Bulletin Werkgroep Zon Maart 2013

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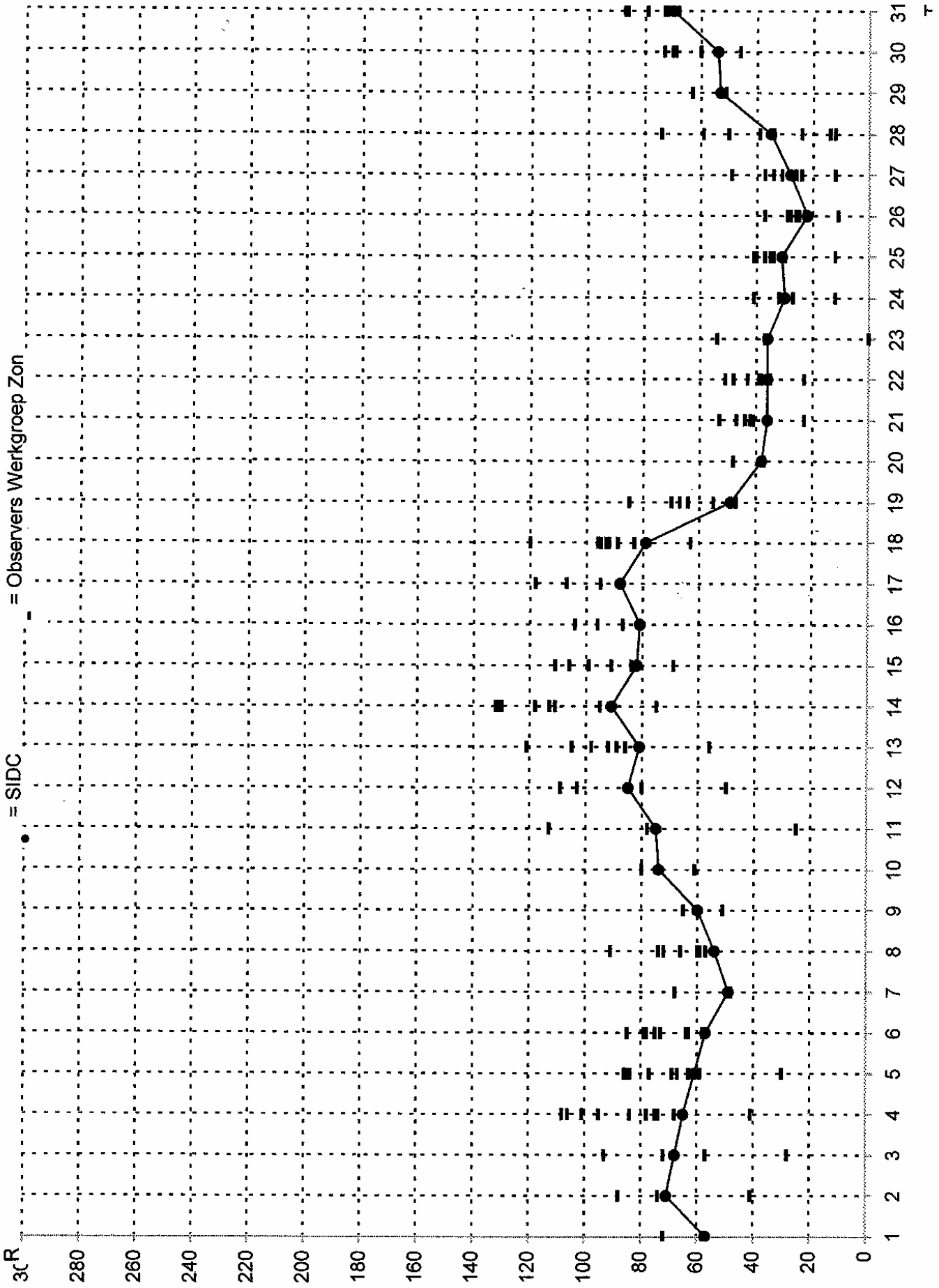
Zonnevlekkengetallen (Sunspot numbers)

Day	SIDC	Bals	Gr60	vSlo	Son	Spa	Zans	Zijle		Poln	Ukk	VdS	WGz
1	57									72		58	
2	71							41		88		74	41
3	68						28			93	57	72	28
4	65	95		106	75	78	41	108		101	74	68	84
5	61	86		85	69	63	30			84	77	59	67
6	57	64		78	85	73				79	63	58	75
7	49									68		48	
8	54	59		72	91					60	66	57	74
9	60									51		65	
10	74									61		80	
11	75						25			113		78	25
12	85			109			50			103		85	80
13	81			121	98		56			105	89	86	92
14	91	118		131	130	111	75			132	118	95	113
15	82	106		99			69			111		84	91
16	81	104								96		87	104
17	88				107					118		95	107
18	79	120		96	89	93	63			95	83	96	92
19	49	64			70					85	47	55	67
20	38									48		37	
21	36	53			44	41	36			47	23	42	44
22	36	51			38	39				48	23	35	43
23	36						0			54		37	0
24	30						12	41		41		32	27
25	31	41				37	12			40	35	34	30
26	22	29			29	28	11	26		37	28	23	25
27	28	37			24	49	12			49	34	26	31
28	35	50	14			59	12			74	24	39	34
29	53									63		51	
30	54			73			46			70	69	54	60
31	70			72		86				68	87	73	79
observ		15	1	11	13	12	17	4		31	17	31	25
k		0,75	2,50	0,76	0,82	0,80	1,90	0,98		0,77	1,00	0,96	1,07
st.dev.		0,07	–	0,10	0,15	0,12	0,67	0,51		0,15	0,28	0,05	0,55
st.d./ k		0,10	–	0,13	0,18	0,15	0,35	0,52		0,20	0,28	0,06	0,52

Observers	[...] = Refractor, d = ... mm	[Rf...] = Reflector, d = ... mm
Bals = H.A.M. Balster [70]	Son = A.T. Son [Rf 150 Kutter]	Poln = TOS (Polen)
Gr60 = Mw G. Gravers [60]	Spa = T. Spaninks [75]	Ukk = Ukkel (Belgie)
vSlo = B. van Slooten [90]	Zans = W. Zanstra [Rf 155]	VdS = Fachgruppe Sonne (Duitsland)
	Zijle = W.A. Zijlema [Rf120]	Wgz = Werkgroep Zon KNVWS


