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说　明

(1991 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。
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,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。

以上各种数据表均利用计算机 (VAX 11/780) 存取、作必要的计算和检验以及提供照相印刷的正本。

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。黑子照相面积由北台提供。"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。(See) 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。

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,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—单色像

D—多卜勒（Doppler）速度场观测波长上的单色像

L—纵向磁场观测资料

Q 及 U—横向磁场观测资料

V—多卜勒（Doppler）速度场观测资料

5—使用 Fe I λ5324.19Å 谱线观测资料（光球）

4—使用 H_β λ4861.34Å 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. 太阳耀斑表列出北台、紫台、乌站、云台等单位用色球望远镜（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。其中极大（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：

校正面积 Sq	耀斑级别 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：

大部分过程有照相观测。

P：部分或仅[illegible]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。

6. 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。

7. 太阳射电辐射流量表，给出在各固定单频上每天太阳辐射总流量在当地太阳中天前后（一般北台、紫台在 0400 UT 左右；乌站、云台在 0500 UT 左右）的以 10^{-22}·瓦·米$^{-2}$·赫$^{-1}$ (s. f. u.) 为单位的实测值，并均已归算到日—地平均距离 1 AU。

8. 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 1S，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）。

9. 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。图中左上角给出日期、频率，右上角给出观测台站，横坐标为时间（UT），纵坐标为爆发流量。

10. 太阳射电巡视时间表为各单频射电望远镜实际巡视时间（不计入小于半小时的停顿）。连续巡视时段用（From—To）表示。

11. 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。

12. 突然电离层扰动（D层）（简称SID）表给出了对罗兰C100 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—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+

13. 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5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）

14. 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（东径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。

15. 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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对“太阳地球物理资料”的意见，请寄北京100080（邮政编码）中国科学院北京天文台“太阳地球物理资料”编辑组。电话：2567194，电报挂号：9053，电传：22040 BAOAS CN。

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 Zurich 分型，第二个字母为黑子群中最大黑子的半影情况，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 Zurich 分型

A　无半影单极群。B 型长度无限制。

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 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　对称和近于园形半影，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(不园)，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：Zurich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。

Zurich 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。

Zurich 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＝有高速暗条伴随的耀斑。
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 CaII 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	1S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	3S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	图形
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 分钟（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　　形
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	图形
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。	

CHINESE SOLAR GEOPHYSICAL DATA (CSGD)
EXPLANATION OF DATA REPORTS
(1991)

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
4. H-Alpha Solar Flares and Time Intervals of H-Alpha Flare Patrol Observations
5. Solar Radio Emission Fluxes and Solar Radio Emission Outstanding Occurrences, Intervals of Solar Radio Emission Patrol Observations and Time Profiles Solar Radio Emission 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. Nonperiodically Published Special Issues for the Data Corresponding Solar-Terrestrial Effects and Preliminary Analyses of Some Selected Events

All the data mentioned above are stored in a VAX 11/780 computer.

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 while photographic results of spot areas are supplied by Beijing Astronomical 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).

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. Heliocentric 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 occupied 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 observations of solar magnetic and velocity fields, the date, the Carrington longitude of the solar disk center (L_0), the number (under Huairou Region) 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 λ 5324.19Å and/or H_β λ 4861.34 Å at Huairou Station of Beijng Astronomical Observatory are given. Meanings of letters in the table are as follows:

S (or T) — monochromatic image
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 5324.19Å
4 — observation at H_β λ 4861.34 Å

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. The table of " H-Alpha Solar Flares " gives H-Alpha flare (including subflares (by S)) patrol observations done at Beijing Astronomical Observatory,Purple Mountain Observatory, Urumqi Astronomical Station, and Yunnan Observatory. 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 apparent area Sd and 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 to 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 where each observatory uses its experience to decide if a flare is rather faint (F), normal (N), or rather bright(B). For flares within 65° from the centre of the disk, i.e., the heliocentric distance is less than 0.906, the first figure assigned to the flare importance is defined by the corrected area Sq according to the following table where areas are given in millionths of a 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 heliocentric distance is equal to or greater than 0.906, the first figure assigned to 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	45	45 - 169	170 - 299	300

The letters C, P, and V in the column marked " 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 are obtained due to an incomplete time coverage

V — the development of the flare was visually observed

The meaning of one or more letters of A to Z in the column marked " 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.

6. In the table of " Intervals of H-Alpha Flare Patrol Observations ", 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 flare patrol observations are less than five minutes.

7. The table of " Daily Solar Radio Emission Flux " gives the flux values of the sun calibrated in units of $10^{-22} \cdot W \cdot M^{-2} \cdot Hz^{-1}$ (s.f.u.) at the time around meridian transit (BEIJ, PURP : around 0400 UT; URUM, YUNN: around 0500 UT) every day at different fixed radio frequencies. All flux values are adjusted to mean sun-earth distance: 1 AU.

8. 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 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.

9. 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.

10. The table of " Intervals of Solar Radio Emission Patrol Observations " gives the time coverage of the patrol observations made with those radio telescopes that contribute the data. The data gaps less than half hour are not listed.

11. 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 and 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 variation 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.

12. 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 the 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 following expression resulted from the analyses and calculation:

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

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

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. As for the importance rating, based on a scale of 1–, the least, to 3+, the most important, is derived from the values of $\Delta\phi_0$, shown as 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+

13. The data included in the table of " The 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 and a_k is as follows :

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

14. Three kinds of geomagnetic storm are listed in the table of " The 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 the rating of geomagnetic storms, 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, for a flare observed at 2230–2400 UT, the equivalent Beijing Standard Time is 0630–0800 next day.

15. 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) will be numbered. The first issue of 1991 of CSGD is numbered 213.

Address your inquires to our Editorial Group, please: CSGD Editorial Group, Beijing Astronomical Observatory, Beijing 100080 China . Telephone Number : 2567194, Telegram code : 9053, Telex : 22040 BAOAS CN.

Appendix 1

The International Astronomical Union Notation for H-Alpha Solar Flares

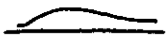
A = Eruptive prominence whose base is less than 90° from the central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant Point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied 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

Classification 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.

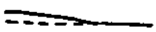
22 GRF 20 GRF type burst with fluctuations to be able to list separately.

23 GRF 20 GRF type burst with fluctuations 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.

《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。

Photographic：照相的。

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，用月一日表示。

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 (sd) Corr (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。

太阳射电辐射流量表

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。

PURP 2700：每天的太阳在 2700 MHz 的流量密度（紫台 0400 UT 测）。

URUM 9375：每天的太阳在 9375 MHz 的流量密度（乌站 0500 UT 测）。

YUNN 2840：每天的太阳在 2840 MHz 的流量密度（云台 0500 UT 测）。

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，除以爆发持续时间。

太阳射电辐射巡视时间表

BEIJ From To 2840：北京天文台 2840 频率射电望远镜巡视时间。

PURP From To 2700：紫金山天文台频率为 2700 射电望远镜巡视时间。

URUM From To 9375：新疆乌鲁木齐天文站频率为 9375 MHz 的巡视时间。

YUNN From To 2840：云南天文台频率为 2840 MHz 的巡视时间。

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"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 1991 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：甚低频信号的相位突然异常。

LF：低频。

VLF：甚低频。

SFA：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。

Ak：Ak 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 Acti. on K-scale：最大活动程度。

3hour Int.：三小时段。

K Index：K 指数。

Maximum Range D' HnT ZnT：最大幅度。

DAILY RELATIVE SUNSPOT NUMBERS AND SUNSPOT AREAS

JANUARY 1991

		Relative-Numbers			Sunspot Areas					
					Drawing			Photographic		
Day	Gro.	N.H.	S.H.	Sum	N.H.	S.H.	Sum	N.H.	S.H.	Sum
1	12	27	122	149	144	592	736	38	243	281
2	12	27	114	141	114	605	719	54	126	180
3	7	10	68	78	92	550	642	55	210	265
4	10	43	72	115	99	500	599	43	188	231
5	9	27	62	89	89	476	565	44	284	328
6	12	31	93	124	96	534	630	49	396	445
7	10	12	87	99	122	689	811	42	533	575
8	11	31	88	119	876	492	1368	402	408	810
9	8	48	65	113	1878	877	2755	1661	482	2143
10	8	55	54	109	1835	955	2790	1646	673	2319
11	9	53	65	118	1875	556	2431	2059	463	2522
12	8	71	58	129	1761	422	2183	2099	447	2546
13	9	77	70	147	1674	382	2056	2065	243	2308
14	10	56	64	120	1697	432	2129	1944	355	2299
15	8	67	68	135	1621	308	1929	1865	349	2214
16	8	75	84	159	1667	416	2083	1984	297	2281
17	10	67	77	144	1634	572	2206	1847	576	2423
18	10	57	91	148	1914	591	2505	1800	516	2316
19	11	42	93	135	1655	744	2399	2241	621	2862
20	9	35	60	95	1329	600	1929	1121	469	1590
21	13	49	73	122	737	833	1570			
22	10	45	78	123	334	2749	3083	305	1850	2155
23	12	53	116	169	250	2140	2390			
24	14	45	142	187	203	2319	2522	113	1902	2015
25	16	36	173	209	136	2310	2446	140	1553	1693
26	12	46	190	236	196	3274	3470	136	3028	3164
27	13	57	174	231	134	3461	3595	250	3347	3597
28										
29	12	70	176	246	737	4103	4840			
30	12	70	153	223	592	4799	5391	547	5135	5682
31	11	70	225	295	443	5112	5555	271	4549	4820
Mean		48.4	101.8	150.2	864.5	1413.1	2277.6			

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Corre. Area Max	See	Remarks
1.08	671	12-26.8	-21	261	68W	DRO	0.93	63	86	58	4	
	672	12-27.4	-10	253	66W	ESI	0.91	93	110	65	4	
	674	12-28.3	-19	242	51W	DSI	0.78	189	152	115	4	
	679	1- 1.5	-11	186	5E	CSI	0.16	307	156	149	4	
	682	12-31.1	-11	204	13W	BXO	0.25	8	4	2	4	
	683	1- 1.8	-24	182	9E	CRI	0.39	59	32	11	4	
	684	1- 2.6	22	172	20E	BXO	0.52	8	5	2	4	
	686	1- 4.1	8	152	39E	CSO	0.64	177	115	96	4	
	687	1- 3.0	-10	166	23E	BXI	0.40	76	41	11	4	
	688	12-28.7	-25	236	46W	BXO	0.76	8	6	3	4	
	1	12-29.2	1	230	39W	DRO	0.62	38	24	13	4	
	2	1- 1.4	-29	187	5E	BXO	0.45	8	5	2	4	
[illegible].08	671				82W	AXX	0.99	8	28	14	3	
	672				78W	BXI	0.97	13	24	8	3	
	674				64W	CSI	0.91	105	125	110	3	
	679				8W	CSI	0.18	315	160	154	3	
	682				26W	BXI	0.44	13	7	2	3	
	683				4W	CRI	0.36	46	25	7	3	
	686				26E	CRI	0.47	177	100	91	3	
	687				12E	DAI	0.24	278	143	104	3	
	688				58W	AXX	0.87	4	4	4	3	
	1				51W	AXX	0.78	13	10	10	3	
	3	1- 2.3	15	176	3E	BXI	0.31	8	4	2	3	
	4	1- 7.9	-19	101	75E	DRO	0.97	46	89	32	3	
3.09	672				78W	HSX	0.98	59	138	138	3	PLAT
	679				20W	HAX	0.34	269	143	143	3	PLAT
	682				36W	AXX	0.59	8	5	5	3	PLAT
	683				13W	BXO	0.39	17	9	5	3	PLAT
	686				13E	CAO	0.30	176	92	86	3	PLAT
	687				1W	DAI	0.11	290	146	75	3	PLAT
	4				64E	DAO	0.90	97	109	85	3	PLAT
4.25	679				36W	HSX	0.59	193	119	119	4	
	682				54W	BXI	0.80	13	11	4	4	
	683				30W	BXI	0.59	25	16	3	4	
	684				21W	BXO	0.51	8	5	2	4	
	686				3W	CSI	0.21	177	90	80	4	

