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NOAA Data Report ERL SEL-1



A CATALOG OF LOW-FREQUENCY OSCILLATIONS OF THE EARTH'S MAGNETIC
FIELD AS OBSERVED AT SMS-1 DURING NOVEMBER 1974 - MARCH 1975

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Space Environment Laboratory
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NATIONAL OCEANIC AND
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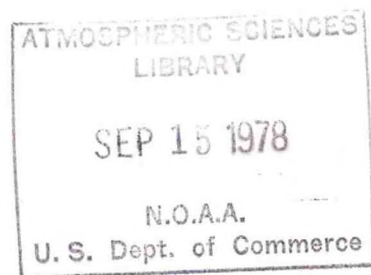
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**UNITED STATES
DEPARTMENT OF COMMERCE**
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NATIONAL OCEANIC AND
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A Catalog of Low-Frequency Oscillations of the Earth's Magnetic
Field as Observed at SMS-1 during November 1974 - March 1975

INTRODUCTION

It is generally accepted that hydromagnetic waves contain important information about the physical conditions in the plasma environment of the earth's magnetosphere (e. g. Troitskaya and Gul'elmi, 1970). Given a knowledge of the wave generation and propagation characteristics of the magnetosphere system, the parameters of geomagnetic pulsations can be used for remote diagnostics of magnetospheric parameters. In order to understand the effects of the magnetosphere-ionosphere system upon the waves, it is necessary to study the waves both on the ground and in the magnetospheric area where they are generated.

A large body of information is available on the characteristics of magnetic pulsations observed on the earth's surface, but relatively little is known about the physical aspects of the waves in space, due to the small number of properly instrumented satellites in orbit at any given time.

The SMS/GOES synchronous satellites provide a particularly good data base for compiling the occurrence statistics of magnetic pulsations in space and for event-by-event comparison of waves observed in space with those observed on the ground. The synchronous orbit provides a daily sampling of all local times at a fixed altitude, and lies within the magnetospheric ULF resonance region (Hughes et al., 1978). In addition to the fortuitous location of the synchronous

orbit, the NOAA Space Environment Laboratory fluxgate magnetometers aboard the satellites provide continuous monitoring starting in June, 1974.

In order to facilitate the statistical analysis of ULF magnetic waves observed at the synchronous orbit, and to expedite the selection of suitable intervals for comparison of SMS/GOES data with observations on the ground and on other satellites, we have begun a catalog of low-frequency magnetic oscillations observed at the SMS/GOES locations. This report covers the period November 1974 through March 1975, and includes observations from the satellite SMS-1, which was located at 75° west geographic longitude. The starting date of the catalog was chosen for data-processing convenience. The next report will include initial observations from the satellite SMS-2, which was launched in February 1975, and was located at 115° west geographic longitude.

OBSERVATIONS AND ANALYSIS

The present catalog is similar to the catalog of wave activity at the satellite ATS-1 by Cummings et al. (1973).

Pulsation events are catalogued which display at least five continuous cycles and a frequency which is roughly constant. When different frequencies are present at the same time, each is identified as an event. Only pulsations with a peak amplitude of at least 3 gammas are included in the catalog. Pulsations observed during magnetospheric substorms are not included.

A given event will typically last several hours and may include intervals as long as one hour each when no waves are observed. Beginning and ending times are sometimes difficult to specify due to low pulsation amplitudes or irregularities in the wave form. When the beginning or ending time of the event marks the end or beginning of a data gap or a magnetic substorm, the abbreviations (D.G.) or (S.S.) will appear next to the corresponding event time. Periods of missing data greater than one hour are specifically catalogued.

Times are given in Universal Time. SMS-1 is stationed in the geographical equatorial plane at a geocentric distance of 6.6 earth radii and at 75° west geographic longitude. Thus, the Local Time of an observation may be found by subtracting 5 hours from the Universal Time.

The events are identified from 3-second-averaged microfilm data. The average period of the waves in each event is determined from at least five and usually ten peak-to-peak measurements of individual waves, spaced fairly evenly throughout the train. At least one wave is sampled from each hour of an event. The error associated with the average period is the standard deviation of the individual measurements of the period. This error is a measure of the variability of the period of selected waves rather than the uncertainty in determining these periods.

