

**Space Weather Highlights**  
**04 - 10 February 2002**

**SWO PRF 1380**  
**12 February 2002**

Solar activity was at low to moderate levels. Moderate activity occurred on 04 February with two low-level M-class flares from Region 9809 (S05, L = 323, class/area Dso/130 on 31 January)(for flare times and magnitudes, please refer to the Energetic Events or Optical Flares lists). Region 9809 was unimpressive in terms of size and complexity. Region 9802 (S15, L = 022, class/area Ekc/780 on 01 February) also produced a low-level M-class flare on 04 February. This region was in a decay phase that began around 03 February. Activity dropped to low levels on 05 February with isolated C-class subflares. Activity returned to moderate levels on 06 February due to a low-level M-class flare from Region 9802, which continued to decay. Activity dropped to low levels during 07 – 08 February with isolated C-class subflares. Activity returned to moderate levels on the last day of the period due to an impulsive low-level M-class flare from Region 9811 (S26, L = 278, class/area Dao/290 on 04 February). Region 9811 was simply structured and began to gradually decay as the period ended.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the period. A high-speed solar wind stream associated with a coronal hole occurred during 05 – 08 February with “gusts” as high as 750 km/sec detected on 06 February. Another high-speed coronal hole wind stream commenced early on 10 February and was in progress as the period ended. Solar wind velocities increased from 400 km/sec to around 620 km/sec during this time.

There were no proton events at geosynchronous orbit during the period.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels during most of the period, but briefly rose to high levels on 09 February.

Geomagnetic field activity was at quiet to unsettled levels on 04 February. Activity increased to quiet to active levels during 05 – 07 February due to coronal hole effects. Activity decreased to quiet to unsettled levels for the rest of the period.

**Space Weather Outlook**  
**13 February - 11 March 2002**

Solar activity is expected to range from low to moderate levels. Isolated, low-level M-class flares will be possible during the period. Major flare activity is not expected.

No proton events are expected during the period.

The greater than 2 MeV electron flux at geosynchronous orbit may reach high levels during 05 – 07 March. Otherwise, normal to moderate levels are expected.

Geomagnetic field activity is expected to be at quiet to unsettled levels during most of the period. However, active conditions will be possible during 04 – 06 March due to recurrent coronal hole effects.



### Daily Solar Data

| Date        | Radio Flux<br>10.7 cm | Sun spot<br>No. | Sunspot Area<br>(10 <sup>-6</sup> hemi.) | X-ray Background | Flares     |   |   |         |   |   |   |   |
|-------------|-----------------------|-----------------|--|------------------|------------|---|---|---------|---|---|---|---|
|             |                       |                 |  |                  | X-ray Flux |   |   | Optical |   |   |   |   |
|             |                       |                 |  |                  | C          | M | X | S       | 1 | 2 | 3 | 4 |
| 04 February | 235                   | 274             | 1970                                     | B9.6             | 4          | 3 | 0 | 5       | 2 | 0 | 0 | 0 |
| 05 February | 221                   | 286             | 1790                                     | C1.5             | 4          | 0 | 0 | 5       | 1 | 0 | 0 | 0 |
| 06 February | 203                   | 226             | 1130                                     | C1.3             | 8          | 1 | 0 | 7       | 0 | 0 | 0 | 0 |
| 07 February | 192                   | 178             | 780                                      | C1.0             | 8          | 0 | 0 | 3       | 0 | 0 | 0 | 0 |
| 08 February | 192                   | 229             | 780                                      | C1.3             | 5          | 0 | 0 | 0       | 0 | 0 | 0 | 0 |
| 09 February | 199                   | 225             | 1010                                     | C1.4             | 10         | 0 | 0 | 7       | 0 | 0 | 0 | 0 |
| 10 February | 217                   | 205             | 1340                                     | C1.4             | 6          | 1 | 0 | 6       | 1 | 1 | 0 | 0 |

### Daily Particle Data

| Date        | Proton Fluence<br>(protons/cm <sup>2</sup> -day-sr) |        |         | Electron Fluence<br>(electrons/cm <sup>2</sup> -day-sr) |        |        |
|-------------|---|--------|---------|---|--------|--------|
|             | >1MeV   | >10MeV | >100MeV | >.6MeV  | >2MeV  | >4MeV  |
|             | 04 February   | 9.1E+4 | 1.1E+4  | 2.5E+3  |        | 1.9E+5 |
| 05 February | 2.0E+5  | 1.3E+4 | 2.6E+3  |   | 6.6E+4 |        |
| 06 February | 4.1E+5  | 1.2E+4 | 2.7E+3  |   | 2.9E+5 |        |
| 07 February | 7.1E+5  | 1.2E+4 | 2.9E+3  |   | 6.2E+6 |        |
| 08 February | 2.9E+5  | 1.3E+4 | 3.0E+3  |   | 2.8E+7 |        |
| 09 February | 9.1E+4  | 1.3E+4 | 3.1E+3  |   | 3.3E+7 |        |
| 10 February | 2.3E+5  | 1.3E+4 | 3.2E+3  |   | 1.6E+7 |        |

### Daily Geomagnetic Data

| Date        | Middle Latitude<br>Fredericksburg |                 | High Latitude<br>College |                 | Estimated<br>Planetary |                 |
|-------------|-----------------------------------|-----------------|--------------------------|-----------------|------------------------|-----------------|
|             | A                                 | K-indices       | A                        | K-indices       | A                      | K-indices       |
|             | 04 February                       | 8               | 1-1-0-0-3-3-3-3          | *               | *-*-*-*-*1-2           | 6               |
| 05 February | 15                                | 3-2-2-2-3-4-4-3 | *                        | 2-3-2-3-4-*4-3  | 16                     | 4-3-2-2-3-4-4-3 |
| 06 February | 13                                | 2-3-3-2-3-3-3-3 | *                        | 3-4-*5-*4-4-4   | 16                     | 3-3-4-4-4-3-3-2 |
| 07 February | 10                                | 2-2-2-2-3-3-1-3 | 25                       | 3-3-4-6-5-2-1-2 | 14                     | 2-3-4-3-4-2-3-3 |
| 08 February | 9                                 | 3-1-2-2-3-3-2-1 | *                        | 3-*-*-*-*3-*    | 10                     | 3-1-1-2-3-3-3-2 |
| 09 February | 6                                 | 2-2-2-2-1-1-2-2 | 9                        | 1-2-2-3-3-3-1-2 | 9                      | 2-3-2-3-2-2-2-3 |
| 10 February | 7                                 | 2-2-3-2-2-1-1-2 | 12                       | 2-2-2-3-4-4-1-1 | 8                      | 3-2-3-2-2-2-2-2 |