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Corre. Area Max	See	Remarks
	687				17W	DSI	0.30	492	258	115	4	
	3				29W	AXX	0.54	4	2	2	4	
	4				45E	ERO	0.72	84	61	27	4	
	5	1- 3.2	10	164	15W	AXX	0.34	4	2	2	4	
	6	1- 9.8	-11	77	73E	HSX	0.95	21	35	35	4	
5.06	679				46W	HSX	0.72	156	113	113	3	
	682				64W	DRI	0.90	59	66	28	3	
	683				40W	CRI	0.69	50	35	15	3	
	684				36W	BXO	0.64	8	5	3	3	
	686				13W	CSI	0.31	147	77	71	3	
	687				27W	DSI	0.45	336	188	85	3	
	4				35E	ERO	0.61	67	42	19	3	
	6				62E	HSX	0.89	29	32	32	3	
	7	1- 1.0	9	192	53W	AXX	0.82	8	7	4	3	
6.06	679				60W	DSO	0.86	188	116	87	4	
	682				77W	DSO	0.98	97	227	168	4	
	683				50W	CRI	0.79	38	31	17	4	
	686				26W	CSI	0.47	147	83	76	4	
	687				41W	DSI	0.64	151	99	38	4	
	4				23E	BXO	0.45	21	12	5	4	
	6				49E	HSX	0.75	42	32	32	4	
	7				67W	BXO	0.92	8	11	5	4	
	8	1- 3.5	-6	159	34W	BXI	0.55	13	8	3	4	
	9	1- 4.5	18	147	21W	AXX	0.49	4	2	2	4	
	10	1- 4.7	-17	144	19W	BXO	0.38	8	5	2	4	
	11	1- 4.8	-12	142	16W	AXX	0.31	8	4	2	4	
7.06	679				73W	DSI	0.95	181	302	133	4	
	683				61W	BXI	0.87	13	13	9	4	
	686				39W	CSI	0.66	185	122	97	4	
	687				53W	DSO	0.80	202	170	71	4	
	4				8E	BXO	0.34	17	9	4	4	
	6				35E	HSX	0.57	76	46	46	4	
	8				46W	DRI	0.72	59	43	21	4	
	11				31W	DSI	0.54	168	100	42	4	
	12	1- 6.8	-17	117	4W	AXX	0.24	8	4	2	4	
	13	1- 7.1	-26	122	1E	AXX	0.38	4	2	2	4	
8.08	679				84W	HSX	0.99	13	42	42	3	

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Corre. Area Max	See Remarks
	683				76W	AXX	0.97	8	16	8	3
	686				53W	CSO	0.82	88	76	73	3
	687				67W	DSI	0.92	84	107	43	3
	4				2W	BXI	0.25	13	7	2	3
	6				21E	HSX	0.39	46	25	25	3
	8				61W	BXO	0.89	13	14	5	3
	11				46W	DAC	0.71	387	276	144	3
	12				19W	AXX	0.40	8	5	2	3
	14	1-11.8	7	51	53E	AXX	0.79	8	7	3	3
	15	1-14.3	15	18	74E	EKC	0.95	475	793	617	3
9.07	686				66W	CSO	0.92	88	112	102	3
	687				76W	AXX	0.97	8	16	8	3
	4				15W	BXI	0.36	13	7	2	3
	6				9E	HSX	0.20	55	28	28	3
	11				60W	DAC	0.86	824	813	270	3
	12				32W	BXI	0.56	21	13	3	3
	14				39W	CRO	0.62	29	19	16	3
	15				64E	FKC	0.90	1548	1747	693	3
10.07	686				80W	HSX	0.98	50	118	118	3
	4				28W	BXO	0.52	8	5	2	3
	6				4W	CSO	0.15	50	26	23	3
	11				74W	DAC	0.97	400	767	299	3
	12				46W	BXI	0.72	13	9	3	3
	14				22E	CRI	0.40	46	25	23	3
	15				51E	FKC	0.82	1956	1692	739	3
	16	1-16.1	-7	354	81E	HSX	0.98	63	148	138	3
11.06	4				42W	BXO	0.69	8	6	3	3
	6				17W	CRI	0.31	42	22	18	3
	11				84W	HSX	0.99	46	153	153	3
	12				60W	CRO	0.86	29	29	12	3
	14				9E	CRI	0.24	34	17	11	3
	15				38E	FKC	0.69	2691	1858	981	3
	16				67E	CAI	0.91	261	311	261	3
	17	1-10.4	-33	69	9W	AXX	0.51	8	5	2	3
	18	1-17.5	-13	336	81E	AXX	0.98	13	30	20	3
12.06	6				29W	BXO	0.49	13	7	5	3

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Max	See Remarks
	12				74W	AXX	0.95	8	14	7	3
	14				4W	BXI	0.21	29	15	9	3
	15				26E	FKC	0.54	2931	1742	945	3
	16				54E	DAI	0.80	429	361	149	3
	17				22W	BXO	0.56	13	8	3	3
	18				68E	CRI	0.92	25	32	21	3
	19	1-12.4	15	42	5E	BXO	0.34	8	4	2	3
13.22	4				65W	AXX	0.90	8	9	5	3
	14				19W	BXO	0.38	13	7	2	3
	15				12E	FKC	0.39	3049	1656	1069	3
	16				39E	DAI	0.62	442	282	80	3
	17				36W	BXI	0.69	42	29	9	3
	18				53E	BXI	0.79	13	10	7	3
	19				13W	BXO	0.37	21	11	5	3
	20	1-16.2	-13	353	40E	AXX	0.64	8	5	3	3
	21	1-17.4	-21	337	52E	DRI	0.78	59	47	27	3
14.05	4				76W	AXX	0.97	8	16	8	2
	14				31W	AXX	0.54	8	5	2	2
	15				3E	FKC	0.33	3154	1673	1048	2
	16				28E	DAI	0.46	547	308	118	2
	17				45W	CRI	0.77	42	33	23	2
	18				42E	BXI	0.68	17	11	3	2
	19				26W	CRO	0.52	25	15	7	2
	20				30E	BXO	0.52	8	5	2	2
	21				40E	DRI	0.67	88	59	37	2
	22	1-17.8	27	331	48E	AXX	0.83	4	4	4	2
15.30	14				48W	AXX	0.76	8	6	3	4
	15				14W	FKI	0.41	2902	1594	1056	4
	16				11E	DAI	0.20	509	259	150	4
	17				59W	AXX	0.89	8	9	5	4
	18				25E	BXI	0.43	8	5	2	4
	20				11E	BXI	0.24	8	4	2	4
	21				24E	DRO	0.49	55	31	19	4
	22				34E	CRI	0.71	29	21	12	4
16.09	15				23W	FKI	0.52	2734	1597	1081	3
	16				0W	DAC	0.05	698	349	189	3

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Max	See Remarks
	18				18E	BXI	0.31	21	11	2	3
	19				49W	AXX	0.78	8	7	3	3
	20				1E	BXI	0.15	34	17	13	3
	21				15E	CRI	0.37	59	32	23	3
	22				24E	CAI	0.64	97	63	49	3
	23	1-15.8	-21	358	4W	BXO	0.30	13	7	4	3
17.09	15				35W	FKI	0.63	2431	1569	1140	3
	16				13W	DKC	0.22	854	437	228	3
	18				5E	DRI	0.17	210	107	62	3
	20				12W	BXI	0.25	13	7	4	3
	21				4E	BXI	0.29	17	9	4	3
	22				11E	DRI	0.56	71	43	25	3
	23				18W	AXX	0.40	8	5	5	3
	24	1-20.1	5	301	40E	BXO	0.66	8	6	3	3
	25	1-21.3	-27	285	54E	BXO	0.83	8	7	4	3
	26	1-21.8	21	278	63E	BXI	0.92	13	16	5	3
18.06	15				48W	FKI	0.78	2132	1709	1129	3
	16				26W	DAC	0.44	673	374	164	3
	18				10W	DAI	0.21	378	193	101	3
	20				26W	AXX	0.45	8	5	2	3
	21				9W	BXI	0.31	8	4	2	3
	22				3W	CRI	0.53	55	32	30	3
	23				30W	AXX	0.55	4	3	3	3
	24				26E	AXX	0.46	4	2	2	3
	25				42E	BXO	0.71	17	12	6	3
	26				49E	DSI	0.82	198	171	135	3
19.07	15				60W	FKI	0.89	1245	1337	1129	3
	16				40W	DAI	0.63	530	342	190	3
	18				24W	DAI	0.43	673	372	174	3
	20				40W	AXX	0.64	4	3	3	3
	21				23W	AXX	0.47	8	5	2	3
	22				16W	BXO	0.57	13	8	3	3
	23				44W	AXX	0.71	4	3	3	3
	25				31E	BXI	0.60	13	8	3	3
	26				36E	DAI	0.70	442	310	206	3
	27	1-18.5	-25	321	7W	BXO	0.36	8	5	2	3
	28	1-22.8	-9	265	49E	BXO	0.75	8	6	3	3

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Corre. Area Max	See Remarks
20.10	15				70W	DKI	0.95	643	1073	1052	3
	16				54W	DAI	0.80	244	205	117	3
	18				37W	DAI	0.40	589	371	207	3
	21				36W	AXX	0.62	4	3	3	3
	22				30W	BXO	0.68	13	9	6	3
	23				58W	AXX	0.85	4	4	4	3
	25				16E	AXX	0.46	13	7	5	3
	26				22E	DAI	0.56	408	247	178	3
	29	1-25.1	-10	235	65E	BXI	0.91	8	10	5	3
21.05	15				82W	HHX	0.99	135	445	445	3
	16				67W	DSI	0.92	143	182	54	3
	18				50W	DAI	0.76	433	332	197	3
	22				43W	AXX	0.79	4	3	3	3
	25				3E	AXX	0.38	8	5	2	3
	26				10E	DAI	0.47	412	234	160	3
	29				52E	AXX	0.78	8	7	3	3
	30	1-19.9	-27	303	15W	BXO	0.44	8	5	2	3
	31	1-23.3	-15	259	28E	AXX	0.52	8	5	2	3
	32	1-26.3	25	219	67E	AXX	0.95	4	7	7	3
	33	1-26.7	-8	214	70E	AXX	0.93	4	6	6	3
	34	1-26.8	9	213	74E	CRI	0.97	25	48	40	3
	35	1-27.8	-18	200	77E	DSI	0.97	151	291	121	3
22.06	16				80W	DRI	0.98	42	99	39	4
	18				64W	DSI	0.90	189	214	81	4
	24				26W	AXX	0.46	4	2	2	4
	26				3W	DAI	0.45	463	259	228	4
	31				15E	BXO	0.32	8	4	2	4
	32				52E	AXX	0.86	4	4	4	4
	33				57E	AXX	0.83	4	4	4	4
	34				60E	CRI	0.87	67	69	60	4
	35				71E	FKI	0.94	959	1435	654	4
	36	1-27.8	-9	199	75E	DKI	0.97	517	993	888	4
23.07	18				79W	DSI	0.98	46	108	49	5
	26				16W	DAI	0.52	345	201	167	5
	29				26E	BXI	0.44	8	5	2	5
	31				3E	AXX	0.16	4	2	2	5

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area Whole	Max	See Remarks
	32				41E	BXI	0.77	8	7	3	5
	33				45E	BXI	0.70	8	6	3	5
	34				46E	CRO	0.74	50	37	34	5
	35				58E	FKI	0.83	1194	1064	487	5
	36				64E	FKI	0.89	854	917	872	5
	37	1-24.3	11	245	13E	BXO	0.36	8	5	2	5
	38	1-24.4	-11	244	13E	BXI	0.23	13	6	2	5
	39	1-29.0	-13	184	76E	HSX	0.97	17	32	32	5
24.08	26				28W	CAI	0.62	273	174	164	4
	28				17W	BXO	0.30	8	4	2	4
	29				13E	BXI	0.24	8	4	2	4
	31				11W	BXO	0.28	8	4	2	4
	32				29E	BXI	0.66	17	11	3	4
	33				33E	BXO	0.54	8	5	2	4
	34				34E	BXI	0.59	25	16	5	4
	35				45E	FKI	0.71	1682	1199	629	4
	36				51E	FKI	0.76	1367	1049	1023	4
	37				3E	AXX	0.29	4	2	2	4
	38				4E	AXX	0.10	8	4	2	4
	39				64E	CSO	0.89	38	41	36	4
	40	1-24.4	-19	244	4E	BXO	0.25	8	4	2	4
	41	1-25.8	-12	226	24E	BXO	0.40	8	5	2	4
25.07	26				40W	CAI	0.74	164	121	112	5
	28				30W	AXX	0.49	8	5	2	5
	29				1E	BXO	0.07	8	4	2	5
	31				23W	AXX	0.41	4	2	2	5
	32				16E	BXI	0.56	13	8	3	5
	33				20E	BXO	0.34	8	4	2	5
	34				22E	BXI	0.45	13	7	2	5
	35				34E	FKI	0.57	2061	1259	753	5
	36				37E	FKI	0.60	1489	928	850	5
	39				50E	CSO	0.75	63	47	44	5
	40				10W	BXI	0.28	13	7	2	5
	41				10E	BXO	0.20	8	4	2	5
	42	1-20.1	-6	302	66W	AXX	0.91	8	10	10	5
	43	1-25.8	-21	226	10E	AXX	0.31	8	4	2	5
	44	1-31.2	-16	155	78E	AXX	0.97	4	8	8	5
	45	2- 1.2	-13	142	87E	AXX	0.99	8	28	28	5

