

# Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS  
SOLAR COMMITTEE



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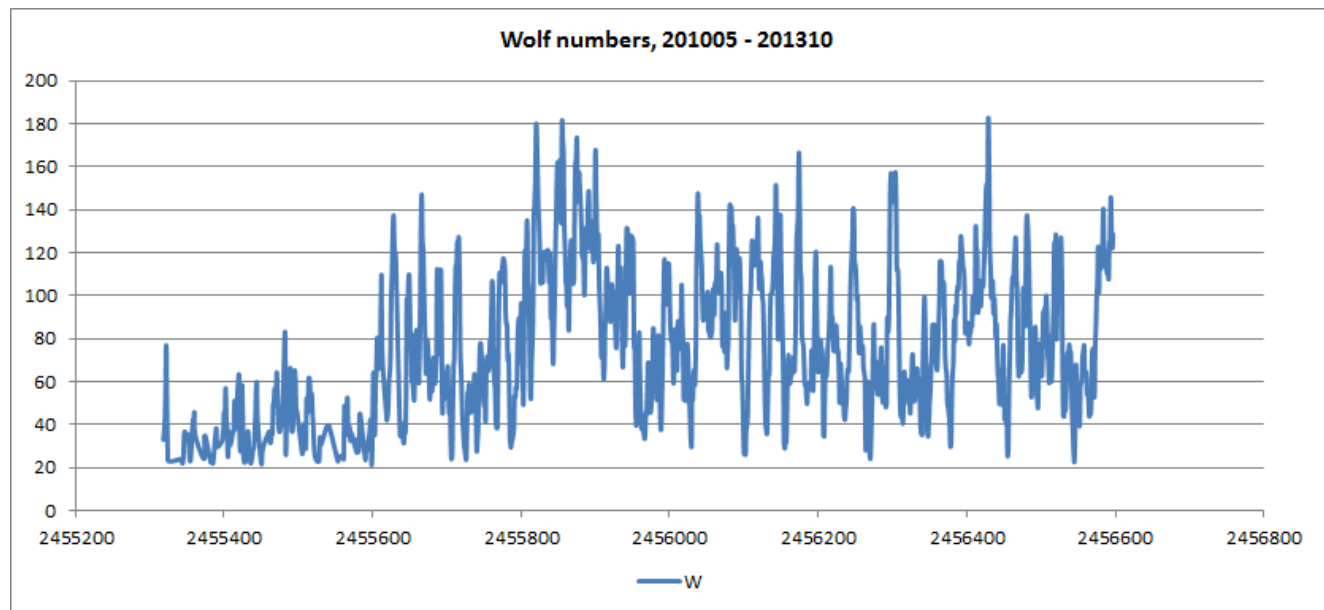
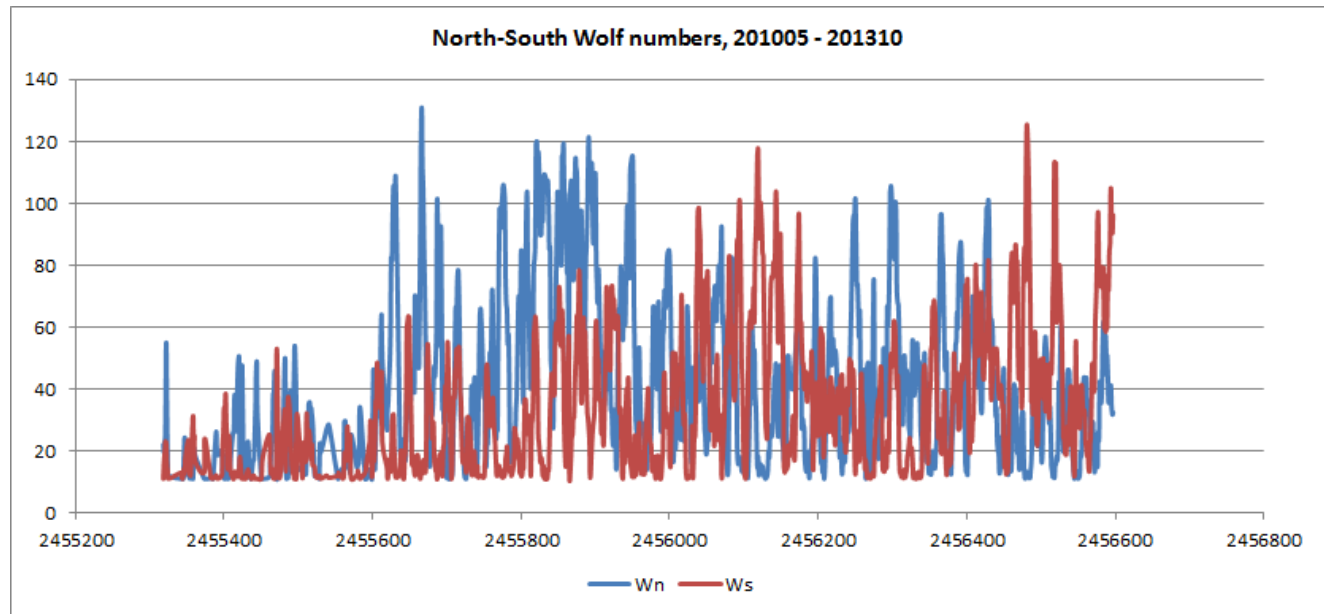
