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ASL-DR-0001

24 MARCH TO 8 APRIL 1977

By

C. White

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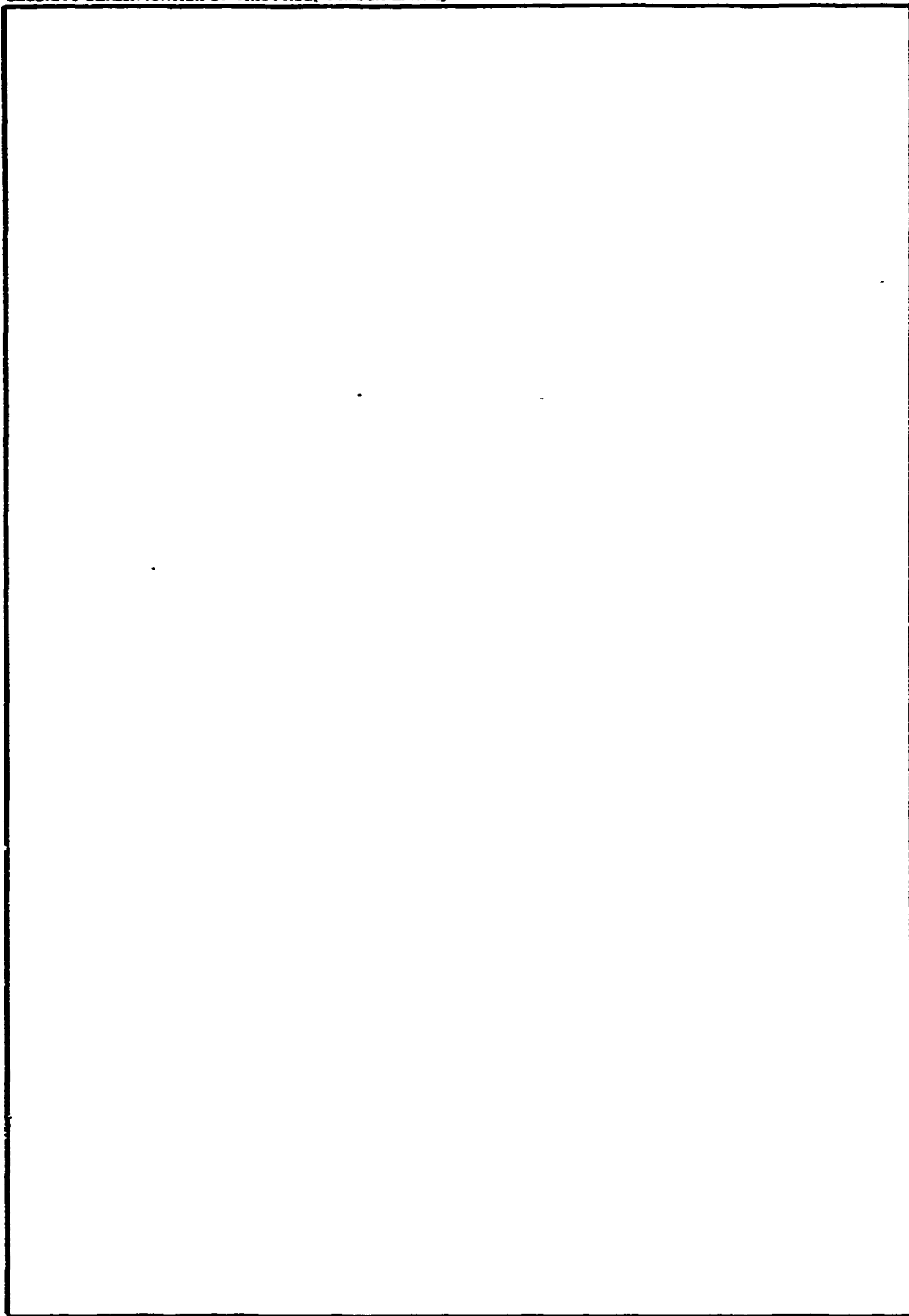
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A set of atmospheric surface, tower, rawinsonde, and aircraft measurements was made at the High Energy Laser Systems Test Facility area from 24 March through 8 April 1977 in support of adaptive optics design for the Navy High Energy Laser Project Manager. These measurements consisted of optical turbulence, wind, water vapor, particulate size distribution, inversion height, air and soil surface temperature, and net radiation. Presented in this data report are plots and selected tabular listings of the surface, tower, and rawinsonde data. The aircraft measurements of optical turbulence are included in an appendix.		

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PREFACE

The authors wish to thank Adela Soto for her assistance in assembling these data and Bobby D. Hinds for his helpful suggestions during the preparation of this report.

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INTRODUCTION

In a letter dated 7 February 1977 the Naval Sea Systems Command (Captain Skolnick, Project Manager, High Energy Lasers) requested and subsequently funded a meteorological measurement program at the White Sands Missile Range (WSMR) to support adaptive optics design. The program would focus primarily on optical turbulence and would initially encompass an intensive 2-week effort. In addition to turbulence, measurements would be made of wind, temperature, relative humidity, inversion heights, and particulate size distribution.

The initial 2-week period was scheduled for 24 March through 8 April 1977 and involved a combination of aircraft, tower, rawinsonde, acoustic sounder, and "surface" measurements/observations. The aircraft measurements were of the atmospheric structure parameter measure of optical turbulence; these measurements were performed by the Wave Propagation Laboratory, Environmental Research Laboratories, National Oceanic and Atmospheric Administration (NOAA) and are covered in Appendix A.

The remainder of the measurements/observations were conducted by the Atmospheric Sciences Laboratory and involved three sites: Laser Systems Test Center (LSTC), Apache Site, and Arky Site (Fig. 1).

At the LSTC, point measurements of optical turbulence, windspeed and direction, and temperature were made at approximately the 7 and 34 m tower levels; and inversion height was monitored with an acoustic sounder. In addition, measurements were made of water vapor, net radiation, and soil surface temperature and observations were made of cloud cover.

At Apache Site (5.5 km west of the LSTC) point measurements of optical turbulence, windspeed and direction, and temperature were made at approximately the 9 and 33 m tower levels. In addition, radiosondes were released from Apache Site and were scheduled to coincide with the NOAA turbulence flights.

At Arky Site (2.6 km northwest of the LSTC) point measurements were made of the particulate size distribution, relative humidity, and windspeed. Extinction coefficients were computed for spherical particles for wavelengths of 1.06, 3.8, and 10.6 micrometers from the measured size distribution and published values of the complex refractive index.

The purpose of this report is to present the basic data acquired during the 2 weeks. Following brief sections on geology/soils/vegetation, sites, instrumentation, sampling frequency, and data availability, the data are presented. The data are organized on a daily basis by site in graphical form, occasionally supplemented by tabular listings. Included in the daily summaries are synoptic and local weather summaries, data logs (temperature, moisture, clouds, remarks), plots of the atmospheric structure parameter (or optical turbulence, C_N^2), exponential coefficient of the vertical variation of C_N^2 , temperature, vertical temperature difference,

net radiation, windspeed and direction, inversion heights, rawinsonde data, and particulate extinction coefficient estimates for wavelengths of 1.06, 3.8, and 10.6 micrometers together with tabular listings of size distribution, extinction coefficient and mass loading.

Analyses of these data will be covered in a future report.

GEOLOGY/SOILS/VEGETATION

The HELSTF area is located near the southwestern corner of the White Sands National Monument on the White Sands Missile Range in south-central New Mexico. Geologically, the HELSTF area is situated along the western boundary of the Tularosa Basin, a graben capped by bolson deposits (valley fill). Tilted fault block mountains with the upraised fault scarps rising more than 1000 m above the semidesert basin floor dip away from the valley on the west and east sides (San Andres and Sacramento Mountains, respectively). During Pleistocene times a lake covered a large part of the basin. Vestiges of the lake are still evident in the Lake Lucero playa located in the northwestern sector of the HELSTF area. The mantle of bolson deposits is of Cenozoic origin and consists largely of gypsum and quartz sand.

The HELSTF area soils are indicated in Fig. 2. A description of the soil mapping units and the associated vegetative groups is contained in Tables 1 and 2. Lake Lucero is intermittently covered with water, a feature which is dependent upon precipitation over the surrounding area.

SITES

Ground-based measurements were taken at the sites identified as LSTC, Apache, and Arky in Fig. 1. Apache Site is located approximately 5.5 km west of the LSTC and Arky Site about 2.6 km to the northwest. Latitude, longitude, and elevation for the three sites are specified in Table 3.

INSTRUMENTATION

The ground-based instrumentation used to measure optical turbulence, wind, water vapor, particulate size distribution, and ancillary elements are listed in Table 4.

The tower-mounted instrumentation for optical turbulence and wind were located on booms as indicated in Fig. 3. The positioning of the instrumentation at a given level was selected so as to minimize the effects of the towers themselves upon the measurements for the winds expected to occur during the 2-week period. Erroneous data and data influenced by the tower were eliminated from the final computer plots (see Appendix B).

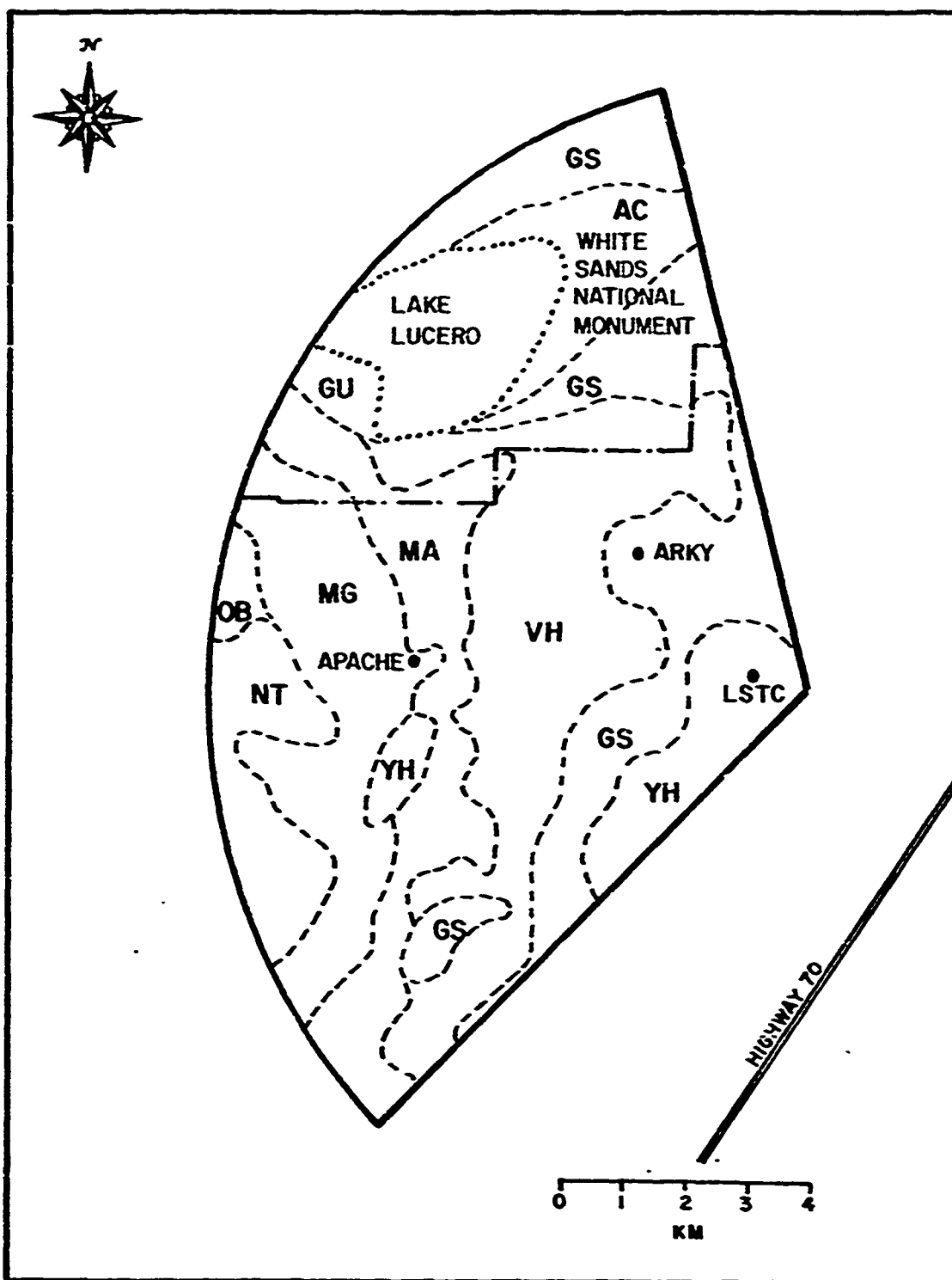


Figure 2. HELSTF area soils (see Table 1 for soil description).

TABLE 1. HELSTF SOILS/VEGETATION*

Map Symbol	Mapping Unit	Description	Vegetative Group*
AC	Active dune land, gypsum	Dunes, 1-30 m high, continually shifted by wind action, gypsum crystals	1
GS	Gypsum land, hummocky	Dunes, gently undulating to rolling gypsum dunes, partly stabilized, little or no soil blowing	2
GU	Gypsum land, level	Level to nearly level gypsum deposits in an old lakebed, water table within 2 m of surface	3
MA	Marcial-Ubar association	55% Marcial silty clay loam, 35% Ubar silt loam, light-brown Ubar occurs higher on landscape than reddish brown Marcial, moderate soil blowing potential	4
MG	Mimbres-Glendale association	55% Mimbres light-brown silt loam, 25% Glendale pale-brown silt loam	5
NT	Nickel-Tencee association	60% Nickel light-brown gravelly fine sandy loam, 25% Tencee brown very gravelly loam, gently to moderate sloping	6
OB	Onite-Bluepoint-Wink association	40% Onite brown loamy fine sand, 25% Bluepoint light-brown fine sand, 20% Wink light-brown loamy fine sand	7
YH	Yesum-Holloman association	35% Yesum very fine sandy loam, 30% Holloman very fine sandy loam, Yesum level to undulating on wind-deposited plains, Holloman level to gently sloping soil in slight depressions and old lake basins	2

*Adapted from: Nohr, R. E. and O. F. Bailey, 1976, "Soil survey of White Sands Missile Range, New Mexico, parts of Dona Ana, Lincoln, Otero, Scharra, and Socorro counties," US Department of Agriculture, US Department of the Army, White Sands Missile Range, and New Mexico Agricultural Experiment Station, 64 pages.

**See Table 2

TABLE 2. VEGETATIVE GROUP

Number	Description
1	No vegetation on dunes, but sparse giant dropseed, spike dropseed, Indian rice grass, little bluestem, rubber rabbit brush, chamiza, seepweed, and iodine bush grows between dunes
2	Sparse cover of rough cordelia, gyp grass, Torrey ephedra, alkali sacaton, lichens, chamiza, gyp grama, rubber rabbit brush, Indian rice grass, little bluestem, and mesquite
3	Scattered iodine bush
4	Alkali sacaton, chamiza, iodine bush, inland salt grass
5	Vine mesquite, sacaton, tobosa, fluff grass, burro grass, chamiza
6	Creosote bush, mesquite, American tarbush, maricopa panthenium, black grama
7	Mesquite, chamiza, giant dropseed, mesa dropseed, spike dropseed, sand sagebrush, tobosa, black grama, soap tree yucca, alkali sacaton

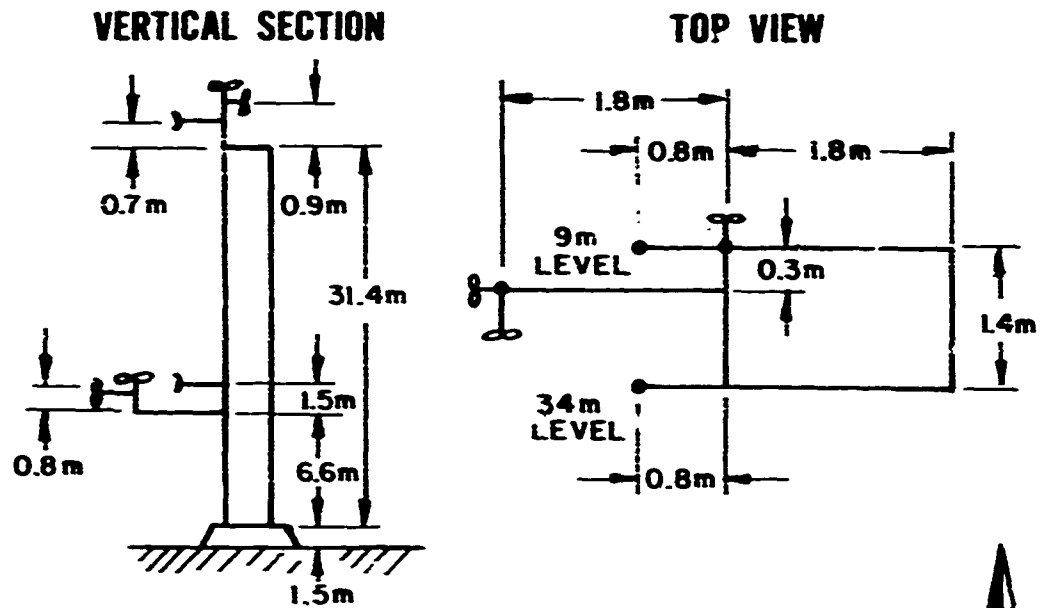
TABLE 3. DATA ACQUISITION SITES

Site	Latitude	Longitude	Elevation (m above Mean Sea Level)
LSTC	32°38'	106°17'	1210
Apache	32°38'	106°24'	1206
Arky	32°40'	106°20'	1206

TABLE 4. TURBULENCE, WIND, EXTINCTION COEFFICIENT, AND RELATED ANCILLARY MEASUREMENTS

Element Measured	Instrument (Manufacturer & Model No.)	Approx. Height Above Ground (m)	Accuracy
Optical turbulence	In house (see text, p.451)	9, 33	within 15% (C_N^2 m ^{-2/3})
Wind (u, v, w)	R. M. Young 27002	9, 33	0.1 m sec ⁻¹
Extinction coefficient			
Gas			
Water vapor	Sling Psychrometer ML-24	2	7%
Particulate			
Size distribution	Particle Measuring Systems CSASP-100	5	Under in-house evaluation
Ancillary			
Inversion height	Aerovisor 300	0	50 m
Soil surface temperature	Thermocouple, reference, Acromag 355	-0.001	0.1°C
Net radiation	Teledyne Geotech temperature compensated net exchange radiometer	1	0.1 Langley's min ⁻¹
pressure	Bell & Howell Digital Barometer 4-461-002	2	1 mb
Temperature	Thermocouple, reference, Acromag 355	9, 33	0.1°C
Rawinsonde			
Wind	AN/GMDX-1A, WBRT, 47	0-5000 m	12% (knots)
Temperature	AN/GMD-1A, 2A, 4, WBRT, 47	0-5000 m	1°C
Pressure	AN/GMW-1A, 2A, 4	0-5000 m	0.2% mb
Relative humidity	AN/GMD-1A, 2A, 4, WBRT, 57, μ L, 476	0-5000 m	0.2%

LASER SYSTEMS TEST CENTER METEOROLOGICAL TOWER



APACHE SITE METEOROLOGICAL TOWER

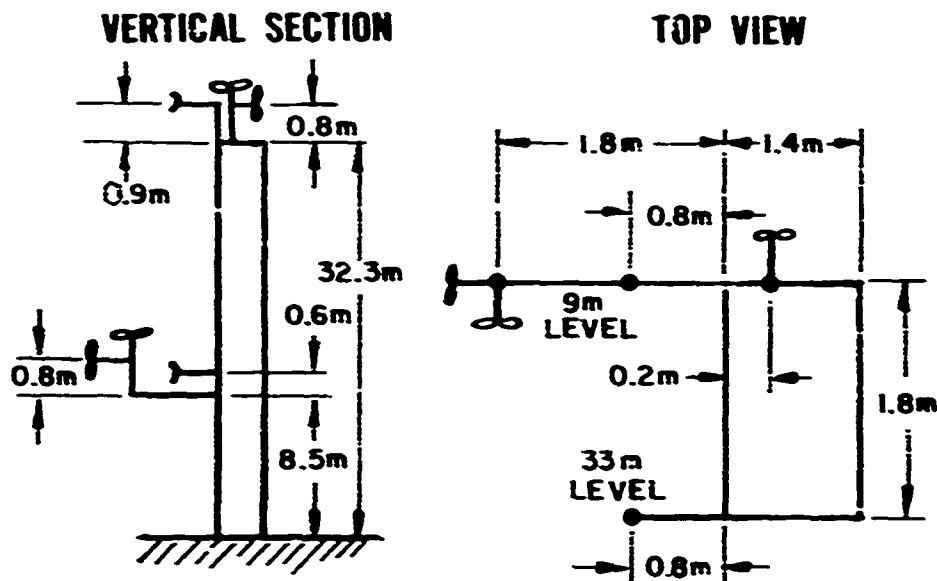


Figure 3. Location of optical turbulence and wind probes on the LSTC and Apache Site meteorological towers.

Turbulence

Optical turbulence, which is characterized by the structure parameter C_N^2 , can be quantified by measuring either optical effects or by measuring thermal fluctuations in the atmosphere. Optical measurements are generally restricted to interpretation using a model. When several measurements are to be made at different altitudes, the thermal fluctuation approach is advantageous. Thermal fluctuation measurements, although indirect, are straightforward and are subject to reasonably direct calibration. The turbulence sensors and their calibration are discussed in Appendix C.

Inversion Height

The Aerovironment 300 acoustic sounder data was recorded on a strip chart. The strip chart was manually examined for inversion heights. Up to three inversion heights were identified:

Top of the lowest inversion

Base of the second inversion

Base of the third inversion

These inversion heights were measured at 15-minute intervals and the resultant data computer processed to arrive at the inversion height plots.

Particulate Size Distribution/Extinction Coefficient

A Knollenberg single-particle light scattering counter was used to measure the size distribution of particulates at Arky Site. The advantage of using a light-scattering counter is that the measurement is done in situ in real-time with minimal disturbance to the particles during measurement. A serious shortcoming of the Knollenberg counter is that particle size can be inferred only from the actual measurement of the amount of light scattered into a certain (forward scattering) solid angle by single particles as they pass through a He-Ne laser beam. The amount of light scattered into this particular solid angle depends not only on the particle size, but also on the complex index of refraction and shape of the individual particles. To infer the size distribution¹ used to estimate the extinction coefficients, it is assumed that the particles have a complex refractive index of $1.55 - 0.005i$ [1] at the wavelength of the He-Ne laser (0.6328 micrometer). For a more detailed account of detector calibration, the reader is referred to Pinnick and Stenmark [2].

¹It is noteworthy that scanning electron microscope measurements of the size distributions of particles collected - simultaneous with the counter measurements - onto filters corroborate the size distribution inferred from the particle counter.

Extinction coefficients at 1.06, 3.8, and 10.6 micrometers were computed for each size distribution. The computation was based on Mie Theory, assumed spherical particles, and incorporated the complex indices of refraction listed in Table 5. Size distributions and extinction coefficients corresponding to mass loadings of less than $50\mu\text{g m}^{-3}$ are not statistically significant. The nonlinear size ranges and mean radius corresponding to the Knollenberg particle counter channel number are listed in Table 6.

In support of the particulate size distribution measurements and extinction coefficient estimates, simultaneous measurements of windspeed and relative humidity were made.

For the results presented here the particulates have been modeled with a polydispersion of homogeneous spheres of uniform composition. However, analysis of dust filter samples has revealed that the particulates are multicomponent and have irregular shapes. A model for these effects is under development. In addition, a source strength model is to be developed for the soil-derived component taking into account sedimentation and diffusion.

SAMPLING FREQUENCY

The sampling frequencies of the various elements are listed in Table 7.

DATA AVAILABILITY

Ground Based

Table 8 contains a summary of the measurements/observations scheduled for each of the three sites.

The actual availability of the data is summarized in Tables 9, 10, and 11. Hazardous atmospheric conditions (generally high windspeeds and the attendant blowing dust and sand) and instrumentation difficulties account for most of the missing data, in particular on 28 and 29 March.

Airborne

The availability of data from the NOAA turbulence flights is summarized in Table 12. The actual data, as previously indicated, are reported in Appendix A.

DATA

The data are summarized, either graphically or in tabular form, on a daily basis. Included in the summaries are:

TABLE 5. COMPLEX INDICES OF REFRACTION USED TO
CALCULATE EXTINCTION COEFFICIENT

Index of Refraction	Wavelength (μm)	Reference
1.65-0.0050i	1.06	3
1.47-0.0045i	3.8	4
1.70-0.3000i	10.6	5

TABLE 6. SIZE RANGES AND MEAN RADIUS CORRESPONDING
TO KNOLLENBERG PARTICLE COUNTER CHANNEL NUMBER

Channel Number	Radius Range (μm)	Mean Radius (μm)
1	0.32 - 0.89	0.61
2	0.89 - 1.48	1.19
3	1.48 - 2.11	1.80
4	2.11 - 4.4	3.26
5	4.4 - 5.5	4.95
6	5.5 - 9.6	7.55
7	9.6 - 10.6	10.1
8	10.6 - 24.7	17.7

TABLE 7. SAMPLING FREQUENCIES FOR THE ASL ATMOSPHERIC DATA

24 March - 8 April 1977

Element	Sampling Frequency
Turbulence	Analog RMS 10 seconds average and arithmetically averaged over 15 minutes
Wind	
LSTC and Apache	Once every 10 seconds and arithmetically averaged over 15 minutes
Arky	Two second arithmetic average every 10-15 minutes
Moisture	
LSTC and Apache	Once every hour
Arky	Once every 15 minutes
Temperature	Once every 10 seconds and arithmetically averaged over 15 minutes
Net radiation	Once every 10 seconds and arithmetically averaged over 15 minutes
Cloud observations	Once every hour
Size distribution	Cumulative over 10-15 minutes
Inversion height	Every 18 seconds
Rawinsonde	0000, 0600, 1200, 1800 hours MST

TABLE 8. SCHEDULED SITE MEASUREMENTS/OBSERVATIONS

LSTC	APACHE	ARKY
Optical turbulence ¹	Optical turbulence ¹	
8 m	9 m	
34 m	33 m	
Wind ¹	Wind ¹	Wind ¹
8 m	9 m	
34 m	33 m	
Temperature ¹	Temperature ¹	
9 m	9 m	
34 m	33 m	
		Particulate size distribution ⁴
	Rawinsonde ³	
Water vapor pressure ²		Relative humidity ¹
Net radiation ²		
Cloud cover ²		
Inversion height ¹		

¹Continuous

²Hourly

³0000, 0500, 1200, and 1800 MST

⁴Generally 10-15 minutes

TABLE 9

DATA AVAILABILITY
TURBULENCE, WIND, TEMPERATURE, VAPOR PRESSURE, NET RADIATION, CLOUD COVER and INVERSION HEIGHTS

Date	Turbulence 9m 33m			Wind Speed & Direction (9m and 33m)			Temperature (9m and 33m)		Vapor Pressure		Net Radiation		Cloud Cover		Inversion Heights	
	L	A	L	A	L	A	L	A	L	A	L	A	L	A	L	A
March 24	P	N	P	N	C	C	C	C	C		C		C		C	
25	P	P	P	P	C	P	C	P	C		C		C		C	
26	P	N	N	N	P	N	P	N	P		P		C		C	
27	P	N	N	N	P	N	P	N	P		P		P		P	
28	N	N	N	N	N	N	N	N	N		N		N		N	
29	N	N	N	N	N	N	N	N	N		N		N		N	
30	P	P	P	P	P	P	P	P	P		P		P		P	
31	P	P	P	N	C	C	C	C	C		C		C		C	
April 1	P	P	P	P	C	C	C	C	C		C		C		C	
2	P	P	P	P	C	C	C	C	C		C		C		C	
3	C	P	P	P	C	P	C	P	C		C		C		C	
4	P	P	P	P	C	C	C	C	C		C		C		C	
5	P	P	P	P	C	C	C	C	C		C		C		C	
6	P	P	P	P	C	C	C	C	C		C		C		C	
7	P	P	P	P	C	C	P	C	C		C		C		C	
8	P	P	P	P	P	C	P	C	P		P		C		C	

L = LSTC C = Complete Data Set N = No Data

A = Apache P = Partial Data Set

TABLE 10. APACHE RADIOSONDE DATA AVAILABILITY
(Release Numbers)

Date	Release Times (MST)			
	0000	0500	1200	1800
March 24		1	2	3
25	4	5	6*	7
26	8	9	10	11**
27	**	**	12	13
28	**	**	**	**
29	**	14***	15	16
30	17	18	19	20
31	21	22	23	24
April 1	25	26	27	28
2	29	30	31	32
3	33	34	35	36
4	37	38	39	40
5	41	42	43	44
6	45	46	47	48
7	49	50	51	52
8	53	54	55	56
9	57			

*Released at 1000 MST

**Canceled due to inclement weather

***Missing

TABLE 11. ARKY PARTICULATE SIZE
DISTRIBUTION DATA AVAILABILITY

Date	Hours (MST)
March 24	C
25	0000-1515
26	1800-2400
27	C
28	C
29	C
30	C
31	C
April 1	C
2	C
3	0000-2342
4	N
5	N
6	1525-2400
7	0000-1755
8	N

C = Complete data set

N = No data

Weather Summary

0500 MST surface weather map and station weather

0500 MST 500-mb height contours

Holloman AFB cloud, wind, visibility, temperature, and vapor pressure summary

LSTC

C_N^2 at 9 and 34 m

Exponential coefficient reflecting altitude change of C_N^2 between 9 and 34 m

Temperature and vapor pressure

Differential temperature (soil and 9 m, soil and 34 m) and net radiation

Windspeed and direction at 8 and 34 m

Apache

C_N^2 at 9 and 33 m

Exponential coefficient reflecting altitude change of C_N^2 between 9 and 33 m

Temperature (air at 9 and 33 m) and vapor pressure

Windspeed and direction at 9 and 33 m

Rawinsonde

Temperature, vapor pressure, and wind with corresponding tabular listing for significant and mandatory levels up to 3600 m above ground level (AGL)

Particulate

Size distribution (tabular)

Extinction coefficient estimates (graphical and tabular)

Windspeed and relative humidity (graphical)

(Additional size distribution data, extinction coefficient estimates, and windspeed and relative humidity data are available for 16, 17, 18, 19 and 23 March. The respective plots and tabular listings are included in Appendix D)

Mass loading (tabular)

REFERENCES

1. Grams, G. W., I. H. Blifford, Jr., D. A. Gillette and P. B. Russell, 1974, "Complex Index of Refraction of Airborne Soil Particles," J. Appl. Meteorol., 13:459-471.
2. Pinnick, R. G., and E. B. Stenmark, 1976, "Response Calculations for a Commercial Light-Scattering Aerosol Counter," R&D Report ECOM-5597, Atmospheric Sciences Laboratory, US Army Electronics Command, White Sands Missile Range, NM, 31pp. (AD A040841)
3. Ivlev, L. S., and S. I. Popova, 1973, "The Complex Refractive Indices of Substances in the Atmospheric-Aerosol Dispersed Phase," Atmospheric Ocean. Phys., 9:587-591. (English edition)
4. Volz, F. E., 1973, "Infrared Optical Constants of Ammonium Sulfate, Sahara Dust, Volcanic Pumice, and Flyash," Appl. Opt., 12:564-568.
5. Patterson, E., 1977, "Atmospheric Extinction Between 0.55 μ m and 10.6 μ m Due to Soil-Derived Aerosols," Appl. Opt., 16:2414-2418.

Weather Summary

Date: 24 March 1977

Synoptic

Surface: Deep surface low-pressure area over eastern Montana with secondary low over Utah. Cold front extending from the low over eastern Montana into southern California.

500 Millibar: Upper air trough off the west coast with short wave over western Texas and resultant northwesterly flow over New Mexico.

Holloman AFB

Clouds: Mostly clear with scattered afternoon high clouds (cirrus).

Wind: Light and variable in the morning with $5-9 \text{ m sec}^{-1}$ southerly winds during the afternoon.

Visibility: Generally greater than 60 km.

Maximum temperature: 23.9°C

Corresponding vapor pressure: 2.5 Torr

Minimum temperature: 7.2°C

Corresponding vapor pressure: 2.2 Torr

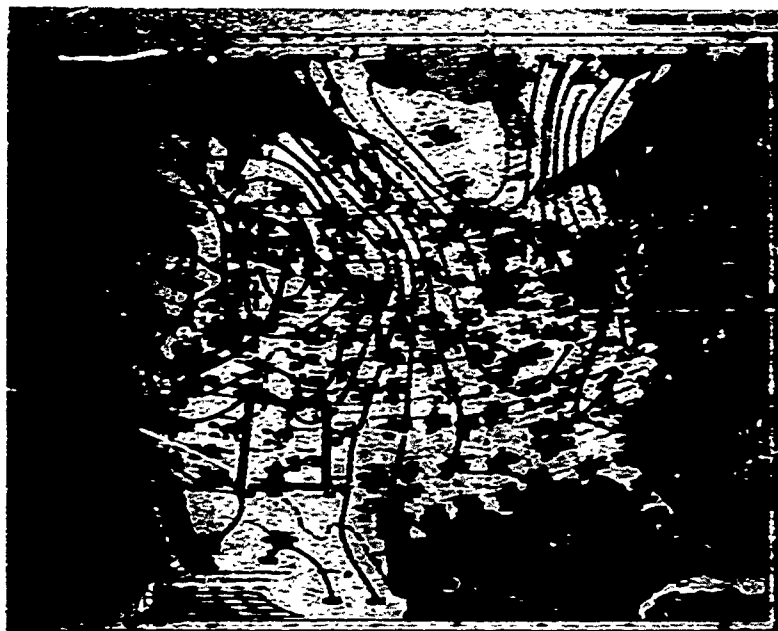


Figure 4a. Surface weather map for 24 March 1977.



Figure 4b. 500-millibar height contours for 24 March 1977.

TABLE 12. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mtd %/Type	High %/Type	
0100	13.8	3.8	-1.8	0	0	0	Acoustic sounder placed in operation at 0945
0200	12.9	4.2	-0.6	0	0	0	
0300	7.3	3.3	-4.1	0	0	0	
0400	4.3	2.8	-6.1	0	0	0	
0500	3.0	2.5	-7.2	0	0	0	
0600	2.8	2.3	-8.2	0	0	0	
0700	4.0	2.7	-6.7	0	0	0	
0800	9.0	3.2	-4.4	0	0	0	
0900	15.3	4.0	-1.2	0	0	0	
1000	17.6	5.0	1.7	0	0	0	
1100	17.7	5.5	2.9	0	0	0	Checked acoustic sounder
1200	21.2	4.5	0.6	0	0	0	
1300	21.3	5.5	3.1	0	0	0	
1400	21.8	5.2	2.5	0	0	0	
1500	23.0	6.8	6.0	0	0	0	
1600	22.4	4.2	-0.3	0	0	0	
1700	22.3	5.8	3.9	0	0	10 Ci	
1800	20.2	5.3	2.6	0	0	10 Ci	
1900	16.0	3.3	-3.5	0	0	10 Ci	
2000	12.3	3.9	-1.6	0	0	10 Ci	
2100	12.1	3.8	-2.2	0	0	10 Ci	
2200	9.8	3.4	-3.6	0	0	10 Ci	
2300	8.1	2.9	-5.5	0	0	10 Ci	
2400	10.7	3.4	-3.5	0	0	10 Ci	

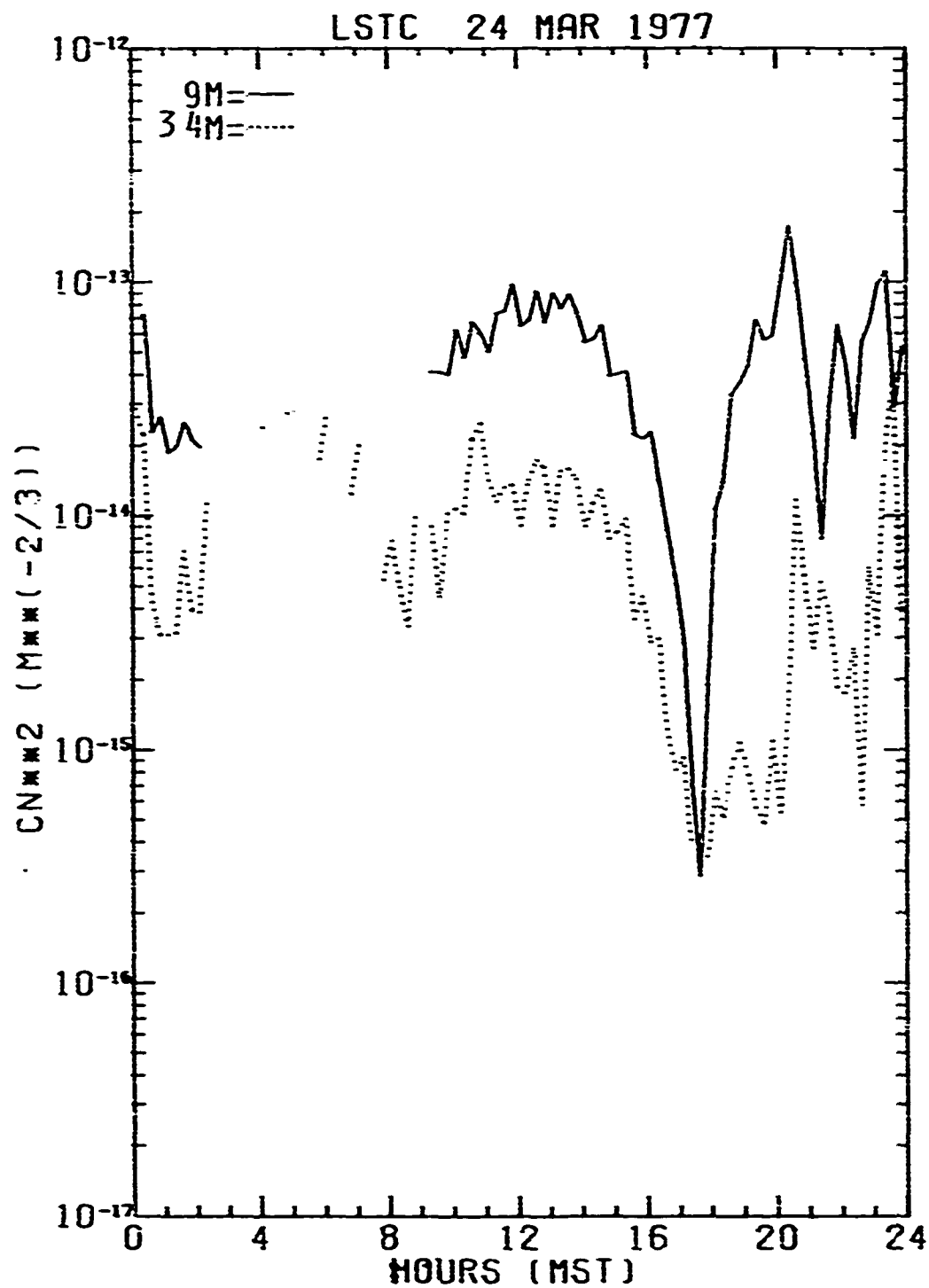


Figure 5. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 24 March 1977.

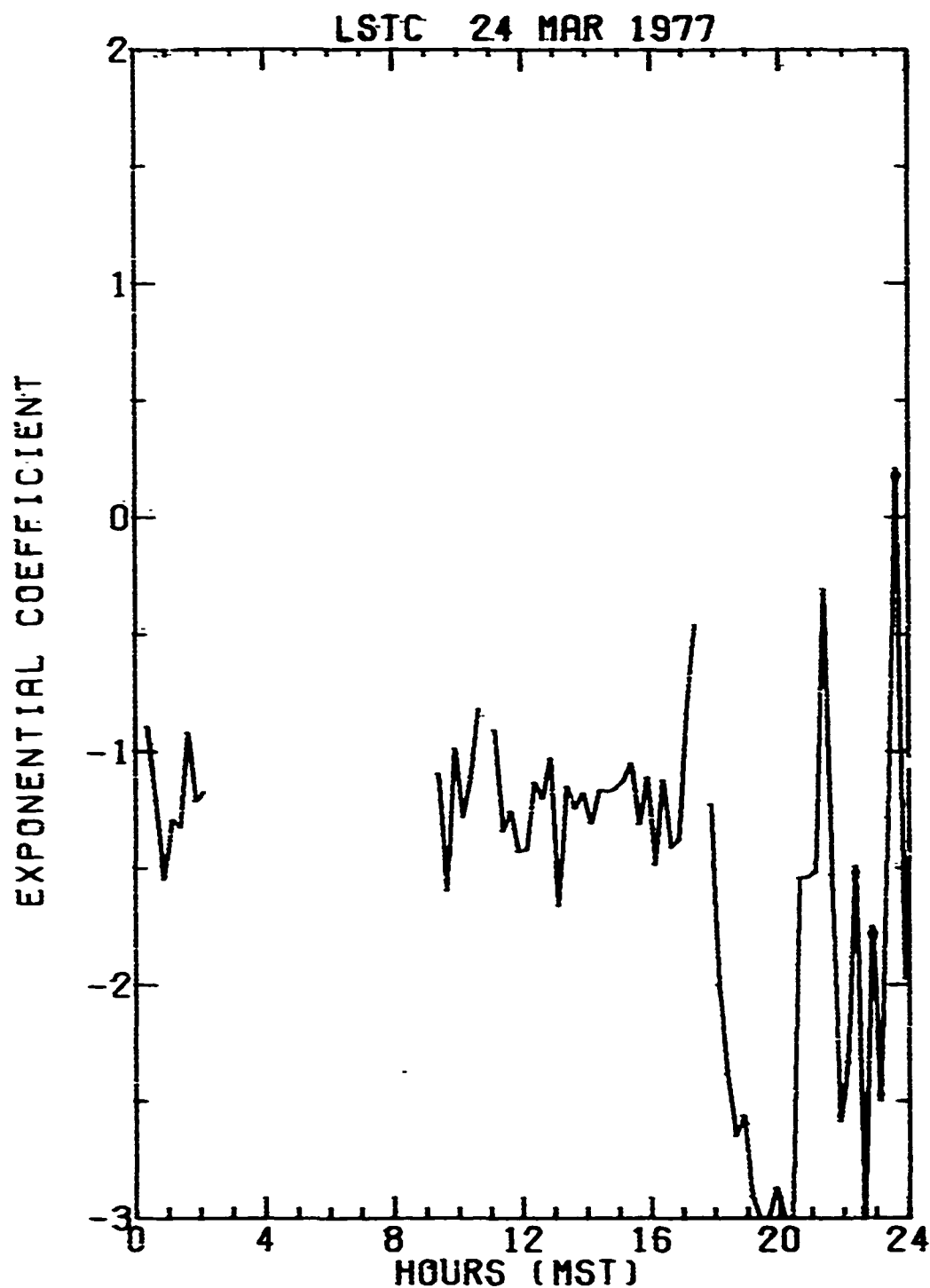


Figure 6. Diurnal variation of the altitude change of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 24 March 1977.

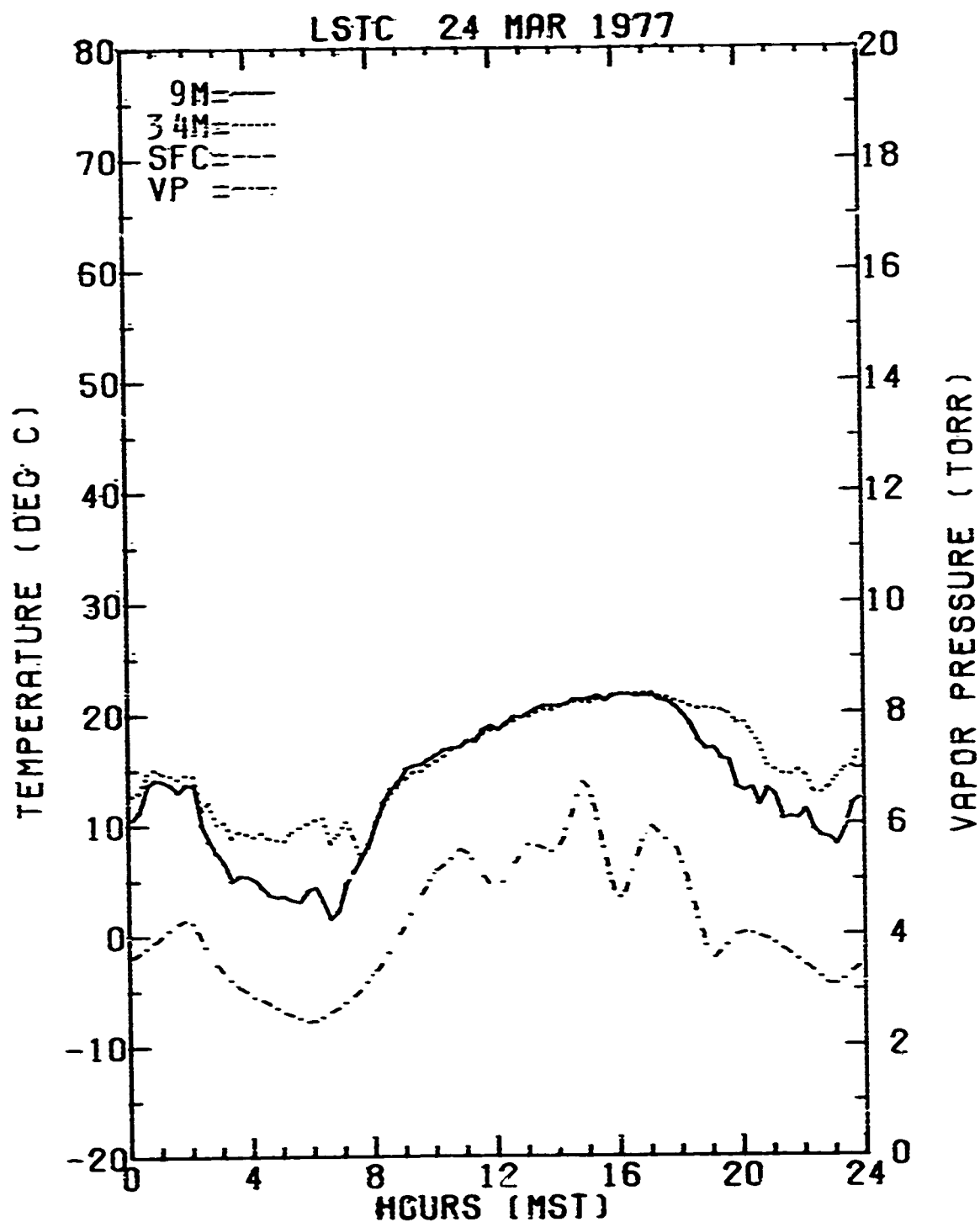


Figure 7. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 24 March 1977.

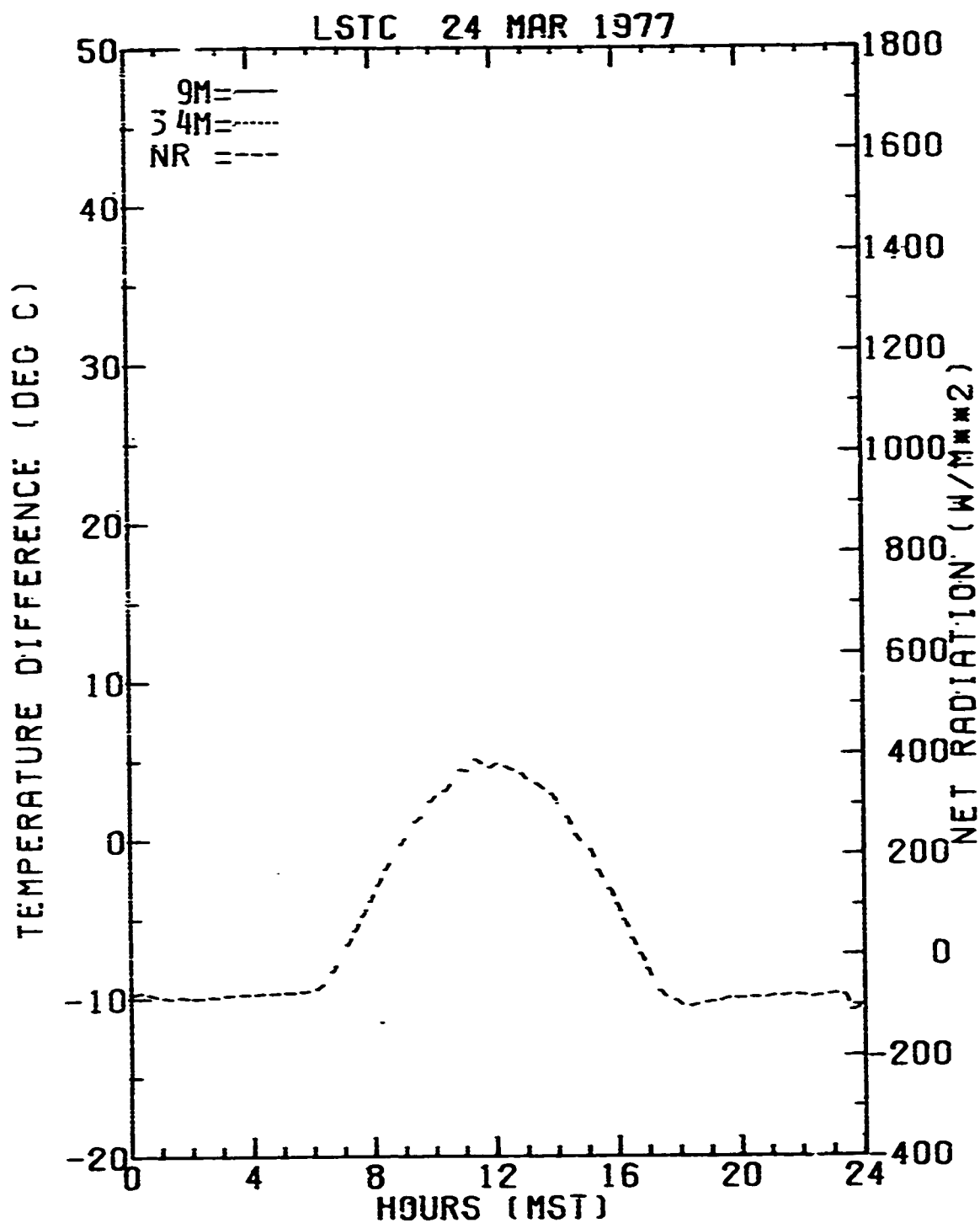


Figure 8. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 24 March 1977.

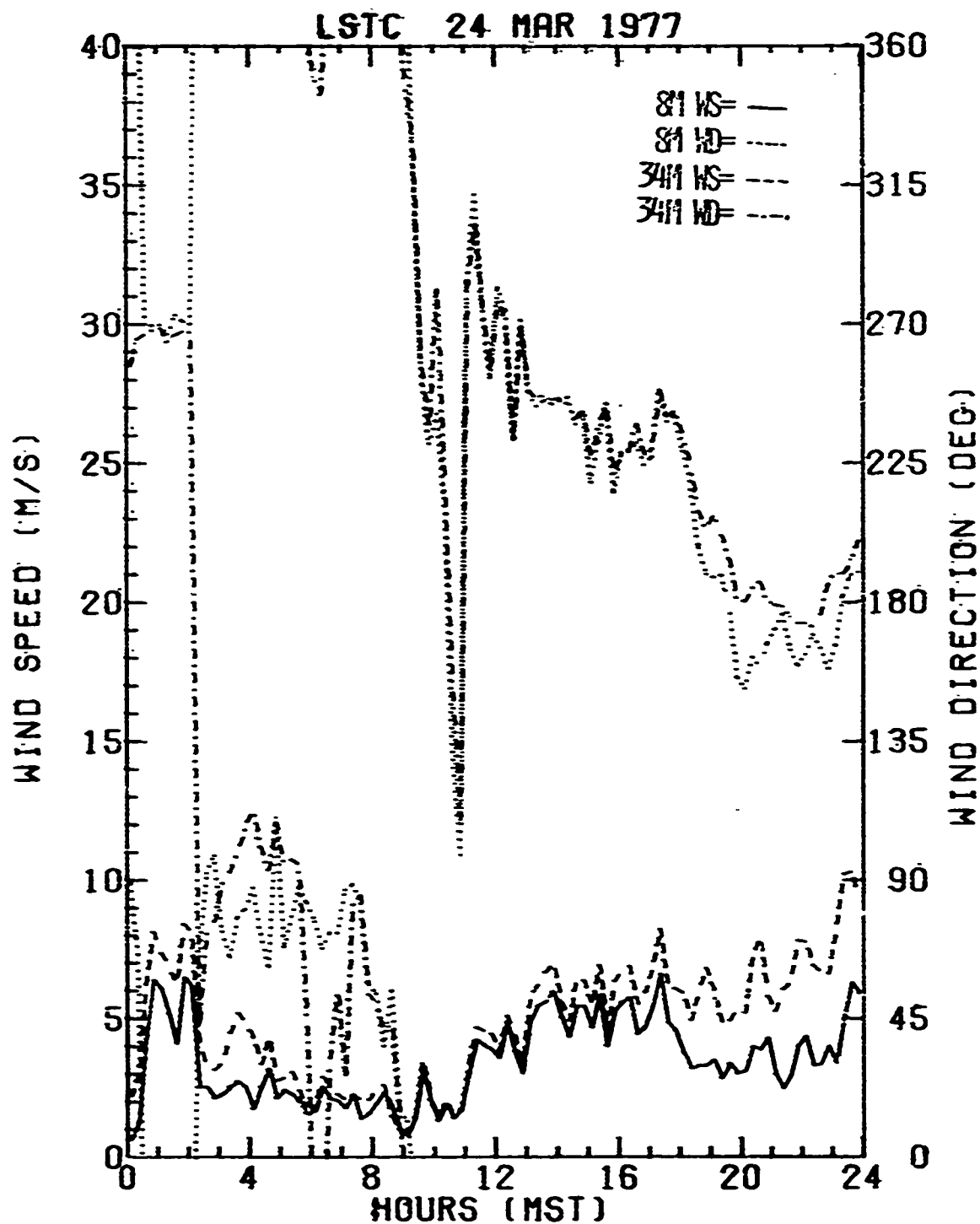


Figure 9. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 24 March 1977.

24 MAR 1977 ACOUSTIC SOUNDER DATA

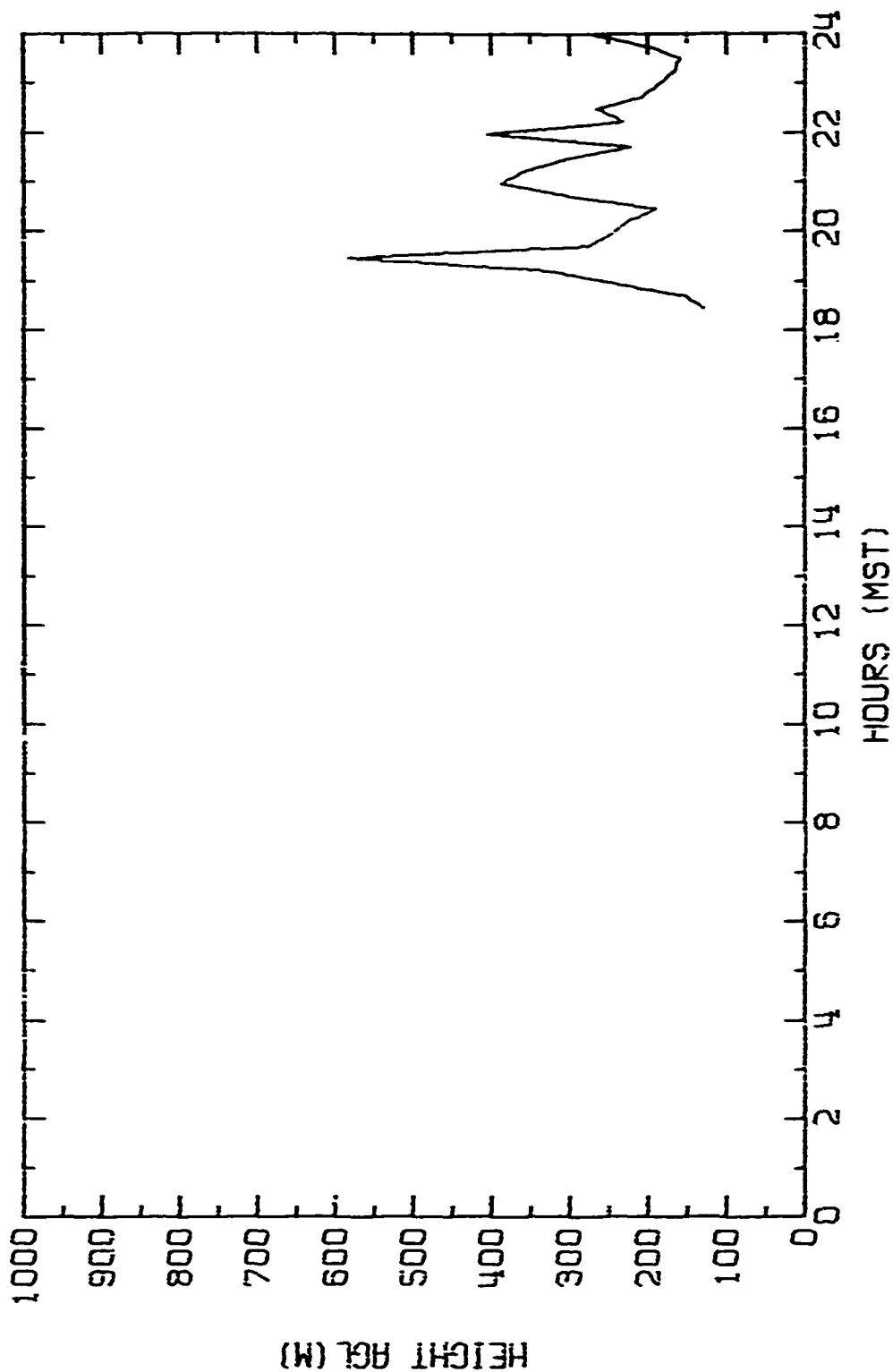


Figure 10. Inversion heights, LSTC, 24 March 1977.

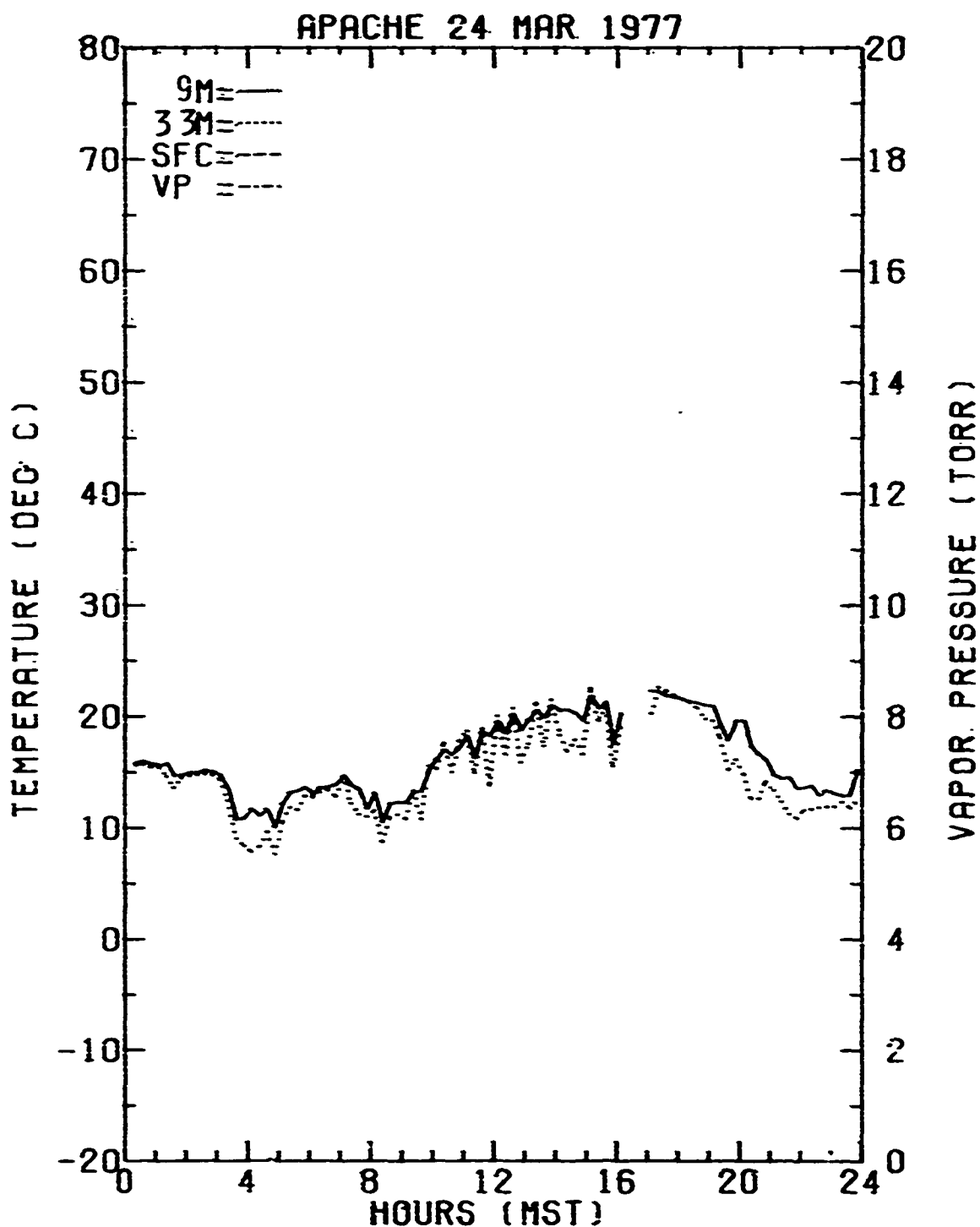


Figure 11. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 24 March 1977.

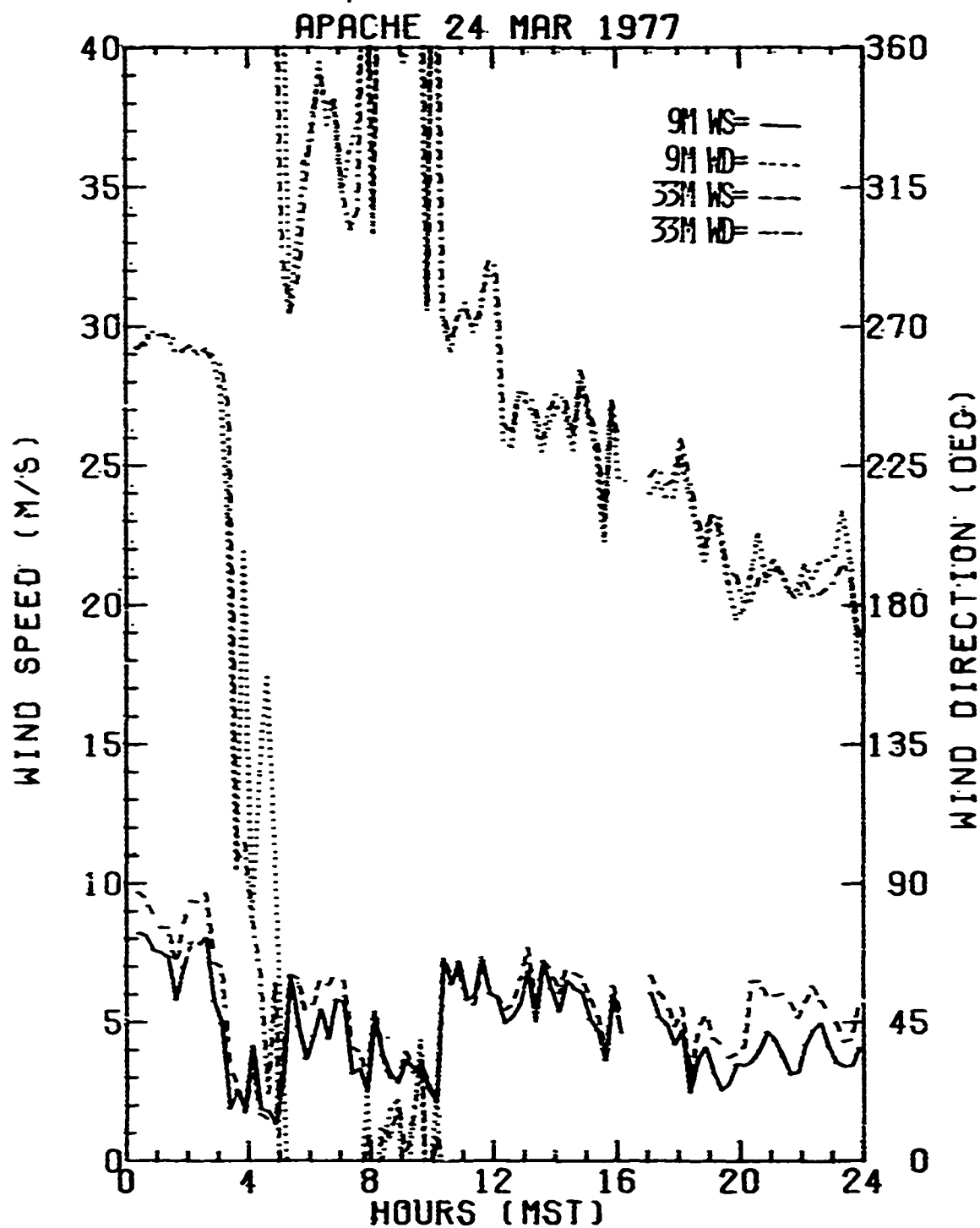


Figure 12. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels. Apache Site, 24 March 1977.

TABLE 14
APACHE SITE RAWINSONDE DATA

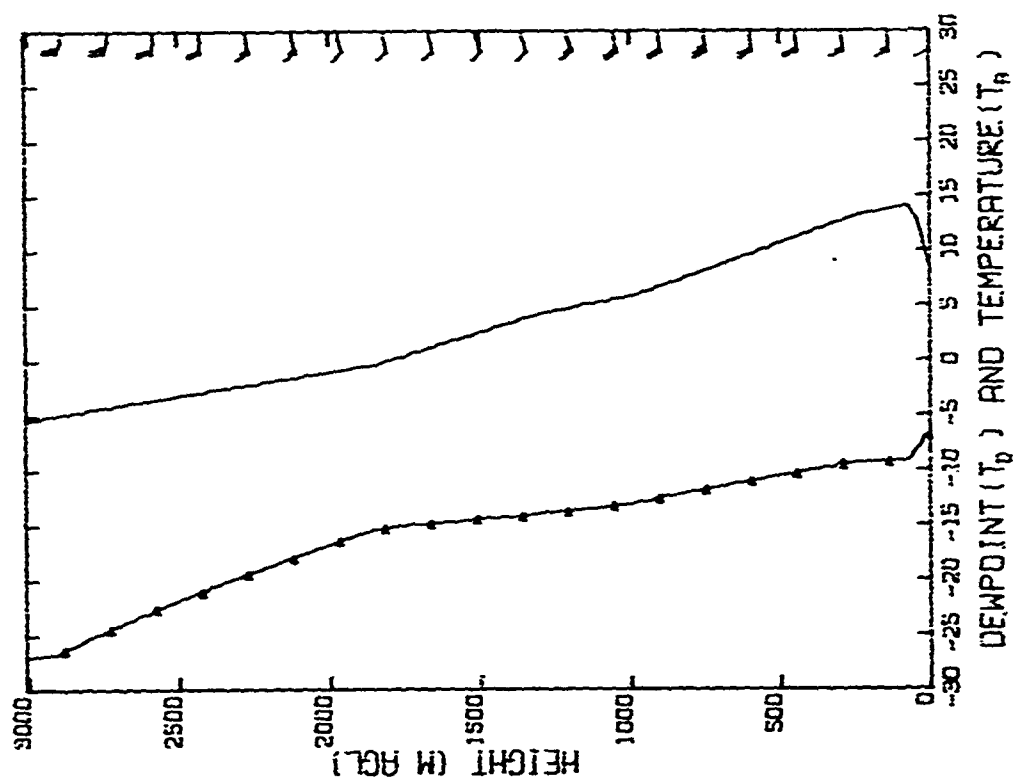
DATE: 24 MAR '77

RELEASE NO. 1

RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	657.4	8.0	2.7	270.0	6.2
57.3	652.9	14.2	2.3	269.6	6.6
258.9	637.5	13.0	2.2	268.3	8.4
972.0	585.0	6.0	1.7	261.3	10.8
1318.5	560.7	4.1	1.5	253.9	6.9
1849.7	525.0	-4	1.4	256.4	5.1
2919.0	458.8	-5.0	0.5	286.8	12.5
3599.5	420.6	-8.6	0.4	300.8	16.0



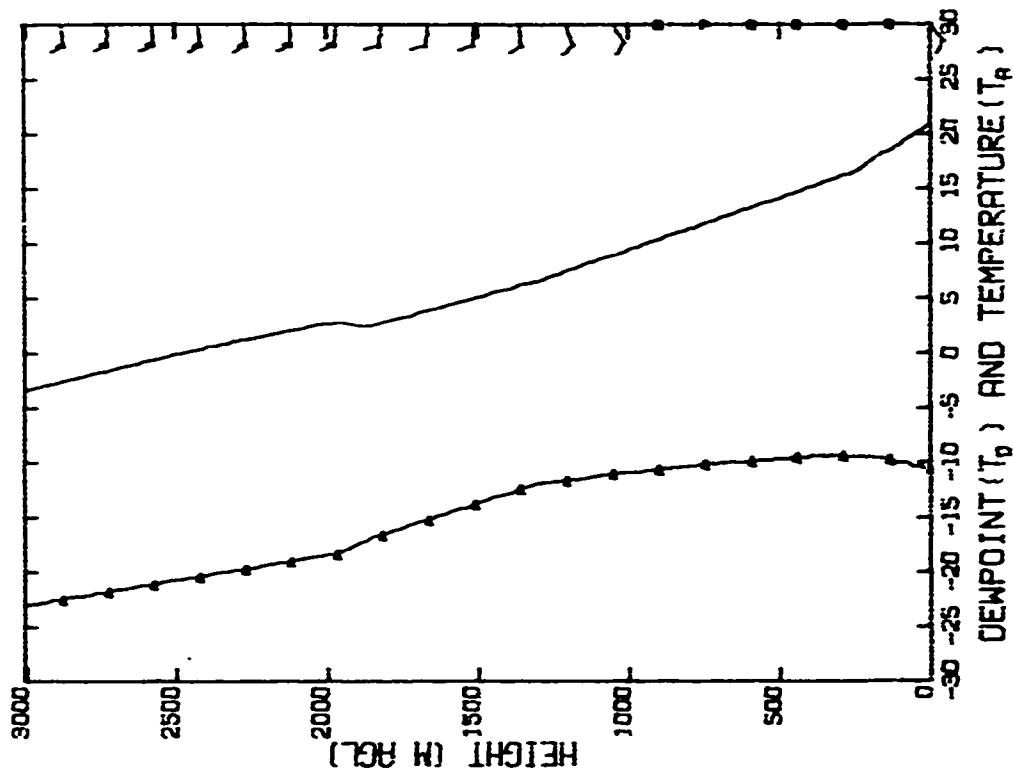
WIND BARB SYSTEM (KTS)

TABLE 15
APACHE SITE RAWINSONDE DATA

DATE: 24 MAR 77 RELEASE NO.: 2 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	656.5	20.9	2.0	230.0	5.1
252.3	637.5	16.5	2.2	0.0	0.0
1309.4	561.7	6.5	1.8	257.2	4.4
1860.9	525.0	2.4	1.2	275.6	6.2
1949.2	519.3	3.0	1.1	274.5	6.5
2404.8	490.8	0.5	0.9	262.9	6.9
3093.7	450.1	-4.0	0.7	254.3	10.1



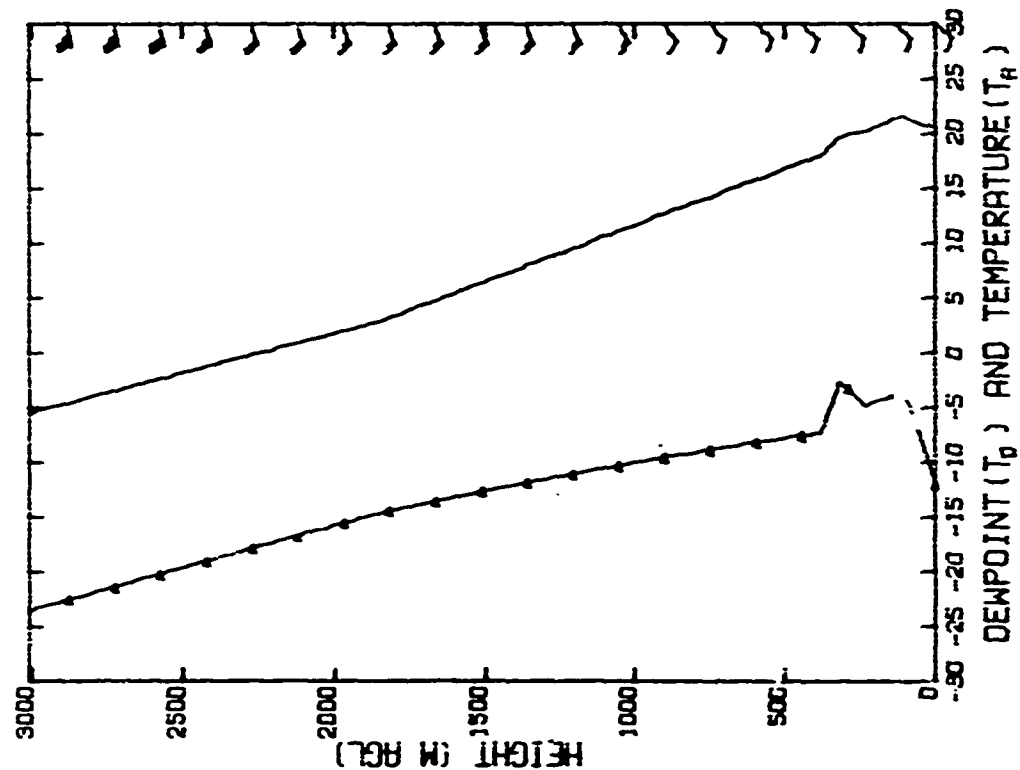
WIND BRK8 SYSTEM (KTS)

TABLE 16
 FPACHE SITE RAWINSONDE DATA

DATE: 24 MAR 77 RELEASE NO.: 3 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	655.0	20.5	1.8	220.0 5.1
107.5	646.9	21.7	3.5	220.6 5.3
234.6	637.5	20.2	3.2	221.3 5.4
318.1	631.3	19.7	3.8	221.8 5.5
382.6	626.6	18.0	2.6	222.2 5.6
1855.7	525.0	2.8	1.5	252.3 8.9
4076.7	395.8	-13.2	0.3	241.9 13.4



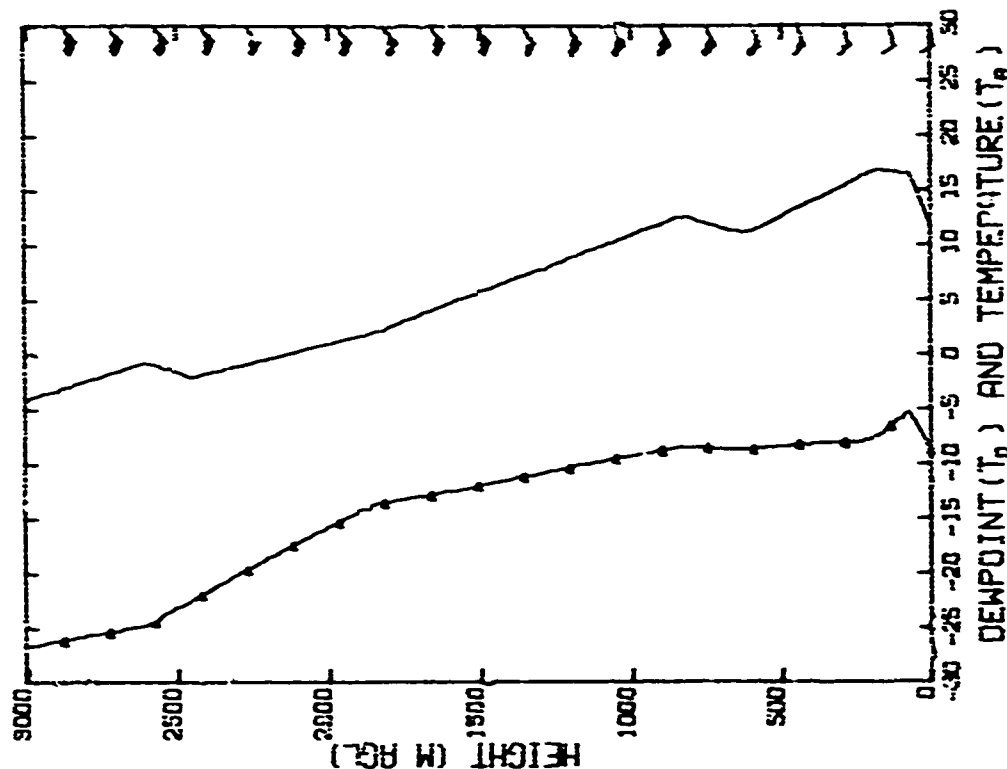
WIND BRK8 SYSTEM (KTS)

TABLE 17
APACHE SITE RAWINSUNDE DATA

DATE: 24 MAY 77 RELEASE NO.: 4 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	655.3	11.6	2.4	260.0 5.1
74.7	649.5	16.5	3.1	257.7 5.8
179.5	641.5	17.0	2.5	255.6 6.5
233.4	637.6	16.2	2.5	254.4 7.1
616.4	609.1	11.0	2.4	248.5 10.9
820.9	594.4	12.7	2.4	245.3 13.1
1577.3	542.5	4.9	1.8	231.0 12.4
1844.4	525.0	2.0	1.6	230.7 12.4
2451.0	486.7	-2.1	0.7	228.4 13.4
2589.9	478.3	-5.6	0.6	228.6 14.3
3357.1	434.1	-7.2	0.4	230.4 17.0



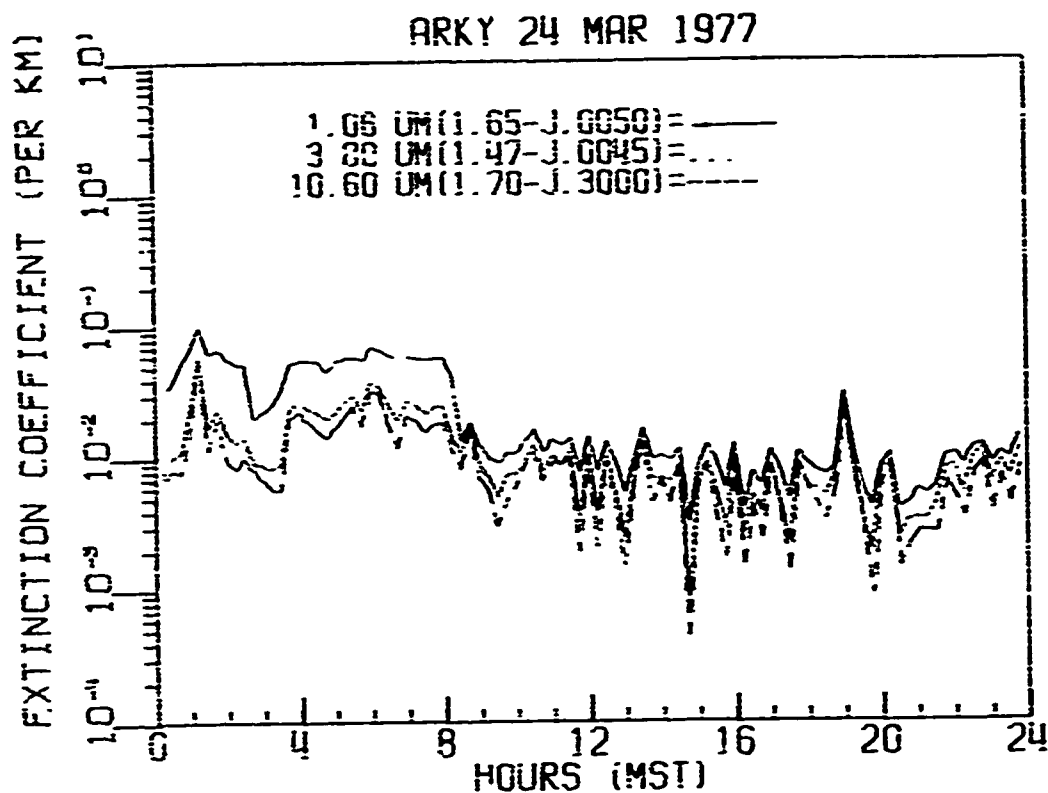


Figure 13. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 24 March 1977.

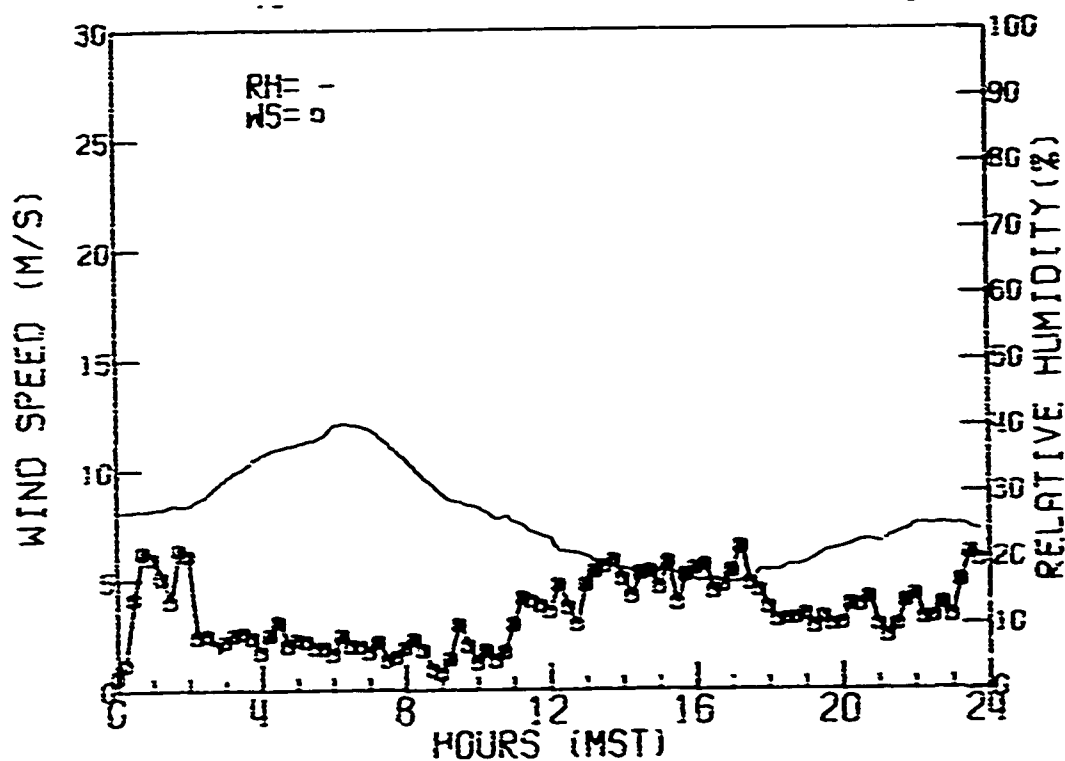


Figure 14. Diurnal variation of windspeed and relative humidity, Arky Site, 24 March 1977.

TABLE 10
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARRY SITE, WENT

DATE TIME SAMPLE (MST) TIME (SEC)	CHANNEL										EXTINCTION (PER KW)			MASS LOADING (UN/MEOS)
	1	2	3	4	5	6	7	8	9	10	1.06	5.6	13.6	
24 MAR 77														
00:00:00 900	.79-01	.57-00	.81-01	.40-01	.00	.31-01	.00	.37-01	.12-01	.98-02				138.
00:01:00 900	.63-01	.31-00	.14-00	.10-01	.00	.00	.00	.37-01	.00	.71-02				67.
00:02:00 900	.79-01	.33-00	.14-00	.40-01	.00	.00	.00	.37-01	.10-01	.10-02				89.
00:03:00 900	.11-02	.44-00	.14-00	.10-01	.00	.00	.00	.37-01	.11-01	.78-02				103.
00:04:00 900	.13-02	.15-01	.43-00	.10-01	.00	.00	.00	.64-01	.22-01	.16-01				229.
00:05:00 900	.13-02	.20-01	.41-00	.12-01	.00	.00	.00	.13-00	.14-01	.16-01				610.
00:06:00 900	.13-02	.12-01	.47-00	.10-01	.00	.00	.00	.44-01	.17-01	.12-01				130.
00:07:00 900	.13-02	.12-01	.33-00	.10-01	.00	.00	.00	.37-01	.24-01	.20-01				277.
00:08:00 900	.12-02	.13-01	.34-00	.20-01	.00	.00	.00	.54-01	.16-01	.10-01				120.
00:09:00 900	.11-02	.46-00	.24-00	.42-01	.00	.00	.00	.42-01	.13-01	.14-02				113.
00:10:00 900	.11-02	.40-00	.14-00	.71-01	.00	.00	.00	.51-01	.15-01	.10-01				124.
00:11:00 900	.11-01	.43-00	.14-00	.10-01	.00	.00	.00	.21-01	.07-02	.63-02				94.
00:12:00 900	.41-01	.36-00	.14-00	.40-01	.00	.00	.00	.23-01	.04-02	.69-02				44.
00:13:00 900	.43-01	.44-00	.24-00	.10-01	.00	.00	.00	.16-01	.85-02	.59-02				57.
00:14:00 900	.70-01	.57-00	.14-00	.30-01	.00	.00	.00	.33-01	.90-02	.57-02				75.
00:15:00 900	.43-01	.43-00	.34-00	.41-01	.00	.00	.00	.41-01	.23-01	.20-01				229.
00:16:00 900	.44-01	.12-01	.43-00	.41-01	.00	.00	.00	.57-01	.24-01	.23-01				253.
00:17:00 900	.42-01	.13-01	.43-00	.41-01	.00	.00	.00	.54-01	.24-01	.19-01				157.
00:18:00 900	.75-01	.11-01	.43-00	.71-01	.00	.00	.00	.14-01	.22-01	.17-01				187.
00:19:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.14-01				124.
00:20:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:21:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:22:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:23:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:24:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:25:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:26:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:27:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:28:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:29:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:30:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:31:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:32:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:33:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:34:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:35:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:36:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:37:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:38:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:39:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:40:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:41:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:42:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:43:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:44:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:45:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:46:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:47:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:48:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:49:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:50:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:51:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:52:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:53:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:54:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:55:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:56:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:57:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:58:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
00:59:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.
01:00:00 900	.49-01	.14-01	.43-00	.41-01	.00	.00	.00	.55-01	.23-01	.17-01				130.

TABLE 18 (CONT)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WSMR

DATE TIME	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER KM)		MASS LOADING (UMPM003)	
		1	2	3	4	5	6	7	8	9	10	1.06	3.0	10.6	
24 MAR 77	12:15:30	13.31	48.33	19.33	13.31	45.31	31.31	31.31	31.31	31.31	31.31	19.31	41.31	12.31	32.31
	12:30:00	13.31	47.33	18.33	13.31	44.31	30.31	30.31	30.31	30.31	30.31	18.31	40.31	11.31	31.31
	12:45:00	11.31	31.33	11.33	11.31	31.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31
	13:00:00	10.31	47.33	12.33	10.31	46.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31
	13:15:00	11.31	44.33	16.33	10.31	43.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31
	13:30:00	11.31	44.33	16.33	10.31	43.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31
	13:45:00	12.31	39.33	11.33	13.31	39.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	14:00:00	10.31	44.33	12.33	10.31	43.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31
	14:15:00	11.31	40.33	14.33	11.31	39.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31
	14:30:00	11.31	40.33	14.33	11.31	39.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31
	14:45:00	12.31	30.33	10.33	12.31	30.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31
	15:00:00	13.31	34.33	14.33	13.31	33.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	15:15:00	11.31	31.33	13.33	11.31	31.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31	11.31
	15:30:00	10.31	16.33	12.33	10.31	16.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31	10.31
	15:45:00	12.31	26.33	13.33	12.31	26.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31
	16:00:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	16:15:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	16:30:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	16:45:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	17:00:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	17:15:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	17:30:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	17:45:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	18:00:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	18:15:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	18:30:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	18:45:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	19:00:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	19:15:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	19:30:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	19:45:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	20:00:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	20:15:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	20:30:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	20:45:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	21:00:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	21:15:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	21:30:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	21:45:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	22:00:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31
	22:15:00	13.31	26.33	13.33	13.31	26.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31	13.31

TABLE 1B (cont)
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SITE, WSNR

DATE TIME (MST)	SAMPLE TIME (SEC)	CHANNEL							EXTINCTION (PER KM)			MASS LOADING (UG/M ³)	
		1	2	3	4	5	6	7	0	1.06	3.8	15.6	
20 MAR 77	23:33:30	.42+33	.27+33	.41-31	.13-31	.33	.03	.03	.00	.43-02	.75-02	.15-02	13.
	20:45:00	.42+00	.20+00	.41-01	.20-01	.00	.00	.00	.00	.44-02	.34-02	.22-02	19.
	21:33:30	.53+33	.30+33	.13+33	.33	.32-31	.33	.33	.00	.57-02	.35-02	.28-02	16.
	21:37:00	.65+00	.24+00	.32+00	.00	.32-03	.00	.00	.00	.54-02	.35-02	.28-02	15.
	21:33:30	.42+33	.23+33	.16+33	.23-31	.33	.33	.03	.00	.62-02	.44-02	.27-02	22.
	21:04:00	.43+00	.27+00	.18+00	.51-01	.32-01	.00	.00	.00	.10-03	.63-02	.67-02	47.
	22:32:30	.45+33	.50+33	.33+33	.43-31	.33	.33	.03	.00	.11-01	.63-02	.52-02	42.
	22:14:00	.45+00	.53+00	.18+00	.00	.32-01	.00	.00	.00	.91-02	.53-02	.36-02	23.
	22:33:30	.46+33	.33+33	.24+33	.33-31	.33	.13-31	.33	.00	.12-01	.99-02	.76-02	46.
	22:45:00	.74+00	.39+00	.24+00	.41-01	.32-01	.00	.00	.00	.13-01	.12-01	.92-02	67.
	23:33:30	.67+33	.41+33	.22+33	.33-31	.33	.03	.03	.00	.92-02	.57-02	.40-02	33.
	23:15:00	.44+00	.31+00	.22+00	.30-01	.00	.13-01	.00	.00	.11-03	.93-02	.73-02	44.
	23:33:30	.47+33	.33+33	.16+33	.40-31	.33	.03	.03	.00	.98-02	.72-02	.66-02	39.
	23:49:00	.13+01	.56+00	.24+00	.40-01	.00	.13-01	.00	.00	.14-03	.11-01	.66-02	44.

Weather Summary

Date: 25 March 1977

Synoptic

Surface: Deep surface low-pressure area over eastern North Dakota with cold front extending southwest to low over Colorado and thence southward to southwestern New Mexico.

500 Millibar: Upper air cutoff low developed over west central California with southwesterly flow over New Mexico.

Holloman AFB

Clouds: Increasing cloudiness with scattered middle (altostratus) and high (cirrus) clouds during the morning and scattered low (cumulus) and middle clouds and overcast high clouds during the afternoon with cloud bases at 2000 m, 5500 m, and 7600 m AGL, respectively.

Wind: Generally southerly at 5-8 m sec⁻¹ with gust to 13 m sec⁻¹ during midafternoon.

Visibility: Generally greater than 60 km.

Maximum temperature: 23.3°C

Corresponding vapor pressure: 2.2 Torr

Minimum temperature: 9.4°C

Corresponding vapor pressure: 1.7 Torr

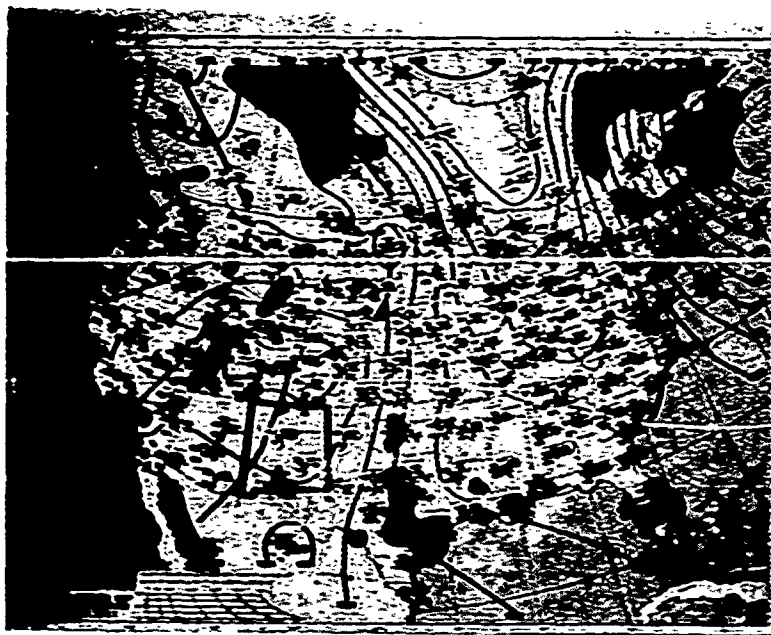


Figure 15a. Surface weather map for 25 March 1977.

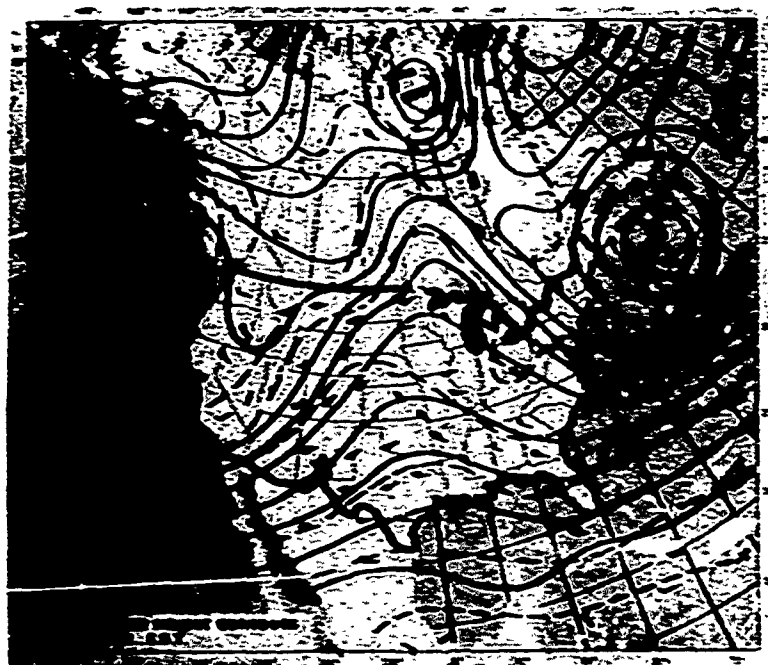


Figure 15b. 500-millibar height contours for 25 March 1977.

