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1990 年 11—12 月

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DAILY RELATIVE SUNSPOT NUMBERS AND SUNSPOT AREAS

NOVEMBER 1990

Day		Relative-Numbers			Sunspot Areas			Photographic		
		Drawing			Sum			Sum		
		M.H.	S.H.	Sum	M.H.	S.H.	Sum	M.H.	S.H.	Sum
1	12	51	75	126	126	749	875	169	792	961
2	6	20	50	70	75	650	725	153	878	1031
3	9	22	79	101	54	573	627			
4	12	55	88	143	134	476	610	119	687	806
5	12	57	100	157	467	793	1260	438	590	1028
6	15	64	110	174	834	1053	1887	550	771	1321
7	18	96	113	209	966	911	1877			
8	13	88	78	166	1665	899	2564	1567	863	2430
9	12	70	60	130	1302	822	2124	1556	797	2353
10	13	93	69	162	1169	690	1859	1278	474	1752
11	15	86	82	168	1034	624	1658	1120	540	1660
12	11	74	76	150	628	535	1163	742	425	1167
13	9	58	51	109	1501	496	1997	704	468	1172
14	7	55	40	95	2834	349	3183			
15	7	56	42	98	3273	380	3653			
16	7	76	44	120	3980	282	4262			
17	8	86	34	120	3994	478	4472	4238	244	4482
18	5	74	26	100	3401	475	3876	3953	262	4215
19	7	98	27	125	2721	180	2901	3405	53	3458
20	5	84	33	117	2640	132	2772	3504	97	3601
21	8	106	44	150	2536	143	2679	3122	101	3223
22	10	106	51	157	2357	136	2493	1776	93	1869
23	10	76	67	143	2222	112	2334	2335	135	2470
24	10	53	82	135	1851	171	2022	2243	261	2504
25	9	58	69	127	1590	249	1839	1908	355	2263
26	10	38	85	123	1270	634	1904	970	532	1502
27	11	39	86	125	794	746	1540	0	628	628
28	11	30	94	124	141	698	839	23	588	611
29	14	52	96	148	319	966	1285			
30								256	406	662
Mean		66.2	67.3	133.5	1582.0	531.1	2113.1			

DAILY RELATIVE SUNSPOT NUMBERS AND SUNSPOT AREAS

DECEMBER 1990

Day	Relative-Numbers			Sunspot Areas			
	Gro.	N.H.	S.H.	Drawing		Photographic	
				N.H.	S.H.	N.H.	S.H.
	Sum			Sum		Sum	
1	10	53	78	131	236	307	543
2	15	75	65	140	1042	439	1481
3	17	90	90	180	902	374	1276
4	17	82	84	166	1037	513	1550
5	17	105	99	204	998	921	1919
6	19	126	101	227	821	1163	1984
7	14	105	81	186	745	593	1338
8	14	111	91	202	677	834	1511
9	15	126	88	214	1381	694	2075
10	16	134	97	231	1097	469	1566
11	16	120	86	206	1459	704	2163
12	18	134	65	199	1959	243	2202
13	17	125	57	182	2441	79	2520
14	11	102	36	138	2276	72	2348
15	10	116	24	140	1961	37	1998
16	10	120	33	153	2077	21	2098
17	7	125	27	152	1884	69	1953
18	7	120	15	135	2343	117	2460
19	8	118	16	134	2538	79	2617
20	9	136	24	160	2349	49	2398
21	10	108	25	133	2084	254	2338
22	7	109	35	144	1686	601	2287
23	10	60	66	126	1534	1008	2542
24	7	40	72	112	1126	1081	2207
25	7	22	80	102	77	953	1030
26	8	19	90	109	48	1098	1146
27	7	18	86	104	18	1071	1089
28	13	29	123	152	21	1114	1135
29	13	23	120	143	168	1215	1383
30	11	15	100	115	148	1086	1234
31	11	15	110	125	127	808	935
Mean				86.5	69.8	156.3	1201.9
				582.8	1784.7	1258.4	314.8
				1573.1			

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

CMP		Day Group	Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area		
										Whole	Max	See Remarks
1.06	564	10-28.3	-14	325	48W	DSI	0.77		143	112	73	3
	568	10-28.0	6	329	57W	BXO	0.83		8	7	4	3
	570	10-30.6	20	295	22W	BXO	0.43		8	5	2	3
	571	10-26.0	-21	355	77W	AXX	0.98		4	10	10	3
	572	11- 1.0	6	277	1W	CSI	0.05		214	107	101	3
	574	11- 3.4	-5	244	32W	EKI	0.54		841	500	385	3
	575	11- 1.6	-14	269	7E	AXX	0.33		8	4	2	3
	577	10-31.4	32	285	10W	AXX	0.49		4	2	2	3
	578	11- 5.5	-19	217	62E	DSI	0.91		93	110	70	3
	579	10-29.4	-3	311	36W	AXX	0.59		4	3	3	3
	580	10-29.7	4	307	32W	AXX	0.53		8	5	2	3
	581	11- 7.0	-15	197	77E	AXX	0.98		4	10	10	3
2.08	564				61W	DSO	0.89		84	90	63	3
	572				15W	CSI	0.26		126	65	55	3
	574				18E	EKI	0.33		925	491	352	3
	578				48E	DSI	0.78		80	64	47	3
	581				62E	AXX	0.90		4	5	5	3
	582	10-27.1	22	341	79W	AXX	0.98		4	10	10	3
	564				72W	CSO	0.95		34	56	49	4
	572				28W	CAI	0.47		88	50	45	4
3.06	574				5E	EKI	0.17		812	412	320	4
	578				34E	DSI	0.63		143	92	60	4
	581				48E	AXX	0.77		4	3	3	4
	583	11- 2.3	-17	259	10W	AXX	0.39		4	2	2	4
	584	11- 3.1	12	248	1E	BXO	0.15		8	4	2	4
	585	11- 4.8	-21	226	22E	AXX	0.54		4	2	2	4
	586	11- 5.9	-25	212	37E	BXO	0.71		8	6	3	4
	572				42W	HRX	0.67		55	37	31	4
	574				8W	DHI	0.21		673	344	236	4
	578				20E	DSI	0.48		135	77	48	4
	581				34E	AXX	0.62		4	3	3	4
	584				13W	BXO	0.25		8	4	2	4
4.04	585				10E	BXI	0.45		13	7	2	4
	586				24E	DRI	0.60		59	37	16	4
	587	11- 4.3	8	233	3E	DRI	0.09		38	19	8	4
	588	11- 4.9	13	226	7E	AXX	0.18		4	2	2	4

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

CMP						Corre. Area					
Day Group	Mo-Day	Lat	L	CMD	Type	r/R	Sd	Whole	Max	See	Remarks
589	11- 9.5	-11	164	75E	AXI	0.97	4	8	8	4	
590	11- 9.8	12	160	75E	AXI	0.97	8	16	16	4	
591	11-10.6	15	150	87E	HSX	0.99	17	56	56	4	
5.05 572				55W	HRX	0.82	42	36	33	3	
574				21W	DHI	0.38	702	380	232	3	
578				6E	DSI	0.39	160	87	50	3	
584				28W	AXX	0.49	4	2	2	3	
585				3W	CRI	0.41	38	21	16	3	
586				10E	DAI	0.53	454	268	131	3	
587				10W	BXI	0.17	38	19	6	3	
588				3W	BXI	0.18	8	4	2	3	
589				61E	BXO	0.89	8	9	5	3	
590				62E	HRX	0.87	13	13	13	3	
591				73E	CHI	0.95	236	393	386	3	
592	11-10.9	-18	146	81E	AXX	0.99	8	28	14	3	
6.24 572				71W	HSX	0.94	46	69	63	3	
574				37W	DHI	0.61	597	377	273	3	
578				9W	CSI	0.40	109	60	46	3	
581				11E	CSI	0.37	63	34	25	3	
585				17W	DRO	0.49	50	29	12	3	
586				5W	DAI	0.48	421	240	122	3	
587				24W	CRO	0.38	21	11	9	3	
588				13W	CRI	0.29	38	20	4	3	
589				45E	AXX	0.72	8	6	3	3	
590				47E	HRX	0.72	42	30	30	3	
591				58E	DHI	0.85	471	448	360	3	
592				65E	HRX	0.92	13	16	16	3	
593	11-11.4	-12	140	71E	CRI	0.95	50	84	77	3	
594	11-12.0	-30	131	76E	HSX	0.98	88	207	207	3	
595	11-11.9	8	133	81E	HSX	0.98	109	256	256	3	
7.04 572				83W	AXX	0.99	4	14	14	3	
574				48W	DHI	0.75	353	266	202	3	
578				22W	CSI	0.51	105	61	51	3	
581				0W	DSI	0.33	185	98	45	3	
585				29W	CRO	0.62	25	16	11	3	
586				16W	DAI	0.55	366	219	101	3	
587				34W	AXX	0.55	8	5	3	3	

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

CMP					Corre. Area		
Day Group	Mo-Day	Lat	L	CMD Type	r/R	Sd	Whole Max See Remarks
588				24W	DRI 0.45	101	56 21 3
589				33E	BIO 0.59	8	5 3 3
590				36E	AXX 0.60	13	8 5 3
591				47E	EKI 0.74	736	543 410 3
592				53E	HSX 0.82	46	40 36 3
593				58E	CSI 0.85	55	52 44 3
594				64E	CSI 0.93	109	150 144 3
595				68E	DAI 0.91	269	321 266 3
596	11- 7.9	-8	186	11E	AXX 0.29	8	4 2 3
597	11- 8.9	-20	173	24E	AXX 0.47	4	2 2 3
598	11-10.6	9	150	43E	CRI 0.68	25	17 11 3
8.22 574				63W	DAI 0.90	214	242 209 2
578				37W	CSI 0.67	80	54 48 2
581				15W	DAI 0.40	357	195 92 2
586				32W	EAO 0.67	210	141 90 2
588				41W	DAC 0.67	648	434 243 2
590				20E	AXX 0.37	4	2 2 2
591				30E	EHI 0.53	1135	669 396 2
592				36E	HRX 0.66	21	14 11 2
593				42E	HRX 0.69	42	29 29 2
594				49E	ESI 0.84	244	224 100 2
595				51E	CHI 0.77	475	372 363 2
598				29E	DRI 0.48	147	84 50 2
599	11-12.6	9	124	61E	DRO 0.87	101	104 60 2
9.02 574				78W	CAO 0.98	101	237 197 3 PLAT
578				51W	HRX 0.80	13	11 11 3 PLAT
581				29W	DAO 0.56	202	122 59 3 PLAT
586				48W	HAX 0.80	126	106 106 3 PLAT
588				52W	DAO 0.79	437	359 228 3 PLAT
590				8E	CRO 0.22	17	9 6 3 PLAT
591				18E	DHI 0.37	1056	568 409 3 PLAT
593				28E	HAX 0.52	29	17 17 3 PLAT
594				38E	DAI 0.75	437	329 250 3 PLAT
595				38E	CHI 0.61	412	260 167 3 PLAT
598				16E	CAI 0.29	97	50 37 3 PLAT
599				47E	DAO 0.74	76	56 31 3 PLAT
10.10 578				63W	HSX 0.91	38	45 40 3

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

CMP			Corre. Area							
Day Group	Mo-Day	Lat	L	CMD Type	r/R	Sd	Whole	Max	See	Remarks
581				41W	ESI 0.74	139	102	62	3	
586				61W	HSX 0.91	97	115	110	3	
588				66W	DAI 0.90	315	356	247	3	
590				4W	AXX 0.16	8	4	2	3	
591				7E	EH1 0.24	871	449	394	3	
592				10E	BX0 0.40	8	5	2	3	
593				17E	BX0 0.37	8	5	2	3	
594				26E	EAI 0.64	639	418	151	3	
595				26E	DAI 0.43	421	232	88	3	
598				6E	DRI 0.15	126	64	26	3	
599				36E	DRO 0.59	93	57	29	3	
600	11- 8.2	13	181	25W	AXX 0.46	13	7	2	3	
11.06 578				76W	AXX 0.98	8	20	20	4	
581				59W	DSI 0.89	59	63	45	4	
586				74W	HSX 0.97	63	121	121	4	
588				78W	DAI 0.97	160	307	242	4	
590				18W	AXX 0.33	8	4	2	4	
591				6W	EH1 0.23	842	423	333	4	
592				2W	BXI 0.37	8	5	2	4	
593				4E	BXI 0.29	8	4	2	4	
594				13E	EAI 0.57	652	398	303	4	
595				12E	DAI 0.21	437	224	95	4	
598				7W	DRI 0.17	55	28	13	4	
599				22E	DRO 0.34	67	36	25	4	
601	11- 7.6	-24	190	46W	AXX 0.79	8	7	3	4	
602	11-14.3	-21	101	43E	AXX 0.75	8	6	3	4	
603	11-16.1	41	77	65E	AXX 0.93	8	12	6	4	
12.04 581				72W	CS0 0.97	84	162	145	3	
591				19W	EH1 0.37	744	400	344	3	
592				16W	BXI 0.45	8	5	2	3	
593				10W	AXX 0.26	8	4	2	3	
594				1W	EAI 0.54	585	347	257	3	
595				2W	DAI 0.08	362	181	78	3	
598				20W	CRI 0.34	25	13	9	3	
599				9E	CRO 0.14	50	25	21	3	
601				59W	BX0 0.89	8	9	5	3	
602				30E	BXI 0.62	13	8	3	3	
603				54E	AXX 0.87	8	9	4	3	

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

Day Group	CMP		Lat	L	CMD Type	r/R	Sd	Corre. Area		See Remarks
	Mo-Day							Whole	Max	
13.03	591				31W DHI	0.55	732	439	403	3
	594				12W EAI	0.57	774	473	283	3
	595				16W DSI	0.25	345	178	74	3
	598				33W BXI	0.54	8	5	2	3
	599				6W CRO	0.15	34	17	13	3
	601				69W AXX	0.94	4	6	6	3
	602				18E CRO	0.51	21	12	10	3
	604	11-11.4	-25	140	22W BXO	0.57	8	5	3	3
	605	11-20.0	19	26	86E DHO	0.99	261	862	626	3
14.35	591				49W CHI	0.76	597	458	439	1
	592				35W CRO	0.64	17	11	8	1
	594				29W EAI	0.68	450	306	223	1
	595				32W DSI	0.54	378	225	100	1
	599				21W BXI	0.36	21	11	5	1
	602				1W DRI	0.39	59	32	16	1
	605				71E FKC	0.94	1430	2140	1101	1
15.04	591				58W CHI	0.85	488	464	448	3
	592				45W AXX	0.76	4	3	3	3
	594				39W EAI	0.76	391	300	252	3
	595				41W DAI	0.66	353	234	92	3
	599				29W BXO	0.48	21	12	5	3
	602				10W CSI	0.44	139	77	40	3
	605				63E FKC	0.90	2271	2563	1139	3
16.03	591				70W CHO	0.94	328	491	478	3
	592				59W AXX	0.87	4	4	4	3
	594				51W DSI	0.85	261	248	228	3
	595				54W DAI	0.80	286	241	131	3
	599				37W AXX	0.61	4	3	3	3
	602				22W BXI	0.53	50	30	5	3
	605				51E FKC	0.79	3953	3245	1554	3
17.04	591				84W HHX	0.99	101	334	334	3
	594				65W CSI	0.93	139	190	184	3
	595				68W DAI	0.93	177	242	127	3
	599				55W AXX	0.82	8	7	4	3
	602				37W DRI	0.68	219	149	109	3

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

Day	Group	CMP		L	CMD	Type	r/R	Sd	Corre. Area		See	Remarks
		Mo-Day	Lat						Whole	Max		
605					38E	FKC	0.64	5215	3407	1621	3	
606	11-16.7	18	70	5W	BXD	0.28	8	4	2	3		
607	11-23.0	-18	347	80E	HSX	0.99	42	139	139	3		
18.04	594			77W	HSX	0.98	71	168	168	3		
	595			82W	CSI	0.99	34	111	97	3		
	602			51W	CAI	0.82	168	146	138	3		
	605			26E	FKC	0.49	5719	3290	1935	3		
	607			66E	HSX	0.92	126	161	161	3		
19.06	602			66W	HSX	0.93	50	69	40	3		
	605			13E	FKC	0.34	5089	2711	1299	3		
	606			31W	AXX	0.55	4	3	3	3		
	607			52E	HSX	0.82	118	102	98	3		
	608	11-14.1	24	104	66W	AXX	0.92	4	5	5	3	
	609	11-18.3	14	48	10W	AXX	0.26	4	2	2	3	
	610	11-18.6	-17	44	6W	BXI	0.34	17	9	2	3	
20.04	602			79W	HRX	0.99	17	56	42	4		
	605			1W	FKC	0.29	5047	2634	1273	4		
	606			44W	BXD	0.71	8	6	3	4		
	607			38E	CSI	0.67	88	59	54	4		
	610			20W	CRI	0.46	29	17	7	4		
21.10	605			14W	FKC	0.36	4710	2520	1274	4		
	606			58W	BXD	0.85	8	8	4	4		
	607			24E	CSI	0.52	101	59	57	4		
	610			32W	DSI	0.60	114	71	42	4		
	611	11-21.2	14	9	2E	BXD	0.22	8	4	2	4	
	612	11-22.2	-14	357	15E	BXI	0.40	8	5	2	4	
	613	11-22.4	8	354	18E	BXI	0.31	8	4	2	4	
	614	11-24.9	-4	322	57E	AXX	0.84	8	8	4	4	
22.06	605			27W	FKC	0.51	4016	2328	1097	3		
	606			73W	AXX	0.95	8	14	7	3		
	607			12E	CSO	0.38	105	57	52	3		
	610			44W	CSI	0.72	88	64	58	3		
	611			12W	AXX	0.30	8	4	2	3		
	613			5E	BXD	0.13	8	4	2	3		
	614			39E	BXD	0.63	8	5	3	3		

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

CMP									Corre. Area		
Day Group	Mo-Day	Lat	L	CMD	Type	r/R	Sd	Whole	Max	See	Remarks
615	11-21.4	23	8	9W	BXO	0.40	8	5	2	3	
616	11-21.9	26	1	2W	AXX	0.41	4	2	2	3	
617	11-25.8	-9	310	49E	BXI	0.76	13	10	3	3	
23.04	605			40W	FKC	0.66	3343	2213	1002	4	
607				1W	CSO	0.33	76	40	38	4	
610				57W	CRO	0.85	38	36	32	4	
611				25W	AXX	0.46	4	2	2	4	
612				11W	AXX	0.33	4	2	2	4	
614				26E	BXI	0.45	34	19	2	4	
615				21W	BXO	0.48	8	5	2	4	
616				16W	AXX	0.48	4	2	2	4	
617				36E	BXI	0.60	21	13	5	4	
618	11-23.5	-2	340	6E	AXX	0.13	4	2	2	4	
24.13	605			54W	FKC	0.80	2187	1841	744	3	
607				15W	CSO	0.40	67	37	32	3	
610				70W	AXX	0.94	4	6	6	3	
612				26W	AXX	0.49	4	2	2	3	
614				11E	DRI	0.21	156	80	30	3	
615				35W	BXO	0.63	8	5	3	3	
616				31W	AXX	0.62	8	5	3	3	
617				22E	BXO	0.41	13	7	2	3	
618				8W	AXX	0.15	8	4	2	3	
619	11-29.3	-6	263	71E	BXO	0.93	25	35	17	3	
25.04	605			65W	FKC	0.90	1396	1576	869	3	
607				27W	BXI	0.54	25	15	5	3	
614				3W	EAC	0.11	378	191	61	3	
615				47W	AXX	0.76	8	6	3	3	
616				40W	AXX	0.72	4	3	3	3	
617				9E	BXO	0.24	8	4	2	3	
619				58E	BXI	0.84	17	15	4	3	
620	11-27.4	8	289	31E	AXX	0.52	8	5	2	3	
621	11-30.6	-4	246	76E	HSX	0.97	13	24	24	3	
26.09	605			76W	FKC	0.95	690	1151	673	3	
607				40W	BXI	0.70	13	9	6	3	
614				16W	EAI	0.29	437	228	114	3	
615				68W	AXX	0.85	8	8	4	3	

