

# Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS - SOLAR COMMITTEE

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Table I. American Relative Sunspot Numbers (Ra) for April 2004 [boldface = maximum, minimum]

| Day | N   | Raw Mean | Ra  |
|-----|-----|----------|-----|
| 1   | 36  | 73       | 53  |
| 2   | 36  | 68       | 49  |
| 3   | 33  | 60       | 46  |
| 4   | 33  | 73       | 55  |
| 5   | 44  | 74       | 53  |
| 6   | 41  | 55       | 39  |
| 7   | 37  | 48       | 34  |
| 8   | 35  | 32       | 23  |
| 9   | 44  | 23       | 17  |
| 10  | 41  | 18       | 14  |
| 11  | 34  | 18       | 15  |
| 12  | 34  | 32       | 25  |
| 13  | 33  | 45       | 32  |
| 14  | 39  | 52       | 39  |
| 15  | 42  | 45       | 33  |
| 16  | 38  | 45       | 33  |
| 17  | 31  | 66       | 48  |
| 18  | 35  | 81       | 56  |
| 19  | 32  | 81       | 59  |
| 20  | 41  | 81       | 59  |
| 21  | 41  | 79       | 58  |
| 22  | 41  | 71       | 53  |
| 23  | 37  | 49       | 36  |
| 24  | 40  | 48       | 36  |
| 25  | 40  | 45       | 33  |
| 26  | 42  | 43       | 32  |
| 27  | 38  | 38       | 28  |
| 28  | 36  | 32       | 23  |
| 29  | 38  | 31       | 22  |
| 30  | 36  | 47       | 33  |
| 31  | --- | ---      | --- |

Means :            37.6            51.8            37.9

Total No. of Observers: 72

Total No. of Observations: 1128

Table II. April 2004 Observers

|                      |                         |
|----------------------|-------------------------|
| 12 AAP P.Abbott      | 17 JAMD D.James         |
| 28 ARAG G.Araujo     | 14 JEFT T.Jeffrey       |
| 11 ATON A.Attanasio  | 11 JENJ J.Jenkins       |
| 11 BARH H.Barnes     | 25 KAPJ J.Kaplan        |
| 10 BATR R.Battaiola  | 4 KHAR R.Khan           |
| 12 BEB R.Berg        | 20 KNJS J&S Knight      |
| 13 BERJ J.Berdejo    | 8 KQR R.Kinne           |
| 2 BLAJ J.Blackwell   | 1 KROL L.Krozel         |
| 10 BMF M.Boschat     | 6 LARJ J.Larriba        |
| 24 BOSB B.Bose       | 11 LERM M.Lerman        |
| 25 BRAR R.Branch     | 5 LEVM M.Leventhal      |
| 27 BROB R.Brown      | 10 MARE E.Mariani       |
| 6 BXA A.Baransky     | 30 MARJ J.Maranon       |
| 9 CAMP P.Campbell    | 14 MAV D.Matsnev        |
| 13 CARJ J.Carlson    | 22 MCE E.Mochizuki      |
| 26 CHAG G.Morales    | 23 MMI M.Moeller        |
| 23 CKB B.Cudnik      | 16 OBSO IPS Observatory |
| 7 CLZ C.Laurent      | 15 RICE E.Richardson    |
| 19 COMT T.Compton    | 17 RITA A.Ritchie       |
| 27 CR T.Cragg        | 27 SCGL G.Schott        |
| 24 DEJV J.van Delft  | 6 SCHG G.Scholl         |
| 2 DEMF F.Dempsey     | 1 SDP S.Sharples        |
| 11 DGP G.Dyck        | 10 SIMC C.Simpson       |
| 11 DPP P.dePonthiere | 3 STEF G.Stefanopoulos  |
| 22 DRAJ J.Dragesco   | 24 STEM G.Stemmler      |
| 25 DUBF F.Dubois     | 18 STQ N.Stoikidis      |
| 15 FEEC C.Feehrer    | 25 SUZM M.Suzuki        |
| 14 FERJ J.Fernandes  | 24 SZUM M.Szulc         |
| 20 FLET T.Fleming    | 27 TESD D.Teske         |
| 24 FUJK K.Fujimori   | 13 THR R.Thompson       |
| 23 GOEM M.Goetz      | 19 TJV J.Temprano       |
| 2 GOLA A.Golovin     | 25 URBP P.Urbanski      |
| 26 GUNM M.Gundlach   | 16 VARG A.Vargas        |
| 10 HALB B.Halls      | 12 VELM M.Velea         |
| 10 HAYK K.Hay        | 21 WILW W.Wilson        |
| 13 HRUT T.Hrutkay    | 21 YESH H.Yesilyaprak   |

