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说　明

(2000)年

《太阳地球物理资料》(简称 CSGD) 刊登来自北京天文台 (简称北台或 BEIJ)、空间科学与应用研究中心、北京地磁台 (BGMO)、北京天文馆 (北馆或 PLAT)、陕西天文台 (陕台或 LINT)、紫金山天文台 (紫台或 PURP)、乌鲁木齐天文工作站 (乌站或 URUM) 和云南天文台 (云台或 YUNN) 等八个单位的有关观测结果。内容包括下列十个部分：

1. 太阳黑子相对数与面积数值表、太阳黑子观测表 (由紫金山天文台编辑)
2. 太阳黑子相对数的平滑值预报
3. 怀柔站太阳活动区磁场与速度场观测表及全日面光球磁场图
4. 太阳耀斑表、耀斑巡视时间表
5. 太阳射电辐射流量表、太阳射电辐射显著事件表、北京天文台密云站综合孔径射电望远镜 232 MHz 太阳观测、太阳射电辐射巡视时间表和太阳射电辐射显著事件图
6. 宇宙线强度表 (由空间科学与应用研究中心编辑)
7. 突然电离层扰动 (D 层) 表
8. 地磁活动指数 K 和 A_K表
9. 磁暴表 (由北京地磁台编辑)
10. 不定期刊登有关论文

以上各种数据可从网址：http://159.226.88.50/pub/bao/publication/csgd/下载。

内容简介

1. 与黑子有关的表格中所列的由目视观测 (手描) 获得的数据，以云台的观测为主。云台缺测时，则用其它台站的结果，并在备注栏内注明台站简称 。"太阳黑子观测" 表中的群号为综合各台站观测记录后的统一编号。"Seeing" 栏给出观测时大气视宁静度的优劣评分，"5" 为最佳；"1" 为最差。

太阳黑子联合发布资料确定每群黑子的座标 (纬度、卡林顿经度) 及过日面中经日期，是以黑子群最接近日面中线的一天计算，标在初见日。各台、馆寄资料时，还处在东半球的黑子群不靠近日面中线，故在数据后标明以 "座标取某日数据"，以后均如此。到下月发资料时，如果黑子群还存在，则用最接近日面中线的座标数据，并不作另外说明。

2. 黑子相对数的平滑值预报给出近一年的预报值 R′和置信度为 90% 的预报误差 E′。预报方法参见 1989 年 1 月 CSGD 的论文部分。

3. 黑子表和耀斑表中的日面位置指卡林顿 (Carrington) 坐标。中经距 (CMD) 指黑子或耀斑所在经圈与日面中心经圈之经度差，以度表示。 E、W 分别表示在日面中心经圈之东、西。日心距 (r/R) 指太阳圆面上的黑子或耀斑相对于日面中心之距离，以太阳半径为单位。视面积 (Sd) 指其在太阳圆面上的表观面积，以太阳圆面积的 10^{-6}为单位。校正面积 (Sp 或

Sq）指经过投影改正后，黑子或耀斑在太阳球面上的真正面积，分别以太阳半球面积的 10^{-6} 或平方度为单位。黑子型别（Type）按 McIntosh 分型。详见附录 1。

4. 在怀柔站太阳磁场、速度场观测表中，发表怀柔太阳观测站的观测日期，世界时 0 时的日面中心的日面经度（L_0），所观测的太阳活动区的怀柔站编号（Huairou Region）、卡林顿坐标（L 表示经度，Lat 表示纬度，括号内的数字是参考值）及所获得的以英文字母表示的观测资料类型。所用字母的含义是：

S（或 T）一纵向（或横向）磁场观测波长上的单色像

D一多卜勒（Doppler）速度场观测波长上的单色像

L一纵向磁场观测资料

Q 及 U一横向磁场观测资料

V一多卜勒（Doppler）速度场观测资料

5一使用 Fe I λ5324.19 Å 谱线观测资料（光球）

4一使用 H_β λ4861.34 Å 谱线观测资料（色球）

在表的最后给出太阳极区（NPL 表示北极区，SPL 表示南极区）纵向磁场观测日期。

5. 在光球磁场图中，每天给出一幅全日面的活动区磁场等强度图。观测时间示于图的下方；右侧给出日面方向（W 表示西，N 表示北）及强度等级。其中 80. 0 表示最外层的磁场强度，越往里强度越大；图中的实线表示磁场的 N 极，虚线表示 S 极；Lev 表示磁场等强度线等级，其单位用高斯表示。

6. 太阳耀斑表列出乌站用色球望远镜（通过 H_α 单色光）观测到的耀斑和亚耀斑（用 S 表示）。表中列出耀斑发生的时刻，极大（Max）表示耀斑亮度极大时刻，面积（Area）为极大时刻的面积。视面积（Sd）和校正面积（Sq）按下列关系换算：

$$Sq = Sd \times \frac{1}{\sqrt{1-(r/R)^2}} \times 0.020626$$

耀斑级别（Imp）以两个字符表示，第一个字符由耀斑在极大时刻的面积决定，第二个字符表示耀斑亮度，由各观测台站根据经验确定。其中 B 表示“亮”、N 表示“中等”、F 表示“弱”。当耀斑日心距 r/R ＜0.906 时，即耀斑日心角 θ（指耀斑和观测者在日心处的张角）＜65° 时，其级别按“校正面积 Sq”定级，如下表所示：

	耀斑级别		
校正面积 Sq	弱(F)	中等(N)	亮(B)
≤2.0	SF	SN	SB
2.1— 5.1	1F	1N	1B
5.2—12.4	2F	2N	2B
12.5—24.7	3F	3N	3B
＞24.7	4F	4N	4B

当耀斑日心距 r/R ≥0.906 时，即耀斑日心角≥65° 时，其级别按“视面积 Sd”定级，如下表所示：

日心距 r/R	耀斑级别 S	1	2	3
.906—.939	Sd<90	90—279	280—599	Sd≥600
.940—.984	75	75—239	240—499	500
.985—.999	50	50—179	180—349	350
1.000	45	45—169	170—299	300

耀斑表中资料栏内各字母分别表示：

C：全部或绝大部分过程有照相观测。

P：部分或很少部分过程有照相观测。

V：目视观测。

备注栏内的各字母的意义详见附录 2。

7. 耀斑巡视时间表仅包括照相巡视，目视和照相间隔小于 5 分钟时，看作连续巡视时段，用（From—To）表示。

8. 太阳射电辐射通量及巡视时间表，给出北京天文台 232 MHz 和 2840 MHz 观测值并归算到日—地平均距离（1AU）处、在各固定频率上每天整个太阳的，以 10^{-22} · 瓦 · 米$^{-2}$ · 赫$^{-1}$（s. f. u.）为单位的射电辐射通量及太阳射电巡视时间（不计入小于半小时的停顿）。连续巡视时段用（From—To）表示

9. 在太阳射电显著事件表中列出的各栏参数有国内外约定的意义。在流量密度（Flux Density）栏内，峰值（Peak）表示峰时流量的增值；相对值（Rel）表示峰值流量与爆发前流量之比值，平均值（Mean）表示流量密度的增值对时间求积分，除以爆发持续时间，频率单位为兆赫（MHz），持续时间（Duration）单位为分，峰值及平均值单位为 s. f. u.。

太阳射电爆发的分型详见附录 3。分型中 1 S，2 S/F，3 S，4 S/F，5 S，20 GRF，21 GRF，22 GRF，23 GRF，41 F，45 C，46 C，47 GB 型爆发只适用于频率 f>600 MHz 的射电爆发；而 6 S，7 C，27 RF，42 SER，43 NS，44 NS，48 C，49 GB 型爆发只适用于 f<600 MHz 的爆发；28 PRE，29 PBI，30 PBI，31 ABS 不能单独存在。

请使用者注意，为了描述简单起见，在附录 3 "太阳射电爆发分型" 的定义中，取了流量密度的绝对值（原始值以 s. f. u. 为单位）与持续时间的绝对值（原始值以分为单位）进行大小比较（两个量进行比较时均为无量纲量）。

10. 米波综合孔径射电望远镜 232 MHz 太阳观测表给出了北京天文台密云观测站米波综合孔径射电望远镜每天测得的太阳日冕一维视直径及爆发源的日面位置和角径。单位均使用角分（′）表示。如：2000 年 1 月 5 日太阳 232 MHz 视直径为 52′，源位置 E10′表示源中心位置距日面中心以东 10 角分，源流量 12 s. f. u. 为爆发流量。

11. 对于峰值流量较大，而且记录质量较好的爆发，在太阳射电显著事件图中给出爆发曲线。图中右上方给出日期、频率、观测台站，横坐标为时间（UT），纵坐标为爆发流量（FLUX）。

12. 宇宙线强度表中分别给出 18－NM－64 超中子堆（SUPER NEUTRON MONITOR）记录的中子数和 ACK－1 大游离室（ION CHAMBER）记录的 μ 介子

(MESON）相对强度以及μ介子多方向望远镜（MESON MULTI-DIRECTIONAL TELESCOPE)垂直分量的记数。每小时的数据都已作了气压校正。中子堆数据表内给出的值是记数率与 1500 的差，求实际值时还需乘以定标因子 256 。μ介子垂直分量(VERTICAL COMPONENT）表内给出的值是记数率与 3000 的差，求实际值时还需乘以定标因子 128 。μ介子数据表列出的是相对强度与 1000 的差，单位是 0.1% 。表中的空格“ ”和“……”表示没有数据。表中最后两列分别给出日均值(Mean)和有记录的小时数（N)。还给出了月均值（Monthly Mean)。最后四行是仪器全天工作天数的月平均日变化（Monthly Mean Daily Variation）与相应的月均值的差，以及按世界时(U.T.)和北京时（B.T.)的调和分量（Harmonic Components)。从第一阶取到第四阶。表中给出各阶(Order）的正弦(SIN)、余弦（COS)、幅值(Amplitude）和极大值的时间(Max.—Hr)。

宇宙线强度图是以 Bartels 太阳旋转周（Solar Rotation）为周期，分别给出北京宇宙线台的中子和μ介子以及广州宇宙线台μ介子多方向望远镜的垂直分量（V)、南北（S—N）和东西（E—W）各向异性每小时强度变化曲线。两条横线之间的距离表示强度变化为 5%，垂直线表示世界时 0^h。

北京宇宙线台中子堆的地理坐标：40.08° N、116.26° E；海拔高度：47 米。游离室的地理坐标：40.0° N、 116.2° E； 海拔高度：43 米。 广州宇宙线台的地理坐标：23.1° N、113.29° E； 海拔高度：21 米。

13. 突然电离层扰动（D 层）(简称 SID）表给出了对罗兰 C 100 kHz 低频信号和奥米加 10.2 kHz 甚低频信号传播的观测所得到的相位突然异常（SPA）和场强突然异常（SFA）的数据。SPA 和 SFA 属突然电离层扰动中的两种表现形式，是电离层 D 层状态突然改变所导致的。这里，低频相位突然异常（LF—SPA）数据由陕台和云台提供，而甚低频相位突然异常(VLF—SPA）数据和低频场强突然异常（LF—SFA）数据则仅由陕台提供。(VLF—SPA）一般为奥米加导航系统 E 台 10.2 kHz 信号的结果。若接受其它台站信号时，将在相应的数据后面用括号内的字母表明。

表中所列的 LF—SPA 数值（以微秒为单位）是对实测值进行了太阳天顶角改正后的结果，所用的分析和计算表达式如下：

$$\Delta\varphi_0 = \left(\frac{5.0}{1.6 + 3.4\cos Z(h_m)}\right) \times \Delta\varphi'$$

$$+\begin{cases} 7.3 \times [\cos Z(h_m - \cos Z(h_S)], & \text{当 } h_m \leqslant 12 \text{ 和 } Z(h_m) \leqslant 80^\circ \\ 0, & \text{当 } 12 < h_m < 13 \\ 7.3 \times [\cos Z(h_m - 1) - \cos Z(h_S - 1)], & \text{当 } h_m \geqslant 13 \text{ 和 } Z(h_m) \leqslant 80^\circ \end{cases}$$

这里 $\Delta\varphi'$（以微秒为单位）是 LF—SPA 的实测值，而 $\Delta\varphi_0$（以微秒为单位）是将 $\Delta\varphi'$ 统一归算到太阳天顶角为零的改正结果。式中，h_S和 h_m是 SPA 传播路径中点的开始和极大时间，用地方平太阳时表示；Z 是相应的太阳天顶角。VLF—SPA（以微秒为单位）是未经任何改正的实测值。LF—SFA 给出以分贝为单位的幅度变化，其中，正、负号分别表示幅度的增加和减少。如果对同一 LF — SFA 事件给出一负一正两个值，则表示幅度先减少，后增加；符号