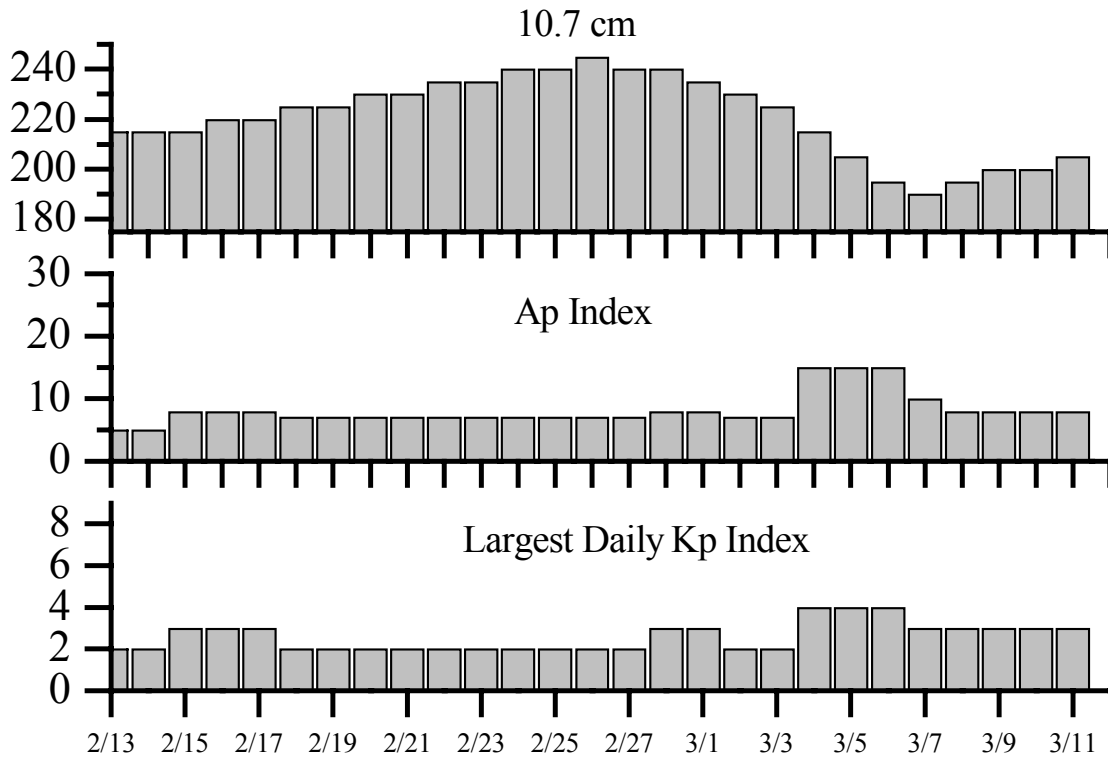


*Alerts and Warnings Issued*

| <u>Date &amp; Time of Issue</u> | <u>Type of Alert or Warning</u>               | <u>Date &amp; Time of Event UT</u> |
|---------------------------------|---|------------------------------------|
| 04 Feb 0022                     | 1 - 245 MHz Burst                             | 03 Feb                             |
| 05 Feb 0013                     | 1 - 245 MHz Burst                             | 04 Feb                             |
| 05 Feb 1756                     | K= 4 Warning                                  | 05 Feb 1756 - 07 Feb 1500          |
| 05 Feb 1800                     | K= 4 Observed                                 | 05 Feb 1500 - 1800                 |
| 06 Feb 0015                     | 4 - 245 MHz Bursts                            | 05 Feb                             |
| 06 Feb 0507                     | Type II Radio Emission                        | 06 Feb 0445                        |
| 07 Feb 0017                     | 7 - 245 MHz Bursts                            | 06 Feb                             |
| 07 Feb 1458                     | EXTENDED K = 4 Warning                        | 05 Feb 1756 - 07 Feb 2359          |
| 08 Feb 0001                     | EXTENDED K= 4 Warning                         | 05 Feb 1756 - 08 Feb 1500          |
| 08 Feb 0040                     | 3 - 245 MHz Bursts                            | 07 Feb                             |
| 09 Feb 0015                     | 3 - 245 MHz Bursts                            | 08 Feb                             |
| 09 Feb 1606                     | Electron Event >2MeV $\geq$ 1000pfu           | 09 Feb 1550                        |
| 10 Feb 0014                     | 3 - 245 Bursts                                | 08 Feb                             |
| 10 Feb 0019                     | CONTINUED Electron Event >2MeV $\geq$ 1000pfu | 09 Feb 1550                        |



### Twenty-seven Day Outlook



| Date   | Radio Flux<br>10.7 cm | Planetary<br>A Index | Largest<br>Kp Index | Date   | Radio Flux<br>10.7 cm | Planetary<br>A Index | Largest<br>Kp Index |
|--------|-----------------------|----------------------|---------------------|--------|-----------------------|----------------------|---------------------|
| 13 Feb | 215                   | 5                    | 2                   | 27     | 240                   | 7                    | 2                   |
| 14     | 215                   | 5                    | 2                   | 28     | 240                   | 8                    | 3                   |
| 15     | 215                   | 8                    | 3                   | 01 Mar | 235                   | 8                    | 3                   |
| 16     | 220                   | 8                    | 3                   | 02     | 230                   | 7                    | 2                   |
| 17     | 220                   | 8                    | 3                   | 03     | 225                   | 7                    | 2                   |
| 18     | 225                   | 7                    | 2                   | 04     | 215                   | 15                   | 4                   |
| 19     | 225                   | 7                    | 2                   | 05     | 205                   | 15                   | 4                   |
| 20 Feb | 230                   | 7                    | 2                   | 06     | 195                   | 15                   | 4                   |
| 21     | 230                   | 7                    | 2                   | 07     | 190                   | 10                   | 3                   |
| 22     | 235                   | 7                    | 2                   | 08     | 195                   | 8                    | 3                   |
| 23     | 235                   | 7                    | 2                   | 09     | 200                   | 8                    | 3                   |
| 24     | 240                   | 7                    | 2                   | 10     | 200                   | 8                    | 3                   |
| 25     | 240                   | 7                    | 2                   | 11     | 205                   | 8                    | 3                   |
| 26     | 245                   | 7                    | 2                   |        |                       |                      |                     |



### *Energetic Events*

| Date   | Time  |      | X-ray    |       | Optical Information |              |         | Peak     |            | Sweep Freq |           |    |
|--------|-------|------|----------|-------|---------------------|--------------|---------|----------|------------|------------|-----------|----|
|        | Begin | Max  | ½<br>Max | Class | Integ<br>Flux       | Imp/Location |         | Rgn<br># | Radio Flux |            | Intensity |    |
|        |       |      |          |       |                     | Brtns        | Lat CMD |          | 245        | 2695       | II        | IV |
| 04 Feb | 0542  | 0602 | 0611     | M2.3  | .023                |              |         | 9809     |            |            |           |    |
| 04 Feb | 0641  | 0658 | 0709     | M1.5  | .019                |              |         | 9809     |            |            |           |    |
| 04 Feb | 2323  | 2330 | 2334     | M1.3  | .005                | Sf           | S13W42  | 9802     | 46         | 84         |           |    |
| 06 Feb | 1126  | 1132 | 1141     | M1.4  | .009                |              |         |          |            |            |           |    |
| 10 Feb | 1840  | 1848 | 1853     | M1.6  | .007                | 2f           | S25W15  | 9811     |            | 64         |           |    |

### *Flare List*

| Date        | Time        |       |       | X-ray<br>Class. | Imp /<br>Brtns | Optical             |        | Rgn  |
|-------------|-------------|-------|-------|-----------------|----------------|---------------------|--------|------|
|             | Begin       | Max   | End   |                 |                | Location<br>Lat CMD |        |      |
| 04 February | 0152        | 0200  | 0214  | C7.3            | 1f             | S03W42              |        | 9801 |
|             | 0211        | 0211  | 0213  |                 | Sf             | S18W36              |        | 9802 |
|             | 0529        | 0530  | 0535  |                 | Sf             | S14W22              |        |      |
|             | 0542        | 0602  | 0611  | M2.3            |                |                     |        | 9809 |
|             | 0641        | 0658  | 0709  | M1.5            |                |                     |        | 9809 |
|             | B0738       | U0738 | A0742 |                 | 1f             | S08E18              |        | 9809 |
|             | B1029       | U1029 | A1046 | C2.7            | Sf             | S13W25              |        | 9802 |
|             | 1522        | 1531  | 1542  | C3.0            |                |                     |        |      |
|             | 1900        | 1903  | 1946  | C7.8            | Sf             | S13W31              |        | 9802 |
|             | B2329       | U2334 | 2337  | M1.3            | Sf             | S13W42              |        | 9802 |
| 05 February | 0535        | 0549  | 0607  | C3.6            |                |                     |        |      |
|             | 0826        | 0829  | 0835  | C2.2            | Sf             | S16W37              |        | 9816 |
|             | 1150        | 1150  | 1154  |                 | Sf             | S07E15              |        | 9809 |
|             | 1158        | 1158  | 1203  |                 | Sf             | S11W37              |        | 9816 |
|             | 2006        | 2017  | 2116  | C4.4            | 1f             | S10E07              |        | 9809 |
|             | 2045        | 2048  | 2052  |                 | Sf             | S23W74              |        | 9804 |
|             | 2218        | 2236  | 2308  | C3.0            | Sf             | N17W09              |        | 9808 |
|             | 06 February | 0437  | 0440  | 0451            | C8.2           | Sf                  | S17W48 |      |
|             | 0451        | 0509  | 0514  | C2.9            | Sf             | S17W50              |        | 9816 |
|             | 0608        | 0609  | 0633  | C3.3            | Sf             | S22E44              |        | 9811 |
|             | 0640        | 0651  | 0703  | C2.1            |                |                     |        |      |
|             | 1126        | 1132  | 1141  | M1.4            |                |                     |        |      |
|             | 1706        | 1713  | 1726  | C1.7            | Sf             | S11W54              |        | 9816 |
|             | 1738        | 1745  | 1752  | C4.1            |                |                     |        |      |
|             | 1930        | 1937  | 2002  | C4.0            | Sf             | S25E34              |        | 9811 |
|             | 2012        | 2013  | 2030  | C5.3            | Sf             | N12E31              |        | 9815 |
|             | 2024        | 2024  | 2035  |                 | Sf             | S09W03              |        | 9809 |
| 07 February | 0054        | 0056  | 0102  | C4.1            | Sf             | S14W60              |        | 9816 |
|             | 0435        | 0524  | 0540  | C3.2            |                |                     |        |      |
|             | 0849        | 0919  | 0941  | C1.9            |                |                     |        |      |
|             | 0954        | 1007  | 1025  | C2.6            |                |                     |        |      |
|             | 1113        | 1118  | 1123  | C2.7            |                |                     |        | 9809 |