## Reporting Addresses

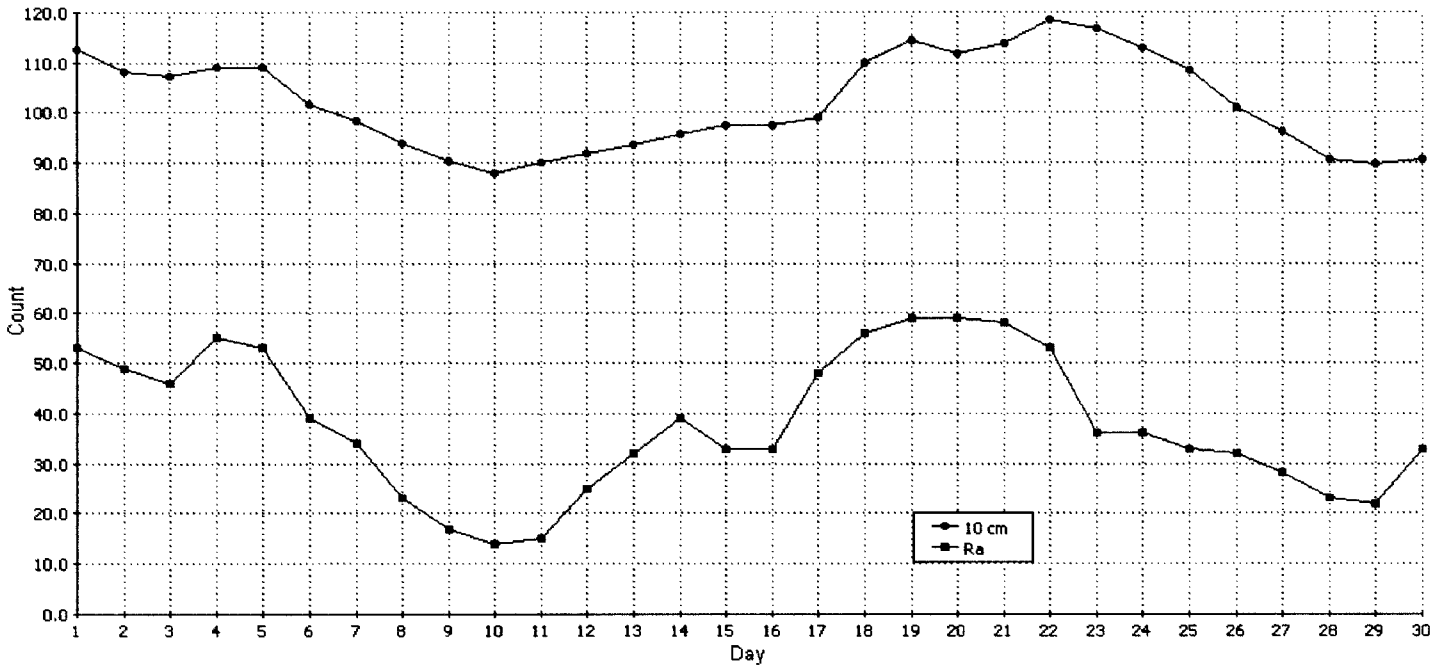
**Sunspot Reports -- email:** solar@aaavso.org  
**postal mail:** AAVSO, 25 Birch St. Cambridge, MA 02138  
**FAX (AAVSO):** (617) 354-0665