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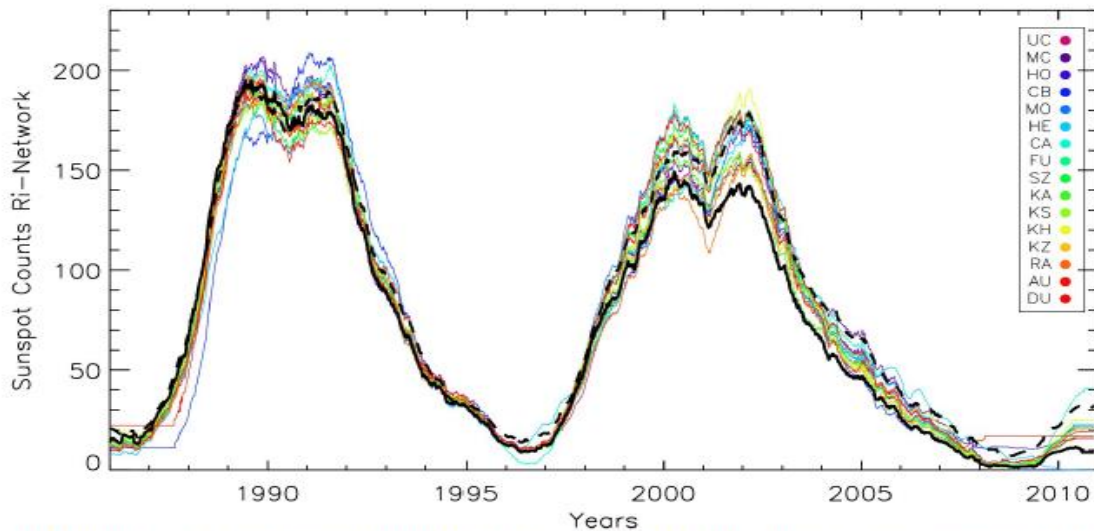
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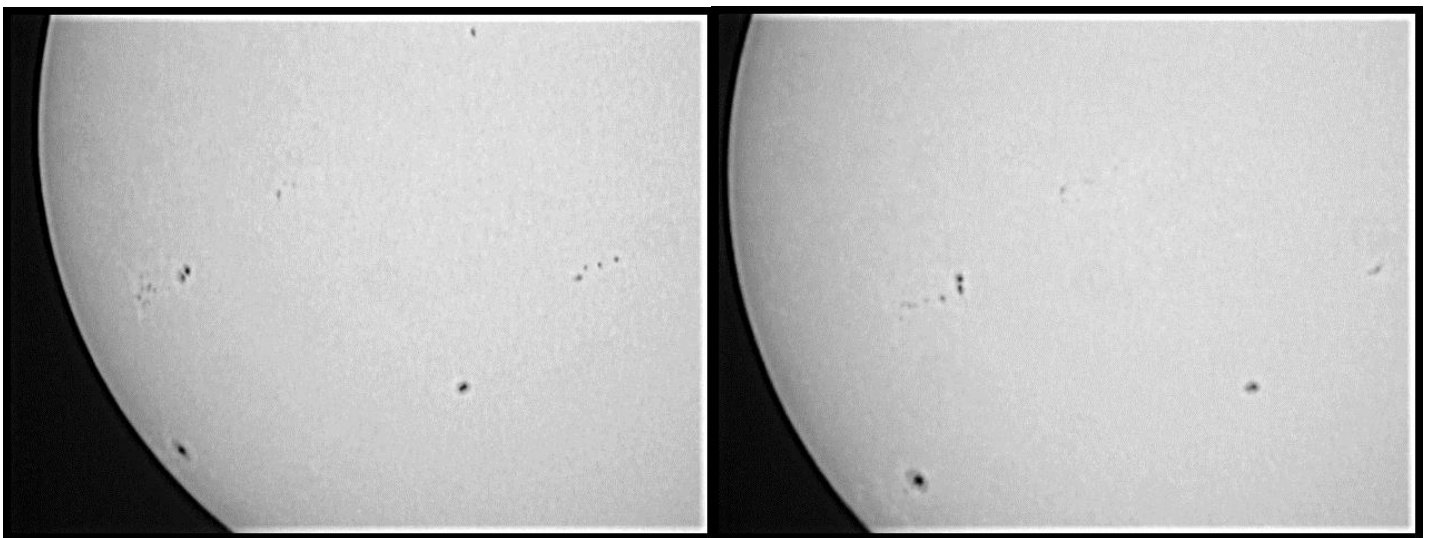


