

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS
SOLAR SECTION



Rodney Howe, Editor, Chairperson
c/o AAVSO, 49 Bay State Rd
Cambridge, MA 02138

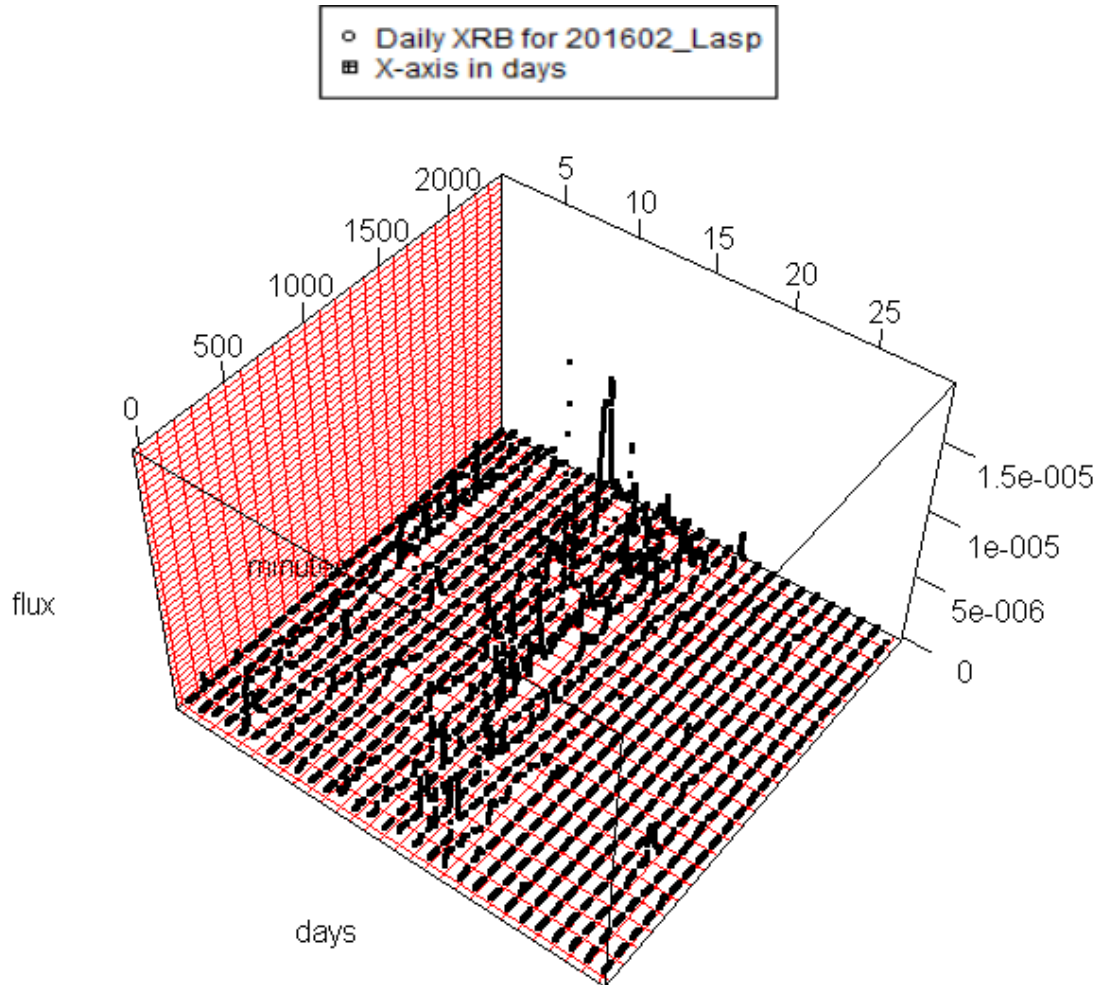
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Email: solar.aavso@gmail.com