TABLE 19. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	12.9	3.4	-3.2	0	0	10 C1	0300 Mag tape quit, 0317 mag tape restarted
0200	13.2	3.5	-3.0	0	0	10 C1	
0300	13.2	3.7	-2.2	0	0	10 C1	
0400	11.9	3.0	-5.2	0	0	10 C1	Propeller driven plane over Mar Site continued N
0500	12.2	3.3	-4.0	0	0	30 C1	
0600	11.3	3.2	-4.2	0	0	50 C1	
0700	14.8	3.5	-3.1	0	0	70 C1	0945 - checked balance on ΔT: reconditioned lines; ok 1020
0800	13.4	4.1	-1.0	0	40 Ac	80 C1	
0900	18.0	4.6	0.7	0	0	80 Cs	
1000	19.5	5.0	1.7	0	0	90 Cs	Acoustic sounder off at 1545, back on line at 1700
1100	21.4	4.2	-0.3	0	0	90 Cs	
1200	21.5	4.4	0.2	0	0	90 Cs	
1300	21.9	3.8	-1.6	0	0	90 Cs	32 meter "ΔT" out "y" at 32 meters seems to be sluggish
1400	20.8	4.3	-0.1	0	0	90 Cs	
1500	20.4	3.2	-3.8	0	0	95 Cs	
1600	20.2	2.9	-4.8	0	0	100 Cs	
1700	19.4	3.3	-3.6	0	0	100 Cs	
1800	17.7	3.0	-5.0	0	20 Ac	80 Cs	
1900	15.3	2.6	-6.6	0	20 Ac	80 Cs	
2000	16.2	3.1	-4.3	0	20 Ac	80 Cs	
2100	14.5	4.2	-0.8	0	100 As	-	
2200	15.3	4.6	0.6	0	100 As	-	
2300	15.0	5.4	2.7	0	100 As	-	
2400	14.1	5.1	2.0	0	100 As	-	

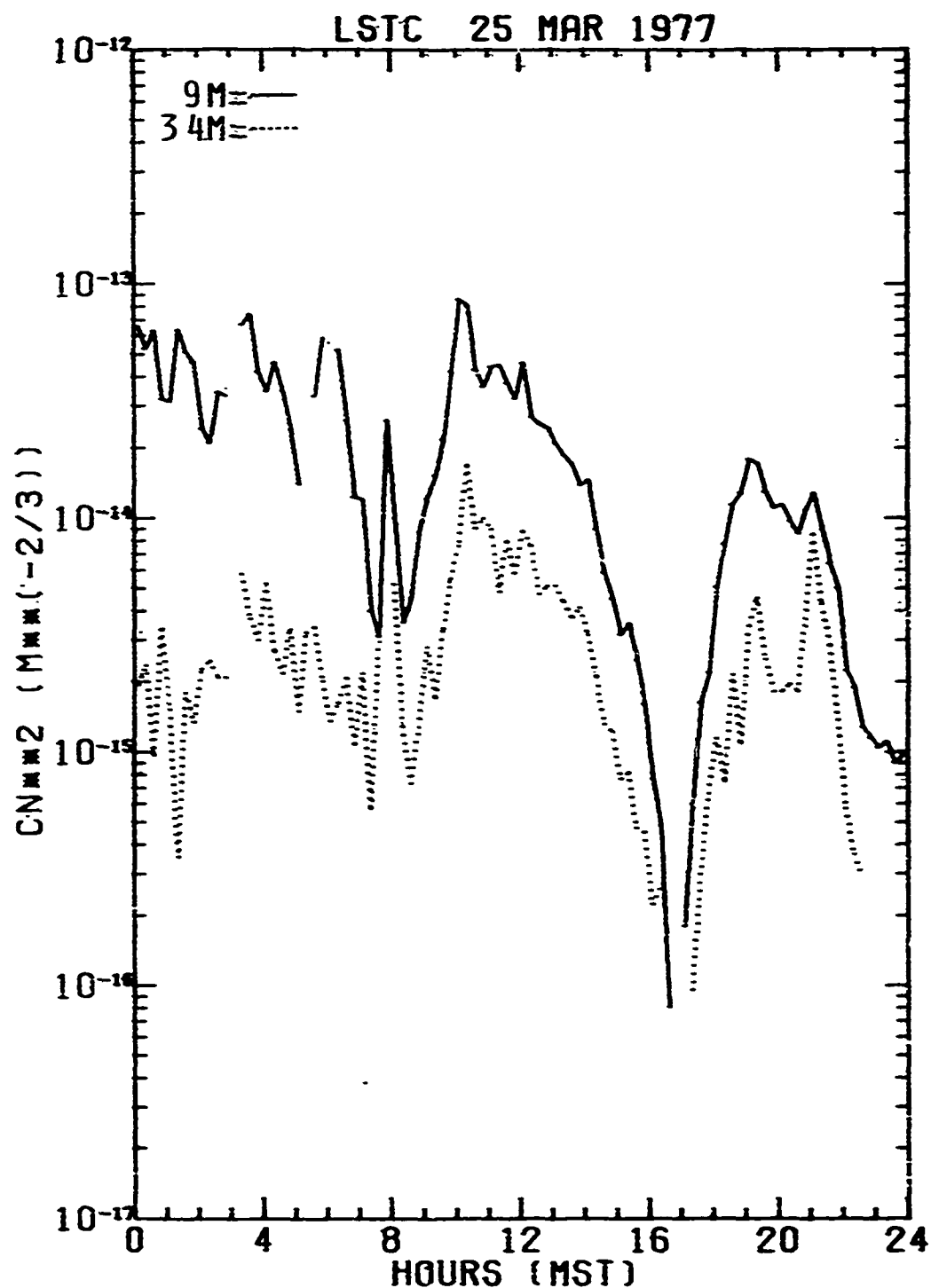


Figure 16. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 25 March 1977.

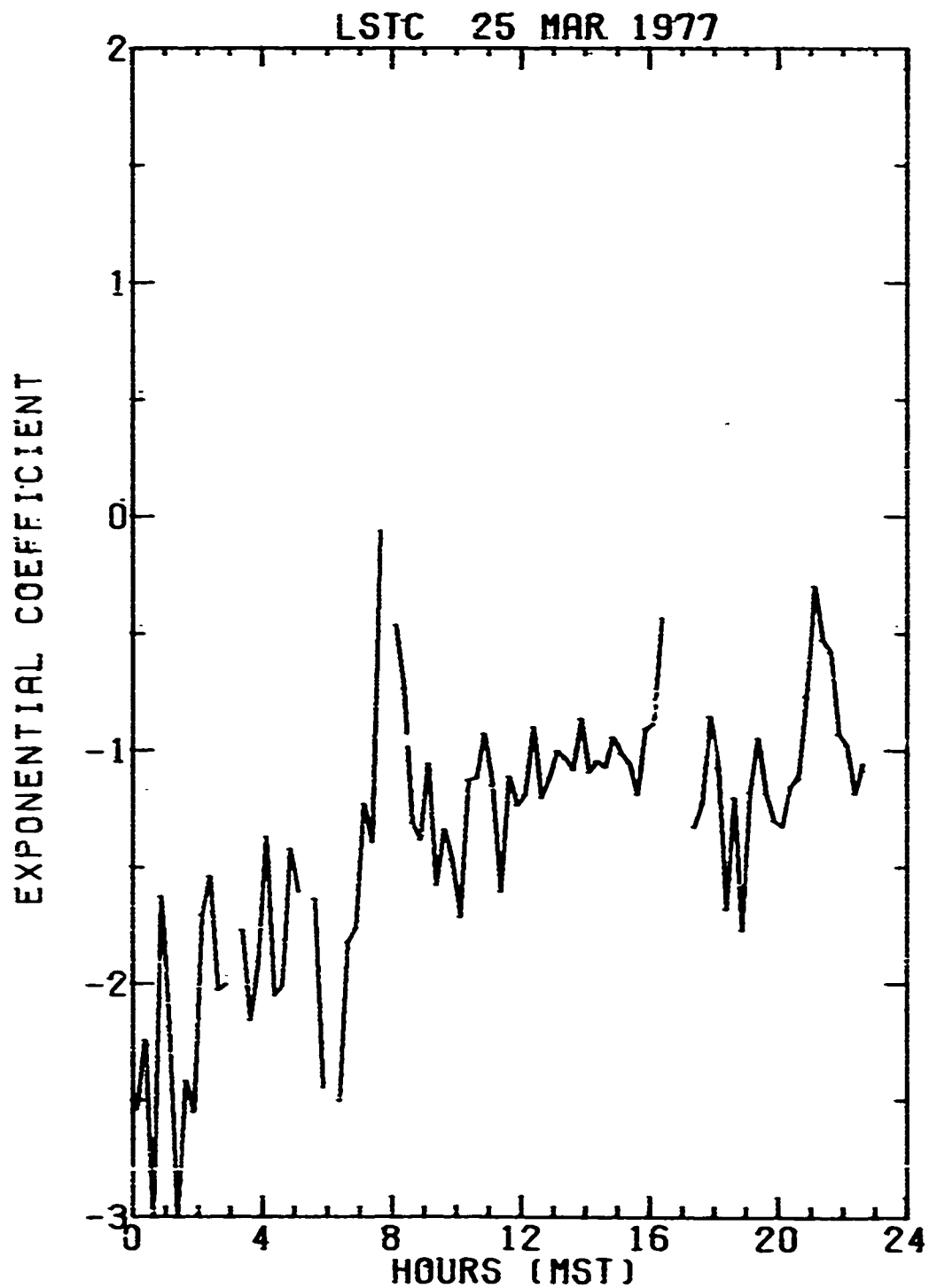


Figure 17. Diurnal variation of the altitude change of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 25 March 1977.

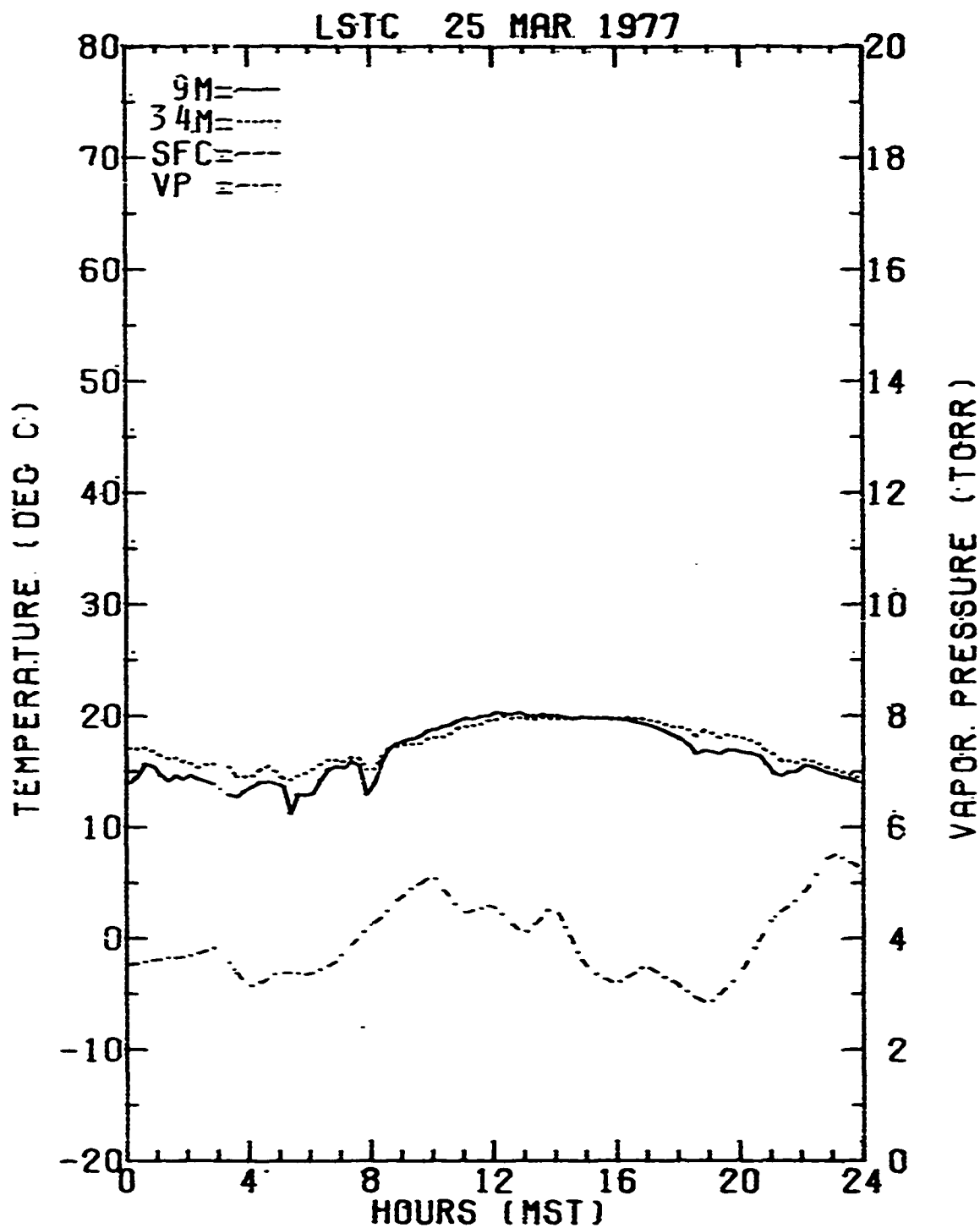


Figure 18. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 25 March 1977.

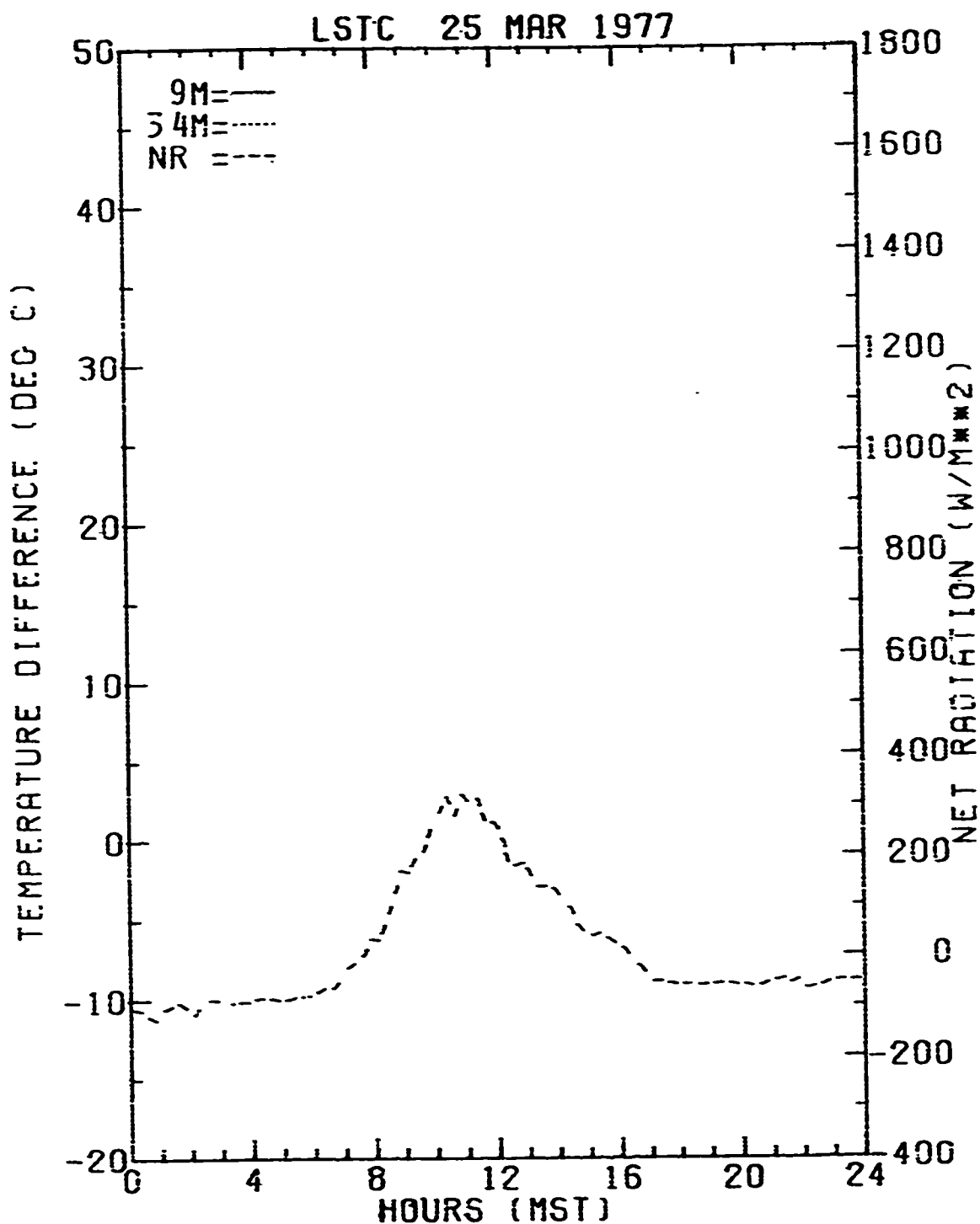


Figure 19. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 25 March 1977.

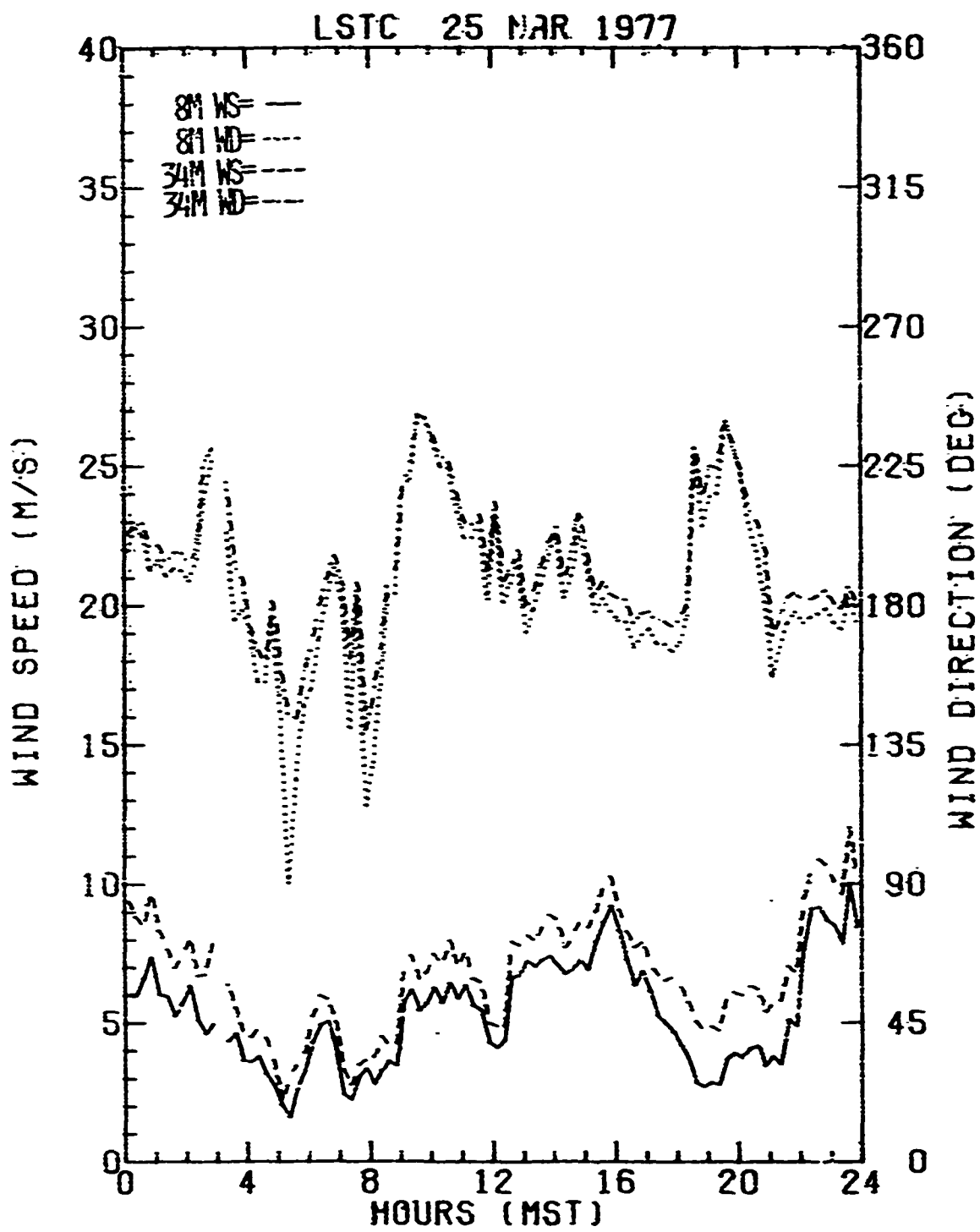


Figure 20. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 25 March 1977.

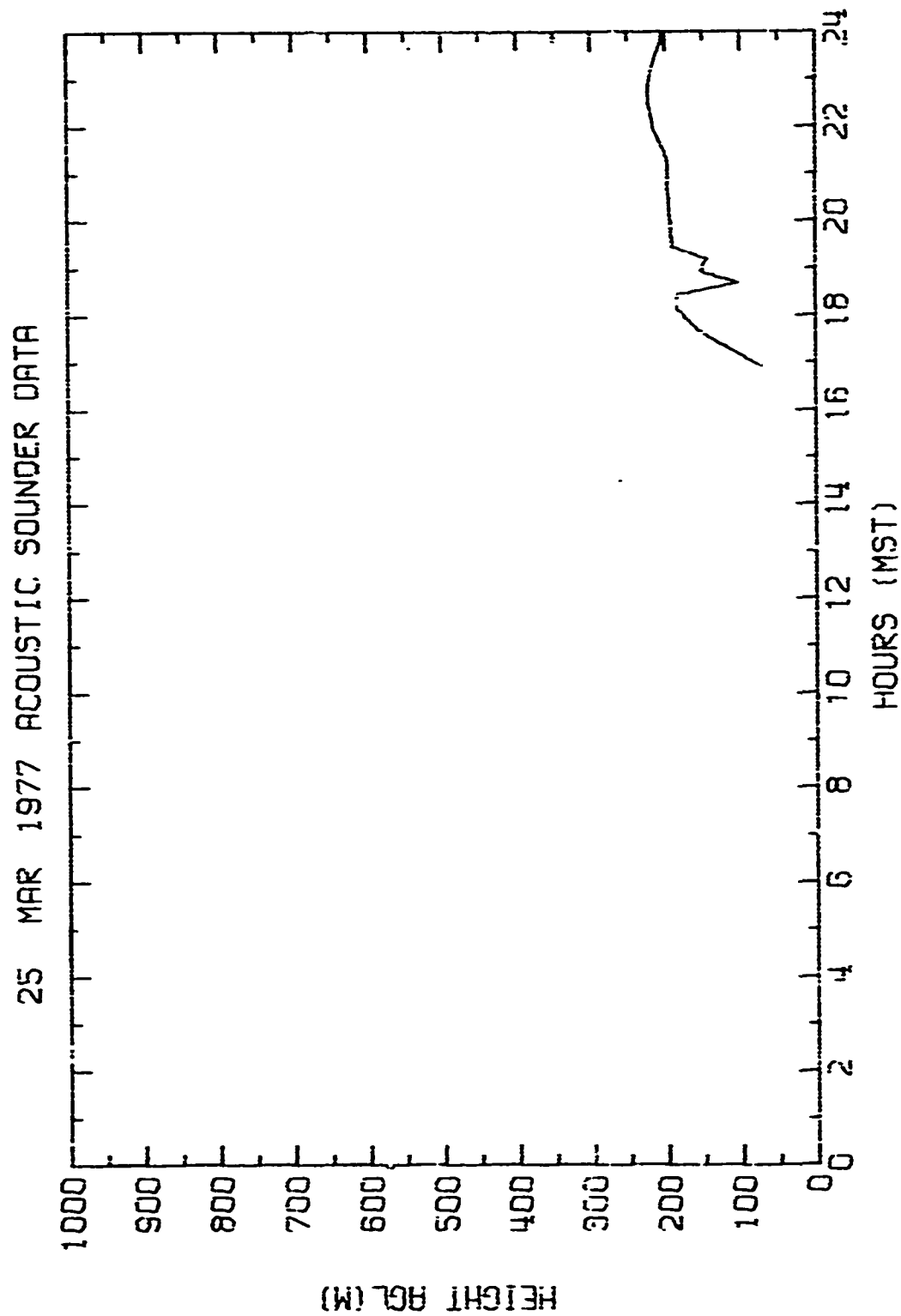


Figure 21. Inversion heights, LSTC, 25 March 1977.

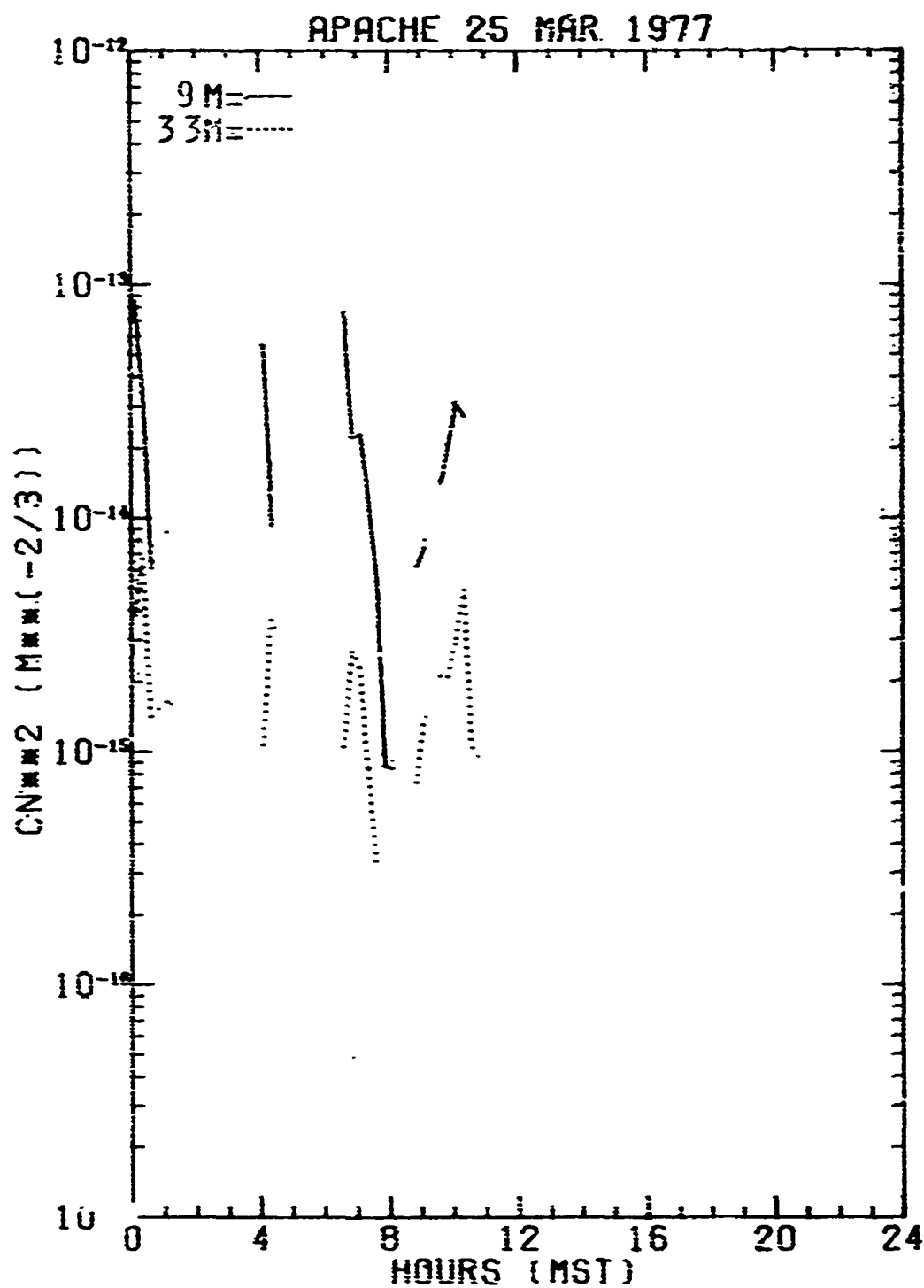


Figure 22. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 25 March 1977.

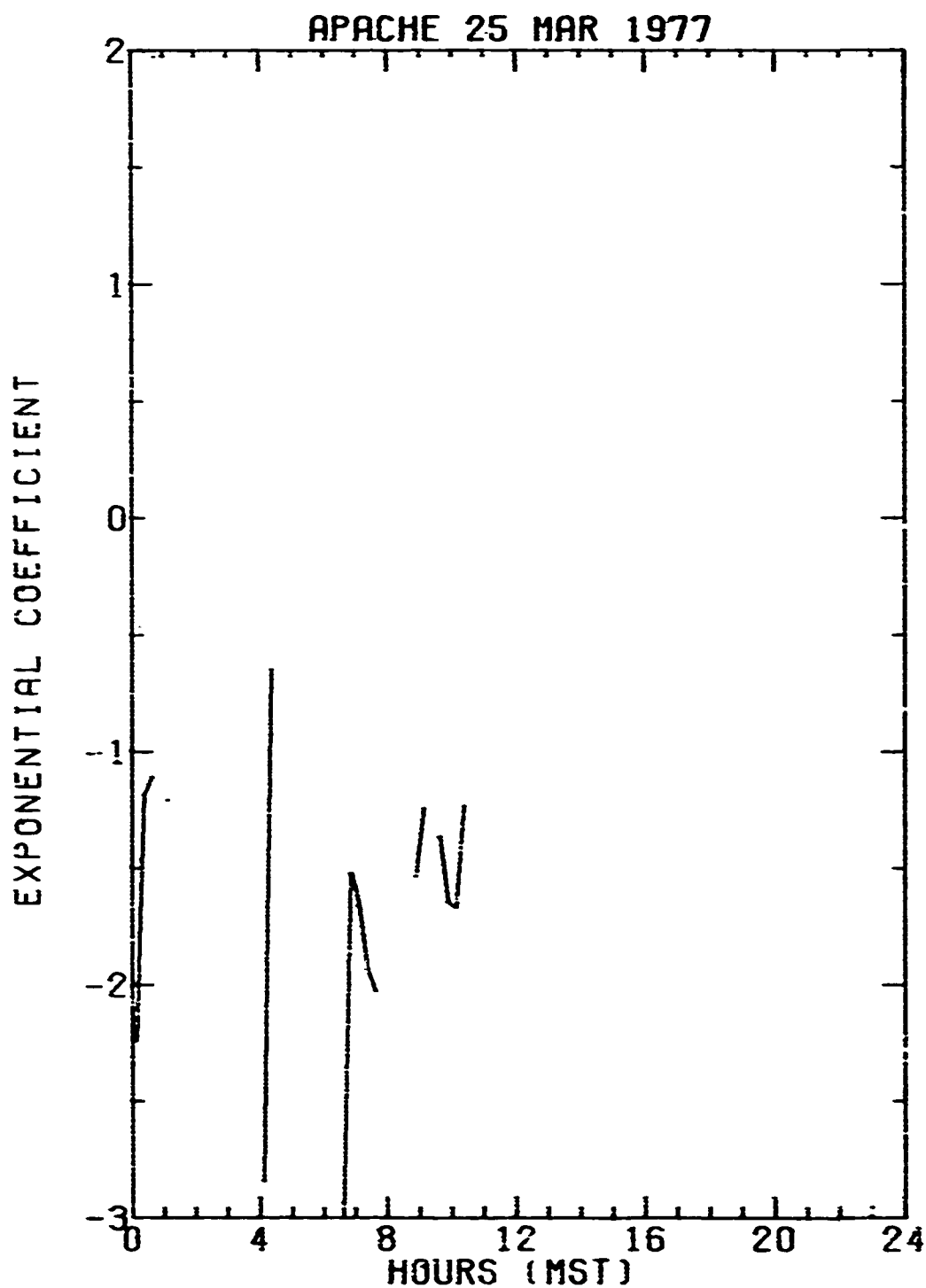


Figure 23. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 25 March 1977.

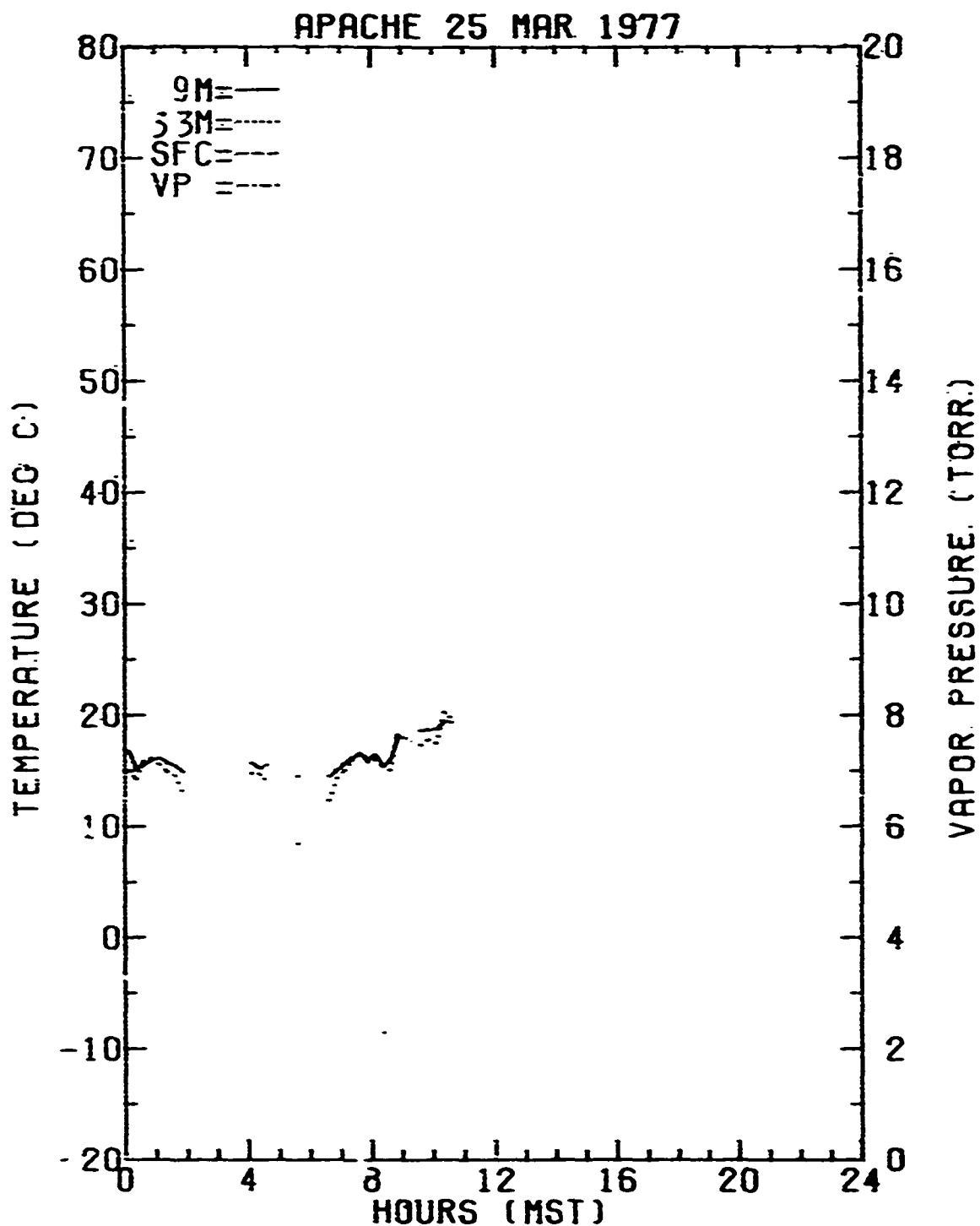


Figure 24. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 25 March 1977.

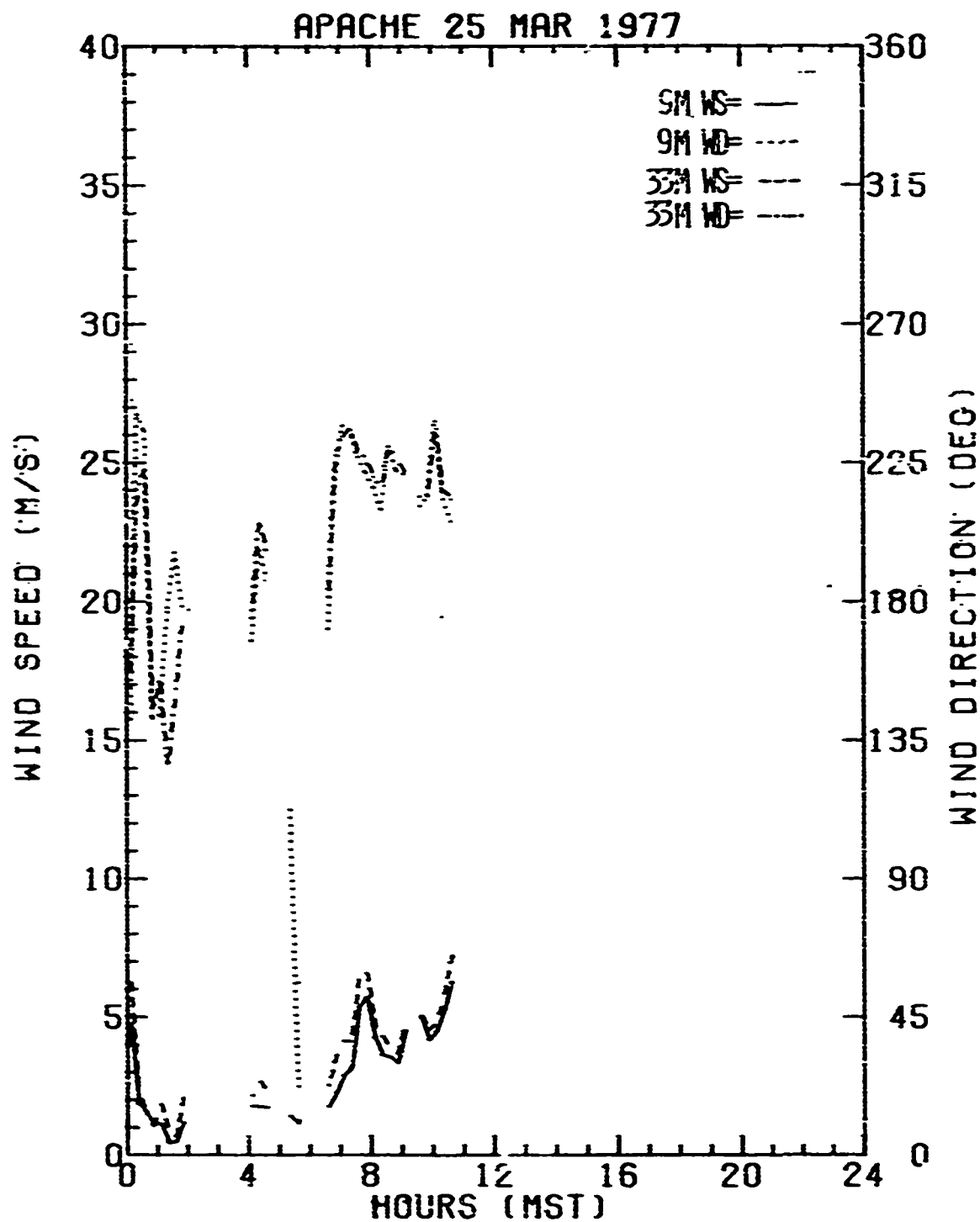


Figure 25. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 25 March 1977.

TABLE 20
APACHE SITE RAWINSONDE DATA

DATE: 25 MAR 77 RELEASE NO.: 5 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	654.5	11.7	2.0	0.0	0.0
45.5	651.0	16.1	2.5	0.0	0.0
223.0	637.5	14.5	2.2	0.0	0.0
944.2	584.5	5.9	1.6	0.0	0.0
1077.9	575.1	6.6	1.4	0.0	0.0
1820.3	525.0	2.1	1.0	233.9	15.8
3350.9	432.1	-9.7	0.4	226.2	15.0

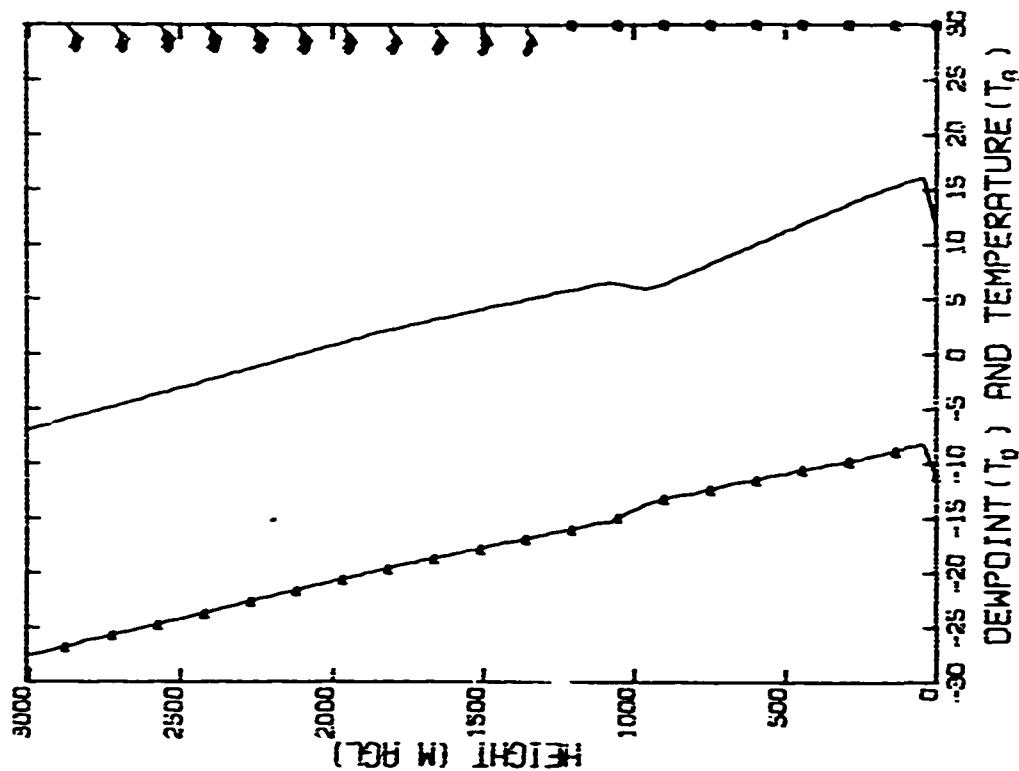


TABLE 21
APACHE SITE RAWINSONDE DATA

DATE: 25 MAR '77 RELEASE NO.: 6 RELEASE TIME: 1000 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	655.7	19.5	1.7	210.0 5.1
78.6	649.7	16.5	3.2	211.9 5.2
239.9	637.5	15.5	2.9	215.6 5.3
1566.3	543.2	2.8	1.5	239.0 9.7
1841.9	525.0	0.9	1.2	234.3 13.5
2688.9	472.0	-5.2	0.7	232.5 18.6
3418.0	430.0	-8.2	0.6	228.9 18.0

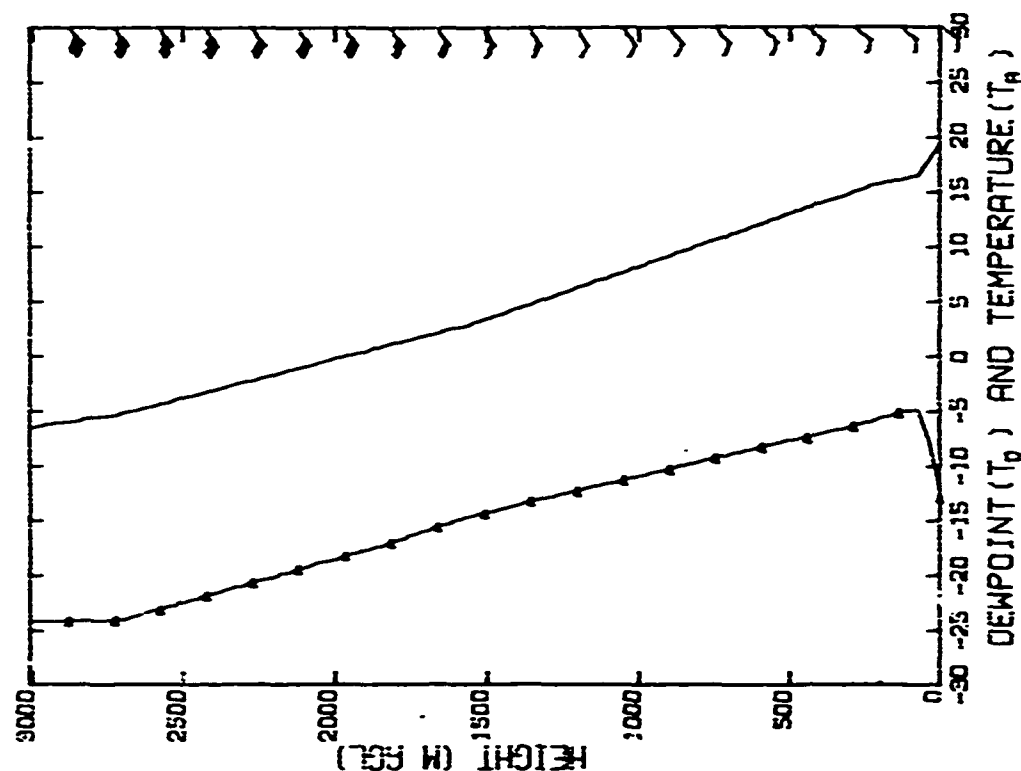


TABLE 22
APACHE SITE RAWINSONDE DATA

DATE: 25 MAR '77 RELEASE NO.: 7 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	653.8	17.0	2.8	210.0	2.6
144.6	642.9	19.6	3.3	0.0	0.0
217.1	637.5	19.4	3.2	0.0	0.0
932.2	585.9	11.2	2.6	0.0	0.0
1763.3	576.7	9.5	2.4	200.0	9.6
1833.1	525.0	1.8	1.8	217.5	10.9
3005.9	452.7	-9.1	1.3	201.5	13.9

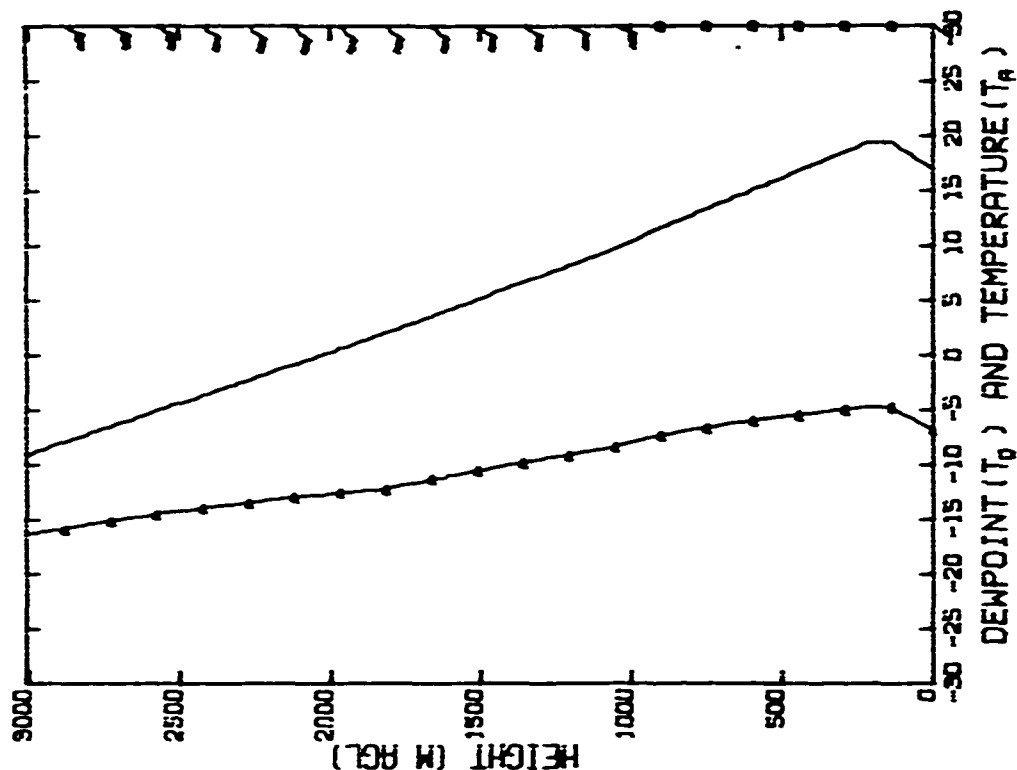
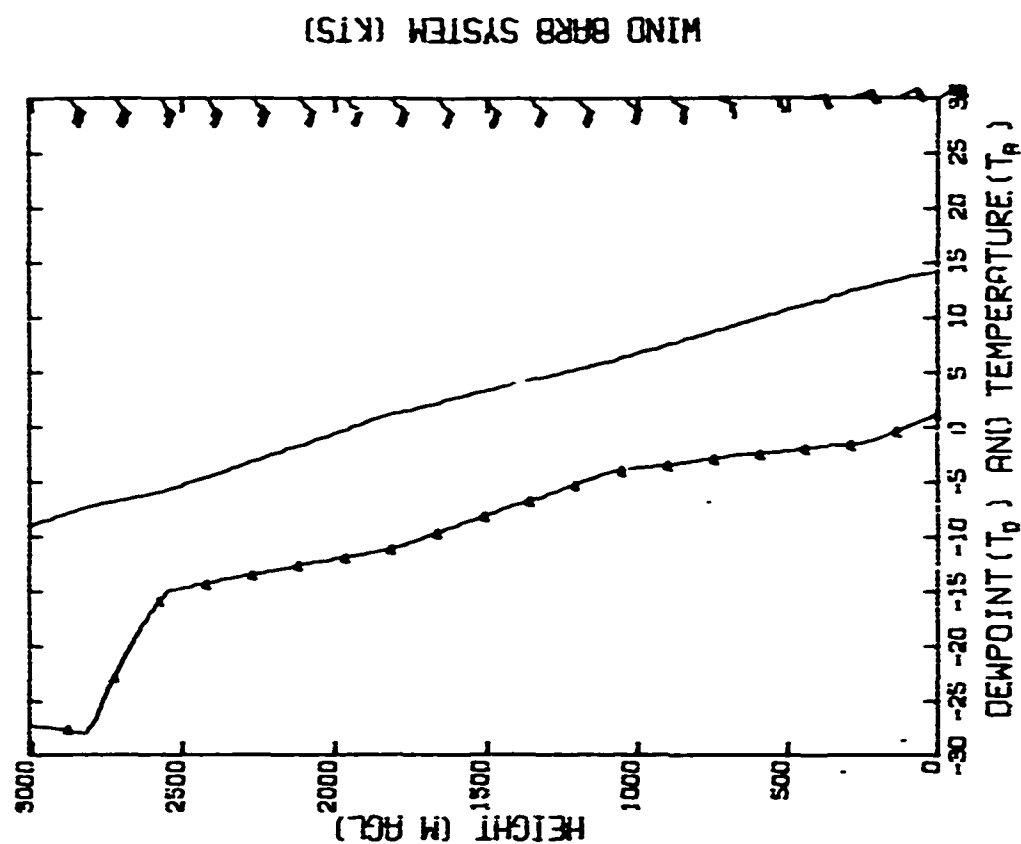


TABLE 23
APACHE SITE RAWINSONDE DATA

DATE: 25 MAR 77 RELEASE NO.: 8 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	654.4	14.2	5.0	150.0	11.3
221.2	637.5	12.9	4.1	160.4	10.1
1085.4	574.5	6.0	3.4	216.7	9.8
1817.9	525.0	1.1	1.9	223.4	11.4
2555.4	478.5	-5.9	1.4	226.4	13.6
2804.7	463.5	-7.3	0.5	222.5	14.6
3494.1	423.9	-13.1	0.5	209.5	14.3



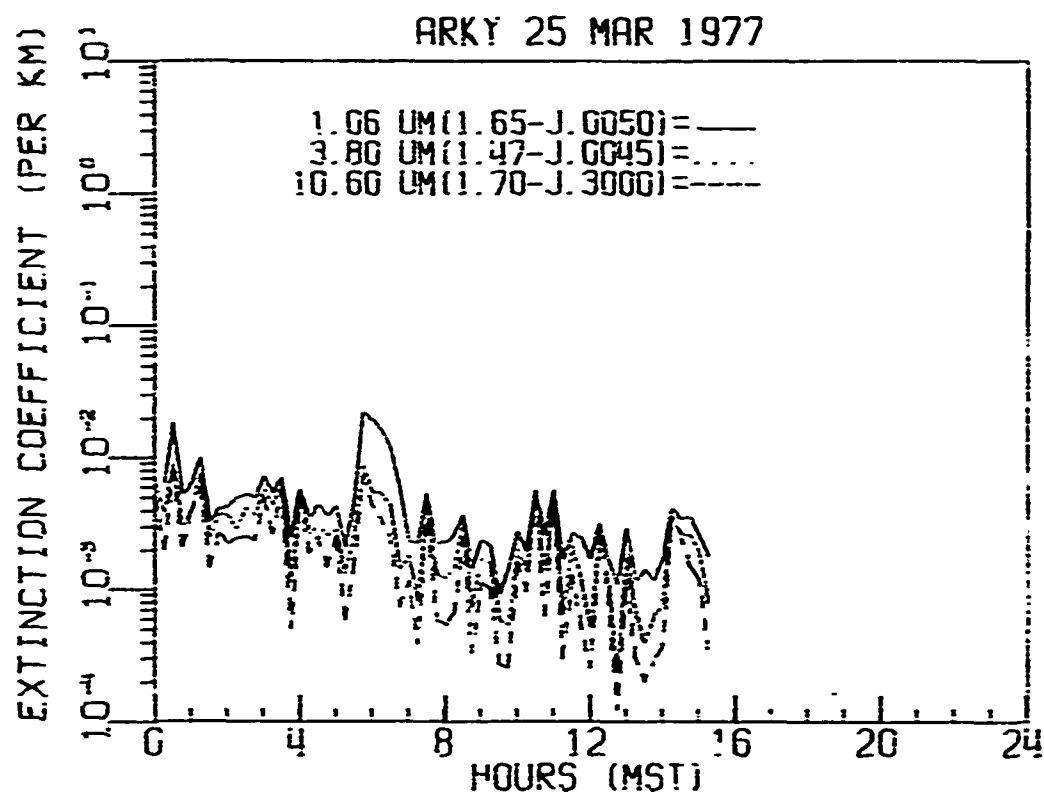


Figure 26. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 25 March 1977.

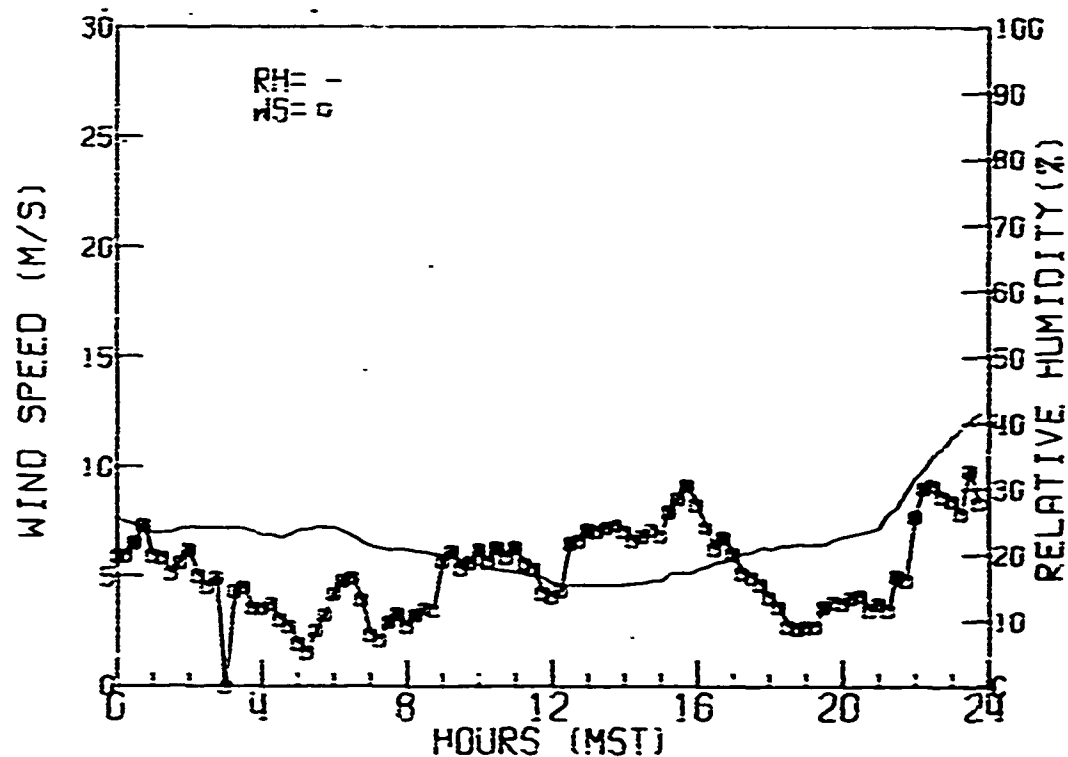


Figure 27. Diurnal variation of windspeed and relative humidity, Arky Site, 25 March 1977.

TABLE 24
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WLM2

DATE TIME	SAMPLE TIME (SEC)	CHANNEL								EXTINCTION (PER KW)			MASS LOADING (UG/MOOS)
		1	2	3	4	5	6	7	8	1.34	3.0	13.6	
25 MAR 77	00:00:00	71+00	41+00	14+00	20+01	32+03	00	00	00	00-02	62-02	47-02	31
	00:05:00	54+00	33+00	14+00	13+01	00	00	00	00	59-02	38-02	20-02	17
	00:10:00	30+01	19+00	41+01	30+01	32+01	00	00	00	19-01	90-02	87-02	100
	00:15:00	79+00	14+00	41+01	20+01	00	00	00	00	11-02	31-02	21-02	20
	00:20:00	67+00	14+00	20+01	00	00	00	00	00	64-02	41-02	40-02	60
	01:00:00	73+00	07+00	14+00	40+01	32+01	00	00	00	13-01	77-02	50-02	43
	01:05:00	32+00	13+00	10+01	10+01	00	00	00	00	34-02	25-02	15-02	12
	01:10:00	27+00	13+00	01+01	10+01	00	00	00	00	41-02	30-02	27-02	22
	02:00:00	29+00	20+00	10+01	20+01	00	00	00	00	45-02	37-02	23-02	19
	02:05:00	53+00	20+00	10+01	20+01	00	00	00	00	51-02	29-02	25-02	14
	02:10:00	56+00	11+00	10+01	20+01	00	00	00	00	54-02	42-02	26-02	21
	02:15:00	45+00	23+00	13+00	20+01	00	00	00	00	53-02	37-02	23-02	20
	03:00:00	49+00	26+00	01+01	20+01	00	00	00	00	73-02	59-02	51-02	67
	03:15:00	49+00	17+00	19+00	20+01	00	00	00	00	55-02	44-02	27-02	21
	03:30:00	39+00	23+00	01+01	20+01	00	00	00	00	73-02	65-02	57-02	72
	03:45:00	33+00	16+00	01+01	10+01	00	00	00	00	25-02	11-02	52-03	5
	04:00:00	20+00	11+00	12+00	10+01	00	00	00	00	58-02	57-02	50-02	65
	04:05:00	36+00	14+00	01+01	20+01	00	00	00	00	36-02	27-02	19-02	16
	04:10:00	24+00	24+00	10+01	00	32+01	00	00	00	44-02	32-02	26-02	33
	04:15:00	36+00	20+00	01+01	10+01	00	00	00	00	37-02	21-02	15-02	12
	04:20:00	31+00	14+00	10+01	10+01	00	00	00	00	43-02	29-02	25-02	13
	04:25:00	25+00	06+01	10+01	10+01	00	00	00	00	21-02	13-02	10-02	9
	04:30:00	62+00	13+00	12+00	10+01	00	00	00	00	47-02	28-02	14-02	14
	04:35:00	31+01	11+00	14+00	20+01	00	00	00	00	21-01	08-02	74-02	58
	04:40:00	38+01	39+00	01+01	10+01	00	00	00	00	14-01	56-02	44-02	44
	04:45:00	32+01	31+00	12+00	20+01	00	00	00	00	12-01	13-02	14-02	40
	04:50:00	23+01	30+00	14+00	10+01	00	00	00	00	41-02	43-02	25-02	28
	04:55:00	12+01	20+00	20+01	10+01	00	00	00	00	16-02	16-02	73-03	11
	05:00:00	30+00	06+01	01+01	10+01	00	00	00	00	23-02	18-02	12-02	10
	05:05:00	33+00	13+00	20+01	10+01	00	00	00	00	22-02	02-03	18-03	4
	05:10:00	34+00	11+00	01+01	10+01	00	00	00	00	55-02	45-02	42-02	59
	05:15:00	26+00	10+00	01+01	10+01	00	00	00	00	23-02	14-02	11-03	5
	05:20:00	30+00	13+00	01+01	10+01	00	00	00	00	23-02	12-02	55-03	5
	05:25:00	25+00	13+00	01+01	10+01	00	00	00	00	27-02	11-02	67-03	4
	05:30:00	20+00	07+01	01+01	10+01	00	00	00	00	37-02	34-02	25-02	21
	05:35:00	20+00	13+00	01+01	10+01	00	00	00	00	19-02	74-03	34-03	3
	05:40:00	20+00	13+00	01+01	10+01	00	00	00	00	24-02	18-02	13-02	10
	05:45:00	20+00	13+00	01+01	10+01	00	00	00	00	22-02	16-02	11-02	7
	05:50:00	21+00	29+01	01+01	10+01	00	00	00	00	44-03	60-03	27-03	2
	05:55:00	26+00	37+01	20+01	10+01	00	00	00	00	13-02	33-03	24-03	3
	10:00:00	23+00	13+00	00	20+01	00	00	00	00	28-02	21-02	14-02	15

TABLE 24 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ANKY SITE, WNR

DATE TIME SAMPLE (MST) (SEC)	CHANNEL										EXTINCTION (PER M)			MASS LOADING (LB/M ² ·H)	
	1	2	3	4	5	6	7	8	9	10	1.26	3.6	12.6		
25 MAR 77															
10:15:00	900	.20+00	.06-03	.26-03	.10-03	.00	.00	.00	.00	.00	.20-02	.14-02	.97-03	9.	
10:30:00	930	.29+00	.11+00	.01-01	.23-01	.00	.00	.00	.00	.00	.57-02	.47-02	.52-02	29.	
10:45:00	960	.30+00	.10+00	.01-01	.00	.00	.00	.00	.00	.00	.26-02	.14-02	.44-03	5.	
11:00:00	990	.22+00	.07-01	.01-01	.00	.00	.00	.00	.00	.00	.57-02	.51-02	.56-02	63.	
11:15:00	900	.26+00	.06-03	.26-03	.00	.00	.00	.00	.00	.00	.17-02	.64-03	.30-03	3.	
11:30:00	930	.23+00	.11+00	.01-01	.13-01	.00	.00	.00	.00	.00	.16-02	.22-02	.13-02	10.	
11:45:00	960	.36+00	.10+00	.01-01	.00	.00	.00	.00	.00	.00	.25-02	.12-02	.54-03	5.	
12:00:00	990	.30+00	.03-01	.23-01	.00	.00	.00	.00	.00	.00	.17-02	.12-03	.26-03	3.	
12:15:00	900	.17+00	.72-03	.01-01	.10-01	.32-01	.00	.00	.00	.00	.32-02	.26-02	.27-02	15.	
12:30:00	930	.23+00	.57-01	.03-01	.13-01	.00	.00	.00	.00	.00	.17-02	.11-02	.53-03	5.	
12:45:00	960	.22+00	.03-01	.00	.00	.00	.00	.00	.00	.00	.11-02	.24-03	.33-03	2.	
13:00:00	990	.37+00	.06-01	.01-01	.13-01	.00	.00	.00	.00	.00	.33-02	.19-02	.12-02	11.	
13:15:00	900	.16+00	.03-01	.01-01	.00	.00	.00	.00	.00	.00	.12-02	.67-03	.30-03	3.	
13:30:00	930	.33+00	.16-01	.23-01	.00	.00	.00	.00	.00	.00	.14-02	.40-03	.21-03	3.	
13:45:00	960	.18+00	.29-03	.01-01	.00	.00	.00	.00	.00	.00	.12-02	.63-03	.29-03	2.	
14:00:00	990	.23+00	.72-01	.01-01	.00	.00	.00	.00	.00	.00	.17-02	.01-03	.57-03	4.	
14:15:00	900	.26+00	.09-03	.20-03	.00	.00	.00	.00	.00	.00	.41-02	.35-02	.37-02	56.	
14:30:00	930	.17+00	.16+00	.23-01	.10-01	.32-01	.00	.00	.00	.00	.33-02	.23-02	.27-02	15.	
14:45:00	960	.33+00	.16+00	.35+00	.10-01	.00	.00	.00	.00	.00	.36-02	.24-02	.35-02	12.	
15:00:00	990	.21+00	.11+00	.01-01	.13-01	.00	.00	.00	.00	.00	.14-02	.20-02	.12-02	10.	
15:15:00	900	.22+00	.14+00	.20-01	.00	.00	.00	.00	.00	.00	.14-02	.02-03	.37-03	4.	

Weather Summary

Date: 26 March 1977

Synoptic

Surface: Weak surface low-pressure area over northern New Mexico, with cold front extending southwest into Mexico, passed WSMR about 1800 MST.

500 Millibar: Upper air closed low over northern Baja moving slowly east with instability showers ahead of the low. Strong southwesterly flow over New Mexico in advance of the closed low.

Holloman AFB

Clouds: Mostly overcast. Ceilings as low as 850 m AGL with layers above and occasional rain showers, blowing dust and blowing sand. A few thunderstorms were reported over the area during the late afternoon and early evening.

Wind: Southeasterly 10 m sec^{-1} becoming southwesterly 5 m sec^{-1} by 1800 MST. Peak gust 16 m sec^{-1} out of the southeast shortly before 0800 MST.

Visibility: Generally greater than 32 km, lowering to 8 km in rain showers and fog by 1900 MST, then improving to greater than 16 km for remainder of day.

Maximum temperature: 18.9°C

Corresponding vapor pressure: 6.3 Torr

Minimum temperature: 6.7°C

Corresponding vapor pressure: 6.1 Torr



Figure 28a. Surface weather map for 26 March 1977.

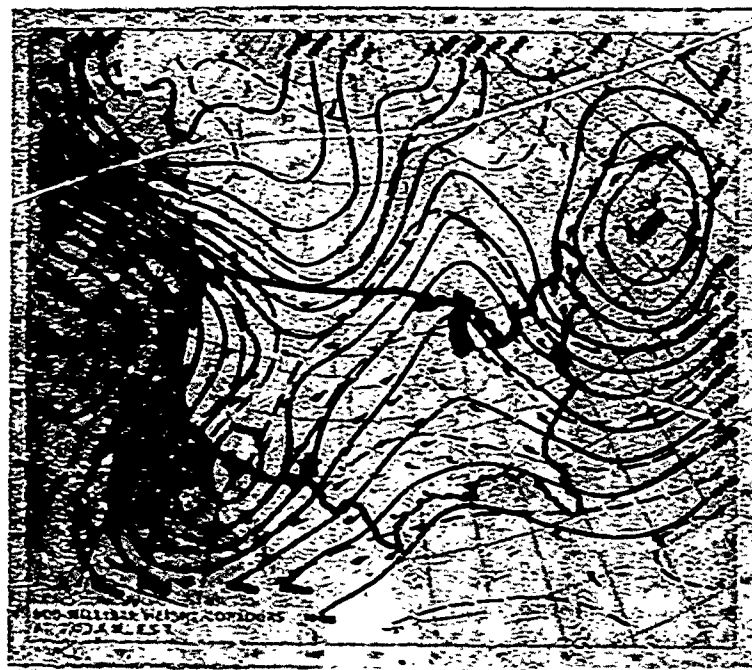


Figure 28b. 500-millibar height contours for 26 March 1977.

TABLE 25. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	14.0	5.8	3.5	0	100 As	-	
0200	13.6	5.7	3.2	0	100 As	-	
0300	13.3	5.7	3.3	0	100 As	-	
0400	12.0	5.3	2.2	0	100 As	-	
0500	11.2	5.4	2.4	0	100 As	-	
0600	11.1	6.1	4.2	80 Sc	20 As	-	
0700	11.0	6.7	5.5	90 Sc	10 Ac	-	Minivert not switching
0800	10.3	7.8	7.7	100 Sc	-	-	0745 rain began/8mΔF out/ computer stopped
0900	10.4	8.2	8.3	100 Sc	-	-	0819 restarted computer
1000	10.8	9.3	10.2	100 Sc	-	-	0940 rain began
1100	15.6	6.7	5.6	10 Cu	20 Ac	30 Ci	
1200	18.3	5.6	2.2	20 Cu	20 Ac	10 Ci	
1300	18.3	5.6	2.8	30 Cu	20 Ac	10 Ci	
1400	18.3	4.9	1.7	30 Cu	0	0	
1500	16.9	6.1	4.4	50 Cu	0	0	
1600	17.0	6.9	6.2	40 Cu	0	0	
1700	15.3	6.0	4.1	80 Sc	10 Ac	0	
1800	6.8	6.8	5.7	100 Cb	-	-	Light hail and rain began 1745, hail ended 1755, rain ended 1950
1900	5.0	5.7	3.0	100 Sc	-	-	
2000	6.9	5.7	3.2	100 Sc	-	-	Rain began 2050, ended 2135
2100	6.2	6.3	4.5	100 Sc	-	-	
2200	5.9	5.9	3.5	30 Sc	0	0	32m temperature pegs mini- verter disconnected, has 1
2300	5.5	6.1	3.8	80 Sc	0	0	V/P-P AC noise. Connect sur-
2400	5.0	5.8	3.3	60 Sc	0	0	face temperature at 2145

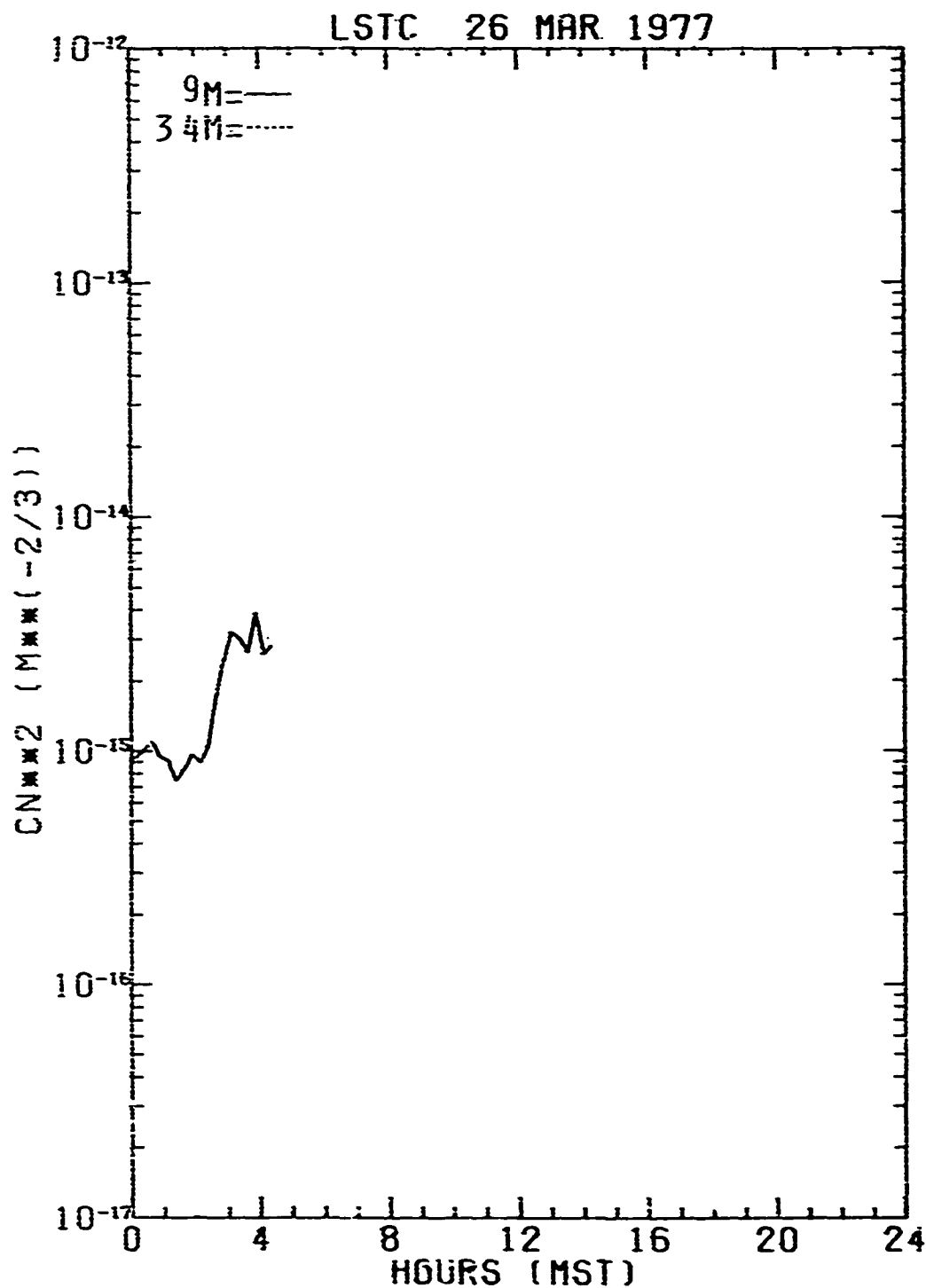


Figure 29. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 26 March 1977.

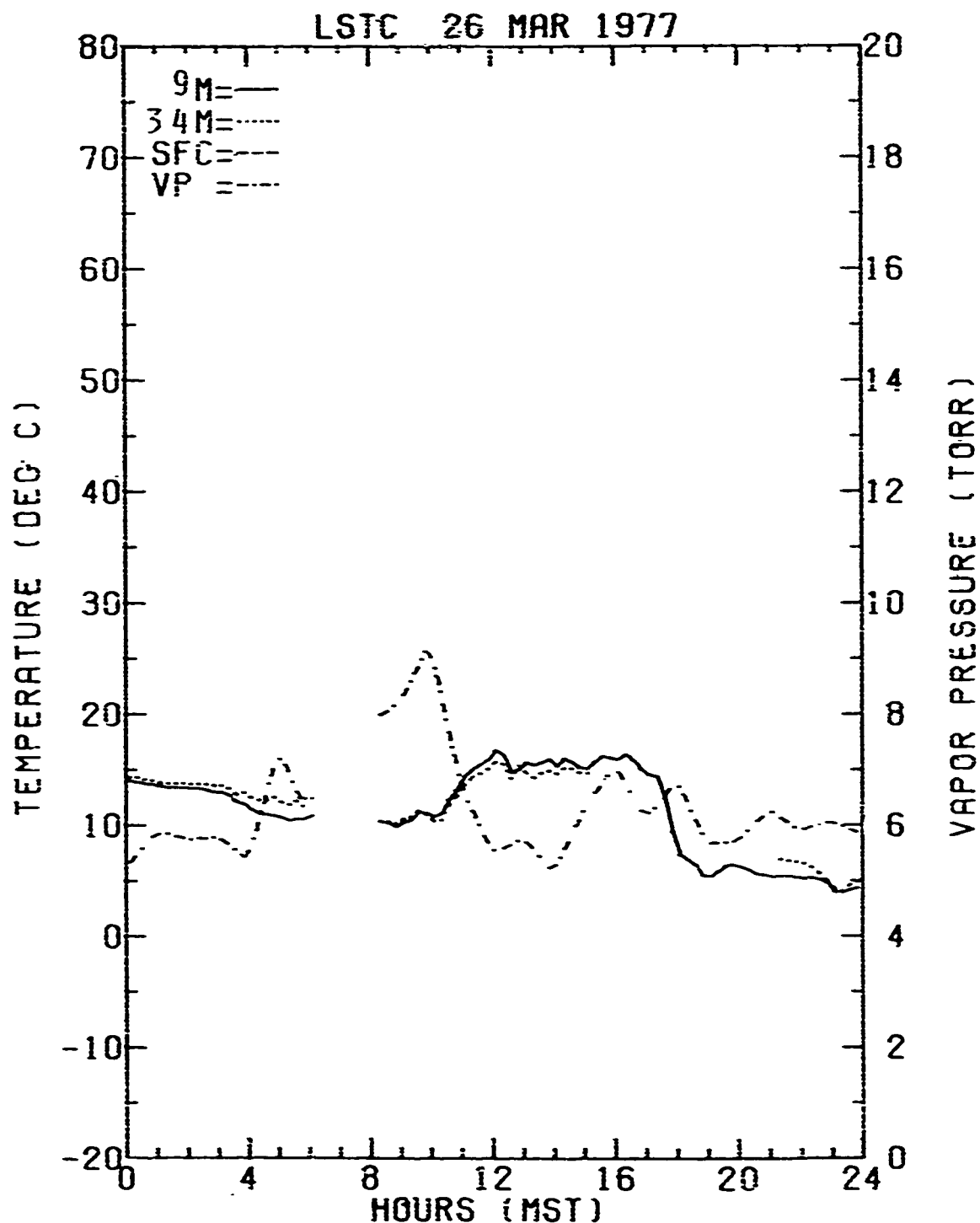


Figure 30. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 26 March 1977.

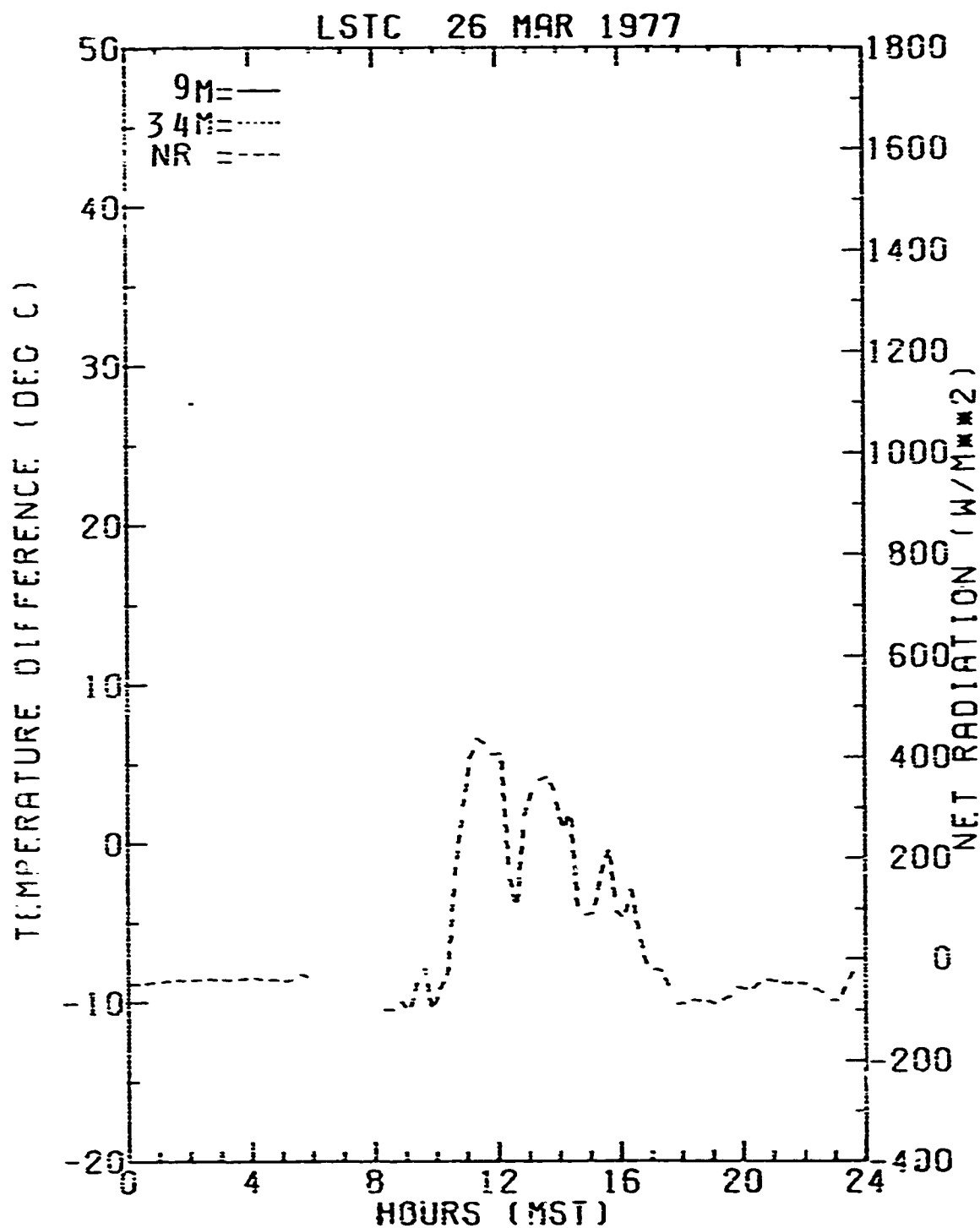


Figure 31. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 26 March 1977.

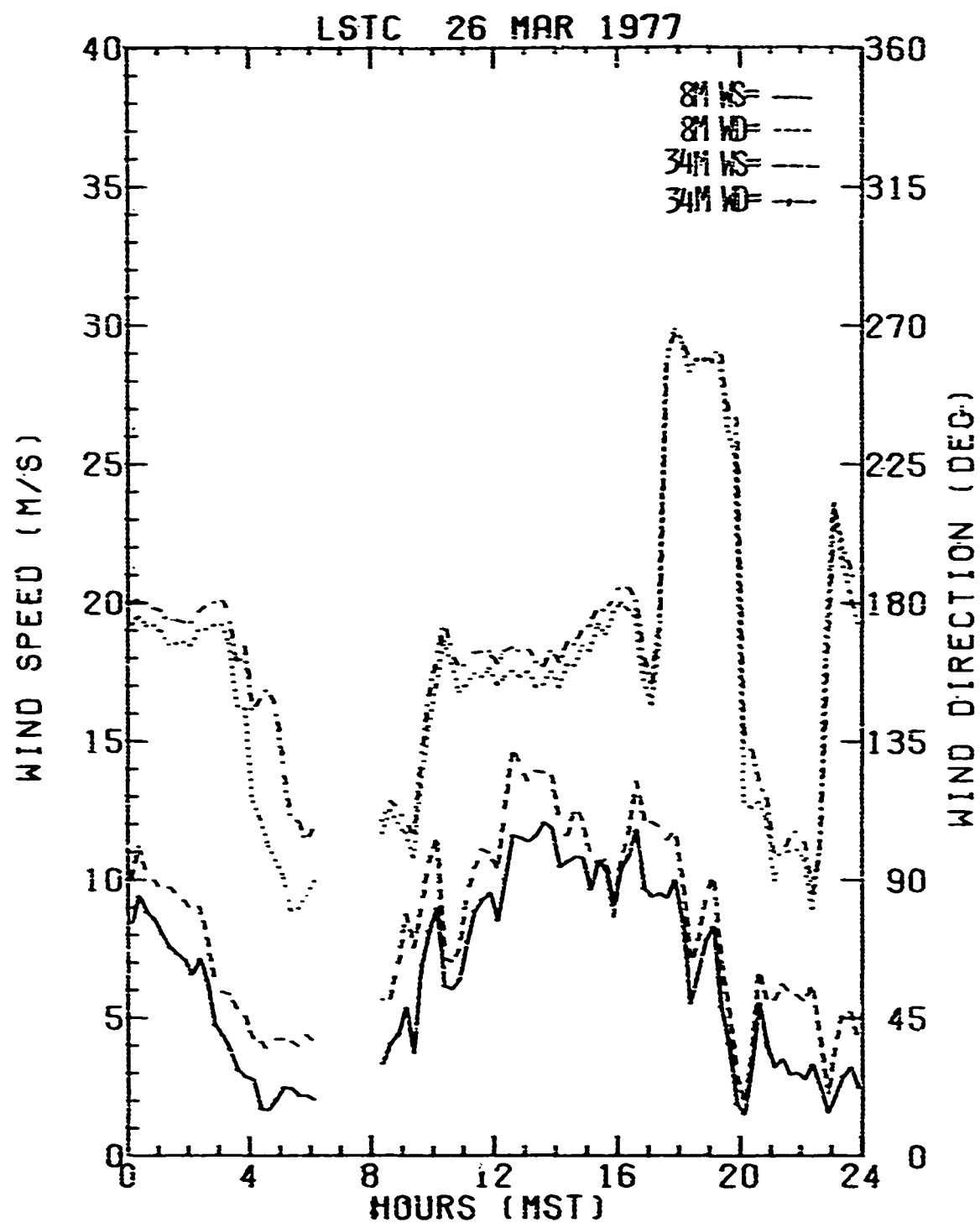


Figure 32. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 26 March 1977.

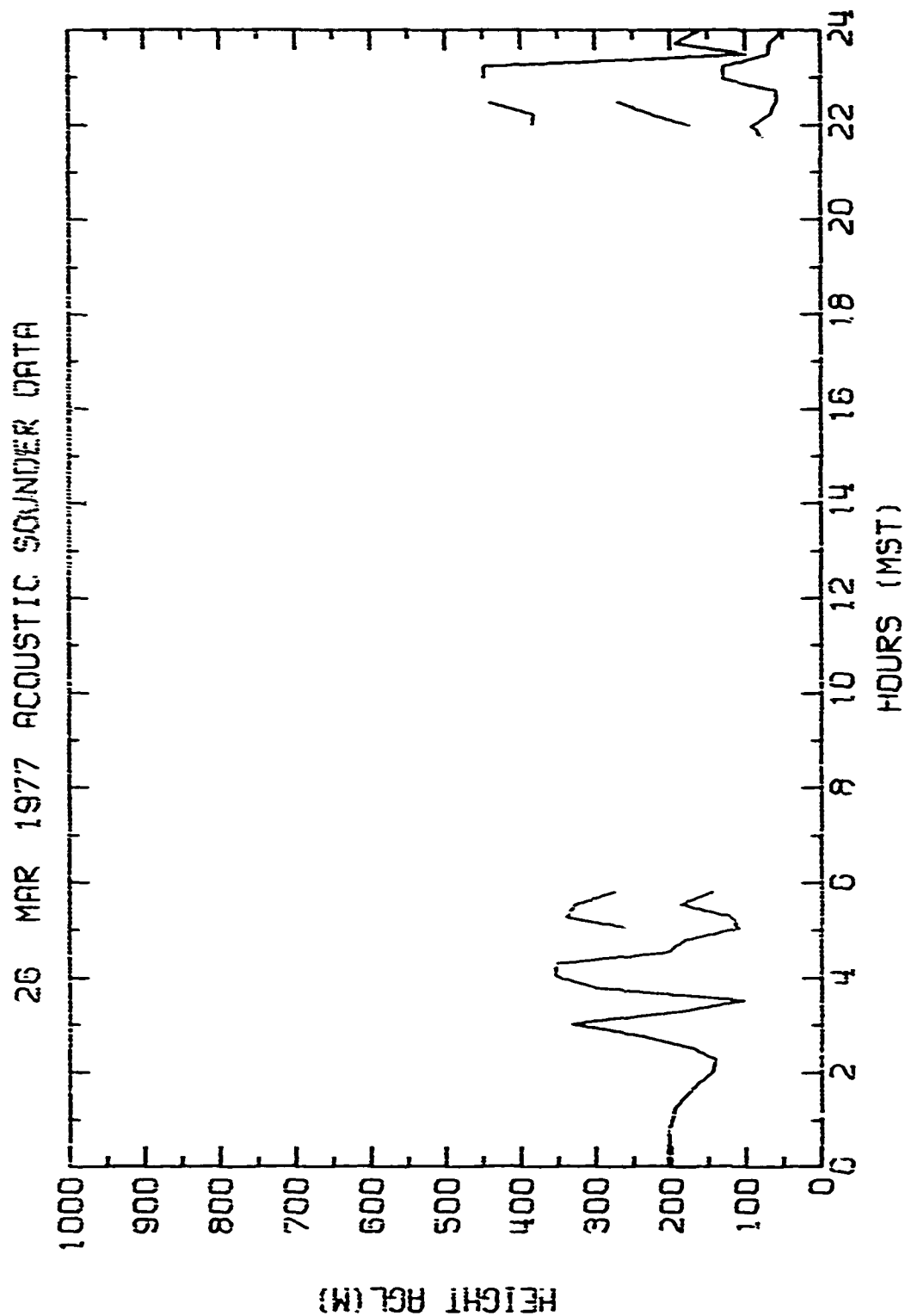


Figure 33. Inversion heights, LSTC, 26 March 1977.

TABLE 26
APACHE SITE RAWINSONDE DATA

DATE: 26 MAR 77 RELEASE NO.: 9 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	653.8	13.2	4.9	0.0	0.0
212.9	637.5	12.4	4.5	195.8	3.8
1003.8	579.6	6.5	3.5	194.8	13.6
1805.4	525.0	-1.5	2.9	197.8	15.1
2997.3	451.0	-11.1	1.6	211.3	13.9

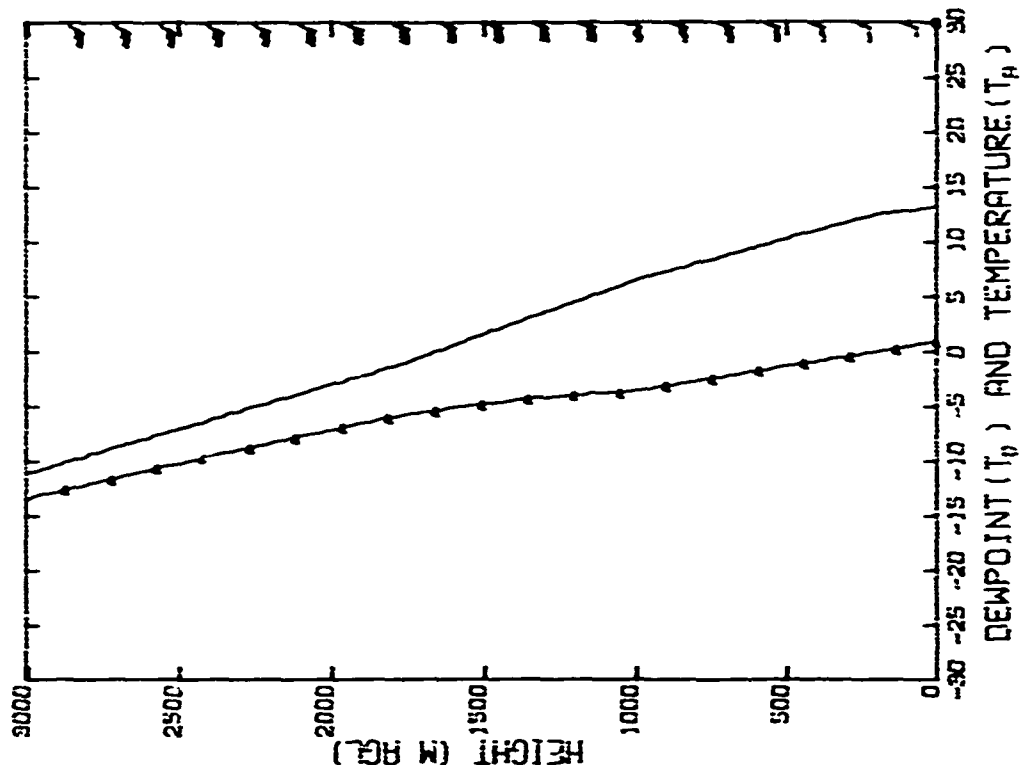
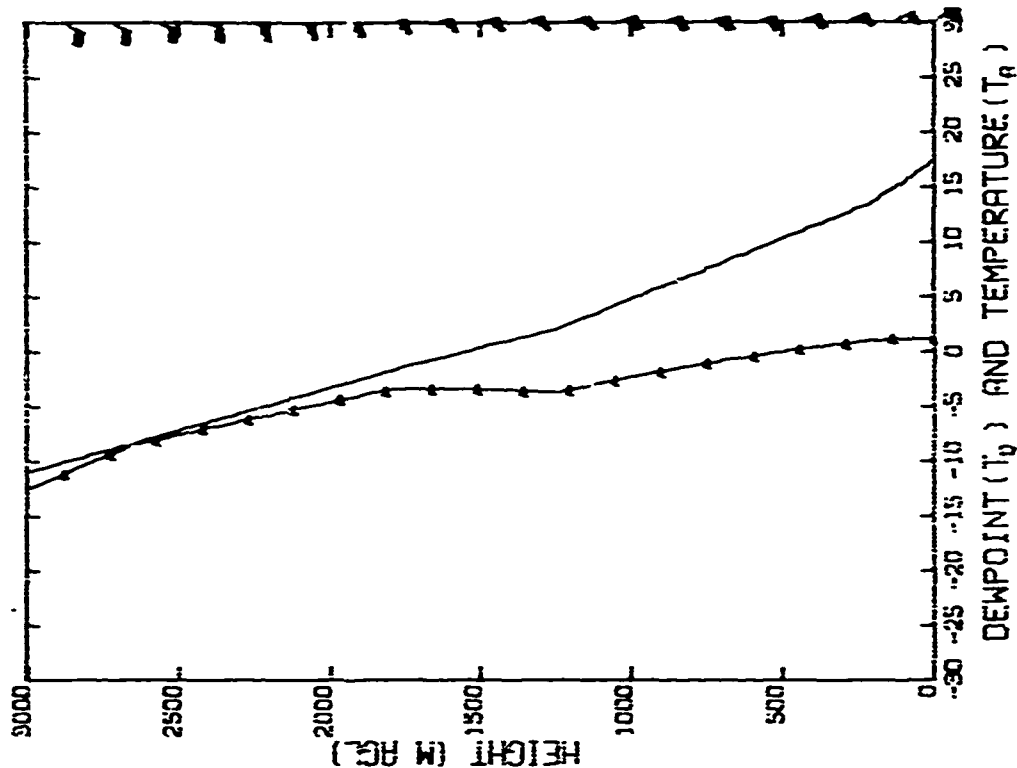


TABLE 27
APACHE SITE RAWINSONDE DATA

DATE: 26 MAR 77 RELEASE NO.: 10 RELEASE TIME: 1225 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (M/S)
0.0	652.8	17.5	5.0	150.0 11.3
201.3	637.5	13.6	4.9	156.9 12.9
1243.0	562.0	2.1	3.5	163.9 12.8
1790.0	525.0	-1.7	3.6	172.4 13.0
2654.3	470.5	-8.4	2.4	200.1 15.7
3274.8	434.1	-13.1	1.3	212.8 18.7



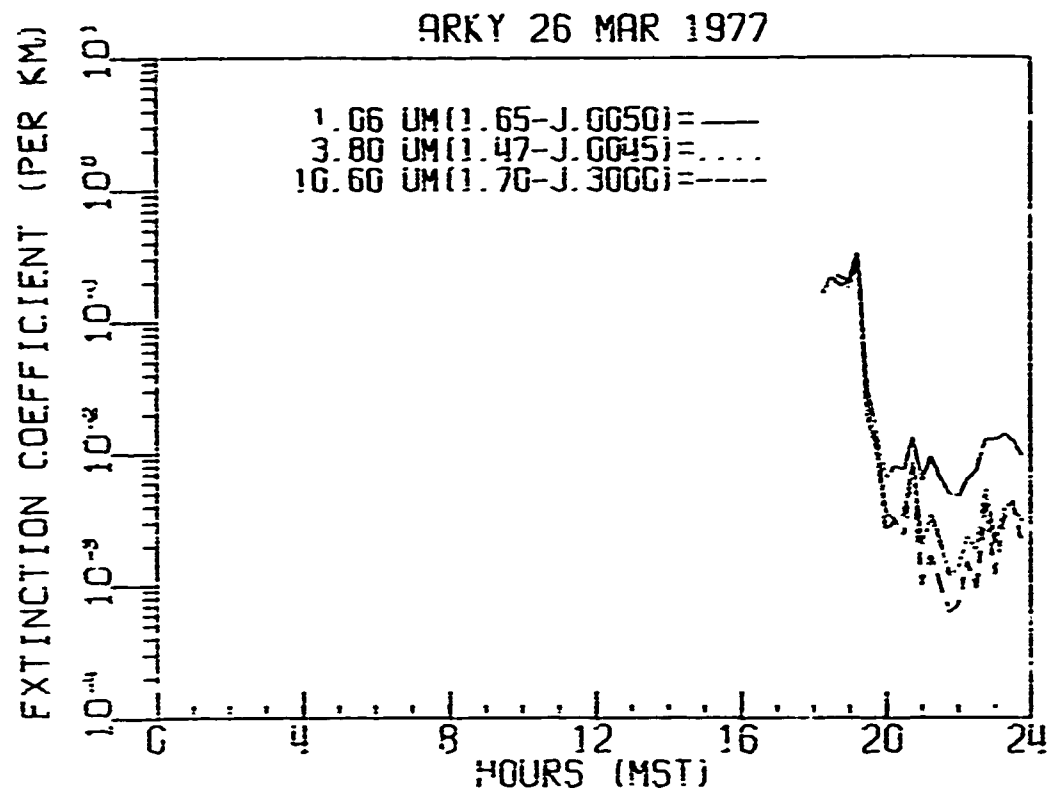


Figure 34. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 26 March 1977.

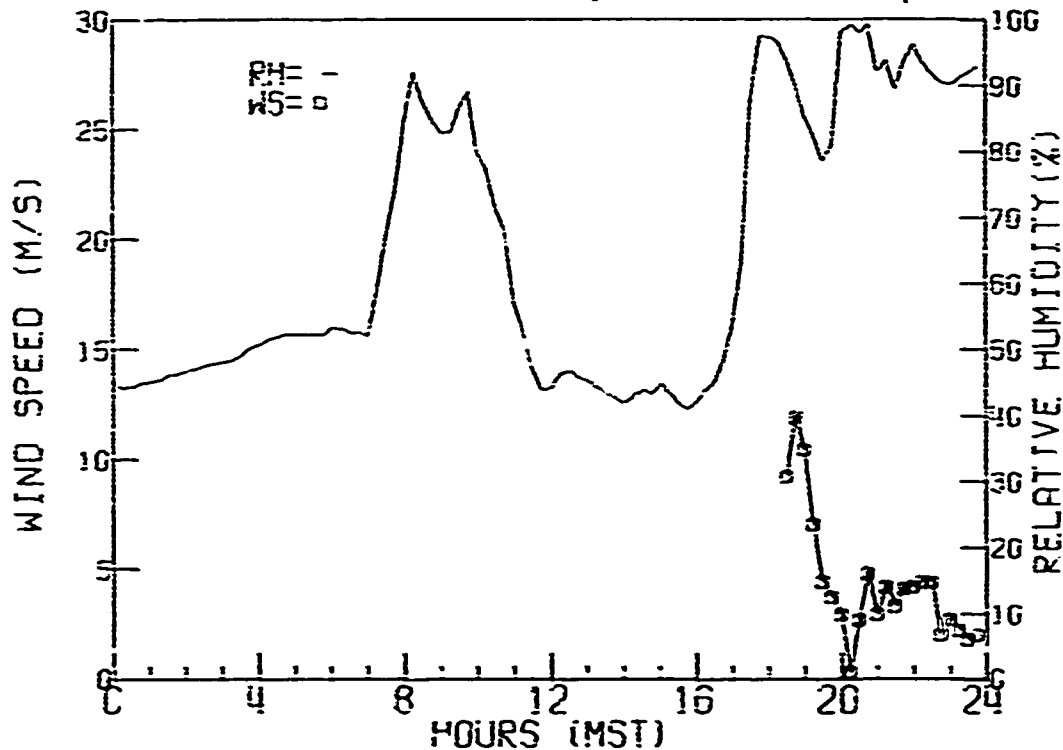


Figure 35. Diurnal variation of windspeed and relative humidity, Arky Site, 26 March 1977.