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See	Remarks
26.08	26				52W	CAI	0.85	164	156	140	3	PLAT
	31				30W	AXX	0.50	8	5	2	3	PLAT
	32				3E	BXI	0.51	34	20	2	3	PLAT
	33				7E	BXI	0.14	21	11	2	3	PLAT
	34				10E	BXI	0.31	38	20	2	3	PLAT
	35				20E	FKI	0.39	1913	1037	662	3	PLAT
	36				22E	EKI	0.39	1615	876	809	3	PLAT
	39				37E	CAI	0.61	84	53	32	3	PLAT
	40				21W	BXO	0.41	8	5	2	3	PLAT
	42					AXX		4			3	PLAT
	44				67E	AXX	0.91	4	5	5	3	PLAT
	45				80E	DAO	0.98	547	1282	690	3	PLAT
27.07	26				65W	HAX	0.93	50	69	63	3	
	32				10W	BXI	0.54	29	17	7	3	
	33				5W	BXI	0.09	8	4	2	3	
	34				4W	BXI	0.26	34	17	7	3	
	35				9E	FKI	0.28	2288	1190	759	3	
	36				10E	FKI	0.20	1388	708	609	3	
	39				23E	CRO	0.40	55	30	25	3	
	40				36W	BXO	0.61	8	5	3	3	
	44				54E	HRX	0.80	21	18	18	3	
	45				67E	EKI	0.91	1199	1431	813	3	
	46	1-28.5	12	190	20E	CRI	0.46	55	31	12	3	
	47	1-29.9	-12	172	36E	BXI	0.60	8	5	3	3	
	48	2- 2.4	-16	125	84E	HSX	0.99	21	70	70	3	
28.00		Not Available										
29.06	32				38W	AXX	0.74	8	6	3	4	
	34				30W	DRI	0.56	202	122	74	4	
	35				18W	FKI	0.36	2305	1233	815	4	
	36				16W	EKI	0.29	1304	681	575	4	
	39				1W	DSI	0.15	282	142	49	4	
	44				27E	HRX	0.47	29	17	17	4	
	45				40E	EKC	0.63	2742	1769	993	4	
	46				7W	DSI	0.32	404	213	151	4	
	47				10E	BXI	0.22	13	6	2	4	

DAILY SUNSPOT OBSERVATIONS

JANUARY 1991

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See	Remarks
	48				57E	DSO	0.83	286	255	135	4	
	49	2- 2.9	20	119	63W	EAI	0.91	320	382	301	4	
	50	2- 3.6	4	110	73E	AXX	0.95	8	14	7	4	
30.14	32				52W	BXO	0.85	8	8	4	3	
	34				44W	BXO	0.70	29	21	9	3	
	35				32W	FKI	0.53	1989	1172	822	3	
	36				29W	DKI	0.47	1123	637	298	3	
	39				15W	EAC	0.30	976	511	119	3	
	44				14E	HRX	0.29	46	24	22	3	
	45				26E	FKC	0.45	3848	2152	1240	3	
	46				21W	DAI	0.45	324	181	122	3	
	47				3W	BXI	0.11	8	4	2	3	
	48				43E	DSO	0.69	433	299	163	3	
	49				49E	EAI	0.82	412	357	247	3	
	50				59E	BXI	0.86	25	25	12	3	
31.08	34				58W	BXI	0.84	34	31	4	3	PLAT
	35				42W	FKI	0.67	1379	925	711	3	PLAT
	36				41W	EKI	0.66	963	637	320	3	PLAT
	39				26W	FKI	0.43	1842	1017	464	3	PLAT
	44				4E	BXI	0.17	17	8	4	3	PLAT
	45				15E	FKC	0.28	4424	2303	2282	3	PLAT
	46				32W	CAI	0.60	139	87	57	3	PLAT
	47				15W	BXO	0.26	8	4	2	3	PLAT
	48				32E	DSO	0.54	366	218	112	3	PLAT
	49				40E	EAI	0.74	416	307	155	3	
	50				46E	BXI	0.72	25	18	6	3	

H-ALPHA SOLAR FLARES

JANUARY 1991

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
3	BEIJ	0620E	0620	0630D	S13	194	W31	.540	168	2.1	1F	P	682	E
3	BEIJ	0629E	0629	0630D	S22	161	E 2	.310	42	0.5	SF	P		DG
4	BEIJ	0435E	0435	0450D	N16	156	W 6	.322	252	2.8	1N	P	693	E
4	BEIJ	0645E	0645	0645D	N10	148	E 2	.241	84	0.9	SF	P	686	E
4	BEIJ	0711E	0711	0711D	S26	184	W34	.621	168	2.2	1F	P	683	E
6	YUNN	0235	0302	0324	S18	100	E25	.475	157	1.9	SN	C	4	F
8	YUNN	0258	0335	0350	S10	146	W48	.747	47	0.7	SF	C	11	E
9	URUM	0500E	0502	0535D	N 2	51	E33	.552	177	2.2	1N	C		E
9	URUM	0512	0515	0535	S11	149	W66	.908	48		SF	C	11	E
9	URUM	0818E	0818U	0826D	S14	148	W66	.912	48		SN	C	11	E
10	URUM	0450E	0450	0458	N11	11	E60	.881	241	5.3	2N	C	15	E
10	URUM	0510	0518	0600	N20	17	E53	.845	241	4.7	1N	C	15	E
11	YUNN	0635E	0652	0727	N20	10	E47	.783	126	2.1	1N	P	15	
11	BEIJ	0636	0651	0701	N19	12	E45	.770	84	1.4	SN	P	15	D
11	YUNN	0702	0707	0736	S10	347	E70	.939	16		SN	C	16	
12	YUNN	0304E	0311	0330	N17	19	E27	.558	126	1.6	SN	P	15	
12	BEIJ	0347	0352	0402	S 6	350	E55	.816	189	3.4	1N	P	16	E
12	BEIJ	0435	0445	0451	N13	45	0	.299	105	1.1	SN	P	19	D
12	URUM	0800	0803	0855	S 7	351	E51	.776	177	2.9	1B	C	16	E
12	YUNN	0808	0815	0845	S 8	352	E51	.780	157	2.6	1N	C	16	
13	BEIJ	0121	0125	0135	S 6	352	E41	.644	147	2.0	SN	P	16	E
13	BEIJ	0215	0218	0223	S 6	352	E41	.644	168	2.3	1N	P	16	E
13	BEIJ	0514	0515	0521	N11	27	E 4	.287	168	1.8	SN	P	15	D
13	BEIJ	0713	0720	0733	S 6	352	E38	.644	357	4.8	1B	P	16	E
13	BEIJ	0721	0723	0726	N11	27	E 3	.287	126	1.4	SF	P	15	D
14	BEIJ	0310	0311	0317	N10	30	W10	.310	84	0.9	SF	P	15	D
15	BEIJ	0535	0540	0553	N29	327	E37	.747	63	1.0	SN	P	22	D
15	URUM	0535	0541	0612	N27	329	E36	.726	96	1.4	SB	C	22	E
15	BEIJ	0645	0654	0700D	N29	327	E37	.747	84	1.3	SN	P	22	E

H-ALPHA SOLAR FLARES

JANUARY 1991

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
15	URUM	0752	0759	0819	N28	328	E36	.734	64	1.0	SN	C	22	E
15	URUM	0819	0820	0835	S 4	353	E10	.176	209	2.2	1N	C	16	E
15	YUNN	0830E	0831U	0854	S 7	353	E10	.179	79	0.8	SN	P	16	
15	URUM	0850	0854	0900	N 5	50	W47	.746	129	2.0	SF	C	14	D
18	YUNN	0350E	0405	0425	S13	338	W12	.248	79	0.9	SN	P	18	
21	YUNN	0254	0306	0312	S18	207	E80	.981	63		SN	C	35	
21	YUNN	0602E	0602	0614	S10	338	W52	.788	24	0.4	SN	P	18	
21	YUNN	0636	0649	0705	S20	206	E79	.979	16		SN	C	35	
22	YUNN	0210	0211	0222	S13	336	W61	.871	157	3.3	1N	C	18	
22	YUNN	0249	0257	0304	S 8	203	E71	.945	110		1N	C	36	
22	YUNN	0256	0258	0304	S20	203	E71	.944	157		1N	C	35	
22	YUNN	0313	0314	0326	S17	205	E69	.932	189		1N	C	35	
22	URUM	0346E	0347	0405	S10	201	E72	.948	16		SN	C	36	D
22	YUNN	0530	0550	0601D	S14	337	W64	.893	189	4.3	1N	P	18	
23	YUNN	0134E	0135	0151	S13	351	W89	1.				P	18	A
23	URUM	0815	0816	0819	S12	196	E62	.877	113	2.4	1N	C	36	E
24	YUNN	0226	0233	0242	S15	206	E42	.673	94	1.3	SN	C	35	
24	BEIJ	0227	0230	0240	S14	208	E40	.678	126	1.8	SN	P	35	E
24	YUNN	0330	0339	0349	S14	203	E45	.703	110	1.6	SN	C	35	
24	BEIJ	0335	0338	0400	S14	207	E41	.678	92	1.3	SN	C	35	D
24	YUNN	0707	0710U	0710D	S14	204	E42	.670	47	0.7	SN	P	35	
24	BEIJ	0708	0710	0723	S24	203	E43	.678	147	2.1	1F	C	35	E
24	YUNN	0811	0815	0815D	S20	210	E35	.605	47	0.6	SB	P	35	
25	YUNN	0249	0318	0350D	S13	152	E83	.990				P	45	A
25	YUNN	0303	0305	0325	S18	193	E42	.680	47	0.7	SN	C	35	
25	YUNN	0407E	0407	0420	S20	210	E24	.467	31	0.4	SB	P	35	
25	YUNN	0443	0450	0515	S 9	145	E89	1.			S	C	45	A
25	YUNN	0502E	0502	0510	S19	195	E39	.652	47	0.6	SN	P	35	
25	BEIJ	0623	0647	0658	S12	143	E90	1.	105		1N	P	45	D
25	BEIJ	0655	0659	0715	S21	212	E21	.437	84	1.0	SF	C	35	D
25	URUM	0749E	0800	0808	S 7	196	E36	.584	32	0.4	SN	C	36	D
26	BEIJ	0407	0412	0429	S15	196	E25	.448	168	1.9	SN	C	36	D

H-ALPHA SOLAR FLARES

JANUARY 1991

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
26	URUM	0410	0414	0420	S15	196	E24	.431	48	0.6	SF	C	36	D
26	BEIJ	0555	0605	0627	S15	196	E25	.448	63	0.7	SF	C	36	D
27	BEIJ	0325	0332	0336	S11	195	E12	.218	126	1.3	SF	C	36	E
27	BEIJ	0330	0333	0335	N13	189	E18	.414	42	0.5	SF	C	46	D
27	BEIJ	0520	0522	0525	S18	199	E 8	.253	42	0.5	SN	C	35	D
27	BEIJ	0536	0542	0546	S10	141	E66	.908	84		SN	P	45	E
30	YUNN	0414E	0414U	0427	N 9	214	W46	.748	173	2.7	1B	P	34	
30	URUM	0851	0854	0934	S10	201	W36	.585	273	3.5	1B	C	36	F
31	BEIJ	0155	0158	0223	N20	108	E48	.805	505	8.8	2B	C	49	E
31	BEIJ	0157	0207	0304	S17	192	W36	.586	988	12.6	3B	C	35	E