Above are two graphs of AAVSO Wolf numbers from May, 2010 thru October, 2013. First graph shows North-South hemisphere Wolf numbers, and the second graph shows total Wolf numbers. It doesn't seem this solar cycle has peaked yet. Although, there is some indication of the North/South polarity cross over about 400 days ago, but even that is not conclusive. (These are raw numbers, not

calculated American Ra numbers). This does not seem to be a normal solar cycle when compared to the last two past cycles, as seen in the graph below. Graph courtesy of SIDC.

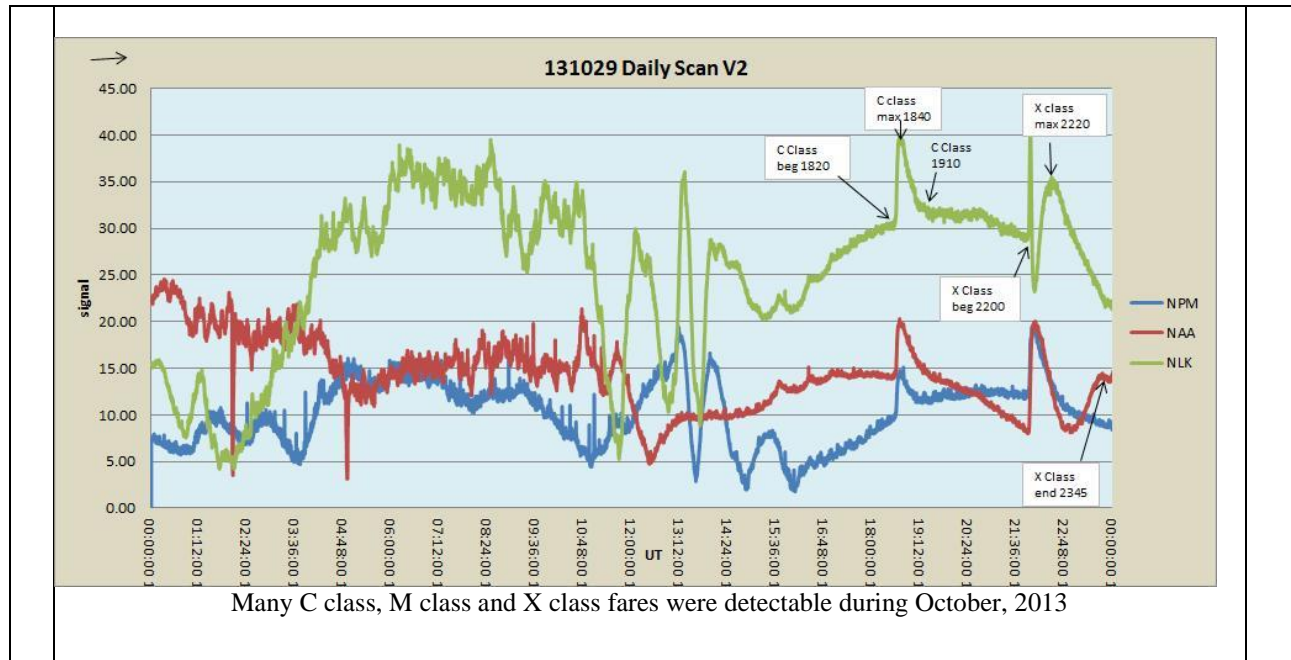


**16 Stations :** Kawaguchi, Fujimori, Kislovodsk, Kandili, Kanzelhöhe, Uccle, Helwan (Egypt), Camaguey (Cuba,CB),Holloman, Mac Kenzie, Mochizuki, Ramey, Coonabarabran (Australia,AU), Dubois (Belgium), Suzuki, Catania + Locarno +  $R_2(F_{10.7})$