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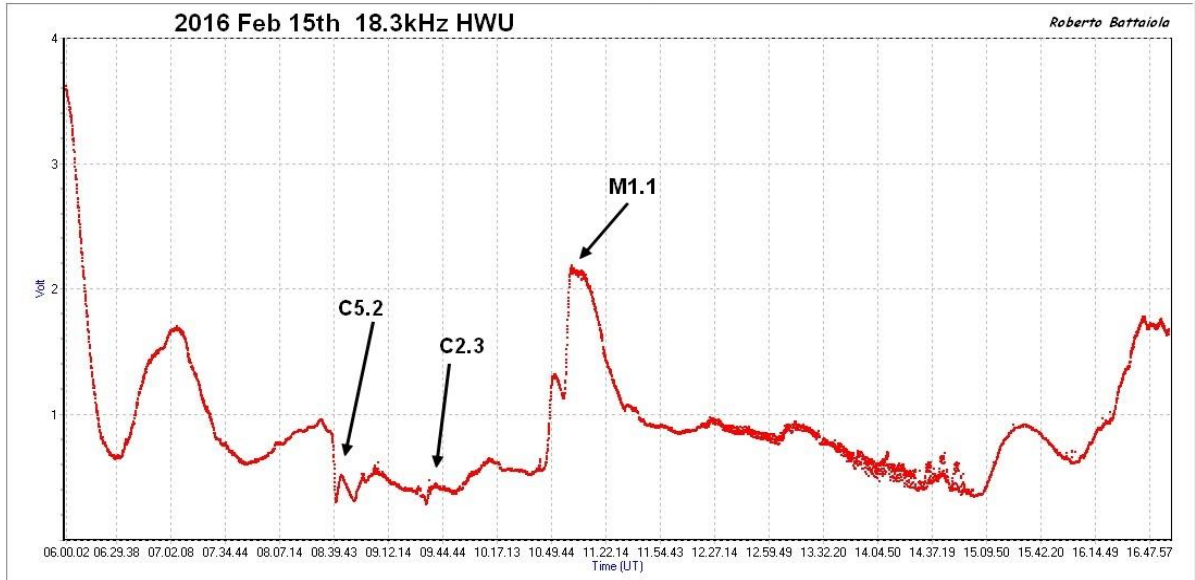
Volume 72 Number 2

February, 2016



Here's a 3-D plot showing EVE data from the Solar Dynamics Observatory (SDO) for all the flares detected for February. <http://lasp.colorado.edu/home/eve/> these data are similar to the GOES – 15 XRA data we use to compare SID Events from our VLF observers, except they are continuous and not aggregated into B, C, and M or X classifications, which we use when comparing VLF SID event durations. Perhaps there'll be a way to match the VLF SID Events to these LASP data with regard to start, maximum and end times.

Sudden Ionospheric Disturbance Report

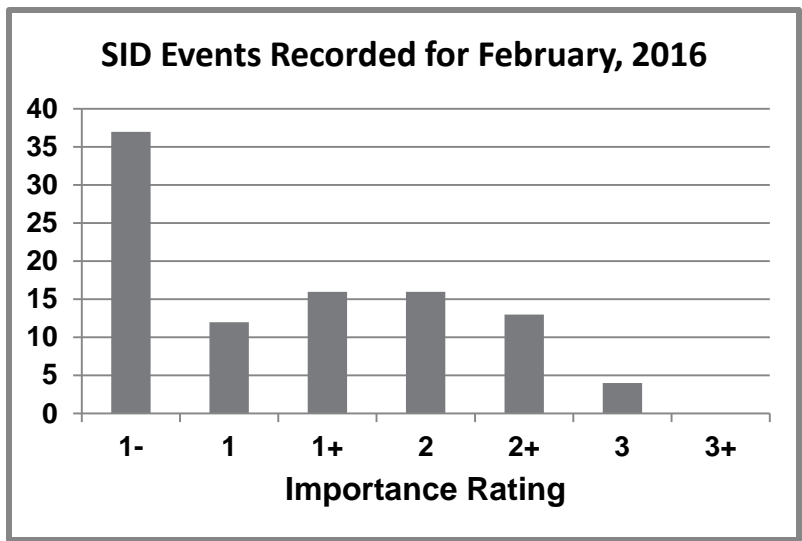


This graph from Roberto Battaola, Milan, Italy shows two C class and an M class flare for February, 15, 2016