“0”表示幅度无变化。另外，所列值后面的字母 E 表示真实值小于所列值；字母 D 表示真实值大于所列值；字母 U 则代表观测结果不太确定。SID 的级别是根据 $\Delta\varphi_0$ 值所确定的（最小 1 一 级，最大 3+ 级），其对应关系如下表所示：

$\Delta\varphi_0$	(0,-1]	(-1,-2]	(-2,-3]	(-3,-4]	(-4,-5]	(-5,-6]	(-6,-7]	(-7,-8]	(<-8)
级别	1−	1	1+	2−	2	2+	3−	3	3+

14. 地磁活动指数 K 和 A_K 表中日期后有 Q 者表示当月五天地磁最平静日；有 D 者表示当月五天地磁最扰动日。三小时时段的 K 指数由各时段地磁水平强度 H 的时均值消去正常日变化后的变化磁场值决定。就中、低纬度地区而言，其对应关系如下：

H＝	3	6	12	24	40	70	120	200	300	（单位为 nT）
K＝0	1	2	3	4	5	6	7	8	9	

每日等效幅度 A_k 是当日 8 个三小时时段等效幅度 a_K 的平均。K 指数与 a_K 的对应关系如下：

K＝0	1	2	3	4	5	6	7	8	9	
a_k＝0	3	7	15	27	48	80	140	240	400	（单位为 1.2 nT）

15. 在磁暴表中，SC 表示急始磁暴；SC* 表示先有一小负脉冲然后继以主要脉冲的急始磁暴，在量 SC* 的急始幅度时，仅量取主要脉冲幅度；GC 表示缓始磁暴。活动程度栏中以 m、ms、s 分别表示中常、中烈和强烈磁暴。即分别对应于 K＝5，6－7，8－9 的磁暴。

北京地磁台的地理坐标：40.0° N、 116.2° E； 地磁坐标：28.9° N、 186.1° E； 海拔高度：43 米。

以上所有图表中的时间一律采用世界时（UT）。由世界时转换到北京时间（东经 120° 标准时）应加上八小时。例如 2300－2400（UT）即相当于北京时间次日上午 0700－0800。

16. 为鼓励观测和资料处理人员尽快发表他们的较有价值的新的观测资料和 6 反应他们的资料及技术工作的成果，为尽快交流研究工作的新进展，本刊不定期刊登短文，内容包括观测报告、附有说明的照片或图像、资料处理和技术报告以及研究方法和新成果的介绍等。短文限在 1000 字以内，包括图表不得超过 4 页，来稿须有英文译文，文责自负。

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附录 1　McIntosh 黑子分型法

黑子的分型由三个字母组成。第一个字母为修正的 Zürich 分型，第二个字母为黑子群中最大的半影情况，第三个字母为黑子群中黑子的分布情况，现将各型分述如下：

(1)　修正的 Zürich 分型

A　无半影单极群。长度上与 B 型群无明确界线。

B　无半影双极群。大多数长度<10°，在老的群中长度可达 20°。黑子间距>3° 者视为双极群。

C　一个极性中有半影的双极群，当半影径向跨度>5° 时，则划为 D 型。C 型长度无限制。

D　二个极性中均有半影的双极群，其径向跨度<10°。

E　二个极性中均有半影的双极群，其径向跨度达 10°—15°。

F　二个极性中均有半影的双极群，其径向跨度>15°。

H　有半影的单极群，伴随黑子距主黑子半影<3°。其主要黑子几乎总是原双极群中的前导黑子。当半影径向跨度>5° 时，则划为密集 D 型。

(2)　最大黑子的半影情况

x　无半影（黑子周围灰区宽度>3″ 时才能视为半影）。

r　不成熟和不规则半影，其宽度～3″，比正常半影亮，半影结构为颗粒状而非纤维状。

s　对称和近于圆型半影，其结构为纤维状，黑子直径<2.5°，本影密集于半影中央。这种黑子变化缓慢。

a　不对称或复杂的半影，其结构为纤维状，黑子直径<2.5°，不对称半影的轮廓不规则或明显变长（不圆），半影中有二个以上本影。这种黑子往往逐日变化。

h　大的对称半影，其直径>2.5°。除了尺度较大外，其余特征与 s 相同。

k　大的不对称半影，其直径>2.5°。除了尺度较大外，其余特征与 a 相同。当半影的径向跨度>5° 时，几乎可肯定半影中有二种极性，从而黑子群成为 Dkc 或 Ekc 或 Fkc 型。

(3)　群中的黑子分布

x　单个黑子。

o　开放型分布。前导与后随黑子之间无黑子，黑子群可明确划分为二部分相反极性。开放型分布暗示极性变换线附近的磁场梯度较小。

i　中间型分布。前导与后随黑子之间有一些黑子，但它们均无半影。

c　密集型分布。前导与后随黑子之间有很多黑子，其中至少一个有半影。密集型分布的极端情况是整群黑子处在连续的半影区中。密集型分布暗示极性变换线附近的磁场梯度很大。

注：Zürich 分型中的 G 型与 J 型，在 McIntosh 分型法的第一个字母中已不再出现。

Zürich 分型中的 G 型现对应 McIntosh 分型法中的 Ero、Eso、Eao、Eho、Eko 和 Fro、Fso、Fao、Fho、Fko。

Zürich 分型中的 J 型现对应 McIntosh 分型法中的：Hrx、Hsx、Hax。

附录 2

耀斑表中备注栏内各字母的意义（IAU 系统）

A＝底部位于中经距小于 90°区域的爆发日珥

B＝可能是一个比较大的耀斑的尾声

C＝十分钟以前还看不见

D＝一个亮点

E＝两个或多个亮点

F＝有几个爆发中心

G＝在邻近区域无可见黑子

H＝有高速暗条半随的耀斑

I＝活动区的范围很大

J＝耀斑前或后谱斑亮度有明显变化

K＝有好几个亮度极大

L＝现存暗条有突然活动的迹象

M＝白光耀斑

N＝耀斑连续光谱出现各种偏振效应

O＝用 Ca II 的 H 或 K 线对耀斑进行了观测

P＝耀斑有 HeD_3发射

Q＝耀斑的巴尔麦连续区呈现发射

R＝耀斑的 H_α线显著不对称表明有高速物质抛射

S＝暗条消失以后在同一位置有增亮现象发生

T＝整天活动的区域

U＝平行型（//）或会聚型（Y）的双亮带耀斑

V＝有爆发相的事件：在大约一分钟内，耀斑面积扩展有伴随或不伴随亮度的急剧增大。

W＝强度极大后，耀斑面积突增。

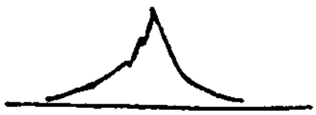
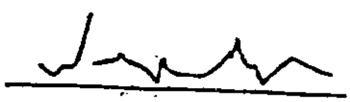
X＝耀斑的 H_α线很宽

Y＝环形日珥系统

Z＝大的黑子本影为耀斑所掩盖

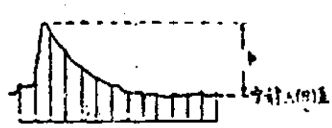
附录 3

太阳射电爆发分型

类型	定义	图形
1 S	持续时间和峰值流量均小于 10。	
2 S/F	1 S 型爆发上叠有起伏。	
3 S	峰值流量的绝对值大于持续时间的绝对值，且峰值流量大于 10。	
4 S/F	3 S 爆发上叠有起伏。	
5 S	不符合其它简单型爆发定义，且峰值流量的绝对值大于持续时间的绝对值的爆发。	
6 S	持续时间为 1 或 2 分钟的简单上升和下降的爆发。	
7 C	持续时间为几秒，峰值流量小于 10 的复杂型爆发。	
8 S	迅速上升又迅速下降、持续时间接近或小于 1 分钟，且峰值流量大于 10 的简单爆发。	

类 型	定 义	图 型
20 GRF	持续时间从 10 分钟到几小时，峰值流量的绝对值小于持续时间的绝对值，且流量值不超过 50。	
21 GRF	20 GRF 型爆发上叠加有清晰的可分别列出的爆发。	
22 GRF	20 GRF 型爆发上有可分别列出的起伏。	
23 GRF	20 GRF 型爆发上有可分别列出的起伏及爆发。	
24 R	持续时间为 5 到 30 分钟流量持续上升，且在上升后数小时内不伴随下降。“持续时间”附有字母 D。	
25 R	24 R 型爆发上叠加有爆发。	
26 FAL	持续时间为 5 到 30 分种（指图中斜的部分）中等强度的流量下降，下降前数小时无流量上升。	
27 RF	有或多或少规律的连续谱上升和下降，持续时间为分到小时。	

类 型	定 义	图 型
28 PRE	在主爆发之前，流量逐渐上升地（时间大于 10 分钟）增强，先兆的结束取在斜率突变的时刻。	
29 PBI	爆发后，流量在逐渐下降时（时间大于 10 分钟）仍有明显的增强，增强的开始取在斜率突变的时刻。	
30 PBI	在 29 PBI 型爆发上叠加有爆发。	
31 ABS	爆发后流量密度逐渐下降后又回到事件前水平。	
32 ABS	流量密度逐渐下降后又回到事件前水平。	
40 F	流量密度有一系列迅速又无规则的变化，各峰无法明显区别，各次峰强度小于主峰的 15％ 。	
41 F	彼此接近的一群小爆发，每个小爆发均下降至爆发前水平，每两个爆发的时间间隔小于或等于 5 分钟。	

类型		定义	图型
42	SER	具有显著时间间隔的一系列爆发，每个爆发均降至爆发前水平。	
43	NS	噪爆开始。“持续时间”带有字母 D。	
44	NS	进行中的噪爆。“开始时间”带有字母 E，“持续时间”带有字母 D。	
45	C	几个或多个简单爆发的合成。	
46	C	45 C 型爆发上有起伏。	
47	GB	峰值流量密度＞500 的爆发。	
48	C	有大振幅、复杂变化的复杂型爆发。	
49	GB	持续时间大于 10 分钟、流量有较大增强的爆发。	
A		噪爆	
B		持续爆发	
AB		A＋B	

CHINESE SOLAR GEOPHYSICAL DATA (CSGD)
EXPLANATION OF DATA REPORTS
(2000)

Introduction

The solar geophysical data contained in " Chinese Solar Geophysical Data " (CSGD) are collected by Beijing Astronomical Observatory (BEIJ), Center for Space Science and Applied Research, Beijing Geomagnetic Observatory (BGMO), Beijing Planetarium (PLAT), Purple Mountain Observatory (PURP), Shaanxi Observatory (LINT), Urumqi Astronomical Station (URUM) and Yunnan Observatory (YUNN). The data in CSGD consist of the following ten parts:

1. Daily Relative Sunspot Numbers and Sunspot Areas, Daily Sunspot Observations compiled by Purple Mountain Observatory
2. Predicted Smoothed Sunspot Numbers
3. Observations of Magnetic and Velocity Fields of Solar Active Regions at Huairou Station, Beijing Astronomical Observatory and Longitudinal Photospheric Magnetograms of Full Solar Disk
4. H-Alpha Solar Flares and Time Intervals of H-Alpha Flare Patrol Observations
5. Solar Radio Emission Fluxes, Solar Radio Emission Outstanding Occurrences, Intervals of Solar Radio Emission Patrol Observations, Meter Wave Aperture Synthesis Radio Telescope 232 MHz Solar Observation at Miyun of BAO and Time Profiles of Solar Radio Bursts
6. Cosmic Ray Meson and Neutron Intensity compiled by Center for Space Science and Applied Research
7. Sudden Ionospheric Disturbances (D-Region) (SID)
8. Geomagnetic Indices K and A_k
9. Magnetic Storms compiled by Beijing Geomagnetic Observatory
10. Short Articles on Observations, Data Analyses and Researches of Solar- Terrestrial Phenomena

All the data mentioned above can be down loaded from
http://159.226.88.50/pub/bao/publication/csgd/ .

Brief Explanation of the Main Contents

1. There are two kinds of sunspot tables in which the visual data mainly come from the observations of Yunnan Observatory. When there are gaps in these observations the table will be filled by observations made on the same day by other observatories whose names will appear in the column of remarks. Sunspot group numbers in the table of " Daily Sunspot Observations " are standardized after collecting all sunspot observations from different observatories. The estimated Seeing Conditions are given in the column " See " on a 5-level scale from best (5) to worst (1).

