Dec '88

LABORATORY FOR ATMOSPHERIC AND SPACE PHYSICS
SOLAR MESOSPHERE EXPLORER
PROCESSED ORBIT DATA FOR THE
NATIONAL SPACE SCIENCE DATA CENTER
1981-1986 DATA

The SOLAR MESOSPHERE EXPLORER (SME) orbit data consists of ozone mixing ratios measured by two instruments. A description of the mission, the instruments, the scientific objectives, and the initial results is contained in a series of articles in the April 1983 issue of Geophysical Research Letters. In JGR in 1984 there are more comprehensive papers on the instruments and data analysis.

The ozone mixing ratios in parts per million by volume from the near infrared spectrometer are given on pressure surfaces from about 50 to 90 km between 85 degrees North and 85 degrees South at each 5 degrees. The analysis is described in "Thomas et. al., 1983, 1984".

The ozone mixing ratios in parts per million by volume from the ultraviolet spectrometer are given in pressure levels from 1.0 to 0.1 mb from 85 degrees South to 85 degrees North in 5 degree latitude intervals (see "Rusch et. al., 1983, 1984").

The previous SME ozone data (both UV and IR) contain slow steady drifts. We believe these drifts were due to a slow small sensivity drift in the UV spectrometer. This has now been corrected, and we expect that the long term behavior is now meaningful.

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

Orbit ozone mixing ratio data for the entire SME mission is contained on six tapes. The contents of these tapes, labeled ORB001 through ORB006, is shown in the following table.

SME OZONE MIXING RATIO DATA, 1981 - 1986

TAPE	FILE	NO.BLOCKS	CONTENTS
ORB001	AOZORB1.DAT	6365	Airglow ozone, 12/15/81 - 12/31/82
	UVOZORB1.DAT	2914	UV ozone, 12/15/81 - 12/31/82
ORB002	AOZORB2.DAT	5300	Airglow ozone, 1/ 1/83 - 12/31/83
	UVOZORB2.DAT	2404	UV ozone, 1/ 1/83 - 12/31/83
ORB003	AOZORB3.DAT	5000	Airglow ozone, 1/ 1/84 - 12/31/84
	UVOZORB3.DAT	2255	UV ozone, 1/ 1/84 - 12/31/84
ORB004	AOZORB4.DAT	7075	Airglow ozone, 1/ 1/85 - 12/31/85
	UVOZORB4.DAT	3254	UV ozone 1/ 1/85 - 12/31/85
ORB005	AOZORB5.DAT	10235	Airglow ozone, 1/ 1/86 - 12/18/86
ORB006	UVOZORB5.DAT	4654	UV ozone, 1/ 1/86 - 12/18/86

Detailed data record formats for the two files on the first tape, ORB001, are described in the following two tables.

Description of AOZORB1.DAT, airglow ozone mixing ratios in parts per million by volume. The pressure in mb for each record is found by log(pressure) = I*(-0.125) where I goes from 1 to 22. No data is indicated by -1.

Record	Format	Description
DATE: 1981 DAY 349		
1	3I5,F10.2	Orbit, Year, Day, Equatorial Long.
2	35E10.3	For pressure = 0.74989 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
3	35E10.3	For pressure = 0.56234 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
4	35E10.3	For pressure = 0.42170 mb
...		...
23	35E10.3	For pressure = 0.00178 mb
24	35F7.2	Longitudes
25	35F7.2	Solar zenith angles
26	35F9.2	Seconds of day
27	35F6.2	Roll angles
DATE: 1981 DAY 350		
28	3I5,F10.2	Orbit, Year, Day, Equatorial Long.
29	35E10.3	For pressure = 0.74989 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
30	35E10.3	For pressure = 0.56234 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
31	35E10.3	For pressure = 0.42170 mb
...		...
50	35E10.3	For pressure = 0.00178 mb
51	35F7.2	Longitudes
52	35F7.2	Solar zenith angles
53	35F9.2	Seconds of day
54	35F6.2	Roll angles

etc., for dates 1981 DAY 349 through 1982 DAY 365 for which we have data.

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Description of UVOZORB1.DAT, UV ozone mixing ratios in parts per million by volume. The pressure in mb for each record is found by log(pressure) = I*(-0.125) where I goes from 0 to 8. No data is indicated by -1.