Dan Vidican (VIDD) sends these two images taken October, 19 and 20. Also, note that the SunEntry database now allows you to enter group and sunspot counts which have been counted from CCD images. That is, you can enter into the header information that you are counting groups and sunspots from CCD images like these (above). We are experimenting with this idea to see if folks who count groups and sunspots from CCD images come up with different numbers than the overall visual observer counts. If you're interested in submitting counts taken from CCD images please email me (Solar Bulletin editor) at [ahowe@frii.com](mailto:ahowe@frii.com) or Sara Beck [sara@aavso.org](mailto:sara@aavso.org)

# Sudden Ionospheric Disturbance Report



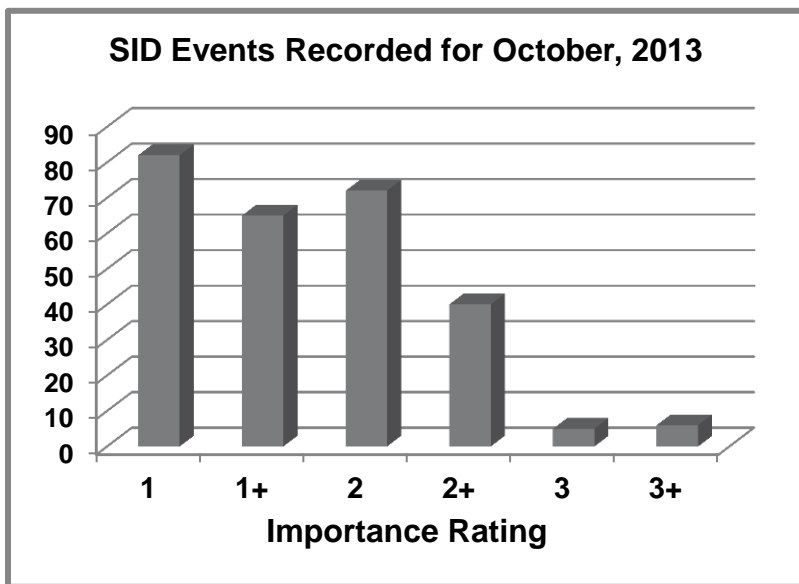
## Sudden Ionospheric Disturbances (SID) Records During October, 2013

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
131002	0159	1	131011	0326	1+	131014	2304	1
131002	2335	2+	131011	1116	1+	131014	1303	2
131002	2022	3+	131011	1702	1+	131014	1320	2
131003	1952	1+	131012	0851	1	131014	0019	1+
131004	0321	2+	131012	1708	1	131014	1352	1+
131006	0051	1+	131012	0634	2	131014	1312	2+
131007	0409	2	131012	1213	2	131015	0334	1
131009	0511	1	131012	1233	2	131015	0410	1
131009	0611	1	131012	0201	1+	131015	0517	1
131009	0138	2	131012	0348	1+	131015	1454	1
131009	0000	2+	131012	0824	1+	131015	1536	1
131010	1104	1	131012	1132	1+	131015	2336	1
131010	1119	1	131012	0000	2+	131015	0000	2
131011	0412	1	131012	0000	2+	131015	0159	2
131011	0550	1	131013	0003	1	131015	0419	2
131011	1418	1	131013	0842	1	131015	0426	2
131011	2015	1	131013	1804	1	131015	0508	1+

