

1991年太陽観測報告

小林正人*

On the Observations of Sunspots in 1991

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1 はじめに

川崎市青少年科学館では、1982年2月より15cm屈折望遠鏡・投影法により太陽観測を続けている。また、8cm屈折望遠鏡で顕著な黒点やプロミネンスの写真撮影を行っている。黒点数は、太陽の活動状態を示す指標とされているが、1991年の太陽黒点は前年に引き続き活発で、依然として極大期の活動を示した。

1991年の観測日数は127日で、観測は原則として筆者が担当(観測日数126日)し、当館天文クラブの戸田雅之氏(観測日数1日)に補っていただいた。

引き続き減少傾向にあるのに対し、南半球は大幅に増加し、全体として1990年に比べやや増加した。南北半球を比較すると、1年を通じて南半球が優勢で、明らかに北半球が優勢だったのは6月のみであった。3ヶ月移動平均で見ると1989年6~12月が第1極大、1990年9月が第2極大、1991年7月が第3極大のような形をしめしている。しかし、1992年に入り明らかに減少傾向に入っており、1991年は今極大期末期の活動といえる。

2 黒点観測

(1) 方法

- ア 観測地 川崎市多摩区枳形
北緯35°36'18" 東経139°33'53"
- イ 観測機材 15cm屈折(40cm反赤に同架)
焦点距離2,250mm F15
- ウ 投影法: 投影像の直径 25cm

(2) 結果

1991年中に観測された黒点群は、表4のように北半球189群、南半球349群、計538群である。まず表1及び図1、2から1991年の黒点相対数の状況をつかむことができる。図1は黒点相対数の月別変化であり、図2は前後の月の観測値を加え、平均をとった3ヶ月移動平均で、黒点数増減の傾向が現われている。

1991年の黒点相対数は、年間を通し150を越え、200以上の月も10ヶ月に及んだ。特に6月(323.4)、8月(342.0)は300を越え、当館での今極大期最高であった1990年8月(308.1)を上回る活発な活動であった。年平均相対数を前年と比較すると、全面217.2→241.8(増加率11.3%)北半球105.0→90.7(減少率13.6%)、南半球112.3→151.2(増加率34.6%)となっている。北半球は前年に引

表1 1991年黒点相対数

| | 観測 日数 | 無黒点 日数 | 北半球 | 南半球 | 全面 |
|-----|----------|-----------|--------|--------|--------|
| 1月 | 16 | 0 | 70.3 | 142.4 | 212.7 |
| 2月 | 15 | 0 | 67.7 | 196.5 | 264.1 |
| 3月 | 9 | 0 | 52.2 | 132.1 | 184.3 |
| 4月 | 13 | 0 | 95.0 | 129.4 | 224.4 |
| 5月 | 14 | 0 | 101.9 | 99.9 | 201.8 |
| 6月 | 9 | 0 | 174.1 | 149.3 | 323.4 |
| 7月 | 8 | 0 | 131.5 | 140.3 | 271.8 |
| 8月 | 6 | 0 | 128.3 | 213.8 | 342.0 |
| 9月 | 7 | 0 | 66.6 | 156.7 | 223.3 |
| 10月 | 7 | 0 | 79.6 | 188.3 | 267.9 |
| 11月 | 11 | 0 | 49.8 | 108.6 | 158.5 |
| 12月 | 12 | 0 | 71.1 | 156.5 | 227.6 |
| 計 | 127 | 0 | 1088.1 | 1813.8 | 2901.8 |
| 年平均 | — | — | 90.7 | 151.2 | 241.8 |

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表2 1991年大型黒点群

| 最大時 | 北半球 | 南半球 | 全 面 |
|-----|-----|-----|-----|
| E型 | 22 | 31 | 53 |
| F型 | 3 | 13 | 16 |
| G型 | 1 | 2 | 3 |
| 計 | 26 | 46 | 72 |

1991年中の大型黒点群は、表2, 3のとおりである。中でも特に目立った黒点群を図3に示した。

前年に比べ巨大黒点群が多数出現している。特に南半球に多数の巨大黒点群が出現した。例えば、黒点数100を越えた群は、1989年に並ぶ5群（1990年0群）を数え、うち4群は南半球であった。また、最大級であるF型群は16群（前年11群）で、前年に比べ増加したが、うち北半球は前年に比べ半減しており、南半球は前年の5群から13群へと大幅に増加している。

図1 1991年黒点相対数

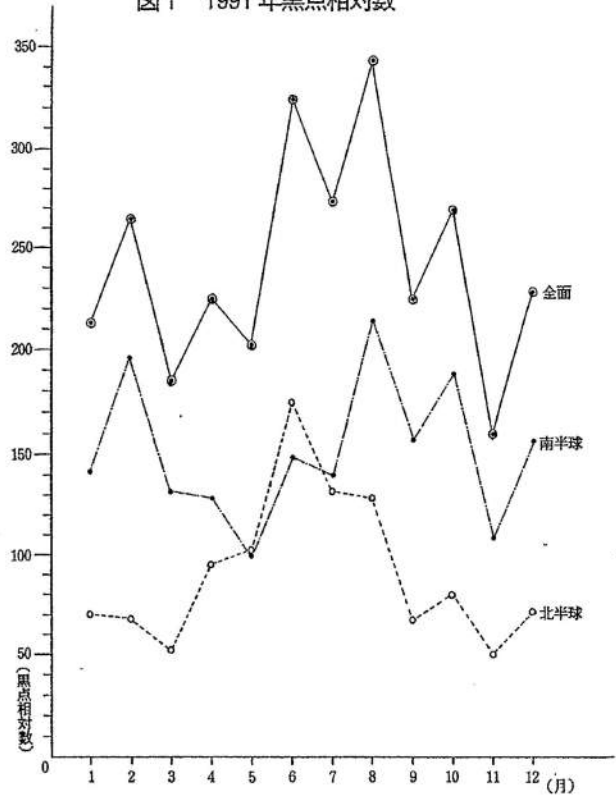


図2 1988年6月～1991年11月 黒点相対数（3ヶ月移動平均）

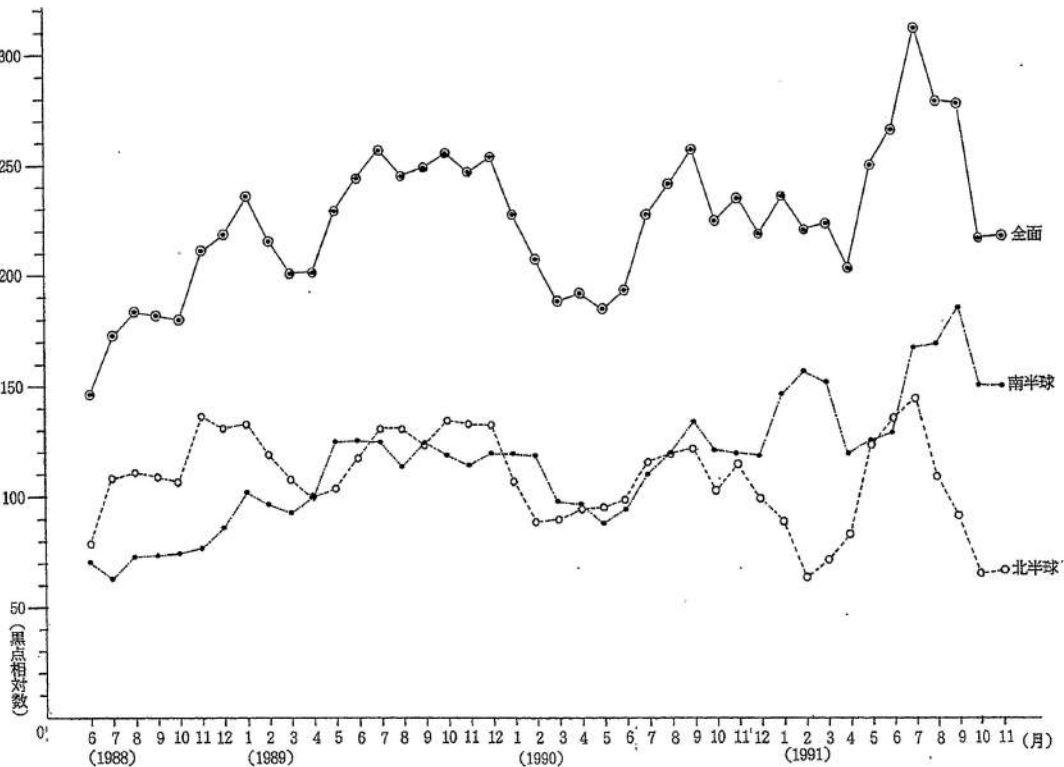
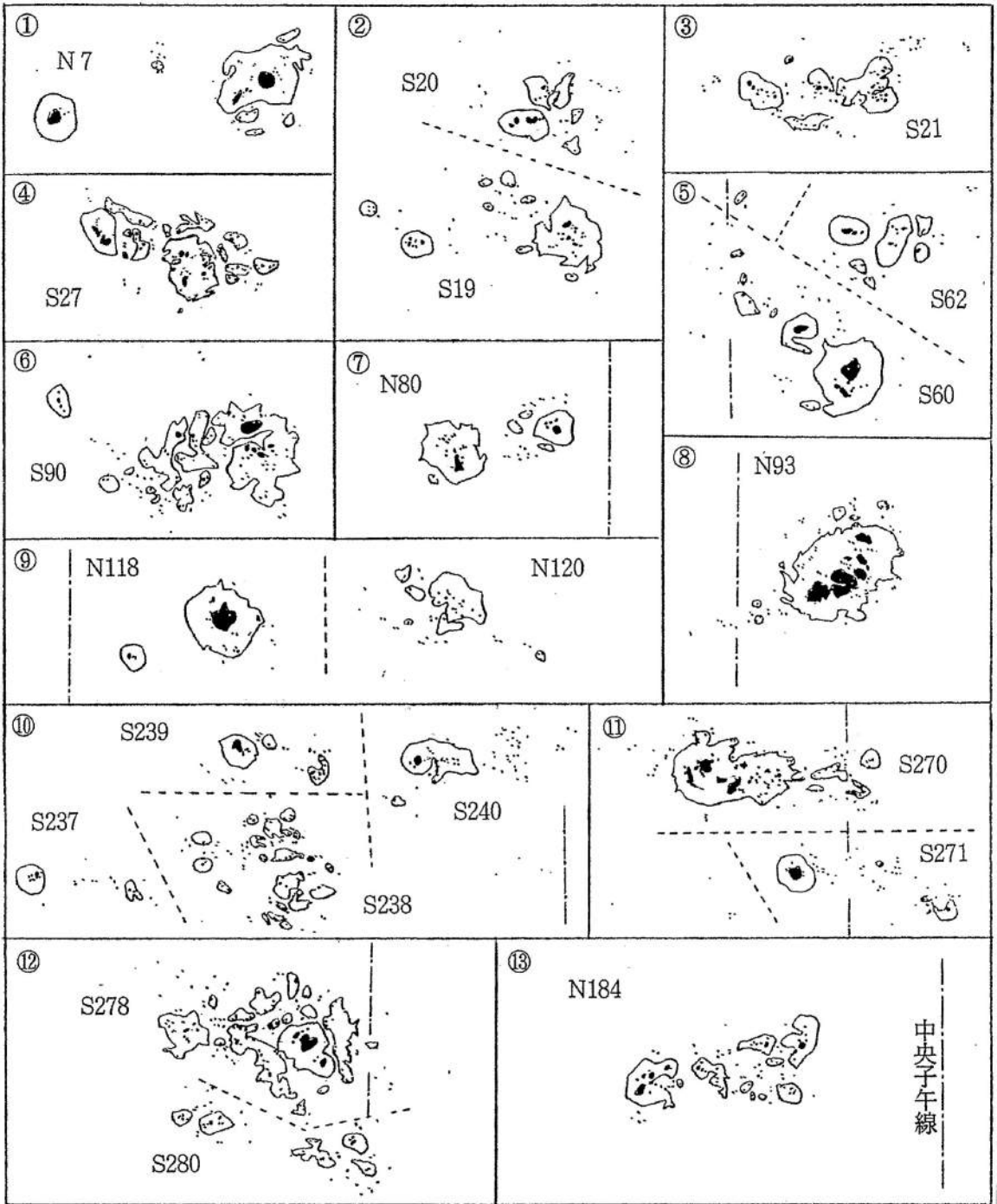


