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说 明

(1996)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. 怀柔太阳活动区磁场与速度场观测表
4. 全日面光球纵向磁场图
5. 太阳耀斑表、耀斑巡视时间表
6. 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
7. 宇宙线强度表(由空间科学与应用研究中心编辑)
8. 突然电离层扰动(D层)表
9. 地磁活动指数 K 和 A_K表
10. 磁暴表(由北京地磁台编辑)
11. 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。(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。

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 λ5324.19 Å 谱线观测资料（光球）

4－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. 由怀柔站提供的光球纵向磁场图中，每天给出一幅全日面的活动区磁场等强度图。观测时间、日面方向（N 表示北，W 表示西）及强度等级，分别在图的下方和上方给出。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 表示磁场等强度线的等级，其单位用高斯表示。

6. 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，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：

	耀斑级别			
日心距 r/R	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，并均已归算到日一地平均距离 1 AU 处的数值。

9. 在太阳射电显著事件表中列出的各栏参数具有国内外约定的意义。在流量密度（Flux Density）栏内，峰值（Peak）表示峰时流量的值；相对值（Rel）表示峰值流量净增值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. 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）。

11. 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。

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：

$$\Delta\varphi_0 = \left(\frac{5.0}{1.6 + 3.4\,cosZ(h_m)}\right) \times \Delta\varphi'$$
$$+\begin{cases} 7.3 \times [cosZ(h_m - cosZ(h_S)], & \text{当 } h_m \leqslant 12 \text{ 和 } Z(h_m) \leqslant 80^\circ \\ 0, & \text{当 } 12 < h_m < 13 \\ 7.3 \times [cosZ(h_m - 1) - cosZ(h_S - 1)], & \text{当 } h_m \geqslant 13 \text{ 和 } Z(h_m) \leqslant 80^\circ \end{cases}$$

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（最小为 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＋

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。

期刊号说明：

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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” 编辑部。电话：2567194，电报挂号：9053，传真：2561085。

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。

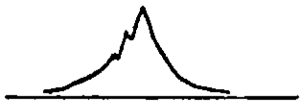
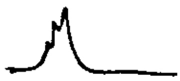
附录 2

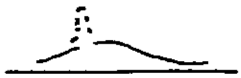
耀斑表中备注栏内各字母的意义（IAU 系统）

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

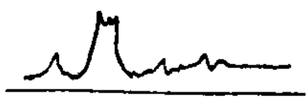
附录 3

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。	

CHINESE SOLAR GEOPHYSICAL DATA (CSGD)
EXPLANATION OF DATA REPORTS

(1996)

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. Longitudinal Photospheric Magnetograms of Full Solar Disk
5. H-Alpha Solar Flares and Time Intervals of H-Alpha Flare Patrol Observations
6. Solar Radio Emission Fluxes Solar Radio Emission Outstanding Occurrences, Intervals of Solar Radio Emission Patrol Observations and Time Profiles of Solar Radio Bursts
7. Cosmic Ray Meson and Neutron Intensity compiled by Center for Space Science and Applied Research
8. Sudden Ionospheric Disturbances (D-Region) (SID)
9. Geomagnetic Indices K and A_k
10. Magnetic Storms compiled by Beijing Geomagnetic Observatory
11. Short Articles on Observations, Data Analyses and Researches of Solar- Terrestrial Phenomena

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. 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 observations of solar magnetic and velocity fields, the date, the Carrington longitude of the solar disk center at 00^h UT(L0), 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 λ 5324.19Å and/or $H_\beta\lambda$ 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 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 5324.19Å

4 — observation at $H_\beta\lambda$ 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. 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 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 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 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 patrol observations are less than five minutes.

8. 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 the mean sun-earth distance: 1 AU.

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 " 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.

11. 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 a half hour are not listed.

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:

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

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

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

Address your inquires to our Editorial Group, please: CSGD Editorial Group, Beijing Astronomical Observatory, Beijing 100080 China . Telephone Number : 2567194, Telegram code : 9053, Fax : 2561085.

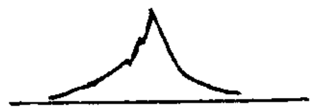
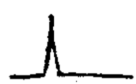
Appendix 1

The International Astronomical Union Notation for H-Alpha Solar Flares

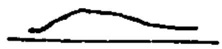
A = Eruptive prominence whose base is less than 90° from the central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant Point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied 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 FA1 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再除以爆发持续时间

太阳射电辐射巡视时间表

BEIJ	北京天文台 2840 MHz 频率
From To 2840：	巡视时间
PURP	紫金山天文台 2700 MHz 频率
From To 2700：	巡视时间
URUM	新疆乌鲁木齐天文站频率为
From To 9375：	9375 MHz 巡视时间
YUNN	云南天文台 2840 MHz 频率
From To 2840：	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 Acti. on 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 1996