*Flare List - continued.*

| Date        | Time  |       |      | X-ray<br>Class. | Optical        |                     | Rgn  |
|-------------|-------|-------|------|-----------------|----------------|---------------------|------|
|             | Begin | Max   | End  |                 | Imp /<br>Brtns | Location<br>Lat CMD |      |
| 08 February | 1206  | 1207  | 1214 |                 | Sf             | S12W79              | 9802 |
|             | 1333  | 1337  | 1339 | C4.7            |                |                     | 9815 |
|             | 2005  | 2006  | 2008 | C2.7            | Sf             | S10W69              | 9816 |
|             | 2047  | 2112  | 2124 | C2.5            |                |                     |      |
|             | 0411  | 0431  | 0449 | C2.2            |                |                     |      |
|             | 0635  | 0640  | 0645 | C2.8            |                |                     |      |
|             | 0857  | 0908  | 0924 | C1.8            |                |                     |      |
|             | 1034  | 1043  | 1104 | C4.0            |                |                     |      |
|             | 1533  | 1605  | 1616 | C1.9            |                |                     |      |
| 09 February | 0524  | 0535  | 0553 | C2.2            |                |                     |      |
|             | 0813  | 0813  | 0824 | C2.6            | Sf             | N15E72              | 9822 |
|             | 0930  | 0930  | 0946 | C2.2            | Sf             | S14E13              | 9821 |
|             | 1109  | 1122  | 1141 | C1.6            |                |                     |      |
|             | 1430  | U1434 | 1441 | C1.5            | Sf             | N10E67              |      |
|             | 1942  | 1943  | 1949 | C1.7            | Sf             | S25W07              | 9811 |
|             | 2058  | 2058  | 2103 | C1.5            | Sf             | S14E04              | 9821 |
|             | 2221  | 2223  | 2227 | C1.7            |                |                     |      |
|             | 2238  | 2247  | 2252 | C2.0            |                |                     |      |
| 10 February | 2335  | 2337  | 2341 |                 | Sf             | N12E65              | 9825 |
|             | 2341  | 2342  | 0000 | C3.1            | Sf             | S14E01              | 9821 |
|             | 0009  | 0025  | 0036 | C2.8            |                |                     |      |
|             | 0113  | 0115  | 0118 | C1.9            | Sf             | S14E01              | 9821 |
|             | 0200  | 0217  | 0224 | C1.3            |                |                     |      |
|             | 0533  | 0542  | 0549 | C1.2            |                |                     |      |
|             | 1247  | 1249  | 1255 |                 | Sf             | S25W12              | 9811 |
|             | 1605  | 1606  | 1610 |                 | Sf             | S28W14              | 9811 |
|             | 1729  | 1732  | 1739 |                 | Sf             | S12W08              | 9821 |
| 1844        | 1848  | 1956  | M1.6 | 2f              | S25W15         | 9811                |      |
| 1919        | 1923  | 1952  | C5.5 | 1f              | N08E52         | 9825                |      |
| 2008        | 2011  | 2019  |      | Sf              | S13W10         | 9821                |      |
| 2346        | 2347  | 2349  | C1.8 | Sf              | S14W12         | 9821                |      |



### Region Summary

| Date               | Location       |     | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |   |   |  |
|--------------------|----------------|-----|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|---|---|--|
|                    | Helio          |     | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |   |   |  |
|                    | ( ° Lat ° CMD) | Lon |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 | 4 |   |  |
| <i>Region 9800</i> |                |     |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |  |
| 25 Jan             | N07E63         | 047 | 0130                            | 08                | Dao           | 010           | B            |       |   |   |         | 1 |   |   |   |   |  |
| 26 Jan             | N08E49         | 048 | 0230                            | 10                | Dsi           | 027           | B            |       |   |   |         | 1 |   |   |   |   |  |
| 27 Jan             | N07E35         | 048 | 0330                            | 12                | Eai           | 035           | B            |       |   |   |         |   |   |   |   |   |  |
| 28 Jan             | N07E23         | 047 | 0550                            | 12                | Ekc           | 036           | Bg           | 2     |   |   |         | 1 |   |   |   |   |  |
| 29 Jan             | N07E10         | 047 | 0600                            | 16                | Fkc           | 052           | Bgd          | 4     |   |   |         | 3 |   |   |   |   |  |
| 30 Jan             | N08W03         | 047 | 0600                            | 16                | Fkc           | 052           | Bg           |       |   |   |         |   |   |   |   |   |  |
| 31 Jan             | N07W18         | 049 | 0570                            | 16                | Fkc           | 052           | Bg           | 2     |   |   |         | 2 |   |   |   |   |  |
| 01 Feb             | N08W31         | 048 | 0570                            | 17                | Fac           | 050           | Bg           | 1     |   |   |         | 3 |   |   |   |   |  |
| 02 Feb             | N10W44         | 048 | 0490                            | 15                | Eai           | 028           | Bg           |       |   |   |         |   |   |   |   |   |  |
| 03 Feb             | N10W58         | 050 | 0320                            | 17                | Fai           | 024           | Bg           |       |   |   |         |   |   |   |   |   |  |
| 04 Feb             | N10W73         | 052 | 0250                            | 08                | Dao           | 005           | B            |       |   |   |         |   |   |   |   |   |  |
| 05 Feb             | N06W89         | 055 | 0140                            | 04                | Dao           | 003           | B            |       |   |   |         |   |   |   |   |   |  |
|                    |                |     |                                 |                   |               |               |              | 9     | 0 | 0 | 11      | 0 | 0 | 0 | 0 | 0 |  |

Crossed West Limb.

Absolute heliographic longitude: 047

|                    |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
|--------------------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|--|
| <i>Region 9801</i> |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
| 25 Jan             | S03E77 | 033 | 0050 | 06 | Cso | 003 | B |   |   |   |   |   |   |   |   |   |  |
| 26 Jan             | S03E64 | 033 | 0100 | 04 | Cao | 002 | B |   |   |   |   |   |   |   |   |   |  |
| 27 Jan             | S03E50 | 033 | 0110 | 04 | Dao | 003 | B |   |   |   |   |   |   |   |   |   |  |
| 28 Jan             | S03E38 | 032 | 0090 | 03 | Dso | 003 | B |   |   |   |   |   |   |   |   |   |  |
| 29 Jan             | S03E23 | 033 | 0110 | 04 | Dso | 005 | B |   |   |   |   |   |   |   |   |   |  |
| 30 Jan             | S04E12 | 032 | 0080 | 04 | Dso | 007 | B |   |   |   |   |   |   |   |   |   |  |
| 31 Jan             | S04W02 | 033 | 0100 | 05 | Dso | 008 | B |   |   |   |   |   |   |   |   |   |  |
| 01 Feb             | S03W16 | 033 | 0110 | 05 | Cso | 010 | B |   |   |   |   |   |   |   |   |   |  |
| 02 Feb             | S04W29 | 033 | 0110 | 05 | Cso | 005 | B |   |   |   |   |   |   |   |   |   |  |
| 03 Feb             | S04W41 | 033 | 0080 | 02 | Hsx | 001 | A |   |   |   |   |   |   |   |   |   |  |
| 04 Feb             | S04W54 | 033 | 0080 | 02 | Hsx | 001 | A | 1 |   |   |   | 1 |   |   |   |   |  |
| 05 Feb             | S04W71 | 037 | 0070 | 01 | Hsx | 001 | A |   |   |   |   |   |   |   |   |   |  |
| 06 Feb             | S02W86 | 038 | 0070 | 02 | Hsx | 001 | A |   |   |   |   |   |   |   |   |   |  |
|                    |        |     |      |    |     |     |   | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |  |

Crossed West Limb.