Record	Format	Description
DATE: 1981 DAY 349		
1	3I5,F10.2	Orbit, Year, Day, Equatorial Long.
2	35E10.3	For pressure = 1.0 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
3	35E10.3	For pressure = 0.74989 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
4	35E10.3	For pressure = 0.56234 mb ...
10	35E10.3	For pressure = 0.1 mb
11	35F7.2	Longitudes
12	35F7.2	Solar zenith angles
13	35F9.2	Seconds of day
14	35F6.2	Roll angles
DATE: 1981 DAY 350		
15	3I5,F10.2	Orbit, Year, Day, Equatorial Long.
16	35E10.3	For pressure = 1.0 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
17	35E10.3	For pressure = 0.74989 mb Field 1: Latitude = -85. Field 2: Latitude = -80. ... Field N: Latitude = (N-18)*5. ... Field 35:Latitude = 85.
18	35E10.3	For pressure = 0.56234 mb ...
24	35E10.3	For pressure = 0.1 mb
25	35F7.2	Longitudes
26	35F7.2	Solar zenith angles
27	35F9.2	Seconds of day
28	35F6.2	Roll angles

etc., for dates 1981 DAY 349 through 1982 DAY 365 for which we have data.

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APPENDIX

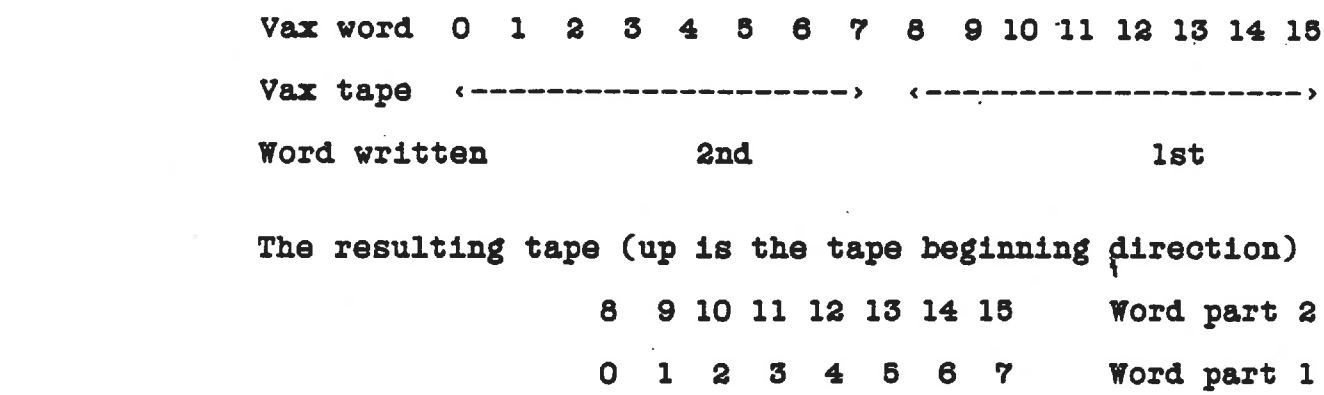
Each of the enclosed tapes has the following characteristics:

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 (2048 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 2048 bytes long; data files are 7-bit ASCII records containing a four byte "control" word followed by the ASCII bytes. The control word contains the logical record length as a right-justified ASCII number. The length refers to the total number of bytes and includes the 4-byte control word. Logical records are blocked into physical records and a hexidecimal value of 5E is used as fill from the end of the last logical record to the end of the physical record.

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



5. An annotated dump is attached which shows the contents of the first six 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.

SME REFERENCES

Barth, C.A., R.W. Sanders, G.E. Thomas, G.J. Rottman, D.W. Rusch, R.J. Thomas, G.H. Mount, G.M. Lawrence, J.M. Zawodny, R.A. West and J. London, Solar Mesosphere Explorer Measurements of the El Chicon Volcanic Cloud, Bull. Amer. Meteor. Soc. 63, 1314, 1982.

Barth, C.A., D.W. Rusch, R.J. Thomas, G.H. Mount, G.J. Rottman, G.E. Thomas, R.W. Sanders, G.M. Lawrence, Solar Mesosphere Explorer: Scientific Objectives and Results, Geophys. Res. Lett. 10, 237-240, 1983.

