 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/m² : 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 - UGEOI group 2)."The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect); s-1-2-3-4 (class of flares); II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); SFI Evaluation (1 x Sn+10 x "1"+100 x ">1").

gemeten gemiddelde = 24,0

$\rightarrow F = 0,8 \times \frac{110,5}{24,0} = 3,68$


R
● = SIDC
— = Observers Werkgroep Zon
120
110
100
90
80
70
60
50
40
30
20
10
0
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 31
T


A.K.
Geomagnetic A.K. Index
MAART 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimax 79
Mrt. 14
Rimin 29
Mrt. 6
Rigem.
54,8

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

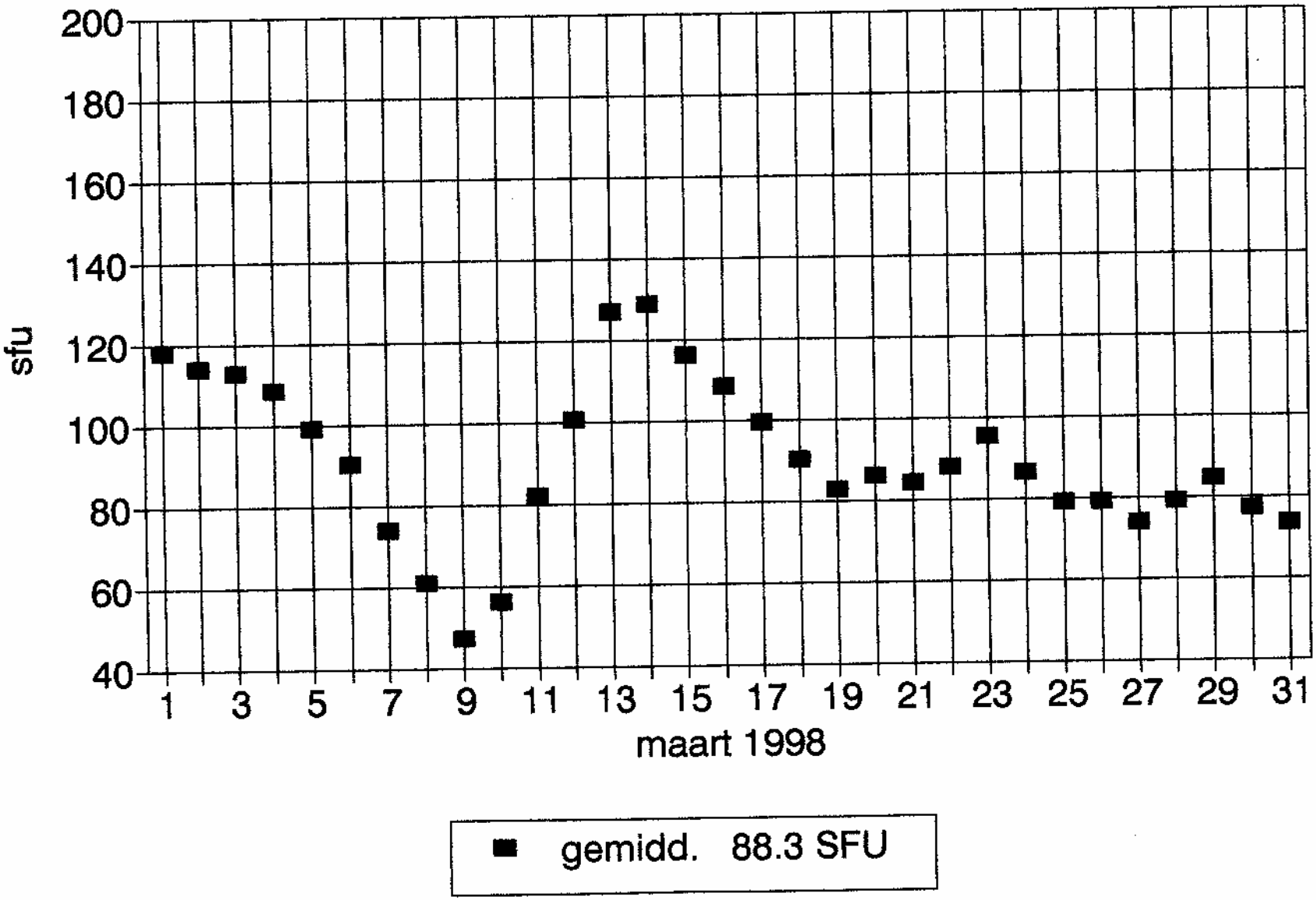
(Hemispheric sunspot numbers)

maart 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	18	41									26	48			13	43
2	17	50	11	64							22	54				
3	9	26														
4	11	25														
5	11	21	16	25	13	16					25	19			14	19
6	12	17														
7	16	20			22	17							23	28		
8	8	25									11	45	11	31	0	14
9	8	27	11	28	11	13	11	47	0	11	17	28	11	32	12	28
10	8	42	11	49	11	41	11	51	0	37	11	64	11	50	11	45
11	8	48														
12	8	64	11	93							11	75	11	100	11	71
13	8	66														
14	8	71	11	75							11	103				
15	8	55														
16	0	60													0	61
17	0	59	0	79			0	39	0	41			0	77	0	58
18	9	55									24	62			0	36
19	13	54	18	69							18	54	18	83	15	48
20	14	48													17	44
21	14	55	17	90			12	61			30	71	16	70	13	57
22	16	56														
23	13	42									19	56			17	40
24	19	40	25	54	16	18	16	18	12	14	24	55	26	47	19	33
25	20	34	33	44	16	20	16	23			32	42	32	60	17	25
26	20	32	28	34							27	28			15	21
27	12	39													15	29
28	21	39	26	25												
29	17	41	24	38									13	69	0	22
30	8	38	11	37							11	51			0	34
31	0	55	0	65	0	38					0	62				

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — April 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

StDC	Day	Bals	Gr 6	Groe	Iden	Jn .9	Jn 4	Kroe	vSlo	Sp 7	Vers	Zans	Zijle	Uccle groups	Uccle spots
56	1														
59	2			51		26		97	69	64	34			5	22
57	3														
51	4	47		39		11		98	38	52	31	32		3	34
59	5	58		47		36	37		51	65	41	50	69	4	36
63	6					39			72	80	55	53		4	45
93	7	115				37		97	105	114	67	55			
106	8	99				49			153					6	47
125	9			96		27			138		72			7	41
108	10			75										7	27
96	11	99				38			111	128					
75	12	71	79			37		70	103	96	75	41		5	17
59	13					34			66	78	37				
70	14					23			67		36				
63	15														
54	16	70				22	22	38	88	86		26			
46	17				0							25	22		
23	18	28								35		15	17		
31	19				19	0		36		43		29	36		
30	20					14			36						
34	21	36				12	12	27	44			33		1	12
32	22	45	30			11		37	41	41		16		1	5
26	23	37		13		0		0	25	36		14		2	6
16	24					0									
23	25					0									
13	26		14	11					13						
12	27								13						
32	28	29	30	30		12			46	33	15	16		2	14
42	29	35		17		13	12		40	21	14	16		1	15
46	30									69		27			
	observ	13	4	9	2	21	4	9	20	16	11	15	4		
	k	0,94	1,00	1,46	1,63	2,65	2,60	0,95	0,90	0,87	1,71	1,68	1,29		
	st.dev.	0,16	0,07	0,46	—	0,88	0,80	0,30	0,17	0,32	0,54	0,44	0,58		
	st.d./k	0,17	0,07	0,32	—	0,33	0,31	0,32	0,19	0,37	0,32	0,26	0,45		

Observers		[...]	= Refractor, d = ... mm	[Rf...]	= Reflector, d = ... mm
Bals	= H.A.M. Balster [70]	Jn .9	= D. Jannink [9]	Sp 7	= T. Spaninks [75]
Gr 6	= Mw G. Gravers [60]	Jn 4	= D. Jannink [40]	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]	Kroe	= K. Kroesen [102]	Zans	= W. Zanstra [Rf 155]
Iden	= J.A. Idenburg [70]	vSlo	= B. van Slooten [90]	Zijle	= W.A. Zijlema [90]

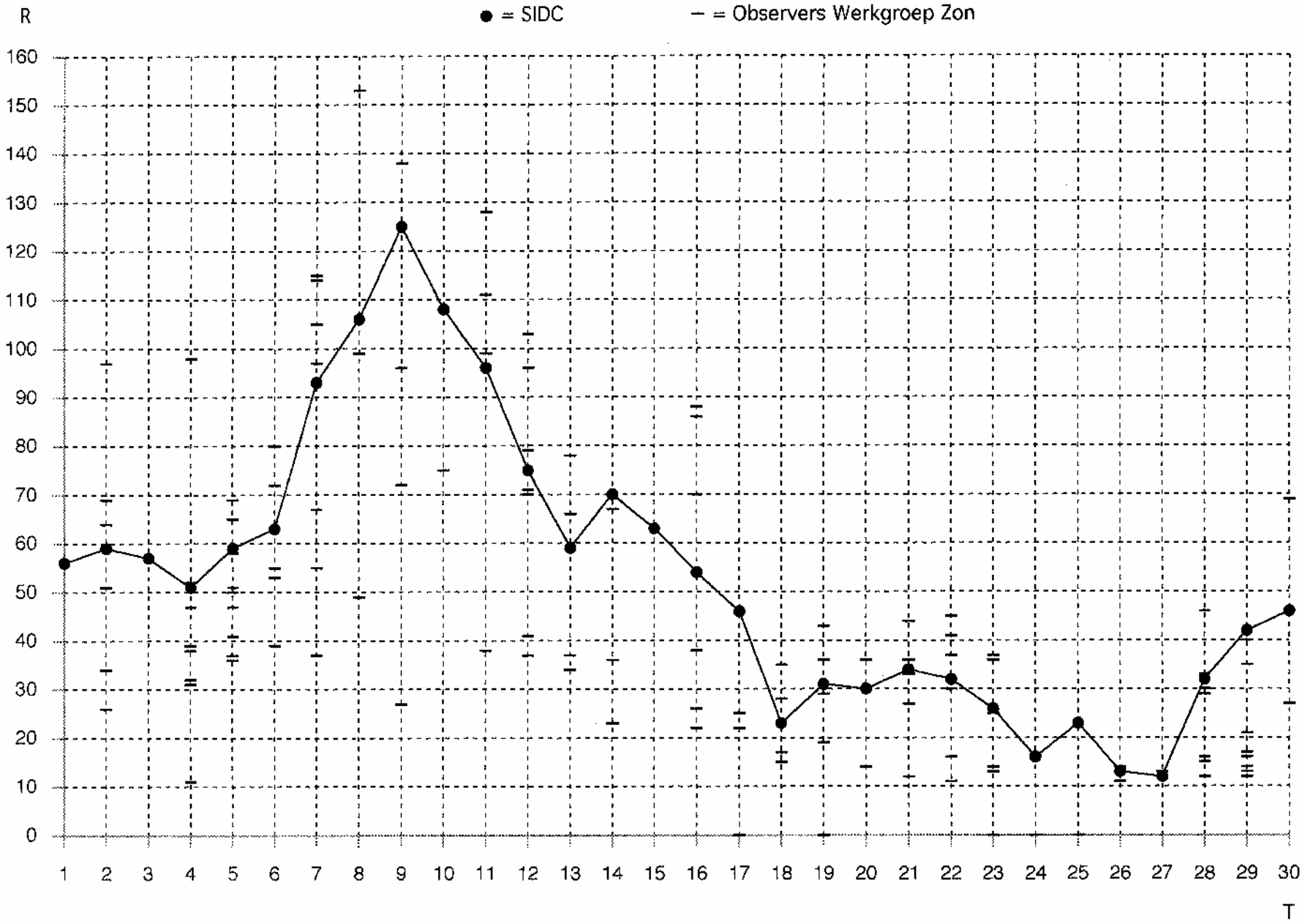
S.I.D.C. SUMMARY OF THE URSIGRAMS

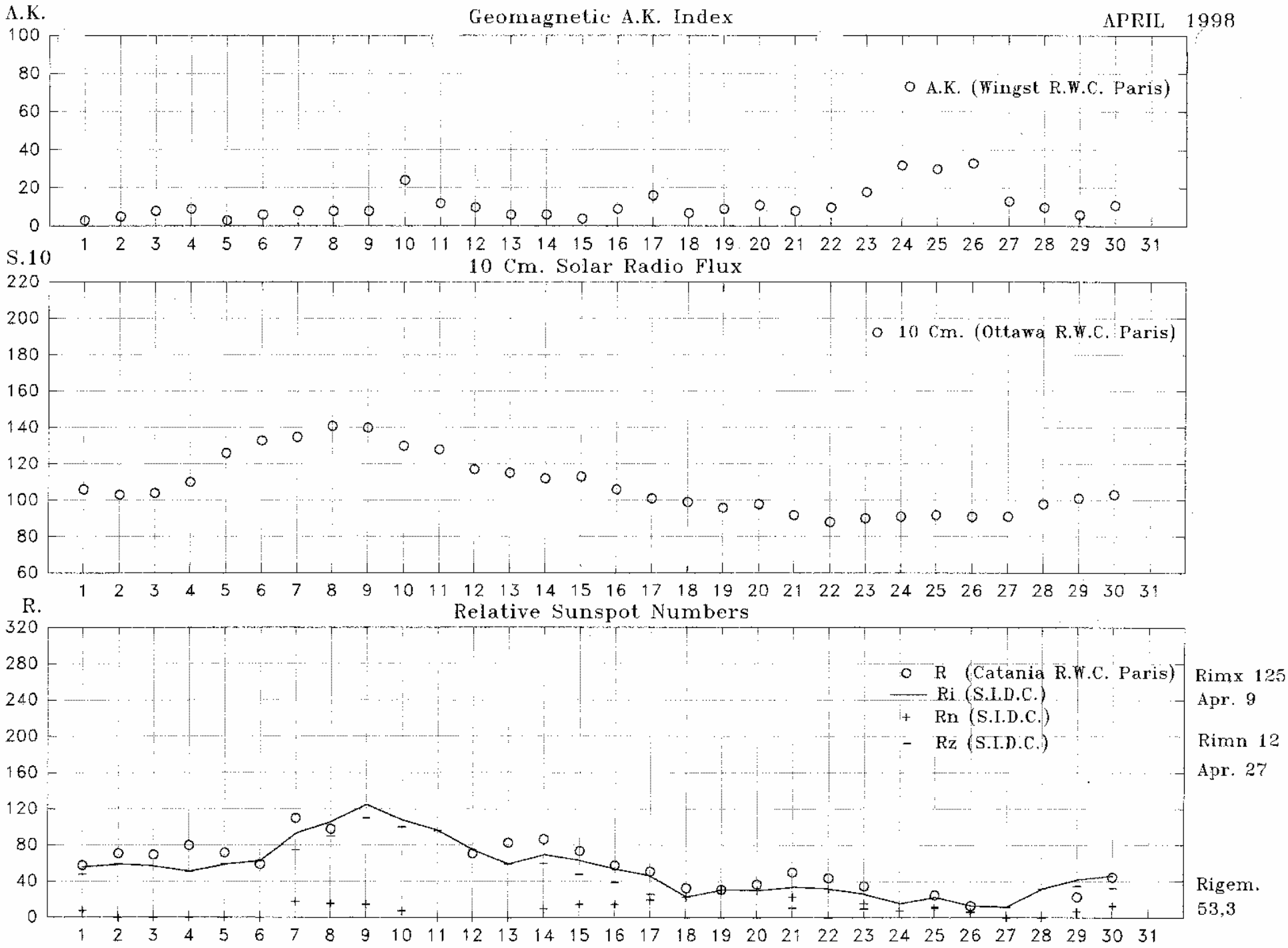
1998 APRIL R^i_{IM} = 53.3

Date	R^i_I	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
31	55	60	42	108	1024	11	0/0	9		
1	56	78	42	106	1023	6	0/0	3		
2	59	56	41	103	1023	8	0/0	5		
3	57	54	41	104	1012	12	0/0	8		
4	51	34	41	110	1022	15	0/0	9		
5	59	56	41	126	1005	6	1/0	3		
6	63	74	48	133	999	102	1/0	6		s2F(1623)
7	93	114	46	135	1002	0	0/0	8		
8	106	115	48	141	988	20	0/0	8		
9	125	112	48	140	977	8	0/0	8		
10	108	124	48	130	986	4	0/0	24		
11	96	108	48	128	982	2	0/0	12		
12	75	96	48	117	984	2	0/0	10		
13	59	72	49	115	982	3	0/0	6		
14	70	47	48	112	982	1	0/0	6		
15	63	49	48	113	984	15	0/0	4		
16	54	19	47	106	996	1	0/0	9		
17	46	12	49	101	991	0	0/0	16		
18	23	10	47	099	979	0	0/0	7		
19	31	14	46	096	977	3	0/0	9		
20	30	21	42	098	977	0	1/0	11		M1.4(0938),p(1400)
21	34	14	42	092	974	0	0/0	8		
22	32	10	41	088	974	7	0/0	10		
23	26	4	41	090	984	0	0/1	18	mgst	ssc(1826) er. prom.(0710)
24	16	1	41	091	984	0	0/0	32		
25	23	7	41	092	985	12	0/0	30		
26	13	10	41	091	989	1	0/0	33		
27	12	21	42	091	986	101	0/1	13		s2B(0855),sid(0859)
28	32	34	41	098	1019	8	0/0	10		
29	42	42	44	101	1025	126	1/0	6	1620	s3B(1606),p(0020)
30	46	65	42	103	1020	107	0/0	(11)		

Low solar activity, increasing from 20, giving rise to important events, low to high geomagnetic activity.

R^i_I, R^i_{IM} : 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/m² : 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 - UGBOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 1).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospharic disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect); s-1-2-3-4 (class of flares); II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); * (Forbush); SYI Evaluation (1 x Sn+10 x "1"+100 x "s1").


R
● = SIDC
– = Observers Werkgroep Zon
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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
T


A.K.
Geomagnetic A.K. Index
APRIL 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 125
Apr. 9
Rimn 12
Apr. 27
Rigem.
53,3

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

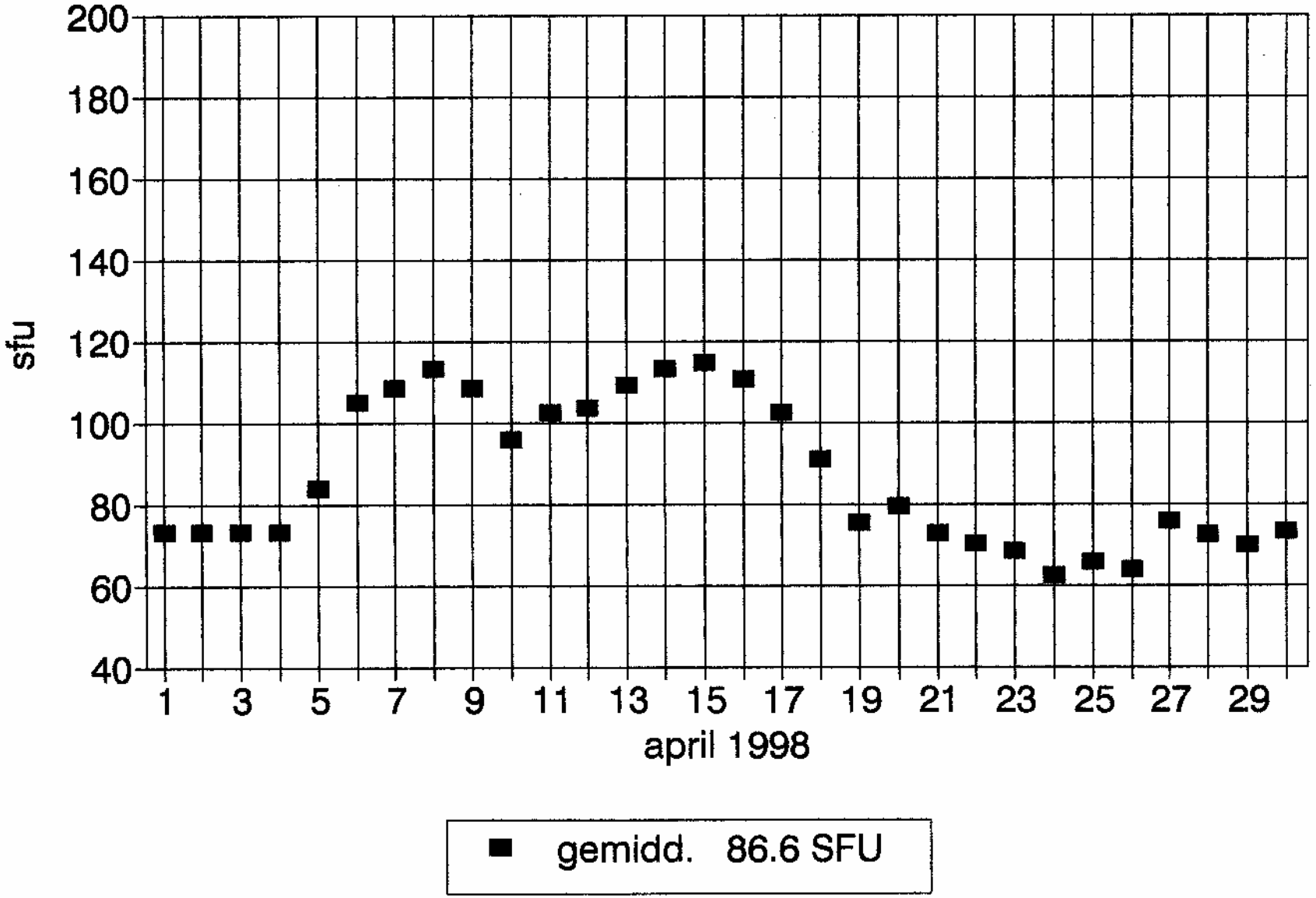
(Hemispheric sunspot numbers)

april 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	8	48														
2	0	59			0	51					0	69	0	64		
3	0	57														
4	0	51	0	47	0	39					0	38	0	52	0	32
5	0	59	0	58	0	47			0	37	0	51	0	65	0	50
6	0	63									0	72	0	80	0	53
7	18	75	27	88							25	80	25	89	0	55
8	16	90	12	87							34	119				
9	15	110			0	96					22	116				
10	8	100			0	75										
11	0	96	0	99							0	111	0	128		
12	0	75	0	71							0	103	0	96	0	41
13	0	59									0	66	0	78		
14	10	60									0	67				
15	15	48														
16	15	39	22	48					11	11	36	52	20	66	15	11
17	20	26					0	0							14	11
18	23	0	28	0									35	0	15	0
19	31	0					19	0					43	0	29	0
20	30	0									36	0				
21	23	11	36	0					12	0	33	11			33	0
22	32	0	45	0							41	0	41	0	16	0
23	16	10	26	11	13	0					25	0	36	0	14	0
24	8	8														
25	11	12														
26	6	7			0	11					0	13				
27	0	12									0	13				
28	0	32	0	29	0	30					0	46	0	33	0	16
29	7	35	0	35	0	17			0	12	0	40	0	21	0	16
30	13	33											31	38	11	16