Absolute heliographic longitude: 033



**Region Summary - continued.**

| Date               | Location       |       | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |   |   |   |
|--------------------|----------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|---|---|---|
|                    | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |   |   |   |
|                    |                | Lon   |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 | 4 |   |   |
| <i>Region 9802</i> |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |
| 26 Jan             | S13E72         | 025   | 0140                            | 08                | Dao           | 005           | B            | 1     |   |   | 1       |   |   |   |   |   |   |
| 27 Jan             | S15E60         | 023   | 0230                            | 09                | Dso           | 010           | B            |       |   |   | 1       |   |   |   |   |   |   |
| 28 Jan             | S16E49         | 021   | 0330                            | 12                | Eko           | 014           | Bg           |       |   |   |         |   |   |   |   |   |   |
| 29 Jan             | S16E36         | 021   | 0390                            | 11                | Eki           | 020           | Bg           |       |   |   |         | 2 |   |   |   |   |   |
| 30 Jan             | S17E22         | 022   | 0510                            | 12                | Eac           | 041           | Bgd          | 1     |   |   | 1       |   |   |   |   |   |   |
| 31 Jan             | S16E09         | 022   | 0650                            | 13                | Ekc           | 049           | Bgd          | 2     |   |   | 2       |   |   |   |   |   |   |
| 01 Feb             | S15W05         | 022   | 0780                            | 14                | Ekc           | 064           | Bgd          |       |   |   | 2       |   |   |   |   |   |   |
| 02 Feb             | S14W18         | 022   | 0660                            | 16                | Fkc           | 055           | Bgd          | 2     |   |   | 2       |   |   |   |   |   |   |
| 03 Feb             | S14W31         | 023   | 0560                            | 14                | Eki           | 054           | Bgd          | 2     |   |   | 2       |   |   |   |   |   |   |
| 04 Feb             | S14W44         | 023   | 0640                            | 17                | Fki           | 057           | Bgd          | 2     | 1 |   | 4       |   |   |   |   |   |   |
| 05 Feb             | S15W56         | 022   | 0500                            | 15                | Eai           | 044           | Bgd          |       |   |   |         |   |   |   |   |   |   |
| 06 Feb             | S13W68         | 020   | 0310                            | 13                | Eai           | 017           | Bg           |       |   |   |         |   |   |   |   |   |   |
| 07 Feb             | S14W80         | 019   | 0110                            | 09                | Dso           | 008           | B            |       |   |   |         | 1 |   |   |   |   |   |
| 08 Feb             | S15W92         | 018   | 0050                            | 10                | Dao           | 003           | B            |       |   |   |         |   |   |   |   |   |   |
|                    |                |       |                                 |                   |               |               |              | 9     | 2 | 0 | 18      | 0 | 0 | 0 | 0 | 0 | 0 |

Crossed West Limb.

Absolute heliographic longitude: 022

|                    |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
|--------------------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|--|
| <i>Region 9804</i> |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
| 28 Jan             | S19E27 | 043 | 0020 | 01 | Axx | 001 | A |   |   |   |   |   |   |   |   |   |  |
| 29 Jan             | S19E13 | 044 | 0010 | 02 | Axx | 002 | A |   |   |   |   |   |   |   |   |   |  |
| 30 Jan             | S19E00 | 044 |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
| 31 Jan             | S19W13 | 044 | 0020 | 02 | Bxo | 004 | B |   |   |   |   |   |   |   |   |   |  |
| 01 Feb             | S17W26 | 043 | 0030 | 06 | Cao | 003 | B |   |   |   |   |   |   |   |   |   |  |
| 02 Feb             | S17W38 | 042 |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
| 03 Feb             | S17W51 | 042 |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
| 04 Feb             | S17W64 | 042 |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |
| 05 Feb             | S17W77 | 042 |      |    |     |     |   |   |   |   | 1 |   |   |   |   |   |  |
|                    |        |     |      |    |     |     |   | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |  |

Crossed West Limb.

Absolute heliographic longitude: 044





**Region Summary - continued.**

| Date | Location       |       | Sunspot Characteristics         |                   |               |               |              | Flares |   |   |         |   |   |   |
|------|----------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|--------|---|---|---------|---|---|---|
|      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray  |   |   | Optical |   |   |   |
|      |                | Lon   |                                 |                   |               |               |              | C      | M | X | S       | 1 | 2 | 3 |

*Region 9805*

|        |        |     |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
|--------|--------|-----|------|----|-----|-----|---|---|--|--|--|--|--|--|--|--|--|--|-----------------|
| 28 Jan | N14E64 | 006 | 0010 | 01 | Hrx | 001 | A |   |  |  |  |  |  |  |  |  |  |  |                 |
| 29 Jan | N14E51 | 006 | 0040 | 05 | Dso | 004 | B |   |  |  |  |  |  |  |  |  |  |  | 1               |
| 30 Jan | N14E39 | 005 | 0010 | 04 | Cso | 004 | B | 1 |  |  |  |  |  |  |  |  |  |  |                 |
| 31 Jan | N12E30 | 001 | 0030 | 04 | Cso | 005 | B |   |  |  |  |  |  |  |  |  |  |  |                 |
| 01 Feb | N15E13 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 02 Feb | N15E00 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 03 Feb | N15W13 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 04 Feb | N15W26 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 05 Feb | N15W39 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 06 Feb | N15W52 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 07 Feb | N15W65 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 08 Feb | N15W78 | 005 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
| 09 Feb | N16W91 | 004 |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  |                 |
|        |        |     |      |    |     |     |   |   |  |  |  |  |  |  |  |  |  |  | 1 0 0 1 0 0 0 0 |

Crossed West Limb.

Absolute heliographic longitude: 005

*Region 9806*

|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |  |                 |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|--|-----------------|
| 28 Jan | N11E70 | 000 | 0040 | 02 | Hsx | 001 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
| 29 Jan | N10E57 | 000 | 0030 | 02 | Hsx | 001 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
| 30 Jan | N10E44 | 000 | 0040 | 01 | Hsx | 001 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
| 31 Jan | N12E31 | 000 | 0050 | 03 | Cao | 004 | B |  |  |  |  |  |  |  |  |  |  |  |                 |
| 01 Feb | N11E17 | 000 | 0040 | 02 | Hsx | 002 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
| 02 Feb | N11E03 | 000 | 0050 | 05 | Dso | 004 | B |  |  |  |  |  |  |  |  |  |  |  |                 |
| 03 Feb | N11W08 | 360 | 0040 | 04 | Dso | 004 | B |  |  |  |  |  |  |  |  |  |  |  |                 |
| 04 Feb | N12W21 | 360 | 0030 | 04 | Cso | 003 | B |  |  |  |  |  |  |  |  |  |  |  |                 |
| 05 Feb | N11W36 | 002 | 0030 | 01 | Hsx | 001 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
| 06 Feb | N12W49 | 001 | 0020 | 01 | Hsx | 001 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
| 07 Feb | N13W63 | 002 | 0030 | 01 | Hsx | 001 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
| 08 Feb | N14W78 | 004 | 0030 | 03 | Hsx | 002 | A |  |  |  |  |  |  |  |  |  |  |  |                 |
|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |  | 0 0 0 0 0 0 0 0 |

Crossed West Limb.

