

说 明

(1994)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 BELJ)、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(S_d)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(S_p 或 S_q)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 $\text{Fe I } \lambda 5324.19 \text{ \AA}$ 谱线观测资料 (光球)

4—使用 $\text{H}_\beta \lambda 4861.34 \text{ \AA}$ 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, 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 (S_d) 和校正面积 (S_q) 按下列关系换算:

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

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) $< 65^\circ$ 时, 其级别按“校正面积 S_q ”定级, 如下表所示:

耀 斑 级 别			
校正面积 S_q	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 $r/R \geq 0.906$ 时, 即耀斑日心角 $\geq 65^\circ$ 时, 其级别按“视面积 S_d ”定级, 如下表所示:

耀 斑 级 别				
日心距 r/R	S	1	2	3
.906—.939	$S_d < 90$	90—279	280—599	$S_d \geq 600$
.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。

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 $10^{-22} \cdot \text{瓦} \cdot \text{米}^{-2} \cdot \text{赫}^{-1}$ (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。

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 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 $f > 600 \text{ MHz}$ 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 $f < 600 \text{ MHz}$ 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)。

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

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

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

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, b_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)

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： $40.0^\circ N$ 、 $116.2^\circ E$ ；地磁坐标： $28.9^\circ N$ 、 $186.1^\circ E$ ；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。

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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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 $< 10^\circ$, 在老的群中长度可达 20° 。黑子间距 $> 3^\circ$ 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 $> 5^\circ$ 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 $< 10^\circ$ 。
- E 二个极性中均有半影的双极群, 其径向跨度达 $10^\circ - 15^\circ$ 。
- F 二个极性中均有半影的双极群, 其径向跨度 $> 15^\circ$ 。
- H 有半影的单极群, 伴随黑子距主黑子半影 $< 3^\circ$ 。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 $> 5^\circ$ 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 $\sim 3''$, 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 $< 2.5^\circ$, 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 $< 2.5^\circ$, 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。
- b 大的对称半影, 其直径 $> 2.5^\circ$ 。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 $> 2.5^\circ$ 。除了尺度较大外, 其余特征与 a 相同。当半影的径向跨度 $> 5^\circ$ 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 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。

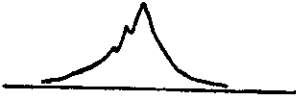
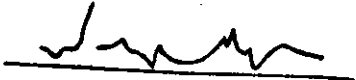
X=耀斑的 H_α 线很宽

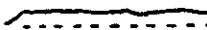
Y=环形日珥系统

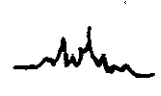
Z=大的黑子本影为耀斑所掩盖

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 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

(1994)

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 (URCM) 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 confidence 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 S_d is the area projected on the disk in millionths of the disk and the Corrected Area S_p 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 5324.19 Å and/or H_β λ 4861.34 Å at Huairou Station of Beijing 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 5324.19 Å

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 S_d and corrected area S_q 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 S_q 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 S_d according to the following table where the areas are given in millionths of the disk.

Heliocentric Distance r/R	I m p o r t a n c e			
	S	1	2	3
.906 — .939	$S_d < 90$	90 — 279	280 — 599	$S_d \geq 600$
.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 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 certain 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 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 graph 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 Ionospheric 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:

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

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

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

$a_k = 0 \quad 3 \quad 7 \quad 15 \quad 27 \quad 48 \quad 80 \quad 140 \quad 240 \quad 400$ (in 1.2 nT)

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 $40.0^\circ N$, $116.2^\circ E$ in geographic coordinates or $28.9^\circ N$, $186.1^\circ E$ 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 ($120^\circ E$) 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 inquiries to our Editorial Group, please: CSGD Editorial Group, Beijing Astronomical Observatory, Beijing 100080 China. Telephone Number : 2567194, Telegram code : 9053, Telex : 22040 BAOAS CN.

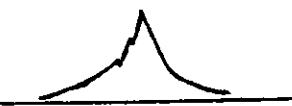
Appendix 1

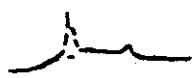
The International Astronomical Union Notation for H-Alpha Solar Flares

- 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 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. 

《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	E':	预报误差
Gro:	每天在日面上的黑子群总数	H α 太阳耀斑表	
Relative—Num—bers:	每天的黑子相对数值	Sta:	台站
N. H.:	每天北半球的黑子相对数	Start (UT):	耀斑开始时间(UT 为世界时,其中“E”为小于此时间。)
S. H.:	每天南半球的黑子相对数	Max (UT):	耀斑的极大时间(“U”为接近此时间,不确定。)
Sum:	南、北半球黑子相对数的总和	End (UT):	耀斑的结束时间(“D”为大于此时间。)
Sunspot Areas:	太阳黑子面积数值	Cen	日心距,即 r/R 。
Drawing:	手描的	Dist:	
Photographic:	照相的	Area	耀斑极大时的面积(S_d 为视面积,单位为太阳圆面积的
N. H.:	每天北半球黑子面积	Measurement	10^{-8} ; S_q 为校正面积,以平方度为单位。)
S. H.:	每天南半球黑子面积	Appar Corr	
Sum:	南、北半球黑子面积的总和	(sd) (sq):	

太阳黑子观测表

Group:	在日面上的黑子群号	Imp:	耀斑的级别
CMP	黑子群过日面中心经圈日期,	Obs	耀斑资料类型
Mo—Day:	用月—日表示。	Type:	
Lat:	黑子群在日面上的纬度	A. R.:	耀斑所在活动区的黑子群号
L:	黑子群在日面上的卡林顿经度	Rem:	备注(记录耀斑发生时
CMD:	黑子群在日面上的中经距		的形态)

Type:	黑子群的 McIntosh 类型	H α 耀斑巡视时间表	
r/R:	黑子群在日面上的日心距(以太阳半径为 1)	From:	耀斑照相巡视开始时间
		To:	耀斑照相巡视的结束时间

Corre. Area S_d	黑子群在日面上所占的面积	太阳活动区磁场和速度场的观测表	
whole Max:	(S_d 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。)	L_0 :	每天的日面中心经度
		Huairou	北京天文台怀柔观测站的
		Region:	活动区编号