TABLE 2B
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SITE, WMT

DATE TIME (MST)	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER M)		MASS LOADING (UG/M ³)	
		1	2	3	4	5	6	7	8	9	10	1.06	3.0	13.6	
26 MAR 77															
18:15:00	900	.14+02	.28+03	.15+01	.42+00	.47+00	.33+00	.00	.00	.00	.00	.21+00	.17+00	.18+00	1895.
18:17:00	900	.15+02	.33+03	.16+01	.52+01	.13+01	.41+00	.00	.00	.00	.00	.26+00	.22+00	.23+00	2543.
18:19:00	900	.14+02	.22+03	.14+01	.38+00	.40+00	.39+00	.00	.00	.00	.00	.22+00	.19+00	.19+00	2350.
19:13:00	900	.14+01	.19+01	.14+01	.29+01	.43+00	.41+00	.00	.00	.00	.00	.23+00	.18+00	.20+00	2270.
19:15:00	900	.14+02	.37+03	.22+01	.77+00	.14+01	.63+00	.00	.00	.00	.00	.34+00	.30+00	.33+00	3478.
19:17:00	900	.17+01	.46+03	.23+02	.51+01	.16+00	.21+01	.00	.00	.00	.00	.33+01	.21+01	.22+01	201.
19:19:00	900	.15+01	.11+00	.41+01	.30+01	.12+01	.26+01	.00	.00	.00	.00	.15+01	.11+01	.12+01	143.
20:13:00	900	.13+01	.13+03	.41+01	.33+01	.33+01	.33+01	.00	.00	.00	.00	.67+02	.37+02	.26+02	26.
20:15:00	900	.14+01	.10+03	.20+01	.10+01	.32+01	.00	.00	.00	.00	.00	.41+02	.31+02	.31+02	23.
20:17:00	900	.13+01	.10+03	.13+01	.20+01	.33+01	.00	.00	.00	.00	.00	.77+02	.31+02	.24+02	24.
20:19:00	900	.15+01	.26+00	.41+01	.00	.00	.24+01	.00	.00	.00	.00	.13+01	.46+02	.42+02	122.
21:13:00	900	.13+01	.11+03	.13+01	.33+01	.33+01	.00	.00	.00	.00	.00	.63+02	.30+02	.10+02	12.
21:15:00	900	.14+01	.20+00	.14+01	.00	.00	.00	.00	.00	.00	.00	.96+02	.35+02	.17+02	19.
21:17:00	900	.12+01	.23+03	.41+01	.33+01	.33+01	.00	.00	.00	.00	.00	.57+02	.22+02	.11+02	13.
21:19:00	900	.11+01	.44+01	.41+01	.00	.00	.00	.00	.00	.00	.00	.90+02	.12+02	.44+03	9.
22:13:00	900	.16+03	.10+03	.41+01	.33+01	.33+01	.00	.00	.00	.00	.00	.18+02	.14+02	.72+03	9.
22:15:00	900	.12+01	.13+00	.41+01	.10+01	.00	.00	.00	.00	.00	.00	.45+02	.24+02	.15+02	17.
22:17:00	900	.15+01	.23+03	.41+01	.33+01	.33+01	.00	.00	.00	.00	.00	.76+02	.14+02	.14+03	16.
22:19:00	900	.22+01	.21+00	.38+01	.10+01	.32+01	.00	.00	.00	.00	.00	.13+01	.55+02	.42+02	33.
23:13:00	900	.31+01	.24+03	.33+01	.33+01	.33+01	.00	.00	.00	.00	.00	.13+01	.21+02	.13+02	24.
23:15:00	900	.24+01	.24+00	.41+01	.00	.32+01	.00	.00	.00	.00	.00	.14+01	.38+02	.32+02	40.
23:17:00	900	.20+01	.14+03	.33+01	.33+01	.33+01	.11+01	.00	.00	.00	.00	.13+01	.43+02	.44+02	71.
23:19:00	900	.20+01	.16+00	.20+01	.20+01	.00	.00	.00	.00	.00	.00	.10+01	.32+02	.23+02	27.

Weather Summary

Date: 27 March 1977

Synoptic

Surface: Weak surface low-pressure area over northeast New Mexico and the panhandle of Texas with cold front extending southward from central Kansas thru Texas.

500 Millibar: Upper air closed low weakening and moving eastward. Closed upper low center moved over El Paso, Texas at 1000-1100 MST with consequent shifting of winds over MSNR from southerly to northerly.

Holloman AFB

Clouds: Mostly cloudy (cumulus) with occasional light drizzle and ceilings 1500 m AGL.

Wind: Southeasterly 5 m sec⁻¹ until 1000 MST, southwesterly 4 m sec⁻¹ until 1600 MST, and southeasterly 3 m sec⁻¹ for the remainder of the day. Peak gust west southwesterly 10 m sec⁻¹ shortly before 1300 MST.

Visibility: Generally 40 km lowering to 16 km in light rain showers at 1800 MST.

Remarks: On the west side of the Tularosa Basin, "A" Station reported sustained west northwesterly winds of 13-15 m sec⁻¹ with peak gusts in the 23-26 m sec⁻¹ range after 1700 MST.

Maximum temperature: 10.6°C

Corresponding vapor pressure: 5.2 Torr

Minimum temperature: 3.9°C

Corresponding vapor pressure: 4.8 Torr



Figure 36a. Surface weather map for 27 March 1977.

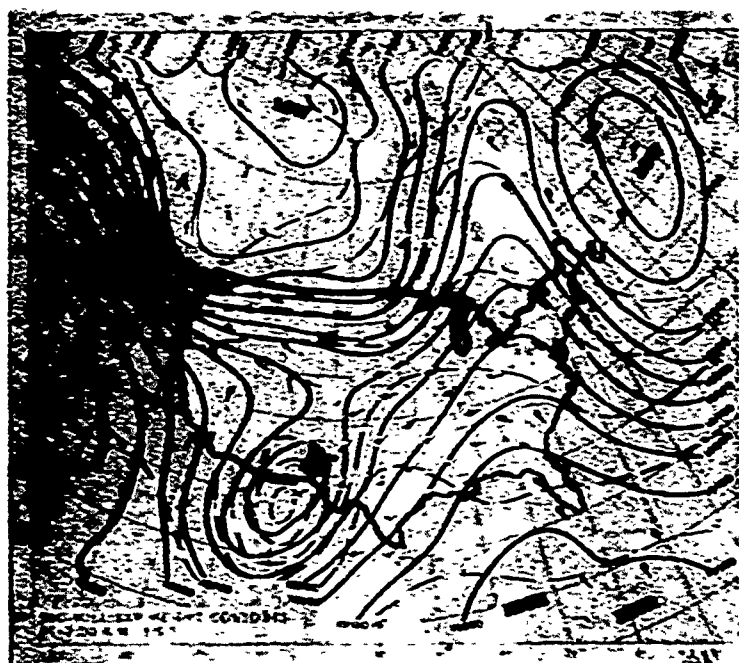


Figure 36b. 500-millibar height contours for 27 March 1977.

TABLE 29. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	4.0	5.7	3.0	10 Sc	0	0	
0200	2.9	5.1	1.4	10 Sc	0	0	
0300	2.1	4.9	1.0	10 Sc	0	0	
0400	2.2	4.6	0.3	20 Sc	0	0	
0500	2.0	4.3	-0.7	20 Sc	0	0	Retrieved data tape from Apache
0600	2.2	4.2	-1.2	20 Sc	0	0	
0700	3.9	4.1	-1.3	20 Sc	0	0	
0800	5.3	4.0	-1.7	20 Sc	0	0	8 m and 32 m ΔT's on line at 0800
0900	7.0	4.9	1.2	50 Cu	0	0	0845 W 32 out 0915 W 32 operational
1000	7.7	4.7	0.7	90 Cu	0	0	V 32 on chart = + on mini- verter = -
1100	9.4	3.6	2.2	100 Cu	0	0	
1200	8.9	3.3	2.8	100 Cu	0	0	
1300	10.1	4.7	0.7	90 Cu	0	0	Apache on - 1233 except 8 m T
1400	9.4	4.5	0.1	90 Cu	0	0	
1500	10.2	4.6	0.3	80 Sc	0	10 Ct	Put up T - 32 m looks bad
1600	10.2	4.6	0.3	100 Sc	0	0	
1700	10.7	4.7	0.8	10 Cu	80 Ac	0	
1800	9.6	5.1	1.8	0	90 Ac	0	

Shut down for weather

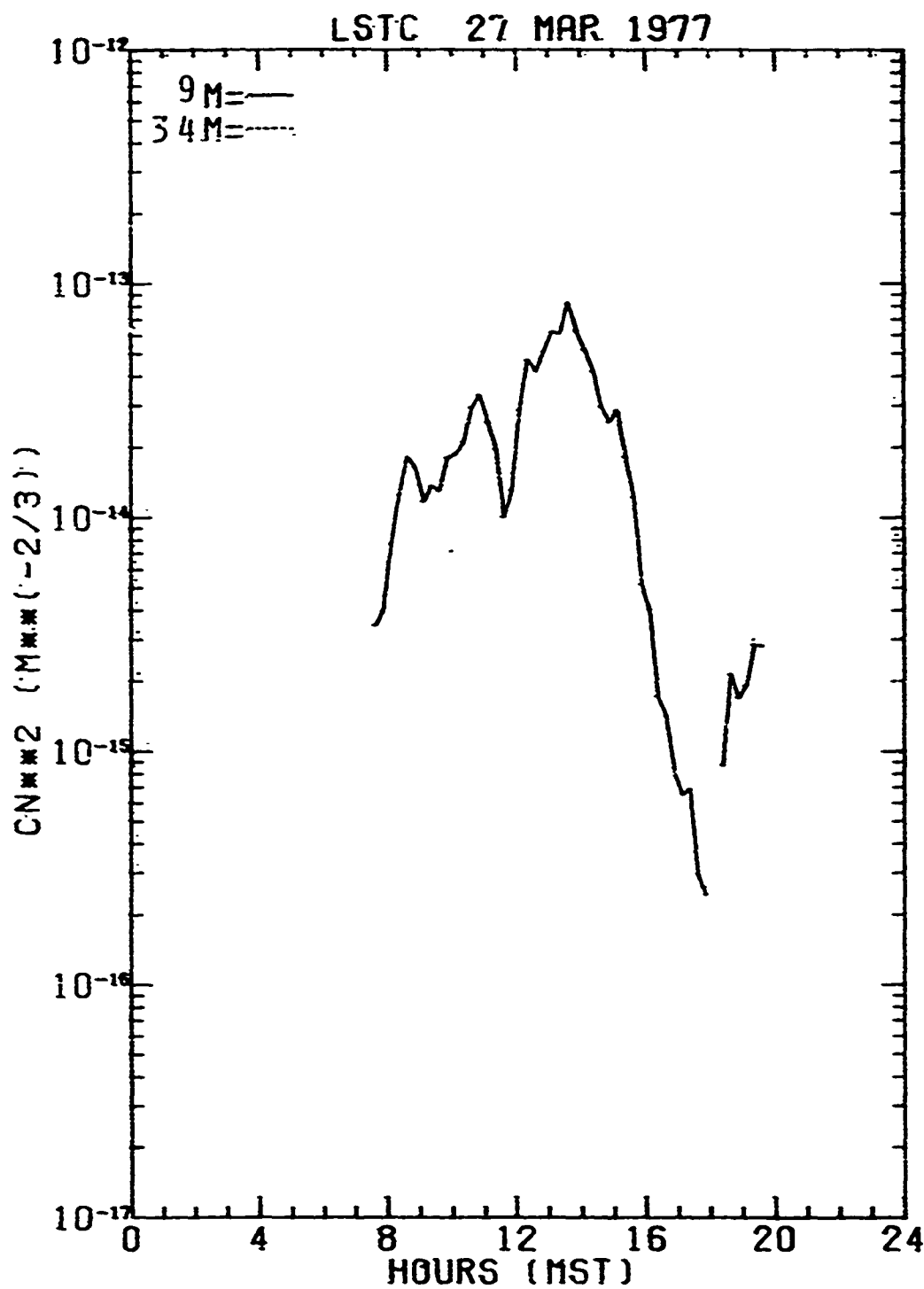


Figure 37. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 27 March 1977.

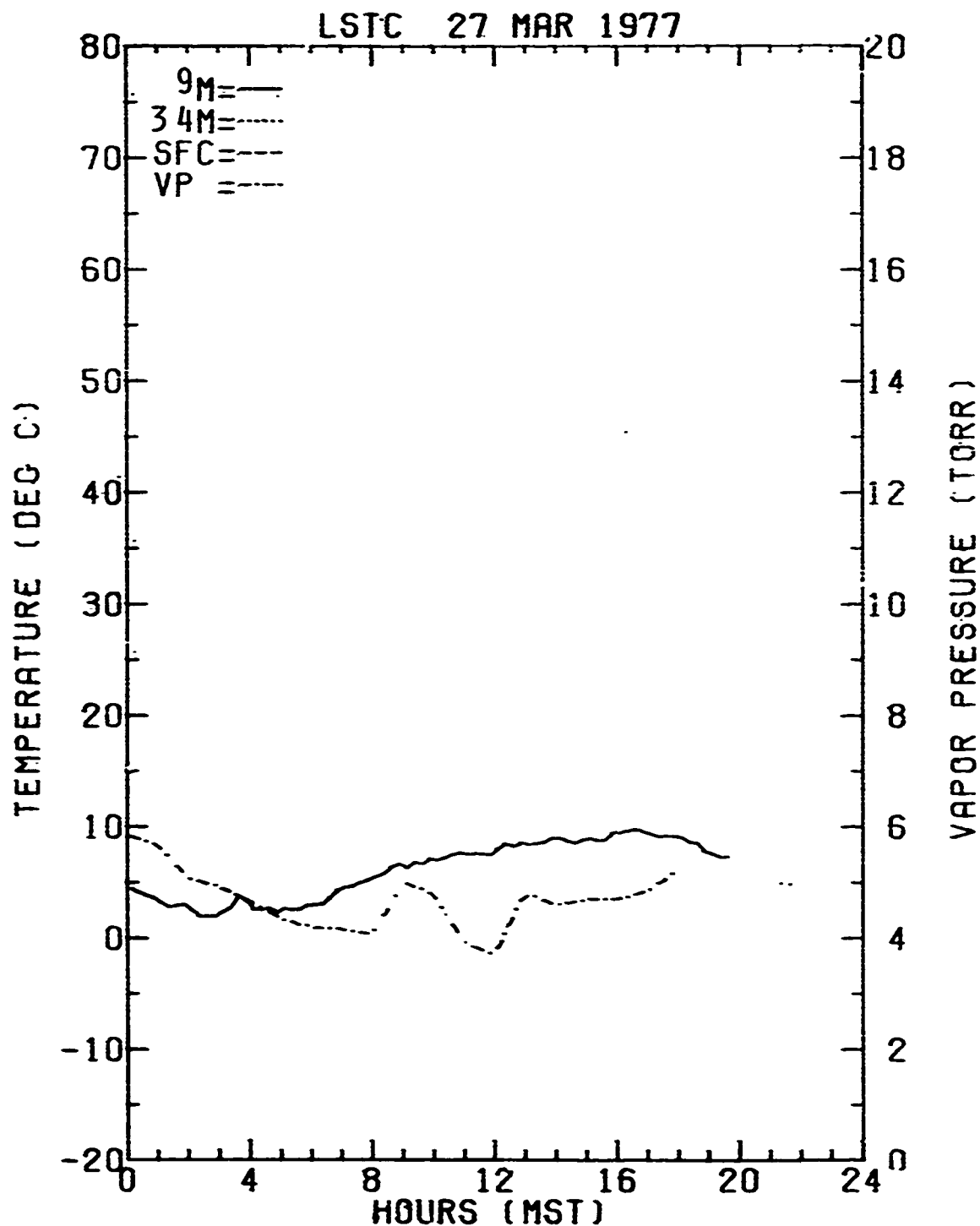


Figure 38. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 27 March 1977.

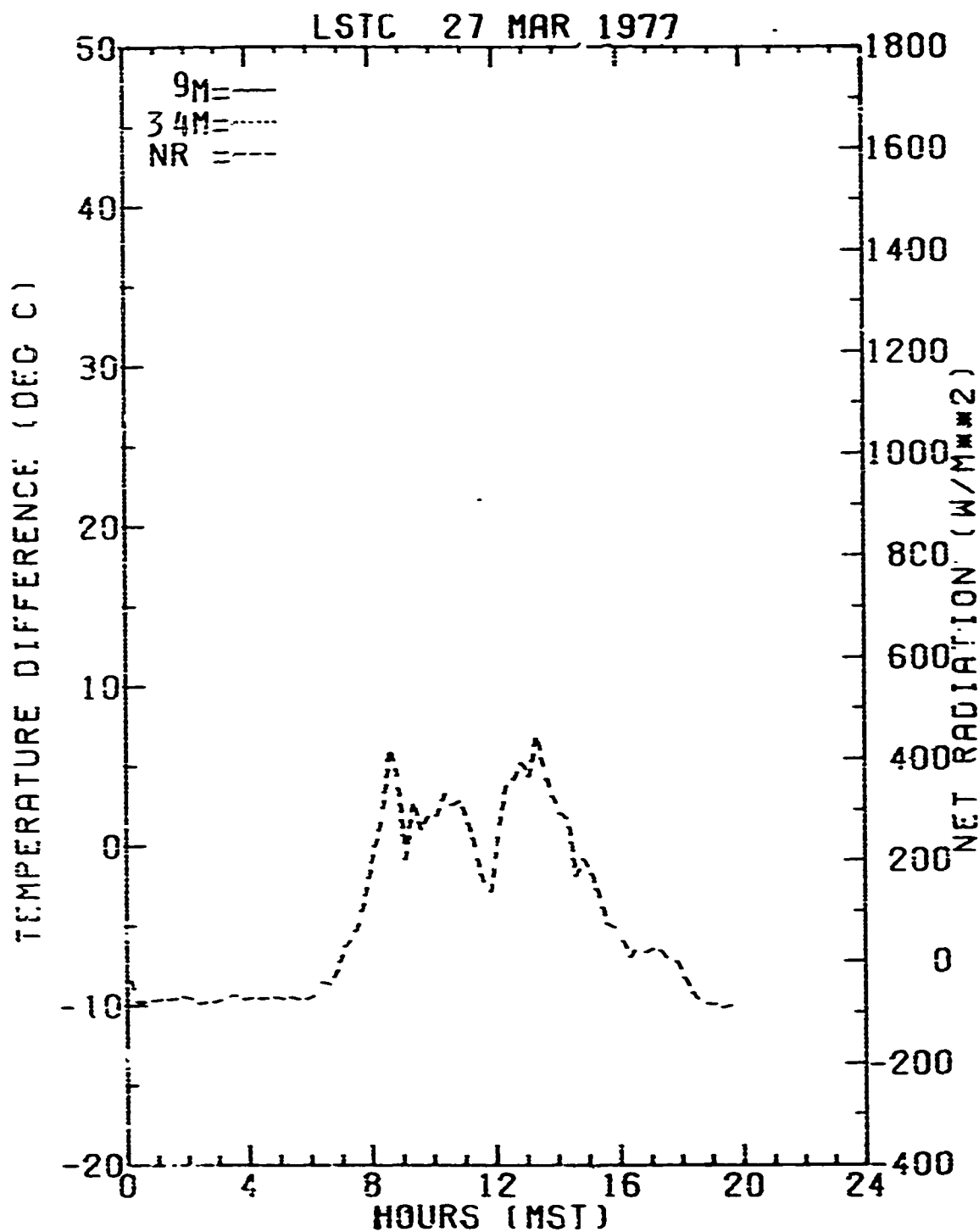


Figure 39. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 27 March 1977.

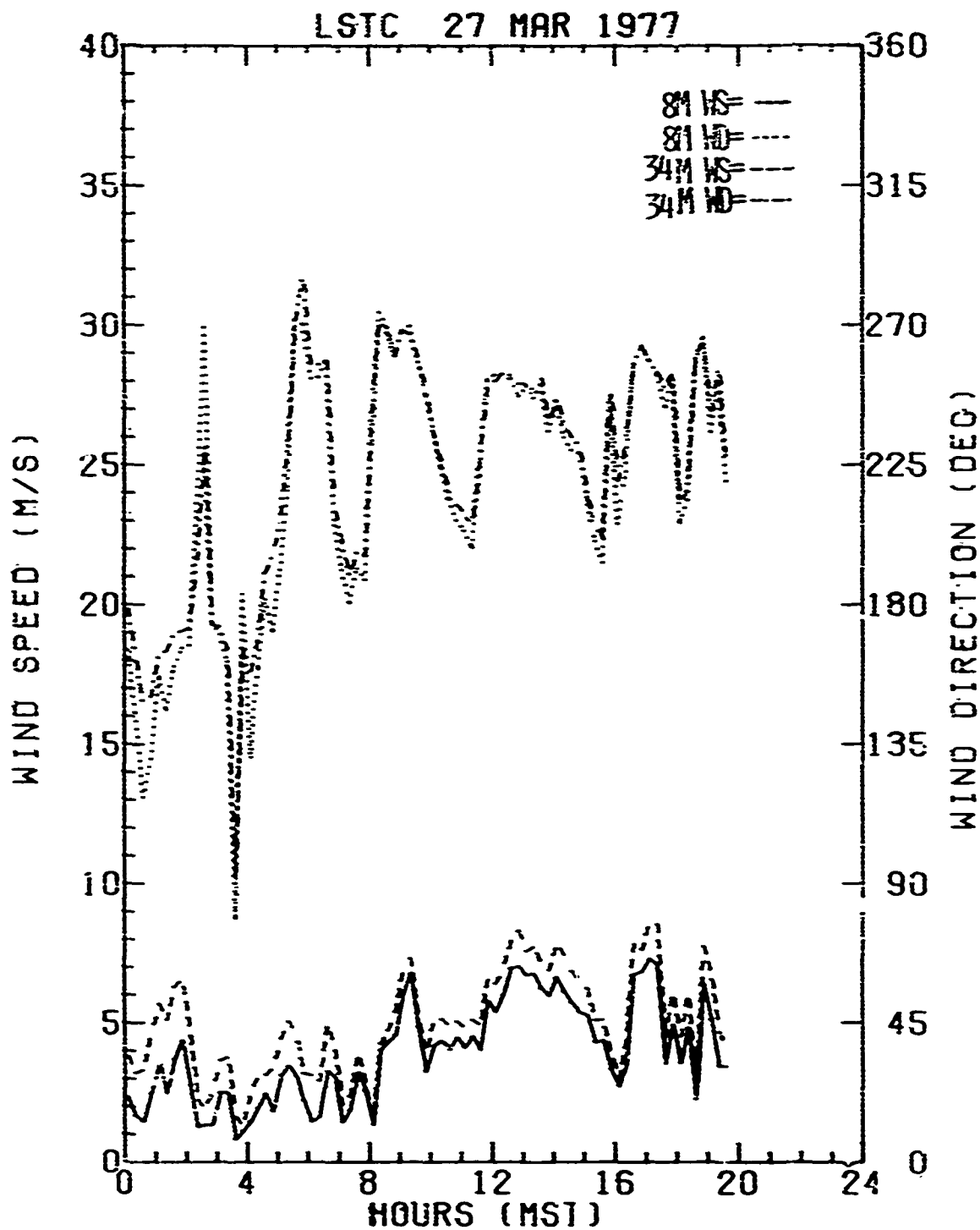


Figure 40. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 27 March 1977.

27 MAR 1977 ACOUSTIC SOUNDER DATA

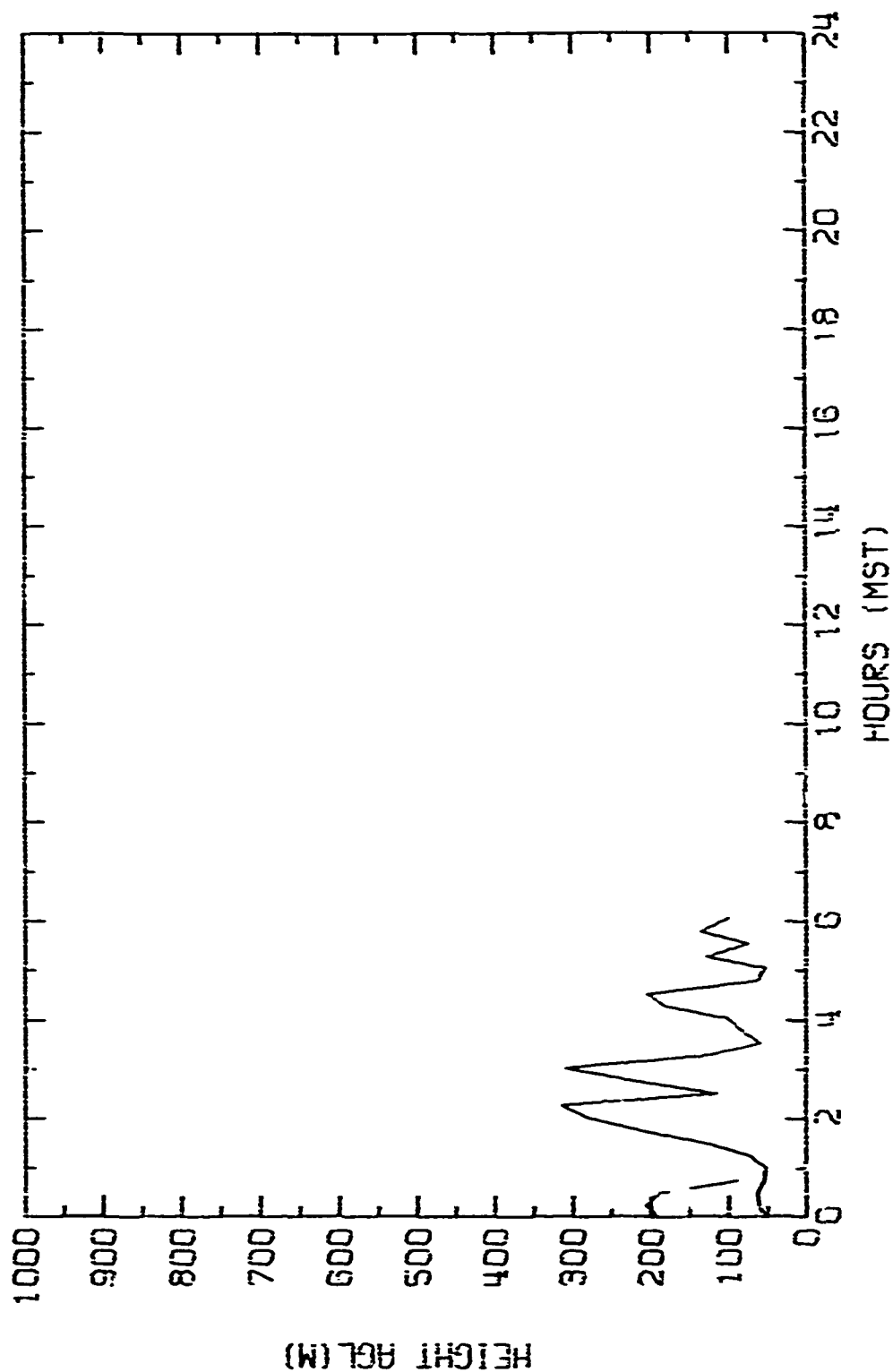


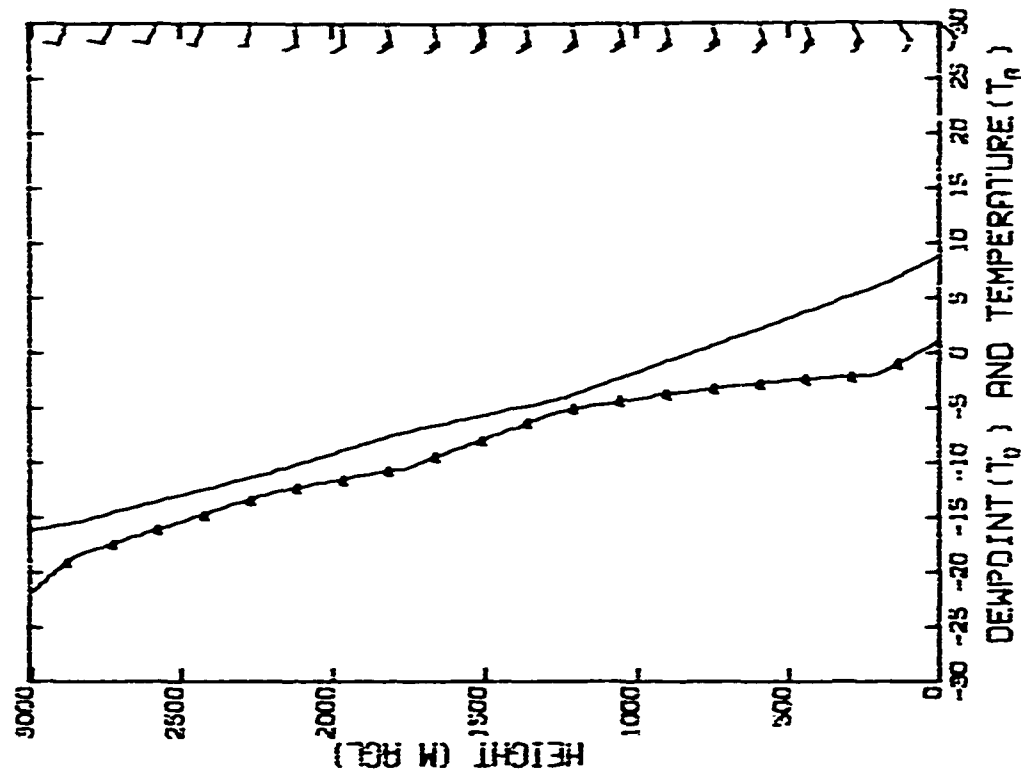
Figure 41. Inversion heights, LSTC, 27 March 1977.

TABLE 30
APACHE SITE RAWINSONDE DATA

DATE: 27 MAR 77 RELEASE NO.: 12 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	653.7	8.8	4.9	220.0	5.1
207.0	637.5	6.0	3.9	235.8	6.0
1240.7	560.7	-4.2	3.1	260.8	8.6
1757.7	525.0	-7.2	2.1	259.7	6.9
2200.1	495.9	-10.9	1.7	273.7	4.0
2863.0	454.6	-15.6	1.0	294.5	4.7
3077.7	441.9	-16.6	0.7	278.6	5.2



WIND BRK SYSTEM (KTS)

TABLE 31
APACHE SITE RAWINSONDE DATA

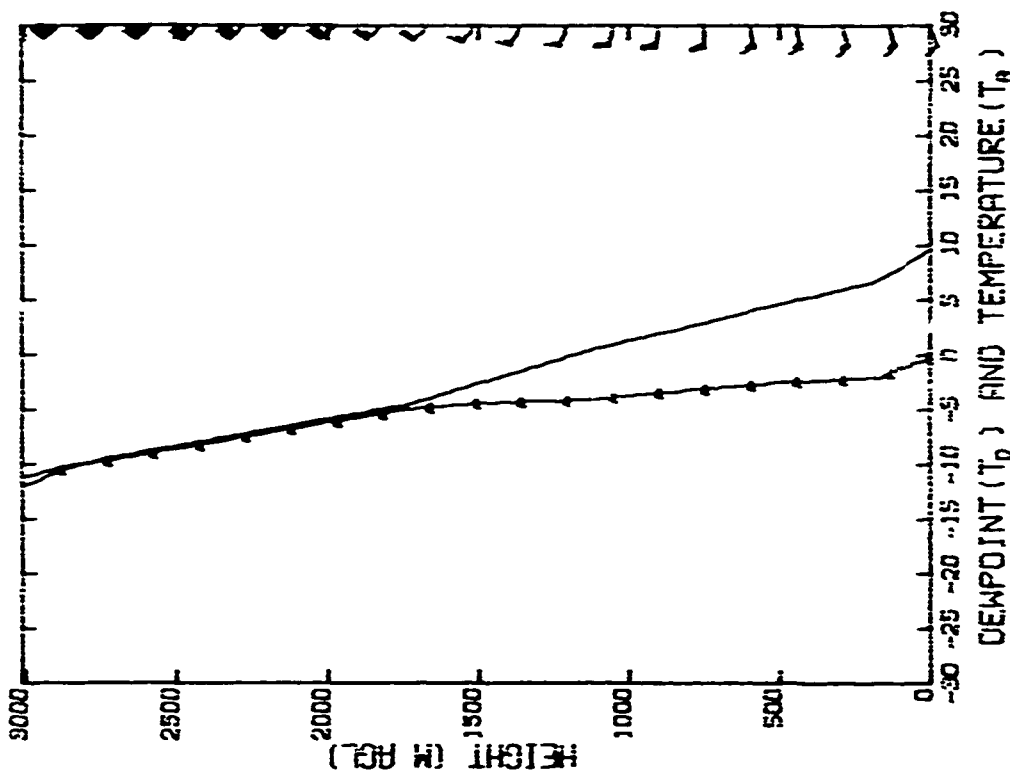
DATE: 27 MAR 77

RELEASE NO. 13

RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	650.8	9.6	4.5	250.0	6.2
170.4	637.5	6.8	3.9	252.8	6.5
1152.3	565.0	0.2	3.4	289.6	8.9
1736.8	525.0	-4.6	3.2	321.5	10.5
2839.3	454.7	-10.2	2.1	326.2	24.2
3423.5	422.5	-14.1	1.2	338.3	22.5



WIND BARB SYSTEM (KTS)

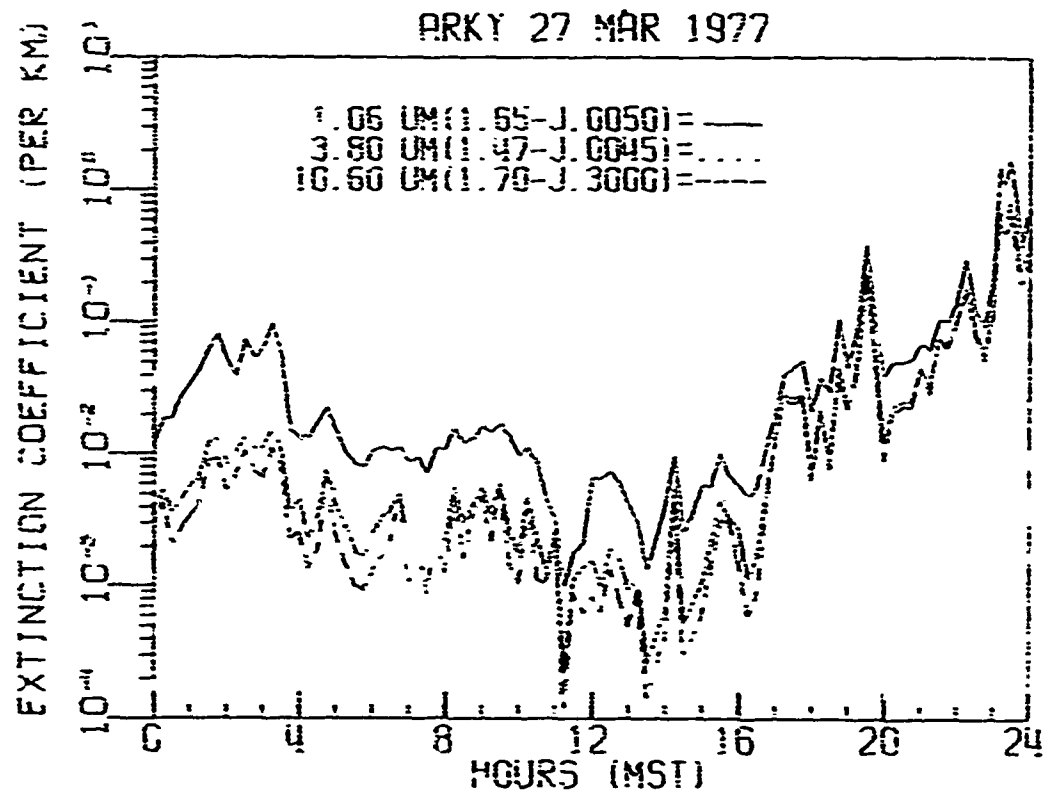


Figure 42. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 27 March 1977.

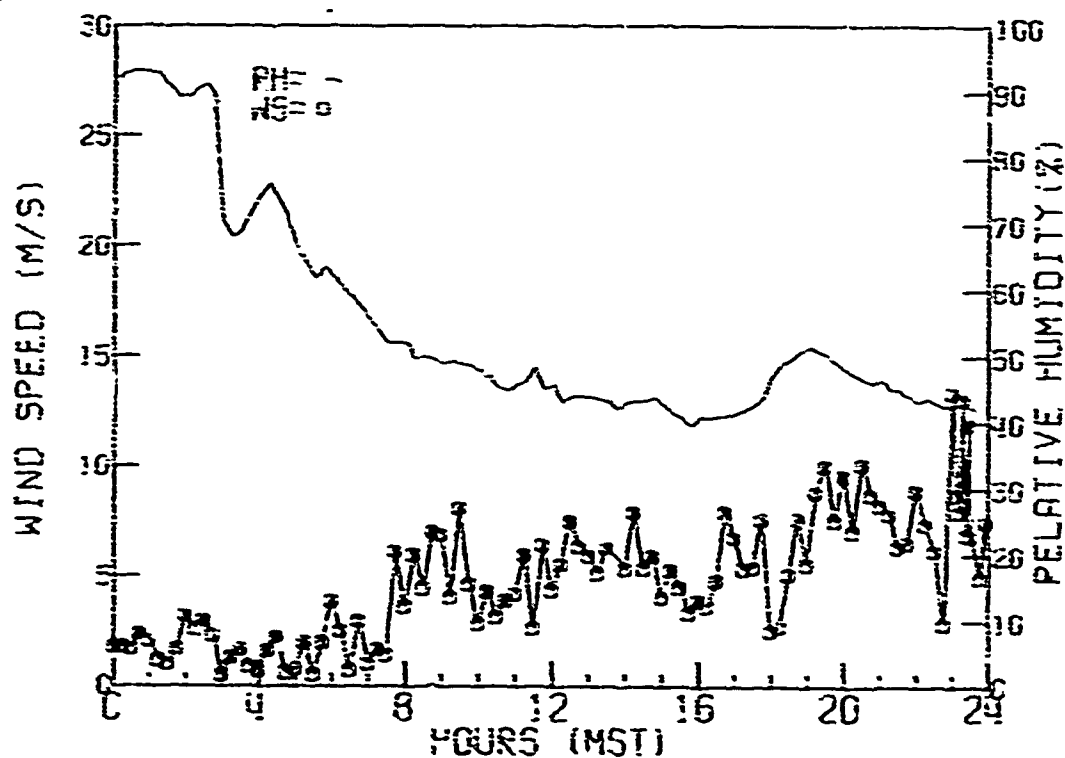


Figure 43. Diurnal variation of windspeed and relative humidity, Arky Site, 27 March 1977.

TABLE 32
M. CULAYE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WING

DATE	TIME	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER K)		MASS LOADING (UG/M ² /SEC)	
			1	2	3	4	5	6	7	8	9	10	1.06	3.8	13.6	13.6
27 MAR 77	0 1:00	900	21-03	39-00	41-03	32-01	30	30	30	30	30	30	11-01	35-02	70-02	24
0 1:15	930	930	35-01	31-00	31-00	32-01	30	30	30	30	30	30	15-01	35-02	70-02	42
0 1:30	960	960	40-01	21-00	31-00	32-01	30	30	30	30	30	30	19-01	37-02	70-02	45
0 1:45	990	990	43-01	26-00	31-01	32-01	30	30	30	30	30	30	28-01	44-02	70-02	53
0 2:00	1020	1020	44-01	26-00	31-00	32-01	30	30	30	30	30	30	35-01	50-02	70-02	62
0 2:15	1050	1050	43-01	26-00	31-01	32-01	30	30	30	30	30	30	43-01	65-02	70-02	77
0 2:30	1080	1080	45-02	40-00	31-00	32-01	30	30	30	30	30	30	45-01	12-01	90-02	127
0 2:45	1110	1110	43-01	30-00	31-01	32-01	30	30	30	30	30	30	41-01	13-01	77-02	152
0 3:00	1140	1140	43-01	30-00	31-01	32-01	30	30	30	30	30	30	51-01	63-02	54-02	94
0 3:15	1170	1170	43-01	30-00	31-01	32-01	30	30	30	30	30	30	54-01	13-01	70-02	90
0 3:30	1200	1200	43-01	30-00	31-01	32-01	30	30	30	30	30	30	70-01	11-01	11-01	103
0 3:45	1230	1230	43-01	30-00	31-01	32-01	30	30	30	30	30	30	75-01	11-01	70-02	107
0 4:00	1260	1260	43-01	30-00	31-01	32-01	30	30	30	30	30	30	65-01	11-01	67-02	114
0 4:15	1290	1290	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 4:30	1320	1320	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 4:45	1350	1350	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 5:00	1380	1380	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 5:15	1410	1410	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 5:30	1440	1440	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 5:45	1470	1470	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 6:00	1500	1500	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 6:15	1530	1530	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 6:30	1560	1560	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 6:45	1590	1590	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 7:00	1620	1620	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 7:15	1650	1650	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 7:30	1680	1680	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 7:45	1710	1710	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 8:00	1740	1740	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 8:15	1770	1770	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 8:30	1800	1800	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 8:45	1830	1830	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 9:00	1860	1860	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 9:15	1890	1890	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 9:30	1920	1920	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 9:45	1950	1950	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191
0 10:00	1980	1980	43-01	30-00	31-01	32-01	30	30	30	30	30	30	98-01	15-01	11-01	191

7041.1 32 (cont)
 40 CALIF. AVE. EX
 ARMY SVE. WING

[illegible]

TABLE 32 (cont)
PARTICULAR ARE SIZE, DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WHP

DATE TIME SAMPLE (MST)	SAMPLE TIME (SEC)	C4HWFL										EXTINCTION (PER K4)		MASS LOADING (UG/MOOS)	
		1	2	3	4	5	6	7	8	9	10	1.06	3.0	17.6	
27 MAR 77															
20149:00	900	.88001	.87000	.39000	.30001	.96001	.39001	.00	.00	.59001	.26001	.59001	.26001	.23001	272.
21023:00	900	.71001	.87000	.37000	.91001	.32001	.12000	.00	.00	.69001	.85001	.69001	.85001	.65001	610.
21151:00	900	.87001	.13001	.59001	.81001	.13000	.39001	.00	.00	.63001	.34001	.63001	.34001	.70001	317.
21152:30	900	.99001	.13001	.79000	.24001	.27000	.11000	.00	.00	.11000	.79001	.11000	.79001	.76001	870.
21154:00	900	.31002	.89001	.97000	.13000	.26000	.12000	.00	.00	.10000	.68001	.10000	.68001	.65001	723.
22137:00	900	.18002	.25001	.13001	.34001	.53000	.11000	.00	.00	.15000	.10000	.15000	.10000	.10000	987.
22141:00	900	.39002	.72001	.10001	.49000	.71000	.21000	.00	.00	.30000	.19000	.30000	.19000	.17000	1692.
22133:00	900	.11002	.21001	.12001	.21001	.17000	.17000	.00	.00	.12000	.88001	.12000	.88001	.92001	993.
22145:00	900	.13002	.22001	.77000	.16000	.19000	.79001	.00	.00	.93001	.58001	.93001	.58001	.52001	565.
23133:00	900	.27002	.51001	.22001	.44001	.61000	.13000	.00	.00	.22000	.13000	.22000	.13000	.12000	1085.
23107:00	425	.14003	.23000	.73001	.14001	.17001	.42000	.00	.00	.97000	.48000	.97000	.48000	.43000	4234.
23111:00	298	.20003	.13002	.11002	.23001	.17001	.57000	.00	.00	.15001	.73000	.15001	.73000	.57000	6254.
23117:00	378	.16003	.26002	.90001	.11001	.18001	.72000	.00	.00	.11001	.57000	.11001	.57000	.49000	5501.
23121:00	293	.21003	.13002	.12002	.16001	.13001	.41000	.00	.00	.13001	.52000	.13001	.52000	.49000	5149.
23126:24	232	.26003	.40002	.15002	.20001	.25001	.76000	.00	.00	.17001	.83000	.17001	.83000	.68000	7371.
23131:07	263	.23003	.37002	.11002	.17001	.21001	.67000	.00	.00	.15001	.72000	.15001	.72000	.59000	6391.
23145:00	493	.40002	.90001	.41001	.79000	.10001	.17000	.00	.00	.38000	.23000	.38000	.23000	.20000	1830.
23151:24	544	.85002	.15002	.68001	.34001	.81000	.31000	.00	.00	.63000	.39000	.63000	.39000	.27000	2943.

Weather Summary

Date: 28 March 1977

Synoptic

Surface: Low-pressure area over eastern Colorado and Kansas with cold front extending southwestward from eastern Colorado thru north-west New Mexico.

500 Millibar: Closed low over Oklahoma and near cutoff low over western Montana. General northwest winds over New Mexico.

Holloman AFB

Clouds: Scattered low (cumulus) and middle (altocumulus) clouds at 1800 m and 3000 m AGL, respectively.

Wind: Generally westerly and southwesterly 10 m sec^{-1} with peak gust of 16 m sec^{-1} around noon.

Visibility: Generally 50 km in the morning, 30 km in the afternoon.

Maximum temperature: 18.3°C

Corresponding vapor pressure: 3.9 Torr

Minimum temperature: 3.9°C

Corresponding vapor pressure: 4.4 Torr



Figure 44a. Surface weather map for 28 March 1977.

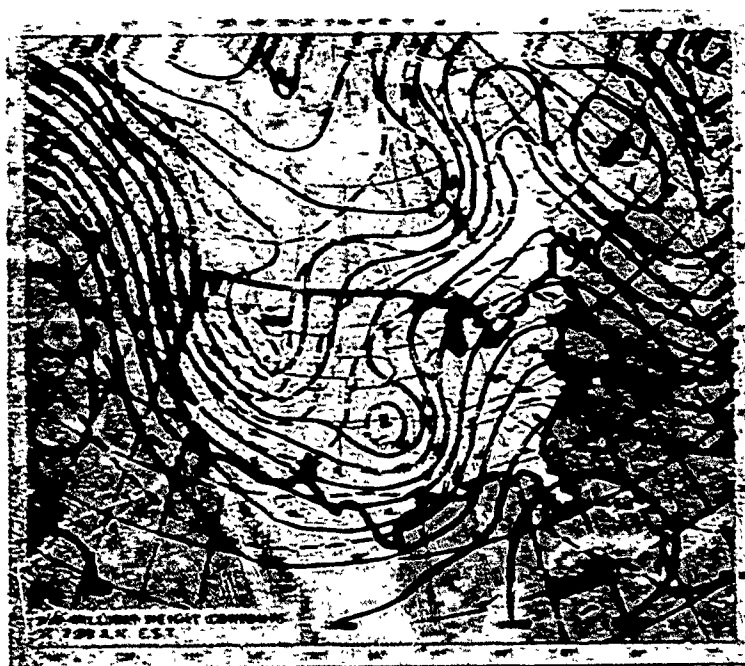


Figure 44b. 500-millibar height contours for 28 March 1977.

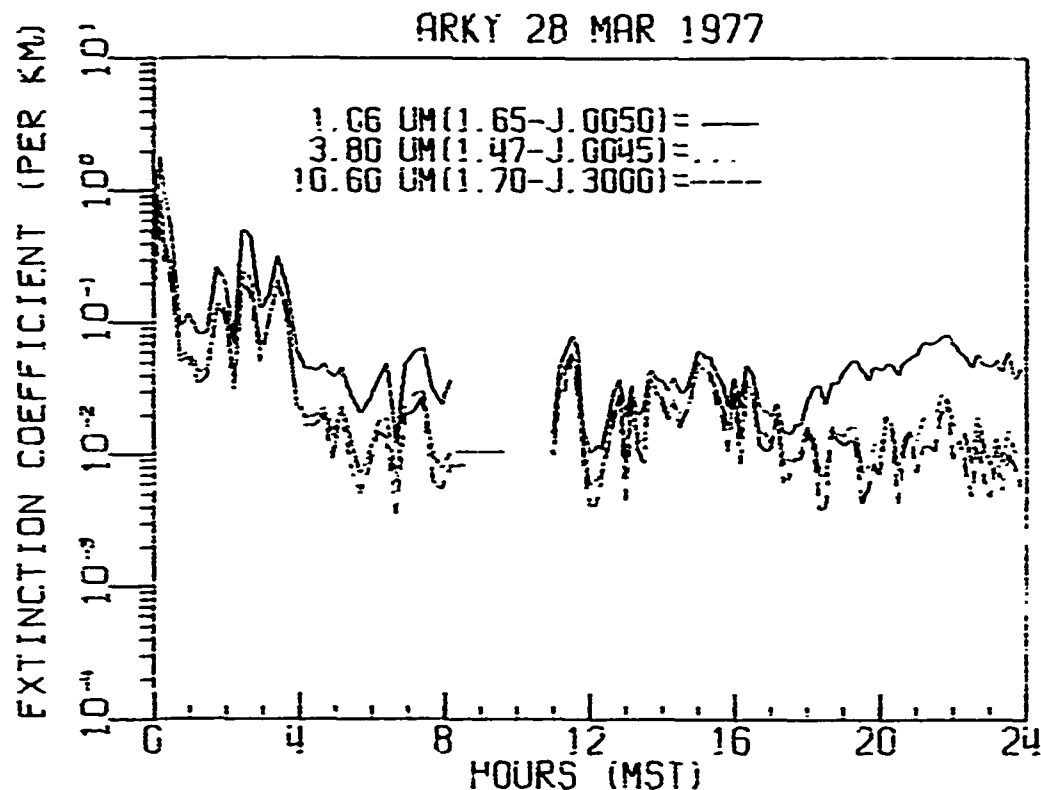


Figure 45. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 28 March 1977.

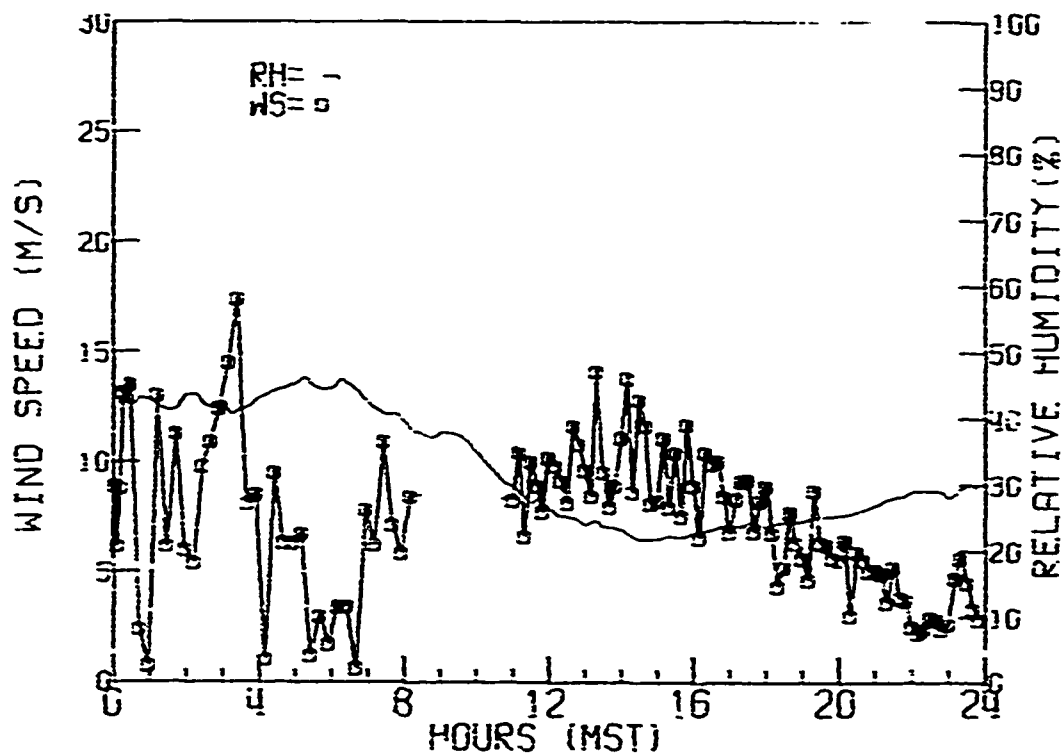


Figure 46. Diurnal variation of windspeed and relative humidity, Arky Site, 28 March 1977.

TABLE 33
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARKY SITE, USMR

DATE	TIME (MST)	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER KM)			MASS LOADING (UB/M ² /HRS)	
			1	2	3	4	5	6	7	8	9	10	1.06	3.8	10.6		
28 MAR 77																	
0 1:18	933		.6632	.1232	.4231	.5133	.5133	.2333	.03	.03	.03	.03	.1500	.2200	.1700	.1875	
0 1:41	323		.1903	.2802	.9301	.1101	.1101	.1100	.00	.00	.00	.00	.1101	.4500	.3400	3206	
0 1:16	215		.2933	.4832	.1832	.2231	.2231	.5133	.03	.00	.00	.00	.1801	.8700	.6900	6929	
0 1:10:30	374		.1603	.2302	.8401	.1201	.1201	.1900	.00	.00	.00	.00	.0900	.4200	.3300	3287	
0 1:23:53	933		.7432	.1132	.4431	.5733	.5733	.2933	.03	.02	.02	.02	.5203	.2500	.2200	2455	
0 1:40:00	047		.1202	.2101	.7300	.9701	.9701	.8401	.00	.00	.00	.00	.9701	.5501	.5201	565	
0 1:47:39	933		.1532	.3131	.1331	.1733	.1733	.6531	.03	.03	.03	.03	.1203	.6531	.5501	573	
01:14:00	900		.1202	.1901	.9100	.9101	.9101	.3901	.00	.00	.00	.00	.4401	.4301	.3601	367	
01:27:33	933		.1202	.1701	.9903	.1233	.1233	.1733	.00	.00	.00	.00	.4601	.4501	.3901	387	
01:40:00	900		.3802	.5301	.1801	.2600	.2600	.1700	.00	.00	.00	.00	.2700	.1400	.1300	1339	
01:47:33	933		.2832	.3801	.1431	.3633	.3633	.1733	.03	.00	.00	.00	.2303	.1200	.1200	1236	
02:14:00	900		.9701	.1601	.6300	.9101	.9101	.1301	.00	.00	.00	.00	.7001	.3501	.3201	253	
02:27:22	932		.7532	.1132	.3731	.7233	.7233	.2133	.03	.00	.00	.00	.5100	.2500	.2100	2287	
02:31:50	048		.7002	.1102	.4001	.6000	.6000	.1800	.00	.00	.00	.00	.4400	.2200	.1700	1854	
02:55:30	933		.2332	.3301	.9203	.1433	.1433	.5131	.03	.02	.02	.02	.1500	.5101	.5201	583	
03:11:00	900		.1802	.2301	.1101	.1101	.1101	.2000	.00	.00	.00	.00	.1600	.1100	.1100	1237	
03:25:30	933		.5532	.5031	.2431	.6533	.6533	.3133	.03	.00	.00	.00	.3300	.2200	.2100	2239	
03:51:00	900		.2302	.2901	.1501	.3900	.3900	.7901	.00	.00	.00	.00	.1900	.1100	.1100	925	
03:55:30	933		.1132	.9303	.2933	.5131	.5131	.2531	.00	.00	.00	.00	.6301	.2501	.2501	254	
04:11:00	900		.7601	.9600	.2000	.6101	.6101	.1301	.00	.00	.00	.00	.4401	.2001	.1701	173	
04:25:30	933		.7331	.9733	.2633	.2331	.2331	.3731	.03	.03	.03	.03	.4401	.2301	.1731	237	
04:41:00	900		.7801	.7200	.3200	.6101	.6101	.2601	.00	.00	.00	.00	.5001	.2301	.2301	228	
04:55:30	933		.7231	.9333	.2833	.2331	.2331	.1331	.03	.00	.00	.00	.3901	.1801	.1701	131	
05:11:00	900		.6501	.6700	.2200	.1001	.1001	.5201	.00	.00	.00	.00	.4601	.2401	.2401	249	
05:25:30	933		.4931	.6333	.3233	.6131	.6131	.03	.03	.00	.00	.00	.2801	.1201	.1201	82	
05:41:00	900		.3901	.5100	.1800	.1001	.1001	.00	.00	.00	.00	.00	.2101	.7302	.5102	49	
05:55:30	933		.4931	.6933	.4131	.3331	.3331	.1331	.03	.00	.00	.00	.2601	.1301	.1301	113	
06:11:00	900		.5401	.4400	.2200	.1001	.1001	.3901	.00	.00	.00	.00	.3701	.1801	.1501	220	
06:25:30	933		.8731	.1031	.5333	.5131	.5131	.03	.03	.00	.00	.00	.5301	.1401	.1401	125	
06:41:00	900		.1401	.6600	.1600	.2001	.2001	.00	.00	.00	.00	.00	.1201	.6402	.3602	34	
06:55:30	933		.6931	.1201	.8133	.1133	.1133	.2531	.03	.03	.03	.03	.1801	.2501	.2001	280	
07:11:00	900		.9601	.1501	.5500	.1133	.1133	.1331	.00	.00	.00	.00	.6101	.2901	.2201	223	
07:25:30	933		.1332	.1331	.4333	.7131	.7131	.1533	.03	.00	.00	.00	.6601	.3001	.2701	272	
07:41:00	900		.6201	.6400	.1800	.4001	.4001	.00	.00	.00	.00	.00	.5201	.9902	.6402	77	
07:55:30	933		.4531	.7233	.1533	.1033	.1033	.3231	.03	.00	.00	.00	.3301	.8032	.3332	33	
08:11:00	900		.7501	.6700	.2200	.1001	.1001	.00	.00	.00	.00	.00	.3701	.1101	.8302	81	
11:27:30	933		.9433	.6733	.2133	.3331	.3331	.03	.03	.00	.00	.00	.1501	.1101	.3432	53	
11:40:00	040		.3101	.1901	.5200	.9101	.9101	.5901	.00	.00	.00	.00	.4701	.3601	.3101	359	
11:55:30	933		.4531	.2931	.1131	.1133	.1133	.4801	.00	.00	.00	.00	.6301	.4101	.3101	323	
12:10:00	040		.6001	.2501	.7300	.1500	.1500	.1900	.00	.00	.00	.00	.4001	.4101	.5601	612	
12:25:30	933		.6831	.2331	.9133	.2333	.2333	.2331	.03	.00	.00	.00	.6501	.4501	.3831	305	

TABLE 33 (cont.)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WSMR

DATE TIME	SAMPLE TIME (MST)	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER KM)			MASS LOADING (UG/M ³)	
			1	2	3	4	5	6	7	8			1.06	3.8	10.6		
28 MAR 77																	
11:55:20	633		.15-01	.56-03	.27-03	.61-01	.44-01	.44-01	.00	.00	.00	.00	.16-01	.12-01	.93-02	.67.	
12:00:00	600		.18-02	.45-00	.30-01	.64-01	.64-01	.64-01	.00	.00	.00	.00	.11-01	.60-02	.93-02	.91.	
12:13:20	633		.18-01	.60-03	.13-03	.33-01	.33-01	.33-01	.00	.00	.00	.00	.12-01	.51-03	.61-02	.39.	
12:20:00	600		.12-01	.26-00	.93-01	.64-01	.64-01	.64-01	.00	.00	.00	.00	.11-03	.75-02	.68-02	.88.	
12:32:00	633		.17-01	.56-03	.27-03	.15-01	.15-01	.15-01	.00	.00	.00	.00	.19-01	.13-01	.11-01	122.	
12:40:00	600		.29-01	.90-00	.27-03	.74-01	.74-01	.74-01	.00	.00	.00	.00	.31-01	.20-01	.19-01	178.	
12:52:20	633		.29-01	.77-03	.61-03	.64-01	.64-01	.64-01	.00	.00	.00	.00	.18-01	.28-01	.28-01	323.	
13:00:00	600		.29-01	.84-00	.30-00	.18-01	.18-01	.18-01	.00	.00	.00	.00	.19-01	.81-02	.46-02	46.	
13:13:20	633		.23-01	.92-03	.28-03	.11-03	.11-03	.11-03	.00	.00	.00	.00	.31-01	.20-01	.26-01	271.	
13:20:00	600		.21-01	.73-00	.12-00	.61-01	.61-01	.61-01	.00	.00	.00	.00	.20-03	.13-01	.11-01	78.	
13:33:20	633		.27-01	.10-01	.43-03	.30-01	.30-01	.30-01	.00	.00	.00	.00	.23-01	.13-01	.98-02	67.	
13:40:00	600		.24-01	.75-00	.30-00	.11-00	.11-00	.11-00	.00	.00	.00	.00	.44-01	.37-01	.39-01	378.	
13:53:20	633		.27-01	.69-03	.11-03	.91-01	.91-01	.91-01	.00	.00	.00	.00	.39-01	.51-01	.12-01	350.	
14:00:00	600		.28-01	.11-01	.33-00	.61-01	.61-01	.61-01	.00	.00	.00	.00	.35-03	.20-01	.42-01	254.	
14:13:20	633		.26-01	.12-01	.17-03	.33-01	.33-01	.33-01	.00	.00	.00	.00	.31-01	.21-01	.19-01	143.	
14:20:00	600		.35-01	.10-01	.40-00	.64-01	.64-01	.64-01	.00	.00	.00	.00	.39-01	.21-01	.26-01	259.	
14:33:20	633		.29-01	.10-01	.17-03	.74-01	.74-01	.74-01	.00	.00	.00	.00	.33-01	.21-01	.17-01	173.	
14:40:00	600		.30-01	.74-00	.37-00	.30-01	.30-01	.30-01	.00	.00	.00	.00	.32-01	.21-01	.21-01	172.	
14:53:20	633		.33-01	.11-01	.33-03	.91-01	.91-01	.91-01	.00	.00	.00	.00	.41-01	.33-01	.29-01	283.	
15:00:00	600		.34-01	.15-01	.44-00	.74-01	.74-01	.74-01	.00	.00	.00	.00	.42-01	.52-01	.52-01	414.	
15:13:20	633		.34-01	.15-01	.53-03	.91-01	.91-01	.91-01	.00	.00	.00	.00	.56-01	.43-01	.43-01	404.	
15:20:00	600		.38-01	.12-01	.73-00	.11-00	.11-00	.11-00	.00	.00	.00	.00	.54-03	.49-01	.49-01	443.	
15:33:20	633		.31-01	.15-01	.52-03	.74-01	.74-01	.74-01	.00	.00	.00	.00	.42-01	.31-01	.26-01	274.	
15:40:00	600		.31-01	.15-01	.53-00	.61-01	.61-01	.61-01	.00	.00	.00	.00	.34-01	.23-01	.19-01	180.	
15:53:20	633		.26-01	.77-03	.45-03	.61-01	.61-01	.61-01	.00	.00	.00	.00	.24-01	.11-01	.11-01	61.	
16:00:00	600		.29-01	.94-00	.37-00	.11-00	.11-00	.11-00	.00	.00	.00	.00	.34-01	.31-01	.29-01	287.	
16:13:20	633		.29-01	.90-03	.40-03	.33-01	.33-01	.33-01	.00	.00	.00	.00	.23-01	.11-01	.11-02	67.	
16:20:00	600		.34-01	.12-01	.43-00	.61-01	.61-01	.61-01	.00	.00	.00	.00	.44-01	.37-01	.37-01	368.	
16:33:20	633		.30-01	.11-01	.41-03	.74-01	.74-01	.74-01	.00	.00	.00	.00	.41-01	.35-01	.35-01	277.	
16:40:00	600		.23-01	.79-00	.37-00	.15-01	.15-01	.15-01	.00	.00	.00	.00	.23-03	.15-01	.12-01	132.	
16:53:20	633		.22-01	.77-03	.33-03	.74-01	.74-01	.74-01	.00	.00	.00	.00	.22-01	.13-01	.11-01	84.	
17:00:00	600		.20-01	.73-00	.12-00	.61-01	.61-01	.61-01	.00	.00	.00	.00	.20-01	.13-01	.11-01	74.	
17:13:20	633		.15-01	.67-03	.13-03	.33-01	.33-01	.33-01	.00	.00	.00	.00	.25-01	.21-01	.20-01	280.	
17:20:00	600		.14-01	.58-00	.30-00	.13-01	.13-01	.13-01	.00	.00	.00	.00	.16-01	.09-02	.04-02	44.	
17:33:20	633		.14-01	.62-03	.21-03	.33-01	.33-01	.33-01	.00	.00	.00	.00	.15-01	.09-02	.11-02	49.	
17:40:00	600		.14-01	.51-00	.91-01	.00	.00	.00	.00	.00	.00	.00	.17-01	.08-02	.05-02	111.	
17:53:20	633		.21-01	.56-03	.12-03	.33-01	.33-01	.33-01	.00	.00	.00	.00	.18-01	.11-01	.05-02	121.	
18:00:00	600		.32-01	.28-00	.24-00	.74-01	.74-01	.74-01	.00	.00	.00	.00	.26-01	.17-01	.15-01	142.	
18:13:20	633		.37-01	.21-03	.21-03	.15-01	.15-01	.15-01	.00	.00	.00	.00	.31-01	.13-01	.13-01	146.	
18:20:00	600		.77-01	.49-00	.21-00	.00	.00	.00	.00	.00	.00	.00	.34-01	.72-02	.40-02	42.	
18:33:20	633		.52-01	.84-03	.13-03	.15-01	.15-01	.15-01	.00	.00	.00	.00	.25-01	.73-02	.42-02	54.	

TABLE 33 (CONT.)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MAX. LOADING
ARMY SITE, WSMR

DATE	TIME	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER KM)		MAX. LOADING (UB/HR/0.3)	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
28 MAR 77	18:00:00	600	.53-01	.62-03	.19-03	.33	.69-01	.31-01	.00	.00	.00	.00	.13-01	.17-01	.16-01	216.
	18:05:00	600	.61-01	.56-06	.12-06	.7A-C1	.9A-01	.00	.00	.00	.00	.00	.36-01	.13-01	.33-01	211.
	18:10:00	600	.63-01	.56-03	.24-03	.33	.49-01	.23-01	.00	.00	.00	.00	.63-01	.19-01	.12-01	159.
	18:15:00	600	.10-02	.58-06	.23-06	.4A-C1	.00	.2C-C1	.00	.00	.00	.00	.58-01	.17-01	.13-01	185.
	18:20:00	600	.11-02	.73-03	.21-03	.33-01	.00	.23-01	.00	.00	.00	.00	.33-01	.16-01	.13-01	183.
	18:25:00	600	.10-02	.62-00	.03-01	.00	.00	.00	.00	.00	.00	.00	.05-01	.7A-02	.4A-02	79.
	18:30:00	600	.63-01	.19-03	.12-03	.33-01	.33	.00	.00	.00	.00	.00	.18-01	.81-02	.17-02	81.
	18:35:00	600	.49-01	.71-00	.13-06	.41-C1	.00	.00	.00	.00	.00	.00	.47-01	.13-01	.08-02	112.
	18:40:00	600	.09-01	.71-03	.19-03	.33	.49-01	.00	.00	.00	.00	.00	.49-01	.97-02	.72-02	87.
	18:45:00	600	.63-01	.60-06	.03-01	.15-C1	.9A-01	.39-C1	.00	.00	.00	.00	.49-01	.20-01	.20-01	252.
	18:50:00	600	.09-01	.59-03	.12-03	.6A-01	.49-01	.23-01	.00	.00	.00	.00	.18-01	.17-01	.13-01	103.
	18:55:00	600	.03-01	.77-00	.12-06	.00	.00	.00	.00	.00	.00	.00	.41-01	.78-02	.4A-02	75.
	19:00:00	600	.11-02	.79-03	.01-01	.33-01	.93-01	.33	.00	.00	.00	.00	.31-01	.16-01	.12-01	119.
	19:05:00	600	.11-02	.62-06	.24-03	.15-01	.96-01	.2C-C1	.00	.00	.00	.00	.55-01	.16-01	.15-01	183.
	19:10:00	600	.13-02	.97-03	.24-03	.15-01	.33	.00	.00	.00	.00	.00	.62-01	.13-01	.75-02	115.
	19:15:00	600	.15-02	.16-01	.33-03	.61-01	.33	.00	.00	.00	.00	.00	.72-01	.20-01	.12-01	154.
	19:20:00	600	.15-02	.18-01	.37-06	.30-C1	.00	.00	.00	.00	.00	.00	.73-01	.19-01	.12-01	153.
	19:25:00	600	.15-02	.17-01	.47-03	.91-01	.33	.23-01	.00	.00	.00	.00	.63-01	.29-01	.21-01	149.
	19:30:00	600	.15-02	.15-01	.24-06	.4A-C1	.29-00	.00	.00	.00	.00	.00	.44-01	.31-01	.28-01	210.
	19:35:00	600	.15-02	.17-01	.37-03	.15-01	.00	.33	.00	.00	.00	.00	.73-01	.17-01	.25-02	135.
	19:40:00	600	.12-02	.17-01	.18-06	.41-C1	.4A-01	.00	.00	.00	.00	.00	.61-01	.14-01	.13-01	186.
	19:45:00	600	.11-02	.13-01	.24-03	.33-01	.33	.00	.00	.00	.00	.00	.75-01	.14-01	.35-02	116.
	19:50:00	600	.11-02	.18-06	.12-06	.00	.00	.00	.00	.00	.00	.00	.47-01	.47-02	.49-02	84.
	19:55:00	600	.11-02	.11-01	.33-03	.66-01	.00	.23-01	.00	.00	.00	.00	.18-01	.20-01	.15-01	200.
	20:00:00	600	.13-02	.04-06	.24-06	.15-C1	.00	.00	.00	.00	.00	.00	.90-01	.12-01	.67-02	97.
	20:05:00	600	.11-02	.71-03	.19-03	.33	.00	.33	.00	.00	.00	.00	.66-01	.81-02	.69-02	83.
	20:10:00	600	.11-02	.72-00	.41-01	.15-C1	.00	.2C-C1	.00	.00	.00	.00	.53-01	.14-01	.11-01	174.
	20:15:00	600	.13-02	.72-00	.61-01	.15-01	.00	.33	.00	.00	.00	.00	.46-01	.89-02	.59-02	85.
	20:20:00	600	.09-01	.60-03	.61-01	.15-01	.33	.00	.00	.00	.00	.00	.61-01	.14-01	.10-01	139.
	20:25:00	600	.13-02	.12-01	.12-03	.41-C1	.00	.00	.00	.00	.00	.00	.38-01	.11-01	.84-02	89.
	20:30:00	600	.04-01	.64-06	.22-06	.19-C1	.00	.00	.00	.00	.00	.00	.05-01	.11-01	.61-02	89.

Weather Summary

Date: 29 March 1977

Synoptic

Surface: Low-pressure area over eastern south Dakota and weak low over central New Mexico.

500 Millibar: Closed low extending from southern Minnesota to northwestern Utah with strong southwesterly flow over New Mexico.

Holloman AFB

Clouds: Clear to few cumulus with bases at 1200 m AGL.

Wind: Generally westerly to southwesterly 10-15 m sec⁻¹ with late morning gust to 19 m sec⁻¹.

Visibility: Generally 16-40 km in the morning decreasing to 3 km in blowing dust and blowing sand by midafternoon.

Maximum temperature: 16.7°C

Corresponding vapor pressure: 3.7 Torr

Minimum temperature: 5.6°C

Corresponding vapor pressure: 2.7 Torr



Figure 47a. Surface weather map for 29 March 1977.



Figure 47b. 500-millibar height contours for 29 March 1977.

TABLE 34
APACHE SITE RAWINSONDE DATA

DATE: 29 MAR 77 RELEASE NO.: 15 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	WIND SPEED (M/S)
0.0	654.2	13.4	2.4	270.0	4.1
62.7	649.3	11.7	3.3	268.2	5.1
216.3	637.5	9.8	3.2	266.0	7.0
748.5	597.6	4.5	2.9	260.4	13.6
1108.4	571.6	1.0	2.7	259.9	19.2
1218.8	563.8	-1.1	2.5	258.9	18.1
1785.9	525.0	-5.4	2.0	251.0	17.6
1892.0	517.9	-6.4	2.0	254.6	20.4
2006.3	510.6	-6.4	1.3	259.3	22.2
2120.1	503.1	-5.6	0.8	263.5	24.6
2259.6	494.2	-4.9	0.5	265.8	27.5
3221.5	436.6	-12.4	0.4	268.3	32.6

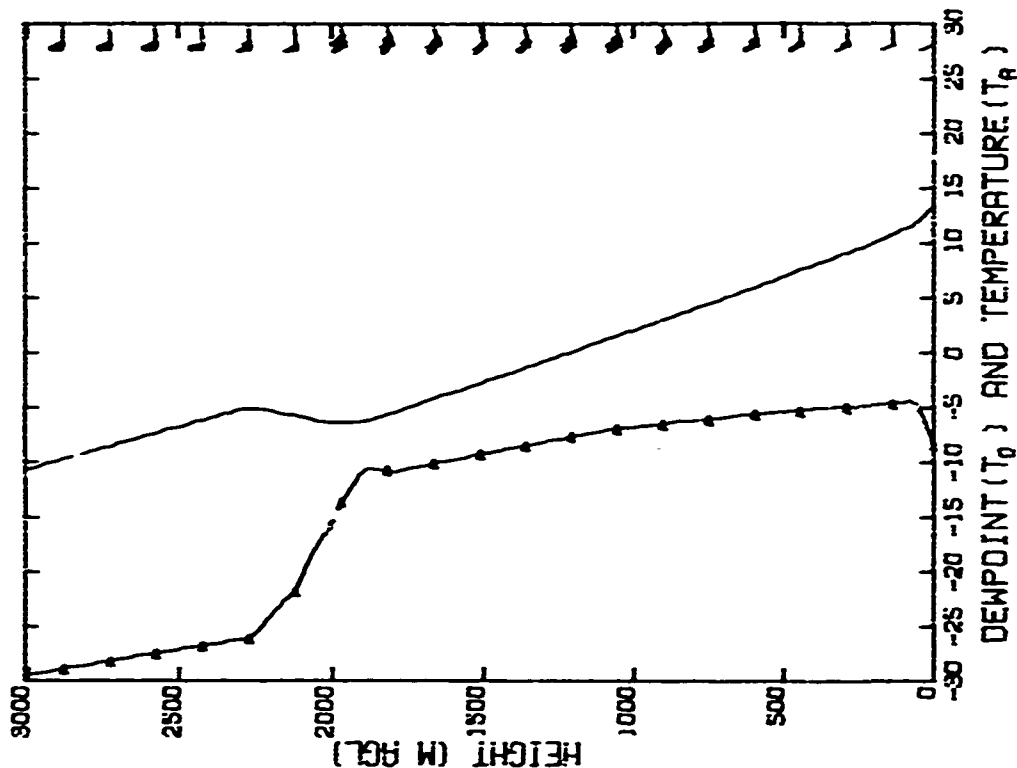


TABLE 35
APACHE SITE RAWINSONDE DATA

DATE: 29 MAR 77 RELEASE NO.: 16 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/5)
0.0	655.2	13.1	2.8	270.0 9.3
229.6	637.5	11.6	2.8	275.2 10.5
1028.6	578.5	2.9	2.2	269.1 15.6
1808.3	525.0	-2.4	1.4	252.5 21.1
2575.6	476.1	-9.3	0.9	254.4 23.8
3050.4	447.6	-13.0	0.4	256.4 26.9

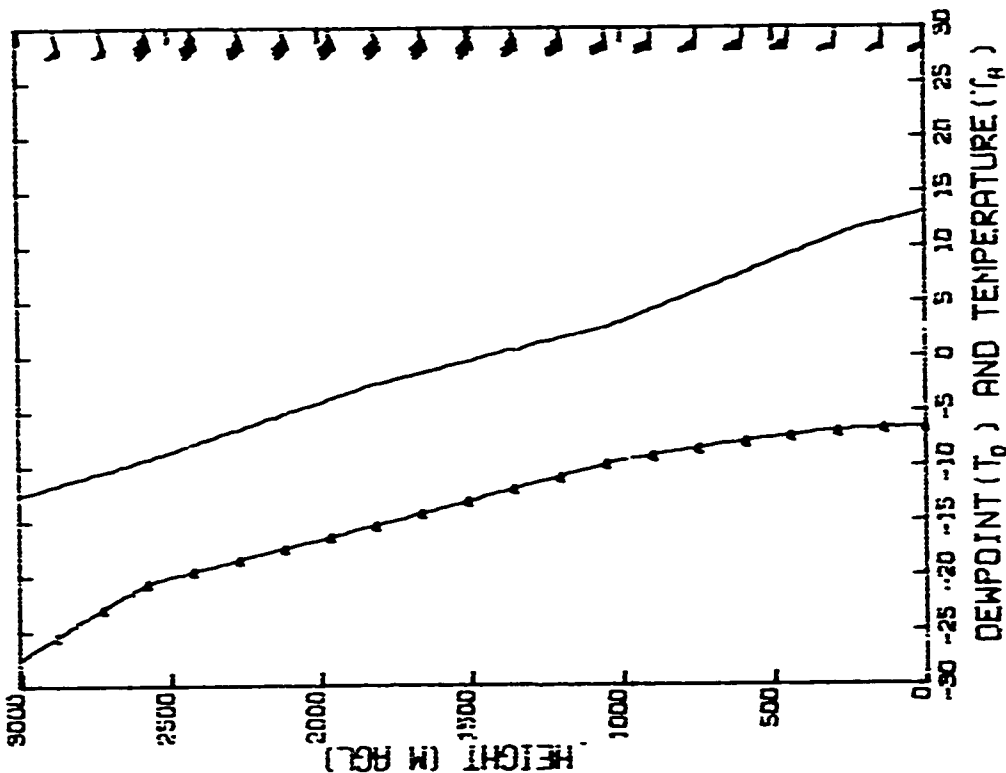


TABLE 36 APACHE SITE RAWINSONDE DATA

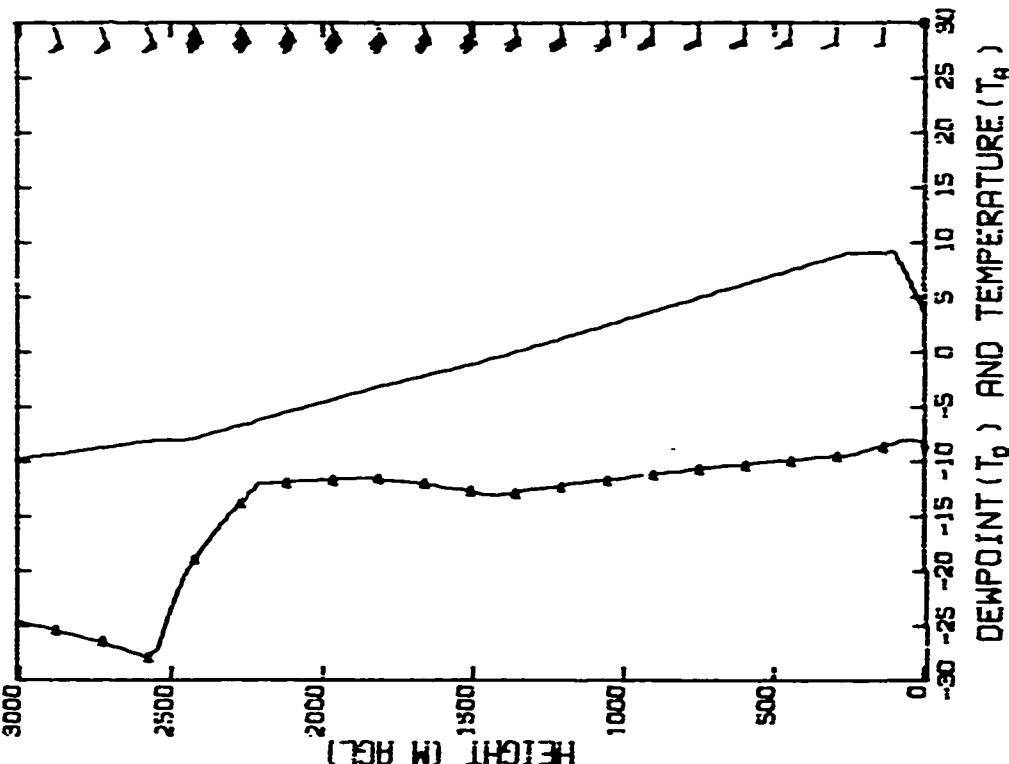
DATE: 29 MAR 77

RELEASE NO.: 17

RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	657.5	3.4	2.4	0.0	0.0
97.0	649.8	9.2	2.4	272.3	1.6
255.3	637.5	9.0	2.2	272.3	4.0
1425.6	552.1	-1.6	1.7	255.4	17.2
1827.2	525.0	-3.3	1.9	246.1	20.5
2217.3	495.5	-6.3	1.8	241.5	22.1
2745.8	478.5	-8.1	0.9	245.6	24.0
2554.8	478.5	-8.1	0.4	247.6	24.8
3265.8	436.5	-10.9	0.7	246.8	31.4



WIND BARB SYSTEM (KTS)

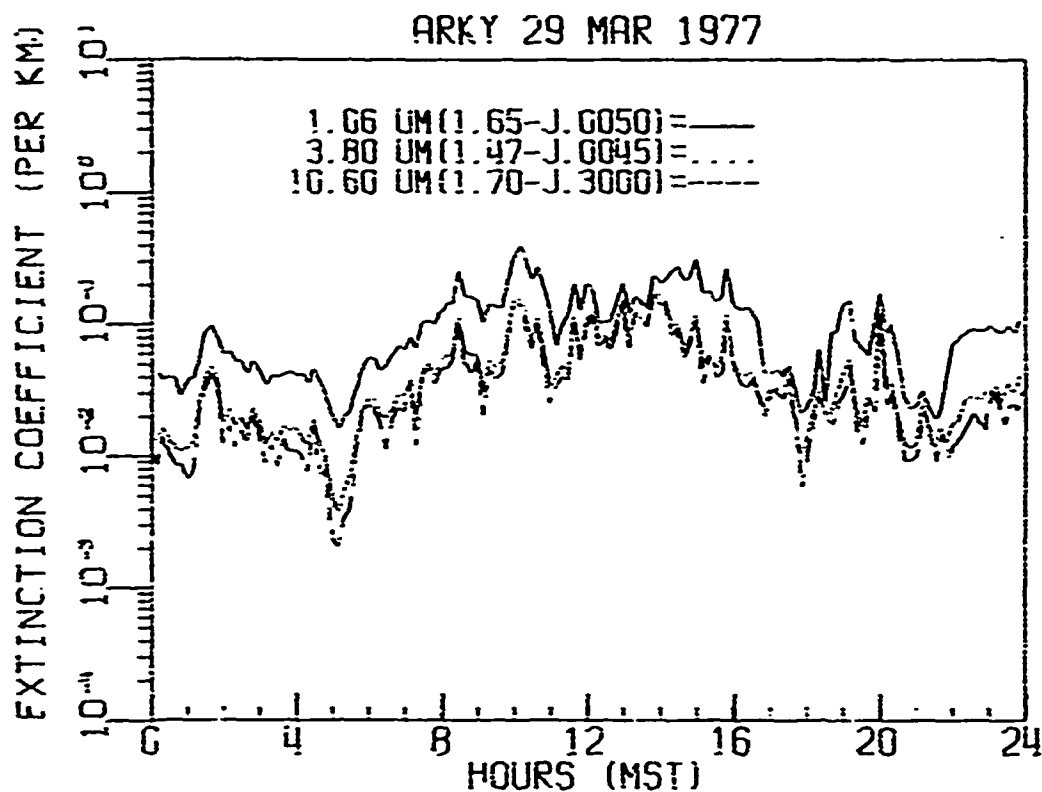


Figure 48. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 29 March 1977.

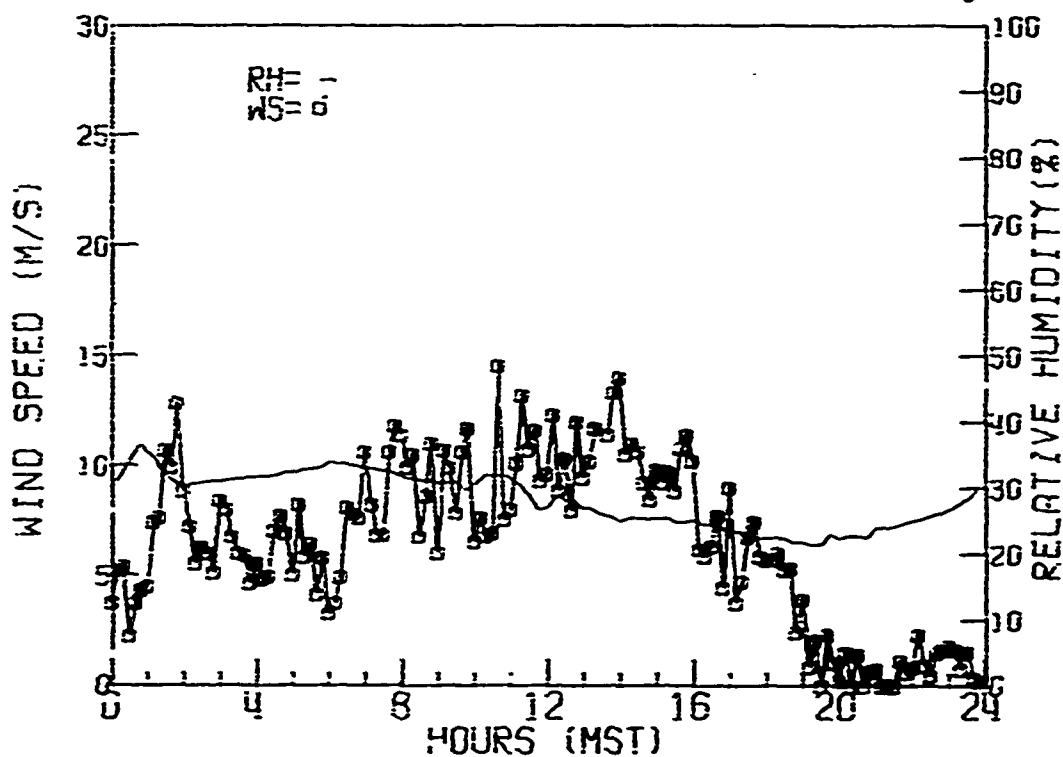


Figure 49. Diurnal variation of windspeed and relative humidity, Arky Site, 29 March 1977.

TABLE 37
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WING

DATE TIME SAMPLE (MST) (SEC)			CHANNEL										EXTINCTION (PER K4)		MASS LOADING (UG/MG5)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
29 MAR 77																
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0										

TABLE 37 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, W1M2

DATE TIME SAMPLE (MST) (SEC)	CHANNEL										EXTINCTION (PER KI)			MASS LOADING (UG/M ³)	
	1	2	3	4	5	6	7	8	9	10	1.26	3.0	12.6		
29 MAR 77															
06:50:00 600	.1102	.1503	.5800	.3001	.0001	.3901	.0000	.0000	.0000	.0000	.6707	.2901	.2301	291.	
07:00:00 600	.1102	.1403	.4300	.1403	.0000	.2301	.0000	.0000	.0000	.0000	.6601	.2901	.2201	297.	
07:10:00 600	.1202	.1403	.4000	.0901	.2400	.3901	.0000	.0000	.0000	.0000	.8007	.3801	.3701	364.	
07:20:00 600	.1302	.1403	.4600	.0101	.2300	.0000	.0000	.0000	.0000	.0000	.6701	.2901	.1201	151.	
07:30:00 600	.1702	.1503	.6100	.0101	.1400	.5901	.0000	.0000	.0000	.0000	.1000	.4001	.4001	946.	
07:40:00 600	.1702	.1703	.5500	.1403	.2103	.3701	.0000	.0000	.0000	.0000	.1100	.5101	.4901	510.	
07:50:00 600	.1702	.1803	.4600	.1100	.1400	.3901	.0000	.0000	.0000	.0000	.9907	.4201	.3501	394.	
08:00:00 600	.2102	.2303	.6700	.1403	.0101	.7701	.0000	.0000	.0000	.0000	.1300	.5101	.4501	591.	
08:10:00 600	.2502	.2703	.8500	.1400	.1400	.5901	.0000	.0000	.0000	.0000	.1400	.5801	.4601	563.	
08:20:00 600	.2502	.2703	.9200	.1503	.1403	.3701	.0000	.0000	.0000	.0000	.1500	.5101	.4401	530.	
08:30:00 600	.4202	.4303	.1701	.3300	.2900	.1200	.0000	.0000	.0000	.0000	.2600	.3100	.2601	1100.	
08:40:00 600	.2902	.3403	.9700	.2303	.2900	.2301	.0000	.0000	.0000	.0000	.1600	.5101	.5201	503.	
08:50:00 600	.2902	.3303	.1001	.1500	.9401	.3901	.0000	.0000	.0000	.0000	.1600	.5801	.4801	521.	
09:00:00 600	.2502	.2903	.7300	.0701	.2300	.5701	.0000	.0000	.0000	.0000	.1500	.5901	.5101	565.	
09:10:00 600	.2102	.2803	.7000	.0101	.0400	.5701	.0000	.0000	.0000	.0000	.1100	.3201	.2101	292.	
09:20:00 600	.2502	.2803	.5800	.1203	.1103	.5701	.0000	.0000	.0000	.0000	.1100	.5101	.4401	454.	
09:30:00 600	.2602	.2203	.7000	.0701	.1900	.3901	.0000	.0000	.0000	.0000	.1400	.4701	.4001	404.	
09:40:00 600	.2302	.2903	.7300	.1103	.9501	.5701	.0000	.0000	.0000	.0000	.1300	.5201	.4201	522.	
09:50:00 600	.3402	.3603	.1001	.1100	.2900	.9401	.0000	.0000	.0000	.0000	.2000	.7001	.6901	614.	
10:00:00 600	.5102	.4403	.1201	.1403	.4100	.2200	.0000	.0000	.0000	.0000	.3200	.1300	.1400	1619.	
10:10:00 600	.6702	.6103	.1701	.1400	.6300	.2400	.0000	.0000	.0000	.0000	.3900	.1600	.1400	1745.	
10:20:00 600	.5902	.6003	.1701	.2403	.2300	.1100	.0000	.0000	.0000	.0000	.3500	.1200	.1000	1256.	
10:30:00 600	.4202	.3903	.1100	.2000	.4300	.2001	.0000	.0000	.0000	.0000	.2300	.7701	.6501	628.	
10:40:00 600	.4502	.4203	.1401	.0101	.4300	.1100	.0000	.0000	.0000	.0000	.2700	.1100	.1000	1241.	
10:50:00 600	.3702	.3203	.0400	.1200	.4401	.7901	.0000	.0000	.0000	.0000	.1900	.6501	.5101	703.	
11:00:00 600	.2502	.2103	.4500	.0701	.1103	.0000	.0000	.0000	.0000	.0000	.1500	.5801	.2601	282.	
11:10:00 600	.0401	.1903	.5400	.0101	.9401	.5901	.0000	.0000	.0000	.0000	.6907	.4101	.3501	404.	
11:20:00 600	.1502	.1503	.1301	.2103	.1103	.2301	.0000	.0000	.0000	.0000	.9707	.4001	.3901	370.	
11:30:00 600	.2202	.1803	.4900	.1400	.1400	.3901	.0000	.0000	.0000	.0000	.1200	.4801	.3701	442.	
11:40:00 600	.2902	.3503	.1401	.2903	.2100	.2300	.0000	.0000	.0000	.0000	.2100	.1200	.1100	1275.	
11:50:00 600	.2102	.2003	.4100	.0101	.1900	.9401	.0000	.0000	.0000	.0000	.1300	.5001	.5401	666.	
12:00:00 600	.3302	.3003	.1201	.3303	.4400	.9101	.0000	.0000	.0000	.0000	.2300	.1000	.7401	949.	
12:10:00 600	.1702	.3403	.1401	.3200	.4400	.2000	.0000	.0000	.0000	.0000	.1800	.1000	.1200	1271.	
12:20:00 600	.0701	.2603	.1301	.2403	.2100	.9101	.0000	.0000	.0000	.0000	.1100	.7801	.4901	711.	
12:30:00 600	.6401	.2603	.0400	.1400	.1400	.1400	.0000	.0000	.0000	.0000	.1000	.7701	.5701	951.	
12:40:00 600	.1302	.3503	.1101	.1403	.2100	.1200	.0000	.0000	.0000	.0000	.1100	.7101	.742.	742.	
12:50:00 600	.1402	.4503	.1401	.0300	.3400	.7501	.0000	.0000	.0000	.0000	.1500	.3000	.8601	815.	
13:00:00 600	.1702	.5103	.1701	.1903	.4300	.2100	.0000	.0000	.0000	.0000	.2100	.1500	.1500	1633.	
13:10:00 600	.1202	.4003	.1301	.2000	.2400	.9401	.0000	.0000	.0000	.0000	.1200	.8101	.8801	724.	
13:20:00 600	.1302	.3903	.1501	.2103	.2200	.2100	.0000	.0000	.0000	.0000	.1400	.1200	.1200	1399.	
13:30:00 600	.1002	.3403	.1201	.3000	.4300	.1400	.0000	.0000	.0000	.0000	.3300	.1000	.4401	953.	