		Relative-Numbers			Sunspot Areas					
					Drawing			Photographic		
Day	Gro.	N.H.	S.H.	Sum	N.H.	S.H.	Sum	N.H.	S.H.	Sum
1	2	17	0	17	10	0	10			
2	2	8	7	15	4	3	7			
3	2	15	0	15	9	0	9			
4	1	23	0	23	140	0	140			
5	3	38	7	45	283	2	285			
6	2	40	0	40	196	0	196			
7	3	38	0	38	221	0	221			
8	2	23	0	23	195	0	195			
9	3	29	0	29	59	0	59			
10	1	8	0	8	19	0	19			
11	0	0	0	0	0	0	0			
12	0	0	0	0	0	0	0			
13	0	0	0	0	0	0	0			
14	0	0	0	0	0	0	0			
15	0	0	0	0	0	0	0			
16	0	0	0	0	0	0	0			
17	0	0	0	0	0	0	0			
18	0	0	0	0	0	0	0			
19	0	0	0	0	0	0	0			
20	0	0	0	0	0	0	0			
21	0	0	0	0	0	0	0			
22	0	0	0	0	0	0	0			
23	0	0	0	0	0	0	0			
24	1	8	0	8	16	0	16			
25	1	8	0	8	9	0	9			
26	1	8	0	8	6	0	6			
27	1	8	0	8	8	0	8			
28	1	7	0	7	5	0	5			
29	1	9	0	9	4	0	4			
30	1	7	0	7	2	0	2			
31	2	15	0	15	8	0	8			
Mean		10.0	0.5	10.4	38.5	0.2	38.7			

DAILY SUNSPOT OBSERVATIONS

JANUARY 1996

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See	Remarks
1.06	152	12-31.9	11	213	1W	BXI	0.25	13	6	2	0	PLAT
	153	1- 1.8	10	200	9E	BXO	0.28	8	4	2	0	
2.07	153				3W	AXX	0.23	8	4	2	0	
	1	1- 5.6	-9	150	47E	AXX	0.74	4	3	3	0	
3.06	153				16W	AXX	0.34	4	2	2	0	
	2	1- 2.8	11	187	3W	BXO	0.24	13	7	4	0	
4.05	2				16W	DRI	0.36	261	140	41	0	
5.06	2				28W	DAI	0.52	391	228	79	0	
	3	1- 5.4	2	154	4E	DRI	0.13	109	55	17	0	
	4	1- 6.1	-20	144	14E	AXX	0.36	4	2	2	0	
6.06	2				42W	DSI	0.69	160	110	46	0	
	3				11W	DSI	0.22	168	86	65	0	
7.12	2				56W	DSO	0.84	130	120	54	0	
	3				25W	DSO	0.44	172	96	72	0	
	5	1- 6.1	14	145	14W	BXO	0.38	8	5	2	0	
8.12	2				70W	CSO	0.95	63	105	84	0	
	3				38W	CRI	0.63	139	90	33	0	
9.06	2				86W	AXX	0.99	4	14	14	0	PURP
	3				51W	CRI	0.78	50	40	30	0	
	6	1- 7.3	9	128	23W	BXO	0.45	8	5	2	0	
10.07	3				64W	HRX	0.90	17	19	14	0	
11.04	0											
12.06	0											
13.06	0											
14.06	0											
15.09	0											PLAT

DAILY SUNSPOT OBSERVATIONS

JANUARY 1996

Day	Group	CMP Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Whole	Area Max	See	Remarks
16.02	0											PURP
17.08	0											PLAT
18.16	0											PURP
19.10	0											PURP
20.38	0											
21.06	0											
22.06	0											
23.06	0											
24.05	7	1-29.7	10	194	75E	AXX	0.97	8	16	8	0	
25.07	7				61E	AXX	0.89	8	9	5	0	
26.05	7				47E	AXX	0.75	8	6	3	0	
27.13	7				33E	AXX	0.60	13	8	5	0	
28.17	7				19E	AXX	0.43	8	5	5	0	
29.03	7				10E	AXX	0.32	8	4	4	0	PURP
30.07	7				5W	AXX	0.28	4	2	2	0	
31.18	7				17W	AXX	0.38	4	2	2	0	
	8	1-27.6	9	221	47W	AXX	0.75	8	6	3	0	

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 1996 HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
1	211.5	75	10	201	S5 L5
2	198.3	75			S5 L5
3	185.1	75			S5 L5
		1	12	(187)	D4 V4 S5 L5 D5 V5
4	172.0	1			S5 L5 T5 Q5 U5
5	158.8	1			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		2	3	153	D4 V4 S5 L5 D5 V5 T5 Q5 U5
8	119.3	1			S5 L5
		2			D4 V4 S5 L5 D5 V5 T5 Q5 U5
9	106.1	2			S5 L5
		3	11	133	S5 L5
10	92.9	2			S5 L5
		3			S5 L5
11	79.8	2			L5
		3			L5
12	66.6	0			
14	40.3	0			
15	27.1	0			
16	13.9	0			
17	0.8	0			
18	347.6	0			
19	334.4	0			
20	321.3	0			

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 1996 HUAIROU ST. BEIJING OBS.

Day	L0	Huairou Region	Lat	L	Data
21	308.1	0			
22	294.9	0			
23	281.8	0			
24	268.6	0			
25	255.4	0			
26	242.3	0			
27	229.1	4	5	189	S5 L5
28	215.9	4			S5 L5
29	202.8	4			S5 L5
30	189.6	4			S5 L5
		5	7	(221)	S5 L5
31	176.4	5			S5 L5

NPL: 11 12 14 15 16 17 18 20 21 22 23 24 25 26 28 29

SPL: 11 12 14 15 16 17 18 19 20 21 22 23 24 25 26 28 29

FULL DISK LONGITUDINAL MAGNETOGRAMS OF SOLAR PHOTOSPHERE

HUAIROU ST. BEIJING OBS.