The average frequency is determined by inverting each individual wave-period measurement and then averaging these individual frequency measurements. The associated error is the standard deviation of the individual frequency measurements.

These average periods, frequencies, and errors are rounded off to the nearest whole unit, because of the uncertainties involved in selecting representative wave samples.

REFERENCES

- Cummings, W. D., F. Mason, and D. Lyons, Catalog of Low-Frequency Oscillations of the Earth's Magnetic Field as Observed at ATS-1 during April, 1968, Grambling College Preprint 39-73-1, 1973.
- Hughes, W. J., R. L. McPherron, and J. N. Barfield, Geomagnetic Pulsations Observed Simultaneously on Three Geostationary Satellites, JGR, in press, 1978.
- Troitskaya, V. A., and A. V. Gul'elmi, Geomagnetic Micropulsations and Diagnostics of the Magnetosphere, Space Sci. Rev., 7, 689, 1970.

TABLE I

Low Frequency Oscillations in the Earth's Magnetic Field

Observed at SMS-1 during November 1974

Day	Begin		End		Average Period	Average Frequency
	Hour/Min.(U.T.)	Day	Hour/Min.(U.T.)	Day	T (sec.)	f(Milli-Hz)
Nov 01	0213		0304		40 ± 5	25 ± 4
	1430		1820		61 ± 8	17 ± 2
	(D.G.)2225		2347		64 ± 14	16 ± 4
02	0127		0246		64 ± 8	16 ± 2
03	0935		1025		130 ± 6	8 ± 0
05	0916		1107		108 ± 5	9 ± 0
	2112		2326		102 ± 15	10 ± 2
	2336		2350		57 ± 5	18 ± 2
06	0210		0323		236 ± 42	4 ± 1
	0744		0805		160 ± 29	6 ± 1
	1707		0345		160 ± 24	6 ± 1
07	0551		0707		136 ± 17	8 ± 1
	1313		1355		67 ± 7	15 ± 2
	1846		2110		140 ± 24	7 ± 1
08	0026		0209		128 ± 18	8 ± 1
10	1700		2023		64 ± 9	16 ± 2
11	0830		0856		82 ± 6	12 ± 1
	1116		1132		140 ± 9	7 ± 0
12	0056		0129		215 ± 26	5 ± 1
	1010		1624		159 ± 21	6 ± 1
	1153		1956(S.S.)		33 ± 8	32 ± 9
13	0200-0357 missing					
	1212		1749		32 ± 4	32 ± 4
	1319		1334		132 ± 14	8 ± 1

	Begin	End	Average Period	Average Frequency
Day	Hour/Min.(U.T.)	Day Hour/Min.(U.T.)	T (sec.)	f(Milli-Hz)

Nov 14	0638	0840	75 ± 15	14 ± 3
	1121	1631	34 ± 5	30 ± 4
	1211	1607	194 ± 18	5 ± 0
	1648-1755 missing			
	2205	2346	90 ± 9	11 ± 1
15	0425	0448	88 ± 19	12 ± 3
(D.G.)	1030	1433	38 ± 5	26 ± 3
	1430	1612	72 ± 10	14 ± 2
	1952	2140	124 ± 11	8 ± 1
	2203	2301	66 ± 11	15 ± 3
16	1108	1154	250 ± 26	4 ± 0
	2043	2231	124 ± 14	8 ± 1
17	0029	0054	195 ± 25	5 ± 1
	1408	1645	56 ± 11	18 ± 4
	1801	1812	69 ± 10	15 ± 2
	1945	2021	138 ± 16	7 ± 1
19	0115	0132	110 ± 13	9 ± 1
	0459	0559	124 ± 25	8 ± 2
	0631	1004	64 ± 7	16 ± 2
	1251	1339	82 ± 8	12 ± 1
	1509	1557	100 ± 6	10 ± 1
	2040	2055	98 ± 16	10 ± 2
	2328	2337	77 ± 7	13 ± 1
20	0854	1149	170 ± 20	6 ± 1
	0904	0953	44 ± 6	23 ± 3
	1200	1709	42 ± 4	24 ± 2
	1900	2031	106 ± 12	10 ± 1
	2054	2307	51 ± 11	20 ± 4