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
131011	0718	2	131013	0923	2	131015	0836	1+
131011	0731	2	131013	1828	2	131015	1530	1+
131011	0919	2	131013	0039	3	131015	2011	1+
131011	1044	2	131013	1151	1+	131015	0917	2+
131011	1237	2	131013	0902	2+	131016	0000	1
131011	1451	2	131014	0102	1	131016	0642	1
131011	1227	3	131014	0322	1	131016	0919	1
131016	1639	1	131018	1054	1+	131022	0002	2
131016	0346	2	131018	0000	2+	131022	0207	2
131016	2148	2	131018	0000	2+	131022	0354	2
131016	0533	1+	131019	0934	1	131022	1518	2
131016	1403	1+	131019	0941	1	131022	1742	2
131016	1435	1+	131019	1039	1	131022	1843	2
131016	1523	1+	131019	1430	1	131022	0458	1+
131016	2326	1+	131019	1837	1	131022	1113	1+
131017	0000	1	131019	0116	1+	131022	1333	1+
131017	0332	1	131019	0839	1+	131022	2121	1+
131017	0614	1	131020	1629	1	131022	1420	3+
131017	1041	1	131020	1200	2	131023	0518	1
131017	1353	1	131020	0945	1+	131023	1713	1
131017	1032	2	131020	1003	1+	131023	2340	1
131017	1203	2	131020	1819	1+	131023	1118	2
131017	1540	2	131021	0815	1	131023	0000	2+
131017	0947	1+	131021	0727	2	131023	0104	2+
131017	1525	1+	131021	0714	1+	131024	0543	1
131017	0000	2+	131021	1436	1+	131024	0608	1
131018	0000	1	131021	1500	1+	131024	1007	1
131018	0831	1	131021	0708	2+	131024	1011	1
131018	1525	2	131021	0831	2+	131024	1411	1
131018	1532	2	131022	0018	1	131024	0001	2
131018	1539	2	131022	0335	1	131024	0001	2
131018	1024	1+	131022	0916	1	131024	0456	2
131018	1031	1+	131022	1308	1	131024	1035	2
131024	1450	2	131026	2235	1	131028	1201	2
131024	2208	2	131026	0032	2	131028	0203	1+
131024	0415	3	131026	0253	2	131028	1147	1+
131024	0342	1+	131026	1110	2	131028	1406	1+
131024	1259	1+	131026	0054	3	131028	1514	1+
131024	0028	2+	131026	0045	1+	131028	0000	2+
131025	1000	1	131026	0925	1+	131028	0000	2+
131025	1337	1	131026	0000	2+	131029	0228	1

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
131025	1447	1	131026	0340	2+	131029	0650	1
131025	1921	1	131026	0937	2+	131029	0022	2
131025	0302	2	131026	0943	2+	131029	0743	2
131025	0801	2	131026	1123	2+	131029	1008	2
131025	1012	2	131026	0346	3+	131029	0436	1+
131025	1510	2	131027	0935	2	131029	1016	1+
131025	1500	3	131027	0953	2	131029	1212	1+
131025	0000	1+	131027	1247	2	131029	0000	2+
131025	0954	1+	131027	1346	2	131029	1908	2+
131025	0000	2+	131027	0330	1+	131029	2136	2+
131025	0627	2+	131027	1644	1+	131029	1343	3+
131026	0146	1	131027	1754	1+	131029	1343	3+
131026	0240	1	131028	0920	1	131031	0459	1
131026	0303	1	131028	1501	1	131031	0654	1+
131026	0604	1	131028	1554	1	131031	1348	1+
131026	0856	1	131028	0441	2	131031	0000	2+
						131031	0055	3+