Mount, G.H., D.W. Rusch, J.M. Zawodny, J.F. Noxon, C.A. Barth, G.J. Rottman, R.J. Thomas, G.E. Thomas, R.W. Sanders, G.M. Lawrence, Measurements of NO2 in the Earth's Stratosphere Using a Limb Scanning Visible Light Spectrometer, Geophys. Res. Lett. 10, 265-268, 1983.

Mount, G.H., D.W. Rusch, J.F. Noxon, J.M. Zawodny, and C.A. Barth, Measurements of Stratospheric NO2 from the Solar Mesosphere Explorer Satellite. 1. An Overview of the Results, J. Geophys. Res. 89, 1327-1340, 1984.

Rottman, G.J., "Solar Ultraviolet Irradiance 1982 and 1983" in Atmospheric Ozone (ed. C.S. Zerefos) D. Reidel Pub. Co., 1985.

Rottman, G.J., C.A. Barth, R.J. Thomas, G.H. Mount, G.M. Lawrence, D.W. Rusch, R.W. Sanders, G.E. Thomas, and J. London: Solar Spectral Irradiance, 120 to 190 nm, October 13, 1981 - January 3, 1982, Geophys. Res. Lett. 9, 587-590, 1982.

Rusch, D.W., R.S. Eckman, and S. Solomon, Implications of the Comparison of Ozone Abundances Measured by the Solar Mesosphere Explorer to Model Calculations, J. Geophys. Res, in press, 1985.

Rusch, D.W., G.H. Mount, C.A. Barth, G.J. Rottman, R.J. Thomas, G.E. Thomas, R.W. Sanders, G.M. Lawrence, R.S. Eckman, Ozone Densities in the Lower Mesosphere Measured by a Limb Scanning Ultraviolet Spectrometer, Geophys. Res. Lett. 10, 241-244, 1983.

Rusch, D.W., G.H. Mount, C.A. Barth, R.J. Thomas, and M.T. Callan, Solar Mesosphere Explorer Ultraviolet Spectrometer: Measurements of Ozone in the 1.0 to 0.1 mb Region, J. Geophys. Res. 89, 11677-11687, 1984.

Rusch, D.W., G.H. Mount, J.M. Zawodny, C.A. Barth, G.J. Rottman, R.J. Thomas, G.E. Thomas, R.W. Sanders, G.M. Lawrence, Temperature Measurements in the Earth's Stratosphere Using a Limb Scanning Visible Light Spectrometer, Geophys. Res. Lett. 10, 261-264, 1983.

Solomon, S., G.H. Mount, and J.M. Zawodny, Measurements of Stratospheric NO2 from the Solar Mesosphere Explorer Satellite. 2. General Morphology of observed NO2 and derived N2O5, J. Geophys. Res. 89, 7317-7321, 1984.

Thomas, G.E., C.A. Barth, E.R. Hansen, C.W. Hord, G.M. Lawrence, G.H. Mount, G.J. Rottman, D.W. Rusch, A.I. Stewart, R.J. Thomas, J. London, P.L. Bailey, P.J. Crutzen, R.E. Dickenson, J.C. Gille, S.C. Liu, J.F. Noxon, and C.B. Farmer: Scientific Objectives of the Solar Mesosphere Explorer Mission, Pageoph 118, 591-615, 1980.

Thomas, R.J., C.A. Barth, G.J. Rottman, D.W. Rusch, G.H. Mount, G.M. Lawrence, R.W. Sanders, G.E. Thomas, L.E. Clemens, Ozone Density Distribution in the Mesosphere (50-90 km) Measured by the SME Limb Scanning Near Infrared Spectrometer, Geophys. Res. Lett. 10, 245-248, 1983.

Thomas, R.J., C.A. Barth, G.J. Rottman, D.W. Rusch, G.H. Mount, G.M. Lawrence, R.W. Sanders, G.E. Thomas, L.E. Clemens, Mesospheric Ozone Depletion During the Solar Proton Event of July 13, 1982, Part I Measurement, Geophys. Res. Lett. 10, 253-255, 1983.

Thomas, R.J., C.A. Barth, D.W. Rusch, and R.W. Sanders, Solar Mesosphere Explorer Near Infrared Spectrometer: Measurements of 1.2 um Radiances and the Inference of Mesospheric Ozone, J. Geophys. Res. 89, 9569-9580, 1984.