Begin Day	Hour/Min.(U.T.)	End Day	Hour/Min.(U.T.)	Average Period	Average Frequency
				T (sec.)	f(Milli-Hz)
Nov 21	1102		1304	162 ± 19	6 ± 1
	1820		1939	52 ± 10	20 ± 4
	1933		1953	86 ± 19	12 ± 3
22	2206		0033	191 ± 52	6 ± 2
	1033		2135	42 ± 7	25 ± 4
	1109		1145	159 ± 20	6 ± 1
23	0308		0335	42 ± 5	24 ± 4
	1048	Nov. 24	0221	32 ± 5	32 ± 6
	1728		1756	73 ± 10	14 ± 2
24	1921		2255	74 ± 14	14 ± 3
	0438		1822(S.S.)	41 ± 8	25 ± 5
	0939		1437	176 ± 19	6 ± 1
25	1913		2049	82 ± 17	13 ± 2
	1948	Nov. 25	0137	32 ± 8	32 ± 8
	0357		0437(S.S.)	42 ± 5	24 ± 3
26	0812		1612	36 ± 4	29 ± 4
	1657		1807	100 ± 18	10 ± 2
	1953		2020	81 ± 10	12 ± 2
27	2124		2134	74 ± 8	14 ± 2
	2305	Nov. 26	0008	94 ± 12	11 ± 1
	0928		2105	35 ± 5	29 ± 4
28	1250		1308	52 ± 6	20 ± 2
	1854		1933	70 ± 9	14 ± 2
	1951		2013	146 ± 13	7 ± 1
29	2148	Nov. 27	0005	66 ± 4	15 ± 1
	0843		2110	36 ± 7	28 ± 5
	0519		0536	80 ± 6	13 ± 1
30	1337		1551	72 ± 8	14 ± 2
	1720		2001	187 ± 12	5 ± 0

TABLE 2

Low Frequency Oscillations in the Earth's Magnetic Field

Observed at SMS-1 during December 1974

Begin Day	Hour/Min.(U.T.)	End Day	Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
Dec 01	0918		1219	176 ± 18	6 ± 0
	1719		1815	161 ± 18	6 ± 1
	2135		2214	77 ± 11	13 ± 2
02	0537		0644	64 ± 6	16 ± 1
	0607		0956	1633 ± 200	1 ± 0
03	0215		0251	64 ± 16	16 ± 4
	1104		1244	176 ± 22	6 ± 1
04	1706		2311	44 ± 5	23 ± 2
08	2120		2326	93 ± 20	11 ± 2
09	0948		1146	171 ± 17	6 ± 1
	1303		1338	184 ± 17	6 ± 0
	1518		1634	41 ± 8	25 ± 5
	1822		1909	91 ± 20	12 ± 3
	2208	Dec. 10	0020	57 ± 12	18 ± 4
	0918		1543	36 ± 4	28 ± 3
10	1629		1914	132 ± 21	8 ± 1
	2037		2159	71 ± 10	14 ± 2
	0244		0307	44 ± 8	23 ± 4
	1013		1335	29 ± 6	36 ± 7
	1724		1939	43 ± 8	24 ± 4
11	1941		2048	228 ± 45	5 ± 1
	2112		2338	128 ± 17	8 ± 1
	0139		0149	114 ± 11	9 ± 1
	0420		0559	87 ± 11	12 ± 2
	0827		1831	32 ± 10	35 ± 12
	1641		2033	66 ± 9	15 ± 2