See:	观测时大气视宁静度	Data:	取得的磁场资料类型
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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。)	太阳射电辐射流量表	
		BEIJ	每天的太阳在 2840 MHz 的
		2840:	流量密度(北台 0400 UT 测量,以 $10^{-22} \cdot \text{瓦} \cdot \text{米}^{-2} \cdot \text{赫}^{-1}(\text{s. f. u.})$ 为单位。)

太阳黑子相对数的平滑值预报表

Time:	预报的时间	PURP	每天的太阳在 2700 MHz 的
R':	月平滑黑子相对数的预报值	2700:	流量密度(紫台 0400 UT 测)

URUM 每天的太阳在 9375 MHz 的
9375 : 流量密度(乌站 0500 UT 测)
YUNN 每天的太阳在 2840 MHz 的
2840 : 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 巡视时间
2840 :
PURP 紫金山天文台 2700 MHz 频率
From To 巡视时间
2700 :
URUM 新疆乌鲁木齐天文站频率为
From To 9375 MHz 巡视时间
9375 :
YUNN 云南天文台 2840 MHz 频率
From To 巡视时间
2840 :

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。

详细说明请见每年第一期。

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 1994 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
tic:
Begining: 开始时间
Ending: 终止时间
h: 小时
m: 分钟
Type: 类型
Sudden Com. 急始变幅
Amplitude
D' HnT ZnT:

Deg. of Acti.: 活动程度
Maximum Acti. 最大活动程度
on K-scale:
3 hour Int.: 三小时时段
K Index: K 指数
Maximum 最大幅度
Range
D' HnT ZnT:

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

目 录

CONTENTS

1994 年 1 月

说明	(I)
Explanation	
表头说明	(i)
Description of Columns in Tables	
太阳黑子相对数与面积数	(1)
Daily Relative Sunspot Numbers and Sunspot Areas	
太阳黑子观测	(2)
Daily Sunspot Observations	
太阳黑子相对数的平滑值预报	()
Predicted Smoothed Sunspot Numbers	
H _α 太阳耀斑	()
H-Alpha Solar Flares	
H _α 耀斑巡视时间	()
Intervals of H-Alpha Flare Patrol Observation	
太阳活动区磁场和速度场观测	(7)
Observation of Magnetic and Velocity Fields of Solar Active Regions	
太阳射电辐射流量	(10)
Solar Radio Emission Flux	
太阳射电辐射显著事件	(11)
Solar Radio Emission Outstanding Occurrences	
太阳射电辐射显著事件图	()
Profiles of Solar Radio Emission Outstanding Occurrences	
太阳射电辐射巡视时间	(12)
Intervals of Solar Radio Emission Patrol Observation	
宇宙线强度	(14)
Cosmic Ray Intensity	
突然电离层扰动 (D 层)	(18)
Sudden Ionospheric Disturbances (D-Region)	
地磁活动指数 K 和 A _K	(20)
The Geomagnetic Activity Indices K and A _K	
磁暴	(21)
Magnetic Storms	
论文	()
Paper	

DAILY RELATIVE SUNSPOT NUMBERS AND SUNSPOT AREAS

JANUARY 1994

Day	Relative-Numbers				Sunspot Areas					
	Gro.	N.H.	S.H.	Sum	Drawing			Photographic		
					N.H.	S.H.	Sum	N.H.	S.H.	Sum
1	5	78	39	117	1912	501	2413			
2	4	56	52	108	661	658	1319			
3	4	50	71	121	450	653	1103			
4	5	91	68	159	395	613	1008			
5	5	55	51	106	370	537	907			
6	6	82	68	150	509	676	1185			
7	6	47	40	87	553	417	970			
8	6	58	35	93	469	337	806			
9	6	77	30	107	360	172	532			
10	3	73	10	83	367	111	478			
11	2	72	0	72	327	0	327			
12	2	36	0	36	383	0	383			
13	3	51	14	65	352	25	377			
14	3	37	15	52	298	28	326			
15	5	34	26	60	303	22	325			
16	6	18	18	36	533	23	556			
17	2	19	0	19	861	0	861			
18	3	23	8	31	956	2	958			
19	2	31	0	31	913	0	913			
20	2	35	0	35	672	0	672			
21	3	52	0	52	638	0	638			
22	4	65	0	65	646	0	646			
23	4	62	0	62	740	0	740			
24	6	71	13	84	820	5	825			
25	6	81	11	92	959	5	964			
26	6	58	10	68	1110	4	1114			
27	6	56	17	73	948	14	962			
28	6	33	25	58	564	20	584			
29	6	21	29	50	61	40	101			
30	8				69	23	92			
31	8	8	17	25	86	91	177			
Mean		51.0	22.2	73.2	589.8	160.5	750.4			

DAILY SUNSPOT OBSERVATIONS

JANUARY 1994

Day	Group	CMP		Lat	L	CMD	Type	r/R	Sd	Corre. Area		See	Remarks
		Mo-Day								Whole	Max		
1.08	365	12-26.1		7	204	77W	EKC	0.98	395	927	769	0	
	366	12-27.2		9	190	67W	DSI	0.92	42	54	37	0	
	373	1- 4.0		-9	87	37E	DAI	0.61	690	435	313	0	
	374	1- 4.2		12	85	40E	FKC	0.67	1388	931	339	0	
	1	1- 3.5		-15	93	33E	DRI	0.56	109	66	41	0	
2.07	366					80W	BXD	0.99	13	42	28	0	
	373					25E	DKI	0.43	1026	567	351	0	
	374					28E	FKC	0.53	1051	619	223	0	
	1					20E	DSI	0.39	168	91	62	0	
3.04	373					13E	EKI	0.23	1081	555	350	0	
	374					15E	FAC	0.36	841	450	131	0	
	1					7E	DSI	0.24	181	93	52	0	
	2	1- 4.9		-12	76	25E	BXD	0.44	8	5	2	0	
4.05	373					1W	EKI	0.10	1051	529	300	0	
	374					2E	FAC	0.29	660	345	125	0	
	1					7W	DSI	0.24	156	80	48	0	
	2					9E	AXX	0.21	8	4	2	0	
	3	1- 9.1		7	20	65E	CSI	0.91	42	50	45	0	
5.06	373					14W	EKI	0.25	925	478	283	0	
	374					12W	FAI	0.34	429	228	108	0	
	1					21W	DSI	0.40	105	57	30	0	
	2					3W	AXX	0.15	4	2	2	0	
	3					54E	DSI	0.82	164	142	55	0	
6.14	373					28W	EKI	0.47	1093	620	453	0	
	374					27W	FSI	0.53	252	149	92	0	
	1					36W	DSO	0.61	88	56	40	0	
	3					40E	DAC	0.66	526	348	95	0	
	4	1- 9.9		5	10	52E	BXD	0.79	8	7	3	0	
	5	1-11.0		9	355	64E	AXX	0.91	4	5	5	0	
7.05	373					40W	EKI	0.66	572	379	203	0	
	374					41W	FSI	0.69	143	99	64	0	
	1					49W	CRD	0.77	42	33	23	0	
	3					27E	EAC	0.49	770	443	152	0	