TABLE 37 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARBY SITE, #12

DATE	TIME (MST)	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER K4)			MASS LOADING (UG/M ³)
			1	2	3	4	5	5	7	8	9	10	1.26	1.8	13.5	
29 MAR 77																
13:50:00	ACC		.17+02	.62+03	.26+01	.41+00	.13+01	.18+00	.18+00	.00	.00	.00	.23+00	.17+00	.17+00	2003.
14:00:00	533		.15+02	.61+01	.23+01	.57+00	.53+00	.21+00	.21+00	.00	.00	.00	.21+00	.15+00	.14+00	1445.
14:10:00	ACC		.24+02	.50+01	.17+01	.27+00	.38+00	.28+00	.28+00	.00	.00	.00	.22+00	.14+00	.13+00	1614.
14:20:00	533		.45+02	.37+01	.13+01	.24+00	.31+00	.24+00	.25+00	.00	.00	.00	.25+00	.09+01	.95+01	975.
14:30:00	ACC		.51+02	.38+01	.07+00	.14+00	.53+00	.12+00	.12+00	.00	.00	.00	.28+00	.10+00	.94+01	1047.
14:40:00	533		.43+02	.33+01	.05+00	.14+00	.11+00	.57+01	.57+01	.00	.00	.00	.22+00	.17+01	.57+01	713.
14:50:00	ACC		.43+02	.32+01	.11+01	.76+01	.48+00	.50+01	.50+01	.00	.00	.00	.23+00	.76+01	.69+01	729.
15:00:00	533		.55+02	.49+01	.12+01	.33+00	.43+00	.12+00	.12+00	.00	.00	.00	.31+00	.12+00	.11+00	1207.
15:10:00	ACC		.76+02	.30+01	.64+00	.11+00	.96+01	.20+01	.20+01	.00	.00	.00	.17+00	.48+01	.35+01	404.
15:20:00	533		.31+02	.21+01	.51+00	.11+00	.43+00	.39+01	.39+01	.00	.00	.00	.18+00	.57+01	.56+01	567.
15:30:00	ACC		.29+02	.21+01	.76+00	.30+01	.14+00	.50+01	.50+01	.00	.00	.00	.15+00	.49+01	.41+01	523.
15:40:00	533		.33+02	.19+01	.82+00	.61+01	.17+00	.57+01	.57+01	.00	.00	.00	.15+00	.53+01	.44+01	557.
15:50:00	ACC		.42+02	.53+01	.16+01	.20+00	.19+00	.20+00	.20+00	.00	.00	.00	.27+00	.12+00	.10+00	1334.
16:00:00	533		.25+02	.21+01	.55+00	.76+01	.95+01	.77+01	.77+01	.00	.00	.00	.14+00	.51+01	.44+01	598.
16:10:00	ACC		.25+02	.15+01	.58+00	.76+01	.14+00	.30+01	.30+01	.00	.00	.00	.13+00	.42+01	.36+01	429.
16:20:00	533		.27+02	.16+01	.33+00	.31+01	.00	.57+01	.57+01	.00	.00	.00	.14+00	.41+01	.34+01	502.
16:30:00	ACC		.24+02	.14+01	.40+00	.17+00	.96+01	.39+01	.39+01	.00	.00	.00	.12+00	.44+01	.38+01	457.
16:40:00	533		.21+02	.16+01	.43+00	.61+01	.21+00	.21+00	.21+00	.00	.00	.00	.13+00	.31+01	.27+01	245.
16:50:00	ACC		.59+01	.12+01	.43+00	.61+01	.19+00	.20+01	.20+01	.00	.00	.00	.44+01	.24+01	.20+01	194.
17:00:00	533		.32+01	.11+01	.37+00	.31+01	.19+00	.39+01	.39+01	.00	.00	.00	.32+01	.32+01	.31+01	202.
17:10:00	ACC		.35+01	.14+01	.54+00	.15+01	.14+00	.56+01	.56+01	.00	.00	.00	.45+01	.33+01	.30+01	332.
17:20:00	533		.33+01	.14+01	.54+00	.61+01	.14+00	.39+01	.39+01	.00	.00	.00	.41+01	.31+01	.29+01	273.
17:30:00	ACC		.32+01	.14+01	.24+00	.61+01	.19+00	.70+01	.70+01	.00	.00	.00	.50+01	.38+01	.39+01	436.
17:40:00	533		.34+01	.11+01	.37+00	.45+01	.95+01	.27+01	.27+01	.00	.00	.00	.32+01	.23+01	.13+01	162.
17:50:00	ACC		.70+01	.11+01	.30+00	.30+01	.00	.00	.00	.00	.00	.00	.22+01	.11+01	.59+02	58.
18:00:00	533		.24+01	.07+00	.14+00	.44+01	.95+01	.00	.00	.00	.00	.00	.25+01	.13+01	.11+01	72.
18:10:00	ACC		.26+01	.11+01	.41+00	.76+01	.19+00	.00	.00	.00	.00	.00	.31+01	.21+01	.20+01	139.
18:20:00	533		.09+01	.11+01	.61+00	.31+01	.95+01	.39+01	.39+01	.00	.00	.00	.65+01	.32+01	.27+01	307.
18:30:00	ACC		.12+01	.10+01	.31+00	.15+01	.96+01	.36+01	.36+01	.00	.00	.00	.26+01	.21+01	.20+01	216.
18:40:00	533		.14+02	.10+01	.24+00	.51+01	.95+01	.00	.00	.00	.00	.00	.84+01	.22+01	.17+01	109.
18:50:00	ACC		.18+02	.16+01	.37+00	.41+01	.48+01	.36+01	.36+01	.00	.00	.00	.91+01	.30+01	.26+01	343.
19:00:00	533		.23+02	.22+01	.73+00	.14+00	.00	.21+01	.21+01	.00	.00	.00	.14+00	.42+01	.33+01	392.
19:10:00	ACC		.24+02	.25+01	.82+00	.91+01	.29+01	.30+01	.30+01	.00	.00	.00	.15+00	.55+01	.48+01	503.
19:20:00	533		.15+02	.11+01	.65+00	.17+01	.00	.00	.00	.00	.00	.00	.77+01	.23+01	.17+01	195.
19:30:00	ACC		.14+02	.82+00	.70+00	.46+01	.48+01	.00	.00	.00	.00	.00	.66+01	.12+01	.12+01	145.
19:40:00	533		.09+01	.09+00	.12+00	.39+01	.94+01	.57+01	.57+01	.00	.00	.00	.59+01	.24+01	.24+01	352.
19:50:00	ACC		.16+02	.15+01	.40+00	.76+01	.48+01	.00	.00	.00	.00	.00	.86+01	.29+01	.29+01	270.
20:00:00	533		.17+02	.27+01	.15+01	.31+00	.43+00	.22+00	.22+00	.00	.00	.00	.17+00	.12+00	.12+00	1327.
20:10:00	ACC		.16+02	.17+01	.52+00	.44+01	.48+01	.36+01	.36+01	.00	.00	.00	.88+01	.32+01	.26+01	334.
20:20:00	533		.19+02	.14+01	.49+00	.14+00	.14+00	.00	.00	.00	.00	.00	.13+01	.37+01	.37+01	243.
20:30:00	ACC		.12+02	.67+00	.33+01	.11+00	.44+01	.00	.00	.00	.00	.00	.60+01	.21+01	.16+01	144.

TABLE 37 (cont.)
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SITE, W-42

DATE TIME SAMPLE (MST) TIME (SEC)	CHANNEL										EXTINCTION (PER K4)			MASS LOADING (UG/M ³)	
	1	2	3	4	5	5	7	8			1.26	3.8	13.5		
29 MAR 77															
20:00:00	600	.49+01	.47+00	.24+00	.91-01	.00	.00	.00	.00	.00	.29-01	.13-01	.95-02	.95	
20:05:00	500	.35+01	.54+00	.15+00	.51-01	.43-01	.00	.00	.00	.00	.24-01	.12-01	.04-02	.79	
21:00:00	600	.32+01	.77+00	.24+00	.30-01	.96-01	.00	.00	.00	.00	.24-01	.12-01	.10-01	.72	
21:10:00	500	.29+01	.54+00	.33+00	.91-01	.43-01	.00	.00	.00	.00	.32-01	.25-01	.22-01	.253	
21:20:00	600	.24+01	.56+00	.27+00	.61-01	.48-01	.00	.00	.00	.00	.24-01	.17-01	.15-01	.153	
21:30:00	500	.21+01	.73+00	.17+00	.15-01	.95-01	.00	.00	.00	.00	.23-01	.12-01	.05-02	.59	
21:40:00	600	.20+01	.54+00	.15+00	.76-01	.48-01	.00	.00	.00	.00	.22-01	.16-01	.15-01	.156	
21:50:00	500	.77+01	.59+00	.91-01	.51-01	.43-01	.00	.00	.00	.00	.43-01	.13-01	.10-01	.105	
22:00:00	600	.15+02	.33+01	.30+00	.30-01	.48-01	.00	.00	.00	.00	.70-01	.18-01	.12-01	.148	
22:10:00	500	.17+02	.11+01	.12+00	.33-01	.00	.00	.00	.00	.00	.79-01	.19-01	.14-01	.227	
22:20:00	600	.17+02	.19+01	.04+00	.11+00	.00	.00	.00	.00	.00	.87-01	.27-01	.17-01	.278	
22:30:00	500	.13+02	.14+01	.51+00	.45+01	.43-01	.00	.00	.00	.00	.93-01	.29-01	.21-01	.263	
22:40:00	600	.18+02	.19+01	.67+00	.61-01	.48-01	.00	.00	.00	.00	.91-01	.28-01	.18-01	.203	
22:50:00	500	.13+02	.19+01	.70+00	.76+01	.00	.00	.00	.00	.00	.98-01	.27-01	.16-01	.193	
23:00:00	600	.16+02	.22+01	.40+00	.61-01	.48-01	.00	.00	.00	.00	.97-01	.39-01	.32-01	.431	
23:10:00	500	.15+02	.20+01	.73+00	.11+00	.43-01	.00	.00	.00	.00	.91-01	.35-01	.26-01	.298	
23:20:00	600	.17+02	.21+01	.58+00	.30-01	.96-01	.00	.00	.00	.00	.86-01	.26-01	.18-01	.186	
23:30:00	500	.13+02	.23+01	.67+00	.91-01	.43-01	.00	.00	.00	.00	.98-01	.35-01	.26-01	.302	
23:40:00	600	.16+02	.19+01	.64+00	.30-01	.96-01	.00	.00	.00	.00	.88-01	.31-01	.23-01	.262	
23:50:00	500	.13+02	.19+01	.67+00	.14+00	.00	.00	.00	.00	.00	.13+02	.41-01	.31-01	.401	

Best Available Copy

Weather Summary

Date: 30 March 1977

Synoptic

Surface: Rapidly filling surface low-pressure area over eastern South Dakota.
Weak surface pressure gradient over New Mexico.

500 Millibar: Closed low pressure centers over eastern South Dakota and north-central California with interconnecting trough resulting in strong southwesterly flow over New Mexico.

Holloman AFB

Clouds: Mostly clear to scattered (less than 0.3) high clouds (cirrus).

Wind: Light and variable with a peak gust of 7 m sec^{-1} out of the south.

Visibility: Generally greater than 60 km.

Maximum temperature: 21.1°C

Corresponding vapor pressure: 2.8 Torr

Minimum temperature: 1.7°C

Corresponding vapor pressure: 2.5 Torr



Figure 50a. Surface weather map for 30 March 1977.

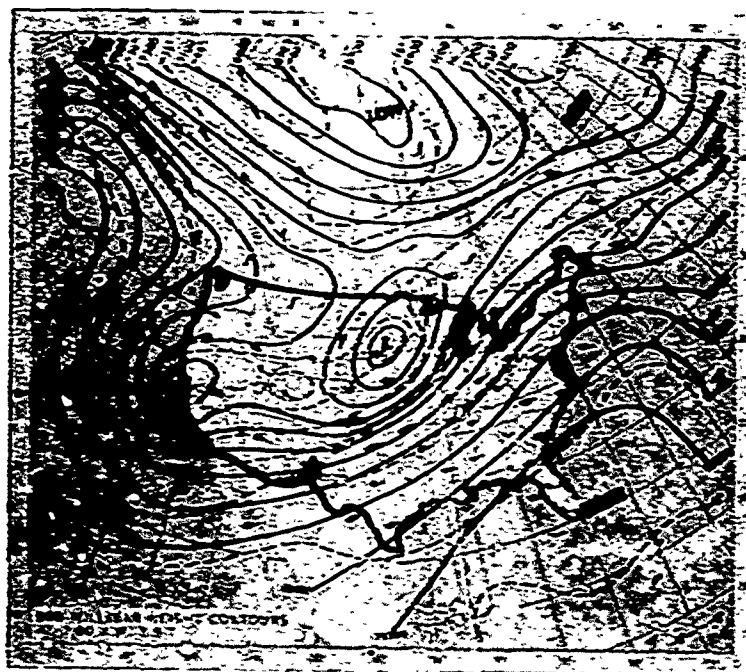


Figure 50b. 500-millibar height contours for 30 March 1977.

TABLE 38. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Date: 30 March 1977							
Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Low %/Type	Clouds Mid %/Type	High %/Type	Remarks
0100							
0200							
0300							
0400							
0500							
0600							
0700							
0800							
0900							
1000							
1100							
1200	16.9	3.1	-4.3	0	0	40 Cs	Plane observed
1300	17.5	3.1	-4.1	0 Cu	0	40 Cs	Single puff Cu W
1400	19.6	3.4	-3.2	0	0	10 Cs	
1500	19.9	3.3	-3.6	0	0	0 Cs	Few Cs N
1600	19.8	2.9	-5.1	0	0	0 Cs	Few Cs N
1700	19.4	2.8	-5.5	0	0	0	
1800	18.0	2.7	-5.9	0	0	0	Apache ok
1900	15.2	2.8	-6.0	0	0	0 Cs	Few Cs W-NW
2000	9.3	2.9	-5.6	0	0	3 C1	
2100	6.5	3.7	-2.5	0	0	3 C1	
2200	7.5	3.4	-3.5	0	0	6 C1	
2300	8.3	3.3	-3.9	0	0	2 C1	
2400	9.5	4.1	-1.2	0	0	0	Plane observed

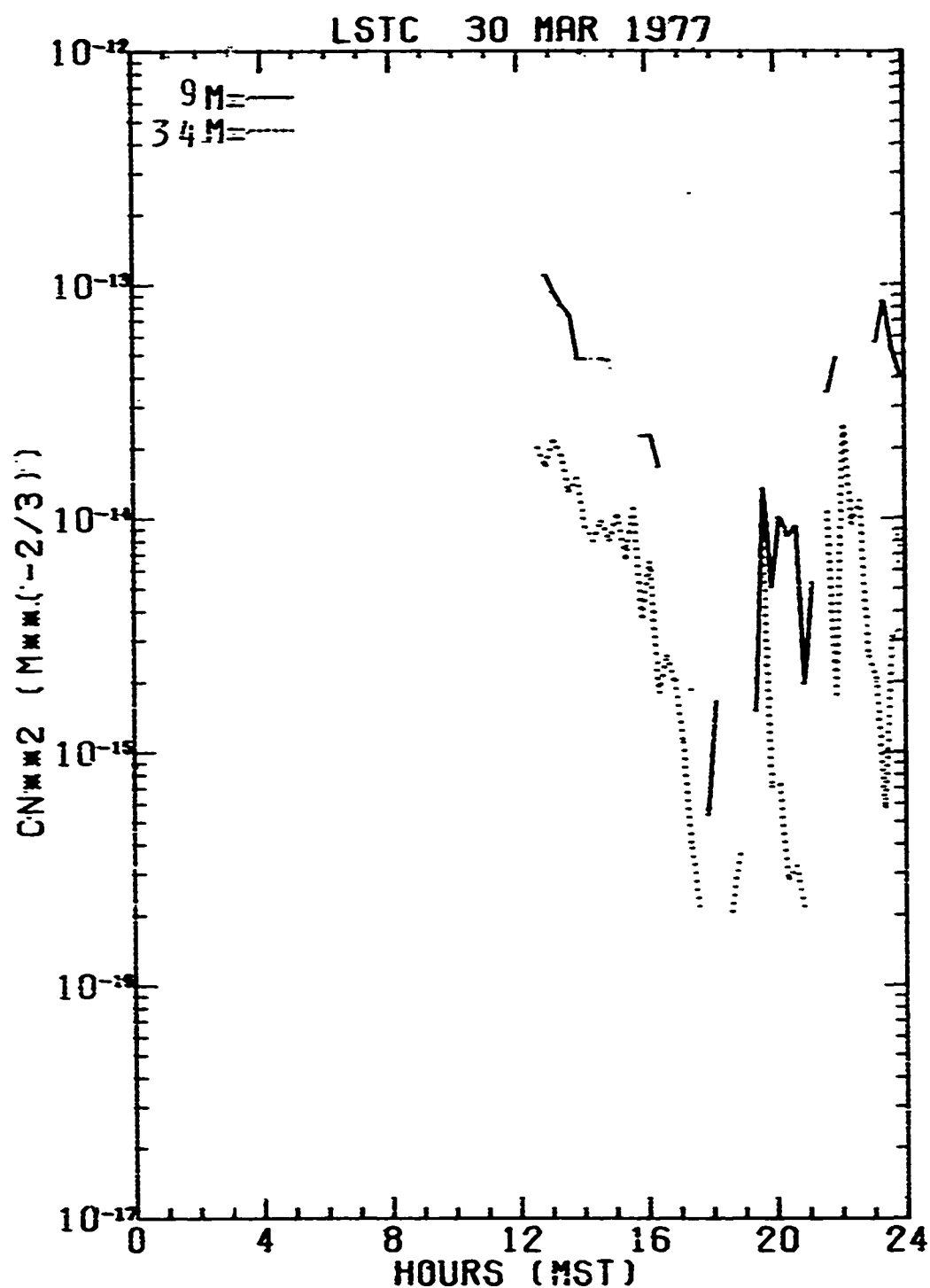


Figure 51. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 30 March 1977.

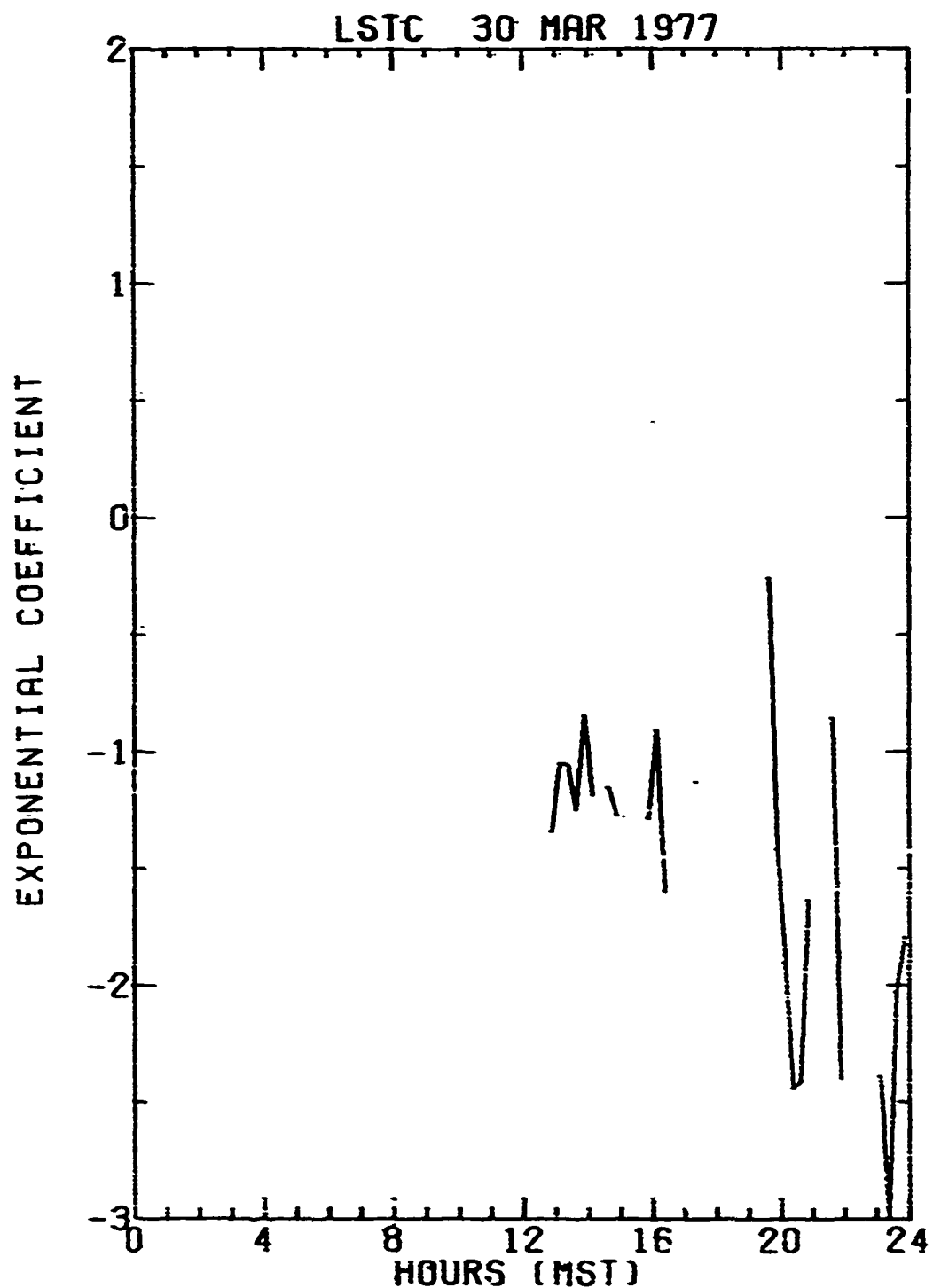


Figure 52. Diurnal variation of the altitude change of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 30 March 1977.

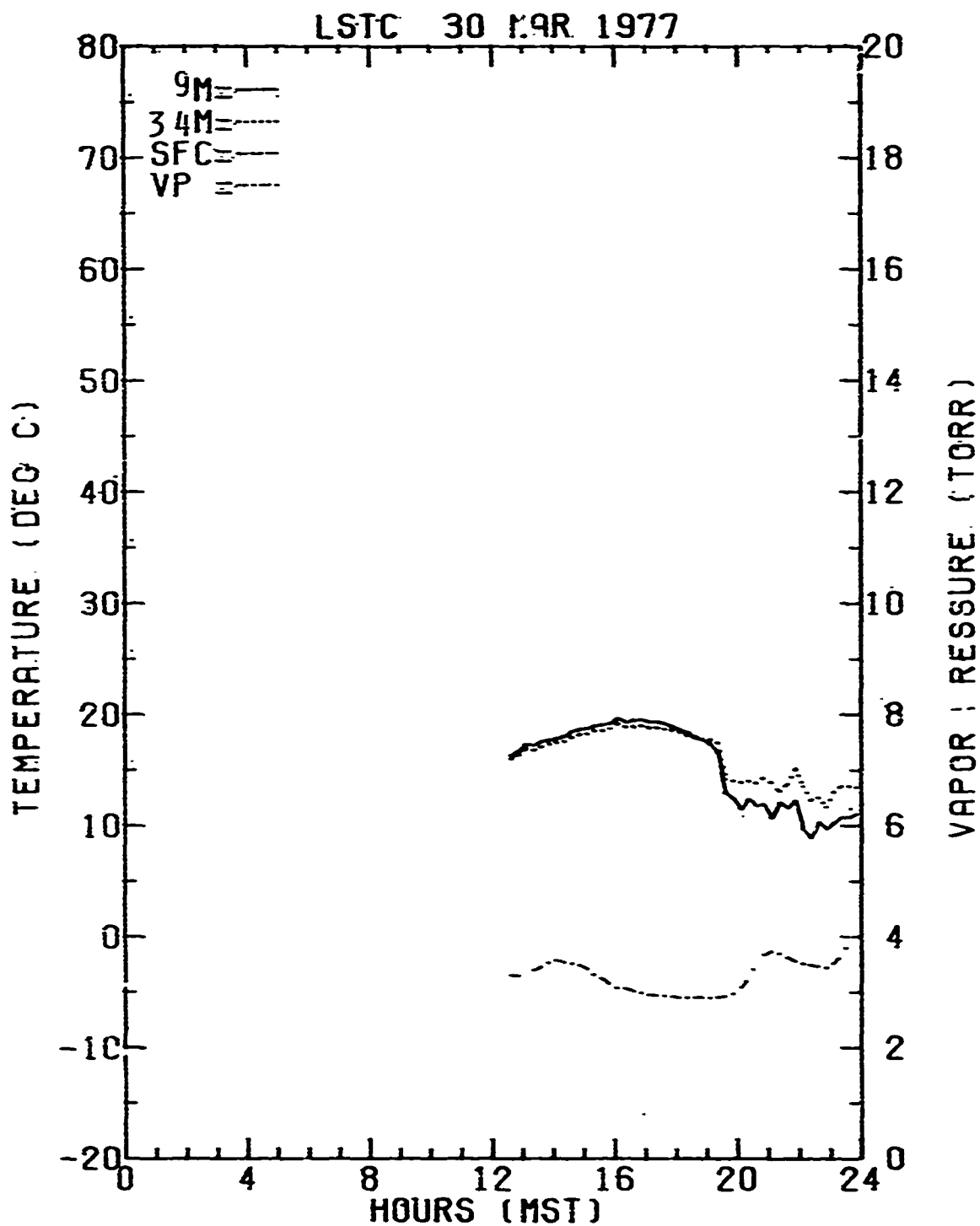


Figure 53. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 30 March 1977.

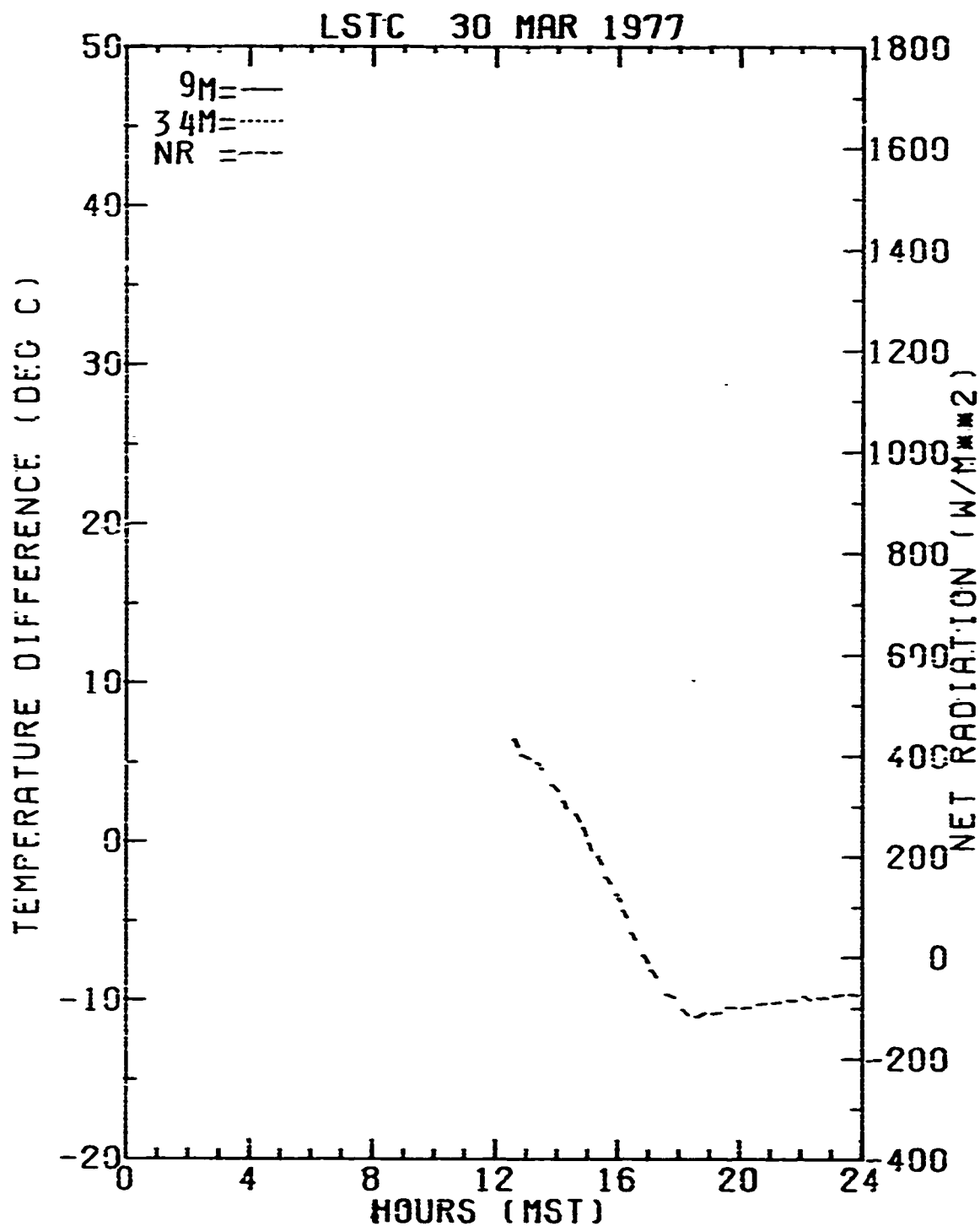


Figure 54. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 30 March 1977.

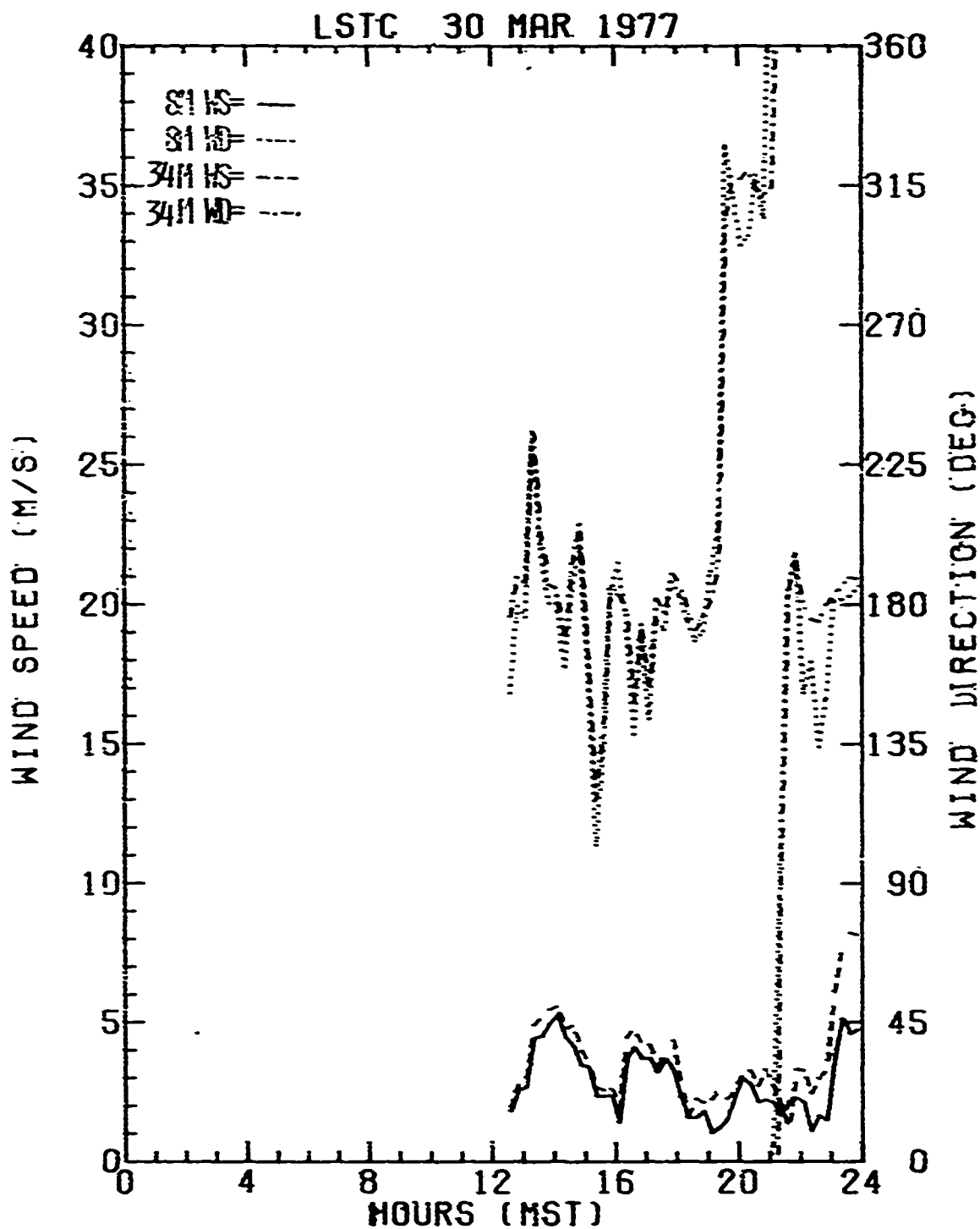


Figure 55. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 30 March 1977.

30 MAR 1977 ACOUSTIC SOUNDER DATA

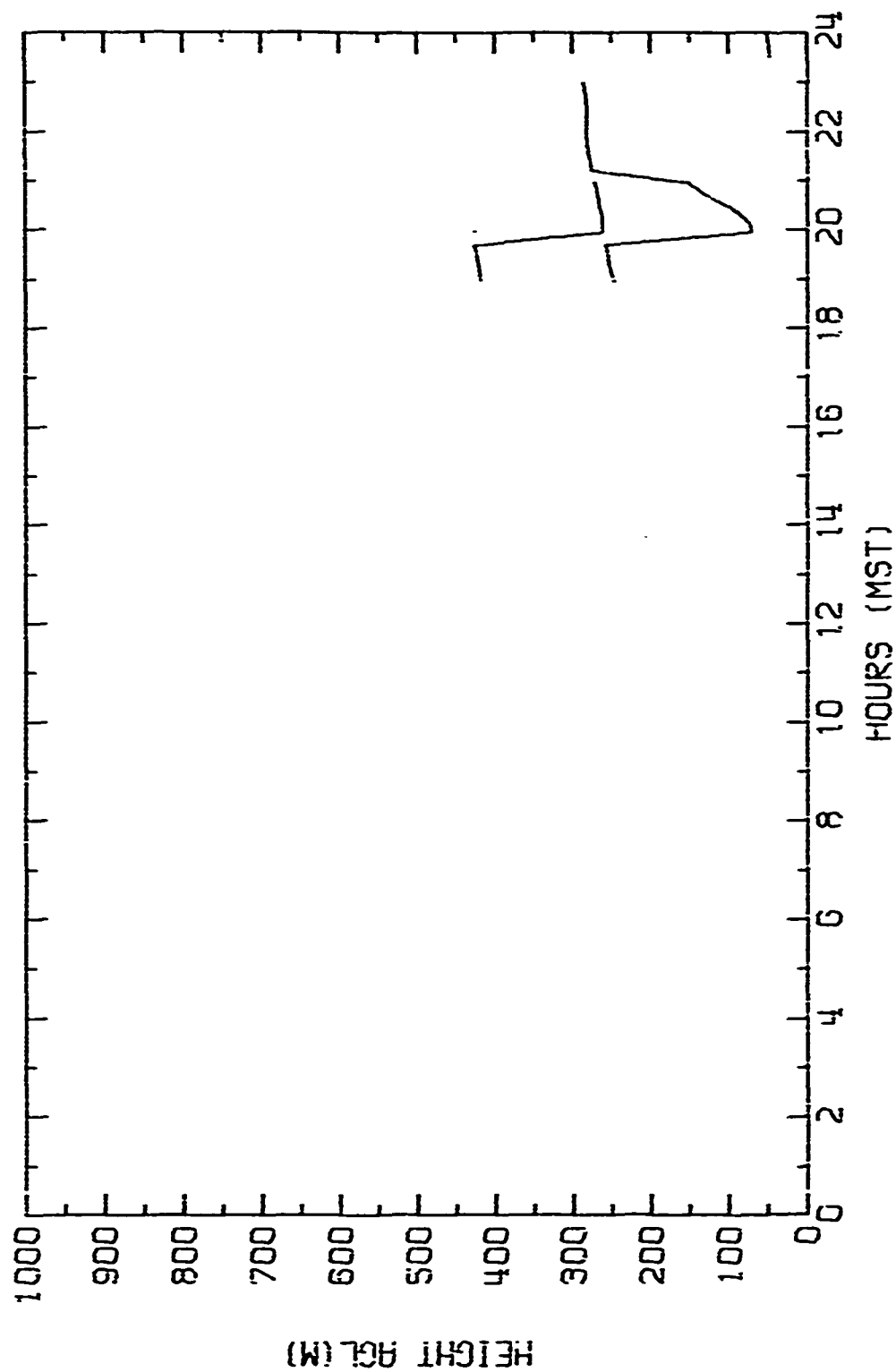


Figure 56. Inversion heights, LSIC, 30 March 1977.

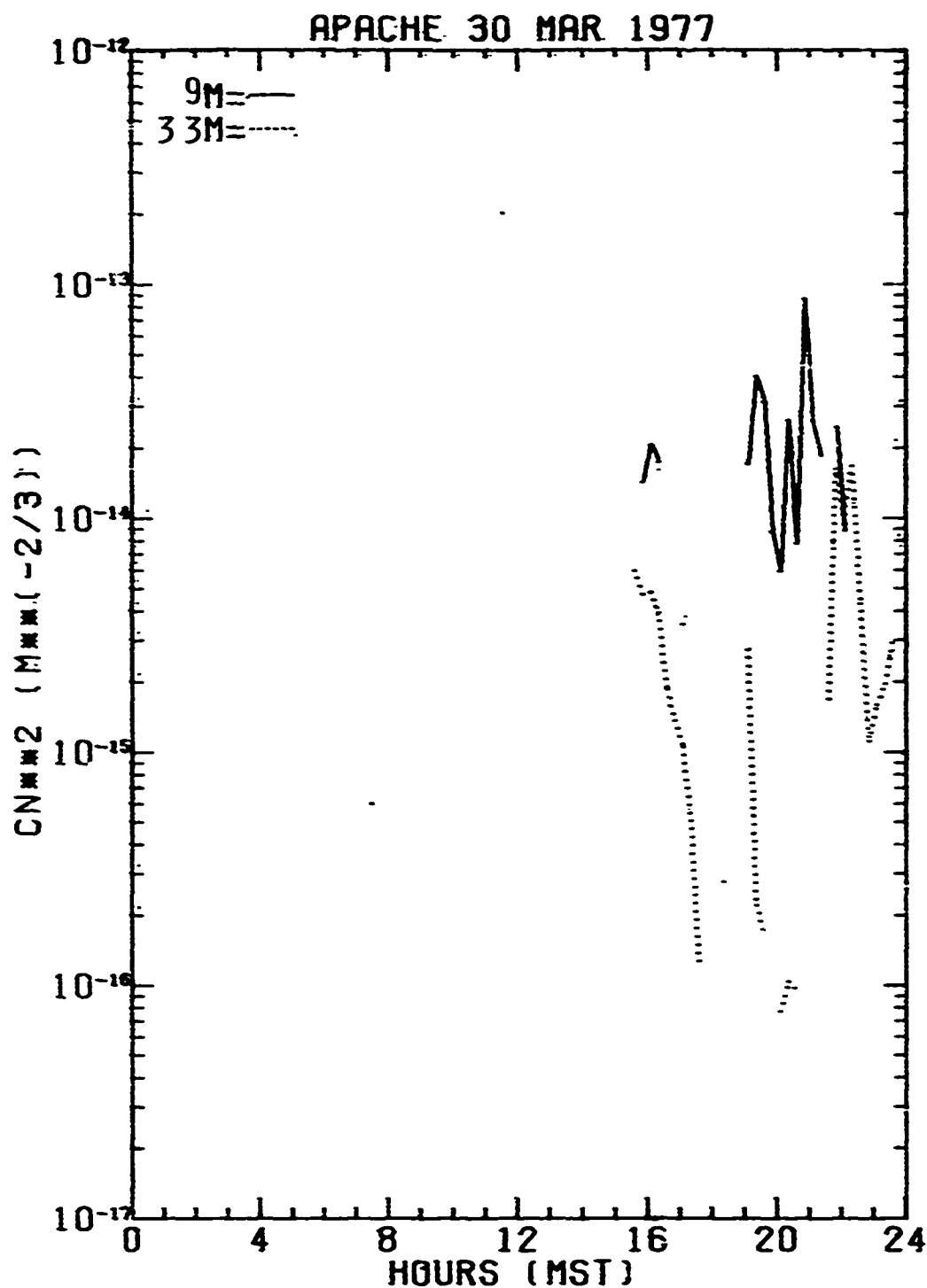


Figure 57. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 30 March 1977.

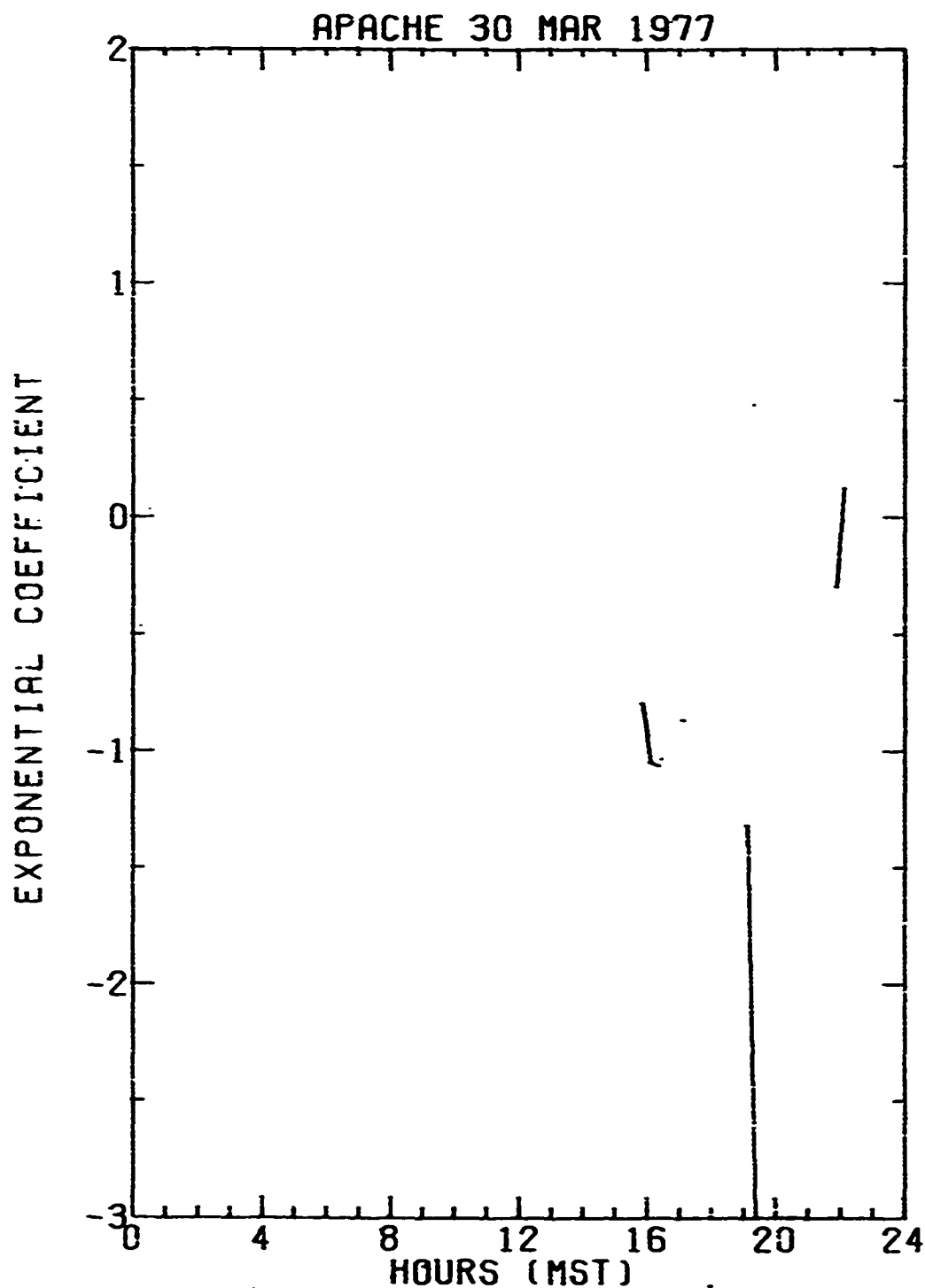


Figure 58. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 30 March 1977.

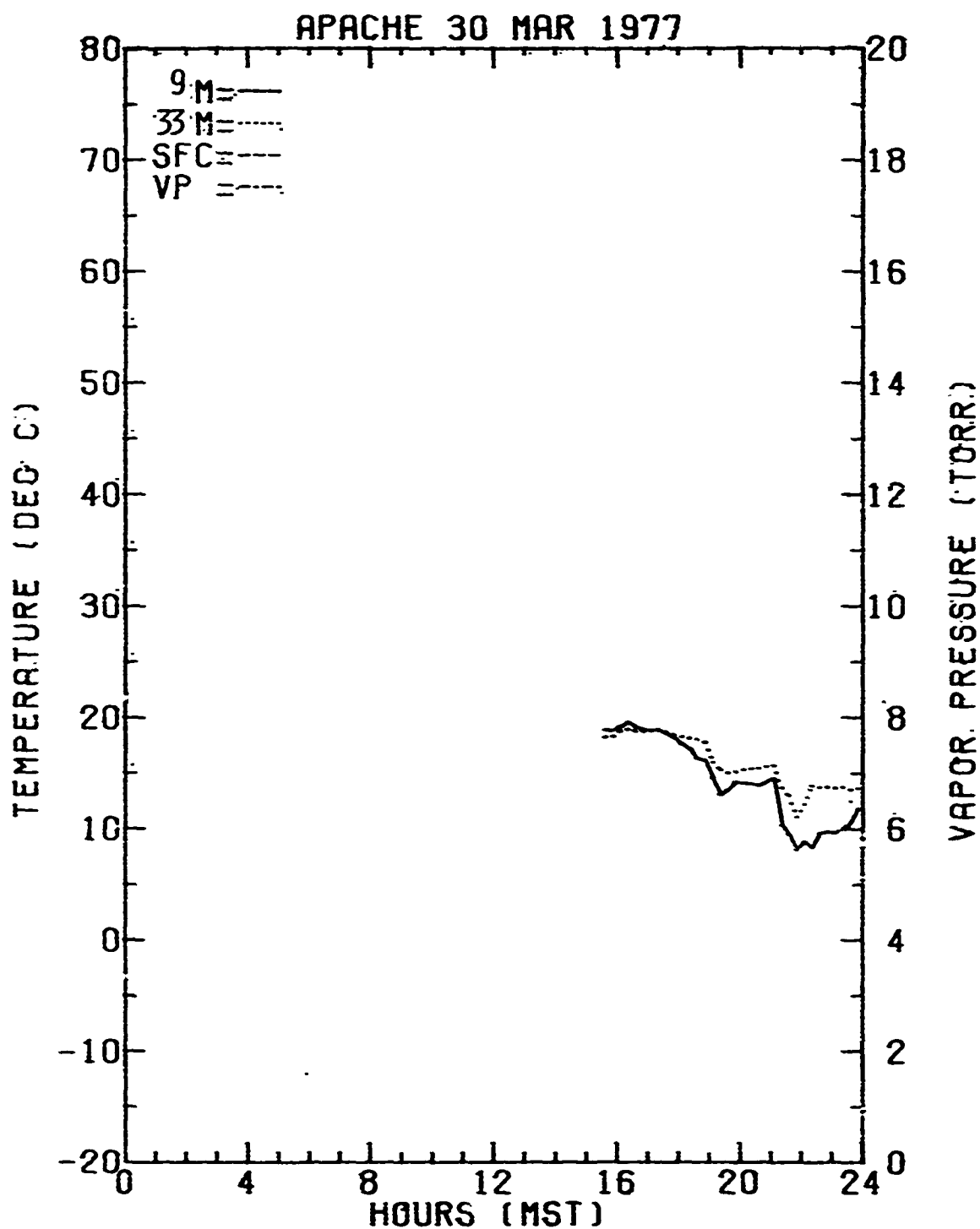


Figure 59. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 30 March 1977.

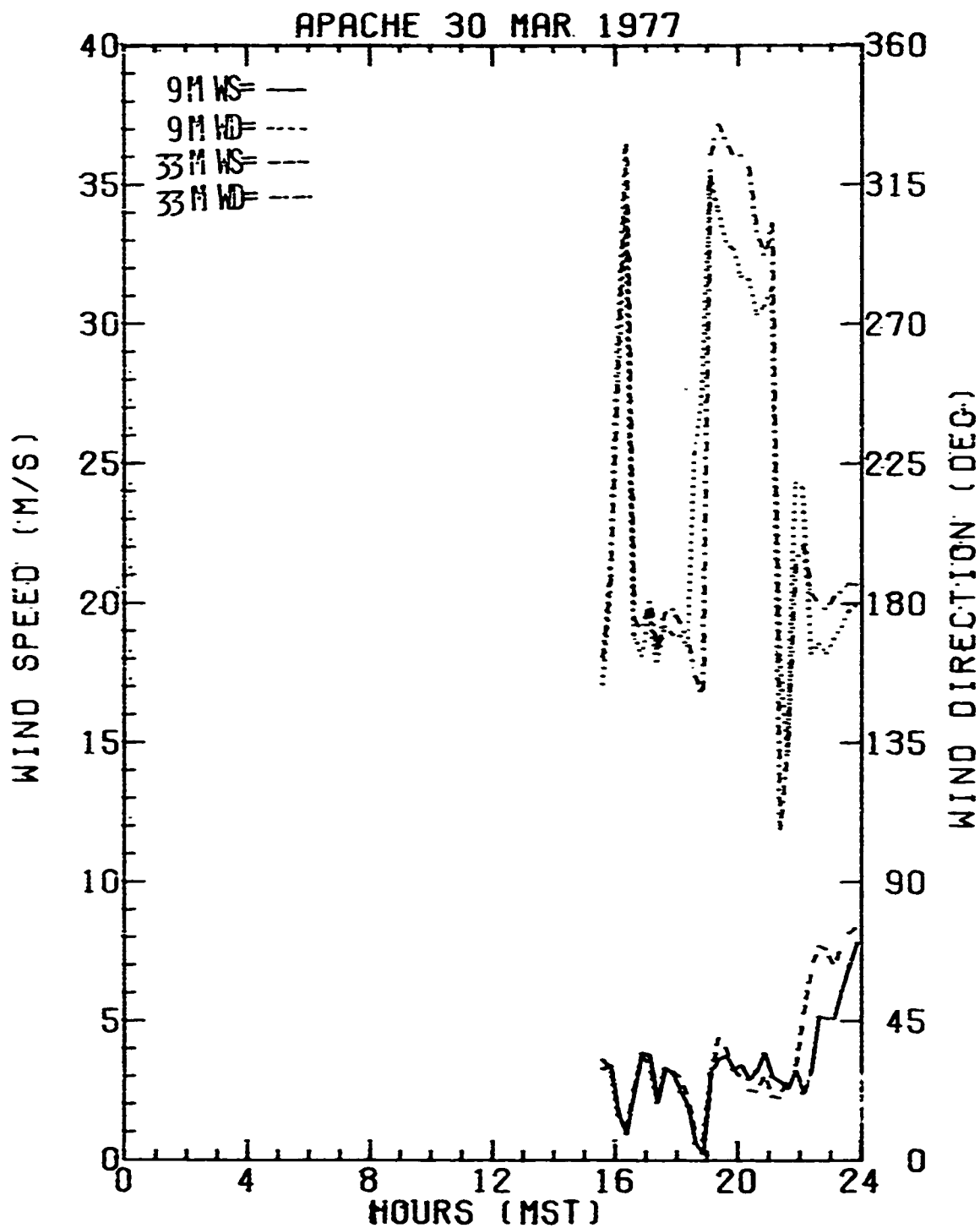


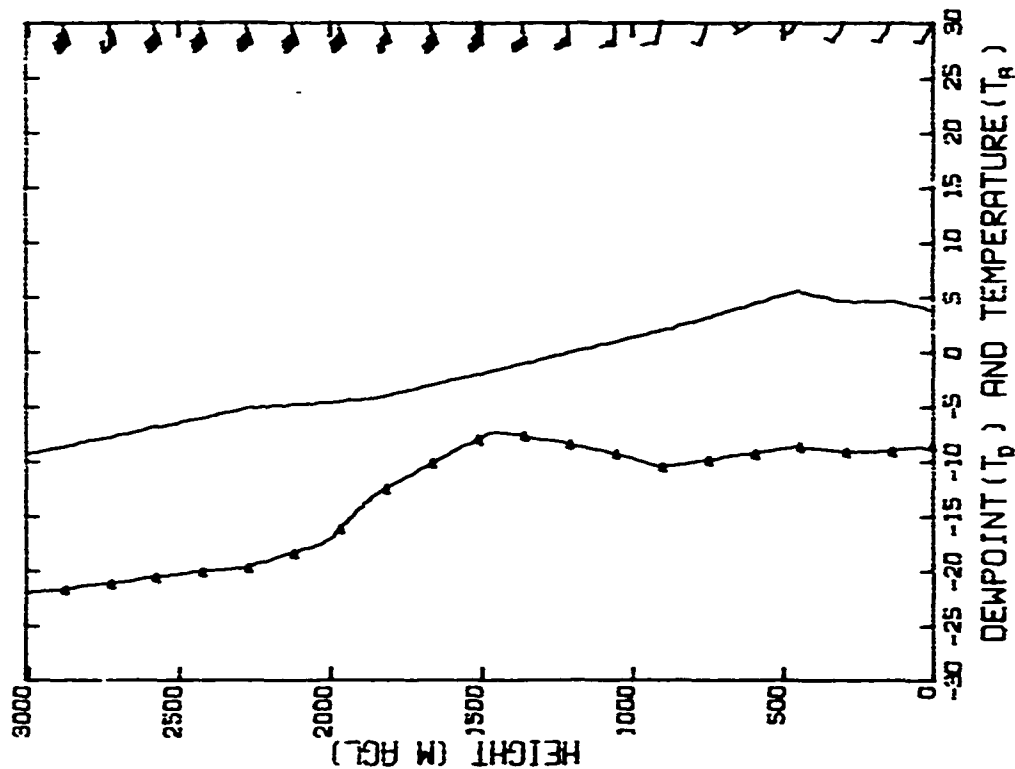
Figure 60. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 30 March 1977.

TABLE 39
APACHE SITE RAWINSONDE DATA

DATE: 30 MAR 77 RELEASE NO.: 18 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES. (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	659.7	3.8	2.4	300.0	2.1
126.9	649.5	4.8	2.3	303.1	1.8
279.1	637.5	4.6	2.3	306.2	1.4
"	624.9	5.6	2.4	316.6	1.1
895.6	591.0	1.9	2.0	285.1	5.7
1460.9	550.8	-1.8	2.6	256.9	15.9
1841.6	525.0	-4.3	1.7	251.5	19.3
2007.9	514.0	-4.7	1.2	253.3	19.7
2264.8	497.5	-5.2	1.0	255.0	20.5
3549.4	421.6	-12.4	0.7	251.3	24.8



WIND GARB SYSTEM (KTS)

TABLE 40 APACHE SITE RAWINSONDE DATA

DATE: 30 MAR 77 RELEASE NO.: 19 RELEASE TIME: 1235 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	661.4	15.6	3.3	180.0	3.1
68.7	656.1	16.5	2.8	178.6	3.1
312.4	637.5	14.4	2.6	174.2	3.2
1902.7	525.0	-2.8	1.9	215.4	2.0
2514.0	485.7	-8.6	1.7	231.0	9.3
2630.0	478.5	-9.2	1.6	234.2	12.3
2745.1	471.4	-9.0	0.8	236.5	14.8
3243.9	442.0	-9.6	0.7	240.9	20.1

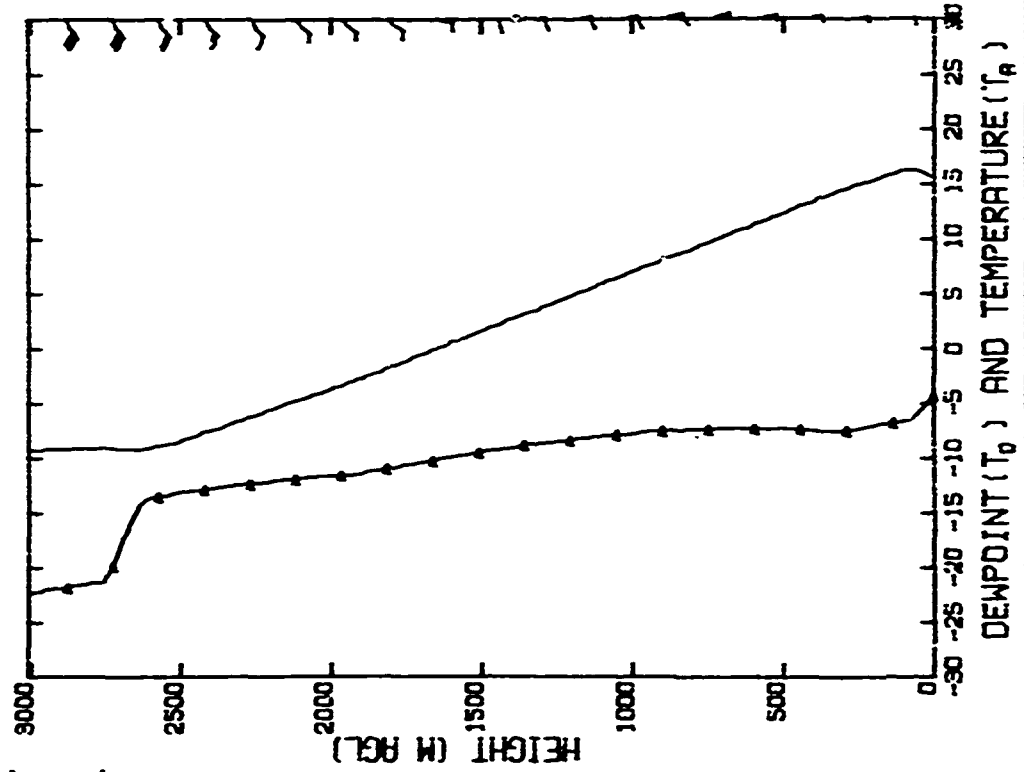


TABLE 41 APACHE SITE RAWINSONDE DATA

DATE: 30 MAR 77

RELEASE NO.: 20

RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	659.8	17.0	3.0	150.0	2.1
291.4	637.5	14.5	3.0	175.3	2.5
1890.3	525.0	0.1	1.5	223.8	10.4
2465.4	488.4	-4.4	1.2	229.1	15.2
3525.5	426.4	-9.5	0.5	237.0	21.9

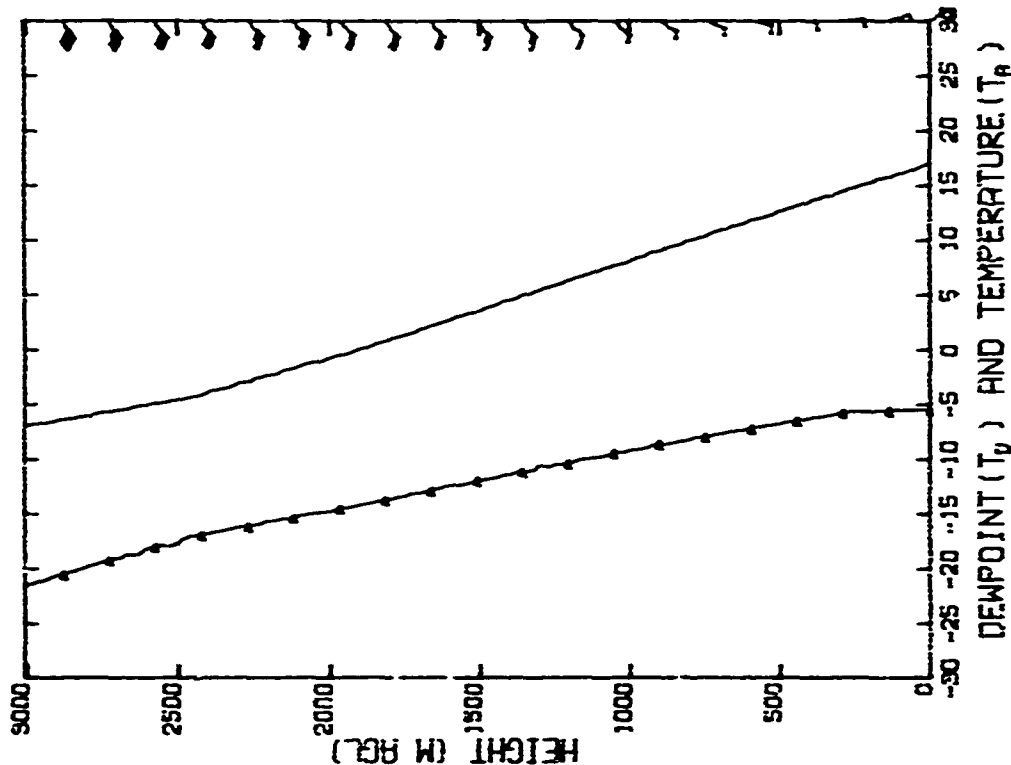
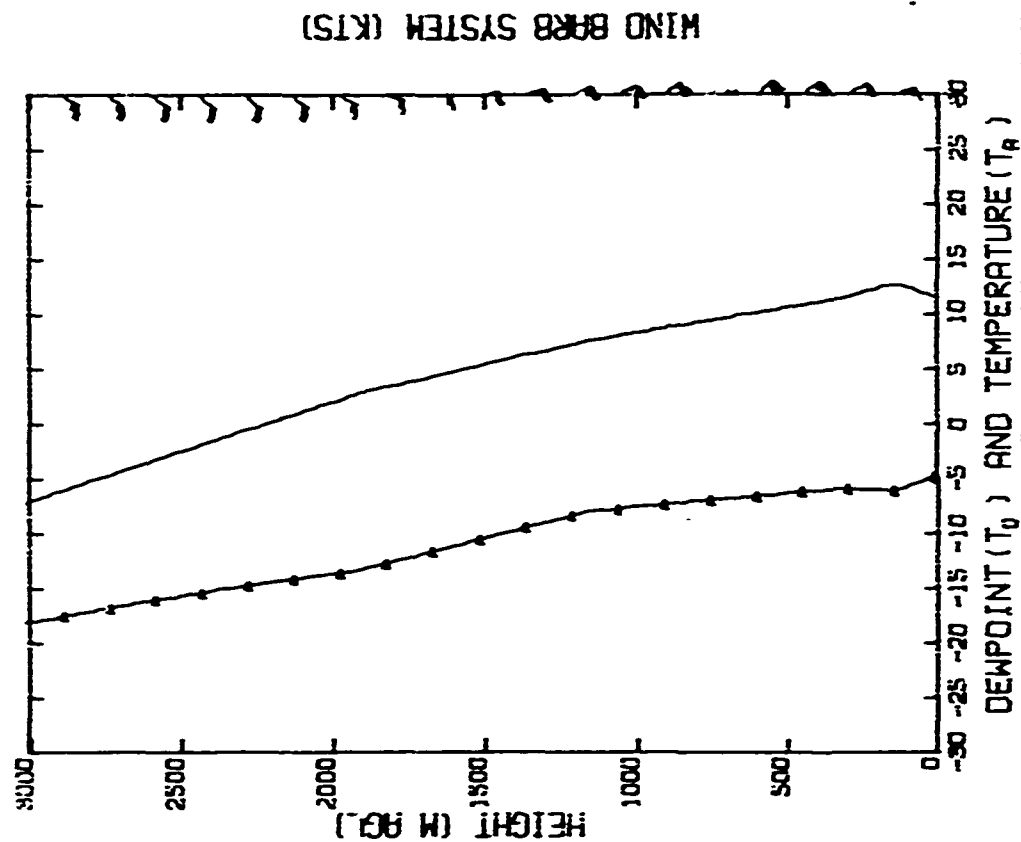


TABLE 42
APACHE SITE RAWINSONDE DATA

DATE: 30 MAR 77 RELEASE NO.: 21 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS			
GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)
C.0	660.8	11.6	3.2
125.5	651.0	12.9	2.9
301.2	637.5	11.5	2.9
1143.5	576.0	7.6	2.5
1901.4	525.0	2.8	1.6
3316.6	439.0	-10.0	0.9
			WIND DIR SPEED (DEG) (M/S)
			180.0 6.2
			164.1 8.3
			154.2 11.0
			159.6 12.4
			202.0 8.8
			203.7 17.6



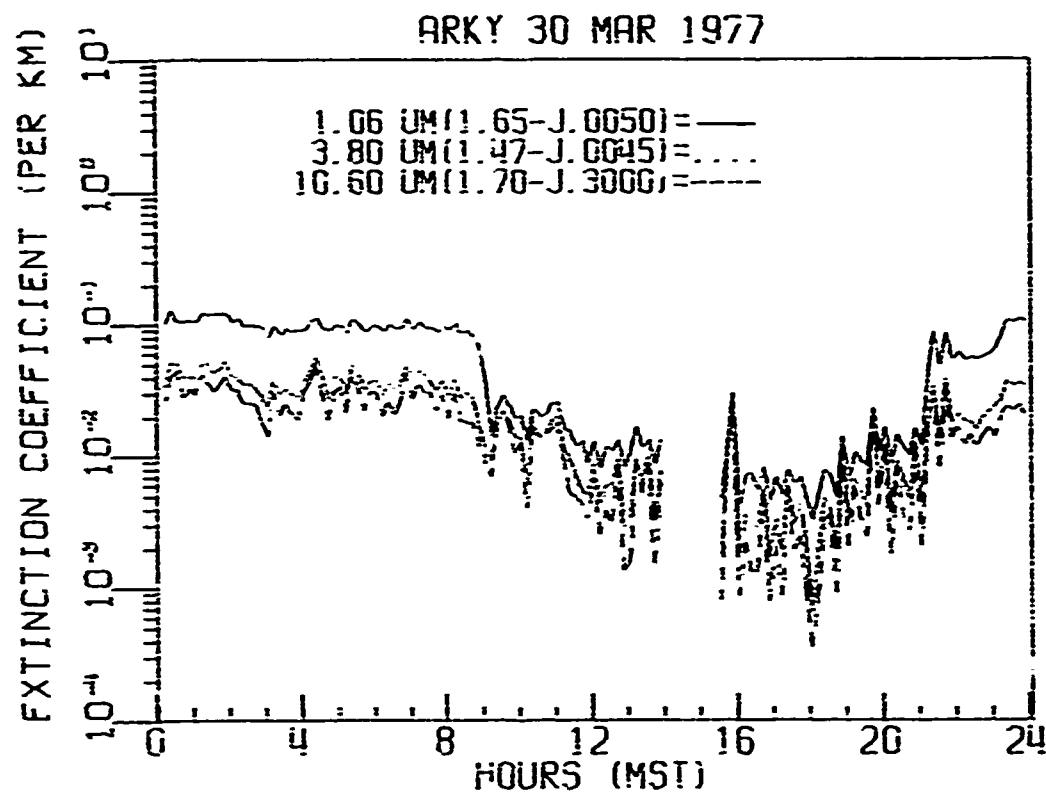


Figure 61. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 30 March 1977.

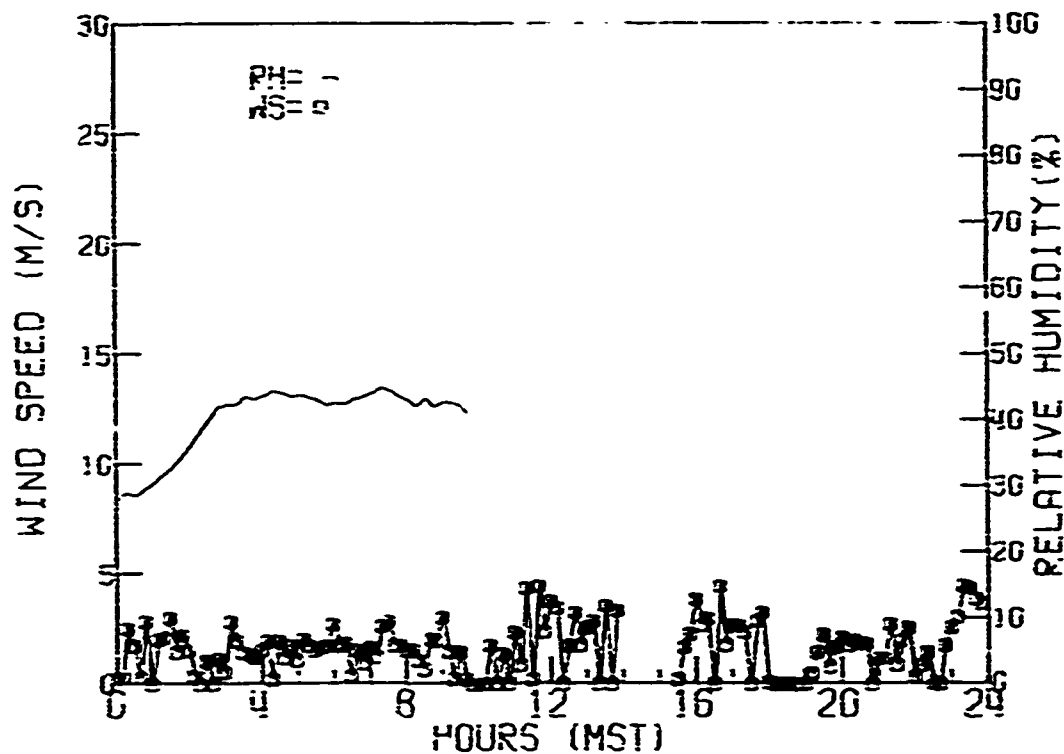


Figure 62. Diurnal variation of windspeed and relative humidity, Arky Site, 30 March 1977.

TABLE 43
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
AERIAL STRENGTH

DATE TIME SAMPLE (MST)	1	2	3	4	5	6	7	8	EXTINCTION (PER KG)			MASS LOADING (TUN/HR)
									1.36	3.6	13.6	
30 MAR 77												
0 1:00	1800	2000	6700	7800	9800	2000	00	00	96-01	33-01	25-01	280
0 1:05	1800	2200	8500	7800	1100	00	00	00	98-01	35-01	25-01	237
0 1:10	2200	2800	1100	1200	9800	00	00	00	1300	53-01	40-01	447
0 1:15	1400	2300	5500	9800	1800	00	00	00	1100	31-01	45-01	507
0 1:20	1800	2100	7100	1800	9800	00	00	00	1100	40-01	29-01	347
0 1:25	1700	2500	5200	7800	9500	00	00	00	1100	43-01	32-01	397
0 1:30	1900	2200	9700	1100	1900	00	00	00	1100	41-01	31-01	271
0 1:35	2300	2800	7500	1200	1700	00	00	00	1200	51-01	42-01	457
0 1:40	2600	3000	1100	1800	9800	00	00	00	1200	52-01	38-01	394
0 1:45	2200	2800	9700	5100	1800	00	00	00	1200	44-01	32-01	365
0 1:50	2200	2800	1100	1800	2800	00	00	00	1200	47-01	36-01	310
0 1:55	2300	2800	7500	1800	00	00	00	00	1200	53-01	41-01	527
0 2:00	1900	2200	6700	7800	9800	00	00	00	1100	41-01	33-01	392
0 2:05	1300	2600	7500	1800	1800	00	00	00	1100	43-01	32-01	322
0 2:10	1900	2100	7700	4600	00	00	00	00	1000	36-01	26-01	343
0 2:15	1900	2300	5100	1200	00	00	00	00	98-01	35-01	25-01	311
0 2:20	1800	2000	7100	7800	1800	00	00	00	97-01	33-01	24-01	243
0 2:25	1800	1900	9800	6100	00	00	00	00	95-01	29-01	19-01	211
0 2:30	1800	2000	7100	7800	00	00	00	00	92-01	24-01	14-01	178
0 2:35	1500	2100	7100	1200	00	00	00	00	96-01	43-01	10-01	323
0 2:40	1500	2200	5200	7800	1800	00	00	00	98-01	30-01	21-01	210
0 2:45	1700	2200	5200	1800	1800	00	00	00	92-01	53-01	25-01	235
0 2:50	1700	2300	5500	1800	00	00	00	00	99-01	30-01	21-01	258
0 2:55	1800	2000	5200	7800	00	00	00	00	99-01	24-01	19-01	259
0 3:00	1800	2000	5200	7800	1800	00	00	00	93-01	37-01	31-01	345
0 3:05	1700	2400	5500	7800	1800	00	00	00	1300	44-01	38-01	406
0 3:10	1700	2100	6100	1200	00	00	00	00	1300	57-01	49-01	609
0 3:15	1400	2800	7100	1200	00	00	00	00	1300	43-01	30-01	319
0 3:20	1700	1900	5200	1800	9800	00	00	00	99-01	27-01	20-01	204
0 3:25	1500	2500	6500	7800	00	00	00	00	98-01	41-01	30-01	312
0 3:30	1700	1700	7000	7800	1800	00	00	00	99-01	41-01	34-01	341
0 3:35	1400	2200	7100	1800	9800	00	00	00	98-01	33-01	22-01	289
0 3:40	1800	2400	6700	1800	1800	00	00	00	1100	50-01	41-01	406
0 3:45	1700	2100	8500	1800	1800	00	00	00	1300	44-01	33-01	303
0 3:50	1800	2300	1100	7800	00	00	00	00	99-01	32-01	23-01	206
0 3:55	1700	1900	1100	7800	00	00	00	00	96-01	37-01	31-01	309
0 4:00	1700	1900	7100	9800	00	00	00	00	98-01	38-01	30-01	341
0 4:05	1700	2300	5100	7800	00	00	00	00	99-01	24-01	21-01	211
0 4:10	1700	2700	9800	9800	00	00	00	00	98-01	36-01	26-01	303
0 4:15	1700	2300	1100	1800	00	00	00	00	91-01	32-01	21-01	270
0 4:20	1700	2100	7100	1800	9800	00	00	00	94-01	36-01	26-01	240

PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINGUISHON, AND MASS LOADING
 ARMY SITE, WLM?

DATE TIME	SAMPLE TIME (SEC)	GAMMA										EXTENSION (PER K)		MASS LOADING (UN/INCH)
		1	2	3	4	5	6	7	8	9	10	1.56	3.0	
30 MAR 77	06:50:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	07:00:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	07:10:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	07:20:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	07:30:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	07:40:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	07:50:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	08:00:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	08:10:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	08:20:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	08:30:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	08:40:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	08:50:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	09:00:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	09:10:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	09:20:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	09:30:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	09:40:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	09:50:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	10:00:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	10:10:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	10:20:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	10:30:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	44-01
	10:40:00	53	15.32	20.51	15.33	17.33	19.31	23.31	00	00	00	04-01	30-31	39-31
	10:50:00	ACC	17.62	23.03	17.06	18.13	24.00	19.03	00	00	00	11.00	40-01	4

TABLE 43 (cont.)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXHAUSTION, AND WASH LOADING
ARRY SITE, WY 1972

[illegible]

TABLE 43 (CONT)
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARRY SITE, W142

DATE TIME SAMPLE (MST)	CHANNEL										EXTENSION (PER K9)		MASS LOADING (UN/MOON)	
	1	2	3	4	5	6	7	8	9	10	1.2A	1.2B	1.2C	
22:00:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:01:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:02:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:03:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:04:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:05:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:06:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:07:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:08:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:09:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:10:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:11:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:12:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:13:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:14:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:15:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:16:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:17:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:18:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:19:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:20:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:21:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:22:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:23:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:24:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:25:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:26:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:27:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:28:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:29:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:30:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:31:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:32:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:33:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:34:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:35:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:36:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:37:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:38:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:39:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:40:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:41:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:42:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:43:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:44:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:45:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:46:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:47:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
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22:49:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:50:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:51:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:52:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:53:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:54:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:55:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:56:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:57:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:58:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
22:59:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:00:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:01:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:02:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:03:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:04:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:05:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:06:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:07:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:08:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:09:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:10:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:11:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:12:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:13:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:14:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:15:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:16:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:17:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:18:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:19:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:20:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:21:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	110C1	
23:22:00 ACC	110C2	110C1	110C0	110C1	110C1	110C1	110C1	110						

Weather Summary

Date: 31 March 1977

Synoptic

Surface: Weak north-south pressure trough thru central Arizona.

500 Millibar: Northeast-southwest oriented trough thru central California weakening and moving east-southeast. Continued strong southwesterly flow over New Mexico.

Holloman AFB

Clouds: Mostly clear to scattered low (cumulus) and high (cirrus) clouds with cumulus bases at 2000 m AGL.

Wind: Generally southerly at $5-8 \text{ m sec}^{-1}$ with a midafternoon peak gust of 15 m sec^{-1} from the south.

Visibility: Generally greater than 16 km.

Maximum temperature: 24.4°C

Corresponding vapor pressure: 3.0 Torr

Minimum temperature: 4.4°C

Corresponding vapor pressure: 3.3 Torr



Figure 63a. Surface weather map for 31 March 1977.



Figure 63b. 500-millibar height contours for 31 March 1977.

TABLE 44. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	10.3	3.4	-3.6	0	0	10 Ci	Plane observed 32 V straight line on recorder- switching on inverter 0640 climbed tower - all sensors ok
0200	9.2	3.4	-3.1	0	0	10 Ci	
0300	8.9	3.8	-2.0	0	0	0	
0400	7.2	4.0	-1.6	0	0	0	
0500	7.8	4.2	-0.7	0	0	0	
0600	7.0	4.3	-0.8	0	0	0	
0700	9.7	4.6	0.4	0	0	0	EWSS helicopter hovering over van and around tower - possible "prop wash" affect on winds
0800	13.2	4.9	1.1	0	0	0	
0900	16.0	5.5	2.9	0	0	0	
1000	17.1	6.5	4.7	0	0	0	1030 - plane observed Apache cff 1145-1227-re-cal thermocouples - balance 8 m ΔT removed at 1600
1100	19.4	5.7	3.0	0	0	0	
1200	21.5	5.7	3.1	0	0	0	
1300	23.0	5.6	2.8	10 Cu	0	0	Sctd Cu Alqds ACSL W Ci INVDG W ACSL W
1400	23.4	5.3	2.1	10 Cu	0	0	
1500	23.7	5.2	1.7	10 Cu	0	0	
1600	22.6	5.6	2.7	10 Cu	0	0	
1700	22.3	6.0	3.9	10 Cu	0	0	
1800	21.2	5.5	2.6	02 Cu	05 As 02 Ac SI 01 Ac SI	10 Ci 5 Cs 20 Cs .100 Ci 80 Cs 20 Ci 90 Cs 10 Ci 50 Cs 10 Ci 10 Cs 10 Ci	
1900	19.0	5.1	1.5	0	0	0	
2000	18.1	3.6	-3.4	0	0	0	
2100	15.7	3.1	-5.3	0	0	0	
2200	16.3	2.9	-6.1	0	0	0	
2300	16.3	2.9	-6.1	0	0	0	
2400	14.9	3.1	-5.4	0	0	0	

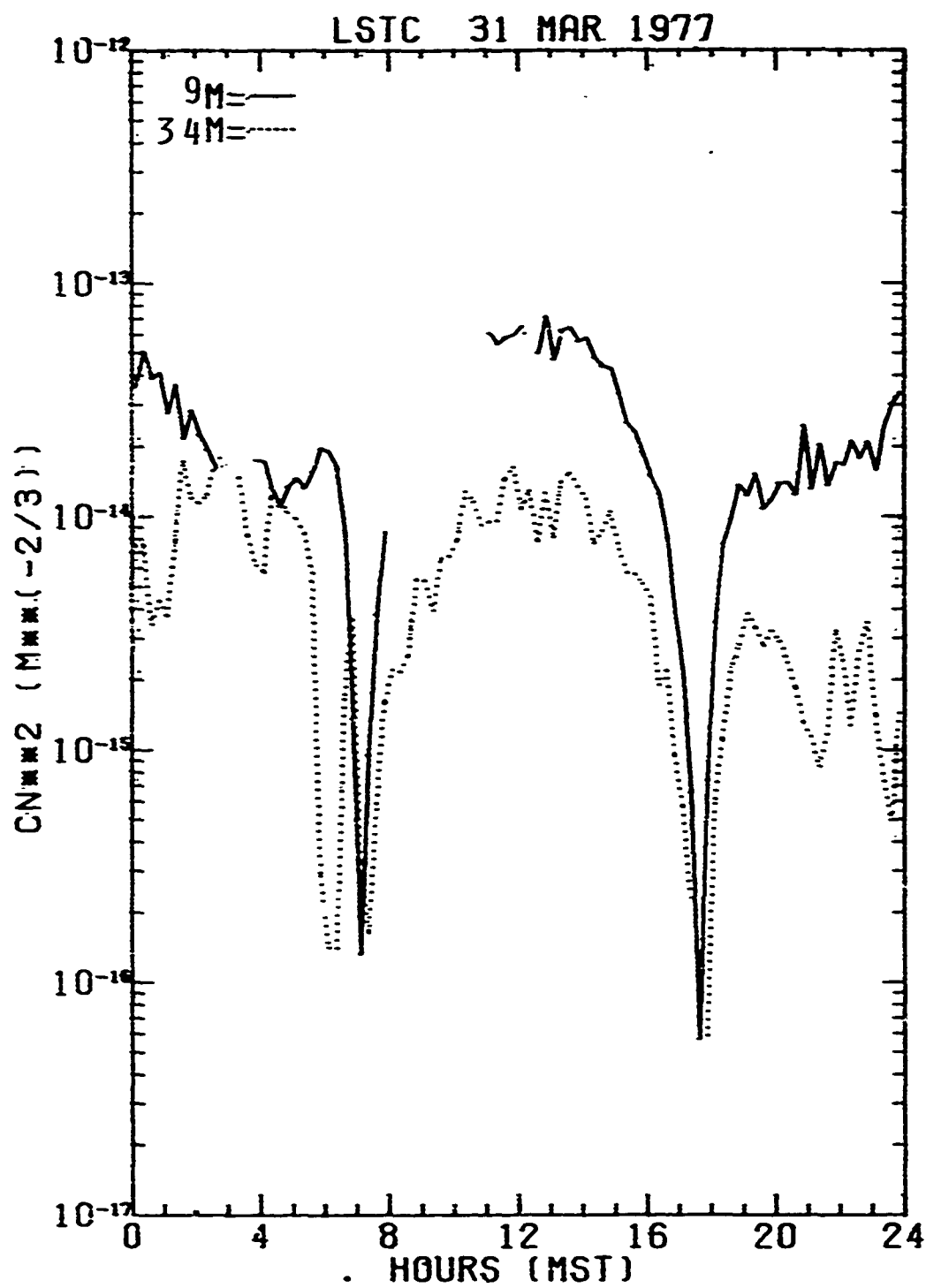


Figure 64. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 31 March 1977.

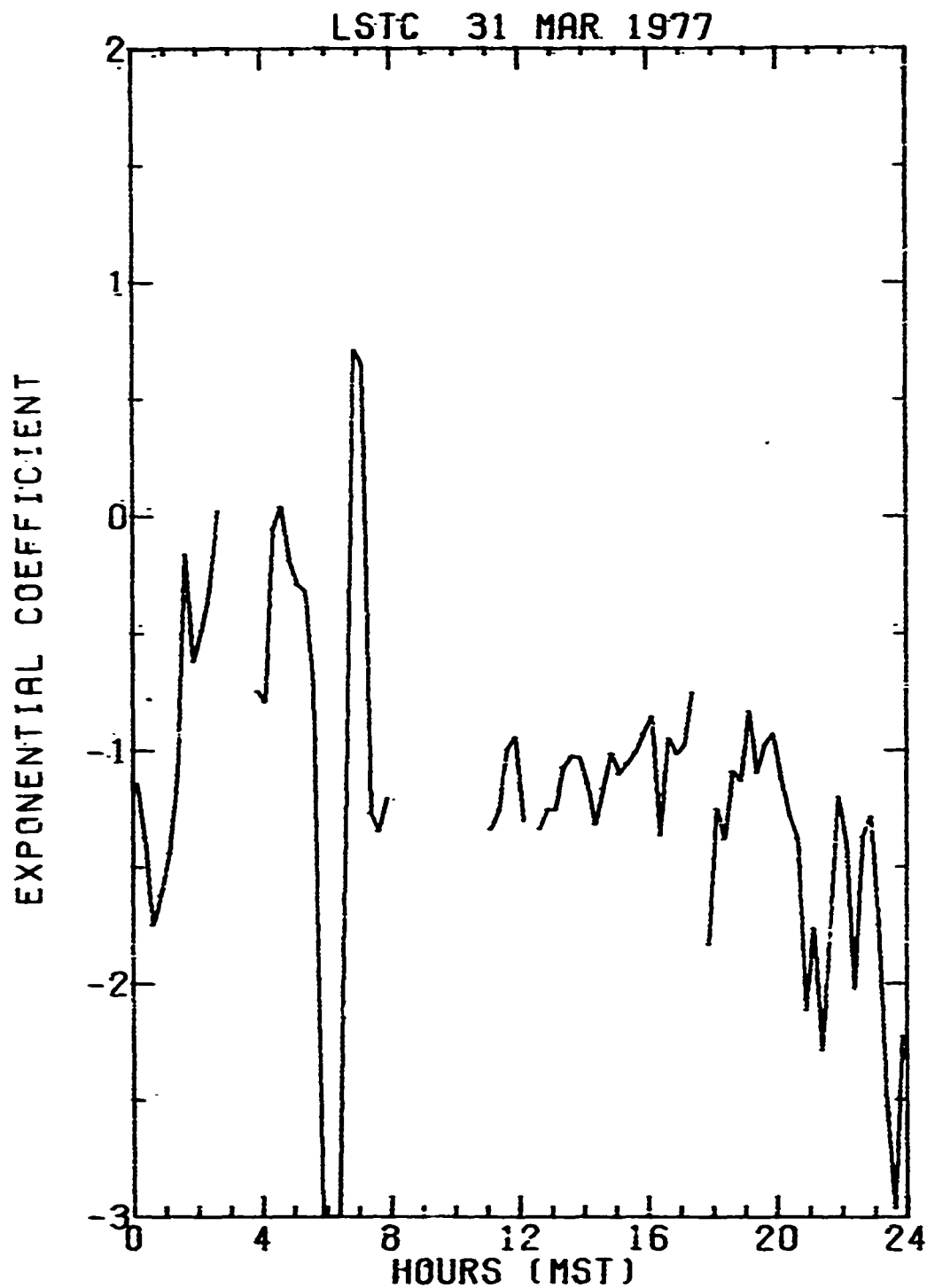


Figure 65. Diurnal variation of the altitude change of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 31 March 1977.

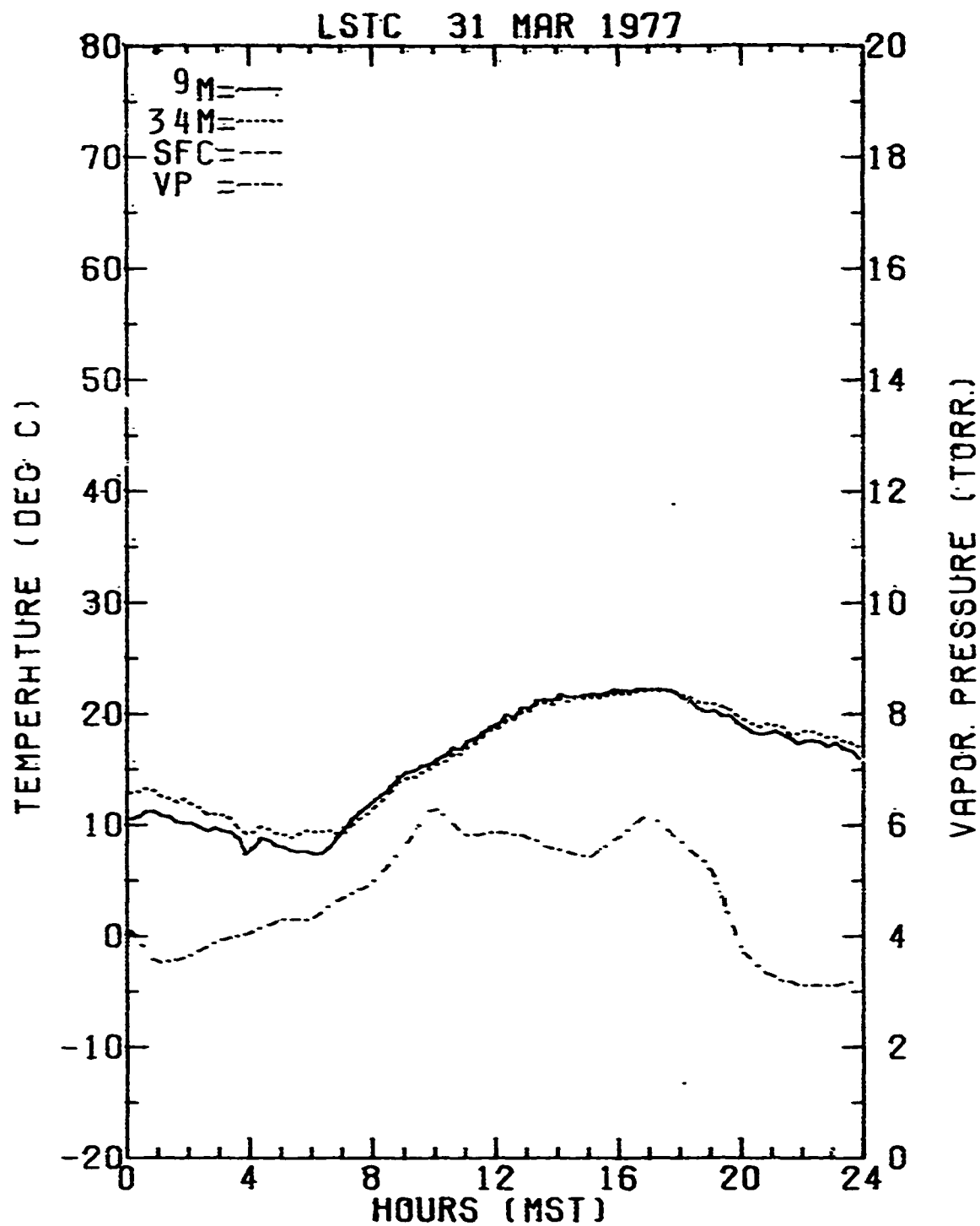


Figure 66. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 31 March 1977.

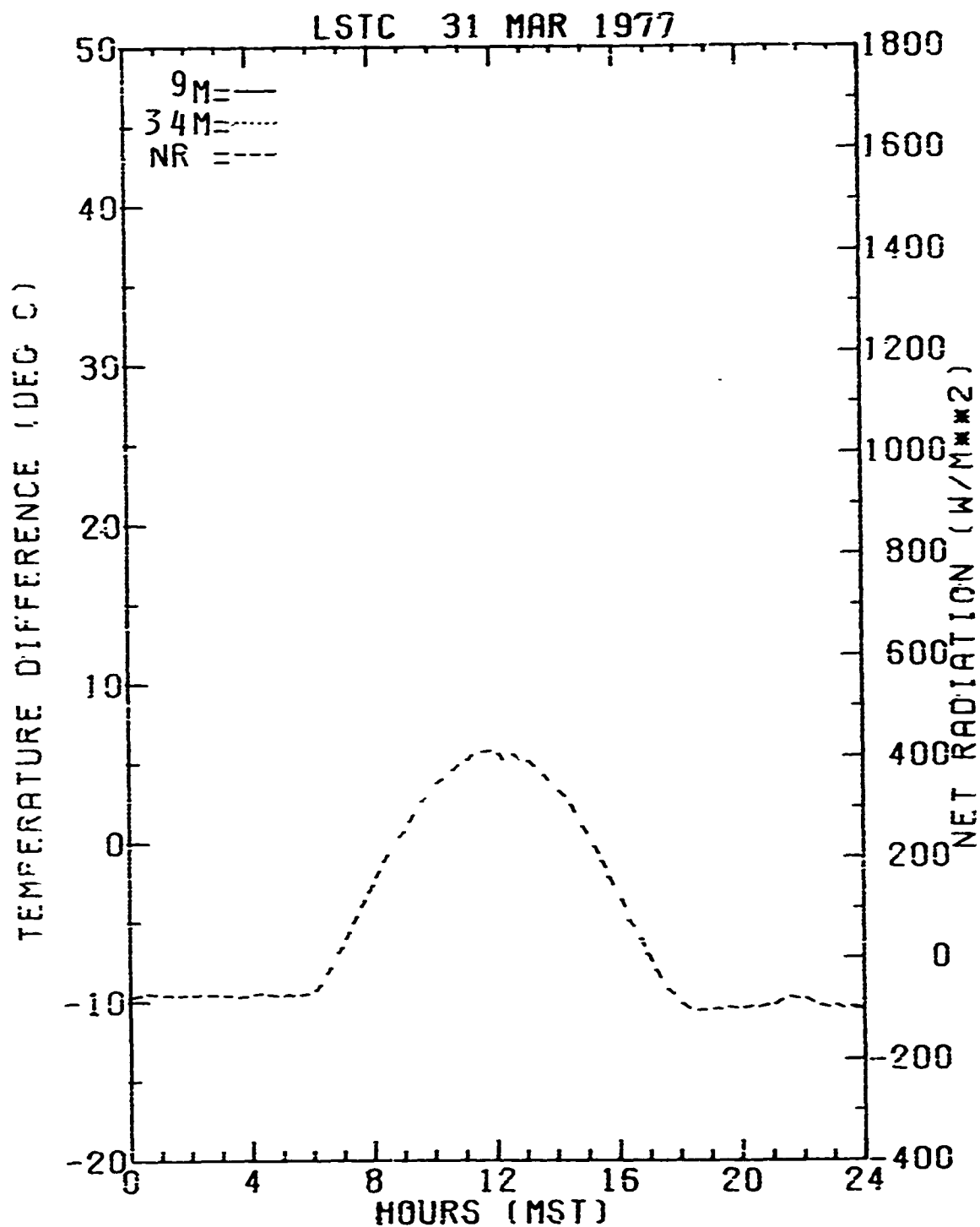


Figure 67. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 31 March 1977.

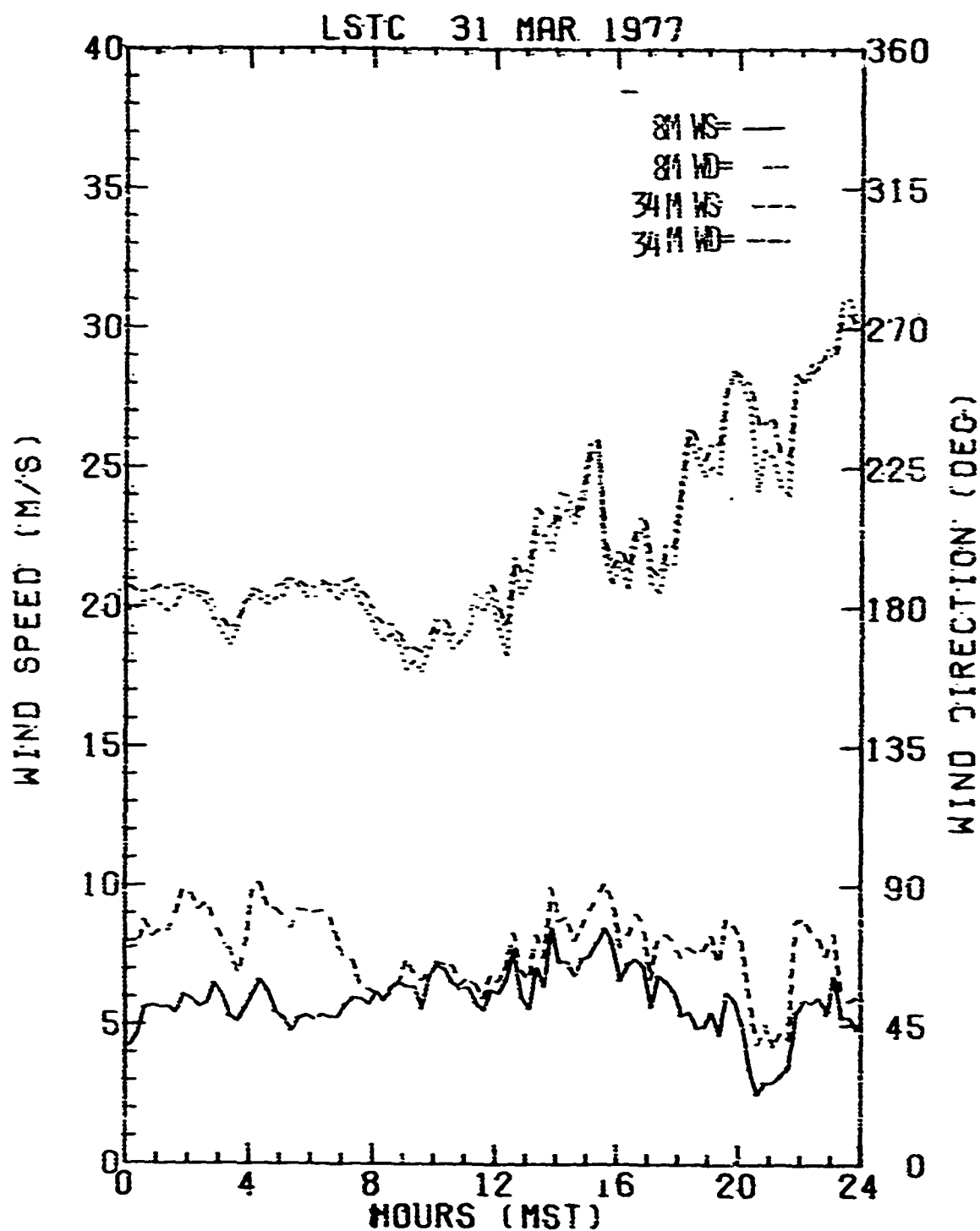


Figure 58. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 31 March 1977.