Absolute heliographic longitude: 000



**Region Summary - continued.**

| Date | Location       |       | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |
|------|----------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|
|      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |
|      |                | Lon   |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 |

*Region 9807*

|        |        |     |      |    |     |     |    |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|----|---|---|---|---|---|---|---|---|---|---|
| 30 Jan | S27E74 | 330 | 0160 | 14 | Eso | 005 | B  |   |   |   |   |   |   |   |   |   |   |
| 31 Jan | S26E64 | 327 | 0370 | 12 | Eko | 007 | B  |   |   |   |   |   |   |   |   |   |   |
| 01 Feb | S27E51 | 326 | 0320 | 13 | Eai | 013 | Bg |   |   |   |   |   |   |   |   |   |   |
| 02 Feb | S27E38 | 326 | 0210 | 13 | Eai | 016 | Bg |   |   |   |   |   |   |   |   |   |   |
| 03 Feb | S27E26 | 326 | 0120 | 13 | Esi | 026 | B  | 2 |   |   |   | 3 |   |   |   |   |   |
| 04 Feb | S27E13 | 326 | 0090 | 14 | Eai | 027 | B  |   |   |   |   |   |   |   |   |   |   |
| 05 Feb | S25E01 | 325 | 0120 | 13 | Eao | 018 | B  |   |   |   |   |   |   |   |   |   |   |
| 06 Feb | S27W11 | 323 | 0030 | 12 | Cao | 009 | B  |   |   |   |   |   |   |   |   |   |   |
| 07 Feb | S27W22 | 321 | 0020 | 10 | Cso | 008 | B  |   |   |   |   |   |   |   |   |   |   |
| 08 Feb | S27W34 | 320 | 0010 | 08 | Cso | 007 | B  |   |   |   |   |   |   |   |   |   |   |
| 09 Feb | S27W47 | 320 |      |    |     |     |    |   |   |   |   |   |   |   |   |   |   |
| 10 Feb | S27W60 | 320 |      |    |     |     |    |   |   |   |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |    | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 325

*Region 9808*

|        |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|---|
| 31 Jan | N15E54 | 337 | 0030 | 03 | Cso | 004 | B |   |   |   |   |   |   |   |   |   |   |
| 01 Feb | N16E41 | 336 | 0060 | 04 | Cao | 008 | B |   |   |   |   |   |   |   |   |   |   |
| 02 Feb | N16E28 | 336 | 0050 | 05 | Cao | 006 | B |   |   |   |   |   |   |   |   |   |   |
| 03 Feb | N17E15 | 337 | 0030 | 06 | Dso | 010 | B | 1 |   |   |   | 1 |   |   |   |   |   |
| 04 Feb | N17E02 | 337 | 0050 | 07 | Dso | 007 | B |   |   |   |   |   |   |   |   |   |   |
| 05 Feb | N17W13 | 339 | 0060 | 08 | Dao | 013 | B | 1 |   |   |   | 1 |   |   |   |   |   |
| 06 Feb | N17W26 | 338 | 0060 | 06 | Dao | 013 | B |   |   |   |   |   |   |   |   |   |   |
| 07 Feb | N18W40 | 339 | 0070 | 06 | Dso | 008 | B |   |   |   |   |   |   |   |   |   |   |
| 08 Feb | N18W54 | 340 | 0030 | 05 | Cso | 005 | B |   |   |   |   |   |   |   |   |   |   |
| 09 Feb | N17W67 | 340 | 0010 | 02 | Axx | 003 | A |   |   |   |   |   |   |   |   |   |   |
| 10 Feb | N17W80 | 340 |      |    |     |     |   |   |   |   |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 337



**Region Summary - continued.**

| Date | Location    |       | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |
|------|-------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|
|      | ° Lat ° CMD | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |
|      |             | Lon   |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 |

*Region 9809*

|        |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |   |  |  |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|---|--|--|
| 31 Jan | S06E68 | 323 | 0130 | 05 | Dso | 002 | B |   |   |   |   |   |   |   |   |   |   |  |  |
| 01 Feb | S06E55 | 322 | 0120 | 05 | Dao | 003 | B |   |   |   |   |   |   |   |   |   |   |  |  |
| 02 Feb | S06E42 | 322 | 0120 | 06 | Dso | 003 | B |   |   |   |   |   |   |   |   |   |   |  |  |
| 03 Feb | S06E29 | 323 | 0060 | 06 | Dso | 005 | B |   |   |   |   |   |   |   |   |   |   |  |  |
| 04 Feb | S06E16 | 323 | 0100 | 09 | Dso | 006 | B |   | 2 |   |   |   | 1 |   |   |   |   |  |  |
| 05 Feb | S06E03 | 323 | 0100 | 09 | Dso | 007 | B | 1 |   |   |   | 1 | 1 |   |   |   |   |  |  |
| 06 Feb | S04W11 | 323 | 0090 | 06 | Dso | 008 | B |   |   |   |   | 1 |   |   |   |   |   |  |  |
| 07 Feb | S05W24 | 323 | 0080 | 07 | Dso | 007 | B | 1 |   |   |   |   |   |   |   |   |   |  |  |
| 08 Feb | S04W38 | 324 | 0060 | 06 | Dso | 005 | B |   |   |   |   |   |   |   |   |   |   |  |  |
| 09 Feb | S05W50 | 323 | 0060 | 05 | Cso | 002 | B |   |   |   |   |   |   |   |   |   |   |  |  |
| 10 Feb | S05W63 | 323 | 0040 | 01 | Hsx | 001 | A |   |   |   |   |   |   |   |   |   |   |  |  |
|        |        |     |      |    |     |     |   |   | 2 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 |  |  |

Still on Disk.

Absolute heliographic longitude: 323

*Region 9810*

|        |        |     |      |    |     |     |   |  |   |   |   |   |   |   |   |   |   |  |  |
|--------|--------|-----|------|----|-----|-----|---|--|---|---|---|---|---|---|---|---|---|--|--|
| 01 Feb | N10E81 | 296 | 0110 | 02 | Hax | 002 | A |  |   |   |   |   |   |   |   |   |   |  |  |
| 02 Feb | N09E68 | 296 | 0200 | 04 | Cso | 002 | B |  |   |   |   |   |   |   |   |   |   |  |  |
| 03 Feb | N09E55 | 297 | 0200 | 04 | Cao | 003 | B |  |   |   |   |   |   |   |   |   |   |  |  |
| 04 Feb | N09E42 | 297 | 0230 | 04 | Dao | 004 | B |  |   |   |   |   |   |   |   |   |   |  |  |
| 05 Feb | N10E26 | 300 | 0190 | 04 | Dko | 003 | B |  |   |   |   |   |   |   |   |   |   |  |  |
| 06 Feb | N11E13 | 299 | 0130 | 04 | Cao | 006 | B |  |   |   |   |   |   |   |   |   |   |  |  |
| 07 Feb | N10E01 | 298 | 0170 | 03 | Hax | 003 | A |  |   |   |   |   |   |   |   |   |   |  |  |
| 08 Feb | N11W14 | 300 | 0130 | 05 | Dao | 010 | B |  |   |   |   |   |   |   |   |   |   |  |  |
| 09 Feb | N10W27 | 300 | 0150 | 08 | Cso | 009 | B |  |   |   |   |   |   |   |   |   |   |  |  |
| 10 Feb | N10W41 | 301 | 0120 | 03 | Cso | 003 | B |  |   |   |   |   |   |   |   |   |   |  |  |
|        |        |     |      |    |     |     |   |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |

Still on Disk.

Absolute heliographic longitude: 298

*Region 9811*

|        |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |  |  |  |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|--|--|--|
| 02 Feb | S27E83 | 281 | 0090 | 02 | Hax | 001 | A |   |   |   |   |   |   |   |   |   |  |  |  |
| 03 Feb | S27E70 | 282 | 0120 | 08 | Cso | 004 | B |   |   |   |   |   |   |   |   |   |  |  |  |
| 04 Feb | S28E57 | 282 | 0290 | 07 | Dao | 007 | B |   |   |   |   |   |   |   |   |   |  |  |  |
| 05 Feb | S25E45 | 281 | 0240 | 07 | Dao | 012 | B |   |   |   |   |   |   |   |   |   |  |  |  |
| 06 Feb | S25E32 | 280 | 0200 | 06 | Dao | 012 | B | 2 |   |   |   | 2 |   |   |   |   |  |  |  |
| 07 Feb | S26E20 | 279 | 0140 | 06 | Dao | 011 | B |   |   |   |   |   |   |   |   |   |  |  |  |
| 08 Feb | S26E06 | 280 | 0140 | 06 | Dao | 012 | B |   |   |   |   |   |   |   |   |   |  |  |  |
| 09 Feb | S27W05 | 278 | 0130 | 06 | Cao | 013 | B | 1 |   |   |   | 1 |   |   |   |   |  |  |  |
| 10 Feb | S26W20 | 280 | 0100 | 04 | Dso | 005 | B |   | 1 |   |   | 2 |   | 1 |   |   |  |  |  |
|        |        |     |      |    |     |     |   |   | 3 | 1 | 0 | 5 | 0 | 1 | 0 | 0 |  |  |  |

Still on Disk.