DAILY SUNSPOT OBSERVATIONS

JANUARY 1994

Day	Group	CMP		L	CMD	Type	r/R	Sd	Corre. Area		See	Remarks
		Mo-Day	Lat						Whole	Max		
	4				40E	BXI	0.67	17	11	6	0	
	6	1- 4.7	-19	78	31W	BXI	0.56	8	5	3	0	
8.06	373				55W	DKI	0.82	357	309	171	0	
	374				55W	CSI	0.84	63	58	39	0	
	1				61W	BXO	0.87	21	22	9	0	
	3				14E	EKI	0.31	744	392	239	0	
	4				27E	CRI	0.47	34	19	5	0	
	6				47W	AXX	0.74	8	6	3	0	
9.07	373				69W	DSO	0.92	118	150	91	0	
	374				70W	CRI	0.94	17	25	19	0	
	1				74W	BXO	0.95	8	14	7	0	
	3				1E	EAI	0.20	597	304	111	0	
	4				13E	DRI	0.26	59	31	7	0	
	6				59W	BXO	0.86	8	8	4	0	
10.05	373				82W	CSD	0.99	34	111	83	0	
	3				13W	EKI	0.31	648	341	250	0	
	4				3W	CRI	0.17	50	26	6	0	
11.05	3				26W	EAI	0.48	484	276	110	0	
	4				16W	CRI	0.31	97	51	22	0	
12.06	3				40W	ESI	0.67	387	260	79	0	
	4				30W	DSI	0.52	210	123	25	0	
13.07	3				54W	ESO	0.80	273	230	71	0	
	4				43W	DSI	0.69	177	122	41	0	
	7	1-11.6	-7	348	20W	CRI	0.33	46	25	18	0	
14.07	3				68W	ESO	0.92	164	209	64	0	
	4				57W	DSI	0.84	97	89	39	0	
	7				34W	CRO	0.55	46	28	23	0	
15.06	3				79W	DSO	0.99	34	111	42	0	PURP
	4				71W	CRI	0.97	42	81	40	0	
	7				48W	BXI	0.74	13	9	3	0	
	8	1- 9.6	-5	14	72W	BXI	0.94	8	13	6	0	
	9	1-21.3	4	220	82E	HSX	0.99	34	111	111	0	

DAILY SUNSPOT OBSERVATIONS

JANUARY 1994

Day	Group	CMP		Lat	L	CMD	Type	r/R	Sd	Corre. Area			See	Remarks
		Mo-Day								Whole	Max			
16.05	4					83W	AXX	0.99	8	28	14	0		
	7					64W	AXX	0.89	4	5	5	0		
	8					83W	AXX	0.99	4	14	14	0		
	9					71E	HSX	0.94	105	157	157	0		
	10	1-15.2	-8	299		11W	AXX	0.20	8	4	2	0		
	11	1-22.3	9	206		81E	DSI	0.99	105	348	223	0		
17.05	9					56E	HSX	0.83	168	150	150	0		
	11					70E	DKC	0.94	475	711	692	0		
18.04	9					42E	HSX	0.68	269	183	183	0		
	11					56E	DKC	0.84	841	773	754	0		
	12	1-18.2	-20	260		2E	AXX	0.26	4	2	2	0		
19.04	9					29E	HSX	0.51	278	161	161	0		
	11					43E	DKC	0.70	1072	752	737	0		
20.06	9					16E	HSX	0.31	269	142	142	0		
	11					30E	DKC	0.54	892	530	500	0		
21.09	9					3E	HSX	0.16	278	141	138	0		
	11					16E	CKI	0.37	904	486	362	0		
	13	1-20.3	12	233		11W	BXI	0.34	21	11	4	0		
22.04	9					11W	HSX	0.23	265	137	137	0		
	11					4E	CKI	0.25	931	490	465	0		
	13					25W	CKI	0.48	25	14	2	0		
	14	1-24.2	12	181		27E	AXX	0.53	8	5	3	0		
23.03	9					23W	HSX	0.41	210	115	115	0		
	11					9W	CKI	0.28	1128	587	576	0		
	13					37W	CRO	0.66	46	31	20	0		
	14					15E	BXO	0.38	13	7	2	0		
24.10	9					37W	HSX	0.62	164	105	105	0		
	11					24W	DKC	0.46	1178	663	639	0		
	13					51W	CRI	0.80	38	32	18	0		
	14					1E	BXI	0.30	25	13	7	0		
	15	1-26.7	-13	148		34E	BXI	0.56	8	5	3	0		

