

## 2001年太陽黒点観測報告

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On the Observations of Sunspots in 2001

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### I はじめに

川崎市青少年科学館では、1982年2月より150mm屈折望遠鏡・投影法による太陽観測を始め、1994年9月より投影法と直視法を併用し観測を続けている。また、80mm屈折望遠鏡で、顕著なプロミネンスの写真撮影を行っている。黒点数は太陽の活動状態を表す指標とされているが、2001年の太陽黒点は、ひきつづき極大期に近い様相を呈している。

なお2001年の観測日数は141日であり、観測は原則として筆者が担当(観測日数136日)し、館職員高岡 英希氏\*(観測日数5日)に補っていた。

### II 方法

1. 観測地 川崎市多摩区枳形  
北緯 35° 36' 18" 東経 139° 33' 53"
  2. 観測機材  
150mm屈折(400mm反赤に同架)  
焦点距離: 2250mm F15
  3. 投影法  
投影像の直径: 250mm  
使用アイピースH40mm(ハイゲン40mm)  
倍率: 56倍
  4. 直視法  
使用アイピース: Or25mm  
(オルソスコピック25mm)  
倍率: 90倍
- なお、観測方法については清水ほか(1972)によった。

### III 結果

2001年に科学館で観測された黒点群は、表2にあるように北半球で246群、南半球で255群、計501群である。ただし9月に欠測が多く、実際にはより多くの黒点群が出現したものと考えられる。

なお、観測者の間では「月15日以上」の観測をもって客観的な数値とする慣例があるが、科学館の2001年における観測では観測日が15日に達していない月が7ヶ月あったため断定的な結論を出すことは出来ない。特に先にもふれているが1月、6月、8月及び9月については観測日数が10日未満であるため参考値ということになる。

まず、表1及び図1から2001年の黒点相対数の状況をつかむことができる。これらは黒点相対数を月ごとの平均値でまとめたものである。

また、太陽黒点観測者の間では、太陽全面の相対数を1つの指標とし、極大期は月平均200以上となる期間を指し、逆に相対数が20以下となる期間は極小期を指すといわれている(成田、1996)。このことを基準として2001年を考察すると次のことが言える。

2001年の黒点相対数(全面)は年平均で174.5である。特に12月は相対数が228.5、10月は観測日数がやや少ないながらも相対数が232.1となっており、ひきつづき極大期に近い特徴が出ていると考えることができる。また、年の後半は相対数が多くなってきている。

このことから、2001年の太陽活動は、まだ極大期に近い状況であることが推察される。今後は観測日数を増やして、データの確実性を高めていくことが課題である。

### 謝 辞

データの集計を行うにあたり、館職員高岡英希氏・館臨時的任用職員豊島瑞穂氏にご協力を頂いた。厚くお礼を申し上げたい。

### 文 献

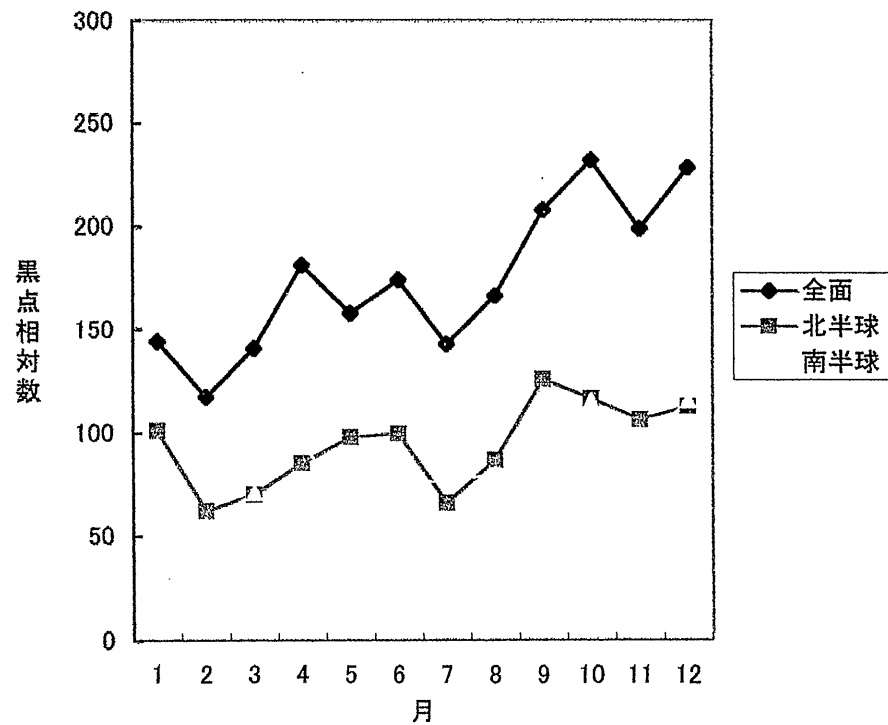
- ・清水一郎・小野 実・小山ひさこ(1972) 太陽黒点の観測. 天体観測シリーズ8 (恒星社厚生閣).

\* 川崎市青少年科学館

表1 2001年黑点相对数

| 月   | 観測日数 | 無黒点日数 | 北半球    | 南半球   | 中央帯   | 全面     |
|-----|------|-------|--------|-------|-------|--------|
| 1   | 9    | 0     | 101.1  | 43.3  | 53.0  | 144.4  |
| 2   | 17   | 0     | 62.2   | 55.2  | 61.0  | 117.4  |
| 3   | 18   | 0     | 70.2   | 70.9  | 61.1  | 141.1  |
| 4   | 16   | 0     | 85.3   | 96.2  | 62.5  | 181.5  |
| 5   | 11   | 0     | 97.9   | 60.1  | 71.3  | 158.0  |
| 6   | 4    | 0     | 99.8   | 74.5  | 101.5 | 174.3  |
| 7   | 15   | 0     | 65.9   | 77.1  | 64.3  | 143.0  |
| 8   | 7    | 0     | 86.9   | 79.6  | 55.6  | 166.5  |
| 9   | 1    | 0     | 126.0  | 82.0  | 100.0 | 208.0  |
| 10  | 13   | 0     | 116.8  | 115.3 | 116.4 | 232.1  |
| 11  | 10   | 0     | 106.5  | 92.5  | 102.1 | 199.0  |
| 12  | 20   | 0     | 112.9  | 115.6 | 116.5 | 228.5  |
| 計   | 141  | 0     | 1131.5 | 962.3 | 965.4 | 2093.8 |
| 年平均 | 11.8 | 0.0   | 94.3   | 80.2  | 80.5  | 174.5  |

图1 2001年黑点相对数(月平均)



| 群   | 緯度   | 経度   | 観測期間 | A    | B  | C | D | E  | F | G | H | J |
|-----|------|------|------|------|----|---|---|----|---|---|---|---|
| S 1 | 13.4 | 16.6 | 1/5  | 1/6  |    |   |   |    |   |   |   |   |
| 2   | 4.3  | 6.2  | 1/6  |      | 4  |   |   |    |   |   |   |   |
| 3   | 13.9 | 14.1 | 1/6  | 1/12 | 2  |   |   |    |   |   |   |   |
| 4   | 6.1  | 7.0  | 1/11 | 1/12 | 2  |   |   |    |   |   |   |   |
| 5   | 30.1 | 30.2 | 1/16 |      |    |   |   |    |   |   |   |   |
| 6   | 22.7 |      | 1/16 |      |    |   |   |    |   |   |   |   |
| 7   | 4.7  | 4.8  | 1/17 |      |    |   |   |    |   |   |   |   |
| 8   | 20.8 | 22.3 | 1/28 |      | 6  |   |   |    |   |   |   |   |
| 9   | 8.4  | 8.6  | 1/28 |      | 2  |   |   |    |   |   |   |   |
| 10  | 4.8  | 6.2  | 1/28 |      |    | 5 |   |    |   |   |   |   |
| 11  | 14.9 | 15.0 | 1/28 | 2    |    |   |   |    |   |   |   |   |
| 12  | 2.5  | 5.7  | 1/28 |      |    |   |   | 40 |   |   |   |   |
| 13  | 23.2 |      | 1/30 | 1    |    |   |   |    |   |   |   |   |
| 14  | 10.1 | 10.5 | 1/30 | 4    |    |   |   |    |   |   |   |   |
| 15  | 7.3  | 8.1  | 1/30 | 4    |    |   |   |    |   |   |   |   |
| 16  | 10.8 | 11.1 | 2/6  | 1    |    |   |   |    |   |   |   |   |
| 17  | 9.2  | 11.0 | 2/6  |      | 3  |   |   |    |   |   |   |   |
| 18  | 27.0 | 27.8 | 2/6  |      |    | 5 |   |    |   |   |   |   |
| 19  | 16.6 | 20.0 | 2/6  | 2    | 7  |   |   |    |   |   |   |   |
| 20  | 9.4  | 11.1 | 2/6  |      |    |   |   | 11 |   |   |   | 1 |
| 21  | 8.7  | 9.1  | 2/8  |      | 3  |   |   |    |   |   |   |   |
| 22  | 20.2 | 20.7 | 2/9  | 2    |    |   |   |    |   |   |   |   |
| 23  | 18.1 | 22.2 | 2/10 |      |    |   |   | 26 |   |   |   |   |
| 24  | 26.4 | 27.5 | 2/14 |      | 3  |   |   |    |   |   |   |   |
| 25  | 21.0 | 22.2 | 2/16 | 1    | 2  |   |   |    |   |   |   |   |
| 26  | 22.4 | 22.7 | 2/17 | 1    | 6  |   | 5 | 2  |   |   |   |   |
| 27  | 7.7  | 10.8 | 2/18 |      |    |   |   |    |   |   |   |   |
| 28  | 23.6 | 26.7 | 2/18 | 2    | 5  |   |   |    |   |   |   |   |
| 29  | 20.9 | 21.1 | 2/20 | 1    |    |   |   |    |   |   |   |   |
| 30  | 6.0  | 9.0  | 2/20 |      | 12 |   |   |    |   |   |   |   |
|     |      |      | 2/22 |      |    |   |   |    |   |   |   |   |