Thomas, R.J., C.A. Barth, and S. Solomon, Seasonal Variations of Ozone in the Upper Mesosphere and Gravity Waves, Geophys. Res. Lett. 11, 673-676, 1984.

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Dump of d      MTA2: on 13-DEC-1988 21:05:22.80

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

 20202020 20202020 20202020 20202020 20202020 20203130 3042524F 314C4F56 ¥0L1QRB001                          000000
 20202020 20202020 20202020 20202020 20202020 20202020 20202020 20202020                                   000020
                                     33202020 20202020 20202020 20202020                3.............. 000040

Dump of device MTA2: on 13-DEC-1988 21:05:22.80

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

 30313030 30313030 42524F20 20202020 20544144 2E314252 4F5A4F41 31524448 HDR1AQZQRB1.DAT      QRB00100010 000000
 46434544 30303030 30302030 30303030 20303433 38382030 30313030 30313030 001000100 88340 00000 000000DECF 000020
                                     20202020 20202020 20204131 31454C49 ILE11A            .............. 000040

Dump of device MTA2: on 13-DEC-1988 21:05:22.80

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

 20202020 20202020 20202020 20202020 20343533 30303834 30323044 32524448 HDR2D0204800354                  000000
 20202020 20202020 20202020 30302020 20202020 20202020 20202020 20202020                 00               000020
                                     20202020 20202020 20202020 20202020                .............. 000040

Dump of device MTA2: on 13-DEC-1988 21:05:22.80

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

 30303030 30303030 31303030 30303030 30303030 32303230 45353130 33524448 HDR3015E020200000000000100000000 000000
 30303030 30303030 30303030 30303030 30303030 30303030 30303030 30303030 00000000000000000000000000000000 000020
                                     20202020 20202020 20202020 30303030 0000           .............. 000040

Dump of device MTA2: on 13-DEC-1988 21:05:22.80

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

 20202020 20202020 20202020 20202020 20202020 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 d    .. MTA2: on 13-DEC-1988 21:05:22.80