(No observed)

SOLAR RADIO EMISSION FLUX

JANUARY 1996

Day	BEIJ 2840	PURP 2700	URUM 9375	YUNN 2840
1	73	77		
2	76	77		
3	75	76		
4	83	85		
5	84	88		
6	82	85		
7	81	84		
8	79	78		
9	72	73		
10	72	74		
11	71	74		
12	70	69		
13	69	71		
14	68	71		
15	66	70		
16	68	67		
17	71	70		
18	71	69		
19	69	71		
20	67	73		
21	68	74		
22	70	76		
23	69	75		
24	71	75		
25	72	76		
26	80	77		
27	73	79		
28	73	78		
29	70	76		
30		77		
31	71	78		
Mean	72.8	75.6		

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JANUARY 1996

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Peak	Density Rel	Mean
6	2700	PURP	20 GRF	0601.0	0613.6	17.0	7.0	3.4	
6	2700	PURP	20 GRF	0634.0	0642.9	25.0	7.0	2.8	
6	2700	PURP	21 GRF	0713.0	0756.5	55.0D	14.0	12.2	
7	2700	PURP	20 GRF	0155.0	0204.4	45.0	10.0	7.0	
13	2700	PURP	1 S	0044.9	0045.5	2.5	6.0	2.8	

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JANUARY 1996

Day	BEIJ From	BEIJ To	PURP From	PURP To	URUM From	URUM To	YUNN From	YUNN To
	2840		2700		9375		2840	
1	0012	0838	0102	0810				
2	0002	0838	0050	0814				
3	0000	0837	0036	0815				
4	0002	0840	0044	0813				
5	0005	0840	0050	0813				
6	0001	0837	0035	0810				
	2353	2400						
7	0000	0845	0042	0807				
	2359	2400						
8	0000	0827	0108	0814				
9	0005	0835	0040	0800				
10	0015	0828	0040	0800				
11	0021	0830	0044	0800				
	2359	2400						
12	0000	0830	0028	0800				
13	0006	0844	0029	0805				
14	0007	0842	0034	0800				
15	0004	0827	0310	0800				
16	0008	0832	0030	0800				
	2358	2400						
17	0000	0842	0029	0645				
18	0012	0818	0228	0633				
19	0013	0835	0049	0810				
20	0002	0847	0102	0806				
	2356	2400						

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JANUARY 1996

Day	BEIJ From	BEIJ To	PURP From	PURP To	URUM From	URUM To	YUNN From	YUNN To
	2840		2700		9375		2840	
21	0000	0838	0041	0810				
22	0013	0855	0039	0156				
			0203	0810				
23	0002	0842	0045	0815				
24	0012	0849	0027	0815				
	2355	2400						
25	0000	0848	0040	0815				
26	0020	0852	0038	0815				
27	0006	0825	0030	0810				
28	0005	0906	0052	0745				
29	0007	0846	0025	0815				
30			0038	0811				
31	0010	0857	0045	0813				

COSMIC RAY NEUTRON INTENSITY

Real Counts: 256 Times (Tabulated Counts Plus 1500)