DAILY SUNSPOT OBSERVATIONS

JANUARY 1994

Day	Group	CMP		L	CMD	Type	r/R	Sd	Corre. Area			Remarks
		Mo-Day	Lat						Whole	Max	See	
	16	1-27.9	8	133	49E	BXI	0.77	8	7	3	0	
25.08	9				50W	HSX	0.77	126	99	99	0	
	11				37W	DKC	0.63	984	635	624	0	
	13				65W	CRO	0.92	17	21	16	0	
	14				13W	DAI	0.36	345	185	92	0	
	15				21E	BXO	0.38	8	5	2	0	
	16				36E	CRI	0.61	29	19	13	0	
26.06	9				63W	HSX	0.90	84	95	95	0	
	11				50W	DKC	0.78	925	742	728	0	
	13				78W	AXX	0.99	4	14	14	0	
	14				26W	DSI	0.52	294	172	91	0	
	15				9E	BXO	0.20	8	4	2	0	
	16				23E	DAO	0.45	156	87	47	0	
27.17	9				78W	HSX	0.98	38	89	89	0	
	11				65W	DKC	0.91	576	688	627	0	
	14				41W	DSI	0.70	168	118	62	0	
	15				6W	BXO	0.16	13	6	2	0	
	16				9E	DAI	0.28	101	53	33	0	
	17	1-31.6	-17	84	60E	BXO	0.86	8	8	4	0	
28.07	11				77W	DAC	0.98	193	454	207	0	
	14				52W	DSO	0.82	93	80	29	0	
	15				21W	AXX	0.38	8	5	2	0	
	16				3W	DRI	0.23	59	30	15	0	
	17				49E	BXO	0.85	17	13	6	0	
	18	1-28.7	-9	122	8E	AXX	0.15	4	2	2	0	PURP
29.12	14				67W	DRO	0.94	34	50	19	0	
	15				34W	BXO	0.55	8	5	3	0	
	16				16W	CRI	0.36	21	11	7	0	
	17				35E	BXI	0.57	25	15	5	0	
	19	1-29.4	-10	112	4E	BXI	0.10	13	6	2	0	
	20	2- 3.9	-8	41	74E	BXO	0.95	8	14	7	0	
30.06	16				29W	AXX	0.54	8	5	2	0	
	17				21E	BXI	0.39	13	7	2	0	
	19				10W	BXI	0.20	8	4	2	0	

DAILY SUNSPOT OBSERVATIONS

JANUARY 1994

		CMP		L	CMD Type	r/R	Sd	Corre. Area		See Remarks
Day	Group	Mo-Day	Lat					Whole	Max	
20					61E AXX	0.87	4	4	4	0
21	1-30.6	-7	97	9E BXI	0.16	8	4	2	0	
22	1-30.8	-12	95	10E AXX	0.21	8	4	2	0	
23	1-31.4	12	86	18E BXI	0.43	8	5	2	0	
24	2- 4.8	3	28	79E HSX	0.98	25	59	59	0	
31.06	15			60W AXX	0.86	4	4	4	0	
	16			42W AXX	0.70	8	6	3	0	
	17			8E DAI	0.23	147	76	48	0	
	20			50E AXX	0.76	4	3	3	0	
	21			6W AXX	0.10	8	4	2	0	
	22			4W BXO	0.13	8	4	2	0	
	23			5E AXX	0.32	8	4	2	0	
	24			65E HSX	0.90	67	76	76	0	

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 1994

HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
1	128.6	153	9	200	D4 V4 S5 L5 D5 V5
		154	10	190	D4 V4 S5 L5 D5 V5
		155	(12)	87	D4 V4 S5 L5 D5 V5 T5 Q5 U5
		156	-9	82	D4 V4 S5 L5 D5 V5 T5 Q5 U5
2	113.4	155			S5 L5
		156			S5 L5
3	100.3	155			L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		156			L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1	-17	93	L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
4	87.1	155			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		156			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
5	73.9	155			S5 L5
		156			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		2	6	15	D4 V4 S5 L5 D5 V5 T5 Q5 U5
6	60.8	155			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		156			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		2			D4 V4 S5 L5 D5 V5 T5 Q5 U5
7	47.6	155			S5 L5 T5 Q5 U5
		156			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		1			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		2			D4 V4 S5 L5 D5 V5 T5 Q5 U5
8	34.4	155			S5 L5
		156			S5 L5
		1			S5 L5
		2			S5 L5
		3	7	8	S5 L5
9	21.2	156			S5 L5
		1			S5 L5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 1994

HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		2			S5 L5
		3			S5 L5
10	8.1	2			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		3			D4 V4 S5 L5 D5 V5 T5 Q5 U5
11	354.9	2			S5 L5
		3			S5 L5
12	341.7	2			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		3			D4 V4 S5 L5 D5 V5 T5 Q5 U5
13	328.6	2			S5 L5
		3			S5 L5
		4	-12	(348)	S5 L5
15	302.2	4			S5 L5
17	275.9	5	9	206	S5 L5
18	262.7	5			D4 V4 S5 L5 D5 V5 T5 Q5 U5
19	249.6	5			D4 V4 S5 L5 D5 V5 T5 Q5 U5
20	236.4	5			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
21	223.2	5			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6	4	219	S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
22	210.1	5			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		7	11	234	S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		8	11	183	S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
23	196.9	5			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		7			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		8			S4 L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
24	183.7	5			D4 V4 S5 L5 D5 V5 T5 Q5 U5

OBSERVATION OF MAGNETIC AND VELOCITY FIELDS OF SOLAR ACTIVE REGIONS

JANUARY 1994

HUAIROU ST. BEIJING OBS.

Day	LO	Huairou Region	Lat	L	Data
		6			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		7			D4 V4 S5 L5 D5 V5 T5 Q5 U5
		8			D4 V4 S5 L5 D5 V5 T5 Q5 U5
26	157.4	5			L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		6			L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		8			L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		9	5	137	L4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
27	144.2	5			S5 L5
		6			S5 L5
		8			S5 L5
		9			S5 L5
28	131.1	5			D4 V4 S5 L5 D5 V5
		6			D4 V4 S5 L5 D5 V5
		8			D4 V4 S5 L5 D5 V5
		9			S4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
		10	-12	101	S4 D4 V4 S5 L5 D5 V5 T5 Q5 U5
29	117.9	5			S5 L5
		8			S5 L5
		9			S5 L5 V5 T5 Q5 U5
		10			S5 L5 V5 T5 Q5 U5
31	91.6	10			S5 L5