3cR
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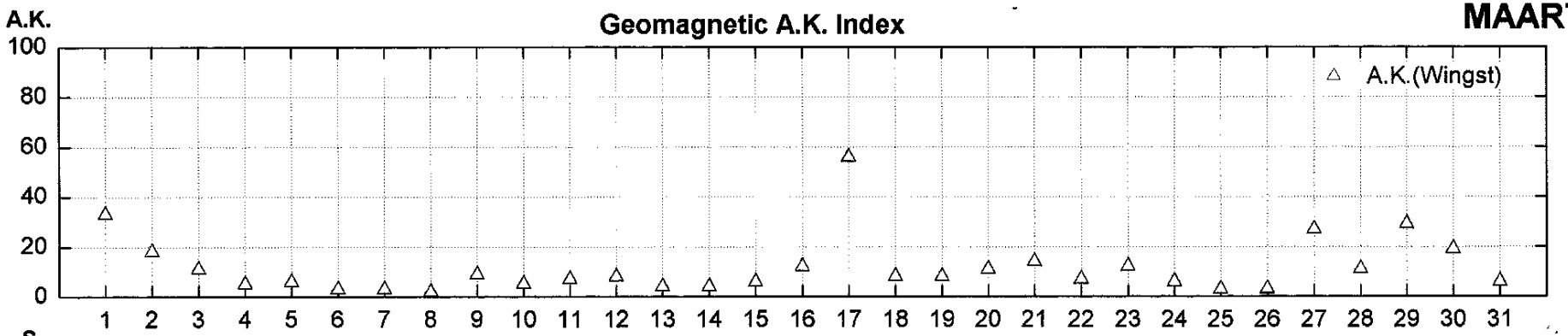
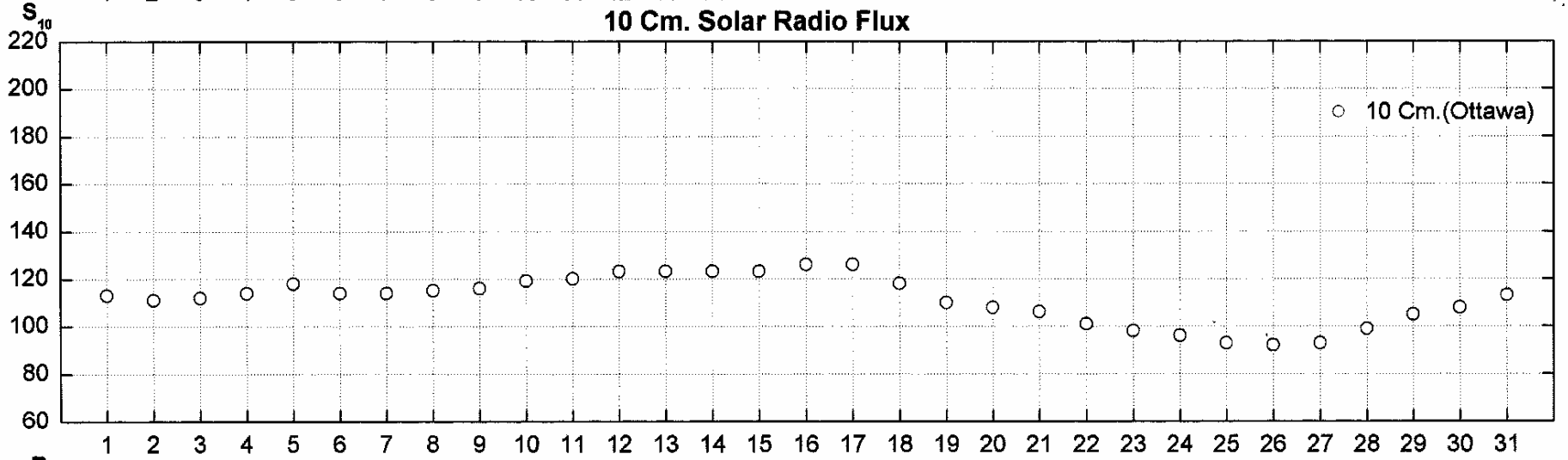
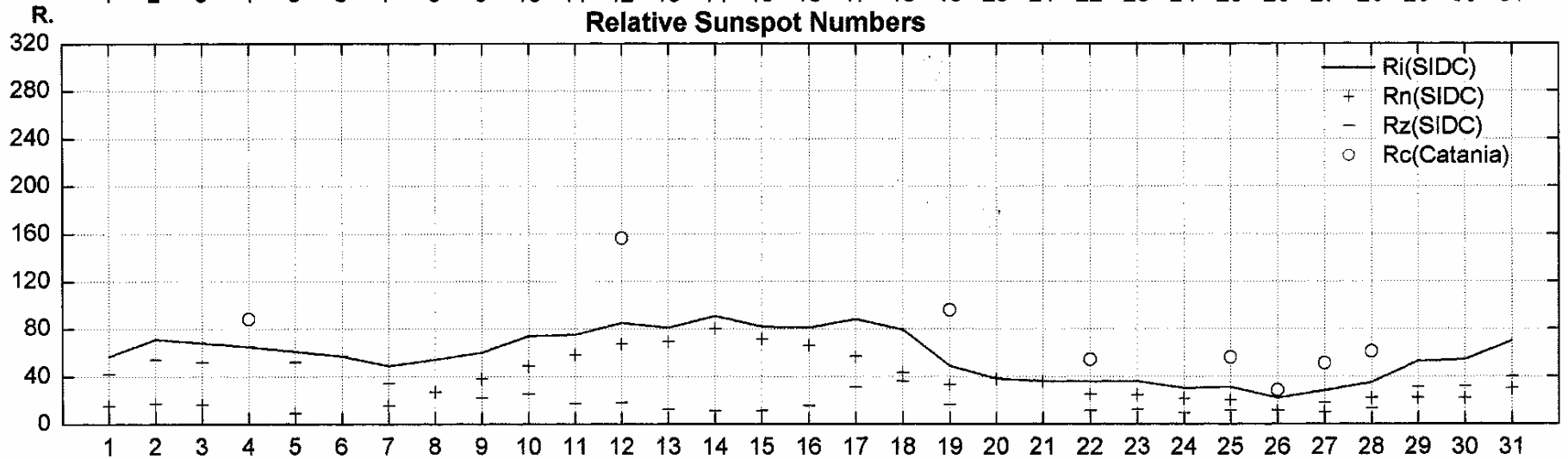
maart 2013







Rimx. 91
Mrt. 14

Rimn. 22
Mrt. 26

Rigem. 57,9

Zonnevlekkengetallen noordelijk- en zuidelijk halfrond

(Hemispheric sunspot numbers)

maart 2013

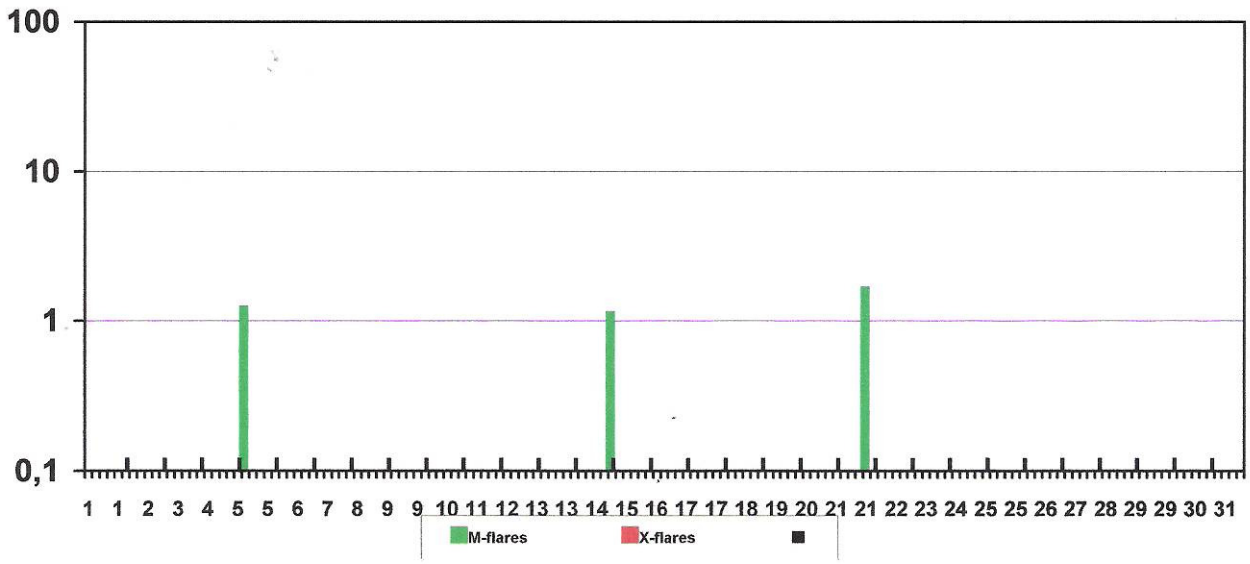
	S.I.D.C.		Balster		v.Slooten		Son		Spaninks		Zanstra	
Day	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs	Rn	Rs
1	15	42										
2	17	54										
3	16	52									0	28
4	0	65	0	95	11	95	0	75	0	23	0	41
5	9	52	11	75	11	74	11	58	0	29	0	30
6	0	57	0	64	11	67	41	44	11	24		
7	15	34										
8	27	27	38	21	36	36	46	45				
9	38	22										
10	49	25										
11	58	17									25	0
12	67	18			85	24					50	0
13	69	12			94	27	81	17			56	0
14	80	11	106	12	108	23	105	25	99	57	75	0
15	71	11	93	13	86	13					58	11
16	66	15	86	18								
17	57	31					58	49				
18	43	36	69	51	47	49	46	43	46	18	36	27
19	33	16	39	25			44	26				
20	38	0										
21	36	0	53	0			44	0	41	12	36	0
22	25	11	38	13			26	12	26	13		
23	24	12									0	0
24	21	9									12	0
25	20	11	25	16					23	14	12	0
26	11	11	14	15			29	0	14	14	11	0
27	10	18	14	23			24	0	13	25	12	0
28	22	13	26	24					25	48	12	0
29	22	31										
30	22	32			28	45					24	22
31	30	40			27	45			38	30		