JAN 1996 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	538	549	541	539	552	545	542	543	546	549	544	535	541	531	531	532	529	525	533	547	534	536	531	547	539.2	24
2	545	537	529	536	540	535	540	527	531	522	536	548	532	542	542	526	525	526	549	544	534	546	558	540	537.1	24
3	551	555	551	540	546	542	528	532	531	529	535	541	529	538	537	536	523	532	535	545	540	546	544	551	539.0	24
4	546	536	538	537	531	537	523	530	536	528	525	530	539	536	539	537	536	534	539	539	535	538	538	543	535.4	24
5	544	549	540	540	530	533	534	529	534	540	536	534	535	539	539	534	535	537	537	545	546	539	528	537	537.3	24
6	542	538	529	535	528	531	533	534	539	538	541	528	531	532	543	545	543	542	543	548	547	540	538	542	537.9	24
7	537	537	538	529	542	545	544	541	546	548	560	553	549	554	566	559	564	571	560	564	565	562	556	563	552.2	24
8	547	546	549	549	542	540	548	549	542	540	543	546	540	548	544	549	541	549	552	541	547	552	544	550	545.8	24
9	543	556	543	548	539	532	541	544	536	544	542	541	550	545	547	539	542	538	541	538	552	546	545	541	543.0	24
10	545	546	539	522	528	535	535	533	535	537	540	536	544	549	539	546	545	539	540	544	534	538	539	543	538.8	24
11	549	536	538	527	538	528	533	530	534	535	548	536	533	533	537	531	533	543	544	545	543	546	539	545	537.7	24
12	553	555	548	546	538	536	539	544	526	532	528	527	519	532	536	548	541	541	546	537	546	549	553	550	540.4	24
13	549	545	547	549	556	551	551	554	547	546	557	551	553	557	555	554	555	547	561	560	552	568	560	565	553.8	24
14	561	564	564	548	540	541	538	546	545	540	545	550	551	552	545	551	545	549	552	550	551	561	561	565	550.2	24
15	549	556	548	553	551	542	545	542	543	543	562	554	550	544	545	543	555	546	546	561	567	567	561	567	551.7	24
16	561	553	552	547	546	557	543	548	541	557	551	549	547	544	542	552	558	560	558	557	553	558	558	558	552.1	24
17	558	553	550	553	546	538	538	546	549	536	549	559	565	550	555	551	558	558	553	553	556	565	565	562	552.8	24
18	570	567	554	561	545	545	543	541	550	556	549	561	558	560	559	550	549	556	549	557	558	564	557	551	554.6	24
19	557	555	541	542	532	538	547	544	550	549	540	540	550	561	553	559	558	561	552	567	561	562	560	565	551.8	24
20	566	560	556	560	555	549	549	547	554	546	544	540	542	541	546	557	551	561	567	551	556	551	544	553	551.5	24
21	552	544	547	543	531	538	541	547	548	539	539	542	548	557	557	557	555	549	553	549	547	549	548	548	547.0	24
22	548	545	545	542	548	537	534	548	536	545	538	544	541	546	542	544	535	544	538	548	550	548	551	559	544.0	24
23	550	535	550	530	543	531	551	547	554	537	544	540	534	543	543	550	549	541	544	544	551	538	537	543	542.9	24
24	550	551	533	536	527	529	540	540	533	536	532	544	542	533	529	526	552	556	543	553	544	564	560	552	541.9	24
25	541	554	552	550	538	533	538	529	530	538	539	542	551	555	549	549	554	547	547	558	550	550	548	559	545.9	24
26	552	544	546	538	541	537	539	552	551	553	555	548	543	540	545	549	550	547	545	545	548	554	544	549	546.5	24
27	554	551	550	539	542	539	545	552	549	546	556	542	549	536	541	547	554	558	557	557	560	565	556	565	550.4	24
28	555	540	555	559	553	552	552	548	552	556	550	554	552	552	553	553	542	542	556	550	561	576	555	559	553.2	24
29	561	559	552	538	534	538	547	549	550	550	538	543	538	531	546	538	549	543	543	545	545	551	556	558	545.9	24
30	557	558	548	536	536	541	545	535	536	547	542	538	528	549	535	534	541	549	557	564	562	586	561	566	548.0	24
31	560	561	554	555	544	553	545	547	544	536	548	550	559	552	550	549	534	544	557	545	549	550	547	546	549.1	24

MONTHLY MEAN=545.704

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE:545.704

(1-12)	5.62	3.81	0.01	-2.90	-4.99	-6.09	-4.70	-3.83	-3.83	-3.83	-1.96	-2.28
(13-24)	-2.38	-1.12	-0.87	-0.70	-0.51	0.59	2.26	4.33	4.10	8.01	4.04	7.26

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

U.T.=(1 3.54 -3.38 4.90 21.09) (2 2.02 -1.14 2.32 11.02) (3 0.56 0.16 0.58 0.34) (4 0.02 0.56 0.56 1.46)

L.T.=(1 1.15 4.76 4.90 5.09) (2 -2.00 -1.18 2.32 7.02) (3 0.56 0.16 0.58 0.34) (4 -0.49 -0.26 0.56 3.46)

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

JAN 1996 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	155	165	169	171	172	147	148	168	161	145	167	159	168	154	168	163	165	166	173	164	165	154	158	162	162.0	24
2	160	155	169	162	175	168	150	157	151	154	162	163	165	154	151	159	164	160	164	165	158	158	163	168	160.6	24
3	158	166	163	172	166	162	159	168	160	144	175	148	159	158	167	152	167	169	172	161	167	181	175	176	164.4	24
4	164	175	175	158	156	166	170	156	166	170	160	168	165	156	164	166	167	162	159	160	162	173	153	176	164.5	24
5	162	160	167	173	180	167	158	165	163	163	159	168	154	160	172	152	164	163	165	162	165	156	160	160	163.3	24
6	155	147	155	152	156	159	151	150	140	145	155	167	152	160	157	162	169	165	147	150	152	144	147	159	154.0	24
7	145	148	143	137	138	140	145	157	146	162	152	153	166	146	155	144	150	168	150	157	167	157	150	163	151.6	24
8	154	162	158	139	156	154	159	156	160	152	166	163	160	160	172	168	178	172	159	179	161	154	164	174	161.7	24
9	174	167	168	167	165	164	158	159	165	176	183	172	175	181	184	171	188	172	197	190	172	179	178	175	174.2	24
10	176	175	182	176	194	168	184	176	177	160	159	166	174	170	177	179	190	177	176	171	170	170	168	163	174.1	24
11	171	162	173	168	172	157	162	172	150	179	158	156	159	167	155	158	166	161	153	168	156	162	160	155	162.5	24
12	171	178	159	166	164	160	147	153	155	164	157	140	157	145	154	150	153	162	170	153	178	166	162	172	159.8	24
13	183	169	166	160	153	163	158	152	159	148	153	160	151	153	146	161	156	157	162	164	158	170	154	158	158.9	24
14	160	171	172	168	171	163	157	153	152	157	147	146	138	150	152	167	167	161	161	154	162	176	158	166	159.5	24
15	148	173	170	161	171	167	167	158	155	153	155	161	149	160	134	145	146	152	148	170	168	169	164	169	158.9	24
16	161	160	162	163	151	166	169	167	162	168	163	173	160	163	163	158	161	158	165	167	170	162	183	158	163.9	24
17	158	148	161	157	152	171	156	145	144	159	167	148	165	154	153	154	156	168	170	161	157	166	154	162	157.8	24
18	161	157	147	146	157	165	163	151	144	146	155	147	161	163	159	161	164	171	164	167	167	160	186	179	160.0	24
19	157	167	163	159	162	164	168	173	162	175	159	165	172	176	160	174	176	183	190	166	161	176	175	194	169.9	24
20	179	168	156	158	161	161	167	166	164	154	152	149	167	155	151	160	150	158	161	148	147	146	156	153	157.8	24
21	160	156	154	140	151	158	145	159	157	144	143	153	149	145	143	163	140	145	167	148	161	148	138	138	150.2	24
22	141	142	135	142	149	142	139	150	148	136	151	139	147	147	150	135	136	138	138	145	145	158	143	156	143.8	24
23	143	153	142	154	143	145	148	144	149	133	147	127	146	155	148	143	145	158	166	149	159	159	155	154	148.5	24
24	155	147	145	147	149	157	148	150	144	143	144	152	162	145	153	140	156	146	153	152	154	152	156	165	150.6	24
25	158	148	160	173	163	151	153	145	151	163	151	150	152	153	170	161	160	162	168	162	168	160	161	159	158.4	24
26	155	164	150	165	150	160	147	157	158	165	173	168	148	161	155	176	159	171	161	161	165	175	171	162	161.5	24
27	161	158	171	164	161	153	155	171	154	158	155	178	160	168	160	171	175	165	151	185	158	172	154	171	163.7	24
28	156	156	153	148	166	158	167	175	169	173	165	159	154	158	151	170	169	168	165	152	165	159	170	162	162.0	24
29	162	165	165	152	149	155	165	149	156	160	153	161	162	159	159	160	168	160	145	182	170	167	161	168	160.5	24
30	166	164	160	164	163	172	163	165	158	158	153	157	161	164	153	166	165	164	164	157	166	162	175	152	162.2	24
31	167	182	153	167	153	171	164	150	168	153	157	144	162	157	162	164	159	150	169	163	175	165	161	160	161.5	24

