87-100A-03B

SOLAR MESOSPHERE EXPLORER
INFRARED RADIANCE DATA

1981-1987

In the normal data mode the spectrometer samples data at two wavelengths, 1.27 micrometers and 1.87 micrometers. The limb altitude radiance profiles with identifying data are on the tapes. See Thomas et al., 1984 for more informaton.

Dr. C. A. Barth is the principal investigator for the SME experiment. Co-investigators Drs. R. J. Thomas, D. W. Rusch, G. E. Thomas, R. W. Sanders, and G. J. Rottman are resident at the laboratory for Atmospheric and Space Physics at the University of Colorado, Boulder, Colorado 80309.

The radiance data from the near infrared spectrometer is written in standard ASCII labeled format with one orbit per file. Each orbit consists of 20 to 60 (approximate range) merged spin sets. Filenames are of the format RMxxxxx.NSS, where xxxxx is the orbit number. The data set consists of 52 tapes containing radiance data from Day 350, 1981 through Day 280, 1983. The following is a listing of tapes and orbit intervals contained on tapes:

Tape Label	Orbit Interval	No. Orbits on Tape
AG0001	1074 - 1952	300
AG0002	1953 - 2693	306
AG0003	2701 - 3399	301
AG0004	3403 - 4055	306
AG0005	4065 - 4675	308
AG0006	4676 - 5189	300
AG0007	5190 - 5750	300
AG0008	5751 - 6286	303
AG0009	6294 - 6832	314
AG0010	6835 - 7377	308
AG0011	7379 - 7914	314
AG0012	7921 - 8459	307
AG0013	8466 - 9004	314
AG0014	9007 - 9543	295
AG0015	9950 - 10091	281
AG0016	10095 - 10629	278
AG0017	10637 - 11066	213
AG0018	10900 - 11698	329
AG0019	11699 - 12455	339
AG0020	12456 - 13001	254
AG0021	13006 - 13306	144
AG0022	13309 - 13608	137
AG0023	13612 - 14010	184
AG0024	14017 - 14418	189
AG0025	14426 - 14823	183
AG0026	14826 - 15117	136
AG0027	15124 - 15520	185
AG0028	15524 - 15921	184
AG0029	15928 - 16502	255
AG0030	16515 - 17399	313

Tape Label	Orbit Interval	No. Orbits on Tape
AG0031	17404 - 18193	296
AG0032	18200 - 18799	298
AG0033	18800 - 19299	336
AG0034	19300 - 19899	379
AG0035	19900 - 20296	318
AG0036	20300 - 20797	325
AG0037	20800 - 21198	316
AG0038	21202 - 21599	311
AG0039	21600 - 22051	346
AG0052	22052 - 22499	311 ** Tape is out of sequential order
AG0040	22502 - 23095	408
AG0041	23102 - 23699	411
AG0042	23700 - 24096	296
AG0043	24100 - 24499	297
AG0044	24500 - 24977	395
AG0045	25000 - 25493	370
AG0046	25500 - 25941	310
AG0047	26000 - 26499	310
AG0048	26500 - 26999	341
AG0049	27000 - 27499	441
AG0050	27500 - 27999	382
AG0051	28000 - 28813	290

The first step in the analysis of the raw science data from the near infrared spectrometer is to merge the spins, data collection rotations of the SME satellite, into groups of 1 to 6 spins. The data consists of long (1.87 micron) and short (1.27 micron) channel radiances and information to identify merged spin set position. The ASCII format of a merged spin set follows:

Format	Description
1X,I3,1X	Julian Day
32(E9.2,1X)	Long channel radiances (wavelength = 1.87 μ, units = MR)
32(E9.2,1X)	Short channel radiances (wavelength = 1.27 μ, units = MR)
F7.1	Seconds into day (GMT)
1X,F8.3	Latitude of merged spin set
1X,F8.3	Longitude of merged spin set
1X,F5.0	Highest altitude (106 km)
1X,F3.0	Number of spins in merged set (1-6)
1X,F3.0	Sampling limb (+1 leading, -1 trailing)
1X,F5.0	Chronological order in orbit of last spin merged into set

The physical characteristics of the tapes are:

Density	1600 bytes per inch
Tracks	9
Blocksize	796 bytes
Label	AGxxxx, where xxxx is the tape # in the series.