NPL SPL: 29

SOLAR RADIO EMISSION FLUX

JANUARY 1994

Day	BEIJ 2840	PURP 2700	URUM 9375	YUNN 2840
1	147	137		
2	146	141		
3	136	134		
4	135	130		
5	139	132		
6	139	138		
7	141	132		
8	128			
9	119	117		
10	119	118		
11	103	104		
12	107	95		
13	98	95		
14	86	92		
15	88	91		
16	95	96		
17	97	94		
18	103	98		
19	102	100		
20	102	100		
21	103	104		
22	115	111		
23	112	111		
24	119	119		
25	122	125		
26	131	125		
27	121	121		
28	117	117		
29	101	109		
30	100	98		
31	95	99		
Mean	114.9	112.8		

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JANUARY 1994

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Peak Flux	Rel Density	Mean
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02	2700	PURP	1 S	0235.6	0236.2	2.0	23.0	9.6	
02	2700	PURP	2 S/F	0545.8	0547.8	11.2	17.0	5.6	
04	2700	PURP	21 GRF	0106.6	0153.0	68.4E	24.0	12.3	
04	2840	BEIJ	21 GRF	0304.0	0306.0	11.0	29.0	21.0	
04	2700	PURP	4 S/F	0305.2	0306.6	2.8	34.0	12.0	
05	2700	PURP	21 GRF	0515.0	0649.5	143.5D	52.0	34.2	
05	2840	BEIJ	21 GRF	0647.0	0654.0	43.0	24.0	18.0	
06	2840	BEIJ	3 S	0604.0	0610.1	10.0	11.8	8.5	
06	2700	PURP	2 S/F	0612.8	0614.6	3.2	40.0	22.8	
09	2700	PURP	7 C	0401.0	0404.4	6.0	21.0	10.9	
11	2840	BEIJ	45 C	0531.0	0539.0	45.0	111.0	108.0	
16	2840	BEIJ	23 GRF	0643.0	0700.0	17.0	48.0	51.0	
16	2700	PURP	46 C	0651.0	0701.0	24.0	57.0	51.7	
19	2700	PURP	4 S/F	0308.0	0313.0	9.0	21.0	11.9	
22	2700	PURP	20 GRF	0102.4	0108.4	12.0	17.0	7.0	
26	2840	BEIJ	3 S	0116.0	0134.3	22.0	27.4	20.9	
26	2700	PURP	3 S	0131.0	0134.4	6.4	56.0	39.1	
27	2840	BEIJ	3 S	0450.0	0457.5	25.0	46.1	38.1	
27	2700	PURP	45 C	0457.0	0507.7	43.0	57.0	42.9	
29	2700	PURP	20 GRF	0308.6	0342.3	51.4	24.0	14.3	
29	2840	BEIJ	1 S	0338.0	0341.4	5.0	7.8	7.7	

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JANUARY 1994

Day	BEIJ	PURP	URUM	YUNN
	From To	From To	From To	From To
	2840	2700	9375	2840

1	0000 0721	0037 0723
2	2342 2400	0032 0730
3	2337 2400	0042 0740
4	2338 2400	0053 0737
5	2343 2400	0043 0743
6	2340 2400	0042 0735
7	2338 2400	0036 0214
8	2338 2400	0257 0736
9	0000 0845	0104 0123
10	0000 0844	0044 0733
11	2351 2400	0038 0730
12	0000 0850	0040 0252
13	2353 2400	0054 0251
14	0000 0848	0037 0730
15	2358 2400	0052 0730
16	0000 0845	0031 0739
17	0000 0851	0039 0155
18	2351 2400	0419 0534
19	0000 0839	0233 0235
20	2353 2400	0405 0656
	0000 0857	0115 0738
	2348 2400	0043 0216
	0000 0853	0306 0736
	2334 2400	

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JANUARY 1994

Day	BEIJ		PURP		URUM		YUNN	
	From	To	From	To	From	To	From	To
	2840		2700		9375		2840	
21	0000	0841	0038	0736				
	2341	2400						
22	0000	0851	0040	0735				
	2349	2400						
23	0000	0846	0030	0800				
	2330	2400						
24	0000	0859	0032	0731				
	2336	2400						
25	0000	0859	0056	0737				
	2343	2400						
26	0000	0853	0051	0738				
	2345	2400						
27	0000	0904	0050	0730				
	2338	2400						
28	0000	0903	0051	0738				
	2342	2400						
29	0000	0909	0056	0735				
	2341	2400						
30	0000	0900	0045	0613				
	2343	2400						
31	0000	0907	0105	0735				
	2341	2400						

COSMIC RAY NEUTRON INTENSITY Real Counts: 256 Times (Tabulated Counts Plus 1500)