Begin		End		Average Period	Average Frequency
Day	Hour/Min.(U.T.)	Day	Hour/Min.(U.T.)	T (sec.)	f(Milli-Hz)
Dec 13	1800		1822	107 ± 27	10 ± 3
	2225	Dec 14	0056	41 ± 5	25 ± 3
14	1709		1800	58 ± 9	18 ± 3
	2004		2025	139 ± 21	7 ± 1
15	1825		1938	98 ± 8	10 ± 1
	2029		2250	59 ± 12	18 ± 4
16	1659		2036	148 ± 14	7 ± 1
	1844		1933	90 ± 14	11 ± 2
	2152		2359	84 ± 14	12 ± 2
17	0009		0050	110 ± 11	9 ± 1
	0121		0159	86 ± 8	12 ± 1
	0259		0757	46 ± 9	22 ± 4
	0955		1344	174 ± 14	6 ± 0
	1448		1520	96 ± 12	11 ± 1
	1938		2124	67 ± 12	15 ± 3
18	0013		0041	227 ± 34	4 ± 1
	0149		0513	49 ± 13	22 ± 7
	0739		0752	66 ± 13	16 ± 3
	1100		1948	43 ± 8	24 ± 5
	1200		1622	184 ± 35	6 ± 1
	1731		1746	63 ± 8	16 ± 2
	1908		1951	70 ± 14	15 ± 3
	2006		2139	28 ± 8	39 ± 13
2116		2249	88 ± 14	12 ± 2	
19	0331		0352	109 ± 16	9 ± 1
	0940	Dec. 20	0343	39 ± 7	26 ± 5
	1006		1450	166 ± 21	6 ± 1
	1755		1916	191 ± 33	5 ± 1
	1928		2152	72 ± 13	14 ± 2

Day	Begin	End Day	Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
	Hour/Min.(U.T.)				
Dec 20	0200		0340	119 ± 24	8 ± 2
	0922		2257	36 ± 7	29 ± 6
	1020		1422	140 ± 40	8 ± 2
21	2105		2145	80 ± 17	13 ± 3
	0232		0258	35 ± 5	29 ± 4
	0828		2339(S.S.)	40 ± 8	26 ± 5
22	1607		2034	108 ± 11	9 ± 1
	2141		2240	86 ± 9	12 ± 1
	2058		2155	72 ± 9	14 ± 2
23	0305		0452	49 ± 7	21 ± 3
24	0915		1637(D.G.)	34 ± 5	30 ± 4
	1733		2026	131 ± 20	8 ± 1
	2035		2203	86 ± 10	12 ± 2
25	1532		1651	66 ± 9	15 ± 2
	1909		1933	86 ± 9	12 ± 1
27	0345		0400	69 ± 11	15 ± 2
	0955		1300	150 ± 11	7 ± 0
	1426		2036	46 ± 5	22 ± 2
	2313		2323	92 ± 8	11 ± 1
28	2324		2343	54 ± 7	19 ± 3
	1035		2158	41 ± 9	26 ± 5
	1855		1947	72 ± 7	14 ± 1
29	1505		1955	78 ± 9	13 ± 1
30	0113		0138	98 ± 7	10 ± 1
	1550-1729 missing				
	2201		2220	129 ± 15	8 ± 1
31	1658		1713	24 ± 5	42 ± 8
	1713	Jan 01	0000(D.G.)	69 ± 17	15 ± 3

TABLE 3

Low Frequency Oscillations in the Earth's Magnetic Field

Observed at SMS-1 during January 1975

Day	Begin Hour/Min.(U.T.)	End Day Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
Jan 01	missing			
02	0159	0250	75 ± 7	13 ± 1
	1330-1510 missing			
	1830	2229	70 ± 8	14 ± 2
03	0135-0257 missing			
	0447-0557 missing			
	1718	2014	1190 ± 174	1 ± 0
04	0005	0105	105 ± 20	10 ± 2
	0757	0812	81 ± 11	12 ± 2
	0834	1028	43 ± 4	23 ± 2
	1002	1544	176 ± 18	6 ± 0
	2134	2150	84 ± 9	12 ± 1
	2305	2321	120 ± 8	8 ± 0
05	0908	1950	36 ± 3	28 ± 3
	0913	1337	135 ± 17	8 ± 1
06	0314	0328	47 ± 7	22 ± 3
	1127	1355	120 ± 6	8 ± 0
	1709	1719	73 ± 10	14 ± 2
	1711	1831	42 ± 7	24 ± 4
07	0112	0137	254 ± 17	4 ± 0
	0528	0608	58 ± 6	18 ± 2
	0751	1301	158 ± 18	6 ± 1
	0804	1805	38 ± 6	27 ± 4
	1458	2023	73 ± 7	14 ± 1
	2323	Jan 08 0059	233 ± 23	4 ± 0