INTERVALS OF H-ALPHA FLARE PATROL OBSERVATION

JANUARY 1991

Day	From	To	From	To	From	To	From	To	From	To	From	To	From	To
1	125	735												
2	140	752												
3	100	640												
4	125	758												
5	205	715	727	821										
6	106	127	137	650										
7	125	705	734	737	750	758								
8	105	358	450	720	737	825								
9	222	545	655	701	818	826								
10	200	615	624	824										
11	225	355	550	807										
12	115	735	745	930										
13	103	820												
14	100	715												
15	230	916												
16	217	555												
17	304	310	445	705										
18	152	423	519	547	607	620	712	734						
19	126	154	620	727										
20	152	226	550	607										
21	203	323	447	822	834	854								
22	151	510	528	601	706	850								
23	134	224	311	804	811	847								
24	100	855												
25	30	730	749	830										
26	55	710	813	825										
27	120	748												
28														
29														
30	250	630	826	934										
31	405	635												

Combined reports from the observatories listed below:

BEIJ YUNN URUM

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

SEPTEMBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
LATE DATA					
1	1.3	195	-25	66	D4,V4,S5,L5,D5,V5
		194	-7	72	D4,V4,S5,L5,D5,V5
		198	-16	357	D4,V4,S5,L5,D5,V5
		199	-13	340	D4,V4,S5,L5,D5,V5
		196	12	29	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		200	15	327	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		201	-12	315	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
2	348.1	196			S5, L5
		200			S5, L5
		201			S5, L5
4	321.7	199			S5, L5
		196			D4,V4,S5,L5,D5,V5
		200			D4,V4,S5,L5,D5,V5
		201			D4,V4,S5,L5,D5,V5
		202	-15	285	D4,V4,S5,L5,D5,V5
		203	17	270	D4,V4,S5,L5,D5,V5
		204	2	264	D4,V4,S5,L5,D5,V5
5	308.5	199			S5, L5
		196			S5, L5
		200			S5, L5
		201			S5, L5
		202			S5, L5
		203			S5, L5
		204			S5, L5
		205	12	235	S5, L5
6	295.3	199			S5, L5
		196			S5, L5
		200			S5, L5
		201			S5, L5
		202			S5, L5
		203			S5, L5
		204			S5, L5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

SEPTEMBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		205			S5, L5
9	255.7	200			S5, L5
		201			S5, L5
		202			S5, L5
		204			D4,V4,S5,L5,D5,V5
		205			D4,V4,S5,L5,D5,V5
		206	7	210	D4,V4,S5,L5,D5,V5
		207	16	201	D4,V4,S5,L5,D5,V5
		203			D4,V4,S5,L5,D5,V5
10	242.5	200			S5, L5
		201			D4,V4,S5,L5,D5,V5
		202			D4,V4,S5,L5,D5,V5
		204			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		205			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		206			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		207			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		203			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		208	-11	175	D4,V4,S5,L5,D5,V5,T5,Q5,U5
11	229.3	204			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		205			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		206			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		207			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		203			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		208			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
12	216.1	204			S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		205			S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		206			S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		207			S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		203			S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		208			S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		209	-12	147	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		210	11	152	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		211	22	134	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		212	-15	201	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		213	-29	144	S4,L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

SEPTEMBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
13	202.9	204			S5, L5
		205			S5, L5
		206			S5, L5
		207			S5, L5
		203			S5, L5
		208			S5, L5
		209			S5, L5
		210			S5, L5
		211			S5, L5
		212			S5, L5
		213			S5, L5
14	189.6	204			S5, L5
		205			S5, L5
		206			S5, L5
		207			S5, L5
		208			S5, L5
		209			S5, L5
		210			S5, L5
		211			S5, L5
		212			S5, L5
		213			S5, L5
15	176.4	208			S5, L5
		209			S5, L5
		210			S5, L5
		211			S5, L5
		212			S5, L5
		213			S5, L5
16	163.3	208			S5
		209			S5
		210			S5
		211			S5
		212			S5
		213			S5
17	150.1	208			D4,S5,L5,D5,T5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

SEPTEMBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		209			L4,D4,S5,L5,D5,T5,Q5,U5
		210			L4,D4,S5,L5,D5,T5,Q5,U5
		211			L4,D4,S5,L5,D5,T5,Q5,U5
		212			L4,D4,S5,L5,D5,T5,Q5,U5
		213			L4,D4,S5,L5,D5,T5,Q5,U5
		215	-9	99	L4,D4,S5,L5,D5,T5,Q5,U5
18	136.9	208			S5, L5
		209			S4,S5,L5,V5,T5,Q5,U5
		210			S4,L4,S5,L5,V5,T5,Q5,U5
		211			S4,L4,S5,L5,V5,T5,Q5,U5
		213			S4,L4,S5,L5,V5,T5,Q5,U5
		215			S4,L4,V4,S5,L5,V5,T5,Q5,U5
19	123.7	208			S5, L5
		209			S5,L5,T5,Q5,U5
		210			S5,L5,V5,T5,Q5,U5
		211			S5,L5,V5,T5,Q5,U5
		215			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		216	-9	79	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		217	-25	51	D4,V4,S5,L5,D5,V5,T5,Q5,U5
21	97.3	208			S5, L5, V5
		209			S5, L5, V5
		210			D4,V4,S5,L5,D5,V5
		211			D4,V4,S5,L5,D5,V5
		215			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		216			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		217			L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		218	15	29	L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
23	70.9	209			S5, L5
		210			D4,V4,S5,L5,D5,V5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

SEPTEMBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		211			D4,V4,S5,L5,D5,V5
		215			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		216			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		217			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		218			S4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		220	-7	358	S4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
24	57.7	215			D4,V4,S5,L5,D5,V5
		216			D4,V4,S5,L5,D5,V5
		217			D4,V4,S5,L5,D5,V5
		218			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		220			D4,V4,S5,L5,D5,V5,T5,Q5,U5
27	18.1	216			S5, L5
		217			S5, L5
		218			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		220			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		221	-14	344	D4,V4,S5,L5,D5,V5,T5,Q5,U5
28	4.9	217			S5, L5
		218			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		220			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		221			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		222	-15	30	D4,V4,S5,L5,D5,V5,T5,Q5,U5
29	351.7	217			S5, L5
		218			D4,V4,S5,L5,D5,V5
		220			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		221			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		222			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		223	11	343	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		224	-12	325	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		225	-16	286	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		226	14	58	D4,V4,S5,L5,D5,V5,T5,Q5,U5
30	338.5	217			S5, L5
		218			S5, L5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

SEPTEMBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		220			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		221			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		222			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		223			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		224			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		225			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		226			D4,V4,S5,L5,D5,V5,T5,Q5,U5

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1 10 14 19 21 23 29 30

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

OCTOBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
1	325.3	218	15	29	D4,V4,S5,L5,D5,V5
		220	-7	358	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		221	-14	344	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		222	-15	30	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		224	-4	315	L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		225	-16	286	L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		227	34	256	L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		223	11	343	L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
		228	21	254	L4,D4,V4,S5,L5,D5,V5,T5,Q5,U5
2	312.1	218			S5, L5
		220			D4,V4,S5,L5,D5,V5
		221			D4,V4,S5,L5,D5,V5
		224			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		225			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		227			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		223			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		228			D4,V4,S5,L5,D5,V5,T5,Q5,U5
3	298.9	218			D4,V4,S5,L5,D5,V5
		220			D4,V4,S5,L5,D5,V5
		224			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		225			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		227			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		228			D4,V4,S5,L5,D5,V5,T5,Q5,U5
4	285.7	218			D4,V4,S5,L5,D5,V5
		220			D4,V4,S5,L5,D5,V5
		224			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		225			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		227			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		228			D4,V4,S5,L5,D5,V5,T5,Q5,U5
		229	12	228	D4,V4,S5,L5,D5,V5,T5,Q5,U5
		230	-15	213	D4,V4,S5,L5,D5,V5,T5,Q5,U5
5	272.5	231	-15	254	S5
6	259.3	224			L5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

OCTOBER 1990 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		225			L5
		227			L5
		228			L5
		229			L5
		230			L5
		231			L5
7	246.1	224			S5
		225			S5
		227			S5
		228			S5
		229			S5
		230			S5
		231			S5
		232	12	157	S5
		233	-13	178	S5
		234	-23	190	S5
8	232.9	224			S5
		225			S5
		228			S5
		229			S5
		230			S5
		231			S5
		232			S5
		233			S5
		234			S5
9	219.7	228			S5
		229			S5
		230			S5
		231			S5
		232			S5
		233			S5
		234			S5
		235	-16	141	S5

SOLAR RADIO EMISSION FLUX

JANUARY 1991

Day	BEIJ 2840	PURP 2700	URUM 9375	YUNN 2840
1	199		308	193
2	205		301	190
3	196		311	173
4	191		313	170
5	187		321	176
6	202		328	178
7	208		330	184
8	238		345	240
9	235		374	234
10	239		369	231
11	243		369	230
12	231		348	216
13	224		309	195
14	211		336	206
15	200		303	204
16	204		326	195
17	204		326	182
18	203		323	172
19	224		329	182
20	212		333	197
21	228		336	190
22	227		371	203
23	237		394	224
24	264		422	230
25	287		415	257
26	298		427	256
27	334		439	288
28	360		441	
29	353		470	311
30	385		499	382
31	387		578	383
Mean	245.7		367.5	222.4

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JANUARY 1991

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Peak	Density Rel	Density Mean
04	2840	BEIJ	5 S	0428.0	0433.5	47.0	45.0	23.6	
05	2840	BEIJ	45 C	0126.0	0126.8	1.0	13.3	7.1	
08	2840	BEIJ	5 C	0214.0	0219.1	8.0	17.8	7.5	
08	2840	BEIJ	47 GB	0357.0	0429.7	54.0	712.3	299.3	
08	9375	URUM	47 GB	0415.0	0431.3	45.0	918.3	266.3	
08	2840	YUNN	49 GB	0421.0	0429.9	31.0	599.0		
09	2840	BEIJ	1 S	0222.5	0223.0	2.0	7.3	3.1	
10	2840	BEIJ	46 C	0509.0	0511.2	8.0	153.0	64.0	
10	9375	URUM	46 C	0509.0	0511.5	24.0	228.5	61.9	
10	2840	YUNN	46 C	0511.0	0512.0	9.0	126.2		
10	2840	BEIJ	29 PBI	0517.0		14.0	16.9	7.1	
11	9375	URUM	4 S/F	0646.5	0647.0	5.1	24.6	6.7	
11	2840	BEIJ	45 C	0647.0	0653.0	20.0	138.8	57.1	
11	2840	YUNN	46 C	0649.4	0653.3	14.6	114.4		
11	2840	BEIJ	5 S	0748.0	0749.2	3.0	13.3	5.5	
11	2840	YUNN	6 S	0748.8	0749.2	1.2	20.7		
12	2840	BEIJ	1 S	0638.0	0639.6	3.0	7.6	3.3	
12	2840	BEIJ	3 S	0700.0	0708.1	19.0	28.3	12.2	
12	9375	URUM	3 S	0816.8	0817.4	3.5	16.3	4.9	
12	9375	URUM	3 S	0825.8	0826.7	4.4	21.8	6.3	
13	2840	BEIJ	3 S	0330.0	0333.1	14.0	59.7	26.7	
13	2840	BEIJ	5 S	0402.0	0402.6	3.0	31.8	14.2	
13	2840	YUNN	45 C	0717.1	0718.7	7.1	103.1		
15	2840	BEIJ	5 S	0534.0	0535.5	3.0	10.3	5.1	
15	2840	BEIJ	1 S	0630.0	0631.4	5.0	3.4	1.7	
16	2840	BEIJ	1 S	0611.0	0611.7	4.0	7.2	3.5	
17	2840	BEIJ	5 S	0555.0	0556.2	4.0	10.1	4.9	
17	9375	URUM	3 S	0954.5	0954.7	1.3	14.5	4.4	
18	2840	BEIJ	5 S	0404.0	0406.0	8.0	14.7	7.2	
18	2840	YUNN	22 GRF	0404.8	0406.8	4.1	14.0		
18	2840	BEIJ	1 S	0511.0	0512.1	5.0	4.4	2.2	
20	2840	BEIJ	45 C	0127.0	0128.6	4.0	8.0	3.8	
20	2840	BEIJ	20 GRF	0150.0	0151.2	13.0	6.5	3.1	
20	2840	BEIJ	45 C	0712.0	0715.6	15.0	66.9	31.5	
21	2840	BEIJ	45 C	0625.0	0638.4	25.0	159.3	69.9	
21	2840	YUNN	3 S	0626.5	0628.0	7.3	42.1		
21	2840	YUNN	3 S	0637.5	0638.5	6.1	145.0		
22	9375	URUM	46 C	0546.7	0547.6	4.7	132.4	35.7	
22	2840	YUNN	3 S	0546.8	0547.7	12.2	39.0		
22	2840	BEIJ	46 C	0547.0	0547.8	4.0	49.8	30.0	