The latitude and longtitade of a sunspot groupe is an estimated if the groupe is in the east hemisphere on the issued day, while they are observational values when the groupe passed the meridian before the issued day.

2. The predicted values of R' with the errors E' referred to the confidance 90 % are given for a year in the table of " Predicted Smoothed Sunspot Numbers ". The method of prediction may be found in the CSGD January 1989, P.27 .

3. In the table of " Daily Sunspot Observations " and the table of " H-Alpha Solar Flares ", Carrington coordinates are used for the position measurement of sunspot groups or flares. Central Meridian Distance shows the distance in degrees between the central meridian and the meridian where a sunspot group or flare is located. E and W indicate that the sunspot group or flare lies to the east or to the west of the central meridian, respectively. Disk-Centric Distance measured in units of disk radius represents the distance from the centre of gravity of the sunspot group or flare on the disk to the centre of the disk. Apparent Areas, Sd, is the area projected on the disk in millionths of the disk and the Corrected Area, Sp, is the real area of the sunspot group or flare on the solar surface in millionths of the hemisphere after the projecting correction. McIntosh classification is used for the classification of sunspot groups.

4. In the table of " Observation of Magnetic and Velocity Fields of Solar Active Regions", the date, the Carrington longitude of the solar disk center at 00^h UT(L_0) , the number (numberd by Huairou Station) and Carrington coordinates (L: Longitude, Lat: Latitude; in bracket is the reference position from sunspot measurement) of an observed active region and data types obtained at Fe I λ5324.19$\mathring{A}$ and/or $H_\beta\lambda$ 4861.34 $\mathring{A}$ at Huairou Station of Beijng Astronomical Observatory are given. Meanings of letters in the table are as follows:

S (or T) — monochromatic image at the wavelength used for the longitudinal(or transverse) field observation.

D — monochromatic image at the wave length used in a Doppler field observation

L — data of longitudinal fields

Q and U — data of transverse fields

V — data of Doppler velocity fields

5 — observation at Fe I λ 5324.19$\mathring{A}$

4 — observation at $H_\beta\lambda$ 4861.34 $\mathring{A}$

In the last part of the table the observation date of the longitudinal fields of solar poles (NPL: +90.0, 0.0; SPL: -90.0, 0.0) is given.

5. A full disk photospheric line-of-sight magnetogram daily obtained at Huairo Solar Observing Station, Beijing is published in the Chinese Solar-Geophysical Data from now, the issue No.253, 1995, on. In the map, the line-of-sight magnetic fields of active regions are shown in contours. The observing time in UT, directions in the map (N-north, W-west) and strength levels are given, respectively, at the bottom and top of the plot. The outer contour represents 80.0 gauss and the inner the strouger is the magnetic intensity. Solid lines indicate N polarity while dashed lines S polarity. Levels indicate intensities of the magnetic fields in units of gausses.

6. The table of " H-Alpha Solar Flares " gives H-Alpha flare (including subflares (by S)) patrol observations at Urumqi Astronomical Station. For each flare, the start time, end time, the time at which the flare shows its maximum brightness (Maxtime) and the area measured at the time of maximum brightness are given. For flares within 65° from the centre of the disk, the formula relating the apparent area Sd with the corrected area

Sq is as follows:

$$S_q = S_d \times \frac{1}{\sqrt{1-(r/R)^2}} \times 0.020626$$

Two figures are assigned for each flare to show the importance of the flare. The first figure is defined by the area of the flare at the maximum phase and the second one is only a qualitative scale which is decided by the observatory according to the flare is faint (F), normal (N), or rather bright(B). For flares within 65° from the centre of the disk, i.e., the disk-centric distance is less than 0.906, the first figure assigned for the flare importance is defined by the corrected area Sq according to the following table where areas are given in millionths of the solar hemisphere.

Corrected Area Sq in Square Degrees	Relative Intensity Evaluation		
	Faint (F)	Normal(N)	Brilliant(B)
≤ 2.0	SF	SN	SB
2.1 — 5.1	1F	1N	1B
5.2 — 12.4	2F	2N	2B
12.5 - 24.7	3F	3N	3B
> 24.7	4F	4N	4B

For flares which are at a distance equal to or greater than 65° from the centre of the disk, i. e., the diskcentric distance is equal to or greater than 0.906, the first figure assigned for the flare importance can be estimated by the apparent area Sd according to the following table where the areas are given in millionths of the disk.

Heliocentric Distance r/R	Importance			
	S	1	2	3
.906 - .939	Sd < 90	90 - 279	280 - 599	Sd ≥ 600
.940 - .984	<75	75 - 239	240 - 499	500
.985 - .999	<50	50 - 179	180 - 349	350
1.000	<45	45 - 169	170 - 299	300

The letters C, P, and V in the column of " Observation Type " represent the nature and completeness of the observations, i.e.:

C — a complete or quasi-complete sequence of photographs is obtained

P — only one or a few photographs of the event is/are obtained due to an incomplete time coverage

V — the development of the flare is visually observed

The meaning of one or more letters of A to Z in the column of " Remarks " follow the International Astronomical Union notation, in which each letter of the alphabet stands for a particular noteworthy condition, as shown in Appendix 1.

7. In the table of " Intervals of H-Alpha Flare Patrol Observation ", the Intervals of H-Alpha Flare Patrol Observations are given by " from to ". Flare patrol observations are considered to be continuous if the intervals of no patrol observations are less than five minutes.

8. The table of " Solar Radio Emission Flux and Intervals of Patrol Observation " gives the daily solar total flux in units of $10^{-22} \cdot W \cdot M^{-2} \cdot Hz^{-1}$ (s.f.u.).The 2840 MHz flux is measured at the time around the meridian transit (BEIJ at 0400 UT) and the 232 MHz flux is an average during the patrol time, and the time intervals of the patrol observation (data gap less than 30 min. is not listed).

9. Each column in the table of " Solar Radio Emission Outstanding Occurrences " has its centain implication following an international implied consent. In the column of Flux Density, " Peak " represents the peak value of flux density of the event; " Rel " represents the relative value $\Delta S/S$, i.e., the ratio of the flux increment ΔS and the flux S before the burst; " Mean " represents the mean flux increment which is an integral of flux increment over the time of the duration and divided by the duration. Both the peak flux density and the mean flux density are measured in " s.f.u. ", frequency in MHz and duration in minutes.

For the classification of bursts see Appendix 2. Among the types, 1 S, 2 S/F, 3 S, 4 S/F, 5 S, 20 GRF, 21 GRF, 22 GRF, 23 GRF, 41 F, 45 C, 46 C and 47 GB are used in the frequency range greater than 600 MHz, 6 S, 7 C, 27 RF, 42 SER, 43 NS, 44 NS, 48 C and 49 GB are used in the frequency range less than 600 MHz, and on the other hand, 28 PRE, 29 PBI, 30 PBI and 31 ABS are not independent types at all.

Finally, one must notice that, for simplicity, we use the absolute value of flux density (with original value in s.f.u.) and duration (with original value in minute) for the definition of classification in Appendix 2.

10. In the table of "Meter Wave Aperture Synthesis Radio Telescope 232 MHz Solar Observations", the observational data with the Aperture Sythesis Radio Telescope of Beijing Astronomical Observatory are presented in two items: daily one dimensional apparent diameter of the corona; position, argular diameter, and flux of burst sources.

11. In the " Profiles Figure of Solar Radio Emission Outstanding Occurrences ", the date, peak fluxes, and frequencies of events are given on the right corner. The time is denoted on the abscissa axis and the amplitude in units of s.f.u. is denoted on the ordinate axis.

12. The intensities of cosmic ray neutrons, mesons and meson vertical component, which are respectively recorded with 18-NM-64 super neutron monitor (NM), ACK-1 large ion chamber (IC), and meson multi-directional telescope are monthly tabulated. The hourly mean values in the table are corrected for the atmospheric pressure. To get the real counting rates of cosmic ray neutrons one should add 1500 to the counting rates given in the table and multiplies by the scaling factor 256. The real counting rates of the vertical component of cosmic ray mesons are that the counting rates in the table plus 3000 and multiplies with the scaling factor 128. The relative intensity of cosmic ray mesons is that the tabulated values plus 1000 and in the units of 0.1 %. The space "   " and the dash " — " mean no data.

The gragh expresses the variations of cosmic ray intensity monitored with the NM and IC at the Beijing Cosmic Ray Observatory and the variations of the vertical component (V) and north-south (N-S) and east-west (E-W) anisotropies of cosmic ray mesons measured at the Guangzhou Cosmic Ray Observatory hourly. The abscissa is the cycle of the Bartels Solar Rotation. The intensity difference between two horizontal lines corresponds to 5%.

The vertical lines indicate 0^h UT.

The neutron monitor is located at 40.08° N, 116.26° E geographic coordinates and elevation is 47 meters and 40.0° N, 116.2° E and 43 m for the ion chamber. The Guangzhou Cosmic Ray Observatory is located at 23.1° N, 113.29° E and has an elevation of 21 m.

13. The table of " Sudden Ionosphereic Disturbances (D-Region) " (SID) presents the information of the Sudden Phase Anomalies (SPA) and the Sudden Field Anomalies (SFA) based on the observations of the propagations of the Loran-C signals at 100 kHz (LF) and the Omega signals at 10.2 kHz (VLF), which are the particular types of a SID resulted from the sudden changes of the condition in the D-Region of the ionosphere. Here, the Sudden Phase Anomalies at low frequency (LF-SPA) are reported by both Shaanxi Observatory and Yunnan Observatory while the Sudden Phase Anomalies at very low frequency (VLF-SPA) and the Sudden Field Anomalies at low frequency (LF-SFA) are reported by Shaanxi Observatory only. (VLF-SPA) is generally obtained from the signal received at 10.2 kHz from Omega-E Station. Letter(s) will be given in the bracket if other signal is used.

The values of the (LF-SPA) in μs listed in this table are the corrected results of the measurements for the solar zenith correction with the following expression:

$$\Delta\phi_0 = \frac{5.0}{1.6 + 3.4\cos Z(h_m)} \times \Delta\phi' +$$

$$+\begin{cases} 7.3 \times [cosZ(h_m) - cosZ(h_s)]\,, & when\ h_m \leq 12\ and\ Z(h_m) \leq 80°; \\ 0\,, & when\ 12 < h_m < 13; \\ 7.3 \times [cosZ(h_m - 1) - cosZ(h_s - 1)]\,, & when\ h_m \geq 13\ and\ Z(h_m) \leq 80°; \end{cases}$$

where $\Delta\phi'$ in μs is a measured value of (LF-SPA) , $\Delta\phi_0$ in μs is a corrected result of $\Delta\phi'$, i.e. a value normalized to the solar zenith angle of zero. h_s and h_m in local mean solar time for the middle point of the propagation path are the SPA start time and the SPA maximum time, respectively, and Z is the corresponding solar zenith angle. The values of the (VLF-SPA) in μs are the measurement results without any correction and the listed values of (LF-SFA), in db, give the information of amplitude variation, where the signs " + " and " – " prefixed to the values indicate the increase and decrease of the amplitude, respectively. In case there are two values listed for the same (LF-SFA) event, one negative and the other positive, it means the amplitude decrease at first and increase afterwards. Sign " 0 " indicates that there is no amplitude change. Besides, " E " after the listed value means that the real value is less than the listed one; the letter " D " after the listed value indicates that the real value is greater than the listed one ; letter " U " denotes an uncertainty in measurement. The importance rating of a SID, based on a scale of 1–, the least, to 3+, the most important, can be derived from the values of $\Delta\phi_0$, by using the following table:

$\Delta\phi_0$	(0,-1]	(-1,-2]	(-2,-3]	(-3,-4]	(-4,-5]	(-5,-6]	(-6.-7]	(-7,-8]	(< -8)
IMP.	1–	1	1+	2–	2	2+	3–	3	3+

14. The data included in the table of " Geomagnetic Activity Indices K and A_k " are: three-hourly K index, five quietest days of the month (Q) and five most disturbed days of the month (D). Three-hourly K index is determined by the H components measured in nT in each corresponding three-hourly period and subtracted by the diurnal normal changes of geomagnetic field. For mid and low latitude areas, the corresponding relation of H and K is as follows :

H =	3	6	12	24	40	70	120	200	300	(in nT)
K = 0	1	2	3	4	5	6	7	8	9	

Daily effective A_k is the average of eight values of three-hourly index a_k , the corresponding relation of K with a_k is as follows :

K =	0	1	2	3	4	5	6	7	8	9
ak=	0	3	7	15	27	48	80	140	240	400 (in 1.2 nT)

15. Three kinds of geomagnetic storm are listed in the table of " Magnetic Storms " : sudden commencement (SC), a small negative initial impulse followed by a main impulse (SC*) and gradual commencement (GC). Three degrees are used for classifying a geomagnetic storm, i.e.: moderate (m), moderate severe (ms) and severe (s) corresponding to K=5, K=6–7, and K=8–9, respectively.