Absolute heliographic longitude: 278



**Region Summary - continued.**

| Date | Location       |       | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |
|------|----------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|
|      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |
|      |                | Lon   |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 |

*Region 9812*

|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|
| 02 Feb | N12W16 | 020 | 0010 | 03 | Dso | 002 | B |  |  |  |  |  |  |  |  |  |  |
| 03 Feb | N12W29 | 021 | 0030 | 05 | Dso | 005 | B |  |  |  |  |  |  |  |  |  |  |
| 04 Feb | N12W42 | 021 | 0030 | 05 | Dro | 004 | B |  |  |  |  |  |  |  |  |  |  |
| 05 Feb | N13W57 | 023 | 0020 | 03 | Cro | 002 | B |  |  |  |  |  |  |  |  |  |  |
| 06 Feb | N11W69 | 021 | 0000 | 00 | Axx | 001 | A |  |  |  |  |  |  |  |  |  |  |
| 07 Feb | N11W82 | 021 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 020

*Region 9813*

|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|
| 03 Feb | S24W13 | 005 | 0010 | 01 | Hsx | 002 | A |  |  |  |  |  |  |  |  |  |  |
| 04 Feb | S24W26 | 005 | 0010 | 00 | Axx | 001 | A |  |  |  |  |  |  |  |  |  |  |
| 05 Feb | S24W39 | 005 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
| 06 Feb | S24W52 | 005 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
| 07 Feb | S24W65 | 005 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
| 08 Feb | S24W78 | 005 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 005

*Region 9814*

|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|
| 03 Feb | N07E15 | 337 | 0010 | 04 | Bxo | 004 | B |  |  |  |  |  |  |  |  |  |  |
| 04 Feb | N07E02 | 337 | 0010 | 00 | Hrx | 001 | A |  |  |  |  |  |  |  |  |  |  |
| 05 Feb | N07W13 | 339 | 0010 | 01 | Axx | 002 | A |  |  |  |  |  |  |  |  |  |  |
| 06 Feb | N07W26 | 339 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
| 07 Feb | N07W39 | 339 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
| 08 Feb | N08W51 | 337 | 0020 | 03 | Cso | 003 | B |  |  |  |  |  |  |  |  |  |  |
| 09 Feb | N06W63 | 336 | 0010 | 01 | Axx | 001 | A |  |  |  |  |  |  |  |  |  |  |
| 10 Feb | N06W76 | 336 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 337



***Region Summary - continued.***

| Date | Location       |       | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |
|------|----------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|
|      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |
|      |                | Lon   |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 |

*Region 9815*

|        |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|---|---|
| 03 Feb | N12E70 | 282 | 0080 | 03 | Hsx | 001 | A |   |   |   |   |   |   |   |   |   |   |   |
| 04 Feb | N10E57 | 282 | 0080 | 02 | Hax | 002 | A |   |   |   |   |   |   |   |   |   |   |   |
| 05 Feb | N12E43 | 283 | 0070 | 03 | Cao | 003 | B |   |   |   |   |   |   |   |   |   |   |   |
| 06 Feb | N12E30 | 282 | 0100 | 03 | Cao | 007 | B | 1 |   |   |   | 1 |   |   |   |   |   |   |
| 07 Feb | N12E17 | 282 | 0080 | 05 | Cao | 010 | B | 1 |   |   |   |   |   |   |   |   |   |   |
| 08 Feb | N11E02 | 284 | 0060 | 06 | Dao | 013 | B |   |   |   |   |   |   |   |   |   |   |   |
| 09 Feb | N11W09 | 282 | 0020 | 06 | Bxo | 009 | B |   |   |   |   |   |   |   |   |   |   |   |
| 10 Feb | N11W24 | 284 | 0040 | 05 | Bxo | 005 | B |   |   |   |   |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |   | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 284

*Region 9816*

|        |        |     |      |    |     |     |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|---|---|---|---|---|---|---|---|---|---|---|
| 04 Feb | S13W33 | 012 | 0080 | 04 | Dao | 009 | B |   |   |   |   |   |   |   |   |   |   |   |
| 05 Feb | S12W46 | 012 | 0150 | 05 | Dso | 011 | B | 1 |   |   |   | 2 |   |   |   |   |   |   |
| 06 Feb | S11W58 | 010 | 0060 | 03 | Dao | 004 | B | 3 |   |   |   | 3 |   |   |   |   |   |   |
| 07 Feb | S11W70 | 009 | 0030 | 04 | Cso | 004 | B | 2 |   |   |   | 2 |   |   |   |   |   |   |
| 08 Feb | S13W85 | 011 | 0030 | 05 | Cso | 003 | B |   |   |   |   |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |   | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

Crossed West Limb.

Absolute heliographic longitude: 012

*Region 9817*

|        |        |     |      |    |     |     |   |  |   |   |   |   |   |   |   |   |   |   |
|--------|--------|-----|------|----|-----|-----|---|--|---|---|---|---|---|---|---|---|---|---|
| 05 Feb | S07E23 | 303 | 0020 | 03 | Bxo | 003 | B |  |   |   |   |   |   |   |   |   |   |   |
| 06 Feb | S06E07 | 305 | 0000 | 00 | Axx | 001 | A |  |   |   |   |   |   |   |   |   |   |   |
| 07 Feb | S06W06 | 305 |      |    |     |     |   |  |   |   |   |   |   |   |   |   |   |   |
| 08 Feb | S06W19 | 305 |      |    |     |     |   |  |   |   |   |   |   |   |   |   |   |   |
| 09 Feb | S06W32 | 305 |      |    |     |     |   |  |   |   |   |   |   |   |   |   |   |   |
| 10 Feb | S06W45 | 305 |      |    |     |     |   |  |   |   |   |   |   |   |   |   |   |   |
|        |        |     |      |    |     |     |   |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Still on Disk.

Absolute heliographic longitude: 305



**Region Summary - continued.**

| Date | Location       |       | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |
|------|----------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|
|      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |
|      |                | Lon   |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 |

*Region 9818*

|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|
| 05 Feb | N06E54 | 272 | 0020 | 00 | Axx | 001 | A |  |  |  |  |  |  |  |  |  |  |
| 06 Feb | N07E40 | 272 | 0010 | 02 | Axx | 002 | A |  |  |  |  |  |  |  |  |  |  |
| 07 Feb | N07E27 | 272 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
| 08 Feb | N07E14 | 272 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
| 09 Feb | N06E01 | 272 | 0020 | 03 | Hsx | 002 | A |  |  |  |  |  |  |  |  |  |  |
| 10 Feb | N06W12 | 272 |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 272

*Region 9819*

|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|
| 05 Feb | S29E68 | 258 | 0050 | 01 | Hsx | 002 | A |  |  |  |  |  |  |  |  |  |  |
| 06 Feb | S30E57 | 255 | 0050 | 03 | Cao | 004 | B |  |  |  |  |  |  |  |  |  |  |
| 07 Feb | S31E43 | 256 | 0030 | 05 | Cso | 005 | B |  |  |  |  |  |  |  |  |  |  |
| 08 Feb | S30E33 | 253 | 0020 | 03 | Cro | 004 | B |  |  |  |  |  |  |  |  |  |  |
| 09 Feb | S31E19 | 254 | 0010 | 04 | Cro | 003 | B |  |  |  |  |  |  |  |  |  |  |
| 10 Feb | S30E04 | 256 | 0020 | 06 | Bxo | 005 | B |  |  |  |  |  |  |  |  |  |  |

