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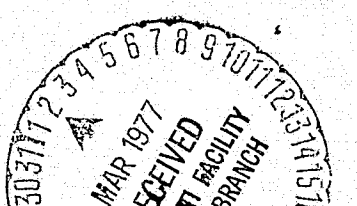
SKYLAB ATM/S-056 X-RAY EVENT ANALYZER OBSERVATIONS VERSUS SOLAR FLARE ACTIVITY: AN EVENT COMPILATION

By Robert M. Wilson

Space Sciences Laboratory



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16. ABSTRACT

An event compilation is presented which correlates ATM/S-056 X-ray event analyzer solar observations with solar flare activity. Approximately 1070 h of pulse-height analyzed X-ray proportional counter data were obtained with the X-ray event analyzer during Skylab. During its operation, 449 flares (including 343 flare peaks) were observed. Seventy events of peak X-ray emission ≥ C1 were simultaneously observed by ground-based telescopes, SOLRAD 9 and/or Vela, and the X-ray event analyzer. These events were observed from preflare through flare rise to peak and through flare decline. This work was performed, in part, as a contribution to the Skylab Solar Workshop Series B on Solar Flares.

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SKYLAB ATM/S-056 X-RAY EVENT ANALYZER OBSERVATIONS VERSUS SOLAR FLARE ACTIVITY: AN EVENT COMPILATION

INTRODUCTION

The flare phenomenon has long fascinated solar physicists. This fascination has continued from the early visual observations made by Carrington and Hodgson in 1859 and Young in 1872 [1,2] to contemporary observations using ground-based telescopes, balloons, sounding rockets, and spacecraft instrumentation.

Prior to the 1960's, observations of the Sun were conducted chiefly from the ground in visible, infrared, and radio wavelengths. Balloon research and the use of rockets provided additional "brief" glimpses of the Sun and extended solar observations into the realm of short wavelengths — ultraviolet (UV), extreme ultraviolet (EUV), and X-ray. The use of Earth satellites and other spacecraft to provide "long-term" studies of the Sun, especially in these short-wavelength regions, began in the 1960's and has continued, resulting in vast improvements in instrumentation with time. Such satellite programs included that of the Naval Research Laboratory Solar Radiation (SOLRAD) satellites and the more diverse NASA Orbiting Solar Observatories. More recently, solar physicists were afforded the opportunity to view the Sun from a highly stable platform in space — the Skylab space station [3] — which allowed detailed observations of the Sun in the visible, UV, EUV, and X-ray regions of the spectrum with high spatial and temporal resolution over an extended period (May 1973 to February 1974). These observations were made with the instrumentation contained in the Apollo Telescope Mount (ATM).

The Skylab data period is, perhaps, the most comprehensive observational period dedicated to solar research, certainly since the International Quiet Sun Years of 1964 and 1965 [4]. The Skylab period saw observatories from all over the world teaming together to perform specific programs of observational interest and to provide daily monitoring of solar activity, especially for the experiment operation teams who prepared the daily ATM instrument observing

programs. A summary of the Skylab Ground-Based Astronomy Program has been prepared by Duncan [5], and a catalog of observation times of ground-based Skylab-coordinated solar observing programs has been compiled by Coffey [6].

Since one of the major scientific objectives of the Skylab/ATM was the study of solar flares and since a series of workshops has been organized recently to investigate the nature of the solar flare phenomenon, in particular the role of flare build-up and the mechanism of energy release, it would be beneficial to have listings and/or compilations of flare activity during the Skylab data period. In fact, several authors already have provided such documents. For example, Donnelly et al. [7] have prepared an atlas of EUV flashes of solar flares based on sudden frequency deviations (SFD's); Hirman et al. [8] have compiled a listing of all reported solar flares, identifying the date, times, coordinates, and class of the event and the region where the event occurred in terms of NOAA, McMath, and Mt. Wilson numbers; and Speich et al. [9] have provided a listing of those flares observed by the ATM/S-056 X-ray telescope. The purpose of this report is to supply a listing of those flares observed by the ATM/S-056 X-ray event analyzer (X-REA). For a description of the X-REA, see Wilson [10].

FLARE OBSERVATION AND CLASSIFICATION

Several authors have provided educational critiques on solar flares and how they are observed and classified [2, 11-13]. Today, flares are classified optically by a dual importance system based on corrected flare area and relative intensity, as observed in H-α, and by their peak X-ray emission (1 to 8 Å) as measured by SOLRAD 9 or Vela [14]. These schemes have been described by Speich et al. [9] in a previous flare listing and will not be discussed here.

ATM/S-056 OBSERVATIONAL SUMMARY

Figure 1 shows three facets of the Skylab data period: (1) the total number of flares occurring in a day as a function of time, where blackened areas indicate those flares which occurred during the Skylab manned operational periods based on the Hirman et al. [8] listing; (2) the total number of images obtained per day as a function of time with the ATM/S-056 X-ray telescope; and (3) the total number of minutes of solar operation per day as a function of time of the ATM/S-056 X-REA. One observes that of the 1870 flares which occurred

between June 2, 1973 and February 3, 1974 (i.e., the inclusive period of all manned ATM operations), 147 flares occurred during the first manned Skylab mission or SL2, 491 during SL3, and 377 during SL4. Of the 147 flares during SL2, 36 were observed by the X-REA (28 flare peaks were observed); of the 491 flares during SL3, 308 were directly observed by the X-REA (242 flare peaks); and of the 377 flares during SL4, 105 were observed by the X-REA (73 flare peaks). Thus, 449 flares (343 flare peaks) were observed by the X-REA during Skylab.

One reason for the greater effectiveness of the X-REA to observe flares during SL3 was the change in philosophy of instrument operation, as compared to that of SL2 and SL4. During SL3 the X-REA was operated "continuously;" i.e., the counters were left on and the ATM/S-056 thermal shield door was allowed to cycle. Thus, the X-REA operated during all attended and unattended solar operational periods. In SL2 and SL4, the X-REA was allowed to operate only during attended solar operational periods.[1]

Table 1 lists those flares observed by the X-REA during SL2, SL3, and SL4 that were $\geq$ C1 and were observed preflare, flare rise, peak, and fall. Seventy flares are contained in the listing. It is to be noted that only those flares are included which fit the aforementioned criteria and which were simultaneously observed by ground-based instruments, SOLRAD 9 and/or Vela and the X-REA. A number of other flares will undoubtedly be added to the list once a SOLRAD 9 X-ray class equivalent is determined, based on the observed X-REA maximum count rate.[2]

X-REA OBSERVATIONS: TABULAR DATA

The X-REA solar observations during the Skylab data period are listed in Tables 2, 3, and 4. Table 2 identifies those X-REA solar observational periods in SL2, Table 3 shows those periods in SL3, and Table 4 tabularizes the observations of SL4. All tables are similar in structure, giving the date

1. Attended operation means that the astronaut was present at the ATM Control and Display Panel performing solar observations; unattended refers to those times when ground commands controlled the ATM instruments.

2. The X-REA counters are known to have degraded with time, complicating the analysis of the flares which occurred late in the mission. See Wilson [10] for additional comments. Also, Wilson has prepared a report ("The Analysis of the X-Ray Event Analyzer Proportional Counter Data: A Comment," A NASA Technical Memorandum scheduled for publication in 1977) which describes the degradation of the counters in more detail.

and day of year (DOY) of the observation, the individual observational data period in the DOY, the begin and end times of the observation, and details on any flares which might have occurred during the observation. These details were taken from Hirman et al. [8] and include H-α flare start, maximum, and end; the solar coordinates of the event; its optical and X-ray class; and the region number where the event occurred, by either its NOAA number, McMath number or both.

In addition to the 1070 h of X-REA solar observations, some time was given to the study of night-sky sources, in particular Comet Kohoutek in December 1973 and January 1974 and to Sco X-1 on September 20, 1973. The total amount of night-sky observation was only several hours, thus bringing the total X-REA observational time to approximately 1100 h. With the possible exception of the Sco X-1 observation, all other night-sky investigations showed no X-ray count rates above background.