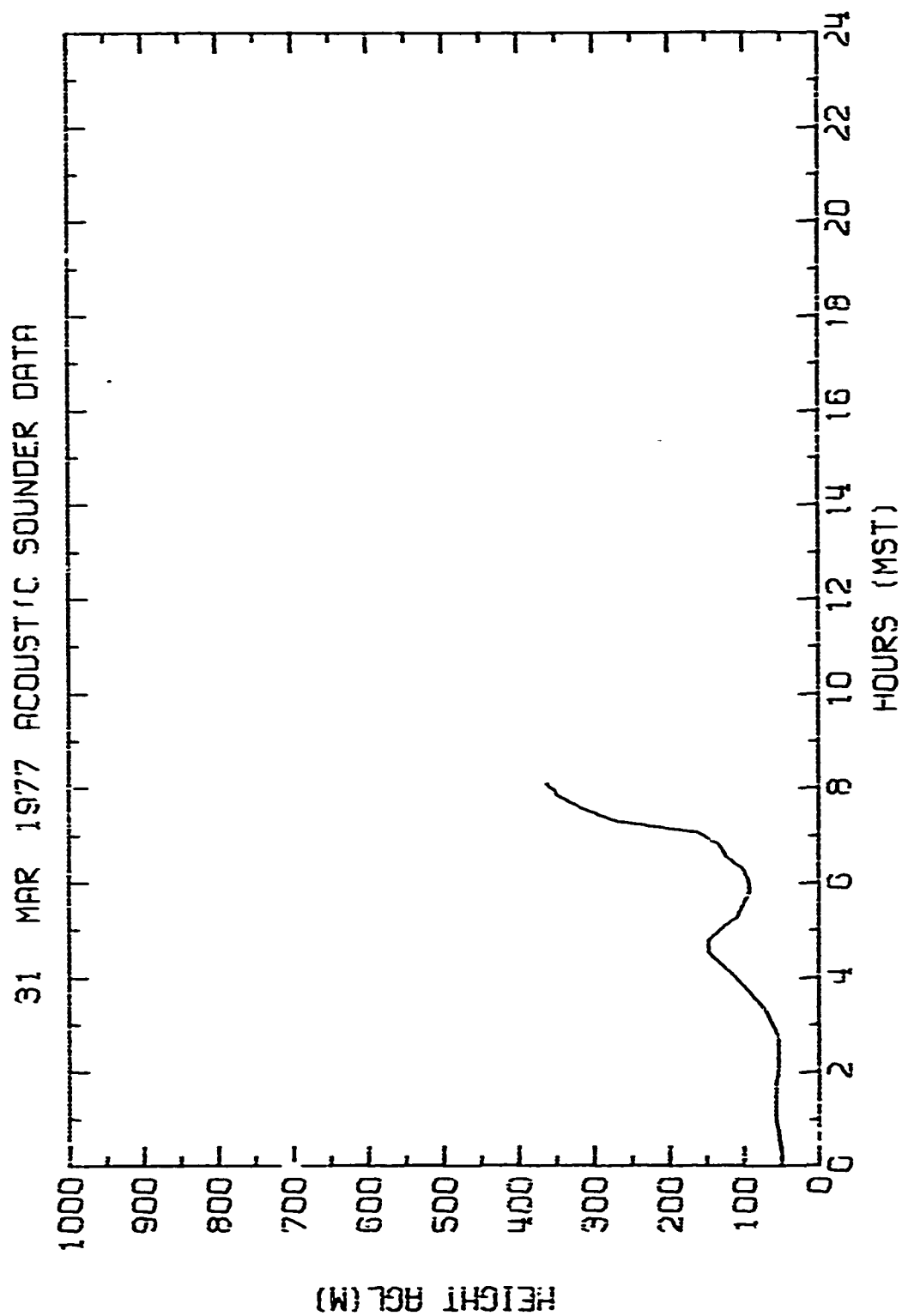


Figure 69. Inversion heights, LSTC, 31 March 1977.

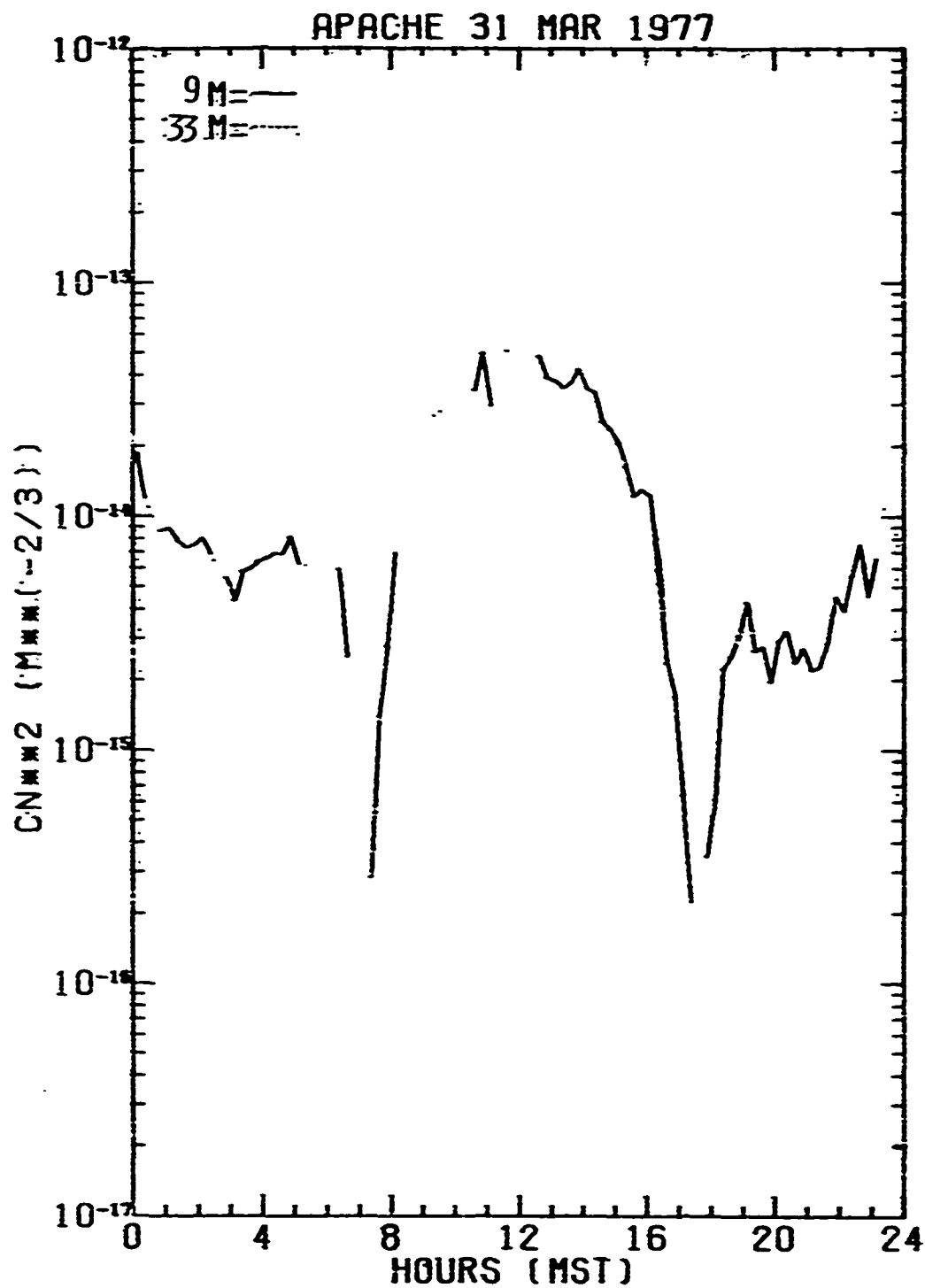


Figure 70. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 31 March 1977.

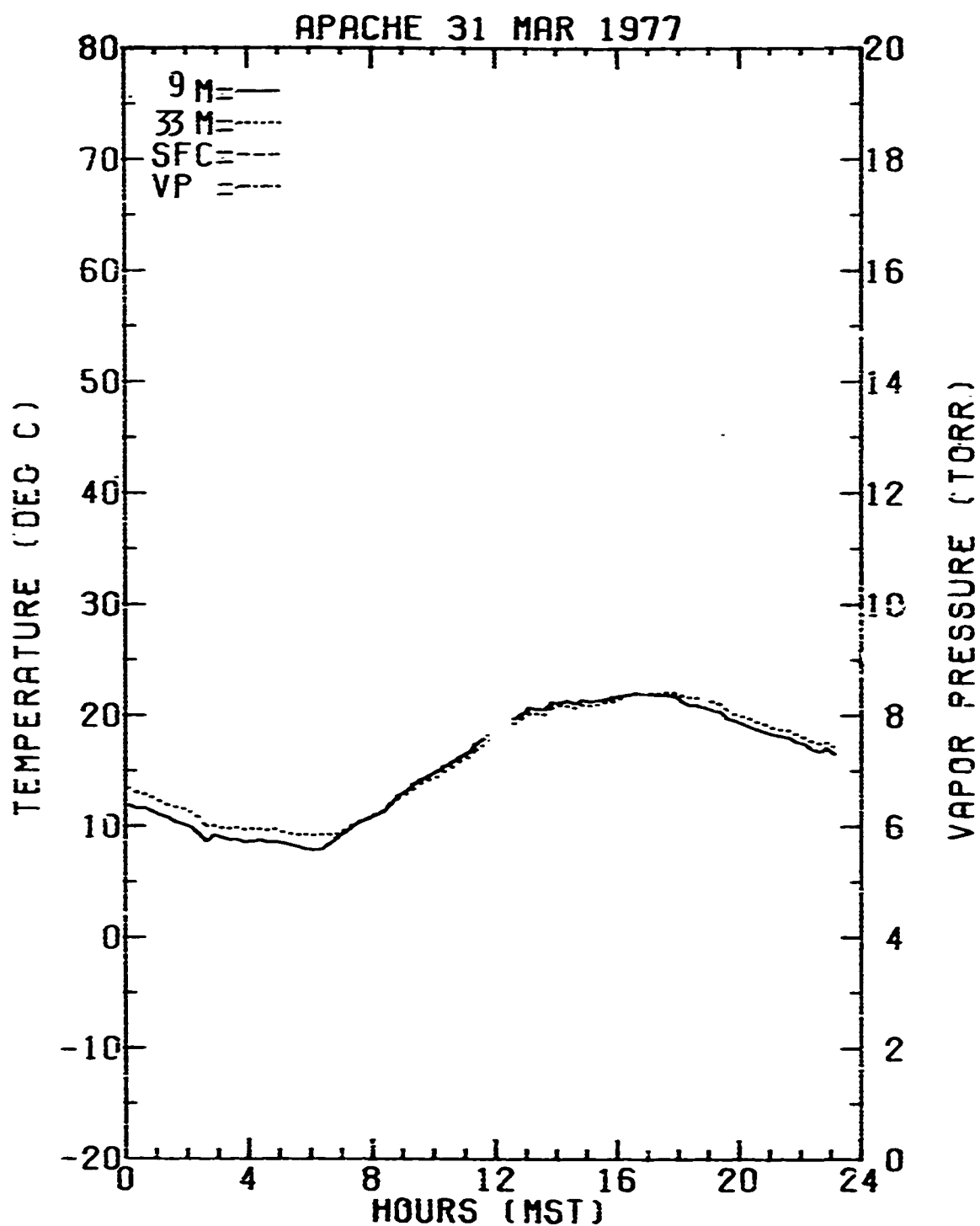


Figure 71. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 31 March 1977.

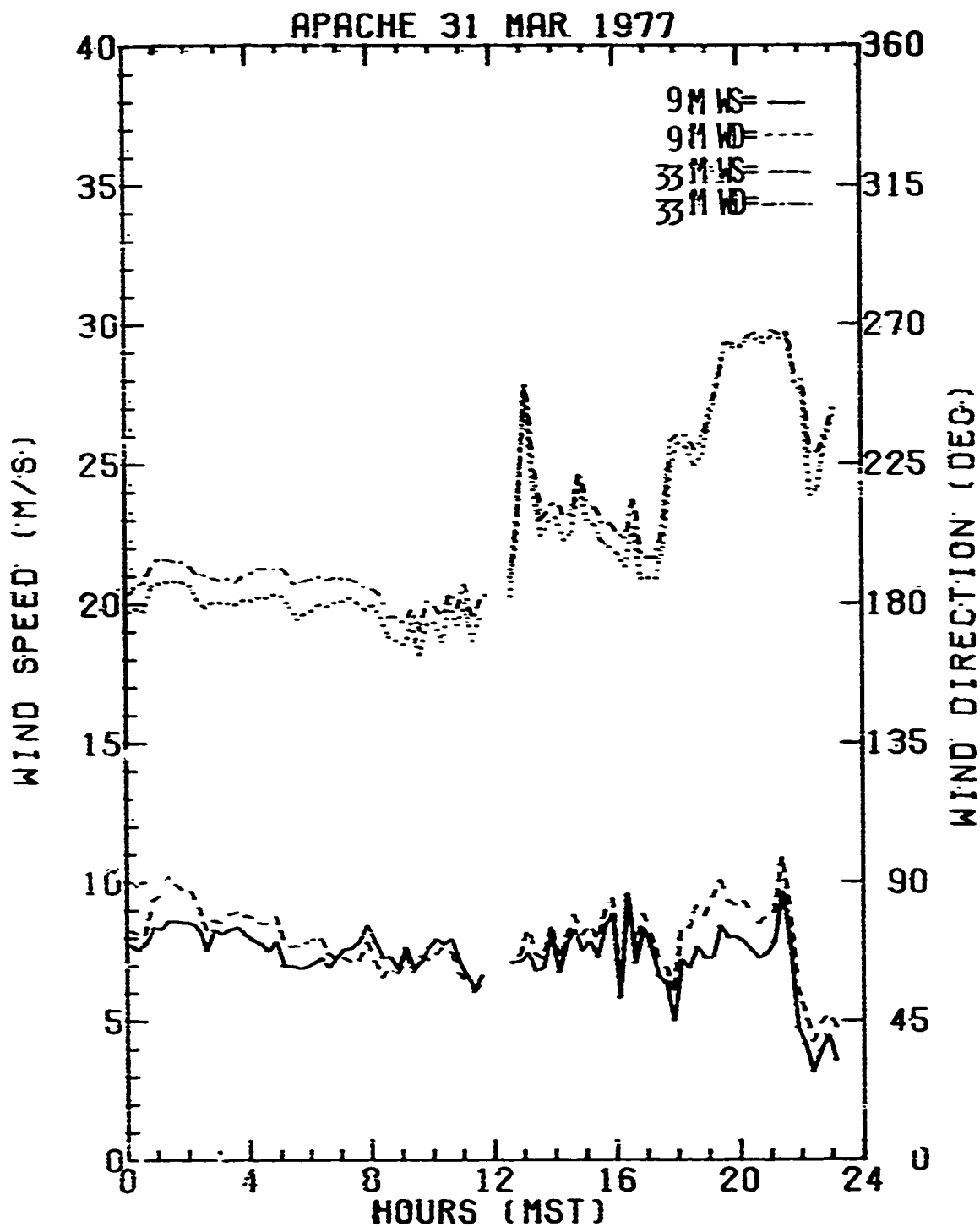


Figure 72. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 31 March 1977.

TABLE 45
APACHE SITE RAWINSONDE DATA

DATE: 31 MAR 77 RELEASE NO.: 22 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	660.1	8.5	3.8	180.0	9.3
288.8	637.5	8.4	3.2	171.5	12.3
491.9	622.0	8.7	3.3	167.6	14.5
913.6	591.0	5.7	2.8	171.0	12.9
1152.5	574.0	6.9	2.4	186.7	10.6
1470.8	552.1	4.0	2.1	220.2	7.4
1879.5	525.0	1.6	1.8	215.1	6.4
2588.5	480.4	-3.4	1.2	204.5	13.7
3389.5	433.6	-10.6	0.8	208.4	17.8

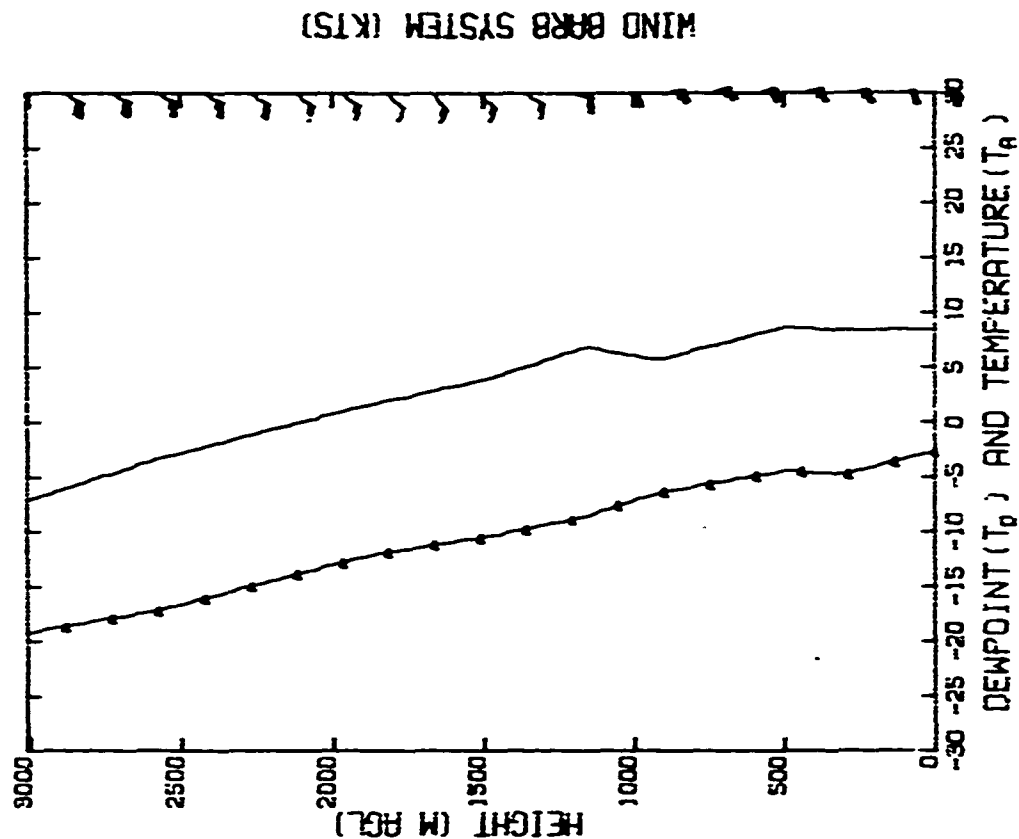
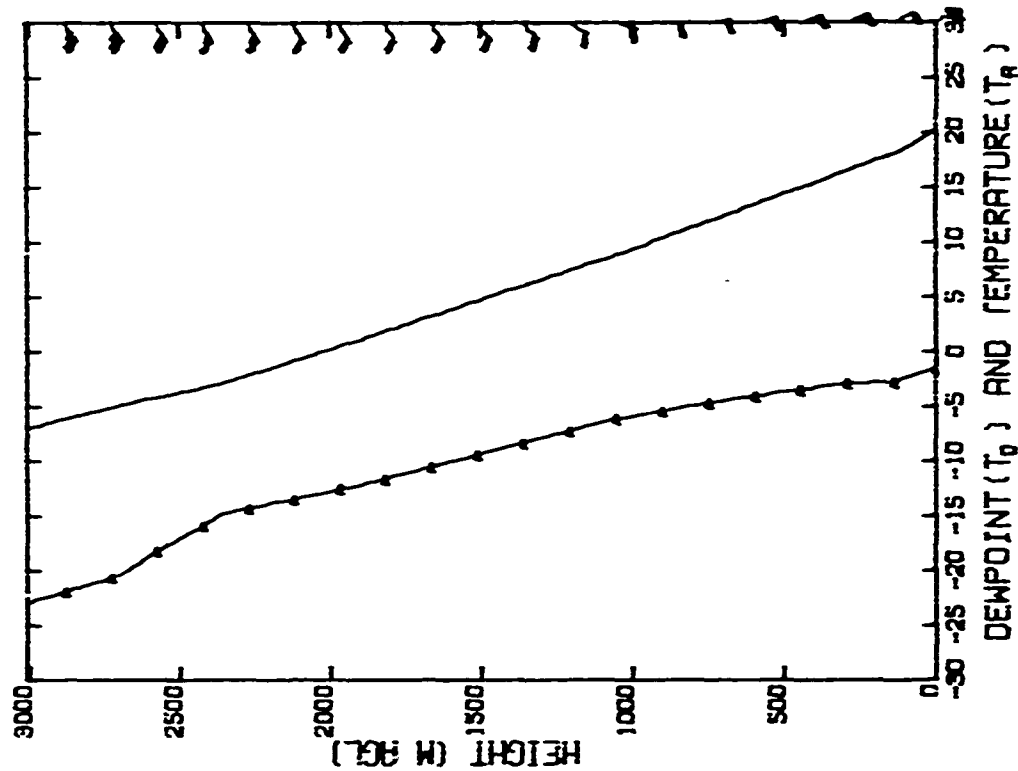


TABLE 46 APACHE SITE RAWINSONDE DATA

DATE: 31 MAR 77 RELEASE NO.: 23 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	658.5	20.2	4.1	150.0	10.3
142.0	647.7	18.0	3.7	154.0	10.1
277.5	637.5	16.7	3.7	158.6	9.8
1062.0	580.6	6.7	2.9	194.6	9.2
1885.0	525.0	1.2	1.8	237.1	11.2
2358.0	494.8	-2.9	1.4	240.7	13.1
2703.4	473.7	-4.9	0.9	237.1	16.9
3310.4	438.3	-9.1	0.6	229.7	17.4



WIND BARB SYSTEM (KTS)

TABLE 47
APACHE SITE RAWINSONDE DATA

DATE: 31 MAR 77 RELEASE NO.: 24 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	655.0	21.0	4.5	240.0 6.2
232.5	637.5	17.9	3.2	232.2 7.8
789.4	597.0	13.5	2.3	223.6 11.0
1850.2	525.0	2.4	1.6	224.2 11.6
3523.0	424.5	-12.5	0.9	219.5 21.4

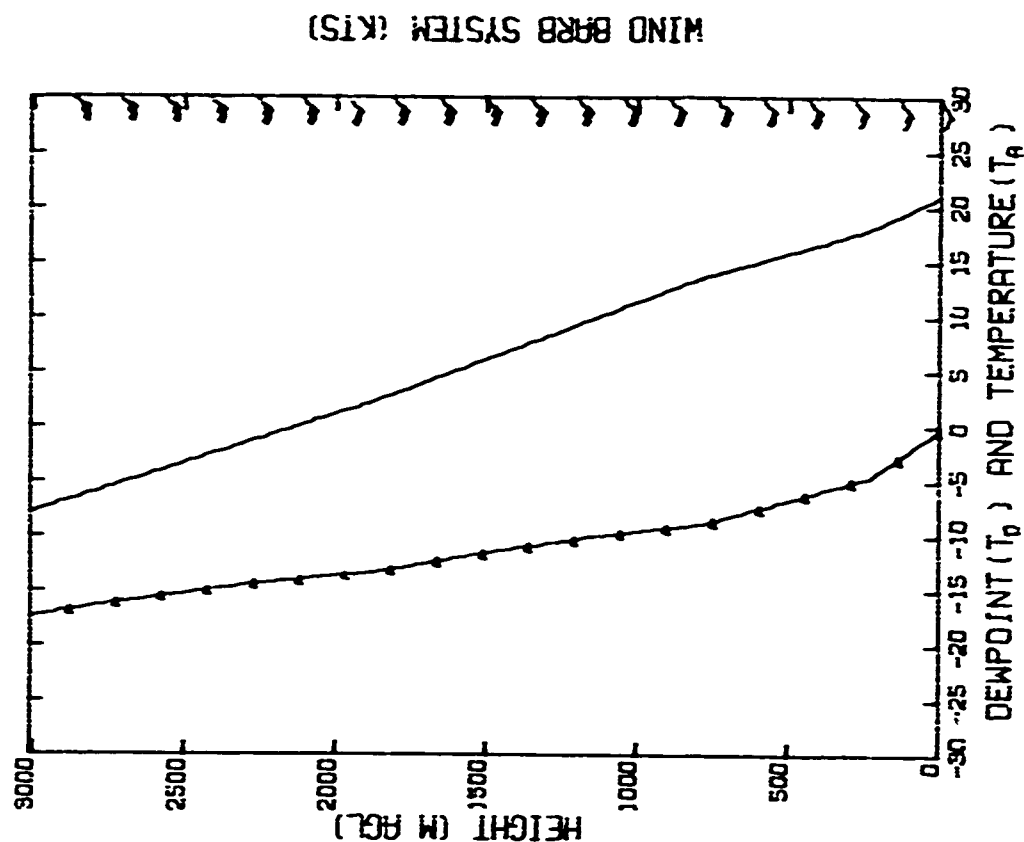


TABLE 48 APACHE SITE RAWINSONDE DATA

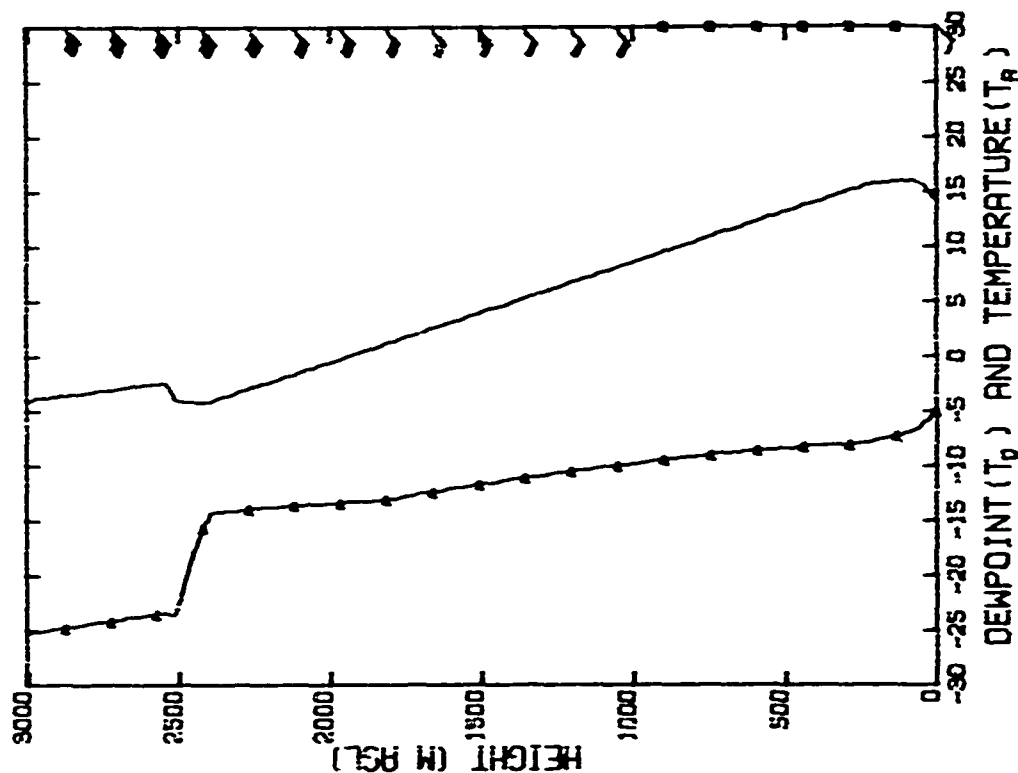
DATE: 31 MAR 77

RELEASE NO.: 25

RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	655.9	14.1	3.1	220.0	4.1
62.2	651.1	16.2	2.9	0.0	0.0
242.0	637.5	15.5	2.5	0.0	0.0
1845.5	525.0	0.8	1.7	227.9	15.2
2402.1	489.6	-4.2	1.5	230.6	24.3
2511.7	482.8	-4.0	0.7	228.7	24.5
2545.1	480.8	-2.4	0.7	228.3	24.3
3098.8	448.3	-4.4	0.6	222.3	25.5



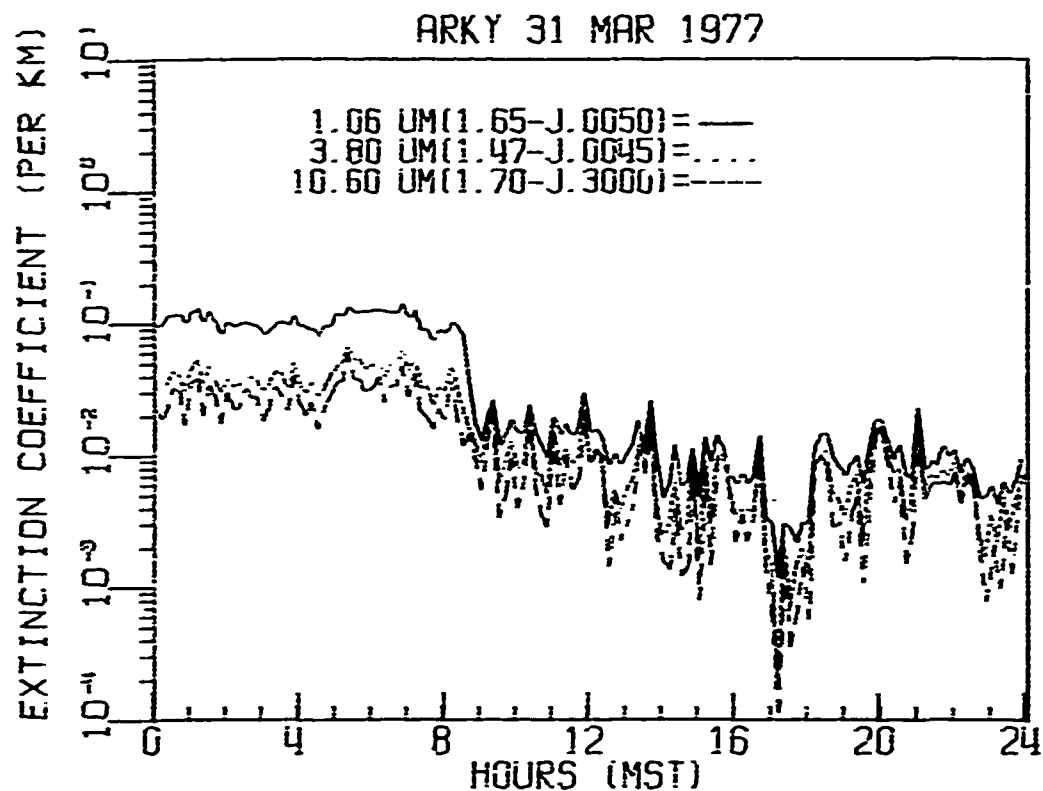


Figure 73. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 31 March 1977.

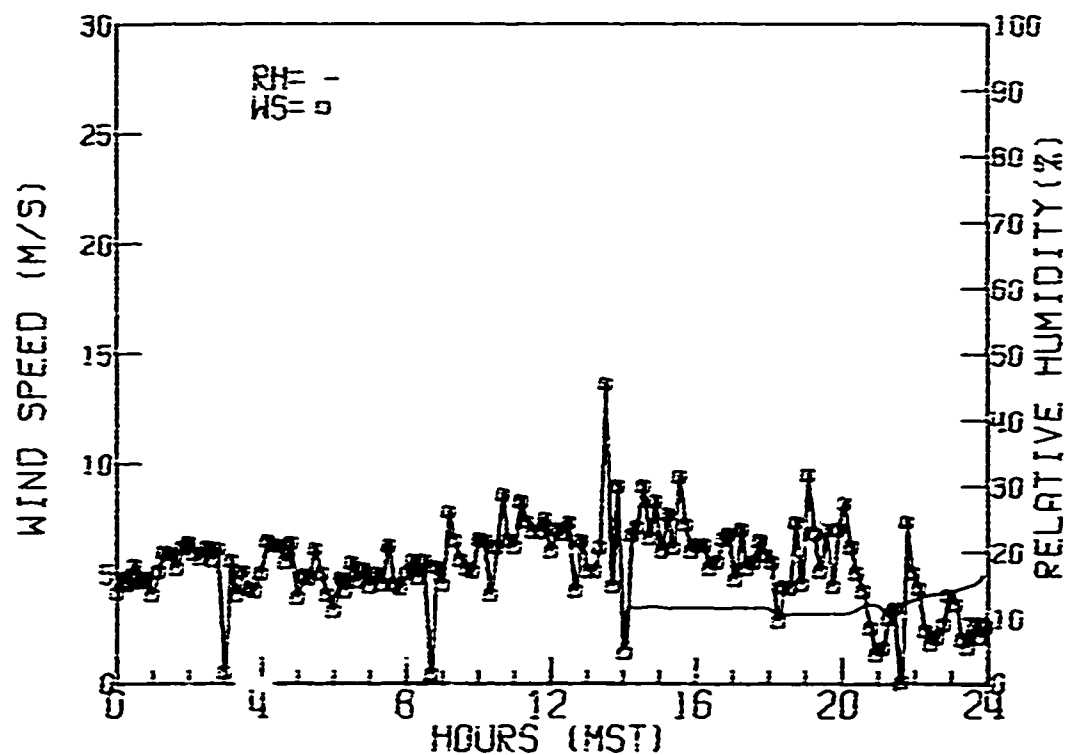


Figure 74. Diurnal variation of windspeed and relative humidity, Arky Site, 31 March 1977.

TABLE 49
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, W147

DATE TIME SAMPLE (MST) (SEC)	GRAVEL										EXTINCTION (PER KG)			MASS LOADING (MG/MOOS)	
	1	2	3	4	5	6	7	8	9	10	1.06	3.4	13.5		
11 MAR 77															
0 : 0:00	ACC	20+01	64+00	12+00	48+01	00	00	00	00	00	00	00	00	00	244
0 : 1:00	500	26+01	67+00	13+01	95+01	00	00	00	00	00	00	00	00	00	210
0 : 2:00	ACC	24+01	63+00	09+01	44+01	00	00	00	00	00	00	00	00	00	245
0 : 3:00	500	27+01	13+01	10+01	93+01	00	00	00	00	00	00	00	00	00	394
0 : 4:00	ACC	23+01	60+00	09+01	19+00	00	00	00	00	00	00	00	00	00	245
0 : 5:00	500	27+01	64+00	04+01	00	00	00	00	00	00	00	00	00	00	217
01 : 0:00	ACC	27+01	73+00	01+01	48+01	00	00	00	00	00	00	00	00	00	476
01 : 1:00	500	33+01	77+00	01+01	44+01	00	00	00	00	00	00	00	00	00	464
01 : 2:00	ACC	24+01	61+00	01+01	00	00	00	00	00	00	00	00	00	00	246
01 : 3:00	500	33+01	77+00	01+01	00	00	00	00	00	00	00	00	00	00	327
01 : 4:00	ACC	22+01	70+00	01+01	00	00	00	00	00	00	00	00	00	00	349
01 : 5:00	500	22+01	70+00	01+01	00	00	00	00	00	00	00	00	00	00	272
02 : 0:00	ACC	23+01	61+00	01+01	00	00	00	00	00	00	00	00	00	00	322
02 : 1:00	500	23+01	61+00	01+01	00	00	00	00	00	00	00	00	00	00	235
02 : 2:00	ACC	26+01	64+00	01+01	00	00	00	00	00	00	00	00	00	00	234
02 : 3:00	500	26+01	64+00	01+01	00	00	00	00	00	00	00	00	00	00	277
02 : 4:00	ACC	25+01	64+00	01+01	00	00	00	00	00	00	00	00	00	00	349
02 : 5:00	500	25+01	64+00	01+01	00	00	00	00	00	00	00	00	00	00	209
03 : 0:00	ACC	23+01	62+00	01+01	00	00	00	00	00	00	00	00	00	00	245
03 : 1:00	500	24+01	77+00	01+01	00	00	00	00	00	00	00	00	00	00	343
03 : 2:00	ACC	27+01	65+00	01+01	00	00	00	00	00	00	00	00	00	00	317
03 : 3:00	500	27+01	65+00	01+01	00	00	00	00	00	00	00	00	00	00	225
03 : 4:00	ACC	28+01	70+00	01+01	00	00	00	00	00	00	00	00	00	00	494
03 : 5:00	500	23+01	73+00	01+01	00	00	00	00	00	00	00	00	00	00	296
04 : 0:00	ACC	23+01	73+00	01+01	00	00	00	00	00	00	00	00	00	00	199
04 : 1:00	500	24+01	67+00	01+01	00	00	00	00	00	00	00	00	00	00	241
04 : 2:00	ACC	21+01	92+00	01+01	00	00	00	00	00	00	00	00	00	00	161
04 : 3:00	500	25+01	64+00	01+01	00	00	00	00	00	00	00	00	00	00	233
04 : 4:00	ACC	25+01	64+00	01+01	00	00	00	00	00	00	00	00	00	00	243
04 : 5:00	500	23+01	13+01	11+01	11+01	00	00	00	00	00	00	00	00	00	432
05 : 0:00	ACC	27+01	10+01	11+01	11+01	00	00	00	00	00	00	00	00	00	713
05 : 1:00	500	27+01	10+01	11+01	11+01	00	00	00	00	00	00	00	00	00	122
05 : 2:00	ACC	33+01	13+01	11+01	11+01	00	00	00	00	00	00	00	00	00	335
05 : 3:00	500	33+01	13+01	11+01	11+01	00	00	00	00	00	00	00	00	00	339
05 : 4:00	ACC	33+01	13+01	11+01	11+01	00	00	00	00	00	00	00	00	00	310
05 : 5:00	500	33+01	13+01	11+01	11+01	00	00	00	00	00	00	00	00	00	177
06 : 0:00	ACC	37+01	70+00	11+01	11+01	00	00	00	00	00	00	00	00	00	279
06 : 1:00	500	33+01	11+01	11+01	11+01	00	00	00	00	00	00	00	00	00	307
06 : 2:00	ACC	31+01	11+01	12+01	12+01	00	00	00	00	00	00	00	00	00	346

TABLE 49 (cont)
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SITE, WIND

DATE TIME SAMPLE (MST)	TIME (SEC)	CANVCEL										EXTINCTION (PER M)		MASS LOADING (UG/M ³)	
		1	2	3	4	5	6	7	8	9	10	1.06	3.0	13.6	
31 MAR 77															
06:50:00	600	.23+02	.32+01	.14+01	.14+00	.96-01	.59-01	.00	.00	.00	.00	.14+00	.64-01	.48-01	563.
07:00:00	600	.19+02	.31+01	.12+01	.11+00	.00	.23+01	.00	.00	.00	.00	.11+00	.43-01	.29-01	379.
07:10:00	600	.21+02	.29+01	.12+01	.14+00	.96-01	.39-01	.00	.00	.00	.00	.23+00	.26-01	.82-01	446.
07:20:00	600	.17+02	.21+01	.08+00	.17+00	.00	.00	.00	.00	.00	.00	.22-01	.38-01	.23-01	293.
07:30:00	600	.15+02	.20+01	.09+00	.11+00	.00	.00	.00	.00	.00	.00	.06-00	.33-01	.20-01	219.
07:40:00	600	.16+02	.20+01	.09+00	.11+00	.00	.00	.00	.00	.00	.00	.76-01	.23-01	.16-01	179.
07:50:00	600	.16+02	.20+01	.09+00	.11+00	.00	.00	.00	.00	.00	.00	.06-01	.33-01	.23-01	232.
08:00:00	600	.15+02	.21+01	.11+00	.12+00	.00	.11+00	.00	.00	.00	.00	.06-01	.33-01	.19-01	211.
08:10:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.30+00	.49-01	.37-01	446.
08:20:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	227.
08:30:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	160.
08:40:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	102.
08:50:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	122.
09:00:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	43.
09:10:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	40.
09:20:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	148.
09:30:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	12.
09:40:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	40.
09:50:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	71.
10:00:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	39.
10:10:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	43.
10:20:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	171.
10:30:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	42.
10:40:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	31.
10:50:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	27.
11:00:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	197.
11:10:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	16.
11:20:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	112.
11:30:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	40.
11:40:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	47.
11:50:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	176.
12:00:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	43.
12:10:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	116.
12:20:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	111.
12:30:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	17.
12:40:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	12.
12:50:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	28.
13:00:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	29.
13:10:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	119.
13:20:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	101.
13:30:00	600	.14+02	.23+01	.12+00	.12+00	.00	.12+00	.00	.00	.00	.00	.06-01	.33-01	.23-01	

TABLE 49 (CONT)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARBY SITE, WING

DATE TIME SAMPLE (MST)	1	2	3	4	5	6	7	8	CHANNEL			EXTINCTION (PER K4)			MASS LOADING (UG/M003)		
31 MAR 77												1.0A	3.8	10.6			
17:00:00	2400	5600	1500	3000	4000	3000	3000	00				2400	1800	1700	230		
17:05:00	1500	3400	2000	1500	3000	1500	3000	00				0700	4100	2600	250		
17:10:00	7500	15000	30000	15000	30000	15000	30000	00				0800	2300	1600	160		
17:15:00	7500	28000	15000	30000	30000	15000	30000	00				6100	3300	1800	130		
17:20:00	18000	58000	30000	30000	30000	30000	30000	00				1200	6400	4000	180		
17:25:00	4000	30000	12000	30000	30000	30000	30000	00				5300	2800	1300	120		
17:30:00	9100	39000	13000	30000	30000	30000	30000	00				6600	3200	1500	140		
17:35:00	8100	19000	6100	30000	30000	30000	30000	00				1100	9700	5300	170		
17:40:00	15000	19000	15000	30000	30000	30000	30000	00				4900	1700	9200	100		
17:45:00	15000	45000	9100	30000	30000	30000	30000	00				9200	9200	7400	90		
17:50:00	11000	41000	14000	30000	30000	30000	30000	00				1400	1300	7600	180		
17:55:00	6600	19000	9100	30000	30000	30000	30000	00				1100	1000	9300	130		
18:00:00	8000	19000	13000	30000	30000	30000	30000	00				7100	1800	9700	90		
18:05:00	7800	24000	12000	30000	30000	30000	30000	00				6200	3700	2200	200		
18:10:00	7800	29000	9100	30000	30000	30000	30000	00				7300	3900	3400	230		
18:15:00	30000	30000	12000	30000	30000	30000	30000	00				6400	3900	2300	200		
18:20:00	7700	26000	9100	30000	30000	30000	30000	00				7300	3800	3400	200		
18:25:00	11000	35000	6100	30000	30000	30000	30000	00				1400	1100	1200	130		
18:30:00	4500	6400	13000	30000	30000	30000	30000	00				1400	1900	1400	130		
18:35:00	4500	4600	9100	30000	30000	30000	30000	00				3000	1500	7000	60		
18:40:00	2400	2100	3000	30000	30000	30000	30000	00				1200	1900	1100	20		
18:45:00	3200	4600	6100	30000	30000	30000	30000	00				3100	2300	1500	30		
18:50:00	4500	15000	3000	30000	30000	30000	30000	00				2900	7100	3600	50		
18:55:00	2300	11000	9100	30000	30000	30000	30000	00				2200	1500	6600	50		
19:00:00	3500	11000	13000	30000	30000	30000	30000	00				3100	2300	1800	130		
19:05:00	4400	21000	3400	30000	30000	30000	30000	00				3200	1300	5800	60		
19:10:00	9200	32000	30000	30000	30000	30000	30000	00				1100	9200	5900	90		
19:15:00	12000	30000	21000	30000	30000	30000	30000	00				1400	1000	9600	100		
19:20:00	1500	43000	37000	30000	30000	30000	30000	00				1500	1100	8800	50		
19:25:00	1500	43000	38000	30000	30000	30000	30000	00				1500	5300	2900	270		
19:30:00	11000	14000	6100	30000	30000	30000	30000	00				4400	4700	3200	130		
19:35:00	9300	41000	15000	30000	30000	30000	30000	00				7200	3900	1600	150		
19:40:00	9900	38000	19000	30000	30000	30000	30000	00				9300	5300	3700	320		
19:45:00	11000	19000	24000	30000	30000	30000	30000	00				1000	7400	4900	410		
19:50:00	9500	35000	6100	30000	30000	30000	30000	00				6100	2400	1100	130		
19:55:00	13000	47000	18000	30000	30000	30000	30000	00				1200	7700	5000	440		
20:00:00	13000	58000	14000	30000	30000	30000	30000	00				1400	1500	1500	190		
20:05:00	8500	39000	15000	30000	30000	30000	30000	00				1900	3000	1700	200		
20:10:00	13000	28000	19000	30000	30000	30000	30000	00				1300	1300	9500	110		
20:15:00	7800	41000	30000	30000	30000	30000	30000	00				9500	7500	5400	90		

PMSC 49 (CONT)
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SITE, WENT

DATE TIME	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER K)		MASS LOADING (UN/MEE3)	
		1	2	3	4	5	6	7	8	9	10	1.2A	3.0	13.6	
11 MAR 77	20:30:00	600	.31+01	.56+00	.15+00	.30+01	.40+01	.00	.00	.00	.00	.12-01	.40-02	.45-02	44.
	20:30:30	600	.96+01	.35+01	.15+01	.32	.32	.00	.00	.00	.00	.71-02	.31-02	.15-02	15.
	20:31:00	600	.69+00	.32+00	.18+00	.14+01	.00	.00	.00	.00	.00	.69-02	.46-02	.26-02	21.
	21:00:00	600	.15+01	.75+01	.49+01	.31+01	.04+01	.00	.00	.00	.00	.23-01	.19-01	.15-01	101.
	21:10:00	600	.75+00	.21+00	.15+00	.15+00	.15+00	.00	.00	.00	.00	.40-02	.55-02	.48-02	29.
	21:20:00	600	.61+01	.20+01	.15+01	.15+01	.49+01	.00	.00	.00	.00	.72-02	.72-02	.51-02	19.
	21:30:00	600	.67+00	.17+00	.12+00	.10	.10	.00	.00	.00	.00	.48-02	.69-02	.63-02	90.
	21:40:00	600	.12+01	.39+01	.13+01	.13+01	.49+01	.00	.00	.00	.00	.12-01	.79-02	.48-02	43.
	21:50:00	600	.10+01	.30+00	.14+00	.10+01	.40+01	.00	.00	.00	.00	.10-01	.71-02	.61-02	80.
	21:55:00	600	.85+01	.24+01	.23+01	.16+01	.49+01	.00	.00	.00	.00	.11-01	.93-02	.78-02	49.
	22:10:00	600	.70+00	.28+00	.16+01	.14+01	.40+01	.00	.00	.00	.00	.76-02	.47-02	.48-02	28.
	22:20:00	600	.75+01	.17+01	.01+01	.14+01	.00	.00	.00	.00	.00	.07-02	.77-02	.73-02	99.
	22:30:00	600	.61+00	.24+00	.31+01	.14+01	.00	.00	.00	.00	.00	.42-02	.73-02	.59-02	50.
	22:40:00	600	.75+01	.13+01	.11+01	.14+01	.00	.00	.00	.00	.00	.53-02	.21-02	.17-02	17.
	22:50:00	600	.78+00	.30+00	.31+01	.14+01	.00	.00	.00	.00	.00	.49-02	.17-02	.80-02	10.
	23:00:00	600	.68+01	.32+01	.21+01	.19+01	.00	.00	.00	.00	.00	.59-02	.34-02	.21-02	19.
	23:10:00	600	.62+00	.17+00	.12+00	.10	.00	.00	.00	.00	.00	.44-02	.22-02	.10-02	9.
	23:20:00	600	.55+01	.21+01	.15+01	.13+01	.00	.00	.00	.00	.00	.63-02	.57-02	.33-02	27.
	23:30:00	600	.60+00	.26+00	.15+01	.10	.00	.00	.00	.00	.00	.53-02	.29-02	.13-02	11.
	23:40:00	600	.84+01	.25+01	.01+01	.15+01	.49+01	.00	.00	.00	.00	.67-02	.47-02	.49-02	26.
	23:50:00	600	.73+00	.17+00	.13+01	.14+01	.00	.00	.00	.00	.00	.93-02	.74-02	.70-02	97.

Weather Summary

Date: 1 April 1977

Synoptic

Surface: Surface low-pressure area over Colorado with trough extending south-southwest into Mexico and moving across WSMR shortly after noon.

500 Millibar: Upper air trough over western Arizona with strong southwesterly flow over New Mexico.

Holloman AFB

Clouds: Scattered low (cumulus), middle (altocumulus), and high (cirrus) clouds at 1800 m, 3600 m, and 7600 m AGL, respectively.

Wind: Southwesterly $3-5 \text{ m sec}^{-1}$ increasing to $8-10 \text{ m sec}^{-1}$ by 1000 MST. Peak gust of 19 m sec^{-1} from the west-southwest during late morning.

Visibility: Generally 50-60 km during morning decreasing to 1.5 km by midafternoon in blowing dust and blowing sand.

Maximum temperature: 17.2°C

Corresponding vapor pressure: 4.6 Torr

Minimum temperature: 10.6°C

Corresponding vapor pressure: 3.2 Torr



Figure 75a. Surface weather map for 1 April 1977.



Figure 75c. 500-millibar height contours for 1 April 1977.

TABLE 50. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	14.0	3.7	-3.7	0	0	0	32 m "ΔT" back on line at 0230
0200	10.8	3.1	-5.3	0	0	0	
0300	8.9	3.5	-3.6	0	10 As	0	
0400	11.6	3.2	-4.9	0	10 As	10 As	
0500	12.0	6.3	5.5	0	10 As	10 Cs	
0600	11.5	5.4	2.4	0	20 As	20 Cs	
0700	12.3	7.0	6.1	10 Cu	0	20 Cs	
				10 Sc		10 C1	
				10 St			
0800	15.0	5.3	2.1	20 Cu	10 As	20 Cs	Checked Apache - tape changed 1145-1213-bal both T/C's and 8 m ΔT
				20 Sc		20 C1	
0900	14.4	5.2	1.8	50 Cu	10 Ac	30 C1	
1000	14.6	5.8	3.3	50 Cu	0	20 C1	
1100	15.1	4.1	-1.5	20 Cu	0	20 C1	
1200	15.3	4.9	.9	20 Cu	0	20 C1	
					0		
1300	15.8	3.1	-5.1	20 Cu	0	10 C1	8 m ΔT out 1616-8 m T back on line (replaced probe) Checked Apache - both ΔT's rdg negative aircraft observed
1400	15.5	2.6	-7.5	10 Cu	0	10 C1	
1500	16.2	2.5	-8.1	10 Cu	0	0	
1600	15.3	2.2	-9.9	0	0	0	
1700	14.4	2.0	-10.7	0	0	0	
1800	12.9	2.0	-10.9	0	0	0	
							Aircraft observed 2330
1900	12.0	2.6	-7.7	0	0	0	
2000	10.3	3.0	-5.8	0	0	0	
2100	9.7	1.9	-11.5	0	0	0	
2200	8.8	2.1	-10.1	0	0	0	
2300	7.3	2.1	-10.0	0	0	0	
2400	8.0	2.6	-7.3	0	0	0	

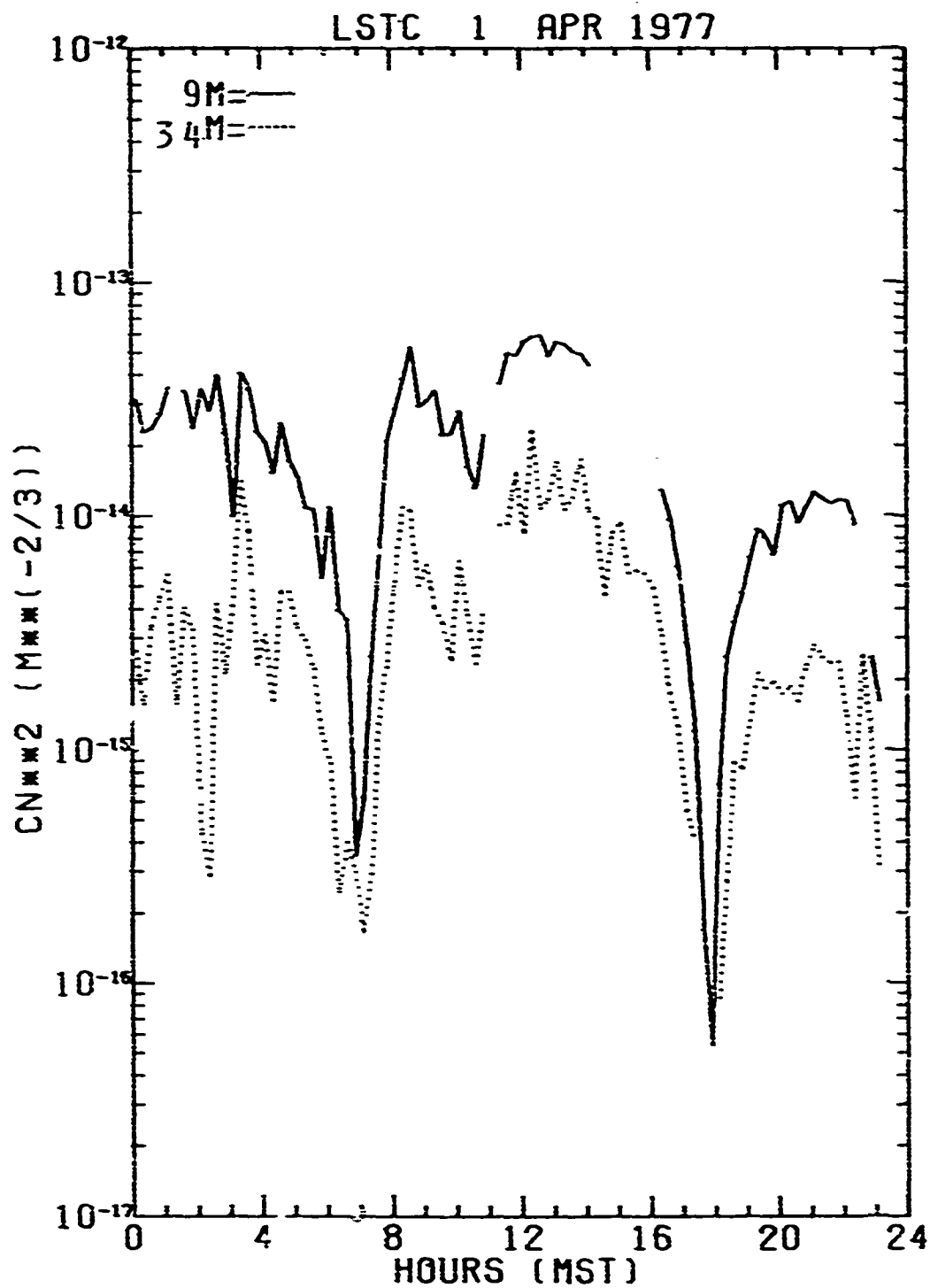


Figure 76. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 1 April 1977.

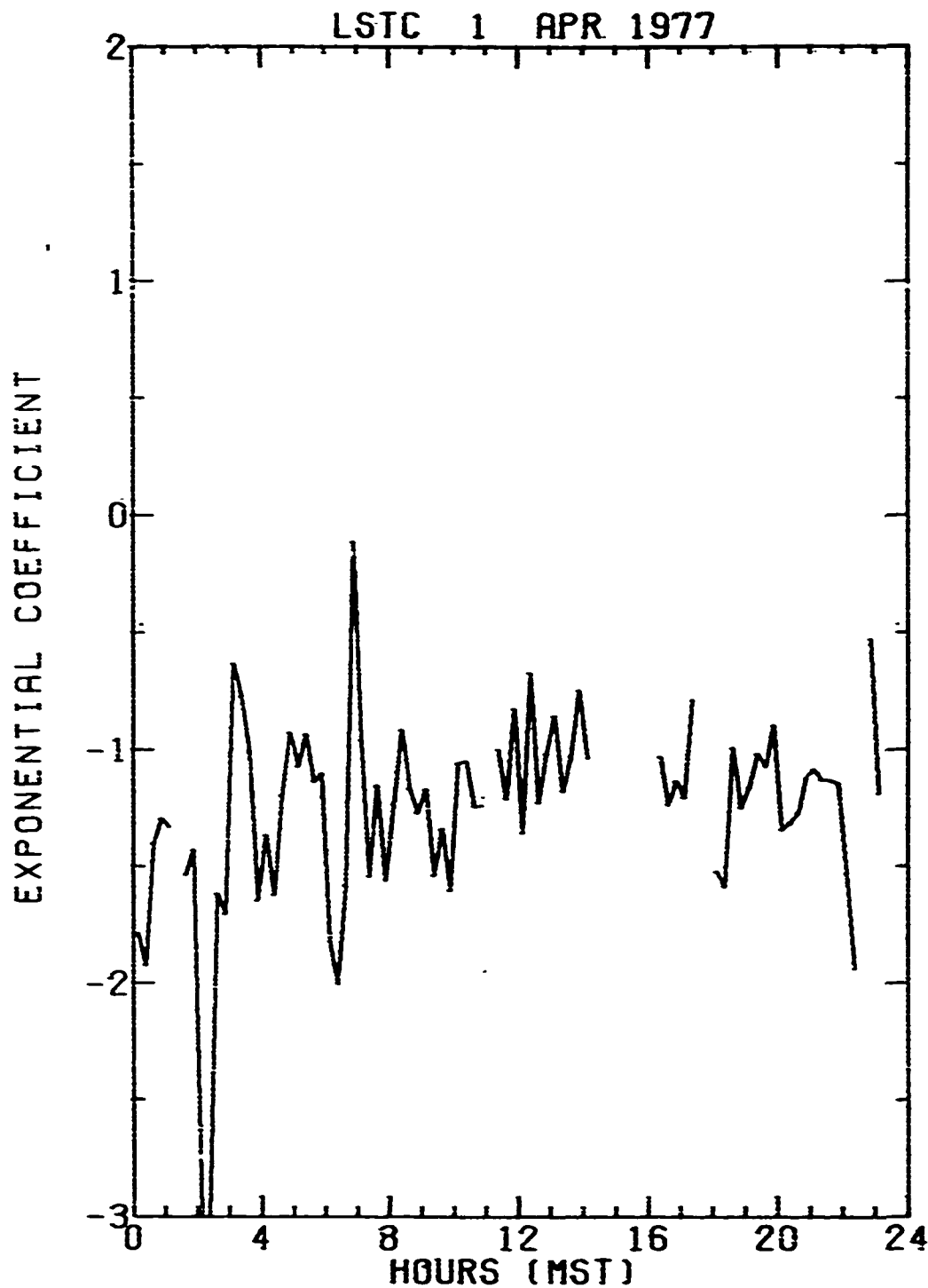


Figure 77. Diurnal variation of the altitude range of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 1 April 1977.

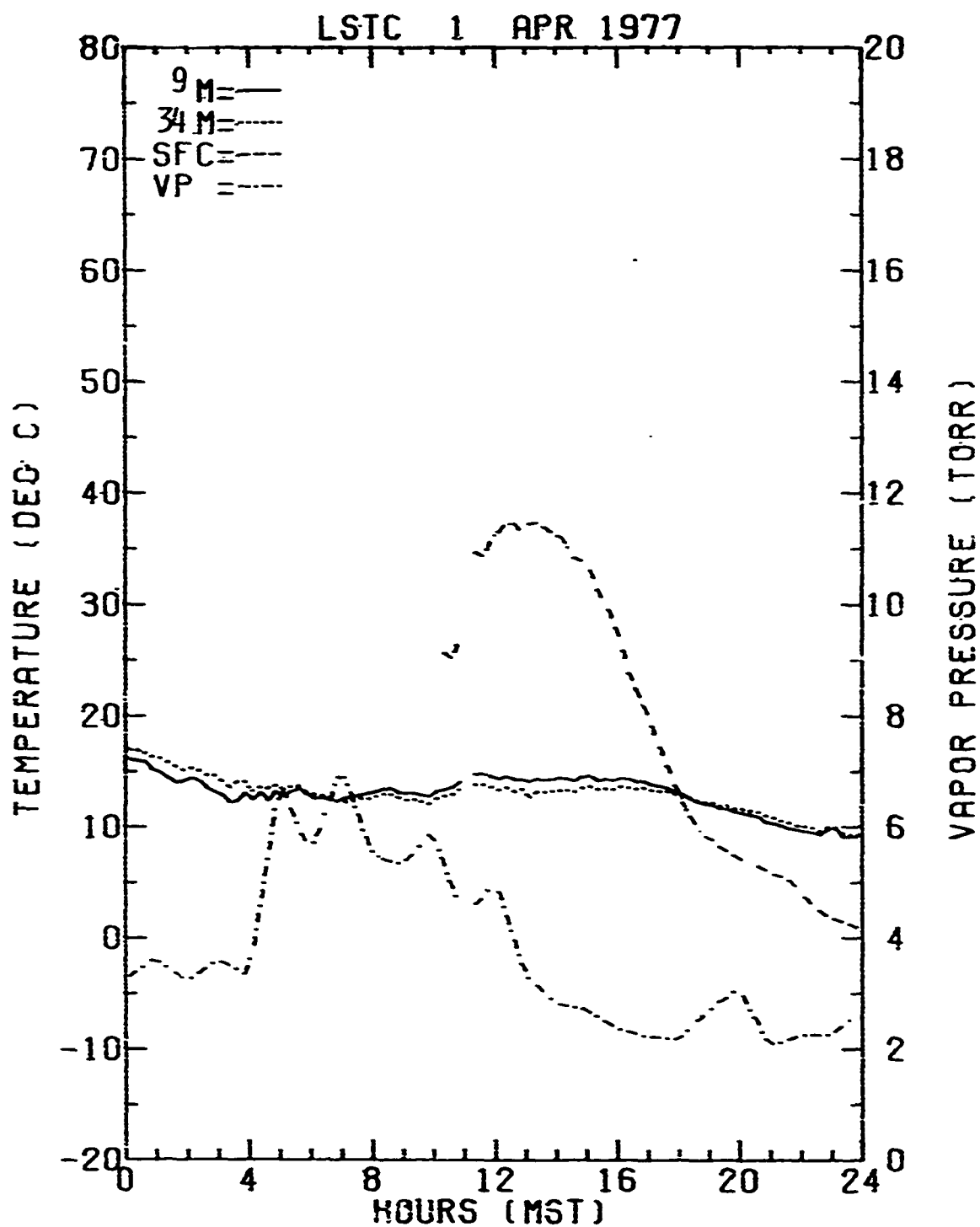


Figure 78. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 tower levels, and vapor pressure at 2 m level, LSTC, 1 April 1977.

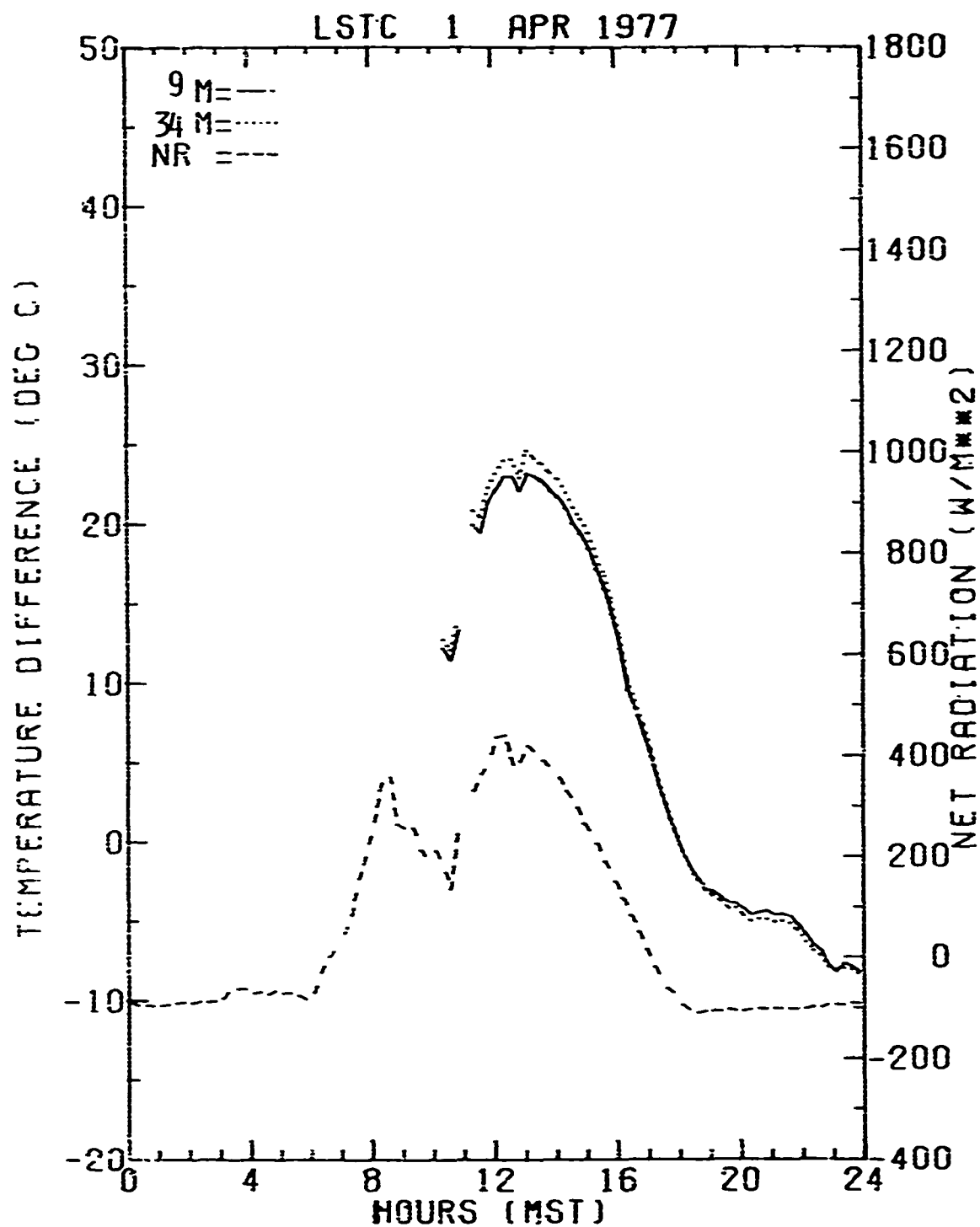


Figure 79. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 1 April 1977.

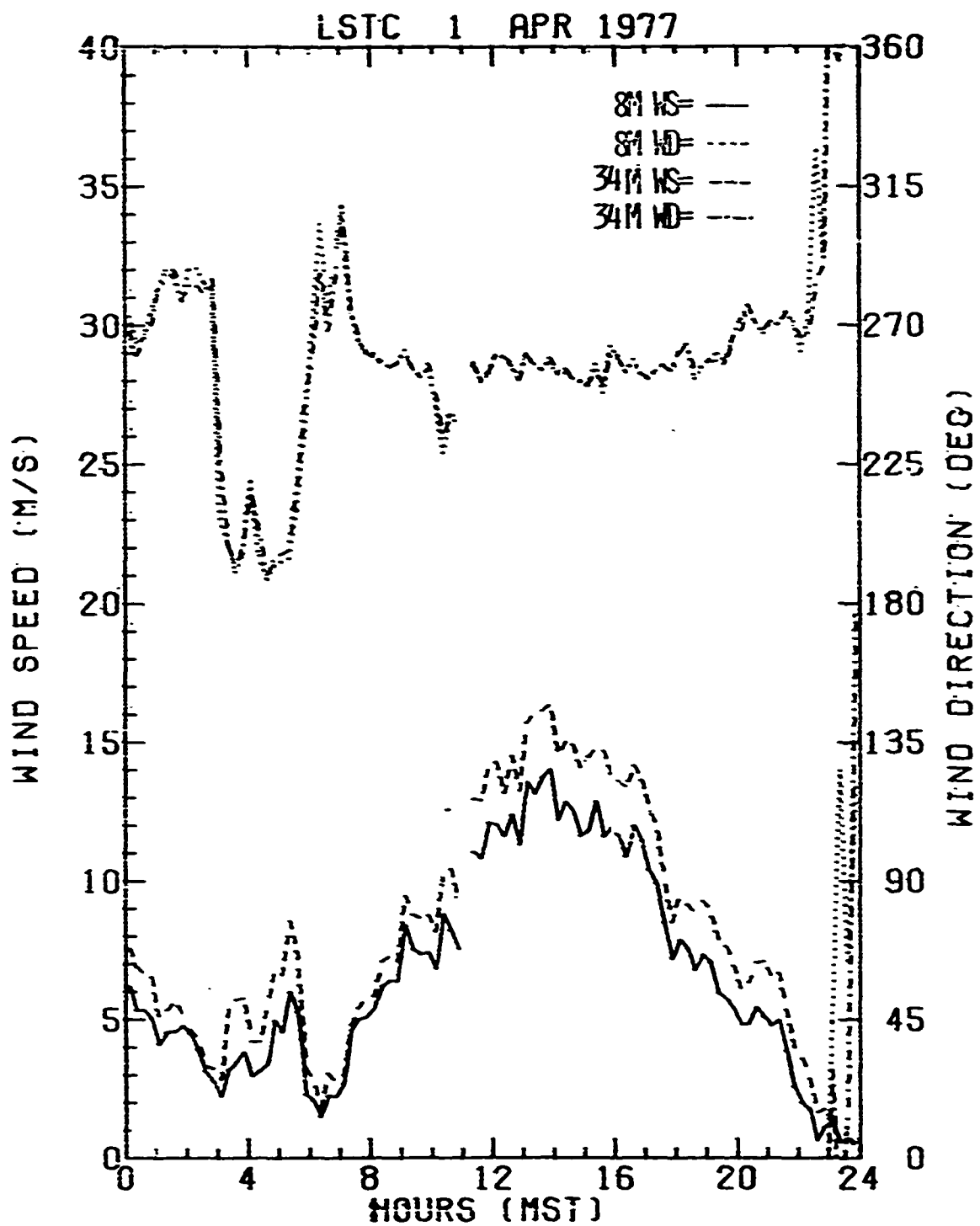


Figure 80. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 1 April 1977.

01 APR 1977 ACOUSTIC SOUNDER DATA

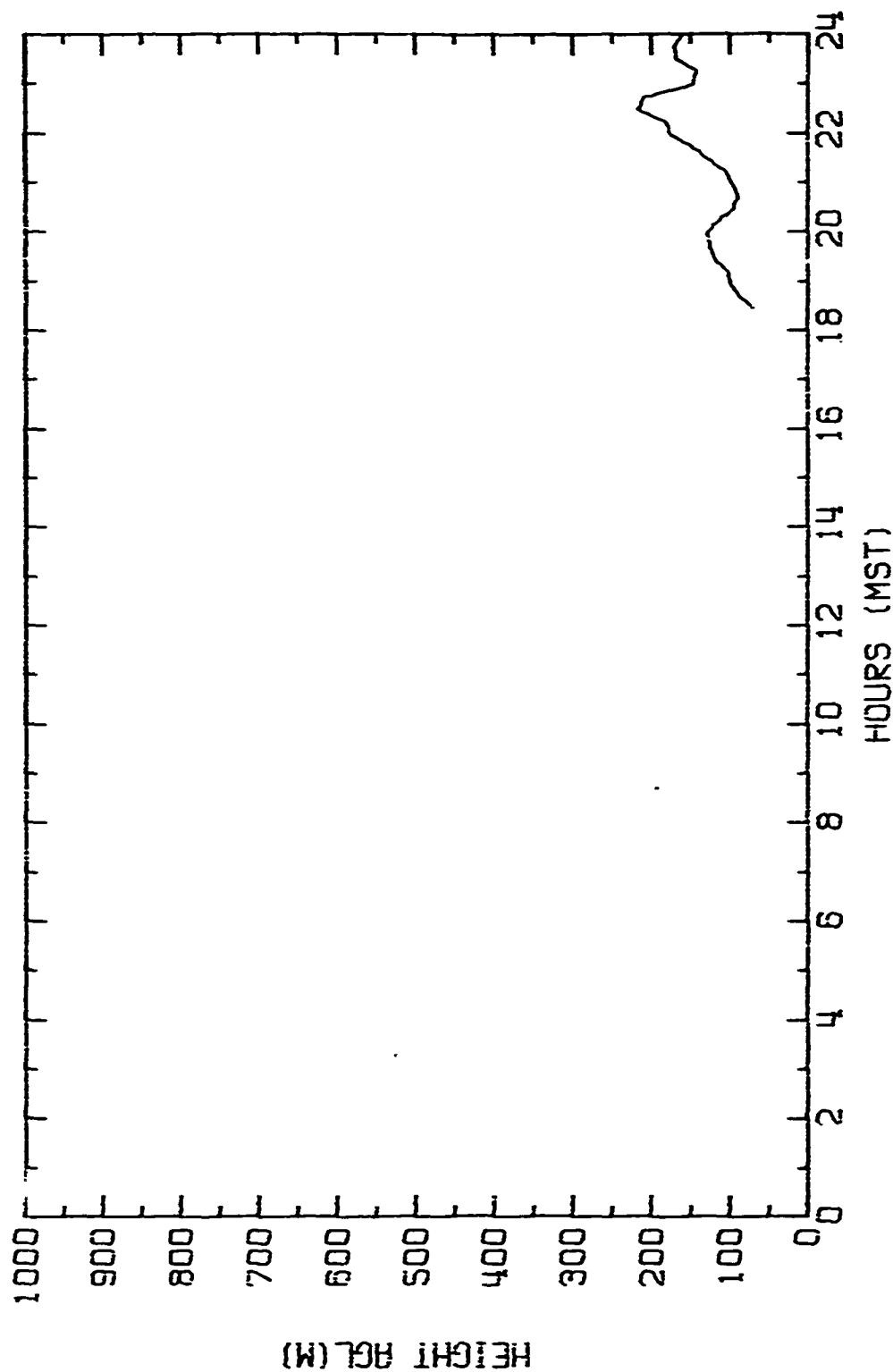


Figure 81. Inversion heights, LSTC, 1 Apr 11 1977.

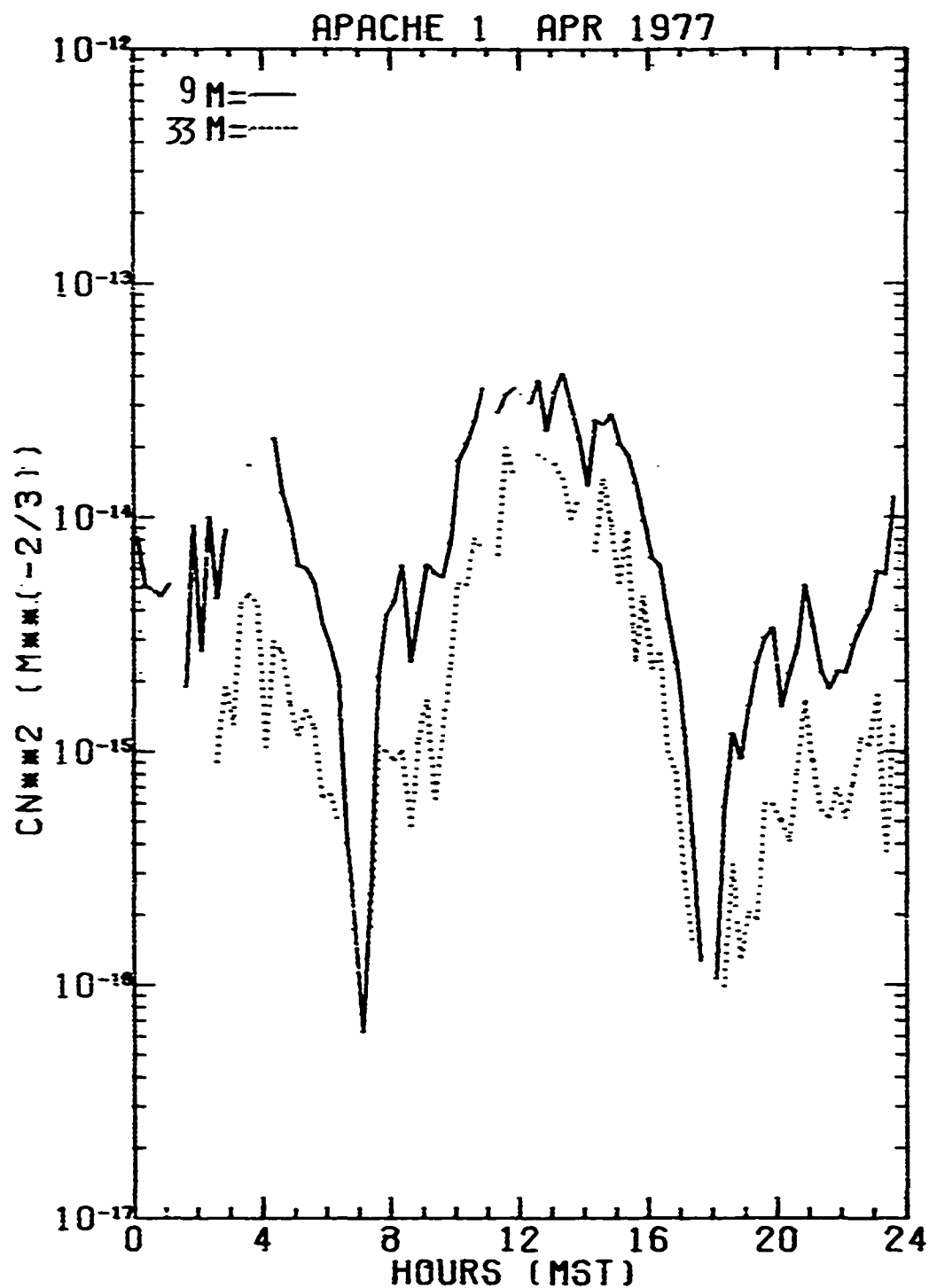


Figure 82. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 1 April 1977.

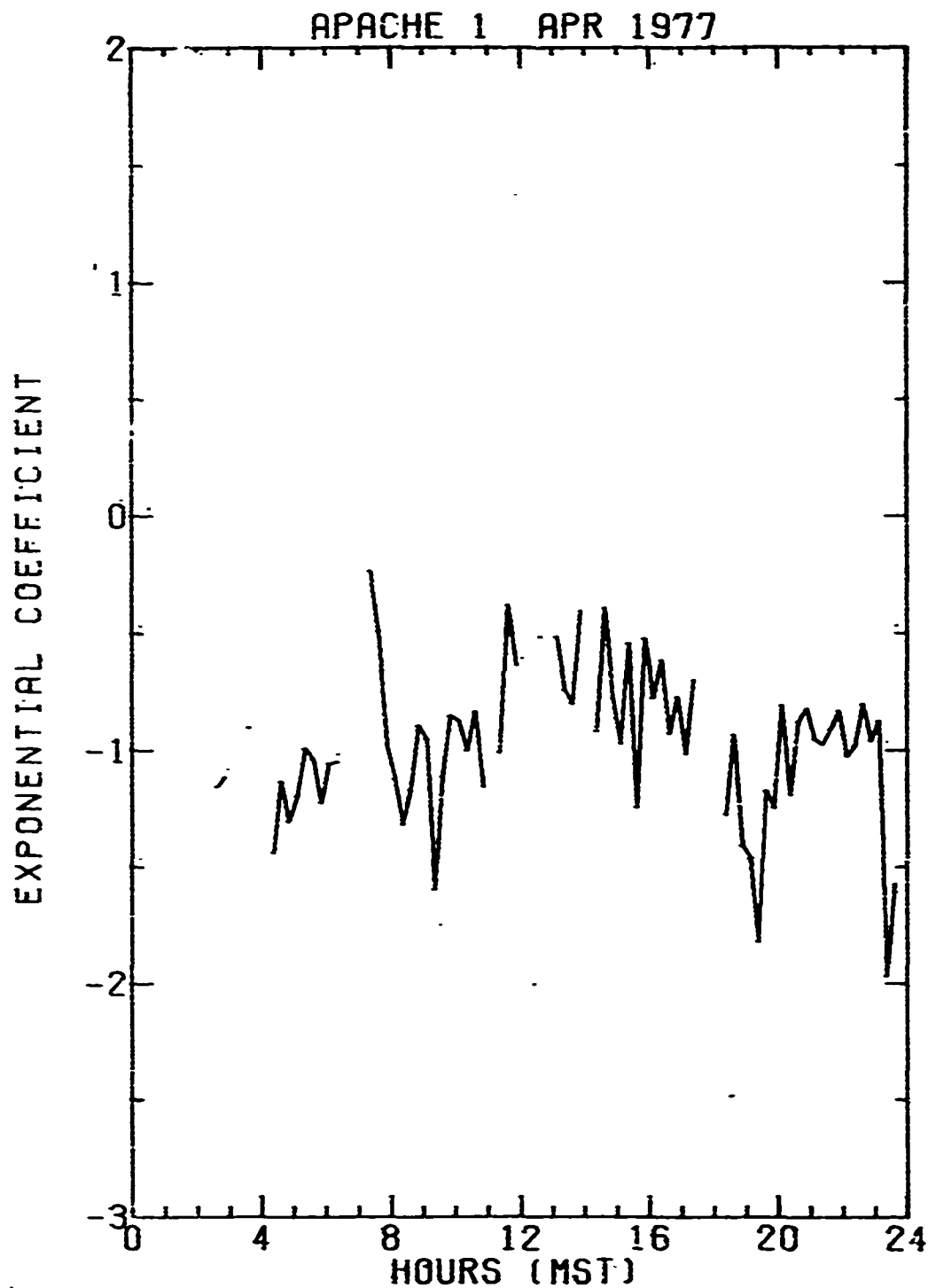


Figure 83. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 1 April 1977.

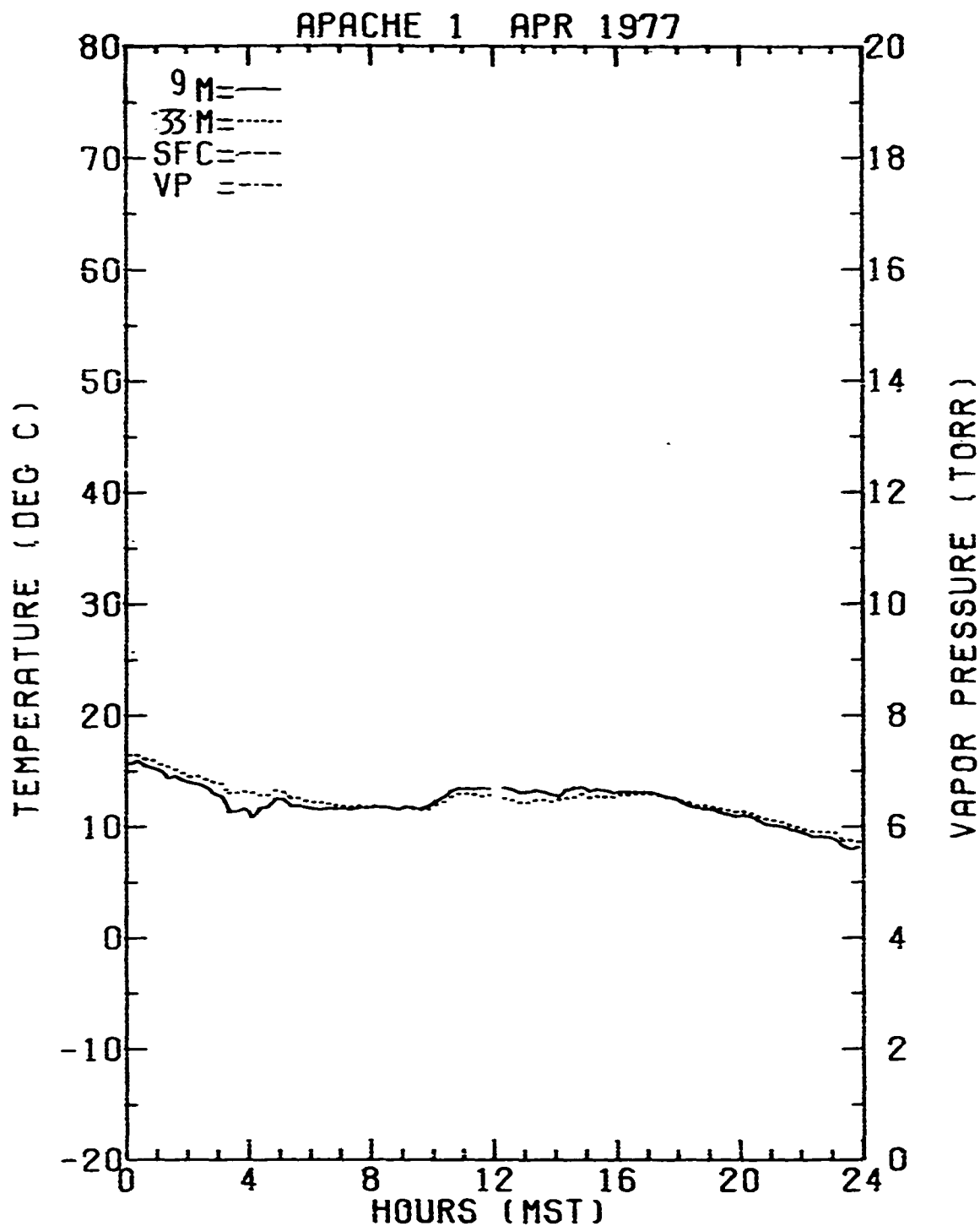


Figure 84. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 1 April 1977.

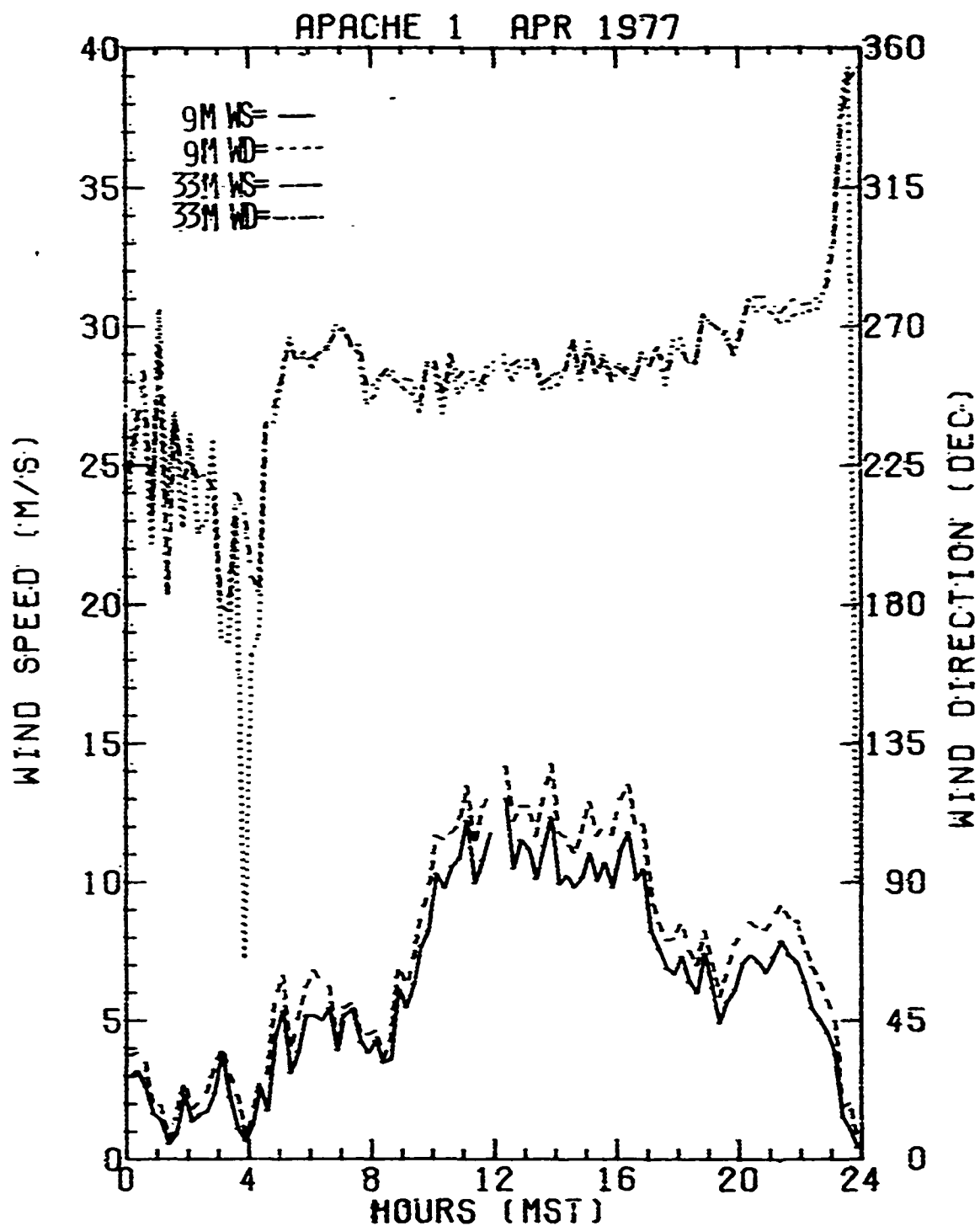


Figure 85. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 1 April 1977.

TABLE 51
APACHE SITE RAWINSONDE DATA

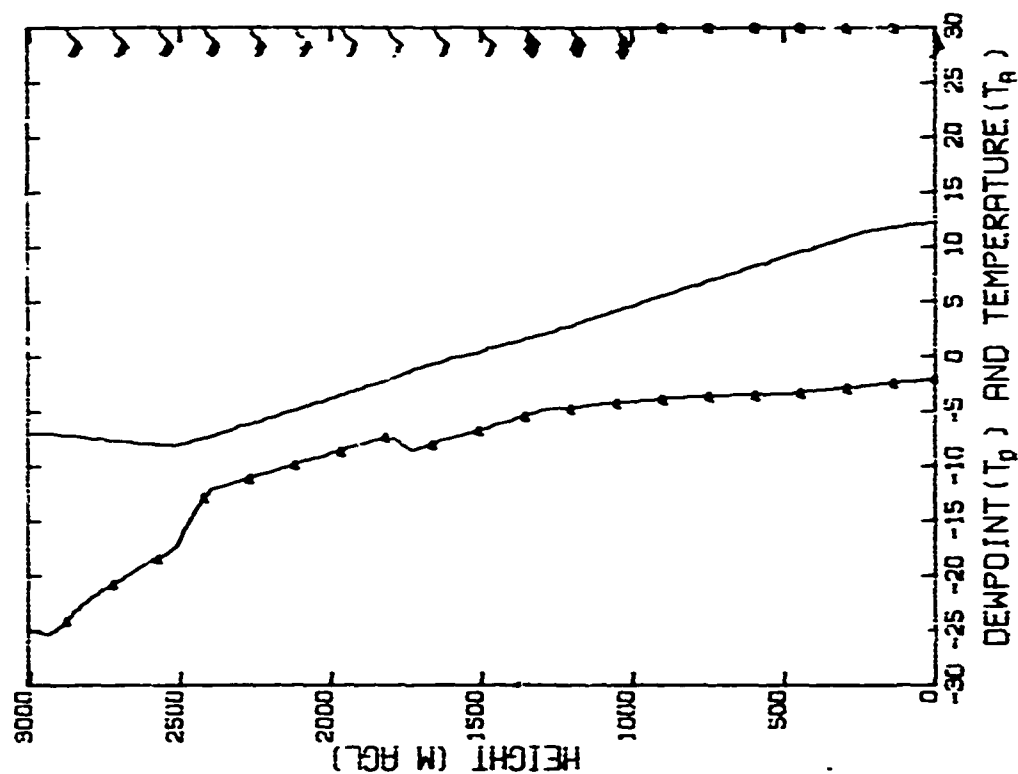
DATE: 01 APR 77

RELEASE NO.: 26

RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	WIND SPEED (M/S)
0.0	654.1	12.2	4.0	250.0	7.2
215.9	637.5	11.5	3.8	0.0	0.0
499.0	616.2	9.1	3.6	0.0	0.0
1296.1	559.0	2.0	3.2	228.0	22.5
1732.7	529.5	-1.2	2.4	225.7	26.3
1800.8	525.0	-2.1	2.7	226.4	26.5
2412.0	485.8	-7.4	1.8	228.8	31.5
2521.1	479.1	-8.1	1.1	229.1	31.5
2932.2	455.1	-6.9	0.6	230.0	32.2
3120.2	443.7	-6.8	0.7	228.3	24.7



WIND BARB SYSTEM (KTS)

DEWPOINT (T_d) AND TEMPERATURE (T_a)

TABLE 52
APACHE SITE RAWINSONDE DATA

DATE: 07 APR 77 RELEASE NO.: 27 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	653.8	15.8	3.1	300.0	11.3
212.7	637.5	12.3	3.0	271.6	10.0
781.4	595.2	5.5	2.4	251.5	17.2
1791.8	525.0	-3.5	1.9	236.9	15.7
2268.5	494.1	-7.8	1.7	231.9	20.5
2476.1	481.0	-10.2	0.8	227.0	20.1
2500.3	479.6	-7.8	0.5	228.9	21.8
2712.0	466.6	-9.7	0.4	240.2	30.4
2752.0	464.2	-7.2	0.5	243.0	32.9
3138.9	441.7	-8.5	0.4	240.1	37.3

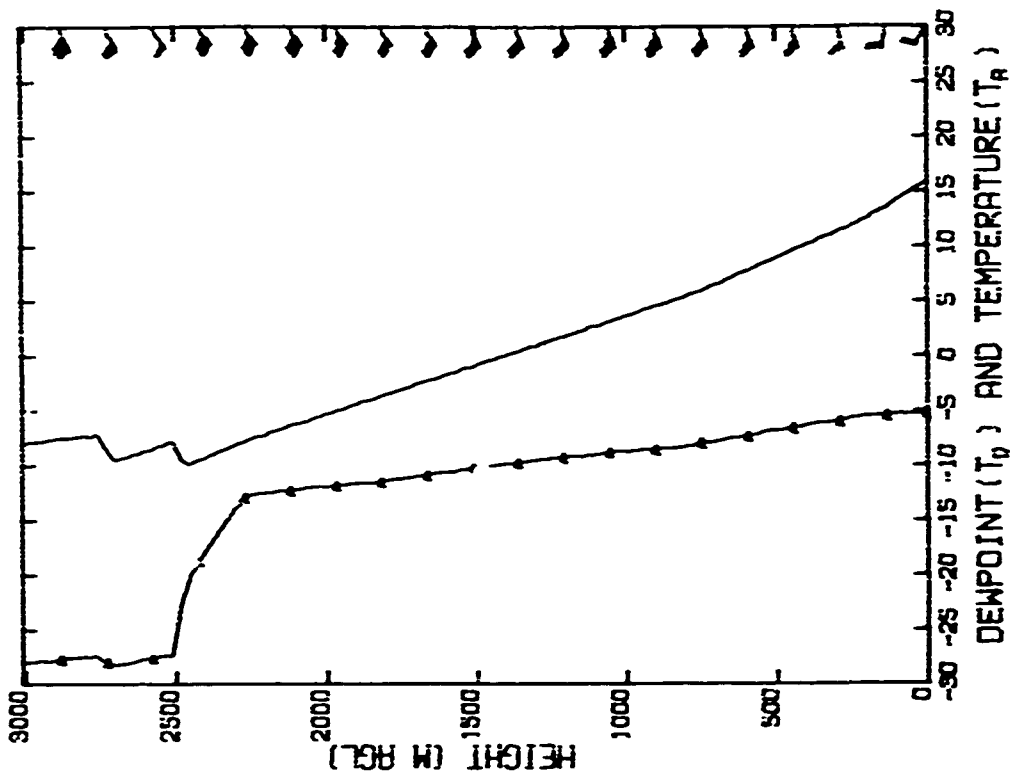


TABLE 53
APACHE SITE RAWINSONDE DATA

DATE: 01 APR 77 RELEASE NO.: 28 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	653.7	13.9	2.0	260.0	7.2
210.1	637.5	10.2	2.1	259.7	8.4
1657.5	533.5	-2.9	2.1	251.4	17.5
1784.3	525.0	-3.9	1.2	249.5	13.5
2160.5	500.5	-6.6	0.8	251.6	22.1
2483.4	480.2	-7.2	0.6	253.7	24.1
4362.8	375.0	-21.3	0.2	248.6	29.5

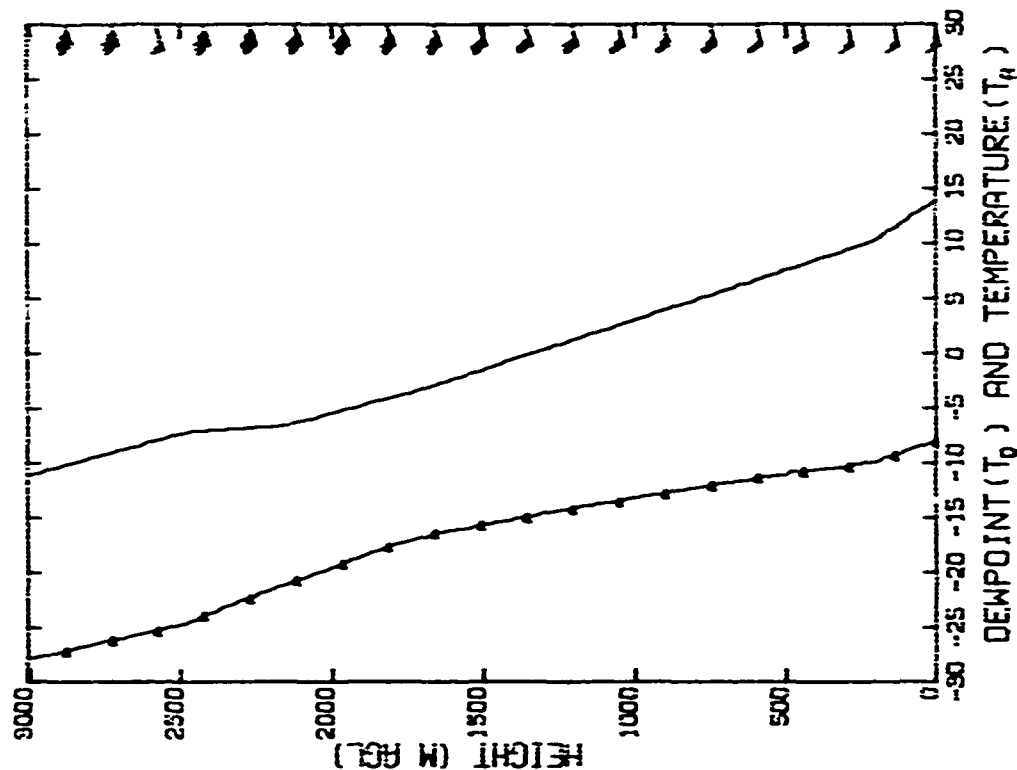
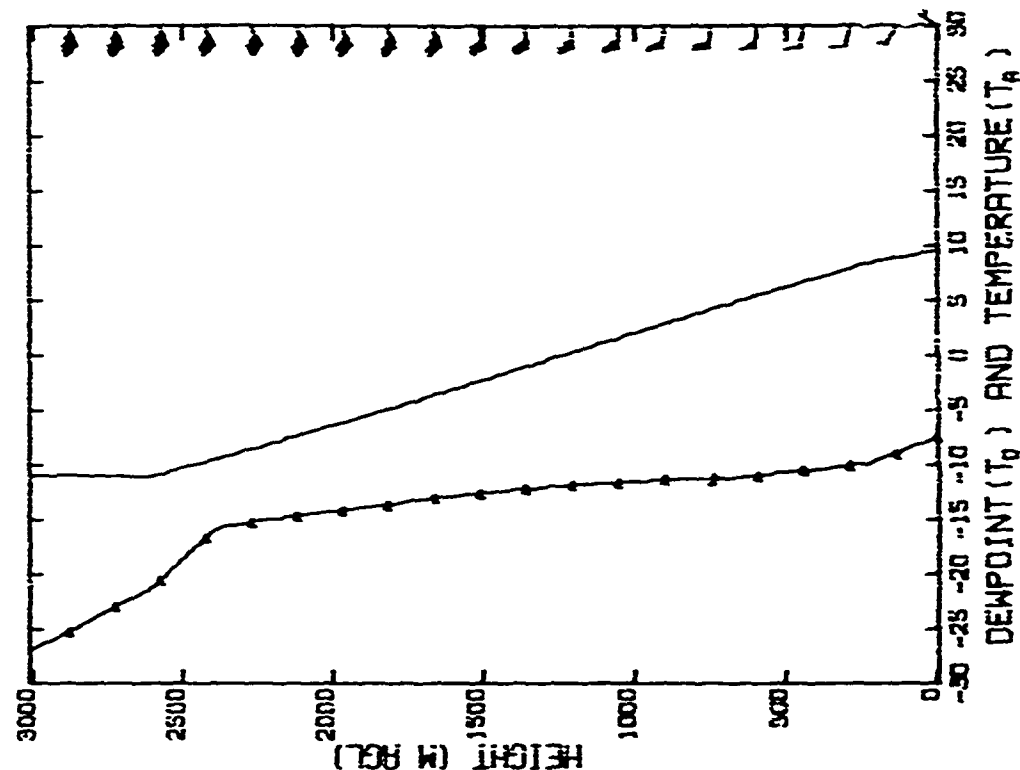


TABLE 54
APACHE SITE RAWINSONDE DATA

DATE: 01 APR 77 RELEASE NO.: 29 RELEASE TIME: 2359 NST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M ASL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	655.3	9.6	2.6	90.0	1.0
228.8	637.5	8.4	2.1	289.3	3.1
677.5	603.6	4.8	1.9	279.3	8.9
1796.3	525.0	-4.8	1.6	249.6	18.2
2383.7	487.0	-9.5	1.3	243.7	20.8
2606.8	473.1	-11.1	0.8	247.6	22.2
2854.8	458.1	-10.9	0.6	247.7	23.7
3202.6	437.8	-11.2	0.4	245.4	23.7



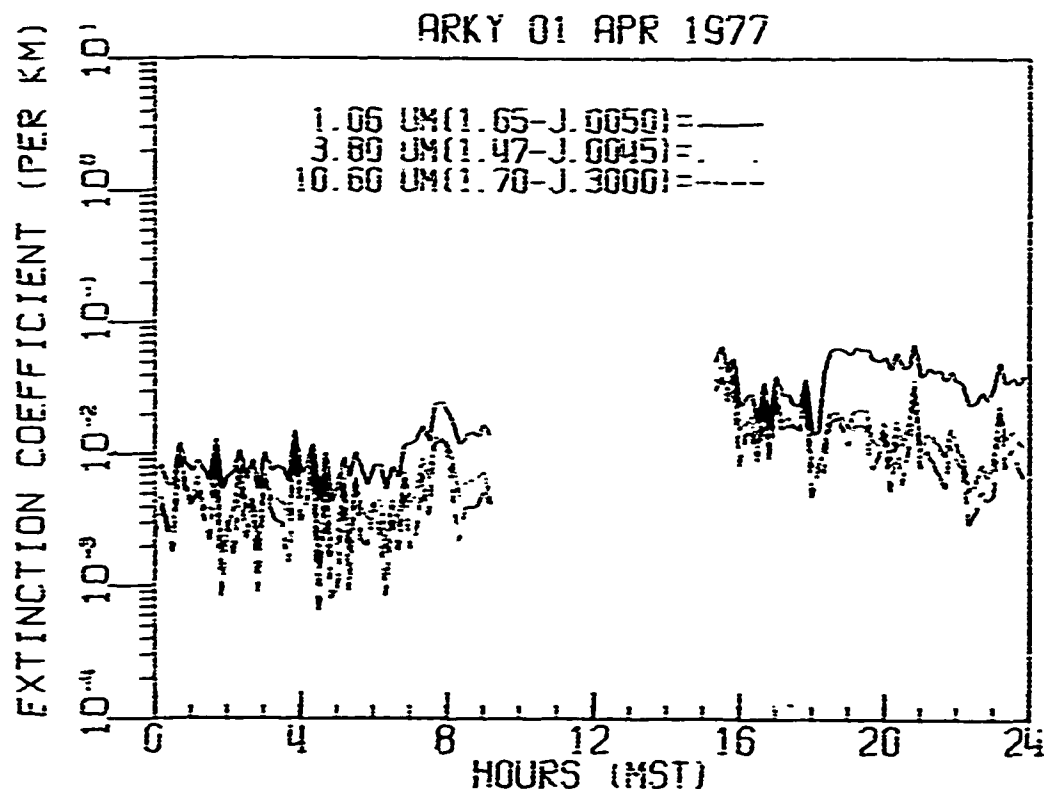


Figure 86. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 1 April 1977.

