Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS - SOLAR COMMITTEE

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Table I. Mean Sunspot Numbers (Ra) for April 2003 [boldface = maximum, minimum]

Day	N	Raw	s.d.	Ra	s.d.	s.e.
1	41	138	5.5	99	2.0	0.31
2	34	149	8.0	111	3.1	0.53
3	35	146	8.2	100	2.5	0.42
4	29	108	5.6	79	2.2	0.41
5	36	87	3.7	65	1.8	0.30
6	40	77	3.4	56	1.7	0.27
7	34	69	3.5	51	1.9	0.33
8	35	51	3.0	39	2.3	0.39
9	38	59	3.7	44	2.3	0.37
10	48	52	3.6	37	1.8	0.26
11	36	35	1.7	28	0.9	0.15
12	45	58	2.5	44	1.7	0.25
13	50	62	2.1	45	1.3	0.18
14	45	54	1.9	40	1.2	0.18
15	42	42	2.2	32	1.4	0.22
16	42	23	2.9	**16**	1.3	0.20
17	41	30	2.4	21	1.4	0.22
18	41	40	2.5	31	1.6	0.25
19	33	57	4.7	40	2.0	0.35
20	39	64	2.7	49	1.7	0.27
21	41	84	5.1	62	2.7	0.42
22	41	107	6.4	74	2.8	0.44
23	43	85	5.0	63	2.2	0.34
24	42	108	6.5	80	3.6	0.56
25	40	121	6.3	90	3.1	0.49
26	40	124	6.6	92	3.6	0.57
27	49	142	7.0	102	2.9	0.41
28	40	159	9.1	113	2.7	0.43
29	42	171	8.7	**119**	3.5	0.54
30	40	154	7.9	110	3.3	0.52
31	---	---	---	---	---	---

Means: 40.0 88.5 64.4

Total No. of Observers: 78

Total No. of Observations: 1201

Table II. April Observers

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14 AAP  P.Abbott
19 ARAG G.Araujo
19 ATON A.Attanasio
18 BARH H.Barnes
 8 BATR R.Battaiola
11 BERJ J.Berdejo
 1 BLAJ J.Blackwell
20 BMF  M.Boschat
15 BOJP P.Bojda
28 BOSB B.Bose
30 BRAB B.Branchett
13 BRAR R.Branch
22 BROB R.Brown
 3 BURS S.Burgess
 2 CAMP P.Campbell
15 CARJ J.Carlson
30 CHAG G.Morales
25 CKB  B.Cudnik
10 CLZ  C.Laurent
16 COMT T.Compton
30 CORA A.Coroas
 3 CVJ  J.Carvajal
21 DEJV J.van Delft
10 DELS S.Delaney
 9 DEMF F.Dempsey
14 DGP  G.Dyck
27 DUBF F.Dubois
30 ELR  E.Reed
 8 FEEC C.Feehrer
19 FERJ J.Fernandes
24 FLET T.Fleming
18 FUJK K.Fujimori
20 GIOR R.Giovanoni
19 GOEM M.Goetz
12 GOTS S.Gottschalk
 2 HALB B.Halls
 9 HAYK K.Hay
 9 HRUT T.Hrutkay
23 JAMD D.James
12 JEFT T.Jeffrey
 6 JENJ J.Jenkins
 4 JENS S.Jenner
20 KAPJ J.Kaplan
17 KHAR R.Khan
24 KNJS J&S Knight
 2 KROL L.Krozel
 5 LARJ J.Larriba
11 LERM M.Lerman
18 LEVM M.Leventhal
 4 LUBT T.Lubbers
28 MALK K.Malde
11 MARE E.Mariani
26 MARJ J.Maranon
23 MCE  E.Mochizuki
10 MILJ J.Miller
 3 MUDG G.Mudry
12 OBSO IPS Observatory
19 RICE E.Richardson
15 RITA A.Ritchie
23 SCGL G.Schott
10 SCHG G.Scholl
 3 SDP  D.Sharples
14 SIMC C.Simpson
27 STAB B.Gordon-States
27 STEM G.Stemmler
16 STQ  N.Stoikidis
17 SUZM M.Suzuki
15 SZAK K.Szatkowski
18 SZUM M.Szulc
23 TESD D.Teske
16 THR  R.Thompson
13 TJV  J.Temprano
22 URBP P.Urbanski
18 VARG A.Vargas
 8 VELM M.Velea
 5 VIDD D.Vidican
14 WILW W.Wilson
16 YESH H.Yesilyaprak
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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 April 2003