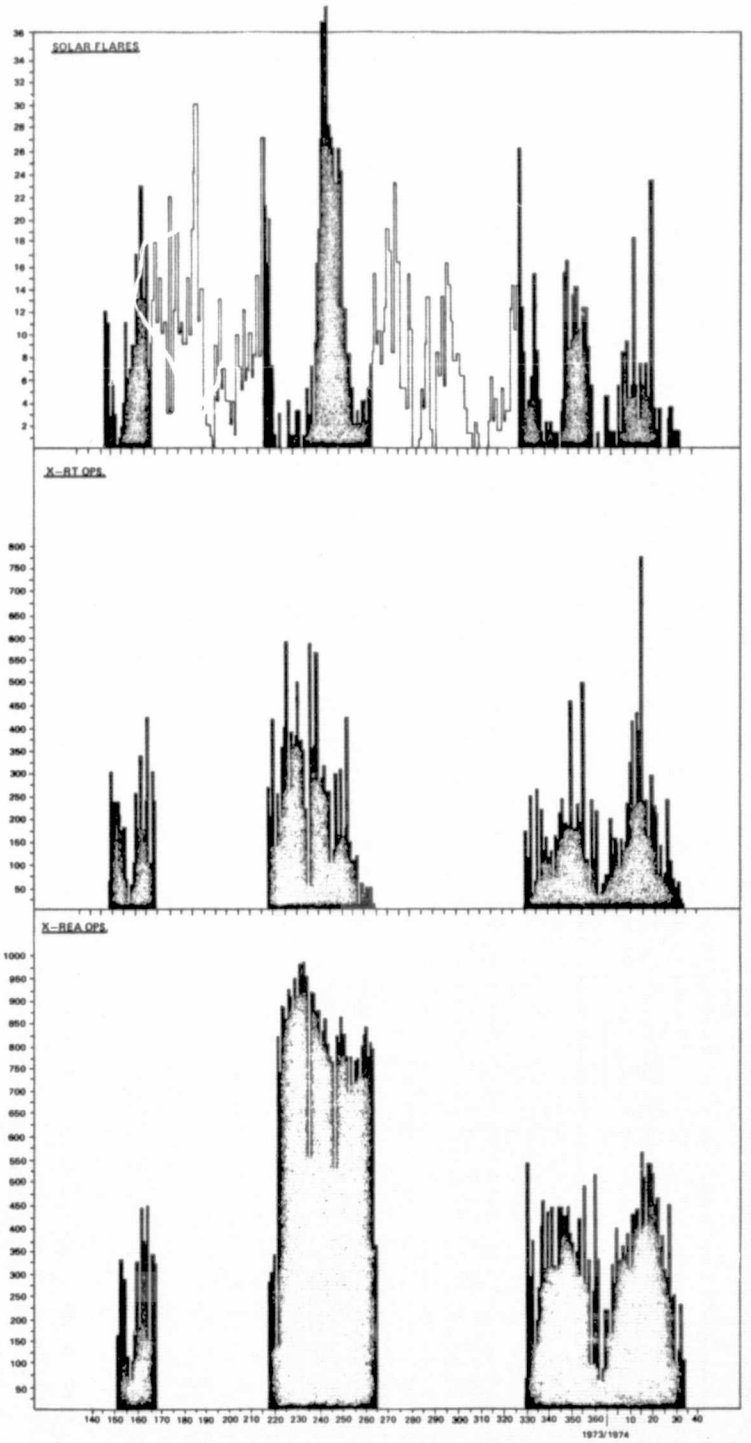

Figure 1. Skylab ATM/S-056 observational summary: number of solar flares versus DOY; number of photographic images obtained with the X-ray telescope versus DOY; and number of minutes of solar observation recorded with the X-REA versus DOY.

TABLE 1. MAJOR FLARES ≥C1 (PARTIAL LISTING)

Date	Begin	Maximum	End	Class	NOAA Region No.	ΔT X-REA Period
15 June	1405	1413	1455	1B/M3	131	1346-1444
15 June	2140	2145	A2155	-N/C1	127	2131-2229
16 June	1811	1815	1828	-F/C1	137	1743-1827
8 August	B2339	2340	A2354	-N/C3	185	2333-0027
9 August	1551	1553	1600	-N/M1	185	1506-1600
9 August	2140	2148	2148	-F/C2	185	2118-2213
31 August	1415	1419	1430	-F/C1	209	1406-1502
31 August	1929	1931	1940	-N/C3	212	1846-1941
31 August	B2202	2203	2205	-F/C1	213	2152-2247
1 September	1349	1350	1401	-F/C1	212	1324-1419
1 September	1825	1829	1841	-F/C2	209	1804-1859
1 September	B2122	2126	2130	-N/C4	215	2111-2206
1 September	2306	2311	2317	-F/C1	215	2244-2339
2 September	0042	0045	0050	-B/C4	215	0017-0112
2 September	B0157	0159	0203	-F/C2	209	0150-0245
2 September	0531	0540	A0553	-N/C2	215	0456-0551
2 September	B0712	0712	0718	-N/C2	215	0630-0724
2 September	0823	0831	0841	-N/C2	218	0803-0858
2 September	B1126	1129	1143	-N/C1	215	1110-1204
2 September	1620	1620	1630	-N/C2	—	1550-1644
2 September	1625	1629	1643	-F/C4	215	1550-1644
3 September	0300	0302	A0311	-N/C1	211	0242-0036
3 September	B1043	1044	1055	-N/C1	215	1028-1122
3 September	B2124	2124	2139	-F/C1	212	2121-2216
4 September	1123	1125	1130	-N/C3	219	1119-1213
4 September	B1602	1604	1618	-N/C1	209	1558-1653
4 September	1627	1635	1652	-N/C7	212	1558-1653
5 September	0920	0924	0944	-N/C4	209	0904-0958
5 September	1655	1701	1717	-F/C1	209	1650-1744
5 September	B1828	1832	A1834	-N/M1	212	1824-1917
5 September	B2327	2327	2330	-F/C2	212	2303-2357
6 September	0106	0115	0129	-F/C1	212	0036-0130
6 September	B1046	1047	1105	-N/C4	213	0955-1049
6 September	B1210	1215	1230	-N/C5	211	1129-1223
6 September	B1353	1353	1400	-N/C2	203	1302-1356
6 September	1616	1624	1646	-N/C3	209	1608-1702
6 September	1634	1639	1714	-F/C2	209	1608-1702

TABLE 1. (Concluded)

Date	Begin	Maximum	End	Class	NOAA Region No.	ΔT X-REA Period
6 September	1816	1832	1920	-B/C2	215	1742-1835
6 September	B1820	1821	A1821	-F/C2	209	1742-1835
7 September	0002	0007	0018	-F/C1	215	2354-0048
7 September	0210	0213	0350	-N/C2	209	0128-0221
7 September	1600	1605	1614	-F/C4	212	1526-1620
7 September	1916	1925	A1926	-N/C2	210	1833-1926
8 September	0237	0241	0250	-B/C2	209	0219-0312
8 September	0411	0413	0416	-N/C1	210	0352-0446
8 September	B1216	1219	1258	1N/C3	219	1138-1232
9 September	B0500	0510	0522	-N/C2	219	0443-0537
9 September	0818	0820	0833	-N/C1	219	0750-0843
9 September	B1843	1847	1907	-F/C1	209	1842-1848
9 September	B2204	2207	2210	-F/C1	224	2148-2243
10 September	B0131	0131	A0150	-F/C1	224	0055-0149
10 September	0223	0232	0251	-N/M1	224	0228-0322
10 September	1211	1214	1226	-N/C1	219	1147-1241
11 September	B0655	0703	0736	-N/M1	224	0626-0720
11 September	1553	1555	1559	-N/C1	219	1545-1639
12 September	B2341	—	2349	-N/C1	224	2249-2344
16 September	0435	0437	0444	-F/C1	226	0430-0526
27 November	0306	0313	0324	-B/M1	287	0253-0348
30 November	0227	0227	0235	-N/C1	287	0224-0320
2 December	1505	1518	1537	1N/M1	292	1500-1555
2 December	B2010	—	A2020	-N/C5	292	1940-2035
3 December	0204	0207	A0216	-B/C2	292	0154-0247
16 December	1954	1956	2023	-F/C2	300	1920-2015
17 December	0029	0032	0057	1B/M1	300	2359-0055
27 December	2011	2017	A2021	-N/C1	300	1935-2029
13 January	B1609	1630	A1634	-F/C1	320	1534-1633
15 January	B1422	1423	A1429	-N/C6	314	1415-1514
18 January	1903	1905	1908	-F/C1	323	1833-1933
22 January	1734	1746	A1758	-N/C3	331	1729-1747
22 January	B2117	2118	2125	-N/C2	331	2035-2134

TABLE 2. SL2 X-REA SOLAR OBSERVATIONS

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
2 June 1973 (153)	1	1501	1545								
	2	1636	1722								
	3	2126	2203								
	4	2248	2323	B2310	2310	A2315	N17W86	-N	C0	117	12364
3 June (154)	1	0021	0117								
	2	0154	0231								
	3	1459	1515								
	4	1553	1649								
	5	1728	1822								
	6	2035	2125								
	7	2206	2300								
4 June (155)	1	0114	0157								
	2	1516	1608								
	3	1819	1915								
	4	1952	2036								
	5	2125	2208								
5 June (156)	1	0032	0116								
	2	0206	0254								
	3	1430	1524								

TABLE 2. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	1604	1659								
	5	2051	2129								
	6	2222	2308								
6 June (157)	1	0124	0202	B0127	0129	0146	N13E43	-F		127	12375
	2	1401	1442								
	3	2002	2036								
7 June (158)	1	0041	0143								
8 June (159)	1	0142	0229								
	2	1532	1628								
9 June (160)	1	0051	0147	0027	0044	A0111	N20E57	-F	C0	131	12379
	2	1321	1358								
	3	1932	2004								
	4	2114	2159	2146	2150	A2155	N17E43	-F	C0	131	12379
10 June (161)	1	0012	0106								
	2	0143	0239								
	3	1543	1638								
	4	1715	1811								
	5	1848	1930	1853	1857	1905	N15E32	-F		131	12379

TABLE 2. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	6	2021	2059	2057	2101	2112	N15E31	-N	CO	131	12379
	7	2223	2241								
11 June (162)	1	0101	0157								
	2	1327	1352								
	3	1856	1903								
	4	1939	2037								
	5	2113	2144								
12 June (163)	1	0019	0116								
	2	0152	0231	0202	0202	0226	N13W43	-F	C0	127	12375
	3	1418	1515								
	4	1551	1648	1629	1632	1646	N17E07	-F	C0	131	12379
	5	1725	1824								
				1916	1918	A1931	N14W52	-F		127	12375
	6	1858	1955	B1948	1948	A1948	N11E63	-N		137	12387
	7	2031	2128								
	8	2204	2301	B2211	2212	2239	N11E60	-F	C0	137	12387
				B2224	2230	A2240	N14E61	-F	C0	137	12387
				B2227	2227	2233	N14W51	-N		127	12375
13 June (164)	1	0110	0154								
				1501	1505	1513	N12W65	-F	C0	127	12375
	2	1509	1607	1501	1506	1513	N13E53	-N	C0	137	12387