MONTHLY MEAN=160.074

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE:160.074

(1-12) 0.44 1.47 0.12 -1.07 0.22 -0.27 -2.33 -1.46 -3.69 -3.30 -2.14 -3.30

(13-24) -1.36 -2.11 -2.07 -0.30 2.15 2.25 2.93 2.28 2.80 3.02 1.64 4.09

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

U.T.=(1 2.27 -1.84 2.92 21.40) (2 -0.47 -0.10 0.48 6.39) (3 0.00 0.04 0.04 1.84) (4 0.50 -0.32 0.59 5.46)

L.T.=(1 0.46 2.88 2.92 5.40) (2 0.15 0.46 0.48 2.39) (3 0.00 0.04 0.04 1.84) (4 0.03 0.59 0.59 1.46)

COSMIC RAY MESON INTENSITY

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

JAN 1996 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	32	32	32	32	30	29	28	28	29	29	29	30	30	30	29	28	29	29	29	30	31	32	33	35	30.2	24
2	37	40	41	41	40	39	40	41	42	44	45	45	47	47	46	45	45	45	45	46	45	46	46	47	43.5	24
3	48	47	46	44	43	42	41	40	40	39	39	39	39	38	36	36	35	37	37	36	36	36	36	36	39.4	24
4	37	36	35	34	32	31	31	31	31	31	33	33	34	35	34	34	35	35	35	35	36	36	36	38	34.1	24
5	39	40	39	38	37	36	36	36	38	38	39	39	39	39	39	39	39	39	40	41	41	40	40	40	38.8	24
6	41	41	41	40	38	38	38	38	38	39	40	40	41	41	42	41	41	41	42	42	42	42	42	43	40.5	24
7	44	44	44	44	44	44	46	48	50	52	54	56	57	57	58	58	57	58	58	58	57	56	56	56	52.3	24
8	56	55	54	53	51	49	48	47	47	46	45	45	45	44	44	44	43	43	43	43	43	42	42	42	46.4	24
9	42	42	42	41	40	38	38	38	37	38	38	39	40	39	39	38	39	39	39	39	39	39	40	40	39.3	24
10	40	42	41	40	39	38	38	38	38	38	39	39	39	38	39	38	38	38	39	39	40	40	42	42	39.3	24
11	43	43	43	43	42	41	42	42	43	44	45	46	46	46	46	46	46	46	46	47	46	46	47	47	44.7	24
12	47	47	47	46	45	44	43	43	43	43	43	43	43	43	42	41	41	42	42	42	42	41	42	42	43.2	24
13	42	43	42	42	40	39	38	39	39	39	39	39	39	38	38	38	38	38	39	39	39	39	40	40	39.4	24
14	41	41	43	42	41	40	40	40	40	40	41	42	42	42	41	41	41	41	42	42	42	41	42	43	41.3	24
15	43	43	44	44	43	42	43	43	44	45	45	46	46	47	47	47	47	48	48	47	47	48	47	47	45.5	24
16	47	48	47	46	47	45	44	44	43	43	44	44	43	44	44	44	44	44	44	45	45	45	45	46	44.8	24
17	47	51	50	49	47	46	46	46	47	46	47	48	48	49	49	49	49	49	51	51	50	50	51	51	48.6	24
18	51	51	50	48	46	45	44	44	44	44	43	44	44	43	44	43	42	42	43	42	42	42	42	41	44.3	24
19	42	42	41	40	38	38	38	38	38	39	39	39	40	40	40	40	41	42	42	43	42	43	45	46	40.7	24
20	47	47	46	46	45	43	44	43	43	43	43	43	43	43	44	45	45	45	45	44	44	44	45	46	44.4	24
21	44	44	44	43	41	40	40	40	40	41	40	41	41	41	41	41	41	42	42	42	42	42	42	42	41.5	24
22	42	43	42	41	40	38	38	38	38	38	38	40	40	41	41	41	42	42	43	44	44	44	45	45	41.2	24
23	46	47	46	46	44	44	42	42	41	42	43	44	44	44	44	44	44	45	45	45	45	46	46	46	44.3	24
24	48	48	47	46	44	43	43	42	42	43	43	44	44	45	45	46	46	47	47	46	46	47	47	47	45.3	24
25	48	48	47	47	45	44	43	42	42	43	43	43	43	44	43	43	44	43	44	44	44	43	43	44	44.0	24
26	44	44	43	42	40	39	39	39	39	39	39	40	41	41	41	41	41	41	42	41	41	41	41	42	40.9	24
27	42	42	42	41	39	38	37	36	36	36	37	37	37	37	37	37	37	38	38	39	38	39	39	40	38.3	24
28	41	42	41	40	38	37	37	38	38	38	39	39	40	40	41	41	42	42	43	43	43	43	44	45	40.6	24
29	46	46	45	44	43	42	42	42	43	43	45	46	46	47	47	48	48	48	49	49	49	50	50	51	46.2	24
30	51	51	50	49	48	46	46	46	45	45	46	48	48	49	50	50	50	51	52	52	51	50	50	51	49.0	24
31	51	51	51	50	49	48	48	47	48	48	49	49	48	48	48	49	49	49	49	49	49	49	50	51	49.0	24