Day	RG	S:G	Day	RG	S:G	Day	RG	S:G	Day	RG	S:G
1	7.8	7.7	**9**	4.4	3.4	**17**	2.3	3.0	**25**	6.8	7.8
2	8.2	8.2	**10**	3.8	3.7	**18**	3.3	2.1	**26**	7.8	5.9
3	7.8	8.7	**11**	2.3	5.2	**19**	4.3	3.3	**27**	7.9	8.0
4	6.5	6.6	**12**	3.5	6.6	**20**	4.5	4.2	**28**	8.1	9.6
5	5.8	5.0	**13**	4.1	5.1	**21**	5.1	6.5	**29**	8.5	10.1
6	5.6	3.8	**14**	4.0	3.5	**22**	6.0	7.8	**30**	7.9	9.5
7	5.4	2.8	**15**	3.3	2.7	**23**	4.6	8.5	**31**	---	---
8	3.8	3.4	**16**	1.7	3.5	**24**	6.0	8.0	**Mn.**	**5.4**	**5.8**

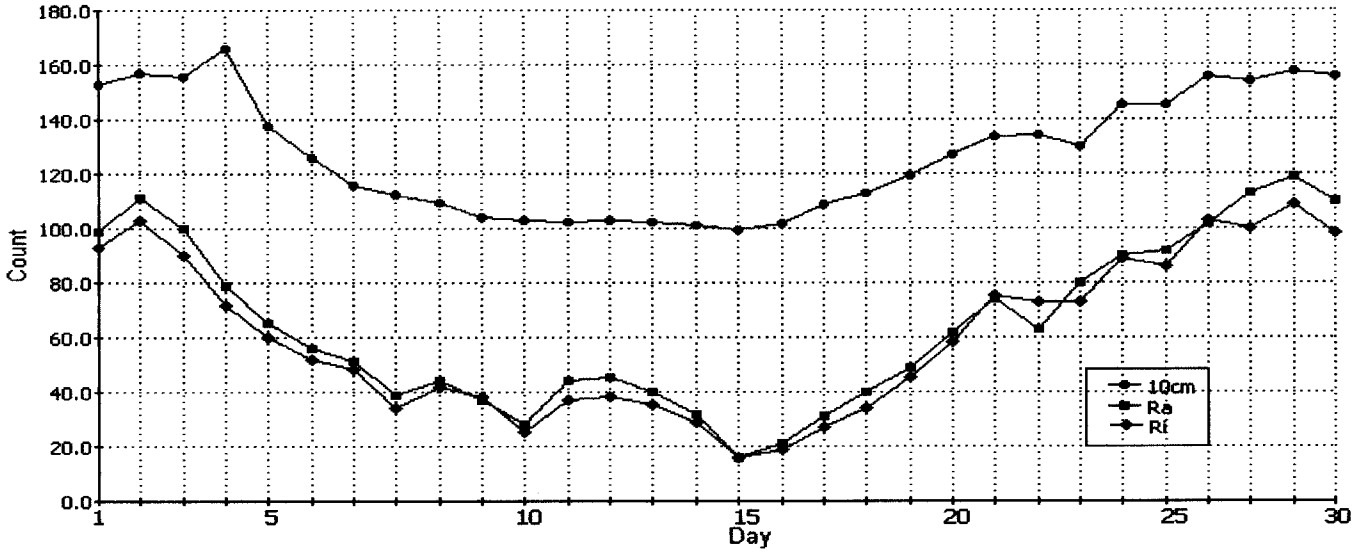


Fig. 1. 10 cm Solar Flux and Comparison of Ri (provisional) with Ra Estimates for April 2003 [r=0.990]
Ri source: http://www.sidc.oma.be/index.php3
10 cm source: http://www.drao.nrc.ca/icarus