| 群   | 緯度   | 経度   | 観測期間 | A    | B | C  | D  | E  | F | G | H | J |
|-----|------|------|------|------|---|----|----|----|---|---|---|---|
| N 1 | 20.2 | 22.0 | 1/5  | 1/6  |   |    | 10 |    |   |   |   |   |
| 2   | 21.5 | 23.6 | 1/5  | 1/6  | 2 |    | 4  |    |   |   |   |   |
| 3   | 12.5 | 12.7 | 1/5  |      | 1 |    |    |    |   |   |   |   |
| 4   | 19.1 | 21.7 | 1/5  | 1/11 | 1 |    | 3  |    |   |   |   |   |
| 5   | 6.8  | 7.5  | 1/5  | 1/12 |   |    | 7  |    |   |   |   | 1 |
| 6   | 16.2 | 17.8 | 1/5  | 1/12 |   |    | 7  |    |   |   |   |   |
| 7   | 6.9  | 7.4  | 1/5  | 1/12 | 2 |    |    |    |   |   |   |   |
| 8   | 7.8  | 9.6  | 1/11 | 1/16 | 1 | 11 | 10 |    |   |   |   |   |
| 9   | 10.1 | 10.8 | 1/11 | 1/16 | 3 |    |    |    |   |   |   | 1 |
| 10  | 9.0  |      | 1/11 |      | 1 |    |    |    |   |   |   |   |
| 11  | 12.4 | 12.5 | 1/11 |      | 2 |    |    |    |   |   |   |   |
| 12  | 7.3  | 12.4 | 1/11 | 1/18 |   |    |    |    |   |   |   |   |
| 13  | 12.1 | 13.7 | 1/11 | 1/18 |   |    | 5  |    |   |   |   |   |
| 14  | 22.1 | 25.4 | 1/16 | 1/18 |   | 9  | 14 |    |   |   |   |   |
| 15  | 2.5  | 3.9  | 1/16 | 1/18 | 2 |    |    |    |   |   |   |   |
| 16  | 7.5  | 8.0  | 1/16 | 1/18 | 4 | 11 | 4  |    |   |   |   |   |
| 17  | 3.5  | 5.0  | 1/28 | 1/30 | 2 |    |    |    |   |   |   |   |
| 18  | 24.5 | 25.2 | 1/28 |      | 2 |    |    |    |   |   |   |   |
| 19  | 27.3 | 27.8 | 1/28 |      | 3 |    |    |    |   |   |   |   |
| 20  | 5.9  | 6.8  | 1/28 | 2/3  | 2 |    |    |    |   |   |   |   |
| 21  | 8.5  | 12.0 | 1/28 | 2/3  | 1 | 6  | 10 |    |   |   |   |   |
| 22  | 17.9 |      | 1/28 |      | 1 |    |    |    |   |   |   |   |
| 23  | 14.8 | 18.2 | 1/28 | 2/3  |   | 12 | 5  |    |   |   |   | 1 |
| 24  | 22.4 | 26.1 | 1/30 | 2/10 | 1 |    | 10 | 10 |   |   |   |   |
| 25  | 7.3  | 7.9  | 2/3  |      |   | 4  |    |    |   |   |   |   |
| 26  | 23.8 | 24.2 | 2/3  |      | 1 |    |    |    |   |   |   |   |
| 27  | 9.1  | 12.2 | 2/3  | 2/12 |   | 2  | 3  | 19 |   |   |   |   |
| 28  | 9.0  | 11.2 | 2/3  | 2/12 | 1 |    | 4  |    |   |   |   | 3 |
| 29  | 7.0  | 8.8  | 2/3  | 2/10 |   | 7  | 11 |    |   |   |   |   |
| 30  | 13.9 | 14.1 | 2/6  |      | 2 |    |    |    |   |   |   |   |
|     |      |      |      |      |   |    |    |    |   |   |   |   |

| 群    | 緯度   | 経度   | 観測期間 | A | B  | C  | D  | E  | F  | G | H | J |
|------|------|------|------|---|----|----|----|----|----|---|---|---|
| N 31 | 7.1  | 7.4  | 2/6  | 1 |    |    |    |    |    |   |   |   |
| 32   | 16.2 | 17.1 | 2/9  | 1 | 2  |    |    |    |    |   |   |   |
| 33   | 28.0 | 29.7 | 2/9  | 2 | 2  |    |    |    |    |   |   |   |
| 34   | 2.5  | 4.7  | 2/9  | 3 | 2  | 3  |    |    |    |   |   |   |
| 35   | 22.0 | 22.7 | 2/10 | 1 |    |    |    |    |    |   |   | 1 |
| 36   | 9.1  | 9.9  | 2/11 |   | 2  |    |    |    |    |   |   |   |
| 37   | 12.1 | 16.0 | 2/11 | 2 | 3  | 12 | 5  |    |    |   |   |   |
| 38   | 17.7 | 18.1 | 2/12 |   |    | 1  |    |    |    |   |   | 1 |
| 39   | 18.0 | 18.8 | 2/18 | 2 |    |    |    |    |    |   |   |   |
| 40   | 10.1 | 14.0 | 2/21 | 1 | 7  | 2  | 45 |    |    |   |   |   |
| 41   | 18.3 | 25.7 | 2/22 | 1 |    |    |    |    |    |   |   |   |
| 42   | 7.8  | 20.3 | 2/23 | 1 |    |    |    |    |    |   |   |   |
| 43   | 15.0 | 15.2 | 2/27 | 1 |    |    |    |    |    |   |   |   |
| 44   | 9.2  | 10.3 | 3/2  | 2 |    |    |    |    |    |   |   |   |
| 45   | 15.9 | 16.3 | 3/3  | 3 |    |    |    |    |    |   |   |   |
| 46   | 22.5 | 25.8 | 3/3  | 1 | 5  |    |    | 24 |    |   |   |   |
| 47   | 7.6  | 11.3 | 3/3  | 1 | 8  | 12 | 14 | 35 |    |   |   |   |
| 48   | 17.5 | 21.2 | 3/6  |   |    |    | 4  | 13 |    |   |   | 3 |
| 49   | 11.8 | 97.6 | 3/6  | 1 |    |    |    |    |    |   |   |   |
| 50   | 28.4 | 28.7 | 3/13 | 1 |    |    |    |    |    |   |   |   |
| 51   | 7.2  | 7.5  | 3/14 | 1 |    |    |    |    |    |   |   |   |
| 52   | 7.7  | 10.4 | 3/15 | 3 | 7  | 6  | 14 |    |    |   |   |   |
| 53   | 11.6 | 13.9 | 3/18 |   | 6  |    |    |    |    |   |   |   |
| 54   | 7.2  | 9.4  | 3/20 |   |    | 12 |    | 20 |    |   |   | 2 |
| 55   | 12.4 | 12.6 | 3/22 |   | 2  |    |    |    |    |   |   |   |
| 56   | 17.2 | 19.7 | 3/22 |   | 12 |    |    |    |    |   |   |   |
| 57   | 12.3 | 16.4 | 3/22 | 1 |    | 8  | 12 | 22 |    |   |   |   |
| 58   | 14.7 | 16.7 | 3/22 | 4 | 3  | 3  |    |    |    |   |   |   |
| 59   | 14.8 | 29.0 | 3/23 |   |    |    |    |    | 70 |   |   |   |
| 60   | 8.1  | 8.4  | 3/23 | 2 |    |    |    |    |    |   |   | 3 |
|      |      |      | 3/28 |   |    |    |    |    |    |   |   |   |