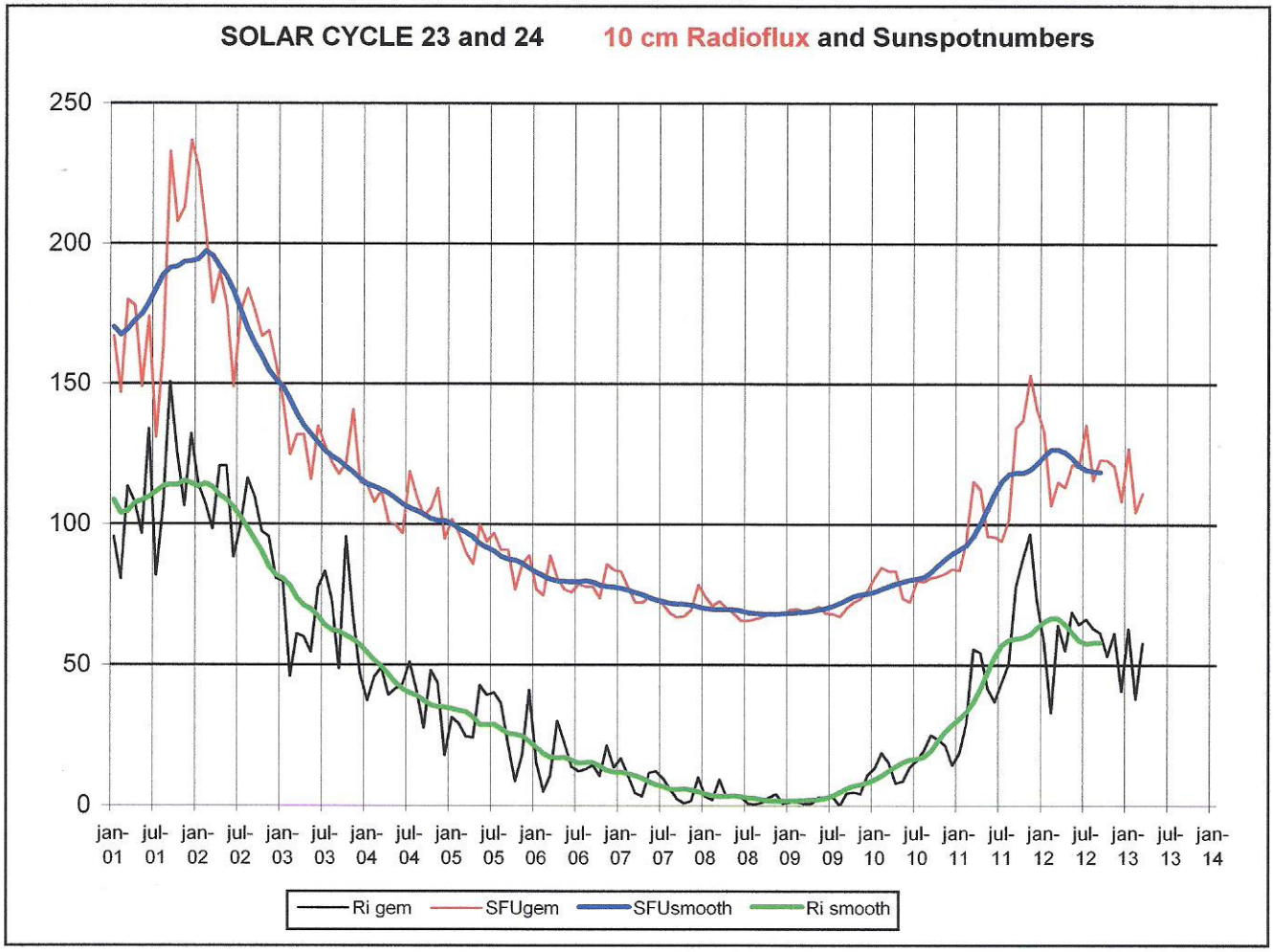
Prominences

	Spaninks		
Day	Rp(t)	Rp(N)	Rp(St)
1			
2			
3			
4	93	46	47
5	112	68	44
6			
7			
8			
9			
10			
11			
12			
13			
14	150	71	79
15			
16			
17			
18	148	68	80
19			
20			
21	138	67	71
22			
23			
24			
25			
26	113	68	45
27	132	59	73
28	111	55	56
29			
30			
31	144	75	69

Spaninks: 63 mm protub.tel + PST 40 Coronado

Flares in MAART 2013





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

Date	R'_i	PPSI	600	2800	COS	SFI	XI	Ak	SEA
28	44	38	-	106	////	3	0/0	11	
1	57	27	-	113	////	2	0/0	33	
2	71	45	-	111	////	0	0/0	18	
3	68	31	-	112	////	0	0/0	11	
4	65	23	-	114	////	0	0/0	5	
5	61	30	-	118	////	2	1/0	6	
6	57	22	-	114	////	0	0/0	3	
7	49	27	-	114	////	0	0/0	3	
8	54	20	-	115	////	0	0/0	2	
9	60	23	-	116	////	0	0/0	9	
10	74	40	-	119	////	0	0/0	5	
11	75	41	-	120	////	1	0/0	7	
12	85	67	-	123	////	11	0/0	8	
13	81	67	-	123	////	2	0/0	4	
14	91	107	-	123	////	1	0/0	4	
15	82	77	-	123	////	22	1/0	6	
16	81	109	-	126	////	5	0/0	12	
17	88	93	-	126	////	1	0/0	56	
18	79	48	-	118	////	0	0/0	8	
19	49	41	-	110	////	1	0/0	8	
20	38	37	-	108	////	1	0/0	11	
21	36	13	-	106	////	0	1/0	14	
22	36	9	-	101	////	2	0/0	7	
23	36	10	-	98	////	1	0/0	12	
24	30	7	-	96	////	0	0/0	6	
25	31	9	-	93	////	2	0/0	3	
26	22	11	-	92	////	0	0/0	3	
27	28	13	-	93	////	0	0/0	27	
28	35	14	-	99	////	0	0/0	11	
29	53	29	-	105	////	0	0/0	29	
30	54	26	-	108	////	0	0/0	19	
31	70	34	-	113	////	0	0/0	6	

R'_i : 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 be subtracted from the mean solar constant to account for the sunspot contribution.
600 : 600 Mhz solar flux from the station at Humain (Belgium).
2800 : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UGEOI). The 10.7cm Flux data are a service of the National Research Council of Canada.
COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Terre Adélie).
SFI : From October 1992, Solar Flare Index from the S.I.D.C. (origin : Ursigrams – UGEOR, evaluation : 1 x Sn+10 x "1"+100 x ">1".
XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin : Ursigrams – UGEOR, UGEOI).
Ak : geomagnetic index from Wingst, Germany (origin : Ursigrams).
SEA : sudden enhancements of atmospherics from Uccle & Humain (Royal Observatory, Belgium).

Note that due to problems of interferences saturating our receivers, no SEA could be detected this month.

Review of solar activity (25 Feb 2013 - 3 Mar 2013)

The period started with a peculiar long duration flare on Feb 25: it lasted 18 hours but reached a flat peak only within the B-class. The long duration flare is visible as a flat bump in the GOES X-ray flux data.

We speculate this flare originated in NOAA AR 1678 (behind the West limb), which had a beta-gamma-delta configuration when it passed over the Solar West limb on Feb 23.

Despite the presence of the beta-gamma configuration of NOAA AR 1682 from Feb 26 onwards, no C-class (or larger) flares were recorded up till March 2 when NOAA AR 1681 produced two minor C-flares.

The GOES proton flux (>=10 MeV) levels increased for 24hours starting around Feb 27 05:00 UT but did not cross event thresholds.

Review of geomagnetic activity (25 Feb 2013 - 3 Mar 2013)

In the beginning of the period, the solar wind speed was low and geomagnetic activity very quiet (Kp max 2). From Feb 28 onwards, we became under the influence of a fast solar wind stream of a coronal hole in the Northern solar hemisphere. It is the black hole lined next to a line of longitude (connecting one pole with the other).

Review of solar activity (4 Mar 2013 - 10 Mar 2013)

Solar activity was low during the full week, with the exception of an impulsive M1.2 flare from active region NOAA 1686 peaking at 07:54 UT on 5 March.

The cut-outs underneath are from the same SDO/AIA 171-image taken at 08:00UT on 5 March. They show resp. the ongoing M-class flare in NOAA 1686 (bottom right), nice coronal loops hovering over the spotless regions NOAA 1681 and 1684 (top right), and trans-equatorial interaction between NOAA 1687 (north, spotless) and NOAA 1688 (south, one small sunspot).

Noticeable Solar Events (4 Mar 2013 - 10 Mar 2013)

DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA	NOTE
5	0747	0754	0759	S15W54	M1.2	SF	0	III/1 II/1		1686	

LOC: approximate heliographic location
XRAY: X-ray flare class
OP: optical flare class
10CM: peak 10 cm radio flux

TYPE: radio burst type
Cat: Catania sunspot group number
NOAA: NOAA active region number

Review of geomagnetic activity (4 Mar 2013 - 10 Mar 2013)

Geomagnetic conditions were quiet during the whole week: no ICMEs (Interplanetary Coronal Mass Ejections), and -though coronal holes were certainly present as shown in the SDO-image underneath- no fast solar wind speed streams arrived at the Earth.

The electron flux (greater than 2MeV) at geosynchronous altitudes subsided to moderate values by the end of the period. They had been at high levels since 02 March due to the effects of a coronal hole wind stream.

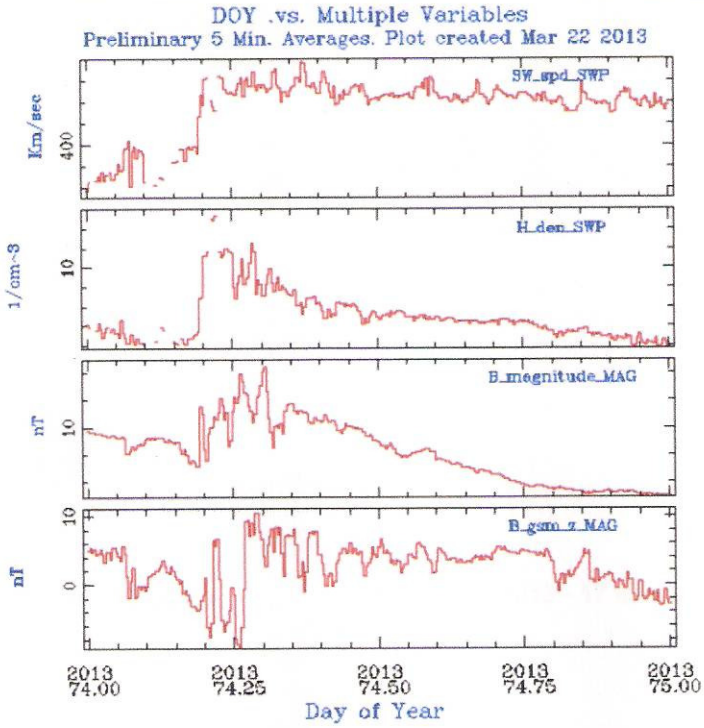
Review of solar activity (11 Mar 2013 - 17 Mar 2013)

The week started on March 11 with quiet conditions. On Tuesday March 12, the solar activity became eruptive featuring a partial halo Earth bound CME associated with a long duration C2.0 flare from NOAA 1690. On Friday March 15th an M1.2 flare occured and was accompanied by a full halo CME towards Earth. You can check CACTus, the software that detects automatically CMEs inSOHO/LASCO-C2 coronograph: http://sidc.oma.be/cactus/catalog/LASCO/2_5_0/qkl/2013/03/CME0048/CME.html

The GOES proton flux (>=10 MeV) levels increased accordingly on March 15 from 20:00UT and just passed the threshold of 10 pfu on March 16th around 20:00 UT. The flux dropped below the 10 pfu treshold on March 17th around 08:30 UT. It reached normal levels during the second part of March 18.