SME REFERENCES

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LABORATORY FOR ATMOSPHERIC AND SPACE PHYSICS

SOLAR MESOSPHERE EXPLORER

AIRGLOW SPECTROMETER RADIANCE DATA FOR THE

NATIONAL SPACE SCIENCE DATA CENTER

APPENDIX

Each of the enclosed tapes has the following characteristics:

1. 9-track, 1600 bpi. Written on a Digital TU77 drive.

2. ANSI STANDARD tape headers and End-of-File (EOF) structure (7-bit ASCII characters) as per VAX 11/780 system software. After the Volume Header record (80 bytes), there are four File Header records (80 bytes each), one EOF, the data records (796 bytes each), one EOF, four File Trailer records (80 bytes each), and one EOF for each of the data files on this tape.

3. Physical data blocks are 796 bytes long; each block contains one logical record. If the logical record is less than 796 bytes long, a hexidecimal value of 5E is used as fill from the end of the logical record to the end of the physical record.

4. The VAX writes bytes onto a 9-track tape in the following order:

Vax word	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Vax tape	‹----------							----------›	‹----------							----------›
Word written	2nd								1st							

The resulting tape (up is the tape beginning direction)

8	9	10	11	12	13	14	15	Word part 2
0	1	2	3	4	5	6	7	Word part 1

5. An annotated dump is attached which shows the contents of the first eight physical blocks. The left side of the dump shows the hexidecimal word (read from right to left) and the right side of the dump shows the ASCII equivalent word contents (read from left to right). The last column on the right is the hexidecimal 4-byte word number for the rightmost four bytes in the hexidecimal dump section.

```
Dump of   vice MTA2: on 21-OCT-1986 22:26:49.77

Block number 1 (00000001), 80 (0050) bytes

 20202020 20202020 20202020 20202020 20202020 20203033 30304741 31404F56 VOL1AG0030                      000000
 20202020 20202020 20202020 20202020 20202020 20202020 20202020 20202020                               000020
                                     33202020 20202020 20202020 20202020                 3.............. 000040


Dump of device MTA2: on 21-OCT-1986 22:26:49.77

Block number 2 (00000002), 80 (0050) bytes

 30313030 30303030 30474120 20202020 30535345 25304155 36314052 31524448 HDR1RM16515.NSS      AG003000010 000000
 46434544 30303030 20202030 30303030 20303032 36332030 30313030 30313030 001000100 86288 00000 000000DECF 000020
                                     20202020 20202020 20204131 31454C49 ILE11A          .............. 000040


Dump of device MTA2: on 21-OCT-1986 22:26:49.77

Block number 3 (00000003), 80 (0050) bytes

 20202020 20202020 20202020 20202020 20303037 30303639 37303046 32524448 HDR2F0079600700                 000000
 20202020 20202020 20202020 30302020 20202020 20202020 20202041 20202020      A             00         000020
                                     20202020 20202020 20202020 20202020                 .............. 000040


Dump of device MTA2: on 21-OCT-1986 22:26:49.77

Block number 4 (00000004), 80 (0050) bytes

 30303030 30303030 31303030 30303030 30303030 31303130 43423230 33524448 HDR3028C0101000000000000100000000 000000
 30303030 30303030 30303030 30303030 30303030 43423230 30303030 30303030 0000000002BC000000000000000000000 000020
                                     20202020 20202020 20202020 30303030 0000            .............. 000040


Dump of device MTA2: on 21-OCT-1986 22:26:49.77

Block number 5 (00000005), 80 (0050) bytes

 20202020 20202020 20202020 20202020 20303020 20202020 20202020 34524448 HDR4                           000000
 20202020 20202020 20202020 20202020 20202020 20202020 20202020 20202020                               000020
                                     20202020 20202020 20202030 30202020    00           .............. 000040

        ***  End of file  ***
```