TABLE 2. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	3	1657	1741	1714	1721	1733	N14W67	-F	C0	127	12375
				1717	1720	1733	N15E53	-N	C0	137	12387
				1723	1726	1734	N17W05	-F	C0	131	12379
	4	1830	1914	1757	1806	1841	N12E50	-N	C4	137	12387
	5	1949	2047	1932	1936	A2013	N17W63	-F	C0	127	12375
	6	2122	2220								
	7	2256	2353								
14 June (165)	1	0029	0126	B0047		0058	N13W70	-F	C0	127	12375
	2	1307	1353								
	3	1734	1831								
	4	1907	2007	1916	1917	1923	N16W77	-F	C0	127	12375
	5	2041	2139	2028	2041	2113	N14W81	-F	C0	127	12375
				2043	2046	2116	N11W87	1N	C0	127	12375
				2049	2051	2056	N12E35	-F	C0	137	12387
	6	2214	2312	B2213	2216	2222	N16W78	-N	C0	127	12375
	7/1	2347									
15 June (166)	7/1		0024								
	2	1039	1137								
	3	1220	1311	1247	1247	1302	S12W13	-F		135	12382
	4	1346	1444	1405	1413	1455	N17W32	1B	M3	131	12379
	5	1559	1617								

TABLE 2. (Concluded)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	6	1652	1750								
	7	1825	1924								
	8	1958	2057								
				2140	2145	A2155	N18W90	-N	C1	127	12375
	9	2131	2229	2200	2205	2232	S15W15	-B	C0	135	12382
16 June (167)	1	1009	1056								
	2	1743	1827	1811	1815	1828	N14E13	-F	C1	137	12387
				2019	2024	2108	N13E11	-N	C0	141	12387
	3	2052	2150	2122	2128	2152	N13E11	-F		141	12387
17 June (168)	1	0915	1012								
	2	1048	1149	1126	1126	A1131	S18W31	-F		143	12382
	3	1222	1312								
	4	1528	1629								
	5	1701	1752	B1722	1722	1728	S10E88	-F	C0	147	12397
	6	2011	2107								
18 June (169)	1	1008	1106	1104	1107	1113	N13W12	-F	C0	137	12387
	2	1139	1235								
	3	1313	1412								
	4	1527	1546								
	5	1619	1719								
	6	2059	2159	2107	2110	2121	S05E88	-F		149	12398

TABLE 3. SL3 X-REA SOLAR OBSERVATIONS

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
7 August 1973 (219)	1	1355	1417								
	2	1456	1550								
	3	1629	1723	B1700	1701	A1702	N06W28	-F	C0	185	12474
				1719	1720	A1724	N04W27	-N		185	12474
	4	1803	1856	1814	1816	1823	N06W24	-N	C0	185	12474
				1837	1847	1853	N06W24	-N		185	12474
	5	1957	2030	B1958	2002	A2015	N07W24	-F	C0	185	12474
				2021	2023	2026	N06W24	-F	C0	185	12474
	6	2109	2200	B2136	2137	2143	S08E45	-F	C0	186	12476
8 August (220)	1	0015	0109	B0033	0034	A0039	N05W39	-F		185	12474
	2	0229	0241								
	3	1414	1508	1458	1501	A1505	S10W22	-F	C0	183	12472
	4	1724	1809	1706	1709	1724	N06W36	-N	C0	185	12474
	5	1854	1948	B1912	1914	1922	N08W38	-N	C0	185	12474
	6	2027	2121								
	7/1	2333		B2255	2300	A2340	S08W20	-F	C0	183	12472
				B2339	2340	A2354	N05W39	-N	C3	185	12474
9 August (221)	7/1		0027								
	2	0132	0201								
	3	0239	0241								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	1506	1600	1509	1537	1601	N14W81	-N		184	12471
				1551	1553	1600	N08W49	-N	M1	185	12474
	5	1638	1733	1718	1719	1725	N14W85	-N		184	12471
	6	1812	1906								
	7	1945	2040								
	8	2118	2213	2140	2148	A2153	N08W52	-F	C2	185	12474
10 August (222)	1	1327	1345								
	2	1429	1518								
	3	2210	2305								
	4/1	2343									
11 August (223)	4/1		0038								
	2	0116	0211								
	3	0249	0344								
	4	0422	0518								
	5	0555	0651	0636	0637	0640	N06W73	-N		185	12474
	6	0729	0824								
	7	0902	0957								
	8	1035	1130								
	9	1208	1304								
	10	1341	1437								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	11	1655	1743								
	12	1821	1917								
	13	1954	2050								
	14	2127	2223								
	15	2301	2357								
12 August (224)	1	0034	0130								
	2	0341	0436								
	3	0514	0610								
	4	0647	0743								
	5	0820	0916								
	6	0953	1049								
	7	1127	1222								
	8	1300	1356								
	9	1525	1528								
	10	1619	1702								
	11	1739	1835								
	12	1912	2009								
	13	2055	2142								
	14	2219	2315								
	15/1	2352									

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
13 August (225)	15/1		0049								
	2	0125	0221								
	3	0259	0355								
	4	0432	0528								
	5	0605	0701								
	6	0738	0834								
	7	0911	1008								
	8	1045	1141								
	9	1218	1315								
	10	1351	1448								
	11	1524	1621								
	12	1657	1754								
	13	1830	1844								
	14	1907	1928								
	15	2004	2101	1950	1953	2009	N13W90	-F	C0	185	12474
	16	2137	2234	2131	2146	2155	S09W90	1N	C1	183	12472
	17/1	2310									
14 August (226)	17/1		0007								
	2	0043	0141								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	3	0216	0314								
	4	0350	0447								
	5	0523	0621								
	6	0657	0754								
	7	0830	0927								
	8	1003	1100								
	9	1136	1233								
	10	1309	1407								
	11	1443	1540								
	12	1616	1713								
	13	1749	1846								
	14	1922	2019								
	15	2055	2152								
	16	2228	2326								
15 August (227)	1	0002	0100								
	2	0135	0233								
	3	0308	0407								
	4	0441	0539								
	5	0615	0713								
	6	0748	0846								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	7	0921	1019								
	8	1054	1153								
	9	1228	1325								
	10	1401	1459								
	11	1534	1632								
	12	1707	1805								
	13	1840	1939								
	14	2014	2112								
	15	2147	2246								
	16/1	2320									
16 August (228)	16/1		0019								
	2	0053	0151								
	3	0227	0326								
	4	0400	0458								
	5	0533	0632								
	6	0706	0805								
	7	0839	0938								
	8	1013	1112								
	9	1146	1244								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	10	1319	1419								
	11	1453	1535								
	12	1541	1551								
	13	1626	1725								
	14	1759	1858								
	15	1932	2030								
	16	2105	2203								
	17	2239	2338								
17 August (229)	1	0012	0111								
	2	0145	0244								
	3	0318	0418								
	4	0452	0551								
	5	0625	0725								
	6	0758	0857	0825	0845	0850	N15E85	-F		193	12488
	7	0931	1031	0950	0955	1005	N13W80	-F			12475
	8	1104	1203								
	9	1238	1336								
	10	1411	1510	1432	1443	A1513	N18W17	-F		192	12483
	11	1544	1643								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	12	1718	1816								
	13	1851	1951	B1936	1937	1948	N10E71	-F		193	12488
	14	2024	2123								
	15	2157	2158								
	16/1	2330									
18 August (230)	16/1		0032								
	2	0104	0204								
	3	0237	0338								
	4	0410	0511								
	5	0544	0644								
	6	0717	0817								
	7	0850	0951								
	8	1023	1124								
	9	1157	1256								
	10	1330	1432								
	11	1503	1603	1546	1548	1558	N16E68	-F		193	12488
	12	1636	1736								
	13	1810	1909								
	14	1943	2045								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	15	2116	2216								
	16	2249	2348								
19 August (231)	1	0023	0125								
	2	0231	0257								
	3	0329	0432								
	4	0503	0603								
	5	0636	0737								
	6	0809	0910	B0813	0814	A0815	N27E57	-F		193	12488
	7	0943	1044								
	8	1116	1215								
	9	1249	1348								
	10	1422	1522								
	11	1555	1655								
	12	1729	1828								
	13	1902	2002								
	14	2035	2135								
	15	2209	2309								
	16	2342									
20 August (232)	16/1		0041								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	2	0115	0215								
	3	0249	0350								
	4	0422	0524								
	5	0555	0657								
	6	0728	0830								
	7	0902	1004								
	8	1035	1135								
	9	1208	1313								
	10	1342	1442	1408	1411	1420	N12E27	-F		193	12488
	11	1515	1620								
	12	1649	1748								
	13	1822	1926	B1812	1817	1838	N19E38	-F	C0	193	12488
	14	1955	2055								
	15	2129	2229								
	16/1	2303									
21 August	16/1		0002								
(233)	2	0036	0135								
	3	0208	0307								
	4	0342	0445								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	5	0515	0617								
	6	0449	0751								
	7	0822	0924	0831	0839	0857	N13E30	-F		193	12488
	8	0955	1058								
	9	1128	1229								
	10	1302	1407	B1344	1407	1433	N12E90	1F			12497
	11	1435	1535								
	12	1609	1709								
	13	1742	1842								
	14	1916	2016								
	15	2049	2149								
	16	2222	2327	B2325	2327	2332	N14W58	-N	C0	196	12482
	17/1	2356									
22 August (234)	17/1		0056								
	2	0129	0229								
	3	0302	0405								
	4	0436	0538								
	5	0609	0712								
	6	0743	0845								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	7	0916	1018								
	8	1049	1152								
	9	1222	1325								
	10	1356	1357								
	11	1531	1630								
	12	1703	1807								
	13	1836	1935								
	14	2009	2114								
	15	2143	2243								
	16	2316									
23 August (235)	16/1		0016								
	2	0053	0154								
	3	0223	0325								
	4	0356	0457								
	5	0530	0633								
	6	0703	0805								
	7	0837	0938								
	8	1010	1112								
	9	1143	1247								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	10	1316	1416								
	11	1450	1549								
	12	1623	1722	B1656	1656	A1705	N16E90	-N			12501
	13	1757	1856								
	14	1930	2030								
	15	2104	2205								
	16	2237	2239								
24 August (236)	1	0010	0112								
	2	0144	0246								
	3	0317	0417								
	4	0450	0552								
	5	0624	0725	0710	0715	0735	N12W21	-F		193	12488
	6	0757	0859								
	7	0931	1031								
	8	1104	1205								
	9	1237	1304								
	10	2331									
25 August (237)	10/1		0029								
	2	0104	0206								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	3	0238	0338								
	4	0411	0511								
	5	0544	0645	B0557	0605	0617	N10W60	-F			12499
				0634	0643	0725	N13W27	-F		193	12488
	6	0718	0819		(See above)						
	7	0851	0952								
	8	1024	1125								
	9	1158	1259								
	10	1331	1429								
	11	1524	1603								
	12	1638	1736								
	13	1811	1909								
	14	1944	2043								
	15	2117	2216								
	16	2251	2349								
26 August (238)	1	0024	0122								
	2	0158	0258								
	3	0331	0430								
	4	0504	0604	B0525	0536	A0539	N12W59	-F			12499
	5	0638	0738								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	6	0811	0911								
	7	0945	1044								
	8	1118	1217								
	9	1251	1349								
	10	1424	1522	1445	1448	1459	N32E35	-F	C0		12500
	11	1558	1655								
	12	1731	1829	1730	1739	1800	N02E35	-F	C0	208	12503
	13	1904	2004								
	14	2037	2136								
	15	2211	2310								
	16/1	2344									
27 August (239)	16/1		0042								
	2	0117	0217								
	3	0251	0350								
	4	0405	0406								
	5	0424	0523								
	6	0557	0655								
	7	0731	0829								
	8	0904	1002	B0917	0928	0957	N04E20	-N	C0	208	12503