Block number 6 (00000006), 2048 (0800) bytes

35333034 302E3431 2D202020 20393433 20203138 39312039 35303120 39323030 0029 1059 1981  349    -14.04035 000000
2030302B 45363035 2E312030 302B4533 38342E31 2030302B 45363634 2E312034 4 1.466E+00 1.483E+00 1.506E+00  000020
2E312030 302B4533 37362E31 2030302B 45373036 2E312030 302B4537 34352E31 1.547E+00 1.607E+00 1.673E+00 1. 000040
37382E31 2030302B 45303238 2E312030 302B4536 37372E31 2030302B 45313337 731E+00 1.776E+00 1.820E+00 1.87 000060
45303630 2E322030 302B4536 30302E32 2030302B 45303439 2E312030 302B4534 4E+00 1.940E+00 2.006E+00 2.060E 000080
302B4538 33312E32 2030302B 45393131 2E322030 302B4535 39302E32 2030302B +00 2.095E+00 2.119E+00 2.138E+0 0000A0
20303028 45343731 2E322030 302B4539 36312E32 2030302B 45363531 2E322030 0 2.156E+00 2.169E+00 2.174E+00  0000C0
2E322030 302B4531 38312E32 2030302B 45313731 2E322030 302B4532 37312E32 2.172E+00 2.171E+00 2.181E+00 2. 0000E0
30302E31 2D30302B 45303030 2E312D30 302B4531 33342E32 2030302B 45303432 240E+00 2.431E+00-1.000E+00-1.00 000100
45303030 2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D30 302B4530 0E+00-1.000E+00-1.000E+00-1.00E 000120
302B4530 30302E31 2D30302B 45303030 2E312D30 302B4530 30302E31 2D30302B +00-1.000E+00-1.000E+00-1.000E+0 000140
3030302B 45303030 2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D30 0-1.000E+00-1.000E+00-1.000E+000 000160
302B4533 36322E31 2030302B 45363432 2E312030 302B4534 35322E31 20343533 354 1.254E+00 1.246E+00 1.263E+0 000180
20303028 45313234 2E312030 302B4531 37332E31 2030302B 45313133 2E312030 0 1.311E+00 1.371E+00 1.421E+00  0001A0
2E312030 302B4537 31352E31 2030302B 45373734 2E312030 302B4531 35342E31 1.451E+00 1.477E+00 1.517E+00 1. 0001C0
38372E31 2030302B 45373237 2E312030 302B4534 35362E31 2030302B 45303835 580E+00 1.654E+00 1.727E+00 1.78 0001E0
45363038 2E312030 302B4530 33382E31 2030302B 45343238 2E312030 302B4537 7E+00 1.824E+00 1.830E+00 1.806E 000200
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20303028 45363138 2E312030 302B4535 33382E31 2030302B 45373238 2E312030 0 1.827E+00 1.835E+00 1.816E+00  000240
2E322030 302B4537 30312E32 2030302B 45343239 2E312030 302B4535 32382E31 1.825E+00 1.924E+00 2.107E+00 2. 000260
30302E31 2D30302B 45303030 2E312D30 302B4530 30302E31 2D30302B 45323432 242E+00-1.000E+00-1.000E+00-1.00 000280
45303030 2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D30 302B4530 0E+00-1.000E+00-1.000E+00-1.000E 0002A0
302B4530 30302E31 2D30302B 45303030 2E312D30 302B4530 30302E31 2D30302B +00-1.000E+00-1.000E+00-1.000E+0 0002C0
45313131 2E312030 302B4536 39302E31 2030302B 45333830 2E312034 35333030 00354 1.083E+00 1.096E+00 1.111E 0002E0
302B4536 37312E31 2030302B 45313531 2E312030 302B4539 32312E31 2030302B +00 1.129E+00 1.151E+00 1.176E+0 000300
20303028 45363332 2E312030 302B4530 32322E31 2030302B 45313032 2E312030 0 1.201E+00 1.220E+00 1.236E+00  000320
2E312030 302B4530 34342E31 2030302B 45333333 2E312030 302B4536 36322E31 1.266E+00 1.333E+00 1.440E+00 1. 000340
30352E31 2030302B 45393635 2E312030 302B4537 39352E31 2030302B 45363435 546E+00 1.597E+00 1.569E+00 1.50 000360
45353235 2E312030 302B4534 38342E31 2030302B 45363634 2E312030 302B4536 6E+00 1.466E+00 1.484E+00 1.525E 000380
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2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D30 302B4536 34362E31 1.646E+00-1.000E+00-1.000E+00-1. 0003E0
30302E31 2D30302B 45303030 2E312D30 302B4530 30302E31 2D30302B 45303030 000E+00-1.000E+00-1.000E+00-1.00 000400
45303030 2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D30 302B4530 0E+00-1.000E+00-1.000E+00-1.000E 000420
34352E39 20313020 45363734 2E392031 302D4531 38332E39 20343533 30303028 +000354 9.381E-01 9.476E-01 9.54 000440
45323037 2E392031 302D4538 33362E39 20313020 45323935 2E392031 302D4532 2E-01 9.592E-01 9.638E-01 9.702E 000460
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20303028 45343831 2E312030 302B4530 33312E31 2030302B 45393730 2E312030 0 1.079E+00 1.130E+00 1.184E+00  0004A0
2E312030 302B4532 37322E31 20303028 45333632 2E312030 302B4532 33322E31 1.232E+00 1.263E+00 1.272E+00 1. 0004C0
32322E31 2030302B 45373332 2E312030 302B4531 35322E31 2030302B 45353632 265E+00 1.251E+00 1.237E+00 1.22 0004E0
45333632 2E312030 302B4534 34322E31 2030302B 45313332 2E312030 302B4539 9E+00 1.231E+00 1.244E+00 1.263E 000500
302B4539 38322E31 2030302B 45303932 2E312030 302B4531 38322E31 2030302B +00 1.281E+00 1.290E+00 1.289E+0 000520
2D30302B 45373432 2E312030 302B4531 35322E31 2030302B 45343732 2E312030 0 1.274E+00 1.251E+00 1.247E+00- 000540
2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D30 302B4530 30302E31 1.000E+00-1.000E+00-1.000E+00-1. 000560
30302E31 2D30302B 45303030 2E312D30 302B4530 30302E31 2D30302B 45303030 000E+00-1.000E+00-1.000E+00-1.00 000580
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39392E37 20313020 45333330 2E382031 302D4532 31302E38 20313020 45343539 954E-01 8.012E-01 8.033E-01 7.99 0005C0
45333537 2E382031 302D4539 34322E38 20313020 45353130 2E382031 302D4532 2E-01 8.015E-01 8.249E-01 8.753E 0005E0
302D4539 38372E39 20313020 45393137 2E392031 302D4535 32332E39 20313020 -01 9.325E-01 9.719E-01 9.789E-0 000600
20313020 45393935 2E392031 302D4532 37352E39 20313020 45363736 2E392031 1 9.676E-01 9.572E-01 9.599E-01  000620
2E392031 302D4538 36362E39 20313020 45353237 2E392031 302D4536 38362E39 9.686E-01 9.725E-01 9.668E-01 9. 000640
34302E31 20303028 45353030 2E312031 302D4531 33372E39 20313020 45353236 625E-01 9.731E-01 1.005E+00 1.04 000660
45323330 2E312030 302B4536 35302E31 20303028 45323630 2E312030 302B4531 1E+00 1.062E+00 1.056E+00 1.032E 000680
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2D30302B 45303030 2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D31 1-1.000E+00-1.000E+00-1.000E+00- 0006C0
2E312D30 302B4530 30302E31 2D30302B 45303030 2E312D30 302B4530 30302E31 1.000E+00-1.000E+00-1.000E+00-1. 0006E0
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E30302B 45303030 000E+00^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 000700
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 000720
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5E5E5E5E   ..5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E :     5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 000760
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 000780
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0007A0
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0007C0
5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E 5E5E5E5E ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ 0007E0
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B R I E F D E S C R I P T I O N