図3 1991年中の巨大黒点群 (25cm 投影原寸大)



| | 緯度 | 経度 | | 緯度 | 経度 |
|---------------------------------|------------|--------------|----------------------------------|-------|--------------|
| ① N 7 (1月16日) 53個F型+12 | ~21 | 7 ~ 29 | ⑨ N118(7月25日) 27個G型+ 5 | ~11 | 350.5 ~ 1.5 |
| ② S 20 (1月29日) 42個E型- 5 | ~12 | 190.5 ~202.5 | N120(7月25日) 45個E型+ 5 | ~15 | 330 ~344.5 |
| S 19 (1月29日) 69個F型- 8 | ~15 | 91.5 ~107.5 | ⑩ S 237(8月21日) 18個E型-17.5~20 | 37 | ~ 50 |
| ③ S 21 (1月31日) 92個F型- 8 | ~15.5 | 174 ~192 | S 239(8月21日) 30個E型- 7.5~10.5 | 22 | ~ 32 |
| ④ S 27 (2月3日) 110個F型- 8 | ~16.5 | 132.5 ~148.5 | S 238(8月21日) 98個C型-12.5~26 | 22 | ~ 34 |
| ⑤ S 62 (2月24日) 29個E型-10 | ~17 | 183 ~194 | S 240(8月21日) 67個C型- 6.5~13 | 4 | ~ 18 |
| ⑥ S 90 (3月26日) 117個F型-17.5~30.5 | 175.5 ~196 | | ⑪ S 270(10月2日) 102個F型- 7.5~13.5 | 171.5 | ~191.5 |
| ⑦ N 80 (5月29日) 42個E型+17.5~24 | 43 ~ 54.5 | | S 271(10月2日) 50個E型-15.5~21.5 | 165.5 | ~179 |
| ⑧ N 93 (6月9日) 93個H型+26 | ~36 | 240.5 ~256.5 | ⑫ S 278(10月29日) 130個F型- 5.5~16.5 | 175.5 | ~196.5 |
| | | | S 280(10月29日) 60個F型-14.5~21.5 | 175.5 | ~191.5 |
| | | | ⑬ N184(12月14日) 79個E型+ 6 | ~13 | 298.5 ~312.5 |

表3 1991年中の大型黒点群（F型及び黒点数50以上）・経緯度測定日

| 群 | 緯度 | 経度 | 東西広約 | 最多数 | 最大型 | 観測期間 | 中央子午線通過日 | 東半球 | | | | 西半球 | | | | | | | | |
|------|-----------|--------------|------|-----|-----|--------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|
| | | | | | | | | 9D | 33F | 55F | 19F | 50F | --- | --- | --- | --- | --- | --- | --- | |
| N 7 | 12 ~21 | 7 ~ 29 | 22 | 55 | F | 1/ 8 ~ 1/20 | 1/14 | | | | | | | 53F | 40F | 13G | 15G | 6H | 4C | |
| 20 | 9.5~18.5 | 8.5 ~ 32 | 23.5 | 50 | F | 2/ 5 ~ 2/17 | 2/10 | 2G | | | | 50F | | | | 37F | | | | |
| 58 | 3 ~11 | 237.5 ~249 | 11.5 | 79 | E | 4/12 ~ 4/20 | 4/16 | | 32E | | | | | | 37D | 30E | | | | |
| 80 | 17.5~24 | 43 ~ 54.5 | 11.5 | 55 | E | 5/22 ~ 5/30 | 5/28 | 10C | | 26D | 33E | 55E | | 42E | 31E | | | | | |
| 98 | 26 ~36 | 240.5 ~256.5 | 16 | 109 | H | 6/ 5 ~ 6/14 | 6/ 9 | | | 23H | | | | | 93H | 109H | 69H | 40H | | |
| 120 | 5.5~12.5 | 331 ~345.5 | 14.5 | 68 | E | 7/21 ~ 7/31 | 7/27 | 21E | | 49E | 68E | 45E | | | | | 24D | | | |
| 184 | 5 ~12 | 297 ~312 | 15 | 79 | F | 12/ 7 ~12/17 | 12/13 | 8C | | | | 26E | 27E | 79E | | | 33F | | | |
| S 19 | 13 ~21 | 192 ~211 | 19 | 69 | F | 1/23 ~ 2/ 3 | 1/28 | | 32F | | 46F | 38F | | 69F | 46F | 31F | 14F | 4H | | |
| 21 | 10 ~16.5 | 171 ~192.5 | 21.5 | 92 | F | 1/23 ~ 2/ 3 | 1/29 | 1J | | 6C | 4C | | | 45E | 40E | 65F | 30F | 40F | | |
| 27 | 7 ~15.5 | 134.5 ~152 | 17.5 | 110 | F | 1/26 ~ 2/ 7 | 2/ 1 | 6G | | | 45E | 45H | 80H | 75E | 60F | | 41F | | 21E | |
| 60 | 12 ~26 | 187.5 ~203.5 | 16 | 51 | F | 2/19 ~ 3/ 3 | 2/24 | 15E | | | 23E | 43E | 36E | 51F | 28E | 25E | | | 12E | 6H |
| 78 | 19.5~25 | 338 ~356 | 18 | 37 | F | 3/ 5 ~ 3/17 | 3/12 | 1J | 16E | 26F | | | | | | | 37F | | 16E | |
| 82 | 4 ~12 | 279.5 ~294.5 | 15 | 58 | F | 3/15 ~ 3/17 | 3/17 | | | | | 33E | | 58F | | | | | | |
| 90 | 17.5~30.5 | 175.5 ~196 | 21.5 | 117 | F | 3/26 ~ 3/30 | | | | | | | | | | | | | | 40F |
| 180 | 11.5~16.5 | 239.5 ~250.5 | 11 | 67 | E | 6/ 8 ~ 6/14 | 6/10 | | | | | 14B | 18C | | 67E | 42E | 32E | 10D | | |
| 210 | 21 ~25 | 156 ~174 | 18 | 33 | F | 7/ 6 ~ 7/11 | | | | | | | 33F | | | | | | | |
| 238 | 12.5~26 | 22 ~ 34 | 12 | 98 | E | 8/15 ~ 8/22 | 8/19 | | | 27D | | 35D | | | | | | | | |
| 240 | 6.5~13 | 4 ~ 18 | 14 | 67 | E | 8/15 ~ 8/22 | 8/21 | 11C | | | 23E | | | | | | | | | |
| 253 | 16.5~23.5 | 190 ~204.5 | 14.5 | 54 | E | 8/28 ~ 9/ 7 | 9/ 3 | 5C | | | | | | | | | | | | |
| 270 | 7 ~13.5 | 170.5 ~190.5 | 20 | 123 | F | 9/28 ~10/ 4 | 10/ 1 | | | | | 36F | | | | | | | | |
| 271 | 15.5~21 | 165 ~179 | 14 | 54 | E | 9/28 ~10/ 4 | 10/ 2 | | | 9D | | | | | | | | | | |
| 278 | 5.5~16.5 | 175.5 ~196.5 | 21 | 130 | F | 10/22 ~10/29 | 10/28 | 10H | 25H | 39H | | | | | | | | | | |
| 280 | 14.5~21.5 | 175.5 ~191.5 | 16 | 60 | F | 10/23 ~10/29 | 10/28 | | | 5C | 21D | | | | | | | | | |
| 323 | 15.5~19 | 330 ~347 | 17 | 33 | F | 12/ 5 ~12/14 | 12/10 | 4A | | | 16E | | | | | | | | | |
| 325 | 8 ~11.5 | 354.5 ~ 13.5 | 19 | 24 | F | 12/10 ~12/14 | | | | | | | | | | | | | | |