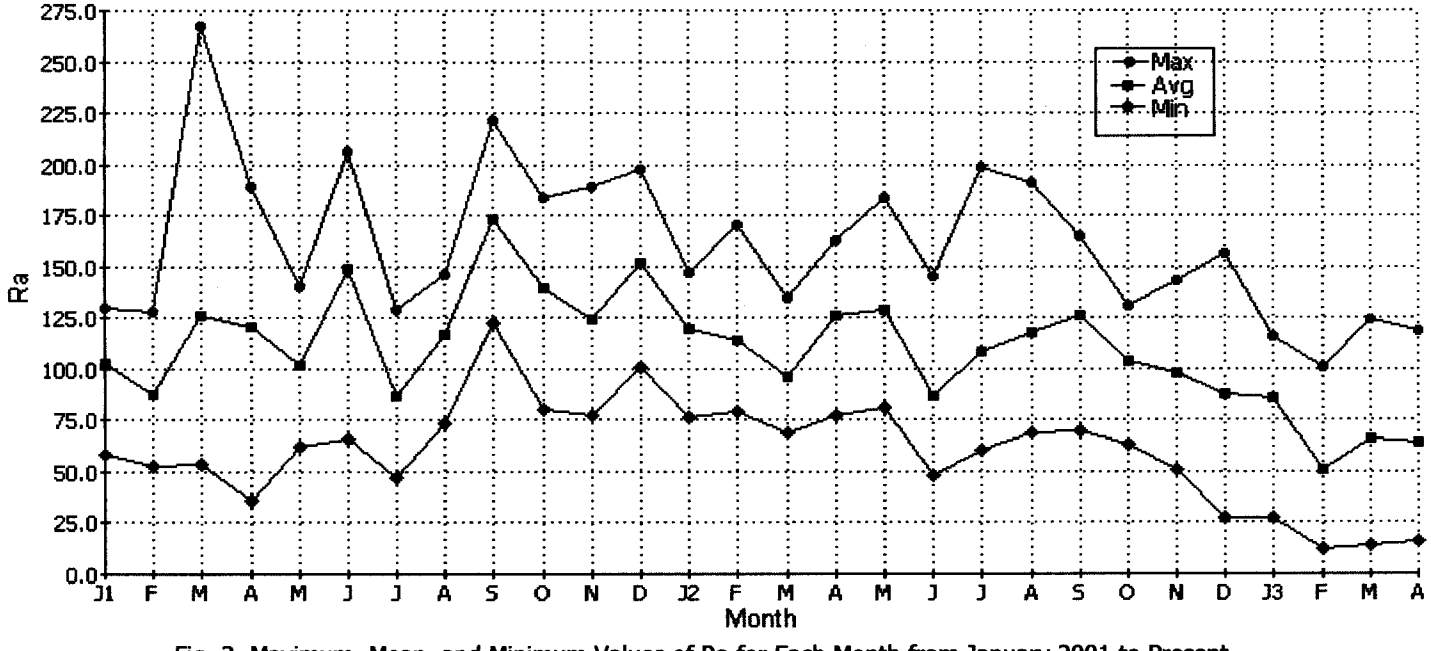


Fig. 2. Maximum, Mean, and Minimum Values of Ra for Each Month from January 2001 to Present.

Summary of AAVSO Solar Committee Activity for the Period Sept. 2002 to February 2003

[Presented at the April 26 Meeting in Tucson, AZ]

Chair: Carl E. Feehrer

Casper Hossfield (1918-2002)

Shortly after the AAVSO's Fall meeting in Somerville, Massachusetts, I received word that Casper Hossfield, a member of the organization since the early 1960's, had passed away. Cap was chairman of the Solar Division from 1963 to 1979 and, until his death, continued to serve the Division actively in a variety of roles. During the three years that I have chaired the group, Cap was almost indefatigable in his efforts to recruit and train new solar observers and to educate people interested in building radio receivers that are capable of detecting solar flares and gamma ray bursts(GRBs). His death represents a great loss to the organization.

Reorganization of Solar Bulletin

Following Cap's death, the *Supplement* to the monthly *Solar Bulletin* that he had authored each month and that had come to contain mixed discussions of GRB detection, solar flare activity, and SID equipment was reconfigured. In the new arrangement, the coordination of discussions on design and operation of equipment and the publication of a new, bulletin focused on GRB detection and reporting has been taken over by the AAVSO's Doug Welch, while reports related to solar flare activity continue to be analyzed and published in the *Solar Bulletin* by Mike Hill. We feel that this arrangement more effectively maintains the focus of the original *Bulletin* while providing better opportunities for growth in the new area of interest to SID observers.