MONTHLY MEAN= 42.613

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 42.613

(1-12)	1.52	1.94	1.45	0.68	-0.71	-1.77	-1.94	-2.00	-1.77	-1.45	-0.94	-0.35
(13-24)	-0.13	-0.03	-0.06	-0.16	-0.06	0.26	0.71	0.77	0.65	0.68	1.13	1.61

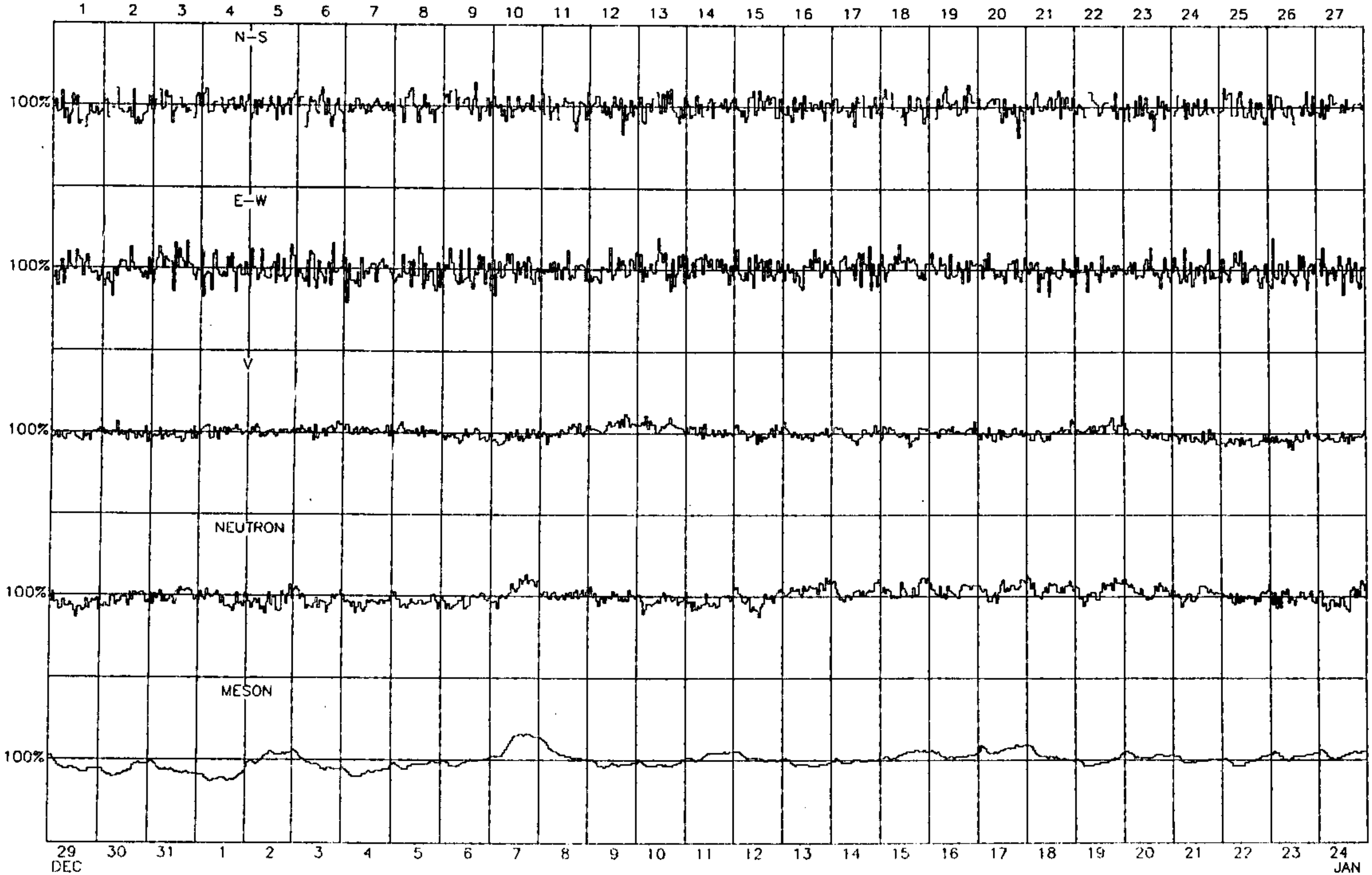
HARMONIC COMPONENTS (ORDER, COS, SIN, AMPLITUDE, MAX.-HR)