| 群    | 緯度   | 経度    | 観測期間 | A | B  | C | D  | E  | F  | G  | H | J |
|------|------|-------|------|---|----|---|----|----|----|----|---|---|
| S 31 | 10.7 | 11.2  | 2/21 | 1 |    |   |    |    |    |    |   |   |
| 32   | 14.8 | 15.0  | 2/22 | 1 |    |   |    |    |    |    |   |   |
| 33   | 27.0 | 27.2  | 2/22 | 1 |    |   |    |    |    |    |   |   |
| 34   | 25.3 | 25.4  | 2/22 | 1 |    |   |    |    |    |    |   |   |
| 35   | 9.8  | 10.6  | 2/27 | 3 |    |   |    |    |    |    |   |   |
| 36   | 23.6 | 23.8  | 3/2  | 1 |    |   |    |    |    |    |   |   |
| 37   | 7.8  | 9.5   | 3/2  | 3 | 8  |   |    |    |    |    |   |   |
| 38   | 22.8 | 25.8  | 3/2  | 1 | 11 |   |    | 11 |    |    |   |   |
| 39   | 11.7 | 169.9 | 3/3  | 1 |    |   |    |    |    |    |   |   |
| 40   | 13.9 | 75.5  | 3/8  | 1 |    |   |    |    |    |    |   |   |
| 41   | 14.1 | 14.5  | 3/9  | 1 |    |   |    |    |    |    |   |   |
| 42   | 24.9 | 25.9  | 3/9  |   | 2  |   |    |    |    |    |   |   |
| 43   | 18.1 | 18.4  | 3/9  | 1 |    |   |    |    |    |    |   |   |
| 44   | 34.2 | 36.3  | 3/10 |   | 10 |   |    |    |    |    |   |   |
| 45   | 9.7  | 9.8   | 3/10 | 2 |    |   |    |    |    |    |   |   |
| 46   | 4.4  | 11.3  | 3/10 | 3 |    |   | 7  | 19 | 46 | 64 |   |   |
| 47   | 16.3 | 17.0  | 3/11 | 1 |    |   |    |    |    |    |   |   |
| 48   | 17.4 | 17.5  | 3/13 | 2 |    |   |    |    |    |    |   |   |
| 49   | 12.5 | 13.1  | 3/13 | 3 |    |   |    |    |    |    |   |   |
| 50   | 10.2 | 10.5  | 3/13 | 1 |    |   |    |    |    |    |   |   |
| 51   | 9.2  | 11.0  | 3/15 |   |    |   | 3  | 6  |    |    |   |   |
| 52   | 12.7 | 14.5  | 3/16 |   |    |   |    |    |    |    |   |   |
| 53   | 12.1 | 12.3  | 3/18 | 2 |    |   |    |    |    |    |   |   |
| 54   | 10.6 | 13.0  | 3/22 |   | 4  |   |    |    |    |    |   |   |
| 55   | 11.2 | 13.7  | 3/22 |   | 9  |   |    |    |    |    |   |   |
| 56   | 12.7 | 15.2  | 3/23 |   | 2  |   |    |    |    |    |   |   |
| 57   | 12.2 | 12.6  | 3/23 | 1 |    |   |    |    |    |    |   |   |
| 58   | 4.0  | 7.5   | 3/27 |   |    |   | 26 | 14 |    |    |   |   |
| 59   | 27.6 | 29.4  | 3/27 |   | 5  |   |    |    |    |    |   |   |
| 60   | 9.9  | 12.0  | 3/27 |   | 10 |   |    |    |    |    |   |   |
|      |      |       | 3/28 |   |    |   |    |    |    |    |   |   |

| 群    | 緯度   | 経度   | 観測期間        | A | B | C  | D  | E  | F  | G | H | J |
|------|------|------|-------------|---|---|----|----|----|----|---|---|---|
| N 61 | 9.2  | 9.6  | 176.9 179.7 | 2 | 3 |    |    |    |    |   |   |   |
| 62   | 17.5 | 23.0 | 132.1 140.5 | 1 |   | 16 | 3  | 23 |    |   | 8 |   |
| 63   | 6.4  | 6.7  | 122.2 122.6 | 3 |   |    |    |    |    |   |   |   |
| 64   | 17.3 | 18.8 | 172.9 173.4 | 1 |   |    |    |    |    |   |   |   |
| 65   | 10.1 |      | 173.2       | 1 |   |    |    |    |    |   |   |   |
| 66   | 9.8  | 12.6 | 85.2 87.5   | 3 |   | 6  |    |    |    |   | 1 | 2 |
| 67   | 24.6 | 25.5 | 80.8 82.8   | 3 |   |    |    |    |    |   | 5 | 2 |
| 68   | 16.1 | 19.1 | 140.7 142.6 | 4 |   |    |    |    |    |   |   |   |
| 69   | 8.5  | 11.3 | 107.4 117.3 | 1 |   | 14 | 7  |    |    |   |   |   |
| 70   | 9.1  | 12.5 | 79.7 84.3   | 4 |   |    |    |    |    |   |   |   |
| 71   | 14.8 | 16.8 | 87.2 93.6   | 4 |   |    | 4  |    |    |   |   |   |
| 72   | 23.2 | 28.0 | 340.3 351.5 | 4 |   |    | 3  | 14 |    |   |   |   |
| 73   | 28.2 | 31.7 | 78.1 81.5   | 4 |   |    |    |    |    |   | 2 |   |
| 74   | 23.5 | 24.7 | 36.7 39.6   | 4 |   |    |    |    |    |   |   |   |
| 75   | 18.9 | 19.7 | 3.1 4.2     | 4 |   |    | 2  |    |    |   |   |   |
| 76   | 12.6 | 14.1 | 323.7 325.6 | 4 |   |    |    |    |    |   |   |   |
| 77   | 6.9  | 7.4  | 224.8 226.1 | 4 |   |    |    |    |    |   |   | 4 |
| 78   | 17.1 | 18.2 | 241.9 246.7 | 4 |   |    |    |    |    |   |   |   |
| 79   | 6.4  | 9.8  | 210.6 217.3 | 4 |   | 18 | 13 |    |    |   |   |   |
| 80   | 10.0 | 20.5 | 141.3 164.3 | 4 |   |    |    |    |    |   |   |   |
| 81   | 6.8  | 8.2  | 119.5 123.8 | 4 |   |    |    | 16 | 94 |   |   |   |
| 82   | 7.9  | 8.9  | 168.8 169.1 | 4 |   | 7  |    |    |    |   |   | 1 |
| 83   | 7.0  | 8.0  | 156.6 159.4 | 4 |   |    |    |    |    |   |   |   |
| 84   | 6.0  | 7.1  | 119.5 122.6 | 4 |   |    |    |    |    |   |   |   |
| 85   | 4.1  | 8.1  | 73.8 84.6   | 4 |   |    |    |    |    |   | 2 |   |
| 86   | 25.8 | 26.2 | 69.6 69.9   | 4 |   |    |    |    |    |   |   | 1 |
| 87   | 21.8 | 22.3 | 129.8 132.7 | 4 |   |    |    |    |    |   |   |   |
| 88   | 10.3 | 13.1 | 57.5 69.7   | 5 |   |    |    |    |    |   |   |   |
| 89   | 20.9 | 27.7 | 150 33.6    | 5 |   |    |    |    |    |   |   |   |
| 90   | 5.3  |      | 23.0        | 5 |   |    |    |    |    |   |   |   |

