

# Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS - SOLAR COMMITTEE

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**Table I. American Relative Sunspot Numbers (Ra) for October 2003 [boldface = maximum, minimum]**

Day	N	Raw Mean	Ra
1	27	106	75
2	35	101	72
3	30	88	59
4	34	85	60
5	38	75	53
6	40	75	51
7	38	73	50
8	28	82	56
9	35	79	58
10	36	68	50
11	35	57	44
12	28	31	22
13	38	17	12
14	33	7	<b>4</b>
15	37	24	17
16	35	33	24
17	22	55	37
18	32	60	43
19	28	64	43
20	32	93	64
21	27	92	66
22	25	104	72
23	33	99	68
24	44	117	81
25	33	115	89
26	27	146	102
27	27	206	141
28	29	221	161
29	28	260	167
30	34	256	<b>171</b>
31	30	224	156

Means:            32.2            100.4            70.0

Total No. of Observers: 67

Total No. of Observations: 998

**Table II. October Observers**

20 ARAG G.Araujo	4 LERM M.Lerman
18 BARH H.Barnes	21 LEVM M.Leventhal
4 BATR R.Battaiola	5 MARE E.Mariani
9 BEB R.Berg	23 MARJ J.Maranon
9 BERJ J.Berdejo	22 MCE E.Mochizuki
3 BLAJ J.Blackwell	21 MMI M.Moeller
13 BMF M.Boschat	8 OBSO IPS Observatory
10 BOSB B.Bose	17 RICE E.Richardson
26 BRAB B.Branchett	17 RITA A.Ritchie
26 BRAR R.Branch	3 SDP D.Sharples
29 BROB R.Brown	1 SHUM M.Sbulga
4 CAMP P.Campbell	14 SIMC C.Simpson
12 CARJ J.Carlson	10 STEF G.Stefanopoulos
30 CHAG G.Morales	17 STEM G.Stemmler
25 CKB B.Cudnik	18 STQ N.Stoikidis
11 CLZ C.Laurent	22 SUZM M.Suzuki
10 COMT T.Compton	9 SYP P.Soron
24 DEJV J.van Delft	13 SZAK K.Szatkowski
6 DEMF F.Dempsey	21 SZUM M.Szule
14 DGP G.Dyck	23 TESD D.Teske
18 DRAJ J.Dragesco	10 THR R.Thompson
21 DUBF F.Dubois	17 TJV J.Temprano
23 ELR E.Reed	20 URBP P.Urbanski
14 FEEC C.Feehrer	14 VARG A.Vargas
12 FERJ J.Fernandes	19 WILW W.Wilson
22 FLET T.Fleming	23 YESH H.Yesilyaprak
20 FUJK K.Fujimori	
25 GIOR R.Giovanoni	
9 GOEM M.Goetz	
1 GOLA A.Golovin	
29 GUNM M.Gundlach	
11 HAYK K.Hay	
13 HRUT T.Hrutkay	
21 JAMD D.James	
6 JEFT T.Jeffrey	
3 JENS S.Jenner	
20 KAPJ J.Kaplan	
4 KHAR R.Khan	
23 KNJS J&S Knight	
4 KROL L.Krozel	
5 LARJ J.Larriba	