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — Mei 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 5	Groe	Iden	Jn .9	Jn 4	Kroe	vSlo	Sp 7	Vers	Zans	Zijle	Uccle groups	Uccle spots
1														
2	64											54		
3	76				30	30		55	72			51		
4	87	65	57		44			91	113		69			
5		56			45				107					
6	78													
7	85						70							
8	75	61	51	46	39	42	65	64	76	50	53	48		
9		46	50	41	35			49	68	41	46	49		
10		41	30		25			49	59	32	32	31		
11	71	44	39	54	25			56	83	42	41			
12	104	73	59	53	39		110	70	81	54	56			
13	91		74		25		107	94	113	62	66	85		
14	115	73		52	37		106	82	110		75	75		
15	106	65	61	75	37	43		76	101		69	61		
16		58	59	65	32		106	93	82		71	71		
17	91	60	60		40			83	71		66	62		
18		56	50	61	37			75	73		58			
19	66	35	25	27	13			67	46	51	47			
20			15		13			31	33		20		5	31
21		16			12			26	16	12	15		2	14
22					0			14			16			
23			15		12				32	12			2	10
24					12			33					2	23
25	66				16			48			31		2	17
26	54	51			25			46		27			3	23
27		49			24	24		59	52	30	33		3	18
28				27	23		41	46	38	27	33		2	16
29			17		12			31	29				3	10
30					12			53	33				4	13
31	62	54			12			61	69			47	3	21
observ	16	17	15	10	27	4	7	25	23	12	19	11		
k	0,82	1,19	1,55	1,34	2,38	2,02	0,83	0,98	0,94	1,54	1,30	1,23		
st.dev.	0,10	0,22	0,51	0,31	0,77	0,36	0,14	0,19	0,24	0,44	0,28	0,21		
st.d./k	0,12	0,18	0,33	0,23	0,32	0,18	0,18	0,19	0,26	0,28	0,22	0,17		

Observers		[...]	= Refractor, d = ... mm	[Rf...]	= Reflector, d = ... mm
Bals	= H.A.M. Balster [70]	Jn .9	= D. Jannink [9]	Sp 7	= T. Spaninks [75]
Gr 5	= Mw G. Gravers [50]	Jn 4	= D. Jannink [40]	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]	Kroe	= K. Kroesen [102]	Zans	= W. Zanstra [Rf 155]
Iden	= J.A. Idenburg [70]	vSlo	= B. van Slooten [90]	Zijle	= W.A. Zijlema [90]

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

1998 MAY R'_{IM} = 56.9

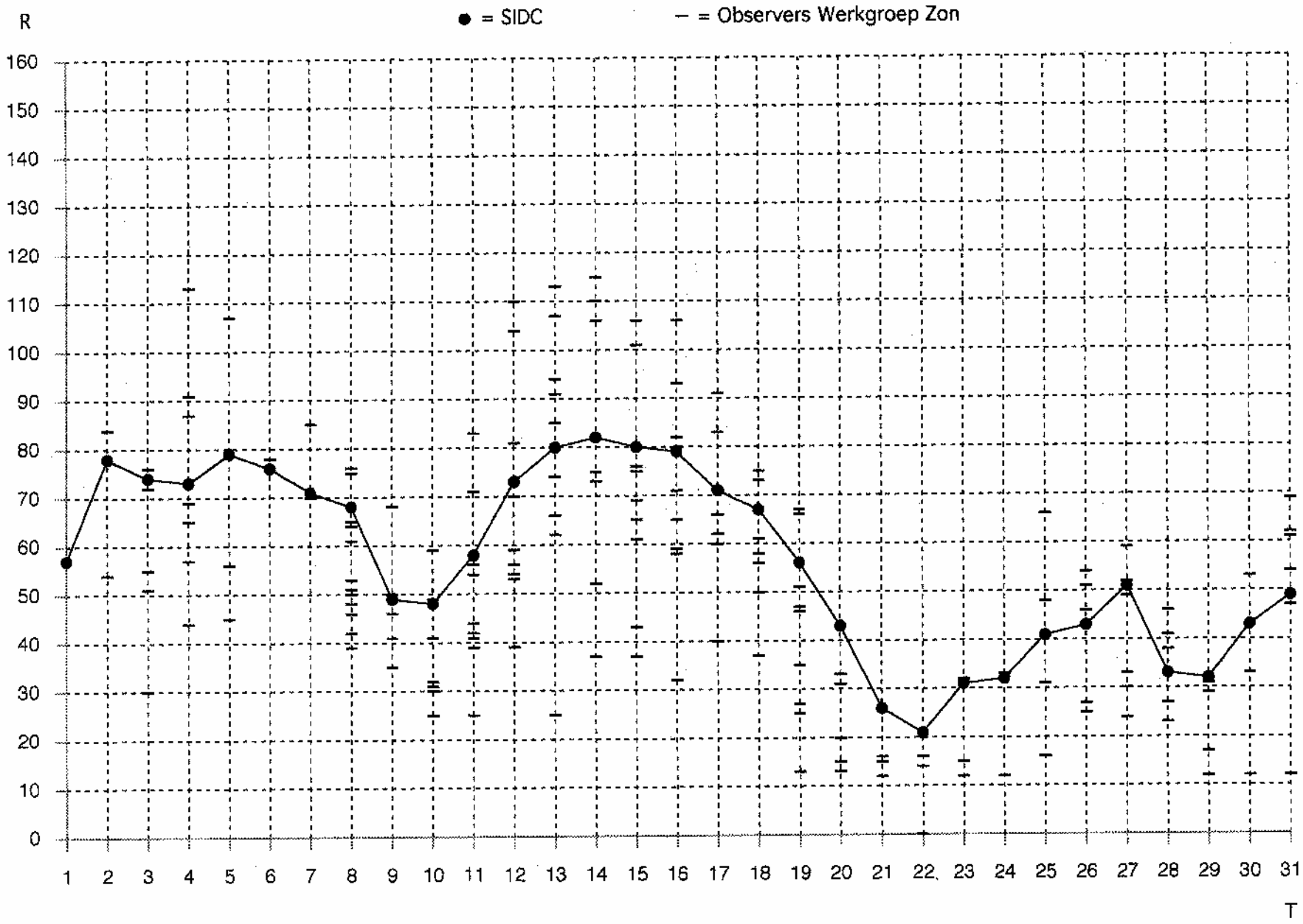
Date	R'_I	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
30	46	65	42	103	1020	107	0/0	(11)		
1	57	79	46	113	1026	28	2/0	10		
2	78	105	78	117	1060	123	0/1	48	1337	S3B(1331),p,mgst
3	74	127	47	117	1054	30	1/0	49		
4	73	146	48	121	1058	23	0/0	80		
5	79	146	48	133	1062	224	1/0	35		
6	76	999	54	130	1045	45	1/1	8	1334	s1N(0758),p(0825)
7	71	80	55	123	1041	36	2/0	14	1325	s1B(1105)
8	68	52	50	118	1033	12	3/0	24	1350	
9	49	49	49	111	1021	101	1/0	15	1303	CME(0304)
10	48	43	-	107	1014	0	2/0	11	1315	SF(1313)
11	58	55	48	108	1011	11	0/0	14		
12	73	60	49	112	1010	4	0/0	14		
13	80	64	48	117	1005	7	0/0	6		
14	82	73	48	117	1002	9	0/0	4		
15	80	72	48	116	1001	2	0/0	12		mgst,ssc(1453)
16	79	77	48	118	1017	4	0/0	16		
17	71	85	48	110	1026	0	0/0	15		
18	67	45	43	102	1020	0	0/0	12		
19	56	32	43	099	1023	0	0/0	8		
20	43	16	43	092	1035	0	0/0	21		
21	26	8	41	089	1032	0	0/0	17		
22	21	5	42	087	1026	0	0/0	14		
23	31	5	42	090	1028	2	0/0	16		
24	32	35	44	096	1027	5	0/0	13		
25	41	42	44	092	1021	0	0/0	12		
26	43	40	42	093	1012	11	0/0	10		
27	51	32	41	094	1012	6	0/0	(7)		CME(1330)
28	33	30	43	098	1008	8	1/0	6	1346	
29	32	27	43	095	1011	0	1/0	27		ssc(1532)
30	43	32	42	096	1023	0	0/0	21		
31	49	31	42	094	1014	1	0/0	6		

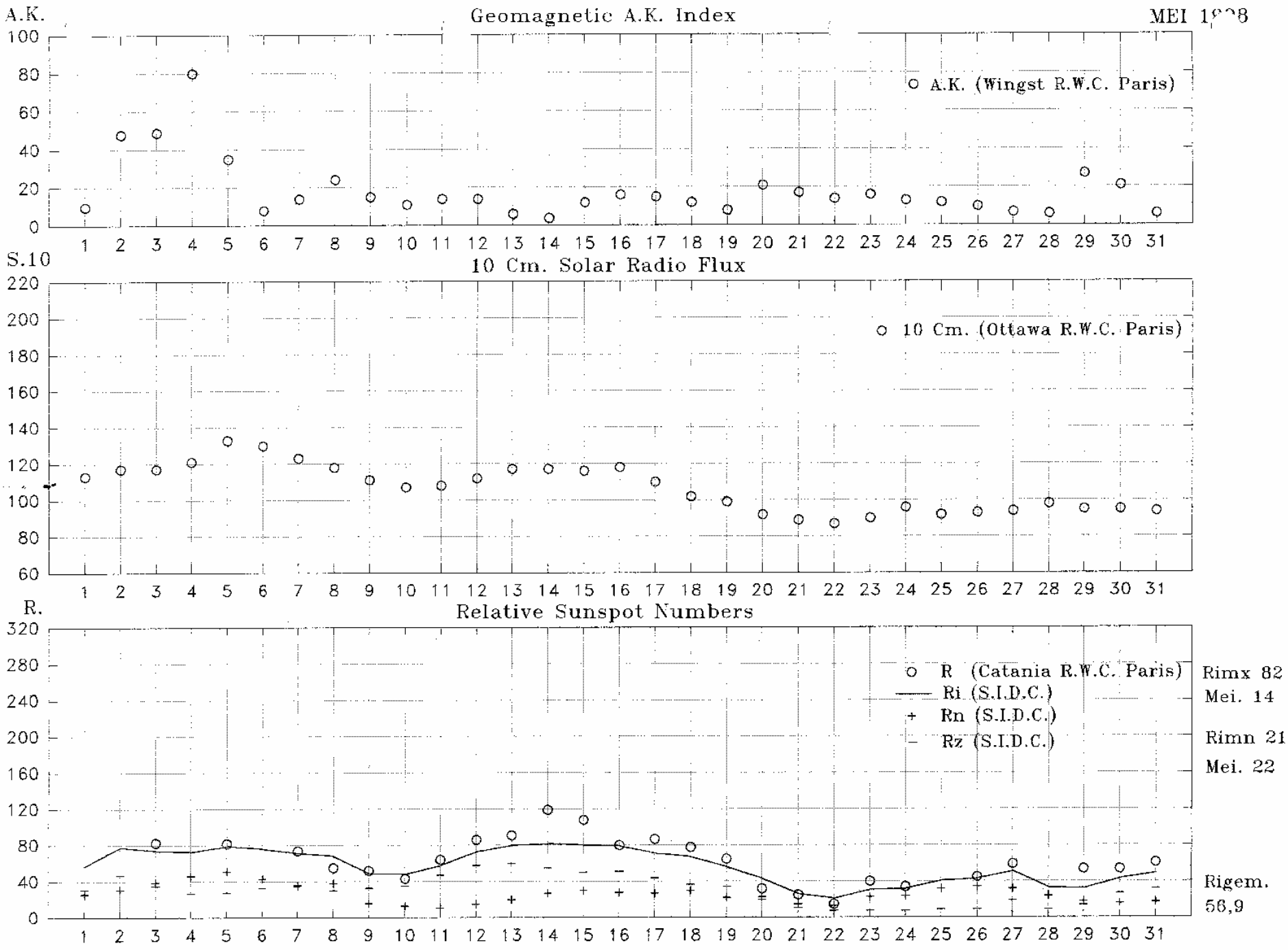
Solar activity : from high to low, then moderate at the end of the month.
Geomagnetic activity : begin very high, then low, increasing again at the end.

gemidd: 106,6

R'_I, R'_{IM} : 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/m² : 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 - UGEOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect); s-1-2-3-4 (class of flares); II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); SFI Evaluation (1 x Sn+10 x N1+100 x >N1).
CME (coronal mass ejection).

gemiddelde gemidd 21cm: 29,1 → $F = 0,8 \times \frac{106,6}{29,1} = 2,93$


R
● = SIDC
– = Observers Werkgroep Zon
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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 31
T


A.K.
Geomagnetic A.K. Index
MEI 1
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 82
Mei. 14
Rimn 21
Mei. 22
Rigem.
56,9

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

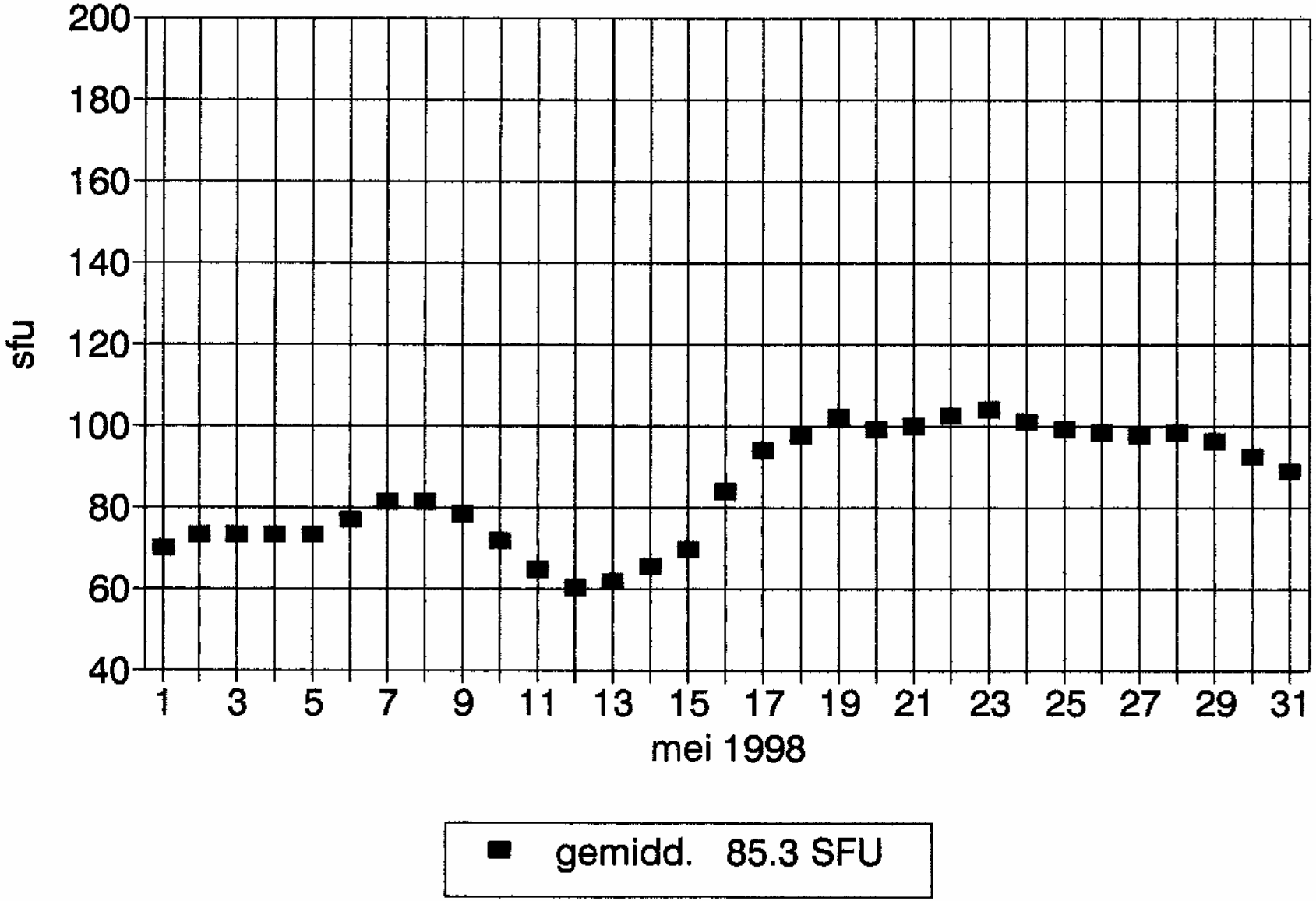
(Hemispheric sunspot numbers)

mei 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	26	31														
2	31	47	34	50												
3	39	35	44	32					17	13	13	42	39	33		
4	46	27	53	34	30	27					50	41	79	34	40	29
5	51	28											69	38		
6	43	33	47	31												
7	35	36	39	46												
8	38	30	41	34	22	29	17	29	17	25	36	28	35	41	24	29
9	16	33			16	34	11	30			15	34	22	46	15	31
10	13	35			0	30					11	38	12	47	0	32
11	11	47	0	71	0	39	0	54			0	56	13	70	0	41
12	15	58	20	84	13	46	0	53			15	55	21	60	11	45
13	20	60	19	72	19	55					24	70	29	84	17	49
14	27	55	31	84			17	35			24	58	34	76	23	52
15	30	50	40	66	22	39	29	46	14	29	27	49	35	66	24	45
16	28	51			18	41	29	36			29	64	27	55	21	50
17	27	44	39	52	22	38					30	53	25	46	21	45
18	30	37			20	30	29	32			29	46	40	33	23	35
19	22	34	27	39	14	11	27	0			27	40	13	33	21	26
20	23	20			15	0					20	11	19	14	20	0
21	15	11									15	11	16	0	15	0
22	13	8									14	0			16	0
23	23	8			15	0							21	11		
24	24	8									22	11				
25	32	9	43	23							37	11			31	0
26	34	9	42	12							35	11				
27	32	19							24	0	35	24	41	11	33	0
28	24	9					27	0			35	11	38	0	33	0
29	18	14			17	0					18	13	17	12		
30	16	27									16	37	17	16		
31	17	32	20	42							17	44	19	50		

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — Juni 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 5	Groe	Iden	Jn .9	Jn 4	Kroe	vSlo	Sp 7	Vers	Zans	Zijle
1	56	59	36		25		47	53	54	45		61
2	54		45		24	24		42	70	40	39	
3	78	71	56		35			51		39	53	
4	89	88			35			84	77			
5	74				24	24		85	77	43	61	
6	83				37			65			46	61
7		52			22			79	90	40	45	
8	87				22			69			44	
9												
10	91	67	59		12				80	42	53	
11	76								66			
12		83	82		22				93		61	
13	98		59		33				112	47	35	
14					22				80		34	
15	53	54	53		22	22				38	26	
16	52			24	34						39	
17	68	68		27	36						42	70
18											50	
19		54	63		22				63	26	30	
20	63			37	25		50		73			
21	69		44		25		74		82		46	67
22	48		44	27	24		74		58		44	
23					33				58			
24				29	34				55			
25					23		37	81	78		68	
26					35			100	91		80	
27	69				46		72		86		53	
28		123	106		46			126	135		110	110
29					59						109	101
30		140	108		46		126	119	115			
observ	17	11	12	5	27	3	7	12	21	9	22	6
k	0,97	0,94	1,16	1,92	2,50	2,69	1,14	0,96	0,90	1,62	1,45	0,98
st.dev.	0,16	0,16	0,23	0,37	0,99	0,52	0,46	0,15	0,11	0,31	0,41	0,11
st.d./k	0,17	0,17	0,20	0,19	0,40	0,19	0,40	0,16	0,12	0,19	0,28	0,11