Sudden Ionospheric Disturbances (SID) Records During February, 2016

Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
160202	2135	2+	160214	1030	2	160216	1554	2
160204	1222	-1	160214	1201	-1	160216	1653	-1
160204	1441	-1	160214	1223	-1	160216	1733	2+
160204	1652	-1	160214	1921	1+	160216	1849	-1
160204	1824	1	160214	1927	1+	160216	2043	2+
160205	55	2	160214	2313	1	160217	501	3
160205	722	2	160215	840	-1	160217	623	-1
160205	1304	3	160215	935	-1	160217	1002	1
160205	1430	-1	160215	957	-1	160217	1106	-1
160206	311	2	160215	1035	3	160217	1137	-1
160207	1200	2	160215	1048	-1	160217	1237	1+
160207	1212	2+	160215	1100	2	160217	1605	1
160209	1906	1	160215	1447	1+	160217	1637	1
160210	1519	-1	160215	1630	1+	160217	1815	1
160210	1910	2+	160215	1720	-1	160217	2019	2
160211	2055	2+	160215	1752	-1	160218	158	3
160212	635	2+	160215	1845	-1	160219	19	2+
160212	1046	2	160215	2130	1+	160219	859	1
160212	1720	1+	160216	159	2+	160219	2310	1+
160213	831	-1	160216	645	-1	160224	1228	-1
160213	1009	-1	160216	753	-1	160227	555	2+
160213	1524	1+	160216	1008	1	160229	1732	-1
160214	439	2+	160216	1353	-1	160229	1732	-1