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JANUARY 1991

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Peak	Density Rel	Mean
24	2840	BEIJ	47 GB	0300.0	0403.2	124.0	1756.0	665.0	
24	9375	URUM	45 C	0319.0	0321.3	10.4	183.4	43.4	
24	2840	YUNN	47 GB	0319.3	0404.0	90.7	891.9		
24	9375	URUM	28 PRE	0337.7	0339.3	8.3	182.3	43.2	
24	9375	URUM	47 GB	0346.0	0401.5	56.0	1000.0D	236.8D	
24	9375	URUM	4 S/F	0813.8	0814.3	2.8	33.1	7.8	
24	9375	URUM	3 S	0903.4	0903.8	2.6	33.1	7.8	
25	9375	URUM	4 S/F	0437.5	0438.3	1.5	87.2	21.0	
25	9375	URUM	4 S/F	0454.5	0457.5	4.5	54.5	13.1	
25	9375	URUM	47 GB	0623.0	0630.0	77.0	1000.0D	241.0	
25	2840	BEIJ	47 GB	0629.0	0639.0E				
25	2840	BEIJ	47 GB	0629.0	0722.0D	86.0D	1129.0	393.0	
26	2840	BEIJ	5 S	0357.0	0358.3	4.0	15.0	5.0	
26	9375	URUM	3 S	0357.3	0357.8	1.2	16.2	3.8	
26	9375	URUM	4 S/F	0409.0	0410.0	3.0	21.7	5.1	
26	2840	BEIJ	45 C	0413.0	0418.3	19.0	31.2	10.5	
26	9375	URUM	4 S/F	0538.9	0539.7	1.0	22.7	5.3	
26	9375	URUM	4 S/F	0554.4	0554.7	3.9	22.7	5.3	
26	9375	URUM	4 S/F	0842.7	0843.9	17.3	75.8	17.7	
27	9375	URUM	4 S/F	0805.8	0810.7	16.2	113.5	25.9	
28	2840	BEIJ	46 C	0120.0	0135.7	32.0	243.4	67.6	
28	9375	URUM	4 S/F	0311.5	0312.2	1.5	15.3	3.5	
28	2840	BEIJ	20 GBF	0639.0	0643.2	21.0	7.1	2.0	
28	9375	URUM	3 S	0704.9	0706.0	10.1	49.0	11.1	
29	9375	URUM	23 GRF	0645.0	0650.5	193.0	212.1	45.1	
29	2840	BEIJ	45 C	0713.0	0713.5	4.0	21.4	6.5	
30	2840	BEIJ	1 S	0411.0	0413.9	10.0	11.0	2.9	
30	2840	YUNN	46 C	0846.7	0854.5	17.5	468.5		
30	9375	URUM	47 GB	0848.0	0854.0D	40.0	700.0D	140.0D	
31	2840	BEIJ	28 PRE	0116.0	0153.0	37.0	32.2	8.3	
31	2840	YUNN	47 GB	0135.8	0204.6	140.3	543.8		
31	2840	BEIJ	47 GB	0153.0	0204.3	180.0	821.1	202.2	
31	2840	BEIJ	29 PBI	0453.0		159.0	87.2	22.5	
31	9375	URUM	3 S	0818.5	0819.0	2.5	50.9	8.8	

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JANUARY 1991

Day	BEIJ From To 2840	PURP From To 2700	URUM From To 9375	YUNN Form To 2840
1	0033 0647		0210 0945	0110 0800
2	0034 0718		0210 0945	0030 0920
3	0047 0650		0210 0941	0030 0910
4	0047 0750		0230 0925	0030 0900
5	0045 0717		0310 0950	0030 0820
6	0040 0754		0215 0937	0110 0800
7	0011 0750		0225 0945	0054 0910
8	0042 0751		0210 0942	0010 0910
9	0040 0750		0210 1005	0015 0900
10	0050 0745		0220 1010	0010 0900
11	0040 0745		0230 0955	0015 0900
12	0051 0721		0210 0930	0010 0800
13	0042 0612		0210 1010	0100 0900
14	0047 0738		0230 0917	0020 0900
15	0047 0751		0210 0920	0020 0900
16	0046 0746		0159 0925	0020 0900
17	0043 0749		0215 1011	0020 0900
18	0047 0750		0150 1000	0015 0900
19	0045 0720		0220 0800	0015 0800
20	0030 0755		0400 0540	0200 0630

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JANUARY 1991

Day	BEIJ From	BEIJ To	PURP From	PURP To	URUM From	URUM To	YUNN From	YUNN To
	2840		2700		9375		2840	
21	0052	0736			0250	0320	0020	0900
22	0040	0745			0240	0603	0100	0900
23	0045	0747			0225	0945	0030	0900
24	0046	0745			0220	1010	0030	0900
25	0059	0755			0205	0945	0020	0600
26	0044	0715			0215	0952	0130	0800
27	0037	0803			0215	0945	0140	0630
28	0047	0715			0220	1020		
29	0057	0743			0220	0958		
30	0042	0745			0205	1014	0130	0940
31	0044	0747			0215	1036	0115	0855

COSMIC RAY NEUTRON INTENSITY

Real Counts: 256 Times (Tabulated Counts Plus 1500)

JAN 1991 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	461	473	468	472	474	491	488	493	484	480	483	482	488	479	479	483	488	470	477	490	480	473	486	478	480.0	24
2	473	488	488	502	482	496	486	485	488	489	477	482	485	481	483	468	474	482	473	479	490	482	488	485	483.6	24
3	482	484	484	486	478	489	507	487	502	502	491	487	496	497	495	471	478	476	477	480	488	487	488	482	487.3	24
4	482	490	474	495	486	493	490	494	470	474	478	479	482	484	485	480	484	492	493	493	485	493	489	482	485.3	24
5	491	487	485	490	490	489	482	473	474	482	475	486	480	483	488	478	481	478	479	480	481	478	489	487	482.8	24
6	483	491	493	499	497	495	488	493	497	507	488	498	495	486	488	481	481	490	493	495	501	488	501	492	492.5	24
7	499	489	490	489	488	491	491	480	499	486	493	486	491	495	492	496	508	488	493	497	497	508	501	500	493.6	24
8	507	497	499	493	501	493	489	486	495	482	485	490	494	493	502	498	498	490	505	499	496	498	494	501	495.2	24
9	487	501	493	487	499	483	486	489	483	481	483	487	482	489	487	491	490	466	477	486	488	491	495	489	487.1	24
10	487	486	488	491	485	487	487	482	482	496	484	482	490	488	488	488	494	488	498	491	496	494	493	492	489.0	24
11	501	493	480	481	493	484	489	480	476	483	500	487	490	486	495	506	490	487	496	508	505	499	500	481	491.3	24
12	496	495	482	484	484	478	475	478	478	483	480	490	487	487	490	490	499	506	496	495	497	489	494	475	487.8	24
13	494	486	489	497	506	502	518	504	499	496	492	477	492	490	490	494	490	498	483	494	500	495	489	496	494.6	24
14	496	504	500	495	491	506	504	487	497	488	478	489	498	493	494	490	492	491	493	492	493	490	495	501	494.0	24
15	498	503	496	504	506	504	501	499	499	497	500	485	503	488	481	479	481	476	487	487	486	492	510	497	494.1	24
16	491	501	488	501	504	495	496	492	503	491	499	488	497	487	494	508	496	495	494	496	496	496	489	484	495.0	24
17	484	489	476	485	484	478	483	477	483	472	485	485	492	493	488	481	484	476	484	480	487	495	480	480	483.4	24
18	477	471	477	476	465	472	475	485	472	481	476	474	477	483	473	477	473	484	474	487	482	479	479	465	476.4	24
19	476	481	479	474	473	477	478	475	476	473	476	487	474	480	474	476	486	481	480	472	487	483	478	487	478.5	24
20	484	491	478	483	486	475	488	485	491	487	482	483	483	497	483	491	489	488	485	492	495	492	492	484	486.8	24
21	489	474	479	488	484	481	484	482	481	483	487	496	491	498	496	496	494	485	491	487	482	492	488	480	487.0	24
22	483	489	492	487	487	497	489	485	488	480	485	485	486	478	485	480	477	463	469	472	470	481	476	476	481.7	24
23	475	474	473	473	471	465	465	466	472	468	472	469	468	470	463	476	476	481	481	480	473	470	482	488	473.0	24
24	490	485	486	479	477	472	464	467	470	483	490	485	487	492	487	494	492	485	477	486	483	482	485	489	482.8	24
25	486	491	499	485	486	480	483	480	466	467	472	470	460	461	470	462	465	473	472	469	479	479	480	480	475.6	24
26	479	483	477	476	473	479	474	469	465	481	465	461	471	470	478	471	468	475	480	471	483	491	482	474	474.8	24
27	472	482	466	477	472	474	483	475	475	476	467	466	477	487	473	479	479	477	483	473	485	485	489	487	477.5	24
28	483	477	481	487	474	475	485	483	480	471	485	477	476	485	478	483	474	485	473	479	481	476	484	472	479.3	24
29	470	480	470	471	483	471	480	473	480	473	463	478	482	479	484	475	478	493	481	484	482	489	487	477	478.5	24
30	489	486	471	480	471	477	481	478	478	476	470	487	485	481	489	482	482	485	484	485	497	488	493	478	482.2	24
31	485	479	476	483	474	477	465	467	474	473	471	467	471	461	467	469	465	462	472	460	464	461	465	446	468.9	24

MONTHLY MEAN=484.503

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE:484.503

(1-12)	0.98	2.59	-1.37	1.63	0.14	0.21	1.11	-2.28	-1.37	-1.89	-2.83	-2.41
(13-24)	0.34	0.05	-0.02	-0.86	-0.44	-1.73	-0.63	0.63	2.88	2.47	3.92	-1.12

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

U.T.=(1 1.53 -0.42 1.59 22.97) (2 0.17 0.01 0.17 0.16) (3 -0.44 -1.05 1.14 5.49) (4 -0.34 0.25 0.42 2.39)

L.T.=(1 -0.40 1.54 1.59 6.97) (2 -0.07 -0.16 0.17 8.16) (3 -0.44 -1.05 1.14 5.49) (4 -0.05 -0.42 0.42 4.39)

COSMIC RAY MESON INTENSITY
VERTICAL COMPONENT
Real Counts: 128 Times (Tabulated Counts Plus 3000)