Beijing Geomagnetic Observatory is located at 40.0°N, 116.2°E in geographic coordinates or 28.9°N, 186.1°E in geomagnetic coordinates, and 43 meters above sea level.

The time used in all these data reports is Universal Time (UT). To transform UT to Beijing Standard Time (120°E) one can simply add 8 hours to Universal Time. For instance, a flare observed at 2230–2400 UT is observed at 0630–0800 in Beijing Time next day.

16. To encourage a fast exchange of information about solar observations and studies, short articles including reports of observations, data treatments, observational technology and research work and photographs with a explanation are accepted and published in this data journal nonperiodically. Articles are limited within 1000 words and 4 pages including tables and figures.

Numbering of CSGD :

From the first issue of 1991 on, Issues of the Chinese Solar-Geophysical Data (CSGD) have been numbered. The first issue of 1991 of CSGD has a number of 213.

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Telephone Number : 64852435, E-mail:WJL@Class1.bao.ac.cn .

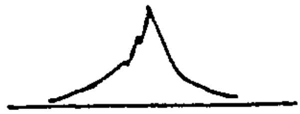
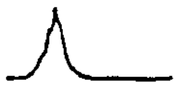
Appendix 1

The International Astronomical Union Notation for H-Alpha Solar Flares

A = Eruptive prominence whose base is less than 90° from the central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant Point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H or K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in H-alpha line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion
in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide H-alpha line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

Appendix 2

Classificatiom of Solar Radio Bursts

Type	Definition	Figure
1 S	Peak flux density (sfu) and duration (min) both less than 10.0.	
2 S/F	1 S with fluctuations.	
3 S	Peak flux density (sfu) greater than both the duration (min) and 10.0.	
4 S/F	3 S with fluctuations.	
5 S	Different from the simple events defined above, also peak flux density (sfu) greater than duration (min) of the burst.	
6 S	Simple rise and fall of minor burst with duration 1 or 2 min.	
7 C	Complex events with duration of several seconds and flux density (sfu) less than 10.0.	
8 S	An event which shows a rapid rise to a single peak, followed by a rapid fall to the pre-event level with a duration about one minute or less and flux density (sfu) greater than 10.0.	

20 GRF Bursts have duration in the range from 10 minutes to several hours and flux density (sfu) less than both the duration (min) and 50.0.

21 GRF 20 GRF type burst with superimposed distinct bursts to be able to list separately.

22 GRF 20 GRF type burst with fluctuations to be able to list separately.

23 GRF 20 GRF type burst with fluctuation and superimposed bursts both to be able to list separately.

24 R A moderate rise of flux from 5 to 30 minutes duration with no accompanying decline during the following hours and with symbol D.

25 R 24 R type bursts with superimposed bursts.

26 FAl A moderate decline of flux from 5 to 30 minutes duration with no rise of flux during the foregoing hours and with symbol D.

27 RF The rise and fall of continuous spectrum more or less regularly with duration in the range from minutes to hours.

28 PRE — A precursive enhancement of the flux density level with duration greater than 10 min preceding the main burst if it is a gradual rise; the end of the precursor is taken at the time when the slope suddenly changes.

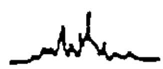
29 PBI — A post-burst enhancement of flux density level with duration greater than 10 min if it decreases gradually; the start of the enhancement is taken at the time when the slope suddenly changes.

30 PBI — 29 PBI type events with superimposed bursts.

31 ABS — After the burst a gradual decrease of the flux density with a subsequent return to the pre-event level.

32 ABS — A gradual decrease of the flux density with a subsequent return to the pre-event level.

40 F — A series of rapid irregular changes in the flux density level, with no distinct peak grouping into individual events; the intensity of each component is less than 15 of the main peak.



41 F — A number of single bursts occur in succession and the flux level returns to the pre-event level; the interval between each two bursts is equal to or less than 5 min.

42 SER — A series of bursts occur with considerable time intervals between bursts; the flux level of each burst returns to the pre-burst.

43 NS   Onset of noise storm. Duration of events with symbol D.

44 NS   Noise storm in progress. Starting time with symbol E, and duration with symbol D.

45 C   Combination of a few or many simple bursts.

46 C   45 C burst with fluctuations.

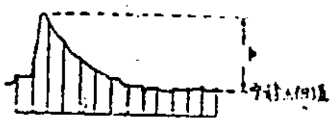
47 GB   Peak flux density of 500 sfu or more

48 C   A complex event with complex and large variation of amplitude.

49 GB   Major increase of flux density, duration greater than 10 min.

A   Noise storm

B   Continue burse



AB   A+B

《太阳地球物理资料》各表表头内容说明

注:各表按目录顺序依次说明,若各表内容有相同的则只作一次说明。

太阳黑子相对数与面积数表

Day:	每天观测日期
Gro:	每天在日面上的黑子群总数
Relative—Numbers:	每天的黑子相对数值
N.H.:	每天北半球的黑子相对数
S.H.:	每天南半球的黑子相对数
Sum:	南、北半球黑子相对数的总和
Sunspot Areas:	太阳黑子面积数值
Drawing:	手描的
N.H.:	每天北半球黑子面积
S.H.:	每天南半球黑子面积
Sum:	南、北半球黑子面积的总和

太阳黑子观测表

Group:	在日面上的黑子群号
CMP Mo—Day:	黑子群过日面中心经圈日期,用月—日表示。
Lat:	黑子群在日面上的纬度
L:	黑子群在日面上的卡林顿经度
CMD:	黑子群在日面上的中经距
Type:	黑子群的 McIntosh 类型
r/R:	黑子群在日面上的日心距(以太阳半径为 1)
Corre. Area Sd whole Max:	黑子群在日面上所占的面积(Sd 为视面积,Whole 为校正后的全群面积,Max 为校正后的最大黑子的面积。)
See:	观测时大气视宁静度
Remarks:	备注(空白表示云南天文台的观测资料,注明 PLAT 的为北京天文馆资料,PURP 为南京紫金山天文台资料。)

太阳黑子相对数的平滑值预报表

Time:	预报的时间
R′:	月平滑黑子相对数的预报值
E′:	预报误差

Hα 太阳耀斑表

Sta:	台站
Start (UT):	耀斑开始时间(UT 为世界时,其中"E"为小于此时间。)
Max (UT):	耀斑的极大时间("U"为接近此时间,不确定。)
End (UT):	耀斑的结束时间("D"为大于此时间。)
Cen Dist:	日心距,即 r/R。
Area Measurement Appar Corr (sd) (sq):	耀斑极大时的面积(Sd 为视面积,单位为太阳圆面积的 10^{-6}; Sq 为校正面积,以平方度为单位。)
Imp:	耀斑的级别
Obs Type:	耀斑资料类型
A.R.:	耀斑所在活动区的黑子群号
Rem:	备注(记录耀斑发生时的形态)

Hα 耀斑巡视时间表

From:	耀斑照相巡视开始时间
To:	耀斑照相巡视的结束时间

太阳活动区磁场和速度场的观测表

L_0:	每天的日面中心经度
Huairou Region:	北京天文台怀柔观测站的活动区编号
Data:	取得的磁场资料类型

太阳射电辐射通量及巡视时间表

BEIJ 2840:	每天的太阳在 2840 MHz 的流量密度(北台 0400 UT 测量,以 10^{-22}·瓦·米$^{-2}$·赫$^{-1}$(s.f.u.)为单位。)
BEIJ 232:	每天的太阳在 232 MHz 的平均流量密度
BEIJ	北京天文台 2840 MHz 频率

From To　巡视时间
2840 :
BEIJ　北台密云站米波 232 MHz
From To　频率巡视时间
232 :

太阳射电辐射显著事件表

Freq:　观测频率
Type:　射电爆发的型别
Duration:　射电爆发的持续时间(以分钟为单位)
Flux Density:　射电爆发的流量密度
Peak:　射电爆发流量的峰值增值
Rel:　射电爆发峰值流量与爆发前流量之比值
Mean:　流量密度的增值对时间求积分再除以爆发持续时间

米波综合孔径射电望远镜 232 MHz 太阳观测表

Flux of Source:　活动区辐射流量(以 10^{-22}·瓦·米$^{-2}$赫$^{-1}$(s.f.u 为单位))
Source Position:　活动区视位置(以角分为单位)
Angular Diameter of Source:　活动区视角径(以角分为单位)
Solar Seeing Diameter:　太阳视直径(以角分为单位)
Patrol Duration　观测时间
Begin End　开始 结束

宇宙线强度表

这部分共有三个表和宇宙线强度图。其中第 1 个表是“超中子堆数据表”,它给出的值是记数率与 1500 的差;第 2 个表是“μ 介子垂直分量表”它给出的值是记数率与 3000 的差;第 3 个表是 “μ 介子数据表”,它列出的是相对强度与 1000 的差。这三个表的第一行数据是 1—24 小时。

Mean:　日均值
N:　记录的小时数
Day:　日期

最后四行是仪器全天工作天数的月平均日变化与相应的月均值的差。宇宙线强度图说明请参见每年第 1 期说明。

突然电离层扰动(D 层)表

Imp:　级别(最小为 1—级,最大为 3+级。)
SPA:　相位突然异常
LF—SPA:　低频相位突然异常
VLF—SPA:　甚低频相位突然异常
LF—SFA:　低频场强突然异常

地磁活动指数 K 和 A_K 表

第一行:　以三小时为时段的 K 指数
Sum:　总和
A_K:　A_K 指数

磁暴表

Time of Magnetic:　磁暴时间
Begining:　开始时间
Ending:　终止时间
h:　小时
m:　分钟
Type:　类型
Sudden Com. Amplitude D′ HnT ZnT:　急始变幅
Deg. of Acti.:　活动程度
Maximum Action K-scale:　最大活动程度
3 hour Int.:　三小时时段
K Index:　K 指数
Maximum Range D′ HnT ZnT:　最大幅度

详细说明请见每年第一期。

Explanation of data reports can be found in the first issue of the year.

DAILY RELATIVE SUNSPOT NUMBERS AND SUNSPOT AREAS

JANUARY 2000

		Relative-Numbers			Sunspot Areas Drawing		
Day	Gro.	N.H.	S.H.	Sum	N.H.	S.H.	Sum
1	5	40	19	59	491	26	517
2	4	48	14	62	451	57	508
3	4	36	18	54	332	91	423
4	6	46	14	60	278	106	384
5	7	57	20	77	260	120	380
6	7	55	20	75	206	147	353
7	8	66	22	88	287	177	464
8	8	60	18	78	225	134	359
9	11	44	49	93	239	142	381
10	9	49	43	92	265	326	591
11	7	39	53	92	234	217	451
12	10	47	99	146	328	361	689
13	13	64	184	248	384	614	998
14	14	60	166	226	514	862	1376
15	13	55	156	211	543	763	1306
16	15	64	143	207	502	902	1404
17	12	63	136	199	472	796	1268
18	11	60	93	153	533	560	1093
19	12	59	89	148	405	285	690
20	9	51	78	129	410	530	940
21	10	54	53	107	252	668	920
22	9	46	50	96	238	623	861
23	9	49	36	85	213	271	484
24	8	39	43	82	166	224	390
25	9	40	50	90	155	193	348
26	7	41	47	88	283	280	563
27	6	24	50	74	228	234	462
28	5	25	41	66	414	286	700
29	7	20	57	77	192	328	520
30	4	0	50	50	0	202	202
31							
Mean		46.7	63.7	110.5	316.7	350.8	667.5