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	9	1038	1136	1040	1049	1111	N03E20	-F	C0	208	12503
	10	1210	1309	B1219	1219	A1239	N03E25	-F		208	12503
				B1219	1237	A1239	N02E24	-F		208	12503
	11	1344	1441								
	12	1650	1748	1658	1711	1727	N12W60	-N		193	12488
	13	1824	1922								
	14	1957	2055								
	15	2131	2228								
	16/1	2304									
28 August (240)	16/1		0001								
	2	0037	0135								
	3	0211	0308								
	4	0344	0441	0322	0328	0345	N03E16	-F		208	12503
	5	0517	0614								
	6	0650	0748								
	7	0824	0921								
	8	0957	1054								
	9	1130	1227	1123	1125	1140	N13W84	-F		193	12488
	10	1304	1401								
	11	1437	1534								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	12	1610	1707								
	13	1743	1842								
	14	1916	2013								
	15	2049	2147								
	16	2223	2320								
	17/1	2356									
29 August (241)	17/1		0053								
	2	0130	0226								
	3	0303	0400								
	4	0436	0533								
	5	0609	0706	B0540	0611	0703	N03W03	-F		208	12503
	6	0742	0839								
	7	0916	1012	0947	0950	0958	N13W85	-F	C0	193	12488
	8	1049	1146	1122	1125	1140	N13W84	-F	C0	193	12488
	9	1223	1238								
	10	1406	1430								
	11	1529	1626								
	12	1702	1759	1650	1652	1704	S14E75	-F	C0	209	12507
				1723	1728	1759	S14E74	-F		209	12507
	13	1835	1838	1835	1836	1842	S17E72	-F	C0	209	12507

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	14	1914	1932								
	15	2008	2105								
	16	2142	2238	B2230	A2230	2237	N02W08	-N		208	12503
	17/1	2315									
30 August (242)	17/1		0011								
	2	0049	0144								
	3	0221	0318	0215	0217	A0223	S14E16	-N	C0	211	12509
	4	0355	0451								
	5	0528	0624								
	6	0701	0757								
	7	0834	0931	0857	0902	A0915	N04W18	-F		208	12503
	8	1008	1104	1024	1025	1032	S09E56	-F		209	12507
				1100	1103	1123	N04W18	-F		208	12503
	9	1141	1237	B1219	1219	1223	S14E06	-F		211	12509
	10	1315	1410								
	11	1447	1543								
	12	1621	1716								
	13	1754	1816								
	14	1927	2023	B1934	1938	1955	S11E55	-N		209	12507
				B1952	1955	2013	N02W06	-F	C0	213	12511
				2023	2024	A2027	N15E83	-N	C0	212	12510

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	15	2100	2157	2100	2103		N03W22	-N		208	12503
				2139	2154	2215	N02W19	"		208	12503
	16	2234	2330	2230	2230	2237	N02W08	-N		208	12503
				2309	2312	2324	S12E52	-N	C0	209	12507
31 August (243)	1	0007	0008								
	2	0019	0026								
	3	0039	0103								
	4	0140	0236	0208	0213	0218	N14E85	-F		212	12510
	5	0313	0409	B0305	0308	0314	N13E85	-F	C0	212	12510
	6	0447	0542	0535	0542	0544	S14E42	-F		209	12507
	7	0620	0716	0559	0603	0606	S16E51	-F	C1	209	12507
				0636	0643	A0813	N13E80	1N		212	12510
	8	0753	0848	(See above)							
	9	0926	1022								
	10	1059	1155	1112	1112	1124	N02W27	-F		208	12503
	11	1233	1328	1303	1306	1310	N14E80	-N		212	12510
	12	1406	1502	1350	1352	1407	S12E44	-N	C0	209	12507
				B1407	1407	A1412	N13E74	-N	C0	212	12510
				1415	1419	1430	S12E44	-F	C1	209	12507
	13	1539	1634	1559	1600	1608	N06W14	-F		214	
				B1615	1616	A1618	S11E45	-F		209	12507

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	14	1713	1808	1731	1735	1754	N05W17	-F	C0	213	12511
	15	1846	1941	1929	1931	1940	N14E79	-N	C3	212	12510
	16	2019	2114								
	17	2152	2247	B2202	2203	2205	N04W19	-F	C1	213	12511
	18	2325		B2357		0006	N04W21	-F	C0	213	12511
1 September (244)	18/1		0021		(See above)						
	2	0059	0154	B0125	0127	A0127	N04W21	-N		213	12511
				B0125	0147	0215	N04W21	-N		213	12511
	3	0232	0327								
	4	0405	0500								
	5	0519	0520								
	6	0538	0633	0537	0538	0550	N04W25	-F	C0	213	12511
				0549	0552	0558	N16E73	-N		212	12510
				B0551	0602	0645	S17E69	1F		215	12512
				B0551	0555	0753	N05W26	-N		213	12511
				0604	0606	0615	N14E75	-F		212	12510
	7	0712	0807	B0728		0750	N05W26	-F	C0	213	12511
				0749	0751	0807	N14E66	-F	C0	212	12510
				B0750		0828	N16W71	-N	C0		12491
	8	0845	0940	0840	0844	0901	N14W02	-F	C0	207	12504
	9	1019	1113	1048	1050	1100	N15W03	-N	C0	207	12504
	10	1151	1246								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	11	1324	1419	1349	1350	1401	N13E63	-F	C1	212	12510
	12	1635	1726								
	13	1804	1859	1825	1829	1841	S17E27	-F	C2	209	12507
	14	1937	2031	2009	2030	A2140	N25W45	-F	C0		
	15	2111	2206	B2122	2126	2130	S17E65	-N	C4	215	12512
	16	2244	2339	2257	2308	2332	S16E58	-N		215	12512
				2303	2306	2310	N06W33	-F	C0	213	12511
				2306	2311	2317	S17E62	-F	C1	215	12512
2 September (245)	1	0017	0112	0006	0011	0025	S16E58	-N		215	12512
				0042	0045	0050	S16E59	-B	C4	215	12512
	2	0150	0245	B0157	0159	0203	S17E24	-F	C2	209	12507
				B0223	0231	0247	S18E57	-F	C0	215	12512
	3	0324	0418	B0359	0424	A0505	S18E56	1N	C0	215	12512
				B0400	0434	A0621	S18E55	1B		215	12512
	4	0456	0551	0531	0540	A0553	S18E56	-N	C2	215	12512
				0534	0540	0600	S09W01	-N		218	12516
				0540	0540	0545	S18E56	-N		215	12512
				0550	0555	0616	N22E15	1F		210	12508
	5	0630	0724	0614	0618	A0633	S18E55	1N	C5	215	12512
				B0624	0624	0634	S18E56	-N	C3	215	12512
				B0712	0712	0718	S18E54	-N	C2	215	12512

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
				B0750	0753	A0822	N24E15	-F		210	12508
				0751	0804	A0822	N05W39	-F		213	12511
	6	0803	0858	0753	0757	0816	S09E01	-N		218	12516
				0813	0815	0821	S17E56	-N	C0	215	12512
				0823	0831	0841	S09E00	-N	C2	218	12516
				0945	0949	1001	S18E57	-N	C0	215	12512
	7	0936	1031	B1024	1029	1057	S18E55	-N		215	12512
				1030	1033	1101	S13E85	-N		219	12513
	8	1110	1204	B1126	1129	1143	S18E54	-N	C1	215	12512
	9	1243	1338	B1233	1235	1244	S18E54	-N	C0	215	12512
				1603	1603	1610	S18E49	-F		215	12512
	10	1550	1644	1620	1620	1630	N06E90	-N	C2		12517
				1625	1629	1643	S16E49	-F	C4	215	12512
	11	1722	1746								
	12	1857	1951	1838	1951	2007	S15E16	-F		209	12507
				B1904	1904	1925	S18E47	-N		215	12512
	13	2029	2123								
	14	2202	2257								
	15/1	2335									
3 September (246)	15/1		0030	0028	0034	0056	S17E44	-N	C2	215	12512
	2	0109	0203	B0202	0210	0241	S18E43	-N		215	12512
	3	0242	0336	0300	0302	A0311	S12W43	-N	C1	211	12509