U.T.=(1 1.09 -0.79 1.35 21.60) (2 0.70 0.43 0.82 1.05) (3 -0.14 0.35 0.38 2.49) (4 -0.01 0.14 0.14 1.55)

L.T.=(1 0.14 1.34 1.35 5.60) (2 0.02 -0.82 0.82 9.05) (3 -0.14 0.35 0.38 2.49) (4 -0.12 -0.08 0.14 3.55)

COSMIC RAY INDICES

Bartels Rotation 2218(DEC 1995–JAN 1996)



GEOMAGNETIC ACTIVITY INDICES K AND A_K

JANUARY 1996 BGMO

Day	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	Sum	A_K
	Three-Hourly Indices K									
1	2	1	1	3	3	1	2	2	15	8
2	1	2	2	2	2	4	3	3	19	11
3	2	3	2	3	3	3	1	2	19	11
4	1	1	2	3	4	3	2	1	17	10
5	1	2	2	2	3	2	2	1	15	7
6	2	3	2	2	2	2	1	1	15	7
7 Q	2	2	2	1	1	1	1	2	12	5
8 Q	0	1	1	0	1	2	2	1	8	3
9 Q	2	1	0	1	2	0	0	1	7	3
10 Q	1	0	1	1	1	1	3	1	9	4
11 Q	2	0	2	1	2	1	2	2	12	5
12	2	2	1	2	1	3	2	3	16	8
13 D	4	4	5	5	5	5	3	2	33	34
14 D	2	2	3	5	6	4	4	4	30	30
15 D	2	1	2	4	4	2	2	2	19	12
16	2	2	2	1	2	2	3	2	16	8
17	1	1	1	2	3	3	4	3	18	11
18	1	2	1	1	2	3	2	1	13	6
19	1	2	1	1	2	3	3	3	16	9
20 D	2	1	3	3	4	4	1	0	18	12
21	2	2	2	3	2	2	2	2	17	8
22	2	2	2	2	4	3	2	1	18	10
23	2	3	2	2	1	1	2	1	14	7
24	1	1	1	2	1	3	4	1	14	8
25	1	3	2	1	1	2	2	2	14	7
26	2	1	1	1	1	3	3	2	14	7
27	1	3	1	3	4	3	2	2	19	12
28	1	2	2	1	1	2	3	3	15	8
29 D	2	2	4	4	4	4	4	2	26	20
30	1	3	1	1	2	3	2	1	14	7
31	3	3	2	3	3	2	2	1	19	11
									Sum	309
									Mean	10.0

MAGNETIC STORMS

JANUARY 1996 BGMO

Time of Magnetic Begining Day	h	m	Ending Day	h	Type	Sudden Com. Amplitude D′	HnT	ZnT	Deg. of Acti.	Maximum Acti. on K-scale Day	3hour Int.	k Index	Maximum Range D′	HnT	ZnT
12	22		13	22	GC				m	13	4	5	11.5	161	24

PREDICTED SMOOTHED SUNSPOT NUMBERS

AUGUST 1995 — JULY 1996

Date	Aug 95	Sep 95	Oct 95	Nov 95	Dce 95	Jan 96
R′	15.9	14.3	12.8	11.4	10.3	9.6
E′	0.8	1.1	1.3	1.7	2.2	2.1
Date	Feb 96	Mac 96	Apr 96	May 96	Jun 96	Jul 96
R′	8.9	8.2	7.7	7.2	6.6	6.7
E′	2.0	2.1	2.8	2.7	2.8	2.4

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

太阳X射线耀斑短期预报检验

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我们对太阳活动22周（1993—1995年）期间的X射线耀斑短期预报（2日报）进行了检验，结果如表（见英文表1—表4)。

从表1到表4中，我们可以清楚地看到，随着太阳活动水平的下降，我们的报准率迅速提高，而虚报率、漏报率迅速下降。1993年报准率为78.5%，虚报率为7.8%，漏报率为13.3%。到1994年报准率已达91%，虚报率降为2.7%，漏报率降为6.3%。而1995年报准率高达99.2%，虚报率、漏报率分别为0%和0.8%。从三年的综合结果看，我们的报准率为90%，虚报率小于4%，而漏报率小于7%。

由于在太阳周下降位相活动事件比较少，漏报天数与实际发生活动的天数的比率具有相当的重要性。因而在表中列出了漏报活动的天数与爆发的天数之比．以R（%）表示。从表列的R值我们可以看出1993年和1994年为20%，而1995年为4%。

致　谢

我们非常感谢王家龙研究员关于增加检验参数R值的建议。感谢副研究员张桂清对本工作的支持和帮助。

收稿日期1996年2月8日

A VERIFICATION OF THE SHORT-TERM PREDICTION OF SOLAR X-RAY FLARES AT RWC-BEIJING

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We verify the RWC-Beijing short-term prediction of X-ray flares made in the descending phase of Solar Cycle 22 (1993-1995) in this report. The results obtained are shown in Table 1 to Table 4.