Solar Events

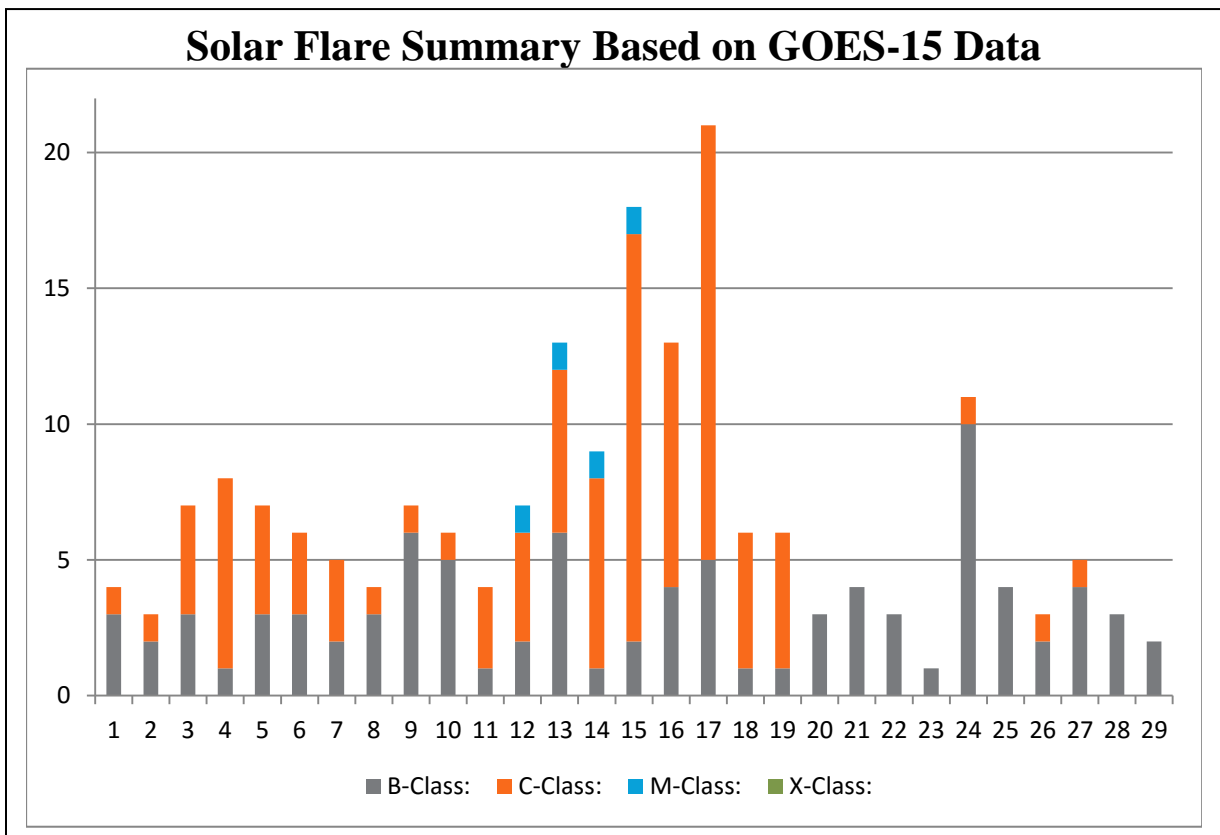


Importance rating: Duration (min)	1-: <19	1: 19-25	1+: 26-32	2: 33-45	2+: 46-85	3: 86-125	3+: 125
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Sudden Ionospheric Disturbances (SID) Observers During February, 2016

Observer	Code	Station(s) monitored	Observer	Code	Station(s) monitored
A McWilliams	A94	NML	R Green	A134	NWC
R Battaiola	A96	HWU	R Mrlak	A136	GQD NSY
J Wallace	A97	NAA	S Aguirre	A138	NPM
L Loudet	A118	DHO	G Silvis	A141	NAA NLK NPM
J Godet	A119	GBZ GQD ICV	I Ryumshin	A142	DHO GQD
B Terrill	A120	NWC	R Rogge	A143	DHO GQD ICV
F Adamson	A122	NWC	K Menzies	A146	NAA
S Oatney	A125	NML	D Russel	A147	NML
J Karlovsky	A131	DHO NSY			