Begin Day	Hour/Min.(U.T.)	End Day	Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
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Jan 08	0118		0332	91 ± 11	11 ± 1
	0726		1723	39 ± 4	26 ± 2
	0837		1547	176 ± 21	6 ± 1
	1858		2029	118 ± 20	9 ± 1
	2038	Jan 09	0150	45 ± 10	23 ± 4
09	0825		1933	36 ± 4	28 ± 3
	1503		1954	63 ± 11	16 ± 3
10	1621		2057	162 ± 21	6 ± 1
	1827		1912	78 ± 7	13 ± 1
12	1928		1946	158 ± 16	6 ± 1
13	0202		0222	64 ± 9	16 ± 2
	1115		1123	49 ± 4	20 ± 2
	1135		1454	232 ± 26	4 ± 0
	1456		1846	57 ± 5	18 ± 2
	2237		2318	183 ± 46	6 ± 1
14	0036		0056	171 ± 17	6 ± 1
	0835		1648	34 ± 5	30 ± 4
	0932		1312	130 ± 16	8 ± 1
	1730		1919	79 ± 11	13 ± 2
15	0755		1633	32 ± 4	31 ± 4
	1515		1740	64 ± 4	16 ± 1
	1748		1940	39 ± 4	26 ± 3
	1909	Jan 16	0044	66 ± 11	16 ± 2
	1944		2030	204 ± 21	5 ± 0
16	2111	Jan 16	0007	40 ± 10	26 ± 6
	0405		0429	54 ± 6	19 ± 2
	0802	Jan 17	0139	34 ± 4	30 ± 3
	1206		1414	130 ± 10	8 ± 1
	1638		1652	78 ± 5	13 ± 1
	1829		2149	68 ± 10	15 ± 2

Begin Day	Hour/Min.(U.T.)	End Day	Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
Jan 17	0530		0537	68 ± 4	15 ± 1
	1032		1235	132 ± 17	8 ± 1
	1050		2054	35 ± 4	29 ± 3
	1553		1609	146 ± 17	7 ± 1
	1934		1943	66 ± 7	15 ± 1
18	1234		1539	112 ± 10	9 ± 1
	1718		2113	56 ± 9	18 ± 3
	2136		2258	94 ± 11	11 ± 1
19	2351	Jan 20	0021	92 ± 7	11 ± 1
20	1943		2230	127 ± 24	8 ± 2
21	1440		1734	104 ± 16	10 ± 1
	2009	Jan 22	0104	94 ± 9	11 ± 1
22	0540		0646	83 ± 9	12 ± 1
	1639		2231	102 ± 7	10 ± 1
23	2040		2123	102 ± 18	10 ± 2
24	0115		0139	145 ± 24	7 ± 1
	1334		1350	155 ± 7	6 ± 0
25	1720		1935	92 ± 6	11 ± 1
	1918		2256	174 ± 25	6 ± 1
27	0217		0354	88 ± 6	11 ± 1
	1259		1326	189 ± 17	5 ± 0
	1953		2332	119 ± 22	9 ± 1
28	0715		0829	112 ± 8	9 ± 1
29	0124		0207	69 ± 7	15 ± 1
	1031		1237	134 ± 7	8 ± 0
	1436		1707	62 ± 5	16 ± 2
30	2231	Jan 31	0013	68 ± 8	15 ± 2
31	1100		1253	138 ± 10	7 ± 0
	1821		2333	118 ± 25	9 ± 2

TABLE 4

Low Frequency Oscillations in the Earth's Magnetic Field
Observed at SMS-1 during February 1975

Begin Day	Hour/Min.(U.T.)	End Day	Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
Feb 01	0724		1358	152 ± 23	7 ± 1
	0901	Feb 02	0522	31 ± 3	32 ± 3
	1959		2141	136 ± 32	8 ± 2
	2326		2344	181 ± 16	6 ± 0
02	0823		1835	32 ± 2	32 ± 2
	1006		1050	125 ± 18	8 ± 1
	2028		2121	46 ± 6	22 ± 2
	2234		2247	48 ± 10	22 ± 4
03	0913		1636	30 ± 2	33 ± 2
	1701		2017(D.G.)	66 ± 10	16 ± 2
	2050-2223 missing				
04	0850		1847	30 ± 3	33 ± 3
	1237		1444	364 ± 21	3 ± 0
	1237		1524	142 ± 15	7 ± 1
	1532		1715	56 ± 7	18 ± 2
	2105	Feb 05	0056	101 ± 28	11 ± 3
05	0225		0258	114 ± 16	9 ± 1
	0722		2236	36 ± 3	28 ± 2
	1023		1533	148 ± 13	7 ± 1
	1933		2208	118 ± 21	9 ± 2
	2317	Feb 06	0116	70 ± 8	14 ± 2
06	0926		2228	33 ± 5	31 ± 5
07	0144-0518 missing				
	0652-0917 missing				
	1642-1749 missing				
08	0602		0639(D.G.)	168 ± 22	6 ± 1
	(D.G.) 0802		0856	160 ± 17	6 ± 1