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	0415	0509								
	5	0548	0639	0545	0546	0548	S17E41	-N		215	12512
				0612	0614	A0617	S18E06	-F	C0	209	12507
	6	0721	0744	0717	0717	0721	N05W51	-F		213	12511
	7	0855	0949	B0825	0825	0910	N07W53	-N		213	12511
				B0825	0835	0905	N23W01	-F		210	12508
				0904	0906	0908	S17E39	-F		215	12512
	8	1028	1122	1012	1022	1034	N05W56	-F		213	12511
				B1043	1044	1055	S17E39	-N	C1	215	12512
	9	1201	1252								
	10	1334	1428								
	11	1640	1735	B1608	1632	1644	N23W04	-F		210	12508
				B1719	1719	1729	N12E29	-F	C0	212	12510
	12	1814	1908								
	13	1947	2041	B2018	2018	A2030	S13E62	-N	C0	219	12513
	14	2121	2216	B2124	2124	A2139	N13E28	-F	C1	212	12510
	15	2255	2348	2335	2337	A0020	N19E35	-N	C0	212	12510
4 September (247)	1	0027	0121	0022	0024	0033	N22W09	-F	C0	210	12508
				0022	0028	0032	N15E26	-N	C0	212	12510
				0036	0043	A0048	S17E32	-N	C0	215	12512
				B0052	0054	A0056	N13E26	-N	C0	212	12510
	2	0200	0255	B0203	0206	0206	S16E29	1F		215	12512

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	3	0333	0427								
	4	1119	1213	1123	1125	1130	S10E57	-N	C3	219	12513
				1129	1135	1148	S13E55	-N		219	12513
	5	1253	1347	1328	1332	1338	N14W43	-F		207	12504
	6	1558	1653	1545	1549	1608	S12W11	-N	C1	209	12507
				B1602	1604	A1618	S06W07	-N	C1	209	12507
				B1621	1623	1645	N13W53	-F	C0	206	
				1627	1635	1652	N14E16	-N	C7	212	12510
	7	1732	1755								
	8	1905	1959	B1942	1947	A2110	N18E24	-F	C0	212	12510
	9	2039	2133		(See above)						
	10	2212	2306								
	11/1	2354									
5 September (248)	11/1		0039	B0020		0047	S17W18	-N	C0	209	12507
	2	0118	0233	0215		0220	S16W16	-F	C0	209	12507
				0231		0240	S17W18	-F	C0	209	12507
	3	0251	0346	0337	0340	0400	N18E19	-B	C0	212	12510
	4	0425	0519	B0436	0440	0451	S18W20	-F	C0	209	12507
				0448	0450	0456	N11E11	-N	C0	212	12510
	5	0558	0652	0635	0640	0650	S18W21	-N		209	12507
				0636	0642	0659	N18E18	-N	C0	212	12510
				B0640	0655	0805	S12W75	-F		211	12509

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	6	0731	0825		(See above)						
	7	0904	0958	0912	0914	0944	N14E13	-F		212	12510
				0920	0921	0940	N11E08	-N		212	12510
				0920	0924	0944	S17W19	-N	C4	209	12507
	8	1037	1131	1113	1117	1126	S18W22	-N	C0	209	12507
	9	1211	1305	B1255	1316	A1330	S16W21	-N	C0	209	12507
				1305	1319	1334	S17W21	-F		209	12507
	10	1344	1438	1438	1443	1508	N14E10	-F	C0	212	12510
	11	1517	1611	1528	1528	1531	N11E06	-F		212	12510
	12	1650	1744	1655	1701	1717	S17W23	-F	C1	209	12507
	13	1824	1917	B1828	1832	A1834	N11E04	-N	M1	212	12510
	14	1957	2050	B1952	2010	A2040	S28W24	-N	C8	209	12507
				2003	2021	2054	S18W25	-N		209	12507
	15	2130	2223								
	16	2303	2357	B2327	2327	2330	N19E09	-F	C2	212	12510
				B2357	0000	0009	N15W80	-N	C1	216	12501
6 September (249)	1	0036	0130	0106	0115	0129	N12W01	-F	C1	212	12510
	2	0209	0303	B0152	0155	0213	N14W03	-N	C1	212	12510
	3	0342	0437	0338	0342	A0350	S15W29	-N	C1	209	12507
	4	0516	0610	0538		0548	N13W04	-F	C0	212	12510
	5	0649	0743								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	6	0822	0915	0831	0841	0910	N10E03	-F		212	12510
				0915	0922	1010	N06W90	1B	X1	213	12511
	7	0955	1049	(See above)							
				B1020	1020	1032	N06W90	-B	C0	213	12511
				B1046	1047	1105	N05W90	-N	C4	213	12511
	8	1129	1223	1206	1220	1305	S17W35	-N		209	12507
				B1210	1215	1230	S13W90	-N	C5	211	12509
	9	1302	1356	(See above)							
				B1250	1255	A1400	S18W33	-F	C4	209	12507
				1302	1308	1315	S15E25	-F	C0	219	12513
				B1353	1353	1400	N04W90	-N	C2	203	12501
	10	1435	1529								
	11	1608	1702	1616	1624	1646	S17W37	-N	C3	209	12507
				1634	1639	1714	S14W36	-F	C2	209	12507
				B1639	1644	A1648	S16E23	-F	C0	219	12513
	12	1742	1835	1816	1832	1920	S19W08	-B	C2	215	12512
				B1820	1821	A1821	S17E09	-F	C2	209	12507
	13	1914	2008								
	14	2048	2114	2038	2049	2104	S17E19	-F	C1	219	12513
				2102	2104	2112	S16E20	-F		219	12513
	15	2221	2315	B2216	2216	2223	N08W90	-N	C0	213	12511
				B2308	2313	2328	N21W46	-F	C0	210	12508
	16/1	2354									

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
7 September (250)	16/1		0048	0002	0007	0018	S18W09	-F	C1	215	12512
	2	0128	0221	0210	0213	0350	S19W43	-N	C2	209	12507
	3	0301	0355		(See above)						
	4	0434	0528	0427	0434	0453	N24W49	-N	C1	210	12508
				0455	0505	0555	S20W43	-B		209	12507
	5	0607	0701	0643	0648	0700	N10W90	-N			12501
	6	0740	0834								
	7	0914	1007								
	8	1047	1141	1135	1145	1336	S18W46	-N		209	12507
				1141	1212	1342	S18W46	2B	X1	209	12507
	9	1220	1314		(See above)						
				B1206	1225	1335	S16W47	3B		209	12507
	10	1353	1447	B1412		1440	N15W17	-F	C0	212	12510
	11	1526	1620	B1523	1527	A1531	S11E10	-F	C0	219	12513
				B1555	1559	A1559	S11E07	-N		219	12513
				1600	1605	1614	N18W17	-F	C4	212	12510
				B1605	1608	A1626	S12E10	-F	C0	219	12513
	12	1700	1753	B1714	1719	1739	S16E07	-F	C0	219	12513
	13	1833	1926	B1904	1905	A1912	S11W78	-N		218	12516
				1916	1925	A1926	N23W57	-N	C2	210	12508
	14	2006	2030								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	15	2139	2233	B2226	2227	2233	S10W80	-N	C0	218	12516
	16/1	2312		2356	0000	0021	S16W50	-F		209	12507
8 September (251)	16/1			(See above)							
			0006	0001	0004	0016	S19W09	-N		215	12512
	2	0046	0139								
	3	0219	0312	0210	0215	A0220	N14W66	-F	C0	210	12508
				B0219	0221	0232	S11E04	-N	C0	219	12513
				0237	0241	0250	S15W52	-B	C2	209	12507
				0245	0252	0258	N15W66	-F	C0	210	12508
	4	0352	0446	0411	0413	0416	N22W63	-N	C1	210	12508
	5	0526	0619								
	6	0659	0752	0732	0738	0825	S11W02	-F		219	12513
				0734	0736	0737	N24W64	-F		210	12508
				0743	0749	A0801	S17W56	-F		209	12507
	7	0832	0925	0848	0849	0900	S16W56	-N		209	12507
				0904	0904	0909	S18W58	-F		209	12507
	8	1006	1059								
	9	1138	1232	B1216	1219	1258	S11W03	1N	C3	219	12513
	10	1311	1405								
	11	1444	1538								
	12	1617	1712								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	13	1751	1845	B1818	1818	1831	N25W73	-F	C0	210	12508
				1830	1831	1840	N17W37	-F	C0	212	12510
	14	1924	2018	B1944	1946	1952	S11W07	-F	C0	219	12513
	15	2057	2151								
	16	2231	2324	2230	2234	2245	S11W10	-N		219	12513
				2324	2327	2345	S11W11	-F		219	12513
9 September (252)	1	0004	0057								
	2	0137	0231	0141	0145	A0153	S10W11	-F	C0	219	12513
	3	0310	0404								
	4	0443	0537	B0451	0452	A0454	S18W38	-F	C0	215	12512
				B0500	0510	0522	S11W15	-N	C2	219	12513
	5	0617	0710	0635	0637	0649	S17W72	-N	C0	209	12507
	6	0750	0843	0818	0820	0833	S10W17	-N	C1	219	12513
	7	0923	1017								
	8	1056	1149	1126	1127	1134	S09W31	-N	C0	224	12520
	9	1229	1323	1212	1220	1303	S11W04	-N		219	12513
	10	1402	1456	1451	1456	1523	S12W29	-N	C0	224	12520
	11	1535	1630	B1526	1532	1542	S09W36	-B	C0	224	12520
				1558	1600	1611	N23W85	-N	C0	210	12508
	12	1709	1803								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	13	1842	1848	1826	1831	1842	N16W37	-F		212	12510
				1831	1835	A1907	S10W36	-F		224	12520
				B1843	1847	1907	S19W80	-F	C1	209	12507
	14	2017	2109	B2053	2055	2111	S19W83	-F	C0	209	12507
				2103	2107	2121	S09W40	-F	C0	224	12520
	15	2148	2243	2143	2150		S10W37	-B		224	12520
				B2204	2207	2210	S11W38	-F	C1	225	12520
				B2215	2215	A2225	N21W88	-F	C0	210	12508
10 September (253)	1	0055	0149	B0131	0131	A0150	S11W40	-F	C1	224	12520
				B0131	0142	A0159	S19W42	-F	C0	215	12512
	2	0228	0322	0223	0232	0251	S11W41	-N	M1	224	12520
				0227	0233	A0255	S17W45	-N		215	12512
				0234	0244	A0323	S18W44	-F		215	12512
				0256	0300	A0323	S10W41	-N		224	12520
				B0300	0300	A0310	S18W43	-N		215	12512
	3	0401	0455								
	4	0534	0556								
	5	0708	0802								
	6	0841	0935	0933	0937	1059	N22W90	-F		210	12508
	7	1014	1108								
	8	1147	1241	1140	1149	A1216	S10W46	-F	C3	224	12520
				1145	1147	1212	S12W43	-N		224	12520
				1150		1221	N23W90	-N	C0	209	12507
				1211	1214	1226	S10W32	-N	C1	219	12513