| 群    | 緯度   | 経度   | 観測期間        | A | B | C  | D  | E  | F  | G | H | J |
|------|------|------|-------------|---|---|----|----|----|----|---|---|---|
| S 61 | 7.3  | 10.1 | 123.6 138.8 | 3 |   |    |    | 17 | 15 |   |   |   |
| 62   | 12.5 | 14.0 | 114.7 122.1 | 3 |   |    |    |    |    |   |   | 1 |
| 63   | 3.4  | 6.9  | 100.4 106.1 | 7 |   | 14 | 22 |    |    |   |   |   |
| 64   | 7.9  | 10.5 | 109.4 120.2 | 3 |   | 9  |    | 37 |    |   |   |   |
| 65   | 12.5 | 13.0 | 49.0 50.5   | 4 |   |    |    |    |    |   |   | 2 |
| 66   | 21.2 | 21.3 | 28.6        | 4 |   | 1  |    |    |    |   |   |   |
| 67   | 10.7 | 10.8 | 31.8 32.0   | 4 |   |    |    |    |    |   |   |   |
| 68   | 17.4 | 23.0 | 32.7 41.9   | 4 |   | 3  | 21 | 30 |    |   |   |   |
| 69   | 23.9 | 24.2 | 28.4 28.6   | 4 |   | 2  |    |    |    |   |   |   |
| 70   | 7.8  | 9.5  | 15.5 22.9   | 4 |   |    | 22 | 25 |    |   |   |   |
| 71   | 25.0 |      | 5.0         | 4 |   |    |    |    |    |   |   |   |
| 72   | 6.7  | 8.7  | 329.5 331.7 | 4 |   |    |    |    |    |   |   | 5 |
| 73   | 15.0 | 16.2 | 57.2 60.3   | 4 |   |    |    |    |    |   |   |   |
| 74   | 15.4 | 17.6 | 329.3 335.6 | 4 |   |    |    |    |    |   |   | 1 |
| 75   | 11.0 | 12.7 | 302.3 306.8 | 4 |   | 13 |    |    |    |   |   | 1 |
| 76   | 23.8 |      | 15.3        | 4 |   |    |    |    |    |   |   | 1 |
| 77   | 7.2  | 8.0  | 335.4 339.9 | 4 |   |    |    |    |    |   |   | 1 |
| 78   | 8.8  | 10.0 | 285.7 291.5 | 4 |   |    |    |    |    |   |   |   |
| 79   | 15.8 | 16.0 | 296.0       | 4 |   |    |    |    |    |   |   |   |
| 80   | 17.1 | 17.5 | 290.5 292.5 | 4 |   |    |    |    |    |   |   |   |
| 81   | 10.7 | 11.0 | 319.9 320.0 | 4 |   |    |    |    |    |   |   |   |
| 82   | 15.1 | 15.5 | 234.2 236.2 | 4 |   |    |    |    |    |   |   |   |
| 83   | 17.5 | 21.9 | 189.0 197.4 | 4 |   |    |    |    |    |   |   |   |
| 84   | 11.2 | 12.6 | 192.0 197.3 | 4 |   | 2  |    | 13 |    |   |   |   |
| 85   | 10.3 | 11.3 | 121.1 121.9 | 4 |   | 10 |    |    |    |   |   | 1 |
| 86   | 20.2 | 21.2 | 168.3 168.6 | 4 |   |    |    |    |    |   |   |   |
| 87   | 11.0 | 11.2 | 97.0        | 4 |   |    |    |    |    |   |   |   |
| 88   | 21.7 | 21.9 | 58.8 59.8   | 4 |   |    |    |    |    |   |   |   |
| 89   | 2.5  | 5.1  | 28.5 32.8   | 5 |   |    |    |    |    |   |   |   |
| 90   | 16.5 | 17.2 | 339.9 341.0 | 5 |   |    |    |    |    |   |   | 2 |

| 群    | 緯度   | 経度   | 観測期間  | A     | B     | C    | D    | E  | F  | G | H | J |
|------|------|------|-------|-------|-------|------|------|----|----|---|---|---|
| N 91 | 19.2 | 22.5 | 349.6 | 349.6 | 349.6 | 5/4  | 5/13 |    |    |   |   | 2 |
| 92   | 8.0  | 14.1 | 227.3 | 239.2 | 5/11  | 5/20 |      | 22 | 50 |   |   | 5 |
| 93   | 2.7  | 5.5  | 278.2 | 284.6 | 5/12  | 5/18 |      |    |    |   |   |   |
| 94   | 24.0 | 24.3 | 258.4 | 260.2 | 5/15  |      |      |    |    |   |   |   |
| 95   | 17.2 | 21.4 | 158.8 | 165.3 | 5/17  | 5/25 |      |    |    |   |   |   |
| 96   | 14.0 | 14.3 | 161.1 | 161.6 | 5/17  | 5/20 |      |    |    |   |   | 1 |
| 97   | 26.7 | 27.2 | 255.7 | 258.6 | 5/18  | 5/19 |      |    |    |   |   |   |
| 98   | 15.3 | 16.9 | 222.5 | 224.7 | 5/18  | 5/19 |      |    |    |   |   |   |
| 99   | 15.8 | 17.9 | 135.7 | 137.7 | 5/18  | 5/25 |      |    |    |   |   |   |
| 100  | 2.8  | 8.9  | 120.1 | 134.4 | 5/19  | 5/25 |      |    |    |   |   |   |
| 101  | 2.4  | 6.9  | 90.4  | 97.8  | 5/25  |      |      |    |    |   |   |   |
| 102  | 10.4 | 10.9 | 71.7  | 72.0  | 5/25  |      |      |    |    |   |   |   |
| 103  | 17.5 | 20.7 | 11.4  | 16.2  | 6/3   | 6/7  |      |    |    |   |   |   |
| 104  | 24.7 | 24.9 | 13.5  |       | 6/3   |      |      |    |    |   |   |   |
| 105  | 27.1 | 28.1 | 4.8   | 8.7   | 6/3   | 6/7  |      |    |    |   |   |   |
| 106  | 18.8 | 22.1 | 281.7 | 285.0 | 6/3   | 6/9  |      |    |    |   |   |   |
| 107  | 16.3 | 20.9 | 264.7 | 274.7 | 6/7   | 6/9  |      |    |    |   |   |   |
| 108  | 17.5 | 20.5 | 240.4 | 248.4 | 6/7   | 6/9  |      |    |    |   |   |   |
| 109  | 23.8 | 24.8 | 244.3 | 245.3 | 6/7   | 6/9  |      |    |    |   |   |   |
| 110  | 5.7  | 8.7  | 234.6 | 237.6 | 6/7   | 6/9  |      |    |    |   |   |   |
| 111  | 6.0  | 7.3  | 222.0 | 229.4 | 6/7   | 6/9  |      |    |    |   |   |   |
| 112  | 7.5  | 8.1  | 297.1 | 299.7 | 6/9   |      |      |    |    |   |   |   |
| 113  | 2.5  | 4.8  | 253.5 | 259.5 | 6/9   |      |      |    |    |   |   |   |
| 114  | 9.8  | 11.6 | 67.1  | 69.1  | 6/29  |      |      |    |    |   |   |   |
| 115  | 21.4 | 22.4 | 24.0  | 30.0  | 6/29  | 7/3  |      |    |    |   |   |   |
| 116  | 16.2 |      | 27.5  | 27.7  | 6/29  |      |      |    |    |   |   |   |
| 117  | 22.2 |      | 20.9  | 21.3  | 6/29  |      |      |    |    |   |   |   |
| 118  | 10.8 | 13.2 | 11.5  | 15.6  | 6/29  | 7/4  |      |    |    |   |   |   |
| 119  | 16.8 | 19.6 | 273.1 | 275.5 | 7/1   | 7/7  |      |    |    |   |   |   |
| 120  | 7.7  | 7.9  | 272.0 | 272.5 | 7/1   | 7/3  |      |    |    |   |   |   |

| 群    | 緯度   | 経度   | 観測期間  | A     | B    | C    | D | E | F | G | H | J |
|------|------|------|-------|-------|------|------|---|---|---|---|---|---|
| S 91 | 20.2 | 22.5 | 300.9 | 303.8 | 5/6  | 5/17 |   |   |   |   |   | 1 |
| 92   | 22.4 | 25.7 | 301.0 | 303.2 | 5/11 |      |   |   |   |   |   |   |
| 93   | 4.1  | 5.5  | 278.8 | 283.9 | 5/11 | 5/12 |   |   |   |   |   |   |
| 94   | 14.9 | 20.4 | 267.1 | 281.4 | 5/11 | 5/19 |   |   |   |   |   |   |
| 95   | 19.2 | 20.3 | 260.7 | 260.9 | 5/13 | 5/15 |   |   |   |   |   |   |
| 96   | 12.2 | 14.2 | 293.4 | 296.5 | 5/15 | 5/18 |   |   |   |   |   |   |
| 97   | 12.5 | 12.6 | 269.8 | 273.0 | 5/15 |      |   |   |   |   |   |   |
| 98   | 22.6 |      | 189.4 |       | 5/15 |      |   |   |   |   |   |   |
| 99   | 32.4 | 32.6 | 134.9 |       | 5/19 | 5/20 |   |   |   |   |   |   |
| 100  | 9.0  | 9.4  | 122.2 | 122.6 | 5/19 | 5/20 |   |   |   |   |   |   |
| 101  | 20.6 | 20.8 | 239.9 |       | 5/20 |      |   |   |   |   |   |   |
| 102  | 10.4 | 10.8 | 112.3 | 112.5 | 5/20 |      |   |   |   |   |   |   |
| 103  | 6.6  | 7.0  | 125.9 | 126.9 | 5/20 |      |   |   |   |   |   |   |
| 104  | 4.9  | 5.3  | 116.3 | 117.9 | 5/25 |      |   |   |   |   |   |   |
| 105  | 7.4  | 8.0  | 103.6 | 104.1 | 5/25 |      |   |   |   |   |   |   |
| 106  | 22.4 | 22.7 | 75.5  | 77.0  | 6/3  |      |   |   |   |   |   |   |
| 107  | 14.8 | 16.6 | 32.7  | 35.1  | 6/3  |      |   |   |   |   |   |   |
| 108  | 10.8 | 12.0 | 359.6 | 357.2 | 6/3  |      |   |   |   |   |   |   |
| 109  | 15.2 | 15.6 | 349.2 | 349.7 | 6/3  |      |   |   |   |   |   |   |
| 110  | 4.4  | 6.8  | 332.1 | 343.8 | 6/3  | 6/9  |   |   |   |   |   |   |
| 111  | 21.2 | 21.7 | 298.7 | 299.5 | 6/3  |      |   |   |   |   |   |   |
| 112  | 14.2 | 16.5 | 284.0 | 285.5 | 6/3  |      |   |   |   |   |   |   |
| 113  | 17.4 | 20.7 | 284.1 | 294.1 | 6/3  | 6/9  |   |   |   |   |   |   |
| 114  | 7.5  | 9.8  | 305.5 | 312.4 | 6/9  |      |   |   |   |   |   |   |
| 115  | 16.3 | 17.0 | 294.6 |       | 6/9  |      |   |   |   |   |   |   |
| 116  | 10.1 | 10.4 | 228.4 |       | 6/9  |      |   |   |   |   |   |   |
| 117  | 20.6 | 21.0 | 82.6  | 83.6  | 6/29 |      |   |   |   |   |   |   |
| 118  | 4.8  | 6.1  | 35.7  | 39.6  | 6/29 | 7/1  |   |   |   |   |   |   |
| 119  | 7.4  | 8.0  | 310.0 | 310.6 | 6/29 | 7/3  |   |   |   |   |   |   |
| 120  | 45.0 | 49.9 | 320.6 | 328.6 | 7/1  | 7/4  |   |   |   |   |   |   |