表4 1991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 |
|----|------|--------|-------------|---|----|----|----|----|----|----|---|---|
| N1 | 10 | 163 | 1/4 | 1 | | | | | | | | |
| 2 | 7 | ~11.5 | 1/4 ~ 1/10 | | | 12 | 9 | | | | | 1 |
| 3 | 8 | ~8.5 | 1/6 | | 3 | | | | | | | |
| 4 | 17.5 | ~146.5 | 1/6 | | | | | | | | | |
| 5 | 15 | 138.5 | 1/6 | | | | | | | | | |
| 6 | 5 | ~49 | 1/8 ~ 1/10 | 2 | 4 | | | | | | | 1 |
| 7 | 12 | ~21 | 1/8 ~ 1/20 | | | | 9 | | | | | |
| 8 | 12 | ~12.5 | 1/16 | | 3 | 10 | | 55 | 15 | 6 | | |
| 9 | 25 | ~324.5 | 1/16 ~ 1/20 | 1 | 5 | | | | | | | |
| 10 | 3 | ~298 | 1/17 | | | | | | | | | |
| 11 | 18.5 | ~271.5 | 1/17 ~ 1/26 | 1 | 3 | 4 | 15 | | | | | |
| 12 | 24.5 | ~217 | 1/23 ~ 1/30 | 2 | 11 | 8 | 6 | | | | | |
| 13 | 8 | ~10.5 | 1/23 ~ 2/1 | | | | | | | | | |
| 14 | 10.5 | ~184 | 1/29 ~ 2/2 | | | 19 | 14 | | | | | 1 |
| 15 | 16 | ~19.5 | 1/29 ~ 2/7 | | | 11 | 10 | | | 13 | 6 | |
| 16 | 19 | ~22 | 1/29 ~ 2/7 | | | 7 | 9 | | | | | |
| 17 | 3 | ~5 | 1/29 ~ 2/2 | 1 | 13 | | | | | | | |
| 18 | 14 | ~15 | 2/1 | 2 | 2 | | | | | | | |
| 19 | 6 | ~6.5 | 2/2 ~ 2/3 | 1 | 4 | 4 | | 50 | 2 | | | |
| 20 | 9.5 | ~18.5 | 2/2 ~ 2/17 | | | | | | | | | |
| 21 | 19.5 | 1.5 | 2/9 | 1 | | | | | | | | |
| 22 | 46 | 298 | 2/14 | 1 | | | | | | | | |
| 23 | 25.5 | ~28.5 | 2/14 ~ 2/17 | 2 | | 12 | | | | | | |
| 24 | 22 | ~23.5 | 2/14 ~ 2/23 | 2 | | 6 | 6 | | | | | 2 |
| 25 | 29 | ~30.5 | 2/17 ~ 2/27 | 1 | | 5 | 9 | | | | | 2 |
| 26 | 7.5 | ~8 | 2/21 ~ 2/24 | | 4 | 4 | | | | | | 1 |
| 27 | 12 | ~200 | 2/21 | 1 | | | | | | | | |
| 28 | 11.5 | ~15.5 | 2/21 ~ 2/26 | | 6 | | 13 | 9 | | | | |
| 29 | 16 | ~18 | 2/21 ~ 2/27 | | | 8 | 11 | 10 | | | | |
| 30 | 25.5 | ~215.5 | 2/23 | 1 | | 11 | | | | | | |
| 31 | 27 | ~28.5 | 2/26 ~ 2/27 | | 12 | 13 | 17 | | | | | 2 |
| 32 | 2 | ~5.5 | 2/26 ~ 3/7 | | 8 | | | | | | | |
| 33 | 9.5 | ~123.5 | 3/2 | 1 | | | | | | | | |
| 34 | 9.5 | ~10.5 | 3/3 ~ 3/6 | 2 | 5 | | | | | | | 1 |
| 35 | 14.5 | 28 | 3/3 ~ 3/7 | 2 | | | | | | | | |
| 36 | 17 | ~41 | 3/5 | 1 | | | | | | | | |
| 37 | 15.5 | ~19.5 | 3/5 ~ 3/15 | | | | 10 | 7 | | | | 2 |
| 38 | 20.5 | ~23.5 | 3/6 | | 2 | | | | | | | |
| 39 | 14 | ~350.5 | 3/6 ~ 3/7 | 1 | | | | | | | | |
| 40 | 22 | ~21 | 3/6 ~ 3/7 | 1 | | | | | | | | |
| 41 | 41 | ~259 | 3/17 | | | | 9 | | | | | |
| 42 | 15.5 | ~176.5 | 3/26 ~ 3/30 | | 8 | | 10 | | | | | |

| 群 | 緯度 | 経度 | 観測期間 | A | B | C | D | E | F | G | H | J |
|-----|------|--------|-------------|---|----|----|----|----|----|----|----|----|
| N43 | 7.5 | 142 | 3/26 | 1 | | | | | | | | |
| 44 | 29.5 | 91.5 | 3/30 | 3 | | | | | | | | |
| 45 | 11.5 | ~63.5 | 3/30 ~ 4/9 | | | | 48 | 46 | | | | 5 |
| 46 | 10.5 | 51 | 3/30 ~ 4/4 | | | | | | | | | |
| 47 | 7.5 | ~35.5 | 3/30 ~ 4/9 | 2 | | 12 | | 38 | | | | |
| 48 | 4.5 | ~330.5 | 4/4 ~ 4/12 | | | | | | | | | 2 |
| 49 | 20.5 | 34 | 4/5 | 1 | | | | | | | | |
| 50 | 7 | ~7.5 | 4/5 ~ 4/6 | | 3 | | | | | | | |
| 51 | 25.5 | ~336.5 | 4/4 ~ 4/4 | 2 | | | | | | | | |
| 52 | 8 | ~336 | 4/9 | 3 | | | | | | | | |
| 53 | 5 | 315 | 4/9 | 1 | | | | | | | | |
| 54 | 4.5 | ~303.5 | 4/9 ~ 4/16 | 3 | | 7 | | | | | | |
| 55 | 25 | ~283.5 | 4/9 ~ 4/19 | | | | 17 | | | 24 | | |
| 56 | 10.5 | ~267.5 | 4/9 ~ 4/16 | 1 | | 5 | | | | | | |
| 57 | 7 | ~261 | 4/12 ~ 4/16 | | 4 | | | 37 | 79 | | | |
| 58 | 3 | ~237.5 | 4/12 ~ 4/20 | | | | | | | | | |
| 59 | 10.5 | ~235.5 | 4/16 ~ 4/20 | 2 | | | | | | | | 3 |
| 60 | 12.5 | ~211.5 | 4/16 ~ 4/23 | 1 | | | 21 | 16 | | | | |
| 61 | 14.5 | ~220.5 | 4/19 ~ 4/23 | 1 | | 5 | | | | | | |
| 62 | 7 | ~117 | 4/26 ~ 4/27 | 2 | | 5 | | | | | | |
| 63 | 7 | ~7.5 | 4/26 ~ 5/2 | | | | | | | | | 2 |
| 64 | 6 | ~30 | 4/27 ~ 5/4 | 2 | | 16 | | 21 | | | | |
| 65 | 22.5 | 347 | 5/10 | 2 | | | | | | | | |
| 66 | 25 | ~265 | 5/10 ~ 5/18 | | | | | | | | 23 | 4 |
| 67 | 4.5 | ~259.5 | 5/10 ~ 5/18 | | | | 15 | | | | | |
| 68 | 11.5 | ~254.5 | 5/10 ~ 5/14 | | 22 | | | | | | | |
| 69 | 3 | ~246.5 | 5/10 ~ 5/18 | 2 | 15 | | | | | | | |
| 70 | 8 | ~229.5 | 5/10 ~ 5/18 | | | 10 | 13 | | | | | 3 |
| 71 | 7 | ~338 | 5/10 ~ 5/11 | | | 3 | | | | | | 10 |
| 72 | 11.5 | ~248.5 | 5/14 | 1 | | | | | | | | |
| 73 | 13 | ~238.5 | 5/14 | | 6 | | | | | | | |
| 74 | 9 | ~211.5 | 5/17 | 2 | | | | | | | | |
| 75 | 12 | ~199.5 | 5/17 ~ 5/21 | 4 | 11 | | | | | | | |
| 76 | 16.5 | ~163.5 | 5/17 ~ 5/18 | 1 | | 4 | | | | | | |
| 77 | 14 | ~136 | 5/18 ~ 5/26 | 1 | | | 32 | 17 | 15 | | | |
| 78 | 20 | ~159 | 5/21 | 1 | | | | | | | | |
| 79 | 4 | ~87.5 | 5/21 ~ 5/26 | 2 | | 17 | | | | | | |
| 80 | 17.5 | ~43 | 5/22 ~ 5/30 | | | 10 | 26 | | | | | |
| 81 | 17 | ~172.5 | 5/24 | 2 | | | 6 | | | | | |
| 82 | 15 | ~96.5 | 5/24 ~ 5/30 | 2 | 16 | 26 | | | | | | |
| 83 | 19.5 | ~87 | 5/26 ~ 5/30 | | 5 | | | | | | | |
| 84 | 12 | ~49 | 5/29 ~ 5/30 | | | 11 | 6 | | | | | |