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

Day Group	CMP Mo-Day	Lat	L	CMD Type	r/R	Sd	Corre. Area		See Remarks
							Whole	Max	
617				4W	CRI 0.21	29	15	6	3
619				44E	DAI 0.68	151	103	40	3
621				62E	HSX 0.87	84	86	86	3
622	11-30.6	-10	247	59E	AXX 0.85	4	4	4	3
623	12- 1.6	-21	232	74E	HSX 0.95	114	189	189	3
624	12- 2.3	16	224	82E	HSX 0.99	34	111	111	3
27.07 605				84W	CHI 0.99	193	640	584	3
607				53W	BXD 0.82	8	7	4	3
614				30W	EAI 0.53	492	290	154	3
615				71W	AXX 0.94	4	6	6	3
617				19W	DAO 0.38	198	107	48	3
619				30E	DAI 0.49	160	92	51	3
621				48E	HSX 0.72	63	46	46	3
623				60E	HSX 0.87	122	125	125	3
624				70E	CSI 0.94	93	138	94	3
625	11-29.7	11	258	33E	BXD 0.56	17	10	5	3
626	12- 3.5	-16	209	83E	HSX 0.99	29	97	97	3
28.11 614				44W	EAI 0.71	412	294	132	3
617				32W	DSO 0.57	101	62	41	3
619				16E	CRI 0.30	67	35	18	3
621				33E	HSX 0.54	101	60	60	3
623				46E	CSI 0.77	168	132	125	3
624				57E	CSI 0.83	143	127	79	3
625				20E	BXD 0.37	13	7	2	3
626				70E	HSX 0.93	76	104	104	3
627	11-26.9	-13	295	16W	AXX 0.38	8	5	2	3
628	11-27.4	23	288	9W	AXX 0.39	13	7	5	3
629	12- 1.3	-8	236	43E	AXX 0.68	8	6	3	3
29.07 614				57W	ESI 0.85	315	300	128	3
617				46W	CRD 0.74	34	25	22	3
619				4E	BXD 0.13	25	13	4	3
621				21E	HSX 0.37	88	47	47	3
623				34E	CSI 0.63	185	119	117	3
624				45E	CSI 0.72	164	119	79	3
625				8E	BXI 0.23	8	4	2	3
626				58E	HSX 0.86	118	116	116	3
628				22E	BXD 0.51	8	5	2	3

DAILY SUNSPOT OBSERVATIONS

NOVEMBER 1990

Day	Group	CMP		L	CMD Type	r/R	Sd	Corre. Area			Remarks
		Mo-Day	Lat					Whole	Max	See	
629					30E	CRI 0.51	59	34	15	3	
630	11-30.1		2	253	13E	CRI 0.22	46	24	13	3	
631	12- 4.9		-14	190	76E	AXX 0.97	8	16	8	3	
632	12- 5.0		-24	188	79E	CSO 0.98	126	296	286	3	
633	12- 5.6		35	180	84E	HSX 0.99	50	167	167	3	

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

CMP		Corre. Area								
Day Group	Mo-Day	Lat	L	CMD Type	r/R	Sd	Whole	Max	See	Remarks
1.08 620	11-27.4	8	289	46W	CAO 0.69	29	20	17	3	PURP
621	11-30.6	-4	246	2W	BXO 0.14	42	21	8	3	PURP
623	12- 1.6	-21	232	7E	HSX 0.39	147	80	80	3	PURP
624	12- 2.3	16	224	17E	CAO 0.37	143	77	77	3	PURP
626	12- 3.5	-16	209	31E	HSX 0.56	84	51	51	3	PURP
632	12- 5.0	-24	188	47E	CAO 0.79	181	148	148	3	PURP
633	12- 5.6	35	180	61E	CAO 0.91	109	131	125	3	PURP
634	11-29.7	-23	259	27W	BXO 0.61	8	5	3	3	PURP
635	12- 2.9	-20	216	26E	AXX 0.54	4	2	2	3	PURP
636	12- 3.5	9	208	38E	BXO 0.62	13	8	3	3	PURP
2.09 619	11-29.3	-6	263	37W	HAX 0.61	34	21	21	3	PLAT
620				61W	AXX 0.87	4	4	4	3	PLAT
621				18W	CAO 0.32	46	24	22	3	PLAT
623				6W	HAX 0.36	143	77	77	3	PLAT
624				4E	CSI 0.25	202	104	91	3	PLAT
626				17E	CSO 0.38	156	84	82	3	PLAT
632				36E	HAX 0.67	315	212	212	3	PLAT
633				47E	DAO 0.82	223	193	167	3	PLAT
634				34W	CRO 0.63	21	14	11	3	PLAT
635				13E	BXO 0.40	13	7	2	3	PLAT
636				20E	CAO 0.37	38	20	18	3	PLAT
637	12- 2.4	24	222	4E	AXX 0.39	4	2	2	3	PLAT
638	12- 7.0	20	162	65E	AXX 0.91	8	10	10	3	PLAT
639	12- 8.1	18	148	80E	DAO 0.98	261	612	365	3	PLAT
640	12- 8.1	9	147	0	HAX 0.99	29	97	97	3	PLAT
3.17 619				53W	CAO 0.80	34	28	18	4	PLAT
620				78W	AXX 0.97	4	8	8	4	PLAT
621				32W	HAX 0.54	21	12	12	4	PLAT
623				19W	HSX 0.46	76	43	43	4	PLAT
624				10W	CAI 0.30	84	44	40	4	PLAT
626				3E	HAX 0.26	130	68	68	4	PLAT
632				23E	CAO 0.53	315	186	181	4	PLAT
633				33E	DAO 0.71	265	189	168	4	PLAT
634				45W	BXI 0.87	21	14	3	4	PLAT
635				1W	CRO 0.33	25	13	7	4	PLAT
636				7E	BXO 0.17	17	9	4	4	PLAT
638				49E	AXX 0.78	8	7	7	4	PLAT

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

CMP				Corre. Area			
Day Group	Mo-Day	Lat	L	CMD Type	r/R	Sd	Whole Max See Remarks
639				63E	DAI 0.90	366	413 133 4 PLAT
640				69E	DAO 0.93	156	213 150 4 PLAT
641	12- 6.5	14	168	47E	BXO 0.75	25	19 6 4 PLAT
642	12- 4.3	-33	198	13E	BXO 0.57	8	5 3 4 PLAT
643	12- 5.9	-11	176	38E	BXO 0.63	8	5 3 4 PLAT
4.36 619							
621				75W	HRX 0.97	38	73 73 2
623				50W	AXX 0.76	8	6 6 2
624				34W	HSX 0.64	63	41 41 2
626				27W	CRO 0.51	55	32 29 2
632				12W	HSX 0.34	93	49 49 2
633				8E	CSI 0.44	378	210 206 2
634				17E	DSO 0.61	223	141 133 2
635				62W	DSI 0.90	101	114 71 2
636				19W	AXX 0.46	4	2 2 2
638				11W	AXX 0.23	4	2 2 2
639				34E	CRO 0.62	17	11 8 2
640				47E	DKI 0.76	639	491 339 2
641				52E	DAO 0.79	412	338 186 2
642				30E	DRO 0.53	38	22 10 2
643				1W	BXI 0.55	8	5 3 2
644	12- 6.3	-25	171	22E	BXO 0.41	8	5 2 2
				23E	BXO 0.55	13	8 5 2
5.12 619							
621				85W	HRX 0.99	8	28 28 3
623				59W	AXX 0.86	8	8 8 3
624				44W	HSX 0.74	46	34 34 3
626				36W	HSX 0.62	50	32 30 3
631	12- 4.9	-14	190	21W	HSX 0.45	109	61 61 3
632				3W	AXX 0.25	8	4 2 3
633				1W	DSI 0.41	433	238 212 3
634				7E	CSI 0.57	219	134 128 3
635				66W	EKC 0.92	421	535 294 3
638				30W	AXX 0.57	4	3 3 3
639				24E	CRO 0.51	17	10 7 3
640				37E	DRI 0.64	715	467 236 3
641				42E	DAI 0.67	496	333 206 3
642				19E	CRO 0.39	34	18 9 3
644				11W	BXO 0.57	13	8 5 3
				14E	AXX 0.48	4	2 2 3

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

Day	Group	CMP		Lat	L	CMD	Type	r/R	Sd	Corre. Area		
		Mo-Day								Whole	Max	See Remarks
6.22	623	12- 9.5	23	128	59E	AXX	0.87		4	4	4	3
						59W	HRX	0.89	17	18	18	3
	624					50W	HRX	0.78	21	17	17	3
	626					35W	HSX	0.62	97	62	62	3
	632					15W	DKI	0.48	786	449	240	3
	633					7W	CSI	0.56	189	115	109	3
	634					80W	DHI	0.98	219	513	247	3
	635					44W	CSI	0.74	126	93	71	3
	636					29W	AXX	0.51	4	2	2	3
	638					8E	HRX	0.37	17	9	9	3
	639					23E	DSI	0.49	442	254	80	3
	640					26E	EAI	0.46	740	417	173	3
	641					4E	BXO	0.24	8	4	2	3
	642					27W	AXX	0.66	4	3	3	3
	643					4W	BXO	0.20	8	4	2	3
	644					1E	AXX	0.43	4	2	2	3
	645					44E	AXX	0.75	4	3	3	3
	646	12- 7.9	-22	150	21E	AXX	0.51		4	2	2	3
	647	12- 9.0	-17	136	35E	BXI	0.62		8	5	3	3
	648	12-11.4	-11	104	69E	BXO	0.93		8	12	6	3
7.27	623					74W	AXX	0.97	4	8	8	2
	624					64W	AXX	0.91	4	5	5	2
	626					49W	HSX	0.78	55	44	44	2
	632					29W	DSC	0.60	631	393	184	2
	633					19W	CAI	0.63	118	76	73	2
	635					59W	HRX	0.87	50	52	48	2
	638					4W	BXO	0.34	8	4	2	2
	639					11E	DAI	0.37	442	237	124	2
	640					12E	EKI	0.26	807	419	305	2
	641					4W	BXI	0.26	8	4	2	2
	643					20W	CRO	0.39	17	9	7	2
	647					22E	DRI	0.46	130	73	43	2
	648					54E	BXO	0.82	8	7	4	2
	649	12-11.4	-27	103	51E	BXO	0.83		8	7	4	2
8.23	624					75W	AXX	0.97	4	8	8	3
	626					61W	HSX	0.89	71	77	77	3
	631					50W	DRI	0.79	105	86	35	3

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

Day Group	Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area		
								Whole	Max	See Remarks
632				42W	DSI	0.74	555	410	177	3
633				31W	CAI	0.70	88	62	59	3
638				18W	AXX	0.46	8	5	5	3
639				2W	EAI	0.32	471	249	118	3
640				2W	EAI	0.16	639	324	239	3
641				20W	CRI	0.40	46	25	9	3
643				32W	DRI	0.54	126	75	30	3
647				10E	DAI	0.33	328	174	71	3
648				40E	AXX	0.66	8	6	3	3
649				39E	BXO	0.71	8	6	3	3
650	12- 9.7	10	126	18E	BXO	0.34	8	4	2	3
9.10	626			72W	HRX	0.95	13	21	21	3
631				64W	DRO	0.91	84	100	65	3
632				53W	DSI	0.84	328	301	139	3
633				43W	HRX	0.80	21	18	11	3
638				31W	AXX	0.60	4	3	3	3
639				13W	DAI	0.39	559	304	123	3
640				13W	DKI	0.26	694	360	327	3
641				30W	DAI	0.55	400	240	101	3
643				43W	CRI	0.69	71	49	17	3
646				16W	AXX	0.45	4	2	2	3
647				2W	DAI	0.30	412	216	112	3
649				29E	BXO	0.63	8	5	3	3
651	12-13.2	24	80	56E	AXX	0.86	8	8	4	3
652	12-15.1	28	55	77E	HSX	0.98	55	128	128	3
653	12-15.2	5	54	83E	DAI	0.99	97	320	320	3
10.31	631			78W	AXX	0.98	4	10	10	3
632				69W	ESI	0.94	156	233	107	3
633				58W	AXX	0.91	8	10	10	3
638				45W	BXI	0.75	13	9	3	3
639				29W	EAI	0.57	244	149	36	3
640				29W	CKI	0.51	547	317	300	3
641				47W	DAI	0.75	219	165	85	3
643				60W	DAI	0.86	71	71	46	3
646				28W	BXO	0.57	8	5	3	3
647				20W	DSI	0.45	236	132	111	3
649				16E	BXI	0.49	17	10	2	3
650				8W	BXO	0.24	8	4	2	3

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

Day	Group	CMP		L	CMD	Type	r/R	Sd	Corre. Area		See	Remarks
		Mo-Day	Lat						Whole	Max		
651					39E	AXX	0.71	4	3	3	3	
652					62E	HSX	0.91	55	65	65	3	
653					67E	DHO	0.92	294	375	321	3	
654	12-14.9	-24	58		57E	BXO	0.86	8	8	4	3	
11.06 632					79W	DKI	0.98	172	404	296	4	
638					57W	DRI	0.86	76	75	37	4	
639					40W	ERI	0.69	151	105	29	4	
640					39W	CKI	0.64	442	288	269	4	
641					57W	ESI	0.86	156	154	54	4	
643					69W	CAI	0.93	105	144	127	4	
647					31W	DSO	0.57	210	128	116	4	
648					5E	BXO	0.20	8	4	2	4	
649					5E	BXO	0.45	13	7	2	4	
650					21W	BXO	0.41	8	5	2	4	
652					53E	HSX	0.84	67	62	62	4	
653					56E	DKI	0.83	488	435	386	4	
654					48E	BXO	0.78	13	10	3	4	
655	12-10.9	-7	110		2W	AXX	0.11	4	2	2	4	
656	12-12.1	-20	95		9E	BXI	0.38	8	5	2	4	
657	12-17.2	19	27		80E	DHO	0.98	143	335	306	4	
12.08 638					69W	DRI	0.94	63	94	38	4	
639					54W	DRI	0.83	34	30	11	4	
640					53W	CKI	0.80	320	269	216	4	
641					69W	CRI	0.93	46	63	35	4	
643					83W	CSO	0.99	42	139	125	4	
647					45W	CSO	0.72	101	73	64	4	
648					9W	BXI	0.18	8	4	2	4	
649					7W	BXI	0.43	8	5	2	4	
651					18E	BXO	0.51	8	5	2	4	
652					39E	CSI	0.72	59	43	40	4	
653					42E	DKI	0.67	799	536	474	4	
654					35E	BXI	0.64	17	11	3	4	
656					0W	AXX	0.33	4	2	2	4	
657					67E	DHO	0.93	421	576	501	4	
658	12- 7.5	-29	155		60W	BXO	0.89	8	9	5	4	
659	12-11.4	17	104		9W	AXX	0.33	8	4	2	4	
660	12-16.5	8	37		60E	AXX	0.87	4	4	4	4	
661	12-18.0	16	16		82E	HSX	0.98	143	335	325	4	

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

CMP				Corre. Area			
Day Group	Mo-Day	Lat	L	CMD Type	r/R	Sd	Whole Max See Remarks
13.06	638			80W	CRO 0.99	21	70 56 3
	639			63W	BXI 0.91	13	15 5 3
	640			66W	CHI 0.92	210	268 235 3
	641			80W	HRX 0.99	13	42 42 3
	647			57W	HSX 0.85	55	52 52 3
	648			25W	AXX 0.44	8	5 2 3
	649			17W	BXO 0.51	8	5 2 3
	651			3E	AXX 0.43	8	5 2 3
	652			26E	CSO 0.61	76	48 45 3
	653			28E	EKI 0.47	938	532 477 3
	654			21E	BXO 0.51	13	7 5 3
	656			13W	BXO 0.38	8	5 2 3
	657			54E	DHO 0.83	673	599 524 3
	660			47E	AXX 0.74	8	6 3 3
	661			67E	DHI 0.92	673	856 776 3
	662	12-11.4	-18	22W	AXX 0.46	4	2 2 3
	663	12-15.5	-17	50	AXX 0.61	4	3 3 3
14.07	640			80W	CKI 0.98	93	217 197 3
	647			71W	HSX 0.94	38	57 57 3
	649			32W	BXO 0.62	8	5 3 3
	651			11W	BXO 0.53	8	5 2 3
	652			13E	HSX 0.52	80	47 47 3
	653			14E	EH1 0.26	816	423 268 3
	654			10E	BXO 0.40	8	5 2 3
	657			40E	DHO 0.70	820	575 490 3
	660			32E	BXI 0.55	8	5 3 3
	661			53E	DHI 0.82	1161	1004 822 3
	663			23E	BXO 0.45	8	5 2 3
15.08	647			85E	AXX 0.99	8	28 28 3
	651			25W	BXO 0.62	8	5 3 3
	652			1E	HSX 0.48	50	29 29 3
	653			1E	EH1 0.11	904	455 311 3
	654			3W	BXO 0.39	8	5 2 3
	657			28E	DHO 0.55	959	575 517 3
	660			10E	BXI 0.34	8	4 2 3
	661			40E	DHI 0.68	1291	878 698 3
	663			5E	BXO 0.30	8	4 2 3

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

CMP		Day Group	Mo-Day	Lat	L	CMD	Type	r/R	Sd	Corre. Area			See Remarks	
										Whole	Max			
		664				28E	BXI	0.52	25	15	5	3		
16.06	652					12W	CRO	0.52	21	12	7	4		
	653					12W	EH1	0.23	862	443	318	4		
	654					21W	BX0	0.51	8	5	2	4		
	657					15E	DKI	0.43	992	548	493	4		
	660					6E	BXI	0.20	13	6	2	4		
	661					27E	DKI	0.52	1821	1064	747	4		
	663					7W	BX0	0.29	8	4	2	4		
	664					13E	AXX	0.32	8	4	2	4		
665	12-18.7	-6			7	32E	BX0	0.54	8	5	2	4		
666	12-20.1	-18			349	53E	AXX	0.82	8	7	4	4		
17.06	652					24W	AXX	0.59	13	8	3	3		
	653					25W	EH1	0.41	698	383	277	3		
	654					26W	BX0	0.54	8	5	2	3		
	657					2E	CKI	0.34	946	504	477	3		
	660					5W	CSI	0.24	198	102	56	3		
	661					13E	DKI	0.36	1657	887	614	3		
	665					22E	DRI	0.39	118	64	30	3		
	18.12	652				39W	AXX	0.74	8	6	3	3		
653					39W	EH1	0.63	513	331	236	3			
657					11W	CKI	0.39	1165	633	621	3			
660					19W	DAI	0.39	913	496	142	3			
661					1W	DKI	0.29	1670	872	540	3			
665					8E	DSI	0.15	231	117	49	3			
667	12-19.8	18			354	20E	AXX	0.47	8	5	2	3		
19.34	652					52W	AXX	0.85	4	4	4	3		
	653					55W	ESO	0.82	328	284	109	3		
	657					25W	CKI	0.53	1047	617	582	3		
	660					34W	DAI	0.59	1035	638	226	3		
	661					16W	DKI	0.39	1787	971	736	3		
	665					8W	DSI	0.15	156	79	34	3		
	668	12-19.0	17			4	5W	BXI	0.33	25	13	7	3	
	669	12-24.4	17			292	66E	AXX	0.92	8	11	5	3	
20.21	653					67W	ESI	0.91	185	221	136	3		
	657					37W	CKI	0.66	984	651	635	3		