| 群    | 緯度   | 経度   | 観測期間        | A | B  | C | D  | E  | F | G | H | J |
|------|------|------|-------------|---|----|---|----|----|---|---|---|---|
| N121 | 2.2  | 5.7  | 260.6 264.2 | 3 |    | 5 |    |    |   |   |   |   |
| 122  | 3.6  | 7.0  | 236.5 242.2 |   | 3  | 9 |    |    |   |   |   | 1 |
| 123  | 20.1 | 21.7 | 333.1 334.7 |   | 3  |   |    |    |   |   |   |   |
| 124  | 10.6 | 11.1 | 160.2 168.3 | 4 | 5  |   |    |    |   |   |   | 1 |
| 125  | 4.6  | 6.8  | 140.8 142.9 |   |    |   |    |    |   |   |   |   |
| 126  | 12.7 |      | 136.3       | 1 |    |   |    |    |   |   |   |   |
| 127  | 17.6 |      | 131.1       | 1 |    |   |    |    |   |   |   |   |
| 128  | 14.6 | 16.8 | 120.8 124.9 |   |    |   | 4  |    |   |   |   |   |
| 129  | 16.4 | 17.5 | 106.1 112.3 | 1 |    | 8 |    |    |   |   |   | 2 |
| 130  | 19.0 | 19.9 | 133.2 134.9 | 2 |    |   |    |    |   |   |   |   |
| 131  | 7.2  | 8.4  | 127.2 129.9 |   | 3  |   |    |    |   |   |   |   |
| 132  | 13.1 | 13.8 | 148.9 150.5 | 3 |    |   |    |    |   |   |   |   |
| 133  | 7.9  | 9.8  | 112.9 119.3 |   | 9  |   |    |    |   |   |   |   |
| 134  | 6.1  | 8.7  | 84.5 86.5   |   | 3  |   |    |    |   |   |   |   |
| 135  | 10.7 | 11.1 | 175.1 176.4 | 1 |    |   |    |    |   |   |   |   |
| 136  | 11.2 | 11.4 | 166.7 167.4 | 1 |    |   |    |    |   |   |   |   |
| 137  | 7.8  | 7.9  | 125.1       | 1 |    |   |    |    |   |   |   |   |
| 138  | 15.7 | 17.0 | 56.3 63.9   |   | 7  | 8 | 15 |    |   |   |   |   |
| 139  | 7.5  | 8.9  | 82.5 85.0   |   | 10 |   |    |    |   |   |   |   |
| 140  | 7.5  | 10.4 | 111.5 115.8 |   |    | 4 | 17 |    |   |   |   |   |
| 141  | 4.0  |      | 88.7        | 1 |    |   |    |    |   |   |   |   |
| 142  | 7.7  |      | 85.5        | 1 |    |   |    |    |   |   |   |   |
| 143  | 16.3 | 17.0 | 88.7 90.4   | 4 |    |   |    |    |   |   |   |   |
| 144  | 8.9  | 9.0  | 74.8        | 1 |    |   |    |    |   |   |   |   |
| 145  | 11.1 | 12.3 | 9.7 13.5    |   | 7  |   |    |    |   |   |   |   |
| 146  | 1.7  | 5.2  | 237.0 246.9 |   |    |   | 4  | 10 |   |   |   |   |
| 147  | 1.6  |      | 262.4       | 1 |    |   |    |    |   |   |   |   |
| 148  | 15.0 | 17.0 | 221.4 228.7 |   | 10 |   |    |    |   |   |   |   |
| 149  | 13.4 | 15.7 | 321.5 328.2 |   |    |   | 6  |    |   |   |   |   |
| 150  | 20.3 | 26.2 | 236.2 245.5 |   |    |   | 35 |    |   |   |   |   |

| 群    | 緯度   | 経度   | 観測期間        | A | B  | C  | D  | E  | F  | G | H | J |
|------|------|------|-------------|---|----|----|----|----|----|---|---|---|
| S121 | 16.2 | 17.0 | 261.0 262.3 | 4 |    |    |    |    |    |   |   | 3 |
| 122  | 49.5 | 49.9 | 316.8 317.7 | 2 |    |    |    |    |    |   |   | 4 |
| 123  | 8.8  | 8.9  | 309.1       | 1 |    |    |    |    |    |   |   |   |
| 124  | 17.7 | 19.9 | 291.2 296.4 |   | 14 |    |    |    |    |   |   |   |
| 125  | 18.2 | 18.3 | 254.7 255.4 | 2 |    |    |    |    |    |   |   |   |
| 126  | 19.6 | 20.0 | 296.3       | 1 |    |    |    |    |    |   |   |   |
| 127  | 3.2  | 7.5  | 219.8 226.5 |   | 3  | 17 | 24 |    |    |   |   |   |
| 128  | 8.0  | 9.9  | 197.6 204.3 |   | 10 | 9  | 2  |    |    |   |   |   |
| 129  | 18.2 | 19.5 | 253.5 254.0 | 2 |    |    |    |    |    |   |   |   |
| 130  | 17.2 | 19.7 | 158.5 172.1 |   | 11 | 32 |    | 36 | 28 |   |   |   |
| 131  | 6.8  | 10.1 | 163.0 168.7 |   | 20 |    | 10 |    |    |   |   |   |
| 132  | 18.8 | 25.8 | 68.1 80.9   |   |    |    |    | 45 | 52 |   |   | 1 |
| 133  | 16.2 | 17.7 | 76.2 81.0   |   | 6  | 5  |    |    |    |   |   |   |
| 134  | 13.2 | 15.0 | 81.6 87.3   | 6 |    |    |    |    |    |   |   |   |
| 135  | 4.0  |      | 54.5        | 1 |    |    |    |    |    |   |   |   |
| 136  | 21.7 |      | 133.7       | 1 |    |    |    |    |    |   |   |   |
| 137  | 7.2  | 8.9  | 339.0 342.0 |   | 2  |    |    |    |    |   |   | 6 |
| 138  | 17.9 | 18.7 | 289.0 294.6 |   | 2  |    |    |    |    |   |   |   |
| 139  | 18.9 | 22.3 | 281.5 288.9 |   | 20 |    | 28 |    |    |   |   |   |
| 140  | 12.6 | 17.0 | 255.1 265.0 |   |    | 11 |    | 17 |    | 7 |   |   |
| 141  | 13.2 | 15.9 | 259.0 262.7 |   | 9  |    |    |    |    |   |   | 2 |
| 142  | 4.1  | 5.0  | 160.7 161.7 |   |    |    |    |    |    |   |   | 1 |
| 143  | 11.0 | 11.6 | 159.4 160.7 |   |    |    |    |    |    |   |   | 1 |
| 144  | 8.2  | 9.0  | 120.6 129.7 |   |    |    |    |    |    |   |   | 1 |
| 145  | 16.3 | 16.6 | 119.2 121.0 |   | 2  |    |    |    |    |   |   |   |
| 146  | 20.8 | 22.8 | 121.6 122.2 |   | 2  |    |    |    |    |   |   |   |
| 147  | 24.8 | 26.0 | 111.2 113.7 | 5 |    |    |    |    |    |   |   |   |
| 148  | 21.6 | 24.1 | 72.3 75.5   |   | 3  |    |    |    |    |   |   |   |
| 149  | 11.2 | 12.7 | 25.1 29.3   |   | 2  |    | 4  |    |    |   |   |   |
| 150  | 9.8  | 10.1 | 19.4 19.7   | 1 |    |    |    |    |    |   |   |   |