Begin Day	Hour/Min.(U.T.)	End Day	Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
Feb 09	0152		0349	151 ± 21	7 ± 1
	2001		2140(D.G.)	191 ± 16	5 ± 0
	2140-2359 missing				
10	0000-1710 missing				
	(D.G.)1710		1758(D.G.)	46 ± 8	22 ± 4
	1758-2221 missing				
11	0253		0622	52 ± 6	19 ± 2
	0910		1558	141 ± 13	7 ± 1
	2048		2147	238 ± 29	4 ± 0
	2151	Feb 12	0056	38 ± 3	26 ± 3
12	0012		0135	132 ± 25	8 ± 1
	0308		0358	122 ± 19	8 ± 1
	0902		1553	143 ± 19	7 ± 1
	0925	Feb 13	0314	33 ± 3	30 ± 3
	1908		2158	206 ± 29	5 ± 1
13	0605		0642	99 ± 10	10 ± 1
	0840	Feb 14	0357	30 ± 5	34 ± 5
	1201		1428	150 ± 16	7 ± 1
	1900		2253	68 ± 6	15 ± 1
	2017		2129	50 ± 7	20 ± 3
	2310	Feb 14	0526	44 ± 6	23 ± 3
14	0927		1641	33 ± 5	31 ± 5
	1723		1958	164 ± 18	6 ± 1
	2128		2226	48 ± 4	21 ± 2
15	0404		0440	94 ± 10	11 ± 1
	0741		0812	60 ± 8	17 ± 2
	0946		2024	31 ± 3	33 ± 2
	1828		2127	60 ± 5	17 ± 1
	2128		2200	81 ± 5	12 ± 1
16	0711		1230	137 ± 11	7 ± 1
	0804		2340	36 ± 4	28 ± 2
	1717		2159	59 ± 8	17 ± 2
	1756		1919	322 ± 24	3 ± 0
	1944		2141	113 ± 6	9 ± 0

Day	Begin	Day	End	Average Period		Average Frequency
	Hour/Min.(U.T.)		Day	Hour/Min.(U.T.)	T (sec.)	f(Milli-Hz)
Feb 17	0935		1351	134 ± 9	7 ± 0	
	1110		2350	36 ± 4	28 ± 3	
18	0221		0243	96 ± 12	11 ± 1	
	1303		1956	34 ± 3	30 ± 3	
19	0036-0257 missing					
	1143		2237	37 ± 4	28 ± 3	
20	1523		1918	88 ± 6	11 ± 1	
21	1257		1342	34 ± 4	29 ± 3	
	1711		1840	75 ± 19	14 ± 3	
	2004-2145 missing					
22	1756		2157	108 ± 8	9 ± 1	
23	1209		1258	271 ± 24	4 ± 0	
	1624		1859	152 ± 19	7 ± 1	
24	2226	Feb 24	0018	140 ± 21	7 ± 1	
	0324		0531	93 ± 15	11 ± 2	
	0825	Feb 25	0146	33 ± 4	31 ± 3	
	1035		1731	158 ± 12	6 ± 0	
	1821		2023	299 ± 16	3 ± 0	
	1912		1957	62 ± 9	16 ± 2	
25	2241	Feb 25	0130	64 ± 10	16 ± 3	
	0427		0451	96 ± 11	10 ± 1	
	1020	Feb 26	0338	34 ± 4	30 ± 3	
	1824		1844	175 ± 22	6 ± 1	
26	1925	Feb 26	0050	138 ± 13	7 ± 1	
	0005		0016	113 ± 19	9 ± 1	
	0902		1604	30 ± 3	34 ± 4	
27	0458		0612	60 ± 9	17 ± 2	
	1807		1833	44 ± 4	23 ± 2	
28	1527	Mar 1	0028	22 ± 3	48 ± 8	
	2113		2127	139 ± 17	7 ± 1	
	2148	Mar 1	0103	86 ± 7	12 ± 1	