Uccle	
groups	spots
3	22
3	25
4	24
5	34
4	26
5	23
6	30
6	28
7	24
9	20
4	21
4	17
5	31
5	11
5	11
5	17
5	31
3	24
4	16
3	9
7	23
6	21
6	19
8	39

Observers		[...] = Refractor, d = ... mm		[Rf...] = Reflector, d = ... mm	
Bals	= H.A.M. Balster [70]	Jn .9	= D. Jannink [9]	Sp 7	= T. Spaninks [75]
Gr 5	= Mw G. Gravers [50]	Jn 4	= D. Jannink [40]	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]	Kroe	= K. Kroesen [102]	Zans	= W. Zanstra [Rf 155]
Iden	= J.A. Idenburg [70]	vSlo	= B. van Slooten [90]	Zijle	= W.A. Zijlema [90]

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

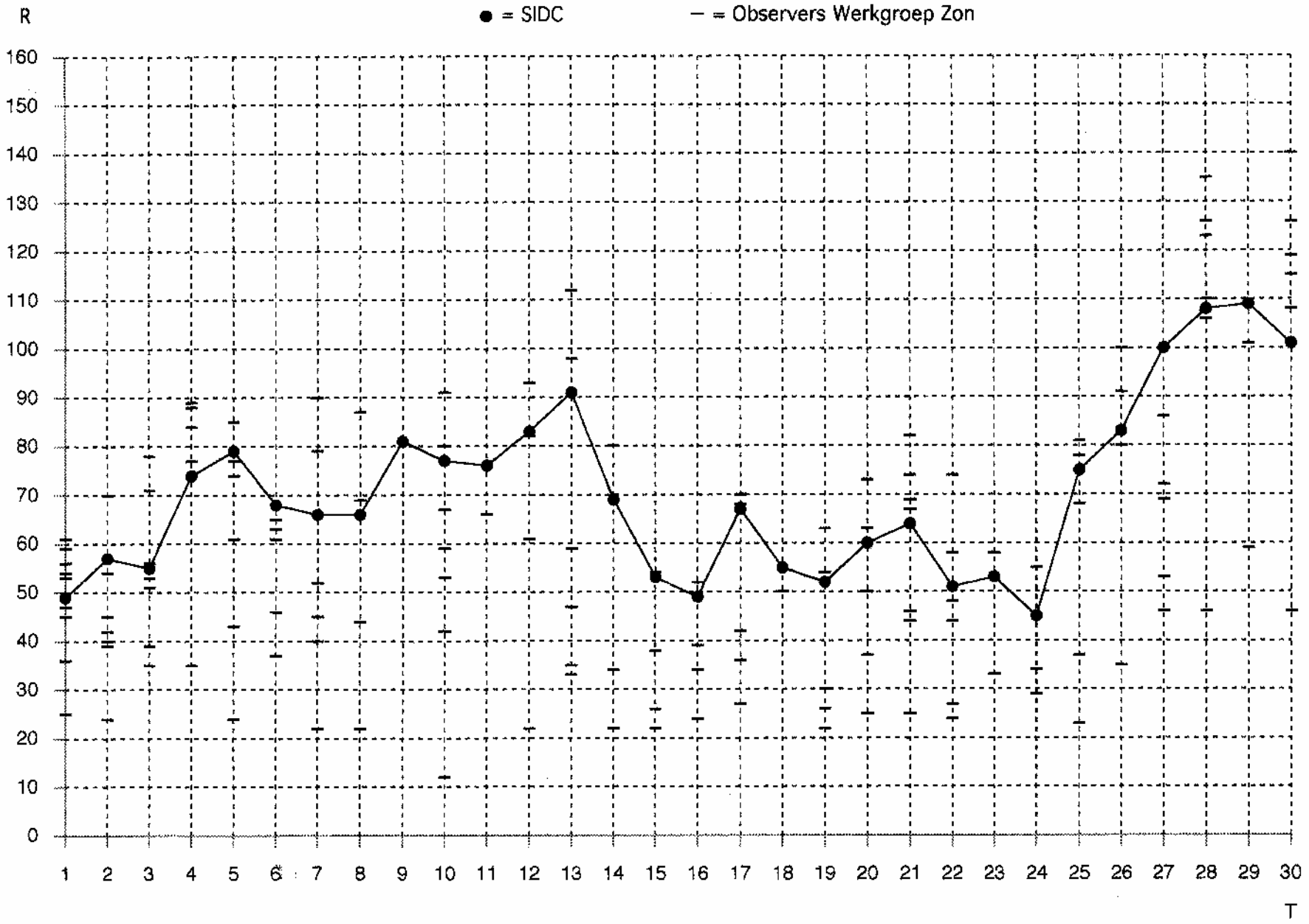
1998 JUNE R^{I}_{IM} = 70.5

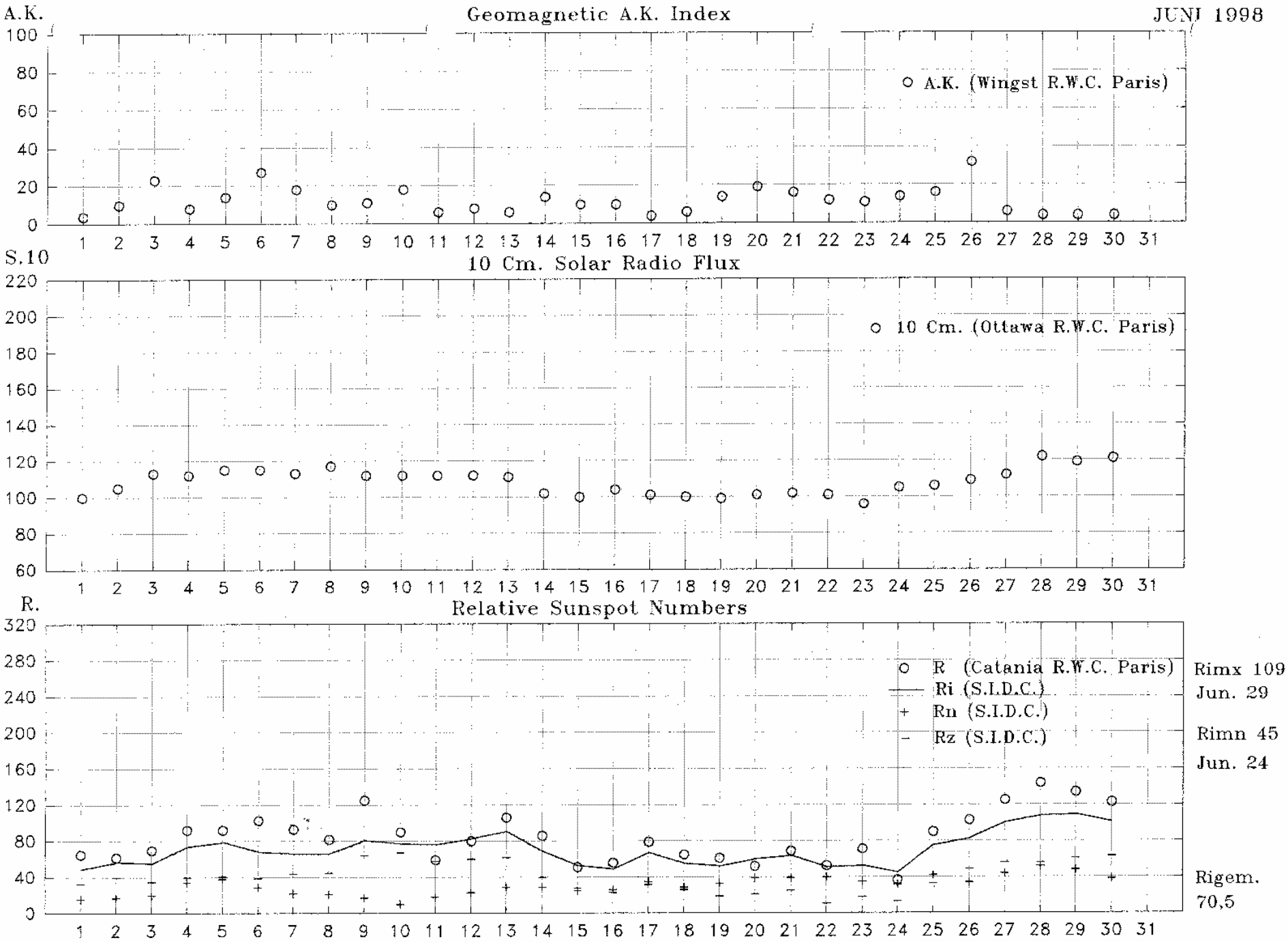
Date	R^{I}	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
31	49	31	42	094	1014	1	0/0	(3)		
1	49	34	41	100	1006	1	0/0	4		
2	57	57	42	105	1002	1	0/0	10		
3	55	62	46	113	1005	9	0/0	23		
4	74	76	46	112	1010	6	0/0	8		
5	79	102	48	115	1009	7	0/0	14		
6	68	91	47	115	1019	1	0/0	27		
7	66	107	48	113	1025	13	0/0	18		
8	66	82	47	117	1023	101	0/0	10		
9	81	79	50	112	1019	0	0/0	11		
10	77	75	50	112	1015	0	0/0	18		ssc(1328)
11	76	57	49	112	1008	2	1/0	6		
12	83	48	48	112	1017	19	0/0	8		
13	91	42	48	111	1014	29	1/0	6		ssc(1926),s1N(0415)
14	69	38	48	102	1023	16	0/0	14		
15	53	38	46	100	1022	1	0/0	10		
16	49	40	45	104	1020	0	1/0	10		
17	67	42	47	101	1021	0	0/0	4		
18	55	51	46	100	1026	0	0/0	6		
19	52	129	44	099	1028	0	0/0	14		
20	60	56	46	101	1025	20	0/0	19		
21	64	62	44	102	1028	0	0/0	16		
22	51	55	44	101	1030	0	0/0	12		
23	53	37	43	096	1027	0	0/0	11		
24	45	32	40	105	1033	0	0/0	20		
25	75	43	45	106	1033	0	0/0	16		
26	83	56	43	109	1030	0	0/0	32		
27	100	68	44	115	1029	10	1/0	6		
28	108	78	48	122	1031	10	0/0	4		
29	109	85	45	119	1016	10	0/0	4		
30	101	88	49	121	1214	10	0/0	4		

low to moderate solar and geomagnetic activity

R^{I}, R^{I}_{IM} : 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/m² : 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 - UGEOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSK Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 1).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); sgeat (magnetic storm); sfa (solar flare effect); s-1-2-3-4 (class of flares); II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gla (ground level event : neutron event); si (sudden impulse); F (Forbush); SFI Evaluation (1 x Sn+10 x "1"+100 x ">1").
CME (coronal mass ejection).

ymax. gemiddeld: 36,3 → F = 0,8 $\frac{1080}{36,3}$ = 339


R
● = SIDC
— = Observers Werkgroep Zon
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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
T


A.K.
Geomagnetic A.K. Index
JUNI 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 109
Jun. 29
Rimn 45
Jun. 24
Rigem.
70,5

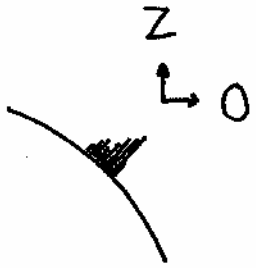
Zonnevlekkengetallen noordelijk- en zuidelijk halfrond

(Hemispheric sunspot numbers)

juni 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	16	33	21	35	18	18					18	35	19	35		
2	17	40	17	37	16	29			12	12	13	29	28	42	12	27
3	20	35	28	50	26	30					18	33			25	28
4	34	40	42	47							44	40	40	37		
5	38	41	39	35					0	24	46	39	42	35	29	32
6	29	39	28	35							28	37			15	31
7	22	44									29	50	30	60	15	30
8	21	45	25	62							25	44			13	31
9	17	64														
10	10	67	13	78	12	47							12	68	13	40
11	18	58	0	76									0	66		
12	23	60			35	47							25	68	25	36
13	29	62	34	64	23	36							46	66	11	24
14	29	40											27	53	11	23
15	25	28	27	26	29	24			11	11					12	14
16	26	23	29	23			24	0							26	13
17	35	32	33	35			27	0							29	13
18	29	26													27	23
19	33	19			40	23							40	23	18	12
20	39	21	39	24			26	11					50	23		
21	39	25	36	33	33	11							48	34	35	11
22	40	11	37	11	29	15	16	11					47	11	33	11
23	35	18											47	11		
24	32	13					18	11					31	24		
25	42	33									39	42	38	40	45	23
26	34	49									47	53	38	53	34	46
27	44	56	19	50									34	52	19	34
28	52	56			44	62					64	62	66	69	49	61
29	48	61													47	62
30	38	63			37	71					57	62	48	67		

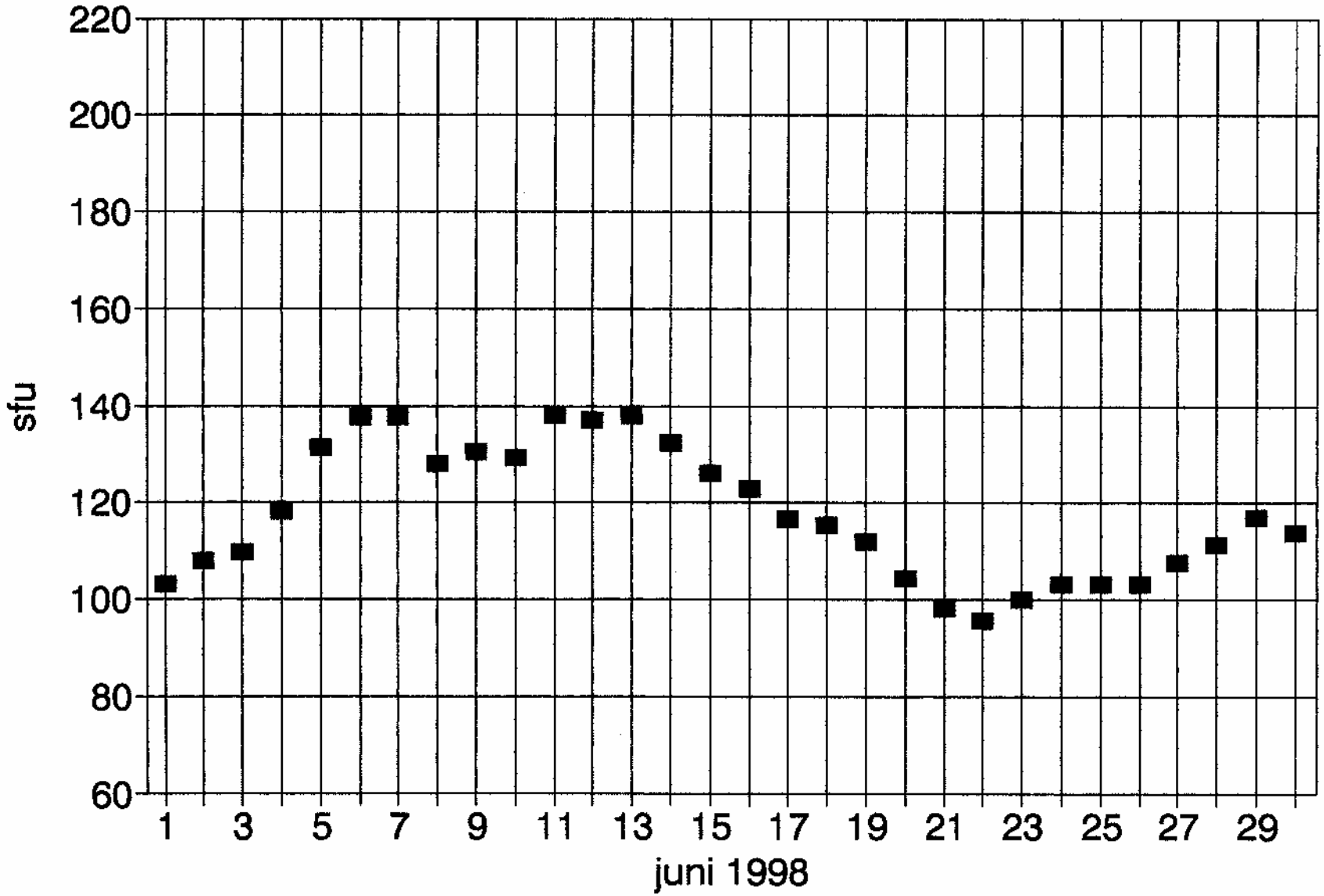
Waarneming Dennis Jannink



Grote protuberans
1 juni 1998 9.45 UT

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — Juli 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 5	Groe	Iden	Jn .9	Jn 4	Kroe	vSlo	Sp 7	Vers	Zans	Zijle	Uccle groups	Uccle spots
1	140	107	100		78			93	116		75	98	9	26
2			104		67								9	27
3					56				128					
4							81	124	137				8	38
5	113				44								8	37
6	91				22						35			
7	54		23		23			63			36		5	10
8	42	31	28		22			52	48				3	10
9														
10			49		22			64			35			
11	49		64	44	22		47	89	62	61	35	71	5	12
12														
13					12			58	58		29		3	13
14	40							44	54				3	12
15					11	11		80					5	18
16					25			99					4	19
17					24		63	78	80				5	18
18					12		80	43	46				4	18
19	59	57		19	13		58	42					4	20
20	84			42	24		83	88	81				6	29
21	88	75		53	23			105	102				7	20
22	118	93		52	23	33		114	129				8	31
23	100	83			25			100	145				8	38
24	102	80	74	43	14			104	110				6	27
25	83	67		45	29			96	85	58		63	4	25
26	79	66		42	29	29		75	76	43		66	4	29
27	74				39			75	73	54			4	29
28		72			38			102					6	29
29														
30					35		55	65	73	47				
31	92				34		66	86	97				5	18
													7	20
observ	17	10	7	8	26	3	8	24	19	5	6	4		
k	0,84	1,00	1,20	1,61	2,69	3,31	0,93	0,80	0,79	1,20	1,54	0,95		
st.dev.	0,13	0,17	0,48	0,19	1,07	1,49	0,26	0,09	0,09	0,19	0,31	0,11		
st.d./k	0,15	0,17	0,40	0,12	0,40	0,45	0,28	0,11	0,12	0,16	0,20	0,12		

Observers		[...]	= Refractor, d = ... mm	[Rf...]	= Reflector, d = ... mm
Bals	= H.A.M. Balster [70]	Jn .9	= D. Jannink [9]	Sp 7	= T. Spaninks [75]
Gr 5	= Mw G. Gravers [50]	Jn 4	= D. Jannink [40]	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]	Kroe	= K. Kroesen [102]	Zans	= W. Zanstra [Rf 155]
Iden	= J.A. Idenburg [70]	vSlo	= B. van Slooten [90]	Zijle	= W.A. Zijlema [90]