| 群     | 緯度   | 経度   | 観測期間        | A     | B  | C  | D  | E  | F | G | H | J |
|-------|------|------|-------------|-------|----|----|----|----|---|---|---|---|
| N 151 | 12.2 | 12.4 | 157.2 161.7 | 8/17  |    |    |    |    |   |   |   |   |
| 152   | 10.0 | 12.0 | 76.7 79.5   | 8/17  | 2  |    |    |    |   |   |   | 4 |
| 153   | 12.2 | 12.4 | 71.9 72.5   | 8/17  | 2  |    |    |    |   |   |   | 1 |
| 154   | 23.2 | 23.8 | 39.3 40.2   | 8/17  | 2  |    |    |    |   |   |   |   |
| 155   | 30.0 | 30.3 | 29.7 31.5   | 8/17  | 2  |    |    |    |   |   |   |   |
| 156   | 14.8 | 15.0 | 30.9        | 8/17  | 1  |    |    |    |   |   |   |   |
| 157   | 10.0 | 17.2 | 4.1 14.3    | 8/17  | 3  |    | 37 | 30 |   |   |   |   |
| 158   | 24.1 | 28.0 | 20.8 31.0   | 8/19  | 2  | 20 | 10 |    |   |   |   |   |
| 159   | 12.7 | 16.3 | 49.6 54.6   | 8/23  | 1  | 9  |    |    |   |   |   |   |
| 160   | 7.5  | 10.1 | 5.8 9.2     | 8/24  | 6  |    |    |    |   |   |   |   |
| 161   | 14.7 | 14.9 | 315.2 315.9 | 8/24  | 2  |    |    |    |   |   |   |   |
| 162   | 13.8 | 15.9 | 49.9 53.9   | 9/18  |    | 6  |    |    |   |   |   |   |
| 163   | 7.2  | 7.5  | 21.2 21.7   | 9/18  |    |    |    |    |   |   |   | 2 |
| 164   | 9.8  | 11.7 | 10.8 13.5   | 9/18  |    | 7  |    |    |   |   |   |   |
| 165   | 11.3 | 12.5 | 348.6 353.2 | 9/18  |    |    | 4  |    |   |   |   |   |
| 166   | 23.2 | 25.7 | 332.9 334.7 | 9/18  | 3  |    |    |    |   |   |   |   |
| 167   | 24.1 | 24.8 | 323.4 323.9 | 9/18  |    |    |    |    |   |   |   | 1 |
| 168   | 10.4 | 16.2 | 321.9 329.6 | 9/18  |    |    | 10 |    |   |   |   |   |
| 169   | 1.2  | 2.0  | 315.6 316.3 | 9/18  |    |    |    |    |   |   |   | 1 |
| 170   | 2.7  | 3.8  | 302.1 302.9 | 9/18  |    |    |    |    |   |   |   | 2 |
| 171   | 11.8 | 12.7 | 225.4 226.4 | 10/6  |    |    |    |    |   |   |   | 3 |
| 172   | 4.8  | 5.0  | 158.6 158.9 | 10/6  | 1  |    |    |    |   |   |   |   |
| 173   | 21.2 |      | 146.5       | 10/6  | 1  |    |    |    |   |   |   |   |
| 174   | 7.6  |      | 140.3 141.4 | 10/6  | 2  |    |    |    |   |   |   |   |
| 175   | 3.8  | 3.9  | 60.3 63.4   | 10/11 |    | 3  |    |    |   |   |   |   |
| 176   | 11.6 | 12.8 | 56.6 63.1   | 10/11 | 13 | 8  |    |    |   |   |   |   |
| 177   | 22.2 | 23.8 | 34.2 37.8   | 10/11 | 4  |    |    |    |   |   |   |   |
| 178   | 9.7  | 11.7 | 21.7 29.4   | 10/11 | 5  | 13 | 9  | 9  |   |   |   |   |
| 179   | 11.2 | 19.9 | 352.0 3.0   | 10/11 | 1  |    |    | 38 |   |   |   |   |
| 180   | 6.8  | 6.9  | 39.3 39.7   | 10/12 | 1  |    |    |    |   |   |   |   |

| 群     | 緯度   | 経度    | 観測期間        | A     | B | C  | D  | E  | F  | G | H  | J |
|-------|------|-------|-------------|-------|---|----|----|----|----|---|----|---|
| S 151 | 21.7 | 22.8  | 107.5 108.2 | 8/19  | 3 |    |    |    |    |   |    |   |
| 152   | 31.0 | 32.5  | 99.0 105.0  | 8/19  |   | 6  |    |    |    |   |    |   |
| 153   | 7.5  | 10.3  | 64.8 69.6   | 8/23  |   |    |    |    | 3  |   |    |   |
| 154   | 27.5 | 29.8  | 315.4 319.0 | 8/23  |   |    |    |    |    |   | 3  |   |
| 155   | 16.0 | 21.2  | 289.6 210.3 | 8/23  |   |    |    |    | 36 |   |    |   |
| 156   | 0.2  | 1.5   | 351.6 353.6 | 8/24  |   | 2  |    |    |    |   |    |   |
| 157   | 19.7 | 21.0  | 281.7 288.9 | 8/24  |   | 3  |    |    |    |   |    | 1 |
| 158   | 32.1 | 32.3  | 95.9        | 9/18  |   |    | 31 |    |    |   |    |   |
| 159   | 9.0  | 14.5  | 20.9 28.7   | 9/18  |   |    |    |    |    |   |    |   |
| 160   | 28.9 | 30.7  | 19.9 23.4   | 9/18  |   | 9  |    |    |    |   |    | 1 |
| 161   | 14.8 | 15.3  | 296.4 298.4 | 9/18  |   |    |    |    |    |   |    | 1 |
| 162   | 13.7 | 14.2  | 223.4 226.4 | 10/6  |   |    | 16 |    |    |   |    | 1 |
| 163   | 16.8 | 18.8  | 193.9 205.1 | 10/6  |   |    |    |    |    |   |    |   |
| 164   | 11.2 | 12.8  | 178.9 181.4 | 10/6  |   |    |    |    |    |   | 2  |   |
| 165   | 22.5 | 23.7  | 167.6 172.8 | 10/6  |   | 6  |    |    |    |   |    |   |
| 166   | 5.0  | 5.8   | 112.2 113.4 | 10/6  | 1 |    |    |    |    |   |    | 3 |
| 167   | 3.3  | 106.4 |             | 10/6  | 2 |    |    |    |    |   |    |   |
| 168   | 14.2 | 14.3  | 107.2 107.4 | 10/6  | 1 |    |    |    |    |   |    |   |
| 169   | 10.0 | 14.1  | 99.8 106.8  | 10/6  | 5 |    | 13 |    |    |   |    |   |
| 170   | 17.7 | 24.0  | 78.4 84.7   | 10/6  | 2 |    | 19 | 19 |    |   | 7  |   |
| 171   | 19.0 | 22.5  | 65.6 70.5   | 10/6  | 7 |    | 8  | 11 |    |   | 4  |   |
| 172   | 10.1 | 15.4  | 22.6 32.9   | 10/11 | 1 | 13 | 13 | 16 |    |   |    | 3 |
| 173   | 14.4 | 17.7  | 16.1 24.9   | 10/11 |   |    | 13 | 10 |    |   |    | 1 |
| 174   | 13.0 | 14.2  | 4.6 5.1     | 10/11 | 2 |    |    |    |    |   |    |   |
| 175   | 5.6  | 7.4   | 103.2 105.0 | 10/12 | 3 |    |    |    |    |   |    |   |
| 176   | 32.2 |       | 90.7 91.0   | 10/12 | 1 |    |    |    |    |   |    |   |
| 177   | 9.4  | 10.2  | 36.4 36.6   | 10/12 | 2 |    |    |    |    |   |    |   |
| 178   | 15.0 | 18.6  | 292.5 298.0 | 10/16 |   |    | 18 |    |    |   | 11 | 1 |
| 179   | 17.6 | 21.0  | 280.8 285.1 | 10/19 |   |    |    |    |    |   | 13 |   |
| 180   | 13.9 | 22.5  | 263.6 278.8 | 10/19 |   | 16 | 31 | 38 |    |   | 16 |   |