# Solar Events

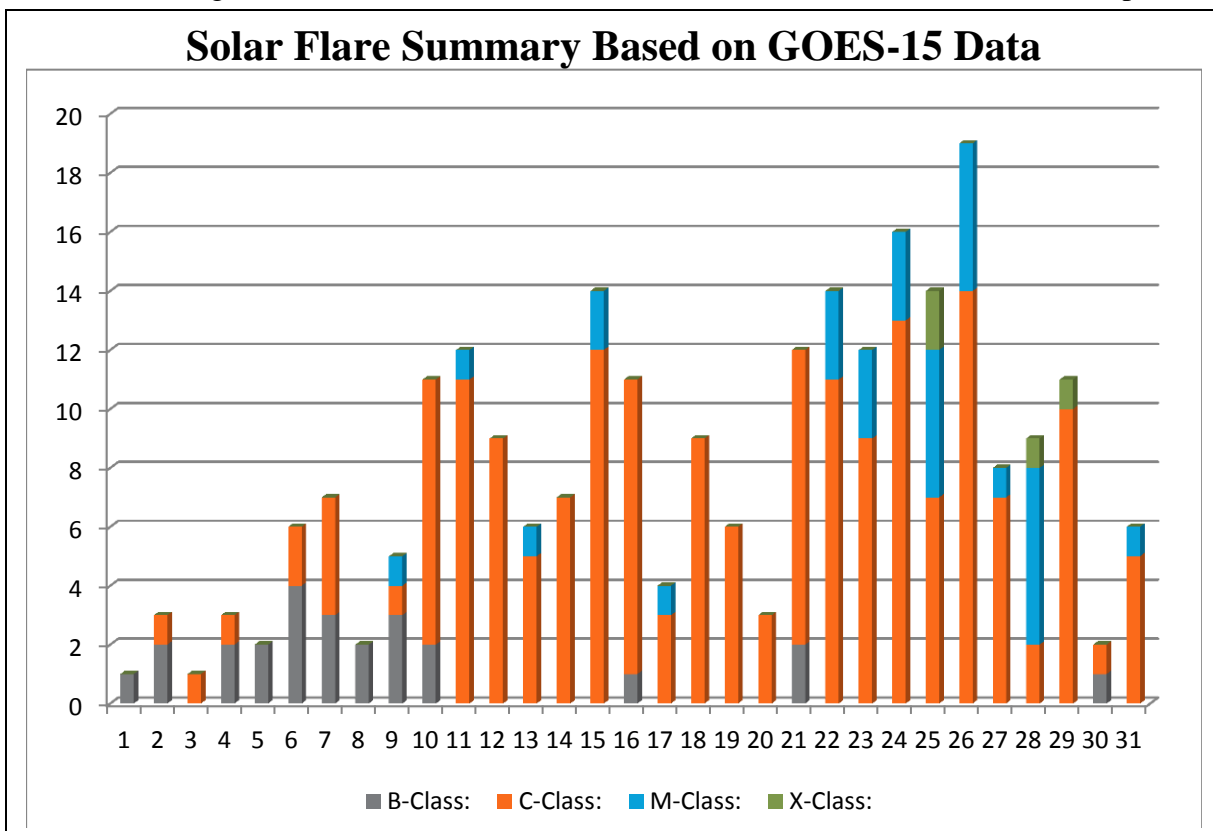


Importance rating: Duration (min)	1-: <19	1: 19-25	1+: 26-32	2: 33-45	2+: 46-85	3: 86-125	3+: >125
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### Sudden Ionospheric Disturbances (SID) Observers During October, 2013

Observer	Code	Stations Monitored	Observer	Code	Stations Monitored
A McWilliams	A94	NML	J Karlovsky	A131	DHO
R Battaiola	A96	ICV	E Soubrouillard	A132	DHO FTA ICV
J Wallace	A97	NAA	R Green	A134	JJI NWC
L Loudet	A118	GQD NAA TBB	R Mrlak	A136	GQD NSY
J Godet	A119	GBZ GQD ICV	D Koawl	A137	JJI NAA NLK
F Adamson	A122	NWC	S Aguirre	A138	NLK
S Oatney	A125	NLK NML	F Francione & C Re	A139	HWU NAA NSY
K Cotar	A129	DHO GBZ	B Terrill	A120	No data NWC down

There were 245 solar flares measured by GOES-15 for October, 2013, 4 X class, 32 M class, 183 C class and 26 B class flares. The sun produced 3 times the number of flares this month compared to last, an amazing turn around. There were 16 AAVSO SID observers who submitted reports.



American Relative Sunspot Numbers (Ra) for  
 October, 2013 [**boldface = maximum, minimum**]