(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 |
|------|-------------|---------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| N127 | 4 | 85.5 ~ 88 | 8/15 | --- | 4 | --- | --- | --- | --- | --- | --- | --- |
| 128 | 22 | 48 ~ 49 | 8/22 | --- | --- | --- | --- | --- | --- | --- | --- | 4 |
| 129 | 7 | 7.5 ~ 41 | 8/17 | 3 | --- | --- | --- | --- | --- | --- | --- | 2 |
| 130 | 7.5 ~ 12.5 | 352.5 ~ 358 | 8/15 | --- | --- | 17 | --- | --- | --- | --- | 8 | 3 |
| 131 | 9.5 | 6.5 | 8/17 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 132 | 1.5 ~ 5 | 351.5 ~ 359 | 8/17 | --- | --- | 23 | 18 | --- | --- | --- | --- | 1 |
| 133 | 1 ~ 2 | 340.5 ~ 342 | 8/17 | --- | --- | --- | --- | 38 | 28 | --- | --- | 3 |
| 134 | 8 ~ 14 | 333.5 ~ 344 | 8/17 | --- | --- | --- | --- | --- | --- | --- | --- | 4 |
| 135 | 16 ~ 18.5 | 350.5 ~ 353 | 8/21 | 3 | --- | --- | --- | --- | --- | --- | --- | --- |
| 136 | 6 | 347 | 8/21 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 137 | 14 ~ 19 | 339.5 ~ 345.5 | 8/21 | --- | --- | 15 | 14 | --- | --- | --- | --- | 2 |
| 138 | 2 | 335 | 8/21 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 139 | 13 | 308.5 ~ 310 | 8/21 | 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 140 | 8 ~ 9.5 | 328 ~ 332.5 | 8/22 | 1 | --- | 7 | --- | --- | --- | --- | --- | --- |
| 141 | 11 ~ 13 | 297.5 ~ 301.5 | 8/22 | --- | --- | --- | 7 | --- | --- | --- | --- | --- |
| 142 | 13.5 ~ 17 | 274.5 ~ 280.5 | 8/27 | 2 | --- | 9 | --- | --- | --- | --- | --- | 2 |
| 143 | 18.5 ~ 25.5 | 279 ~ 247 | 8/27 | --- | --- | --- | 9 | 41 | --- | --- | --- | --- |
| 144 | 17 | 212.5 | 8/27 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 145 | 7.5 ~ 9.5 | 277.5 ~ 279.5 | 9/2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 146 | 18 ~ 19 | 234 ~ 235 | 9/2 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 147 | 9 ~ 13 | 221 ~ 232 | 9/2 | 4 | 10 | 21 | --- | 28 | --- | --- | --- | --- |
| 148 | 29.5 | 208 | 9/2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 149 | 3 | 221.5 | 9/3 | 1 | --- | --- | --- | 47 | --- | --- | --- | --- |
| 150 | 0 ~ 4 | 95.5 ~ 104.5 | 9/7 | 3 | --- | --- | --- | --- | --- | --- | --- | --- |
| 151 | 19.5 | 115 | 9/10 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 152 | -0.5 ~ 1 | 359 ~ 0.5 | 9/12 | --- | --- | --- | --- | --- | --- | --- | --- | 2 |
| 153 | 8 ~ 10 | 307.5 ~ 310.5 | 9/28 | --- | --- | --- | --- | --- | --- | --- | --- | 1 |
| 154 | 12 ~ 12.5 | 278.5 ~ 284.5 | 9/28 | --- | --- | 3 | --- | --- | --- | --- | --- | --- |
| 155 | 22 ~ 24.5 | 230.5 ~ 232 | 9/28 | 2 | --- | --- | --- | --- | --- | --- | --- | --- |
| 156 | 15.5 ~ 22.5 | 146.5 ~ 158.5 | 10/2 | --- | --- | --- | --- | 45 | --- | --- | --- | --- |
| 157 | 11.5 | 142 | 10/2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 158 | 8.5 ~ 11.5 | 124.5 ~ 133 | 10/2 | --- | 3 | 12 | 15 | --- | --- | --- | --- | --- |
| 159 | 1.5 | 114 | 10/2 | 2 | --- | --- | --- | --- | --- | --- | --- | --- |
| 160 | 10.5 | 107.5 | 10/3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 161 | 20.5 ~ 24 | 230 ~ 304 | 10/22 | 2 | 21 | --- | --- | --- | --- | --- | --- | --- |
| 162 | 8 ~ 11 | 240.5 ~ 246 | 10/22 | --- | --- | 18 | 27 | --- | --- | --- | --- | --- |
| 163 | 18.5 ~ 19.5 | 198.5 ~ 201 | 10/22 | --- | 6 | 8 | --- | --- | --- | --- | --- | 3 |
| 164 | 14 ~ 19.5 | 154.5 ~ 168.5 | 10/24 | --- | --- | --- | --- | 46 | --- | --- | --- | --- |
| 165 | 21.5 ~ 22.5 | 198.5 ~ 201 | 10/24 | 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 166 | 21 | 198.5 ~ 201 | 10/29 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 167 | 5.5 ~ 6.5 | 21.5 ~ 22.5 | 11/7 | 3 | --- | --- | --- | --- | --- | --- | --- | --- |
| 168 | 18 ~ 22 | 11 | 11/7 | --- | --- | 12 | 17 | --- | --- | --- | --- | --- |
| | | | 11/15 | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| 群 | 緯度 | 経度 | 観測期間 | A | B | C | D | E | F | G | H | J |
|-----|-------------|---------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| N85 | 8.5 | 44 | 5/29 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 86 | 3.5 ~ 11 | 341 ~ 351 | 6/5 | --- | 14 | --- | --- | 33 | --- | --- | --- | --- |
| 87 | 18 ~ 20 | 276 ~ 287 | 6/5 | --- | 24 | --- | --- | 23 | --- | --- | --- | 2 |
| 88 | 6 ~ 10 | 278.5 ~ 285.5 | 6/5 | --- | 7 | 36 | --- | --- | --- | --- | --- | --- |
| 89 | 9.5 ~ 13 | 284.5 ~ 273.5 | 6/5 | 3 | 22 | 17 | --- | --- | --- | --- | --- | --- |
| 90 | 7 ~ 8 | 289 ~ 270.5 | 6/5 | 2 | --- | --- | --- | --- | --- | --- | --- | 5 |
| 91 | 13 ~ 16 | 258 ~ 285 | 6/5 | --- | --- | --- | 7 | --- | --- | --- | --- | --- |
| 92 | 10 ~ 12 | 261.5 ~ 261.5 | 6/5 | 2 | --- | --- | --- | --- | --- | --- | --- | --- |
| 93 | 26 ~ 36 | 240.5 ~ 256.5 | 6/5 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 94 | 8.5 ~ 10.5 | 240 ~ 241.5 | 6/5 | --- | --- | --- | --- | --- | --- | 109 | --- | --- |
| 95 | 13 | 278.5 | 6/8 | 1 | --- | --- | --- | --- | --- | --- | --- | 6 |
| 96 | 10.5 ~ 12 | 262 ~ 262 | 6/9 | 2 | --- | --- | --- | --- | --- | --- | --- | --- |
| 97 | 16 ~ 17.5 | 256.5 ~ 258.5 | 6/9 | 7 | --- | --- | --- | --- | --- | --- | --- | 1 |
| 98 | 11 ~ 12.5 | 209 ~ 212 | 6/9 | 7 | 5 | --- | --- | --- | --- | --- | --- | --- |
| 99 | 13.5 | 199.5 | 6/11 | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| 100 | 10 ~ 12 | 207 ~ 210 | 6/14 | --- | --- | 8 | --- | --- | --- | --- | --- | --- |
| 101 | 11 | 137 ~ 137.5 | 6/14 | 2 | --- | --- | --- | --- | --- | --- | --- | 3 |
| 102 | 6 ~ 10 | 92 ~ 93.5 | 6/26 | --- | 8 | --- | --- | --- | --- | --- | --- | 2 |
| 103 | 12 ~ 15.5 | 83 ~ 89.5 | 6/26 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 104 | 21 ~ 23.5 | 44.5 ~ 47.5 | 6/26 | --- | 7 | --- | --- | --- | --- | --- | --- | --- |
| 105 | 2 ~ 8 | 350 ~ 0 | 6/26 | --- | --- | 22 | 42 | --- | --- | --- | --- | --- |
| 106 | 2 ~ 4 | 323.5 ~ 332.5 | 6/26 | --- | 6 | --- | --- | --- | --- | --- | --- | 5 |
| 107 | 7 ~ 12 | 239 ~ 235.5 | 6/27 | --- | 7 | --- | --- | --- | --- | --- | --- | --- |
| 108 | 11 ~ 12.5 | 333.5 ~ 334 | 7/6 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 109 | 9.5 ~ 13 | 297.5 ~ 280.5 | 7/6 | --- | 30 | --- | --- | --- | --- | --- | --- | --- |
| 110 | 17 ~ 18 | 278 ~ 279 | 7/6 | --- | --- | --- | --- | --- | --- | --- | --- | 3 |
| 111 | 13 ~ 15.5 | 252 ~ 260.5 | 7/6 | --- | 16 | --- | --- | --- | --- | --- | --- | 3 |
| 112 | 22 ~ 23.5 | 231 ~ 250 | 7/6 | --- | --- | --- | --- | 36 | --- | --- | --- | --- |
| 113 | 18 ~ 21 | 237.5 ~ 248 | 7/6 | 2 | 11 | --- | --- | --- | --- | --- | --- | --- |
| 114 | 32.5 ~ 34.5 | 221 ~ 225 | 7/6 | --- | 11 | 27 | --- | --- | --- | --- | --- | --- |
| 115 | 9.5 ~ 13 | 210 ~ 213.5 | 7/6 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 116 | 20 | 174 | 7/11 | 2 | --- | --- | --- | --- | --- | 13 | --- | --- |
| 117 | 20.5 ~ 22.5 | 47 ~ 50 | 7/19 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 118 | 5 ~ 12 | 351 ~ 3 | 7/19 | --- | --- | 13 | --- | --- | --- | --- | --- | 3 |
| 119 | 10 | 51 ~ 52.5 | 7/21 | 4 | --- | --- | --- | --- | --- | 30 | --- | --- |
| 120 | 5.5 ~ 12.5 | 331 ~ 345.5 | 7/21 | --- | --- | 24 | 68 | --- | --- | --- | --- | --- |
| 121 | 0 ~ 4 | 336.5 ~ 343 | 7/21 | 1 | --- | --- | --- | --- | --- | --- | 11 | 16 |
| 122 | 26.5 | 53 | 7/23 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 123 | 8 ~ 10 | 318.5 ~ 322 | 7/31 | --- | 6 | --- | --- | --- | --- | --- | --- | --- |
| 124 | 13 ~ 15 | 270 ~ 275 | 7/31 | --- | 10 | --- | --- | --- | --- | --- | --- | --- |
| 125 | 20.5 ~ 25 | 236 ~ 249.5 | 7/31 | --- | --- | --- | --- | 45 | --- | --- | --- | --- |
| 126 | 32 ~ 33 | 216.5 ~ 218.5 | 7/31 | --- | --- | --- | --- | --- | --- | --- | --- | 2 |