Review of geomagnetic activity (11 Mar 2013 - 17 Mar 2013)

Geomagnetic activity was quiet to moderate during the week.
Even on Friday March 15 when the CME that left the Sun on Tuesday March 12th arrived. Only a small jump in the solar wind speed, density and temperature was measured by ACE. The Bz component of the interplanetary magnetic field stayed mainly positive. This was the reason why the geomagnetic influence stayed limited. The graph below shows the in situ measurements done by ACE of 4 solar wind parameters on March 15. The top panel is the solar wind speed, the second is the plasma density, the third shows the total magnetic field and the bottom panel shows the Bz component of the IMF.



However, the conditions changed on March 17 when the full halo CME of Friday March 15th arrived on Earth.
The CME passed the spacecraft ACE just before 3UT: see the graph below. The jump in the magnetic field (top panel), the density (third panel), solar wind speed (fourth panel) and plasma temperature (bottom panel) is a sign that a shock passed. The shock is followed by the post-shock sheat in which Bt (white curve in the top panel) and Bz (red curve in the top panel) fluctuate. At a certain point, Bz turns slowly from negative to positive values: the magnetic field rotates from 1 direction to the opposite direction. This is the magnetic cloud, the actual CME.

Noticeable Solar Events (11 Mar 2013 - 17 Mar 2013)

DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA	NOTE
15	0546	0658	0835	N11E12	M1.1	1F	150	IV/2	16	1692	Full halo CME

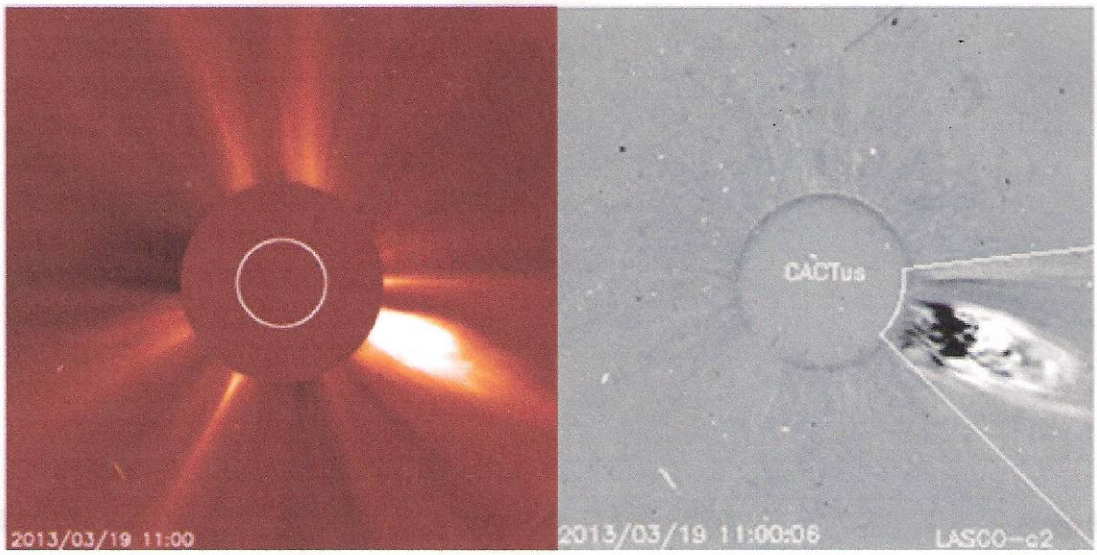
LOC: approximate heliographic location
XRAY: X-ray flare class
OP: optical flare class
10CM: peak 10 cm radio flux

TYPE: radio burst type
Cat: Catania sunspot group number
NOAA: NOAA active region number

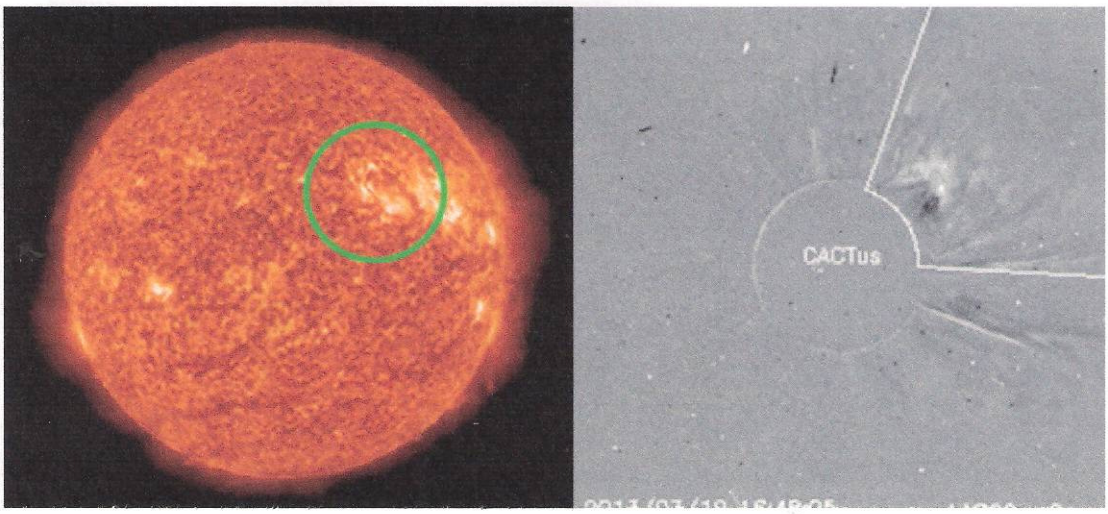
Review of solar activity (18 Mar 2013 - 24 Mar 2013)

Past week's solar activity was at quiet to eruptive levels, with several C-flares mainly originating from active regions NOAA 1698 and 1692. The largest event was an M1.6 flare in active region NOAA 1692 peaking at 22:04UT on Thursday 21 March.

A CME was detected around 08:00UT on 19 March originating from active region NOAA 1698, located behind the west limb. The CME was propagating to the southwest of the Sun-Earth line.



A few hours later on the same day (19 March), another CME was observed due to a filament eruption near active region NOAA 1695. The x-ray flux peaked already at 14:23UT (C1.5), and the first hints of this faint CME became visible in the LASCO-images around 15:30UT. From STEREO-A data, it could be deduced that this CME had a more Earth-directed component.



Review of geomagnetic activity (18 Mar 2013 - 24 Mar 2013)

Geomagnetic activity was quiet to moderate during the week.

Geomagnetic activity reached active conditions with K-values up to 4 as measured in Dourbes on Thursday morning 21 March from midnight till 06:00UT due to the arrival of the 17 March halo CME. ACE measured a jump in the solar wind speed to 730 km/s. See image underneath.

Also geomagnetic conditions were active in Dourbes from Saturday 23 March 21:00 UT until early morning on Sunday 24 March due to the arrival of the 19 March CME from NOAA 1695.