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

CMP		Day Group			Mo-Day	Lat	L	CND	Type	r/R	Sd	Corre. Area	
												Whole	Max See Remarks
		660		46W	DAI	0.74		782		577	220	3	
		661		27W	DKI	0.52		1497		875	622	3	
		665		20W	CSI	0.33		80		42	25	3	
		667		6W	AXX	0.34		8		4	2	3	
		668		17W	AXX	0.41		8		5	2	3	
		669		56E	AXX	0.85		17		16	8	3	
		670	12-19.4	11W	AXX	0.30	-16	359		7	4	3	
21.06	653			78W	CSO	0.97		59		113	97	4	
	657			48W	DKI	0.78		770		617	553	4	
	660			58W	DAI	0.86		543		535	207	4	
	661			38W	DKI	0.67		1190		798	576	4	
	665			31W	BXO	0.51		8		5	2	4	
	667			17W	BXI	0.43		21		12	7	4	
	668			29W	AXX	0.55		4		3	3	4	
	669			43E	BXO	0.72		8		6	3	4	
	670			23W	AXX	0.44		4		2	2	4	
	671	12-26.8	-21	78E	DSO	0.98		105		247	197	4	
22.03	657			63W	CKI	0.91		538		643	627	3	PURP
	660			76W	DAO	0.97		135		258	186	3	PURP
	661			53W	DKI	0.80		925		779	443	3	PURP
	667			29W	AXX	0.56		4		3	3	3	PURP
	669			30E	AXX	0.59		4		3	3	3	PURP
	671			67E	EAC	0.94		252		378	145	3	PURP
	672	12-28.3	-19	80E	HAX	0.99		67		223	223	3	PURP
23.10	657			74W	CKI	0.95		311		519	512	4	
	660			82W	AXX	0.99		8		28	14	4	
	661			65W	DKI	0.92		765		974	492	4	
	667			42W	AXX	0.71		8		6	3	4	
	669			17E	BXO	0.43		13		7	5	4	
	671			50E	DAI	0.77		437		343	165	4	
	672			69E	DAI	0.93		311		426	357	4	
	673	12-27.0	-29	52E	AXX	0.83		8		7	4	4	
	674	12-27.4	-10	253	62E	BXI	0.87	8		9	4	4	
	675	12-28.0	-25	246	63E	DAI	0.90	198		223	109	4	
24.06	661			78W	DKI	0.98		463		1085	513	3	
	667			58W	BXI	0.86		8		8	4	3	

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

Day Group	CMP		L	CMD	Type	r/R	Sd	Corre. Area		See	Remarks
	No-Day	Lat						Whole	Max		
669				5E	CRI	0.33	63	33	13	3	
671				37E	DAI	0.64	673	440	137	3	
672				55E	DHI	0.83	429	382	345	3	
674				44E	BXI	0.70	46	32	6	3	
675				51E	DAI	0.80	269	227	85	3	
25.06 669				8W	DRI	0.36	126	68	27	3	
671				23E	DSI	0.49	631	363	128	3	
672				42E	DHI	0.69	463	319	279	3	
674				30E	DRI	0.51	114	66	12	3	
675				37E	DAI	0.68	294	200	163	3	
676	12-22.6	-11	317	33W	AXX	0.56	8	5	5	3	
677	12-25.4	8	279	5E	BXO	0.18	17	9	4	3	
26.12 669				22W	DRI	0.48	80	46	22	3	
671				10E	DSI	0.36	656	351	99	3	
672				28E	DHO	0.53	463	273	253	3	
674				18E	ERI	0.34	252	134	63	3	
675				23E	DAI	0.54	286	170	140	3	
677				9W	AXX	0.23	4	2	2	3	
678	12-29.1	-19	231	41E	AXX	0.68	4	3	3	3	
679	1- 1.5	-11	186	85E	HSX	0.99	50	167	167	3	
27.06 669				35W	BXI	0.63	25	16	5	3	
671				3W	DSI	0.32	707	373	113	3	
672				15E	CHO	0.38	551	298	291	3	
674				5E	ERI	0.16	252	128	30	3	
675				12E	DSI	0.43	139	77	46	3	
677				21W	AXX	0.38	4	2	2	3	
679				71E	CSO	0.94	130	195	189	3	
28.04 669				46W	AXX	0.76	4	3	3	3	
671				14W	ESI	0.40	707	386	103	3	
672				3E	DSI	0.28	484	252	214	3	
674				8W	DAI	0.18	429	218	81	3	
675				1W	DRI	0.39	76	41	32	3	
677				33W	BIO	0.56	8	5	3	3	
678				14E	AXX	0.36	4	2	2	3	
679				58E	CSO	0.85	210	200	196	3	
680	12-28.4	-13	240	5E	AXX	0.20	4	2	2	3	

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

CMP					Corre. Area		
Day Group	Mo-Day	Lat	L	CMD Type	r/R	Sd	Whole Max See Remarks
681	12-30.3	19	215	30E	AXX 0.59	4	3 3 3
682	12-31.3	-11	204	42E	AXX 0.68	4	3 3 3
683	1- 1.8	-24	182	64E	BXO 0.91	8	10 5 3
684	1- 2.6	22	172	77E	AXX 0.98	4	10 10 3
29.08 669				60W	BXO 0.89	8	9 5 3
671				28W	DSI 0.55	471	282 126 3
672				11W	CSO 0.32	400	211 209 3
674				21W	EAI 0.38	900	486 218 3
675				14W	BXO 0.44	13	7 2 3
678				0W	AXX 0.28	4	2 2 3
679				44E	CSI 0.70	294	206 203 3
680				8W	AXX 0.23	4	2 2 3
682				27E	BXO 0.47	13	7 2 3
683				50E	AXX 0.80	8	7 4 3
684				64E	AXX 0.92	8	11 5 3
685	12-30.8	-17	208	23E	BXO 0.45	8	5 2 3
686	1- 4.1	8	152	79E	HSX 0.98	63	148 148 3
30.05 671				41W	DSI 0.69	336	232 116 3
672				24W	CSO 0.47	391	222 219 3
674				35W	EAI 0.57	664	406 224 3
675				27W	AXX 0.54	4	2 2 3
678				13W	AXX 0.34	4	2 2 3
679				31W	CSI 0.53	345	203 198 3
682				14E	BXO 0.28	8	4 2 3
683				36E	BXI 0.64	17	11 3 3
684				51E	AXX 0.82	8	7 4 3
686				65E	HSX 0.91	118	141 141 3
687	1- 3.0	-10	166	54E	AXX 0.80	4	4 4 3
31.05 671				54W	DSO 0.83	143	127 60 3
672				37W	CSO 0.63	383	247 244 3
674				49W	EAI 0.76	290	223 87 3
679				18E	CSO 0.33	299	158 156 3
682				1E	BXI 0.13	8	4 2 3
683				23E	CRI 0.51	59	34 12 3
684				39E	AXX 0.69	4	3 3 3
686				52E	HSX 0.80	147	124 106 3
687				38E	BXI 0.62	8	5 3 3

DAILY SUNSPOT OBSERVATIONS

DECEMBER 1990

CMP		Corre. Area		Whole Max		See Remarks	
Day Group	Mo-Day	Lat	L	CMD	Type	r/R	Sd

688	12-28.7	-25	236	31W	AXX	0.61	8	5	3	3
689	12-30.1	-25	218	13W	BXD	0.43	8	5	2	3

SMOOTHED (PREDICTED) SUNSPOT NUMBERS

AUGUST 1990-JULY 1991

Time	90.08	90.09	90.10	90.11	90.12	91.01	91.02	91.03	91.04	91.05	91.06	91.07
R/	138.0	137.4	137.9	139.4	141.6	144.3	144.5	143.3	140.5	137.5	134.4	132.7
E/	2.8	2.7	5.5	11.1	12.7	17.3	23.2	22.9	26.7	26.1	28.2	26.5

H-ALPHA SOLAR FLARES

NOVEMBER 1990

Area
Measurement
Obs
Can Appar Corr
Imp Type A.R. Rem

Time

Start Max End

(UT) (UT) (UT)

Lat

L

CMD

Dist (Sd)

(Sq)

Imp

Type

A.R.

Rem

2	URUM	0414	0417	0421	S 4	244	E17	.319	16	0.2	SF	C	574	D
3	URUM	0328	0332	0348	S 6	240	E 7	.218	48	0.5	SN	C	574	D
4	YUNN	0255	0306	0307D	S19	216	E19	.499	32	0.4	SN	P	578	
5	BEIJ	0035E	0035	0035D	S24	208	E15	.529	336	4.1	1B	P	586	E
6	BEIJ	0221	0230	0246	N16	221	W12	.322	105	1.2	SN	P	588	E
6	BEIJ	0431	0436	0445	S18	219	W11	.425	63	0.7	SB	P	578	D
6	BEIJ	0727E	0727	0727D	S25	211	W 5	.483	126	1.5	SB	P	586	E
7	URUM	0230E	0247	0310	N15	222	W27	.482	193	2.3	1N	C	588	E
7	YUNN	0230	0235	0249	N15	221	W25	.446	32	0.4	SN	P	588	
7	URUM	0402	0404	0415	N16	223	W29	.509	145	1.7	SN	C	588	D
7	URUM	0415	0429	0448	N15	223	W29	.504	161	1.9	SN	C	588	D
7	URUM	0448	0452	0550	N17	153	E41	.675	193	2.7	1N	C	591	E
7	URUM	0452E	0452	0559	S15	197	W 3	.327	145	1.6	SN	C	581	E
7	URUM	0530	0544	0559D	N15	223	W30	.520	145	1.8	SN	C	588	D
7	YUNN	0814	0823	0823D	S18	144	E49	.797	96	1.6	SN	P	592	
8	URUM	0259	0335	0450	S22	214	W32	.647	611	8.3	2B	C	586	F
8	BEIJ	0355E	0355	0420	S22	215	W33	.690	673	9.6	2N	P	586	F
8	YUNN	0547	0548	0549D	N14	221	W40	.653	161	2.2	1N	P	588	
8	URUM	0645	0715	0748	N16	222	W42	.684	241	3.4	1N	C	588	E
8	URUM	0752	0811	0945	N16	223	W44	.704	225	3.3	1N	C	588	EK
8	URUM	0830			N16	223	W44	.704	161	2.3	1N	C	588	EK
8	URUM	0902			N15	221	W43	.691	209	3.0	1N	C	588	EK
8	URUM	0828	0840	0910	N16	220	W42	.677	145	2.0	SN	C	588	D
9	BEIJ	0250E	0250	0310	N 8	129	E40	.644	589	8.0	2F	P	595	E
9	BEIJ	0335	0340	0345	S18	223	W54	.828	84	1.6	SB	P	578	D
9	BEIJ	0507	0508	0514	S26	209	W41	.747	210	3.3	1F	C	586	D
9	URUM	0615E	0615U	0638	N16	220	W53	.804	193	3.4	1N	C	588	D
11	PURP	0146	0151	0159	N 7	133	E10	.201	53	0.6	SB	C	595	E
11	URUM	0551	0555	0600	N 5	134	E 7	.124	48	0.5	SN	C	595	D
12	BEIJ	0145	0149	0158	N 7	137	W 6	.149	420	4.4	1F	P	595	D

H-ALPHA SOLAR FLARES

NOVEMBER 1990

Day	Sta	T i m e			Lat	L	CMD	Area Measurement			Obs		A.R.	Rem
		Start	Max	End				Cen	Appar	Corr				
		(UT)	(UT)	(UT)				Dist	(Sd)	(Sq)	Imp	Type		
12	PURP	0151E	0151U	0155D	N 8	135	W 5	.115	60	0.6	SB	P	595	
12	BEIJ	0227	0228	0230	N 8	135	W 5	.149	84	0.9	SF	C	595	D
12	URUM	0334E	0334	0345	N 7	130	W 1	.067	80	0.8	SN	C	595	E
12	BEIJ	0450	0457	0505	S26	141	W12	.529	757	9.2	2N	P		EF
12	URUM	0605	0610	0624	N 7	136	W 9	.162	113	1.2	SN	C	595	E
12	PURP	0606	0611	0624	N 8	137	W 9	.172	26	0.3	SN	C	595	
12	BEIJ	0609	0610	0611	N 7	137	W 8	.149	84	0.9	SF	P	595	D
12	URUM	0804	0815	0820	N 9	153	W28	.479	32	0.4	SF	C	598	D
12	URUM	0815	0820	0835	S32	125	E 1	.576	32	0.4	SF	C	594	E
13	YUNN	0136E	0137U	0152	N12	160	W43	.692	32	0.5	SN	P	590	
13	URUM	0550	0556	0602	S33	134	W19	.647	16	0.2	SF	C	594	D
13	URUM	0556	0558	0620	N 8	134	W20	.346	32	0.4	SF	C	595	D
13	YUNN	0729	0731	0738	N 7	136	W22	.374	64	0.7	SN	C	595	
15	YUNN	0707	0717	0728	S22	103	W15	.481	48	0.6	SN	C	602	
15	YUNN	0751E	0759U	0810D	S20	103	W16	.468	48	0.6	SN	P	602	
15	YUNN	0832	0834	0849	S20	105	W18	.474	193	2.3	1N	C	602	
16	URUM	0320	0330	0352	S21	102	W26	.576	48	0.6	SF	C	602	E
16	URUM	0330	0333	0340	N18	35	E41	.686	32	0.5	SN	C	605	D
16	URUM	0350	0354	0400	N17	35	E41	.681	64	0.9	SN	C	605	D
16	URUM	0432	0451	0540	S22	103	W27	.591	48	0.6	SN	C	602	E
16	URUM	0540	0543	0548	N15	32	E43	.697	16	0.2	SN	C	605	E
16	YUNN	0609E	0609U	0617	S24	101	W26	.603	32	0.4	SN	P	602	
16	YUNN	0728	0732	0800	N25	22	E52	.817	16	0.3	SN	P	605	
16	YUNN	0814	0820	0823	N25	35	E39	.629	80	1.1	SB	P	605	
17	YUNN	0645	0724U	0730	N17	26	E35	.608	193	2.5	1N	P	605	
18	YUNN	0402	0408U	0428	N12	32	E18	.340	48	0.5	SN	P	605	
18	URUM	0403E	0404	0410	N11	30	E19	.361	32	0.4	SN	C	605	D
18	URUM	0505	0511	0528	N18	69	W20	.420	96	1.1	SN	C	606	E
18	YUNN	0505E	0508U	0520	N16	72	W23	.449	80	0.9	SN	P	606	
18	YUNN	0510E	0510U	0512	N17	31	E18	.384	16	0.2	SN	P	605	
18	URUM	0534	0535	0546	N16	24	E24	.461	48	0.6	SN	C	605	E
18	URUM	0628	0632	0635	N15	29	E19	.377	48	0.5	SN	C	605	E
18	URUM	0636	0640	0648	N22	35	E13	.393	48	0.5	SN	C		E
18	URUM	0721	0724	0729	N16	24	E24	.453	32	0.4	SN	C	605	D

H-ALPHA SOLAR FLARES

NOVEMBER 1990

Area
Measurement
Cen Appar Corr
Obs
Day Sta (UT) (UT) (UT) (UT) Lat L CMD Dist (Sd) (Sq) Imp Type A.R. Rem

18	URUM	0810	0814	0817	N14	30	E18	.360	80	0.9	SN	C	605	D
19	YUNM	0219E	0219U	0225D	N22	34	E 4	.343	193	2.1	1B	P	605	
20	YUNM	0458	0502	0512	N20	31	W 8	.338	321	3.5	1N	C	605	
20	BEIJ	0521	0524	0534	N23	31	W 8	.368	105	1.2	SB	P	605	D
21	PURP	0252	0301	0316	N18	24	W13	.345	66	0.7	SN	C	605	
21	BEIJ	0252	0257	0343	N19	25	W14	.368	420	4.7	1B	P	605	E
21	BEIJ	0520	0535	0550	N19	25	W15	.368	210	2.3	1B	C	605	E
21	PURP	0527	0531	0539	N18	29	W19	.408	33	0.4	SF	C	605	
21	YUNM	0527	0530U	0617	N18	23	W13	.355	161	1.8	SN	P	605	
21	BEIJ	0630	0635	0635	N19	22	W13	.333	84	0.9	SB	C	605	
21	URUM	0818	0821	0825	N25	1	E 6	.393	32	0.4	SN	C	616	D
21	URUM	0840	0848	0900D	N23	31	W23	.513	32	0.4	SN	C	605	D
22	PURP	0145	0149	0204	N16	29	W30	.563	119	1.5	SF	C	605	U
22	BEIJ	0147	0155	0213	N14	25	W27	.483	231	2.7	1B	P	605	E
22	BEIJ	0220	0223	0230	N24	30	W32	.621	84	1.1	SB	P	605	D
22	URUM	0742	0745	0750	N19	16	W21	.451	48	0.6	SN	C	605	E
22	URUM	0825	0832	0924	N17	71	W77	.973	64		SN	C	606	E
23	YUNM	0144E	0147U	0228	S 5	255	E90	1.			P	619	A	
23	URUM	0321	0325	0341	N23	29	W45	.745	48	0.8	SN	C	605	D
23	URUM	0400	0407	0435	N23	29	W46	.756	48	0.8	SN	C	605	E
23	PURP	0400	0402	0404	N19	30	W46	.741	53	0.8	SF	C	605	
23	YUNM	0405E	0405U	0432	N20	28	W44	.731	80	1.2	SB	P	605	
23	YUNM	0500	0510	0517	N21	29	W46	.747	64	1.0	SB	C	605	
23	PURP	0501	0503	0506	N19	20	W36	.626	66	0.9	SF	C	605	
23	BEIJ	0503	0505	0510	N19	21	W37	.655	126	1.7	SB	C	605	D
24	BEIJ	0253	0255	0258	S 4	320	E12	.230	210	2.2	1B	P	614	E
24	YUNM	0258E	0258U	0324	S 6	322	E10	.212	48	0.5	SN	P	614	E
24	URUM	0243E	0250	0305D	S 5	319	E12	.231	96	1.0	SN	C	614	E
24	URUM	0709	0724	0751	N15	29	W60	.873	16	0.3	SF	C	605	D
24	YUNM	0835E	0843U	0847D	S 4	319	E 9	.176	80	0.8	SF	P	614	
25	YUNM	0153	0156	0242	S 3	320	W 1	.081	193	2.0	SF	C	614	
25	PURP	0317	0327	0340	S 4	322	W 4	.121	146	1.5	SN	C	614	

H-ALPHA SOLAR FLARES

NOVEMBER 1990-DECEMBER 1990

Day	Sta	T i m e			Lat	L	CMD	Area Measurement			Obs	A.R.	Rem
		Start (UT)	Max (UT)	End (UT)				Cen Dist	Appar (Sd)	Corr (Sq)			
NOVEMBER 1990													
25	BEIJ	0337	0340	0414	S 3	318	0	.080	168	1.7	SB P	614	E
26	YUNW	0712	0716	0722	S 5	320	W17	.315	80	0.9	SF C	614	
26	YUNW	0809	0811	0822	S 3	321	W19	.338	48	0.5	SN C	614	
27	BEIJ	0438	0447	0459	S 4	321	W30	.517	168	2.0	SB C	614	E
28	URUM	0656	0657	0710	S 4	325	W49	.754	113	1.8	SN C	614	E
28	YUNW	0656E	0656U	0657D	S 4	328	W51	.780	64	1.1	SB P	614	
DECEMBER 1990													
2	BEIJ	0136E	0136U	0210	S 8	239	W12	.253	252	2.7	1W P	621	E
3	BEIJ	0250	0305	0330	N 9	202	E11	.241	84	0.9	SN P	636	D
4	BEIJ	0215	0220	0245	N 8	142	E58	.839	168	3.2	1B P	640	E
5	URUM	0539	0544	0550	N19	150	E35	.629	64	0.9	SN C	639	E
5	URUM	0555	0602	0625	S26	190	W 6	.460	96	1.1	SF C	632	E
5	YUNW	0558E	0606U	0618	S26	191	W 6	.447	47	0.6	SN P	632	
5	URUM	0720	0730	0749D	N 9	142	E42	.675	418	5.9	2B C	640	E
5	YUNW	0722E	0730	0755D	N11	143	E41	.667	236	3.3	1W P	640	
5	URUM	0755E	0759	0838	N 9	147	E36	.602	32	0.4	SF C	640	E
6	YUNW	0628	0630	0642	N10	138	E33	.557	157	2.0	SN P	640	
6	BEIJ	0630	0631	0634	N 9	139	E32	.552	126	1.6	SB P	640	E
7	BEIJ	0135E	0135	0135D	S26	193	W32	.644	63	0.9	SB P	632	D
7	URUM	0426	0430	0439	N10	138	E21	.392	48	0.5	SF C	640	E
7	URUM	0434	0436	0450	S25	239	W80	.987	96		1W C	623	A
7	YUNW	0700E	0702	0708D	S27	191	W33	.667	31	0.4	SN P	632	
7	YUNW	0707	0722	0730D	N21	84	E74	.965	63		SN P		G
7	BEIJ	0720E	0720	0720D	N26	98	E60	.874	231	4.9	1B P		E
7	YUNW	0729E	0741	0752	N12	142	E16	.338	47	0.5	SN P	640	