Participation in Sun-Earth Day at Boston Museum of Science

At the invitation of AAVSO member Larry Krozel, Mike Hill and I had the privilege of participating in the Boston Museum of Science's celebration of Sun-Earth Day on March 18. On that occasion, Mike installed in the Museum's observatory a SID receiver and antenna that he had built. This contribution enhances the Museum's ability to demonstrate solar phenomena to the public. For example, if a flare were detected with the aid of the Museum's white light and/or hydrogen-alpha telescope configurations, the receiver could be turned on and the effect of the flare on signal propagation in the ionosphere observed.

Observer/Report Statistics

Although solar activity has begun to diminish, the numbers of observers and observations remains high. There are 103 sunspot and 20 SID observers on record, with 2 new observers having been added to each group since the last period. Five thousand four hundred and fifty-six sunspot observations and 87 SID observations were submitted during the period covered by this report.

Reduction in Mailing Costs

Downloads of the web version of the *Solar Bulletin* have remained high since the initial publication in 2001. The response has been good enough so that it made sense to inquire how many subscribers to the publication would be willing to acquire it by downloading rather than by having it mailed to them each month. About 30% of subscribers have responded favorably to date and will now receive emailed reminders each month when the Bulletin has been posted to the website. The remainder will continue to receive the regular mailing. This should result in some reduction in the cost of Committee operations.

Acknowledgments

As in past reporting periods, the work completed in the last six months represents the outcome of a team effort. I want to extend my thanks to our loyal observers, to Mike Hill, SID Analyst and Chairperson of the Solar Flare Group, to Arthur Ritchie, who helps in the preparation of the sunspot data, and to AAVSO staff who are responsible for getting the Bulletin mailed each month and posted to the website.

Editor's Notes

An increasing number of observers are using the SUNKEY and SolObs programs or simple ascii text file formats available on the AAVSO website for reporting their results. The use of any of these avoids the risk of errors during the recoding of reports at headquarters and reduces the time required to produce the Bulletin and related reports. Many thanks to those of you who use these methods.

Occasionally, reports generated with these programs contain user-induced errors that are not immediately obvious and that bring our processing routines to a halt. The offending report(s) and error(s) must then be identified and corrected, and the processing restarted. A list of the most common errors of this type are listed below.

A project to rewrite all of the Solar Committee's older sunspot processing software and bring it into conformity with modern standards was begun this month. I'm hopeful that error-trapping routines and other measures will be included in the new software and that the new programs will be more robust in the face of at least some of the errors on the list. In the meantime, it would be extremely helpful if observers would examine their reports before emailing them and make sure that none of these errors has been made.

Thank you.

-CEF

Common User-induced Errors in Electronic Reports

1. **Use of ditto marks in "Obs. ID" and/or "Remarks" columns:** During processing, observers' reports are co-mingled in a single time-ordered file and the references made by ditto marks are lost. Please repeat your ID and, where appropriate, your remark for each observation.

2. **Missing ID in header:** Be certain that your ID is contained on the "Solar data from:" line.

3. **Missing name in header:** Be certain that your name is included on the line following "Solar data from:" line.

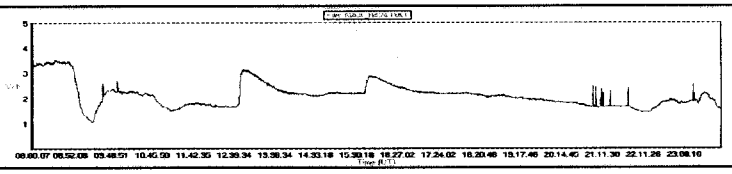
4. **"Homemade" report formats with incorrect column/character alignments:** Some observers present their data in formats that are very similar to--but not quite identical to--the formats generated by the programs. The AAVSO processing programs are extremely sensitive to column layout and character position, and any departure from the standard produces a fatal processing error. If you have created your own approximation to the standard format, display it using a non-proportional font making sure that the column spacings and allocations are correct, and add your data using a non-proportional font (Courier is ideal).

5. **Wrong reporting month/year:** A substantial number of reports are received in which the "For the month of;" line contains the month that the report is mailed, not the month during which the observations were made. E.g., observations made in April but mailed in May contain the date, "May". Less frequently, the year is wrong.

6. **Date not expressed in English:** An unfortunate aspect of our processing routines is that they only understand English! I regret this, and I will happily "correct" the report of an observer who is unfamiliar with the English word for the month.