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

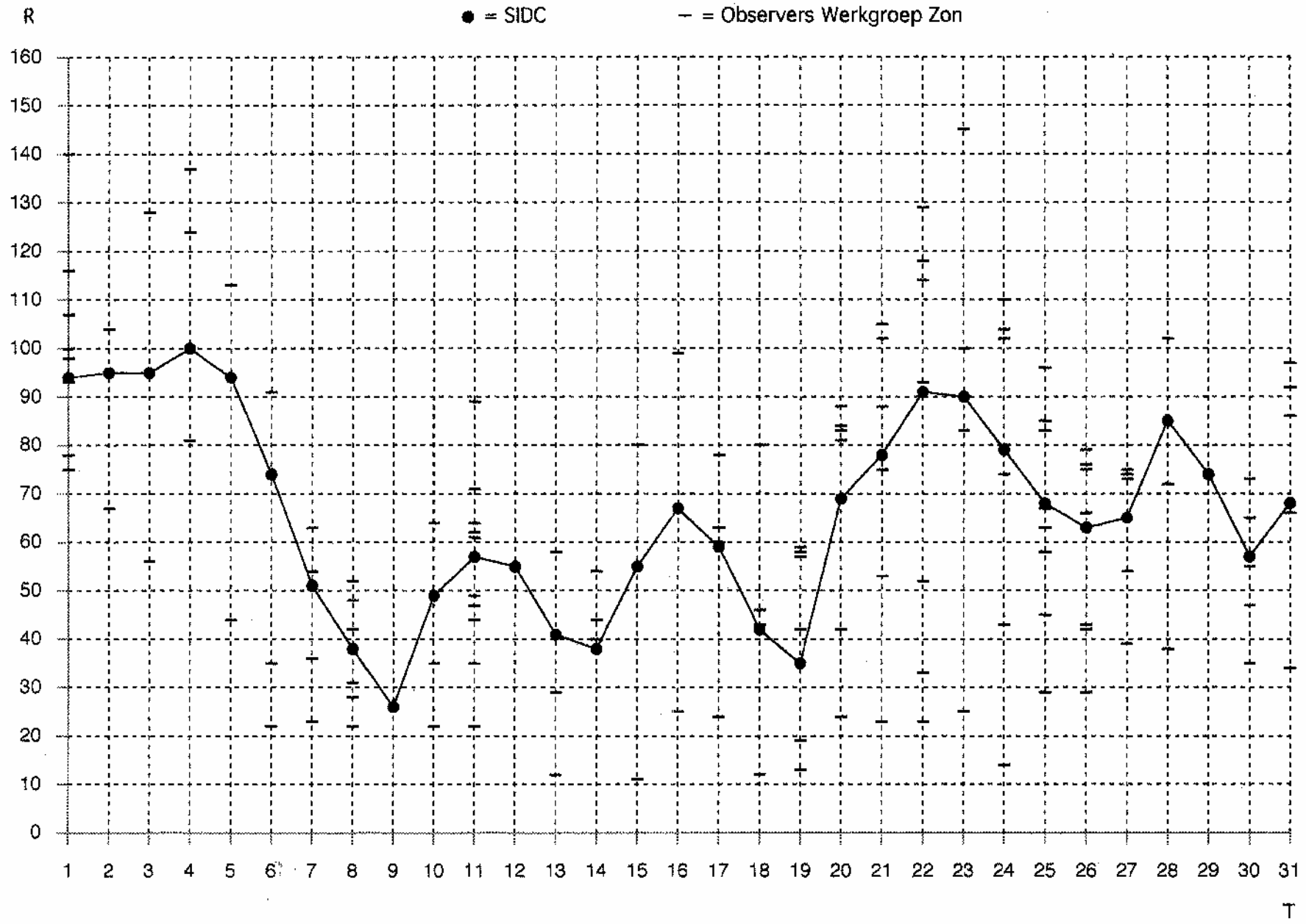
1998 JULY — R^{I}_{IM} = 66.2

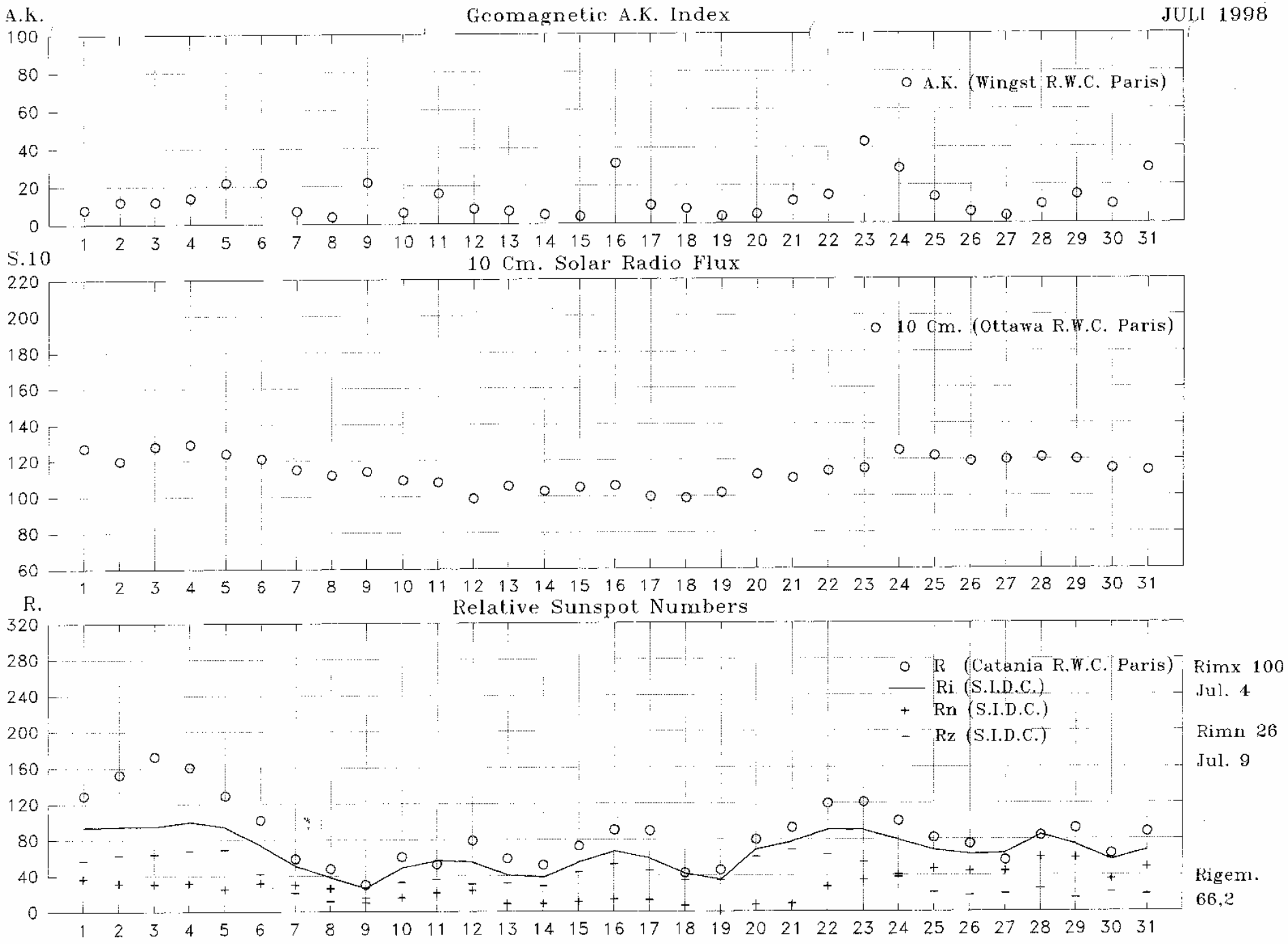
Date	R^{I}_{I}	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG	
30	101	88	49	121	1214	10	0/0	4			
1	94	71	50	127	1334	0	0/0	8			
2	95	73	50	120	1311	0	0/0	12			
3	95	87	52	128	1017	0	1/0	12			
4	100	93	54	129	1012	10	1/0	14	1637		
5	94	83	54	124	1030	100	0/0	22	1649		1639 C9 X flare
6	74	74	52	121	1030	0	0/0	22			
7	51	60	52	115	1023	0	0/0	7			
8	38	50	52	112	1009	0	0/0	4			
9	26	36	50	114	1010	0	0/0	22			
10	49	25	49	109	1002	0	0/0	6			
11	57	17	49	108	1000	0	0/0	16			
12	55	20	49	099	1008	0	0/0	8			
13	41	14	48	106	1007	0	0/0	7			
14	38	16	48	103	1007	10	1/0	5	1254		1255 1B, T
15	55	16	48	105	1007	0	0/0	4			2109 mgst
16	67	13	48	106	1009	10	0/0	32			
17	59	34	48	100	1008	0	0/0	10	1737		
18	42	21	47	099	1009	0	0/0	8			
19	35	23	46	102	1007	0	0/0	4			
20	69	22	46	112	1007	0	0/0	5			
21	78	33	46	110	1007	0	0/0	12			
22	91	29	46	114	1013	0	0/0	15			1148 mgst
23	90	38	47	115	1008	0	0/0	43			
24	79	68	47	125	1014	0	0/0	29			
25	68	107	47	122	1011	0	0/0	14			
26	63	145	47	119	1011	0	0/0	6			
27	65	151	42	120	1007	0	0/0	4			
28	85	125	41	121	1008	0	0/0	10			
29	74	121	40	120	1005	0	0/0	15			
30	57	82	42	115	1001	0	0/0	10			
31	68	62	42	114	1004	100	0/0	29			

Low to moderate, then very low to low solar activity. Low to moderate geomagnetic activity. 1114,0

R^{I}_{I}, R^{I}_{IM} : 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/m² : the quantity to substract from the mean solar constant.
600 : 600 Mhz solar flux from Humain station (Belgium).
2800 : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UCSOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSH Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UCSOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UCSOR group 2; UCSOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssa (sudden storm commencement); mgst (magnetic storm); sfa (solar flare effect); s-1-2-3-4 (class of flares); II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); SFI Evaluation (1 x Sn=10 x "1"+100 x "=1").
CME (coronal mass ejection).

gemeten gemiddeld: 34,8 → F = 0,8 × 1114,0 / 34,8 = 2,62


R
● = SIDC
– = Observers Werkgroep Zon
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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 31
T


A.K.
Geomagnetic A.K. Index
JULI 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 100
Jul. 4
Rimn 26
Jul. 9
Rigem.
66,2

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

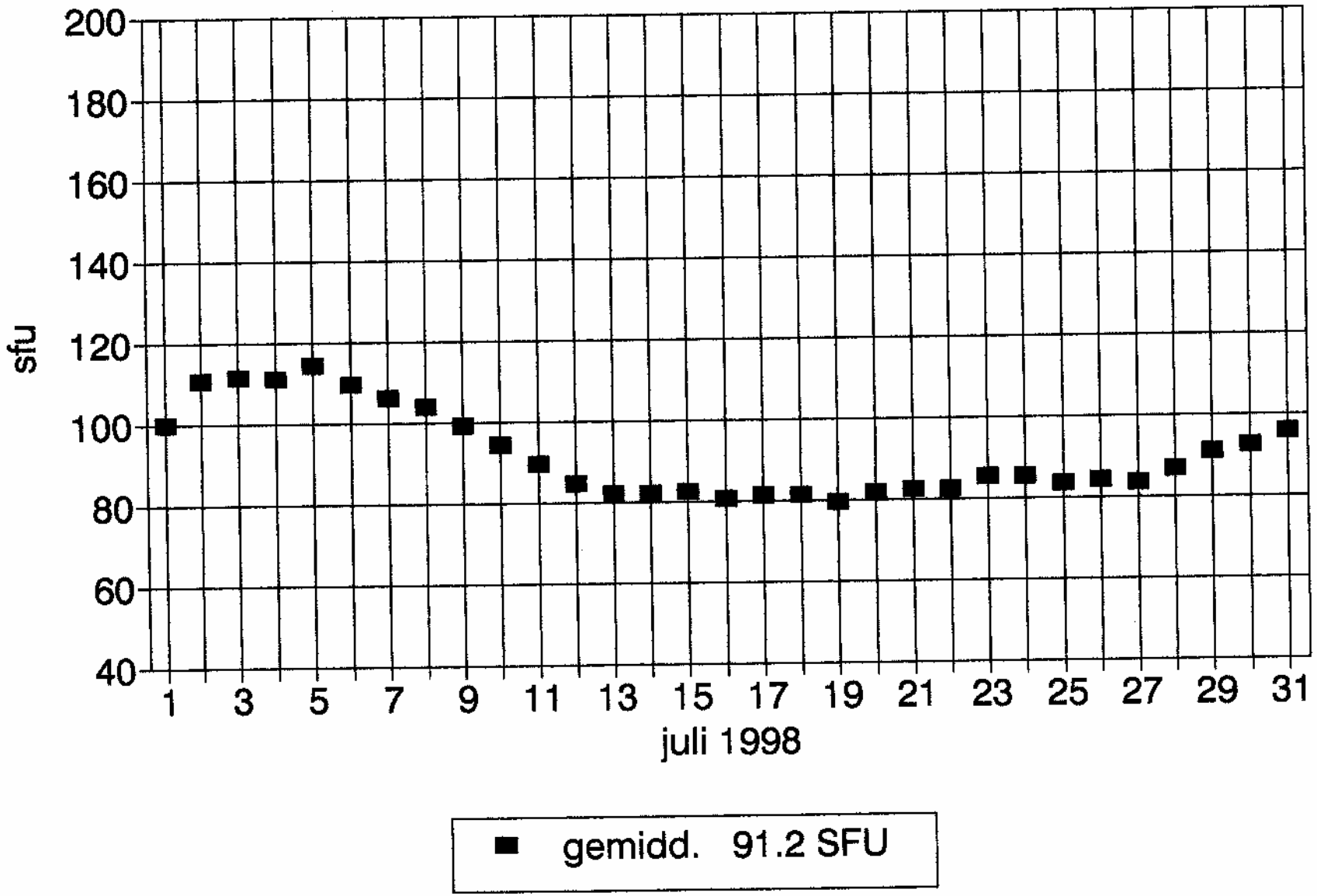
(Hemispheric sunspot numbers)

Juli 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	37	57	60	80	38	62					41	52	44	72	25	50
2	32	63			35	69										
3	31	64											49	79		
4	32	68									51	73	46	91		
5	25	69	42	71												
6	32	42	39	52											13	22
7	30	21	41	13	12	11					40	23			14	22
8	26	12	25	17	13	15					37	15	31	17		
9	10	16														
10	16	33			23	26					22	42			22	13
11	21	36	22	27	23	41	22	22			37	52	25	37	24	11
12	24	31														
13	9	32									25	33	14	44	13	16
14	9	29	12	28							13	31	13	41		
15	11	44							0	11	0	80				
16	14	53									24	75				
17	13	46									12	66	0	60		
18	7	35									0	43	0	46		
19	0	35	0	59			0	19			0	42				
20	8	61	0	84			0	42			12	76	0	81		
21	9	69	13	75			13	40			27	78	15	87		
22	28	63	41	77			13	39	0	33	41	73	44	85		
23	35	55	44	56							48	52	56	89		
24	41	38	58	44	47	27	28	15			51	53	52	58		
25	47	21	62	21			28	17			64	32	58	27		
26	45	18	58	21			28	14	15	14	53	22	55	21		
27	45	20	53	21							58	17	53	20		
28	60	25									73	29				
29	59	15														
30	36	21									43	22	49	24		
31	49	19	69	23							64	22	74	23		

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — Augustus 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 5	Gr 5*	Groe	Iden	Iden*	Jn .9	Jn 4	Kroe*	vSlo	Son	Sp 7	Sp 7*	Vers	Zans	Zijle
1	75						33		45	76						
2	84						33		55	118				44		
3	70		75		50		22			99	74		82	48		
4	74		60	55	55		24	24	61	68			96			
5			82	56			27			77	83		90			
6	109		95		72		27		75	114	126		132	58		90
7	135		94	88	45		29		74	118				56		
8	95				57		43		85	112	92		136	68		84
9				94	77		44	58	103	137	112		174	75		99
10	122		141	93	76		53			113	111		153	89		94
11	134		141				53		125	134	122			77		
12	131			97			63		116	125				68		
13	105			72	65		48		84	99	61			51		
14				57			37			86		104		53		
15	79				52		39		61	73	61	98				64
16	113	120		65			48		68	105	89	108		69		72
17	99	96			84		58			88	61	96		65		79
18		82		73			56	56		97		118				68
19	137			92	83		67		80	105	89	135		78		
20	113				74		56		73	93		101		70		
21							48			133	72					
22	87	130					49		90	95		105		56		
23						62	35			91						
24		102		56			37			90	79					
25	84					52	36			96					59	
26				71		60	25		25	122					61	
27	117			58		45	38		56	134		101		58	67	
28	98					50										
29		109				74	50	51	91	124	93	115			83	71
30		118					60		102	161		162			110	72
31		108		87		66	41			127	96	136			71	79
observ	20	8	7	15	12	7	30	4	19	30	16	12	7	17	6	11
k	0,89	0,87	0,95	1,30	1,43	1,64	2,27	2,06	1,34	0,86	1,08	0,83	0,74	1,55	1,32	1,25
st.dev.	0,08	0,14	0,12	0,18	0,32	0,36	0,59	0,52	0,56	0,11	0,19	0,09	0,06	0,20	0,17	0,17
st.d./k	0,08	0,16	0,13	0,14	0,22	0,22	0,26	0,25	0,42	0,13	0,18	0,11	0,08	0,13	0,13	0,13

Uccle	
groups	spots
6	10
6	14
5	22
5	26
7	43
8	51
8	55
7	40
11	56
10	70
9	50
8	28
5	29
5	22
8	32
9	21
9	24
11	29
8	28
6	16
4	20
6	29
7	24
8	39
7	43
7	37
5	74

Observers		[...] = Refractor, d = ... mm		[Rf...] = Reflector, d = ... mm	
Bals	= H.A.M. Balster [70]	Jn .9	= D. Jannink [9]	Sp 7	= T. Spaninks [75]
Gr 5	= Mw G. Gravers [50]	Jn 4	= D. Jannink [40]	Sp 7*	= idem, Reinsbronn
Gr 5*	= idem, div. plaatsen in NL	Kroe*	= K. Kroesen [102] v.a. 8/5 Voorthuizen	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]			Zans	= W. Zanstra [Rf 155]
Iden	= J.A. Idenburg [70]	vSlo	= B. van Slooten [90]	Zijle	= W.A. Zijlema [90]
Iden*	= idem, Scuol / Switzerland	Son	= A.T. Son [Rf 150]		