H-ALPHA SOLAR FLARES

DECEMBER 1990

Day	Sta	T i m e			Lat	L	CMD	Area Measurement			Obs		A.R.	Rem
		Start	Max	End				Cen	Appar	Corr				
		(UT)	(UT)	(UT)				Dist	(Sd)	(Sq)	Imp	Type		
7	YUNN	0729E	0741	0752	N12	153	E 5	.222	47	0.5	SN	P	639	
8	URUM	0550	0554	0610	N14	164	W19	.404	32	0.4	SF	C	641	D
8	YUNN	0639E	0644	0654D	S11	177	W32	.560	63	0.8	SN	P	643	
8	URUM	0645E	0647	0700	S10	176	W31	.542	64	0.8	SB	C	643	E
8	URUM	0659	0715	0726	N15	164	W20	.424	96	1.1	SB	C	641	E
9	BEIJ	0317E	0317	0318D	N13	166	W32	.563	168	2.1	1N	P	641	D
9	YUNN	0503E	0507	0507D	N 3	49	E84	.994	16		SN	P	653	
10	BEIJ	0250E	0250	0255	N14	169	W48	.759	84	1.3	SN	C	641	E
10	BEIJ	0422	0427	0435	N10	169	W48	.736	126	1.9	SB	P	641	E
10	YUNN	0430E	0434	0446	N16	168	W48	.770	63	1.0	SN	P	641	
11	YUNN	0711	0714	0714D	N16	153	W48	.770	47	0.8	SB	P	639	
12	YUNN	0315E	0337U	0345D	N20	161	W67	.931	126		1B	P	638	
12	BEIJ	0329E	0329	0335	N20	164	W70	.942	168		1N	P	638	D
12	YUNN	0330	0332	0347	N19	14	E80	.987	16		SN	P	661	
12	YUNN	0330E	0338U	0345D	S26	184	W90	1.				P	632	
12	YUNN	0330E	0335	0338D	N14	145	W51	.797	31	0.5	SN	P	640	
12	URUM	0335E	0337	0415	N21	160	W67	.932	64		SN	C	638	E
12	URUM	0340	0341	0349	N12	163	W69	.940	48		SN	C	641	E
12	URUM	0622	0638	0646	N20	160	W69	.941	32		SN	C	638	D
12	URUM	0626	0635	0640	N17	16	E76	.972	96		1N	C	661	D
12	YUNN	0642E	0708	0718D	N21	170	W78	.980	79		1N	P	638	
12	URUM	0659	0707	0725	N20	160	W68	.939	193		1N	C	638	E
12	URUM	0739	0748	0800	N 4	49	E42	.678	64	0.9	SB	C	653	E
12	URUM	0756	0806	0835	N22	158	W67	.932	64		SB	C	638	E
13	YUNN	0243	0252	0252D	N18	12	E69	.943	16		SN	P	661	
13	YUNN	0624	0636	0649	N 0	54	E25	.427	31	0.4	SN	C	653	
13	URUM	0626	0633	0654	N 1	54	E25	.419	16	0.2	SF	C	653	D
13	YUNN	0723	0739	0752	S26	59	E20	.537	16	0.2	SN	C	654	
13	YUNN	0758E	0758	0808	N 7	51	E27	.469	63	0.7	SN	P	653	
14	BEIJ	0151	0155	0201	N20	18	E51	.805	126	2.2	1N	P	661	D
14	BEIJ	0632	0635	0644	N20	31	E36	.701	84	1.2	SN	P	652	E
14	YUNN	0830E	0841	0856D	N 4	55	E10	.183	94	1.0	SN	P	653	

H-ALPHA SOLAR FLARES

DECEMBER 1990

Day	Sta	T i m e			Lat	L	CMD	Area Measurement			Obs	Type	A.R.	Rem
		Start	Max	End				Cen	Appar	Corr				
		(UT)	(UT)	(UT)				Dist	(Sd)	(Sq)	Imp			
14	YUNN	0841E	0841	0856	N20	21	E44	.754	16	0.3	SN	P	661	
14	YUNN	0841	0848	0856	N21	31	E34	.636	79	1.1	SN	C	657	
15	BEIJ	0349	0351	0357	N13	16	E37	.632	105	1.4	SN	P	661	D
15	BEIJ	0535	0545	0552	N13	16	E37	.632	210	2.8	1B	P	661	DH
16	BEIJ	0223	0226	0240	N18	21	E21	.460	84	1.0	SN	P	657	E
16	YUNN	0325E	0325	0339	N 5	46	W 5	.130	16	0.2	SN	P	653	
16	YUNN	0325E	0325	0345	N14	16	E25	.479	24	0.3	SN	P	661	
16	BEIJ	0415	0417	0428	N18	21	E20	.460	210	2.4	1N	P	657	E
16	YUNN	0429E	0429	0435D	N 4	48	W 7	.157	79	0.8	SN	P	653	
16	YUNN	0429E	0429	0435D	N22	17	E24	.543	47	0.6	SF	P	661	
16	BEIJ	0444E	0445	0449	N12	16	E25	.471	294	3.4	1B	P	661	E
16	YUNN	0447E	0447	0503	N14	16	E25	.479	47	0.6	SN	P	661	
16	YUNN	0534E	0537	0600	N14	18	E22	.447	47	0.6	SN	P	661	
16	YUNN	0602	0613	0636	N13	17	E23	.458	47	0.6	SN	C	661	
17	BEIJ	0259E	0259	0303	N18	29	W 1	.322	42	0.5	SN	P	657	D
17	BEIJ	0445	0457	0516	N14	17	E10	.322	168	1.8	SN	P	661	D
17	BEIJ	0641	0645	0658	N14	17	E 9	.322	294	3.2	1B	C	661	E
18	BEIJ	0152	0155	0232	N10	35	W20	.379	168	1.9	SN	P	660	D
18	BEIJ	0230	0232	0236	N11	32	W17	.356	168	1.9	SN	P	660	D
18	BEIJ	0232	0235	0239	N 9	53	W38	.621	63	0.8	SN	P	653	D
18	BEIJ	0235	0245	0247	N 4	58	W43	.678	42	0.6	SN	P	653	D
18	BEIJ	0254	0256	0304	N13	18	W 3	.253	420	4.5	1B	P	661	E
18	BEIJ	0434	0436	0439	N13	18	W 4	.253	126	1.4	SN	P	661	E
18	BEIJ	0516	0517	0529	N12	33	W19	.379	189	2.1	1B	P	660	EK
18	BEIJ	0516	0517	0519	N 4	58	W44	.678	42	0.6	SN	P	653	D
20	PURP	0705E	0719	0745	N14	34	W47	.752	131	2.1	1B	C	660	
20	URUM	0709E	0720	0807	N14	32	W46	.749	80	1.3	SB	C	660	E
20	YUNN	0713E	0721	0801	N15	32	W46	.747	157	2.4	1B	P	660	
21	YUNN	0157E	0158	0158D	N17	28	W52	.816	47	0.8	SN	P	657	
21	URUM	0537	0541	0552	N19	14	W40	.699	16	0.2	SF	C	661	D
24	YUNN	0331E	0333	0343	S24	244	E52	.814	47	0.8	SN	P	672	
24	YUNN	0331E	0333	0343	N17	291	E 5	.330	126	1.4	SN	P	669	

H-ALPHA SOLAR FLARES

DECEMBER 1990

Day	Sta	T i m e			Lat	L	CMD	Area Measurement			Obs			A.R.	Rem
		Start	Max	End				Gen	Appar	Corr					
		(UT)	(UT)	(UT)				Dist	(Sd)	(Sq)	Imp	Type			
24	URUM	0544	0550	0600	N 4	262	E32	.539	32	0.4	SF	C			E
24	URUM	0558	0620	0730	N17	290	E 3	.339	113	1.2	SB	C	669		E
24	YUNN	0745	0752	0810	S22	237	E57	.858	16	0.3	SN	C	672		
25	YUNN	0135E	0136	0150	S20	267	E17	.413	31	0.4	SN	P	671		
25	BEIJ	0238	0241	0244	S19	264	E19	.414	126	1.4	SN	P	671		D
25	YUNN	0241E	0241U	0242D	S26	245	E38	.692	16	0.2	SN	P	675		
25	BEIJ	0530	0535	0538	S19	264	E17	.414	84	1.0	SN	P	671		D
26	BEIJ	0210E	0220	0255	S27	244	E26	.575	463	5.8	2N	P	675		E
28	YUNN	0325E	0327	0338	S26	243	E 0	.401	31	0.4	SN	P	675		
28	YUNN	0457E	0508	0531	S18	256	W14	.346	16	0.2	SN	P	671		
28	YUNN	0734E	0736	0745	S11	253	W12	.259	94	1.0	SN	P	674		
30	URUM	0559	0600	0605	S 8	252	W37	.610	16	0.2	SN	C	674		D
30	URUM	0605	0611	0624	S22	238	W23	.495	16	0.2	SN	C	672		D
30	YUNN	0622	0624	0627	S 8	257	W42	.670	24	0.3	SN	C	674		
30	URUM	0721	0724	0730	S 8	253	W39	.629	16	0.2	SN	C	674		D
31	URUM	0749E	0814	0826	S15	185	E15	.334	64	0.7	SN	C	679		E

INTERVALS OF H-ALPHA FLARE PATROL OBSERVATION

NOVEMBER 1990

Day	From	To	From	To	From	To	From	To	From	To	From	To	From	To
1	125	819	830	914										
2	140	915	935	948										
3	200	212	224	235	255	307	328	727	747	800				
4	340	800												
5	35	45	122	143	200	210	630	635	645	655				
6	55	740	803	807	907	911								
7	55	116	125	128	147	155	205	213	230	559	730	740	813	823
8	259	945												
9	250	638												
10	116	743												
11	57	105	115	855										
12	43	839												
13	48	118	136	249	412	442	525	559	612	827				
14	549	711	726	737										
15	107	300	534	728	751	817	832	849						
16	233	240	250	609	617	647	715	747	800	850				
17	307	355	407	411	418	422	433	440	455	458	509	555	617	652
	702	755												
18	305	444	505	935										
19	130	150	219	225	244	300	359	403	455	517	534	846		
20	110	854												
21	125	759	815	825	835	900								
22	110	924												
23	102	716	731	820										
24	230	751	759	928										
25	115	800	814	910										
26	135	630	707	730	749	830								
27	125	205	223	620										
28	255	535	650	723										
29	400	517	534	548	626	812								
30	135	730												

Combined reports from the observatories listed below:

BEIJ PURP URUM YUNN

INTERVALS OF H-ALPHA FLARE PATROL OBSERVATION

DECEMBER 1990

Day	From	To	From	To	From	To	From	To	From	To	From	To
1	125	140	325	700								
2	135	802										
3	105	630	636	700	833	900						
4	105	740										
5	115	850										
6	220	420	534	715								
7	125	245	355	756	830	845						
8	325	334	437	610	624	819						
9	239	254	315	545								
10	220	705										
11	200	220	449	555	632	717						
12	150	846										
13	200	716	723	828								
14	135	310	340	715	758	823	830	856				
15	221	715										
16	112	636	714	729								
17	110	720										
18	105	810										
19												
20	150	848										
21	135	334	426	646	720	843						
22	110	630	732	810	826	839						
23	130	803										
24	130	848										
25	120	330	530	630								
26	210	700										
27	152	320	707	843								
28	230	825										
29	134	307	318	851								
30	152	340	459	805	825	1000						
31	30	826										

Combined reports from the observatories listed below:

BEIJ PURP URUM YUNN

SOLAR RADIO EMISSION FLUX

NOVEMBER 1990

Day	BEIJ 2840	PURP 2700	URUM 9375	YUNW 2840
1	160		308	142
2	156		305	137
3	152		290	140
4	177		311	153
5	184		318	162
6	201		330	180
7	217		335	199
8	251		364	221
9	231		324	217
10	220		332	201
11	207		338	191
12	212		339	181
13	213		352	187
14	230		361	195
15	227		376	196
16	237		408	197
17	249		392	210
18	238		411	209
19	222		384	195
20	211		362	193
21	211		356	179
22	201		357	181
23	196		331	166
24	202		339	168
25	197		324	175
26	180		336	151
27	171		310	156
28	171		320	169
29	176		313	179
30	186		326	182
Mean	202.9		341.7	180.4

SOLAR RADIO EMISSION FLUX

DECEMBER 1990

Day	BEIJ 2840	PURP 2700	URUM 9375	YUNW 2840
1	187		323	187
2	197		326	192
3	204		324	189
4	220		324	210
5	233		341	200
6	255		349	216
7	253		332	225
8	257		341	231
9	263		358	243
10	258		355	245
11	271		372	245
12	257		358	230
13	246		347	221
14	226		347	212
15	217		338	205
16	212		325	200
17	219		347	209
18	227		359	212
19	255		380	199
20	218		371	197
21	210		359	202
22	216		347	206
23	206		347	191
24	208		337	199
25	206		335	187
26	222		327	199
27	207		318	191
28	214		330	194
29	204		323	202
30	208		333	193
31	209		321	178
Mean	225.3		341.7	206.8

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

NOVEMBER 1990

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Peak	Density Rel Mean
01	2840	BEIJ	5 S	0554.0	0558.1	8.0	12.4	7.7
01	9375	URUM	3 S	0555.7	0556.2	3.0	41.8	13.6
02	9375	URUM	4 S/F	0707.1	0707.4	59.6	54.2	17.8
05	2840	BEIJ	5 S	0345.0	0346.7	7.0	10.4	5.7
09	2840	BEIJ	5 S	0152.0	0153.5	4.0	10.4	4.5
09	2840	BEIJ	5 S	0246.0	0249.3	6.0	22.5	9.7
09	2840	BEIJ	5 S	0332.0	0333.5	4.0	40.5	17.5
11	2840	BEIJ	5 S	0420.0	0426.6	22.0	20.7	10.0
12	9375	URUM	3 S	0508.0	0508.6	1.3	22.3	6.6
13	2840	BEIJ	3 S	0414.0	0434.7	44.0	134.5	63.1
13	9375	URUM	4 S/F	0441.7	0443.2	3.0	315.4	89.7
15	2840	BEIJ	5 S	0523.0	0526.3	8.0	14.8	6.5
16	9375	URUM	4 S/F	0251.3	0251.8	1.4	28.3	6.9
16	2840	BEIJ	3 S	0353.0	0354.6	11.0	18.5	7.8
16	9375	URUM	3 S	0354.3	0354.9	1.1	26.0	6.4
16	9375	URUM	4 S/F	0358.0	0358.4	0.7	22.6	5.5
17	2840	BEIJ	20 GRF	0201.0	0227.0	43.0	37.4	15.0
17	9375	URUM	3 S	0325.2	0325.7	2.5	28.8	7.3
17	9375	URUM	3 S	0333.5	0333.8	1.2	17.3	4.4
17	9375	URUM	4 S/F	0409.7	0411.4	6.0	46.1	10.6
17	2840	BEIJ	1 S	0410.0	0412.6	4.0	4.4	1.8
17	2840	BEIJ	1 S	0418.0	0419.9	4.0	3.7	1.5
17	2840	BEIJ	5 S	0427.0	0427.5	4.0	15.6	6.3
17	9375	URUM	3 S	0607.3	0608.7	6.0	26.5	6.8
17	2840	BEIJ	1 S	0631.0	0633.7	5.0	2.9	1.2
17	2840	BEIJ	1 S	0642.0	0645.8	8.0	6.6	2.7
17	2840	BEIJ	1 S	0653.0	0655.5	11.0	8.1	3.2
17	9375	URUM	3 S	0720.7	0722.2	3.5	20.7	5.3
18	2840	BEIJ	5 S	0125.0	0128.6	7.0	14.7	6.2
18	2840	BEIJ	1 S	0247.0	0248.0	3.0	4.7	2.0
18	2840	BEIJ	20 GRF	0540.0	0602.1	54.0	8.5	3.6
18	9375	URUM	4 S/F	0950.7	0951.2	1.8	49.0	11.9
19	2840	BEIJ	5 S	0047.0	0048.2	3.0	25.1	11.3
19	2840	BEIJ	3 S	0209.0	0216.8	12.0	27.5	12.4
19	9375	URUM	3 S	0335.3	0337.2	6.0	35.8	9.3
19	9375	URUM	4 S/F	0454.7	0454.9	3.0	40.2	10.5
19	2840	BEIJ	5 S	0455.0	0456.4	5.0	37.4	16.8
19	9375	URUM	3 S	0552.7	0556.7	7.0	13.0	3.4
19	2840	BEIJ	46 C	0620.0	0624.2	10.0	61.3	27.6
19	9375	URUM	46 C	0620.7	0622.2	7.0	152.0	39.6

NOVEMBER 1990

Day	Freq	Sta	Type	Start (UT)	Maximum (UT)	Duration (Min)	Flux	Peak	Rel	Density	Mean
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SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

DECEMBER 1990

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Peak Flux	Rel Density	Mean
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03	2840	BEIJ	1 S	0222.0	0222.6	1.5	6.0	2.9	
04	2840	BEIJ	46 C	0157.0	0202.0	11.0	410.1	186.4	
04	2840	YUNN	45 C	0158.6	0201.4	9.4	301.3		
05	2840	BEIJ	46 C	0519.0	0525.7	14.0	206.4	88.6	
05	2840	BEIJ	46 C	0559.0	0640.1	81.0	31.7	13.6	
05	2840	BEIJ	45 C	0720.0	0725.6	13.0D	193.6	83.1	
05	9375	URUM	46 C	0720.6	0724.7	17.3	446.0	130.9	
05	2840	YUNN	45 C	0721.8	0725.7	9.8	149.2		
06	2840	BEIJ	45 C	0213.0	0216.5	6.0	11.5	4.5	
06	9375	URUM	46 C	0627.3	0628.6	1.6	52.3	15.0	
06	2840	BEIJ	45 C	0628.5	0630.0	30.5	37.9	14.8	
06	2840	YUNN	45 C	0628.8	0630.0	5.7	31.3		
08	9375	URUM	3 S	0641.9	0643.4	3.0	21.9	6.4	
08	2840	BEIJ	46 C	0642.0	0644.3	10.0	53.2	20.7	
09	2840	BEIJ	1 S	0312.0	0312.8	2.0	6.8	2.6	
09	2840	BEIJ	1 S	0354.0	0355.7	3.0	6.8	2.6	
09	2840	BEIJ	45 C	0532.0	0534.4	5.0	20.0	7.6	
09	9375	URUM	3 S	0533.2	0533.3	0.7	22.3	6.2	
09	2840	YUNN	3 S	0533.8	0534.3	1.2	17.2		
09	2840	BEIJ	1 S	0538.0	0539.0	3.0	3.6	1.4	
09	2840	BEIJ	1 S	0558.0	0604.1	9.0	4.3	1.6	
09	2840	BEIJ	5 S	0613.0	0613.9	2.0	18.6	7.1	
09	2840	YUNN	3 S	0613.5	0614.0	1.5	20.2		
09	2840	BEIJ	22 GRF	0615.0	0618.9	10.0	10.0	3.8	
09	2840	YUNN	45 C	0816.5	0817.0	18.5	203.1		
09	9375	URUM	46 C	0836.9	0837.9	12.0	330.6	9.2	
10	2840	BEIJ	5 S	0358.0	0358.6	2.0	13.1	5.1	
10	2840	YUNN	1 S	0358.5	0358.8	0.7	9.8		
10	2840	BEIJ	1 S	0420.0	0421.0	3.0	3.9	1.5	
10	2840	BEIJ	1 S	0443.0	0443.1	2.0	3.1	1.2	
10	2840	YUNN	20 GRF	0443.0	0450.2	18.0	7.0		
10	2840	BEIJ	1 S	0448.0	0450.0	8.0	4.6	1.8	
10	2840	BEIJ	1 S	0512.0	0513.0	5.0	9.0	3.5	
10	2840	BEIJ	45 C	0653.0	0656.7	20.0	35.9	13.9	
10	9375	URUM	20 GRF	0739.9	0742.9	26.0	89.9	6.7	
10	2840	YUNN	4 S/F	0741.2	0743.5	9.8	93.8		
11	2840	BEIJ	20 GRF	0258.0	0258.4	10.0	3.6	1.3	
11	2840	BEIJ	1 S	0308.0	0309.0	7.0	4.4	1.6	
11	2840	BEIJ	3 S	0346.0	0351.0	10.0	8.7	3.2	
11	2840	BEIJ	1 S	0410.0	0411.5	4.0	3.6	1.3	

SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

DECEMBER 1990

Time of
Start (UT)
Maximum (UT)
Duration (Min)
Peak Flux
Rel Density
Mean

11	2840	YUNN	3 S	0502.0	0504.2	5.0	13.5	6.9	3.6	11	2840	BEIJ	5 S	0502.0	0504.7	6.0	18.8	6.9	3.6	11	2840	BEIJ	1 S	0726.0	0727.7	5.0	8.7	3.2	11	2840	YUNN	3 S	0726.5	0727.5	4.0	12.2	3.1	12	2840	BEIJ	1 S	0050.0	0051.1	3.0	8.1	3.4	12	2840	BEIJ	1 S	0144.0	0146.2	5.0	8.8	15.6	12	2840	BEIJ	5 S	0257.0	0258.5	5.0	40.1	26.3	12	2840	YUNN	3 S	0257.5	0258.3	6.5	6.6	2.6	12	2840	YUNN	21 GRF	0315.5	0342.2	30.5	44.7	16.4	12	2840	BEIJ	5 S	0326.0	0327.2	6.0	42.2	19.8	12	2840	BEIJ	45 C	0335.0	0342.3	20.0	51.0	6.5	12	9375	URUM	45 C	0623.6	0623.9	2.9	23.4	9.6	12	2840	YUNN	46 C	0659.9	0700.6	3.0	34.5	9.6	12	2840	YUNN	46 C	0742.5	0757.5	23.0	92.0	9.3	12	9375	URUM	45 C	0758.4	0800.6	4.5	33.4	8.0	13	9375	URUM	4 S/F	0342.9	0344.2	2.0	27.8	3.6	15	2840	BEIJ	1 S	0446.0	0448.0	3.0	2.9	1.2	14	2840	BEIJ	1 S	0158.0	0159.9	2.0	10.2	4.5	15	2840	BEIJ	3 S	0154.0	0202.0	20.0	115.1	53.0	15	2840	YUNN	4 S/F	0159.5	0202.1	14.6	64.8	3.6	15	2840	BEIJ	1 S	0215.0	0218.9	7.0	7.9	1.3	15	2840	BEIJ	1 S	0244.0	0245.6	3.0	2.9	6.6	15	9375	URUM	4 S/F	0348.6	0348.9	2.3	22.3	6.6	15	2840	YUNN	3 S	0348.9	0350.0	3.1	10.5	2.0	15	2840	BEIJ	1 S	0412.0	0415.9	6.0	4.3	2.0	15	2840	BEIJ	20 GRF	0535.0	0541.5	30.0	9.4	4.3	16	9375	URUM	3 S	0442.9	0444.1	2.4	58.9	18.1	16	2840	BEIJ	3 S	0443.0	0443.8	8.0	27.5	12.9	16	2840	YUNN	3 S	0444.4	0445.0	5.0	46.4	5.5	16	2840	BEIJ	3 S	0514.0	0515.0	5.0	11.7	3.5	16	2840	YUNN	3 S	0514.5	0515.1	3.5	18.8	3.5	16	2840	BEIJ	1 S	0602.0	0603.2	9.0	7.4	3.5	17	2840	YUNN	3 S	0309.6	0317.2	15.4	45.4	12.9	17	2840	BEIJ	45 C	0312.0	0317.1	9.0	28.3	13.7	17	9375	URUM	21 GRF	0312.0	0316.4	29.0	47.5	25.5	17	9375	URUM	46 C	0633.9	0637.3	14.0	88.4	7.4	17	2840	BEIJ	45 C	0637.0	0638.1	6.0	16.3		17	2840	YUNN	45 C	0637.7	0638.2	3.6	38.1	
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SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

DECEMBER 1990

Day	Freq	Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Peak	Density Rel Mean
18	2840	BEIJ	45 C	0148.0	0152.0	13.0	27.2	12.0
18	2840	YUNN	4 S/F	0249.5	0251.4	6.5	44.9	
18	9375	URUM	3 S	0254.4	0254.9	1.0	55.6	15.5
18	9375	URUM	4 S/F	0750.2	0750.3	0.7	22.3	6.2
18	9375	URUM	4 S/F	0825.9	0826.9	2.4	15.6	4.3
19	2840	BEIJ	45 C	0406.0	0416.0	42.0	18.1	7.1
19	2840	YUNN	3 S	0512.4	0516.3	6.9	29.7	
19	2840	YUNN	46 C	0525.0	0529.8	11.9	27.9	
19	9375	URUM	3 S	0616.9	0617.4	2.0	22.3	5.9
19	9375	URUM	3 S	0835.2	0835.6	0.7	18.9	5.0
20	9375	URUM	3 S	0351.9	0352.4	1.0	13.1	3.5
20	9375	URUM	4 S/F	0407.4	0409.8	11.5	43.7	11.8
20	9375	URUM	4 S/F	0504.1	0506.1	15.8	109.4	29.5
20	2840	BEIJ	45 C	0703.0	0715.6	45.0	114.0	52.3
20	9375	URUM	23 GRF	0703.9	0716.6	46.0	131.2	35.4
20	2840	YUNN	46 C	0704.6	0715.4	39.4	123.0	
24	2840	BEIJ	1 S	0144.0	0147.7	10.0	12.1	5.8
25	2840	YUNN	3 S	0927.5	0928.0	1.0	19.8	
26	2840	BEIJ	20 GRF	0556.0	0601.8	28.0	10.8	4.8
27	2840	BEIJ	1 S	0044.0	0045.0	3.0	16.6	8.0
28	2840	BEIJ	5 S	0731.0	0733.1	9.0	26.2	12.2
28	2840	YUNN	4 S/F	0732.2	0733.5	3.8	27.2	
30	2840	BEIJ	45 C	0457.0	0459.6	8.0	10.8	5.2
30	2840	YUNN	3 S	0921.0	0923.0	3.0	11.7	

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

NOVEMBER 1990

Day	BEIJ		PURP		URUM		YUNN	
	From	To	From	To	From	To	Form	To
	2840		2700		9375		2840	
1	0058	0757			0208	1006	0225	0800
2	0054	0802			0210	1000	0120	0800
3	0028	0620			0200	0955	0015	0900
4	0043	0610			0220	0950	0200	0720
5	0050	0750			0159	1000	0020	0650
6	0100	0839			0218	1000	0140	0910
7	0212	0809			0208	1000	0010	0900
8	0106	0749			0210	0945	0145	0840
9	0050	0750			0155	1006		
10	0056	0715			0205	0910	0200	0810
11	0030	0550			0156	1010	0230	0800
12	0035	0745			0159	0930	0045	1000
13	0045	0746			0200	1007	0145	0940
14	0048	0746			0210	1000	0114	0900
15	0045	0740			0225	1000	0036	0909
16	0051	0745			0159	1000	0010	0905
17	0047	0719			0200	0955	0100	0950
18	0048	0813			0255	1019	0042	0950
19	0048	0746			0205	1000	0045	0950
20	0044	0745			0230	1020	0010	0950

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

NOVEMBER 1990

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

21	0045 0745	0200 1000	0030 0950
22	0048 0741	0159 0957	0010 0950
23	0044 0742	0205 1005	0010 1000
24	0046 0720	0155 1000	0010 0956
25	0030 0720	0200 0930	0150 0630
26	0041 0050	0230 1005	0050 0905
27	0042 0745	0210 1006	0030 0930
28	0045 0745	0200 1000	0040 0900
29	0056 0745	0201 0950	0020 0942
30	0045 0745	0209 0800	0020 0905

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

DECEMBER 1990

Day	BEIJ From To 2840	PURP From To 2700	URUM From To 9375	YUNN From To 2840
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1	0052 0722 2355 2400	0210 0950	0100 0840	
2	0000 0702	0215 1000	0115 0645	
3	0050 0651	0208 0950	0030 0830	
4	0050 0740	0157 0950	0108 0845	
5	0050 0745	0210 1010	0100 0940	
6	0050 0740	0202 0950	0100 0845	
7	0251 0740	0215 0935	0100 0845	
8	0050 0715	0200 0950	0100 0930	
9	0043 0725	0225 0930	0140 0845	
10	0043 0751	0201 0951	0150 0910	
11	0047 0742	0240 0945	0020 0900	
12	0051 0750	0208 0945	0015 0900	
13	0057 0749	0218 0947	0020 0915	
14	0043 0740	0240 0935	0015 0900	
15	0059 0724	0208 0945	0020 0920	
16	0045 0750	0240 0920	0150 0640	
17	0031 0740	0240 0950	0030 0900	
18	0040 0740	0245 0945	0030 0920	
19	0050 0745	0215 0945	0015 0850	
20	0050 0748	0208 0947	0045 0900	

INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

DECEMBER 1990

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

21	0040 0732	0210 0940	0050 0925
22	0050 0715	0210 0955	0300 1000
23	0042 0750	0240 0940	0210 0855
24	0045 0740	0210 0250	0040 0900
25	0052 0742	0205 0955	0050 1000
26	0050 0740	0205 0945	0020 1002
27	0050 0740	0205 0930	0040 1000
28	0050 0740	0208 0950	0220 1008
29	0047 0350	0220 0945	0045 1013
30	0042 0750	0210 0948	0100 1002
31	0043 0450	0200 0940	0030 0930

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

NOV 1990

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	422	429	434	426	426	421	427	419	419	423	415	423	424	426	416	419	425	431	430	427	430	418	429	426	424.3	24	
2	427	432	424	434	436	438	430	421	430	428	421	427	435	426	441	433	427	435	428	431	422	422	433	437	429.9	24	
3	431	429	430	436	436	435	433	434	432	427	428	433	432	428	431	431	428	425	425	416	421	424	427	429.0	24		
4	429	424	432	428	435	433	433	433	421	431	432	429	436	437	434	425	434	432	431	442	435	432	430	442	432.1	24	
5	428	434	428	433	431	448	444	437	440	456	453	448	446	444	442	449	441	441	439	439	433	421	432	437	439.3	24	
6	450	445	450	447	450	444	446	453	450	447	452	458	444	453	443	438	435	444	443	440	444	439	447	446.0	24		
7	445	448	449	448	447	451	445	448	462	449	458	444	450	451	463	455	456	451	460	450	455	456	445	458	451.9	24	
8	448	450	450	444	447	449	452	455	456	458	444	450	451	463	455	456	451	460	450	455	456	445	458	451	452.3	24	
9	453	461	464	458	452	453	463	461	457	446	455	447	447	452	454	448	450	451	458	457	448	457	451	455	454.2	24	
10	453	454	453	452	446	447	452	459	449	455	452	446	447	456	448	450	449	441	445	458	454	463	459	458	451.9	24	
11	451	451	455	451	458	461	459	453	460	447	442	452	448	454	437	453	440	441	446	440	446	439	451	448	449.7	24	
12	448	451	453	439	450	443	442	448	437	441	442	427	435	438	430	431	443	431	434	439	438	445	438	452	440.6	24	
13	442	439	441	447	442	434	443	444	431	426	445	431	432	437	430	437	439	440	446	451	441	447	455	446	453.4	24	
14	449	443	443	439	437	434	450	436	433	424	432	429	433	437	430	443	439	441	446	445	439	441	449	438	438.8	24	
15	446	440	442	437	444	436	446	432	424	426	436	427	430	440	431	438	424	430	428	440	437	446	435	435.3	24		
16	438	436	425	434	439	447	447	452	441	450	448	453	462	445	450	445	435	452	444	453	446	447	447	444	445.0	24	
17	448	447	448	445	440	441	452	437	441	435	430	443	445	429	441	428	439	443	434	434	440	437	446	436	440.0	24	
18	447	449	448	450	448	451	454	450	447	448	449	442	441	447	448	447	445	452	450	441	450	451	450	448	448.0	24	
19	440	451	452	457	449	453	451	442	460	454	456	443	458	451	437	452	449	450	456	448	456	452	462	463	452.2	24	
20	461	464	463	463	474	463	456	464	466	471	471	469	468	455	457	455	460	460	463	461	462	466	456	462.7	24		
21	450	455	453	459	470	467	453	446	446	449	456	440	443	446	445	457	454	445	462	458	449	454	444	451.9	24		
22	443	441	450	441	449	447	453	449	445	457	447	440	443	442	452	449	450	453	443	443	447	455	452	443	447.3	24	
23	445	440	439	451	444	444	452	446	443	443	440	444	453	454	450	446	438	447	449	437	437	438	450	443	450	437.1	24
24	441	439	440	435	446	426	435	443	433	441	434	435	426	436	438	428	441	439	449	437	437	438	437	436	437.1	24	
25	432	438	453	440	439	436	439	444	432	434	440	443	446	438	456	440	446	446	449	451	456	453	452	451	443.9	24	
26	454	439	443	441	444	442	433	437	439	427	432	435	444	444	452	452	451	456	448	445	449	445	447	439	443.3	24	
27	434	443	449	440	443	441	443	438	436	429	439	444	443	444	435	446	445	445	443	466	451	468	455	456	449.4	24	
28	454	447	455	460	451	463	443	453	442	440	450	450	442	447	448	441	445	446	430	445	447	441	437	441	447.0	24	
29	446	446	433	443	445	449	446	440	448	444	444	450	459	443	444	440	457	447	449	454	455	455	458	456	446.0	24	
30	454	453	454	453	455	449	459	456	448	458	460	457	461	461	469	466	474	464	452	465	476	472	469	460.4	24		

MONTHLY MEAN DAILY VARIATION FOR 30 COMPLETE DAYS DEVIATIONS FROM AVERAGE:444.317

(1-12) -0.35 -0.38 1.12 0.05 1.45 0.55 1.72 0.02 -2.05 -1.85 -0.88 -2.05
(13-24) 0.28 -0.22 -1.12 -1.05 -0.85 0.35 -0.18 0.28 0.88 0.55 2.12 1.62

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

U.T.=(1 1.04 0.05 1.04 0.19) (2 -0.23 0.02 0.23 5.82) (3 -0.28 -0.68 0.73 5.51) (4 0.39 -0.09 0.40 5.79)
L.T.=(1 -0.57 0.88 1.04 8.19) (2 0.14 0.19 0.23 1.82) (3 -0.28 -0.68 0.73 5.51) (4 -0.12 0.38 0.40 1.79)

MONTHLY MEAN=444.317

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

U. T. Hours at End of Interval

DEC 1990

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	σ	
1	459	473	473	470	465	478	463	464	485	478	477	481	468	464	476	472	473	477	471	478	481	476	476	476	473.2	24	
2	478	466	474	487	480	474	482	482	471	477	474	477	482	476	476	470	470	476	474	476	484	478	468	480	477.2	24	
3	460	466	476	474	480	472	477	474	468	471	471	472	476	476	476	470	474	477	476	474	472	472	469	472.5	24	24	
4	468	481	473	484	481	482	472	473	471	473	471	472	471	471	471	471	473	471	471	471	471	472	473	469	472.5	24	24
5	468	489	489	489	489	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	24	24
6	453	453	458	458	458	452	443	446	443	446	443	446	449	449	449	449	449	449	449	449	449	449	449	449	449	24	24
7	458	456	456	458	458	458	448	448	448	448	448	448	448	448	448	448	448	448	448	448	448	448	448	448	448	24	24
8	452	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	446	24	24
9	434	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	24	24
10	429	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	433	24	24
11	450	453	461	445	445	444	444	444	444	444	444	444	444	444	444	444	444	444	444	444	444	444	444	444	444	24	24
12	439	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	24	24
13	464	473	459	468	467	466	461	457	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	24	24
14	464	463	462	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	24	24
15	458	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	24	24
16	455	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	24	24
17	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24
18	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24
19	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24
20	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24
21	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24
22	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24
23	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24
24	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	468	24	24

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 459.353
(1-12) 1.03 2.16 1.19 1.19 0.84 -0.19 0.48 -1.87 -0.66 -1.84 -1.97 -1.10
(13-24) -1.16 0.10 -1.61 -4.48 -2.36 -1.29 0.19 1.19 1.74 1.81 4.26 2.23
HARMONIC COMPONENTS (ORDER, COS, SIN, AMPLITUDE, MAX.-RM)
U. T. = (1 2.13 0.16 2.14 0.28) (2 0.58 -0.61 0.77 10.61) (3 -0.64 -0.42 0.77 4.75) (4 0.20 0.27 0.34 0.90)
L. T. = (1 -1.20 1.77 2.14 8.28) (2 -0.74 -0.24 0.77 6.81) (3 -0.64 -0.42 0.77 4.75) (4 -0.34 0.04 0.34 2.90)

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

U.T. Hours at End of Interval

NOV 1990

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	26	25	26	25	27	23	26	26	26	26	27	27	29	29	25	28	28	29	29	29	30	30	30	28	27.3	24
2	29	29	28	28	28	26	26	26	26	26	27	27	28	28	26	27	27	26	26	27	27	25	25	26	27.1	24
3	25	26	26	25	23	22	24	24	26	26	26	26	26	26	25	26	26	26	26	22	22	22	22	23	24.3	24
4	21	23	24	22	23	22	24	26	26	26	26	26	26	26	25	26	26	26	26	22	22	22	22	24.8	24	
5	25	21	24	22	23	22	24	26	26	26	26	26	26	26	25	26	26	26	26	22	22	22	22	26.4	24	
6	22	24	24	24	25	27	27	28	28	28	28	28	28	28	25	26	26	26	26	27	27	27	27	26.0	24	
7	29	31	30	30	32	33	36	36	36	36	36	36	36	36	35	36	36	36	36	33	33	33	33	33.8	24	
8	33	33	39	41	40	39	39	39	39	39	39	39	39	39	38	39	39	39	39	34	34	34	34	33.8	24	
9	38	38	33	33	32	29	29	28	28	28	28	28	28	28	25	26	26	26	26	24	24	24	24	26.0	24	
10	33	33	31	31	32	29	29	28	28	28	28	28	28	28	25	26	26	26	26	24	24	24	24	26.0	24	
11	27	27	29	29	26	26	26	26	26	26	26	26	26	26	25	26	26	26	26	24	24	24	24	26.0	24	
12	29	29	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26.0	24	
13	29	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	26.0	24	
14	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	26.0	24	
15	25	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	26	26	24	24	24	24	26.0	24	
16	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	24	24	24	24	26.0	24	
17	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
18	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27	24	24	24	24	26.0	24	
19	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	28	28	28	26.0	24	
20	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	28	28	28	28	26.0	24	
21	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
22	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
23	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
24	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
25	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
26	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
27	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
28	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	
30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	26.0	24	

MONTHLY MEAN = 30.564

MONTHLY MEAN DAILY VARIATION FOR 30 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 30.564

(1-12) 0.17 0.37 0.97 0.37 0.24 -0.03 -0.36 -0.26 -0.96 -0.96 -0.46 0.34

(13-24) -0.20 0.04 0.50 -0.06 0.40 0.07 -0.20 -0.66 0.10 0.20

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

U.T.=(1) 0.21 -0.12 0.24 22.04 (2) 0.03 0.45 0.45 2.86 (3) -0.11 0.08 0.13 3.20 (4) 0.11 0.04 0.12 0.34
L.T.=(1) 0.00 0.24 0.24 6.04 (2) 0.37 -0.25 0.45 10.86 (3) -0.11 0.08 0.13 3.20 (4) -0.09 0.08 0.12 2.34