| 群     | 緯度   | 経度   | 観測期間                    | A | B  | C  | D      | E  | F | G | H | J |
|-------|------|------|-------------------------|---|----|----|--------|----|---|---|---|---|
| N 181 | 3.4  | 6.0  | 61.2 67.3 10/16         |   | 5  |    |        |    |   |   |   |   |
| 182   | 24.7 | 26.3 | 312.1 319.3 10/16 10/23 | 2 |    | 7  |        |    |   |   |   | 2 |
| 183   | 10.1 | 17.3 | 300.7 313.8 10/16 10/26 |   |    | 26 |        | 39 |   |   |   | 1 |
| 184   | 13.7 | 16.3 | 313.3 321.1 10/19 10/23 |   | 12 |    | 22     |    |   |   |   |   |
| 185   | 0.5  | 5.7  | 262.4 265.0 10/19 10/27 | 1 |    | 10 |        |    |   |   | 6 | 5 |
| 186   | 13.5 | 15.0 | 237.9 238.7 10/20 10/31 | 1 |    |    |        |    |   |   |   | 2 |
| 187   | 22.5 |      | 292.2 10/23             | 1 |    |    |        |    |   |   |   |   |
| 188   | 19.5 | 20.9 | 233.5 239.9 10/23 10/27 |   | 12 |    |        |    |   |   |   |   |
| 189   | 6.2  | 10.0 | 215.3 230.0 10/23 11/1  | 6 |    |    | 62     |    |   |   |   |   |
| 190   | 7.5  | 15.0 | 166.2 178.5 10/25 11/1  |   |    |    | 27 113 |    |   |   | 2 |   |
| 191   | 26.0 | 29.3 | 197.5 206.8 10/26 10/27 | 1 |    |    |        |    |   |   |   |   |
| 192   | 3.9  | 4.0  | 175.4 175.6 10/31 11/1  | 1 |    |    |        |    |   |   |   |   |
| 193   | 16.3 | 16.4 | 167.6 167.8 10/31       | 1 |    |    |        |    |   |   |   |   |
| 194   | 20.6 |      | 157.6 157.8 10/31       | 1 |    |    |        |    |   |   |   |   |
| 195   | 2.7  | 8.9  | 129.9 140.3 10/31 11/1  | 2 | 2  |    |        | 40 |   |   |   |   |
| 196   | 14.2 | 14.8 | 97.6 98.3 10/31 11/1    | 1 |    | 8  |        |    |   |   |   |   |
| 197   | 2.5  | 5.6  | 92.6 100.1 10/31 11/1   | 1 |    |    |        |    |   |   |   |   |
| 198   | 5.5  |      | 174.7 11/1              | 1 |    |    |        |    |   |   |   |   |
| 199   | 3.8  | 4.6  | 106.1 107.6 11/11       |   |    |    |        |    |   |   |   | 2 |
| 200   | 3.8  | 8.9  | 77.8 87.8 11/11         |   |    |    |        | 25 |   |   |   |   |
| 201   | 11.2 | 11.3 | 71.4 71.6 11/11         | 1 |    |    |        |    |   |   |   |   |
| 202   | 23.5 | 25.4 | 48.9 50.6 11/11         |   | 2  |    |        |    |   |   |   |   |
| 203   | 7.3  | 7.7  | 8.3 9.1 11/11 11/16     | 1 |    |    |        |    |   |   |   | 2 |
| 204   | 12.4 |      | 4.6 11/11               | 1 |    |    |        |    |   |   |   |   |
| 205   | 13.1 | 14.8 | 349.7 357.0 11/11 11/16 |   |    |    |        |    |   |   |   | 2 |
| 206   | 10.1 | 11.6 | 320.6 321.8 11/11 11/22 |   |    |    |        |    |   |   |   | 2 |
| 207   | 22.2 | 22.5 | 325.6 328.9 11/16       |   | 4  |    |        |    |   |   |   |   |
| 208   | 10.2 | 10.4 | 310.4 310.5 11/16       | 1 |    |    |        |    |   |   |   |   |
| 209   | 9.6  | 15.4 | 301.1 306.7 11/16 11/24 |   |    |    | 11     |    |   |   | 2 |   |
| 210   | 6.5  | 9.9  | 227.9 231.9 11/22 11/24 |   | 16 |    |        |    |   |   |   |   |

| 群     | 緯度   | 経度   | 観測期間                    | A | B  | C  | D  | E   | F  | G  | H | J |
|-------|------|------|-------------------------|---|----|----|----|-----|----|----|---|---|
| S 181 | 7.5  | 8.6  | 285.7 292.0 10/19 10/21 |   | 2  | 9  |    |     |    |    |   |   |
| 182   | 17.4 | 20.8 | 278.3 284.3 10/20 10/27 | 2 |    | 12 |    | 9   |    |    |   |   |
| 183   | 12.3 | 12.8 | 240.9 242.1 10/21 10/26 | 2 | 3  |    |    | 26  |    |    |   | 1 |
| 184   | 1.0  | 1.1  | 266.3 266.7 10/23       | 1 |    |    |    |     |    |    |   |   |
| 185   | 6.0  |      | 234.4 10/23             | 1 |    |    |    |     |    |    |   |   |
| 186   | 8.9  |      | 233.3 10/23             | 1 |    |    |    |     |    |    |   |   |
| 187   | 8.8  | 10.2 | 207.5 212.1 10/23 10/31 | 4 | 10 |    |    |     |    |    |   |   |
| 188   | 28.0 |      | 265.5 265.8 10/25       | 1 |    |    |    |     |    |    |   |   |
| 189   | 22.5 | 25.0 | 235.0 238.9 10/25 10/27 | 9 |    |    | 10 |     |    |    |   |   |
| 190   | 17.7 | 18.0 | 85.1 86.1 11/1          | 1 |    |    |    |     |    |    |   |   |
| 191   | 25.0 | 27.0 | 95.6 96.6 11/11         |   |    |    |    |     |    |    |   | 2 |
| 192   | 19.4 | 20.7 | 84.0 86.9 11/11         |   | 5  |    |    |     |    |    |   |   |
| 193   | 17.2 | 18.4 | 72.2 73.6 11/11         | 6 |    |    |    |     |    |    |   |   |
| 194   | 18.4 | 22.2 | 62.6 67.3 11/11         | 6 |    |    |    |     |    |    |   |   |
| 195   | 12.7 | 21.8 | 14.0 38.0 11/11 11/16   |   |    |    |    | 107 | 14 |    |   |   |
| 196   | 4.6  | 6.0  | 320.6 321.6 11/11       |   |    |    |    |     |    |    |   | 5 |
| 197   | 22.2 | 24.0 | 303.3 304.2 11/16 11/24 |   |    |    |    | 2   |    |    |   | 1 |
| 198   | 13.2 | 22.0 | 264.4 275.2 11/16 11/25 |   |    |    |    | 26  | 46 |    |   |   |
| 199   | 17.4 | 17.5 | 280.3 280.9 11/22       | 2 |    |    |    |     |    |    |   |   |
| 200   | 14.7 | 15.6 | 274.4 275.4 11/22 11/23 | 3 |    |    |    |     |    |    |   |   |
| 201   | 9.2  | 12.6 | 237.2 246.9 11/22 11/25 |   |    |    |    |     |    | 13 |   |   |
| 202   | 7.9  | 10.2 | 190.2 198.4 11/23 12/2  |   | 10 | 3  |    | 8   |    |    |   |   |
| 203   | 10.8 | 11.2 | 236.8 237.6 11/25       |   | 2  |    |    |     |    |    |   |   |
| 204   | 9.5  | 9.8  | 220.9 222.5 11/25       | 3 |    |    |    |     |    |    |   |   |
| 205   | 7.5  | 9.0  | 190.8 193.0 11/25       |   | 4  |    |    |     |    |    |   |   |
| 206   | 4.8  | 7.2  | 125.7 127.2 11/25 12/2  | 1 |    |    |    |     |    |    |   |   |
| 207   | 10.4 | 10.6 | 242.7 243.2 11/27       | 1 |    |    |    |     |    |    |   |   |
| 208   | 3.2  | 7.7  | 81.6 91.4 11/28 12/8    |   |    |    |    | 6   | 35 |    |   |   |
| 209   | 15.2 | 18.9 | 76.6 87.5 11/29 12/7    | 2 | 17 |    |    |     |    |    |   |   |
| 210   | 5.5  | 5.7  | 160.3 160.5 11/30       | 1 |    |    |    |     |    |    |   |   |