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 256

*Region 9820*

|        |        |     |      |    |     |     |   |  |  |  |  |  |  |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|---|--|--|--|--|--|--|--|--|--|--|
| 07 Feb | N15E46 | 253 | 0020 | 04 | Cso | 003 | B |  |  |  |  |  |  |  |  |  |  |
| 08 Feb | N15E30 | 256 | 0020 | 02 | Hsx | 002 | A |  |  |  |  |  |  |  |  |  |  |
| 09 Feb | N14E15 | 258 | 0010 | 01 | Axx | 001 | A |  |  |  |  |  |  |  |  |  |  |
| 10 Feb | N14E01 | 259 | 0010 | 00 | Axx | 001 | A |  |  |  |  |  |  |  |  |  |  |

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 259

*Region 9821*

|        |        |     |      |    |     |     |    |   |  |  |   |  |  |  |  |  |  |
|--------|--------|-----|------|----|-----|-----|----|---|--|--|---|--|--|--|--|--|--|
| 08 Feb | S14E16 | 270 | 0030 | 05 | Dso | 011 | B  |   |  |  |   |  |  |  |  |  |  |
| 09 Feb | S14E03 | 270 | 0080 | 08 | Dso | 026 | B  | 3 |  |  | 3 |  |  |  |  |  |  |
| 10 Feb | S14W11 | 271 | 0280 | 11 | Esi | 033 | Bg | 2 |  |  | 4 |  |  |  |  |  |  |

5 0 0 7 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 270



**Region Summary - continued.**

| Date                                 | Location       |       | Sunspot Characteristics         |                   |               |               | Flares       |       |   |   |         |   |   |   |   |   |   |   |
|--------------------------------------|----------------|-------|---------------------------------|-------------------|---------------|---------------|--------------|-------|---|---|---------|---|---|---|---|---|---|---|
|                                      | ( ° Lat ° CMD) | Helio | Area<br>(10 <sup>-6</sup> hemi) | Extent<br>(helio) | Spot<br>Class | Spot<br>Count | Mag<br>Class | X-ray |   |   | Optical |   |   |   |   |   |   |   |
|                                      |                | Lon   |                                 |                   |               |               |              | C     | M | X | S       | 1 | 2 | 3 | 4 |   |   |   |
| <i>Region 9822</i>                   |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| 08 Feb                               | N18E69         | 217   | 0150                            | 09                | Dao           | 009           | B            |       |   |   |         |   |   |   |   |   |   |   |
| 09 Feb                               | N17E56         | 217   | 0070                            | 06                | Cso           | 005           | B            | 1     |   |   |         | 1 |   |   |   |   |   |   |
| 10 Feb                               | N17E40         | 220   | 0070                            | 05                | Cso           | 007           | B            |       |   |   |         |   |   |   |   |   |   |   |
|                                      |                |       |                                 |                   |               |               |              | 1     | 0 | 0 | 1       | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| Absolute heliographic longitude: 220 |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| <i>Region 9823</i>                   |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| 09 Feb                               | S05E24         | 249   | 0020                            | 03                | Cso           | 004           | B            |       |   |   |         |   |   |   |   |   |   |   |
| 10 Feb                               | S05E09         | 251   | 0030                            | 06                | Cso           | 007           | B            |       |   |   |         |   |   |   |   |   |   |   |
|                                      |                |       |                                 |                   |               |               |              | 0     | 0 | 0 | 0       | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| Absolute heliographic longitude: 251 |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| <i>Region 9824</i>                   |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| 09 Feb                               | N21E67         | 206   | 0100                            | 02                | Hsx           | 001           | A            |       |   |   |         |   |   |   |   |   |   |   |
| 10 Feb                               | N21E54         | 206   | 0130                            | 03                | Hsx           | 001           | A            |       |   |   |         |   |   |   |   |   |   |   |
|                                      |                |       |                                 |                   |               |               |              | 0     | 0 | 0 | 0       | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| Absolute heliographic longitude: 206 |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| <i>Region 9825</i>                   |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| 09 Feb                               | N12E69         | 204   | 0320                            | 13                | Eko           | 006           | B            |       |   |   |         | 1 |   |   |   |   |   |   |
| 10 Feb                               | N12E57         | 203   | 0480                            | 13                | Eki           | 012           | B            | 1     |   |   |         |   | 1 |   |   |   |   |   |
|                                      |                |       |                                 |                   |               |               |              | 1     | 0 | 0 | 1       | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| Absolute heliographic longitude: 203 |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| <i>Region 9826</i>                   |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| 10 Feb                               | S23E39         | 221   | 0020                            | 03                | Cao           | 005           | B            |       |   |   |         |   |   |   |   |   |   |   |
|                                      |                |       |                                 |                   |               |               |              | 0     | 0 | 0 | 0       | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Still on Disk.                       |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |
| Absolute heliographic longitude: 221 |                |       |                                 |                   |               |               |              |       |   |   |         |   |   |   |   |   |   |   |



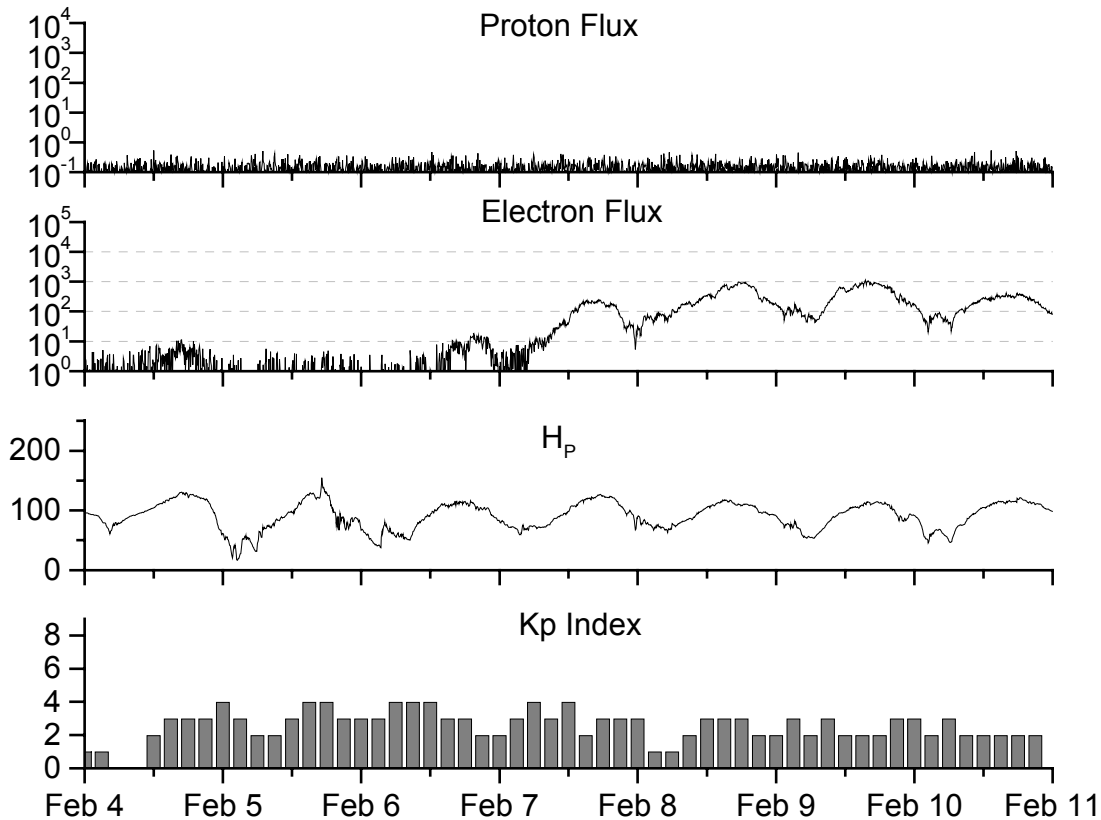
**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