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	9	1320	1414								
	10	1453	1548	B1450	1450	1500	S10W48	-F	C0	224	12520
				1516	1519	1523	S10W32	-F		219	12513
	11	1627	1721	B1610		A1629	S18W90	-N		209	12507
	12	1800	1807	1807	1810	1817	S10W33	-F		219	12513
	13	2106	2200								
	14	2239	2334								
11 September (254)	1	0013	0107								
	2	0147	0240								
	3	0319	0413								
	4	0452	0547								
	5	0626	0720	B0655	0703	0736	S11W55	-N	M1	224	12520
	6	0800	0853	0753		0800	S13W41	-F		219	12513
				0756	0803	0826	S11W41	-N		219	12513
	7	0932	1026								
	8	1105	1200	B1126	1126	A1133	S12W42	-F		219	12513
	9	1239	1258	B1245	1247	1258	S12W39	-F	C0	219	12513
	10	1424	1506	1445	1451	1532	S10W46	-F		219	12513
				1449	1452	1504	S11W56	-F		224	12520
	11	1545	1639	1553	1555	1559	S12W45	-N	C1	219	12513

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	12	1718	1813								
	13	1852	1946								
	14	2025	2048								
	15	2159	2252								
	16/1	2331									
12 September	16/1		0025								
(255)	2	0104	0158								
	3	0238	0332								
	4	0411	0505	0420	0424	0433	S12W64	-F	C0	224	12520
	5	0544	0638								
	6	0717	0811	B0645	0655	A0722	S12W70	-F		224	12520
	7	0950	0944								
	8	1024	1118	1049	1052	A1105	S12W60	-F	C0	219	12513
	9	1157	1216	B1130	1145	A1200	S11W57	-F		219	12513
	10	1330	1424								
	11	1503	1556								
	12	1812	1904	B1819		A1822	S10W78	-F	C0	224	12520
	13	1942	1950								
	14	2117	2211								
	15	2249	2344	B2341		2349	S12W74	-N	C1	224	12520

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
13 September (256)	1	0022	0117								
	2	0155	0250								
	3	0328	0423								
	4	0502	0557								
	5	0635	0730	B0629	0642	0645	S12W70	-F		219	12513
				B0646	0647	0800	S12W66	-F	C0	219	12513
	6	0808	0903								
	7	0941	1037								
	8	1114	1210								
	9	1248	1343								
	10	1421	1516								
	11	1554	1650								
	12	1728	1742								
	13	2036	2129								
	14	2207	2303								
	15/1	2340									
14 September (257)	15/1		0036								
	2	0113	0209								
	3	0246	0342	0225	0231	A0251	S15W85	-N	C2	219	12513
				0304	0307	0322	S11W81	-B		219	12513

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	0420	0515								
	5	0553	0648								
	6	0726	0822								
	7	0900	0955								
	8	1033	1129								
	9	1206	1302								
	10	1400	1423	1416	1421	1432	S12W90	-F		219	12513
	11	1512	1608								
	12	1819	1915								
	13	1952	2048								
	14	2125	2153								
	15	2259	2354								
15 September (258)	1	0032	0128								
	2	0205	0301								
	3	0338	0434								
	4	0512	0608								
	5	0644	0741								
	6	0818	0914								
	7	0951	1001								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	8	1007	1024								
	9	1124	1221								
	10	1257	1354								
	11	1430	1527								
	12	1910	2007								
	13	2044	2140								
	14	2217	2313	2243	2245	A2253	S08E54	-N	C0	226	12522
	15/1	2350									
16 September	15/1		0047								
(259)	2	0123	0220								
	3	0257	0351								
	4	0430	0526	0435	0437	0444	S13E51	-F	C1	226	12522
	5	0603	0659								
	6	0736	0833	0717	0723	0736	N16E65	-N		227	12525
	7	0909	1006								
	8	1042	1139								
	9	1216	1313	1228	1232	1238	N13W22	-F		229	12527
	10	1349	1446								
	11	1744	1753								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	12	1829	1926								
	13	2001	2059								
	14	2139	2232								
	15/1	2309									
17 September	15/1		0006								
(260)	2	0042	0138								
	3	0215	0312								
	4	0348	0445								
	5	0522	0619								
	6	0655	0752								
	7	0828	0925								
	8	1001	1058								
	9	1134	1232								
	10	1308	1405								
	11	1615	1712	B1610		1632	S13E12	-N			
	12	1747	1845								
	13	1920	2018								
	14	2054	2152								
	15	2227	2325								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
18 September (261)	1	0000	0007								
	2	0039	0058								
	3	0134	0231								
	4	0310	0405								
	5	0441	0538	B0438	0438	0443	N22E86	-N			12533
	6	0613	0711	0638	0640	0714	S10E20	-F		226	12522
				0645	0657	0750	N21W05	-F			12529
	7	0746	0844								
	8	0920	1018								
	9	1053	1151								
	10	1226	1324								
	11	1359	1458								
	12	1532	1539								
	13	1706	1804								
	14	1839	1937								
	15	2012	2110	B1956	1956	2012	N17E35	-F		227	12525
	16	2146	2244								
	17/1	2319									
19 September (262)	17/1		0017								
	2	0052	0151								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-RAY Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	3	0226	0324								
	4	0359	0457	B0423	0423	0430	N17E24	-F		227	12525
	5	0532	0631	0616	0618	0628	N13E28	-F	C0	227	12525
	6	0705	0803								
	7	0838	0843								
	8	0852	0907								
	9	0931	0936								
	10	1012	1110	1046	1052	A1057	N12E90	-N		234	12532
	11	1145	1242	B1203	1206	A1214	N19E24	-N		227	12525
	12	1319	1338								
	13	1500	1549								
	14	1625	1723								
	15	1759	1857								
	16	1931	1936								
	17	2105	2203								
	18	2238	2337								
20 September (263)	1	0012	0110								
	2	0145	0243								
	3	0318	0416								

TABLE 3. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	0451	0550								
	5	0625	0723								
	6	0758	0825	B0823	0823	A0823	N05E47	-N		231	12530
	7	0941	1029								
	8	1104	1203								
	9	1238	1336								
	10	1411	1509								
	11	1544	1642								
	12	1718	1816								
	13	1852	1948								
	14	2159	2248								
	15	2331									
21 September (264)	1		0030								
	2	0104	0203								
	3	0237	0336								
	4	0410	0510								
	5	0544	0643								
	6	0717	0816								
	7	0906	0949								

TABLE 3. (Concluded)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	8	1024	1122	1035	1040	1102	N12E68	-F		236	12535
	9	1157	1256								
	10	1535	1602								
	11	1637	1735								
	12	1810	1908								
	13	1943	2042	B2017	2017	A2055	N13E68	1N	C0	236	12535
	14	2116	2216	B2132	2147	A2152	N15W18	-F		227	12525
	15	2250	2349								
22 September (265)	1	0023	0122								
	2	0157	0256								
	3	0330	0429	0353	0357	0408	S16W17	-F		228	12523
	4	0503	0602								
	5	0637	0736	B0654	0654	A0704	N15W14	-F	C0	227	12525
	6	0810	0909								

TABLE 4. SL4 X-REA SOLAR OBSERVATIONS

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
26 November 1973 (330)	1	1929	2006	1954	1956	A1956	S06E10	-F	C0	287	12628
	2	2213	2248								
27 November (331)	1	0012	0044								
	2	0120	0219	B0104		0124	N07W20	-F	C0	291	12636
				0124	0127	0138	S09E05	-N		287	12628
				B0145	0147	0152	N05W19	-N	C0	291	12636
	3	0253	0348	0306	0313	0324	S07E03	-B	M1	287	12628
	4	0452	0459	0416	0419	0539	S13W80	-B		290	12626
	5	1346	1440								
	6	1652	1749								
	7	1826	1918	1813	1823	1851	N06W28	-F	C1	291	12636
	8	1959	2057								
	9	2133	2230								
	10/1	2306		2309		2318	S09E07	-F		287	12628
				B2330	2333	2348	S09E07	-N		287	12628
28 November (332)	10/1		0003								
	2	0212	0310								
	3	1439	1536								
	4	1746	1842								
	5	2054	2149								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	6	2225	2321								
29 November (333)	1	0132	0228								
	2	1358	1454								
	3	1531	1627								
	4	1704	1800								
	5	2019	2107								
	6	2144	2240								
	7/1	2317									
30 November (334)	7/1		0013								
	2	0224	0320	0227	0227	0235	S08W31	-N	C1	287	12628
	3	1450	1545								
	4	1708	1719								
1 December (335)	1	0142	0238								
	2	1547	1637								
	3	2154	2250								
	4/1	2327									
2 December (336)	4/1		0023								
	2	0234	0330								
	3	1500	1555	1459	1505	1514	S11W64	-N		287	12628
				1505	1518	1537	S13W64	1N	M1	292	12628