Dump of vice MTA2: on 21-OCT-1986 22:26:49.77

Block number 6 (00000006), 796 (031C) bytes

```
28453835 2E332020 30302E45 35372E33 20203030 28453936 2E352020 35373220   275  5.69E+00  3.75E+00  3.58E+ 000000
30302E45 36322E37 20203130 28453930 28312020 30302E45 36302E35 20203030 00  5.06E+00  1.03E+01  7.26E+00 000020
20203030 28453634 2E352020 30302E45 34392E36 20203030 28453839 2E342020   4.98E+00  6.94E+00  8.46E+00   000040
2E352020 30302E45 34312E35 20203030 28453837 2E352020 30302E45 39382E36 5.89E+00  6.70E+00  5.14E+00  5. 000060
35332E35 20203030 28453835 2E342020 30302E45 35302E35 20203030 28453732 27E+00  5.03E+00  8.58E+00  5.35 000080
28453837 2E352020 30302E45 30352E38 20203030 28453839 2E352020 30302E45 E+00  6.86E+00  8.50E+00  5.76E+ 0000A0
30302E45 37332E34 20203030 28453837 2E342020 30302E45 33362E37 20203030 00  7.63E+00  4.74E+00  4.37E+00 0000C0
20203030 28453631 2E352020 30302E45 31362E39 20203030 28453238 2E372020   7.82E+00  9.61E+00  5.16E+00   0000E0
2E322020 30302E45 30302E32 20205230 28457839 2E352020 31302E45 31362E34 4.61E+01  5.98E+02 -2.00E+00 -2. 000100
30302E32 20203030 28453030 2E322020 30302E45 30302E32 20203030 28453030 00E+00 -2.00E+00 -2.00E+00 -2.00 000120
28453535 2E342020 30302E45 31302E34 20203130 28453239 2E352020 30302E45 E+00  5.92E-01  4.01E+00  4.55E+ 000140
31302E45 34352E32 20203130 28453136 2E312020 31302E45 35312E31 20203030 00  1.15E+01  1.61E+01  2.54E+01 000160
20203130 28453739 2E342020 31302E45 35332E33 20203130 28453935 2E332020   3.58E+01  3.95E+01  4.97E+01   000180
2E312020 32302E45 32302E31 20203130 28453835 2E372020 31302E45 36332E36 6.36E+01  7.58E+01  1.02E+02  1. 0001A0
34332E32 20203230 28453931 2E322020 32302E45 30332E31 20203230 28453534 45E+02  1.80E+02  2.19E+02  2.34 0001C0
28453432 2E312020 32302E45 30372E31 20203230 28453431 2E322020 32302E45 E+02  2.14E+02  1.70E+02  1.24E+ 0001E0
31302E45 31342E34 20203130 28453633 2E362020 31302E45 34312E39 20203230 02  9.14E+01  6.36E+01  4.41E+01 000200
20203130 28453737 2E322020 31302E45 37352E34 20203130 28453031 2E342020   4.10E+01  4.57E+01  2.77E+01   000220
2E322020 30302E45 30302E32 20203330 28453332 2E322020 32302E45 34362E36 6.64E+02  2.23E+03 -2.00E+00 -2. 000240
30302E32 20203030 28453030 2E322020 30302E45 30302E32 20203030 28453030 00E+00 -2.00E+00 -2.00E+00 -2.00 000260
20203030 352E3120 20202033 30362E35 38202020 362E3531 31303120 30302E45 E+00 10115.6  -85.603    1.508   000280
5E5E5E5E 202E3531 20202020 31202020 32202034 32382E39 38202020 2E363031 106.   89.824  2.  1.   15. ^^^^ 0002A0
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E52 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0002C0
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0002E0
         5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^.... 000300
```