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Max	See.	Remarks
1.08	574	12-28.6	-29	53	44W	AXX	0.75	8	6	3	4	
	577	12-31.9	37	9	2W	FKI	0.63	442	285	223	4	
	586	1- 3.3	-15	337	31E	CRI	0.56	34	20	8	4	
	589	1- 4.4	10	323	45E	HHX	0.71	252	180	180	4	
	1	1- 5.8	10	305	62E	CRI	0.87	25	26	17	4	
2.07	577				15W	FHO	0.68	383	260	203	4	
	586				17E	CSI	0.40	105	57	48	4	
	589				32E	CSI	0.57	257	157	154	4	
	1				47E	CRI	0.74	46	34	9	4	
3.06	577				28W	EHO	0.74	231	171	133	3	
	586				4E	DAI	0.23	177	91	71	3	
	589				19E	CHO	0.39	244	132	130	3	
	1				36E	CRI	0.60	46	29	13	3	
4.07	577				39W	EHO	0.80	160	135	106	3	
	586				9W	DSI	0.25	206	106	83	3	
	589				5E	HHX	0.25	231	120	120	3	
	1				23E	CRI	0.44	29	16	7	3	
	2	1- 3.9	22	330	3W	AXX	0.44	4	2	2	3	
	3	1- 5.6	24	308	20E	BXO	0.54	8	5	2	3	
5.05	577				51W	EHO	0.89	126	136	108	4	
	586				22W	DSI	0.41	210	115	92	4	
	589				8W	CSI	0.28	181	94	59	4	
	1				10E	BXI	0.29	25	13	4	4	
	2				18W	BXO	0.52	8	5	2	4	
	3				8E	BXI	0.47	21	12	5	4	
	4	1- 3.5	-11	335	21W	BXO	0.37	8	5	2	4	
6.06	577				61W	CSO	0.94	71	107	94	3	
	586				36W	CSI	0.60	227	142	134	3	
	589				21W	CSI	0.43	139	77	51	3	
	1				4W	BXI	0.24	8	4	2	3	
	2				30W	BXI	0.61	17	11	3	3	
	3				7W	BXI	0.46	13	7	2	3	
	4				33W	BXO	0.55	8	5	3	3	
7.02	577				76W	HAX	0.98	25	59	59	3-	PURP

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See.	Remarks
	586				50W	CAO	0.76	189	145	139	3-	PURP
	589				34W	DAO	0.60	118	73	42	3-	PURP
	1				17W	AXX	0.38	4	2	2	3-	PURP
	2				45W	DAI	0.75	122	92	42	3-	PURP
	5	1- 8.1	15	274	17E	AXX	0.43	8	5	2	3-	PURP
	6	1-12.6	-15	215	71E	HRX	0.94	21	32	32	3-	PURP
	7	1-13.1	26	209	80E	HRX	0.99	17	56	56	3-	PURP
8.05	586				62W	HSX	0.87	93	95	86	4	
	589				44W	ERI	0.69	55	38	15	4	
	1				30W	AXX	0.54	8	5	2	4	
	2				57W	DSI	0.87	88	91	52	4	
	5				1E	BXI	0.32	17	9	2	4	
	6				57E	CSO	0.84	42	39	35	4	
	7				63E	HSX	0.92	63	80	80	4	
	8	1- 6.4	10	297	22W	AXX	0.44	4	2	2	4	
9.08	586				76W	HSX	0.97	29	57	57	4	
	589				57W	BXI	0.85	25	24	12	4	
	2				70W	DRO	0.94	50	76	57	4	
	5				14W	BXO	0.40	17	9	7	4	
	6				43E	CSO	0.69	55	38	35	4	
	7				50E	CHO	0.83	143	127	124	4	
	8				35W	AXX	0.61	4	3	3	4	
	9	1- 4.3	-11	325	63W	AXX	0.89	6	5	5	4	
	10	1-10.9	-16	238	24E	AXX	0.45	8	5	2	4	
	11	1-14.1	-32	195	62E	BXO	0.90	8	9	5	4	
	12	1-15.8	-13	173	83E	AXX	0.99	8	28	28	4	
10.06	589				71W	BXI	0.97	8	16	8	3	
	5				29W	BXI	0.57	13	8	3	3	
	6				30E	CSO	0.55	101	61	55	3	
	7				38E	EHI	0.78	278	222	175	3	
	8				50W	BXO	0.78	8	7	3	3	
	11				48E	CRI	0.82	34	29	22	3	
	12				74E	FSI	0.95	139	232	105	3	
	13	1- 9.8	-15	253	4W	BXI	0.21	8	4	2	3	
	14	1-15.3	10	180	68E	BXI	0.93	8	12	6	3	
11.05	6				17E	CRI	0.33	29	16	7	4	

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See.	Remarks
	7				25E	EHI	0.67	324	217	147	4	
	8				63W	BXO	0.89	8	9	5	4	
	11				38E	DRI	0.71	34	24	9	4	
	12				63E	FSI	0.84	181	166	124	4	
	14				56E	AXX	0.85	8	8	4	4	
	15	1-16.3	-22	166	68E	AXX	0.92	8	11	5	4	
12.06	6				7E	BXI	0.23	21	11	2	4	
	7				12E	EHI	0.59	248	153	132	4	
	11				26E	CRI	0.59	29	18	10	4	
	12				50E	FKI	0.68	425	289	143	4	
	14				41E	BXI	0.70	13	9	3	4	
	15				56E	AXX	0.83	8	7	4	4	
	16	1-10.4	18	244	22W	DSI	0.51	101	58	37	4	
	17	1-10.5	-11	243	21W	CRI	0.37	59	32	18	4	
	18	1-11.5	-13	229	7W	BXO	0.20	8	4	2	4	
	19	1-17.6	15	149	75E	CSI	0.98	46	108	79	4	
13.06	6				6W	BXI	0.22	46	24	2	4	
	7				1E	ESI	0.54	252	150	130	4	
	11				12E	BXI	0.49	29	17	5	4	
	12				35E	FHI	0.51	744	431	149	4	
	14				29E	BXI	0.53	8	5	2	4	
	15				42E	BXI	0.69	29	20	6	4	
	16				34W	CSI	0.64	88	58	41	4	
	17				33W	CRI	0.54	88	52	7	4	
	18				19W	BXO	0.33	13	7	2	4	
	19				61E	ESI	0.91	143	171	95	4	
	20	1-13.9	-10	198	11E	BXI	0.21	21	11	2	4	
	21	1-13.8	-17	199	11E	BXO	0.28	8	4	2	4	
	22	1-19.0	-18	131	76E	CRI	0.97	25	48	40	4	
14.06	6				21W	BXI	0.34	21	11	2	4	
	7				13W	CSI	0.53	265	156	144	4	
	11				1E	BXI	0.46	25	14	2	4	
	12				22E	FSI	0.31	866	456	133	4	
	15				31E	CRO	0.54	17	10	5	4	
	16				47W	CSO	0.79	67	55	38	4	
	17				45W	CKI	0.74	345	255	220	4	
	18				32W	BXI	0.54	17	10	2	4	

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See.	Remarks
	19				47E	ESI	0.80	164	138	74	4	
	20				2W	BXI	0.09	17	8	2	4	
	21				3W	CRI	0.21	34	17	6	4	
	22				63E	CSI	0.90	71	81	52	4	
	23	1-15.8	11	173	24E	BXI	0.45	13	7	2	4	
	24	1-20.1	19	116	77E	HSX	0.98	67	158	158	4	
15.06	6				31W	BXI	0.53	13	7	2	4	
	7				26W	CHO	0.61	269	170	162	4	
	11				15W	BXI	0.51	13	7	2	4	
	12				9E	FKI	0.17	753	382	177	4	
	15				17E	CRI	0.40	76	41	7	4	
	16				58W	BXI	0.87	8	9	4	4	
	17				58W	CRI	0.86	189	187	178	4	
	19				34E	ESI	0.67	240	161	96	4	
	21				17W	BXI	0.36	21	11	2	4	
	22				50E	DSI	0.78	93	74	51	4	
	24				63E	HSX	0.91	160	191	191	4	
	25	1-11.3	-16	233	50W	CSI	0.75	71	54	51	4	
	26	1-20.1	9	116	67E	BXO	0.93	8	12	6	4	
16.06	6				44W	BXI	0.70	13	9	3	3	
	7				39W	CHO	0.72	177	128	125	3	
	11				29W	BXI	0.61	13	8	3	3	
	12				4W	FAI	0.20	799	407	109	3	
	15				4E	DAI	0.29	214	112	46	3	
	16				73W	CRI	0.97	17	32	24	3	
	17				71W	CSI	0.94	122	183	176	3	
	19				21E	ESI	0.51	177	102	80	3	
	21				27W	BXO	0.48	8	5	2	3	
	22				39E	DAI	0.64	227	148	55	3	
	23				4W	BXI	0.26	13	7	2	3	
	24				51E	HHX	0.82	257	222	222	3	
	25				61W	CRI	0.87	17	17	13	3	
	26				53E	BXI	0.83	13	11	4	3	
	27	1-20.9	-13	106	62E	BXI	0.87	13	13	4	3	
17.06	7				52W	CSO	0.83	118	105	94	4	
	12				16W	ESC	0.34	597	318	99	4	
	15				11W	CSI	0.31	139	73	58	4	

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See.	Remarks
	17				82W	HRX	0.99	8	28	28	4	
	19				7E	ESI	0.39	290	158	132	4	
	21				41W	CRI	0.64	46	30	16	4	
	22				26E	EHC	0.46	580	327	185	4	
	23				17W	BXI	0.38	17	9	2	4	
	24				39E	HHX	0.70	273	192	192	4	
	25				72W	BXO	0.95	8	14	7	4	
	26				38E	BXO	0.64	13	8	3	4	
	27				48E	BXO	0.74	8	6	3	4	
18.07	7				65W	HSX	0.94	88	132	132	3	
	12				29W	ESI	0.51	231	134	51	3	
	15				22W	CRO	0.46	59	33	12	3	
	19				6W	CSI	0.36	240	128	117	3	
	21				56W	BXI	0.80	21	18	4	3	
	22				13E	EHC	0.31	694	365	179	3	
	23				30W	AXX	0.55	8	5	3	3	
	24				25E	CHI	0.53	395	233	225	3	
	26				29E	BXO	0.54	8	5	2	3	
	27				36E	CRO	0.57	17	10	8	3	
	28	1-23.9	12	67	76E	CRI	0.98	13	30	20	3	
19.31	7				81W	HRX	0.99	13	42	42	3	
	12				44W	CSI	0.70	59	41	29	3	
	15				37W	BXO	0.63	8	5	3	3	
	19				22W	CSO	0.49	189	109	106	3	
	21				63W	BXO	0.87	8	9	4	3	
	22				4W	ESI	0.24	336	173	61	3	
	24				9E	CSI	0.41	336	185	173	3	
	26				11E	AXX	0.29	4	2	2	3	
	27				21E	AXX	0.38	4	2	2	3	
	28				59E	CSO	0.87	63	65	60	3	
	29	1-16.9	-8	159	32W	DSI	0.53	93	55	30	3	
	30	1-18.4	20	139	12W	AXX	0.46	4	2	2	3	
20.04	12				56W	CAI	0.82	38	33	26	4-	PURP
	19				32W	CAO	0.62	139	88	88	4-	PURP
	21				71W	BXO	0.94	8	13	6	4-	PURP
	22				14W	DAI	0.35	442	235	80	4-	PURP
	24				1E	DAI	0.40	391	214	189	4-	PURP

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See.	Remarks
	26				1E	AXX	0.24	4	2	2	4-	PURP
	28				52E	DAO	0.81	126	106	85	4-	PURP
	29				43W	DAI	0.67	361	243	124	4-	PURP
	31	1-25.4	-35	47	70E	AXX	0.94	4	6	6	4-	PURP
21.17	12				69W	AXX	0.93	4	6	6	4	
	19				47W	HSX	0.77	71	56	53	4	
	22				31W	EHO	0.54	336	200	175	4	
	24				15W	CSI	0.45	265	148	146	4	
	26				15W	BXO	0.33	8	4	2	4	
	27				4W	BXI	0.16	8	4	2	4	
	28				35E	CRI	0.63	50	33	14	4	
	29				57W	DHI	0.83	505	450	217	4	
	32	1-21.4	11	99	3E	BXI	0.29	21	11	4	4	
	33	1-23.6	-24	71	32E	BXI	0.59	13	8	3	4	
22.08	19				59W	HSX	0.89	46	50	50	4	
	22				44W	CHI	0.69	210	145	139	4	
	24				26W	CSI	0.56	257	155	153	4	
	27				13W	BXO	0.25	8	4	2	4	
	28				24E	BXI	0.49	25	15	5	4	
	29				68W	EHO	0.92	345	439	321	4	
	32				9W	BXI	0.31	34	18	4	4	
	33				19E	BXO	0.44	8	5	2	4	
	34	1-27.2	-28	23	65E	CRI	0.91	25	30	20	4	
23.07	19				72W	HSX	0.95	25	42	42	3	
	22				56W	CSO	0.83	105	94	90	3	
	24				39W	HSX	0.70	193	136	136	3	
	28				11E	BXO	0.34	21	11	4	3	
	29				78W	HHX	0.97	63	121	113	3	
	32				22W	BXI	0.45	34	19	5	3	
	33				7E	BXO	0.34	8	4	2	3	
	34				50E	CSO	0.79	63	52	48	3	
	35	1-25.2	13	50	27E	BXO	0.53	8	5	2	3	
24.07	22				69W	HSX	0.93	67	92	92	4	
	24				51W	HSX	0.83	151	135	135	4	
	28				3W	BXI	0.30	8	4	2	4	
	32				37W	CRI	0.64	34	22	14	4	