(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 |
|------|----|-------|-------|--------|-------|-------|----|----|----|-----|---|-----|
| S289 | 7 | ~11.5 | 184.5 | ~187.5 | 12/27 | ~1/6 | 5 | | | | | (4) |
| S | 1 | 5 | 201 | ~211 | 1/4 | ~1/6 | 10 | | | | | |
| | 2 | 22.5 | ~25.5 | 171 | 1/4 | ~1/6 | | | | | | |
| | 3 | 8 | ~11.5 | 162 | 1/4 | ~1/9 | 22 | | | | | |
| | 4 | 17.5 | ~19 | 96 | 1/4 | ~1/8 | 6 | | | 7 | | |
| | 5 | 11 | ~11.5 | 75 | 1/4 | ~1/10 | | | | | | 3 |
| | 6 | 6 | ~7.5 | 156.5 | 1/6 | ~1/8 | 4 | | | | | |
| | 7 | 17.5 | 144.5 | ~151 | 1/6 | 1/10 | | | | | | |
| | 8 | 9.5 | ~13.5 | 141 | 1/6 | 1/10 | 23 | | | | | |
| | 9 | 16.5 | ~19 | 114.5 | 1/8 | 1/10 | | | | | | 3 |
| | 10 | 5 | ~10 | 345.5 | 1/10 | ~1/20 | 23 | 17 | | | | |
| | 11 | 21 | ~21.5 | 354 | 1/16 | ~1/19 | 2 | | | | | |
| | 12 | 13 | ~14 | 349 | 1/16 | ~1/18 | 2 | | | | | |
| | 13 | 20 | ~21 | 336.5 | 1/16 | ~1/19 | 3 | | | | | |
| | 14 | 12 | ~15.5 | 331 | 1/16 | ~1/23 | 7 | 3 | 22 | 28 | | |
| | 15 | 26 | ~27.5 | 281 | 1/16 | ~1/20 | 2 | | | | | |
| | 16 | 24 | ~26 | 319.5 | 1/19 | ~1/20 | 3 | | | | | |
| | 17 | 19.5 | 264.5 | ~282 | 1/19 | | | | | | | |
| | 18 | 10.5 | ~11 | 234.5 | 1/20 | | | | | | | |
| | 19 | 13 | ~21 | 192 | 1/23 | ~2/3 | | | 69 | | 4 | |
| | 20 | 5 | ~12 | 190.5 | 1/23 | ~2/3 | 38 | 10 | 42 | 45 | | 1 |
| | 21 | 10 | ~16.5 | 171 | 1/23 | ~2/3 | 6 | | 92 | | | |
| | 22 | 6 | | 301 | 1/25 | ~1/26 | | | | | | |
| | 23 | 17.5 | ~18 | 243 | 1/25 | ~1/26 | 1 | 5 | | | | |
| | 24 | 6 | | 234.5 | 1/25 | | 1 | | | | | |
| | 25 | 6 | 216.5 | ~246 | 1/25 | | 2 | | | | | |
| | 26 | 14 | ~17 | 148 | 1/25 | ~2/3 | 2 | 3 | | | | |
| | 27 | 7 | ~15.5 | 134.5 | 1/26 | ~2/7 | 2 | | | | | 1 |
| | 28 | 13 | ~14.5 | 125.5 | 1/26 | ~2/7 | | | 75 | 110 | 6 | 80 |
| | 29 | 15 | ~16.5 | 120 | 1/29 | ~2/9 | | | | | | 4 |
| | 30 | 24.5 | ~25.5 | 138 | 1/31 | ~2/9 | 3 | | | | | 5 |
| | 31 | 9 | 89 | ~138.5 | 1/31 | | 1 | | | | | |
| | 32 | 32 | 113 | ~138.5 | 2/1 | | 1 | | | | | |
| | 33 | 9 | ~10 | 60 | 2/1 | ~2/9 | 3 | | | | | 5 |
| | 34 | 21 | ~23.5 | 49 | 2/2 | ~2/9 | | | | | | 2 |
| | 35 | 25 | ~26 | 135 | 2/3 | ~2/9 | | | 7 | | | |
| | 36 | 9 | ~11 | 64 | 2/3 | ~2/9 | 3 | | | | | 1 |
| | 37 | 9 | 32 | ~71.5 | 2/5 | | 1 | | | | | |
| | 38 | 23 | 85 | ~85 | 2/7 | ~2/9 | 1 | | | | | 1 |
| | 39 | 14 | ~14.5 | 341 | 2/7 | ~2/9 | 1 | | | | | 1 |
| | 40 | 4.5 | ~7.5 | 359.5 | 2/9 | ~2/9 | | | | | | |
| | 41 | 8 | ~11.5 | 322.5 | 2/9 | ~2/19 | 1 | | | | | 1 |

| 群 | 緯度 | 経度 | 観測期間 | A | B | C | D | E | F | G | H | J |
|------|------|-------|-------|--------|-------|--------|----|----|----|----|---|---|
| N169 | 18 | ~22.5 | 356.5 | ~6.5 | 11/10 | ~11/17 | 28 | | | | | |
| N170 | 8 | ~12.5 | 336.5 | ~949 | 11/10 | ~11/17 | 5 | 31 | | | | |
| N171 | 9 | ~10.5 | 256 | ~259.5 | 11/15 | | | | | | | |
| N172 | 6 | ~7 | 224 | ~226 | 11/17 | ~11/21 | | | | | | |
| N173 | 9.5 | ~10 | 257.5 | ~259 | 11/19 | | | | | | | |
| N174 | 24.5 | ~18 | 195 | ~191 | 11/21 | ~11/24 | 3 | | | | | 2 |
| N175 | 16 | ~18 | 159 | ~164 | 11/21 | ~11/24 | 3 | | | | | |
| N176 | 8 | ~10 | 153.5 | ~160.5 | 11/29 | ~11/30 | 13 | | | | | |
| N177 | 4 | ~6.5 | 149.5 | ~155.5 | 11/29 | ~11/30 | | | | | | |
| N178 | 4 | | 39 | | 11/30 | ~12/3 | | | | | | |
| N179 | 18 | 74.5 | | | 12/3 | | | | | | | |
| N180 | 18.5 | ~21 | 16 | ~26.5 | 12/3 | ~12/10 | | | | | | |
| N181 | 15 | ~21 | 347 | ~1.5 | 12/3 | ~12/14 | 15 | | | | | |
| N182 | 9.5 | ~12.5 | 348.5 | ~353.5 | 12/3 | ~12/14 | 7 | 35 | | | | 5 |
| N183 | 23 | ~24 | 29.5 | ~31 | 12/7 | | | | | | | |
| N184 | 5 | ~12 | 297 | ~312 | 12/7 | ~12/17 | 2 | | 79 | 33 | | |
| N185 | 15 | | 345 | | 12/10 | ~12/11 | 8 | | | | | |
| N186 | 24 | | 301.5 | ~303.5 | 12/11 | | 3 | | | | | |
| N187 | 8.5 | | 292.5 | | 12/17 | | 1 | | | | | |
| N188 | 20 | ~22 | 281.5 | ~285 | 12/17 | | | 5 | | | | |
| N189 | 17 | | 185.5 | | 12/21 | | 1 | | | | | |