Table 1. The Verification of the Short-Term (2 days) Prediction of Solar X-Ray Flares For 1993

Year and Month	Prediction (days)	Observation (days)	Correction (days)	Falsification (days)	Failure (days)	Burst (days)	Rates of Correction (%)	Rates of Falsification (%)	Rates of Failure (%)	R (%)
1993. 1	17	17	17	0	0	9	100	0	0	0
2	20	20	14	3	3	19	70	15	15	16
3	23	23	16	1	6	22	69	4	26	27
4	22	22	17	2	3	17	77	9	14	18
5	21	21	11	3	7	17	52	14	33	41
6	22	22	13	4	5	16	59	18	23	31
7	22	22	20	1	1	8	91	5	5	13
8	22	22	20	0	2	9	91	0	9	22
9	22	22	20	1	1	7	91	5	5	14
10	20	20	17	3	0	13	85	15	0	0
11	22	22	18	1	2	12	82	9	9	17
12	23	23	18	1	4	17	78	4	17	24

R=Failure(days)/burst(days)(%)

Table 2. The Verification of the Short-Term (2 days) Prediction of Solar X-Ray Flares For 1994

Year and Month	Prediction (days)	Observation (days)	Correction (days)	Falsification (days)	Failure (days)	Burst (days)	Rates of Correction (%)	Rates of Falsification (%)	Rates of Failure (%)	R (%)
1994.1	21	21	11	4	6	16	52	19	29	38
2	14	14	14	0	0	7	100	0	0	0
3	23	23	23	0	0	7	100	0	0	0
4	21	21	21	0	0	4	100	0	0	0
5	17	17	17	0	0	1	100	0	0	0
6	17	17	16	0	1	5	94	0	6	20
7	18	18	17	0	1	6	94	0	6	17
8	22	22	17	0	5	8	77	0	23	63
9	14	14	14	0	0	5	100	0	0	0
10	19	19	18	0	1	5	95	0	5	20
11	12	12	12	0	0	0	100	0	0	0
12	23	23	22	1	0	7	96	4	0	0

R=Failure(days)/burst(days)(%)

Table 3. The Verification of the Short-Term
(2 days) Prediction of Solar X-Ray Flares For 1995

Year and Month	Prediction (days)	Observation (days)	Correction (days)	Falsification (days)	Failure (days)	Burst (days)	Rates of Correction (%)	Rates of Falsification (%)	Rates of Failure (%)	R (%)
1995.1	19	19	19	0	0	10	100	0	0	0
2	17	17	17	0	0	3	100	0	0	0
3	23	23	23	0	0	15	100	0	0	0
4	20	20	20	0	0	5	100	0	0	0
5	22	22	22	0	0	4	100	0	0	0
6	22	22	22	0	0	2	100	0	0	0
7	21	21	21	0	0	0	100	0	0	0
8	23	23	23	0	0	2	100	0	0	0
9	21	21	21	0	0	2	100	0	0	0
10	22	22	20	0	2	4	91	0	9	50
11	22	22	22	0	0	0	100	0	0	0
12	21	21	21	0	0	0	100	0	0	0

R=Failure(days)/burst(days)(%)

Table 4. A Summary of the Verification of the
Short-Term Prediction of Solar X-Ray Bursts For 1993–1995

Year	Prediction (days)	Observation (days)	Correction (days)	Falsification (days)	Failure (days)	Burst (days)	Rates of Correction (%)	Rates of Falsification (%)	Rates of Failure (%)	R (%)
1993	256	256	201	20	34	166	78.5	7.8	13.3	20
1994	221	221	202	6	14	71	91	2.7	6.3	20
1995	253	253	251	0	2	47	99.2	0	0.8	4
93-95	730	730	654	26	50	241	90	3.6	6.8	21

R=Failure(days)/burst(days)(%)

According to Table 1 ,2,3, and 4, we can see clearly that the rates of correct predictions rapidly increased and the rates of false and failed predictions rapidly decresed from 1993 to 1995 along with the decay of solar activity of Cycle 22.

In 1993, the rate of correct predictions was 78.5% , rate of false predictions was 7.8% , rate of failed predictions was 13.3% . In 1994, the rates were respectively 91% , 2.7% and 6.3% . And, in 1995 the rates were respectively 99.2% , 0% , and 0.8% . While the yearly rates for these three years were respectively 90% , <4% , and < 7% .

On the other hand,we may see from the values of R in Tables 1-4 that the yearly R for these three years were respectively 20% , 20% , and 4% , indicating about 20% of burst days were missed.

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