JAN 1994

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	#
1	513	513	526	518	521	530	533	524	520	522	520	522	525	512	507	508	503	509	507	514	523	510	504	505	516.2	24
2	507	496	504	506	508	506	517	506	505	502	509	498	505	496	505	502	505	506	514	512	520	513	514	514	507.1	24
3	518	496	497	503	499	487	490	491	492	503	496	502	501	502	506	506	507	501	517	515	518	514	514	509	503.4	24
4	488	495	497	503	496	492	491	482	494	481	494	490	490	497	489	488	496	497	502	507	496	508	515	504	495.5	24
5	504	501	499	489	502	494	490	495	481	480	494	484	490	490	478	475	482	487	491	497	482	486	508	513	491.3	24
6	514	508	506	496	494	494	495	497	493	482	484	492	493	498	487	489	499	513	502	513	508	514	514	508	499.7	24
7	507	496	492	489	486	488	481	471	472	476	470	483	490	486	482	490	497	493	487	496	493	503	510	507	489.4	24
8	507	495	498	495	492	483	484	484	480	483	476	488	496	493	496	493	506	493	492	500	504	508	516	514	494.8	24
9	507	505	503	505	505	504	497	493	496	491	498	497	496	506	500	493	496	503	511	513	512	517	523	520	503.8	24
10	520	502	510	510	499	500	500	493	492	500	490	502	493	497	511	509	502	505	510	508	508	510	516	515	504.3	24
11	501	504	501	513	498	499	496	503	499	488	498	491	502	494	505	496	510	508	502	501	500	504	507	509	501.2	24
12	513	510	512	517	510	503	500	499	505	491	489	485	484	499	512	492	491	508	505	503	515	512	518	513	503.6	24
13	508	511	512	509	518	515	504	502	492	492	501	501	503	495	502	490	495	498	503	509	501	505	509	509	503.5	24
14	515	498	496	504	500	501	505	497	494	493	493	499	499	495	505	506	503	502	502	505	498	507	514	501	501.3	24
15	506	491	498	501	502	494	493	496	497	494	496	490	501	503	499	492	507	506	507	508	516	506	513	505	500.8	24
16	510	506	504	506	507	515	517	516	513	515	514	520	510	516	527	521	520	520	512	526	526	524	526	523	516.4	24
17	517	518	521	513	502	501	510	509	497	504	499	521	523	528	525	527	528	527	525	523	527	530	531	524	517.9	24
18	518	512	522	515	524	517	511	505	507	510	508	522	523	508	519	529	523	531	526	534	523	524	533	522	519.4	24
19	524	507	522	516	518	511	508	502	516	518	518	519	523	522	527	523	532	519	525	522	527	529	529	527	520.2	24
20	532	533	524	518	518	523	505	509	504	509	519	513	520	523	520	528	535	520	527	524	526	512	524	608	519.8	24
21	510	513	513	515	515	519	523	512	517	517	519	522	522	523	520	530	521	544	548	539	531	525	521	514	522.2	24
22	512	518	517	520	521	519	514	506	509	510	513	509	508	515	515	525	524	528	526	519	530	523	531	541	518.9	24
23	533	526	529	528	521	526	512	523	509	507	514	515	515	534	527	533	521	513	528	523	523	521	528	523	521.8	24
24	536	521	522	520	528	528	521	516	509	521	517	527	517	523	535	532	519	528	522	523	542	531	541	533	525.5	24
25	527	525	510	514	510	509	505	506	507	510	513	509	515	518	519	511	522	533	530	521	521	544	532	537	518.7	24
26	527	534	538	545	547	540	534	530	516	511	512	512	517	519	521	525	515	512	513	510	516	517	521	527	523.3	24
27	535	532	547	538	527	515	514	519	504	505	505	500	512	501	501	512	520	510	505	507	500	513	523	520	515.2	24
28	527	530	528	534	521	519	523	509	515	514	515	517	513	514	508	501	496	499	511	505	514	505	518	514	514.6	24
29	511	514	508	510	511	514	500	503	495	490	490	493	495	484	490	490	497	489	496	498	500	504	495	510	499.5	24
30	510	503	507	510	524	513	517	513	504	493	496	497	499	501	506	499	496	499	507	515	504	507	501	507	505.3	24
31	508	512	510	507	502	495	496	497	499	497	493	500	496	501	499	495	485	496	501	498	502	506	514	511	500.8	24

MONTHLY MEAN=508.884

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE:508.884

(1-12) 6.05 1.60 3.15 2.95 1.63 -0.69 -2.88 -5.40 -7.82 -8.59 -7.40 -5.05

(13-24) -3.21 -2.66 -1.05 -2.11 -0.72 0.70 2.53 3.63 4.18 5.05 9.28 6.83

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

U.T.=(1 5.81 -2.44 6.30 22.48) (2 0.53 0.83 0.98 1.92) (3 -0.59 -1.25 1.39 5.44) (4 0.61 -0.39 0.73 5.46)

L.T.=(1 -0.79 6.25 6.30 6.48) (2 0.46 -0.87 0.98 9.92) (3 -0.59 -1.25 1.39 5.44) (4 0.03 0.73 0.73 1.46)

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

JAN 1994

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	47	27	29	33	50	34	48	46	34	25	25	16	10	15	18	8	3	15	11	9	23	6	7	20	23.3	24
2	14	5	21	18	16	10	22	-1	22	19	18	10	21	1	11	3	0	9	25	8	5	14	22	21	13.1	24
3	26	14	14	14	13	27	16	28	9	17	15	0	8	-7	15	2	7	-5	-7	5	19	25	12	24	10.7	24
4	24	25	10	10	34	17	23	16	7	7	-2	1	18	-2	2	4	-3	-10	-12	19	19	17	25	17	11.7	24
5	16	11	10	10	17	10	24	2	22	10	1	11	1	8	12	2	16	20	14	19	21	11	25	16	16.0	24
6	38	22	20	23	35	24	9	22	2	11	15	20	11	27	18	18	13	13	24	19	21	28	34	30	21.9	24
7	23	18	18	10	30	16	7	36	30	31	18	12	13	37	14	18	20	12	11	11	24	32	31	31	16.8	24
8	21	38	28	36	26	25	27	44	39	37	18	29	23	34	24	30	40	28	34	21	26	39	36	30	31.4	24
9	36	33	47	37	32	19	26	18	28	25	16	29	29	37	24	31	31	22	37	25	34	30	31	34	29.0	24
10	40	28	28	35	26	23	34	27	23	31	11	17	37	27	27	24	40	28	34	45	30	24	31	31	29.1	24
11	20	29	27	48	28	40	38	45	20	20	26	13	2	9	17	15	20	22	33	27	32	27	33	36	26.4	24
12	25	35	43	52	46	39	28	4	15	16	25	9	23	20	-13	9	19	9	23	30	17	27	33	36	23.4	24
13	34	33	38	38	38	37	37	37	35	48	35	48	34	31	41	31	31	42	36	39	38	41	47	39	40.9	24
14	24	43	38	33	33	33	47	46	43	40	50	20	20	46	46	46	47	42	36	39	38	41	44	44	40.9	24
15	47	38	39	39	40	40	44	46	33	28	35	36	36	37	37	37	37	37	33	38	41	47	47	39	40.9	24
16	30	43	39	28	36	52	43	43	35	48	35	48	34	31	41	31	31	42	34	23	25	36	42	34	34.6	24
17	40	39	45	45	45	47	48	48	38	38	38	38	38	38	38	38	38	46	46	48	50	43	49	34	41.8	24
18	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	46	46	48	50	43	49	34	41.8	24
19	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	59	59	59	59	42	57	45	50.2	24
20	47	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	64	64	64	64	61	90	77	67.0	24
21	20	47	43	41	54	51	44	68	74	74	61	65	69	72	72	72	72	72	72	72	61	90	77	67.0	24	
22	55	73	73	75	75	61	64	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68.8	24
23	79	79	76	72	72	81	64	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	68.8	24
24	59	70	71	63	64	73	53	66	66	64	64	59	73	61	62	66	67	65	65	65	65	66	66	78	66.0	24
25	61	56	50	50	57	63	62	63	63	54	57	48	48	55	55	48	48	52	53	53	57	65	66	59	56.2	24
26	58	58	58	74	77	67	67	67	67	65	46	46	46	41	41	46	46	29	29	29	30	31	48	48	50.8	24
27	59	64	67	76	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	41.6	24
28	49	38	69	60	71	57	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	32.1	24
29	40	35	43	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	31.4	24
30	26	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	21.9	24
31	25	24	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	21.9	24