(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 |
|-----|-------------|---------------|-------------|---|----|----|----|----|-----|---|---|---|
| S84 | 9 | 268.5 ~ 269 | 3/15 ~ 3/17 | 2 | | | | | | | | |
| 85 | 12 | 245 | 3/15 ~ 3/17 | 1 | | | 6 | | | | | |
| 86 | 16 | 225 | 3/15 ~ 3/26 | | | | 5 | | | | | 1 |
| 87 | 1 | 227.5 ~ 232 | 3/17 | 2 | | | | | | | | 1 |
| 88 | 19.5 ~ 20.5 | 315.5 ~ 320 | | | | 7 | | | | | | |
| 89 | 14 | 228 | 3/26 ~ 3/30 | 2 | | | | | | | | |
| 90 | 17.5 ~ 30.5 | 175.5 ~ 196 | 3/26 ~ 3/30 | 1 | | | 5 | | 117 | | | |
| 91 | 12.5 ~ 14 | 185 ~ 193 | 3/26 ~ 3/30 | 2 | | | | | | | | |
| 92 | 6.5 ~ 7 | 173 ~ 175.5 | 3/26 ~ 3/30 | 1 | 4 | 25 | | | | | | |
| 93 | 9.5 ~ 13.5 | 161 ~ 169.5 | 3/26 ~ 3/30 | 2 | 6 | | | | | | | |
| 94 | 20 | 155.5 ~ 158 | 3/26 ~ 3/30 | | | | | | | | | |
| 95 | 12 ~ 16.5 | 134 ~ 147 | 3/26 ~ 3/30 | | | 4 | 35 | | | | | |
| 96 | 7 ~ 9 | 178 ~ 182.5 | 3/30 | | | 6 | | | | | | |
| 97 | 7.5 ~ 12 | 50 ~ 60.5 | 3/30 ~ 4/9 | | | | 38 | 37 | | | | |
| 98 | 9 | 11 | 4/3 | 1 | | | | | | | | |
| 99 | 12 ~ 14.5 | 353.5 ~ 0 | 4/3 ~ 4/9 | 5 | | | | | | | | |
| 100 | 17 ~ 23 | 349 | 4/3 ~ 4/12 | 6 | | | 12 | | | | | |
| 101 | 18 | 44.5 | 4/4 | 1 | | | 11 | | | | | |
| 102 | 10.5 ~ 11 | 342.5 ~ 346.5 | 4/4 ~ 4/12 | 1 | 6 | | | | | | | |
| 103 | 8 ~ 8.5 | 346 ~ 348 | 4/4 | 2 | | | | | | | | |
| 104 | 25 ~ 27 | 345.5 ~ 350.5 | 4/4 ~ 4/12 | 3 | 6 | 10 | | | | | | |
| 105 | 9 ~ 12.5 | 329 ~ 339.5 | 4/4 ~ 4/12 | 3 | 3 | 2 | | | | | | 2 |
| 106 | 10.5 | 29 | 4/4 ~ 4/6 | 1 | | | | | | | | |
| 107 | 49 ~ 50.5 | 23.5 ~ 27 | 4/6 | 2 | 4 | | | | | | | |
| 108 | 18.5 ~ 20 | 21 ~ 27.5 | 4/6 ~ 4/12 | 1 | 8 | 11 | | | | | | |
| 109 | 8 | 14 | 4/9 | 1 | | | | | | | | |
| 110 | 18 ~ 19.5 | 304.5 ~ 309 | 4/9 | 1 | 6 | | | | | | | |
| 111 | 26 | 272 | 4/9 | 1 | | | | | | | | |
| 112 | 22 ~ 22.5 | 264 ~ 272 | 4/9 | | 3 | | | | | | | |
| 113 | 12.5 ~ 13 | 7.5 ~ 8 | 4/12 | 2 | | | | | | | | |
| 114 | 21 ~ 22 | 325.5 ~ 326.5 | 4/12 | | 2 | | | | | | | |
| 115 | 2.5 | 302.5 ~ 304.5 | 4/12 | | 3 | | | | | | | |
| 116 | 16 ~ 17.5 | 278 ~ 279.5 | 4/12 | | 3 | | | | | | | |
| 117 | 22 ~ 26 | 254.5 ~ 265.5 | 4/12 ~ 4/20 | | | | | | | | | |
| 118 | 25.5 ~ 26.5 | 252 | 4/12 ~ 4/16 | 2 | | | | | | | | |
| 119 | 27 | 230.5 ~ 231 | 4/12 ~ 4/16 | 4 | | | | | | | | |
| 120 | 19 ~ 20 | 238.5 ~ 246.5 | 4/16 ~ 4/20 | | 11 | 9 | | | | | | |
| 121 | 8.5 ~ 9.5 | 205.5 ~ 211 | 4/16 ~ 4/20 | 1 | | | | | | | | |
| 122 | 10 ~ 14 | 187 ~ 196.5 | 4/16 ~ 4/26 | | | | | | | | | |
| 123 | 5 ~ 8 | 182 ~ 191.5 | 4/16 ~ 4/20 | 2 | | | | | | | | |
| 124 | 20.5 | 186.5 | 4/16 | 1 | | | | | | | | |
| 125 | 21.5 | 174 | 4/16 | 1 | | | | | | | | |

| 群 | 緯度 | 経度 | 観測期間 | A | B | C | D | E | F | G | H | J |
|-----|-------------|---------------|-------------|---|----|----|----|----|----|----|---|----|
| S42 | 3 ~ 5 | 323 ~ 324 | 2/9 ~ 2/19 | | 6 | | | | | | | 4 |
| 43 | 6 | 316.5 | 2/9 | | | | | | | | | 1 |
| 44 | 6 | 7 | 2/14 ~ 2/17 | | | | | | | | | 1 |
| 45 | 10 ~ 13.5 | 14 | 2/14 ~ 2/17 | | | | | | | | | 1 |
| 46 | 12 ~ 16 | 347.5 ~ 355.5 | 2/14 ~ 2/19 | | | 24 | 10 | | | | | |
| 47 | 9 ~ 12 | 344.5 ~ 351.5 | 2/14 ~ 2/19 | | 5 | | | | | | | |
| 48 | 18 ~ 20 | 341.5 ~ 344 | 2/14 | | 6 | | | | | | | |
| 49 | 4 ~ 6.5 | 341.5 ~ 310.5 | 2/14 | | | 6 | | | | | | |
| 50 | 9.5 ~ 13 | 259.5 ~ 265.5 | 2/14 ~ 2/24 | | | 5 | | | | | | |
| 51 | 17 | 334.5 | 2/17 | 1 | | | | | | | | 2 |
| 52 | 6.5 | 315.5 | 2/17 | 1 | | | | | | | | |
| 53 | 8 ~ 10 | 264 ~ 269 | 2/17 | | 8 | | | | | | | |
| 54 | 15 ~ 17.5 | 256 ~ 258 | 2/17 ~ 2/21 | | | | | | | | | |
| 55 | 12 ~ 12.5 | 251 ~ 254 | 2/17 ~ 2/19 | | 10 | 5 | | | | | | |
| 56 | 13 ~ 18 | 224.5 ~ 235.5 | 2/17 ~ 2/27 | | 3 | | | | | | | |
| 57 | 21.5 ~ 24 | 341 ~ 248 | 2/19 | | | 14 | 23 | 15 | | | | |
| 58 | 7 ~ 8 | 300 ~ 301 | 2/19 | | 3 | 4 | | | | | | 2 |
| 59 | 3 ~ 4 | 220 ~ 227.5 | 2/19 ~ 2/23 | 2 | | | | | | | | 10 |
| 60 | 12 ~ 26 | 187.5 ~ 203.5 | 2/19 ~ 3/3 | | | 4 | | | | | | |
| 61 | 9.5 ~ 11 | 195.5 ~ 201 | 2/19 ~ 2/26 | 1 | | 4 | | | | | | 3 |
| 62 | 10 ~ 17 | 183 ~ 194 | 2/19 ~ 3/3 | | | | | 43 | 51 | | | |
| 63 | 6 ~ 7.5 | 298.5 ~ 304 | 2/21 ~ 2/22 | | | 6 | | | | | | |
| 64 | 13 | 247.5 ~ 248 | 2/22 ~ 2/23 | 3 | | | | | | | | 1 |
| 65 | 16 | 221 | 2/22 | 1 | | | | | | | | |
| 66 | 15 | 212 | 2/22 | 1 | | | | | | | | |
| 67 | 9 ~ 12 | 141 ~ 153 | 2/22 ~ 3/3 | 1 | 5 | 20 | 5 | | | | | 2 |
| 68 | 5 ~ 7.5 | 153 ~ 162 | 2/23 ~ 3/3 | 1 | 5 | 5 | 13 | | | | | |
| 69 | 12 ~ 16.5 | 208 ~ 212.5 | 2/24 | | 7 | | | | | | | |
| 70 | 10 ~ 11.5 | 171.5 ~ 177 | 2/26 ~ 3/3 | 1 | 6 | | | | | | | |
| 71 | 17.5 | 139 | 2/26 | 1 | | | | | | | | |
| 72 | 21 | 180 | 2/27 | 1 | | | | | | | | |
| 73 | 14 ~ 17 | 134 ~ 138 | 3/2 | 3 | | | | | | | | |
| 74 | 23 ~ 23.5 | 115.5 ~ 118.5 | 3/3 | | 4 | | | | | | | |
| 75 | 20 ~ 23 | 149 ~ 154 | 3/3 ~ 3/5 | | 5 | | | | | | | |
| 76 | 14.5 ~ 17.5 | 52 ~ 55 | 3/5 | | 5 | | | | | | | |
| 77 | 6 ~ 10 | 356.5 ~ 6.5 | 3/5 ~ 3/15 | 5 | | 15 | | | | | | |
| 78 | 19.5 ~ 25 | 338 ~ 356 | 3/5 ~ 3/17 | 1 | | | | | | | | 5 |
| 79 | 11 ~ 12.5 | 334.5 ~ 336.5 | 3/7 ~ 3/17 | | | | | | 16 | 37 | | 1 |
| 80 | 14 ~ 12.5 | 341.5 ~ 343.5 | 3/15 ~ 3/17 | | 2 | 19 | | | | | | 2 |
| 81 | 23.5 ~ 28.5 | 325.5 ~ 335.5 | 3/15 ~ 3/17 | | | | | | | | | |
| 82 | 4 ~ 12 | 279.5 ~ 294.5 | 3/15 ~ 3/17 | | | | | 29 | | | | |
| 83 | 22 ~ 23.5 | 269 ~ 279 | 3/15 ~ 3/17 | | | | | 33 | 58 | | | |