SME
81-100A

The Solar Mesosphere Explorer (SME) mission objective was primarily to investigate the processes that create and destroy ozone in the Earth's mesosphere and upper stratosphere. Some specific goals were (1) to determine the nature and magnitude of changes in mesospheric ozone densities resulting from changes in the solar ultraviolet flux; (2) to determine the interrelationship between solar flux, ozone, and the temperature of the upper stratosphere and mesosphere; (3) to determine the interrelationship between ozone and water vapor; and (4) to determine the interrelationship between nitrogen dioxide and ozone. The satellite experiment complement consisted of a solar ultraviolet spectrometer, an ultraviolet ozone spectrometer, an infrared radiometer, a 1.27-micrometer spectrometer, and a nitrogen dioxide spectrometer. In addition, a solar proton alarm detector was carried on board to measure the integrated solar flux in the range 30 to 500 MeV. Spin stabilized at 5 rpm, the satellite moved in a 3 a.m. to 3 p.m. sun-synchronous orbit. The spacecraft body was a cylinder approximately 1.7 by 1.25 m and consisted of two major modules: the observatory module that housed the scientific instruments, and the spacecraft bus. The spin axis was oriented normal to the orbital plane. The command system was capable of executing commands in real time or from stored program control. Power was supplied by a solar cell array. The telemetry system was used either in a real-time or in a tape-recorder mode. Further details and some measurement results are written in C. A. Barth et al., "Solar Mesosphere Explorer: scientific objectives and results," Geophys. Res. Lett., v. 10, no. 4, p. 237, 1983. All instruments on board the SME were turned off in December 1988 because of energy considerations.

B R I E F D E S C R I P T I O N

SME,Limb View UV Ozone Spect
81-100A-01

The objective of the Ultraviolet Ozone Experiment was to measure ozone absorption of Rayleigh-scattered sunlight in the middle ultraviolet region. A dual-channel Ebert-Fastie spectrometer operated in the regions 1880-3100 A and 2230-3404 A and viewed normal to the spin axis. There were 208 or 11 grating steps per scan, respectively. At half maximum the full width of the signal was 15 A.

B R I E F D E S C R I P T I O N

SME,Near IR(1.27-Mircon)Spectrom
81-100A-03

The objective of the 1.27-Micrometer Airglow Experiment was to obtain limb-scanning measurements of the 1.27-micrometer airglow in the 50- to 90-km altitude range, and of the hydroxyl emission between 60 and 90 km altitude. A dual-channel Ebert-Fastie spectrometer operated in the regions 1.1 to 2.6 micrometers (channel 1) and 1.1 to 3.2 micrometers (channel 2), and viewed normal to the spin axis. The full width of the signal at half-maximum was 123 A. There were 512 grating steps per scan.