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See.	Remarks
	33				8W	AXX	0.36	4	2	2	4	
	34				38E	CSI	0.68	181	123	114	4	
	35				14E	BXO	0.39	8	5	2	4	
	36	1-23.2	-17	76	12W	BXI	0.28	13	7	2	4	
25.31	22				86W	AXX	0.99	4	14	14	3	
	24				66W	HSX	0.93	67	92	92	3	
	32				53W	BXO	0.82	17	15	7	3	
	33				24W	BXO	0.49	8	5	2	3	
	34				23E	CHO	0.52	261	152	147	3	
	35				2W	BXO	0.33	8	4	2	3	
	36				28W	BXI	0.49	29	17	5	3	
	37	1-23.6	5	71	23W	DRI	0.43	80	44	16	3	
	38	1-27.5	-14	19	33E	AXX	0.55	8	5	3	3	
26.07	24				79W	HAX	0.98	34	79	79	3-	PURP
	32				67W	AXX	0.92	8	11	5	3-	PURP
	33				37W	HRX	0.63	17	11	11	3-	PURP
	34				13E	CAO	0.44	395	219	215	3-	PURP
	36				39W	DRI	0.63	50	32	8	3-	PURP
	37				34W	DAI	0.58	315	193	82	3-	PURP
	38				21E	DAO	0.39	34	18	9	3-	PURP
27.16	34				1E	CAO	0.39	290	158	153	3	PURP
	36				52W	AXX	0.78	8	7	3	3	PLAT
	37				49W	DAI	0.75	298	224	88	3	PURP
	38				5E	DAI	0.18	88	45	23	3	PURP
	39	1-30.9	37	335	49E	AXX	0.88	4	4	4	3	PLAT
	40	2- 1.7	-9	311	79E	HRX	0.97	13	24	24	3	PURP
28.06	34				11W	CHI	0.43	353	195	181	4	
	37				58W	EHI	0.86	408	402	216	4	
	38				9W	CRI	0.21	50	26	17	4	
	39				41E	BXI	0.86	13	12	4	4	
	40				64E	CRI	0.91	55	65	55	4	
29.06	34				24W	EHI	0.51	353	205	190	4	
	37				72W	ESI	0.97	97	186	81	4	
	38				23W	CRI	0.36	42	23	18	4	
	39				24E	AXX	0.74	8	6	3	4	

DAILY SUNSPOT OBSERVATIONS

JANUARY 2000

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See.	Remarks
	40				51E	CSI	0.79	88	72	62	4	
	41	1-24.7	-25	57	58W	BXO	0.85	8	8	4	4	
	42	1-30.6	-17	338	19E	CRO	0.37	38	20	18	4	
30.04	34				36W	DAO	0.66	151	100	50	3	PURP
	38				34W	CAO	0.58	55	34	31	3	PURP
	40				38E	CAO	0.61	101	64	56	3	PURP
	42				8E	BXO	0.23	8	4	2	3	PURP
31.00												

PREDICTED SMOOTHED SUNSPOT NUMBERS

AUGUST 1999 — JULY 2000

Date	Aug 99	Sep 99	Oct 99	Nov 99	Dec 99	Jan 2000
R′	96.5	99.1	102.6	105.2	105.9	106.3
E′	2.9	5.0	7.2	12.6	15.9	18.1
Date	Feb 2000	Mar 2000	Apr 2000	May 2000	Jun 2000	Jul 2000
R′	107.7	110.3	112.3	112.9	113.5	114.7
E′	20.5	23.2	31.4	32.7	36.3	34.4

R′: The predicted value of monthly smoothed sunspot numbers.
E′: The error of the predicted value.

H-ALPHA SOLAR FLARES

JANUARY 2000

Day	Sta	Time Start (UT)	Time Max (UT)	Time End (UT)	Lat	L	CMD	Cen Dist	Area Measurement Appar (Sd)	Area Measurement Corr (Sq)	Imp	Obs Type	A.R.	Rem
6	URUM	0758	0801	0835	N19	330	W33	.636	96	1.3	SN	C	2	E
6	URUM	0852E	0852	0856	N11	307	W11	.306	113	1.2	SF	P	1	E
7	URUM	0425E	0425	0430	N 9	313	W27	.493	96	1.1	SB	P	1	D
7	URUM	0740	0744	0800	N10	314	W30	.543	80	1.0	SN	C	1	E
11	URUM	0830	0835	0843	N17	244	W13	.421	177	2.0	1N	C	8	E
12	URUM	0647	0651	0703	S 3	242	W23	.405	80	.9	SN	C	17	E
12	URUM	0823E	0823	0836	S11	176	E42	.707	64	.9	SN	P	12	E
13	URUM	0248E	0248	0256	N12	139	E69	.945	370		2N	P	19	E
13	URUM	0327E	0327	0335	N16	244	W36	.653	113	1.5	SN	P	16	E
14	URUM	0743	0747	0755	S15	241	W49	.754	161	2.5	1N	C	17	E
14	URUM	0851	0855	0907	S13	240	W49	.753	64	1.0	SN	C	17	E
17	URUM	0447	0459	0514	S16	198	W44	.699	161	2.3	1N	C	21	E
17	URUM	0530E	0530	0545	S17	172	W18	.366	80	.9	SF	P	12	E
18	URUM	0423	0424	0432	N16	149	W 7	.382	161	1.8	SN	C	19	D
18	URUM	0820E	0820	0820D	S12	190	W51	.778	193	3.2	1N	P	12	E

INTERVALS OF H-ALPHA FLARE PATROL OBSERVATION

JANUARY 2000

Day	From	To	From	To	From	To	From	To	From	To	From	To	From	To
1	723	852												
2														
3														
4														
5	354	535												
6	750	923												
7	440	800												
8	440	855												
9														
10	345	505												
11	724	859												
12	512	939												
13	248	519												
14	256	930												
15	351	915												
16	320	750												
17	315	943												
18	326	820												
19														
20														
21														
22														
23														
24	847	907												
25	422	947												
26	309	935												
27	443	820												
28														
29	319	954												
30														
31														

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 2000 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
2	354.9	254			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		255			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		256			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
6	302.2	254			S5 L5
		255			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		256			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		257	(22)	330	S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1	23	331	S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		2	23	306	S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
7	289.0	255			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		256			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		257			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		2			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		3	17	270	D4 V4 S5 L5 D5 V5 T5 Q5 U5
8	275.9	255			D4 V4 S5 L5 D5 V5
		256			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		2			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		3			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		4	27	208	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		5	-16	(215)	D4 V4 S5 L5 D5 V5 T5 Q5 U5
9	262.7	255			S5 L5
		256			S5 L5
		1			S5 L5
		3			S5 L5
		4			S5 L5
		5			S5 L5
10	249.5	3			S5 L5
		4			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		5			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6	-36	198	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		7	-14	173	D4 V4 S5 L5 D5 V5 T5 Q5 U5
13	210.0	4			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		5			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			D4 V4 S5 L5 D5 V5 T5 Q5 U5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 2000 HUAIROU ST. BEIJING OBS.

Day	L0	Huairou Region	Lat	L	Data
		7			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		8	13	(244)	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		9	-13	249	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		10	-13	195	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		11	-25	162	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		12	-21	129	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		13	14	145	D4 V4 S5 L5 D5 V5 T5 Q5 U5
14	196.8	4			S5 L5
		6			S5 L5
		7			S5 L5 T5 Q5 U5
		8			S5 L5 T5 Q5 U5
		9			S5 L5 T5 Q5 U5
		10			S5 L5 T5 Q5 U5
		11			S5 L5 T5 Q5 U5
		12			S5 L5 T5 Q5 U5
		13			S5 L5 T5 Q5 U5
16	170.5	4			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		7			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		8			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		9			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		11			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		12			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		13			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
17	157.3	7			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		9			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		11			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		12			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		13			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		14	17	116	D4 V4 S5 L5 D5 V5 T5 Q5 U5
18	144.2	4			S5 L5
		7			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		9			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		11			D4 V4 S5 L5 D5 V5 T5 Q5 U5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 2000 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		12			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		13			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		14			D4 V4 S5 L5 D5 V5 T5 Q5 U5
19	131.0	7			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		9			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		11			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		12			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		13			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		14			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		15	-11	(173)	D4 V4 S5 L5 D5 V5 T5 Q5 U5
20	117.8	7			D4 V4 S5 L5 D5 V5
		11			D4 V4 S5 L5 D5 V5
		12			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		13			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		14			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		15			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
23	78.3	12			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		13			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		14			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		15			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		16	7	100	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		17	7	65	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		18	(-28)	22	D4 V4 S5 L5 D5 V5 T5 Q5 U5
24	65.2	12			D4 V4 S5 L5 D5 V5
		13			D4 V4 S5 L5 D5 V5
		14			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		15			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		16			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		17			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		18			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		19	-15	76	D4 V4 S5 L5 D5 V5 T5 Q5 U5
25	52.0	12			D4 V4 S5 L5 D5 V5
		14			D4 V4 S5 L5 D5 V5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 2000 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		16			D4 V4 S5 L5 D5 V5
		18			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		19			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		20	9	72	D4 V4 S5 L5 D5 V5 T5 Q5 U5
26	38.8	16			S5 L5
		18			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		19			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		20			D4 V4 S5 L5 D5 V5 T5 Q5 U5
27	25.7	18			S5 L5 T5 Q5 U5
		19			S5 L5 T5 Q5 U5
		20			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		21	-18	21	D4 V4 S5 L5 D5 V5 T5 Q5 U5
28	12.5	18			S5 L5 T5 Q5 U5
		19			S5 L5 T5 Q5 U5
		20			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		21			D4 V4 S5 L5 D5 V5 T5 Q5 U5
29	359.3	18			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		20			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		21			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		22	-29	(57)	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		23	-20	342	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		24	-11	307	D4 V4 S5 L5 D5 V5 T5 Q5 U5
30	346.2	18			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		20			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		21			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		22			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		23			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		24			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
31	333.0	18			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		21			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		23			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		24			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5

NPL SPL: 18 13

SOLAR RADIO EMISSION FLUX AND INTERVALS OF PATROL OBSERVATION

JANUARY 2000

Day	BEIJ 2840	BEIJ 232	BEIJ From To 2840	BEIJ From To 232
1	150		0416 0515	
2	130	9	0337 0505	0024 0745
3	131	10	0251 0335	0049 0730
4	139	10	0032 0822	0049 0746
5	146	12	0003 0818	0011 0830
6	123	11	0007 0821	0019 0759
7	145	10	0007 0828	0002 0840
8	155	9	0000 0827	0010 0800
9	147	9	0000 0829	0015 0750
10	151	11	0002 0820 2340 2400	0023 0801
11	164	11	0000 0823 2348 2400	0030 0800
12	174	11	0000 0820 2344 2400	0036 0758
13	190	8	0000 0827 2354 2400	0013 0759
14	190	7	0000 0755	0016 0829
15	202		0056 0759	
16	205	9	0300 0543	0036 0838
17	191	8	0041 0827 2349 2400	0033 0838
18	182	15	0000 0828 2353 2400	0256 0828

SOLAR RADIO EMISSION FLUX AND INTERVALS OF PATROL OBSERVATION

JANUARY 2000

Day	BEIJ 2840	PURP 2700	BEIJ 2840 From	BEIJ 2840 To	PURP 2700 From	PURP 2700 To
19	183	32	0000	0829	0019	0813
			2353	2400		
20	159	26	0000	0829	0011	0505
			2352	2400		
21	162		0000	0830		
			2357	2400		
22	149	23	0000	0827	0006	0821
23	139	26	0002	0828	0011	0818
24	133	61	0001	0830	0013	0803
			2356	2400		
25	135	10	0000	0830	0017	0753
26	147	25	0608	0830	0016	0707
			2356	2400		
27	130	20	0000	0804	0112	0904
28	126	17	0032	0820	0028	0729
29	127	20	0020	0736	0132	0913
30	121	42	0039	0745	2338	0901
31	130		0058	0820		
Mean	153.4	17.1				