TABLE 5

Low Frequency Oscillations in the Earth's Magnetic Field

Observed at SMS-1 during March 1975

Day	Begin	End Day	Average Period T (sec.)	Average Frequency f(Milli-Hz)
	Hour/Min.(U.T.)			
Mar 01	0104	0138	53 ± 8	19 ± 3
	0911	1324	174 ± 11	6 ± 0
	0936	1956	46 ± 5	22 ± 2
	1138	1232	30 ± 2	33 ± 2
02	1045	1848	34 ± 3	30 ± 3
	2132	2308	53 ± 8	19 ± 3
03	1128	1729	34 ± 3	30 ± 3
	1247	1335	132 ± 11	8 ± 0
	1820	2036	94 ± 10	11 ± 1
	2236	Mar 04 0033	68 ± 8	15 ± 2
04	0209	0218	94 ± 12	11 ± 2
	0500	0523	212 ± 24	5 ± 0
	1502	1717	36 ± 2	28 ± 2
	2351	Mar 05 0052	56 ± 6	18 ± 2
05	0221	0237	118 ± 14	8 ± 1
	1200	1833	35 ± 5	29 ± 4
	1211	1230	140 ± 6	7 ± 0
	1944	2309	113 ± 12	9 ± 1
06	1128	1304	113 ± 10	9 ± 1
	1313	1545	30 ± 4	33 ± 4
	1739	1950	57 ± 9	18 ± 3
	2009	2156	98 ± 14	10 ± 2
07	1334	2142	70 ± 7	14 ± 1
09	0415-0602 missing			
	1652-1804 missing			
10	0410-0607 missing			
	1020	1047	208 ± 21	5 ± 0

Day	Begin Hour/Min.(U.T.)	End Day Hour/Min.(U.T.)	Average Period T (sec.)	Average Frequency f(Milli-Hz)
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Mar 10	1912-14/0000	missing		
14	0215	0248	42 ± 5	24 ± 3
	0415-0606	missing		
	1423	1512(D.G.)	30 ± 0	33 ± 0
	1700-1808	missing		
	1902	1933	98 ± 14	10 ± 1
	1937-2219	missing		
15	0009	0055	41 ± 4	25 ± 2
	0415-0608	missing		
	1016	1942	34 ± 3	30 ± 3
	1952	2148	60 ± 4	16 ± 1
16	0135	0158	79 ± 7	13 ± 1
	0415-0548	missing		
	1932	2316	71 ± 8	14 ± 2
17	0415-0606	missing		
	1426-21/2217	missing		
22	0426-0610	missing		
	1700-1908	missing		
23	0400-0551	missing		
	1738-1839	missing		
	2327	Mar 24 0049	69 ± 6	14 ± 1
24	0415-0606	missing		
	0846	1111	158 ± 22	6 ± 1
	1652-1853	missing		
	1902	1950(D.G.)	138 ± 18	7 ± 1
	2104	2151	106 ± 16	10 ± 1
25	0400-1119	missing		

Begin	End	Average Period	Average Frequency
Day Hour/Min.(U.T.)	Day Hour/Min.(U.T.)	T (sec.)	f(Milli-Hz)

Mar 26	0415-0628 missing			
	0732	0956	130 ± 12	8 ± 1
	1603-1718 missing			
	1729	2024	50 ± 4	20 ± 1
	2038	2051	67 ± 8	15 ± 2
	2213	2313	142 ± 18	7 ± 1
27	0415-1100 missing			
	(D.G.)1102	1453	102 ± 6	10 ± 1
	2233	2258	63 ± 7	16 ± 2
28	0415-0603 missing			
	0704	1430	136 ± 9	7 ± 0
	1641-2006 missing			
	2102	2144	116 ± 14	9 ± 1
29	0415-0602 missing			
	1920	2118	42 ± 4	24 ± 2
	2147	2302	114 ± 15	9 ± 1
30	0028	0034	64 ± 4	16 ± 1
	0415-1134 missing			
31	0420-0558 missing			