There were 193 solar flares measured by GOES-15 for February, 2016: Four M class, 99 C class and 90 B class flares. Far more flaring this month compared to last. There were 17 AAVSO SID observers who submitted reports this month.



American Relative Sunspot Numbers (Ra) for
February, 2016 [**boldface = maximum, minimum**]

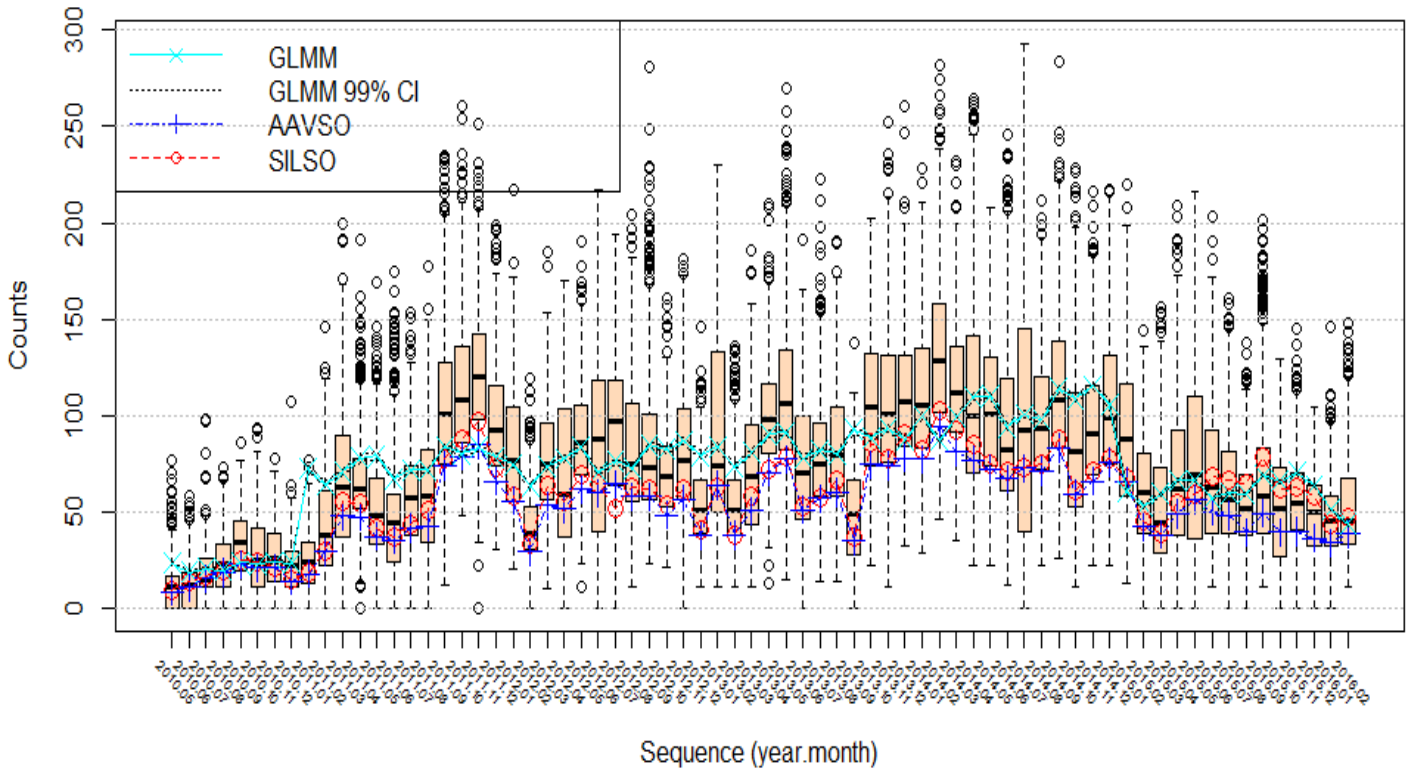
DAY	NumObs	RAW	Ra
1	24	37	29
2	23	48	39
3	28	83	64
4	24	106	77
5	26	82	59
6	26	58	47
7	31	80	61
8	31	79	62
9	26	72	54
10	21	69	54
11	25	74	53
12	23	48	37
13	28	37	29
14	26	44	32
15	25	43	32
16	27	37	27
17	36	33	26
18	31	33	25
19	32	39	31
20	27	48	40
21	27	40	31
22	30	31	25
23	27	35	28
24	28	31	24
25	26	29	23
26	30	33	25
27	32	27	21
28	38	31	25
29	32	43	34
Average	27.9	50	38.3