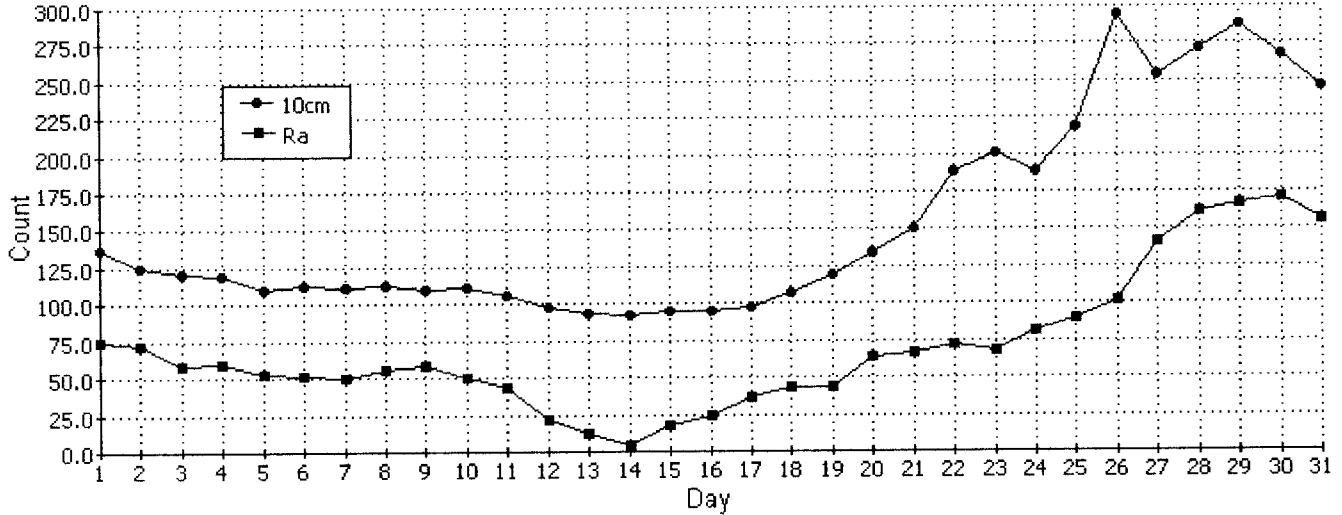
## Reporting Addresses

**Sunspot Reports -- email:** solar@aavso.org  
**postal mail:** AAVSO, 25 Birch St. Cambridge, MA 02138  
**FAX (AAVSO):** (617) 354-0665

**SID Solar Flare Reports -- email:** noatak@aol.com  
**postal mail:** Mike Hill  
114 Prospect St. Marlboro, MA 01752

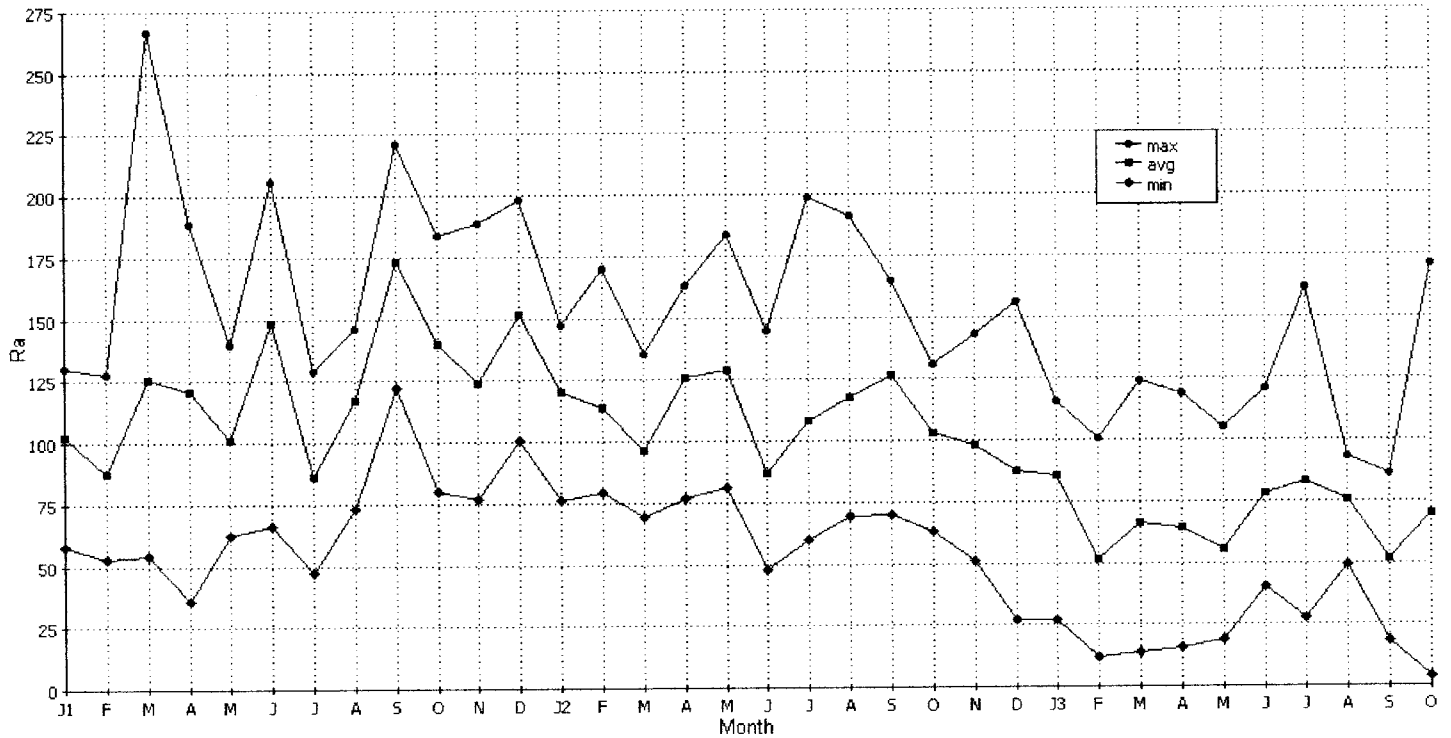
**Table III. Means of Raw Group Counts (RG) and Ratios of Spots to Groups (S:G) in October 2003**