JAN 1991

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	100	103	94	99	104	99	101	100	95	112	100	99	98	93	97	101	113	100	100	106	94	103	97	95	100.1	24
2	102	108	116	117	104	111	117	112	106	113	93	107	105	94	98	100	114	102	101	101	104	95	87	110	104.9	24
3	113	111	114	123	124	127	126	120	123	114	115	129	117	127	101	110	120	103	108	106	107	97	90	102	113.6	24
4	116	92	101	120	126	120	120	114	108	115	106	109	112	115	117	107	114	117	107	124	121	111	105	120	113.2	24
5	125	132	129	130	133	133	136	135	131	121	120	107	134	110	83	116	116	128	127	113	107	108	112	110	120.7	24
6	127	128	115	137	79	92	134	110	143	123	127	84	59	70	128	125	134	126	118	110	114	122	117	127	114.5	24
7	113	113	103	89	139	130	123	132	133	127	119	117	113	122	132	120	132	125	100	124	117	130	114	131	120.8	24
8	129	124	138	134	137	148	145	142	139	122	130	129	121	129	123	132	130	133	137	136	130	125	127	120	131.7	24
9	127	134	138	131	150	140	140	132	128	130	135	117	119	118	115	122	118	129	117	123	110	112	113	111	125.4	24
10	119	120	125	116	116	130	137	128	119	104	96	113	107	113	128	127	128	132	116	122	111	120	110	104	118.4	24
11	102	117	107	117	125	134	125	133	115	135	127	112	127	121	118	118	109	122	111	115	112	103	94	102	116.7	24
12	91	109	116	111	108	122	118	130	113	114	115	104	114	121	121	116	123	121	139	134	120	121	109	100	116.3	24
13	108	106	107	112	135	128	117	135	114	113	121	111	109	125	97	111	115	107	118	123	129	99	92	109	114.2	24
14	110	121	117	128	118	130	139	124	116	98	48	58	64	84	95	55	64	66	50	119	116	125	126	116	99.5	24
15	111	118	99	125	124	133	148	135	142	120	117	113	116	101	114	107	115	105	104	119	101	102	108	124	116.7	24
16	124	135	138	134	141	132	140	133	123	120	121	111	113	127	112	119	118	105	119	113	114	118	120	117	122.8	24
17	98	119	111	109	118	124	123	123	118	115	116	106	111	117	106	118	90	101	101	95	99	91	101	109	109.1	24
18	116	107	100	112	114	120	106	111	112	88	113	107	103	88	99	92	95	91	89	102	92	94	109	97	102.4	24
19	98	106	98	98	103	102	102	94	98	113	110	104	101	98	94	96	102	91	96	96	97	102	114	95	100.3	24
20	87	110	100	101	93	83	86	102	115	99	96	97	102	85	97	86	93	95	87	92	93	94	83	79	94.0	24
21	91	94	96	105	94	92	101	91	92	87	93	100	100	85	101	91	98	100	89	92	72	83	90	83	92.5	24
22	97	92	96	100	103	111	109	106	103	104	97	100	102	99	87	89	85	82	88	89	82	84	78	95	94.9	24
23	83	92	96	89	105	96	90	89	85	89	89	79	86	95	80	88	91	97	92	94	96	76	96	89	90.1	24
24	89	106	97	105	102	105	89	81	84	88	84	101	89	103	89	102	104	87	81	92	89	96	98	101	94.3	24
25	110	95	130	117	118	115	109	109	110	101	98	90	81	87	82	71	93	101	89	96	85	83	88	93	98.0	24
26	92	96	85	94	106	106	107	111	116	102	88	94	92	93	102	87	82	80	96	89	83	99	92	104	95.7	24
27	99	96	101	99	106	109	108	126	111	118	101	123	106	112	119	111	94	108	108	107	104	105	111	107	107.9	24
28	127	108	126	112	123	110	114	125	107	111	122	112	116	107	105	108	110	103	127	120	94	104	112	111	113.1	24
29	95	99	117	117	120	112	119	126	113	114	114	113	105	99	108	98	112	107	109	107	106	118	115	104	110.3	24
30	113	108	116	121	137	117	112	109	101	104	99	108	107	105	104	107	100	113	114	113	107	103	123	118	110.8	24
31	122	120	130	99	107	102	108	106	94	109	91	104	86	85	106	104	116	112	113	105	107	96	101	90	104.7	24

MONTHLY MEAN=108.621

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE:108.621

(1-12)	-1.07	1.67	2.86	4.31	7.90	7.93	9.09	8.28	4.51	1.80	-2.14	-3.52
(13-24)	-4.91	-4.49	-3.52	-4.30	-1.27	-2.52	-3.75	0.31	-4.98	-4.78	-4.36	-3.04

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

U.T.=(1 0.62 5.40 5.44 5.57) (2 -3.39 0.34 3.41 5.81) (3 0.52 -0.01 0.52 7.97) (4 0.17 0.57 0.59 1.23)

L.T.=(1 -4.99 -2.17 5.44 13.57) (2 1.99 2.77 3.41 1.81) (3 0.52 -0.01 0.52 7.97) (4 -0.58 -0.14 0.59 3.23)

COSMIC RAY MESON INTENSITY

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

JAN 1991 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	42	44	43	47	39	48	44	44	45	45	45	46	44	46	44	44	48	44	43	44	45	45	44	43	44.4	24
2	45	44	45	43	47	45	42	44	47	44	47	46	47	46	43	45	44	48	51	47	47	48	50	52	46.1	24
3	44	47	50	50	48	47	46	46	45	46	45	47	46	48	46	47	47	44	47	41	43	44	46	45	46.0	24
4	48	45	48	49	47	50	48	47	46	45	45	45	48	49	47	49	47	49	50	47	45	46	47	50	47.4	24
5	50	50	50	52	52	51	50	46	48	46	45	47	44	47	45	42	49	44	47	46	45	44	45	46	47.1	24
6	46	48	45	47	46	49	47	46	49	45	48	47	46	48	48	49	49	50	48	49	50	49	50	49	47.8	24
7	54	51	53	53	51	51	51	50	49	49	49	49	50	50	52	51	51	52	47	49	48	50	51	52	50.5	24
8	52	52	52	51	51	50	49	46	47	45	47	48	48	47	47	49	47	45	42	44	41	43	44	44	47.1	24
9	45	46	47	45	45	46	46	45	41	42	46	46	44	42	46	46	44	48	45	43	44	45	43	45	44.8	24
10	46	49	49	48	46	46	43	46	43	46	46	47	50	48	46	46	43	47	46	44	44	48	45	44	46.1	24
11	47	48	49	52	49	48	51	37	47	39	48	53	51	53	53	52	52	54	53	52	52	51	52	50	49.7	24
12	55	52	51	48	47	49	51	47	49	51	50	52	52	50	51	52	55	52	53	51	52	49	49	51	50.8	24
13	50	52	50	55	51	52	53	52	50	51	51	51	50	52	53	51	51	51	52	52	50	48	49	50	51.1	24
14	52	50	49	51	51	53	51	52	50	51	46	48	47	48	50	48	45	46	48	47	46	47	47	45	48.7	24
15	48	47	50	52	49	49	38	48	47	45	45	45	45	41	44	46	43	43	44	44	44	45	49	47	45.8	24
16	47	46	49	50	48	48	49	48	48	47	48	43	47	44	47	46	48	46	44	46	46	46	46	47	46.8	24
17	46	47	47	49	48	48	46	48	46	45	46	46	44	47	44	44	46	45	42	41	41	41	43	44	45.2	24
18	44	45	42	44	44	43	42	42	43	39	40	40	43	42	39	42	42	41	41	39	41	43	43	42	41.9	24
19	42	42	43	43	42	41	41	42	41	40	39	39	43	41	43	41	43	41	41	43	40	40	39	42	41.3	24
20	44	46	45	43	43	42	42	38	45	39	41	44	46	44	46	47	44	45	42	45	48	44	46	47	44.0	24
21	46	45	46	46	47	49	45	45	45	45	46	47	48	49	48	48	49	46	49	46	45	46	48	48	46.8	24
22	49	47	47	50	49	50	49	49	50	47	46	47	45	47	46	47	46	46	45	42	44	42	44	43	46.5	24
23	44	44	45	44	45	44	44	45	42	43	44	42	42	43	42	43	46	46	44	41	41	43	44	45	43.6	24
24	45	44	47	46	45	44	43	40	40	41	43	44	44	45	43	46	46	46	44	45	44	42	44	43	43.9	24
25	44	45	50	46	45	45	44	41	44	41	42	40	43	42	41	38	41	39	42	41	41	40	40	44	42.5	24
26	46	45	45	45	43	44	41	42	42	41	41	43	40	41	42	42	42	43	41	42	40	40	38	40	42.0	24
27	44	43	44	43	44	42	40	42	40	42	42	44	46	43	43	44	45	45	45	45	45	44	45	45	43.5	24
28	47	47	47	48	47	47	44	45	45	48	44	45	45	45	45	45	44	46	45	44	46	44	44	44	45.5	24
29	45	46	46	45	45	46	46	46	46	46	45	46	45	48	46	46	48	45	45	45	44	44	44	43	45.5	24
30	46	47	45	45	46	46	44	44	43	45	43	45	43	42	42	46	43	43	44	45	43	43	44	42	44.1	24
31	42	47	46	44	44	40	43	39	39	39	40	38	40	38	37	40	42	42	41	40	40	39	39	38	40.7	24

MONTHLY MEAN= 45.720

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 45.720

(1-12)	0.89	1.09	1.54	1.83	0.86	1.15	-0.14	-0.82	-0.49	-1.27	-0.78	-0.24
(13-24)	-0.04	-0.04	-0.27	0.15	0.41	0.15	-0.20	-0.88	-1.04	-1.11	-0.49	-0.24

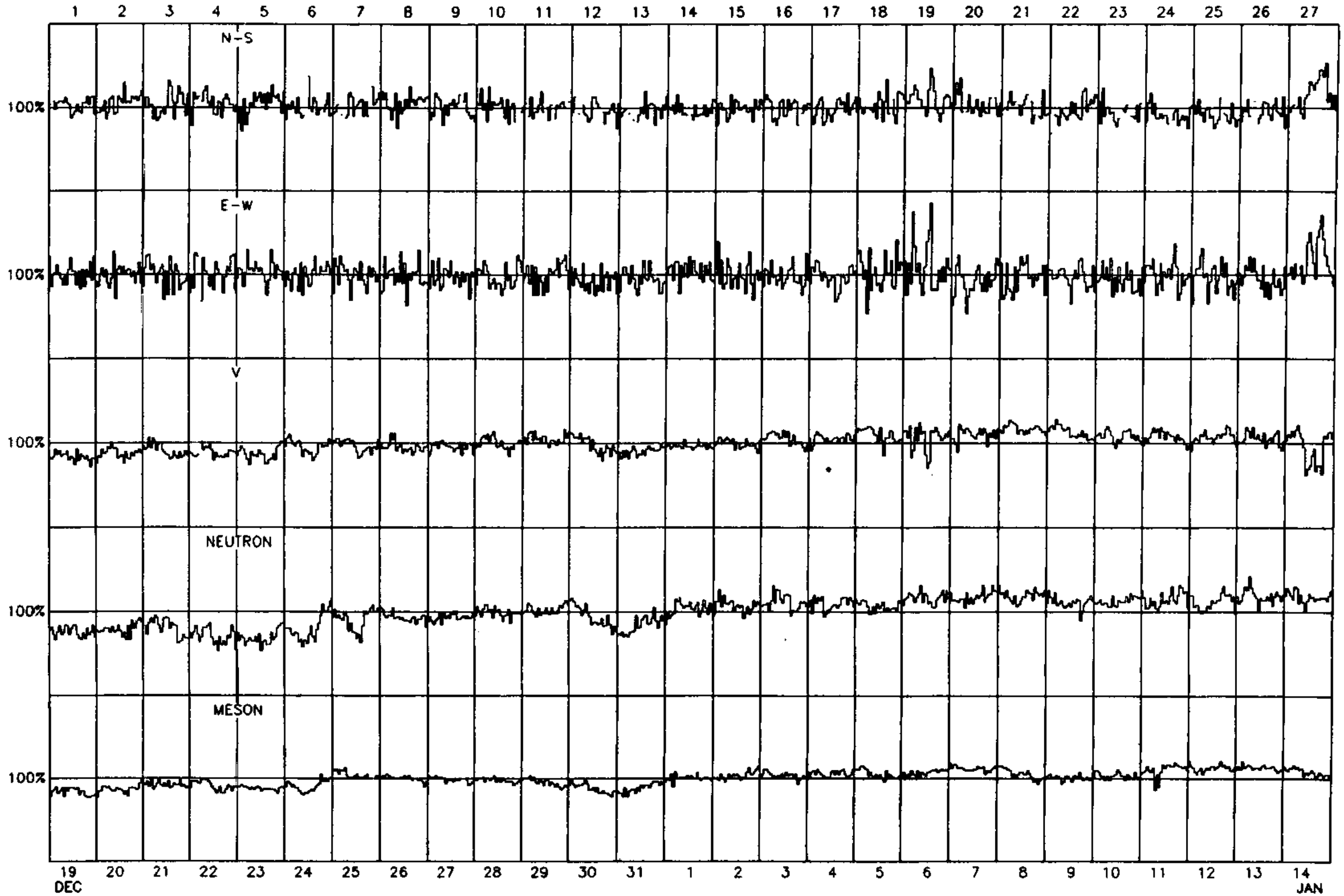
HARMONIC COMPONENTS (ORDER, COS, SIN, AMPLITUDE, MAX.-HR)

U.T.=(1 0.40 0.40 0.56 2.99) (2 -0.07 0.95 0.95 3.14) (3 -0.09 0.19 0.21 2.56) (4 0.14 -0.06 0.16 5.61)

L.T.=(1 -0.54 0.15 0.56 10.99) (2 0.86 -0.42 0.95 11.14) (3 -0.09 0.19 0.21 2.56) (4 -0.02 0.16 0.16 1.61)

COSMIC RAY INDICES

Bartels Rotation 2150 (DEC 1990–JAN 1991)



SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

JANUARY 1991

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA LF	SPA VLF	SFA LF
02	LINT	0814	0826	0920	3+	- 8.7		+11.5
04	YUNN		0006	0016	3+	-12.4		
04	YUNN	0420	0436	0453	1	- 1.8		
04	LINT	0432	0444	0520	1-	- 0.5	- 2	- 0.9
04	YUNN	0619	0620	0635	1	- 1.3		
04	YUNN	0705	0710	0730	1+	- 2.3		
05	YUNN	0316	0318	0322	1	- 1.8		
05	YUNN	0420	0423	0443	1+	- 2.6		
06	LINT	0419	0431	0446	1-	- 0.7	- 4	- 1.5
06	LINT	0447	0451	0520	1-	- 0.4	- 2	- 1.3
07	YUNN		0007	0022	2-	- 3.3		
07	YUNN	0646	0648	0655	2-	- 3.9		
07	YUNN	0655	0659	0703	1	- 1.3		
07	YUNN	0703	0707	0740	2-	- 3.9		
07	YUNN	0842	0846	0752	2	- 4.7		
08	LINT	0216	0230	0400	2-	- 3.1	- 5	+ 1.6
08	LINT	0413	0442	0620	3	- 7.6	-38	- 2.2,+ 3.1
08	LINT	0656	0700	0722	1-	- 1.0	-11	+ 1.6
09	LINT	0633	0638	0654	1-	- 0.9	- 5	+ 0.8
10	LINT	0314	0340	0410	1-	- 1.0	- 7	0
10	YUNN	0447	0450	0505	1+	- 2.1		
10	LINT	0447	0454	0510D	1	- 2.0	-11	+ 0.7
10	YUNN	0510	0515	0534	2-	- 3.3		
10	LINT	0511	0522	0620	2-	- 3.4	- 4(H)	+ 1.8
10	YUNN	0751	0758	0759	1+	- 3.0		
10	YUNN	0759	0803	0823	2	- 4.5		
11	LINT	0507	0522	0610	1-	- 1.0	- 4	- 1.3
11	YUNN	0650	0652	0713	1+	- 2.6		
11	LINT	0651	0707	0810D	2	- 4.4		-11.2,+11.0
11	YUNN	0713	0715	0720	1	- 1.6		
11	YUNN	0908	0916	0941	2+	- 6.0		
12	LINT	0215	0220	0250	1	- 1.8		- 4.1
12	LINT	0302	0311	0330	1-	- 0.5		- 1.7
12	LINT	0348	0359	0420	1-	- 0.8		- 0.8
12	LINT	0527	0538	0600	1-	- 0.6		- 0.5
12	LINT	0709	0719	0800	2-	- 3.7		- 2.6
12	LINT	0813	0820	0850D	2	- 5.0		- 2.9,+ 2.1
13	LINT	0045	0049	0107	1-	- 0.6	- 2	- 0.6
13	LINT	0215	0222	0250	1	- 1.5	- 7	- 4.9
13	LINT	0333	0339	0353	1-	- 0.2	0	- 0.6

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

JANUARY 1991

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA LF	SPA VLF	SFA LF
15	LINT	0800	0805	0818	1-	- 0.6	- 2	- 1.2
15	LINT	0820	0823	0840	1-	- 0.6	- 2	- 1.1
16	YUNN	0910	0921	0951	3+	-11.9		
18	LINT	0058	0150	0350D	3+	-10.9	-68	- 2.6,+ 4.9
18	LINT	0356	0414	0550	3-	- 6.7	-26	- 3.0,+ 5.8
20	LINT	0133	0141	0153D	1-	- 0.9		- 2.4
20	YUNN	0152	0200	0255	3-	- 6.3		
20	LINT	0155	0222	0309	3-	- 6.7		-13.1
20	YUNN	0309	0311	0331	1	- 1.6		
20	LINT	0311	0317	0343	1	- 1.4		- 5.3
20	YUNN	0714	0720	0803	3	- 7.9		
20	LINT	0717	0730	0903D	3+	-11.6		-10.8,+ 8.5
20	YUNN	0813	0819	0834	3+	-10.2		
20	YUNN	0914	0921	0931	3+	- 8.2		
21	YUNN	0014	0021	0031	3+	-12.8		
21	LINT	0017	0025	0143U	3+	-11.0		+ 2.7,- 4.1
21	LINT	0025	0033	0213U	3+	- 9.8		+ 6.9
21	LINT	0601	0614	0641D	1-	- 0.9		- 1.4
21	YUNN	0630	0641	0652	3-	- 6.6		
21	LINT	0641	0700	0803U	3+	-10.4		-13.3,+14.0
21	YUNN	0716	0717	0720	1+	- 2.6		
21	YUNN	0817	0819	0838	2-	- 3.6		
21	YUNN	0951	0955	1020	3+	-10.9		
22	YUNN	0059	0103	0113	1+	- 2.7		
22	LINT	0129	0134	0137U	1-	- 0.3		- 0.7
22	YUNN	0146	0153	0208	2-	- 3.2		
22	LINT	0153	0201	0211	1	- 1.5		- 1.9
22	LINT	0213	0218	0257	2	- 4.1		- 2.3
22	YUNN	0208	0219	0240	2+	- 5.8		
22	LINT	0314	0319	0340	1-	- 1.0		- 1.4
22	LINT	0343	0350	0413	1-	- 0.5		- 0.9
22	LINT	0551	0556	0723D	3+	- 9.1		-14.6,+13.8
22	YUNN	0625	0628	0643	1+	- 2.6		
22	YUNN	0747	0754	0824	2+	- 5.4		
22	LINT	0745	0757	0831	2	- 4.7		+ 2.5
22	YUNN	0921	0924	0944	3+	-12.2		
23	YUNN	0011	0013	0020	2	- 4.2		
23	YUNN	0132	0136	0152	2-	- 3.1		
23	LINT	0130	0142	0213D	2	- 4.3		- 3.6
23	YUNN	0211	0212	0221	1-	- 1.0		

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

JANUARY 1991

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA LF	SPA VLF	SFA LF
23	LINT	0213	0217	0243U	1-	- 0.2		- 0.5
23	YUNN	0223	0225	0235	1	- 1.2		
23	LINT	0615	0622	0653	1-	- 0.8		- 1.5
23	YUNN	0817	0822	0842	2	- 4.1		
23	LINT	0817	0824	0848	3-	- 6.3		- 2.4
24	LINT	0221	0246	0321D	1-	- 0.9		- 1.0,+ 0.4
24	LINT	0322	0343	0613	3+	-12.1		-13.3,+19.6
25	LINT	0118	0134	0224D	3-	- 6.1		- 7.2
25	LINT	0136	0140	0224U	1	- 1.6		
25	LINT	0231	0252	0400	2+	- 5.5		+ 4.4
25	LINT	0456	0502	0530	1	- 1.5		- 0.6,+ 0.6
25	LINT	0624	0635	0900	3+	-17.9		+ 4.3
25	LINT	0713	0716	0734	1	- 1.5		- 0.8
26	LINT	0358	0404	0410U	1-	- 0.3		- 1.1
26	LINT	0410	0420	0450	1-	- 0.9		- 2.1
26	LINT	0626	0635	0648	1-	- 0.8		- 1.1
26	LINT	2341	2350	0002	1	- 1.5		- 1.7
27	LINT	0229	0236	0250	1+	- 2.4		- 1.2
27	LINT	0301	0307	0310D	1	- 1.3		- 1.0
27	LINT	0310	0317	0325U	1-	- 0.2		- 0.1
27	YUNN	0324	0334	0409	2-	- 3.2		
27	LINT	0325	0336	0352U	1	- 1.5		- 0.6
27	LINT	0354	0359	0420	1-	- 0.3		+ 0.5
27	YUNN	0417	0422	0430	1	- 1.8		
27	YUNN	0536	0539	0559	1+	- 2.5		
27	LINT	0534	0541	0630	1	- 1.7		- 0.7,+ 0.4
27	YUNN	0559	0604	0614	1	- 1.8		
27	YUNN	0636	0638	0651	1	- 1.7		
27	LINT	0814	0818	0830	1-	- 0.8		- 1.7
27	YUNN	0824	0824	0839	1	- 1.7		
28	LINT	0130	0159	0400	3+	- 9.9		-12.0,+ 2.9
28	LINT	0523	0526	0545	1-	- 0.7		- 1.8
28	LINT	0643	0650	0708	1-	- 0.8		- 1.6
28	LINT	0754	0758	0830	2-	- 3.5		- 3.9,+ 0.6
29	LINT	0056	0104	0120	1-	- 0.7		- 0.3
29	YUNN	0150	0155		2	- 4.2		
29	LINT	0149	0159	0230	2+	- 5.8		-12.5
29	LINT	0304	0319	0340	1-	- 0.5		- 1.0
29	LINT	0350	0404	0408D	1-	- 0.5		- 0.7
29	LINT	0409	0420	0440	1	- 1.2		- 2.1

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

JANUARY 1991

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA LF	SPA VLF	SFA LF
29	LINT	0442	0445	0452U	1-	- 0.4		0
29	LINT	0453	0457	0508	1-	- 0.6		- 1.2
29	LINT	0514	0519	0538	1-	- 0.3		0
29	LINT	0607	0614	0630	1-	- 0.4		0
29	YUNN	0650	0654	0729	2+	- 5.9		
29	LINT	0651	0658	0746D	3	- 7.6		-12.0,+ 8.0
29	LINT	0747	0750	0804	1-	- 0.5		+ 2.5
30	YUNN	0024	0026	0031	1	- 2.0		
30	LINT	0100	0111	0142	2-	- 3.1		- 0.7
30	YUNN	0051	0111	0145	3	- 7.4		
30	LINT	0352	0400	0410D	1-	- 0.4		+ 4.4
30	LINT	0414	0420	0458	1	- 1.3		- 2.0
30	LINT	0857	0905	0944	3	- 7.5		+ 2.6
30	YUNN	0852	0908	0943	3+	-20.4		
31	YUNN	0156	0209	0234	3+	-12.6		
31	LINT	0153	0224	0400U	3+	-14.7		-13.1,+10.9
31	YUNN	0446	0449	0504	1	- 1.8		
31	LINT	0445	0450	0526	1-	- 0.8		+ 2.9

GEOMAGNETIC ACTIVITY INDICES K AND A_K

JANUARY 1991 BGMO

Day	Three-Hourly Indices K 0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	Sum	A_K
1	3	1	0	0	0	2	0	0	6	3
2	1	2	1	1	3	2	1	0	11	5
3	1	1	2	4	3	1	0	2	14	8
4	2	2	2	0	1	2	1	1	11	5
5	0	2	0	1	3	1	1	1	9	4
6 Q	0	1	1	0	0	0	0	0	2	1
7 Q	0	1	0	0	0	1	0	0	2	1
8	1	0	3	1	3	1	3	1	13	7
9	1	3	2	1	2	2	1	2	14	7
10	1	0	1	2	1	3	1	2	11	5
11	1	0	1	3	4	1	2	0	12	7
12 D	3	1	5	3	2	5	2	1	22	18
13	2	1	1	1	2	3	3	0	13	7
14 Q	2	0	0	0	0	1	0	0	3	1
15 D	1	1	2	2	3	0	3	1	13	7
16	0	1	2	1	3	1	2	2	12	6
17	2	2	1	4	3	4	1	3	20	13
18	1	0	1	0	2	3	3	2	12	6
19 Q	0	1	0	2	1	2	2	0	8	3
20	0	0	0	2	1	3	2	0	8	4
21	1	1	1	2	1	0	0	3	9	4
22 Q	2	2	1	1	1	1	0	0	8	3
23	0	2	2	2	2	2	2	2	14	6
24 D	3	2	3	5	3	6	2	3	27	25
25 D	3	3	3	3	2	4	4	3	25	17
26	2	3	3	1	1	2	1	2	15	8
27	0	1	2	1	2	1	2	2	11	5
28	0	2	1	1	0	2	1	2	9	4
29	0	1	1	2	1	0	1	0	6	2
30	0	1	0	0	1	3	2	1	8	4
31 D	3	3	5	2	3	4	3	3	26	20
									Sum	216
									Mean	7.0

MAGNETIC STORMS

JANUARY 1991 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
23	20	30	26	10	SC	0.2	12	0	ms	24	6	6	7.8	114	26