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JANUARY 2000

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Peak	Density Rel	Mean
04	232	BEIJ	A	0326.0	0330.0	94.0	37.6		
06	2840	BEIJ	3 S	0647.0	0649.0	12.0	65.9	53.6	
07	232	BEIJ	AB	0054.0	0310.0	276.0	22.4		
12	2840	BEIJ	45 C	0123.0	0137.0	21.0	240.0	138.0	
15	2840	BEIJ	5 S	0157.0	0158.0	2.0	26.7	13.2	
17	232	BEIJ	A	0730.0	0748.0	50.0	15.4		
19	232	BEIJ	AB	0019.0	0402.0	475.0	94.0		
19	2840	BEIJ	5 S	0455.0	0457.0	5.0	13.9	7.6	
20	2840	BEIJ	5 S	0222.0	0224.5	4.0	40.3	25.4	
21	2840	BEIJ	5 S	0507.0	0507.5	3.0	113.0	69.5	
21	2840	BEIJ	5 S	0646.0	0647.2	7.0	19.0	11.7	
22	232	BEIJ	A	0006.0	0430.0	495.0	123.0		
23	232	BEIJ	A	0011.0	0230.0	487.0	92.0		
24	232	BEIJ	AB	0013.0	0655.0	470.0	123.0		
25	232	BEIJ	AB	0017.0	0400.0	358.0	50.0		
25	2840	BEIJ	5 S	0143.0	0144.0	3.0	14.9	11.0	
25	2840	BEIJ	1 S	0346.0	0347.0	2.0	4.7	3.5	
25	2840	BEIJ	1 S	0621.0	0624.0	4.0	6.0	4.4	
26	232	BEIJ	AB	0016.0	0430.0	411.0	84.6		
28	232	BEIJ	AB	0440.0	0520.0	125.0	123.0		
30	232	BEIJ	A	0730.0	0734.0	9.0	94.0		
31	2840	BEIJ	5 S	0156.0	0158.5	3.0	25.4	19.5	
31	2840	BEIJ	1 S	0237.0	0239.0	3.0	26.9	20.7	

COSMIC RAY NEUTRON INTENSITY

Real Counts: 256 Times(Tabulated Counts Plus 1500)

JAN 2000 U.T. Hours at End of Interval

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	N
1	450	457	455	455	455	445	454	444	439	440	435	439	442	440	442	436	436	453	446	446	432	459	457	435	445.5	24
2	435	435	439	448	460	454	459	436	448	442	448	437	435	442	433	434	432	424	436	446	446	458	463	451	443.4	24
3	450	448	455	435	444	440	435	447	445	440	445	450	440	437	438	440	431	433	444	445	448	447	451	447	443.1	24
4	443	449	438	449	446	440	442	437	448	443	441	436	436	445	430	434	439	437	438	445	445	454	453	445	442.2	24
5	432	451	447	453	447	444	446	444	445	447	454	442	437	449	442	450	459	455	445	449	452	458	462	464	448.9	24
6	453	464	444	455	455	448	461	470	462	465	458	456	444	447	461	467	472	467	475	482	484	487	487	457	463.4	24
7	452	466	464	468	455	453	465	467	464	468	463	460	452	452	457	457	459	447	454	460	462	474	468	467	460.6	24
8	463	463	464	454	465	462	458	458	461	452	448	454	447	454	451	457	455	457	452	454	463	458	474	466	457.9	24
9	465	471	467	464	475	451	467	459	461	453	452	454	448	453	447	444	440	458	449	459	457	459	472	468	458.0	24
10	463	469	470	471	462	465	464	467	457	459	459	464	460	451	445	446	459	454	452	459	467	463	460	464	460.4	24
11	473	469	461	459	459	447	444	457	450	451	437	437	445	442	436	423	419	428	431	446	452	449	455	440	446.3	24
12	449	454	455	457	460	449	452	449	444	447	446	435	436	437	432	444	426	440	443	432	445	437	452	440	444.2	24
13	445	446	444	454	457	454	455	453	461	451	455	451	447	448	445	448	437	441	452	445	451	457	459	458	450.6	24
14	464	462	461	464	466	457	470	448	459	441	448	461	448	457	455	455	453	450	448	455	462	472	479	469	458.5	24
15	460	455	458	468	468	462	465	461	460	454	461	459	461	449	463	451	450	466	457	464	468	465	471	464	460.8	24
16	471	476	475	465	478	468	469	484	475	461	474	469	470	465	467	459	454	466	463	469	472	470	486	472	469.9	24
17	477	475	472	477	474	466	474	470	468	467	463	472	454	469	463	455	464	458	467	469	479	481	480	486	470.0	24
18	491	498	495	493	485	485	476	481	473	478	482	478	484	484	482	482	489	492	483	484	491	491	489	499	486.0	24
19	481	489	486	470	477	470	479	469	457	469	476	461	463	468	471	472	480	463	478	479	483	490	489	493	475.5	24
20	481	490	491	486	484	475	466	473	474	468	471	462	468	474	473	454	468	458	459	465	469	481	475	483	472.8	24
21	470	467	469	465	480	473	464	471	457	459	458	465	458	448	453	455	439	452	454	440	456	456	452	461	459.3	24
22	461	460	452	454	463	455	460	462	446	440	444	439	440	431	446	447	440	451	460	462	463	475	481	482	454.8	24
23	471	488	490	486	471	470	455	456	456	460	453	452	461	451	457	456	449	461	455	466	473	470	474	467	464.5	24
24	466	474	478	468	475	470	459	468	471	462	457	452	455	452	463	465	454	460	461	473	459	469	471	475	464.9	24
25	478	469	472	471	482	482	477	479	473	474	467	473	453	467	460	464	469	451	463	466	473	478	484	488	471.4	24
26	481	480	474	478	481	477	480	474	467	467	468	459	458	470	465	457	462	469	465	465	471	485	473	473	470.8	24
27	480	472	477	464	468	471	468	459	454	457	463	468	448	459	452	450	452	454	446	454	463	453	460	466	460.8	24
28	462	460	470	459	478	466	461	454	451	460	452	452	444	447	455	454	448	455	449	467	466	469	478	470	459.5	24
29	450	453	441	461	463	455	463	460	459	466	465	455	453	455	471	473	457	451	467	469	476	474	483	491	463.0	24
30	481	487	478	466	472	477	472	474	477	474	472	466	461	456	466	457	459	464	461	464	464	482	492	479	470.9	24
31	475	472	485	471	471	470	474	474	479	468	468	469	460	461	470	457	454	465	464	474	486	486	480	471	471.0	24

MONTHLY MEAN=460.282

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE:460.282

(1-12)	3.36	6.46	5.10	3.85	6.69	1.04	2.10	1.17	-0.90	-2.77	-2.77	-4.57
(13-24)	-8.41	-6.73	-5.73	-7.28	-8.51	-6.09	-4.90	-0.51	3.52	7.69	11.01	7.17

HARMONIC COMPONENTS (ORDER, COS, SIN, AMPLITUDE, MAX.-HR)

U.T.=(1 6.65 2.91 7.26 1.58) (2 1.08 -1.80 2.10 10.03) (3 -0.25 -1.43 1.45 5.78) (4 -0.99 -0.71 1.22 3.59))

L.T.=(1 -5.85 4.30 7.26 9.58) (2 -2.10 -0.04 2.10 6.03) (3 -0.25 -1.43 1.45 5.78) (4 1.11 -0.51 1.22 5.59))

COSMIC RAY MESON INTENSITY

Real Relative Intensity: 0.1% Times(Tabulated Value Plus 1000)

JAN 2000 U.T. Hours at End of Interval

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean	N
1	30	29	32	31	31	31	30	31	30	29	29	27	29	31	30	33	32	31	30	29	29	31	31	30	30.3	24
2	32	33	33	32	34	32	32	29	32	31	32	31	31	33	31	30	32	31	31	32	31	35	31	33	31.8	24
3	33	34	34	34	35	31	33	33	34	32	34	32	33	33	35	34	34	33	31	30	30	30	30	31	32.6	24
4	32	32	33	30	31	31	29	35	32	35	33	34	34	33	34	32	35	33	35	32	32	30	35	34	32.8	24
5	36	37	38	37	35	36	35	35	35	37	37	36	38	37	39	39	39	36	39	36	38	39	42	41	37.4	24
6	42	45	43	44	44	43	44	45	42	42	45	47	47	44	47	46	45	43	41	42	41	40	40	43	43.5	24
7	41	43	41	42	42	41	39	39	40	38	38	38	41	37	39	40	38	36	37	35	34	35	37	38	38.7	24
8	37	38	36	36	35	38	35	35	34	31	31	36	36	34	33	34	35	34	33	32	32	32	30	34	34.2	24
9	36	36	39	38	36	36	37	36	35	35	33	34	33	33	33	34	33	33	32	32	34	35	34	37	34.8	24
10	39	38	36	38	38	35	37	35	35	35	35	37	37	36	38	38	36	37	36	37	37	37	37	36	36.7	24
11	39	39	39	38	39	37	39	36	33	35	37	35	33	34	34	34	33	32	31	32	31	30	30	31	34.6	24
12	33	35	36	38	36	32	32	33	35	35	35	36	35	36	34	33	34	30	33	30	32	33	34	33	33.9	24
13	34	37	38	39	39	36	34	35	33	32	35	36	37	38	37	37	36	35	30	31	33	33	32	34	35.0	24
14	35	37	39	39	36	38	35	35	34	33	36	36	37	35	37	36	35	34	33	34	35	35	35	35	35.6	24
15	37	37	38	37	38	38	40	38	37	37	38	38	36	38	37	37	36	39	37	37	36	37	38	38	37.5	24
16	40	41	43	39	40	41	41	41	39	41	39	39	39	38	36	34	35	35	36	37	37	38	38	39	38.6	24
17	39	40	41	41	37	41	41	42	39	37	39	39	39	41	38	37	37	40	38	38	37	35	36	38	38.8	24
18	42	42	41	43	41	42	42	44	43	44	43	45	48	46	48	50	47	49	48	46	45	49	47	47	45.1	24
19	49	47	48	46	45	41	42	39	43	45	45	44	45	45	46	45	46	45	46	45	48	46	46	48	45.2	24
20	46	46	49	49	47	48	45	42	44	42	45	42	44	43	45	45	45	45	43	41	43	41	43	41	44.3	24
21	42	44	45	44	45	43	41	41	40	39	42	42	40	39	40	38	38	38	36	36	33	36	37	33	39.7	24
22	35	40	37	38	39	38	37	36	35	32	35	36	34	33	33	36	33	37	34	34	36	38	38	37	35.9	24
23	39	44	45	44	40	44	42	41	41	38	38	41	41	43	43	43	44	44	45	46	46	48	47	45	43.0	24
24	46	49	49	50	47	50	48	46	45	45	48	47	47	45	45	46	48	48	48	47	45	46	47	46	47.0	24
25	48	48	50	47	50	48	46	46	44	47	44	47	45	45	45	44	43	45	46	43	43	44	45	46	45.8	24
26	46	45	49	46	48	46	48	46	43	41	44	45	44	44	45	45	46	44	44	44	43	43	45	44	44.9	24
27	46	47	47	45	43	43	44	43	43	44	40	40	39	40	40	40	41	42	37	37	39	39	39	38	41.5	24
28	37	40	39	41	40	39	39	37	35	34	36	35	36	37	37	38	37	39	41	39	38	39	40	42	38.1	24
29	40	43	43	44	43	41	42	44	45	43	47	45	48	46	49	48	49	48	48	47	49	48	49	48	45.7	24
30	50	51	51	51	49	49	51	48	49	50	51	50	51	51	51	51	52	51	49	50	50	50	50	49	50.2	24
31	49	51	51	49	47	49	48	47	47	46	45	46	45	45	46	45	46	44	44	44	44	43	44	43	46.2	24

MONTHLY MEAN= 39.329

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 39.329

(1-12)	0.35	1.57	2.06	1.64	0.99	0.61	0.28	-0.20	-0.75	-1.10	-0.33	-0.10
(13-24)	0.09	-0.20	0.19	0.09	0.03	-0.26	-0.88	-1.43	-1.23	-0.78	-0.39	-0.23