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	1840	1902	1827	1831	A1900	S12W69	-F	C2	292	12628
	5	1940	2035	B2010		A2020	S14W67	-N	C5	292	12628
				2029	2034	2041	S15W65	-F		292	12628
	6	2113	2208	B2115	2115	2125	S15W69	-N		292	12628
				B2158	2158	2204	S18W68	-N		292	12628
3 December (337)	1	0154	0247	0204	0207	A0216	S15W71	-B	C2	292	12628
				0236	0239	0250	S15W71	-B		292	12628
	2	1245	1340								
	3	1418	1513								
	4	1629	1647								
	5	1753	1820	B1753	1754	1802	S13W85	-N		292	12628
	6	1858	1953								
	7	2031	2126								
	8	2205	2300								
	9/1	2338									
4 December (338)	9/1		0033								
	2	0111	0206								
	3	0244	0339								
	4	1337	1432								
	5	1510	1523								
	6	1527	1528								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	7	1716	1738								
	8	1817	1911								
	9	1950	2045								
	10	2123	2218								
	11	2256	2346								
5 December (339)	1	0203	0258								
	2	1255	1335								
	3	1429	1446								
	4	1639	1656								
	5	1735	1829								
	6	1908	2003								
	7	2042	2136								
	8/1	2349									
6 December (340)	8/1		0044								
	2	0121	0216								
	3	1348	1441								
	4	1520	1615								
	5	1654	1748								
	6	1827	1921								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	7	2001	2055								
	8	2133	2227								
	9	2306	0000								
7 December (341)	1	0040	0134								
	2	1207	1227								
	3	1305	1327								
	4	1515	1533								
	5	1612	1706	B1634	1637	1645	N06E82	-F		296	12651
	6	1745	1827								
	7	1951	2013								
	8	2052	2147								
	9	2225	2319								
8 December (342)	1	0136	0226								
	2	1244	1318								
	3	1357	1452								
	4	1530	1625								
	5	1703	1758								
	6	1859	1931								
	7	2010	2105								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	8	2143	2238								
	9/1	2316									
9 December	9/1		0003								
(343)	2	0059	0101								
	3	1315	1358								
	4	1622	1717								
	5	1755	1850								
	6	1929	2024								
	7	2118	2157								
	8	2235	2330								
10 December	1	0145	0236								
(344)	2	1540	1634								
	3	1852	1942								
	4	2020	2116								
	5	2154	2249								
	6/1	2327									
11 December	6/1		0022								
(345)	2	0100	0155								
	3	0233	0306								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	1459	1554								
	5	1632	1727								
	6	1806	1900								
	7	1939	2034								
	8	2112	2207								
	9	2245	2340								
12 December (346)	1	0019	0114								
	2	0210	0246								
	3	0325	0420								
	4	1554	1646								
	5	1726	1819								
	6	1857	1952								
	7	2031	2126								
	8	2204	2259								
	9/1	2337									
13 December (347)	9/1		0032								
	2	0250	0326								
	3	1349	1432								
	4	1529	1605								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	5	1643	1731								
	6	1816	1909								
	7	1949	2045								
	8	2123	2218								
	9	2256	2351								
14 December (348)	1	0048	0125								
	2	0202	0258								
	3	1303	1351								
	4	1430	1524								
	5	1618	1658								
	6	1735	1831								
	7	1909	2004								
	8	2042	2137	B2130 2135	2137 2139	2147 2145	S05E90 N04E89	-F -F		299	12662
	9	2215	2229								
15 December (349)	1	0027	0028								
	2	0121	0217								
	3	1351	1443								
	4	1521	1616	1511	1513	1528	N01W28	-F		296	12651

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	5	1654	1750								
	6	1827	1923	B1829	1832	1844	N00W31	-F		296	12651
	7	2001	2056	2013	2017	2026	N02E77	-F		299	12662
	8	2134	2229								
	9/1	2307									
16 December (350)	9/1		0002								
	2	0041	0136								
	3	0214	0309								
	4	1307	1402	1316	1317	1338	S17E80	-N	C0	300	12664
	5	1532	1535								
	6	1613	1707	1617	1617	1622	S18E85	-F		300	12664
	7	1920	2015	1954	1956	2023	S17E74	-F	C2	300	12664
				1954	2008	2023	S17E74	-N		300	12664
	8	2053	2145								
	9	2240	2322								
	10/1	2359		2354	2358	0010	S17E77	-N	C2	300	12664
17 December (351)	10/1				(See above)						
			0055	0029	0032	0057	S17E77	1B	M1	300	12664
	2	0133	0228								
	3	1532	1628	1624	1627	A1635	S17E65	-N	C0	300	12664

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	1722	1801								
	5	1839	1935								
	6	2012	2108								
	7/1	2319		2355	2356	0007	S18E75	-F	C0	300	12664
18 December (352)	7/1		0014								
	2	0309	0318								
	3	1320	1414								
	4	1627	1720	B1659	1700	1714	S17E49	-F	C0	300	12664
	5	1758	1851	1801	1806	1811	S17E48	-F	C0	300	12664
	6	1931	2027	1941	1947	2004	S15E48	-N	C0	300	12664
				1945	1947	1953	S11W40	-N	C0		
	7	2253	2334	B2331	2333	2339	S16E45	-N		300	12664
19 December (353)	1	0011	0107								
	2	0145	0240	0124	0132	0146	S16E45	-N	C2	300	12664
	3	1303	1333	1242	1251	1315	S18E41	-F		300	12664
	4	1411	1506								
	5	1544	1550								
	6	1850	1908								
	7	1925	1946	1934	1943	1959	S18E37	-N	C0	300	12664

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	8	2024	2119								
	9	2157	2226								
	10/1	2346									
20 December (354)	10/1		0026								
	2	0104	0159								
	3	1330	1425	1321	1326	1340	S17E26	-F	C2	300	12664
	4	1503	1558								
	5	1636	1732								
	6	1810	1905								
	7	1943	2038	B1947	1947	A1954	S19E18	-N		300	12664
	8	2249	2345	2248	2254	2307	S18E15	-N	C0	300	12664
21 December (355)	1	0217	0249								
	2	1310	1344								
	3	1422	1515								
	4	1902	1957	B1938	1939	1952	S18E08	-F	C0	300	12664
	5	2035	2130								
	6	2209	2304	2213	2213	2232	S18E03	-F	C0	300	12664
				B2248	2302	2312	S18E03	-F	C0	300	12664
	7/1	2357									

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
22 December (356)	7/1		0037	0022	0023	0027	S19E02	-N	C0	300	12664
	2	0115	0210	0112	0120	0128	S19E03	-F	C1	300	12664
	3	0314	0344	B0300	0306	0328	S18E03	-N	C2	300	12664
	4	1353	1436								
	5	1514	1609								
	6	1703	1743								
	7	1821	1916								
	8	1954	2049								
	9	2128	2223								
	10	2301	2356	B2252	2314	2324	S18E02	-N	C0	300	12664
23 December (357)	1	0034	0129	0104	0105	0116	S19W10	-F		300	12664
	2	0207	0300								
	3	1315	1355								
	4	1433	1457								
	5	1626	1702								
	6	2223	2315								
	7/1	2353									
24 December (358)	7/1		0044								
	2	0141	0222								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	3	1407	1447								
	4	1526	1545	1518	1523	1537	S16W53	-F		305	12668
	5	1548	1613								
	6	1659	1735								
	7	1739	1751								
	8	2139	2234	2222	2225	2232	S19W44	-F		300	12664
	9/1	2312									
25 December (359)	9/1		0007	0004	0011	0015	S16W41	-N		300	12664
	2	0045	0140	0040	0041	0049	S16W42	-F		300	12664
				0132	0136	0143	S16W42	-F		300	12664
	3	0220	0253								
26 December (360)	1	0448	0538								
	2	1710	1805	1725	1728	1736	N07W67	-F	C0	299	12662
	3	2016	2111								
	4	2150	2244								
	5/1	2323		2331	2336	A2344	S17W63	-F	C0	300	12664
27 December (361)	5/1		0018								
	2	0056	0151								
	3	0229	0324								
	4	1322	1417								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	5	1455	1550								
	6	1629	1723								
	7	1802	1856								
	8	1935	2029	2011	2017	A2021	S13W78	-N	C1	300	12664
	9	2109	2203								
	10	2242	2336	2247	2252	2258	S15W83	-N	C0	300	12664
28 December (362)	1	0015	0109								
	2	0148	0242								
	3	1414	1509								
	4	1548	1642								
	5	1721	1815								
	6	1854	1947								
29 December (363)	1	1333	1427								
30 December (364)	1	1307	1346								
	2	2037	2132								
31 December (365)	1	0117	0212								
	2	1343	1435								
	3	1956	2050								
	4	2129	2224								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
1 January 1974 (001)	1	0035	0130								
	2	0209	0303								
	3	1434	1527								
	4	2047	2142								
2 January (002)	1	0127	0222								
	2	1526	1621	1612	1614	1625	S15W03	-N	C0	312	12684
	3	1659	1738								
	4	2141	2151								
3 January (003)	1	0045	0140								
	2	1206	1233								
	3	1311	1406								
	4	1444	1516								
	5	1639	1713								
	6	1751	1846								
	7	1924	2019	B1939		A1946	S12E87	-F	C0		12699
4 January (004)	1	1229	1325								
	2	1402	1458								
	3	1536	1631	1531	1534	1539	N16E01	-F	C0		12696