Day	RG	S:G	Day	RG	S:G	Day	RG	S:G	Day	RG	S:G
1	6.3	6.9	9	4.5	7.7	17	4.0	3.7	25	3.6	22.1
2	5.7	7.9	10	4.3	6.0	18	3.7	6.2	26	4.1	25.5
3	4.7	8.9	11	4.3	3.3	19	3.1	10.7	27	7.0	19.3
4	4.2	10.3	12	2.6	2.0	20	4.0	13.4	28	7.5	19.5
5	3.3	12.6	13	1.4	2.5	21	4.1	12.1	29	8.6	20.3
6	3.7	10.4	14	0.6	2.6	22	4.6	12.5	30	8.8	19.2
7	3.6	10.3	15	1.6	4.7	23	3.8	16.3	31	8.5	16.4
8	4.2	9.7	16	2.3	4.3	24	3.5	23.8	Mn.	4.4	11.3



**Fig. 1. 10 cm Solar Flux and American Relative Sunspot Numbers (Ra) for October 2003**

10 cm source: <http://www.drao.nrc.ca/icar>



**Fig. 2. Maximum, Mean, and Minimum Values of Ra for Each Month from January 2001 to Present.**

## Summary of AAVSO Solar Committee Activity for the Period from October 2002 to September 2003

**Chair and Sunspot Observing Group Leader: Carl E. Fehrer**  
**Solar Flare/SID Observing Group Leader: William Michael Hill**

The Division continues to attract new contributors to both of its observation activities. During the period, 95 observers have filed sunspot reports, a gain of five over the previous year, and 24 observers have filed SID reports, a gain of four. We hope that these gains and the high levels of interest demonstrated by both sunspot and SID observers can be maintained as solar activity levels now trend toward the minimum part of the sunspot cycle.

### **Sunspot Reports**

During the period, 887 sunspot reports containing a total of 13,645 observations were received and processed. A larger number of reports has been received in this period than in the previous periods as a result of growth in the size of the observer group. On average, reports have been received from an average of 75 observers during each month of the period.

### **SID Reports**

Despite the loss of the NAA transmitter in Cutler, ME due to an extended period of maintenance, 158 reports based on the monitoring of seven different VLF stations were received and processed. The average number of SID observers reporting each month was 13.

### **Website Activity**

The number of contributions of solar images continues to increase to the extent that it is now possible to become somewhat selective concerning the images chosen to appear on the site. The numbers of downloads from the AAVSO/Solar website also remain high and the ability to obtain the *Bulletin* in this way has reduced the need for hardcopy mailings.

### **Reorganization of the Sudden Ionospheric Disturbances Supplement**

In December 2002, AAVSO member Doug Welch (A-104), who earlier had set up the AAVSO's GRB and SID discussion groups, assumed the responsibility for editing a stand-alone version of the *Sudden Ionospheric Disturbances Supplement* that had accompanied the *Solar Bulletin* until the death of its author, Casper Hossfeld, the month before. This document is now published in electronic form on an irregular basis and is available for downloading via a link on the AAVSO website. The *Solar Bulletin* continues as before with analyses and commentary related to sunspots and solar flares.

### **New Software in Development**

Software required for the analysis of sunspot reports in a modern (e.g., Windows XP) environment is now being written by AAVSO member Lenny Abbey. This software will replace programs written some years ago for an MS-DOS environment and will provide new tools for identification of non-conforming data formats and other report deficiencies that greatly complicate the monthly task of preparing observations for analysis.

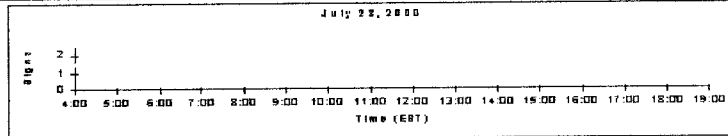
### **Acknowledgements**

The successful performance of the Solar Division during the period was due, as usual, to the dedication and hard work of our network of observers, the AAVSO's staff, and Arthur Ritchie, a volunteer who assists in the preparation of the monthly sunspot data.

Thank you all.

# Sudden Ionospheric Disturbance Report

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## Sudden Ionospheric Disturbances (SID) Recorded During October 2003 (Analysis performed by Michael Hill, SID Analyst)