DEC 1990

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	SE	
1	48	45	46	46	45	46	46	46	46	48	47	47	51	44	46	47	46	47	47	46	44	43	47	44	46.2	24	
2	45	49	45	47	44	41	42	42	43	43	40	43	43	45	43	45	44	45	43	41	41	42	42	42	43.3	24	
3	43	41	41	42	40	42	43	42	41	39	40	42	41	46	39	39	42	42	43	41	39	40	38	41	41.1	24	
4	43	42	40	43	40	38	39	37	34	37	36	37	35	37	36	39	39	37	35	38	38	37	36	35	37.8	24	
5	34	34	37	33	31	34	33	34	31	32	35	33	30	32	34	31	32	33	33	31	30	29	30	31	32.4	24	
6	29	31	30	31	31	31	32	33	30	30	29	29	29	29	27	30	29	31	31	31	29	31	28	33	30.2	24	
7	32	33	29	36	33	34	33	32	32	36	33	31	32	32	30	30	30	33	31	33	31	33	29	34	32.1	24	
8	30	32	31	33	32	36	30	30	33	33	30	34	35	31	30	29	29	28	29	28	29	25	27	28	30.5	24	
9	31	30	31	34	34	35	28	29	29	34	32	33	29	28	31	31	33	33	32	29	33	32	34	36	31.7	24	
10	42	42	42	41	43	43	43	44	45	46	46	48	45	47	44	43	44	44	43	42	44	45	46	44	44.0	24	
11	46	46	44	46	43	43	42	41	41	41	43	41	40	42	40	41	40	40	38	39	39	36	36	34	41.0	24	
12	37	36	37	40	38	38	37	36	37	37	39	36	37	40	37	35	36	34	32	38	34	36	34	36	34	36.5	24
13	37	39	38	39	40	40	40	41	39	40	41	41	42	39	40	40	42	42	43	43	44	43	45	40.8	24		
14	47	47	44	46	45	42	44	42	44	46	43	42	43	42	43	45	44	46	44	43	41	42	42	41	43.7	24	
15	42	42	45	42	40	41	39	38	37	40	40	43	42	44	45	42	41	45	41	42	42	42	41	41	41.6	24	
16	43	43	45	45	46	44	43	45	43	43	43	44	43	42	43	42	41	45	44	45	42	44	42	44	43.5	24	
17	43	44	43	45	43	42	40	38	38	37	38	42	40	40	36	36	39	41	43	41	42	38	38	40	40.3	24	
18	40	40	40	43	40	39	39	37	36	37	36	36	36	38	37	39	40	37	41	36	35	35	35	35	37.9	24	
19	33	36	37	39	35	36	38	33	36	36	36	38	38	37	38	34	36	36	33	32	32	33	33	34	35.5	24	
20	32	36	36	39	39	38	39	37	36	36	36	37	37	36	34	36	33	38	38	38	37	37	41	43	37.1	24	
21	41	40	42	39	44	37	39	41	43	40	39	41	39	42	38	39	41	40	40	43	39	40	38	39	40.2	24	
22	38	42	42	42	41	41	43	44	43	42	41	39	37	35	36	39	35	35	37	40	39	36	39	39	39.4	24	
23	39	39	40	39	39	38	37	38	37	38	39	38	36	37	37	37	37	37	37	36	35	38	39	38	37.7	24	
24	39	42	41	39	40	38	38	36	35	34	35	35	36	37	36	38	40	41	47	42	44	42	44	45	39.3	24	
25	50	49	50	47	49	49	51	46	45	45	45	46	47	45	45	44	46	47	44	44	44	44	46	44	46.3	24	
26	44	46	45	45	46	45	45	44	44	44	45	45	46	45	46	44	43	44	44	44	43	42	39	42	44.2	24	
27	46	44	44	45	45	46	45	44	44	41	43	43	44	42	44	43	43	44	44	44	43	40	41	42	43.6	24	
28	44	43	44	44	45	42	44	43	44	43	46	42	43	42	43	43	42	42	42	42	40	41	42	43	42.9	24	
29	43	44	45	44	46	43	45	42	41	44	42	40	43	43	40	42	41	39	41	39	37	38	40	39	41.7	24	
30	40	43	41	39	40	40	40	41	43	41	37	38	36	36	38	35	36	36	35	35	34	33	36	36	37.9	24	
31	36	35	35	33	38	33	36	37	35	36	38	40	38	40	40	40	38	41	42	42	42	40	42	41	38.1	24	
MONTHLY MEAN= 39.313																											

MONTHLY MEAN DAILY VARIATION FOR 31 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 39.313

[illegible]

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

	U.T.=(1	0.20	0.66	0.69	4.88)	(2	-0.08	0.55	0.55	3.29)	(3	-0.19	0.40	0.44	2.55)	(4	0.22	0.05	0.23	0.21)
U.T.=(1	-0.68	-0.16	0.69	12.88)	(2	0.52	-0.20	0.55	11.29)	(3	-0.19	0.40	0.44	2.55)	(4	-0.15	0.17	0.23	2.21)	

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

NOV 1990

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	59	57	56	61	62	68	60	68	51	56	57	47	59	45	59	55	62	64	57	78	63	60	61	55	59.2	24
2	51	61	71	72	76	61	57	75	70	56	57	80	61	82	68	64	55	61	75	73	62	66	70	75	66.6	24
3	59	68	74	62	69	68	58	61	75	69	73	81	72	78	86	76	63	73	64	73	65	67	68	66	69.5	24
4	61	56	64	59	63	75	82	81	81	74	76	79	71	77	83	83	84	79	75	68	65	68	68	65	72.4	24
5	64	71	73	74	63	70	82	74	80	76	85	96	77	66	72	73	69	77	62	58	55	74	60	68	71.6	24
6	75	71	67	71	80	84	70	71	66	78	80	85	81	67	62	75	60	69	64	59	74	56	71	64	70.8	24
7	65	61	59	78	71	72	66	75	59	66	78	81	74	57	79	72	66	55	65	59	57	57	64	56	66.3	24
8	57	61	55	52	59	74	78	71	69	56	75	64	72	73	68	70	60	59	50	50	57	45	45	53	61.4	24
9	57	58	76	67	69	71	75	67	68	72	74	66	65	60	66	71	57	64	64	84	69	62	74	73	67.9	24
10	83	62	79	76	87	70	94	78	77	89	92	86	81	67	69	56	68	76	70	79	67	85	93	74	77.4	24
11	75	79	80	80	87	97	86	79	92	77	70	78	77	76	69	80	67	69	65	70	72	75	91	90	78.4	24
12	86	78	67	83	80	85	72	67	75	80	79	70	67	58	61	59	81	62	77	79	84	86	81	86	75.1	24
13	67	91	89	76	85	69	73	64	70	63	72	71	75	58	64	71	55	73	79	64	86	88	84	78	73.5	24
14	88	83	81	74	80	73	80	81	78	85	70	69	58	72	71	80	79	86	70	85	67	93	73	84	77.5	24
15	75	73	88	69	78	88	82	81	76	78	94	79	63	67	78	68	51	75	68	67	76	63	68	70	74.0	24
16	80	62	58	83	75	76	88	81	78	71	83	76	82	75	77	78	79	67	72	77	72	70	73	81	75.6	24
17	75	74	80	80	77	88	85	90	77	78	72	75	70	66	74	60	83	60	68	64	61	65	78	75	74.0	24
18	79	82	87	70	79	85	87	87	80	73	87	73	72	62	66	74	75	71	86	75	70	71	81	76	77.0	24
19	77	76	85	73	90	87	72	68	67	64	73	60	78	69	58	65	56	55	53	72	59	60	60	58	68.1	24
20	83	82	79	74	82	87	89	66	74	60	70	53	68	65	76	51	52	52	54	63	54	59	58	68	67.5	24
21	59	78	85	82	84	92	89	78	79	78	74	61	72	71	71	70	93	64	76	82	78	79	74	83	77.2	24
22	78	76	72	91	82	94	100	78	96	78	90	76	74	77	71	66	68	74	66	68	63	75	67	73	77.2	24
23	72	82	84	81	79	87	77	73	81	65	79	71	78	73	67	66	82	79	73	69	82	80	73	77	76.3	24
24	80	69	76	94	93	85	88	82	77	76	66	64	71	84	80	74	68	79	81	87	84	88	68	66	78.3	24
25	81	92	91	76	76	82	74	68	61	58	75	66	84	85	79	71	76	82	76	89	85	75	85	69	77.3	24
26	74	77	88	90	86	85	89	78	77	61	80	76	79	87	89	94	95	85	81	72	83	73	84	69	81.3	24
27	78	88	84	90	85	101	89	86	86	84	89	79	89	82	81	70	69	81	87	84	74	80	87	90	83.9	24
28	85	71	94	107	106	102	100	88	83	93	79	76	80	75	81	67	80	79	89	88	71	83	77	86	85.0	24
29	79	82	72	79	83	97	95	88	87	98	107	92	100	89	80	86	72	73	86	76	94	104	96	83	87.4	24
30	88	91	84	99	91	97	92	107	90	97	91	94	110	94	107	96	79	82	88	103	101	99	98	110	95.3	24

MONTHLY MEAN= 74.767

MONTHLY MEAN DAILY VARIATION FOR 30 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 74.767

(1-12) -1.77 -1.03 1.83 2.67 4.47 7.57 6.20 2.27 1.23 -1.13 3.47 -0.63
(13-24) 0.57 -2.87 -1.03 -3.40 -4.63 -3.93 -3.40 -0.93 -3.10 -1.23 -0.43 -0.73

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

U.T.=(1 0.12 3.69 3.69 5.88) (2 -0.82 -0.13 0.83 6.30) (3 -0.99 -1.09 1.47 5.06) (4 0.58 -0.40 0.70 5.43)
L.T.=(1 -3.25 -1.74 3.69 13.88) (2 0.30 0.78 0.83 2.30) (3 -0.99 -1.09 1.47 5.06) (4 0.05 0.70 0.70 1.43)

COSMIC RAY MESON INTENSITY

VERTICAL COMPONENT

Real Counts: 128 Times (Tabulated Counts Plus 3000)

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	108	115	104	113	107	114	111	119	118	112	116	90	109	110	107	104	120	97	113	118	110	122	103	107	110.3
2	103	117	103	106	122	114	99	107	132	120	84	107	111	113	111	98	97	109	101	107	107	106	113	109	108.2
3	111	95	100	96	99	105	109	115	115	100	127	110	116	115	94	105	106	106	113	89	94	90	94	107	104.6
4	110	111	111	100	125	103	120	106	106	107	90	123	113	95	110	111	96	103	117	115	106	115	101	100	108.1
5	89	87	77	92	93	101	90	106	101	111	94	112	102	89	98	97	100	102	108	92	120	111	100	96	98.7
6	83	94	97	101	86	101	94	100	100	88	92	86	95	81	78	81	79	80	83	90	87	84	79	86	88.5
7	68	77	87	91	84	83	89	91	87	88	85	88	86	92	83	74	88	82	79	67	71	71	81	88	80.8
8	79	92	83	81	88	84	91	88	81	94	79	80	86	87	83	85	83	62	74	72	64	65	66	57	78.5
9	75	83	83	98	84	76	77	74	63	56	63	65	65	84	68	68	64	67	66	55	60	56	69	57	69.9
10	65	68	61	46	65	67	69	50	53	62	40	80	74	78	68	59	58	61	64	64	75	77	66	62	63.8
11	63	64	74	73	80	64	90	83	79	76	84	77	87	80	67	68	77	73	67	65	61	65	57	67	72.5
12	69	65	68	83	75	82	85	77	92	78	81	79	81	72	85	84	79	80	77	68	69	77	79	83	77.8
13	93	85	77	87	94	97	90	86	88	73	84	73	85	81	81	77	74	64	76	81	83	79	77	74	81.8
14	69	90	93	90	75	88	85	70	65	70	79	80	73	69	79	70	87	82	64	83	86	80	63	67	76.5
15	89	85	80	96	87	86	80	77	83	74	82	83	80	88	79	84	91	95	68	85	97	84	75	82	83.8
16	76	73	88	81	85	79	80	79	76	78	83	76	86	72	84	77	82	83	81	82	77	76	81	85	80.0
17	96	88	68	80	93	79	88	97	88	91	86	70	65	92	71	69	71	86	98	82	95	84	87	67	83.0
18	88	92	93	100	100	93	91	98	107	94	95	78	76	100	80	75	86	82	93	95	92	72	67	85	88.8
19	78	76	79	93	85	91	81	85	85	90	74	80	77	86	94	73	85	81	76	83	93	61	77	76	80.0
20	69	82	78	93	86	88	98	95	104	94	95	76	79	84	69	89	77	75	87	81	90	87	93	87	85.7
21	100	93	95	115	96	114	107																		
22	88	86	81	79	84	107	92	92	99	96	104	92	73	87	80	79	80	78	85	79	91	90	89	87	87.2
23	83	90	100	93	85	75	66	89	83	84	80	92	86	85	83	68	74	76	86	74	97	101	108	106	85.4
24	100	114	121	110	103	100	106	109	99	80	93	90	86	88	73	79	86	105	104	98	102	101	113	105	98.5
25	110	105	113	113	100	109	111	112	113	105	110	100	89	78	82	89	92	96	98	85	97	98	94	112	100.5
26	103	95	96	95	102	123	112	123	91	99	103	87	94	90	94	97	84	89	105	100	91	89	99	100	98.4
27	83	89	105	102	108	96	108	110	103	101	100	100	97	90	96	96	107	84	106	94	105	105	102	84	98.8
28	97	102	98	116	119	113	122	108	120	127	118	113	98	101	97	94	99	82	100	94	105	105	111	107	105.8
29	107	117	103	124	127	110	128	112	114	106	118	118	105	99	111	111	109	102	113	106	105	131	116	125	113.2
30	125	122	116	117	113	124	107	115	113	118	91	112	94	88	82	96	73	88	102	96	82	102	91	87	102.3
31	88	77	92	80	92	77	90	101	93	79	86	85	92	84	94	101	93	96	91	91	93	103	97	99	90.6
MONTHLY MEAN= 90.098																									

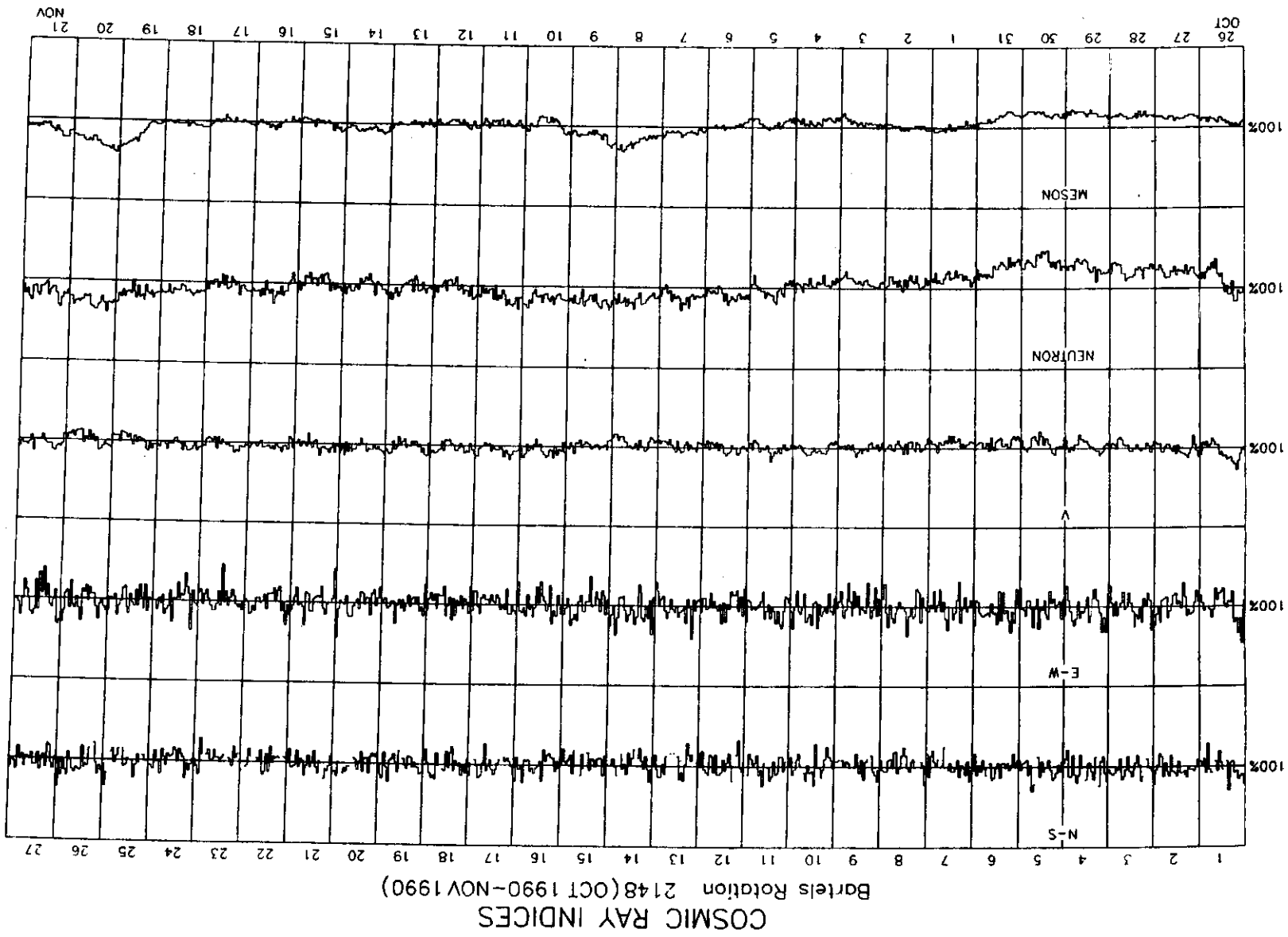
MONTHLY MEAN DAILY VARIATION FOR 30 COMPLETE DAYS DEVIATIONS FROM AVERAGE: 90.190

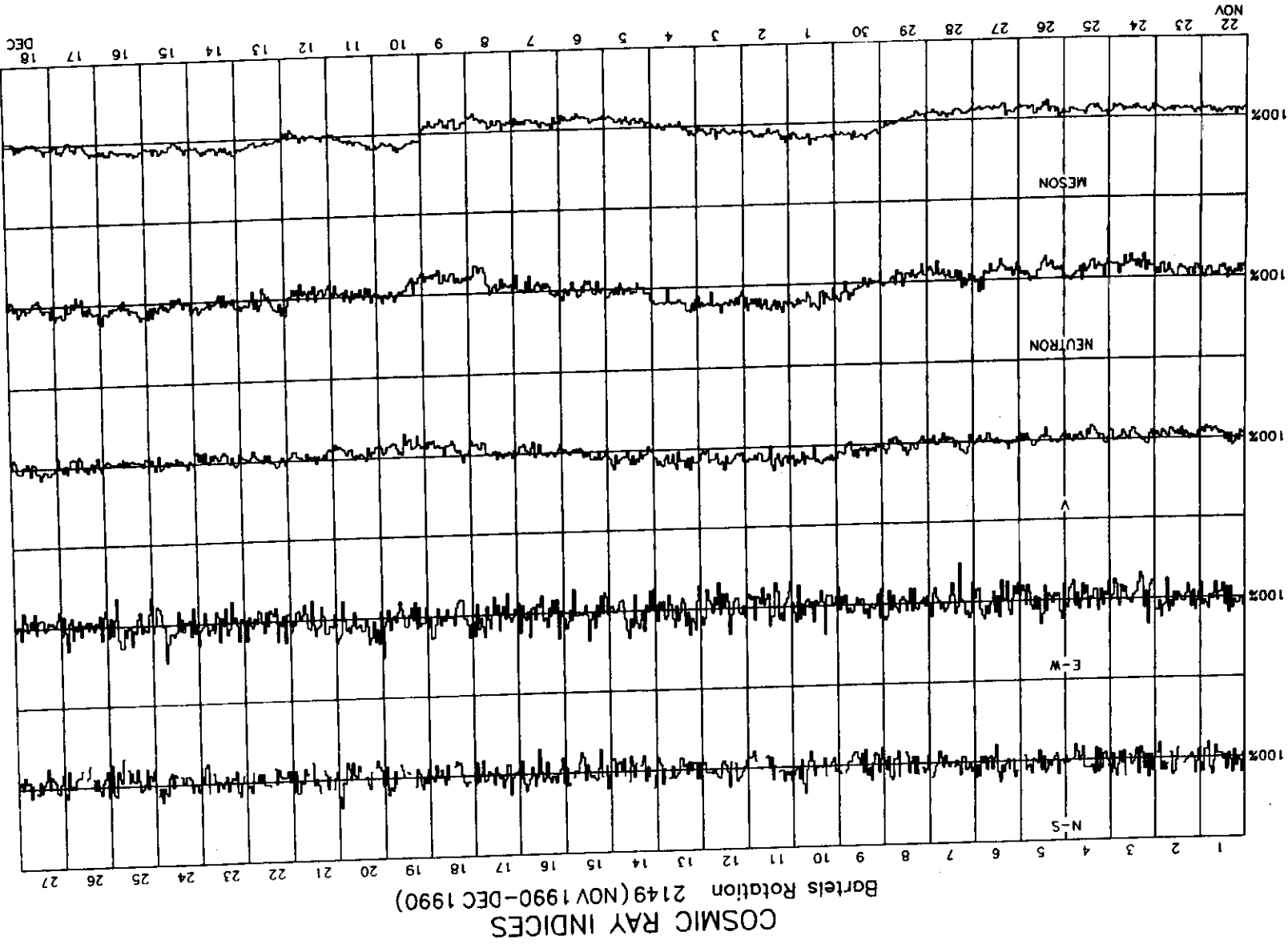
NORTHELY MEAN DAILY VARIATION FOR 30 COMPLETE DAYS DEVIATIONS FROM ANNUAL MEAN

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

[illegible]