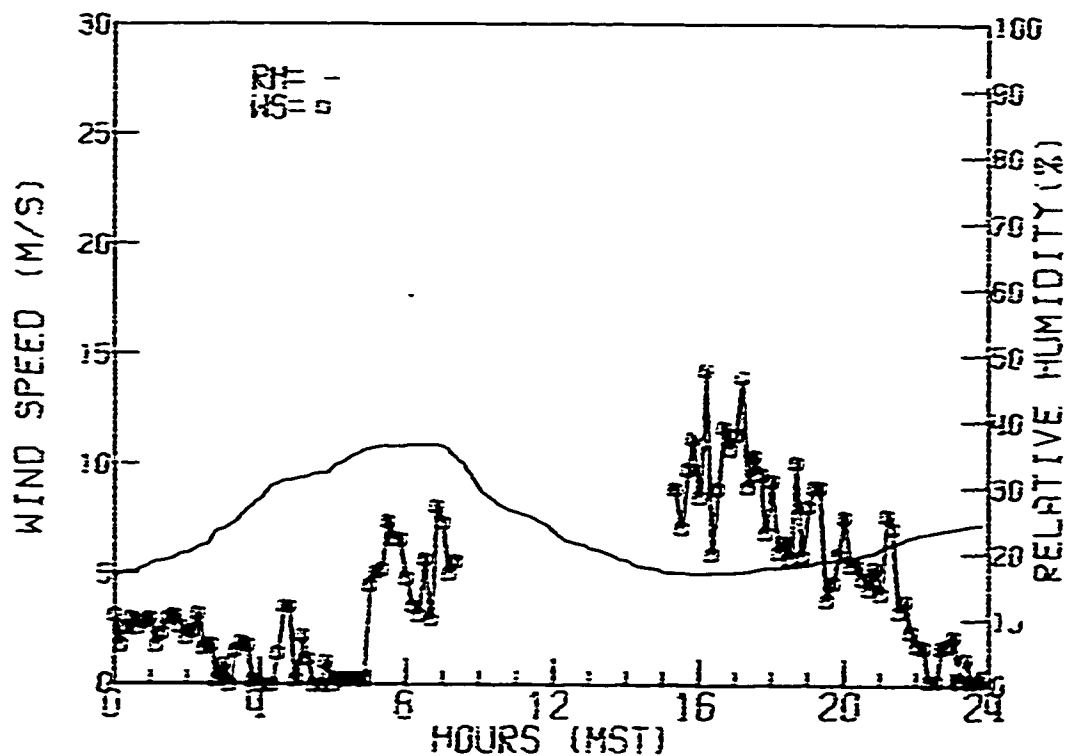


Figure 87. Diurnal variation of windspeed and relative humidity, Arky Site, 1 April 1977.

[illegible]155

PARTICULAR ARE SIZE DETERMINATION, CALCULATED EXTINCTION, AND MASS LOADING
 ANY SITE, W/2

[illegible]

TABLE 55 (CONT.)
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SPEC. WIND

DATE TIME SAMPLE (MST)	1	2	3	4	5	6	7	8	EXTINCTION (PER KM)			MASS LOADING (UG/MOS)
									1.7A	3.0	13.5	
01 APR 77												
10:30:00	600	13+02	19+01	43+00	15+01	44-01	20-01	20-01	63-01	22-01	16-01	203
10:35:00	575	12+02	09+02	21+02	35-01	33	33	33	45-01	13-01	40-02	113
10:40:00	550	11+02	19+00	18+00	00	00	20-01	20-01	51-01	12-01	97-02	182
20:30:00	575	11+02	11+01	27+02	19-01	44-01	27-01	27-01	44-01	14-01	15-01	183
20:35:00	600	09+01	07+00	00	00	00	00	00	05-01	06-02	53-02	87
20:40:00	575	12+02	13+01	17+02	06-01	06-01	33	33	53-01	19-01	13-01	170
20:45:00	600	07+01	11+02	00	00	00	00	00	47-01	12-01	63-02	87
20:50:00	625	02+01	13+01	03+02	76-01	33	33	33	19-01	14-01	11-01	125
20:55:00	600	10+02	09+01	08+00	14+00	14+00	34-01	34-01	70-01	38-01	35-01	357
21:00:00	575	01+01	08+02	19+02	15-01	09-01	33	33	43-01	11-01	43-02	95
21:05:00	600	07+01	07+00	24+00	15-01	00	20-01	20-01	45-01	15-01	77-01	163
21:10:00	575	08+01	11+01	19+02	01-01	33	33	33	44-01	14-01	70-02	109
21:15:00	600	07+01	10+01	24+01	30-01	00	00	00	44-01	12-01	73-02	90
21:20:00	575	07+01	02+02	21+02	15-01	33	33	33	38-01	17-01	57-02	77
21:25:00	600	07+01	02+00	24+00	30-01	00	20-01	20-01	44-01	16-01	72-01	167
22:00:00	575	07+01	08+02	19+02	33	33	23-01	23-01	37-01	12-01	72-02	181
22:05:00	600	08+01	03+00	03-01	00	00	20-01	20-01	33-01	08-02	82-02	182
22:10:00	575	08+01	07+02	19+02	33	33	33	33	34-01	31-02	10-02	85
22:15:00	600	09+01	03+01	03-01	34-01	00	00	00	34-01	61-02	38-02	43
22:20:00	575	06+01	07+02	19+02	15-01	33	33	33	33-01	05-02	55-02	61
22:25:00	600	08+01	02+00	03-01	30-01	00	00	00	24-01	69-02	47-02	61
23:00:00	575	08+01	08+00	03-01	15-01	33	33	33	32-01	03-02	51-02	67
23:05:00	600	01+01	08+00	24+00	01-01	44-01	34-01	34-01	02-01	24-01	22-01	278
23:10:00	575	06+01	09+02	17+02	06-01	33	33	33	16-01	13-01	51-02	99
23:15:00	600	07+01	02+00	33+00	01-01	44-01	00	00	38-01	16-01	31-01	106
23:20:00	575	06+01	13+01	24+02	61-01	33	33	33	55-01	14-01	46-02	93
23:25:00	600	07+01	12+01	18+00	30-01	00	00	00	39-01	12-01	49-02	87

Weather Summary

Date: 2 April 1977

Synoptic

Surface: Deep surface low-pressure area over Iowa with cold fronts extending south into eastern Texas and southwestward into southeastern Colorado.

500 Millibar: Closed low center over western Utah and eastern Nevada with continued strong southwesterly flow over New Mexico.

Holloman AFB

Clouds: Mostly clear. Few middle clouds (altocumulus) at 3000 m AGL.

Wind: Southwesterly 5-10 m sec⁻¹ with peak gust of 13 m sec⁻¹ from the southwest at 1000 MST.

Visibility: Greater than 60 km.

Maximum temperature: 19.4°C

Corresponding vapor pressure: 2.5 Torr

Minimum temperature: 2.8°C

Corresponding vapor pressure: 2.2 Torr



Figure 88a. Surface weather map for 2 April 1977.

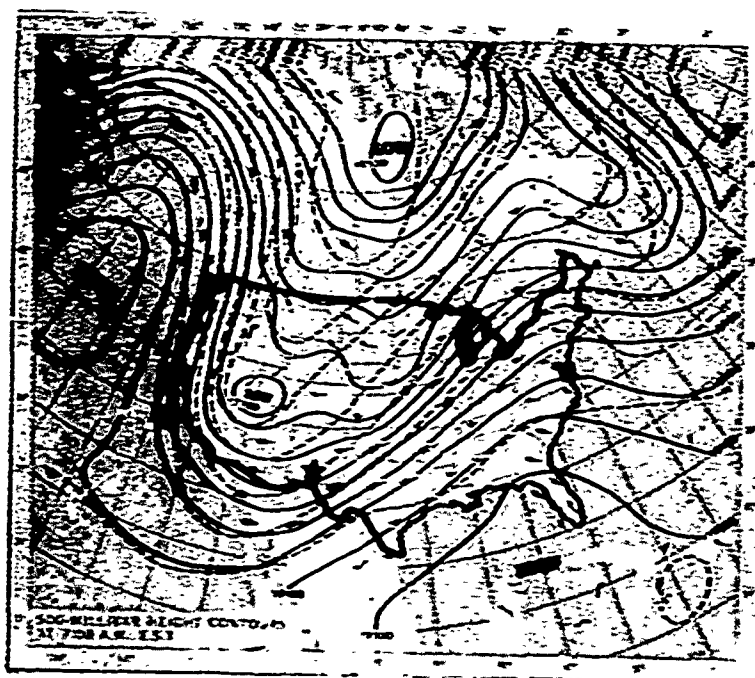


Figure 88b. 500-millibar height contours for 2 April 1977.

TABLE 56. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER. AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	6.8	2.3	-9.2	0	0	0	
0200	6.5	2.0	-11.2	0	0	0	
0300	6.8	2.1	-10.0	0	0	0	
0400	3.0	2.1	-10.5	0	0	0	
0500	2.1	2.0	-11.0	0	0	0	
0600	0.7	2.2	-9.9	0	0	0	
0700	5.6	2.4	-8.4	0	0	0	
0800	10.5	2.6	-7.4	0	0	0	
0900	12.0	2.5	-8.1	0	0	0	
1000	13.0	2.1	-10.1	0	0	05 C1	
1100	14.5	2.4	-8.4	0	0	05 C1	
1200	15.9	2.8	-6.5	0	0	0	Checked u-v-w sensors and balanced "T's"
1300	16.6	2.4	-8.5	0	0	0	
1400	18.0	2.4	-8.3	0	0	0	
1500	20.1	2.5	-8.2	05 Cu	0	0	
1600	19.0	2.8	-6.7	05 Cu	0	0	
1700	18.0	2.4	-8.3	05 Sc	0	0	1730 - plane observed
1800	16.5	2.3	-9.3	10 Sc	0	0	
1900	15.2	2.2	-9.6	10 Sc	0	0	
2000	14.1	1.7	-12.7	10 Sc	0	0	
2100	11.9	2.8	-6.7	0	0	0	
2200	9.6	2.9	-6.3	0	0	0	
2300	9.2	2.9	-6.3	0	0	0	
2400	9.4	3.1	-5.2	0	10 ACSL	0	2400 - plane observed

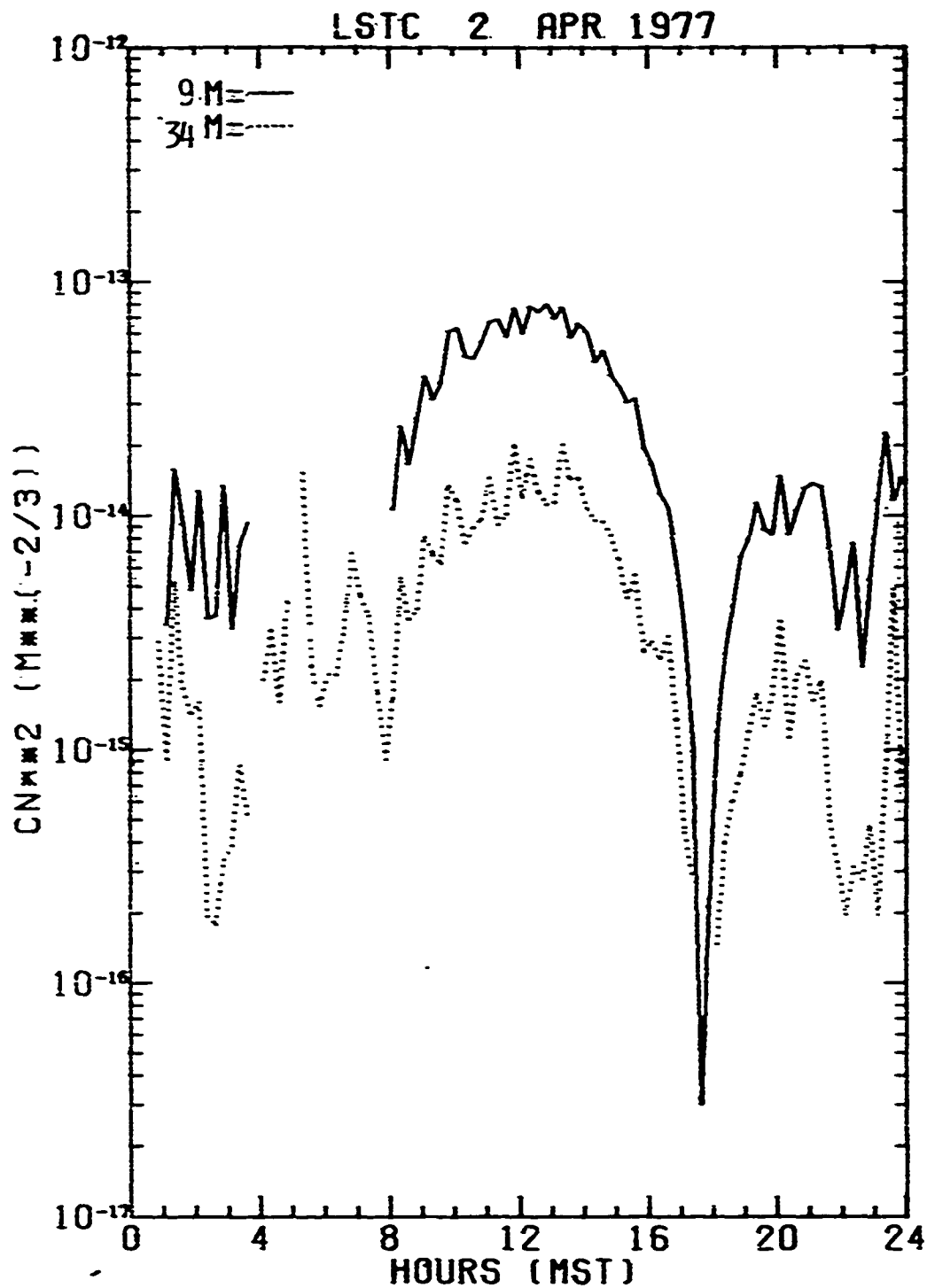


Figure 89. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 2 April 1977.

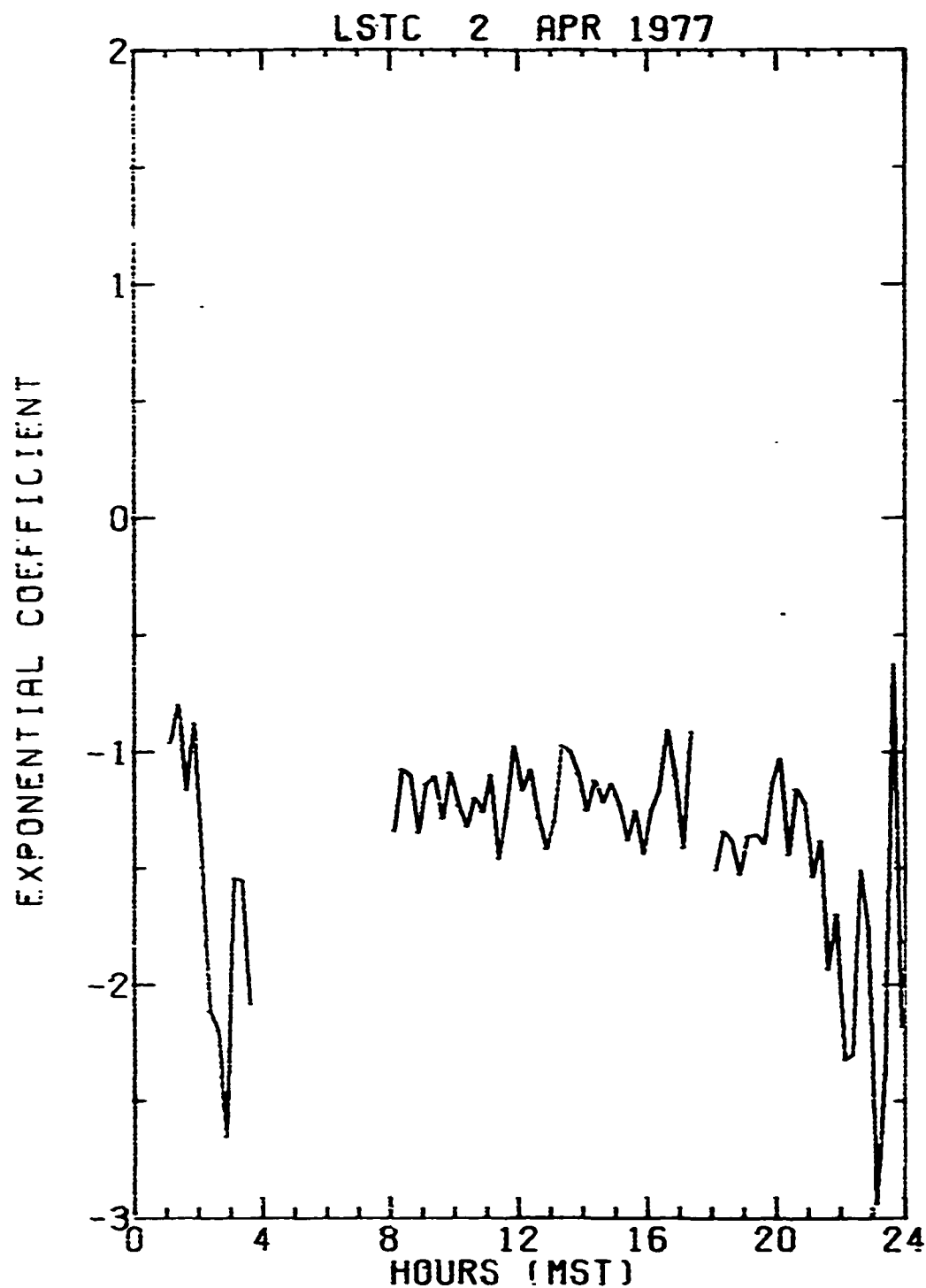


Figure 90. Diurnal variation of the altitude change of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 2 April 1977.

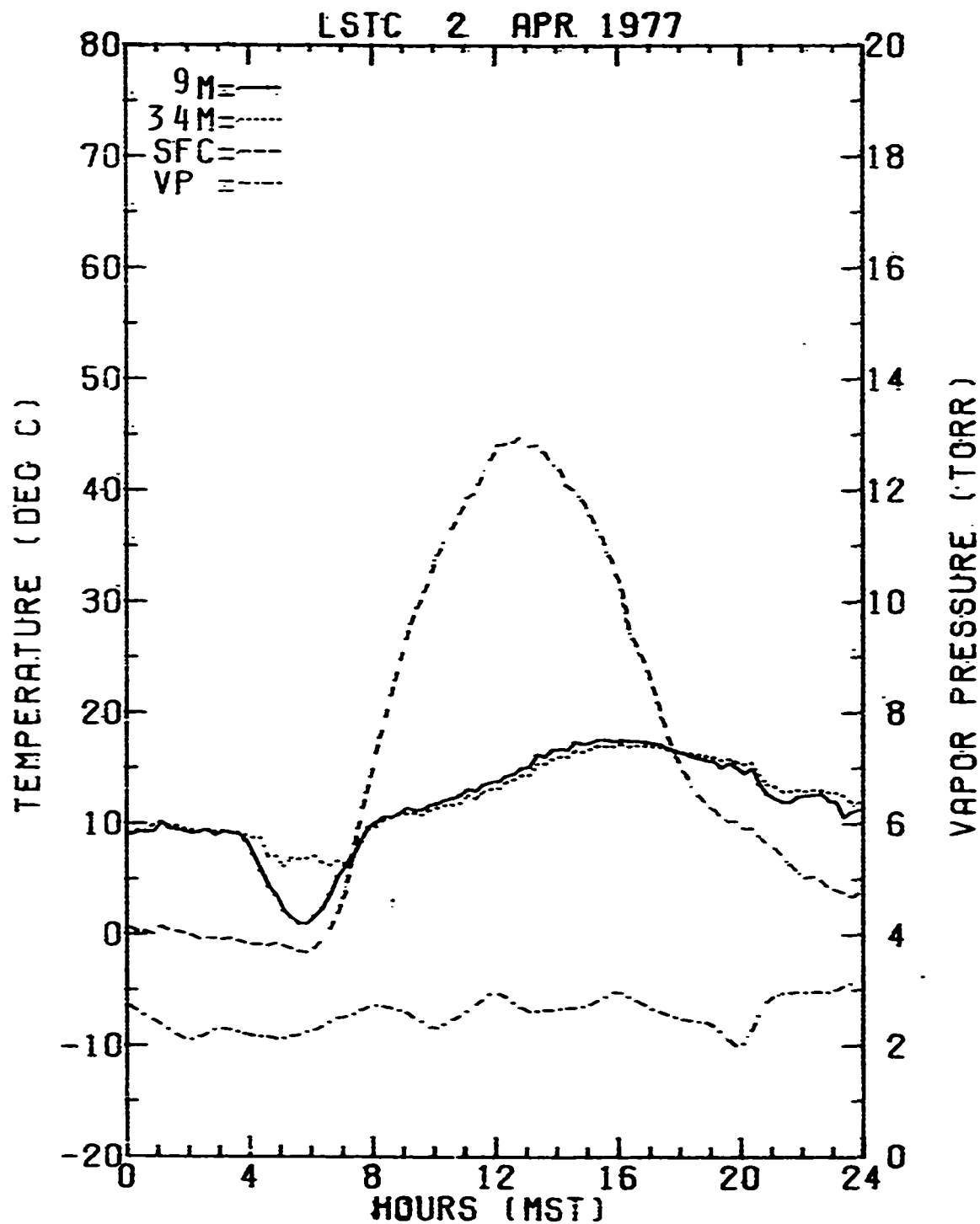


Figure 91. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 2 April 1977.

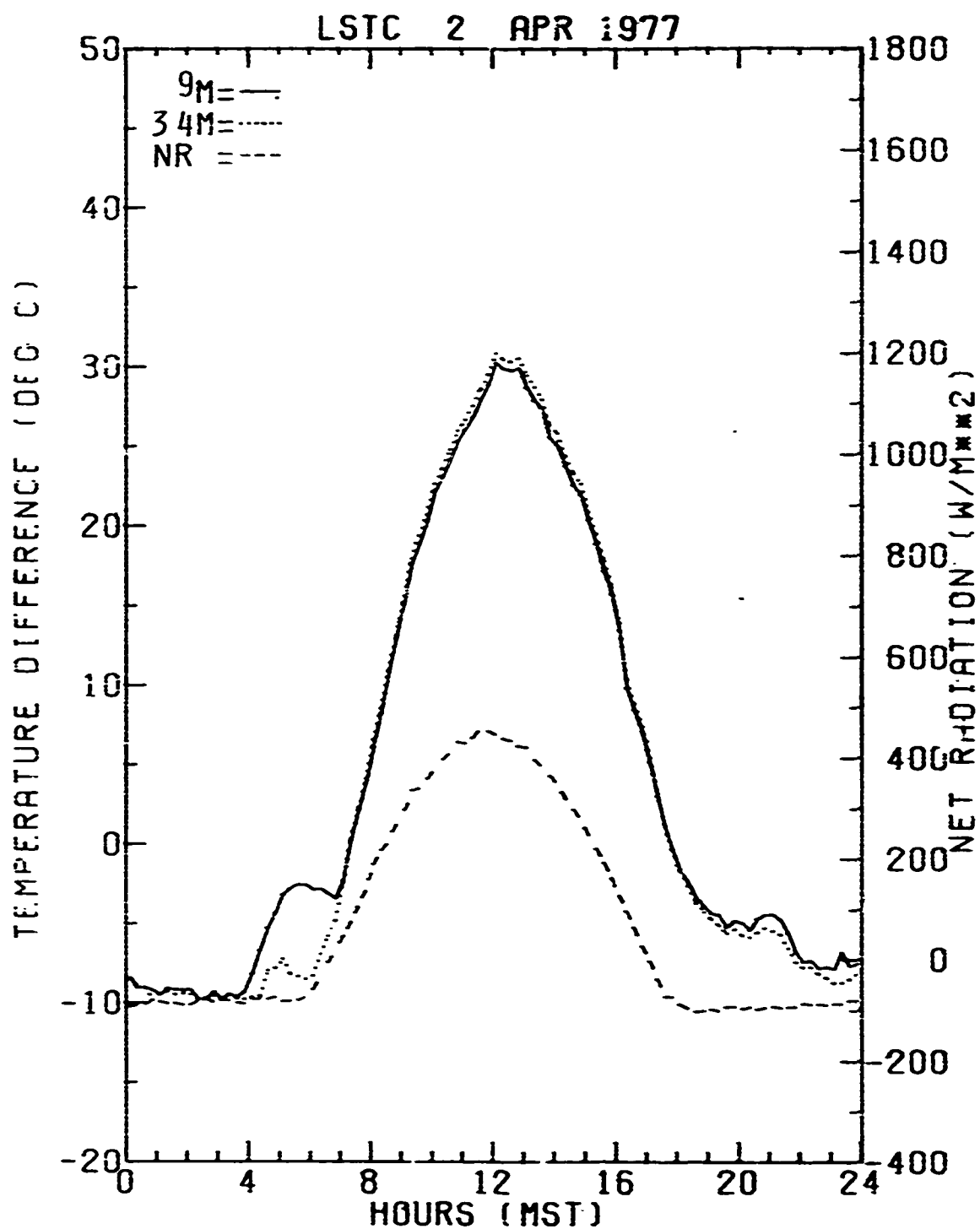


Figure 92. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 2 April 1977.

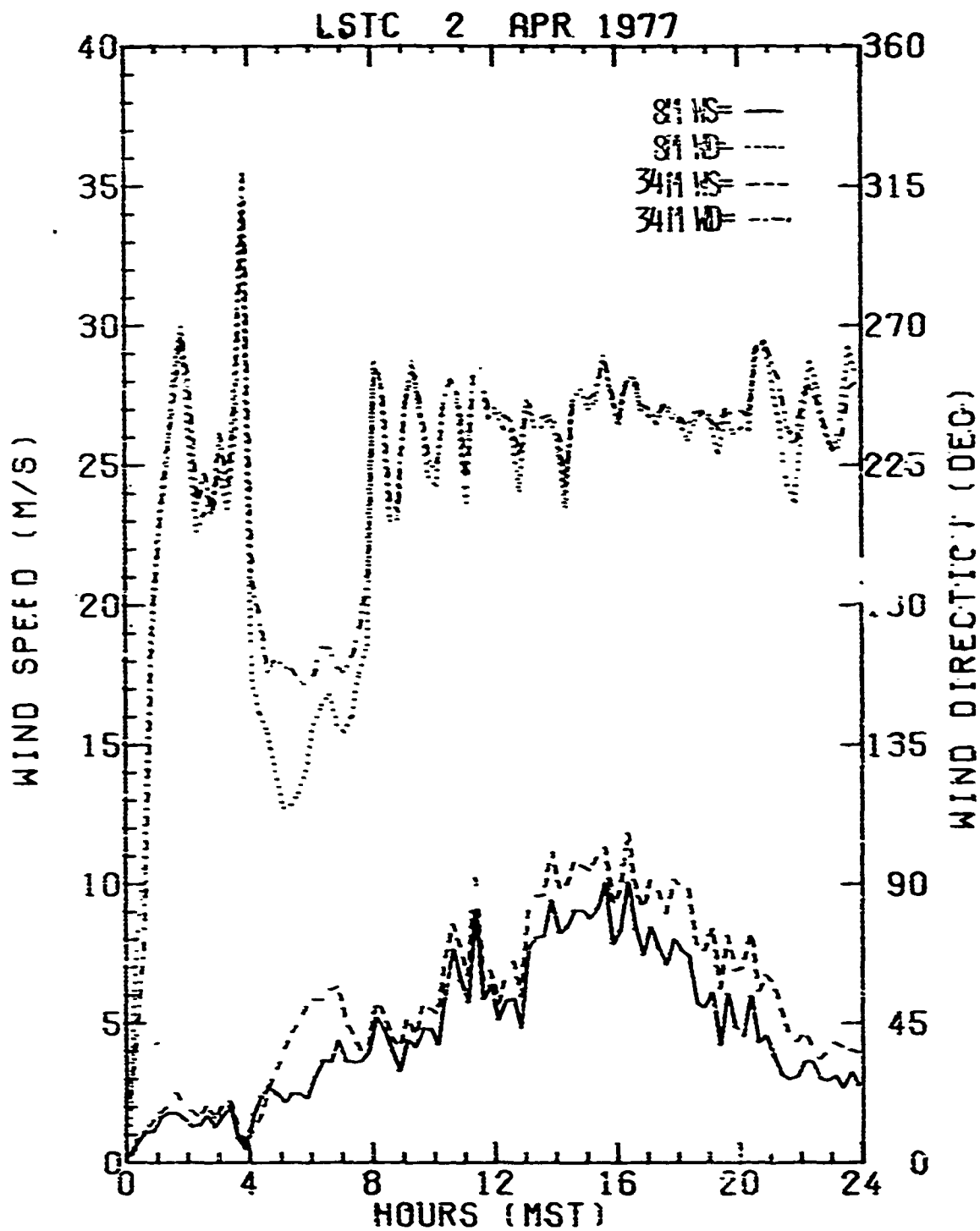


Figure 93. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 2 April 1977.

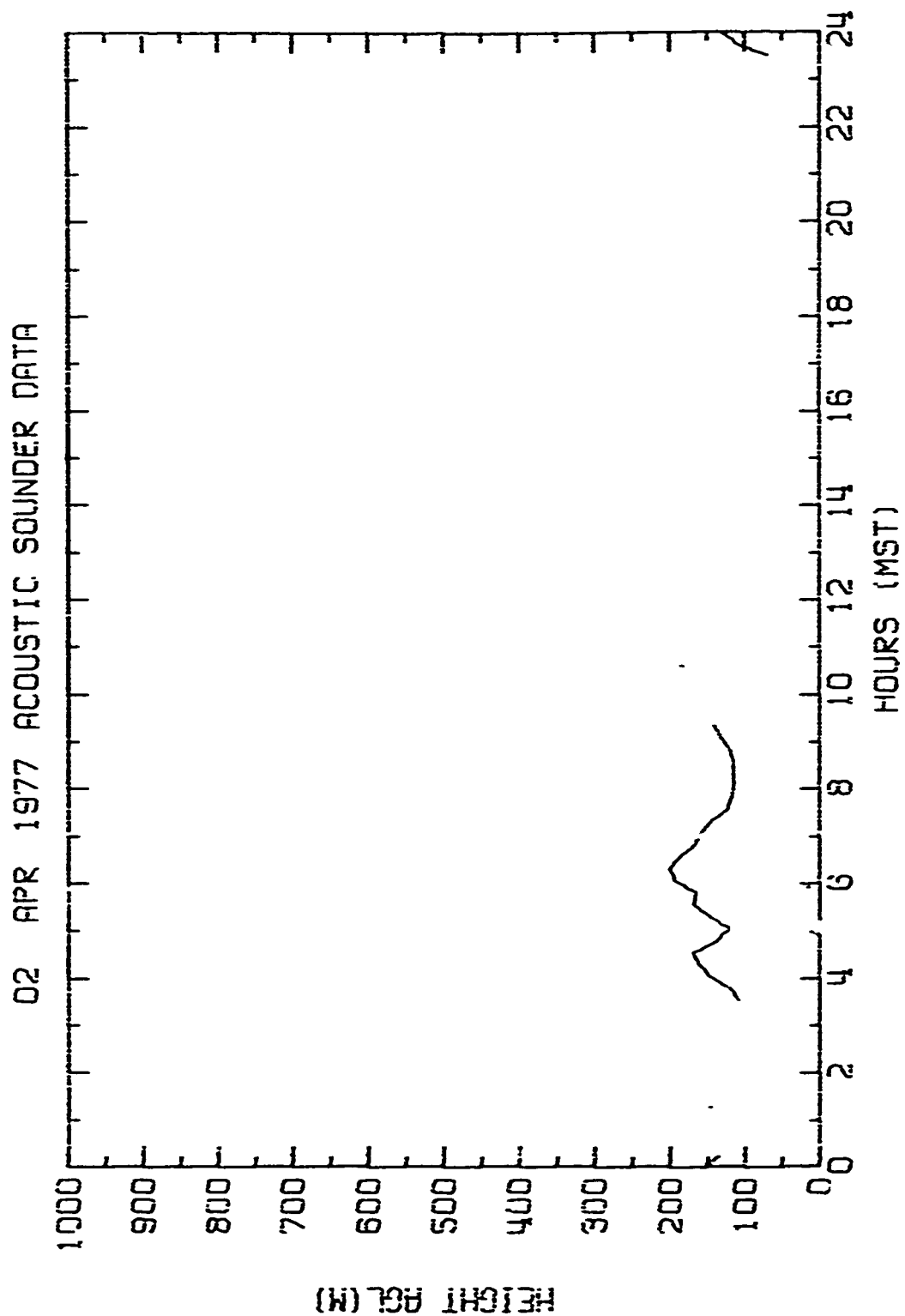


Figure 94. Inversion heights, LSTC, 2 April 1977.

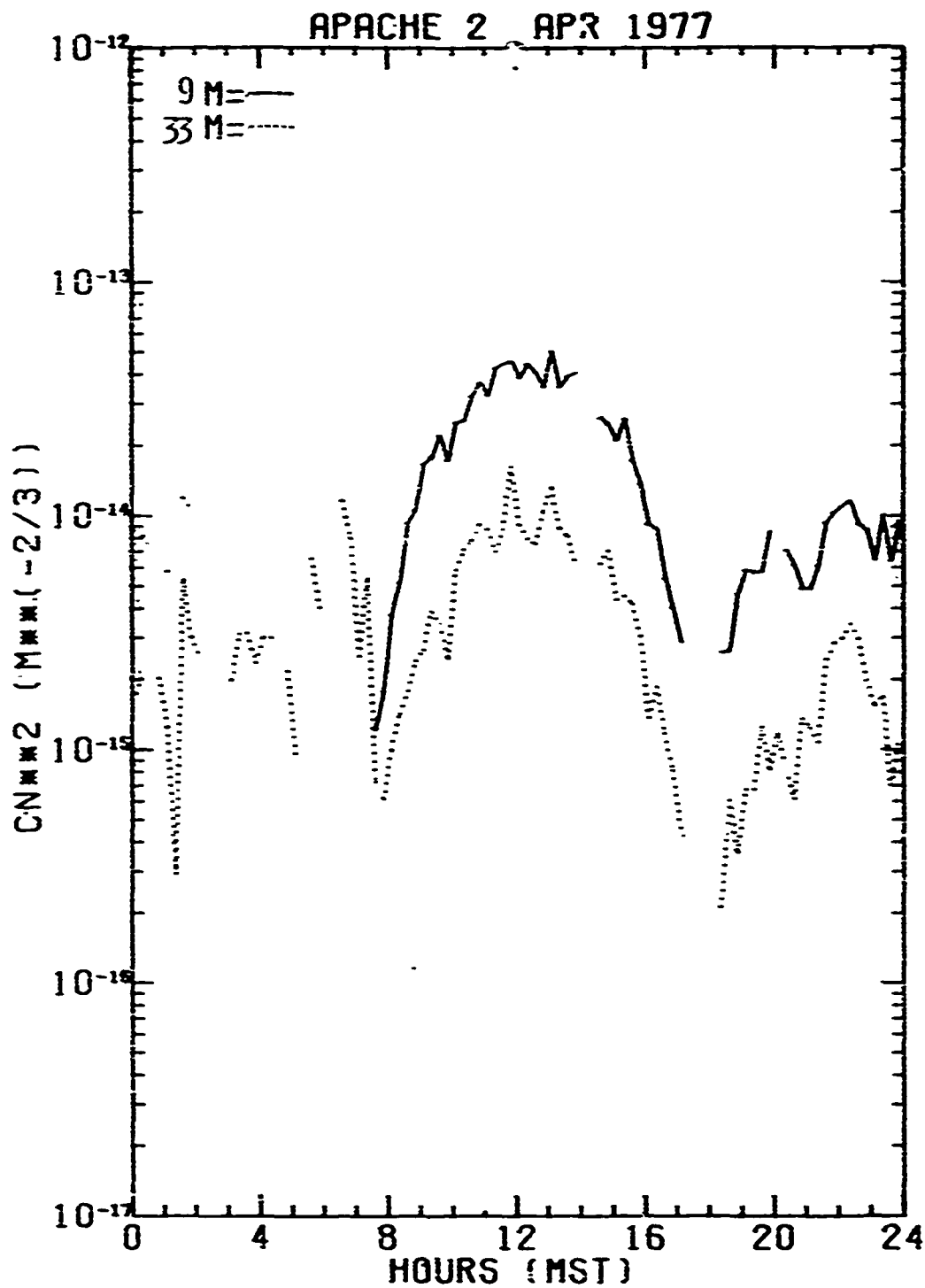


Figure 95. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 2 April 1977.

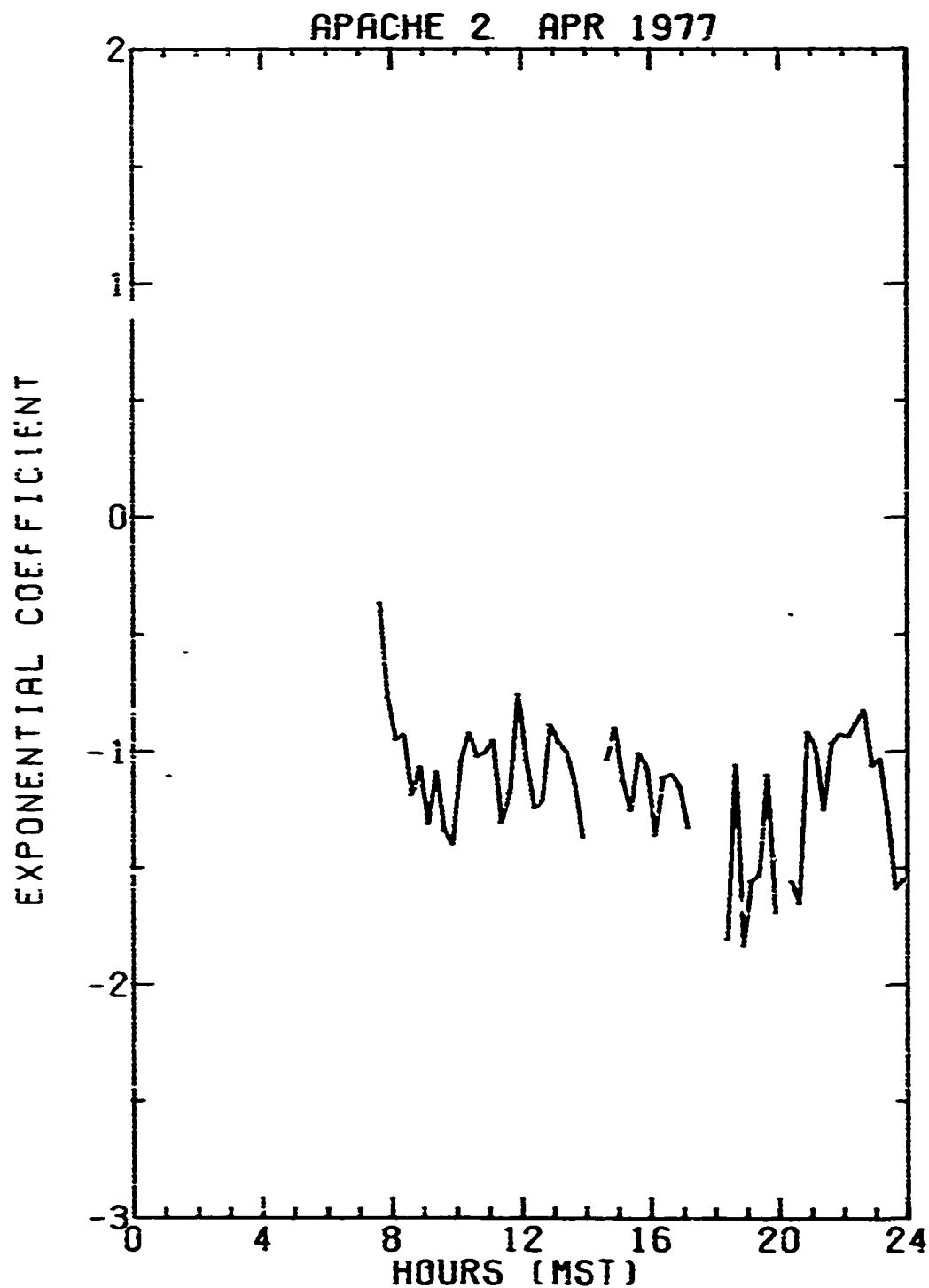


Figure 96. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 2 April 1977.

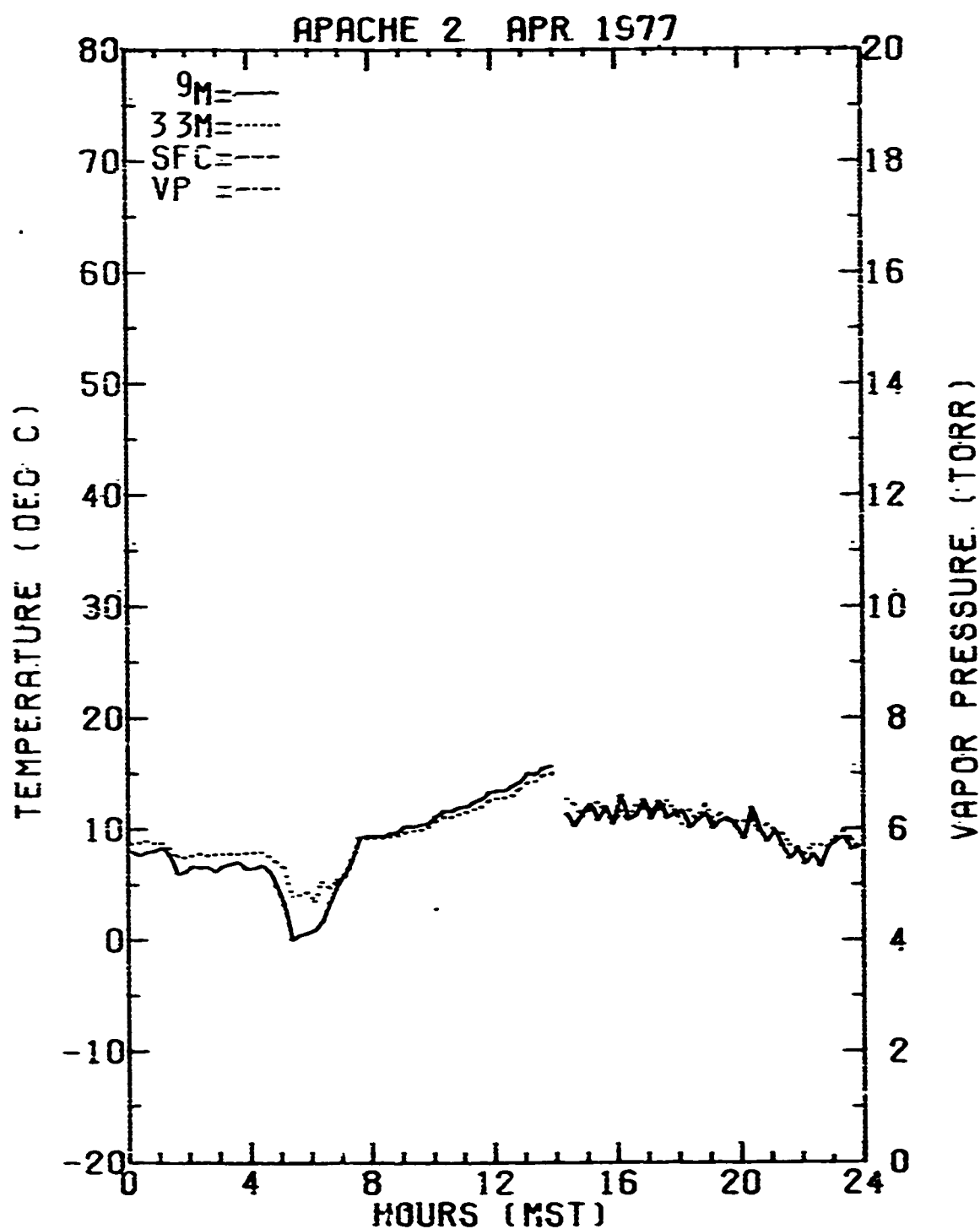


Figure 97. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 2 April 1977.

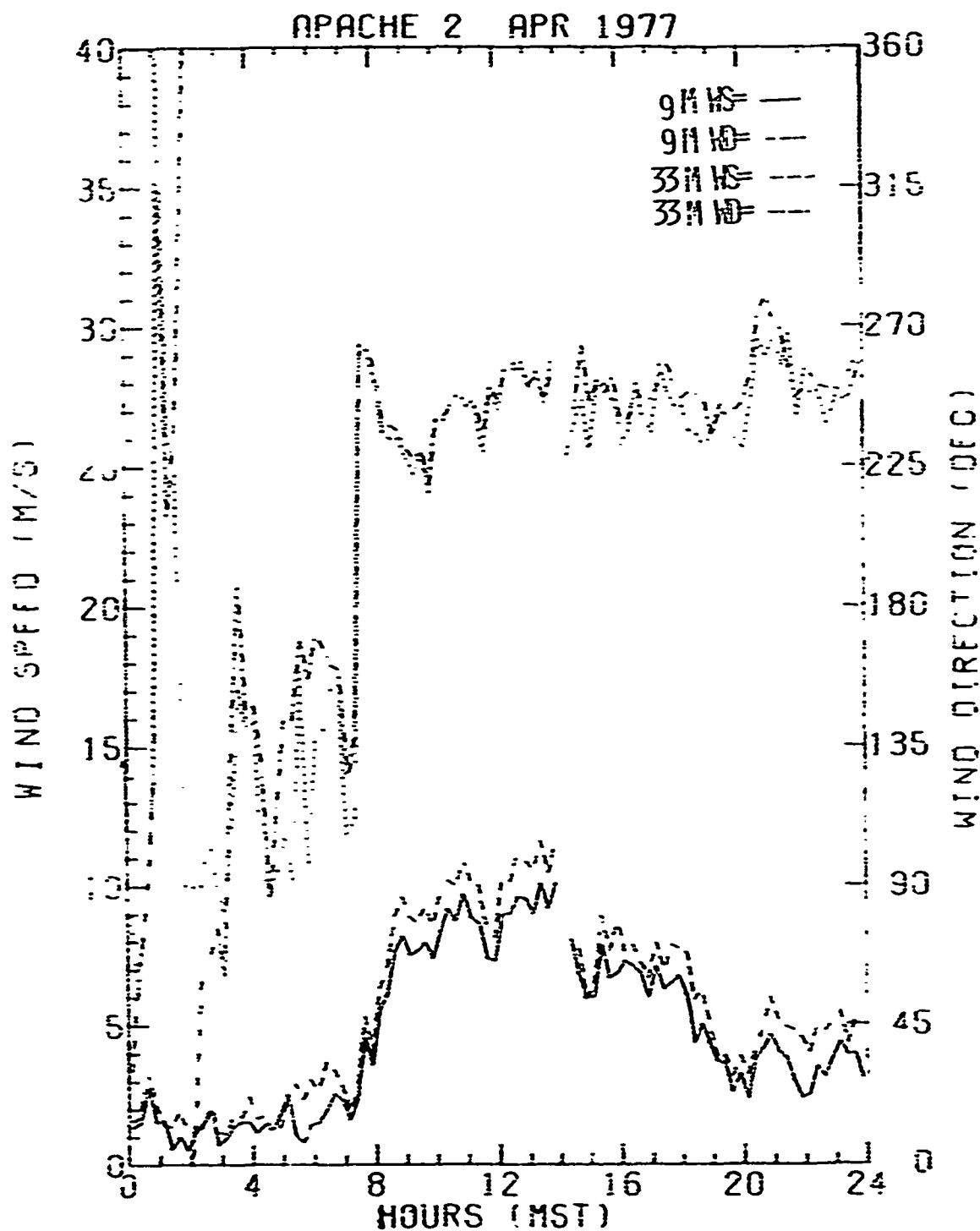


Figure 98. Diurnal variation of wind speed and wind direction at the 9 and 33 m tower levels, Apache Site, 2 April 1977.

TABLE 57

APACHE SITE RAWINSONDE DATA

DATE: 02 APR 77

RELEASE NO.: 30

RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/5)
0.0	655.1	6.0	2.4	110.0	3.1
223.7	637.5	6.4	2.3	201.4	3.2
524.3	614.5	4.0	2.1	231.5	7.5
1190.5	565.7	-1.3	1.8	245.5	13.1
1616.3	536.1	-5.7	1.6	249.3	19.4
1780.4	525.0	-6.4	1.3	249.8	22.5
1935.0	514.7	-7.1	0.7	249.5	24.1
2283.2	492.2	-8.4	0.8	247.5	25.8
2746.7	483.7	-8.4	0.5	242.0	27.9
4012.1	392.8	-18.1	0.3	247.4	31.0

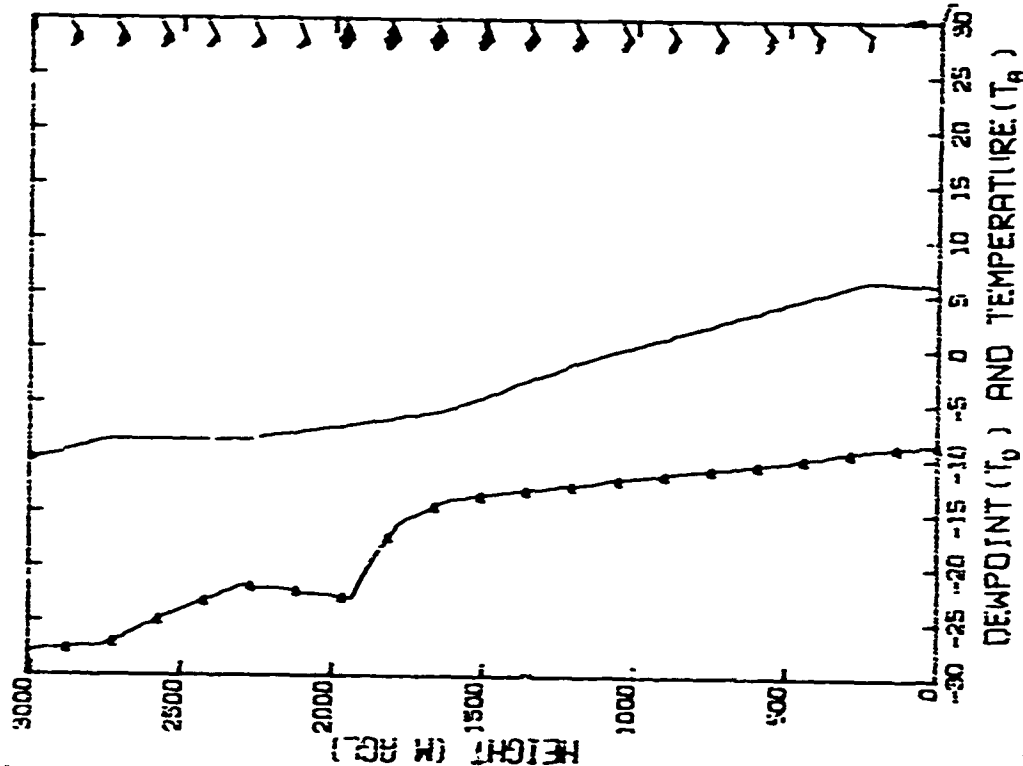


TABLE 58
APACHE SITE RAWINSONDE DATA

DATE: 02 APR 77 RELEASE NO. 31 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	654.8	15.8	2.4	240.0 10.3
225.4	637.5	10.6	2.3	238.8 10.8
460.1	619.7	8.3	2.1	237.7 11.4
514.2	615.7	7.6	3.1	237.6 11.5
1800.2	525.0	-4.2	1.5	246.5 14.4
2328.6	490.7	-9.0	1.2	248.9 14.7
2784.6	462.6	-11.1	1.0	255.1 22.8
3038.5	447.6	-10.7	0.7	245.0 30.2

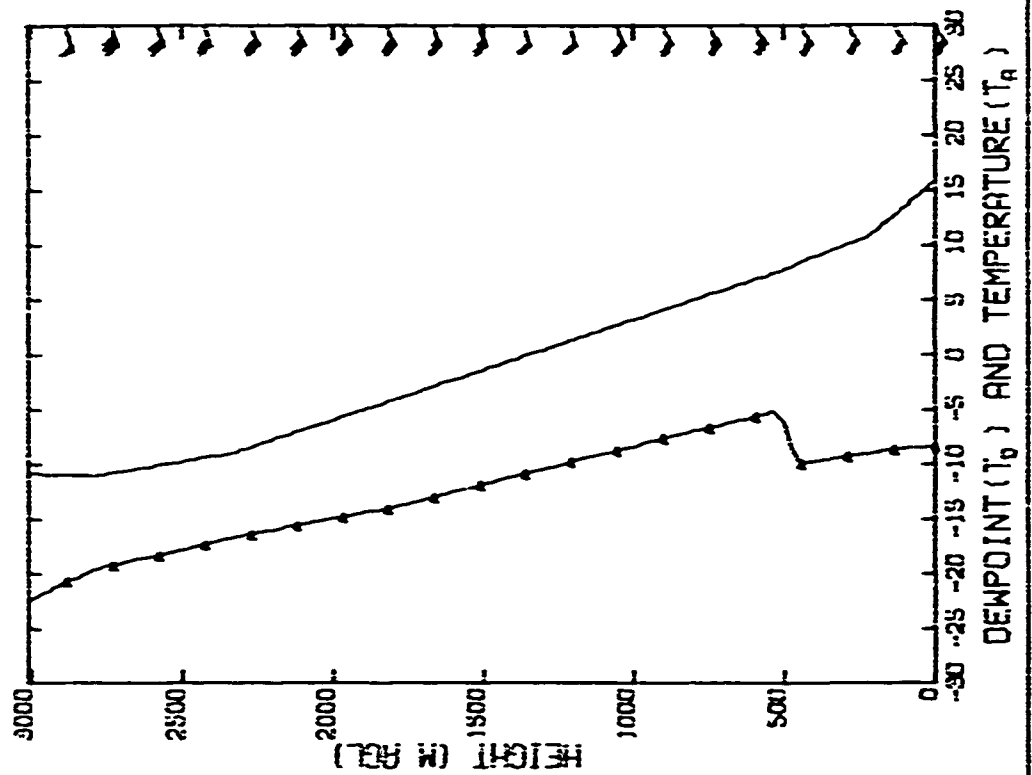


TABLE 59 APACHE SITE RAWINSONDE DATA

DATE: 02 APR 77

RELEASE NO.: 32

RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	652.9	17.0	2.6	240.0 11.3
203.0	637.5	14.2	2.5	240.6 11.5
1795.3	525.0	-1.8	1.4	236.8 15.8
3414.0	426.2	-15.5	0.8	237.2 26.9

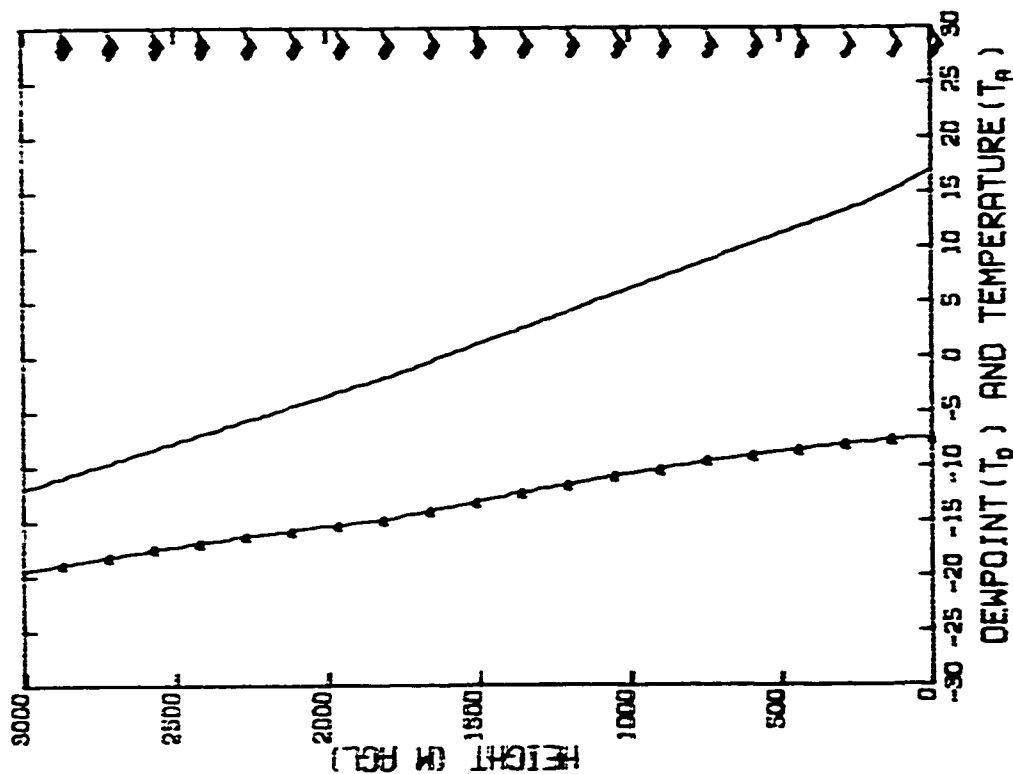
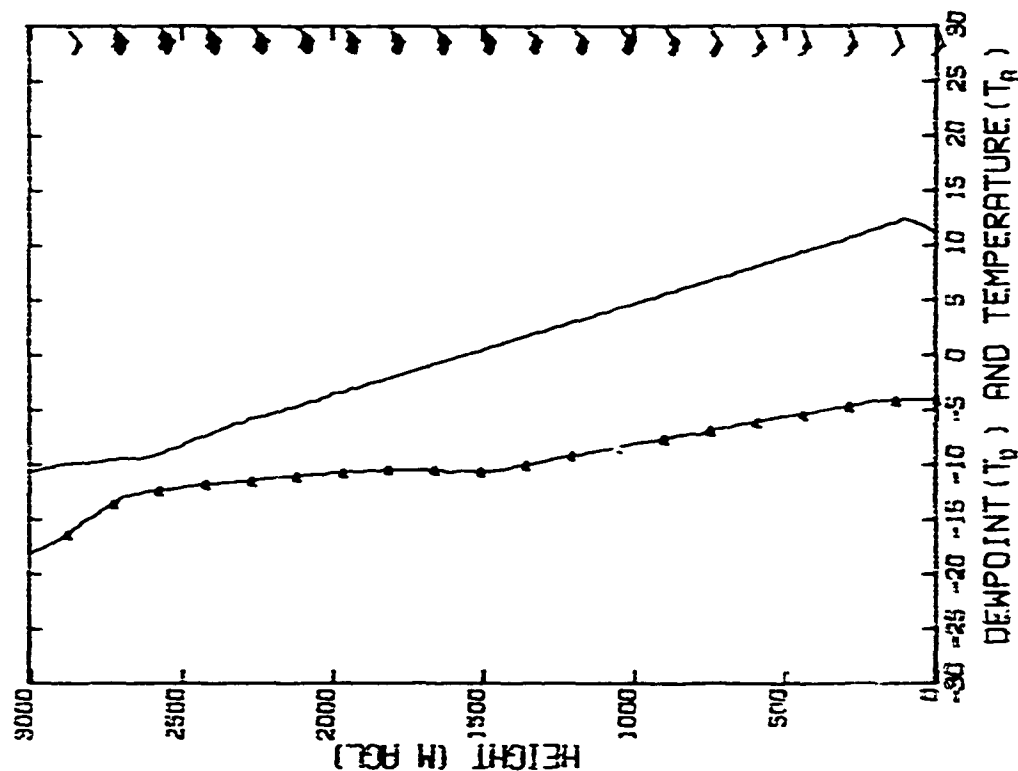


TABLE 60
APACHE SITE RAWINSONDE DATA

DATE: 02 APR 77 RELEASE NO.: 33 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIP (DEG)	WIND SPEED (M/S)
0.0	654.1	11.2	3.4	250.0	5.1
94.6	646.7	12.6	3.4	249.6	5.8
215.0	637.5	11.3	3.3	249.2	6.6
1476.2	546.6	0.7	2.0	224.8	16.8
1799.0	525.0	-2.0	2.1	223.0	17.3
2350.3	489.6	-6.6	1.9	221.3	21.6
2622.3	472.8	-9.5	1.7	225.8	23.2
2691.4	468.6	-9.5	1.7	227.1	23.6
2904.8	455.8	-10.1	1.2	230.9	24.6
3228.1	437.1	-12.1	0.8	234.9	26.3



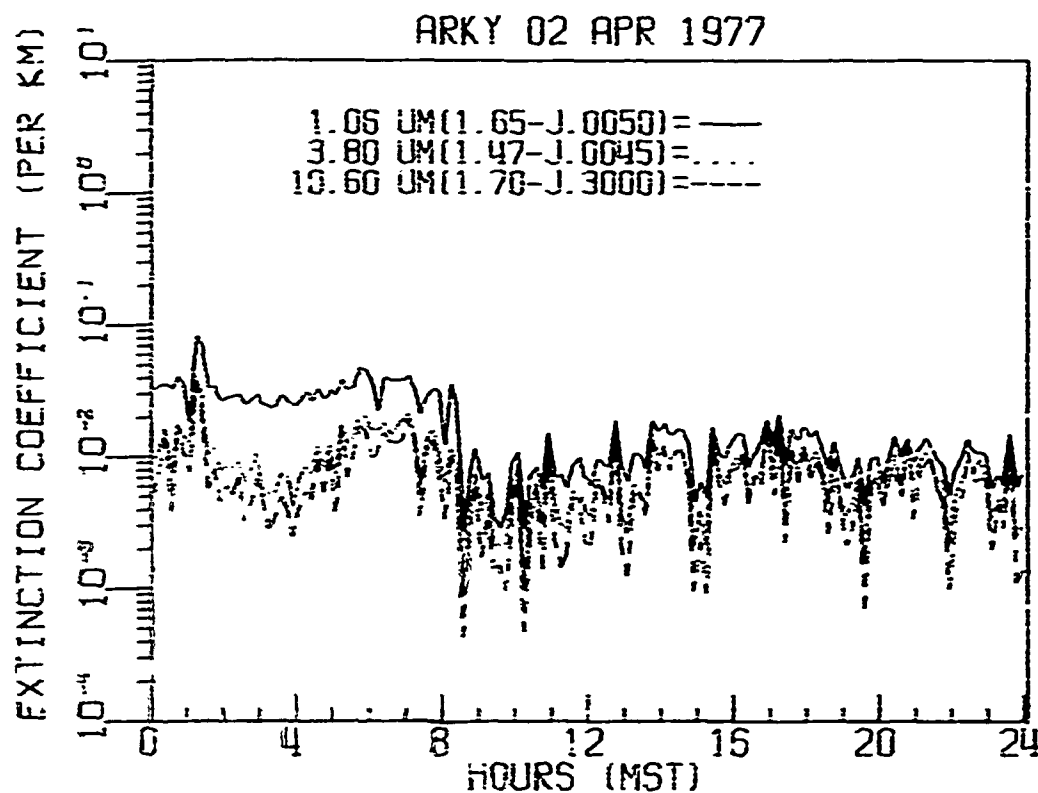


Figure 99. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 2 April 1977.

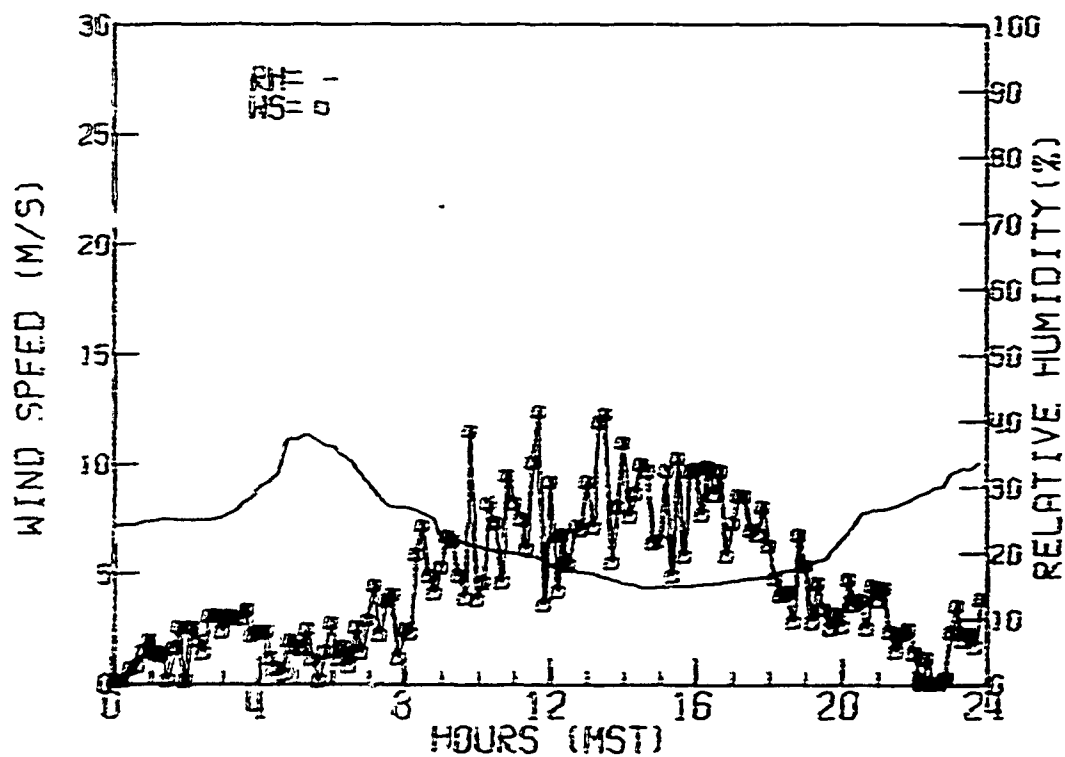


Figure 100. Diurnal variation of windspeed and relative humidity, Arky Site, 2 April 1977.

TABLE 61
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, W1M2

DATE TIME SAMPLE TIME (MST) (SEC)			CHANNELS										EXTINCTION (PER K4)			MASS LOADING (UG/M003)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
02 APR 77																	
0	01:00	600	.63-C1	.10-C1	.24-C1	.19-C1	.00	.49-C1	.00	.00	.00	.00	.33-C1	.10-C1	.55-C2	.69	
0	01:05	600	.67-C1	.71-C1	.21-C1	.19-C1	.49-C1	.00	.20-C1	.00	.00	.00	.35-C1	.12-C1	.46-C2	.93	
0	01:10	600	.69-C1	.43-C1	.27-C1	.76-C1	.00	.20-C1	.00	.00	.00	.00	.36-C1	.16-C1	.38-C1	172	
0	01:15	600	.71-C1	.59-C1	.19-C1	.00	.00	.00	.00	.00	.00	.00	.35-C1	.75-C2	.40-C2	61	
0	01:20	600	.62-C1	.69-C1	.21-C1	.14-C1	.14-C1	.20-C1	.00	.00	.00	.00	.40-C1	.18-C1	.38-C1	171	
0	01:25	600	.61-C1	.74-C1	.14-C1	.19-C1	.00	.00	.00	.00	.00	.00	.35-C1	.11-C1	.11-C1	152	
0	01:30	600	.20-C1	.75-C1	.43-C1	.61-C1	.00	.00	.00	.00	.00	.00	.19-C1	.13-C1	.79-C2	.67	
0	01:35	600	.12-C1	.17-C1	.19-C1	.01-C1	.00	.00	.00	.00	.00	.00	.44-C1	.41-C1	.36-C1	428	
0	01:40	600	.11-C1	.17-C1	.40-C1	.76-C1	.00	.94-C1	.00	.00	.00	.00	.69-C1	.23-C1	.23-C1	247	
0	01:45	600	.69-C1	.60-C1	.33-C1	.14-C1	.00	.00	.00	.00	.00	.00	.35-C1	.11-C1	.58-C2	72	
0	01:50	600	.61-C1	.73-C1	.37-C1	.19-C1	.48-C1	.00	.00	.00	.00	.00	.34-C1	.12-C1	.62-C2	76	
0	01:55	600	.59-C1	.66-C1	.28-C1	.19-C1	.00	.00	.00	.00	.00	.00	.27-C1	.01-C2	.66-C2	59	
0	02:00	600	.53-C1	.62-C1	.24-C1	.00	.44-C1	.00	.00	.00	.00	.00	.28-C1	.06-C2	.62-C2	48	
0	02:05	600	.61-C1	.60-C1	.12-C1	.33-C1	.00	.00	.00	.00	.00	.00	.33-C1	.04-C2	.50-C2	69	
0	02:10	600	.57-C1	.73-C1	.19-C1	.33-C1	.00	.44-C1	.00	.00	.00	.00	.30-C1	.03-C2	.70-C2	49	
0	02:15	600	.59-C1	.54-C1	.21-C1	.33-C1	.00	.00	.00	.00	.00	.00	.16-C1	.51-C2	.31-C2	49	
0	02:20	600	.54-C1	.67-C1	.28-C1	.19-C1	.00	.00	.00	.00	.00	.00	.27-C1	.01-C2	.46-C2	58	
0	02:25	600	.56-C1	.77-C1	.21-C1	.44-C1	.00	.00	.00	.00	.00	.00	.32-C1	.11-C1	.59-C2	77	
0	02:30	600	.54-C1	.39-C1	.01-C1	.00	.44-C1	.00	.00	.00	.00	.00	.23-C1	.01-C2	.47-C2	40	
0	02:35	600	.59-C1	.63-C1	.12-C1	.33-C1	.00	.00	.00	.00	.00	.00	.24-C1	.51-C2	.29-C2	40	
0	02:40	600	.54-C1	.39-C1	.01-C1	.19-C1	.00	.00	.00	.00	.00	.00	.27-C1	.01-C2	.50-C2	41	
0	02:45	600	.59-C1	.67-C1	.28-C1	.19-C1	.00	.00	.00	.00	.00	.00	.27-C1	.01-C2	.48-C2	46	
0	02:50	600	.57-C1	.67-C1	.19-C1	.33-C1	.00	.00	.00	.00	.00	.00	.31-C1	.51-C2	.55-C2	73	
0	02:55	600	.59-C1	.67-C1	.19-C1	.33-C1	.00	.00	.00	.00	.00	.00	.28-C1	.74-C2	.49-C2	44	
0	03:00	600	.57-C1	.67-C1	.19-C1	.33-C1	.00	.00	.00	.00	.00	.00	.27-C1	.01-C2	.48-C2	46	
0	03:05	600	.59-C1	.67-C1	.19-C1	.33-C1	.00	.00	.00	.00	.00	.00	.31-C1	.51-C2	.55-C2	73	
0	03:10	600	.59-C1	.67-C1	.19-C1	.33-C1	.00	.00	.00	.00	.00	.00	.28-C1	.74-C2	.49-C2	44	
0	03:15	600	.63-C1	.50-C1	.14-C1	.30-C1	.00	.00	.00	.00	.00	.00	.33-C1	.12-C1	.37-C2	140	
0	03:20	600	.59-C1	.43-C1	.14-C1	.30-C1	.00	.00	.00	.00	.00	.00	.32-C1	.03-C2	.53-C2	136	
0	03:25	600	.59-C1	.69-C1	.19-C1	.19-C1	.00	.00	.00	.00	.00	.00	.30-C1	.75-C2	.39-C2	46	
0	03:30	600	.61-C1	.69-C1	.14-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.16-C1	.17-C1	222	
0	03:35	600	.59-C1	.69-C1	.14-C1	.33-C1	.00	.00	.00	.00	.00	.00	.33-C1	.13-C1	.72-C2	78	
0	03:40	600	.59-C1	.71-C1	.19-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	03:45	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	03:50	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	03:55	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:00	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:05	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:10	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:15	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:20	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:25	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:30	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:35	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:40	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:45	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:50	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	04:55	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:00	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:05	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:10	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:15	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:20	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:25	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:30	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:35	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:40	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:45	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:50	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	05:55	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:00	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:05	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:10	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:15	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:20	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:25	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:30	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:35	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:40	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:45	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:50	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	06:55	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	
0	07:00	600	.77-C1	.33-C1	.33-C1	.33-C1	.00	.49-C1	.00	.00	.00	.00	.38-C1	.13-C1	.72-C2	78	

TABLE 61 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINGUISHION, AND MASS LOADING
ARKY SITE, WNP

DATE	TIME (MST)	SAMPLE TIME (SEC)	GRAVEL										EXTINGUISHION (PER K4)			MASS LOADING (UG/M ² /MO3)	
			1	2	3	4	5	6	7	8	9	10	1.0A	3.0	10.6		
32 APR 77	06:47:50	600	.50+01	.80+00	.52+00	.40+01	.00	.20+01	.00	.00	.00	.00	.39-01	.19-01	.14-01	140.	
	07:02:30	600	.62+01	.50+00	.24+00	.40+01	.40+01	.37+01	.00	.00	.00	.00	.42-01	.22-01	.20-01	249.	
	07:17:50	600	.51+01	.56+00	.21+00	.30+01	.48-01	.20+01	.00	.00	.00	.00	.32-01	.19-01	.17-01	142.	
	07:22:30	600	.43+01	.50+00	.12+00	.19+01	.00	.00	.00	.00	.00	.00	.22-01	.13-01	.17-02	47.	
	07:30:00	600	.45+01	.40+00	.33+00	.30+01	.40+01	.00	.00	.00	.00	.00	.29-01	.13-01	.11-01	41.	
	07:36:30	600	.51+01	.40+00	.37+00	.33+01	.40+01	.00	.00	.00	.00	.00	.33-01	.13-01	.10-01	155.	
	07:50:00	600	.50+01	.71+00	.27+00	.15+01	.40+01	.00	.00	.00	.00	.00	.32-01	.13-01	.70+02	72.	
	08:02:30	600	.15+01	.77+00	.19+00	.15+01	.00	.00	.00	.00	.00	.00	.13-01	.13-01	.55+02	13.	
	08:10:00	600	.70+01	.56+00	.41+00	.41+01	.40+01	.00	.00	.00	.00	.00	.30+01	.12-01	.90+02	90.	
	08:22:30	600	.45+01	.20+00	.13+00	.00	.00	.00	.00	.00	.00	.00	.20+01	.13-01	.71+02	115.	
	08:30:00	600	.49+00	.13+00	.30+00	.00	.00	.00	.00	.00	.00	.00	.70+02	.92+03	.40+03	5.	
	08:40:30	600	.40+00	.45+00	.91+00	.14+01	.00	.00	.00	.00	.00	.00	.70+02	.41+02	.70+02	22.	
	08:50:00	600	.40+00	.47+00	.91+00	.14+01	.40+01	.00	.00	.00	.00	.00	.12-01	.70+02	.75+02	41.	
	09:02:30	600	.42+00	.55+00	.13+00	.00	.00	.00	.00	.00	.00	.00	.50+02	.30+02	.17+02	15.	
	09:10:00	600	.47+00	.45+00	.91+00	.30+01	.00	.00	.00	.00	.00	.00	.70+02	.52+02	.30+02	29.	
	09:20:30	600	.43+00	.13+00	.30+00	.14+01	.00	.00	.00	.00	.00	.00	.30+02	.21+02	.13+02	10.	
	09:30:00	600	.23+00	.17+00	.30+00	.14+01	.00	.00	.00	.00	.00	.00	.29+02	.22+02	.19+02	13.	
	09:40:30	600	.40+00	.19+00	.12+00	.00	.00	.00	.00	.00	.00	.00	.30+02	.22+02	.10+02	5.	
	09:50:00	600	.13+01	.19+00	.15+00	.30+01	.00	.00	.00	.00	.00	.00	.42+02	.53+02	.35+02	32.	
	10:02:30	600	.60+00	.20+00	.12+00	.00	.40+01	.00	.00	.00	.00	.00	.11-01	.40+02	.50+02	100.	
	10:10:00	600	.50+00	.13+00	.30+00	.00	.00	.00	.00	.00	.00	.00	.29+02	.10+02	.40+03	6.	
	10:20:30	600	.70+00	.20+00	.13+00	.14+01	.00	.00	.00	.00	.00	.00	.70+02	.42+02	.20+02	22.	
	10:30:00	600	.73+00	.13+00	.91+00	.00	.00	.00	.00	.00	.00	.00	.40+02	.60+02	.40+02	49.	
	10:40:30	600	.40+00	.21+00	.11+00	.00	.00	.00	.00	.00	.00	.00	.50+02	.31+02	.14+02	12.	
	10:50:00	600	.12+01	.41+00	.91+00	.30+01	.40+01	.00	.00	.00	.00	.00	.15+01	.13+01	.13+01	122.	
	11:02:30	600	.42+01	.20+00	.13+00	.14+01	.00	.00	.00	.00	.00	.00	.70+02	.40+02	.20+02	22.	
	11:10:00	600	.40+00	.20+00	.13+00	.14+01	.00	.00	.00	.00	.00	.00	.70+02	.31+02	.19+02	15.	
	11:20:30	600	.40+00	.19+00	.12+00	.14+01	.40+01	.00	.00	.00	.00	.00	.50+02	.20+02	.19+02	15.	
	11:30:00	600	.41+01	.36+00	.12+00	.14+01	.40+01	.00	.00	.00	.00	.00	.40+02	.30+02	.50+02	32.	
	11:40:30	600	.42+00	.30+00	.12+00	.14+01	.00	.00	.00	.00	.00	.00	.70+02	.42+02	.20+02	21.	
	11:50:00	600	.71+00	.32+00	.91+00	.14+01	.00	.00	.00	.00	.00	.00	.62+02	.35+02	.21+02	22.	
	12:02:30	600	.73+00	.30+00	.41+00	.00	.00	.00	.00	.00	.00	.00	.97+02	.70+02	.40+02	92.	
	12:10:00	600	.10+01	.19+00	.41+00	.30+01	.40+01	.00	.00	.00	.00	.00	.90+02	.37+02	.50+02	17.	
	12:20:30	600	.12+01	.26+00	.91+00	.30+01	.00	.00	.00	.00	.00	.00	.40+02	.47+02	.32+02	10.	
	12:30:00	600	.11+01	.41+00	.41+00	.14+01	.00	.00	.00	.00	.00	.00	.19+01	.15+01	.16+01	209.	
	12:40:30	600	.12+01	.41+00	.41+00	.14+01	.00	.00	.00	.00	.00	.00	.40+02	.30+02	.23+02	24.	
	12:50:00	600	.09+01	.36+00	.91+00	.14+01	.00	.00	.00	.00	.00	.00	.60+02	.27+02	.13+02	13.	
	13:00:30	600	.10+01	.51+00	.32+00	.14+01	.40+01	.00	.00	.00	.00	.00	.11+01	.60+02	.52+02	30.	
	13:10:00	600	.10+01	.32+00	.32+00	.30+01	.40+01	.00	.00	.00	.00	.00	.11+01	.35+02	.55+02	39.	
	13:20:30	600	.10+01	.32+00	.91+00	.00	.40+01	.00	.00	.00	.00	.00	.40+02	.42+02	.37+02	22.	

TABLE 61 (cont)
PARTICULATE SIZE DISTRIBUTION - CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WENT

DATE TIME SAMPLE (MST) (SEC)	CANAL										EXTINCTION (PER K9)			MASS LOADING (UG/M ³)	
	1	2	3	4	5	6	7	8	9	10	1.26	3.8	13.6		
02 APR 77															
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	137.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	59.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	75.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	109.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	123.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	117.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	42.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	9.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	20.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	131.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	94.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	44.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	63.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	114.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	109.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	209.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	46.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	214.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	123.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	47.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	119.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	101.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	119.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	46.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	29.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	108.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	29.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	29.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	40.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	9.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	11.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	92.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	25.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	39.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	44.
13:00:00	49+00	27+00	48-01	20-C1	.00	.19-01	.15-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	.13-01	44.

TABLE 61 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WENT

CHANNEL										EXTINCTION (PER KM)		MASS LOADING (UG/M ³)	
DATE TIME SAMPLE (MST)	1	2	3	4	5	6	7	8	1.26	3.0	13.6		
02 APR 77													
20:30:00 600	.11-C1	.34-C0	.15-C0	.15-C1	.40-C1	.00	.00	.00	.10-01	.61-02	.51-02	13.	
20:40:00 600	.11-C1	.36-C1	.15-C1	.15-C1	.41-C1	.00	.00	.00	.11-01	.11-01	.11-01	119.	
20:50:00 600	.10-C1	.26-C0	.12-C0	.12-C1	.40-C1	.00	.00	.00	.03-02	.60-02	.35-02	27.	
21:00:00 600	.11-C1	.26-C1	.15-C0	.15-C1	.40-C1	.00	.00	.00	.12-01	.93-02	.90-02	56.	
21:10:00 600	.11-C1	.39-C0	.15-C0	.15-C1	.40-C1	.00	.00	.00	.14-01	.11-01	.93-02	68.	
21:20:00 600	.11-C1	.39-C1	.15-C1	.15-C1	.41-C1	.00	.00	.00	.14-01	.91-02	.91-02	109.	
21:30:00 600	.10-C1	.19-C0	.13-C0	.13-C1	.40-C1	.00	.00	.00	.07-02	.67-02	.59-02	39.	
21:40:00 600	.11-C1	.36-C1	.15-C1	.15-C1	.41-C1	.00	.00	.00	.10-02	.50-02	.46-02	39.	
21:50:00 600	.12-C0	.24-C0	.13-C1	.13-C1	.40-C1	.00	.00	.00	.53-02	.22-02	.10-02	31.	
22:00:00 600	.10-C1	.39-C0	.13-C0	.13-C1	.40-C1	.00	.00	.00	.02-02	.14-02	.90-02	37.	
22:10:00 600	.11-C1	.26-C1	.13-C1	.13-C1	.40-C1	.00	.00	.00	.10-03	.66-02	.53-02	33.	
22:20:00 600	.11-C1	.34-C0	.15-C0	.15-C0	.40-C1	.00	.00	.00	.14-01	.93-02	.11-01	117.	
22:30:00 600	.11-C1	.39-C1	.15-C0	.15-C1	.40-C1	.00	.00	.00	.11-01	.79-02	.67-02	95.	
22:40:00 600	.11-C1	.39-C1	.15-C1	.15-C1	.40-C1	.00	.00	.00	.11-01	.91-02	.68-02	56.	
22:50:00 600	.10-C0	.26-C0	.12-C0	.12-C1	.40-C1	.00	.00	.00	.10-03	.77-02	.69-02	47.	
23:00:00 600	.11-C1	.28-C1	.13-C1	.13-C1	.40-C1	.00	.00	.00	.53-02	.38-02	.21-02	18.	
23:10:00 600	.11-C1	.32-C0	.13-C1	.13-C1	.40-C1	.00	.00	.00	.73-02	.48-02	.45-02	27.	
23:20:00 600	.11-C1	.17-C1	.13-C1	.13-C1	.40-C1	.00	.00	.00	.69-02	.43-02	.30-02	26.	
23:30:00 600	.11-C1	.26-C0	.13-C1	.13-C1	.40-C1	.00	.00	.00	.13-01	.12-01	.10-01	179.	
23:40:00 600	.11-C1	.43-C1	.13-C1	.13-C1	.40-C1	.00	.00	.00	.11-02	.23-02	.11-02	12.	
23:50:00 600	.11-C1	.45-C0	.13-C1	.13-C1	.40-C1	.00	.00	.00	.74-02	.30-02	.14-02	15.	

Weather Summary

Date: 3 April 1977

Synoptic

Surface: Weak surface low-pressure area developed over central New Mexico and moved slowly eastward.

500 Millibar: Northeast-southwest oriented trough thru northeastern Arizona moving rapidly eastward with generally strong southwesterly flow over New Mexico.

Holloman AFB

Clouds: Mostly low (cumulus) and middle (altocumulus) cloudiness at 1800 m and 3000 m AGL, respectively, becoming partly cloudy after 1900 MST.

Wind: Generally southwesterly at 5-10 m sec⁻¹ with peak gust of 15 m sec⁻¹ from the southwest near noon decreasing thru the afternoon to northwesterly at 4 m sec⁻¹ by 1600 MST.

Visibility. Generally greater than 30 km.

Maximum temperature: 13.9°C

Corresponding vapor pressure: 2.7 Torr

Minimum temperature: 6.1°C

Corresponding vapor pressure: 4.0 Torr



Figure 101a. Surface weather map for 3 April 1977.

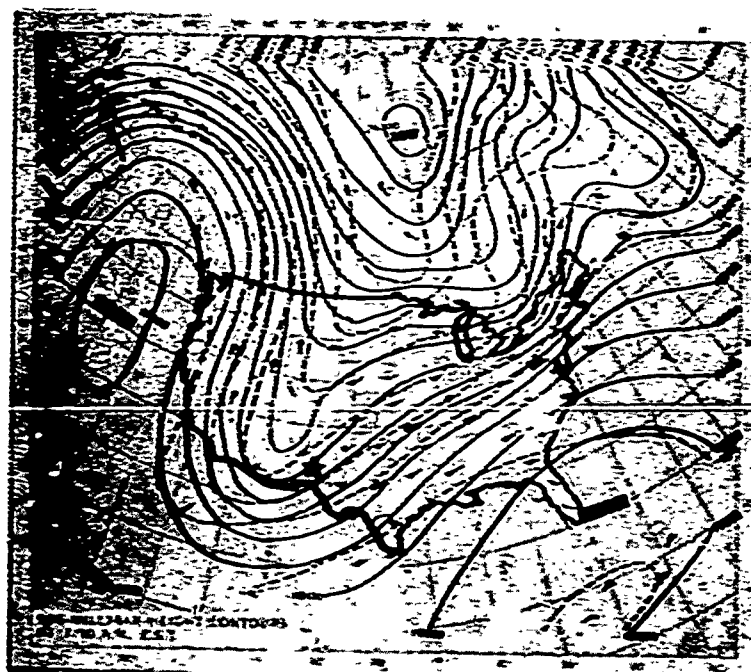


Figure 101b. 500-millibar height contours for 3 April 1977.

TABLE 62. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	7.7	3.2	-4.8	0	50 Ac	0	0030 - plane observed - checked acoustic sounder
0200	9.0	3.2	-4.6	0	90 Ac	0	0445 - plane observed
0300	7.0	4.7	.3	0	20 Ac	0	
0400	6.9	4.6	.2	0	30 Ac	0	
0500	6.5	4.6	0.0	0	90 Ac	0	
0600	5.9	2.9	-6.0	0	90 Ac	0	0730 - replaced broken 8 in u at Apache - still looks bad
0700	6.1	2.5	-7.9	0	80 Ac	0	
0800	6.9	2.4	-8.5	0	70 Ac	30 C1	Possible cumulonimbus S Possible cumulonimbus S 32 m "T" has spikes in high wind - suspect a defective probe Towering Cu SW-NW Towering Cu SW-NW CB NW, N-towering Cu SW-NW, NE-E/rain showers NW/dissipated Cb's S CB W, NW, N-E/rain showers NW, NE/virga W/towering Cu SW CB SW-N-SE and overhead/snow showers NW, E/virga N, S, E overhead Snow showers began 1715 (strong thermal activity noted on ΔT at 32m level only) Snow showers ended 1745 Cb all quads snow showers NW-SW, NE-SE virga N,S; breaks in overcast N, S Cb SE, SW rain showers SE, SW, lightening cloud to ground SE
0900	8.0	2.8	-6.5	80 Sc	0	20 C1	
1000	9.9	2.6	-7.4	30 Sc	30 Ac	10 C1	
1100	12.2	1.8	-12.3	70 Cu	05 Ac	0	
1200	13.8	2.5	-8.2	30 Cu	0	0	(thin) (thin)
1300	13.5	3.0	-5.5	60 Cu	0	0	
1400	12.1	2.5	-7.9	90 Sc	0	0	
1500	13.0	2.7	-6.9	40 Cu	0	0	
1600	12.3	2.6	-7.5	50 Cb	0	0	Snow showers ended 1745 Cb all quads snow showers NW-SW, NE-SE virga N,S; breaks in overcast N, S Cb SE, SW rain showers SE, SW, lightening cloud to ground SE
1700	11.8	2.4	-8.1	90 Cb	0	0	
1800							
1900							
1900	9.0	2.9	-5.9	90 Cb	10 Ac	-	(thin) (thin)
1900	8.9	2.2	-9.8	40 Cu	50 Ac	0	
2000	7.7	2.5	-7.9	30 Sc	70 Ac	0	
2100	8.3	2.3	-9.3	10 Sc	90 Ac	0	
2200	5.3	2.3	-9.0	0	30 Ac	60 C1	(thin) (thin)
2300	3.5	3.5	-3.6	0	20 Ac	20 C1	
2400	3.5	9.5	-3.6	0	20 Ac	0	

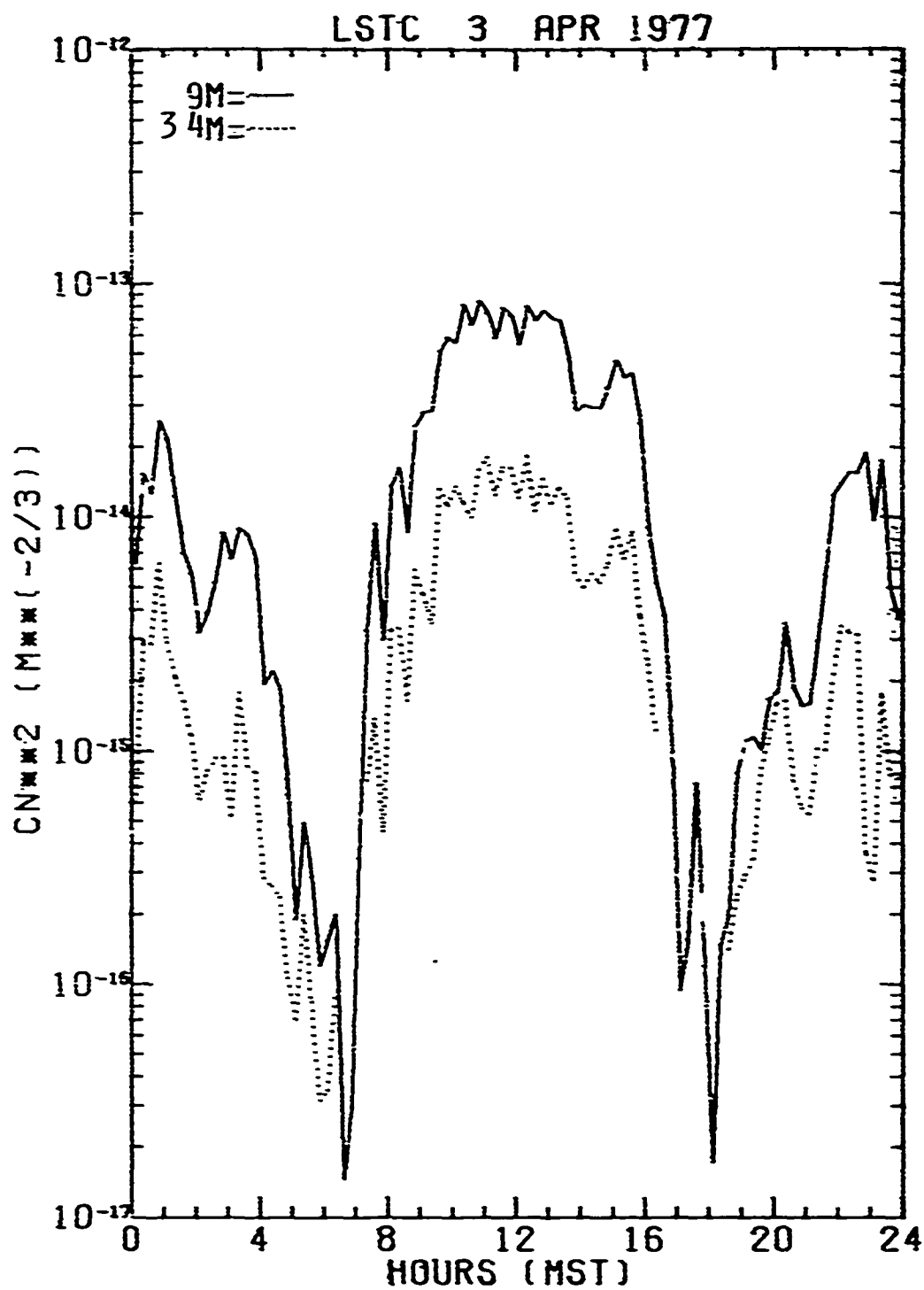


Figure 102. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 3 April 1977.