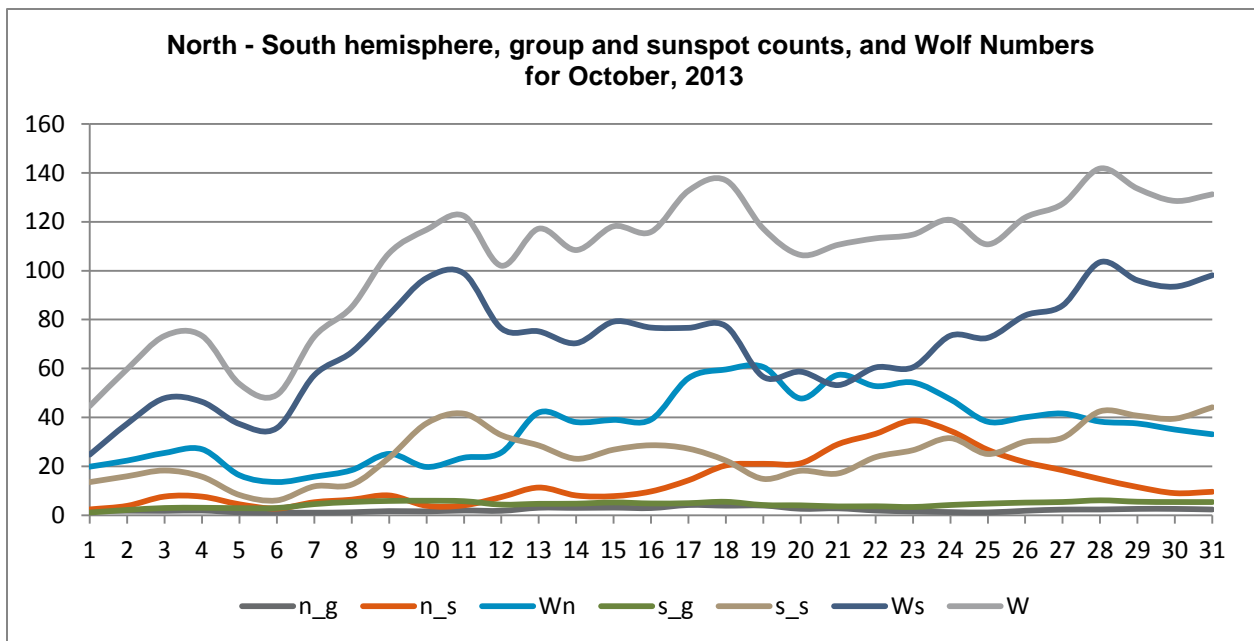
DAY	NumObs	RAW	Ra
1	27	45	<b>32</b>
2	36	59	42
3	35	79	56
4	28	72	52
5	34	56	39
6	37	47	34
7	38	68	51
8	39	79	60
9	38	101	73
10	34	97	74
11	32	105	75
12	34	105	76
13	26	119	87
14	33	105	80
15	30	103	80
16	23	106	73
17	30	127	89
18	35	137	<b>101</b>
19	40	113	88
20	36	101	75
21	32	111	86
22	34	108	78
23	29	110	84
24	36	114	88
25	32	107	79
26	30	123	93
27	35	128	95
28	35	138	<b>101</b>
29	29	128	96
30	30	126	89
31	33	119	83
<b>Average</b>	<b>32.9</b>	<b>101.1</b>	<b>74.5</b>

Obs	#Obs	Name
AAP	3	A. Patrick Abbott
AAX	13	Alexandre Amorim
AJV	16	J. Alonso
ARAG	31	Gema Araujo
ASA	17	Salvador Aguirre
BARH	9	Howard Barnes
BATR	3	Roberto Battaiola
BDDA	22	Diego Bastiani
BERJ	22	Jose Alberto Berdejo

BMF	22	Michael Boschat
BRAB	30	Brenda Branchett
BRAF	8	Raffaello Braga
BROB	29	Robert Brown
BSAB	21	Santanu Basu
BXD	12	Alexandru Burda
CFO	3	Jean F. Coliac
CHAG	14	German Morales Chavez
CIOA	10	Ioannis Chouinavas
CKB	19	Brian Cudnik
CLZ	1	Laurent Corp
CNT	11	Dean Chantiles
CVJ	7	Jose Carvajal
DEMF	2	Frank Dempsey
DGP	22	Gerald Dyck
DJOB	12	Jorge del Rosario
DUBF	19	Franky Dubois
FAM	4	Fabio Mariuzza
FERJ	15	Javier Ruiz Fernandez
FLET	16	Tom Fleming
FLF	10	Fredirico Luiz Funari
FTAA	10	Tadeusz Figiel
FUJK	19	K. Fujimori
HALB	1	Brian Halls
HAYK	16	Kim Hay
HMQ	5	Mark Harris
HOWR	22	Rodney Howe
JASK	19	Krystyna Wirkus
JGE	9	Gerardo Jimenez Lopez
JJK	2	Jerry Klotz
JJMA	13	Jessica M. Johnson
KAPJ	16	John Kaplan
KNJS	21	James & Shirley Knight
KROL	24	Larry Krozel
LEVM	22	Monty Leventhal
LKR	14	Kristine Larsen
MCE	19	Etsuiku Mochizuki
MGAA	2	Gael Mariani
MILJ	18	Jay Miller
MJHA	26	John McCammon
MMI	23	Michael Moeller
MUDG	10	George Mudry
OATS	12	Susan Oatney
OBSO	16	IPS Observatory
ONJ	5	John O'Neill
RICE	11	E. C. Richardson
RLM	12	Mat Raymonde