L.T.=(1 -4.11 -1.72 4.46 13.52) (2 0.04 1.50 1.50 2.95) (3 -0.46 -0.07 0.47 4.19) (4 -0.31 -0.22 0.38 3.09)





SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

NOVEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
01	LINT	0324	0336	0428	1-	- 1	- 4	- 3.1
02	YUNN	0807	0809	0829	2-	- 3.1		
03	YUNN	0802	0805	0830	2+	- 6.0		
04	LINT	0303	0308	0334	1-	- 0.2	- 1	- 0.8
04	LINT	0509	0519	0540	1-	- 0.7	- 2	- 2.0
04	YUNN	0733	0735	0810	1+	- 2.1		
05	LINT	0033	0040	0057U	2+	- 5.1	- 4	- 2.9
05	YUNN	0700	0707	0722	1	- 1.3		
06	YUNN	0208	0210	0245	1	- 1.9		
06	LINT	0159	0211	0230U	1-	- 0.3	- 1	- 0.8
08	YUNN	0347	0329	0349	1	- 2.0		
06	LINT	0434	0438	0500	1-	- 0.5	- 2	- 0.8
07	LINT	0311	0331	0400U	1-	- 0.7	- 2	0
07	LINT	0450	0500	0528	1-	- 0.4	- 4	+ 0.3
08	LINT	2356	0012	0110D	3+	- 8.5	-13	- 0.8,+ 4.9
08	LINT	0259	0330	0450	2-	- 3.2	-15	- 7
08	LINT	0400	0406	0420	1-	- 0.3	0	- 0.2
08	LINT	0548	0551	0610	1-	- 0.9	- 4	- 1.9
09	LINT	0153	0158	0215U	1-	- 0.5	- 1	0
09	LINT	0248	0256	0330	2-	- 3.3	-11	- 9.5
09	LINT	0337	0340	0400	1-	- 1	- 5	- 2.4
11	YUNN	0422	0431	0437	3	- 7.1		
11	LINT	0422	0437	0640	3+	- 8.2	-47	- 1.8,+ 7.2
11	YUNN	0551	0556	0606	1	- 1.2		
12	LINT	0009	0015	0028	2-	- 3.5	- 4	- 2.2,+ 0.7
12	LINT	0147	0156	0220U	1+	- 2.2	0	- 0.9
12	LINT	0540	0632	0750D	2	- 4.7	-23	- 0.8
13	LINT	0200	0208	0230U	1-	- 0.6	- 2	- 1.0
13	YUNN	0313	0316	0323	1+	- 2.2		
13	LINT	0311	0325	0412	1+	- 2.4	- 9	- 3.2
13	YUNN	0323	0327	0341	1+	- 2.3		
13	YUNN	0444	0446	0458	2-	- 4.0		
13	LINT	0444	0447	0600	2+	- 5.3	-25	- 1.9,+ 1.5
13	YUNN	0846	0847	0852	1+	- 2.4		
13	YUNN	0933	0936	0943	3+	-86.5		
14	LINT	0105	0116	0130D	1-	- 0.8	- 5	- 2
14	LINT	0130	0142	0210D	1-	- 0.5	- 4	+ 0.5
14	LINT	0400	0406	0430	1-	- 0.5	- 1	- 0.9
15	LINT	0253	0256	0320	1-	- 0.9	- 4	- 1.8
15	YUNN	0526	0530	0555	1+	- 2.2		

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

NOVEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
15	LINT	0525	0531	0610	1+	- 2.4	-13	0
15	LINT	0806	0829	0915	1+	- 2.2	0	- 2.3,+ 0.7
16	LINT	0025	0032	0103	2-	- 3.1	- 3	- 3.8
16	YUNN	0205	0209	0210	2-	- 3.4		
16	LINT	0203	0226	0340	3	- 7.3	-20	-10.2,+ 3.7
16	LINT	0357	0400	0420	1-	- 0.7	- 2	- 1.4
17	YUNN	0218	0227	0247	2-	- 3.4		
17	LINT	0214	0239	0350	2	- 4.5	-18	-11
17	LINT	0411	0415	0450	1	- 1.3	- 4	- 3.8
17	LINT	0458	0504	0520	1-	- 0.5	- 2	- 1.2
17	LINT	0541	0547	0640D	2	- 4.3	-17	- 2.9,+ 1.9
17	YUNN	0543	0548	0558	2-	- 3.7		
18	LINT	0010	0022	0120	3+	-13.5	0	+11.3
18	YUNN	0110	0117	0134	2	- 4.7		
18	LINT	0129	0133	0150	1-	- 0.5	- 4	- 0.2
18	LINT	0200	0205	0222	1-	- 0.3	- 2	- 0.4
18	LINT	0530	0538	0558	1-	- 0.5	- 4	- 1.5
18	LINT	0601	0605	0620	1-	- 0.5	- 2	- 1.3
18	YUNN	0915	0920	1001	3+	-15.1		
19	YUNN	0114	0118	0128	2-	- 3.5		
19	LINT	0203	0206	0214D	1-	- 0.4	- 1	0
19	YUNN	0217	0219	0251	1	- 1.5		
19	LINT	0216	0219	0245	1	- 1.5	- 7	- 1.7
19	YUNN	0340	0342	0402	1-	- 1.0		
19	LINT	0338	0343	0410	1-	- 0.9	- 5	- 1.8
19	LINT	0453	0455	0510	1-	- 0.3	0	- 0.6
19	YUNN	0547	0549	0559	1-	- 1.0		
19	YUNN	0623	0625	0647	1	- 2.0		
19	LINT	0622	0626	0645	1+	- 2.2	- 7	- 1.7
19	YUNN	0647	0649	0706	1-	- 1.0		
19	YUNN	0942	0947	0957	2+	- 5.6		
20	LINT	0032	0037	0110D	2+	- 5.6		- 4.1,+ 4.8
20	YUNN	0050	0052	0112	2-	- 3.4		
20	LINT	0049	0059	0140U	2-	- 3.1		+ 7
20	LINT	0202	0207	0228U	1-	- 0.5	- 2	0
20	LINT	0242	0246	0256	1-	- 0.2	- 1	0
20	LINT	0453	0506	0550	1	- 1.4	- 9	- 1.2
20	YUNN	0504	0512	0527	1	- 1.7		
20	YUNN	0941	0944	1024	3+	-13.7		
21	YUNN	0157	0201	0211	1	- 1.4		
21	LINT	0243	0249	0253D	1	- 1.2	- 6	- 3.3

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

NOVEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	LF	SPV	VLF	SFA	LF
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21	YUNN	0244	0253	0333	1+	- 2.3				
21	LINT	0253	0300	0350	1	- 1.2	- 6		- 4.1	
21	YUNN	0500	0503	0531	1+	- 2.3				
21	LINT	0500	0505	0522D	2-	- 3.4	-12		- 9.8	
21	YUNN	0531	0534	0551	1	- 1.9				
21	LINT	0528	0536	0620	2-	- 3.7	-16	- 3.7, + 2.2		
21	LINT	0631	0636	0710	1+	- 2.8	-11		- 6.3	
21	YUNN	0849	0853	0913	2-	- 3.9				
22	LINT	0145	0149	0228	1	- 1.6	- 7		- 3.2	
22	YUNN	0149	0155	0230	2-	- 3.5				
22	LINT	0405	0408	0424	1-	- 0.1	- 2		- 1.1	
23	LINT	0011	0025	0100D	1+	- 2.2			+ 3.8	
23	LINT	0437	0443	0450D	1	- 1.4			- 2.9	
23	LINT	0502	0505	0540	1+	- 2.2			- 2.9	
24	LINT	0154	0200	0210D	1-	- 0.3	- 4		+ 0.7	
24	YUNN	0227	0238	0300	2+	- 5.2				
24	LINT	0221	0249	0410	2+	- 5.4	-26		- 5	
25	LINT	0201	0209	0226	1-	- 0.7	- 5		- 1	
25	YUNN	0318	0321	0336	2	- 5.0	-30	- 9.7, + 1.5		
25	LINT	0319	0327	0500	3	- 7.3				
25	LINT	0616	0620	0640	1-	- 0.4	- 2		- 0.8	
25	YUNN	0813	0818	0833	2-	- 3.1	-13		- 6.8	
25	LINT	0814	0819	0906	2+	- 5.1	-13			
26	LINT	0120	0130	0220	2+	- 5.9	-13		- 4.4	
26	YUNN	0122	0131	0152	3+	- 8.3				
26	YUNN	0543	0544	0551	1-	- 0.8				
26	LINT	0635	0652	0730U	1+	- 2.5	-16	- 0.9		
27	LINT	0104	0108	0122	1-	- 0.9	- 4		0	
27	LINT	0249	0258	0314	1-	- 0.6	- 2	- 0.8, + 0.3		
27	YUNN	0329	0332	0347	1-	- 0.5			- 0.7	
27	LINT	0328	0341	0418	1-	- 0.5	- 4			
27	LINT	0440	0447	0500U	1-	- 0.6	- 2		- 0.8	
27	YUNN	0503	0512	0602	2+	- 5.9				
27	LINT	0501	0515	0630	3	- 7.2	-34	- 6.6, + 1.4		
28	LINT	0127	0159	0330	2	- 4.2	-19			
28	LINT	0415	0436	0518	1	- 1.4	- 8		- 3.8	
28	YUNN	0625	0635	0701	2-	- 3.3	-24		- 2.4	
28	LINT	0622	0644	0720D	3-	- 6.4				
29	LINT	0148	0153	0206D	1+	- 2.8	- 2		- 1.7	
29	LINT	0207	0230	0330	1+	- 3.0	-16		- 1.5	

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

NOVEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
29	LINT	0740	0810	0900	2	- 4.3	0	- 7.3
29	YUNN	1017	1020	1045	2+	- 5.2		
30	LINT	0400	0412	0444	1-	- 0.6	- 4	- 0.8
30	YUNN	0550	0555	0620	2-	- 3.7		
30	LINT	0549	0555	0630	1+	- 2.3	-11	- 3.3

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

DECEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
01	LINT	0044	0110	0258	3+	- 8.7	-16	- 5.3,+ 8.7
01	YUNN	0159	0202	0217	2-	- 3.6		
01	LINT	0550	0608	0700	1	- 1.5		- 1.5,+ 1.0
03	LINT	0331	0336	0352	1-	- 0.2	- 4	- 0.4
04	YUNN	0028	0031	0038	2	- 4.4		
04	YUNN	0038	0041	0056	2-	- 3.9		
04	YUNN	0155	0157	0207	1+	- 2.6		
04	LINT	0159	0207	0400	3+	- 9.7	-44	- 5.9,+ 8.7
04	LINT	0734	0739	0746U	1-	- 0.6	-10	+ 2.4
05	LINT	0537	0541	0558	1-	- 0.6		- 0.2
05	LINT	0723	0732	0802U	3	- 7.7	-33	- 0.6
06	YUNN	0036	0046	0051	2	- 4.6		
06	LINT	0253	0305	0320	1-	- 0.5	- 5	- 0.7
06	LINT	0630	0639	0720	1	- 2.0	- 7	- 1.7
07	YUNN	0054	0055	0111	1	- 1.8		
07	LINT	0429	0435	0501	1-	- 0.6	- 5	- 1.9
07	LINT	0729	0734	0736	1-	- 0.7	- 6	- 4.6
07	YUNN	0733	0735	0805	1-	- 0.9		
08	LINT	0644	0650	0700U	1+	- 3.0	-16	0
09	LINT	0122	0147	0230U	1-	- 0.5	- 6	+ 0.5
09	LINT	0313	0325	0350	1	- 1.3	- 6	- 2.8
09	YUNN	0341	0344	0354	2-	- 3.7		
09	LINT	0354	0400	0437	1-	- 0.6	- 3	- 1.1
09	LINT	0504	0513	0540	1-	- 0.3		- 1.2
09	YUNN	0539	0541	0546	2	- 4.1		
09	LINT	0620	0629	0650	1-	- 0.6	- 3	0
09	YUNN	0807	0809	0821	2-	- 4.0		
09	LINT	0817	0825	0826	2-	- 3.3	-40	- 6 ,+14.8
09	YUNN	0821	0826	0848	3+	-14.7		
10	LINT	0020	0029	0040U	1-	- 0.9	- 3	- 1
10	LINT	0050	0058	0108U	1-	- 0.7	- 7	+ 0.7
10	LINT	0122	0134	0136U	1-	- 0.6	- 8	- 0.3,+ 0.5
10	LINT	0200	0212	0222	1-	- 0.6	- 5	0
10	LINT	0420	0425	0452U			- 5	
10	YUNN	0421	0426	0431	1	- 1.3		
10	LINT	0657	0702	0716	1-	- 0.9	- 4	0
10	LINT	0727	0734	0744D	1	- 1.2	- 6	
10	LINT	0744	0759	0820U	3+	-10.6	-40	0
11	LINT	0156	0200	0230	1-	- 0.7	- 4	- 2.6
11	LINT	0258	0308	0309D	1	- 1.4	- 9	0

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

DECEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
11	LINT	0310	0315	0350	1-	- 0.3	- 7	- 0.8
11	YUNN	0302	0313	0343	1+	- 2.7		
11	YUNN	0503	0508	0538	2-	- 3.4		
11	LINT	0501	0511	0610	2-	- 3.6	-26	-10.1
11	LINT	0620	0626	0634	1-	- 0.3	- 2	- 0.6
11	LINT	0709	0713	0727	1-	- 0.8	- 5	- 1.0
12	LINT	0159	0211	0240	1-	- 0.8	- 4	- 1.7
12	LINT	0254	0304	0318D	1-	- 0.8	- 5	- 2.3
12	YUNN	0318	0319	0325	1	- 1.3		
12	YUNN	0325	0329	0337	2	- 4.7		
12	YUNN	0337	0343	0457	1	- 1.8		
12	LINT	0318	0350	0540U	3+	- 8.3		- 3.5,+10.1
12	YUNN	0457	0458	0508	1	- 1.5		
12	YUNN	0531	0532	0547	1	- 1.5		
12	YUNN	0629	0634	0702	1+	- 2.2		
12	YUNN	0702	0706	0750	1+	- 2.8		
12	LINT	0700	0710	0750D	2	- 4.2	-25	+ 3.3
12	YUNN	0750	0800	0815	2-	- 3.2		
12	LINT	0754	0804	0850U	2-	- 3.1	-36	- 6.0,+12.9
13	LINT	0112	0134	0300	2+	- 5.8	-21	+ 6.4
13	YUNN	0412	0416	0436	1+	- 2.8		
13	LINT	0411	0418	0440U	1	- 1.2	-12	- 5.7
14	LINT	0143	0152	0200D	1-	- 0.6	- 3	+ 1.5
14	LINT	0200	0208	0232	1-	- 0.9	- 6	- 1.7
14	LINT	0316	0325	0344U	1-	- 0.7	- 3	- 1.9
15	LINT	0050	0116	0135U	3	- 7.1	-17	
15	YUNN	0204	0209	0234	2-	- 3.7		
15	LINT	0202	0220	0346	2-	- 3.6	-15	- 0.6,+ 3
15	LINT	0352	0356	0411	1-	- 0.3	- 2	0
15	LINT	0414	0419	0446	1-	- 0.3	- 2	0
15	YUNN	0541	0545	0600	2	- 4.1		
15	LINT	0541	0546	0724	2+	- 5.2	-35	- 3.8,+ 4.4
16	LINT	0208	0219	0300U	1+	- 2.3	- 7	- 0.9,+ 0.5
16	YUNN	0445	0446	0451	1	- 1.8		
16	LINT	0444	0449	0530D	1+	- 2.5	-12	- 2.4,+ 0.5
16	LINT	0532	0544	0557	1-	- 0.5	- 5	+ 1.4
17	LINT	0317	0325	0331D	1	- 1.5	- 6	- 3.7
17	YUNN	0320	0325	0329	1+	- 2.1		
17	YUNN	0337	0340	0350	1	- 1.9		
17	LINT	0335	0347	0451	1+	- 3.0	-18	- 2.1,+ 2.5

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

DECEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
17	YUNN	0637	0639	0649	2-	- 3.4		
17	LINT	0637	0647	0730U	2	- 4.1	-25	0
18	LINT	0012	0026	0044U	1	- 1.7	- 4	+ 0.9
18	LINT	0150	0158	0220	1-		-29	
18	LINT	0254	0258	0320U	1-		-12	
18	YUNN	0508	0509	0515	1	- 1.5		
18	YUNN	0515	0519	0539	2-	- 3.4		
18	LINT	0513	0523	0556	2-	- 3.3	-15	- 5.1
19	LINT	0102	0200	0404D	3-	- 6.1	-32	-12.5,+ 4.1
19	YUNN	0404	0438	0511	2	- 4.9		
19	LINT	0405	0446	0610U	3	- 7.2	-26	- 5.8,+12.6
20	LINT	0056	0118	0130U	1	- 1.8	-21	
20	YUNN	0114	0118	0123	2-	- 3.9		
20	LINT	0353	0358	0404D	1-	- 0.5	- 5	- 0.9
20	LINT	0404	0410	0430	1-	- 0.4	- 2	- 1.1
20	YUNN	0507	0508	0513	1	- 1.7		
20	LINT	0507	0513	0540	1	- 1.7	- 8	- 5
20	YUNN	0708	0719	0724	3	- 7.9		
20	LINT	0706	0730	0746D	3+	-10.9	-51	-10.8,+ 5.7
21	YUNN	0151	0159	0219	3	- 7.4		
21	LINT	0158	0212	0300U	1+	- 2.7	- 9	- 3.8
21	YUNN	0323	0330	0340	2	- 4.5		
21	LINT	0319	0338	0500	3-	- 6.8	-35	-15.3,+12.7
22	LINT	0018	0030	0050U	1-	- 0.6	- 2	- 1.5
22	LINT	0150	0206	0259D	2	- 5.0	-11	- 7.4,+ 1.9
22	LINT	0316	0340	0510	2	- 5.0	-28	- 0.8,+ 3.4
22	YUNN	0633	0636	0646	2-	- 3.5		
22	LINT	0633	0640	0718	1+	- 2.6	-11	- 3.1
23	LINT	0037	0044	0100U	2	- 4.1	- 5	- 4.1
23	YUNN	0108	0125	0205	2	- 5.0		
23	LINT	0118	0129	0148	1-	- 0.8	- 5	- 0.8,+ 0.5
23	YUNN	0306	0308	0318	1	- 1.4		
24	LINT	0055	0110	0141U	2	- 4.9	-20	- 9.6
24	LINT	0255	0306	0330	1	- 1.2	- 7	- 4.6
24	LINT	0417	0420	0440	1-	- 0.4		- 1.7
24	LINT	0600	0615	0645	1+	- 2.9		- 7.2
24	LINT	0748	0753	0806	1-	- 0.6	- 4	- 1.5
25	LINT	0056	0106	0132	1	- 1.6		
25	LINT	0134	0139	0152	1-	- 0.6	- 4	0
25	LINT	0156	0210	0232	2-	- 3.4	- 9	-10.4