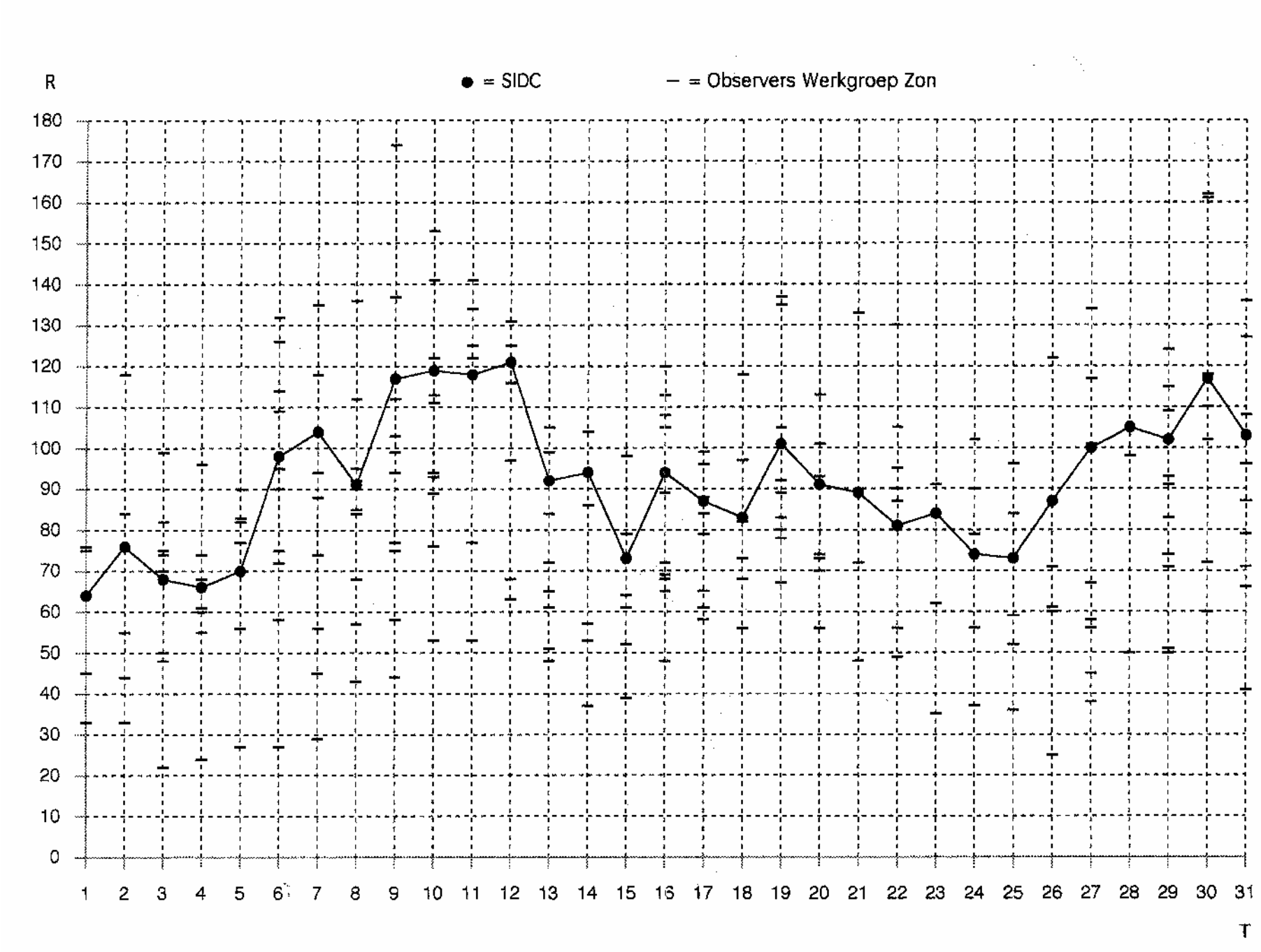
S.I.D.C. SUMMARY OF THE URSIGRAMS

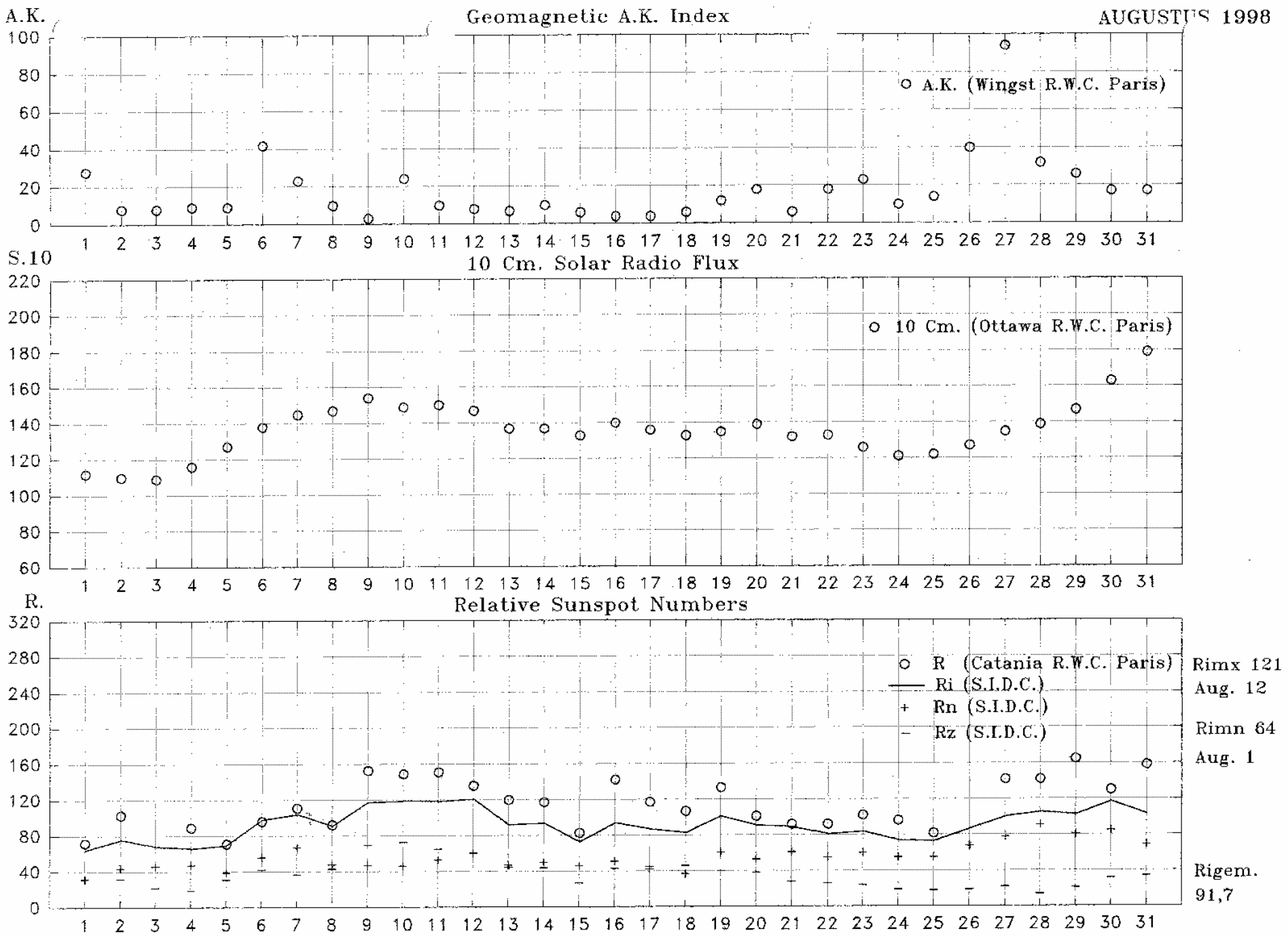
1998 AUGUST ↓ R^{I}_{IM} = 91.7

Date	R^{I}	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
31	68	62	42	114	996	100	0/0	29		
1	64	45	37	112	993	10	0/0	28		
2	76	30	38	110	995	0	0/0	8		
3	68	26	38	109	994	0	0/0	8		
4	66	41	37	116	996	0	0/0	9		
5	70	48	38	127	993	0	0/0	9		
6	98	69	37	138	986	0	0/0	42		mgst ssc (0736).
7	104	108	36	145	989	0	0/0	23		
8	91	136	35	147	988	10	1/0	10		
9	117	191	35	154	991	110	2/0	3	1714	2B (1709)
10	119	210	56	149	984	0	0/0	24		
11	118	213	48	150	993	0	1/0	10		
12	121	215	48	147	986	0	0/0	8		
13	92	195	48	137	992	0	0/0	7		
14	94	178	48	137	990	10	1/0	10	0826	1N (0819)
15	73	164	49	133	988	0	0/0	6		
16	94	144	48	140	981	0	1/0	4		
17	87	94	48	136	983	0	0/1	4		
18	83	75	48	133	998	0	1/2	6	0818	SN (0814) 1B (2210)
19	101	52	49	135	993	10	2/1	12	1408	SF (1404) SSC (2135) 1F (2135)
20	91	56	48	139	988	0	0/0	18		
21	89	83	48	132	982	10	1/0	6		2B (2357)
22	81	94	48	133	976	120	0/0	18		mgst (0534)
23	84	153	49	126	951	10	1/0	23		1N (0923)
24	74	82	48	121	959	0	0/1	10		3B (2150)
25	73	88	48	122	963	0	0/0	14		p (1230)
26	87	84	48	127	919	0	0/0	40		mgst ssc (0651)
27	100	62	48	135	917	0	0/0	94		
28	105	65	48	139	939	0	0/0	32		F
29	102	77	48	147	957	0	0/0	26		
30	117	160	48	163	961	40	0/0	17		
31	103	129	56	179	969	10	0/0	17	1536	

Low to high solar activity during the two last weeks. Geomagnetic activity low to very high.

R^{I}, R^{I}_{IM} : 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/m² : 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 - UGEOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 1).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect), 1-2-3-4 (class of flares); IB-IV radio-burst; T (ten cm radio-burst); F (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); SFI Evaluation (1 x Sn+10 x "1"+100 x ">1").
CME (coronal mass ejection).


R
● = SIDC
— = Observers Werkgroep Zon
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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 31
T


A.K.
Geomagnetic A.K. Index
AUGUSTUS 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 121
Aug. 12
Rimn 64
Aug. 1
Rigem.
91,7

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

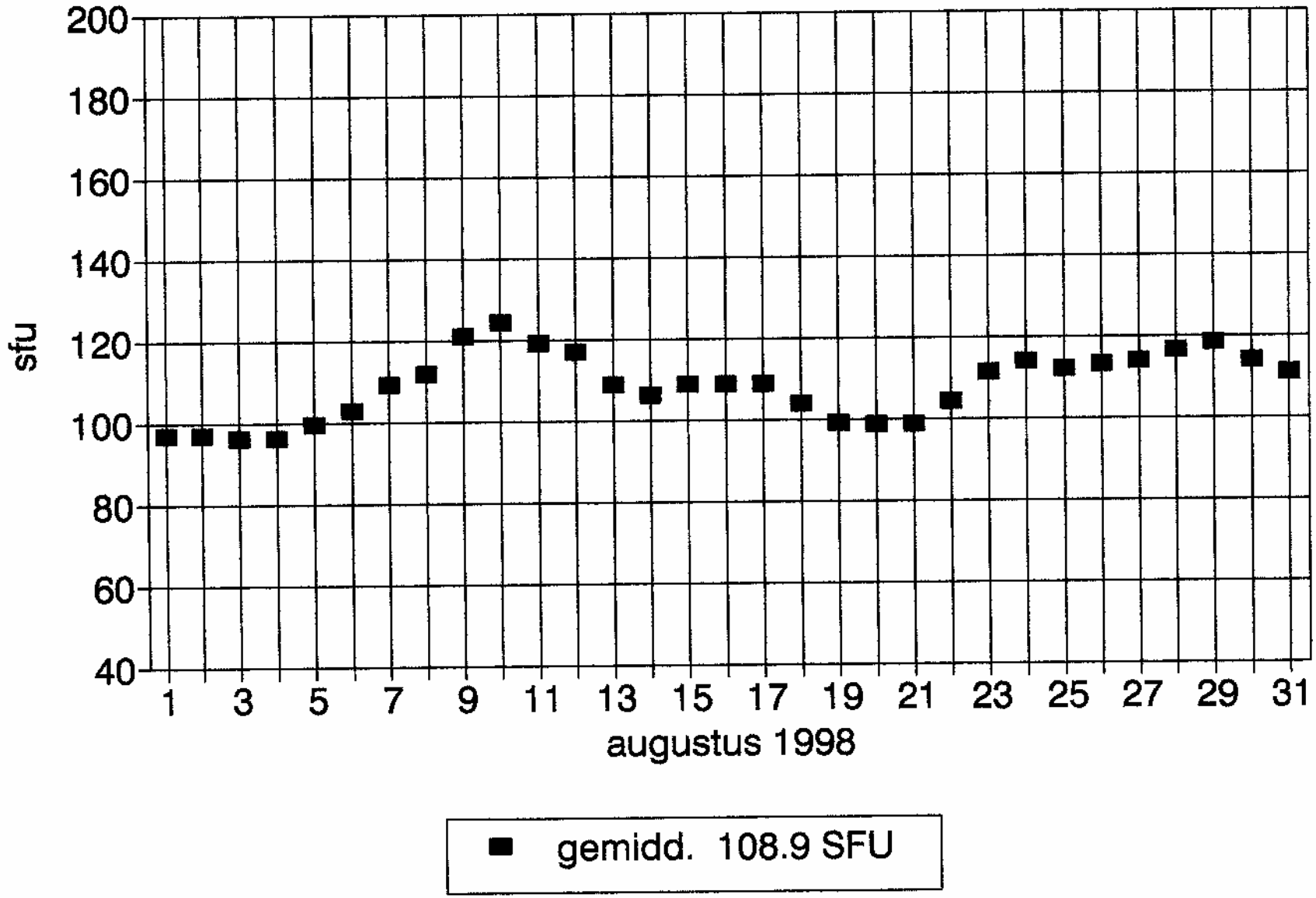
(Hemispheric sunspot numbers)

augustus 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		v. Slooten		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	32	32	38	37							38	38				
2	44	32	48	36							71	47				
3	46	22	49	21			36	14			60	39				
4	47	19	55	19	40	15	40	15	11	13	50	18				
5	39	31			37	19					46	31				
6	56	42	67	42			46	26			64	50				
7	67	37	90	45	64	24	22	23			83	35				
8	48	43	54	41			33	24			67	45				
9	47	70			42	52	39	38	36	22	52	85				
10	46	73	47	75	42	51	29	47			47	66				
11	53	65	62	72							56	78				
12	60	61	56	75	50	47					58	67				
13	47	45	51	54	30	42	26	39			52	47				
14	50	44			32	25					48	38	65	39		
15	46	27	54	25			30	22			50	23	65	33		
16	51	43	69	44	40	25					58	47	60	48		
17	42	45	53	46			40	44			43	45	50	46		
18	37	46			37	36			34	22	41	56	59	59		
19	61	40	70	67	59	33	50	33			67	38	77	58		
20	53	38	65	48			41	33			55	38	54	47		
21	61	28									94	39				
22	55	26	62	25							57	38	77	28		
23	60	24					40	22			67	24				
24	55	19			34	22					67	23				
25	55	18	60	24			41	11			73	23			48	11
26	68	19			60	11	38	22			89	33			51	11
27	78	22	91	26	47	11	34	11			108	26	75	26	45	22
28	91	14	86	12			39	11								
29	81	21					51	23	29	22	99	25	88	27	57	26
30	85	32									111	50	124	38	81	29
31	69	34			67	20	45	21			94	33	85	51	48	23

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — September 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 6	Groe	Iden	Iden*	Jn .9	Jn 4	Kroe	vSlo	Son	Sp 7	Vers	Zans	Zijle
1			95			37			118	92	130		76	
2													64	
3														
4					57	30			86		97	62		
5	99								85		131			
6		127				43			139				73	87
7			125		111	65			132					
8						54	65		122		182		91	
9					104				144		129		82	
10	149				81	49		75	122			66	70	
11	110					62		76	126		110		79	
12			86						121		113			
13						75				86	109		90	93
14														
15	74					34	35		78		78			
16	68					12			50		69		27	
17	91					34			75				40	
18	79					34		58	106		75		65	
19						57		92	132	79	122			
20	123					59			141		126		108	121
21	139		110			37	60	80	168	143			106	
22	157		137	109		48		79	160	132	140	101	126	139
23	171					50		108	145	147	170			
24	159		115	110		57		81	142	122		91	106	
25	127		99			58			131					
26		103				57			122	94		41	72	84
27	102	100				58		77	91	64	85		78	
28	96					44			113	62			82	
29						33				50			45	
30						0			38	25		12		
observ	15	3	7	2	4	24	3	9	25	12	16	6	19	5
k	0,83	0,81	1,04	1,16	1,19	2,19	1,91	1,33	0,84	1,12	0,82	1,81	1,30	1,04
st.dev.	0,06	0,06	0,06	0,14	0,14	0,75	0,19	0,25	0,12	0,22	0,10	0,85	0,29	0,14
st.d./ k	0,07	0,06	0,06	0,12	0,12	0,34	0,10	0,19	0,14	0,20	0,12	0,47	0,22	0,13

Uccle	
groups	spots
6	71
5	48
6	51
7	77
11	57
10	40
6	36
8	43
6	22
7	13
7	23
8	47
12	65
12	108
13	82
13	61
12	59
8	45
8	46
8	33
6	16
4	9

Observers		[...]	= Refractor, d = ... mm	[Rf...]	= Reflector, d = ... mm
Bals	= H.A.M. Balster [70]	Jn .9	= D. Jannink [9]	Sp 7	= T. Spaninks [75]
Gr 6	= Mw G. Gravers [60]	Jn 4	= D. Jannink [40]	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]	Kroe	= K. Kroesen [102]	Zans	= W. Zanstra [Rf 155]
Iden	= J.A. Idenburg [70]	vSlo	= B. van Slooten [90]	Zijle	= W.A. Zijlema [90]
Iden*	= idem, Scuol / Switzerland	Son	= A.T. Son [Rf 150 Kutter]		

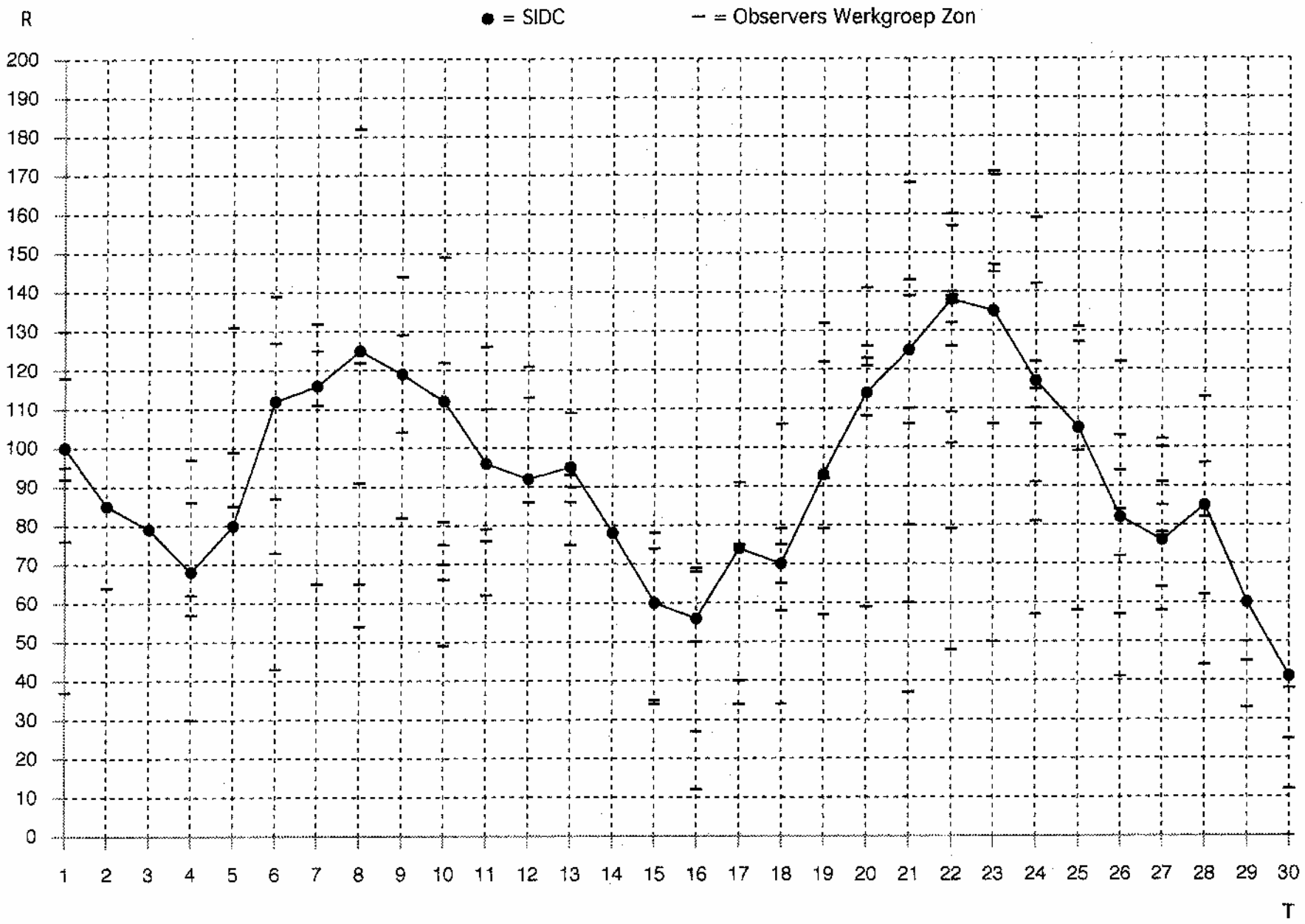
S.I.D.C. SUMMARY OF THE URSIGRAMS

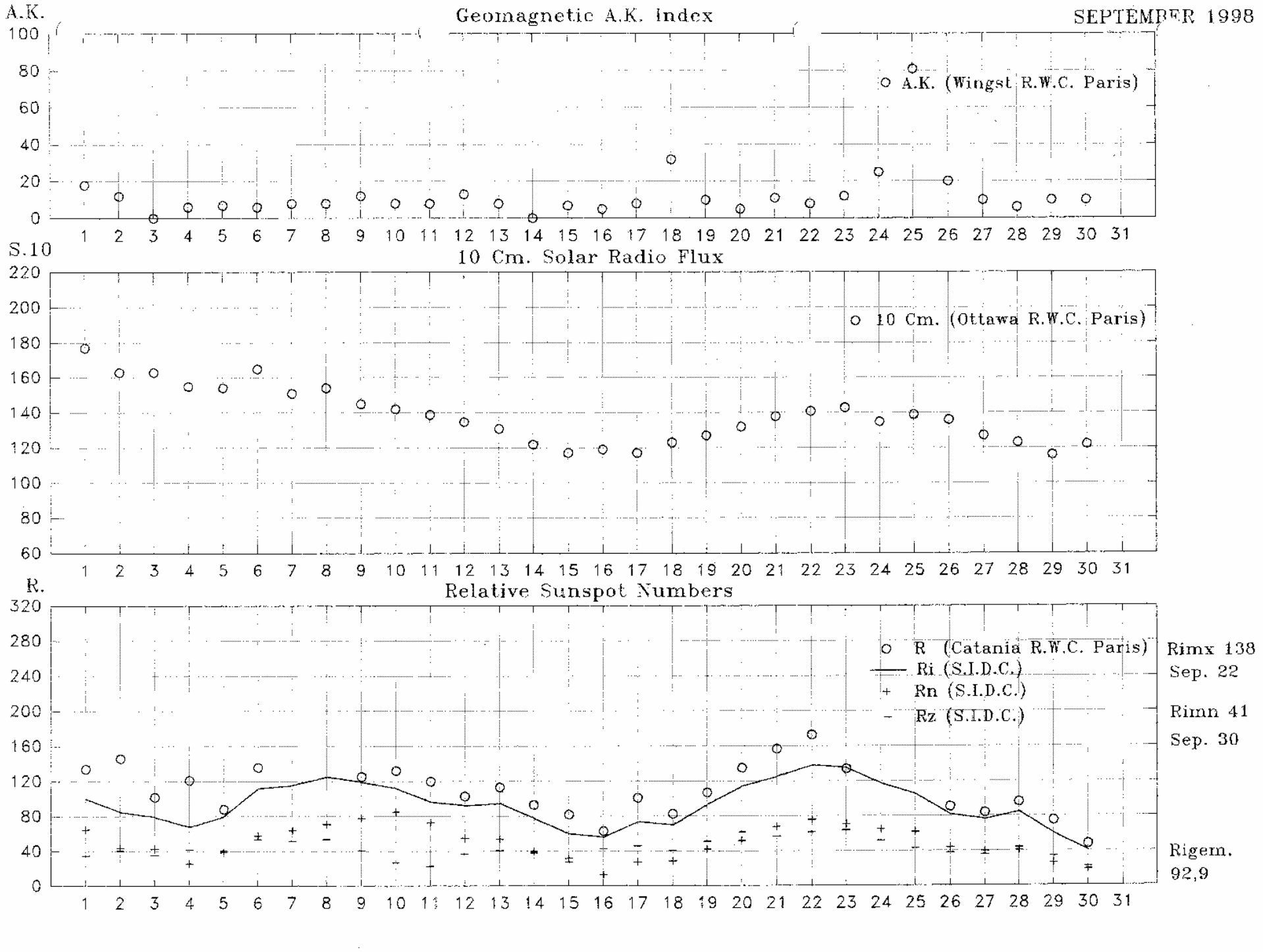
1998 SEPTEMBER R^{1}_{IM} = 92.9

Date	R_I	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
31	103	129	56	179	969	10	0/0	17		
1	100	163	66	177	987	37	1/0	18		
2	85	212	58	163	989	5	1/0	12		1027 ssc
3	79	193	56	163	991	4	2/0	0		
4	68	208	53	155	997	1	0/0	6		
5	80	162	50	154	1005	10	0/0	7		
6	112	172	49	165	1003	12	0/0	6		
7	116	134	49	151	1002	3	0/0	8		
8	125	91	49	154	1005	6	0/0	8		
9	119	107	49	145	1000	17	1/0	12		0452 M2.8 II-IV sid
10	112	113	49	142	1003	6	0/0	8		
11	96	103	50	139	1006	24	1/0	8		1558 M2.1 1B
12	92	101	51	135	1008	8	0/0	13		
13	95	84	51	131	1002	4	0/0	8		
14	78	53	45	122	1007	4	0/0	0		
15	60	57	47	117	1003	2	0/0	7		
16	56	29	45	119	1003	0	0/0	5		
17	74	27	45	117	996	0	0/0	8		
18	70	44	44	123	991	5	0/0	32		1833 mgst
19	93	75	47	127	993	3	0/0	10		
20	114	95	47	132	988	5	1/0	5		0233 M1.8 IV T
21	125	122	47	138	988	14	0/0	11		
22	138	117	50	141	991	4	0/0	8		
23	135	125	74	143	987	108	1/0	12		0649 M6.9 2B II-IV sid
24	117	121	52	135	985	15	0/0	25		2345 mgst ssc
25	105	90	49	139	917	5	0/0	81		
26	82	92	50	136	936	8	0/0	20		
27	76	59	44	127	959	36	0/0	10		0806 C2.6 SF
28	85	37	37	123	969	3	1/0	6		
29	60	15	49	116	972	1	0/0	10		
30	41	7	50	122	989	104	1/0	10		1308 M2.8 2N II-IV T / 1520 p

Low to moderate solar activity during the whole month except on 23 (flare). Low to high geomagnetic activity on 25. From 18 September,no possible observations of SEA at Uccle or Humain, due to unknown interferences.