新的太阳耀斑分类建议

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太阳耀斑研究工作的进展，特别是近十年来观测技术的飞速进步，给耀斑分类工作创造了一定的必要条件。日本"火鸟"卫星在 X 射线波段对太阳耀斑所作的大量观测，为 X 射线耀斑的 A B C 分类提供了实测基础。这种耀斑分类法最先由 TANAKA 提出，而后 TSUNETA 对它作了细致的讨论。按照 TANAKA 的说法，A 类是高温耀斑，有强的 FE XXVI 线辐射，在 40 KEV 以上硬 X 射线辐射为软谱，射电辐射弱；B 类是脉冲耀斑，其幅射源初始位于低日冕，谱由较硬变为较软，后期源位置较高；C 类是渐变-硬耀斑，其源位置高，谱硬而且渐硬化，有强的微波辐射。虽然耀斑的这种分类已得到国际上较普遍的承认，但实测发现有的耀斑具有 A，B 和 C 三类耀斑的性质，表明这种分类缺乏唯一性。

近年 BAI 和 STURROCK 提出了一种耀斑五分类法。这种分类涉及到荷电粒子的行星际测量，也就意味着日地空间环境的状态或条件会大大影响他们对耀斑的分类。

观测表明，任何一个耀斑都具有三维空间结构和时间结构。同时，不同的耀斑具有不同的结构特征。一个较好的耀斑分类应该能较好的反映耀斑的共性和个性。我们提出了一种新的耀斑分类，这种分类考虑耀斑在初期位相中 H-ALPHA 辐射源与硬 X 辐射源的位置关系，耀斑源的温度以及后期位相中有无射电 IV 型爆。我们用三个字符进行耀斑分类，每个字符取为 Y 或 N。如果在耀斑的初相其 H-ALPHA 源与硬 X 射线源的位置是投影重合的，则第一个字符取为 Y，否则为 N；如果耀斑有 FE XXVI 线发射，则第二个字符取为 Y，不然为 N；如果在后相有射电 IV 型爆，那么第三个字符取 Y，否则为 N。在我们的分类中，第一个字符代表耀斑初相的空间结构，第二个字符代表耀斑的温度特征，第三个字符表示其磁场的演化。于是，所有的耀斑就被分为八类：YYY，YYN，YNY，NYY，NNY，NYN，YNN 及 NNN。例如，1982 年 2 月 3 日的 2B／X1.1 耀斑在 ABC 分类中难于归类，但在我们的分类中可确切的划归 YYY 类。

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A SUGGESTED NEW CLASSIFICATION OF SOLAR FLARES

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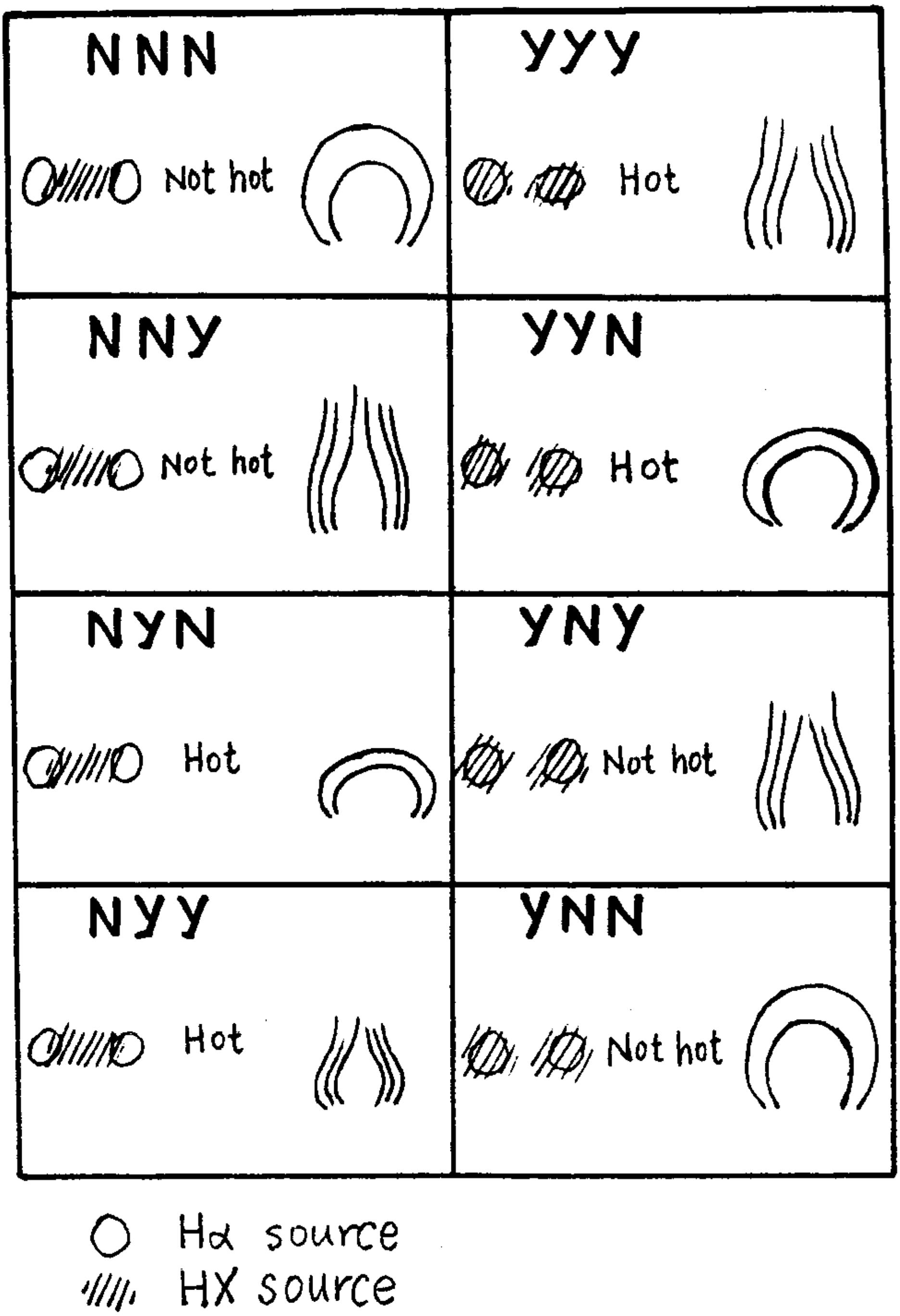
The progress made in solar flare research, especially the rapid development of solar observational techniques, has created a necessary condition for new flare classifications. Space observations of solar flares by the Japanese satellite Hinotori in X-ray region provided a base on which the A B C classification of X-ray flares was proposed. This classification was firstly suggested by Tanaka and discussed further by Tsuneta. According to Tanaka[1], flares of Types A, B and C have mainly the following properties:
Type A: hot thermal flare with T=3-4(7) K, strong FeXXVI line emission, gradual time profile, compact source, soft HXR spectrum, and weak radio emission
Type B: typical impulsive HXR flare, low corona source including footpoints of loops, and softening spectrum
Type C: Gradual-hard flare, long duration, high corona source, hard and hardening spectrum, and strong microwave emission
This classification is generally accepted by scientists working on solar flares but as pointed out that some flares have the main properties of Type B and C and some flares have even of Type A, B and C properties.

Recently, Bai and Sturrock[2] proposed a new classification of solar flares, dividing flares into five types. They are: Thermal Hard X-ray Flares: thermal hard X-ray emission (< 40 keV), soft X-ray spectrum (> 40 keV), and weak microwave emission Non-thermal Hard X-ray Flares: intense flare showing impulsive variations with time scale ranging from 0.1 to 30 Sec., and intermediate HX spectrum
Impulsive GR/P Flares: similar to nonthermal hard X-ray flares but with an additional process of particle acceleration, and gamma-ray emission
Gradual GR/P Flares: these flares have been called two-ribbon flares, proton flares, extended flares, long-decay events, gradual flares etc.
Quiescent Filament-Eruption Flares: flares led by a quiescent filament eruption and showing pairs of faint H-alpha ribbons together with IP shocks and energetic IP protons and heavy ions
It should be noted that the categorizing of a flare in Bai and Sturrock classification would be affected by the interplanetary condition because the observation of IP charged particles depends strongly on the space condition.

Now, we propose a new classification of solar flares using multi-wavelength observational data. In our classification the following three properties of flares are considered:
the relation between the H-alpha source and hard X-ray source of flares in the early phase
the temperature of plasma of flares
and the structure of the magnetic field of flares.
Three letters are used in our classification for categorizing flares. The first letter is Y if the H-alpha source and the hard X-ray source of the flare are coincident in position, while N if no. The second letter is Y if F XXVI line emissions are observed during the flare categorised, while N is no. The

Table 1.

A SUGGESTED NEW CLASSIFICATION OF SOLAR FLARES



third letter is Y if a type IV burst is recorded for the flare, while N if no. Thus, flares are divided into eight types in our classification as shown in Table 1. For examples, the flare on February 3, 1982[3] showing not only one type property in A B C classification is clearly one of Type YYY flares , and the flare on May 21, 1980 which was described in detail by de Jager and Svestka[4] can also clearly be classified as one of Type YYY flares in our classification.

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发生在小黑子区的 3B 级耀斑

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1990 年 7 月 30 日在一个简单的黑子群(图 1)附近我们观测到了 3B 级 Hα 耀斑。耀斑开始在 0720 UT 以前,极大为 0736 UT,结束于 0805 UT 以后。坐标为 N20 E45。该耀斑是双带耀斑,双带呈缓慢分开。耀斑区的暗条消失后又复原(图 2)。耀斑掩盖了整个黑子。

耀斑所在活动区的 C. S. G. D. 编号为 385(SGD AR6180)。这个活动区由一个非常简单的黑子群构成,(见图 1 中左边的黑子)。7 月 27 日在日面东边出现,8 月 2 日过日面中心,坐标为 N18,L35。它在日面存在的 12 天中形态一直比较简单,型别大多呈 HSX 和 CSO。主黑子以外的很少的小黑子,要高分辨率的照片才可看到。它的最大面积为 144 面积单位(7 月 28 日)。7 月 30 日的型别为 CSO,面积为 86 面积单位。

2840 MHz 记录到峰值流量为 2235. 0 sfu 的爆发,持续时间长达 94 分钟。GOES 卫星记录到 X 射线爆发为 M4. 4 级。该耀斑引起了 3 级电离层扰动和 8 月 1 日 0741 UT 开始的急始磁爆。

从 Wilson 天文台 29 日和 30 日的磁图可以看出在 AR6180 区,3 级耀斑发生的地方,负级磁场有衰减。

联想到 1980 年 10 月 15 日观测到的大耀斑,它们可能都由同一机制引起。

参考文献(见英文稿)。

Fig. 1 The flare at its maximum phase 0736 UT 30 July 1990

Fig. 2 AR 6180 with only small sunspots

本文 1991 年 3 月 25 日收到。

A 3B FLARE OBSERVED IN AR 6180 WITH ONLY SMALL SUNSPOTS

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A 3B flare (Fig. 1) was observed in the region with only small sunspots (Fig. 2), AR 6180 in S.G.D.[1] (No. 1990 385 in C.S.G.D.[2]) on July 30, 1990. The flare began before 0720 UT. The flare peaked at 0736 UT and ended after 0805 UT. The location of the flare is N20 E45 L28. The flare was a two-ribbon flare. The two ribbons separated slowly. The relevant filament disappeared and then recovered and the sunspot was covered by one of the flare ribbons.

This region (N18 L35, AR 6180) contained only a very simple sunspot group, appeared at the east limb of the solar disk on 27 July, and passed the central meridian of the disk on 2 August. The sunspot group in the region had been being quiet simple during its passage of the solar disk. It was classified as HSX and CSO for the most days of its passage. The maximum area of the sunspot group was only 86 area units.

A great solar radio burst was recorded at 2840 MHz to correspond to this flare. The radio burst had a peak flux density of 2235.0 sfu and a duration of 94 minutes. Also an M4.4 X-ray flare was recorded by the GOES satellite. As the geophysical effects of the flare, a sudden ionospheric disturbance (SID) of importance 3 and a geomagnetic storm with sudden commencement starting at 0741 UT on 1st August were recorded.

An inspection of the Mt. Wilson data of solar magnetic fields indicated that the magnetic field of negetive polarity in this region showed flux disappearance at the location of the flare.

In comparison with the big flare observed on 15 October 1980, it seems that they are likely caused by a same mechanism[3].

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[1] S.G.D. No. 553 part 1 p. 92-93, 1990.

[2] C.S.G.D. 6-7, 1990.

[3] Shi Zhongxian, Chen Chuanle, Publ. Yunnan Astron. Obs., 3-4, p. 37, 1981.

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