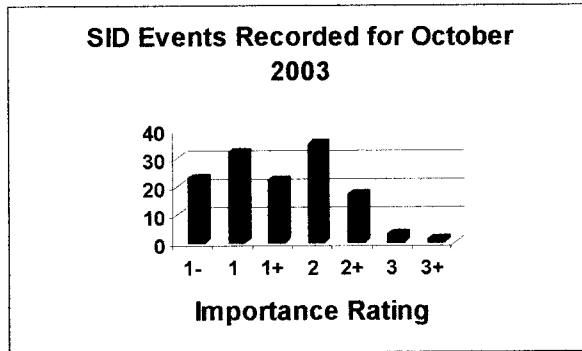
Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
031001	0453	2+	031022	1502	1+	031027	1941	1
031001	0502	2	031022	1514	1	031027	2005	2+
031001	0916	2	031022	1559	1	031027	2059	2+
031002	0400	1	031022	1957	1+	031027	2253	2+
031002	0429	1-	031022	2205	2	031028	0135	2+
031002	0606	1	031023	0242	1-	031028	0325	2
031002	0656	2	031023	0708	2	031028	0416	2
031003	0341	1	031023	0827	3	031028	0512	1
031003	0621	1	031023	1052	1-	031028	0601	1
031003	0644	1-	031024	0233	2	031028	0647	1-
031003	0759	1	031024	0512	1	031028	0730	1-
031004	0506	1	031024	0608	1+	031028	0739	1-
031004	1317	1+	031024	0755	1+	031028	0757	1
031004	1549	1+	031024	0835	1-	031028	0805	1
031004	1759	1-	031024	0920	1	031028	0820	1
031004	1916	2	031024	1000	1+	031028	0838	1-
031004	2015	2	031024	1036	1	031028	0851	1
031005	0922	1	031024	1856	2+	031028	0947	1-
031005	1245	1-	031024	2027	1+	031028	0958	1
031005	1328	1	031024	2128	2	031028	1010	1-
031018	0540	1-	031024	2143	2	031028	1104	2
031018	0548	1-	031025	0208	1+	031029	0154	2
031018	0859	1+	031025	0438	2+	031029	0321	1-
031018	1654	1	031025	0553	2+	031029	0415	1-
031018	1955	2	031025	0720	1-	031029	0438	1
031018	2137	2+	031025	0950	1-	031029	0458	3+
031018	2317	2	031025	1035	2	031029	0752	2
031019	0624	2+	031025	1451	1+	031029	0933	1
031019	1648	1+	031026	0454	1-	031029	0940	3
031020	0722	3	031026	0507	1-	031029	1339	2
031020	1305	2+	031026	0611	2	031029	1421	1
031020	1825	1-	031026	1421	1+	031029	1430	2
031020	2003	1+	031026	1432	1-	031029	1658	2
031020	2040	2	031026	2140	2+	031030	0201	2
031020	2102	1+	031027	0139	1	031030	0209	2
031021	0340	2	031027	0251	1	031030	0838	1+
031021	0346	2+	031027	0349	2	031030	1526	2
031021	0450	2	031027	0432	2	031031	0154	1
031021	0501	2	031027	0622	1	031031	0239	2
031021	0826	1+	031027	0805	2+	031031	0433	1+
031022	0335	2	031027	0825	2+	031031	0612	1+
031022	0355	2	031027	0913	1+	031031	0749	1
031022	0845	1	031027	0926	1+	031031	2039	2+
031022	0955	1+	031027	1233	2			
031022	1145	1	031027	1846	2+			

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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The events listed above meet at least one of the following criteria

- 1) Event reported by two or more observers within ±5 minutes
- 2) Event matched to GOES-8 XRA event to within ±15 minutes and event time < 1000 UT
- 3) reported by observer with a quality rating > 8 (scale 1-10)

# Solar Events



## Observers Contributing Data for October

Observer	Code	Station(s) monitored
J Winkler	A50	NPM XXX
D Toldo	A52	nwc xx22 xx41
J Ellerbe	A63	ICV
P King	A80	HWU
W Moos	A84	FTA ICV
G DiFillipo	A93	DHO HWU
M King	A99	HWU
F Steyn	A102	NWC
B Bose	A103	FTX
L Observatory	A107	DHO
P Mortfield	A108	NLK
Truman State U.	A110	XXX

October 2003 was certainly a month to remember. Last month there were 26 SID events. This month, however, there were a record 133 correlated SID events recorded by our observers. What a difference a month makes. There were 235 X-Ray flares recorded by the GOES-12 satellite which is not too unusual. What was unusual was that out of these, thirty seven were M-Class events and seven were X-Class events, a rare occurrence indeed. This was of course attributed to the very large spot groups crossing the sun in the latter half of the month, most notably NOAA region 0486 which produced an impressive X17 event followed by another X28 event. This last one was in November of course so does not show up in this months data set. For those of you who were getting bored, this month surely perked up the interest and made for an exiting time, including, for those of us lucky enough to see it, a very impressive auroral display on the 30<sup>th</sup> of October. We have a new contributor to our data set. Observing station A110 is the Physics Department of Truman State University in Kirksville, Missouri. The SID monitoring is part of an expanding radio science curriculum. We welcome you to our group and hope you enjoyed this first most active month of SID monitoring.