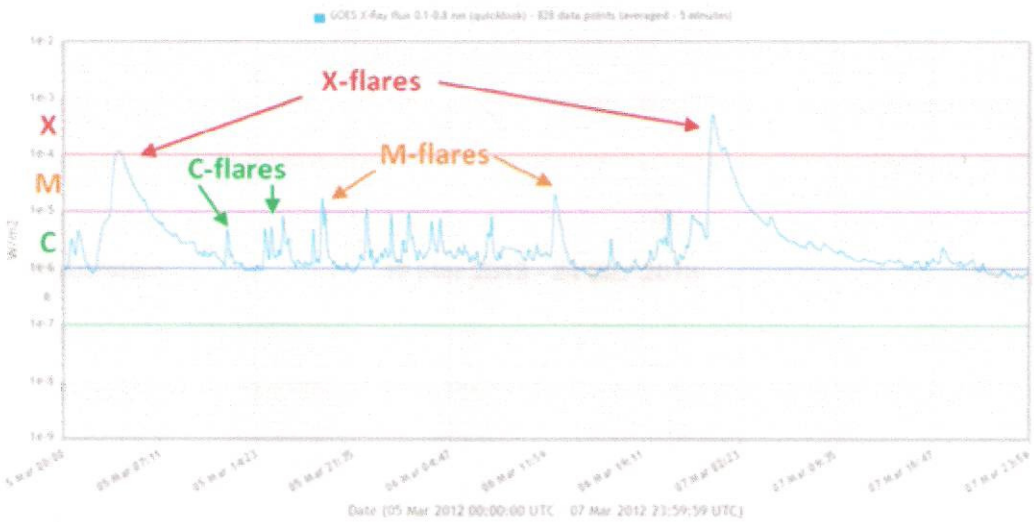
Noticeable Solar Events (18 Mar 2013 - 24 Mar 2013)

DAY	BEGIN	MAX	END	LOC	XRAY	OP	10CM	TYPE	Cat	NOAA	NOTE
21	2142	2204	2236	W limb	M1.6		0	III/1		1692	

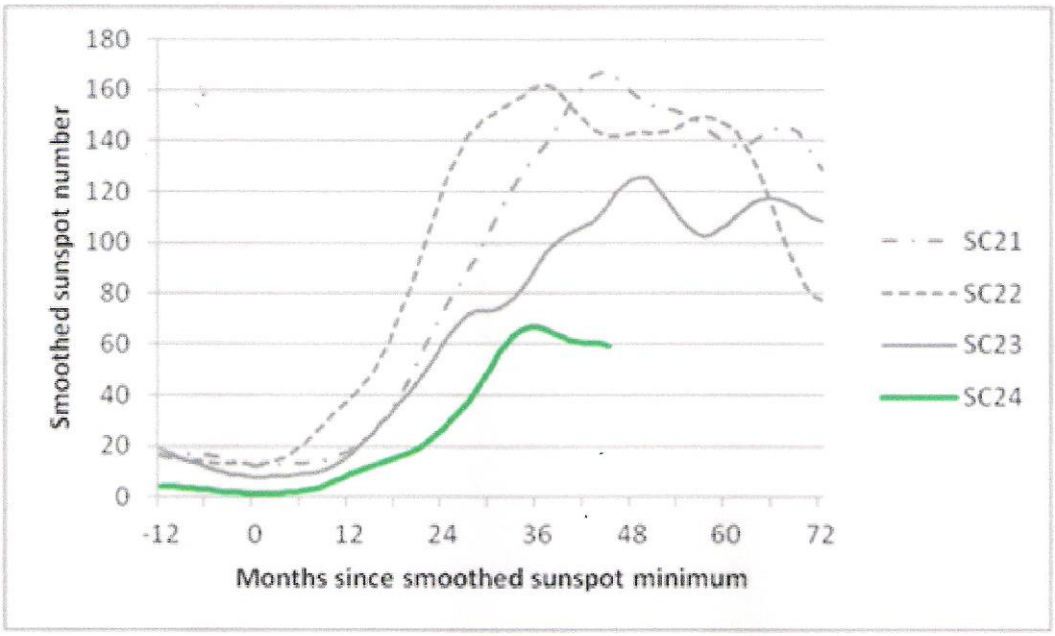
LOC: approximate heliographic location
XRAY: X-ray flare class
OP: optical flare class
10CM: peak 10 cm radio flux
TYPE: radio burst type
Cat: Catania sunspot group number
NOAA: NOAA active region number

The numbers are down... (25 Mar 2013 - 31 Mar 2013)

A solar flare is a sudden release of an enormous amount of energy due to magnetic reconnection in the solar atmosphere, usually above sunspot regions. This energy release takes place over the entire electromagnetic spectrum. Solar flares are often classified according to their peak strength in x-rays. Scientists usually use three categories: "C" (common), "M" (medium) and "X" (extreme), with each category 10 times stronger than the previous one. As an example: an X6-flare is 10 times stronger than an M6-flare, and 600 times stronger than a C1-flare.

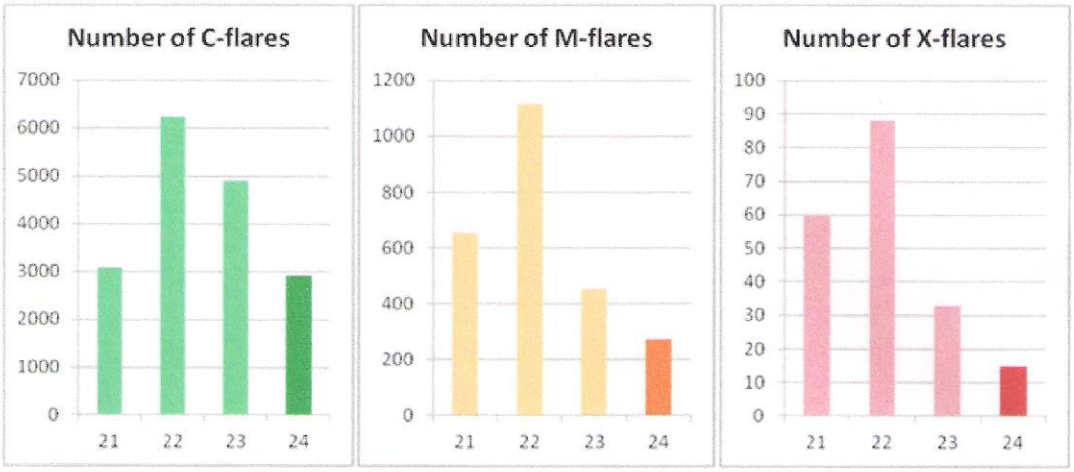


51 months have elapsed now since the previous solar cycle minimum in December 2008. Though sunspot activity has risen, it has also been relatively low, notwithstanding a brief intensification during the second half of 2011. Thus, it's no surprise that also the number of solar flares has been relatively low.

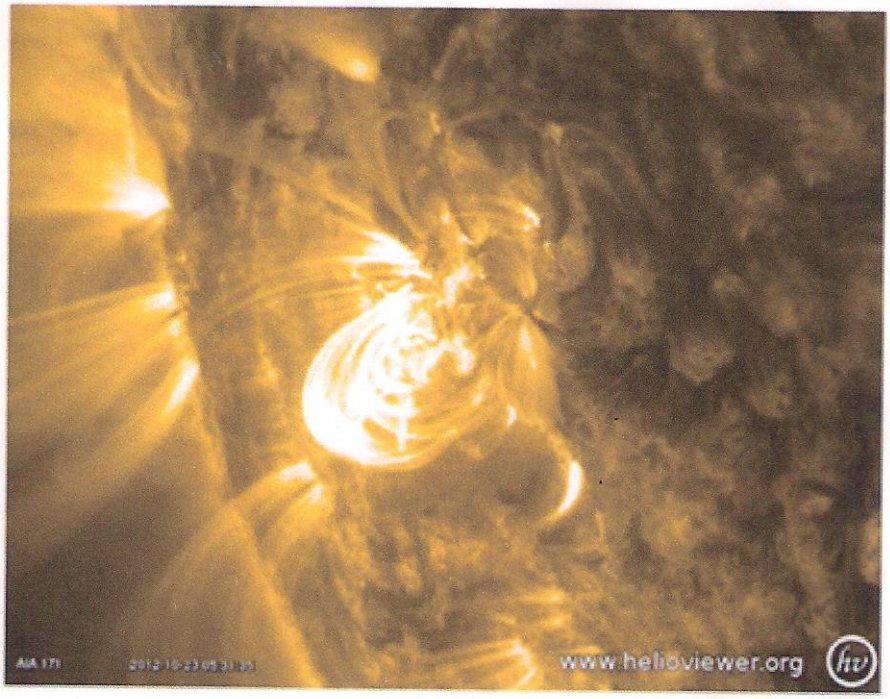


In order to get a feeling how low, a comparison is made with the previous 3 solar cycles for the same period (51 months), based on data from NOAA/NGDC (http://www.ngdc.noaa.gov/stp/solar/).

As can be seen in the image below, the number of flares for each category is the lowest for the ongoing solar cycle 24 (SC24). Only in the C-class, numbers are comparable to SC21. For the stronger M- and X-category, the numbers are depressingly low, with SC24 having produced so far only half of what SC23 produced. And these numbers pale when compared to the very active SC21 and SC22, attaining only about a quarter. An overview of the 15 X-class solar flares from SC24 can be found in a previous STCE Newsletter at http://www.stce.be/news/167/welcome.html



Isn't there any good news? Maybe. Both SC21 and SC23 started slow, but were quite active during the second half producing many M- and X-class solar flares. At the end of the cycle, SC21 even managed to produce more flares in all three categories than SC22, while SC23 is still well known for the Halloween events and for particular active episodes in January and September 2005. So, there's still hope for SC24, and we may see more X-class solar flares such as this X1.8-event from 23 October 2012 (image underneath; post-flare coronal loops)!



Review of solar and geomagnetic activity (25 Mar 2013 - 31 Mar 2013)

Solar Activity

Solar activity was very low during the week, with no flaring activity above C level. The only noticeable event was a type II burst on March 30th, around 1320 UT, which was associated with a B4.8 flare in NOAA AR 1708, but without any clear signature of a CME.