| 群     | 緯度   | 経度   | 観測期間  | A     | B  | C  | D  | E  | F  | G | H | J |
|-------|------|------|-------|-------|----|----|----|----|----|---|---|---|
| N 211 | 9.5  | 13.5 | 175.0 | 182.5 | 7  | 14 | 20 | 24 |    |   |   | 1 |
| 212   | 3.0  | 8.0  | 131.4 | 143.4 |    |    | 8  | 50 |    |   |   |   |
| 213   | 2.1  | 3.6  | 147.7 | 153.7 | 11 |    |    |    |    |   |   |   |
| 214   | 2.5  | 6.6  | 92.7  | 97.9  |    | 2  |    |    |    |   | 4 | 2 |
| 215   | 11.6 | 12.7 | 75.5  | 78.2  |    | 5  |    |    |    |   | 4 | 3 |
| 216   | 8.9  | 11.7 | 72.7  | 74.3  |    |    |    |    |    |   |   | 4 |
| 217   | 14.9 | 15.4 | 148.0 | 150.0 |    | 3  |    |    |    |   |   |   |
| 218   | 7.6  |      | 141.4 | 141.5 |    |    |    |    |    |   |   | 1 |
| 219   | 11.3 |      | 136.2 |       | 1  |    |    |    |    |   |   |   |
| 220   | 12.1 | 12.2 | 64.2  |       | 1  |    |    |    |    |   |   | 2 |
| 221   | 6.6  | 11.2 | 40.4  | 44.3  | 1  |    | 8  |    |    |   |   |   |
| 222   | 33.8 | 36.8 | 75.7  | 85.5  |    |    |    |    |    |   |   |   |
| 223   | 23.4 | 23.5 | 59.7  | 61.1  | 1  |    |    |    |    |   |   |   |
| 224   | 22.2 | 22.3 | 55.9  | 56.1  | 1  |    |    |    |    |   |   |   |
| 225   | 22.7 | 24.4 | 10.6  | 14.9  | 1  |    |    |    |    |   |   |   |
| 226   | 2.1  | 2.5  | 329.2 | 338.3 | 1  |    |    |    |    |   |   | 3 |
| 227   | 12.5 | 13.2 | 59.9  | 66.3  |    | 2  |    |    |    |   |   |   |
| 228   | 9.6  | 15.9 | 305.1 | 319.1 |    |    |    |    |    |   |   | 1 |
| 229   | 16.8 | 17.0 | 293.8 |       | 1  |    |    |    |    |   |   |   |
| 230   | 3.9  | 4.1  | 28.2  | 30.4  |    | 2  |    |    |    |   |   |   |
| 231   | 3.8  | 4.7  | 245.9 | 249.0 | 1  | 7  |    |    |    |   |   | 1 |
| 232   | 6.2  | 14.0 | 205.9 | 225.9 |    |    | 4  |    |    |   |   |   |
| 233   | 14.2 | 17.0 | 190.0 | 195.6 | 1  | 14 | 6  | 12 |    |   |   |   |
| 234   | 2.6  | 4.4  | 251.0 | 254.3 |    | 4  |    |    |    |   |   |   |
| 235   | 9.1  | 11.6 | 163.8 | 171.6 |    | 3  | 10 | 19 |    |   |   |   |
| 236   | -0.9 | 7.5  | 134.9 | 148.4 |    |    |    | 5  | 82 |   |   |   |
| 237   | 2.4  | 2.5  | 182.2 | 182.5 | 1  |    |    |    |    |   |   |   |
| 238   | 1.0  | 1.3  | 125.2 | 125.4 | 1  |    |    |    |    |   |   |   |
| 239   | 5.0  | 6.0  | 110.3 | 113.5 | 1  | 3  |    |    |    |   |   |   |
| 240   | 8.3  | 9.2  | 71.9  | 73.5  | 1  |    |    |    |    |   |   | 2 |

| 群     | 緯度   | 経度   | 観測期間  | A     | B | C | D  | E  | F | G | H | J |
|-------|------|------|-------|-------|---|---|----|----|---|---|---|---|
| S 211 | 4.7  | 6.2  | 119.3 | 124.5 | 1 | 4 |    |    |   |   |   |   |
| 212   | 14.9 | 16.2 | 131.8 | 135.1 |   | 5 |    |    |   |   |   |   |
| 213   | 10.6 | 11.3 | 143.5 | 145.6 |   | 3 |    |    |   |   |   |   |
| 214   | 4.4  | 4.8  | 69.9  | 70.9  | 2 |   |    |    |   |   |   |   |
| 215   | 8.0  |      | 72.5  |       | 1 |   |    |    |   |   |   |   |
| 216   | 12.7 |      | 39.4  |       | 1 |   |    |    |   |   |   |   |
| 217   | 12.1 | 17.8 | 29.6  | 34.2  | 1 |   | 13 |    |   |   |   | 1 |
| 218   | 5.2  | 5.8  | 118.7 | 119.2 |   |   |    |    |   |   |   | 1 |
| 219   | 25.0 | 28.5 | 70.1  | 76.9  |   | 9 |    |    |   |   |   |   |
| 220   | 22.4 | 24.3 | 29.7  | 29.9  | 2 |   |    |    |   |   |   |   |
| 221   | 15.8 | 23.0 | 13.2  | 25.1  |   |   | 24 | 46 |   |   |   | 3 |
| 222   | 5.9  | 6.6  | 73.5  | 77.1  |   |   | 4  |    |   |   |   |   |
| 223   | 8.9  | 10.6 | 19.2  | 25.7  | 4 |   |    |    |   |   |   | 1 |
| 224   | 24.8 | 28.4 | 299.3 | 304.8 | 1 | 4 |    |    |   |   |   | 2 |
| 225   | 12.3 | 12.6 | 293.2 | 293.5 | 1 |   | 7  |    |   |   |   | 1 |
| 226   | 12.5 | 14.7 | 313.7 | 323.5 | 1 |   | 21 | 10 |   |   |   | 2 |
| 227   | 13.0 | 16.7 | 262.4 | 268.5 | 1 | 9 |    |    |   | 6 |   | 1 |
| 228   | 17.4 | 22.4 | 258.6 | 264.7 |   | 9 |    |    |   |   |   | 1 |
| 229   | 12.6 | 15.8 | 287.6 | 291.2 |   | 4 |    |    |   |   |   |   |
| 230   | 7.6  | 11.0 | 201.8 | 205.7 |   |   |    |    |   |   |   | 3 |
| 231   | 5.9  | 6.1  | 253.8 | 254.7 | 2 |   |    |    |   |   |   |   |
| 232   | 5.2  |      | 254.8 |       | 1 |   |    |    |   |   |   |   |
| 233   | 9.8  |      | 251.2 |       | 1 |   |    |    |   |   |   |   |
| 234   | 11.3 |      | 246.1 |       | 1 |   |    |    |   |   |   |   |
| 235   | 17.2 | 17.5 | 268.9 | 269.2 | 1 |   |    |    |   |   |   |   |
| 236   | 14.2 | 15.7 | 213.9 | 216.6 | 1 | 3 |    |    |   |   |   |   |
| 237   | 9.0  | 10.0 | 153.9 | 159.9 | 1 | 3 |    |    |   |   |   |   |
| 238   | 14.8 | 16.3 | 271.3 | 277.7 |   |   |    |    |   |   |   |   |
| 239   | 27.8 | 29.5 | 281.2 | 292.2 |   | 4 |    |    |   |   |   |   |
| 240   | 4.7  | 5.2  | 211.4 | 211.5 | 2 |   |    |    |   |   |   |   |

表2-9 2001年の黒点群(A~Jの数字は各型の最多黒点数)

| 群     | 緯度   | 経度   | 観測期間  | A     | B     | C   | D | E | F | G | H | J |
|-------|------|------|-------|-------|-------|-----|---|---|---|---|---|---|
| N 241 | 15.0 | 18.0 | 114.2 | 117.2 | 12/28 | 3   |   |   |   |   |   |   |
| 242   | 12.0 | 15.2 | 99.3  | 107.0 | 12/28 | 1/5 | 4 | 8 |   |   |   | 3 |
| 243   | 5.2  | 5.8  | 57.8  | 62.6  | 12/28 | 1/1 | 3 |   |   |   |   | 1 |
| 244   | 3.0  | 5.6  | 42.8  | 46.2  | 12/30 | 1/6 | 3 | 5 |   |   |   | 1 |
| 245   | 4.0  | 5.7  | 29.6  | 33.9  | 12/30 | 1/9 | 3 |   |   |   |   | 3 |

| 群     | 緯度   | 経度   | 観測期間  | A     | B     | C     | D  | E  | F  | G | H  | J |
|-------|------|------|-------|-------|-------|-------|----|----|----|---|----|---|
| S 241 | 9.2  | 12.2 | 187.5 | 198.3 | 12/22 | 12/28 | 18 | 28 |    |   |    |   |
| 242   | 17.4 | 22.4 | 133.4 | 141.8 | 12/22 | 1/1   | 9  | 8  |    | 2 |    | 1 |
| 243   | 16.4 | 16.7 | 270.0 | 270.2 | 12/23 |       |    |    |    |   |    | 1 |
| 244   | 20.8 | 21.0 | 148.8 | 149.0 | 12/23 |       |    |    |    |   |    |   |
| 245   | 6.8  | 11.8 | 114.6 | 130.2 | 12/23 | 1/1   | 9  | 32 | 48 |   |    |   |
| 246   | 28.0 | 28.3 | 208.0 | 208.2 | 12/26 |       |    |    |    |   |    |   |
| 247   | 2.3  | 7.3  | 93.3  | 98.5  | 12/26 | 1/5   | 4  |    |    |   | 12 | 3 |
| 248   | 27.5 | 28.8 | 71.6  | 75.0  | 12/26 | 1/1   | 3  |    |    |   | 4  | 3 |
| 249   | 9.7  | 10.7 | 142.3 | 144.9 | 12/27 | 12/30 | 1  |    |    |   |    |   |
| 250   | 4.8  | 7.4  | 132.5 | 134.2 | 12/28 |       |    |    |    |   |    |   |
| 251   | 20.8 | 21.0 | 128.0 | 128.1 | 12/28 |       |    |    |    |   |    |   |
| 252   | 22.0 | 22.1 | 81.7  |       | 12/28 |       |    |    |    |   |    |   |
| 253   | 15.2 | 15.6 | 42.1  | 43.0  | 12/30 |       |    |    |    |   |    |   |
| 254   | 18.9 | 19.6 | 27.3  |       | 12/30 |       |    |    |    |   |    |   |
| 255   | 17.0 | 28.3 | 9.7   | 26.4  | 12/31 | 1/11  | 5  | 22 | 63 |   |    |   |