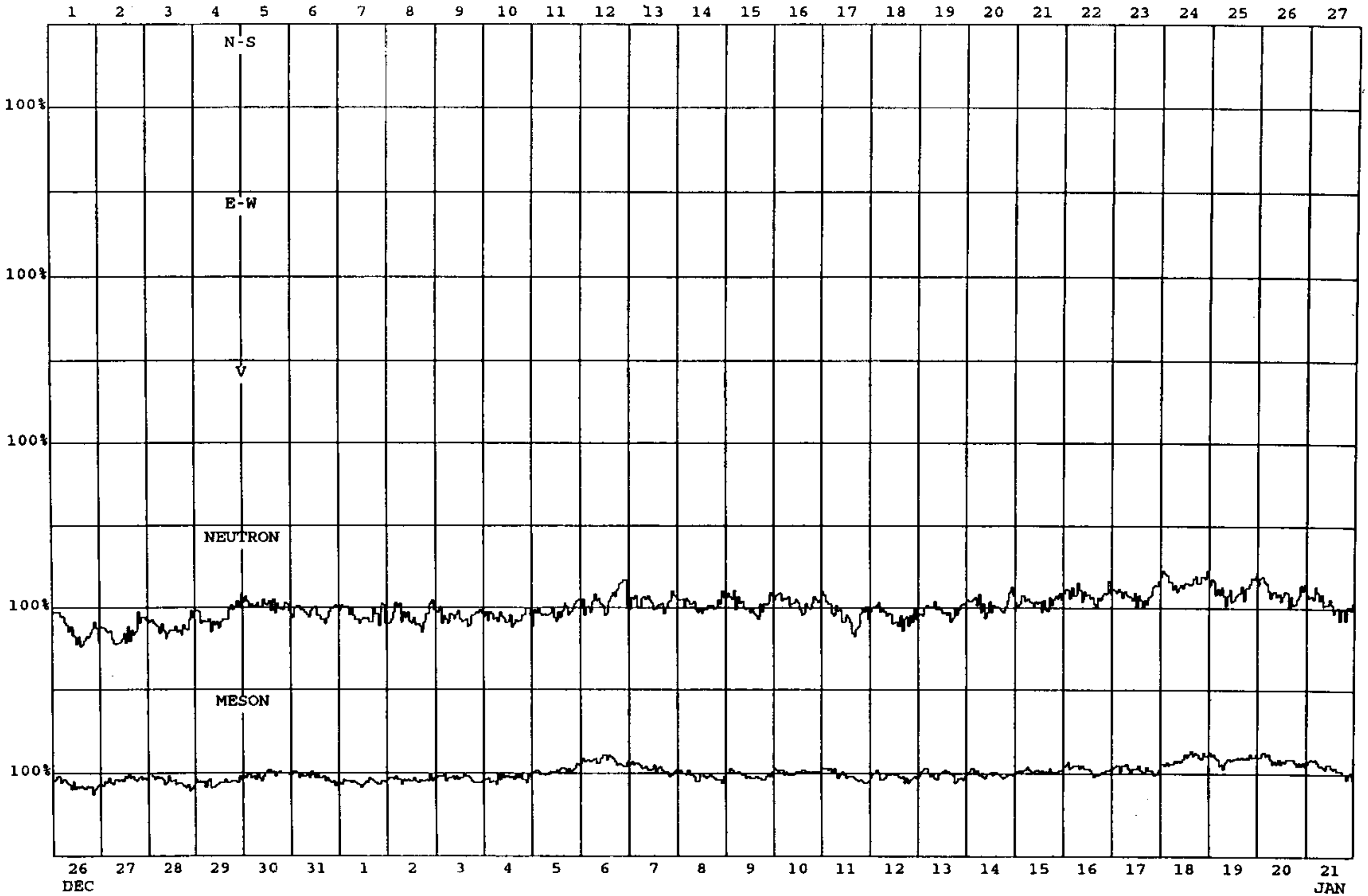
HARMONIC COMPONENTS (ORDER, COS, SIN, AMPLITUDE, MAX.-HR)

U.T.=(1 0.33 0.61 0.70 4.11) (2 0.12 0.95 0.95 2.77) (3 -0.06 0.11 0.13 2.61) (4 -0.02 -0.03 0.04 4.03))

L.T.=(1 -0.70 -0.02 0.70 12.11) (2 0.76 -0.57 0.95 10.77) (3 -0.06 0.11 0.13 2.61) (4 0.04 0.00 0.04 0.03))

COSMIC RAY INDICES

Bartels Rotation 2272 (DEC 1999-JAN 2000)



SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

JANUARY 2000

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA LF	SPA VLF	SFA LF
01	LINT	0922	0936	1100D	3+	-16.2E		+12.0
05	LINT	0411	0420	0450	1-	- 0.6		- 4.4
06	LINT	0648	0701	0743	1	- 2.0		- 3.1
08	LINT	0526	0532	0544	1-	- 0.6		+ 1.3
11	LINT	0107	0120	0217	2-	- 3.8		+ 2.8
11	LINT	0225	0233	0255	1-	- 0.3		0
11	LINT	0342	0350	0339D	1	- 1.5		- 0.8
11	LINT	0339	0415	0430D	1	- 1.6		- 1.9
11	LINT	0415	0427	0520	2-	- 4.0		- 0.9,+ 0.5
12	LINT	0124	0142	0300D	3+	-10.1		-10.1,+17.6
12	LINT	0347	0408	0530	2-	- 3.1		- 0.9,+ 1.0
13	LINT	0249	0302	0410	2-	- 3.9		+ 1.2
17	LINT	0015	0101	0210D	2+	- 5.7		+11.4
18	LINT	0221	0304	0400	1	- 1.4		- 8.3,+ 6.8
25	LINT	0310	0322	0350U	1-	- 0.6		+ 0.8
26	LINT	0325	0400	0440D	1	- 1.6		+ 2.9

GEOMAGNETIC ACTIVITY INDICES K AND A_K

JANUARY 2000 BGMO

Day		Three-Hourly Indices K								Sum	A_K
		0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24		
1	D	4	4	4	3	5	5	4	3	32	29
2		3	3	3	3	3	4	3	2	24	16
3		2	2	2	4	4	3	3	2	22	14
4		1	2	2	3	4	4	3	3	22	15
5		2	2	3	4	4	3	5	2	25	19
6		1	3	1	4	5	5	3	2	24	21
7		2	1	1	2	3	3	3	2	17	9
8	Q	0	0	0	2	3	2	1	0	8	4
9	Q	0	0	0	0	0	1	1	1	3	1
10		1	1	2	0	2	3	3	4	16	10
11	D	2	3	1	4	5	5	6	5	31	35
12		2	3	2	2	2	2	3	1	17	9
13		2	1	2	3	3	4	1	1	17	10
14		1	2	1	1	1	3	2	1	12	6
15		0	1	1	1	1	1	1	1	7	3
16		0	1	2	1	2	2	3	1	12	6
17	Q	0	0	0	0	0	0	1	0	1	0
18	Q	0	1	1	1	1	3	2	0	9	4
19		0	3	3	1	1	2	3	4	17	11
20		0	2	2	3	4	2	3	2	18	11
21	Q	0	0	1	0	1	0	0	0	2	1
22		1	2	4	5	4	4	5	5	30	29
23	D	4	4	3	3	3	3	2	0	22	15
24		1	2	3	4	3	3	2	3	21	13
25		0	3	2	2	1	3	3	1	15	8
26		1	2	1	1	1	2	1	3	12	6
27		3	2	4	4	5	5	5	4	32	31
28	D	5	4	3	4	5	5	4	3	33	32
29	D	3	3	3	3	5	5	5	3	30	27
30		2	2	2	2	4	4	4	3	23	16
31		2	2	1	2	3	4	2	2	18	10
										Sum	421
										Mean	13.6

MAGNETIC STORMS

JANUARY 2000 BGMO

Time of Magnetic						Sudden Com. Amplitude			Deg. of	Maximum Acti. on K-scale			Maximum Range		
Begining			Ending								3hour	k			
Day	h	m	Day	h	Type	D'	HnT	ZnT	Acti.	Day	Int.	Index	D'	HnT	ZnT
11	14	25	12	12	SC	1.0	22	2	ms	11	7	6	8.9	112	14
27	14	52	28	20	SC	0.8	35	2	m	28	1	5	709	125	15

北京天文台综合孔径射电望远镜米波太阳观测*

康连生
（中国科学院 北京天文台）

随着太阳物理的不断发展和活动峰年的到来，需要有更多更好的高灵敏度、高分辨率的设备投入观测。北京天文台米波综合孔径射电望远镜完成了北天区普查后投入了太阳观测。对于提供米波太阳观测资料是一个很有实力的设备。

北京天文台综合孔径射电望远镜由 28 面 9 米口径的抛物面天线组成。按东西方向排成一字长阵。阵长 1164 米，可获得 3.′8 的空间分辨率。观测太阳采用 10 秒和 20 毫秒两种模式，因此可获得 20 毫秒的高时间分辨率。观测频率为 232 MHz，波长 1.29 米。所以对于研究太阳日冕层及其快速活动现象是十分有效的设备。

太阳日冕物质抛射（CME）是十分重要的太阳活动现象。一次可以抛出 10^{25}焦尔能量和 10^{13}公斤质量。可能引起日冕结构变化和太阳风绕动。日冕物质抛射往往伴随着质子事件，引起电离层扰动和地磁暴。因此研究太阳日冕物质抛射除了其本身的科学意义，对于人类的生产生活也是十分重要的问题。通常日冕光学观测只能在日全蚀发生时或利用白光日冕仪进行，而且看到的是太阳侧面。而射电观测每天都能作。并且得到的是正面日冕数据。

米波太阳观测使用 s.f.u 即 10^{-22}·瓦·米$^{-2}$赫$^{-1}$作流量单位。我们用射电源 CygA 定标（在 232 MHz 流量密度约 7984 Jy，1 Jy=10^{-26}·瓦·米$^{-2}$赫$^{-1}$）。232 MHz 太阳视直径约 50 个角分。

在《太阳地球物理资料》上刊登的米波综合孔径射电望远镜 232 MHz 太阳观测表给出米波爆发源的位置、角径和流量。

同时我们使用一套单天线观测系统监测太阳爆发时间和每天的平均流量。

我们欢迎使用米波太阳观测资料，并给我们提出建议和要求。

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Solar Observations in Metre Wavelength with the Aperture Synthesis Radio Telescope of Beijing Astronomical Observatory

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Abstract

Solar observation with the aperture synthesis radio telescope of Beijing Astronomical Observatory is briefly introduced in this paper. We welcome colleagues in the world to make use of our observational data.

The aperture synthesis radio telescope (ASRT)of Beijing Astronomical Observatory (BAO) consists of 28 antennas 9m diametre. The main structures of ASRT are as follows: The original Miyun E—W interferometer elements, which consist of 16 dishes equally spaced at 72m one from another. Call it the A—array. Additional 12 elements, 6 at each end of the A—array is named the B—array. Correlation between all the elements of the two arrays gives 192 interferometer spacings. The longest spacing is 1164m.

The working frequency is 232 MHz, system band width is 1.5 MHz. The sky noise plus system noise is taken as 300°k. For the 232 MHz system, the spatial resolution is 3.′8, the temporal resolution is 20ms, continue observation time can be 11 hours.

The position and angular diameter of the burst sources and their variation can be given by means of the ASRT. A single antenna receiver is used also for monitoring solar activity, in time resolution models of 10ms and 1s. In addition ASRT has powerful anti—interference ability.

The radio source CygA with flux density 7964 Jy at 232 MHz is taken as the reference source for solar observation flux correction. The softwares for the solar observation of the ASRT have been developed . Since the ASRT has fringe track and delay system, solar one dimension map can be obtained with fast Fourier transform (FFT) in 20ms, which is useful to study solar high speed variable phenomenon.

Recently we are developing new adding system of the ASRT in order to observe the interplanetary scintillation which is useful for the study of solar wind and interplanetary space.

Over the whole electromagnetic spectrum of the Sun the metre wave—length band (1 to 10m) is unique. Shorter wavelengths, from γ—rays to microwaves, come mostly from regions containing dense matter associated and longer wavelengths come mainly from interplanetary space. Meter waves along are generated in the tenuous plasma known as the solar corona, ordinarily visible only at the time of a total eclipse, and they reveal a spectacular range of phenomena.

Solar coronal mass ejections (CMEs) are importent phenomena in solar activity, which eject energy up to 10^{25}J and mass to 10^{13}kg. CMEs make corona structure change and solar wind disturbance. The particle flux wave in solar wind cause ionosphere disturbance and geomagnetic storm. Many observation cases are showing: interplanetary high—energy proton event is related closely with shock by quick CMEs driving, and affect directly near—earth space magnetic field and ionosphere disturbance, related to the human for the living, exist, and produce. So, the observation and research of occur mechanism and driving process of CME have very important real significance expect itself developing scientific value. The ASRT can be observe coronal burst, solar IV type and II type radio bursts related closely to CMEs. We expect that the ASRT of BAO will make its contribution in this research field.

We sincerely wish colleagues in the world to make use of our data and yet forward their comments and suggestions.

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