SUDDEN IONOSPHERIC DISTURBANCES (D REGION)

DECEMBER 1990

Day	Sta	Start (UT)	Max (UT)	End (UT)	Imp	SPA		SFA LF
						LF	VLF	
25	LINT	0240	0300	0328	1-	- 0.6	- 3	+ 3.5
26	LINT	0128	0140	0200U	1-	- 0.7		- 0.9
26	YUNW	0210	0222	0235	3	- 7.1		
26	LINT	0203	0232	0434	3	- 7.5	-33	- 1.4, + 4.7
26	YUNW	0706	0712	0727	1	- 1.9		
26	LINT	0707	0722	0810	1	- 1.1	- 9	- 0.7
27	LINT	0119	0128	0140	1-	- 0.5		- 1.9
27	YUNW	0143	0146	0151	1	- 1.9		
28	YUNW	0832	0835	0900	2+	- 5.5		
29	YUNW	0051	0052	0100	1+	- 2.3		
29	LINT	0818	0833	0910	2-	- 3.3		+ 2.4
30	YUNW	0900	0911	0927	3+	-11.8		
31	YUNW	0102	0103	0110	1+	- 2.4		
31	YUNW	0110	0118	0145	3	- 7.6		

GEOMAGNETIC ACTIVITY INDICES K AND A_K

NOVEMBER 1990

BGMO

Three-Hourly Indices K											Sum	A _K
Day	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24				
1	1	2	0	2	2	2	1	2	12	5		
2	1	2	1	1	1	3	2	1	12	6		
3	1	0	1	2	3	2	2	0	11	5		
4 Q	0	0	1	0	0	1	1	0	3	1		
5 Q	0	0	0	0	1	0	0	0	1	0		
6 Q	0	2	1	0	0	1	1	0	5	2		
7	1	0	2	3	4	3	2	0	15	9		
8	0	1	3	2	3	3	2	2	16	9		
9	2	2	3	2	3	4	4	1	21	14		
10	1	1	2	3	2	4	4	1	18	12		
11	1	3	3	2	4	2	2	1	18	11		
12	1	3	0	2	1	2	2	0	11	5		
13	1	1	2	0	0	1	0	0	5	2		
14 Q	0	0	0	1	0	0	0	0	1	0		
15	0	0	0	0	1	1	2	1	5	2		
16 D	4	4	4	5	5	3	3	2	30	27		
17 D	0	2	3	3	4	5	4	2	23	18		
18 D	3	2	0	3	5	4	3	1	21	16		
19	3	3	3	2	1	3	1	1	17	10		
20	2	3	3	1	2	1	2	0	14	7		
21	2	3	1	1	3	2	1	1	14	7		
22	0	1	0	0	1	1	2	0	5	2		
23	0	0	0	1	2	3	0	0	6	3		
24 Q	1	0	0	0	0	0	1	0	2	1		
25	1	0	0	1	2	1	1	1	7	3		
26	1	1	2	1	3	1	1	3	13	7		
27 D	3	3	3	4	5	6	7	3	34	44		
28 D	3	3	2	2	2	3	4	1	20	12		
29	0	2	1	0	0	1	1	0	5	2		
30	0	2	1	1	3	3	2	1	13	7		
									Sum	249		
									Mean	8.3		

GEOMAGNETIC ACTIVITY INDICES K AND A_K

DECEMBER 1990

BGMO

Three-Hourly Indices K												
Day	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	Sum	A _K		
1	0	0	0	0	1	2	0	1	4	2		
2	0	0	1	1	3	2	3	1	11	6		
3	1	0	0	0	1	4	3	3	12	8		
4 D	4	2	2	3	3	3	3	2	22	14		
5 D	1	1	3	3	3	4	2	1	18	11		
6	1	2	2	3	3	2	2	0	15	8		
7	2	1	1	0	0	0	0	0	4	2		
8	0	1	2	1	3	3	3	2	15	8		
9	3	2	0	2	4	2	1	1	15	9		
10 Q	0	0	0	1	0	0	1	0	2	1		
11 Q	0	0	0	0	0	1	1	0	2	1		
12	0	0	0	1	2	4	3	3	13	8		
13 D	3	3	4	3	1	2	1	2	19	12		
14	2	2	2	1	1	3	2	0	13	6		
15	0	1	1	1	1	2	2	0	8	3		
16	0	1	1	1	3	3	2	2	13	7		
17	2	3	2	1	2	3	3	0	16	9		
18	1	0	0	3	3	1	0	0	8	5		
19 Q	0	0	0	0	1	1	0	0	2	1		
20	0	1	0	3	2	3	3	0	12	7		
21	0	1	0	0	0	2	1	1	5	2		
22 Q	0	1	1	1	1	0	1	3	8	4		
23	1	1	4	3	2	2	1	3	17	10		
24 D	0	2	2	3	4	3	4	3	21	14		
25	1	1	1	3	3	3	3	0	15	9		
26 Q	0	0	1	1	0	1	0	1	4	2		
27	1	2	1	1	3	1	0	1	10	5		
28	1	2	0	1	1	1	1	0	7	3		
29	0	0	0	0	0	2	1	0	3	1		
30 D	3	4	4	3	3	3	4	2	26	19		
31	1	3	2	4	3	3	2	1	19	12		
									Sum	209		
									Mean	6.7		

MAGNETIC STORMS

SEPTEMBER-DECEMBER 1990

BGMO

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

SEPTEMBER 1990

11	05	35	11	24	SC	0.6	27	0	m	11	3	5	9.7	121	68
----	----	----	----	----	----	-----	----	---	---	----	---	---	-----	-----	----

OCTOBER 1990

09	10		10	21	GC				ms	10	3	6	10.2	196	40
----	----	--	----	----	----	--	--	--	----	----	---	---	------	-----	----

29	20	12	30	11	SC	0.6	12	1	m	30	1	5	7.7	113	14
----	----	----	----	----	----	-----	----	---	---	----	---	---	-----	-----	----

NOVEMBER 1990

15	22		16	23	GC				m	16	4	5	8.7	140	39
----	----	--	----	----	----	--	--	--	---	----	---	---	-----	-----	----

26	23	32	28	21	SC	1.6	25	3	ms	27	7	7	10.4	195	31
----	----	----	----	----	----	-----	----	---	----	----	---	---	------	-----	----

DECEMBER 1990

Not Available

第二十二太阳周太阳活动概貌与预报

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1. 第 22 太阳周前半周的活动特征

A. 总体性质 第 22 太阳周开始于 1986 年 9 月, 起始的黑子数月均平滑值的极小值为 12.3. 实际上, 在极小之前 8 个月, 在 1986 年 1 月 28 日观测到的高纬黑子群 (N33), 可能已经是属于新周的黑子了. 经过一个短的上升时段, 第 22 周黑子数的月均平滑值 (以下简称黑子数) 在 1989 年 7 月达到 158.1, 这是 1755 年以来的 22 个太阳周中, 排在第 3 位的高黑子数太阳周.

表 1 中列出了黑子数大于 140 的高值周的几个重要参量 (定义见正文), 比较这些参量可以看出: (1) 第 22 周的起始极小值 12.3 是 22 个极小值中最大的一个; (2) 第 22 周黑子数的上升速率仅次于第 19 周, 位居第二位; (3) 第 22 周的上升段是高值周中最短的; (4) 第 22 周黑子数的时间变化曲线有一个平的顶部, 类似于第 18 周.

表 2 中列出了最近三个太阳周 (第 20, 21 和 22 周) 产生的活动区、耀斑和太阳质子事件的情况. 由表 2 可知, 在时间上相对应的同长时段内, 第 22 周的活动区数居第 20 和 21 周之中, 耀斑数略少, 而 X 级的 X 射线爆发及质子事件却大大多于第 21 周, 是第 21 周的 1.7 倍.

B. 某些时段的高活动 第 22 周上升段的某些时期太阳活动水平非常高, 其中最高的时段是 1989 年 3 月, 高活动主要由活动区 AR5395 (SESC 编号) 产生. AR5395 过日面期间, 共观测到 11 个 X 级的 X 射线爆发, 48 个 M 级爆发. 其中 3 月 6 日的 X 射线爆发为 M15, 寿命超过 6.5 小时, 3 月 10 日的 X4.5 级爆发引起了 1932 年以来最大的地磁暴. 研究发现, 发生在太阳周极大期的 AR5395 的活动特性与发生在太阳周极小期的高活动区 AR4711 (1986 年 2 月) 的活动性质有很大差异.

2. 第 22 周未来活动展望

众所周知, 太阳活动情况的长期预报在很大程度上还处于研究阶段, 尚不能给出准确的结果. 但是实际工作的需要要求对未来的太阳活动做预测. 根据黑子数大于 100 的高太阳周的平均周长, 预测第 22 太阳周将结束于 1996-1997 年. 进一步利用表 2 给出的数据可以估计: 从 1989 年 11 月至第 22 周结束, 还可观测到约 200 个 X 级 X 射线耀斑、80 次太阳质子事件; 从 1990 年 1 月至第 22 周结束, 还可观测到大约 3000 个活动区和大约 40000 个耀斑.

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OUTLINE AND OUTLOOK OF THE SOLAR ACTIVITY IN SOLAR CYCLE 22

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1. Characteristics of the First Half of Cycle 22

A. General Property Solar Cycle 22 started with a smoothed monthly sunspot number of 12.3 at September 1986. Actually, the sunspot group observed on 28 January 1986, about eight months before the end of the cycle 21, at high latitude (N33) might be the first observed one which belonged to the new cycle. The smoothed monthly sunspot number (hereafter sunspot number) reached 159 in July 1989 after a short ascending phase, implying a third highest cycle. Of the recorded 20 cycles, cycles 19 and 21 are the first and second highest ones, respectively.

In Table 1 parameters for cycles with a maximum sunspot number greater than 140 are given. In the table, Cyc.No indicates the cycle number, St.Min the beginning minimum of sunspot number of cycles, SSN24 the sunspot number of the 24th month after the beginning minimum, V24 the average rate of sunspot number for the first 24 months of the cycle, PA the ascending length of cycles in months, Max SSN the maximum sunspot number of cycles, P0.9 the time length by which the sunspot number goes down to 90% of the peak sunspot number of the cycle, and PD the descending length of the cycle in months. Also in Table 1 the average parameters for cycles 8 to 21 are shown.

Table 1
Parameters of High Solar Cycles

Cyc. No.	St. Min	SSN24	V24 (Month) ⁻¹	PA (Months)	Max SSN	P0.9 (Months)	PD (Months)
8	7.3	69.4	2.6	40	146.9	5	76
11	5.2	88.9	3.5	41	140.5	8	100
18	7.7	67.5	2.5	39	151.8	13	83
19	3.4	120.7	4.9	47	201.3	8	79
21	12.2	91.7	3.3	42	164.5	11	81
Average	7.61	87.6	3.4	41.8	161	9	83.8
8-21	5.67	~ 59	~ 2.2	47	~ 110	16	~ 83
22	12.3	121.2	4.5	34?	159?	≥ 12	?

One can conclude from Table 1 that (1) the beginning minimum of 12.3 of Cycle 22 is the highest one of the recorded 22 minima, (2) the rate of the increase of sunspot number of Cycle 22 is the secondly highest one, less than Cycle 19 only, (3) the time length with which the sunspot number of Cycle 22 reached its first peak is the shortest in contrast with other high cycles, (4) like Cycle 18, Cycle 22 has a rather even top part.

In Table 2 solar activities including active regions, optical flares, X class bursts and proton events of Cycle 20, 21 and 22 are given. T40 indicates the total number of active regions and optical flares observed in the first 40 months of the cycle, and T38 indicates the total number of X class bursts and proton events observed in the first 38 months of the cycle in Table 2.

Table 2
Solar Activity in Cycles 20, 21 and 22*

Cycle No.	Active Region		Optical Flare		X Class Burst		Proton Event	
	Total Number	T40	Total Number	T40	Total Number	T38	Total Number	T38
20	4732	994	58452	17717				
21	4015	1325	53192	15775	172	42	60	18
22	?	1174	?	14051	?	70	?	38

Table 2 shows that comparing with Cycle 20 and Cycle 21, the number of active regions occurring in the ascending phase of Cycle 22 is the medium, the number of flares is less, but X class bursts and proton events are 0.7 times more.

B. High Activity in Some Periods Very high solar activities were observed in certain periods in the ascending phase of Cycle 22. The period with the highest activity was March 1989. From 6 to 19 March Active Region 5395 produced, at least, 11 X class and 48 M class bursts. Of these bursts the one on 6th March was classified as M15 and lasted more than 6 hours, and in particular the one on 10th March (X4.5/3B) lasted even more than 7.5 hours and caused largest geomagnetic storm recorded since 1932 and a series of geophysical phenomena^[1]. It was found that activities produced in AR 5395 were quite different from that produced in AR 4711 which appeared in the solar minimum between 21st and 22nd cycles^[2].

2. Outlook of Cycle 22

As one can see in the figure given by Brown^[3] that most of solar cycle's predictions for Cycle 21 and Cycle 22 could not give a result as good as expected. However, an estimate of solar activity in the coming half of Cycle 22 is needed. The average length of high solar cycles is about 10.75 years. We may expect that Cycle 22 would end in 1996-1997. Before an obvious decrease of the sunspot Cycle 22 might have a rather long and relatively plain top in its time profile.

In regard to activities in the second half of Cycle 22, we may use data given in Table 2 to make predictions as follows: There will be about 3000 active regions and 40000 flares to be observed in the period from Jan. 1990 to the end of Cycle 22, and 200 X class bursts and 70 proton events to be observed in the period from Nov. 1989 to the end of Cycle 22. It is known that major flares might have a delay peak in their occurrence rate^[4]. That means that we may expect a high activity of major flares within the near one or two years.

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1991 年 1 月 31 日的射电爆发

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我们在 1991 年 1 月 31 日在两个波段上 (2840 MHz, 2640 MHz) 观测到一个射电大爆发, 其记录资料见图 1 (在此只给出爆发的主部)。由图 1 可见 (见英文稿), 这两个波段的射电大爆发的形态都比较复杂, 峰中含峰, 谷里有谷, 在极大时间处均出现脉冲。而这两个波段的爆发形态也十分相似。在它们的时间记录曲线上看出, 2840 MHz 在 0116 UT 开始, 在 0204.3 UT 达到极大。而 2640 MHz 则在 0141 UT 开始, 在 0204.5 达到极大, 均在 0433 UT-0453 UT 左右结束。持续时间近 3 个小时。这两个波段的射电爆发均为 47 GB 型。2840 MHz 的峰值流量为 821 sfu, 相对流量为 202%。2640 MHz 的峰值流量 808 sfu, 相对流量为 189%。

图 1 还明显表明, 在 0152 UT-0234 UT 的时段里, 两个波段的爆发均有三群主峰互相一一对应。三群主峰持续时间约为 6-18 m。其中在 0152 UT-0158 UT 时段为第一群主峰, 在 0158 UT-0216 UT 为第二群主峰, 在 0222 UT-0234 UT 为第三群主峰, 而且每群主峰里又各自含有峰值流量不等的次峰。这两个波段大爆发的基本参量列于表 1 中。

表 1. 微波大爆发的基本参量

Table 1. The fundamental parameters of the microwave bursts at 2840 MHz and 2640 MHz

日期	台站	频率 (MHz)	开始时间 (UT)	极大时间 (UT)	持续时间 (UT)	极大增量 (sfu)	极大相对 增量(%)	类型 (S.G.D)
1991 年 1 月 31 日	北京 天文台	2840	0116	1004.3	180	821	202	47GB
		2640	0141	1004.5	160	808	189	47GB

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SOLAR RADIO BURSTS OBSERVED ON JANUARY 31, 1991

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Abstract

Two outstanding solar radio bursts were observed at 2840 MHz and 2640 MHz on January 31, 1991. In Figure 1 shown are only main parts of the time profiles of the bursts at 2840 MHz and 2640 MHz.

The solar radio bursts at the two wavelengths are both very complex and the shapes of them are very similar. The burst at 2840 MHz started at 0116 UT, peaked at 0204.3 UT and ended at 0433 UT. The corresponding burst at 2640 MHz started at 0141 UT, peaked at 0204.5 UT and ended at 0453 UT. They both had a very long duration of about three hours. It can be found in figure 1 that there is an impulsive phase at the major burst. Before each of the major bursts there is a precursive enhancement of flux density level, on which a type 47 GB burst is superimposed and after the major burst there is a post - burst enhancement. The types of the two bursts are both 47 GB.

Figure 1 also shows that there are all three groups of bursts respectively from 0152 UT to 0234 UT at 2840 MHz and 2640 MHz. The first group is from 0152 UT to 0158 UT, the second group is from 0158 UT to 0216 UT and the third group is from 0222 UT to 0234 UT. The duration of the three groups are about 6 - 18 minutes. The fundamental parameters of the bursts at 2840 MHz and at 2640 MHz on January 31, 1991 are listed in Table 1, respectively.

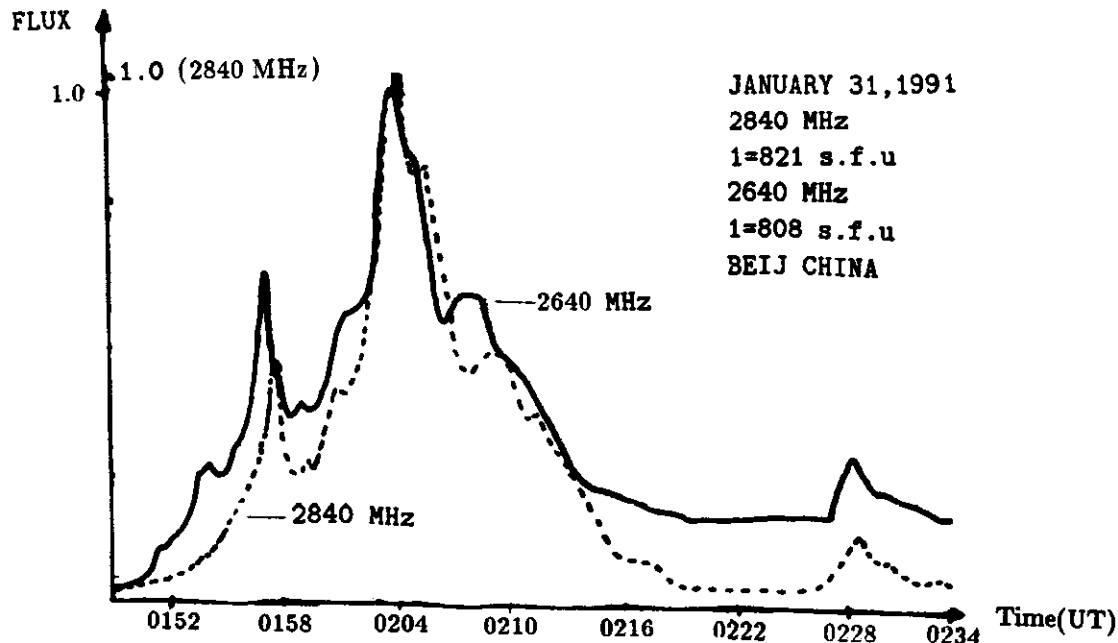


Fig.1. The profiles of the radio bursts observed at 2840 MHz
and 2640 MHz on January 31, 1991