(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 |
|------|-----------|-------|--------------|---|----|----|----|-----|-----|---|---|---|
| S252 | 16 ~16.5 | 238 | 8/28 | 2 | | | | | | | | |
| 253 | 16.5~23.5 | 190 | 8/28 ~9/7 | | 54 | | | 46 | | | | |
| 254 | 8 ~13.5 | 177.5 | 9/2 ~9/10 | | 13 | 41 | 47 | | | | | |
| 255 | 11.5~12 | 140 | 9/2 | 3 | | | | | | | | |
| 256 | 13.5 | 180.5 | 9/3 | 2 | | | | | | | | |
| 257 | 7 ~7.5 | 191.5 | 9/6 ~9/7 | | 9 | | | | | | | |
| 258 | 24 ~27.5 | 136.5 | 9/6 ~9/12 | 5 | | | | | | | | |
| 259 | 10 ~13 | 110.5 | 9/6 ~9/12 | | 3 | | 31 | | | | | |
| 260 | 23 ~25 | 100 | 9/6 ~9/12 | | | | | | | | | 3 |
| 261 | 20.5 | 97 | 9/7 | 1 | | | | | | | | |
| 262 | 6 | 63 | 9/7 ~9/12 | 3 | | | | | | | | 2 |
| 263 | 18.5~22 | 39.5 | 9/10 ~9/12 | | | 19 | 27 | | | | | |
| 264 | 19.5~23 | 23.5 | 9/10 ~9/12 | | 6 | | 31 | | | | | |
| 265 | 11.5~13 | 13.5 | 9/12 | | 3 | | | | | | | |
| 266 | 7.5 | 264.5 | 9/28 | 1 | | | | | | | | |
| 267 | 8.5~10.5 | 254.5 | 9/28 | | 7 | | | | | | | |
| 268 | 19.5 | 213.5 | 9/28 | 1 | | | | | | | | |
| 269 | 4 ~8 | 195.5 | 9/28 ~10/4 | | 14 | | 24 | | | | | |
| 270 | 7 ~13.5 | 170.5 | 9/28 ~10/4 | | | | 9 | 54 | 123 | | | |
| 271 | 15.5~21 | 165 | 9/28 ~10/4 | | 4 | | | | | | | |
| 272 | 18 ~20.5 | 182.5 | 10/2 | 1 | 5 | 13 | | | | | | |
| 273 | 23.5~26.5 | 152 | 10/2 ~10/4 | | | | | | | | | |
| 274 | 16 ~17 | 82 | 10/3 ~10/4 | 1 | | | | | | | | 3 |
| 275 | 7 | 180.5 | 10/4 | | | | | | | | | |
| 276 | 10.5~15.5 | 302 | 10/22 ~10/24 | | 20 | | | | | | | |
| 277 | 15 ~18.5 | 232 | 10/22 ~10/24 | | 22 | | | | | | | |
| 278 | 5.5~16.5 | 175.5 | 10/22 ~10/29 | | | | | 130 | | | | |
| 279 | 18.5~20 | 254.5 | 10/23 | 4 | | | | | | | | |
| 280 | 14.5~21.5 | 175.5 | 10/23 ~10/29 | | | 5 | 21 | 60 | | | | |
| 281 | 5.5 | 241.5 | 10/24 | 1 | | | | | | | | |
| 282 | 7 ~7.5 | 171 | 10/24 ~10/29 | | | | | | | | | 2 |
| 283 | 4.5~5.5 | 203.5 | 10/29 | | 6 | | | | | | | |
| 284 | 2 | 145.5 | 10/29 | 1 | | | | | | | | |
| 285 | 11 ~13.5 | 137 | 10/29 ~11/7 | | | 4 | | | | | | 2 |
| 286 | 7.5~9.5 | 111 | 10/29 | | | 9 | | | | | | |
| 287 | 15 | 99 | 10/29 | 1 | | | | | | | | |
| 288 | 13.5~18.5 | 81.5 | 11/7 ~11/10 | | | | | 40 | | | | |
| 289 | 30 ~32.5 | 86.5 | 11/7 | | 8 | | | | | | | |
| 290 | 15.5~20 | 73.5 | 11/7 | | 19 | | | | | | | |
| 291 | 15 ~17.5 | 57 | 11/7 | | 5 | | | | | | | |
| 292 | 6 ~9.5 | 44 | 11/7 ~11/10 | | 13 | 17 | | | | | | |
| 293 | 21 ~23 | 5.5 | 11/7 | | 4 | | | | | | | |

| 群 | 緯度 | 経度 | 観測期間 | A | B | C | D | E | F | G | H | J |
|------|-----------|-------|------------|---|----|----|----|----|----|---|---|----|
| S210 | 21 ~25 | 156 | 7/6 ~7/11 | | | | | | 33 | | | 1 |
| 211 | 17.5 | 206.5 | 7/11 | 2 | | | | | | | | |
| 212 | 1.5 | 191.5 | 7/11 | 2 | | | | | | | | |
| 213 | 24 ~25 | 181 | 7/11 | 4 | | | | | | | | |
| 214 | 9.5~11.5 | 141 | 7/11 ~7/19 | | | | | | | | | 5 |
| 215 | 14 ~16.5 | 136 | 7/11 | | | 6 | | | | | | |
| 216 | 30 | 124 | 7/19 | 2 | | | | | | | | |
| 217 | 23 ~25 | 84.5 | 7/19 ~7/24 | 1 | | 4 | 18 | | | | | |
| 218 | 19 ~22.5 | 63 | 7/19 ~7/25 | | 5 | 6 | 18 | | | | | |
| 219 | 7.5~11 | 13 | 7/19 ~7/25 | | 3 | 24 | | 34 | | | | |
| 220 | 4 ~8 | 4 | 7/19 ~7/25 | | 8 | | 7 | | | | | 2 |
| 221 | 12 ~17.5 | 351.5 | 7/19 ~7/31 | | | 32 | 23 | | | | | 1 |
| 222 | 24.5~25 | 17.5 | 7/21 | | 4 | | | | | | | |
| 223 | 23 ~24.5 | 344 | 7/21 ~7/25 | 3 | 5 | | | | | | | |
| 224 | 0.5~1.5 | 61 | 7/23 ~7/25 | 8 | 13 | | | | | | | 9 |
| 225 | 19.5~20 | 314.5 | 7/23 ~7/25 | 3 | | | | | | | | |
| 226 | 19.5~21 | 355 | 7/24 | 6 | 11 | | | | | | | |
| 227 | 5.5~7.5 | 338 | 7/24 | 2 | | | | | | | | |
| 228 | 8.5~11 | 345.5 | 7/25 | | 3 | | | | | | | |
| 229 | 2.5~5 | 347 | 7/31 | | 10 | | | | | | | |
| 230 | 11 | 319 | 7/31 | 1 | | | | | | | | |
| 231 | 12.5~17.5 | 274 | 7/31 | | | 22 | | | | | | |
| 232 | 13.5~17.5 | 238 | 7/31 | | | | 15 | | | | | |
| 233 | 21.5~22.5 | 159.5 | 8/15 | | | | 11 | | | | | 1 |
| 234 | 8 ~11.5 | 131 | 8/15 ~8/17 | | 4 | | | | | | | |
| 235 | 20.5~23 | 109.5 | 8/15 ~8/17 | | | 4 | | | | | | |
| 236 | 7 ~9.5 | 42 | 8/15 ~8/22 | | | 12 | | | | | | |
| 237 | 17.5~21 | 37 | 8/15 ~8/22 | | 28 | | 35 | | | | | 5 |
| 238 | 12.5~26 | 22 | 8/15 ~8/22 | | | 28 | 35 | 98 | | | | |
| 239 | 6 ~11 | 22.5 | 8/15 ~8/22 | | | 22 | 30 | | | | | |
| 240 | 6.5~13 | 4 | 8/15 ~8/22 | | | 67 | | | | | | 13 |
| 241 | 0 ~4 | 0.5 | 8/15 ~8/22 | | | 7 | | | | | | |
| 242 | 12 ~16 | 351.5 | 8/17 ~8/22 | | 16 | | | 8 | | | | |
| 243 | 24 ~26.5 | 353 | 8/17 ~8/27 | 1 | | 14 | | | | | | 3 |
| 244 | 10 | 353 | 8/21 | 1 | | | | | | | | |
| 245 | 4.5 | 350.5 | 8/21 | 1 | | | | | | | | |
| 246 | 8 ~9 | 324.5 | 8/21 ~8/22 | | 6 | 5 | | | | | | |
| 247 | 7 ~8.5 | 265.5 | 8/27 ~9/3 | | | | | | | | | 3 |
| 248 | 10 ~12.5 | 253 | 8/27 ~8/28 | | | 11 | 11 | | | | | |
| 249 | 15 ~16.5 | 248 | 8/27 ~8/28 | | | 4 | | | | | | 1 |
| 250 | 2.5~10 | 239.5 | 8/27 ~9/3 | | 22 | 52 | | | | | | |
| 251 | 19 ~21 | 208.5 | 8/27 ~9/7 | | | 8 | 4 | | | | | 3 |

| 群 | 緯度 | 経度 | 観測期間 | A | B | C | D | E | F | G | H | J |
|------|----------|--------|--------------|---|----|---|----|---|---|---|---|---|
| S336 | 14.5 | 284 | 12/14 | 1 | | | | | | | | |
| 337 | 16 ~17 | ~270.5 | 12/17 ~12/21 | | | 3 | 14 | | | | | 1 |
| 338 | 8 | 264 | 12/17 | 1 | | | | | | | | |
| 339 | 6.5~13 | ~198 | 12/17 ~12/22 | | | | 19 | | | | | |
| 340 | 8 ~11 | ~187 | 12/17 ~12/22 | | 5 | | | | | | | 2 |
| 341 | 7 ~7.5 | ~245 | 12/20 | | | | | | | | | 2 |
| 342 | 7 ~10 | ~215.5 | 12/20 ~12/22 | | 21 | 6 | | | | | | |
| 343 | 7 | 159.5 | 12/20 ~12/22 | 1 | | | | | | | | |
| 344 | 18 ~21 | ~153.5 | 12/20 ~12/22 | | | | 7 | | | | | |
| 345 | 10.5~16 | ~147 | 12/20 ~12/22 | | | | 22 | | | | | |
| 346 | 8 | 203.5 | 12/21 | 2 | | | | | | | | |
| 347 | 25 | 194 | 12/21 ~12/22 | 2 | | | | | | | | |
| 348 | 17 ~17.5 | ~183.5 | 12/21 ~12/22 | | 3 | | | | | | | |
| 349 | 15.5~18 | ~104 | 12/22 ~1/4 | | | | | | | | | 2 |