**SID Solar Flare Reports -- email:** noatak@aol.com

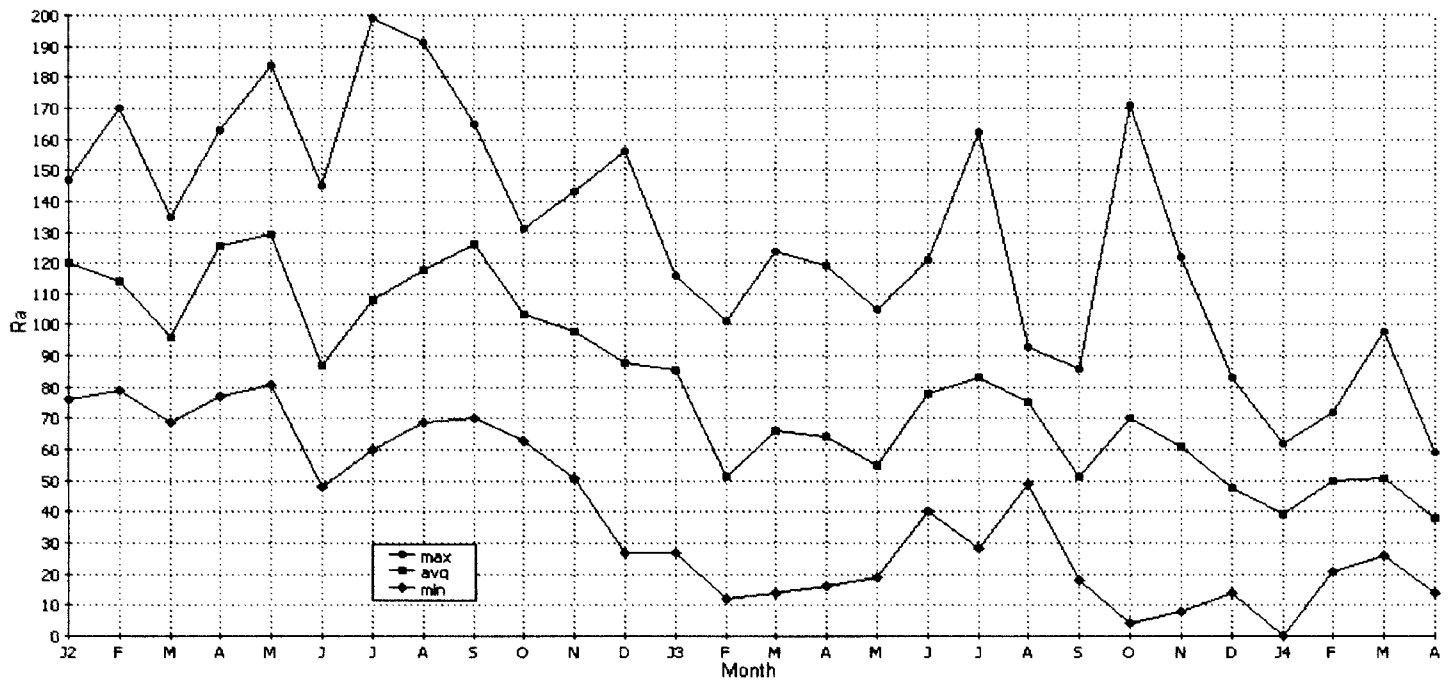
**postal mail:** Mike Hill  
114 Prospect St. Marlboro, MA 01752

**Table III. Means of Raw Group Counts (RG) and Ratios of Spots to Groups (S:G) in April 2004**

| Day | RG  | S:G | Day | RG  | S:G | Day | RG  | S:G | Day | RG  | S:G |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | 3.9 | 8.8 | 9   | 1.4 | 6.1 | 17  | 4.9 | 3.3 | 25  | 2.5 | 8.2 |
| 2   | 4.2 | 6.1 | 10  | 1.2 | 4.5 | 18  | 5.1 | 5.9 | 26  | 2.6 | 6.3 |
| 3   | 4.1 | 4.6 | 11  | 1.3 | 4.2 | 19  | 4.3 | 8.9 | 27  | 2.5 | 5.4 |
| 4   | 4.7 | 5.6 | 12  | 2.3 | 3.9 | 20  | 4.5 | 8.2 | 28  | 2.2 | 4.3 |
| 5   | 4.7 | 5.9 | 13  | 3.0 | 4.8 | 21  | 4.6 | 7.0 | 29  | 2.3 | 3.3 |
| 6   | 3.3 | 6.9 | 14  | 3.5 | 4.8 | 22  | 3.9 | 8.4 | 30  | 2.9 | 6.3 |
| 7   | 3.0 | 6.1 | 15  | 3.2 | 4.1 | 23  | 2.6 | 8.6 | 31  | --- | --- |
| 8   | 1.9 | 6.8 | 16  | 3.5 | 2.8 | 24  | 2.9 | 6.6 | Mn. | 3.2 | 5.9 |



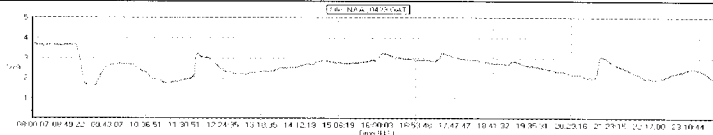
**13.Fig. 1. 10 cm Solar Flux and American Relative Sunspot Numbers (Ra) for April 2004**  
 10 cm source: <http://www.drao.nrc.ca/icarus>



**Fig. 2. Maximum, Mean, and Minimum Values of Ra for Each Month from January 2002 to Present.**

# Sudden Ionospheric Disturbance Report

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## Sudden Ionospheric Disturbances (SID) Recorded During April 2004