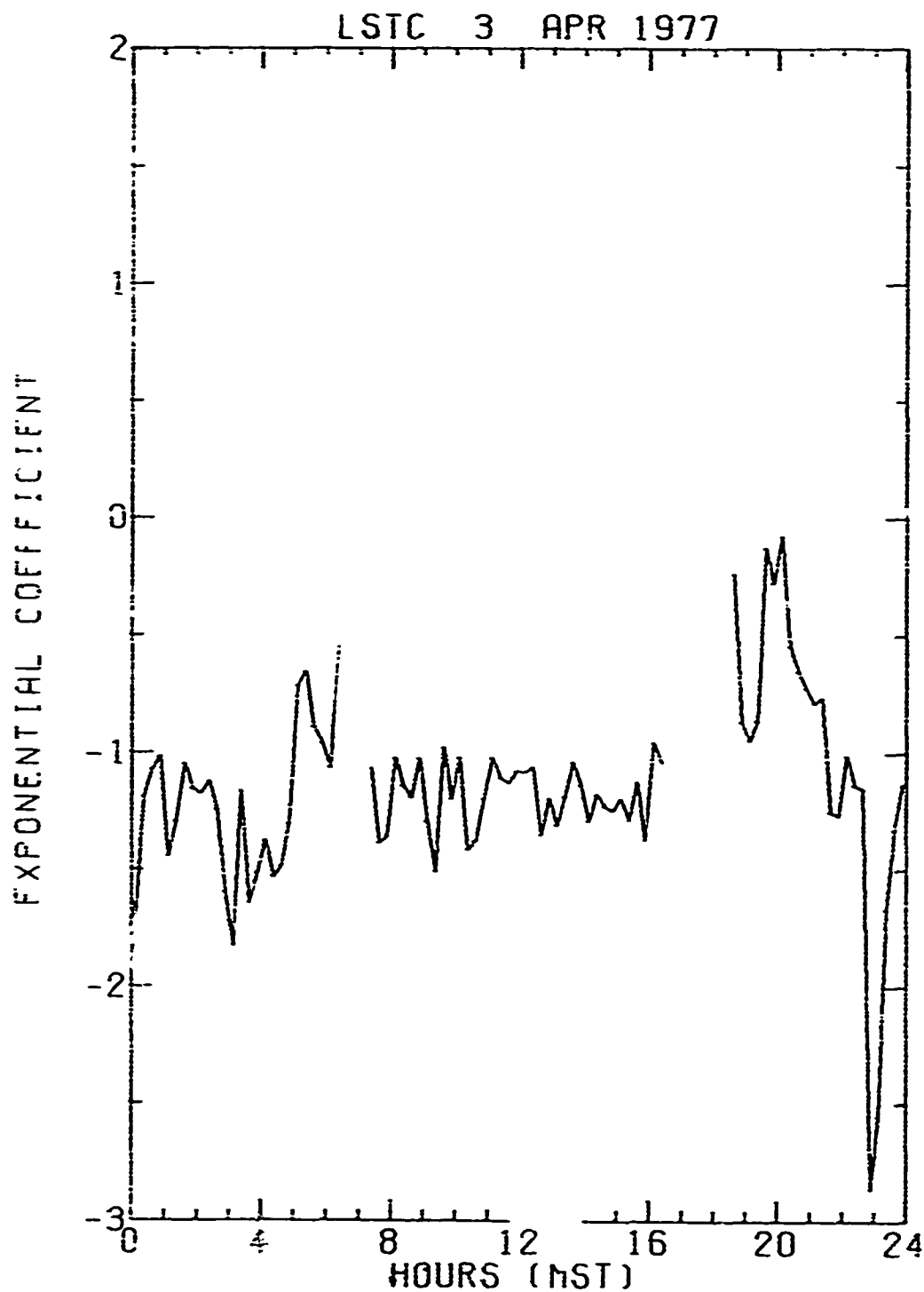


Figure 103. Diurnal variation of the altitude change of C_H^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_H^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_H^2 value, LSTC, 3 April 1977.

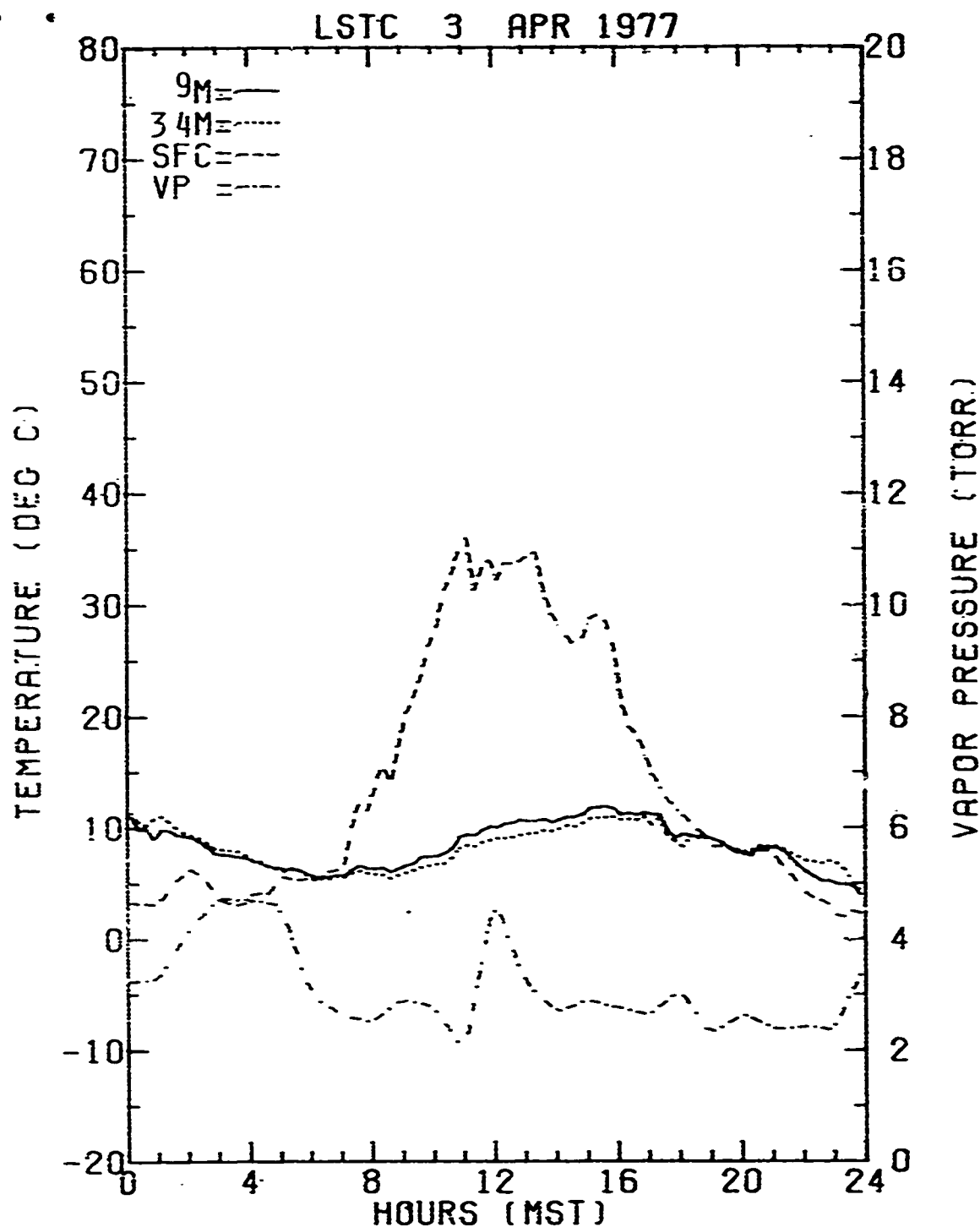


Figure 104. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 3 April 1977.

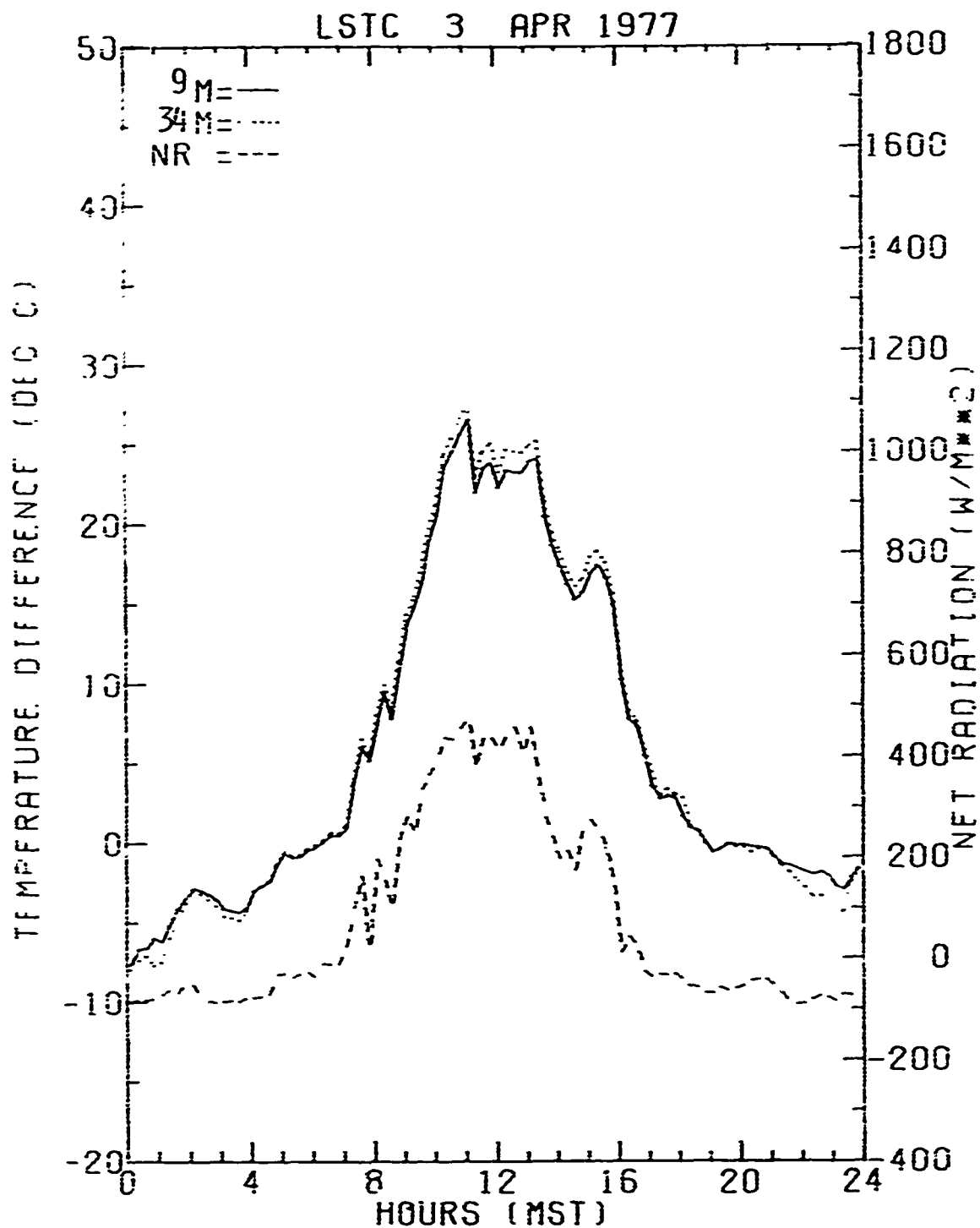


Figure 105. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 3 April 1977.

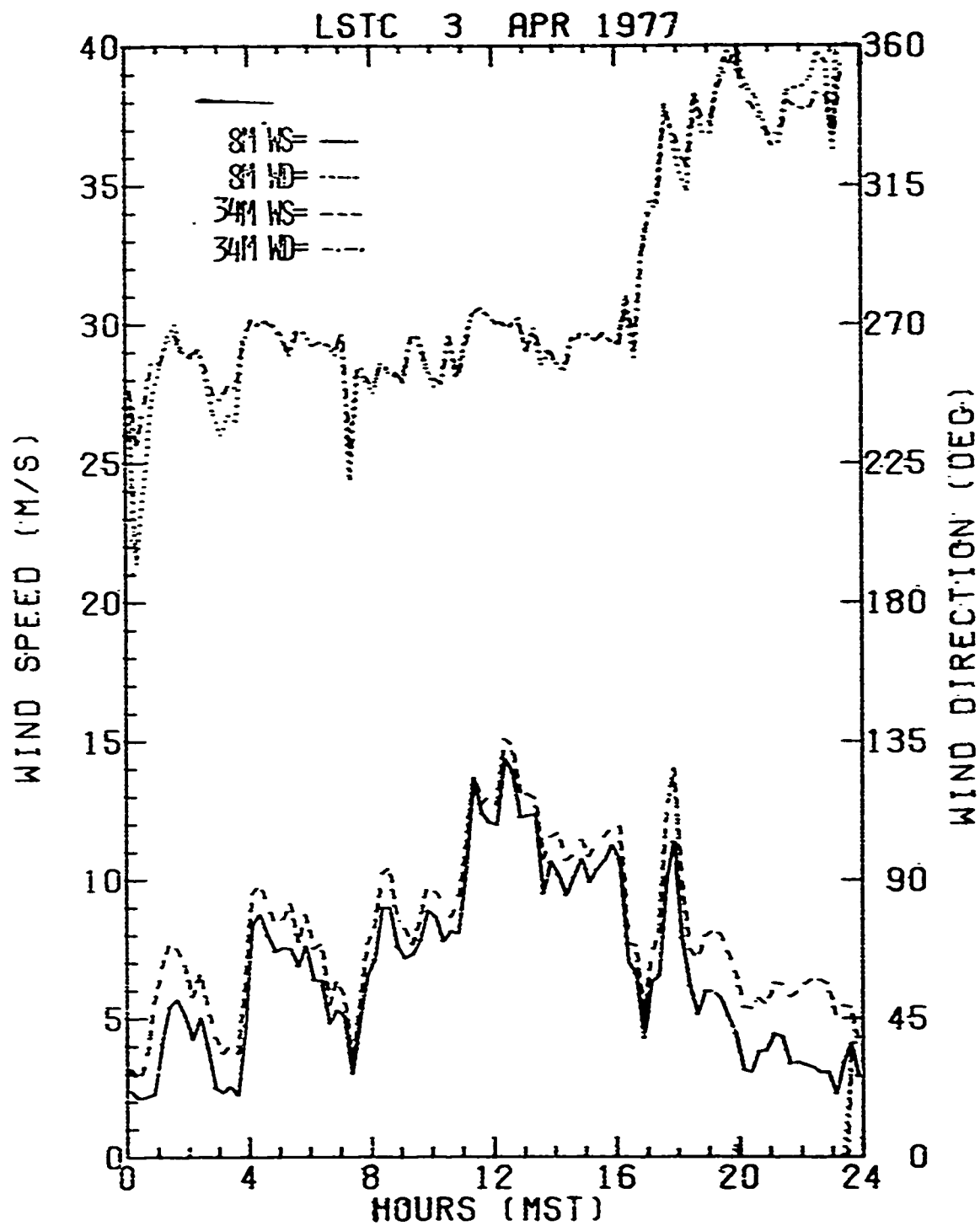


Figure 106. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 3 April 1977.

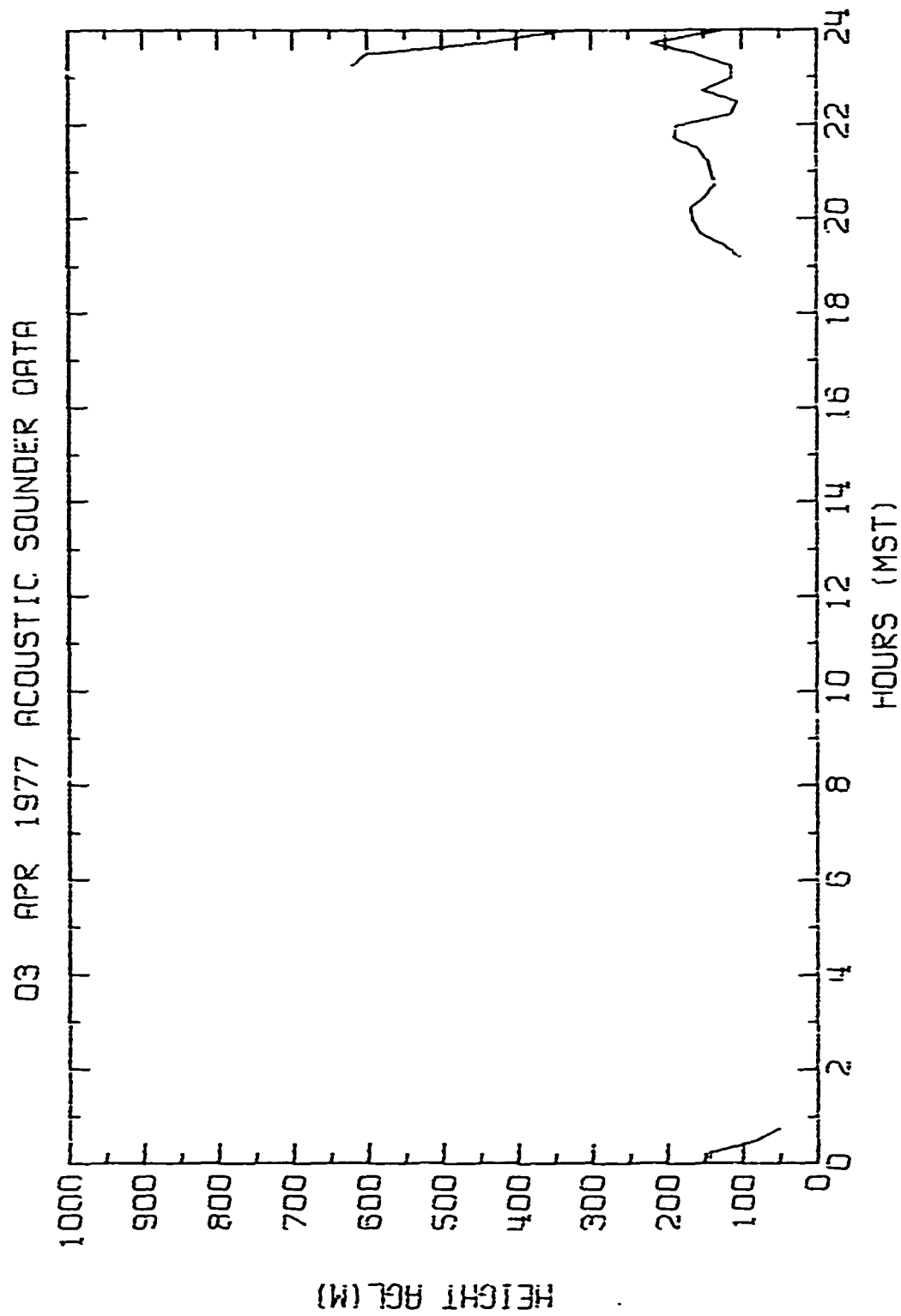


Figure 107. Inversion heights, LSTC, 3 April 1977.

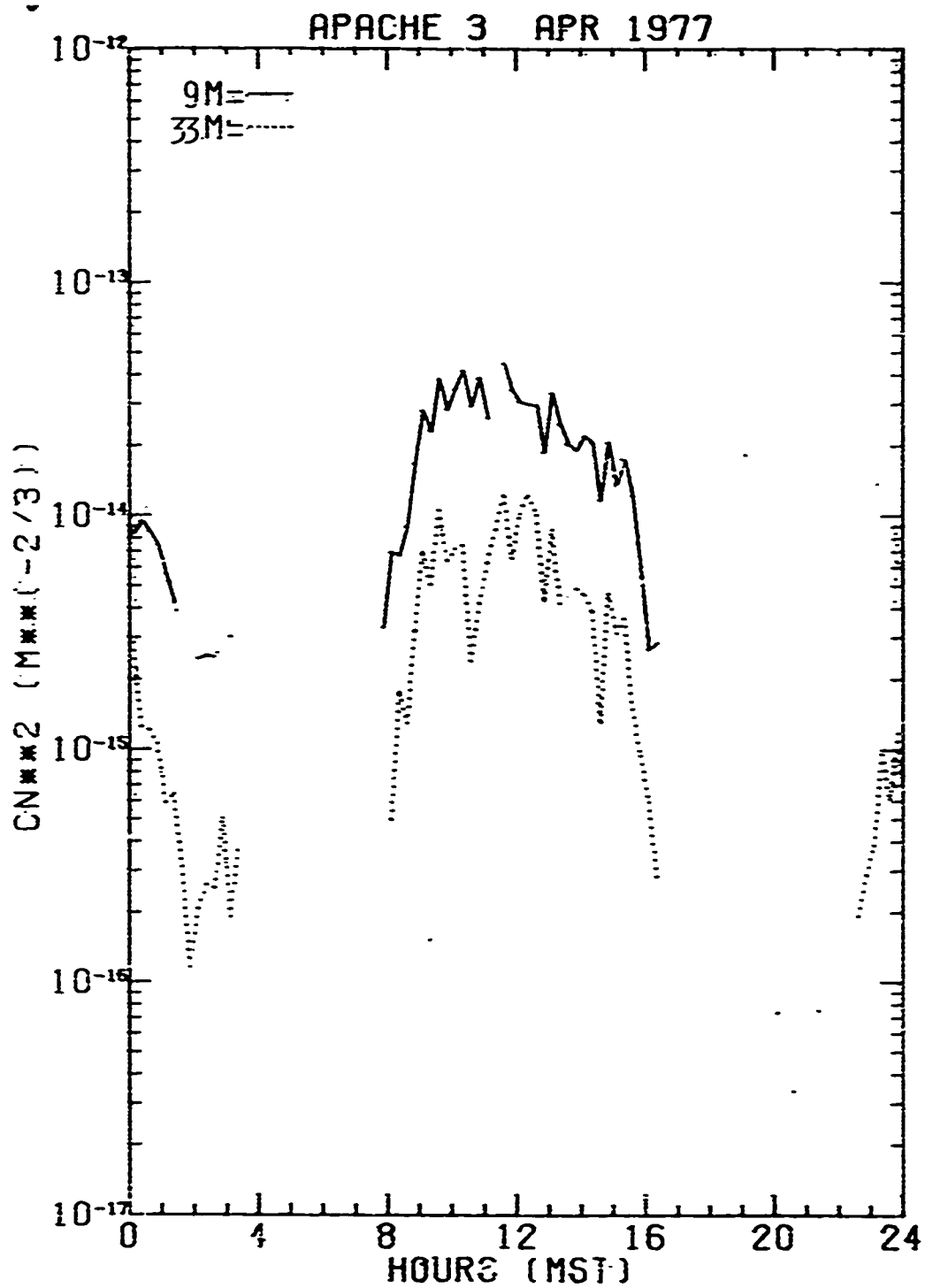


Figure 108. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m lower levels, 3 April 1977.

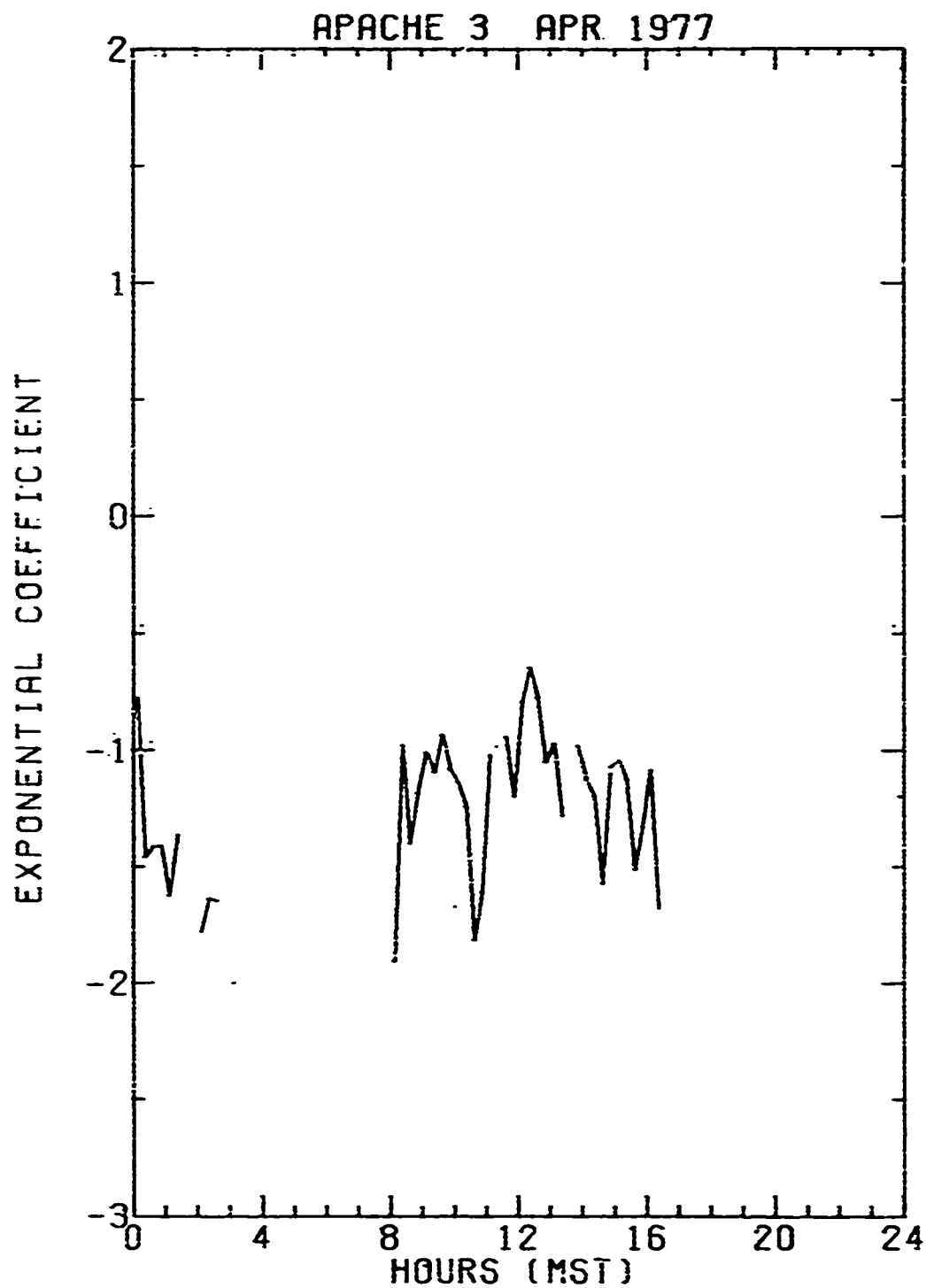


Figure 109. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 3 April 1977.

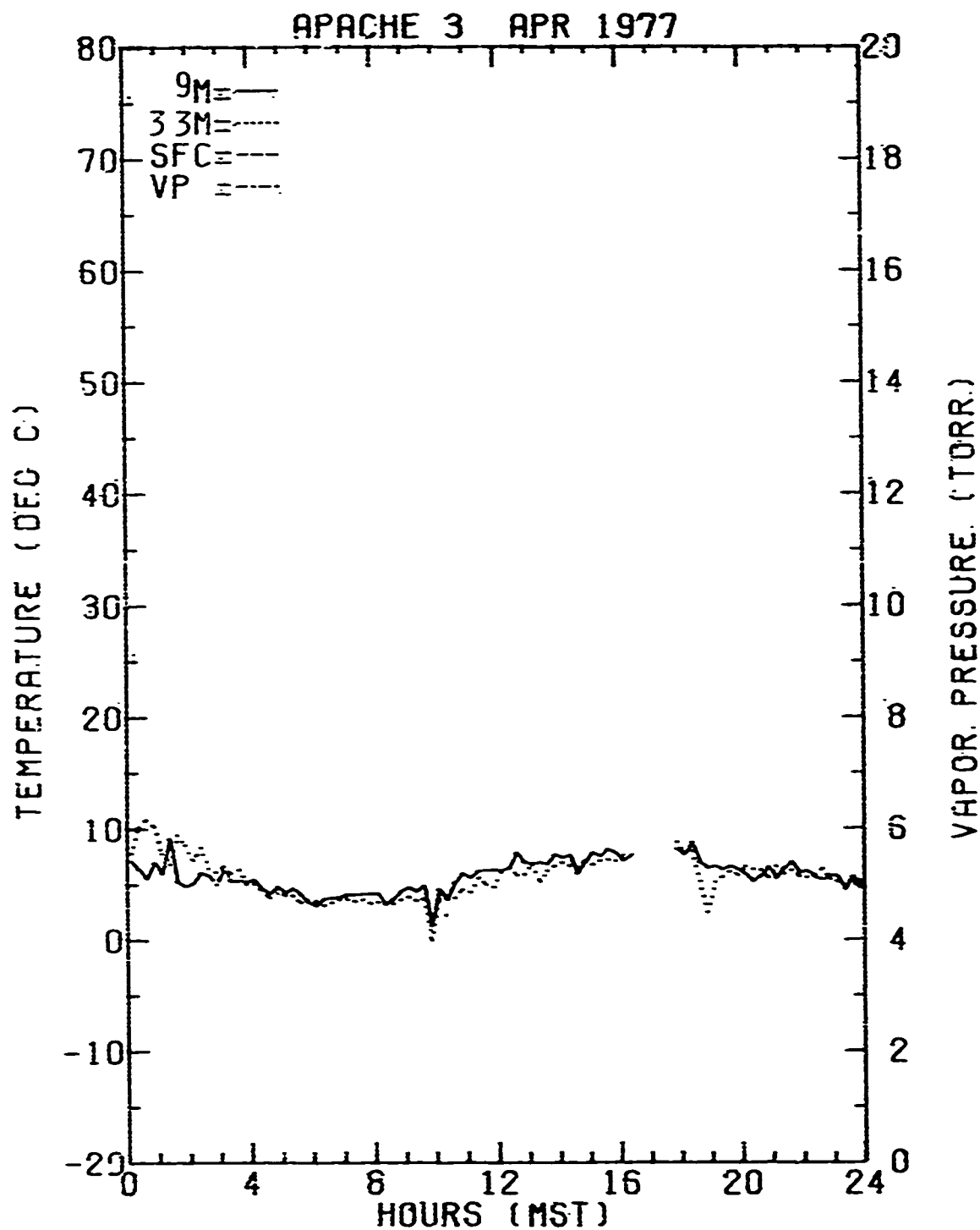


Figure 110. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 3 April 1977.

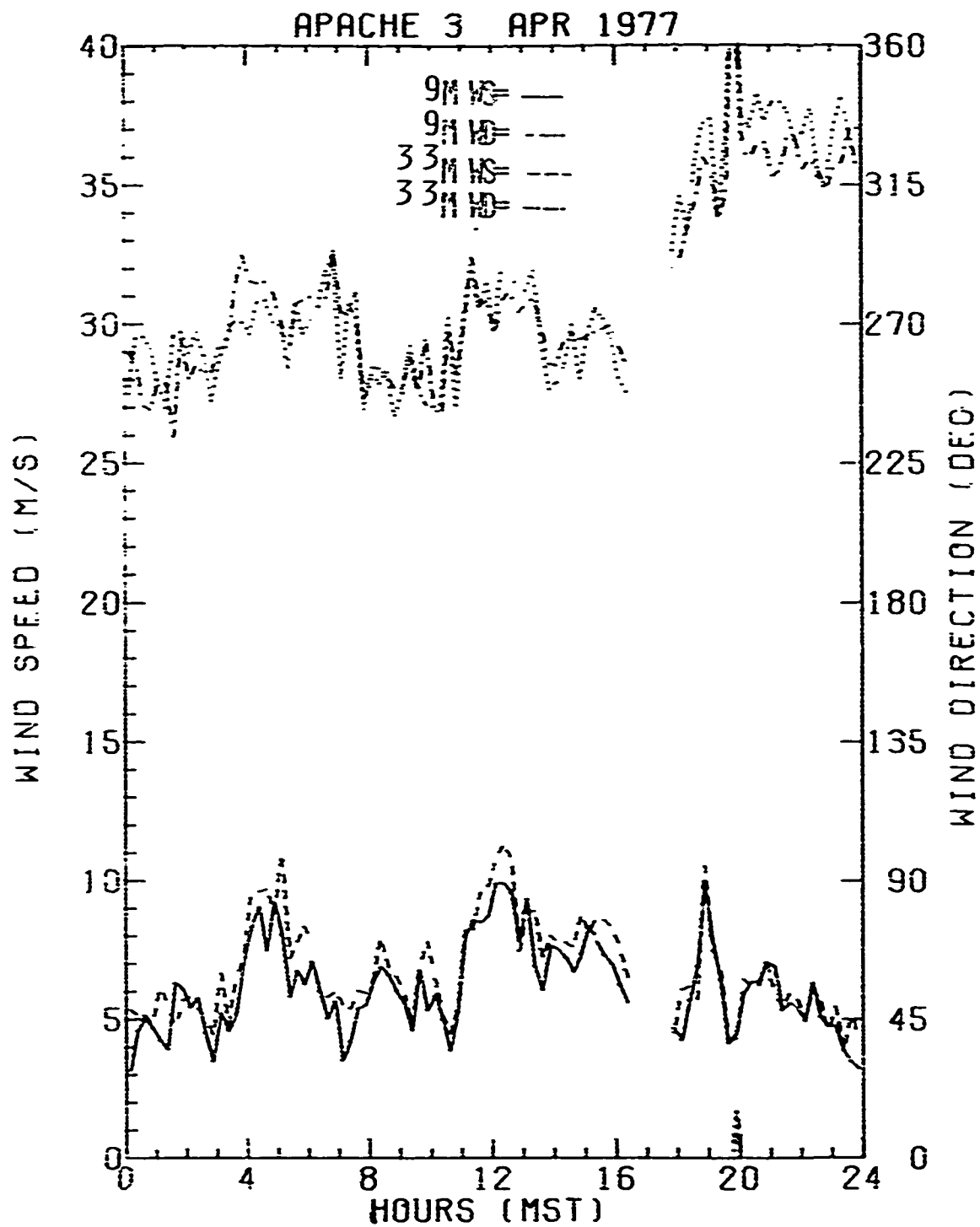


Figure 111. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 3 April 1977.

TABLE 63

APACHE SITE RAWINSONDE DATA

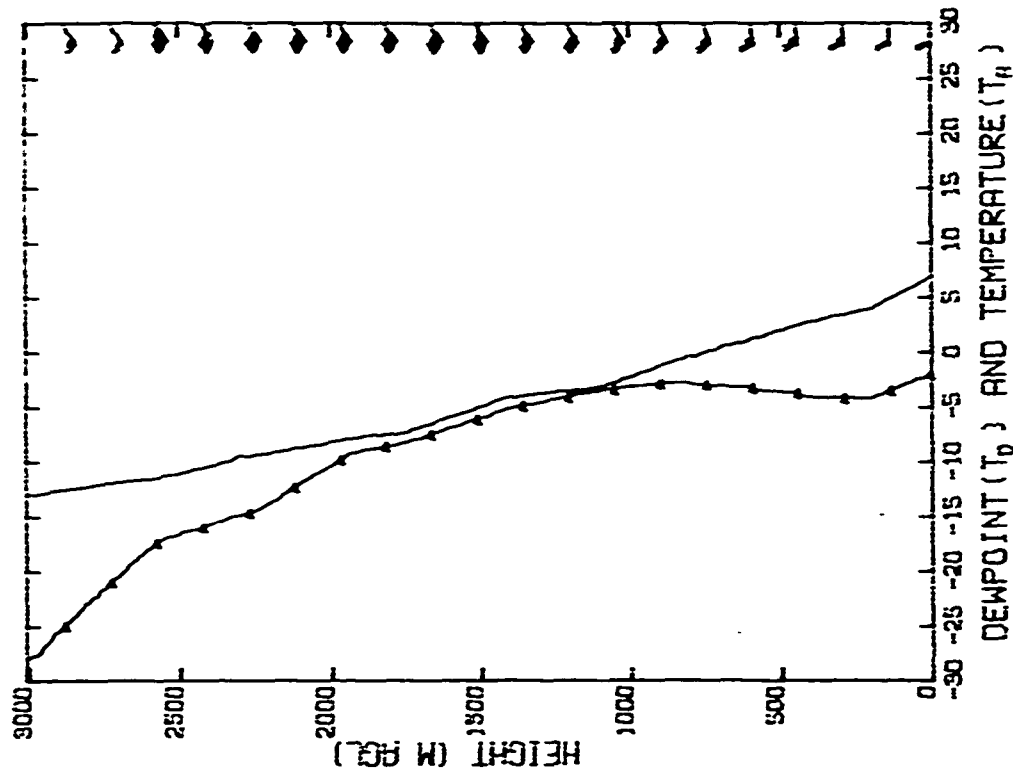
DATE: 03 APR 77

RELEASE NO.: 34

RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	653.8	6.9	4.0	270.0	9.3
207.3	637.5	3.9	3.3	268.3	11.4
383.1	623.8	2.9	3.4	267.3	13.4
902.8	584.8	-1.3	3.7	246.2	11.9
1104.5	570.2	-3.3	3.5	239.3	14.2
1401.6	549.2	-4.1	3.1	236.0	18.7
1756.2	527.0	-7.4	2.4	233.6	20.8
1933.1	513.2	-7.9	2.3	234.1	21.1
2234.1	493.7	-9.4	1.5	233.3	21.2
2569.5	472.7	-11.5	1.2	233.6	22.1
2779.3	460.0	-12.2	0.8	234.8	26.8
2981.5	448.0	-13.0	0.5	233.7	30.2
3301.1	429.6	-13.4	0.4	232.9	25.4



WIND BARB SYSTEM (KTS)

TABLE 64
APACHE SITE RAWINSONDE DATA

DATE: 03 APR 77 RELEASE NO.: 35 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	655.0	12.0	3.6	270.0 12.9
163.3	642.2	7.4	2.0	0.0 0.0
224.1	637.5	7.4	2.0	0.0 0.0
1288.8	558.6	-4.6	1.5	270.1 12.6
1583.9	538.0	-7.4	1.5	269.2 13.2
1773.7	525.0	-9.5	1.6	265.7 14.5
2211.0	496.0	-13.1	1.4	261.4 13.9
2439.2	481.3	-13.9	0.5	271.0 14.5
3163.6	437.1	-20.5	0.3	260.9 17.9

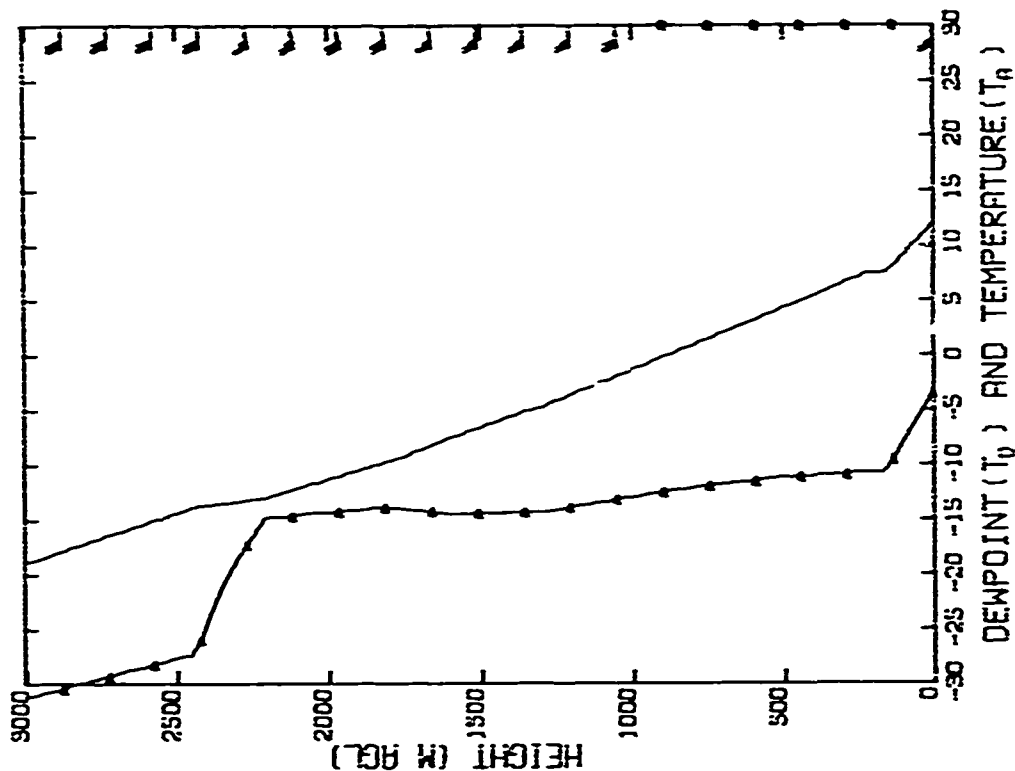


TABLE 65
APACHE SITE RAWINSONDE DATA

DATE: 03 APR 77 RELEASE NO.: 36 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	656.1	10.2	3.9	320.0	10.3
237.8	637.5	6.5	2.3	315.2	12.0
1221.0	564.6	-1.2	1.7	295.1	12.0
1795.2	525.0	-7.3	1.5	289.4	10.3
2555.5	475.7	-13.6	1.2	290.6	13.0
3687.6	409.0	-22.6	0.3	285.4	15.2

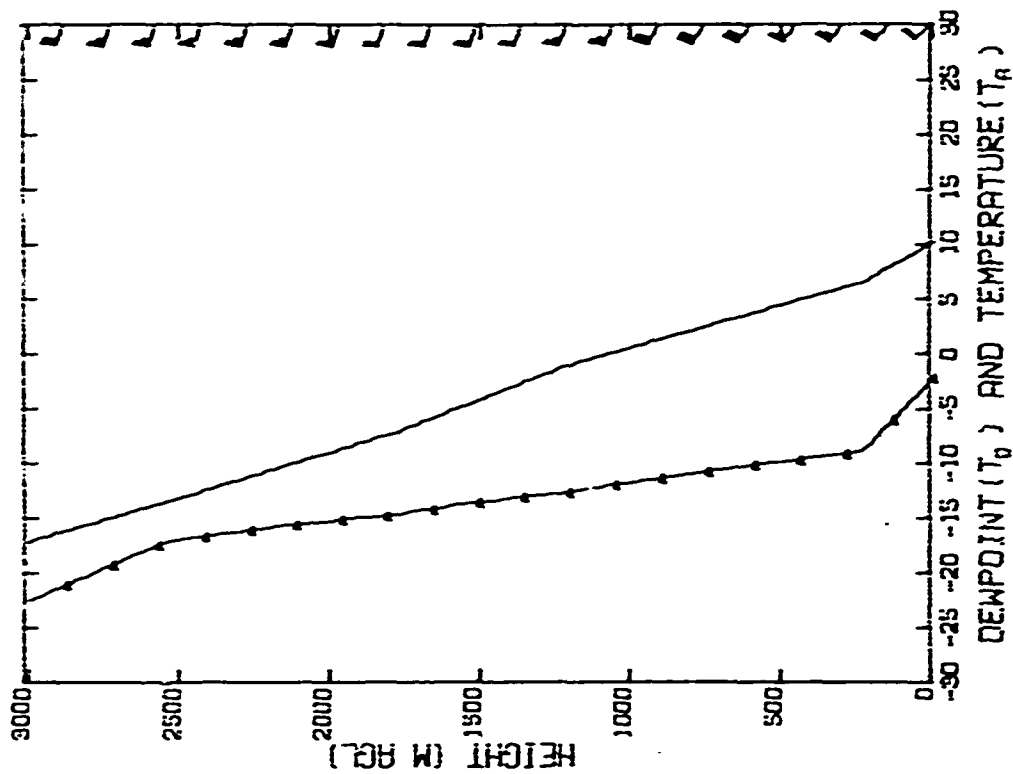
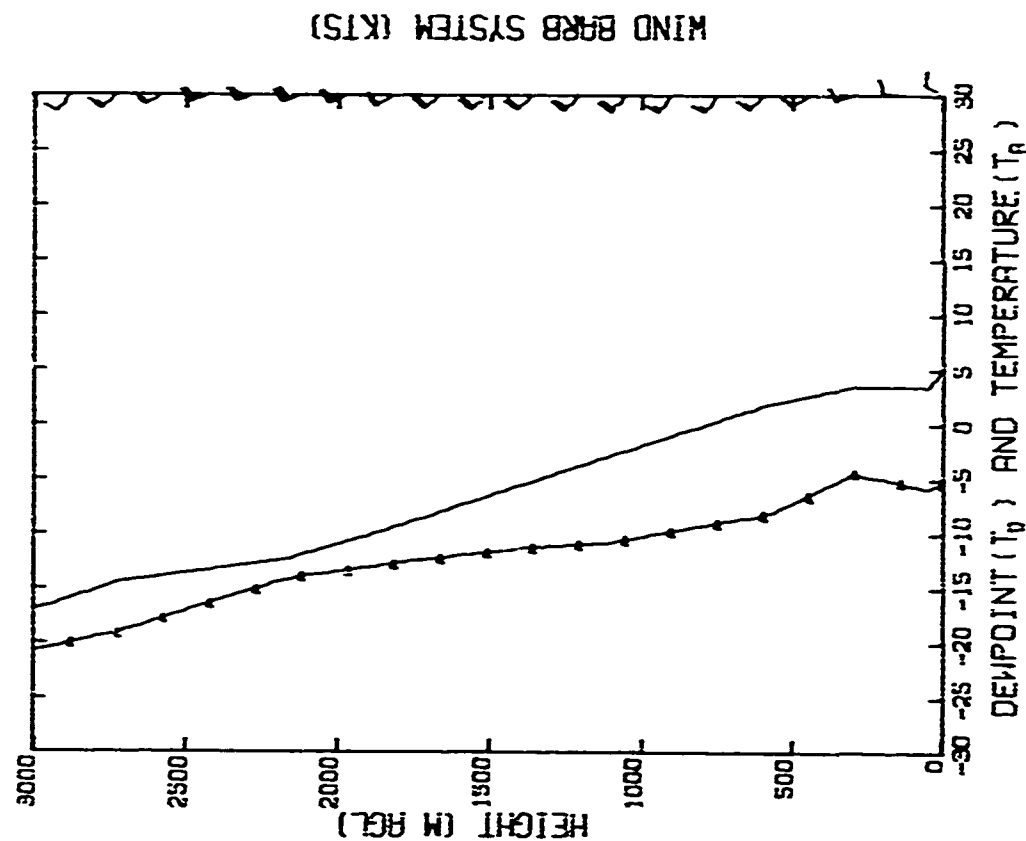


TABLE 66
APACHE SITE RAWINSONDE DATA

DATE: 03 APR 77 RELEASE NO.: 37 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	660.0	5.0	3.1	30.0 4.1
39.0	656.8	3.5	2.9	22.6 4.0
282.0	637.5	3.5	3.3	346.2 4.8
570.1	615.2	1.9	2.5	323.8 7.1
1099.7	575.8	-2.9	2.0	319.1 9.2
1824.3	525.0	-9.6	1.7	333.0 11.1
2163.8	502.3	-12.4	1.5	343.7 14.2
2712.6	467.5	-14.5	1.0	325.7 6.9
3034.4	440.0	-17.4	0.8	304.8 5.7



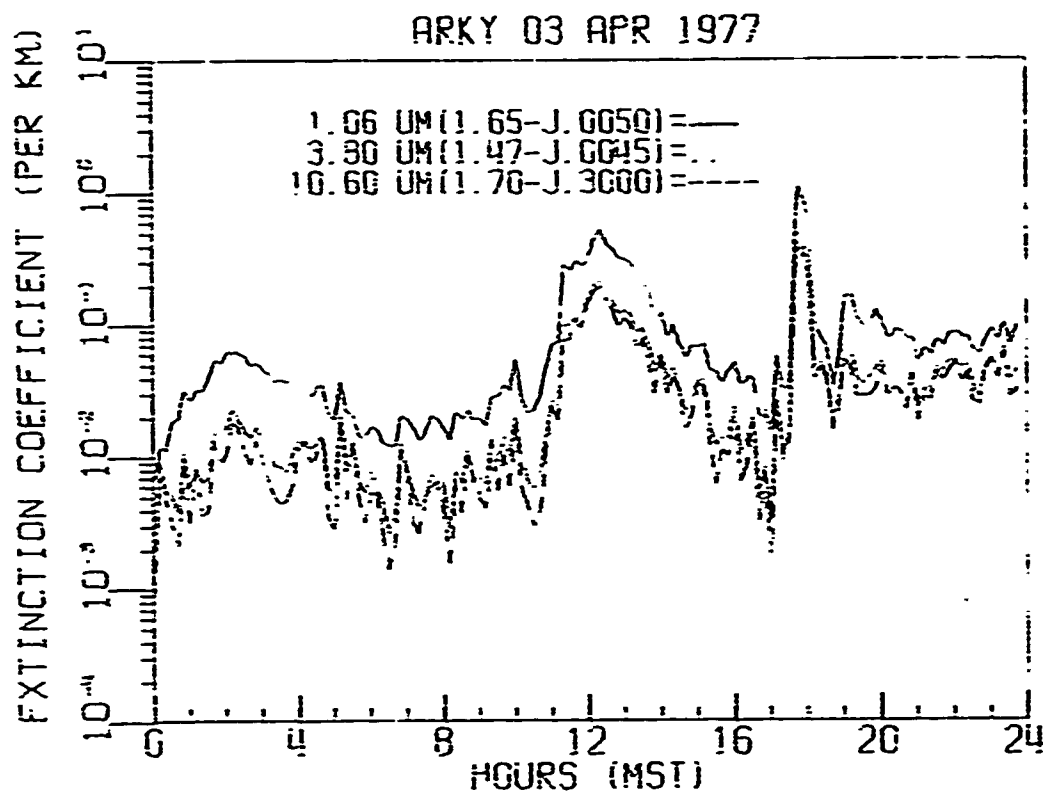


Figure 112. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 3 April 1977.

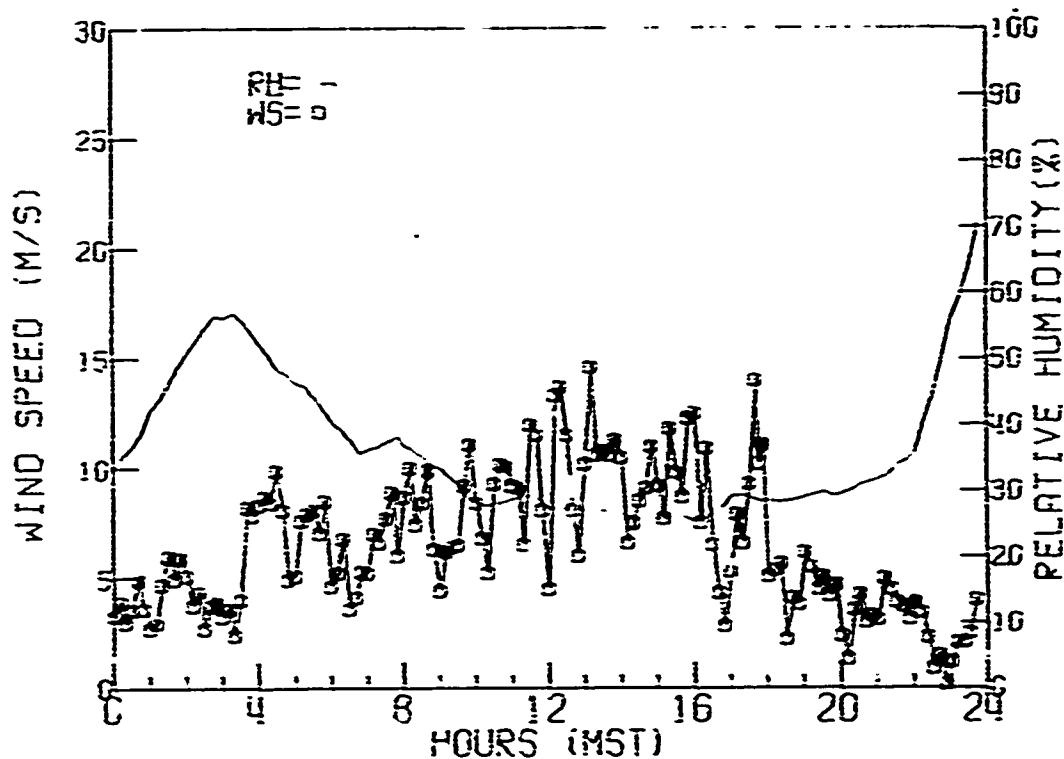


Figure 113. Diurnal variation of windspeed and relative humidity, Arky Site, 3 April 1977.

TABLE 67

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TABLE 67 (cont.)
ARTICULATE GIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARKY SITE, WYNY

DATE TIME SAMPLE (MST) (SEC)	CHANNEL										EXTINCTION (PER K1)		MASS LOADING (UG/M ³)
	1	2	3	4	5	6	7	8	9	10	1.26	3.5	
03 APR 77													
06:56:00 660	26+C1	3A+C0	12+C0	61-C1	0C	20-C1	60	00	21-01	13-01	11-01	139.	
07:00:00 670	33+C1	30+C0	61-C1	19-C1	49-C1	00	00	00	19-01	02-02	73-02	62.	
07:04:00 680	33+C1	34+C0	19+C0	19-C1	0C	00	00	00	17-01	58-02	32-02	78.	
07:08:00 690	24+C1	24+C0	91-C1	14-C1	00	00	00	00	14-01	42-02	26-02	72.	
07:12:00 700	30+C1	21+C0	30-C1	19-C1	48-C1	00	00	00	16-01	51-02	49-02	41.	
07:16:00 710	34+C1	14+C0	12+C0	14-C1	49-C1	00	00	00	21-01	71-02	50-02	31.	
07:20:00 720	30+C1	21+C0	0C	00	00	20-C1	00	00	19-01	68-02	66-02	107.	
07:24:00 730	31+C1	30+C0	14+C0	32-C1	00	00	00	00	17-01	53-02	41-02	83.	
07:28:00 740	33+C1	17+C0	91-C1	00	0C	00	00	00	14-01	29-02	16-02	29.	
07:32:00 750	49+C1	28+C0	12+C0	32-C1	49-C1	00	00	00	22-01	70-02	68-02	74.	
07:36:00 760	39+C1	41+C0	21+C0	19-C1	0C	00	00	00	20-01	66-02	30-02	45.	
07:40:00 770	33+C1	26+C0	91-C1	19-C1	00	23-C1	00	00	22-01	11-01	10-01	174.	
07:44:00 780	33+C1	47+C0	61-C1	60	9A-C1	00	00	00	20-01	68-02	70-02	48.	
07:48:00 790	37+C1	28+C0	91-C1	19-C1	00	00	00	00	19-01	72-02	50-02	56.	
07:52:00 800	33+C1	43+C0	91-C1	30-C1	0C	00	00	00	38-01	62-02	41-02	46.	
07:56:00 810	42+C1	16+C0	19+C0	30-C1	00	31-01	00	00	26-01	11-01	13-01	197.	
07:00:00 820	58+C1	40+C0	21+C0	30-C1	00	00	00	00	29-01	92-02	57-02	68.	
07:04:00 830	43+C1	67+C0	43+C0	14-C1	49-C1	00	00	00	33-01	13-01	10-01	93.	
07:08:00 840	63+C1	67+C0	24+C0	30-C1	0C	00	00	00	32-01	10-01	61-02	73.	
07:12:00 850	97+C1	12+C1	37+C0	16-C1	11+C0	00	00	00	23-01	23-01	17-01	141.	
07:16:00 860	93+C1	64+C0	24+C0	30-C1	0C	00	00	00	27-01	94-02	57-02	65.	
07:20:00 870	43+C1	41+C0	91-C1	33-C1	00	00	00	00	21-01	61-02	44-02	53.	
07:24:00 880	47+C1	73+C0	12+C0	00	0C	00	00	00	23-01	58-02	30-02	43.	
07:28:00 890	63+C1	58+C0	27+C0	30	00	00	00	00	33-01	71-02	40-02	76.	
07:32:00 900	93+C1	79+C0	18+C0	19-C1	00	20-C1	00	00	47-01	14-01	11-01	145.	
07:36:00 910	12+C1	12+C1	24+C0	76-C1	11+C0	23-01	00	00	71-01	21-01	24-01	254.	
07:40:00 920	19+C1	13+C0	4A+C0	46-C1	14+C0	0C	00	00	76-01	24-01	19-01	177.	
07:44:00 930	53+C1	58+C0	14+C0	21+C0	21+C0	31-01	00	00	24-01	13-01	7A-01	877.	
07:48:00 940	44+C1	48+C0	14+C0	17+C0	14+C0	12+C0	00	00	26-01	98-01	80-01	1014.	
07:52:00 950	42+C1	53+C0	11+C0	26+C0	39+C0	11+C0	00	00	31-01	11-01	11-01	1379.	
07:56:00 960	51+C1	43+C0	12+C0	32+C0	29+C0	12+C0	00	00	28-01	11-01	93-01	1120.	
08:00:00 970	51+C1	50+C0	17+C0	32+C0	43+C0	21+C0	00	00	33-01	11-01	14-01	1749.	
08:04:00 980	79+C1	70+C0	2A+C0	3A+C0	53+C0	30+C0	00	00	40-01	20-01	18-01	2172.	
08:08:00 990	70+C1	79+C0	18+C0	43+C0	57+C0	21+C0	00	00	33-01	22-01	19-01	2259.	
08:12:00 1000	60+C1	57+C0	17+C0	32+C0	59+C0	11+C0	00	00	41-01	17-01	35-01	1678.	
08:16:00 1010	60+C1	57+C0	17+C0	32+C0	59+C0	11+C0	00	00	37-01	19-01	13-01	1672.	
08:20:00 1020	57+C1	59+C0	18+C0	24+C0	34+C0	12+C0	00	00	32-01	12-01	10-01	1178.	
08:24:00 1030	41+C1	58+C0	14+C0	31+C0	39+C0	11+C0	00	00	31-01	13-01	11-01	1272.	
08:28:00 1040	50+C1	54+C0	19+C0	32+C0	48+C0	74-C1	00	00	20-01	13-01	10-01	1035.	
08:32:00 1050	43+C1	46+C0	16+C0	23+C0	11+C0	71-01	00	00	21-01	43-01	49-01	843.	
08:36:00 1060	53+C1	41+C0	14+C0	21+C0	19+C0	32+C0	00	00	21-01	44-01	70-01	945.	

TABLE 67 (cont.)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINGUISHMENT, AND MASS LOADING
ARMY SITE, WENT

DATE TIME SAMPLE (MST) (SEC)	CHANNEL							EXTINGUISHMENT (PER K9)			MASS LOADING (LBS/M ² ·H)		
	1	2	3	4	5	6	7	8	9	10	11	12	
03 APR 77													
13:00:00 600	.30+02	.30+03	.12+01	.14+00	.14+00	.59+01	.00	.00	.37+00	.68-01	.53-01	618.	
13:01:00 600	.19+02	.26+01	.17+02	.17+02	.03	.23+01	.00	.00	.11+00	.44-01	.30-01	355.	
13:02:00 600	.17+02	.28+01	.17+02	.14+00	.14+00	.98+01	.00	.00	.12+00	.66-01	.58-01	693.	
13:03:00 600	.13+02	.23+01	.17+02	.76+01	.03	.57+01	.00	.00	.42+01	.59-01	.31-01	409.	
13:04:00 600	.13+02	.23+01	.17+02	.14+00	.03	.79+01	.00	.00	.98+01	.47-01	.40-01	514.	
13:05:00 600	.11+02	.11+01	.17+02	.14+00	.03	.57+01	.00	.00	.72+01	.31-01	.33-01	315.	
13:06:00 600	.10+02	.11+01	.17+02	.13+00	.03	.00	.00	.00	.77+01	.22-01	.16-01	161.	
13:07:00 600	.12+02	.17+01	.17+02	.12+02	.03	.44+01	.00	.00	.69+01	.29-01	.20-01	192.	
13:08:00 600	.07+01	.12+01	.17+02	.30+01	.03	.96+01	.00	.00	.70+01	.37-01	.35-01	447.	
13:09:00 600	.13+02	.13+01	.17+02	.11+02	.03	.95+01	.00	.00	.72+01	.59-01	.35-01	412.	
13:10:00 600	.78+01	.12+01	.17+02	.00	.03	.48+01	.00	.00	.46+01	.17-01	.33-01	165.	
13:11:00 600	.12+01	.12+01	.17+02	.03	.03	.03	.00	.00	.43+01	.12-01	.63-02	82.	
13:12:00 600	.45+01	.44+00	.21+00	.30+01	.03	.20+01	.00	.00	.36+01	.14-01	.11-01	154.	
13:13:00 600	.03+01	.56+02	.13+02	.03	.03	.23+01	.00	.00	.45+01	.14-01	.10-01	155.	
13:14:00 600	.42+01	.75+00	.33+00	.44+01	.03	.39+01	.00	.00	.41+01	.24-01	.23-01	267.	
13:15:00 600	.73+01	.73+02	.33+02	.33+01	.03	.03	.00	.00	.36+01	.11-01	.57-02	83.	
13:16:00 600	.75+01	.46+00	.36+00	.35+01	.03	.00	.00	.00	.39+01	.12-01	.45-02	85.	
13:17:00 600	.43+01	.34+00	.34+00	.35+01	.03	.57+01	.00	.00	.39+01	.19-01	.19-01	229.	
13:18:00 600	.38+01	.39+02	.91+01	.03	.03	.23+01	.00	.00	.20+01	.51-02	.32-02	43.	
13:19:00 600	.34+01	.36+00	.61+01	.35+01	.03	.00	.00	.00	.22+01	.65-02	.74-02	113.	
13:20:00 600	.91+01	.79+02	.27+02	.00	.03	.37+01	.00	.00	.16+01	.33-02	.18-02	29.	
13:21:00 600	.57+01	.62+00	.17+02	.00	.03	.11+02	.00	.00	.18+01	.27-01	.26-01	291.	
13:22:00 600	.59+01	.40+02	.17+00	.35+01	.03	.00	.00	.00	.31+01	.10-01	.43-02	76.	
13:23:00 600	.91+02	.12+02	.41+01	.41+01	.03	.23+01	.00	.00	.35+01	.13-01	.13-01	105.	
13:24:00 600	.18+02	.25+02	.75+01	.55+01	.03	.67+02	.00	.00	.55+00	.24+00	.39+00	2097.	
13:25:00 600	.14+01	.14+02	.73+01	.14+01	.03	.34+00	.00	.00	.11+01	.49+00	.38+00	8471.	
13:26:00 600	.11+01	.16+02	.47+01	.11+01	.03	.91+01	.00	.00	.90+00	.42+00	.36+00	3694.	
13:27:00 600	.44+01	.13+01	.42+01	.14+02	.03	.20+01	.00	.00	.67+01	.33+00	.24+00	2557.	
13:28:00 600	.79+01	.12+01	.44+00	.14+02	.03	.96+01	.00	.00	.79+01	.51-01	.49-01	585.	
13:29:00 600	.45+01	.48+02	.44+00	.19+00	.03	.39+01	.00	.00	.67+01	.41-01	.40-01	370.	
13:30:00 600	.45+01	.48+02	.44+00	.31+01	.03	.23+01	.00	.00	.34+01	.19-01	.16-01	172.	
13:31:00 600	.21+02	.34+01	.13+01	.23+02	.03	.39+01	.00	.00	.59+01	.29-01	.24-01	296.	
13:32:00 600	.19+02	.42+01	.17+01	.23+02	.03	.03	.00	.00	.16+00	.73-01	.54-01	627.	
13:33:00 600	.17+02	.24+01	.61+00	.17+00	.03	.20+01	.00	.00	.11+00	.67+01	.48-01	550.	
13:34:00 600	.15+02	.24+01	.61+00	.30+01	.03	.20+01	.00	.00	.97+01	.35-01	.29-01	291.	
13:35:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:36:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:37:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:38:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:39:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:40:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:41:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:42:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:43:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:44:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:45:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:46:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:47:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:48:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:49:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:50:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:51:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:52:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:53:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:54:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:55:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:56:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:57:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
13:58:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	
13:59:00 600	.15+02	.24+01	.61+00	.12+02	.03	.20+01	.00	.00	.13+00	.47-01	.28-01	312.	
14:00:00 600	.23+02	.34+01	.12+01	.12+02	.03	.00	.00	.00	.13+00	.47-01	.28-01	312.	

TABLE 67 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WIND

DATE	TIME (MST)	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER K4)		MASS LOADING (UG/MOS3)	
			1	2	3	4	5	6	7	8	9	10	1.36	3.8	13.6	
03 APR 77	20:22:00	600	.1862	.2161	.6166	.3160	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	373.
	20:23:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	359.
	20:24:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	219.
	20:25:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	597.
	21:02:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	213.
	21:12:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	519.
	21:22:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	261.
	21:32:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	434.
	21:42:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	431.
	21:52:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	599.
	22:02:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	488.
	22:12:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	481.
	22:22:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	397.
	22:32:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	289.
	22:42:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	283.
	22:52:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	483.
	23:02:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	612.
	23:12:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	371.
	23:22:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	782.
	23:32:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	274.
	23:42:00	600	.1862	.2161	.7901	.7901	.9601	.7901	.7901	.00	.00	.00	.8901	.4001	.3301	339.

Weather Summary

Date: 4 April 1977

Synoptic

Surface: Weak surface pressure gradient over the southwestern United States.

500 Millibar: Northeast-southwest oriented trough over WSMR with strong southwesterly flow in advance of the trough and strong northerly flow behind the trough over New Mexico.

Holloman AFB

Clouds: Clear to few high clouds (cirrus).

Wind: Light and variable except northwesterly 5 m sec^{-1} during late morning and afternoon. Peak gust of 8 m sec^{-1} out of the northwest observed shortly after 1100 MST.

Visibility: Greater than 60 km.

Maximum temperature: 18.9°C

Corresponding vapor pressure: 2.1 Torr

Minimum temperature: -0.6°C

Corresponding vapor pressure: 2.9 Torr



Figure 114a. Surface weather map for 4 April 1977.

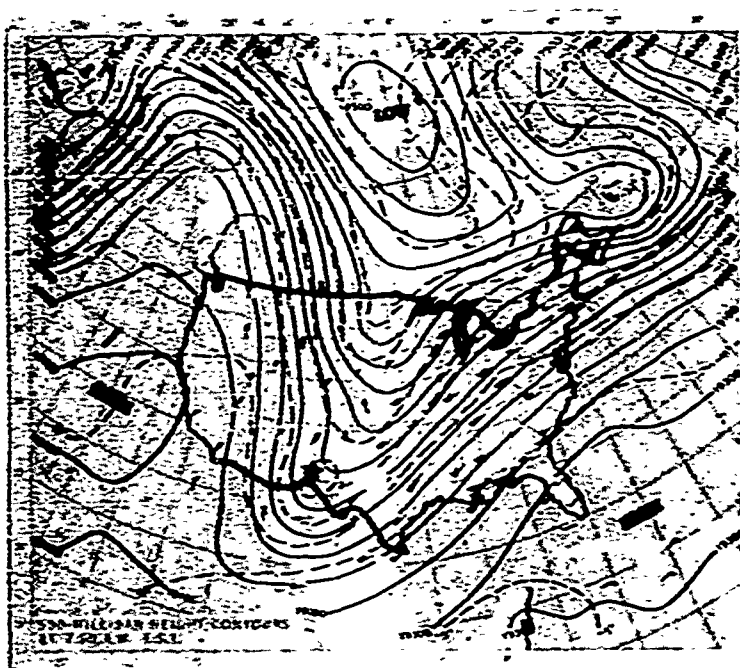


Figure 114b. 500-millibar height contours for 4 April 1977.

TABLE 68. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	1.9	3.5	-3.6	0	0	0	Plane observed
0200	0.7	3.5	-3.8	0	0	0	
0300	-1.6	2.9	-6.2	0	0	0	
0400	-2.5	2.6	-7.8	0	0	0	
0500	-2.6	2.7	-6.9	0	0	0	Apache tape changed 0945-1020 - recal 32 ΔT - unable to adjust either T/C to any constant readout - uvw's and 8 ΔT ok - time on datalogger 1 hour fast - reset time Recal LSTC ΔT's - all else ok, plane observed 1220-1300 1345-1445 - fixed grounding problem on Apache datalogger, all Apache data ok 8 m u-v-w at Apache was 90° off corrected at 1700
0600	-1.9	2.7	-7.0	0	0	0	
0700	-0.1	2.8	-6.5	0	0	0	
0800	4.0	2.7	-6.9	0	0	0	
0900	7.3	3.1	-5.2	0	0	0	
1000	10.0	2.8	-6.4	0	0	0	
1100	12.3	2.9	-6.3	0	0	0	
1200	13.2	3.1	-5.3	0	0	0	
1300	14.9	3.3	-4.6	0	0	0	
1400	16.5	2.6	-7.4	0	0	0	
1500	16.9	2.5	-8.3	0	0	0	
1600	15.9	2.3	-8.8	0	0	0	
1700	16.5	1.5	-14.8	0	0	0	
1800	16.0	2.1	-10.1	0	0	0	
1900	10.5	2.0	-10.6	0	0	0	
2000	6.4	1.7	-13.0	0	0	0	
2100	8.5	2.8	-6.4	0	0	0	
2200	8.2	2.0	-10.9	0	0	0	
2300	2.8	1.7	-12.9	0	0	0	
2400	3.3	1.9	-11.2	0	0	0	

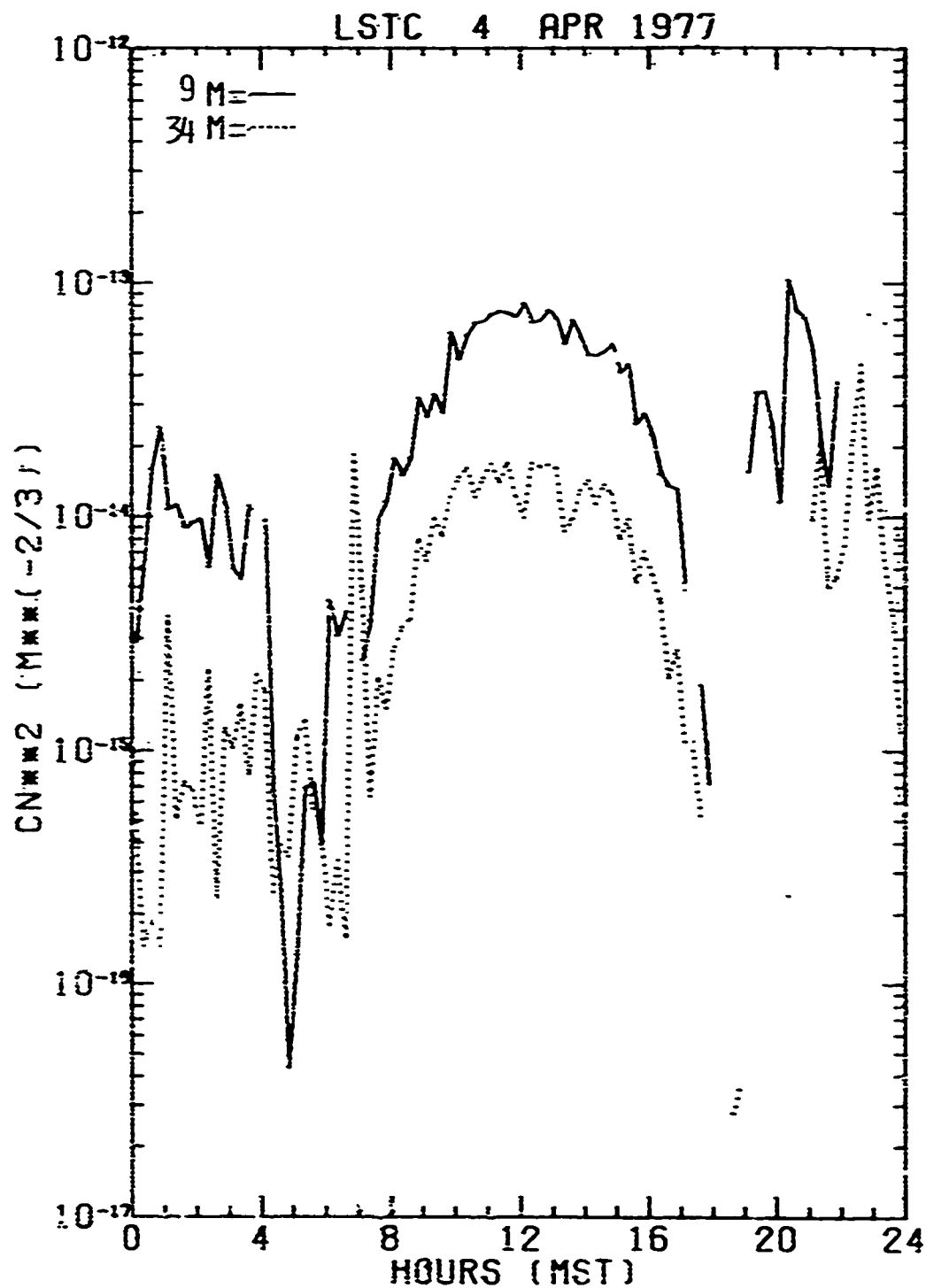


Figure 115. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 4 April 1977.

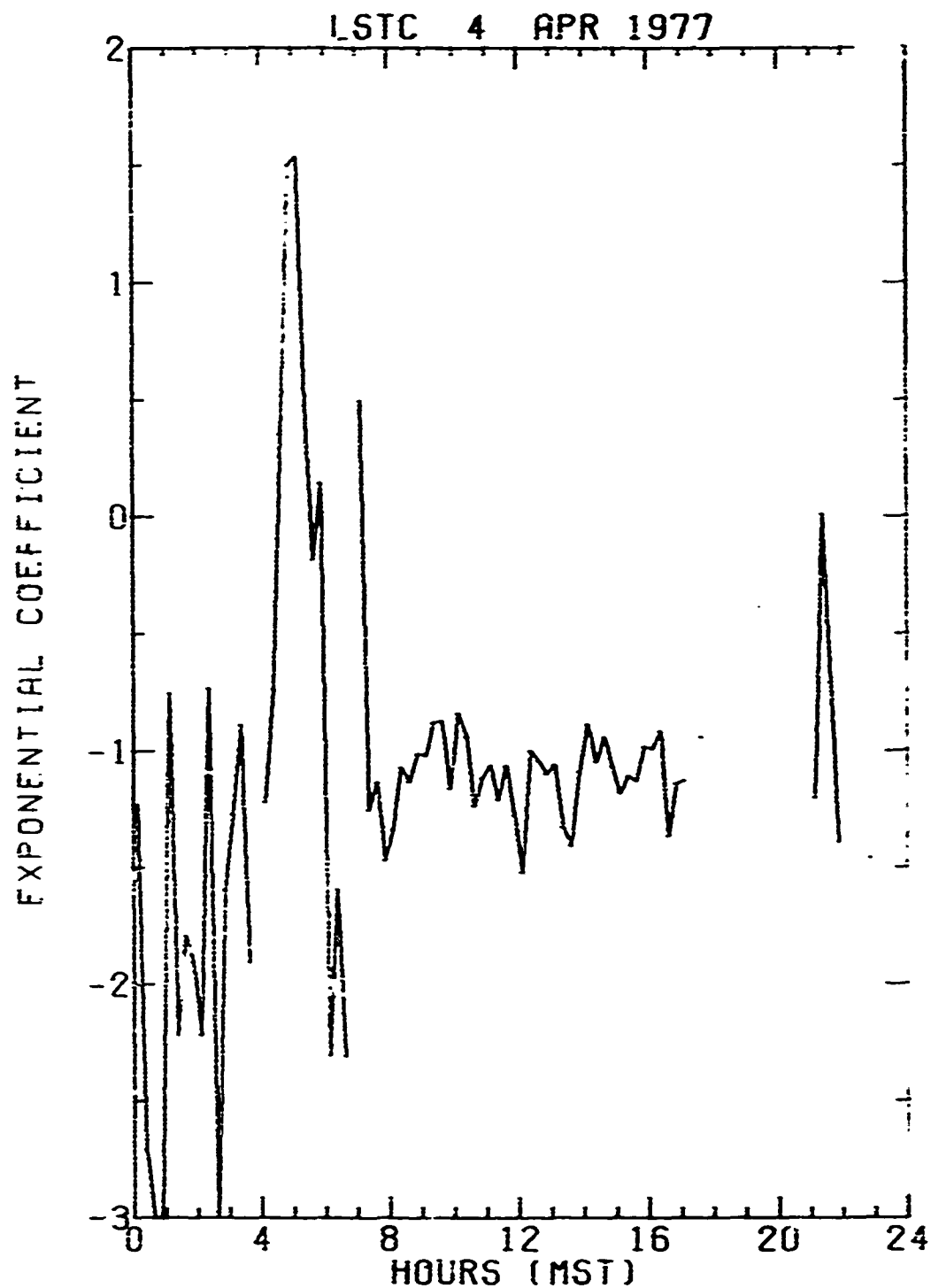


Figure 116. Diurnal variation of the altitude change of C_H^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_H^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_H^2 value, LSTC, 4 April 1977.

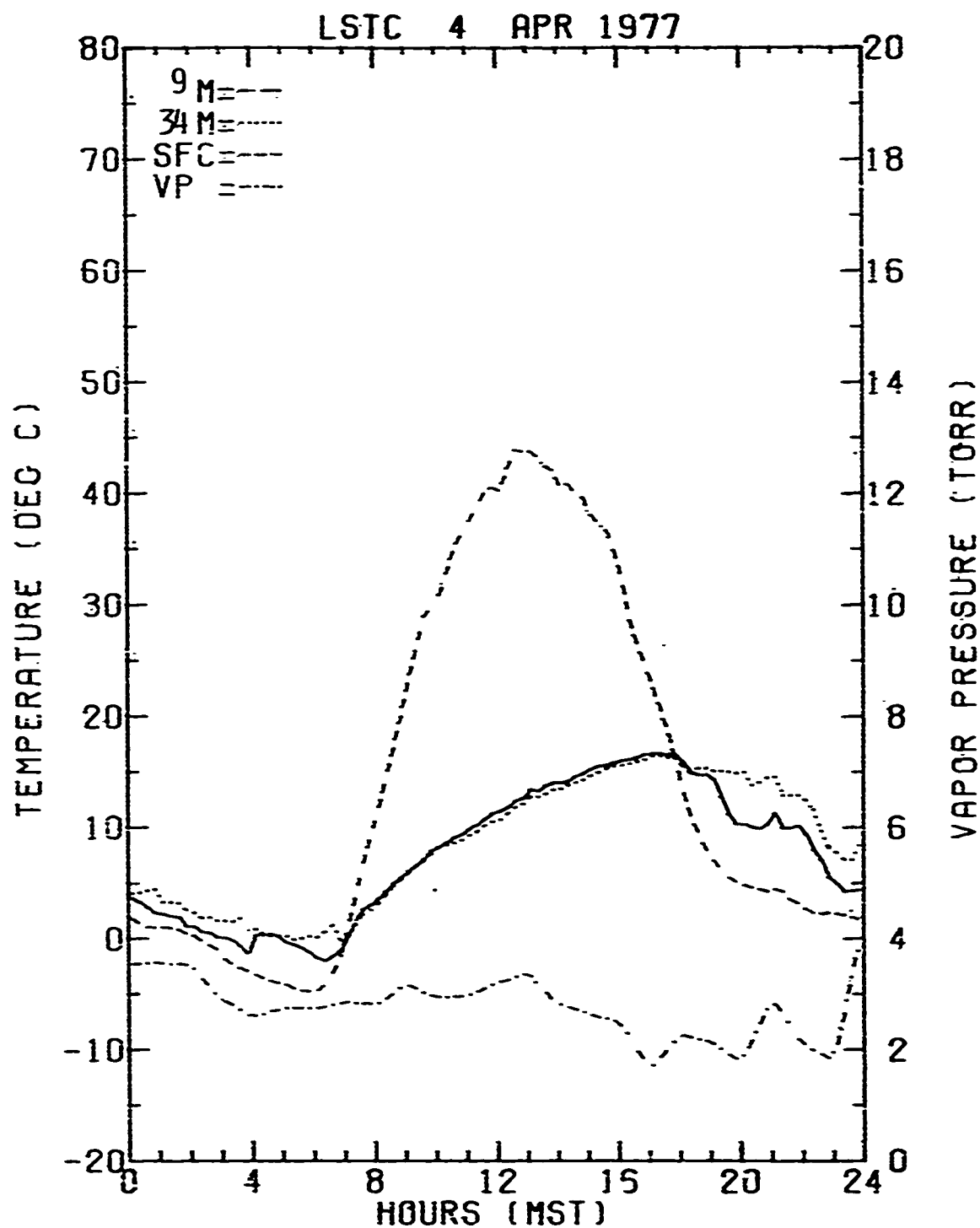


Figure 117. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 4 April 1977.

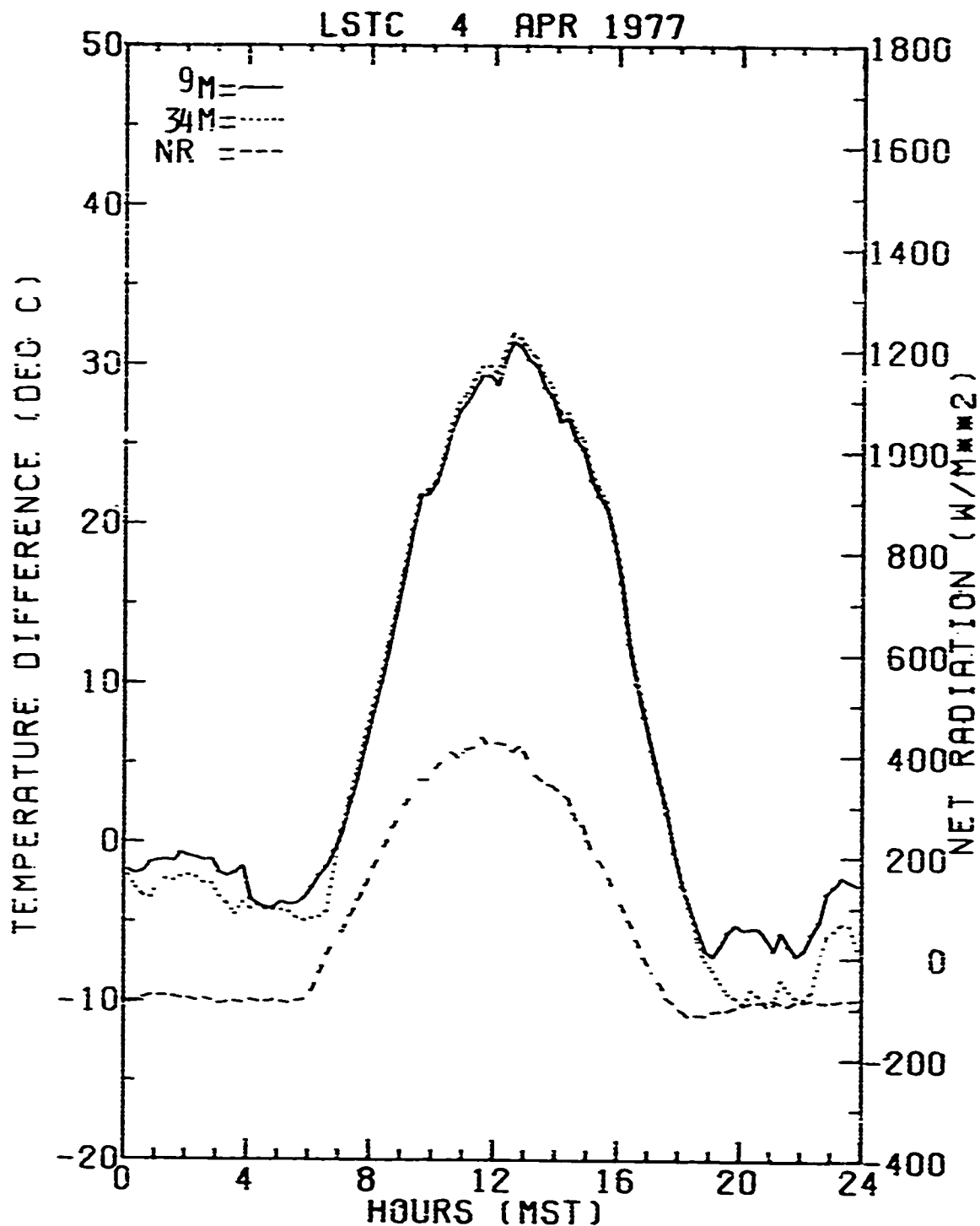


Figure 118. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 4 April 1977.

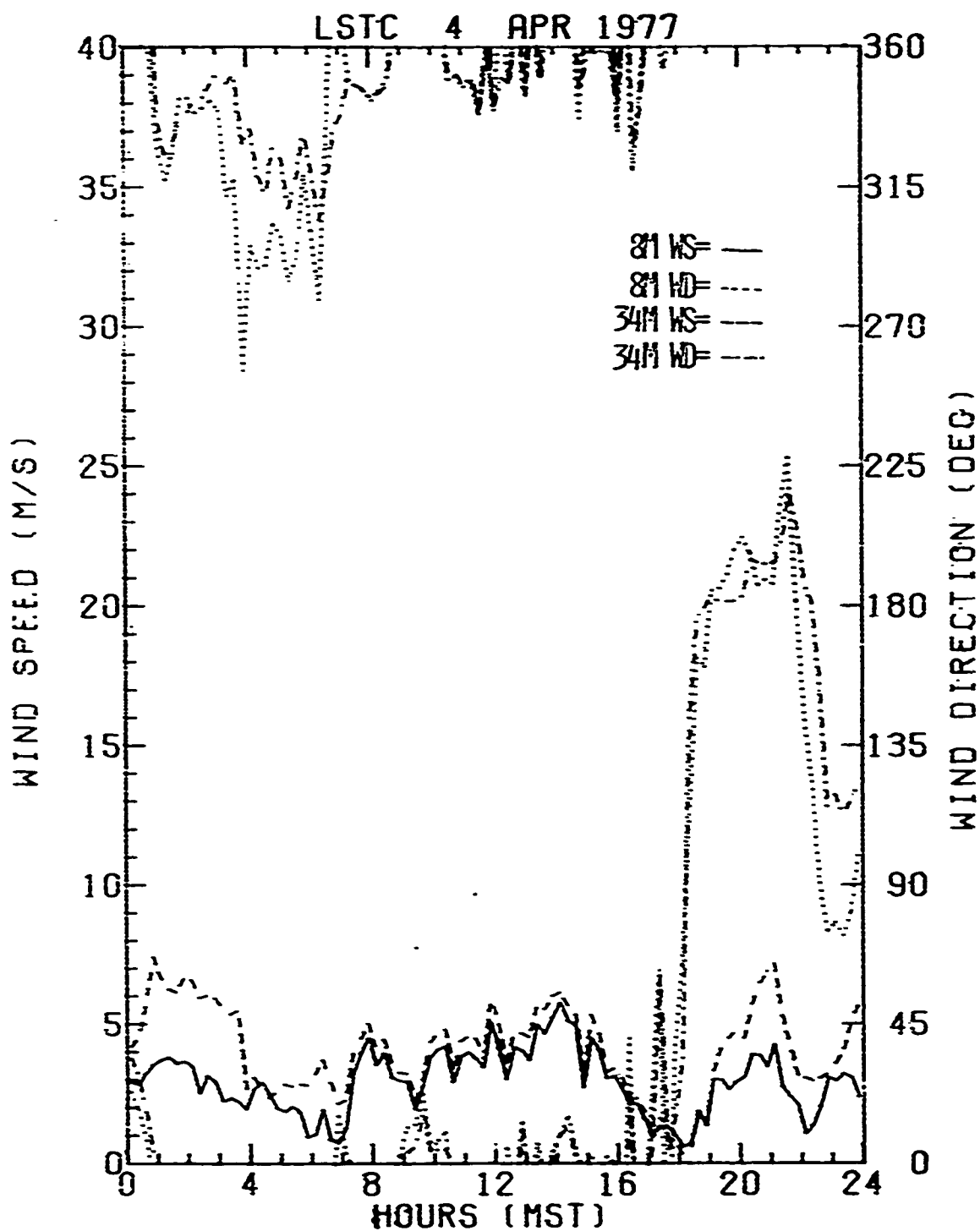


Figure 119. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 4 April 1977.

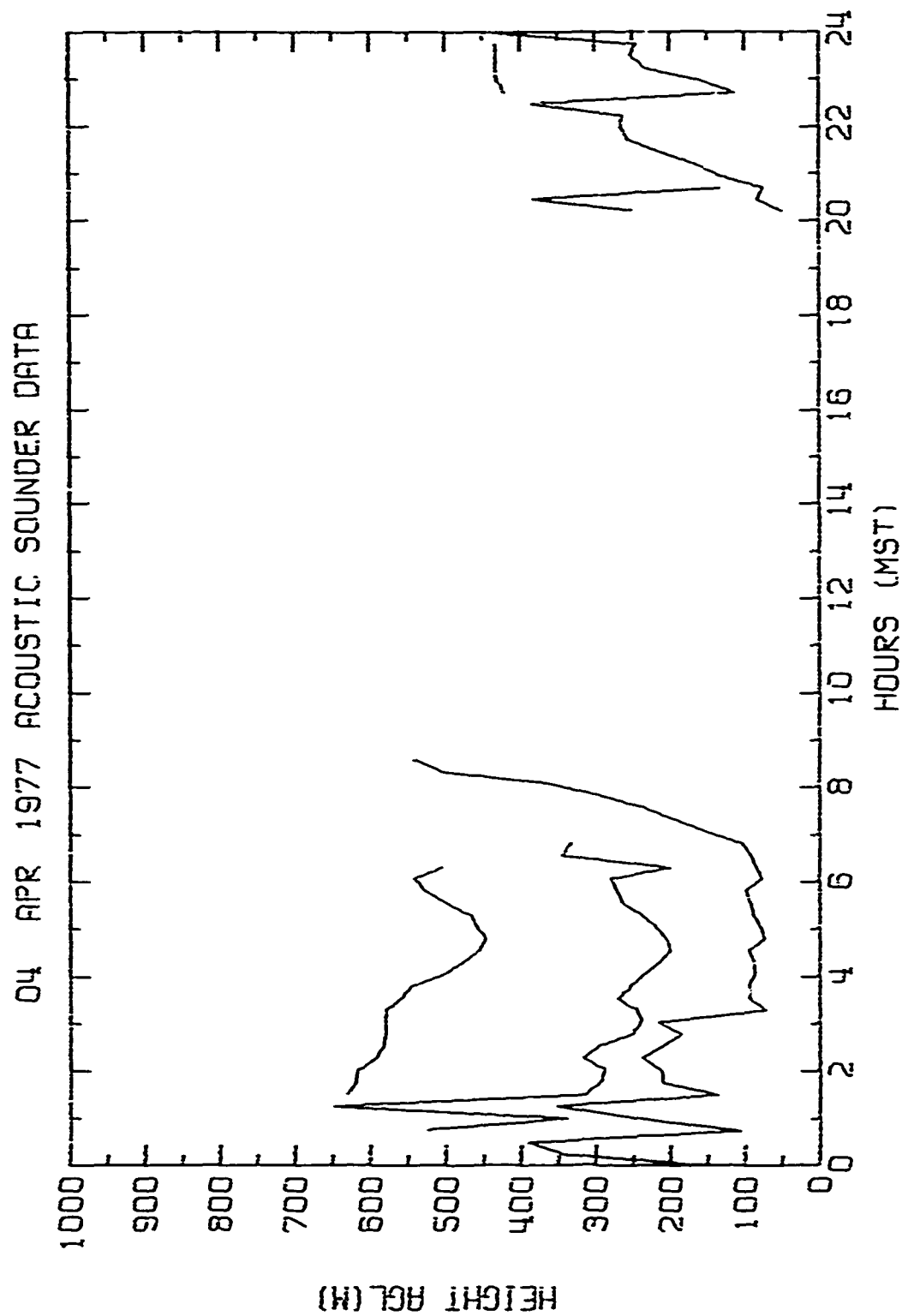


Figure 120. Inversion heights, LSTC, 4 Apr 11 1977.

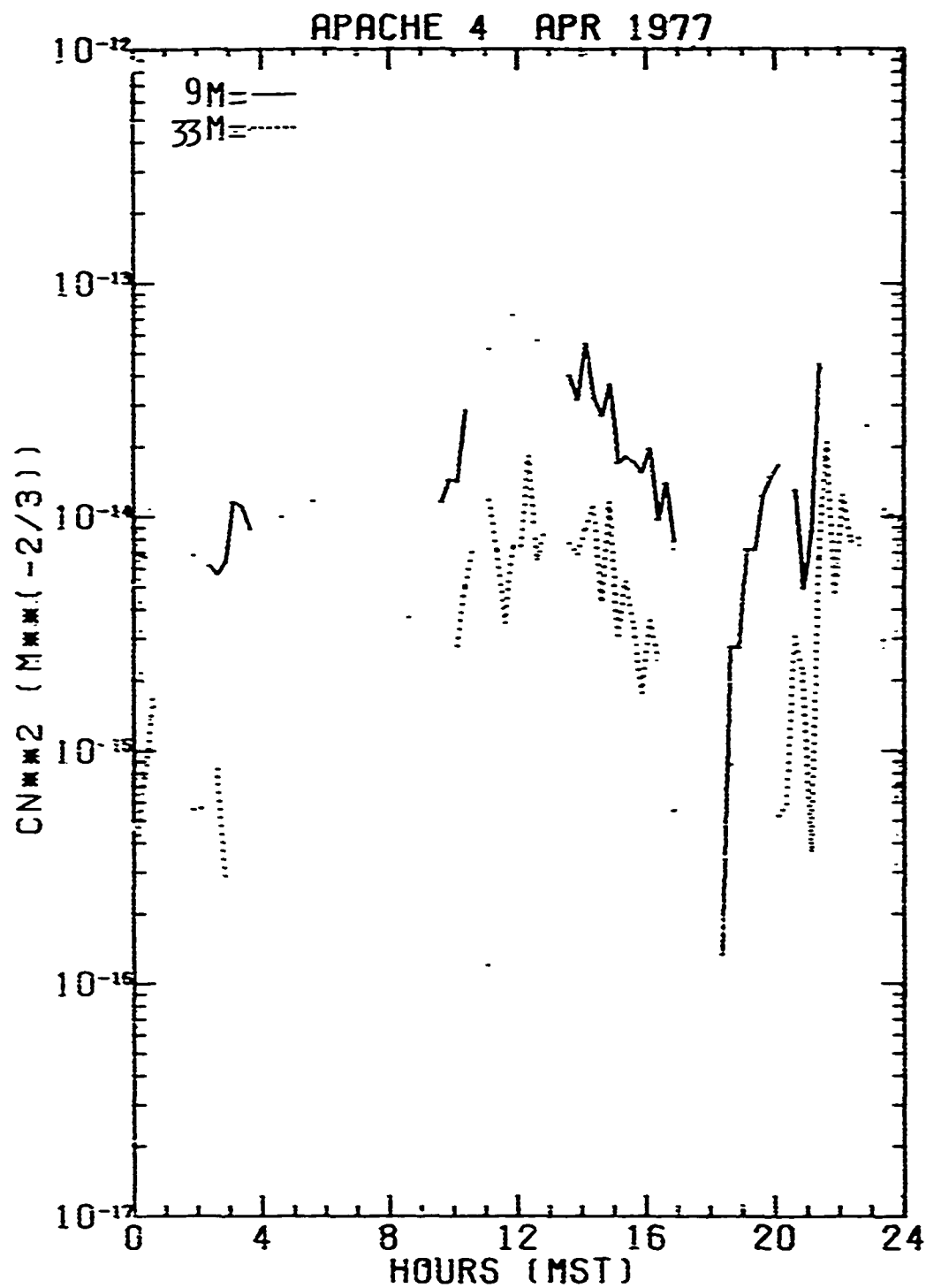


Figure 121. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 4 April 1977.