R_I, R^{1}_{IM} : 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 Humain station (Belgium).
2800 : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UMOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSR Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UMHOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UMHOR group 2; UMHOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect) 1-2-3-4 (class of flares); M,C Xray flare class; II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); CME (coronal mass ejection); SFI Evaluation (1 x Sn+10 x "1"+100 x ">1").


R
● = SIDC
– = Observers Werkgroep Zon
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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
T


A.K.
Geomagnetic A.K. Index
SEPTEMBER 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 138
Sep. 22
Rimn 41
Sep. 30
Rigem.
92,9

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

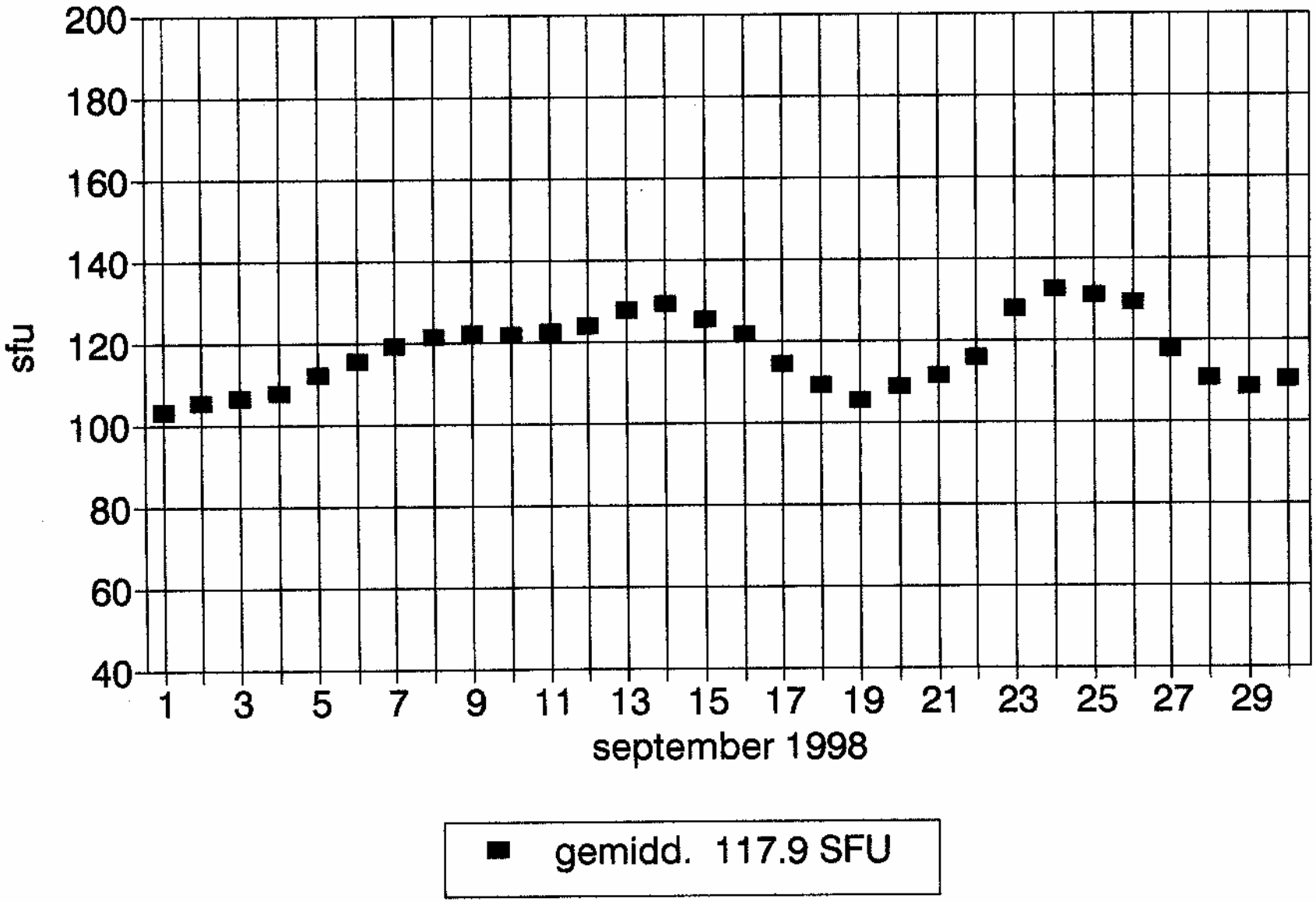
(Hemispheric sunspot numbers)

september 1998

	S.I.D.C.		Balster		Groenew.		Idenburg		Jannink 4		v. Slooten		Son		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	65	35			65	30					81	37	62	30	78	52	47	29
2	44	41															32	32
3	43	36																
4	26	42					22	35			38	48			40	57		
5	39	41	52	47							44	41			51	80		
6	58	54									70	69					31	42
7	64	52			66	59	55	56			70	62						
8	71	54							27	38	71	51			88	94	39	52
9	78	41					61	43			94	50			85	44	44	38
10	85	27	112	37			56	25			83	39					45	25
11	73	23	84	26							85	41			83	27	56	23
12	55	37			47	39					62	59			59	54		
13	54	41											46	40	58	51	64	26
14	40	38																
15	32	28	36	38					12	23	41	37			38	40		
16	13	43	15	53							14	36			15	54	13	14
17	28	46	36	55							22	53					13	27
18	29	41	30	49							41	65			29	46	28	37
19	42	51									67	65	17	62	46	76		
20	52	62	57	66							61	80			46	80	48	60
21	68	57	72	67	61	49			25	35	94	74	47	96			58	48
22	76	62	83	74	68	69	47	62			85	75	70	62	71	69	62	64
23	71	64	85	86							73	72	68	79	84	86		
24	65	52	81	78	58	57	60	50			64	78	60	64			62	44
25	62	43	67	60	55	44					61	70						
26	44	38									57	65	42	52			32	40
27	40	36	56	46							39	52	36	28	38	47	37	41
28	41	44	48	48							49	64	22	40			34	18
29	26	34											23	27			23	22
30	19	22									11	27	11	14				

radioflux van de zon op 1421 MHz

Radio Observatorium Den Helder



Bulletin Werkgroep Zon — Oktober 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonneviekkengetallen (Sunspot numbers)

Day	Bals	Gr 6	Groe	Jn .9	Jn 4	Kroe	vSlo	Son	Sp 7	Vers	Zans	Zijle	Uccle groups	Uccle spots
1								25					5	10
2										11	25	12		
3														
4														
5													2	17
6				14	15	39	74				32			
7														
8														
9				27			132	52						
10	61			24			54				42			
11							57							
12	55			24			60				32	33	4	25
13	73			13							52		4	23
14														
15	101			23	36		95				63		7	39
16	106			25			123				75		7	52
17				39							73			
18	123	115	84	40		77	148		118		84	94	8	54
19	116		79	37			107		96		77		7	39
20	87		73	24		39	91		81		55		6	29
21														
22														
23														
24	45			12			44		48				3	29
25				0			38	24	39		30			
26						25	30				16		5	23
27														
28				11			52				24			
29	69		55	22	22				71		38		6	12
30	49		46	23			50						6	15
31	47										26			
observ	12	1	5	16	3	4	15	3	6	1	16	3		
k	0,87	0,86	1,12	2,94	3,00	1,58	0,84	1,37	0,85	2,91	1,40	1,69		
st.dev.	0,13	—	0,10	0,75	1,22	0,30	0,19	0,29	0,10	—	0,38	0,86		
st.d./k	0,15	—	0,09	0,26	0,41	0,19	0,22	0,21	0,12	—	0,27	0,51		

Observers		[...] = Refractor, d = ... mm		[Rf...] = Reflector, d = ... mm	
Bals	= H.A.M. Balster [70]	Jn 4	= D. Jannink [40]	Sp 7	= T. Spaninks [75]
Gr 6	= Mw G. Gravers [60]	Kroe	= K. Kroesen [102]	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]	vSlo	= B. van Slooten [90]	Zans	= W. Zanstra [Rf 155]
Jn .9	= D. Jannink [9]	Son	= A.T. Son [Rf 150 Kutter]	Zijle	= W.A. Zijlema [90]

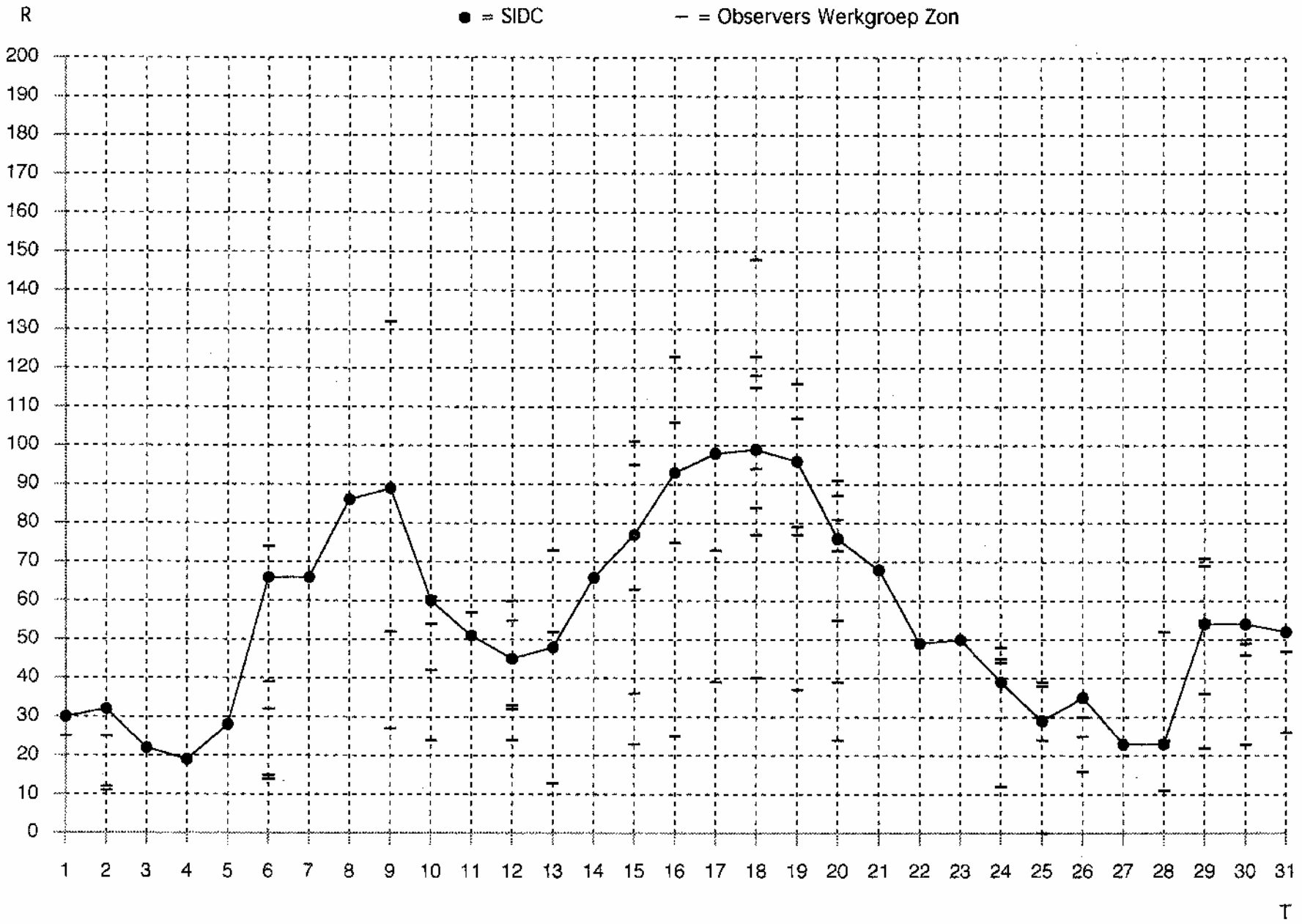
S.I.D.C. SUMMARY OF THE URSIGRAMS

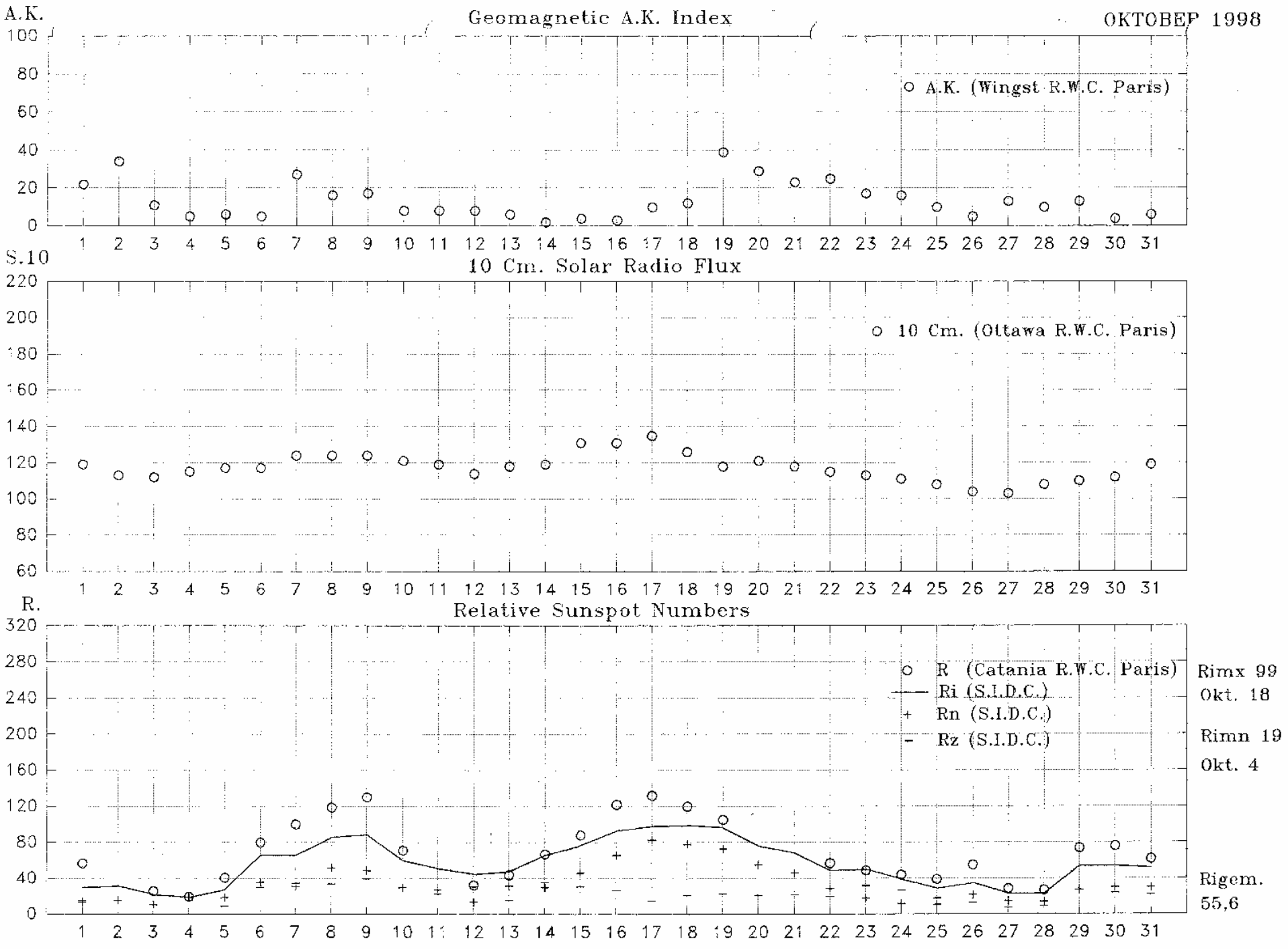
1998 OCTOBER R^{I}_{IM} = 55.6

Date	R^{I}_{I}	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
30	41	7	50	122	989	104	1/0	10		2N (1308),II/IV p(1520)
1	30	5	48	119	993	2	0/0	22		
2	32	15	47	113	994	0	0/0	34		ssc (0724)
3	22	16	47	112	992	2	0/0	11		
4	19	30	51	115	991	2	0/0	5		
5	28	41	48	117	1004	1	0/0	6		
6	66	66	41	117	1013	0	0/0	5		ssc (1630)
7	66	72	53	124	-	37	2/0	27		1N (1242)
8	86	77	48	124	1002	11	0/0	16		
9	89	64	48	124	1006	9	0/0	17		
10	60	50	48	121	1001	0	0/0	8		
11	51	35	46	119	999	3	0/0	8		
12	45	31	46	114	996	2	0/0	8		
13	48	33	48	118	1000	3	0/0	6		
14	66	57	43	119	999	9	0/0	2		
15	77	66	54	131	997	2	0/0	4		
16	93	71	46	131	995	7	0/0	3		
17	98	88	43	135	995	16	0/0	10		
18	99	66	44	126	990	21	1/0	12		ssc (1951)
19	96	41	41	118	985	18	0/0	39		mgst
20	76	17	40	121	987	7	0/0	29		
21	68	35	39	118	986	2	0/0	23		
22	49	46	48	115	988	6	0/0	25		
23	50	35	48	113	989	1	0/0	17		
24	39	12	47	111	985	1	0/0	16		
25	29	4	48	108	994	2	0/0	10		
26	35	8	45	104	992	1	0/0	5		
27	23	8	47	103	1002	0	0/0	13		
28	23	16	46	108	1007	2	0/0	10		
29	54	24	48	110	1005	0	0/0	13		
30	54	35	47	112	1004	0	0/0	4		
31	52	36	49	119	999	0	0/0	6		

Very low to moderate solar activity, decreasing again at the end of the month. Low to moderate geomagnetic activity.

R^{I}_{I}; R^{I}_{IM} : 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/m² : 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 - UGEOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect); 1-2-3-4 (class of flares); M,C Xray flare class; IV-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proton event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); CME (coronal mass ejection); SFI Evaluation (1 x Sn+10 x "1"+100 x ">1").