SCGL	25	Gerd-Lutz Schott	WAU	2	Artur Wargin
SDOH	31	Solar Dynamics Obs - HMI	WILW	21	William M. Wilson
SIMC	9	Clyde Simpson	WKM	2	Michael Wiskirken
SMNA	7	Michael Stephanou	WRP	3	Russell Wheeler
SONA	18	Andries Son			
STAB	28	Brian Gordon-States			
SUZM	18	Miyoshi Suzuki	<b>Total</b>	<b>Observers:</b>	<b>71</b>
TESD	20	David Teske	<b>Total</b>	<b>Observations:</b>	<b>1020</b>
URBP	26	Piotr Urbanski			
VARG	15	A. Gonzalo Vargas			
VIDD	5	Daniel Vidican			

40 of our 71 observers submitted data on the sunspot and group counts for the Sun's north and south hemispheres. It is interesting to note how the Wolf numbers of groups and Sunspots counts cross over on the 19<sup>th</sup> and 21<sup>st</sup> day this month, and the southern hemisphere is predominant.





# Creating the Solar Bulletin

Creating the Solar Bulletin each month is a team effort mostly between Kim Hay, the Sunspot Report Coordinator, and Rodney Howe, the Solar Chair, Solar Bulletin editor, and SID analyst. We thought you might be interested to read what each of them do and what is involved in the process.

Kim Hay is the one who monitors the [solar.aavso@gmail.com](mailto:solar.aavso@gmail.com) email account, and helps new and existing observers with any questions they may have. When she receives interesting news or images from you, she will pass these along to Rodney for possible inclusion in the Solar Bulletin.

Kim also makes sure that a new observer's code is in the master observer file and if necessary, checks with AAVSO Headquarters staff members Sara Beck or Lauren Rosenbaum to ensure that the new observer has the login credentials they need to use SunEntry.

On the 10th of each month, when all solar reporting is in, Kim makes sure all submitted reports via doc, docx, xls, pdf, raw or txt files are in the database for the month of reporting. She also checks to see if the numbers submitted make sense and if there are questions, she will contact the observer.

Once complete, these observations are compiled and two separate programs are run on them to produce the raw counts and Ra numbers. Kim makes sure the data compiled matches what is in the summary file for the observing month. Once approved by Headquarters, these files are sent to the AAVSO and to the Rodney.

Meanwhile, Rodney Howe has been working on the SID report. Every few days, he collects the GOES SID Events from this web page: <http://www.swpc.noaa.gov/ftpmenu/indices/events.html>. At the end of the month all the VLF SID event reports from our SID group begin to come in. Once he has all of the reports, he spends a few hours running the analysis software Mike Hill wrote (in 2000), which compares the GOES event logs with the VLF SID events from our observers and creates new entries for the SID database.

Rodney then posts the output statistics from the analysis software as graphs, into the Solar Bulletin. He then begins working on the images or graphs for the first page of the Bulletin. If the sun is doing something creative, he'll try to post something about that at the end of the Solar Bulletin.

When Kim has finalized all the data entry and sends the Ra numbers to Rodney, he adds these in and finishes formatting the Solar Bulletin. Headquarters Staff then posts the Bulletin to the website and sends out the email announcements and paper copies.

After that, Rodney wraps up with miscellaneous things like sending raw data counts to interested scientists. He also sends the monthly Ra numbers to Bill Denig at NOAA/NGDC, who also posts the AAVSO data here <http://www.ngdc.noaa.gov/stp/space-weather/solar-data/solar-indices/sunspot-numbers/american/>

Rodney finds that one of the most interesting things about being Solar Chair is keeping up with data requests and analysis of observations from our Solar Database. Each month he is reminded that the AAVSO American Relative Sunspot Number (Ra) is a valued piece of the International Sunspot group of Indexes.

Thank you for making it all possible!

## Reporting Addresses:

Sunspot Reports – Kim Hay [solar.aavso@gmail.com](mailto:solar.aavso@gmail.com)

SID Solar Flare Reports – Rodney Howe [ahowe@frii.com](mailto:ahowe@frii.com)