| 群 | 緯度 | 経度 | 観測期間 | A | B | C | D | E | F | G | H | J |
|------|-----------|--------|--------------|---|----|----|----|----|----|---|----|----|
| S294 | 15 | 359 | 11/7 | 1 | | | | | | | | |
| 295 | 18.5~19.5 | ~356 | 11/7 | 3 | | | | | | | | |
| 296 | 11 | 2 | 11/10 | 2 | | | | | | | | |
| 297 | 17.5 | 334.5 | 11/10 | 1 | | | | | | | | |
| 298 | 8 ~13 | ~324 | 11/10 ~11/20 | | | | 5 | 31 | | | 32 | |
| 299 | 3 ~4.5 | ~42.5 | 11/13 | | 7 | | | | | | | |
| 300 | 23 ~23.5 | ~351.5 | 11/13 | 2 | | | | | | | | |
| 301 | 19.5~20 | ~321.5 | 11/13 | | 2 | | | | | | | |
| 302 | 10.5~15.5 | ~312 | 11/13 ~11/17 | 1 | 11 | | | | | | | |
| 303 | 17.5 | 284.5 | 11/15 | 1 | | | | | | | | |
| 304 | 13.5~16.5 | ~241.5 | 11/17 ~11/24 | 3 | 2 | 11 | 16 | | | | | |
| 305 | 15 | 232 | 11/19 | 1 | | | | | | | | |
| 306 | 5 ~9 | ~250.5 | 11/19 ~11/24 | | 7 | 18 | 10 | | | | | |
| 307 | 8 ~12.5 | ~204 | 11/19 ~11/30 | | | 4 | 13 | | | | | |
| 308 | 19 | 191.5 | 11/19 | 2 | | | | | | | | |
| 309 | 7 ~7.5 | ~182.5 | 11/19 ~11/24 | 3 | | | | | | | | |
| 310 | 11 ~11.5 | ~181.5 | 11/19 ~11/29 | 2 | 2 | | | | | | | 2 |
| 311 | 23 ~26 | ~279.5 | 11/20 ~11/21 | 1 | 7 | | | | | | | |
| 312 | 8 ~9.5 | ~186 | 11/24 ~11/30 | | 7 | | 3 | | | | | |
| 313 | 6 ~8 | 150 | 11/24 | 4 | | | | | | | | |
| 314 | 9 ~12 | ~143.5 | 11/24 ~12/4 | | 6 | 4 | 18 | | | | | |
| 315 | 1 ~6 | ~112.5 | 11/29 ~12/5 | | | 7 | 18 | | | | | |
| 316 | 16 ~17 | ~91.5 | 11/29 | 3 | | | | | | | | |
| 317 | 5 ~11.5 | ~61.5 | 11/29 ~12/7 | | | | 28 | | | | 10 | 6 |
| 318 | 2.5~5.5 | ~38 | 11/30 ~12/11 | 2 | | 9 | 28 | 33 | | | | |
| 319 | 9.5~12 | ~70.5 | 12/3 ~12/4 | 5 | | | | | | | | |
| 320 | 18 ~20 | ~15.5 | 12/3 ~12/5 | 4 | 6 | | | | | | | |
| 321 | 14.5 | 107 | 12/5 | 1 | | | | | | | | |
| 322 | 12 ~12.5 | 61 | 12/5 | 2 | | | | | | | | |
| 323 | 15.5~19 | ~330 | 12/5 ~12/14 | 4 | | | | 27 | 33 | | | |
| 324 | 18 ~18.5 | ~55.5 | 12/7 | 2 | | | | | | | | |
| 325 | 8 ~11.5 | ~354.5 | 12/10 ~12/14 | | | | 24 | 24 | 11 | | | |
| 326 | 12.5~13 | ~334.5 | 12/10 ~12/11 | 2 | | | | | | | | |
| 327 | 22 ~25.5 | ~329.5 | 12/10 ~12/14 | | | 13 | 10 | | | | | |
| 328 | 11.5~15 | ~322.5 | 12/10 ~12/14 | | | 7 | | | | | | |
| 329 | 20 ~21.5 | ~306.5 | 12/10 ~12/11 | 1 | 2 | | | | | | | |
| 330 | 5 ~6.5 | ~287 | 12/10 ~12/11 | | 4 | 2 | | | | | | |
| 331 | 0 ~5 | ~266.5 | 12/10 ~12/22 | 3 | 3 | 18 | 19 | | | | | 11 |
| 332 | 6 ~8.5 | ~260.5 | 12/10 ~12/17 | 3 | 10 | | | | | | | |
| 333 | 1 | 291.5 | 12/11 | 1 | | | | | | | | 1 |
| 334 | 15 ~17.5 | ~260 | 12/11 ~12/20 | | 2 | | | | | | | |
| 335 | 25.5 | 263 | 12/13 | 1 | | 22 | | | | | | |

3 太陽写真撮影

1991年中は、表5のように太陽を撮影した。
機材等は次のとおり。

- H α 単色光による太陽面撮影
8 cm 屈折を4 cm に絞る F30
H α フィルター 6562.8Å 半値幅 0.6Å
テクニカルパン 2415 (D19 現像)
- 黒点の撮影
8 cm 屈折, F15
テクニカルパン 2415 (D19 現像)
- プロミネンスの撮影
8 cm 屈折, F15
H α フィルター 6562.8Å 半値幅 3 Å
フジクローム 100 D
テクニカルパン 2415 (ミニコピー現像)

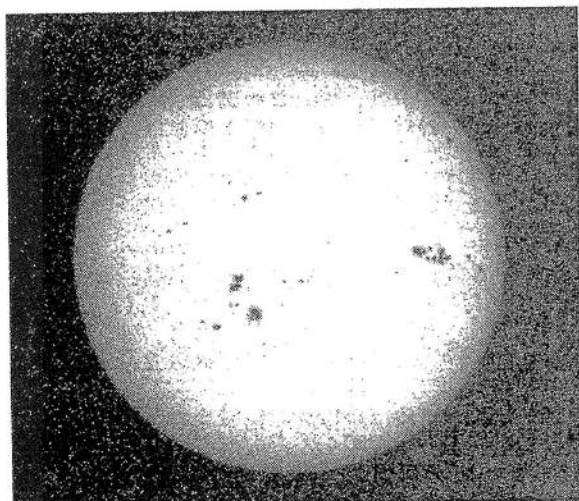
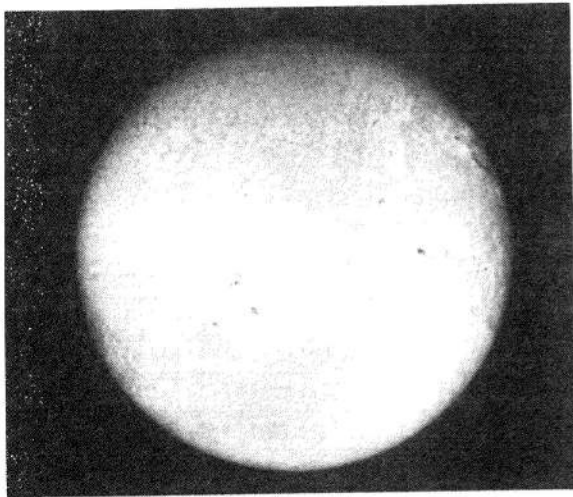
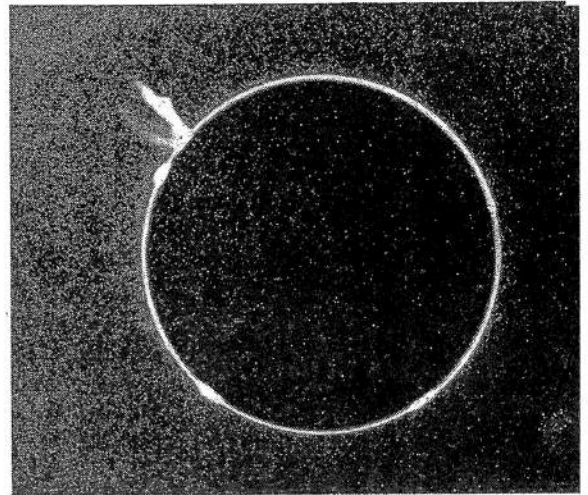


表5 撮影状況 (1991年)

| 撮影日 | 撮影対象 | フィルム |
|-------|----------------|--------------|
| 1月29日 | 黒点, H α | テクニカルパン 2415 |
| 3月 3日 | プロミネンス | フジクローム 100D |
| 3月 3日 | プロミネンス | テクニカルパン 2415 |
| 3月26日 | 黒点 | テクニカルパン 2415 |
| 6月 9日 | 黒点 | テクニカルパン 2415 |



▲巨大プロミネンス

1991年 3月 3日 11時45分22秒撮影 露出 1/8秒
高さ 40万 km を越えた噴出型プロミネンス。

◀H α 単色光による太陽面

1991年 1月 29日 11時 19分 42秒撮影
(エクステンダー使用) 露出 1/60秒

◀白色光による太陽面

1991年 1月 29日 09時 35分 15秒撮影
(ND400+G530+エクステンダー) 露出 1/1000秒

1月下旬～2月初めの黒点活動は活発で、1月29日も黒点相対数 388, 南半球に F型 1群, E型 3群が見られた。