R
● = SIDC
– = Observers Werkgroep Zon
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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 31
T

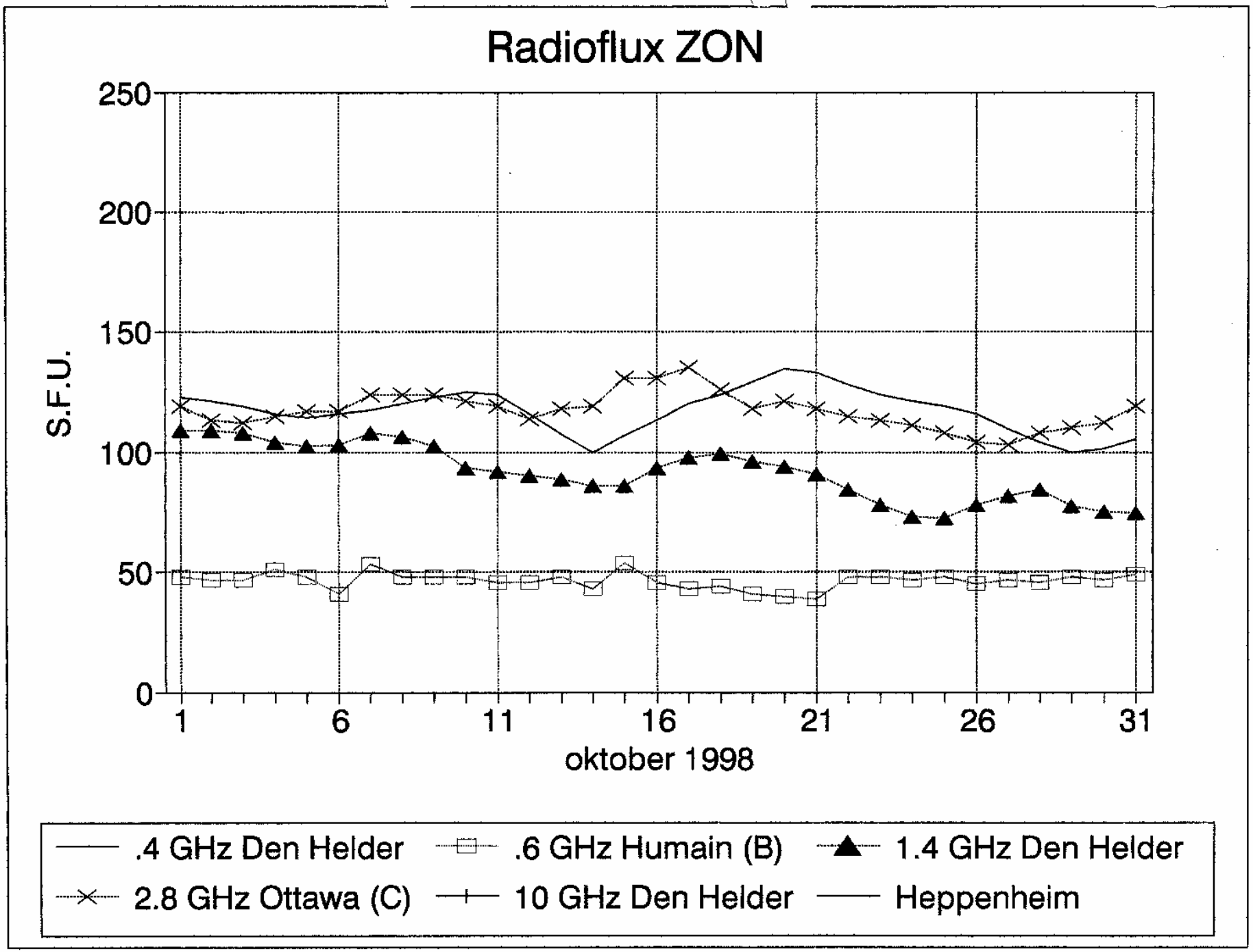

A.K.
Geomagnetic A.K. Index
OKTOBER 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 99
Okt. 18
Rimn 19
Okt. 4
Rigem.
55,6

Zonnevlekkengetallen noordelijk- en zuidelijk halfrond

(Hemispheric sunspot numbers)

oktober 1998

	S.I.D.C.		Balster		Groenew.		Jannink 4		v. Slooten		Son		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	14	16									11	14				
2	16	16													14	11
3	11	11														
4	19	0														
5	19	9														
6	36	30					15	0	37	37					32	0
7	31	35														
8	52	34														
9	49	40							72	60	25	27				
10	30	30	29	32					23	31					23	19
11	23	28							24	33						
12	14	31	13	42					24	36					11	21
13	32	16	48	25											31	21
14	30	36														
15	46	31	53	48			23	13	55	40					40	23
16	66	27	75	31					79	44					57	18
17	83	15													57	16
18	78	21	92	31	69	15			109	39			90	28	66	18
19	73	23	88	28	66	13			80	27			68	28	62	15
20	55	21	64	23	52	21			64	27			60	21	38	17
21	46	22														
22	29	20														
23	18	32														
24	12	27	14	31					14	30			14	34		
25	11	18							14	24	13	11	13	26	17	13
26	22	13							30	0					16	0
27	15	8														
28	14	9							27	25					24	0
29	27	27	34	35	22	33	22	0					35	36	36	0
30	30	24	25	24	23	23			26	24						
31	30	22	25	22											26	0


Radioflux ZON
250
200
150
100
50
0
S.F.U.
1
6
11
16
21
26
31
oktober 1998
.4 GHz Den Helder
.6 GHz Humain (B)
1.4 GHz Den Helder
2.8 GHz Ottawa (C)
10 GHz Den Helder
Heppenheim

Bulletin Werkgroep Zon — November 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 6	Groe	Jn .9	Jn 4	Kroe	vSlo	Son	Sp 7	Vers	Zans	Zijle	Uccle groups	Uccle spots
1	50	28	34	12			53		52		25	39	4	9
2											24			
3				23									5	25
4				47			109				58		9	60
5	104			49							62		7	68
6			70	48		65	123				81		7	100
7	116								111	77			7	76
8														
9											57			
10				56			63						7	39
11	88			47	45	49	85	38		47	49		7	35
12	77			46			82						6	41
13														
14														
15			63	46			138							
16	69		53	24	25	38	84		76		42		5	27
17	68		44	25			69		62		44		3	21
18	57		13	13			52			25	41		5	19
19	35			13		40	33				32		3	13
20	38	37	27	12		40	67		55	26	34		4	21
21	40		33	27			35	33	45		34	36	2	19
22	61	44	39	22		37	44		48	26	43		3	19
23	54		35	33		49	65		54		37	41	4	10
24	57			34	34				67	35	55		5	19
25														
26														
27	121								115		102		6	35
28	122			43				99		62	85	79		
29											88	78		
30														
observ	16	3	10	19	3	7	15	3	10	7	19	5		
k	0,90	1,17	1,57	2,22	2,08	1,28	0,85	1,27	0,87	1,65	1,29	1,12		
st.dev.	0,14	0,21	0,86	0,81	0,84	0,38	0,13	0,41	0,09	0,24	0,23	0,19		
st.d./k	0,15	0,18	0,55	0,37	0,40	0,30	0,16	0,32	0,11	0,14	0,18	0,17		

Observers		[...]	= Refractor, d = ... mm	[Rf...]	= Reflector, d = ... mm
Bals	= H.A.M. Balster [70]	Jn 4	= D. Jannink [40]	Sp 7	= T. Spaninks [75]
Gr 6	= Mw G. Gravers [60]	Kroe	= K. Kroesen [102]	Vers	= D. Verschuuren [Rf 80]
Groe	= A. Groenewegen [102]	vSlo	= B. van Slooten [90]	Zans	= W. Zanstra [Rf 155]
Jn .9	= D. Jannink [9]	Son	= A.T. Son [Rf 150 Kutter]	Zijle	= W.A. Zijlema [90]

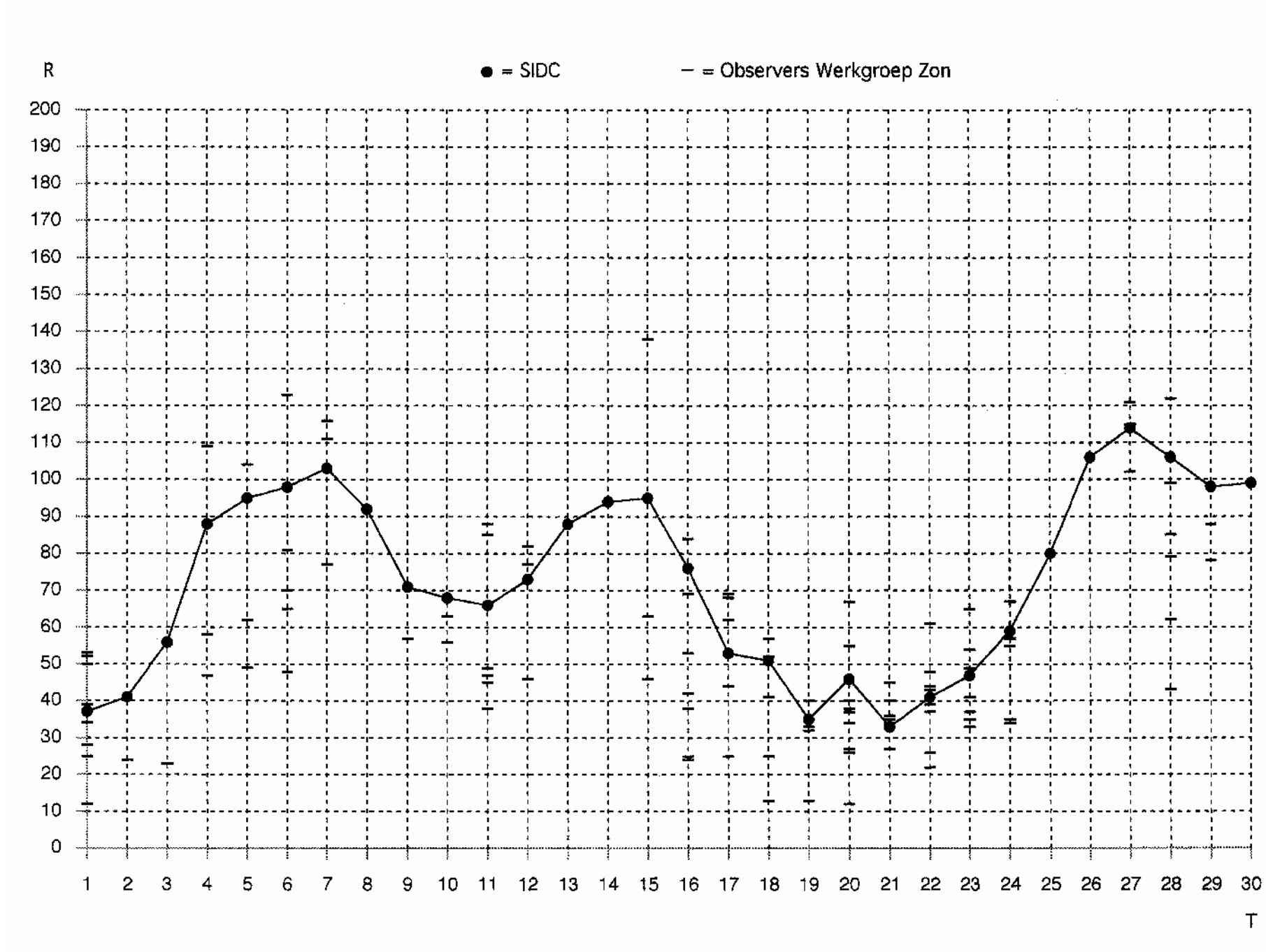
S.I.D.C. SUMMARY OF THE URSIGRAMS

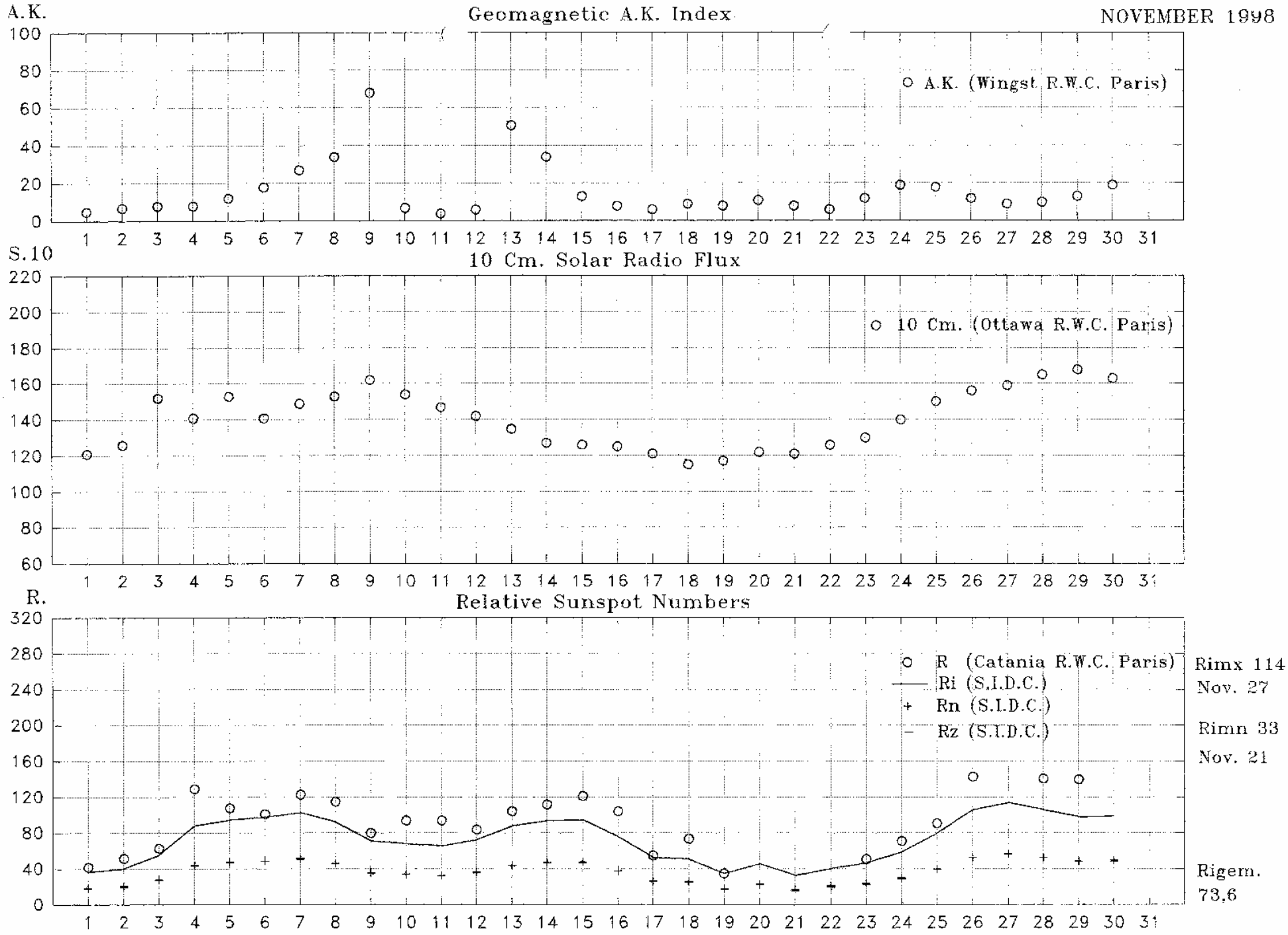
1998 NOVEMBER R^{f}_{IM} = 73.6

Date	R^{i}	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG	
31	52	36	50	119	999	0	0/0	6			
1	37	31	52	121	1004	3	0/0	5			
2	41	55	46	126	1008	1	0/0	7			
3	56	59	52	152	1011	106	1/0	8			2N,M1 (1852)
4	88	77	56	141	1007	33	0/0	8			
5	95	104	63	153	1012	132	3/0	12			2B,M8.4,II (1900)
6	98	120	53	141	998	52	1/0	18	1510		1B,M1.7 (1510)
7	103	111	62	149	998	21	1/0	27	1103		Mgst,SSC (0815), M2.4 (1102)
8	92	131	57	153	981	153	2/0	34			SSC (0450), 2B,M2.7 (1427)
9	71	91	55	162	954	10	0/0	68			CME (1754)
10	68	88	58	154	970	26	1/0	7	1542		
11	66	82	53	147	978	1	2/0	4			
12	73	89	57	142	984	14	1/0	6			
13	88	103	51	135	980	3	0/0	51	1448		
14	94	120	54	127	968	-	-	34			C1.3 (0500), P (0810)
15	95	112	51	126	964	1	0/0	13			
16	76	64	50	125	976	3	0/0	8			
17	53	52	49	121	989	0	0/0	6			
18	51	43	51	115	989	0	0/0	9			
19	35	31	47	117	997	1	0/0	8			
20	46	13	48	122	999	8	0/0	11			
21	33	7	47	121	1000	25	0/0	8			
22	41	19	45	126	1000	120	2/2	6	1610		1N,X3.7,II(0630),2N,X2.5 (1610)
23	47	30	54	130	1002	12	1/1	12	1100		X2,IV (0628),1N,M3.1,IV/II(1059
24	59	33	49	140	995	13	0/1	19			X1.0,II/III (0207)
25	80	62	54	150	1000	11	0/0	18			
26	106	84	57	156	981	18	0/0	12			
27	114	87	56	159	978	106	1/0	9			2N,M1.6,II (0715)
28	106	107	66	165	973	105	0/1	10			3N,X3.3,II/IV (0454)
29	98	127	54	168	976	9	0/0	13			
30	99	98	56	163	972	8	0/0	19			Mgst,SSC (0509)

Low to high solar activity, with maxima on 5 and from 22. Low to high geomagnetic activity.

R^{i}, R^{f}_{IM} : 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/m² : 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 - UGEOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect 1-1-3-4 (class of flares); M,C Xray flare class; II-IV radio-burst; T (ten cm radio-burst); P (proton flare); p (proto event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); CME (coronal mass ejection); SFI Evaluation (1 x Sn+10 x "1"+100 x "+1").


R
● = SIDC
– = Observers Werkgroep Zon
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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
T

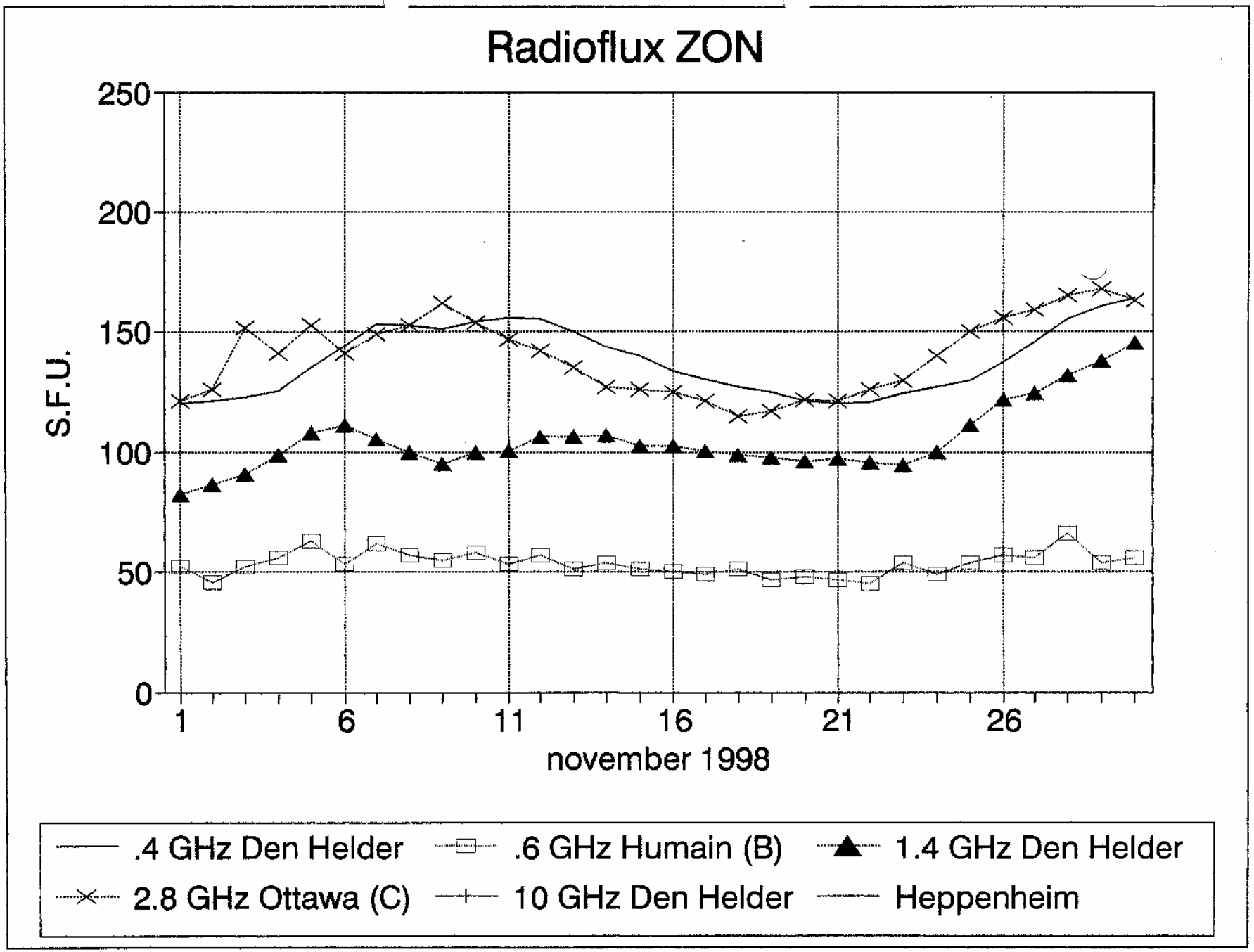

A.K.
Geomagnetic A.K. Index
NOVEMBER 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 114
Nov. 27
Rimn 33
Nov. 21
Rigem.
73,6