Geomagnetic Activity

Geomagnetic activity was low for most of the week, but there was a period of active conditions from March 27 (1500 UT) to March 28 (0300 UT) and a period of active to minor storm conditions from March 29 (0600 UT) to March 30 (0300 UT). These disturbed periods were linked to the effect of a coronal hole at a geoeffective position on the Sun

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SIDC DEFINITIVE INTERNATIONAL AND HEMISPHERIC SUNSPOT NUMBERS FOR 2012

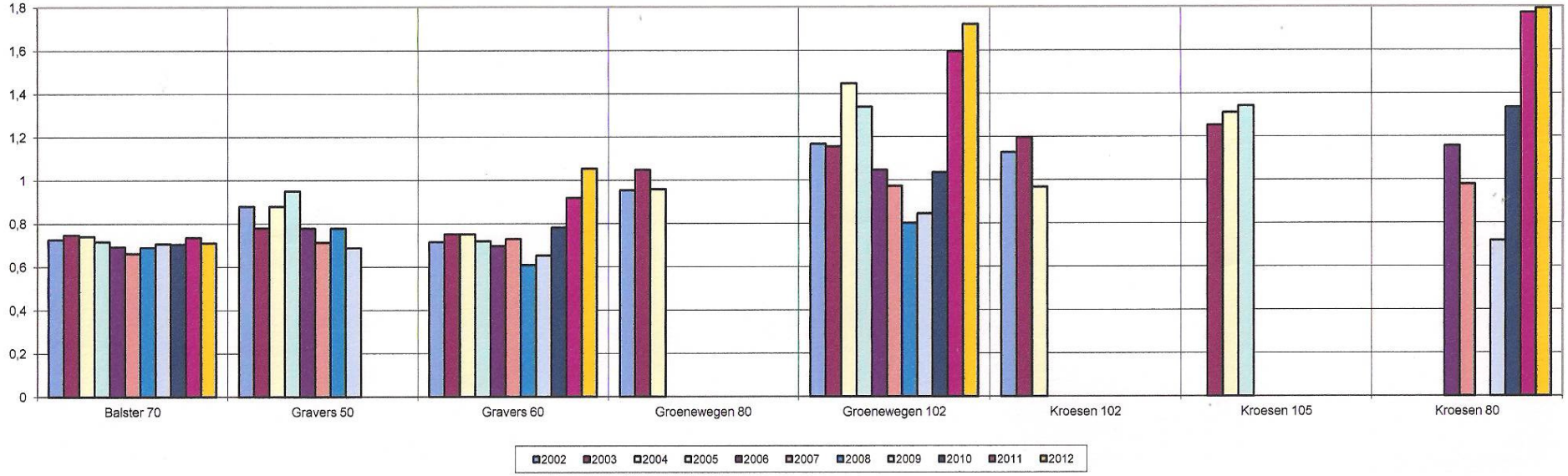
	OCTOBER			NOVEMBER			DECEMBER		
Date	Ri	Rn	Rs	Ri	Rn	Rs	Ri	Rn	Rs
1	54	27	27	33	8	25	38	38	0
2	51	12	39	32	0	32	34	34	0
3	44	0	44	31	14	17	32	32	0
4	43	0	43	32	10	22	39	39	0
5	42	0	42	36	21	15	43	35	8
6	30	0	30	33	17	16	20	20	0
7	28	0	28	43	14	29	22	22	0
8	34	0	34	46	21	25	36	36	0
9	49	22	27	46	19	27	30	30	0
10	53	30	23	56	20	36	31	31	0
11	51	25	26	76	35	41	34	34	0
12	58	33	25	86	50	36	48	48	0
13	56	32	24	85	52	33	52	52	0
14	66	49	17	94	64	30	43	43	0
15	83	58	25	97	64	33	45	25	20
16	80	53	27	100	70	30	47	26	21
17	71	39	32	98	80	18	53	29	24
18	76	46	30	93	84	9	43	17	26
19	66	45	21	85	70	15	39	13	26
20	51	40	11	74	58	16	40	14	26
21	57	37	20	75	55	20	43	15	28
22	59	44	15	67	50	17	56	21	35
23	64	40	24	55	46	9	57	22	35
24	66	39	27	58	44	14	41	19	22
25	55	28	27	59	27	32	38	29	9
26	54	27	27	51	22	29	41	32	9
27	47	25	22	54	26	28	39	30	9
28	37	13	24	54	30	24	38	28	10
29	48	20	28	55	35	20	40	30	10
30	45	14	31	49	36	13	40	30	10
31	35	9	26				64	47	17
MEAN :	53.3	26.0	27.3	61.8	38.1	23.7	40.8	29.7	11.1

Berekening van de k-factor over 2012 m.b.v. de definitieve zonnevlekkengetallen van het SIDC.

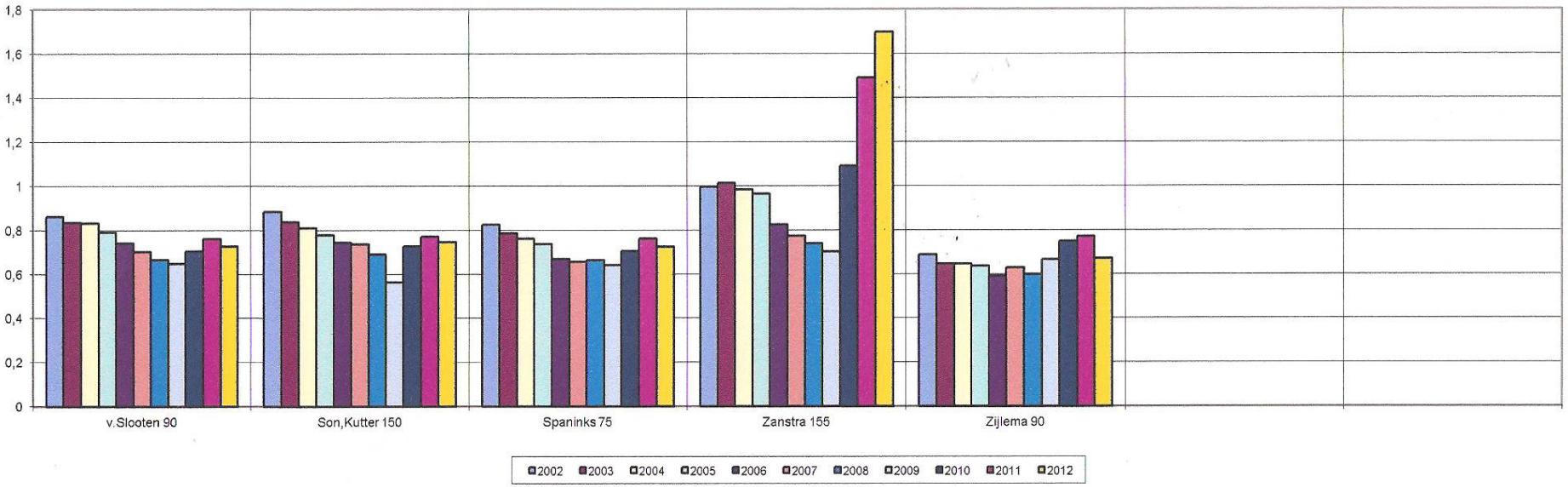
Naam:		Balster	Gravers	Groenew.	Kroesen	v.Slooten	Son	Spaninks	Zanstra	Zijlema
Instrument		70	60	102	80	90	105 K	75	Rf 155	90
Aantal waarn.	(N) =	206	29	24	78	256	144	142	201	93
waarvan R=0	(No) =	0	0	1	0	0	0	0	6	0
waarvan R>0	(Nj) =	206	29	23	78	256	144	142	195	93
k-factor	(k) =	0,711	1,054	1,720	1,792	0,727	0,747	0,725	1,698	0,672
Spreiding	(σ) =	0,10	0,33	0,86	1,01	0,11	0,14	0,12	0,95	0,15
Spreiding / k	($\sigma 1$) =	0,14	0,31	0,50	0,56	0,15	0,18	0,16	0,56	0,22