Dump of device MTA2: on 21-OCT-1986 22:26:49.77

Block number 7 (00000007), 796 (031C) bytes

```
28453433 2E342020 30302E45 33322E35 20203030 28453233 2E362020 35373220   275  6.32E+00  5.23E+00  4.34E+ 000000
30302E45 37302E35 20203030 28453833 28362020 30302E45 38352E35 20203030 00  5.58E+00  6.38E+00  5.07E+00 000020
20203030 28453234 2E352020 30302E45 33322E33 20203030 28453135 2E362020   6.51E+00  3.23E+00  5.42E+00   000040
2E362020 30302E45 37382E33 20203030 28453633 2E372020 30302E45 35322E34 4.25E+00  7.36E+00  3.87E+00  6. 000060
37332E37 20203030 28453734 2E352020 30302E45 35302E36 20203030 28453438 84E+00  6.05E+00  5.47E+00  7.37 000080
28453430 2E342020 30302E45 36342E35 20203030 28453038 20352020 30302E45 E+00  5.80E+00  5.46E+00  4.04E+ 0000A0
30302E45 36382E34 20203020 28453337 2E352020 30302E45 39332E35 20203030 00  5.39E+00  5.73E+00  4.86E+00 0000C0
20203030 28453033 2E332020 30302E45 36362E37 20203030 28453731 2E332020   8.17E+00  7.86E+00  8.30E+00   0000E0
2E362020 30302E45 30302E36 20203030 28453030 2E362020 31302E45 30362E35 5.60E+01 -6.00E+00 -6.00E+00 -6. 000100
30302E36 20203030 28453030 2E362020 30302E45 30302E36 20203030 28453030 00E+00 -6.00E+00 -6.00E+00 -6.00 000120
28453535 2E342020 30302E45 31312E33 20203030 28453934 2E322020 30302E45 E+00  2.49E+00  3.11E+00  4.55E+ 000140
31302E45 36352E32 20203130 28453634 2E312020 30302E45 38392E37 20203030 00  7.98E+00  1.46E+01  2.56E+01 000160
20203130 28453336 2E352020 31302E45 35342E34 20203130 28453136 2E332020   3.61E+01  4.35E+01  5.63E+01   000180
2E312020 32302E45 34322E31 20203130 28453136 2E392020 31302E45 37352E37 7.57E+01  9.51E+01  1.24E+02  1. 0001A0
39302E33 20203230 28453737 2E322020 32302E45 36322E32 20203230 28453037 70E+02  2.26E+02  2.77E+02  3.09 0001C0
28453039 2E312020 32302E45 33352E32 20203230 28453330 2E332020 32302E45 E+02  3.03E+02  2.53E+02  1.98E+ 0001E0
31302E45 32312E39 20203230 28453431 2E312020 32302E45 32352E31 20203230 02  1.52E+02  1.14E+02  9.12E+01 000200
20203130 28453035 2E372020 31302E45 35362E37 20203130 28453337 2E372020   7.73E+01  7.63E+01  7.50E+01   000220
2E362020 30302E45 30302E36 20203030 28453030 2E362020 32302E45 34342E35 5.44E+02 -6.00E+00 -6.00E+00 -6. 000240
30302E36 20203030 28453030 28362020 30302E45 30302E36 20203030 28453030 00E+00 -6.00E+00 -6.00E+00 -6.00 000260
20203134 352E3239 20202033 32352E39 38202020 302E3730 31303120 30302E45 E+00 10187.6  -89.323  -92.841   000280
5E5E5E5E 202E3531 20202020 31202020 36202033 33322E37 38202020 2E363031 106.   87.233  6.  1.   16. ^^^^ 0002A0
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0002C0
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0002E0
         5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^.... 000300
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```