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	4	170^	1804								
	5	2156	2244								
5 January (005)	1	0111	0150								
	2	1203	1244								
	3	1321	1417								
	4	1627	1723								
	5	1800	1856								
	6	1934	2029								
	7	2107	2203								
	8	2240	2311								
6 January (006)	1	0013	0107								
	2	1416	1508								
	3	1545	1641								
	4	1718	1742								
	5	1928	1948								
	6	2025	2121								
	7	2158	2255	2230	2231	2235	S14W57	-N	C0	312	12684
7 January (007)	1	0247	0335								
	2	1213	1243								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	3	1335	1427								
	4	1504	1521								
	5	1526	1601								
	6	1637	1700								
	7	1810	1907								
	8	1943	2040								
8 January (008)	1	0027	0120	0101		A0114	S22E54	-F	C0	314	12690
	2	1304	1346								
	3	1422	1519								
	4	1555	1613								
	5	1901	1958								
	6	2034	2052								
	7	2058	2132								
	8	2208	2306								
	9/1	2341									
9 January (009)	9/1		0016								
	2	0121	0212								
	3	1208	1305								
	4	1340	1438								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	5	1821	1917								
	6	1953	2013								
	7	2138	2224								
	8	2306	2332								
10 January (010)	1	0047	0130								
	2	1431	1530	B1455	1455	A1457	N12E08	-N		318	12700
	3	1604	1643								
	4	1740	1836								
	5	1911	2010	B1957	2010	2023	S13E51	-F		316	12694
	6	2044	2140								
	7	2217	2315								
	8/1	2351									
11 January (011)	8/1		0009								
	2	1353	1449								
	3	1522	1622								
	4	1656	1713								
	5	1912	1929								
	6	2002	2102								
	7	2136	2217								
	8/1	2324									

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
12 January (012)	8/1		0009								
	2	0042	0123								
	3	1134	1238								
	4	1308	1408								
	5	1441	1541								
	6	1615	1631								
	7	1834	1848	1838	1838	1841	S18E77	-N		320	12703
	8	1921	2022								
	9	2055	2139	2055	2056	2100	S17E78	-N		320	12703
	10	2238	2328								
13 January (013)	1	0001	0045								
	2	1401	1501								
	3	1534	1633	B1609	1630	A1634	S16E62	-F	C1	320	12703
				1625	1654	1659	S18E61	-N	C2	320	12703
	4	1709	1807								
	5	1841	1941								
	6	2014	2100								
	7	2158	2247								
	8/1	2321									

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
14 January (014)	8/1		0026								
	2	0054	0154								
	3	1148	1247	B1229	1229	A1229	N06W73	-N		314	12686
	4	1321	1421								
	5	1454	1510								
	6	1805	1900								
	7	1933	1956								
	8	2001	2022								
	9	2116	2208								
	10	2241	2341								
15 January (015)	1	0015	0103								
	2	1241	1341	1340	1347	1355	N10W11	-F	C0	323	12700
	3	1415	1514	B1422	1423	A1429	N07W84	-N	C6	314	12686
	4	1547	1558								
	5	1722	1822								
	6	1855	1955								
	7	2203	2301								
	8/1	2335									

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
16 January (016)	8/1		0046								
	2	0108	0208								
	3	1202	1303								
	4	1336	1448								
	5	1504	1609								
	6	1823	1917								
	7	1950	2050	1946	1948	1956	S20E21	-F	C0	320	12703
	8	2124	2236								
	9	2250	2356								
17 January (017)	1	0030	0130								
	2	1157	1224								
	3	1258	1358								
	4	1431	1543								
	5	1559	1705								
	6	1738	1838								
	7	1911	2023								
	8	2040	2152								
	9	2218	2219								
	10/1	2352									

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
18 January (018)	10/1		0053								
	2	0126	0207	0206	0223	0239	N04W65	1N		323	12700
	3	1401	1453								
	4	1526	1626	1524	1527	1530	S14W55	-F		316	
	5	1700	1800								
	6	1833	1933	B1851	1903	A1903	S17E12	-F	C0	321	12706
				1903	1905	1908	N07W78	-F	C1	323	12700
	7	2006	2020	B1950	1952	A2058	S15E11	-N		321	
	8	2145	2242								
19 January (019)	1	0055	0110								
	2	0115	0148								
	3	1140	1240								
	4	1314	1412								
	5	1446	1546								
	6	1619	1639								
	7	1648	1720	1647	1647	1657	S18W19	-N	C0	320	12703
	8	1754	1855	1840	1842	1849	N06W18	-F		331	12708
	9	1928	2029								
	10	2103	2203								
	11	2237	2335								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
20 January (020)	1	0009	0115	0004	0007	0014	N03W23	-B		331	12708
	2	0156	0219								
	3	1131	1159								
	4	1234	1340	B1325	1335	1405	N13W11	-F			12710
	5	1408	1508								
	6	1542	1641								
	7	1715	1814								
	8	1847	1849	1836	1838	1849	S16W07	-N	C0	321	12706
	9	1935	1947								
	10	2021	2121								
	11	2154	2255	2254	2300	2316	N07W37	-N	C0	331	12708
	12/1	2329									
21 January (021)	12/1		0029								
	2	0102	0202								
	3	1156	1255								
	4	1328	1428								
	5	1502	1601								
	6	1635	1735								
	7	1808	1908	1839	1842	1905	N14W26	-F	C0	332	12710

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	8	1941	1946								
	9	2117	2215								
	10	2248	2309	B2244	2320	A2336	N06W51	-N	C7	331	12708
	11	2313	2348		(See above)						
22 January (022)	1	0022	0125								
	2	1115	1214	1100	1106	1116	N07W57	-F	C1	331	12708
				1154	1201	1214	N06W59	-N		331	12708
	3	1248	1347	1332	1338	1353	N04W60	-B		331	12708
	4	1422	1521	B1450	1452	A1458	N26W40	-N	C0	332	12710
				B1450	1453	1505	N07W60	-F	C0	331	12708
				B1450	1453	1457	S16W50	-N	C0	333	12703
	5	1555	1654	1534	1536	1713	N06W56	1N		331	12708
	6	1729	1747	1734	1746	A1758	N07W62	-N	C3	331	12708
	7	1957	2001								
	8	2035	2134	B2117	2118	2125	N04W60	-N	C2	331	12708
	9	2208	2307	B2228	2230	2246	S16W50	-F	C0	333	12703
23 January (023)	1	1215	1308								
	2	1342	1440								
	3	1516	1611								
	4	1649	1747								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	5	1822	1920								
	6	1955	2054	2044	2053	2102	N17W55	-F		332	12710
	7	2128	2226								
	8/1	2302									
24 January (024)	8/1		0001								
	2	0035	0133								
	3	1135	1227	1200	1201	1203	S15W90	-F			12703
	4	1301	1359								
	5	1915	2012								
	6	2048	2145								
	7	2221	2318								
	8/1	2355									
25 January (025)	8/1		0052								
	2	1221	1318								
	3	1354	1451								
	4	1836	1931								
	5	2007	2104								
	6	2140	2237								
	7	2314	2354								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
26 January (026)	1	1320	1410								
	2	1446	1543								
	3	1619	1716	1616	1619	1627	S16W05	-F	C0	336	12720
	4	1753	1809								
	5	2100	2156								
	6	2233	2338								
27 January (027)	1	0006	0102								
	2	0139	0235								
	3	1309	1328								
	4	1405	1501								
	5	2151	2247								
	6/1	2324									
28 January (028)	6/1		0013								
	2	0100	0140								
	3	1150	1246								
	4	1324	1419								
	5	1457	1552								
	6	1630	1726								
	7	1938	2032								

TABLE 4. (Continued)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
	8	2110	2205								
	9	2243	2338								
29 January (029)	1	0016	0111								
	2	1242	1337								
	3	1415	1510								
	4	1549	1558								
	5	2204	2257								
	6	2335	2341								
30 January (030)	1	1205	1256								
	2	1334	1429								
	3	2002	2042								
	4	2120	2215	2120	2122	2128	S01W20	-F		339	12724
	5	2253	2336								
31 January (031)	1	0036	0121								
	2	1905	1959								
1 February (032)	1	1409	1439								
	2	2130	2225								
	3	2304	2348								

TABLE 4. (Concluded)

Date (DOY)	Pass No.	X-REA Observation		Events			Solar Co-Ord	Class		Region No.	
		Begin	End	Begin	Maximum	End		Optical	X-Ray	NOAA	McMath
2 February (033)	1	1742	1837								
	2	1915	2010	B2009	2009	A2029	S14W66	-F			
	3	2048	2143								
	4	2222	2317								
	5/1	2355									
3 February (034)	5/1		0050								
	2	0130	0223								

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APPROVAL

SKYLAB ATM/S-056 X-RAY EVENT ANALYZER OBSERVATIONS VERSUS SOLAR FLARE ACTIVITY: AN EVENT COMPILATION

By Robert M. Wilson

The information in this report has been reviewed for security classification. Review of any information concerning Department of Defense or Atomic Energy Commission programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

This document has also been reviewed and approved for technical accuracy.

Anthony C. DeLoach

ANTHONY C. DeLOACH
Chief, Solar Sciences Branch

William C. Snoddy

WILLIAM C. SNODDY
Chief, Solar-Terrestrial Physics Division

Charles A. Lundquist

CHARLES A. LUNDQUIST
Director, Space Sciences Laboratory

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