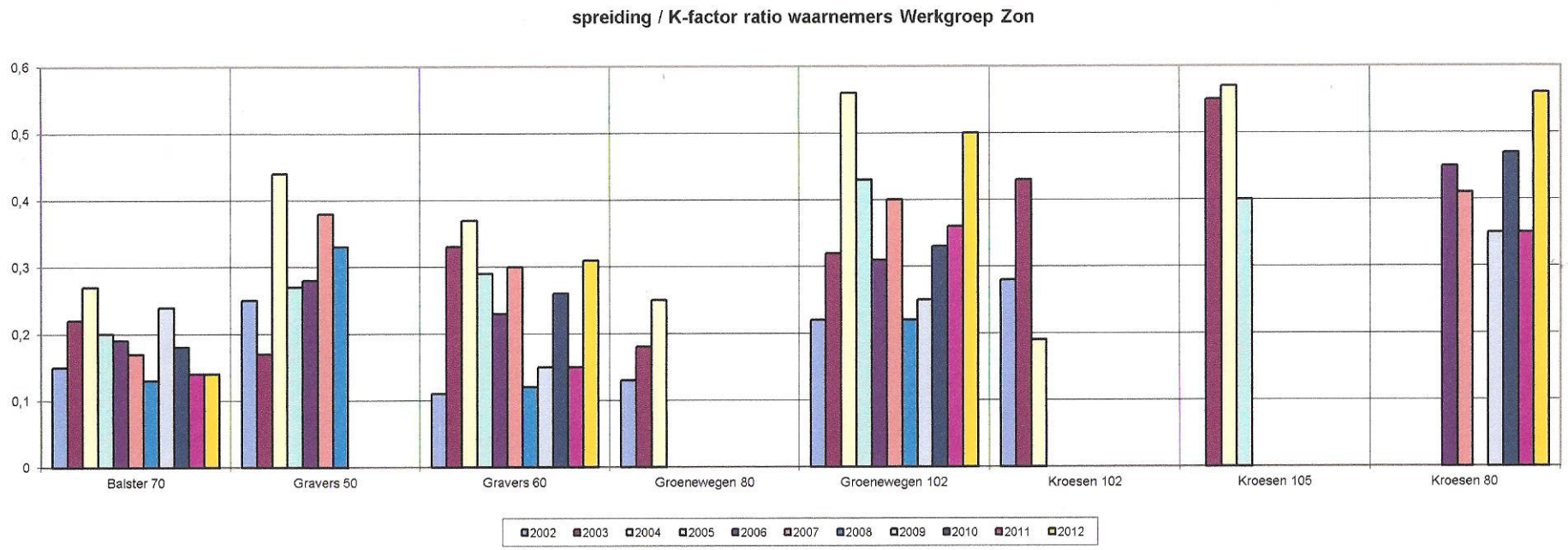
	Balster 70	Gravers 50	Gravers 60	Groenewegen 80	Groenewegen 102	Kroesen 102	Kroesen 105	Kroesen 80		
2002	0,727	0,880	0,716	0,954	1,167	1,128				
2003	0,748	0,779	0,752	1,048	1,155	1,197	1,253			
2004	0,742	0,880	0,752	0,959	1,447	0,967	1,311			
2005	0,717	0,950	0,720		1,339		1,342			
2006	0,693	0,778	0,697		1,047			1,157		
2007	0,661	0,713	0,730		0,972			0,979		
2008	0,691	0,778	0,609		0,802					
2009	0,707	0,688	0,652		0,845			0,718		
2010	0,705		0,782		1,034			1,334		
2011	0,735		0,919		1,594			1,772		
2012	0,711		1,054		1,720			1,792		
	v.Slooten 90	Son,Kutter 150	Spaninks 75	Zanstra 155	Zijlema 90					
2002	0,861	0,883	0,824	0,996	0,689					
2003	0,834	0,838	0,786	1,013	0,646					
2004	0,831	0,809	0,762	0,984	0,647					
2005	0,791	0,779	0,737	0,964	0,637					
2006	0,741	0,744	0,669	0,825	0,591					
2007	0,702	0,737	0,657	0,774	0,629					
2008	0,665	0,690	0,663	0,740	0,597					
2009	0,649	0,564	0,641	0,703	0,665					
2010	0,705	0,728	0,705	1,090	0,749					
2011	0,761	0,770	0,761	1,491	0,771					
2012	0,727	0,747	0,725	1,698	0,672					