Dump of device MTA2: on 21-OCT-1990 22:16:44.77

Block number 3 (00000003), 784 (0310) bytes

 28453631 2E352020 30302B45 34342E30 20203030 28453332 2E332020 35373220  275  3.25E+00  3.94E+00  5.15E+ 000000
 30302B45 36362E35 20203030 28453031 2E342020 30302B45 39332E34 20203030 00  4.89E+00  4.10E+00  5.88E+00 000020
 20203030 28453033 2E342020 30302B45 30322E35 20203030 28453337 2E342020   4.73E+00  5.20E+00  5.30E+00   000040
 2E332020 30302B45 32372E33 20203030 28453736 2E342020 30302B45 33382E36 6.83E+00  4.67E+00  3.72E+00  3. 000060
 35322E35 20203030 28453836 2E342020 30302B45 31342E34 20203030 28453636 66E+00  4.41E+00  4.68E+00  5.25 000080
 28453434 2E352020 30302B45 36342E35 20203030 28453434 2E352020 30302B45 E+00  5.44E+00  5.48E+00  5.44E+ 0000A0
 30302B45 35332E37 20203030 28453730 2E352020 30302B45 35352E35 20203030 00  5.55E+00  5.07E+00  7.35E+00 0000C0
 20203030 28453732 2E352020 30302B45 32362E38 20203030 28453638 2E372020   7.86E+00  8.62E+00  5.27E+00 - 0000E0
 2E362D20 30302B45 30302E36 20203030 28453030 2E362D20 30302B45 30302E36 6.00E+00 -6.00E+00 -6.00E+00 -6. 000100
 30302E36 2D203030 28453030 2E362D20 30302B45 30302E36 2D203030 28453030 00E+00 -6.00E+00 -6.00E+00 -6.00 000120
 28453235 2E342020 30302B45 33352E35 20203030 28453335 2E342020 30302B45 E+00  4.53E+00  5.53E+00  4.52E+ 000140
 31302B45 34392E32 20203130 28453735 2E312020 30302B45 31392E36 20203030 00  6.91E+00  1.57E+01  2.94E+01 000160
 20203130 2D453937 2E362020 31302B45 35352E34 20203130 28453238 2E332020   3.82E+01  4.53E+01  6.79E+01   000180
 2E322020 32302B45 38342E31 20203230 28453631 2E312020 31302B45 37342E39 9.47E+01  1.16E+02  1.48E+02  2. 0001A0
 30392E33 20203230 28453533 2E332020 32302B45 39362E32 20203230 28453430 04E+02  2.69E+02  3.35E+02  3.90 0001C0
 28453338 2E322020 32302B45 36352E33 20203230 28453530 2E342020 32302B45 E+02  4.05E+02  3.56E+02  2.83E+ 0001E0
 32302B45 30352E31 20203230 28453238 2E312020 32302B45 35322E32 20203230 02  2.25E+02  1.82E+02  1.50E+02 000200
 2D203230 28453134 2E312020 32302B45 31332E31 20203230 28453433 2E312020   1.34E+02  1.31E+02  1.41E+02 - 000220
 2E362D20 30302B45 30302E36 2D203030 28453030 2E362D20 30302B45 30302E36 6.00E+00 -6.00E+00 -6.00E+00 -6. 000240
 30302E36 2D203030 28453030 2E362D20 30302B45 30302E36 2D203030 28453030 00E+00 -6.00E+00 -6.00E+00 -6.00 000260
 20203031 342E3236 31302B33 30332E35 38202020 362E3935 32303120 30302B45 E+00 10259.6  -85.303 -162.410   000280
 5E5E5E5E 202E3731 20202020 31202020 36202030 35362E34 38202020 2E363031 106.   84.650  6.  1.   17. ^^^^ 0002A0
 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0002C0
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          5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^.... 000300
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