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 36.534

(1-12) 2.21 2.98 6.31 7.31 9.66 7.43 6.56 5.18 -1.53 -4.15 -5.02 -5.15
(13-24) -5.31 -4.47 -4.82 -2.92 -5.60 -2.92 -4.18 -1.99 -2.28 0.27 0.53 1.89

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

U.T.=(1) 3.97 4.60 6.07 3.28 (2) -1.91 1.37 2.35 4.81 (3) -0.30 -1.31 1.35 5.71 (4) 0.17 -0.02 0.17 5.87
L.T.=(1) -5.97 1.13 6.07 11.28 (2) 2.14 0.97 2.35 0.81 (3) -0.30 -1.31 1.35 5.71 (4) -0.07 0.16 0.17 1.87

COSMIC RAY MESON INTENSITY
Real Relative Intensity: 0.1% Times (Tabulated Value Plus 1000)

JAN 1994

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	46	48	47	43	44	44	41	42	46	46	44	39	40	37	39	37	35	39	39	40	44	39	39	37	41.3	24
2	38	39	39	38	41	41	42	43	40	41	41	40	39	41	41	36	41	42	43	43	44	44	45	40.9	24	
3	47	45	45	46	45	44	42	43	40	42	42	41	42	40	41	37	39	39	43	42	41	41	42	41.8	24	
4	44	43	44	41	41	41	41	41	41	41	41	41	41	41	41	36	40	40	44	43	43	43	40	44.0	24	
5	43	44	44	41	41	41	41	41	41	41	41	41	41	41	41	36	40	40	44	43	43	43	40	44.0	24	
6	47	47	45	45	45	42	42	42	46	48	43	40	40	43	43	42	42	42	44	44	45	46	46	43.5	24	
7	46	49	49	48	48	46	46	46	46	46	46	46	46	46	46	48	48	48	50	47	47	47	47	46.9	24	
8	42	43	43	43	43	43	43	43	43	43	43	43	43	43	43	48	48	48	50	47	47	47	47	46.9	24	
9	42	43	43	43	43	43	43	43	43	43	43	43	43	43	43	48	48	48	50	47	47	47	47	46.9	24	
10	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	48	48	48	50	47	47	47	47	46.9	24	
11	44	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	50	47	47	47	47	46.9	24	
12	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	24
13	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	24
14	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	24
15	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	24
16	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	24
17	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	24
18	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	24
19	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	24
20	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	24
21	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	24
22	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	24
23	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	24
24	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	24
25	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	24
26	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	24
27	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	24
28	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	24
29	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	24
30	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	24
31	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	24
32	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	24
33	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	24
34	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	24
35	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	24
36	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	24
37	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	24
38	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	24
39	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	24
40	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	24
41	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	24
42	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	24
43	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	24
44	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	24
45	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	24
46	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	24
47	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	24
48	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	24
49	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	24
50	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	24
51	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	24
52	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	24
53	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	24
54	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	24
55	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	24
56	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	24
57	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	24
58	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	24
59	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	24
60	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	24
61	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	24
62	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	24
63	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	24
64	87	87	87	87	87	87	87	87	87	87	87	87	87													

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 46.185
(1-12) 1.36 2.49 2.14 1.20 0.27 -0.28 0.59 -0.22 -0.38 -1.12 -1.09 -1.80
(13-24) -0.86 -0.77 -0.64 -1.48 -1.19 0.33 0.65 0.65 -0.38 0.49 -0.31 0.33
HARMONIC COMPONENTS (ORDER, COS, SIN, AMPLITUDE, MAX, MIN)
U.T.=(1) 1.16 0.30 1.20 0.98 (2) -0.09 0.33 3.52 (3) -0.04 0.40 0.41 2.14 (4) 0.03 0.57 0.57 1.44
L.T.=(1) -0.85 0.86 1.20 8.98 (2) 0.33 -0.09 0.34 11.52 (3) -0.04 0.40 0.41 2.14 (4) -0.51 -0.26 0.57 3.44

COSMIC RAY INDICES

Bartels Rotation 2191 (DEC 1993-JAN 1994)



SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

JANUARY 1994

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
01	LINT	0325	0329	0338D	1-	- 0.4	- 3	- 0.9
01	LINT	0338	0343	0435	1-	- 0.8	- 4	- 1.4
01	LINT	0552	0556	0635	1-	- 0.6		- 1.7
02	LINT	0230	0237	0300	1-	- 0.6	- 5	- 1.5
03	YUNN	0251	0253	0259	1	- 1.1		
04	YUNN	0044	0045	0052	1+	- 2.3		
04	YUNN	0241	0242	0248	1-	- 1.0		
04	LINT	0305	0315	0345	1	- 1.3	- 8	- 1.7
04	YUNN	0658	0659	0706	1+	- 2.8		
06	LINT	0050	0055	0105U	1	- 1.1	0	- 0.9
06	YUNN	0212	0213	0221	1+	- 2.2		
06	LINT	0404	0408	0445	1	- 1.9	- 9	- 3.1
06	YUNN	0406	0411	0420	1+	- 2.9		
06	LINT	0612	0620	0650	1	- 1.7	- 2	- 1.2
07	LINT	0115	0128	0200	2-	- 3.4	-10	+ 8.0
07	LINT	0217	0230	0400	1+	- 2.7	-16	- 0.8
07	LINT	0250	0300	0315	1-	0	- 4	0
08	LINT	0240	0250	0304	1-	- 0.4	- 5	- 0.5
08	LINT	0304	0321	0350	1-	- 0.8	- 7	- 1.1
10	YUNN	0049	0050	0054	1	- 1.6		
10	YUNN	0159	0200	0206	1+	- 2.8		
11	LINT	0410	0421	0455	1-	- 1.0	- 5	- 1.0
11	YUNN	0814	0816	0822	1+	- 2.1		
14	YUNN	0739	0740	0745	1-	- 0.9		
15	LINT	0112	0115	0125	2-	- 3.3	0	+ 0.3
15	YUNN	0149	0150	0157	1	- 1.5		
15	LINT	0413	0418	0423D	1-	- 0.4	- 3	- 0.7
15	LINT	0423	0429	0449	1-	- 0.7	- 5	- 1.7
15	LINT	0500	0512	0540	1-	- 0.7	- 5	- 1.5
16	LINT	0102	0113	0130U	1-	- 1.0	0	- 1.2
16	LINT	0650	0710	0910	3-	- 6.7		- 5.2
17	LINT	0035	0040	0050U	1-	- 0.7		- 2.4
17	LINT	0605	0612	0630	1-	- 1.0		- 0.9
18	LINT	0240	0248	0325	1-	- 0.9		- 1.2
18	LINT	0420	0428	0512	1+	- 2.7		- 3.5
18	YUNN	0421	0432	0443	2-	- 3.1		
19	LINT	0310	0318	0435	2+	- 5.1		- 1.7, + 1.7
19	YUNN	0310	0319	0331	2+	- 5.6		
19	LINT	0450	0455	0511	1-	- 0.6		0
20	LINT	0236	0245	0310	1-	- 1.0		- 0.6

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

JANUARY 1994

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
22	YUNN	0020	0028	0037	3+	-10.6		
22	LINT	0104	0110	0122	2-	- 3.5		- 2.8
22	YUNN	0147	0149	0157	1	- 1.2		
25	LINT	0057	0104	0110U	1	- 1.1		- 0.5
25	LINT	0342	0350	0410	1-	- 0.5		- 1.2
26	LINT	0536	0542	0606	1	- 1.2		- 1.1
27	LINT	0024	0028	0040	1	- 1.3		- 0.3
27	LINT	0211	0215	0230	1-	- 0.8		- 0.5
27	LINT	0341	0402	0455	2+	- 5.1		- 7.6
27	YUNN	0345	0354	0408	2+	- 5.5		
27	LINT	0458	0515	0550	3+	- 9.4		- 1.3, + 4.7
27	YUNN	0459	0513	0522	3	- 7.7		
27	YUNN	0742	0744	0751	1	- 1.4		
28	LINT	0321	0329	0341D	1-	- 0.7		- 2.2
28	LINT	0341	0346	0405	1-	- 0.9		- 1.7
28	YUNN	0344	0348	0359	1	- 1.9		
28	LINT	0450	0507	0550	1+	- 2.9		- 4.9
28	YUNN	0500	0508	0517	2-	- 3.6		
29	LINT	0057	0104	0115U	1-	- 0.4		- 0.7
29	LINT	0315	0324	0332D	1-	- 0.5		- 1.5
29	LINT	0332	0344	0408D	3+	-10.7		- 9.8, +11.0
29	YUNN	0336	0345	0354	3+	- 8.5		
29	LINT	0408	0412	0425	1-	- 0.3		+ 2.2
30	LINT	0102	0108	0125	1+	- 2.3		- 3.1
30	YUNN	0105	0109	0117	1+	- 2.2		
30	LINT	0134	0140	0153	1-	- 0.5		- 1.0
30	LINT	0245	0250	0300	1-	- 0.3		- 2.2

GEOMAGNETIC ACTIVITY INDICES K AND A_K

JANUARY 1994

BGMO

Day	Three-Hourly Indices K										Sum	A _K
	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24				
1 D	2	3	3	5	5	5	3	2			28	25
2	2	3	3	4	4	4	3	2			23	15
3	2	2	3	4	4	4	5	3	1		24	19
4	1	2	2	1	2	2	2	2	1		13	6
5 Q	0	2	1	2	1	1	2	2			11	5
6	3	2	2	3	3	4	4	1	2		20	12
7 Q	1	1	2	2	2	2	3	3	2		15	7
8	1	2	2	2	3	3	3	1	2		16	8
9 Q	1	1	2	2	2	2	2	3	2		15	7
10 Q	1	2	2	2	1	1	1	1	1		11	5
11	2	3	3	4	4	5	4	4			29	24
12 D	4	3	3	3	5	5	5	2	3		28	24
13 D	3	3	2	3	5	5	5	3	4		28	24
14 D	3	3	3	4	6	4	4	2	2		27	24
15	2	3	2	1	3	3	3	5	2		21	15
16	2	3	4	3	3	4	4	2	2		23	15
17 D	3	3	4	4	4	4	4	3	2		27	20
18	3	3	3	3	5	5	5	2	2		26	21
19	4	4	3	3	6	3	3	4	2		29	27
20	2	2	3	3	4	3	3	3	2		22	14
21	1	2	2	2	2	4	4	4	4		21	14
22	4	2	2	2	1	2	2	2	2		17	9
23	2	4	2	2	2	3	2	2	2		19	11
24 Q	2	2	2	2	1	1	2	1	1		13	6
25	2	2	2	1	0	1	2	3			13	6
26	2	3	5	4	4	4	4	3	2		27	22
27	2	3	4	3	4	4	4	4	3		27	20
28	3	2	2	4	4	3	2	2	2		22	14
29	2	2	3	2	4	2	2	2	1		18	10
30	2	2	2	3	3	4	4	4	1		21	14
31	3	2	2	3	3	3	3	2	2		20	11
											Sum	454
											Mean	14.6

MAGNETIC STORMS

JANUARY 1994

BGMO

Time of Magnetic					Sudden Com.			Deg.	Maximum Acti.			Maximum			
Beginning Ending					Amplitude			of	on K-scale			Range			
									3hour k						
Day	h	m	Day	h	Type	D'	HnT	ZnT	Acti.	Day	Int.	Index	D'	HnT	ZnT

11 05 20 12 19 SC 0.1 3 0 m 11 6 5 8.8 86 17