Sudden Ionospheric Disturbance Report

Michael Hill, SID Analyst
114 Prospect St
Marlborough, MA 01752 USA
noatak@aol.com



Sudden Ionospheric Disturbances (SID) Recorded During April 2003

(Analysis performed by Michael Hill, SID Analyst)

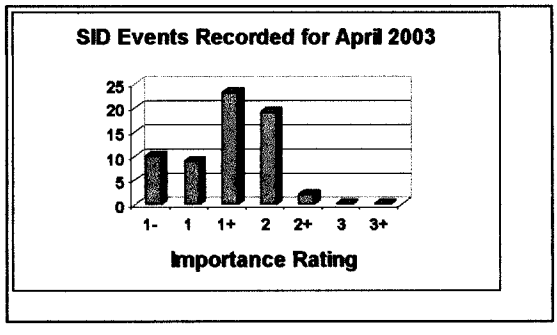
Date	Max	Imp	Date	Max	Imp	Date	Max	Imp
030401	0803	1-	030420	1927	1+	030426	0306	2
030402	1516	1	030421	1306	1+	030426	0806	1+
030403	0435	1	030421	1601	1-	030426	1446	1+
030403	0715	1+	030422	1619	1-	030426	1543	1-
030403	1027	2	030423	1038	1-	030426	1635	1+
030404	0558	2	030423	1209	1+	030426	1759	1+
030404	0700	2	030423	1547	1+	030426	1940	2
030404	0842	1+	030423	1554	2	030427	0741	1+
030404	1001	1+	030424	0453	2	030427	0817	1+
030404	1214	1	030424	0459	2	030427	1217	1
030404	1340	1	030424	0534	2	030427	1532	1+
030404	1419	1	030424	0815	2	030427	1607	2
030404	1554	1	030424	1250	2	030429	1059	1-
030405	0918	1+	030424	1256	1+			
030405	1017	1+	030424	1549	2			
030405	1131	1-	030424	1554	1+			
030405	1510	1+	030425	0100	1-			
030406	0815	2	030425	0540	2+			
030406	1928	2	030425	0916	1-			
030409	0612	2	030425	1723	1+			
030409	0932	1+	030425	1953	2			
030411	0731	1+	030425	2058	1			
030413	0855	1	030425	2202	1+			
030414	0819	2	030426	0058	1-			
030418	1959	2	030426	0151	2+			

Importance rating : Duration(min)	-1: <19	1: 19-25	1+: 26-32	2: 33-45	2+: 46-85	3: 86-125	3+: >125

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)

Observer	Code	Station(s) monitored
A Clerkin	A29	NAA
J Winkler	A50	NAA NPM NPR
D Toldo	A52	NAA NWC XXX
J Ellerbe	A63	ICV
A Panzer	A83	NAA
W Moos	A84	FTA
M Hill	A87	NAA
L Anderson	A91	NWC
G DiFillipo	A93	DHO HWU
T Poulos	A95	NAA
R Battaiola	A96	DHO
J Wallace	A97	NAA
M King	A99	HWU
P Campbell	A100	NLK
S Bressan	A101	DHO
F Steyn	A102	NAA NWC
L Observatory	A107	DHO



Solar Events

April was another very active month on the sun. There were three significantly active periods centered about the 3rd , 10th, and especially the 25th of the month. For those of you who also view the sun visually, the sunspot activity was equally active with some very complex regions, some of which resulted in the enhanced flare activity. There were 233 X-Ray flares reported by the GOES-10 satellite this month. None of them were X-Class flares but there were 14 M-Class events. Note that I am now reporting GOES-10 data. GOES-8 is not in service anymore, and NOAA now monitors the the X-Ray emissions with it's successor GOES-10. Observers reported 63 correlated SID events this month. Most of these had a medium importance rating assigned to them. None were long duration events. The most active day was the 24th of the month, although the period from the 23rd to the 27th had many events each day. Thanks go to all of you for sending in your data promptly and consistently every month. It is only with a consistent overlapping data set that the observer-to-observer correlation of events can be done effectively each month. If observer reports were sporadic, there would be unfortunate trends in the data that would not correctly reflect the changing level of SID activity from month to month, making the long term SID database less useful as an indicator of the changing solar activity levels.