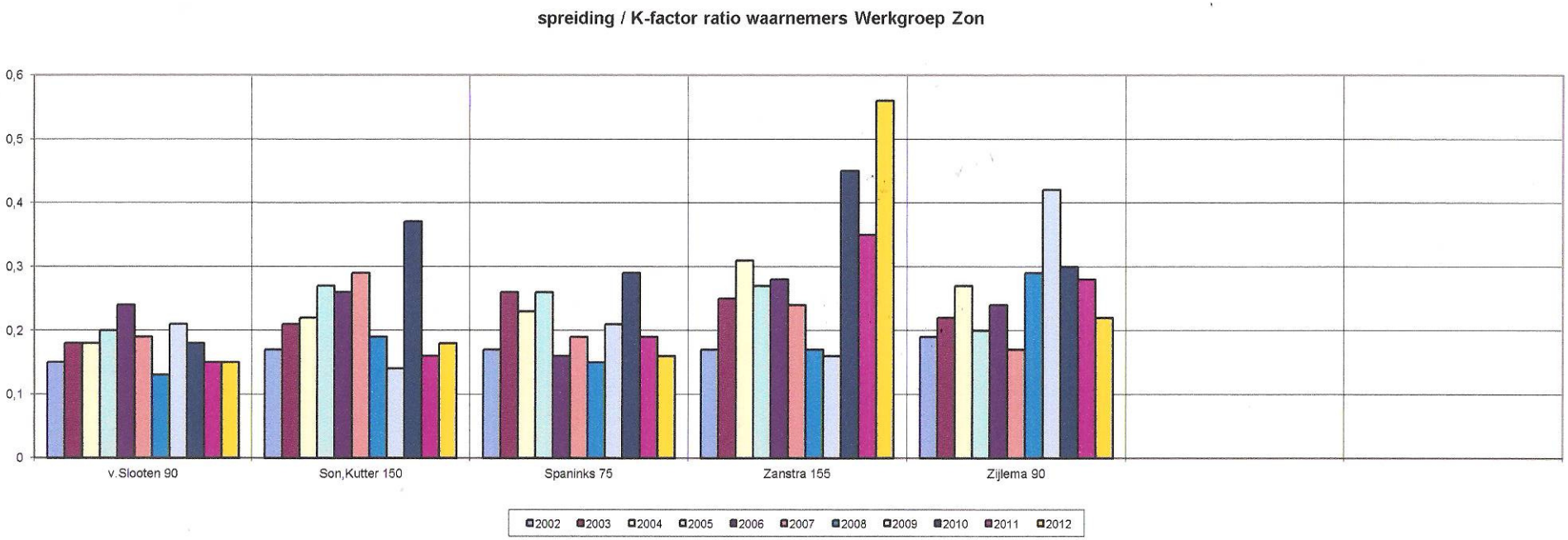
K-factoren waarnemers Werkgroep Zon

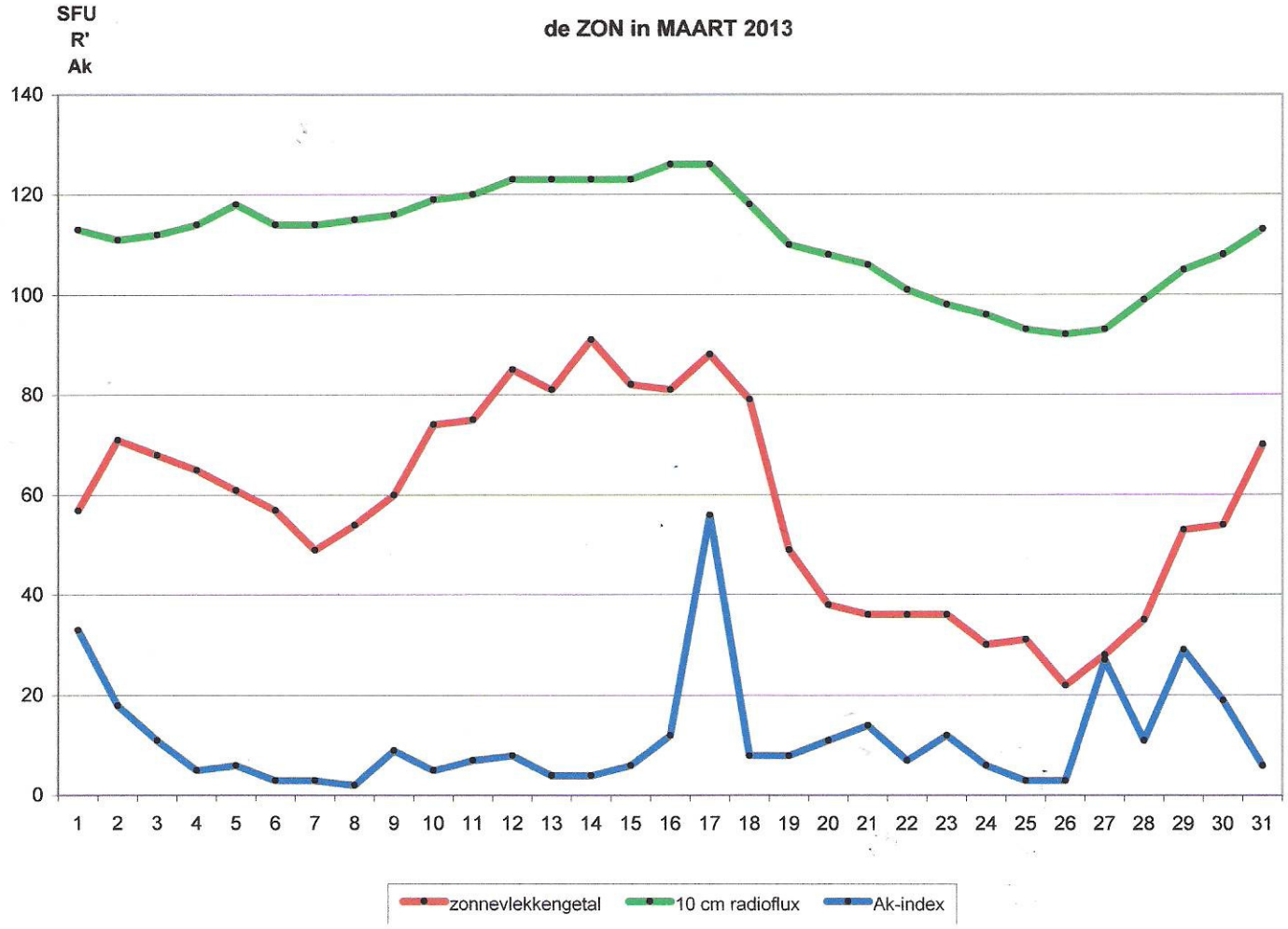


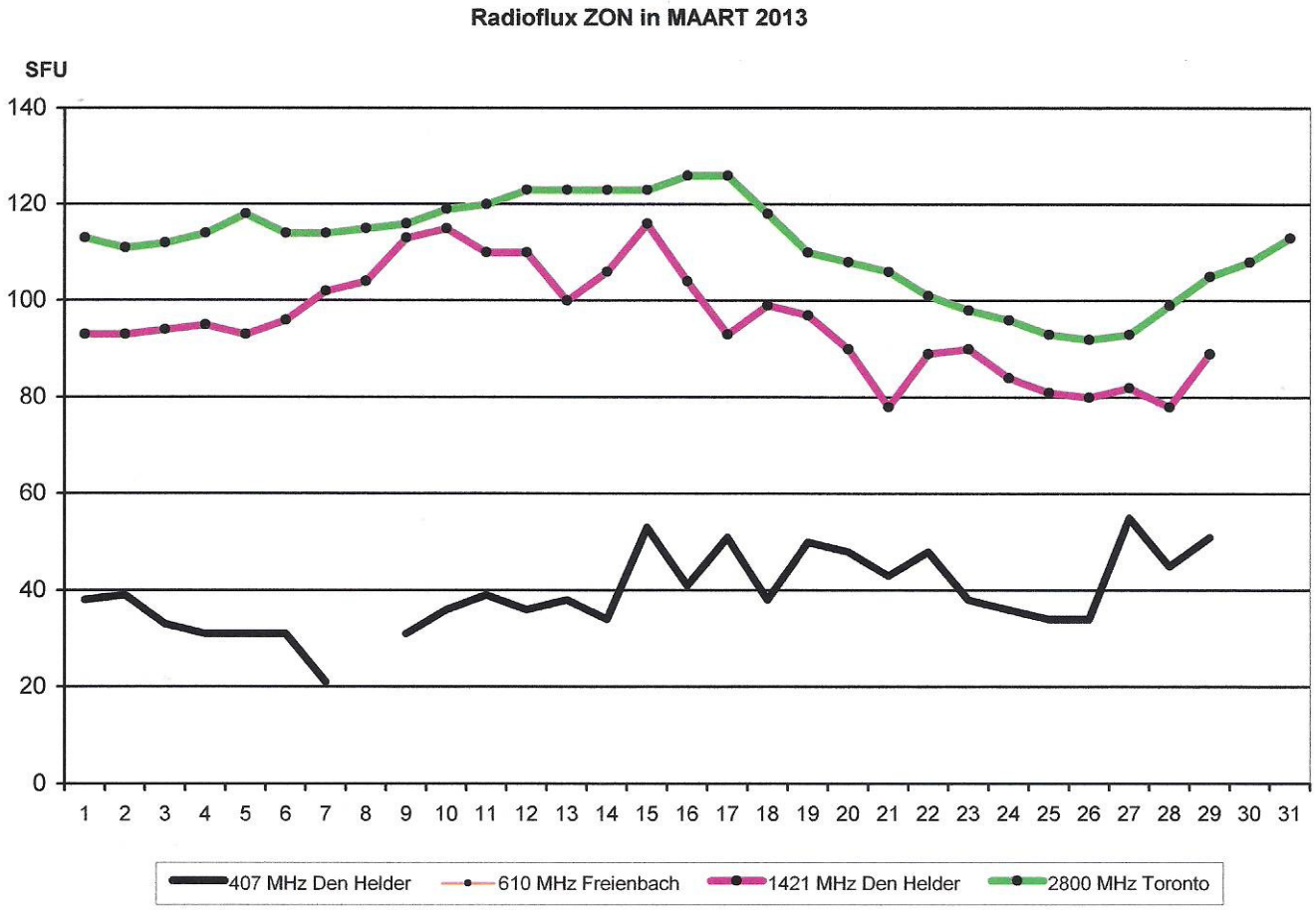
K-factoren waarnemers Werkgroep Zon




spreiding / K-factor ratio waarnemers Werkgroep Zon
0,6
0,5
0,4
0,3
0,2
0,1
0
Balster 70
Gravers 50
Gravers 60
Groenewegen 80
Groenewegen 102
Kroesen 102
Kroesen 105
Kroesen 80
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012


spreiding / K-factor ratio waarnemers Werkgroep Zon
0,6
0,5
0,4
0,3
0,2
0,1
0
v.Slooten 90
Son,Kutter 150
Spaninks 75
Zanstra 155
Zijlema 90
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012


SFU
R'
Ak
de ZON in MAART 2013
140
120
100
80
60
40
20
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
zonnevlekkengetal
10 cm radioflux
Ak-index


Radioflux ZON in MAART 2013
SFU
140
120
100
80
60
40
20
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
407 MHz Den Helder
610 MHz Freienbach
1421 MHz Den Helder
2800 MHz Toronto

Jaarverslag Werkgroep Zon over 2012

In 2012 werd het bestuur gevormd door:
T. Spaninks voorzitter
N. Heijblok penningmeester / waarneemleider
W. Majoor secretaris

De bijeenkomsten vonden plaats op 11 februari en 26 mei op Sonnenborgh en op 27 oktober in Genk.

De bestuursvergaderingen vonden plaats op 11 februari en 26 mei op Sonnenborgh.

De jaarvergadering vond plaats op 11 februari voorafgaand aan de bijeenkomst.

Op de bijeenkomst van 26 mei gaf professor de Jager een presentatie over zijn onderzoek naar de activiteit van de zon en zijn publicatie hierover in de Journal of Atmosperic and Solar-Terrestrial Physics.

In navolging op de gedachten wisseling tussen H. ten Haaf van Sterrenwacht Halley en Werkgroep Zon over een nieuw zonneobservatorium d.d. 15 oktober 2011, heeft H. ten Haaf op de bijeenkomst van 26 mei 2012 een presentatie gegeven over de verdere ontwikkelingen en ideeën.

De bijeenkomsten van 11 februari en 26 mei werden bezocht door ca. 10 leden.

Op 27 oktober vond er een gezamenlijke bijeenkomst plaats met de VVS werkgroep Zon in het Cosmodrome v.h. Europlanetarium in Genk, waar diverse presentaties werden gehouden.

In 2012 had de werkgroep 35 leden. In 2012 heeft de werkgroep 4 nieuwe leden mogen verwelkomen.

Waarnemingen:
In 2012 hebben 9 waarnemers 1.184 zonnevlekkenwaarnemingen verricht en 809 tekeningen/foto's gemaakt. Eén lid legde dagelijks, indien het weer het toeliet, de prominences op het noordelijke en zuidelijke zonneoppervlak vast.

Verder heeft 1 waarnemer dagelijks de solar-radioflux op 407 MHz (=70 cm golflengte) en 1421 MHz (=21 cm golflengte) gemeten.

Vier waarnemers deden dagelijks SID-metingen en tevens volgden vier waarnemers dagelijks het invloed van de zon op het aardmagnetisch veld.

Tot slot zijn er regelmatig waarnemingen verricht in H-α en werden protuberansen vastgelegd.

Maandelijks werd voor de leden een bulletin uitgegeven met daarin o.a. de volgende onderwerpen:

- Zonnevlekkentellingen van de eigen waarnemers
- Prominence-tellingen op noordelijk en zuidelijk zonsoppervlak
- De jaarlijkse k-factoren van de eigen waarnemers
- De definitieve zonnevlekken-getallen per kwartaal
- Incidentele tekeningen van zonnevlekgroepen en protuberansen
- Radiowaarnemingen van eigen leden op 4017 en 1421 MHZ
- Magnetogrammen van leden, verenigingsmededelingen
- Het SIDC maandrapport met voorlopige zonnevlekken-getallen van de maand, de radioflux op 600 en 2800 MHz, de Ak-factor, specificaties van flares en radiobursts
- Interessante artikelen, aankondigingen van evenementen en bijeenkomsten.

De zonnevlekken-getallen en de solar radio flux werden gepubliceerd op de website van de European Radio Astronomy Club (ERAC).

Contacten derden:
Met diverse werkgroepen werden contacten onderhouden en abonnementen uitgewisseld: JWG (Universum), Coronae Borealis, Sterrenwacht Halley, VVS Werkgroep Zon, Ursa Astronomical Association (Finland), Fachgruppe Sonne (Duitsland) en Towarzystwo Obserwatorow Slonca (Polen).

Noteer alvast in uw agenda:

De volgende werkgroepbijeenkomsten zijn:

12 oktober 2013 en 15 februari 2014