Obs	#Obs	Name
AAX	9	Alexandre Amorim
AJV	21	J. Alonso
ARAG	28	Gema Araujo
ASA	24	Salvador Aguirre
BARH	8	Howard Barnes
BERJ	20	Jose Alberto Berdejo
BRAB	28	Brenda Branchett
BRAF	8	Raffaello Braga
BROB	26	Robert Brown
BSAB	19	Santanu Basu
BXD	3	Alexandru Burda
CHAG	24	German Morales Chavez

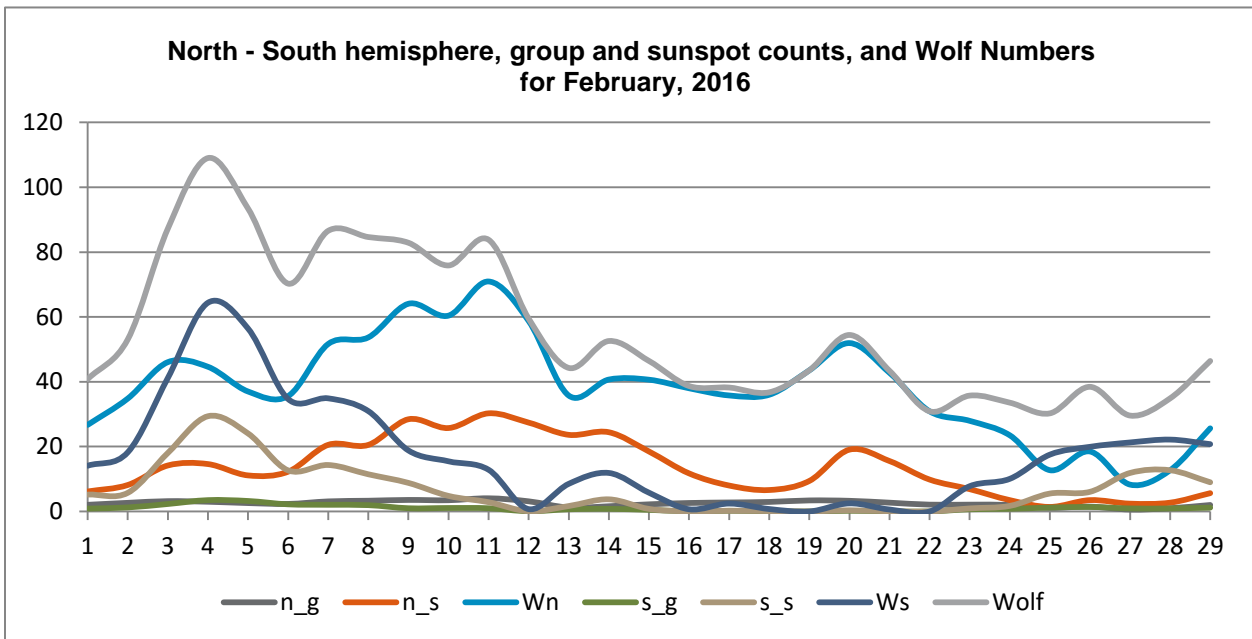
CIOA	6	Ioannis Chouinavas
CKB	26	Brian Cudnik
CNT	7	Dean Chantiles
DEMF	4	Frank Dempsey
DJOB	6	Joege de Rosario
DUBF	20	Franky Dubois
FERJ	15	Javier Ruiz Fernandez
FLET	24	Tom Fleming
FLF	15	Fredirico Luiz Funari
FTAA	11	Tadeusz Figiel
FUJK	19	K. Fujimori
HAYK	10	Kim Hay
HOWR	26	Rodney Howe
JASK	7	Krystyna Wirkus
JDAC	16	David Jackson
JGE	7	Gerardo Jimenez Lopez
JJMA	9	Jessica M.Johnson
KAND	20	Kandilli Observatory
KAPJ	9	John Kaplan
KNJS	26	James & Shirley Knight
KROL	13	Larry Krozel
LEVM	21	Monty Leventhal
LKR	9	Kristine Larsen
LRRR	7	Robert Little
MARE	4	Enrico Mariani
MILJ	8	Jay Miller
MJAF	28	Juan Antonio Moreno Quesada
MJHA	26	John McCammon
MUDG	1	George Mudry
MWU	3	Walter Maluf
OATS	3	Susan Oatney
OBSO	16	IPS Observatory
ONJ	4	John O'Neill
RLM	9	Mat Raymonde
SCGL	14	Gerd-Lutz Schott
SDOH	29	Jan Alvestad (SDO)
SIMC	5	Clyde Simpson
SMNA	1	Michael Stephanou
SONA	8	Andries Son
SPIA	6	Piotr Skorupski
STAB	27	Brian Gordon-States
SUZM	23	Miyoshi Suzuki
TESD	23	David Teske
URBP	13	Piotr Urbanski
VARG	13	A. Gonzalo Vargas
VIDD	13	Dan Vidican
WAU	1	Artur Wargin

Total Observers: 61
Total Observations: 845

Loglinear Mixed Model Fit, AAVSO, and SILSO Values vs Sequence Boxes and whiskers represent unprocessed counts



The above graph, made from raw AAVSO sunspot and group counts data, is developed by Dr. Jamie Riggs and shows the comparison of the SILSO International Sunspot Number (ISN) along with the AAVSO American Relative (Ra) number, as well as her Generalized Log-linear Mixed Model (GLMM). AAVSO data go back to the beginning of this solar cycle 24 (2010). A close look will show how the ISN and Ra numbers match up until July, 2015, when SILSO changed their method for calculating the ISN. <https://www.aavso.org/silso-warning-major-changes-sunspot-number-reference-series> <http://www.sidc.be/silso/> However, now the SILSO numbers do not match up to the American Ra since July, 2015, but rather match more closely to Jamie's GLMM, which does not use the AAVSO k – factors, only raw daily counts. The SILSO relative mean sunspot number is 46.8 for February, 2016. (See last page of their February Solar Bulletin). <http://www.sidc.be/sunspots/bulletins/monthly/monthlybull201602.pdf>



There were 40 out of 61 observers who counted northern and southern hemisphere groups and sunspots this month. It looks like the northern hemisphere was predominant with days of crossover on the 3rd, 6th, and 25th, 29th.

Reporting Addresses:

Sunspot Reports – Kim Hay solar.aavso@gmail.com

SID Solar Flare Reports – Rodney Howe ahowe@frii.com