(Analysis performed by Michael Hill, SID Analyst)

| Date   | Max  | Imp | Date   | Max  | Imp | Date | Max | Imp |
|--------|------|-----|--------|------|-----|------|-----|-----|
| 040401 | 1713 | 2   | 040423 | 0931 | 1-  |      |     |     |
| 040404 | 1624 | 2   | 040423 | 0950 | 1   |      |     |     |
| 040405 | 0554 | 1+  | 040423 | 1045 | 1-  |      |     |     |
| 040406 | 0536 | 1+  | 040423 | 1149 | 1+  |      |     |     |
| 040406 | 1324 | 2+  | 040423 | 1204 | 1   |      |     |     |
| 040406 | 1331 | 2+  | 040423 | 1605 | 2+  |      |     |     |
| 040408 | 0149 | 1   | 040423 | 1608 | 1+  |      |     |     |
| 040408 | 1018 | 2+  | 040423 | 1724 | 2   |      |     |     |
| 040408 | 1320 | 2+  | 040423 | 1733 | 2   |      |     |     |
| 040411 | 0419 | 1-  | 040423 | 1906 | 1   |      |     |     |
| 040412 | 0750 | 1+  | 040423 | 2110 | 2   |      |     |     |
| 040415 | 1644 | 2   | 040423 | 2256 | 1+  |      |     |     |
| 040416 | 1442 | 1   | 040424 | 0209 | 1   |      |     |     |
| 040419 | 0034 | 1-  | 040424 | 0551 | 1   |      |     |     |
| 040419 | 1834 | 2+  | 040424 | 0904 | 2   |      |     |     |
| 040421 | 0304 | 2+  | 040424 | 1302 | 1+  |      |     |     |
| 040421 | 1454 | 1+  | 040424 | 1404 | 1+  |      |     |     |
| 040421 | 1500 | 1+  | 040424 | 1528 | 1+  |      |     |     |
| 040421 | 1617 | 2   | 040425 | 0146 | 1+  |      |     |     |
| 040422 | 0221 | 1+  | 040425 | 0537 | 2   |      |     |     |
| 040422 | 1415 | 2   | 040425 | 1016 | 1   |      |     |     |
| 040422 | 1451 | 1-  | 040425 | 1614 | 2   |      |     |     |
| 040423 | 0456 | 1   | 040426 | 0251 | 2   |      |     |     |
| 040423 | 0655 | 2+  | 040427 | 0722 | 2+  |      |     |     |
| 040423 | 0757 | 2+  | 040430 | 0547 | 1   |      |     |     |

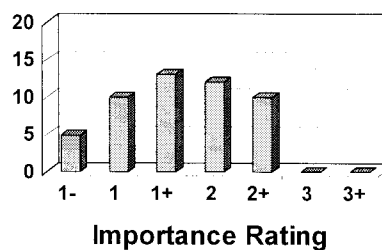
|                                   |         |          |           |          |           |           |          |
|-----------------------------------|---------|----------|-----------|----------|-----------|-----------|----------|
| Importance rating : Duration(min) | 1-: <19 | 1: 19-25 | 1+: 26-32 | 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  $\pm 5$  minutes
- 2) Event matched to GOES-8 XRA event to within  $\pm 15$  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 NML              |
| D Toldo     | A52  | NAA NSS NWC          |
| J Ellerbe   | A63  | ICV                  |
| P King      | A80  | FTA                  |
| W Moos      | A84  | FTA                  |
| M Hill      | A87  | NAA                  |
| L Anderson  | A91  | NWC                  |
| G DiFillipo | A93  | DHO HWU              |
| T Poulos    | A95  | NAA                  |
| J Wallace   | A97  | NAA                  |
| M King      | A99  | HWU                  |
| P Campbell  | A100 | NLK                  |
| F Steyn     | A102 | NWC                  |
| B Bose      | A103 | VTX                  |
| P Mortfield | A108 | NLK                  |

SID Events Recorded for April 2004



# Solar Events

April was an interesting month. Overall there was not a lot of activity but there was a surge of it on and around the 23<sup>rd</sup> which resulted in a fairly high count for SID events. In all there were 50 correlated SID events this month. All had an importance rating of 2+ or less. They were pretty evenly spread across the month but note the sudden peak on the 23<sup>rd</sup> followed by 3 fairly active days afterwards. These were all attributed to active region 597 which I'm sure some of you followed visually as well. The increase in activity mirrored quite closely the activity level seen by the GOES-12 satellite. It detected a total of 291 X-Ray flares this month, quite an increase from last month where there were only 206. Interestingly last month there were more SIDs detected so the flares, on average must have been more powerful last month. Of the 291 flares, only 5 were M-Class and there were no X-Class events. On the 23<sup>rd</sup> there were 21 flares, 2 of them M-Class.

Just a friendly reminder about data formats. The data you send me should be in an attached file that has the proper format as discussed on the AAVSO SID web site. The file must be a non-formatted text file and it should be named according to your observer ID and the Station monitored. For example A87NAA.DAT. Please make sure your data is in this format. Otherwise it will not be processed unless you can resubmit it after reformatting.

**Solar Flare Summary Based on GOES-12 Data**