| Month       | Sunspot Numbers        |             |                 | Radio Flux           |                     | Geomagnetic           |                 |                 |                 |
|-------------|------------------------|-------------|-----------------|----------------------|---------------------|-----------------------|-----------------|-----------------|-----------------|
|             | Observed values<br>SWO | Ratio<br>RI | Ratio<br>RI/SWO | Smooth values<br>SWO | Smooth values<br>RI | *Penticton<br>10.7 cm | Smooth<br>Value | Planetary<br>Ap | Smooth<br>Value |
| <b>2000</b> |                        |             |                 |                      |                     |                       |                 |                 |                 |
| February    | 161.9                  | 112.9       | 0.70            | 172.1                | 116.7               | 173.2                 | 176.8           | 15              | 15.0            |
| March       | 203.6                  | 138.5       | 0.68            | 175.4                | 119.9               | 208.2                 | 178.4           | 09              | 15.0            |
| April       | 193.4                  | 125.5       | 0.65            | 176.3                | 120.8               | 184.2                 | 180.5           | 15              | 15.0            |
| May         | 188.8                  | 121.6       | 0.64            | 173.1                | 119.0               | 184.5                 | 180.0           | 15              | 15.0            |
| June        | 190.3                  | 124.9       | 0.66            | 172.0                | 118.7               | 179.8                 | 179.7           | 15              | 15.1            |
| July        | 236.7                  | 169.1       | 0.71            | 173.0                | 119.7               | 204.7                 | 180.2           | 21              | 14.8            |
| August      | 166.6                  | 130.5       | 0.78            | 171.8                | 118.6               | 163.1                 | 179.5           | 16              | 14.2            |
| September   | 157.9                  | 109.9       | 0.70            | 169.0                | 116.2               | 182.1                 | 177.1           | 18              | 14.2            |
| October     | 138.9                  | 100.1       | 0.72            | 166.2                | 114.4               | 167.7                 | 175.6           | 18              | 14.6            |
| November    | 149.9                  | 106.5       | 0.71            | 162.7                | 112.7               | 178.8                 | 173.6           | 17              | 14.6            |
| December    | 146.4                  | 104.5       | 0.71            | 160.8                | 112.1               | 173.6                 | 172.0           | 08              | 14.4            |
| <b>2001</b> |                        |             |                 |                      |                     |                       |                 |                 |                 |
| January     | 142.7                  | 95.1        | 0.67            | 156.3                | 108.8               | 166.7                 | 168.8           | 08              | 13.8            |
| February    | 131.0                  | 80.1        | 0.61            | 151.4                | 104.2               | 147.3                 | 165.8           | 06              | 13.3            |
| March       | 166.7                  | 114.2       | 0.69            | 154.0                | 104.9               | 177.7                 | 167.9           | 17              | 12.9            |
| April       | 163.6                  | 108.2       | 0.66            | 159.4                | 107.7               | 178.3                 | 171.7           | 18              | 12.7            |
| May         | 135.1                  | 97.3        | 0.72            | 163.1                | 108.8               | 148.7                 | 174.8           | 12              | 12.5            |
| June        | 196.7                  | 134.0       | 0.68            | 167.2                | 109.9               | 173.7                 | 178.8           | 12              | 12.4            |
| July        | 124.6                  | 82.2        | 0.66            | 172.1                | 111.8               | 131.3                 | 183.9           | 11              | 12.4            |
| August      | 159.4                  | 106.8       | 0.67            |                      |                     | 163.2                 |                 | 13              |                 |
| September   | 229.1                  | 150.7       | 0.66            |                      |                     | 233.3                 |                 | 12              |                 |
| October     | 197.4                  | 125.6       | 0.64            |                      |                     | 208.2                 |                 | 18              |                 |
| November    | 178.6                  | 106.5       | 0.60            |                      |                     | 212.5                 |                 | 14              |                 |
| December    | 217.5                  | 131.8       | 0.61            |                      |                     | 236.6                 |                 | 08              |                 |
| <b>2002</b> |                        |             |                 |                      |                     |                       |                 |                 |                 |
| January     | 189.0                  | 113.9       | 0.60            |                      |                     | 226.4                 |                 | 07              |                 |

**NOTE:** All smoothed values after June 1999 and monthly values after December 2000 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI= 158.5, occurred July 1989. \*After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.







*Weekly Geosynchronous Satellite Environment Summary*

*Week Beginning 28 January 2002*

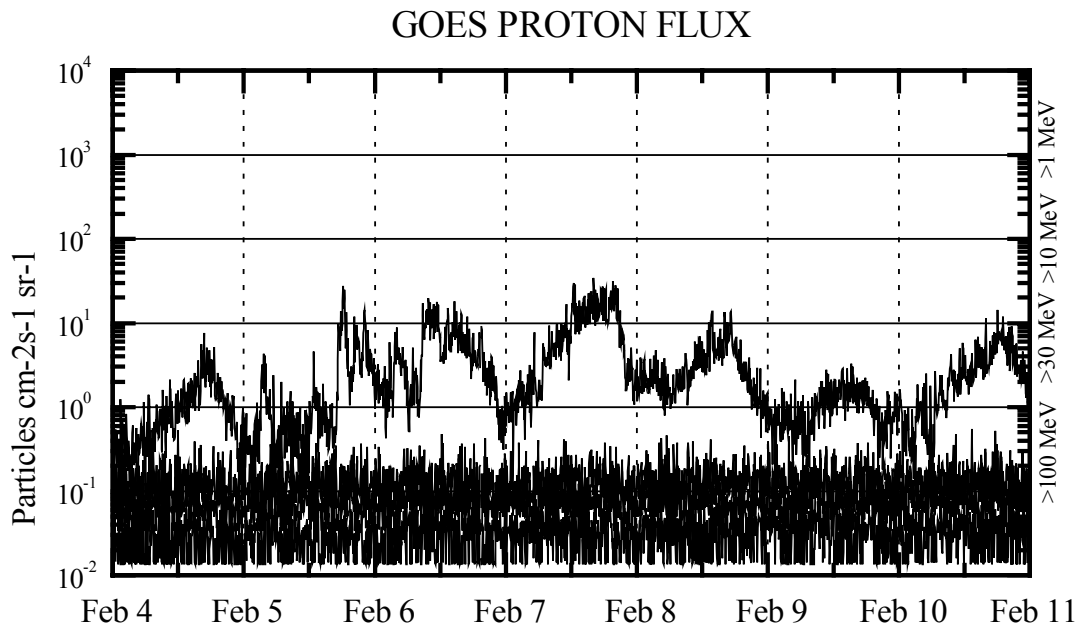
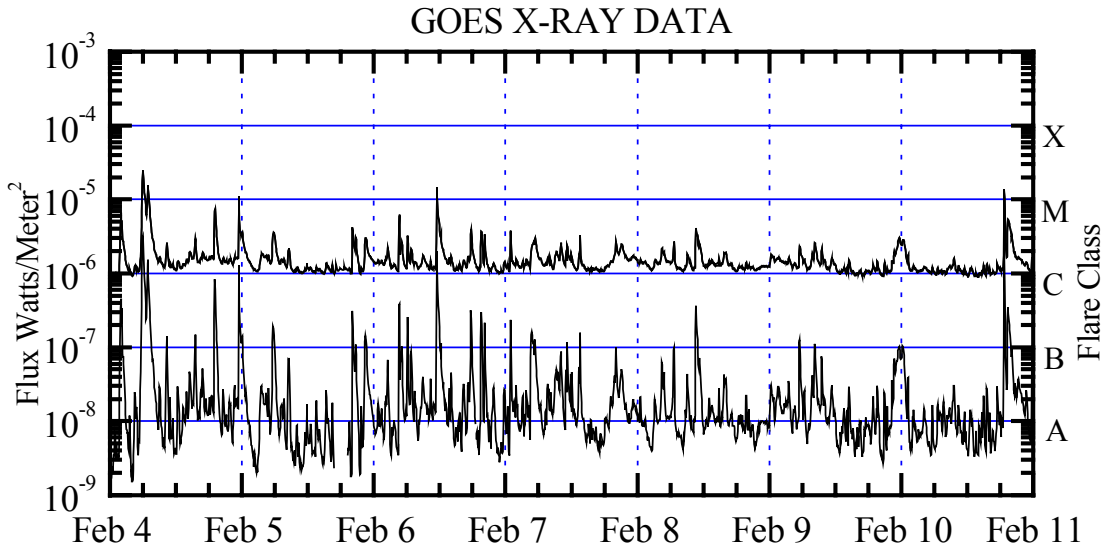
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-8.

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*K<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K<sub>p</sub> values derived from a more extensive network of magnetometers. The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K<sub>p</sub> are "global" parameters that are applicable to a first order approximation over large areas. H<sub>p</sub> is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





*Weekly GOES Satellite X-ray and Proton Plots*

X-ray plot contains five-minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 8 and 10 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