Zonnevlekkengetallen noordelijk– en zuidelijk halfrond

(Hemispheric sunspot numbers)

november 1998

	S.I.D.C.		Balster		Groenew.		Jannink 4		v. Slooten		Son		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	19	18	27	23	23	11			27	26			27	25	25	0
2	21	20													24	0
3	28	28														
4	44	44							61	48					41	17
5	48	47	64	40											49	13
6	49	49			55	15			89	34					64	17
7	52	51	91	25									86	25		
8	46	46														
9	36	35													44	13
10	34	34							38	25						
11	33	33	48	40			22	23	54	31	16	22			23	26
12	37	36	45	32					36	46						
13	44	44														
14	47	47														
15	48	47			22	41			56	82						
16	38	38	23	46	12	41	0	25	35	49			23	53	11	31
17	27	26	29	39	13	31			32	37			26	36	15	29
18	26	25	11	46	0	13			12	40					12	29
19	18	17	0	35					0	33					0	32
20	23	23	0	38	0	27			12	55			0	55	0	34
21	17	16	0	40	0	33			0	35	0	33	0	45	0	34
22	21	20	11	50	0	39			0	44			0	48	0	43
23	24	23	13	54	0	35			12	53			11	43	0	37
24	30	29	0	57			0	34					0	67	0	55
25	40	40														
26	53	53														
27	57	57	69	52									59	56	50	52
28	53	53	77	45							57	42			47	38
29	49	49													72	16
30	50	49														


Radioflux ZON
250
200
150
100
50
0
S.F.U.
1
6
11
16
21
26
november 1998
.4 GHz Den Helder
.6 GHz Humain (B)
1.4 GHz Den Helder
2.8 GHz Ottawa (C)
10 GHz Den Helder
Heppenheim

Bulletin Werkgroep Zon — December 1998

NVWS Werkgroep Zon. Secretariaat: Veenenburg 36, 2804 WZ Gouda. Tel: 0182-539082

Zonnevlekkengetallen (Sunspot numbers)

Day	Bals	Gr 6	Groe	Jn .9	Jn 4	Kroe	vSlo	Son	Sp 7	Vers	Zans	Zijle	Uccle groups	Uccle spots
1	123			50			95				59			
2											76			
3														
4		121	86			84	105			63	74		9	40
5	85	122	62				92		81	39	61			
6	119	115	88	98		95	123	98	107	57	89		8	21
7				78		128	130				114		10	36
8	176										90			
9														
10														
11														
12														
13		128	79	38	38	91		60					7	44
14				42										
15														
16	59		46	36			89			47			4	17
17	62	76	43	37		82	48						3	19
18														
19	60						50							
20	58	76	55	27	47		75	67	58	48		66		
21	59			36			59		47			50	3	16
22				22										
23	52			12										
24		75	62				82		86				5	16
25														
26	94			40			105							
27														
28														
29		96	72	46			102		139				4	51
30	121	92	82	44	47	63	91	119		48			7	73
31	114	94	90	42			104						5	50
observ	13	10	11	15	3	6	15	4	6	6	7	2		
k	0,84	0,78	1,09	1,94	1,79	0,97	0,86	0,97	0,80	1,51	1,25	0,81		
st.dev.	0,10	0,18	0,14	0,71	0,63	0,33	0,19	0,29	0,10	0,36	0,43	0,07		
st.d./k	0,12	0,22	0,13	0,37	0,35	0,35	0,22	0,30	0,12	0,24	0,34	0,09		

Observers	[...] = Refractor, d = ... mm	[Rf...] = Reflector, d = ... mm
Bals = H.A.M. Balster [70]	Jn 4 = D. Jannink [40]	Sp 7 = T. Spanninks [75]
Gr 6 = Mw G. Gravers [60]	Kroe = K. Kroesen [102]	Vers = D. Verschuuren [Rf 80]
Groe = A. Groenewegen [102]	vSlo = B. van Slooten [90]	Zans = W. Zanstra [Rf 155]
Jn .9 = D. Jannink [9]	Son = A.T. Son [Rf 150 Kutter]	Zijle = W.A. Zijlema [90]

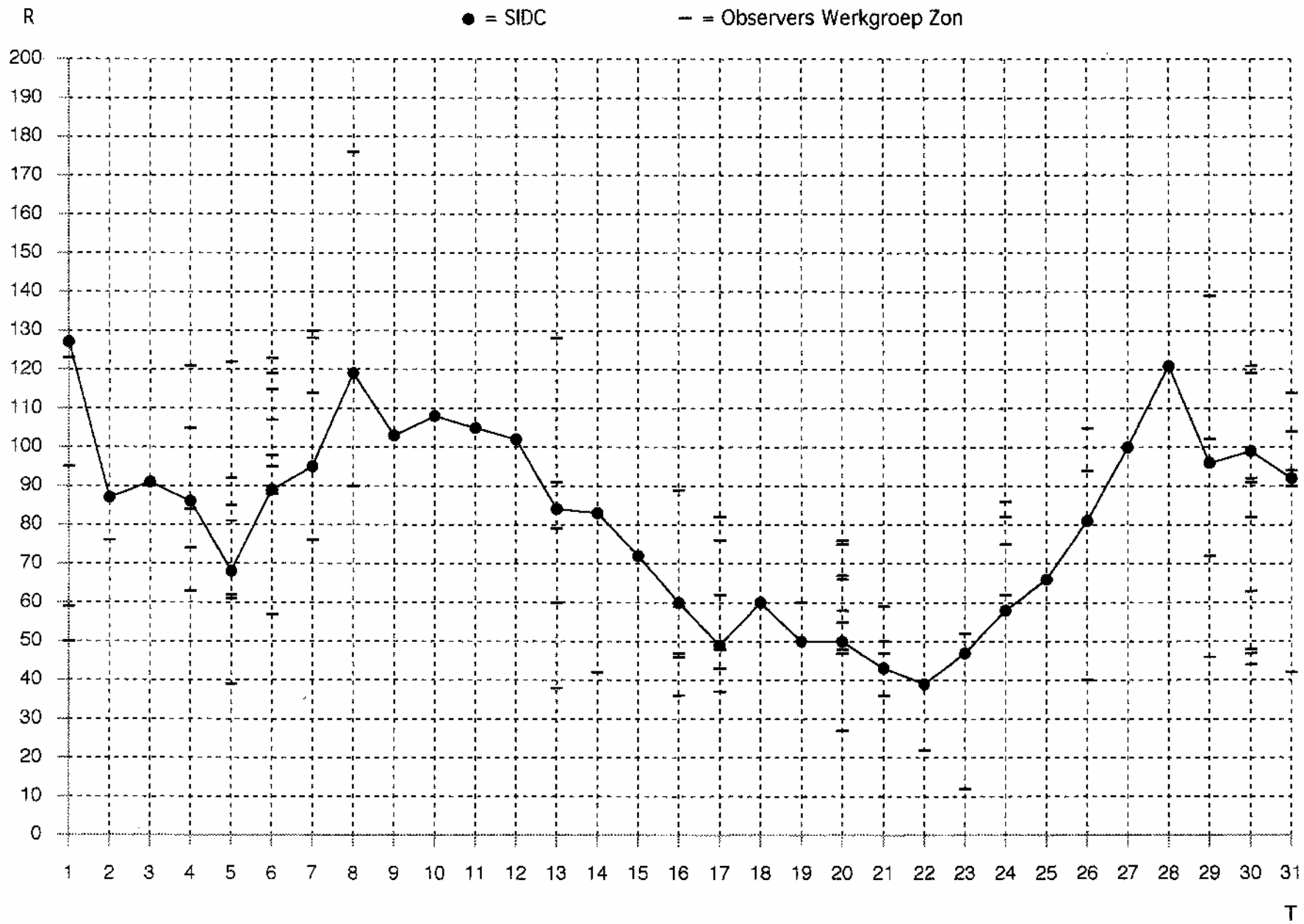
S.I.D.C. SUMMARY OF THE URSIGRAMS

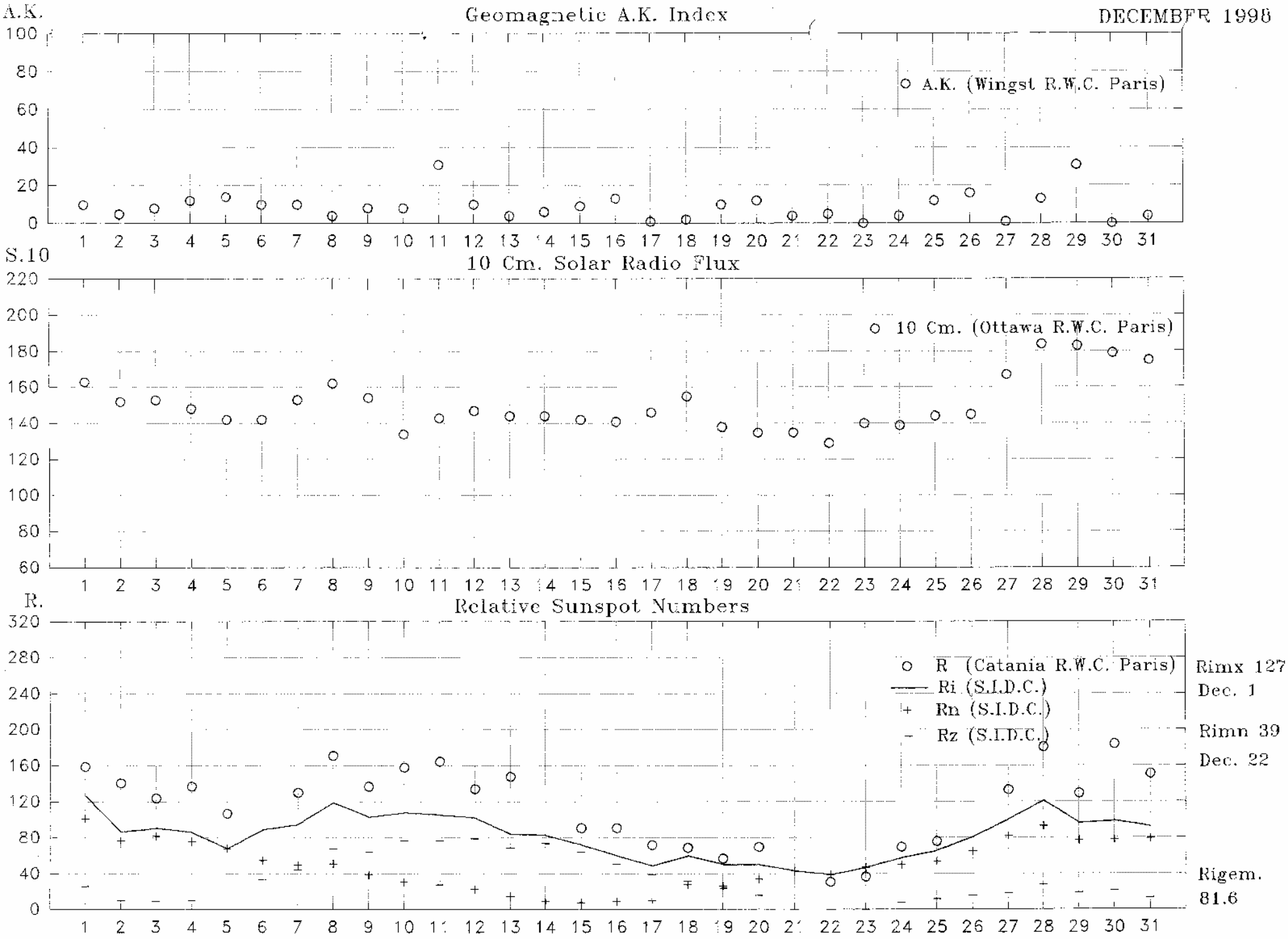
1998 DECEMBER R^{i}_{IM} = 81.6

Date	R_i	PPSI	600	2800	COS	SFI	XI	Ak	SEA	MAG
30	99	98	56	163	972	8	0/0	19		
1	127	155	57	163	974	17	0/0	10		
2	87	123	58	152	971	7	0/0	5		
3	91	117	53	153	981	5	0/0	8		
4	86	140	57	148	980	1	0/0	12		
5	68	134	50	142	978	1	0/0	14		
6	89	139	54	142	981	4	0/0	10		
7	95	125	47	153	979	9	0/0	10		
8	119	145	44	162	987	21	0/0	4	1236	
9	103	113	55	154	988	18	0/0	8		
10	108	96	47	134	991	7	0/0	8		
11	105	84	45	143	991	13	0/0	31		mgst 1300
12	102	79	48	147	980	16	0/0	10		
13	84	91	45	144	966	11	0/0	4		
14	83	114	43	144	958	18	0/0	6	0942	
15	72	95	44	142	966	5	0/0	9		
16	60	76	43	141	984	16	0/0	13		
17	49	47	44	146	996	46	1/0	1	1417	M3.2,1N,II 0740
18	60	30	47	155	995	117	1/0	2		M8.0,2N,II 1713
19	50	30	48	138	1003	4	0/0	10		
20	50	23	46	135	999	17	1/0	12		
21	43	36	53	135	996	6	0/0	4		
22	39	22	52	129	982	4	0/0	5		
23	47	19	54	140	972	2	2/0	0		
24	58	17	60	139	976	17	1/0	4	1145	
25	66	27	58	144	977	6	1/0	12		
26	81	55	59	145	970	26	0/0	16		
27	100	110	60	167	969	14	0/0	1		
28	121	134	58	184	975	61	4/0	13		M1.4,SF 0515;M3.1,1B 0545,SSC
29	96	141	58	183	977	26	0/0	31		
30	99	131	57	179	984	14	1/0	0		
31	92	120	55	175	984	20	0/0	4		

Low to moderate solar activity, low geomagnetic activity.

R_i, R_{IM} : 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/m² ; 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 - UGEOI group 2). "The 10.7cm Flux data are provided as a service of the National Research Council of Canada."
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Kerguelen).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams - UGEOR group 3).
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams - UGEOR group 2; UGEOI group 5).
Ak : planetary geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Dourbes station (Royal Meteorological Institute, Belgium).
MAG : magnetic events from Dourbes station (Royal Meteorological Institute, Belgium).
Remarks : sid (sudden ionospheric disturbance); ssc (sudden storm commencement); mgst (magnetic storm); sfe (solar flare effect 1-2-3-4 (class of flares); M,C Xray flare class; IV-IV radio-burst; T (tan cm radio-burst); P (proton flare); p (proto event); gle (ground level event : neutron event); si (sudden impulse); F (Forbush); CME (coronal mass ejection); SFI Evaluation (1 x $N+10 x "1"+100 x ">1").


R
● = SIDC
– = Observers Werkgroep Zon
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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 31
T

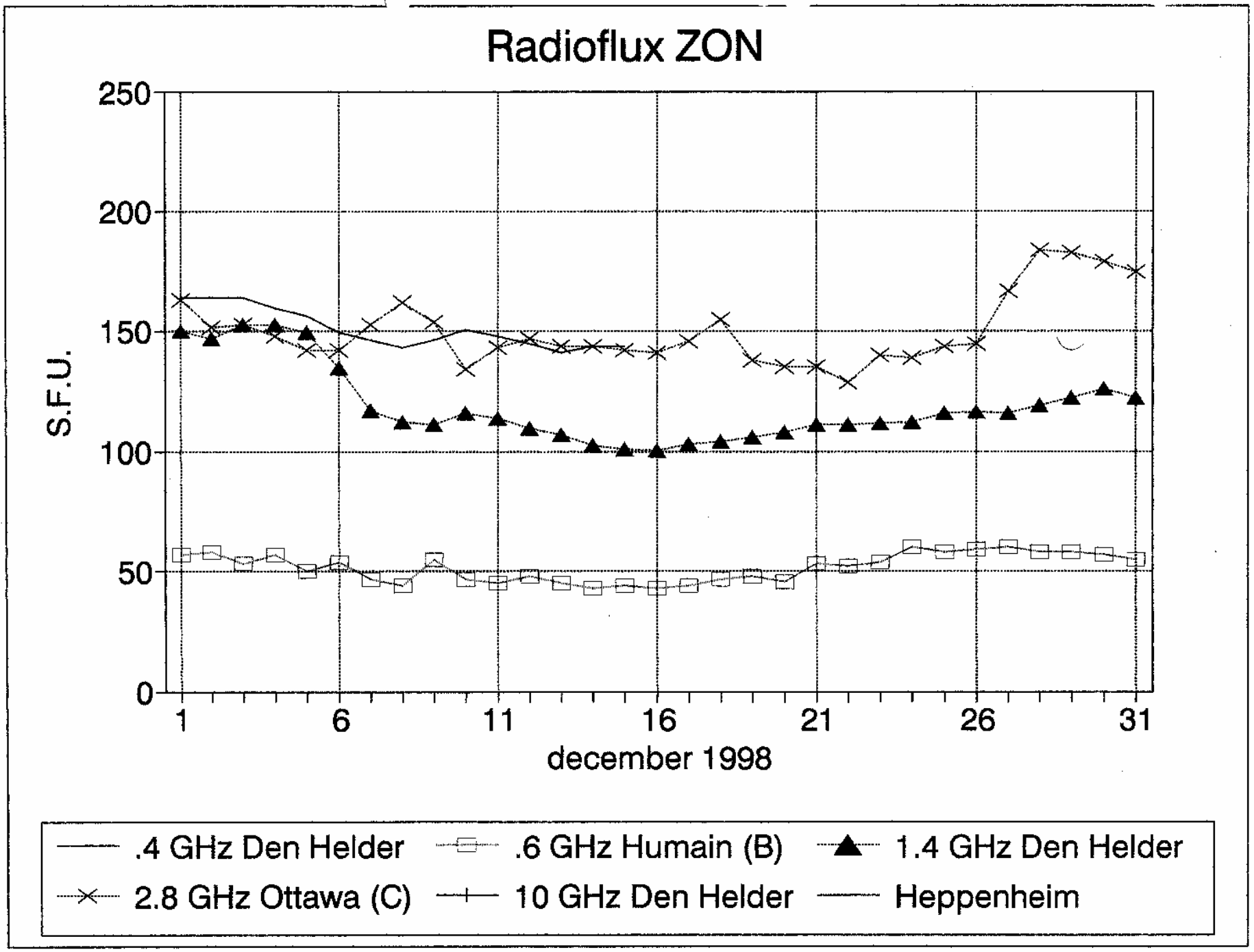

A.K.
Geomagnetic A.K. Index
DECEMBER 1998
A.K. (Wingst R.W.C. Paris)
S.10
10 Cm. Solar Radio Flux
10 Cm. (Ottawa R.W.C. Paris)
R.
Relative Sunspot Numbers
R (Catania R.W.C. Paris)
Ri (S.I.D.C.)
Rn (S.I.D.C.)
Rz (S.I.D.C.)
Rimx 127
Dec. 1
Rimn 39
Dec. 22
Rigem.
81.6

Zonnevlekkengetallen noordelijk- en zuidelijk halfrond

(Hemispheric sunspot numbers)

December 1998

	S.I.D.C.		Balster		Groenew.		Jannink 4		v. Slooten		Son		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	101	26	107	16					79	16					46	13
2	77	10													64	12
3	82	9														
4	76	10			75	11			92	13					74	0
5	68	0	85	0	62	0			81	11			81	0	61	0
6	55	34	77	42	61	27			69	54	69	29	65	42	62	27
7	50	45							75	55					63	51
8	51	68	84	92											37	53
9	39	64														
10	31	77														
11	28	77														
12	23	79														
13	15	69			22	57	11	27			11	49				
14	9	74														
15	8	64														
16	9	51	11	48	11	35			24	65						
17	10	39	12	50	11	32			11	37						
18	28	32														
19	26	24	27	33					36	14						
20	34	16	45	13	43	12	36	11	52	23	56	11	45	13		
21	43	0	48	11					47	12			47	0		
22	39	0														
23	47	0	52	0												
24	50	8			51	11			71	11			75	11		
25	54	12														
26	65	16	75	19					76	29						
27	82	18														
28	93	28														
29	77	19			57	15			77	25			112	27		
30	78	21	96	25	66	16	35	12	65	26	85	34				
31	79	13	99	15	75	15			86	18						


Radioflux ZON
250
200
150
100
50
0
S.F.U.
1
6
11
16
21
26
31
december 1998
.4 GHz Den Helder
.6 GHz Humain (B)
1.4 GHz Den Helder
2.8 GHz Ottawa (C)
10 GHz Den Helder
Heppenheim