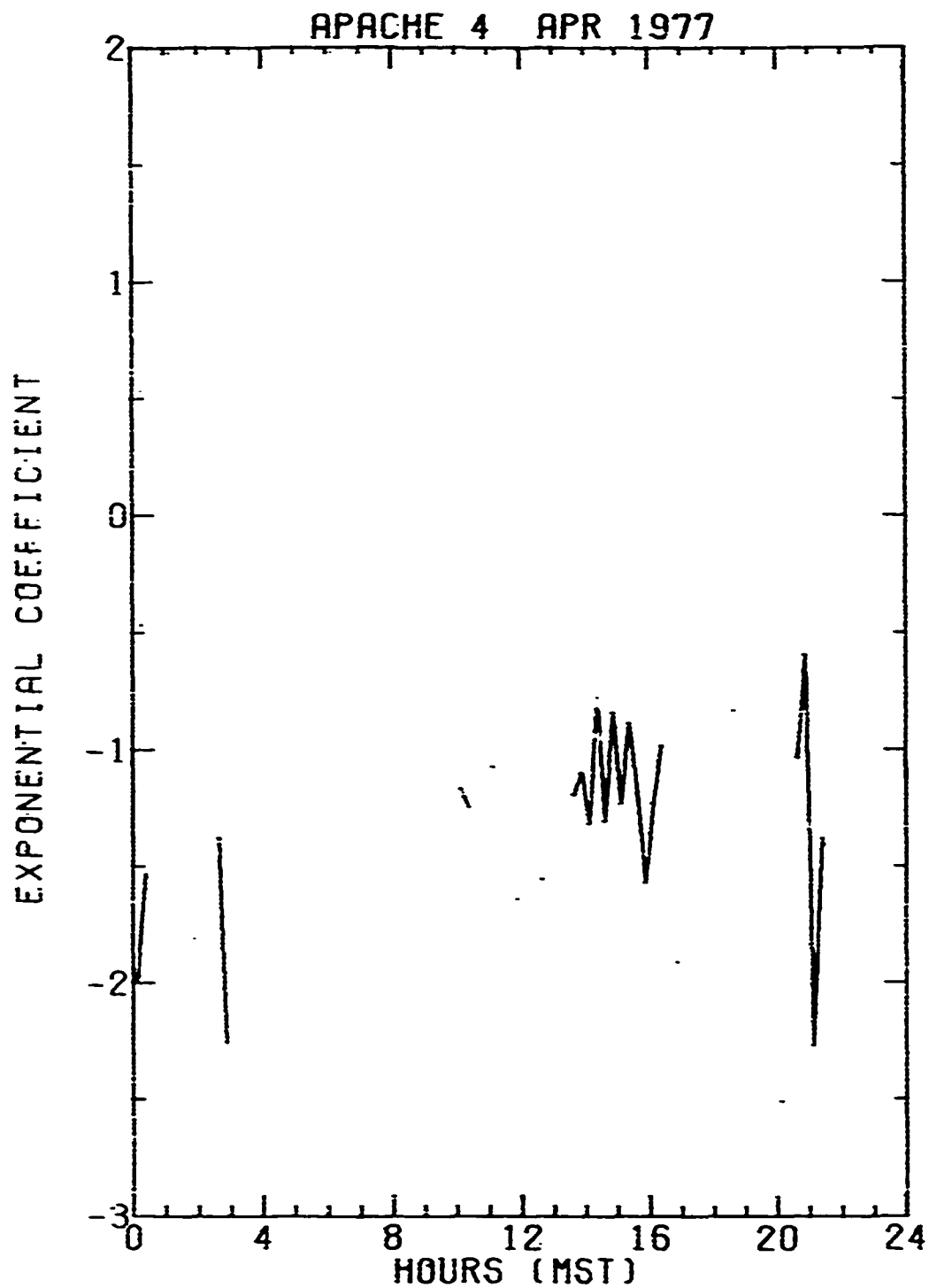


Figure 122. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 4 April 1977.

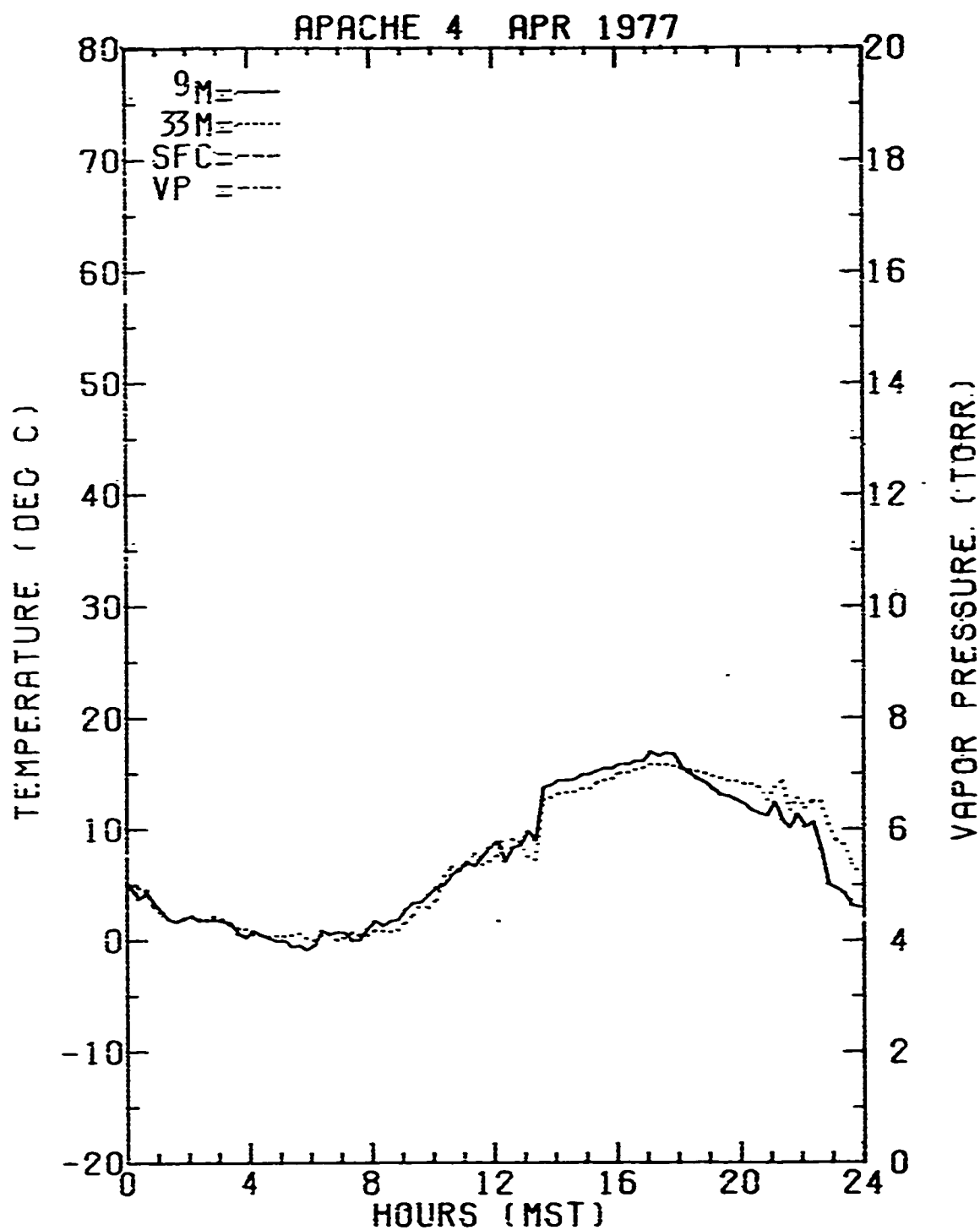


Figure 123. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 4 April 1977.

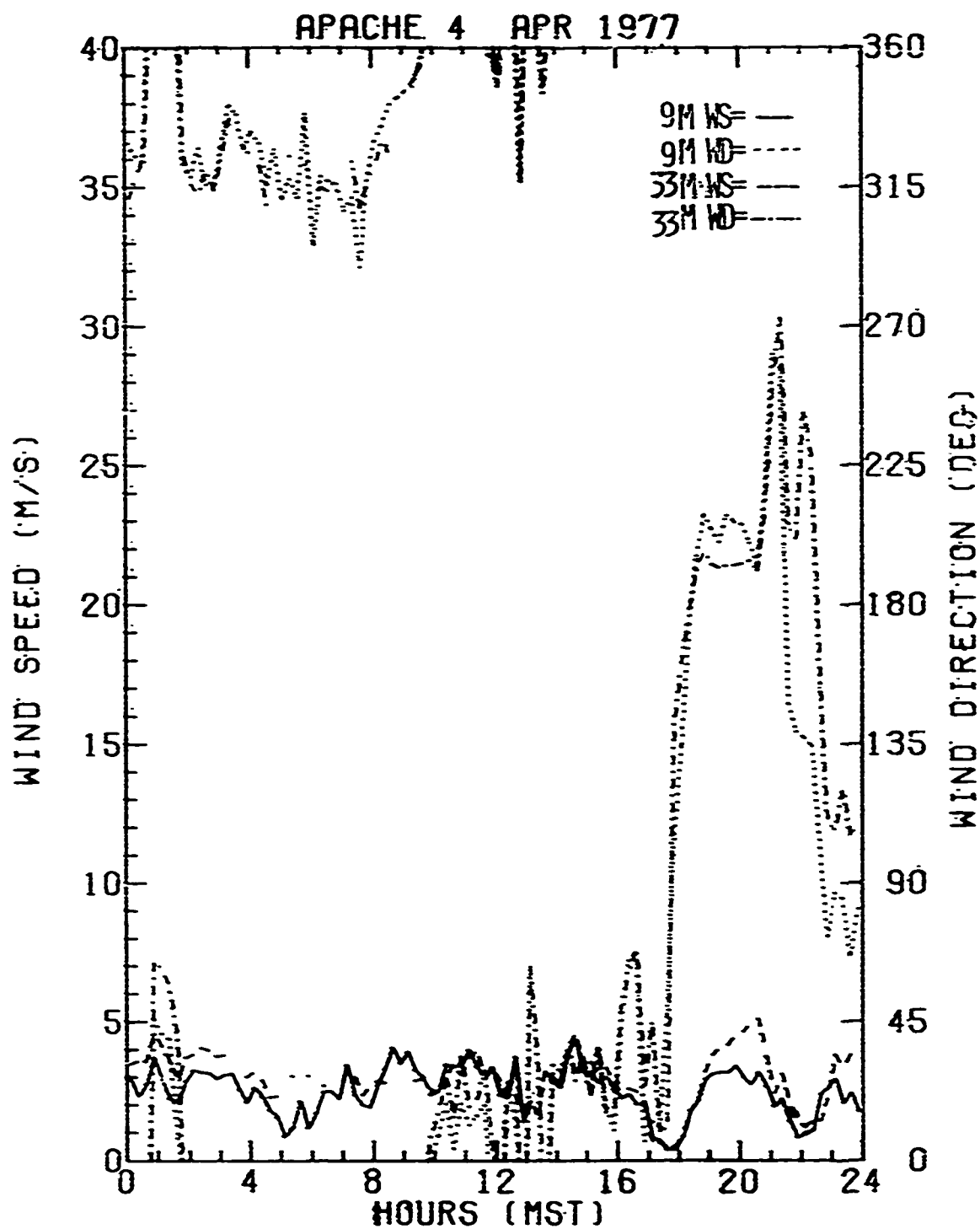


Figure 124. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 4 April 1977.

TABLE 69
APACHE SITE RAWINSONDE DATA

DATE: 04 APR 77 RELEASE NO.: 38 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	660.2	-5	2.5	340.0	1.0
281.9	637.5	2.3	2.6	332.3	3.5
564.4	615.6	2.0	1.9	331.0	5.8
1825.6	525.0	-8.5	1.0	317.7	10.1
2967.1	452.5	-14.6	0.6	307.3	10.5
4365.0	375.0	-24.6	0.2	351.1	14.4

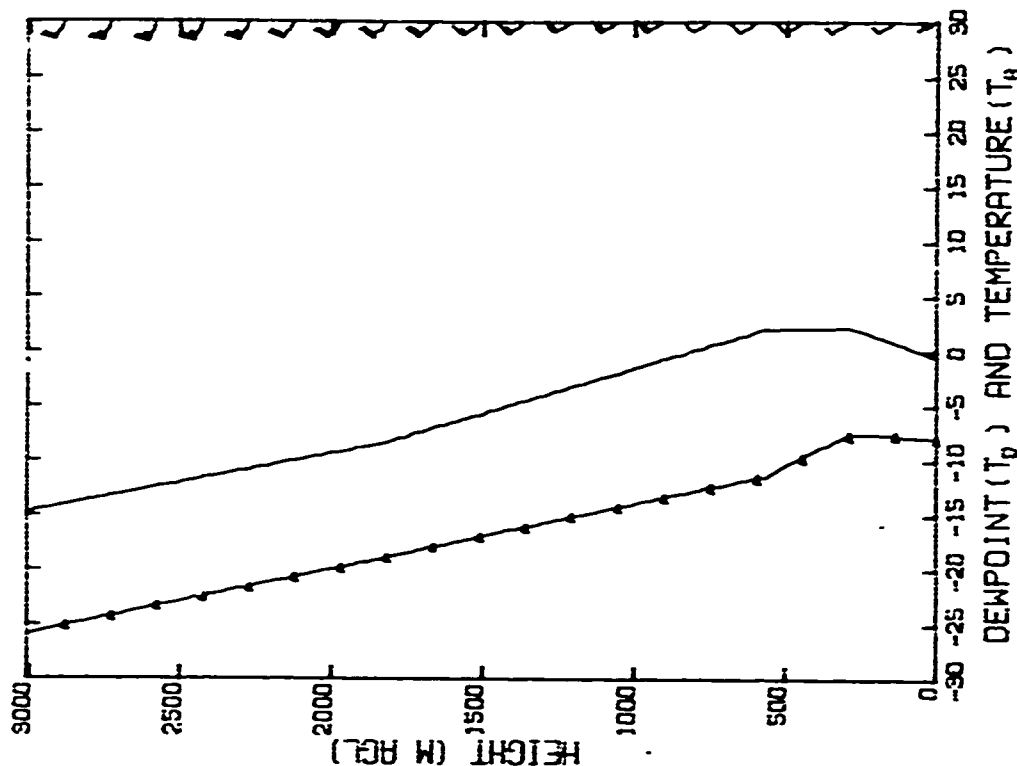


TABLE 70
APACHE SITE RAWINSONDE DATA

DATE: 04 APR 77 RELEASE NO.: 39 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	662.0	11.6	2.8	360.0	4.1
312.7	637.5	6.3	2.1	339.2	4.2
1146.5	575.1	-1.1	1.6	320.1	8.1
1868.0	525.0	-5.9	1.1	348.0	13.0
2281.8	498.0	-6.5	1.0	338.7	13.5
3900.0	403.2	-17.7	0.4	357.3	19.7

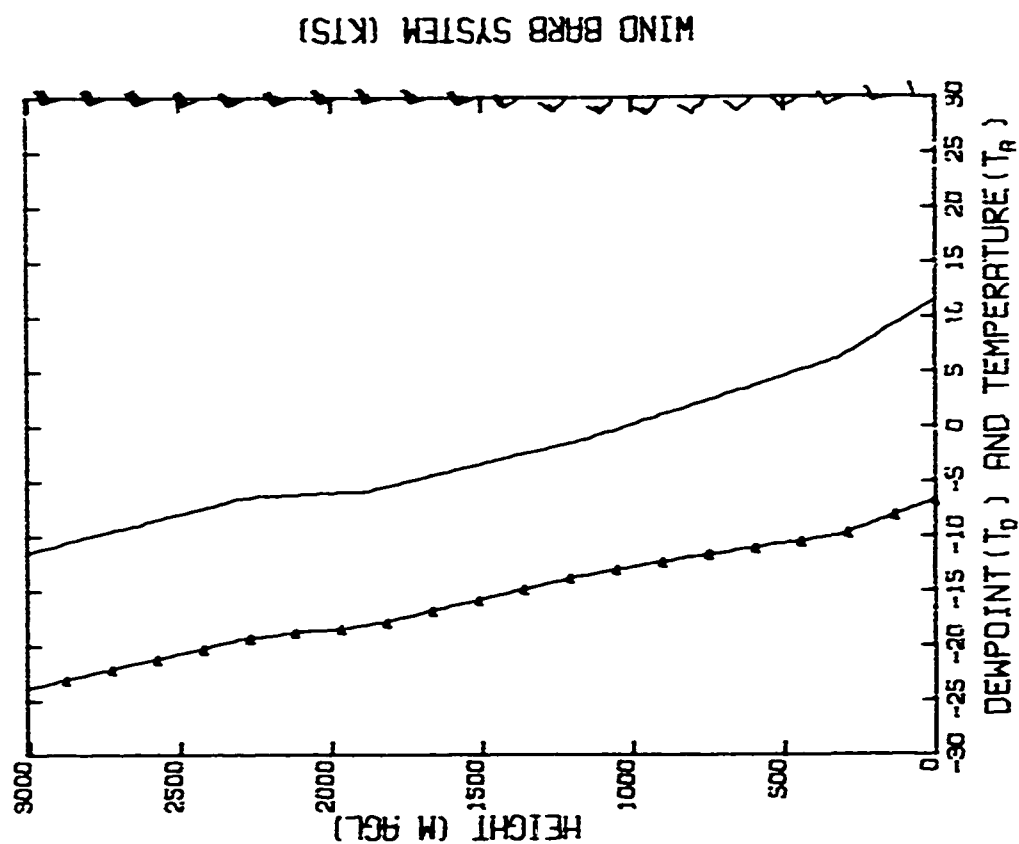


TABLE 71
APACHE SITE RAWINSONDE DATA

DATE: 04 APR 77 RELEASE NO.: 40 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	660.2	16.5	2.5	0.0 0.0
296.8	637.5	14.3	2.8	348.0 0.2
1893.8	525.0	-3	1.5	322.5 11.2
2340.5	496.3	-3.9	1.1	325.4 13.8
2672.0	475.9	-4.4	1.1	334.1 12.3
3039.7	454.2	-6.5	0.9	337.7 12.9

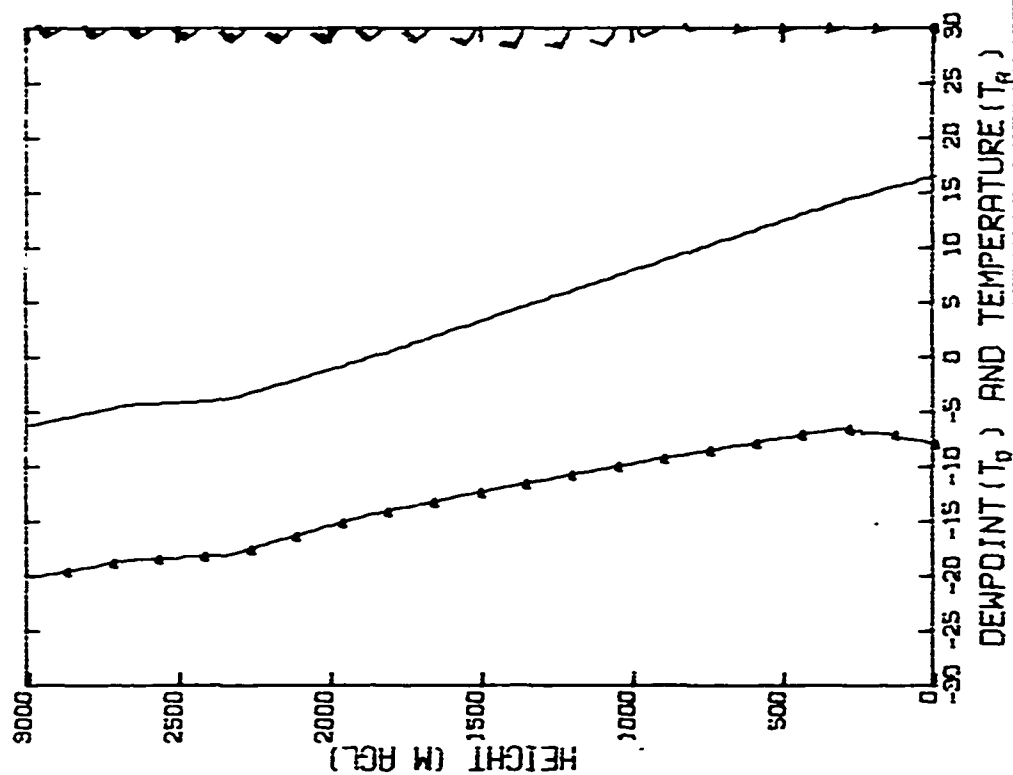
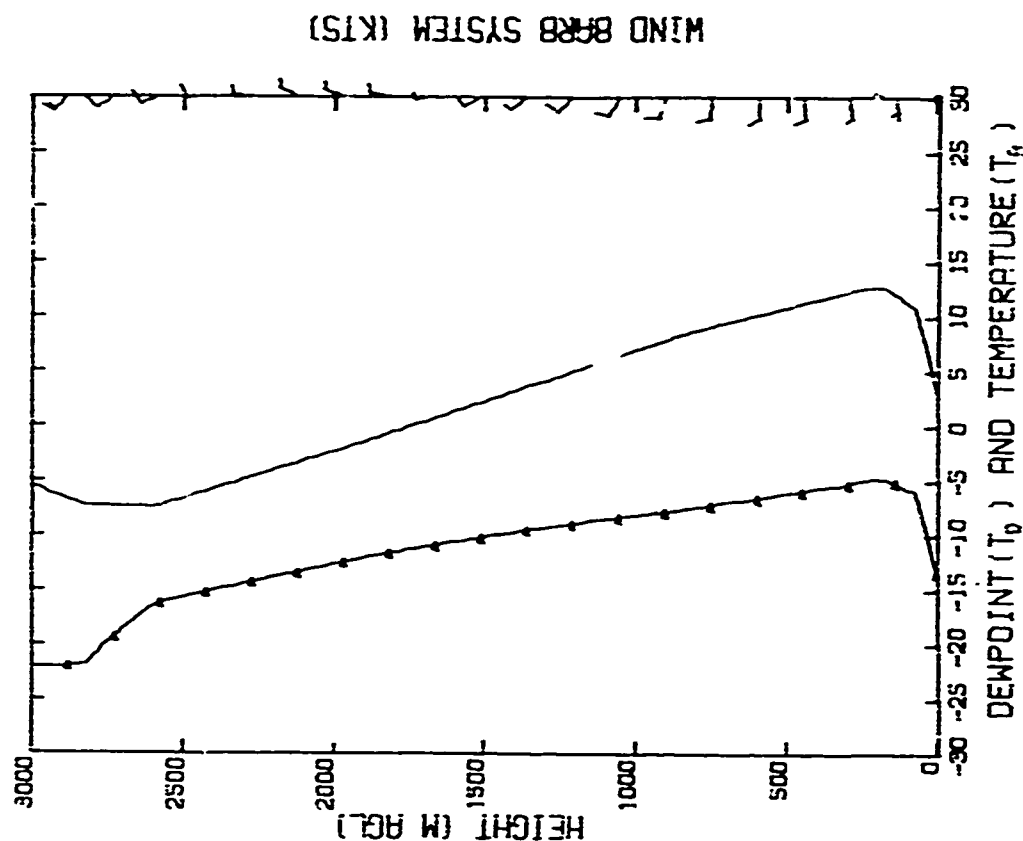


TABLE 72
APACHE SITE RAWINSONDE DATA

DATE: 04 APR 77 RELEASE NO. 41 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	662.5	3.2	1.6	0.0	0.0
73.9	656.5	10.9	2.9	263.5	0.7
175.9	648.6	12.9	3.2	263.5	1.5
320.7	637.5	12.0	3.0	263.5	2.9
827.4	599.8	8.5	2.6	284.5	5.1
1910.2	525.0	-1.6	1.8	17.1	2.6
2587.5	481.8	-7.5	1.3	339.9	5.4
2829.4	467.1	-7.2	0.8	321.9	7.2
3161.9	447.7	-3.8	0.8	312.6	10.1



Weather Summary

Date: 5 April 1977

Synoptic

Surface: Weak pressure gradients over southwestern United States.

500 Millibar: Pressure ridge moving eastward into western United States with moderate northwesterly flow over New Mexico.

Holloman AFB

Clouds: Clear.

Wind: Light and variable with peak wind of 0.4 m sec^{-1} from the south observed shortly before noon.

Visibility: Greater than 60 km.

Maximum temperature: 22.2°C

Corresponding vapor pressure: 2.9 Torr

Minimum temperature: 1.1°C

Corresponding vapor pressure: 2.0 Torr



Figure 125a. Surface weather map for 5 April 1977.

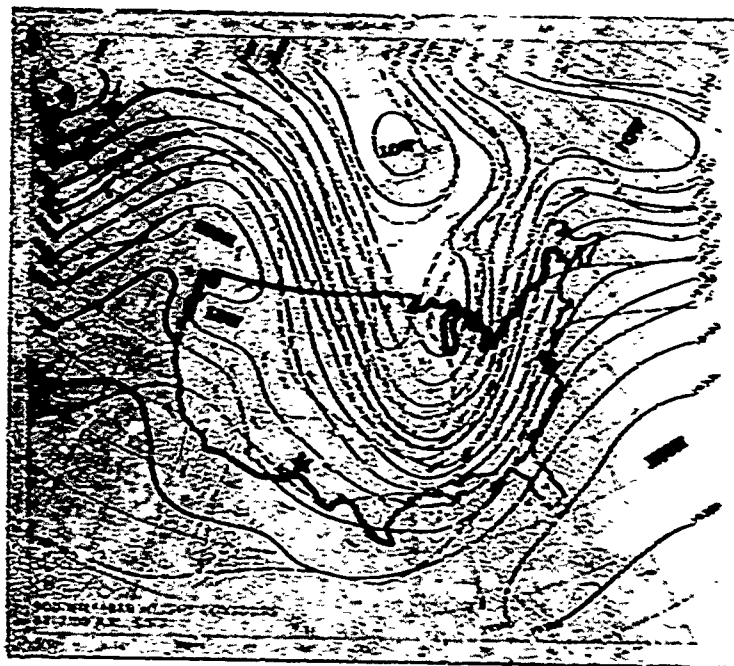


Figure 125b. 500-millibar height contours for 5 April 1977.

TABLE 73. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	0.3	1.8	-12.5	0	0	0	
0200	-0.9	1.8	-11.9	0	0	0	
0300	-1.9	1.5	-14.9	0	0	0	
0400	-0.6	2.3	-9.1	0	0	0	
0500	-3.5	1.4	-15.2	0	0	0	
0600	-2.0	1.7	-12.4	0	0	0	
0700	5.8	2.0	-10.7	0	0	0	
0800	10.6	3.6	-3.2	0	0	0	
0900	13.0	3.2	-4.2	0	0	0	
1000	14.9	3.1	-5.0	0	0	0	
1100	17.3	3.1	-5.1	0	0	0	Apache dr for cal. 1032-1101-na1 both ΔT's - all else ok
1200	18.3	3.2	-4.9	0	0	0	
1300	20.0	3.0	-5.6	0	0	0	
1400	19.4	2.8	-6.6	0	0	0	
1500	21.2	2.9	-5.7	0	0	0	Cal LSTC ΔT's
1600	20.2	2.6	-7.4	0	0	0	
1700	20.4	2.5	-7.8	0	0	0	
1800	19.6	2.5	-8.0	0	0	0	
1900	15.6	2.2	-9.1	0	0	0	
2000	14.5	2.3	-8.9	0	0	0	
2100	11.9	2.3	-9.3	0	0	0	
2200	11.8	2.3	-8.6	0	0	0	
2300	6.2	2.1	-10.4	0	0	0	
2400	6.0	1.9	-11.2	0	0	0	

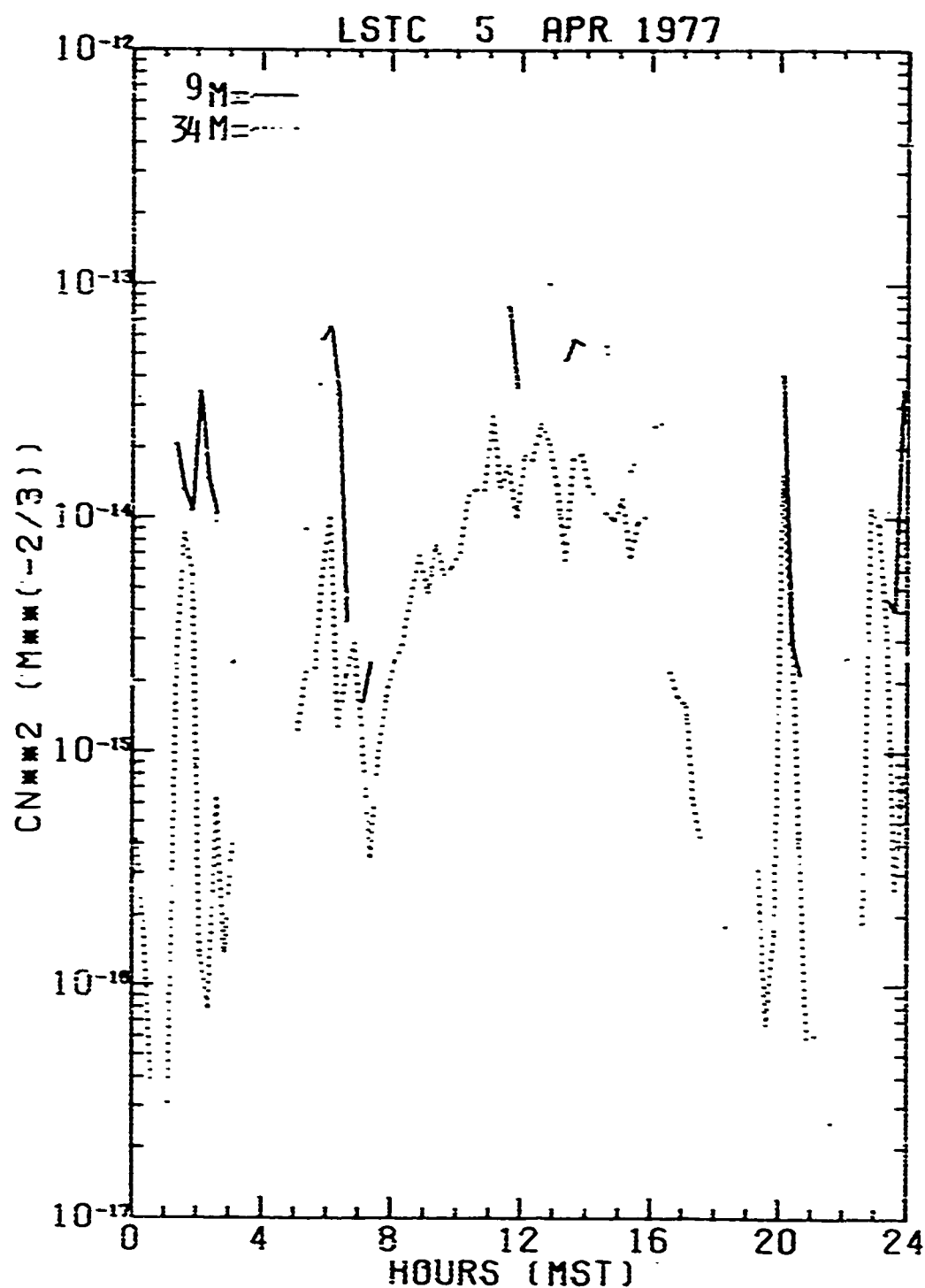


Figure 126. Diurnal variation of the atmospheric structure parameter, C_n^2 , at the LSTC for the 9 and 34 m tower levels, 5 April 1977.

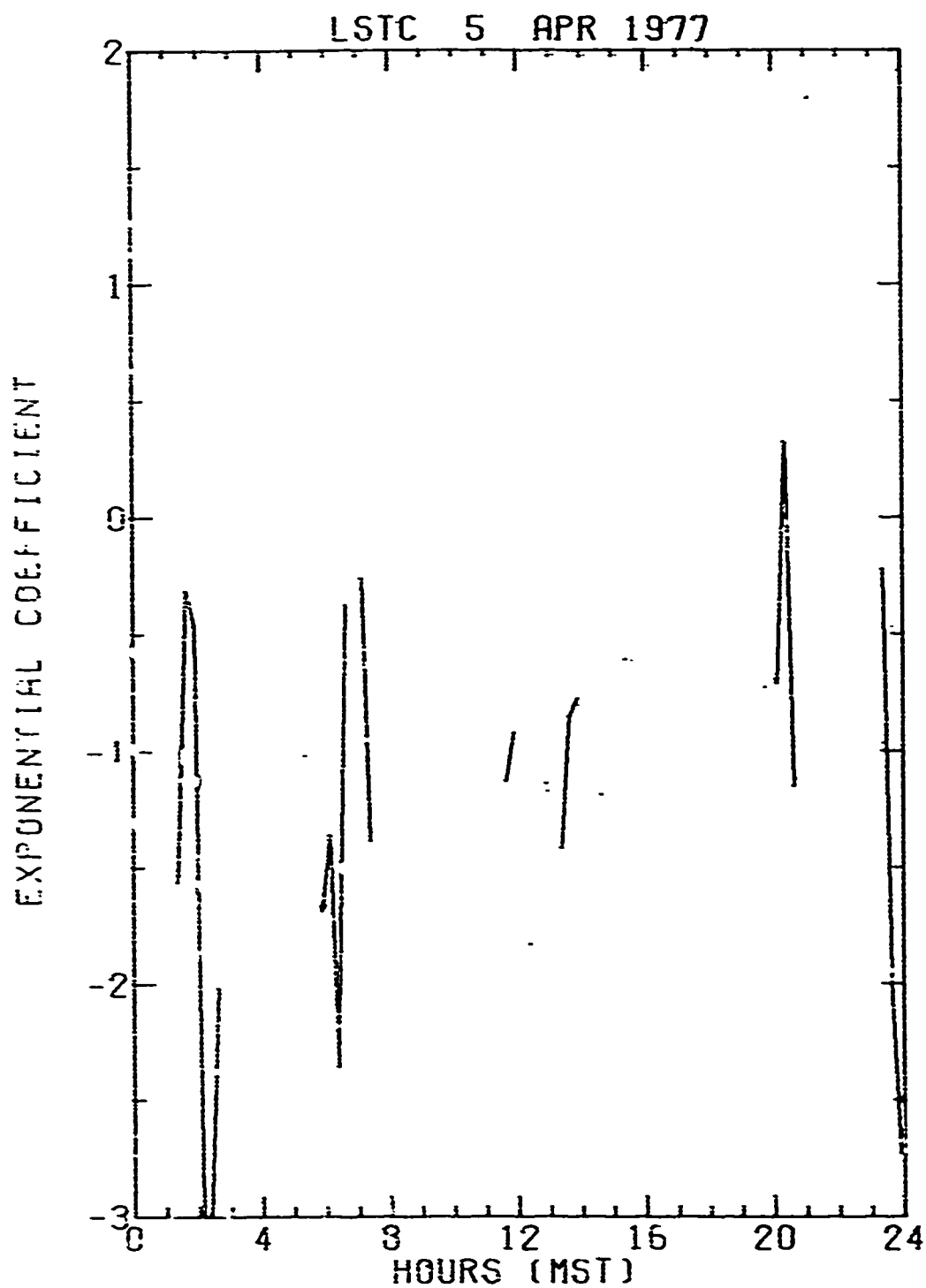


Figure 127. Diurnal variation of the altitude change of C_n^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_n^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_n^2 value, LSTC, 5 April 1977.

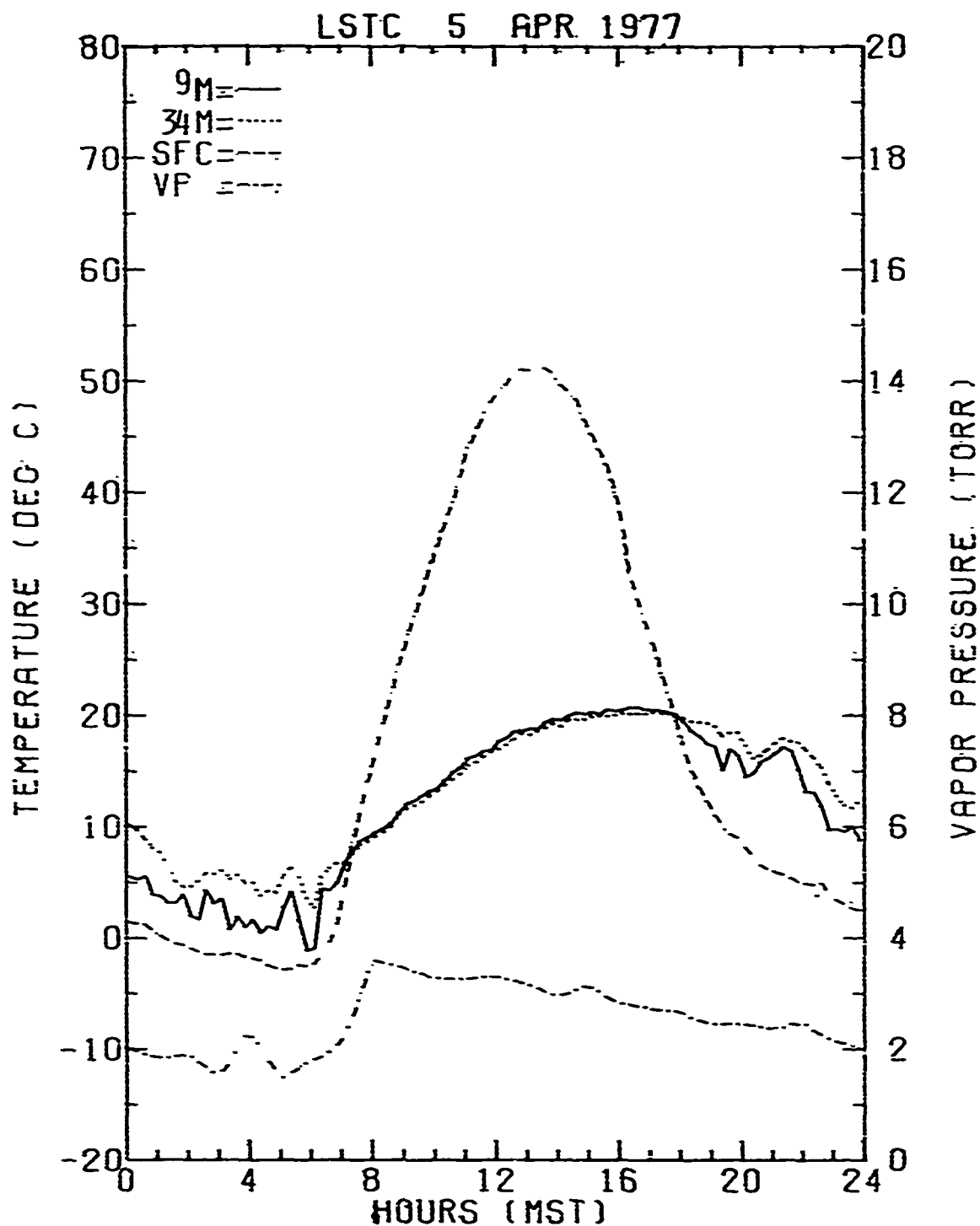


Figure 128. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 5 April 1977.

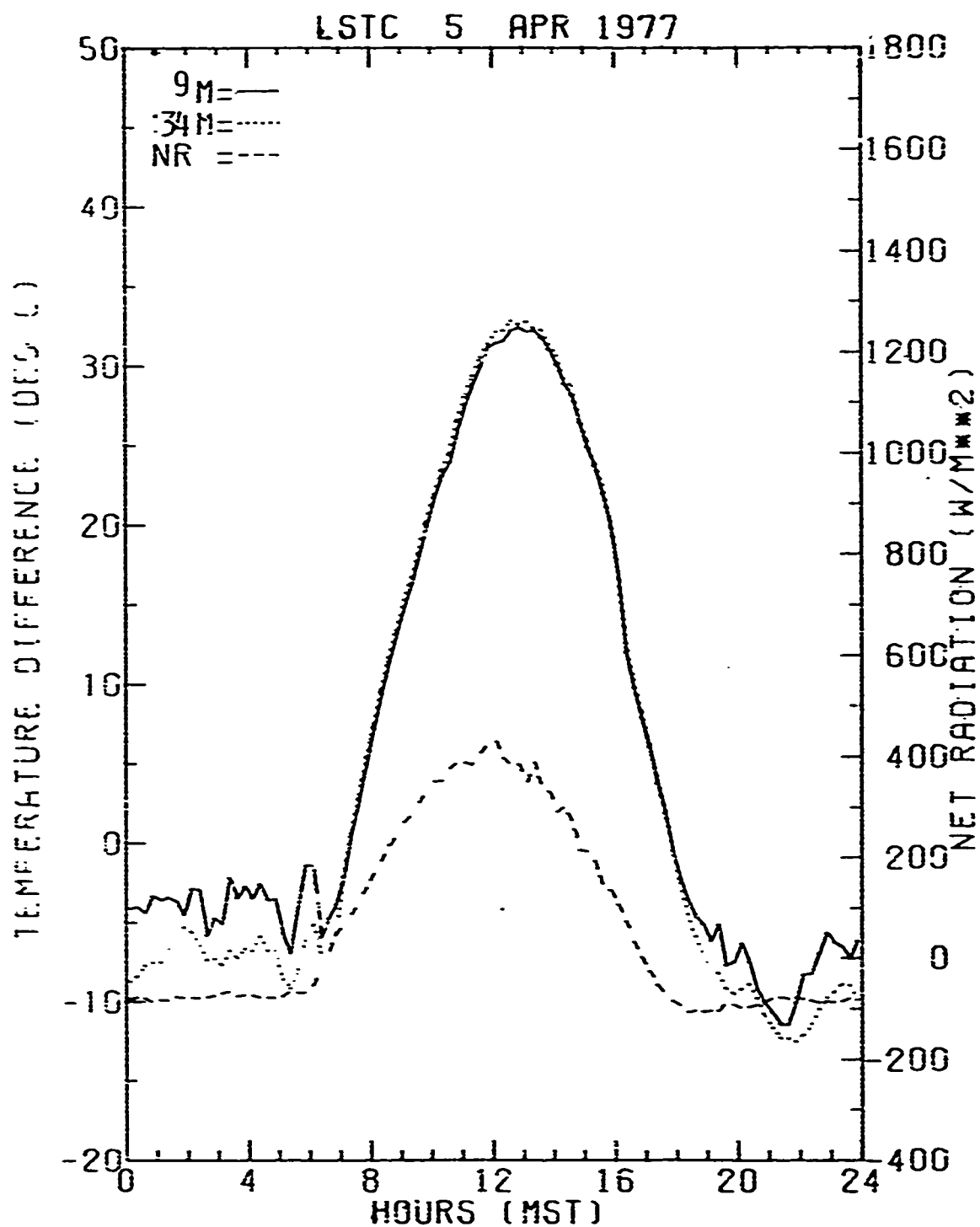


Figure 129. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 5 April 1977.

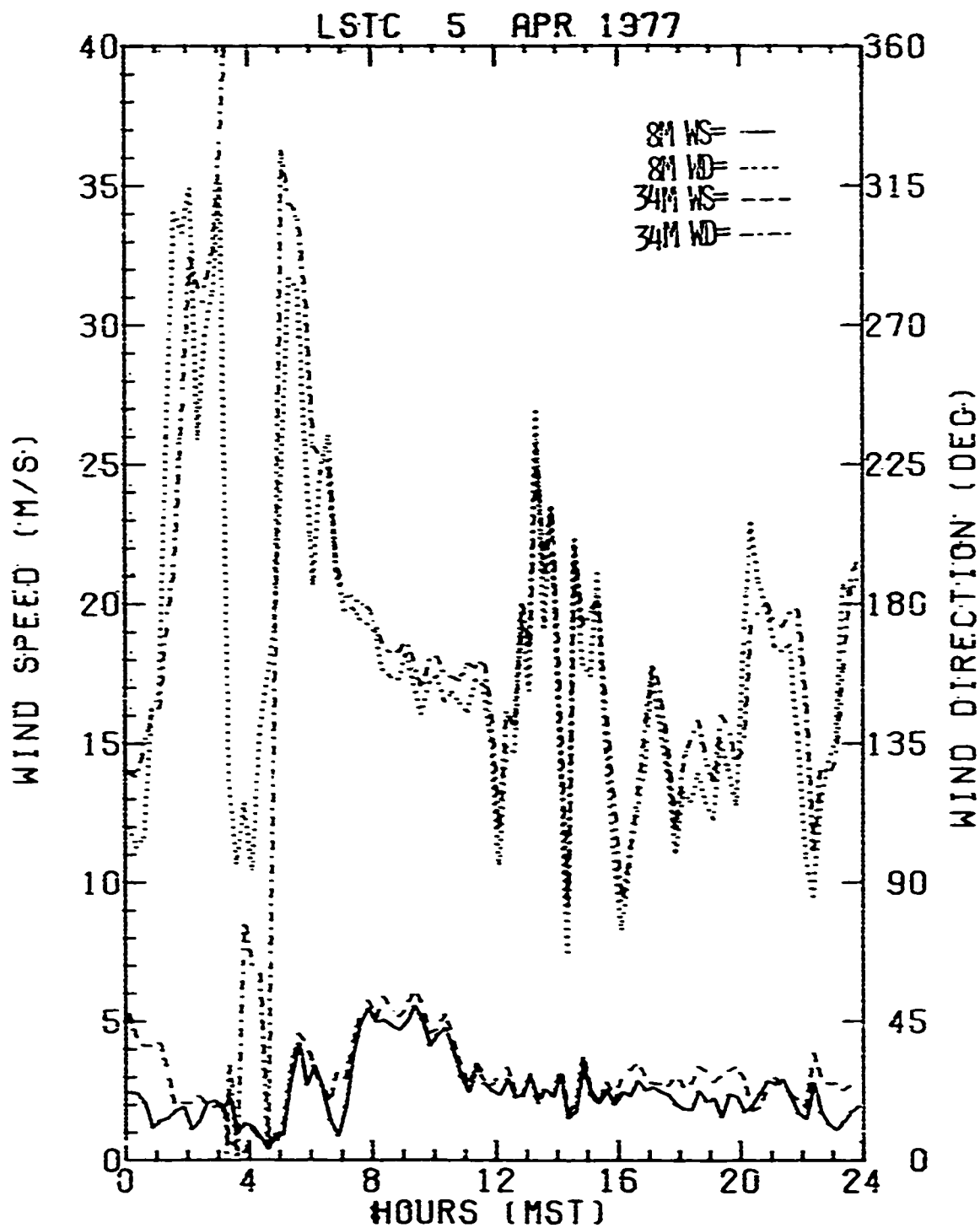


Figure 130. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 5 April 1977.

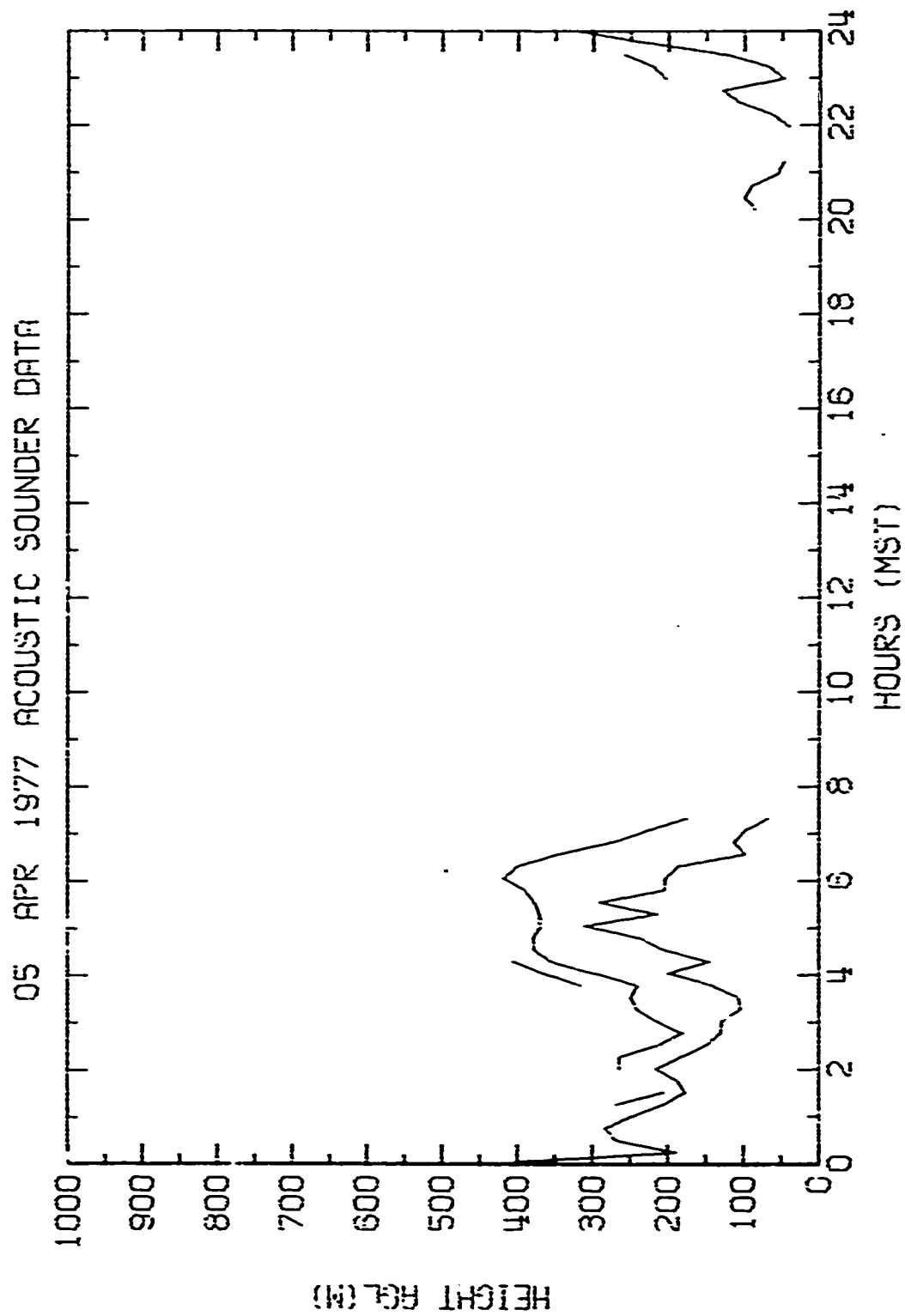


Figure 131. Inversion heights, LSTC, 5 April 1977.

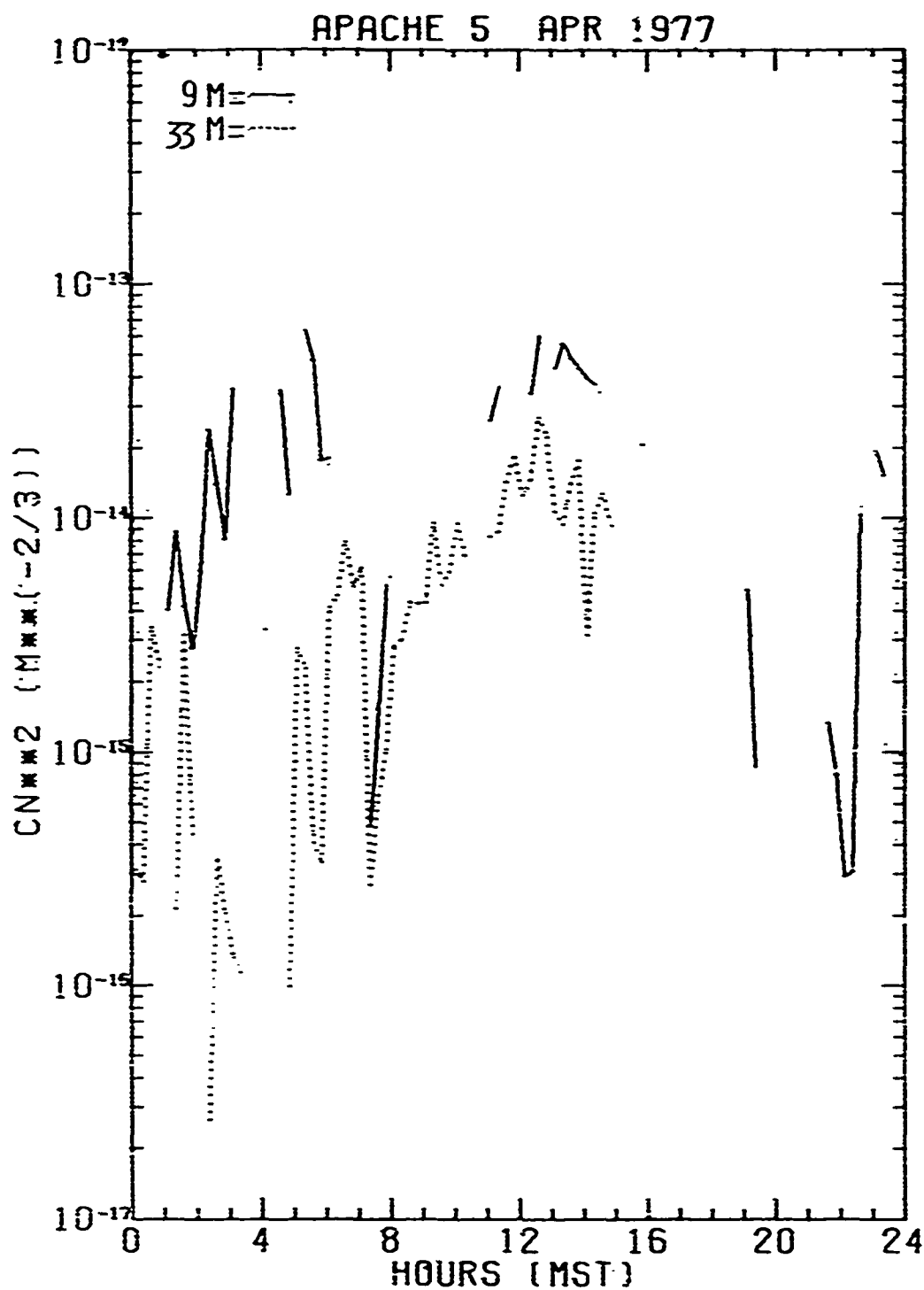


Figure 132. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 5 April 1977.

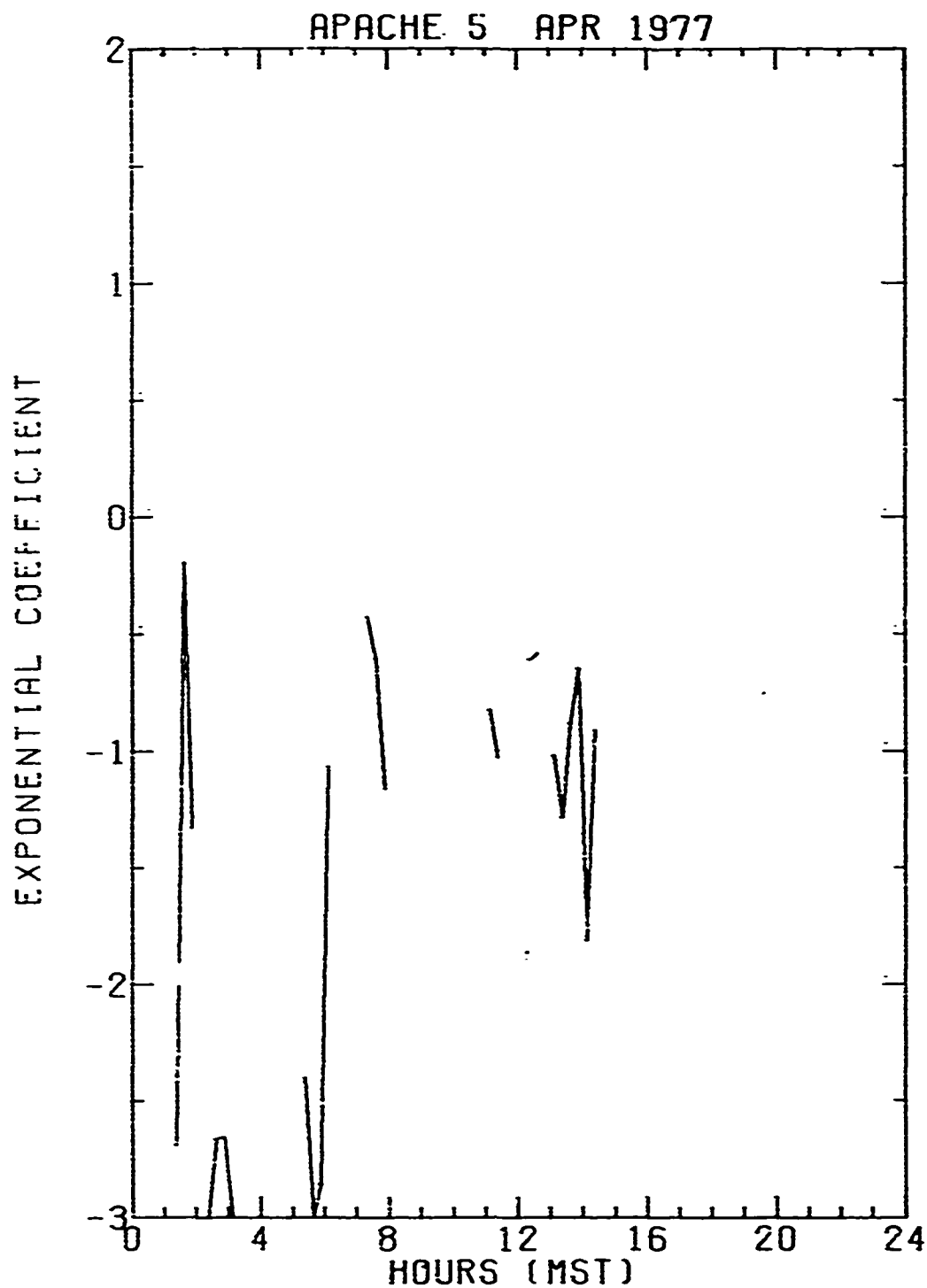


Figure 133. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 5 April 1977.

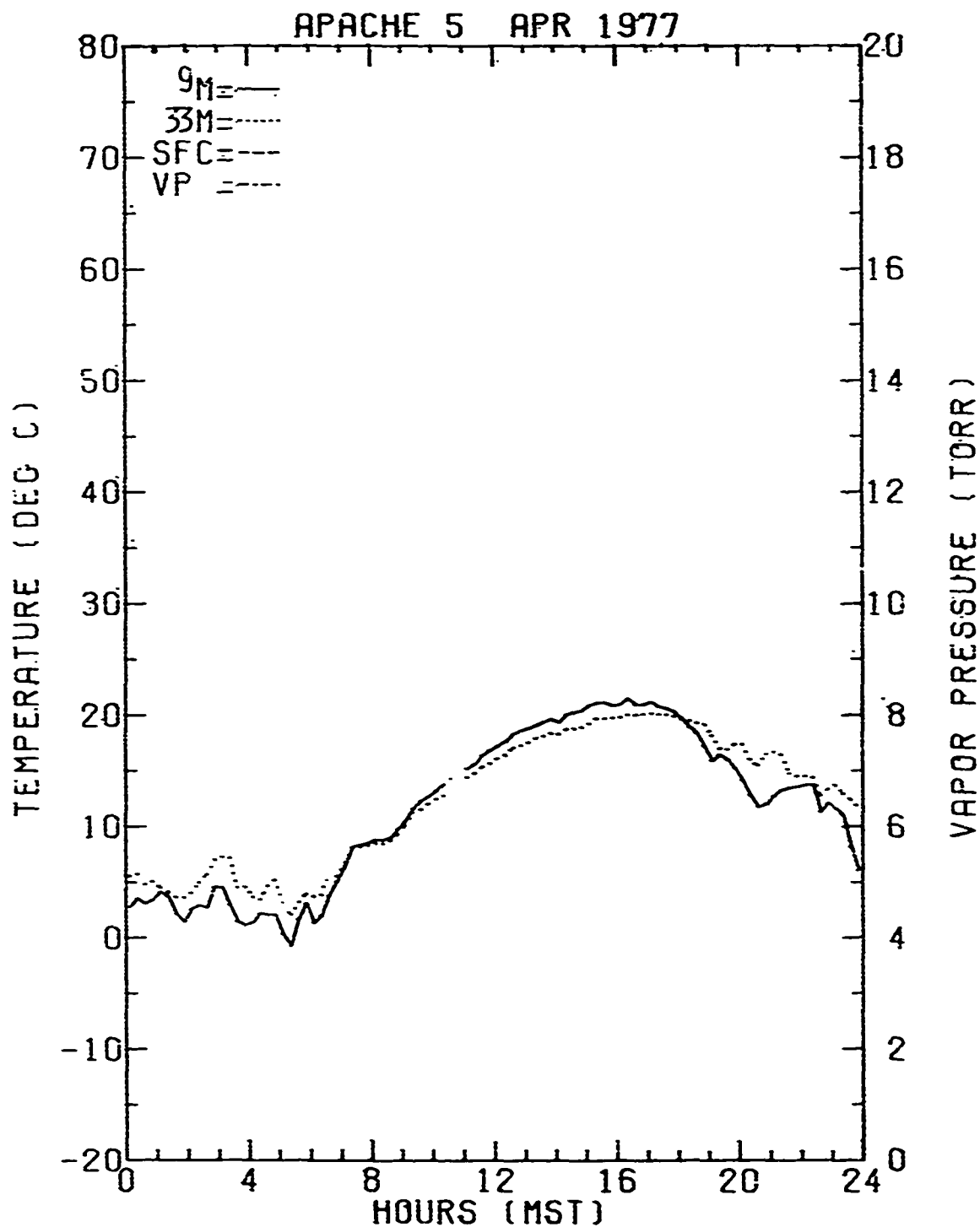


Figure 134. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 5 April 1977.

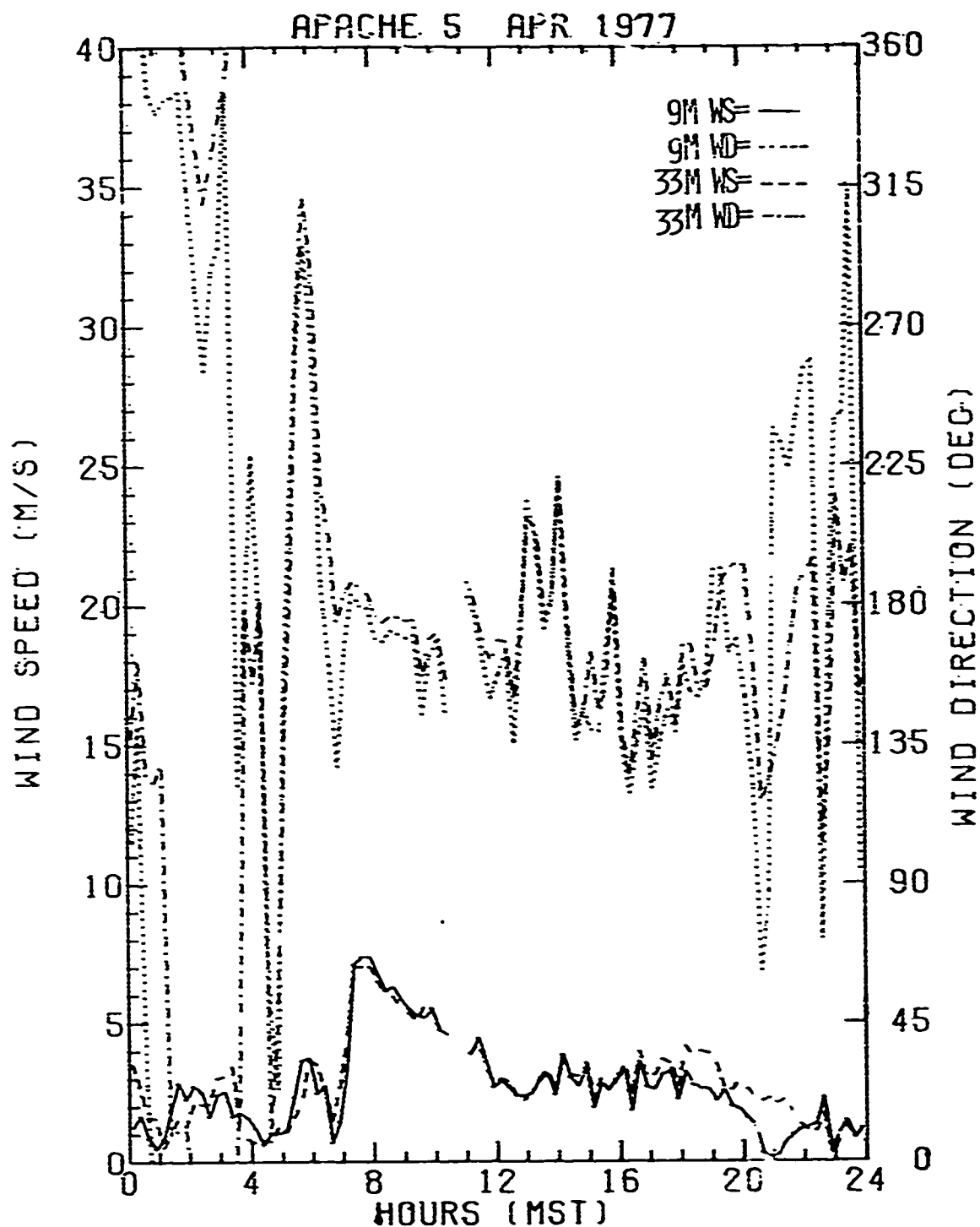


Figure 135. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 5 April 1977.

TABLE 74
APACHE SITE RAINWINDSONDE DATA

DATE: 05 APR 77 RELEASE NO. 02 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/5)
0.0	563.2	-1.0	1.4	0.0	0.0
35.7	560.3	5.8	2.2	0.0	0.0
590.2	537.5	6.4	2.2	0.0	0.0
444.7	628.2	7.6	2.4	0.0	0.0
998.5	587.2	5.6	2.4	0.0	0.0
1902.9	525.0	-2.2	1.6	0.0	0.0
2235.9	503.4	-4.3	1.5	0.0	0.0
2564.7	482.8	-4.9	1.0	0.0	0.0
2925.2	461.2	-4.9	0.8	0.0	0.0
3610.5	422.5	-8.7	0.6	0.0	0.0

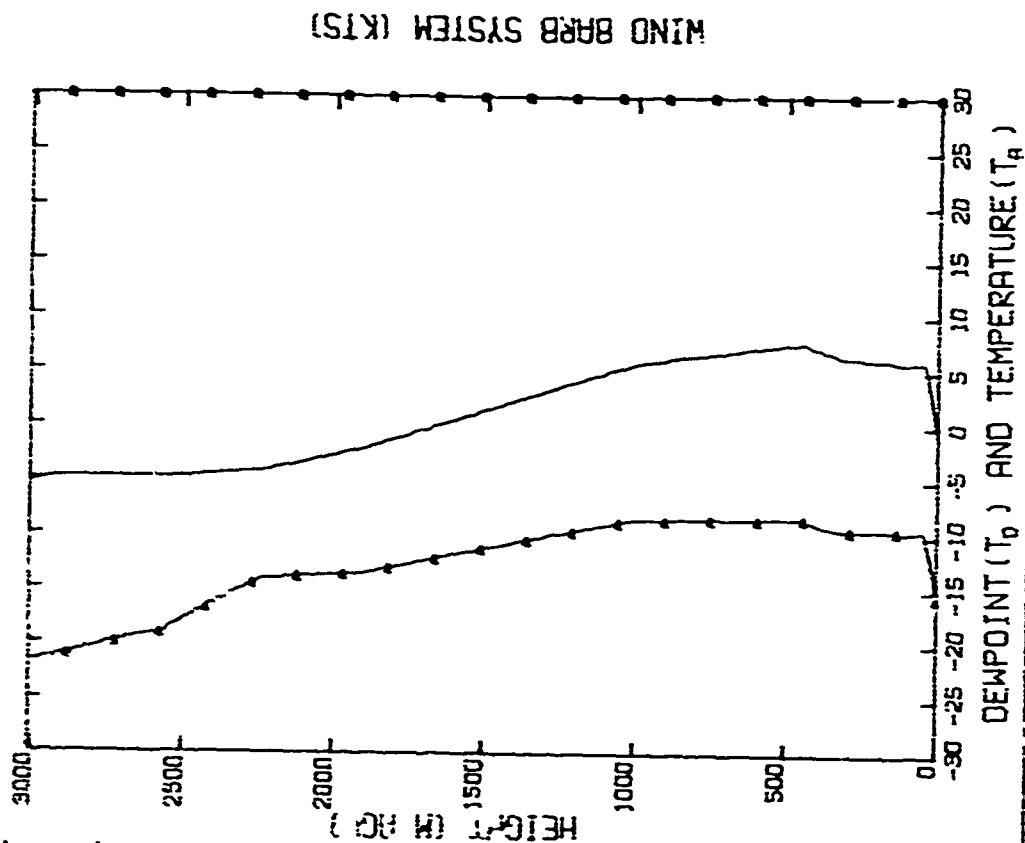
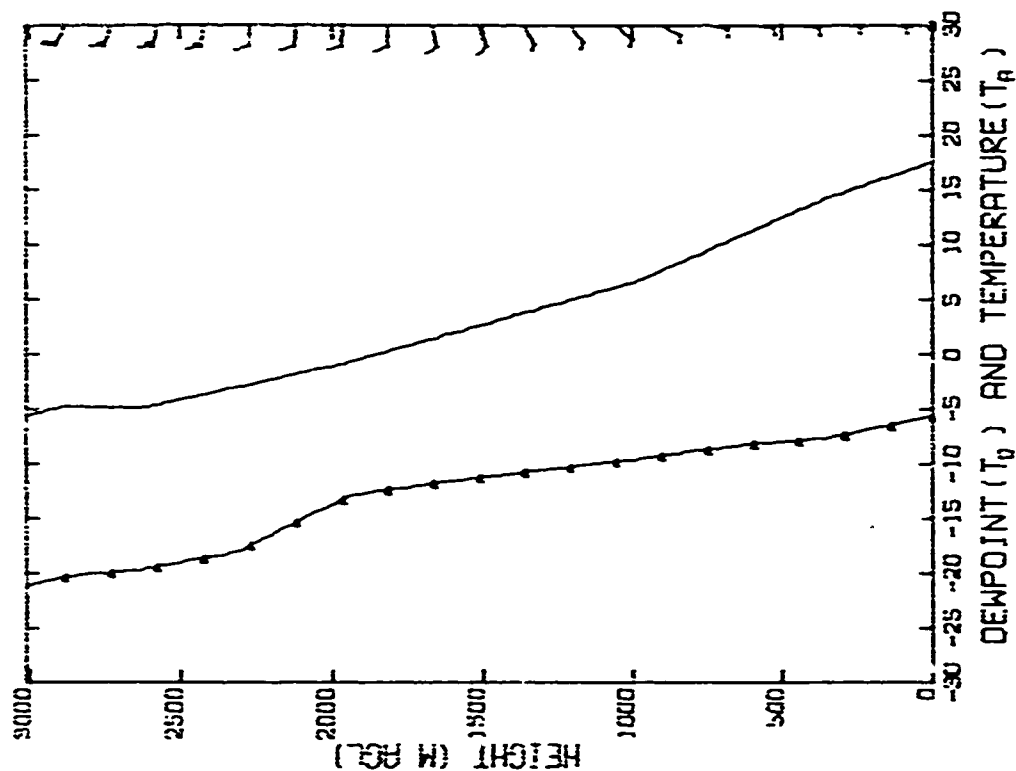


TABLE 75 APACHE SITE RAWINSONDE DATA

DATE: 05 APR 77 RELEASE NO. 43 RELEASE TIME: 1200 MST

STENIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	654.0	17.5	3.0	0.0	0.0
346.3	637.5	14.3	2.6	184.4	1.3
979.3	590.8	6.7	2.2	213.5	2.5
1937.6	525.0	-7	1.7	273.2	5.6
2308.0	501.1	-3.0	1.1	274.5	6.2
2631.5	481.0	-4.9	1.0	285.6	8.3
2876.1	466.3	-4.7	0.9	294.2	9.4
3322.0	440.5	-8.0	0.7	301.3	9.5



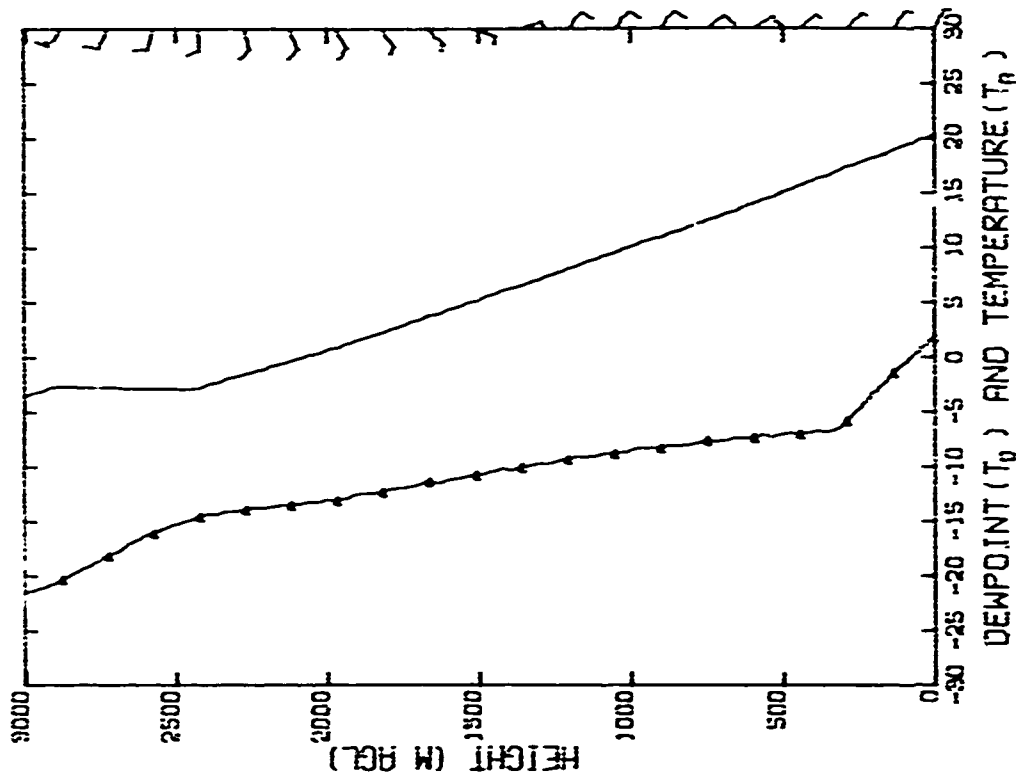
WIND B59RB SYSTEM (KTS)

TABLE 76
APACHE SITE RAWINSONDE DATA

DATE: 05 APR 77 RELEASE NO. 44 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M ASL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	662.1	20.4	5.2	120.0	3.1
324.7	637.5	17.0	2.8	137.0	3.6
676.5	611.5	13.2	2.6	152.0	4.1
1338.6	564.7	6.8	2.1	152.0	3.1
1932.7	525.0	1.2	1.7	238.0	4.1
2437.3	492.9	-2.9	1.5	269.0	5.2
2903.0	465.0	-2.6	0.9	311.0	7.2
4154.5	395.7	-14.2	0.4	304.8	8.1



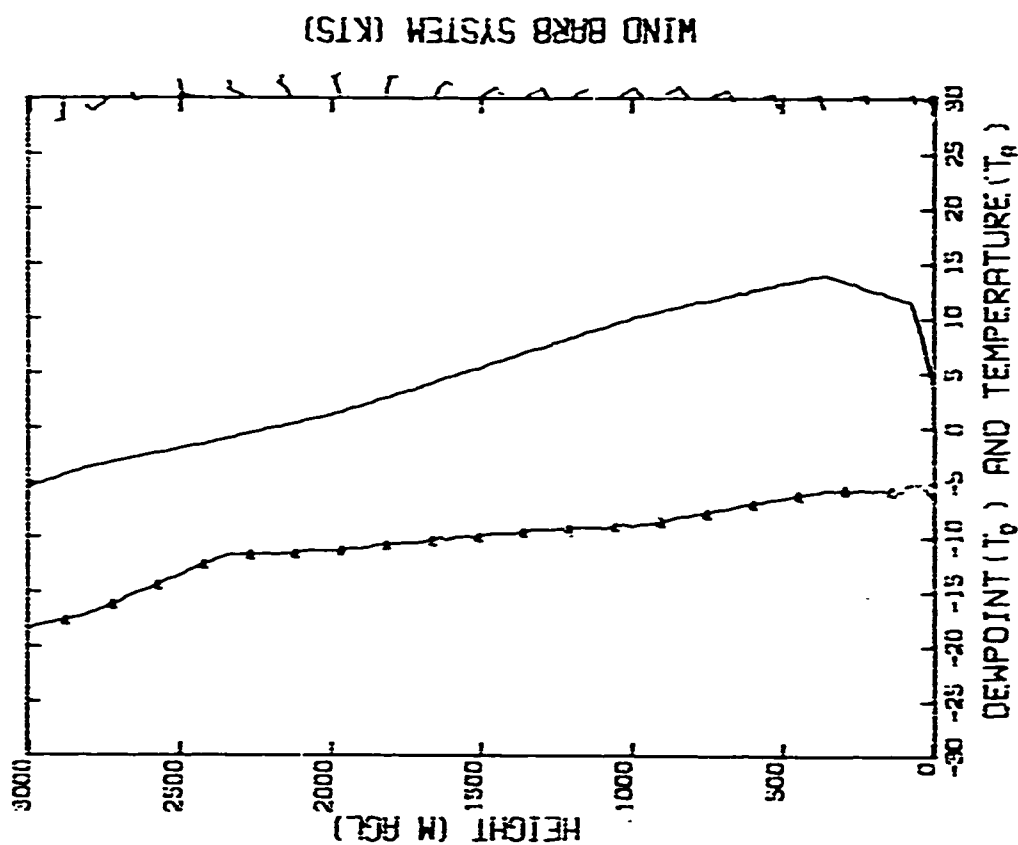
WIND BRB8 SYSTEM (KTS)

TABLE 77
APACHE SITE RAWINSONDE DATA

DATE: 05 APR 77 RELEASE NO.: 45 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	664.6	3.8	3.0	0.0	0.0
71.0	658.9	11.5	2.9	173.0	1.0
348.9	637.5	14.0	3.0	173.0	3.6
981.2	591.1	10.1	2.3	151.0	5.2
1953.4	525.0	1.5	1.9	72.0	2.6
2358.1	499.2	-1.1	1.9	16.0	4.1
2802.9	472.0	-3.6	1.2	307.0	2.1
3124.6	453.1	-6.6	1.0	247.2	3.9



Weather Summary

Date: 6 April 1977

Synoptic

Surface: Weak surface pressure gradient over New Mexico.

500 Millibar: Weak ridge over western United States with light north-westerly flow over New Mexico.

Holloman AFB

Clouds: Generally clear to thin scattered high clouds (cirrus) with few low clouds (cumulus) at 2000 m AGL during the afternoon.

Wind: Light and variable with peak gust of 8 m sec^{-1} from the east-southeast shortly before 1400 MST.

Visibility: Generally greater than 60 km.

Maximum temperature: 26.7°C

Corresponding vapor pressure: 2.9 Torr

Minimum temperature: 5.0°C

Corresponding vapor pressure: 2.5 Torr



Figure 136a. Surface weather map for 6 April 1977.

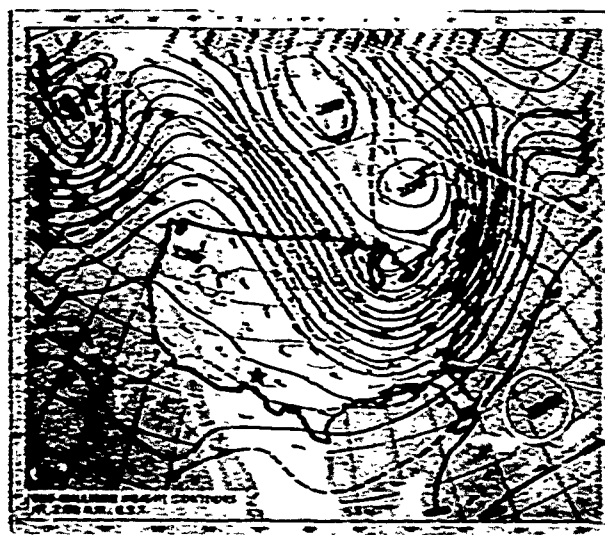


Figure 136b. 500-millibar height contours for 6 April 1977.

TABLE 78. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb		Vapor		Dew Point (°C)	Clouds			Remarks
	Temp (°C)	Pressure (Torr)	Pressure (Torr)	% Type		Low % Type	Mld % Type	High % Type	
0100	4.7	1.6	1.6		-13.4	0	0	0	System crashed/reprogrammed and on at 0220 MST psychrometer broke (conversion tables in use)
0200	4.9	1.6	1.6		-13.5	0	0	0	
0300	4.9	1.8	1.8		-12.3	0	0	0	
0400	1.5	1.7	1.7		-12.6	0	0	0	
0500	-1.1	2.3	2.3		-9.1	0	0	0	Small Cu build up NE of station
0600	-0.6	2.3	2.3		-9.1	0	0	0	
0700	6.1	2.8	2.8		-6.7	0	0	0	
0800	10.6	3.0	3.0		-5.3	0	0	0	
0900	14.9	2.7	2.7		-7.0	0	0	0	
1000	18.1	3.0	3.0		-5.4	0	0	0	
1100	20.6	3.2	3.2		-4.6	10 Cu	0	0	
1200	23.3	3.1	3.1		-5.3	10 Cu	0	0	
1300	24.5	3.0	3.0		-5.8	10 Cu	0	0	
1400	24.8	2.9	2.9		-6.1	0	0	0	
1500	25.3	2.7	2.7		-6.9	0	0	0	
1600	25.1	2.5	2.5		-8.1	10 Cu	0	0	
1700	24.5	2.2	2.2		-9.5	0	0	10 Cl	
1800	22.8	2.1	2.1		-10.5	0	0	20 Cl	
1900	19.1	1.6	1.6		-13.8	0	0	30 Cl	
2000	14.6	2.4	2.4		-8.7	0	0	30 Cl	
2100	11.4	2.3	2.3		-9.0	0	0	20 Cl	
2200	11.6	2.1	2.1		-10.5	0	0	10 Cl	APA 32 AT back on line 1742
2300	11.4	2.5	2.5		-8.1	0	0	0	
2400	11.0	2.6	2.6		-7.7	0	0	0	

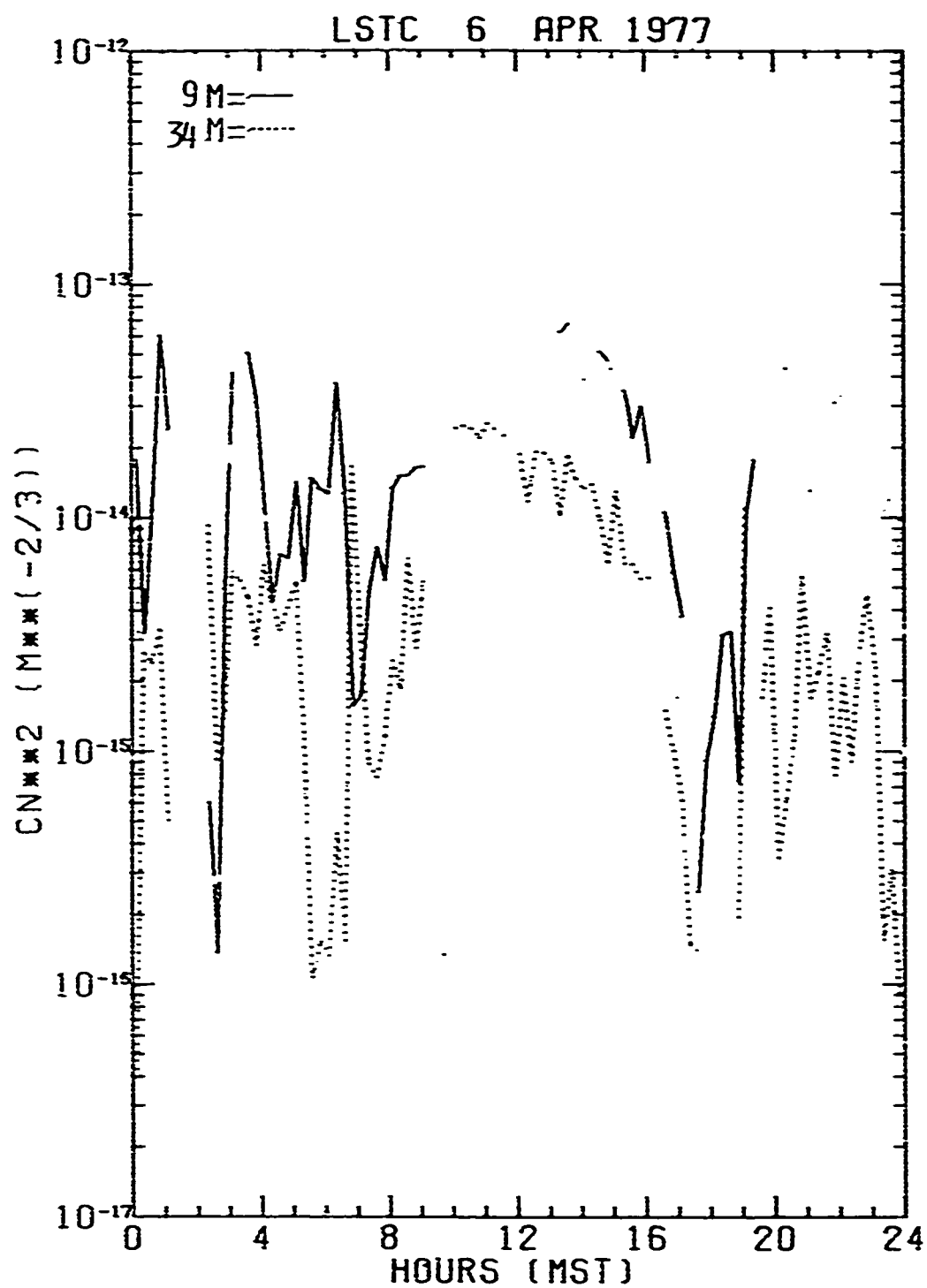


Figure 137. Diurnal variation of the atmospheric structure parameter, C_n^2 , at the LSTC for the 9 and 34 m tower levels, 6 April 1977.

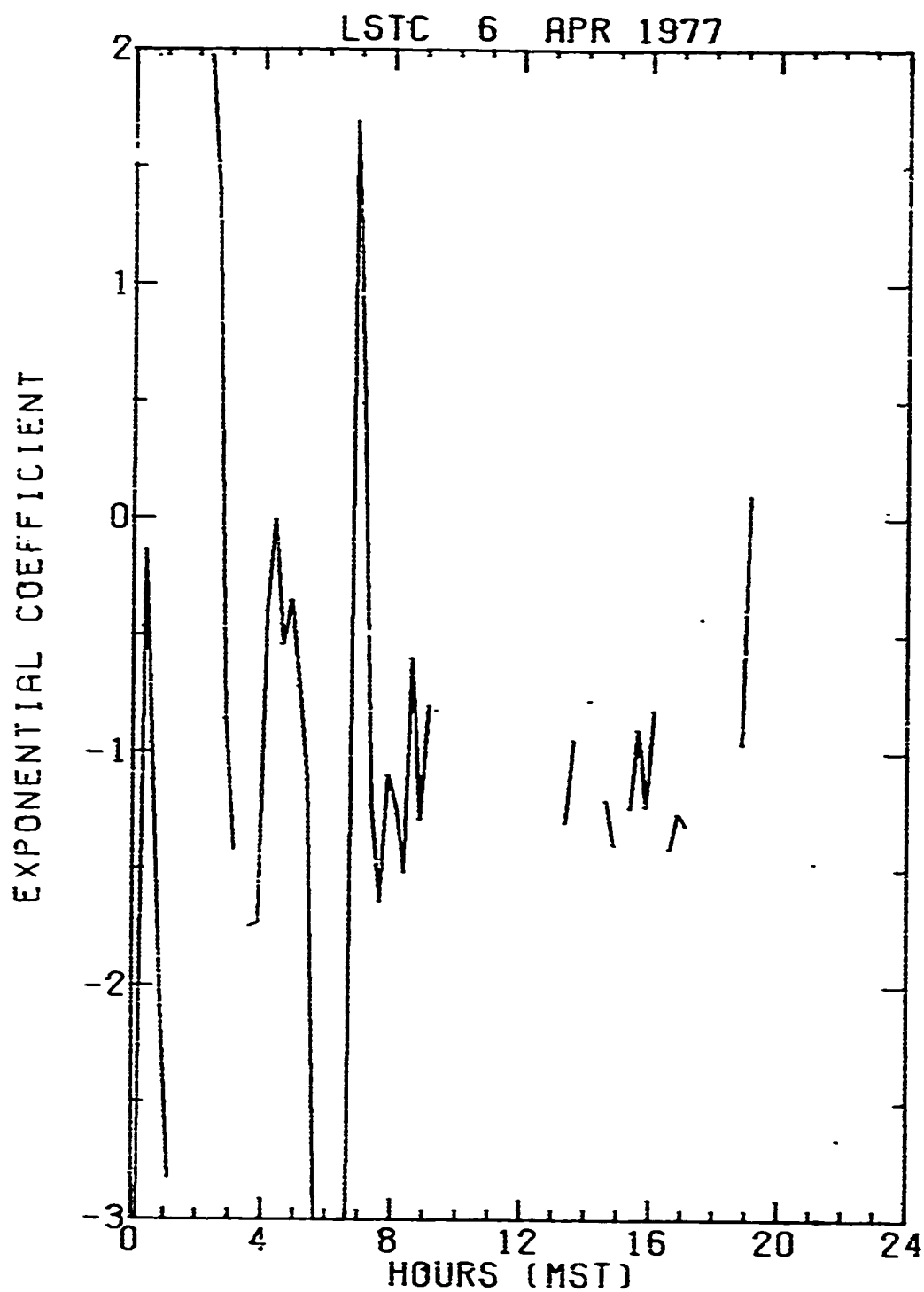


Figure 138. Diurnal variation of the altitude change of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 6 April 1977.

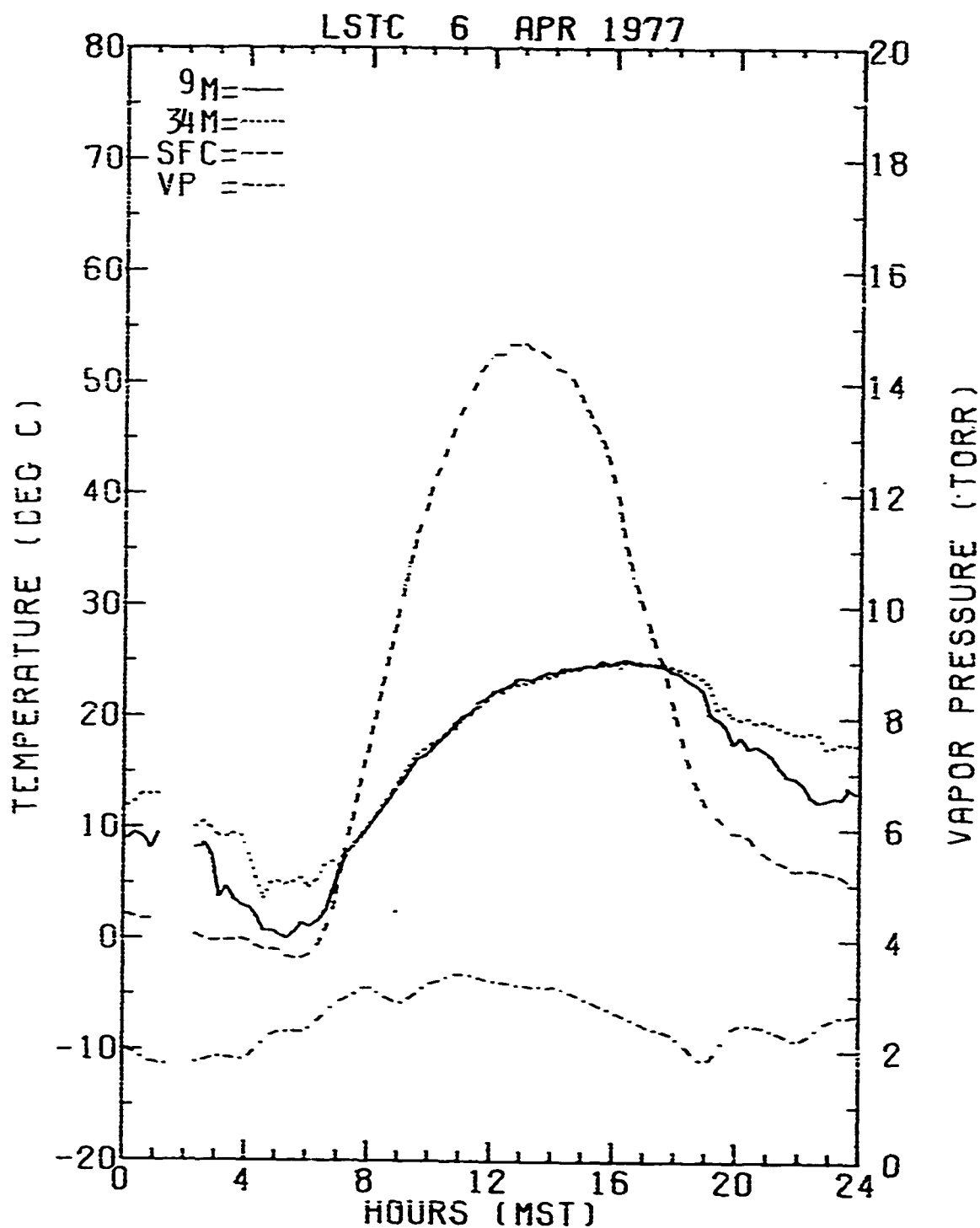


Figure 139. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 6 April 1977.

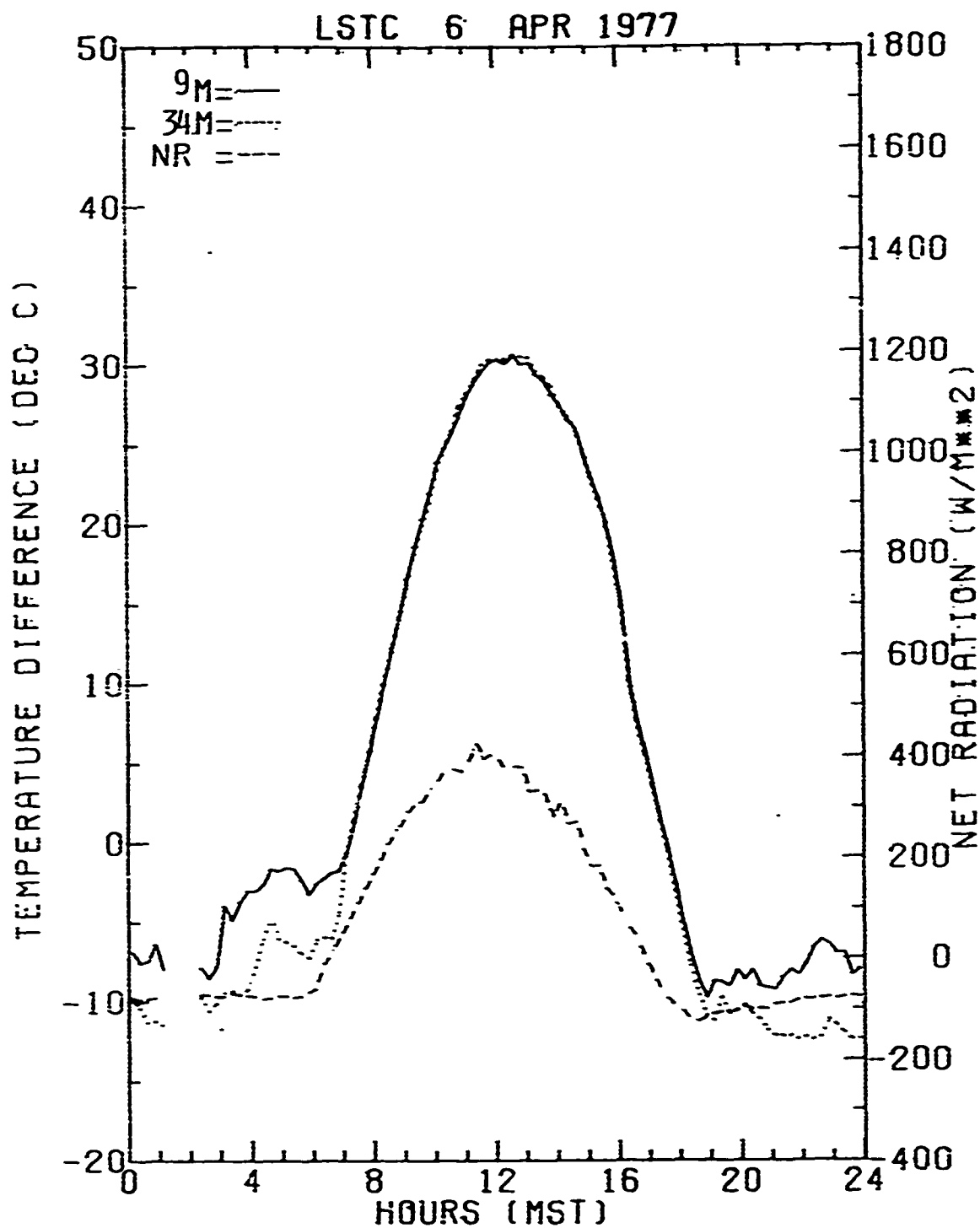


Figure 140. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 6 April 1977.

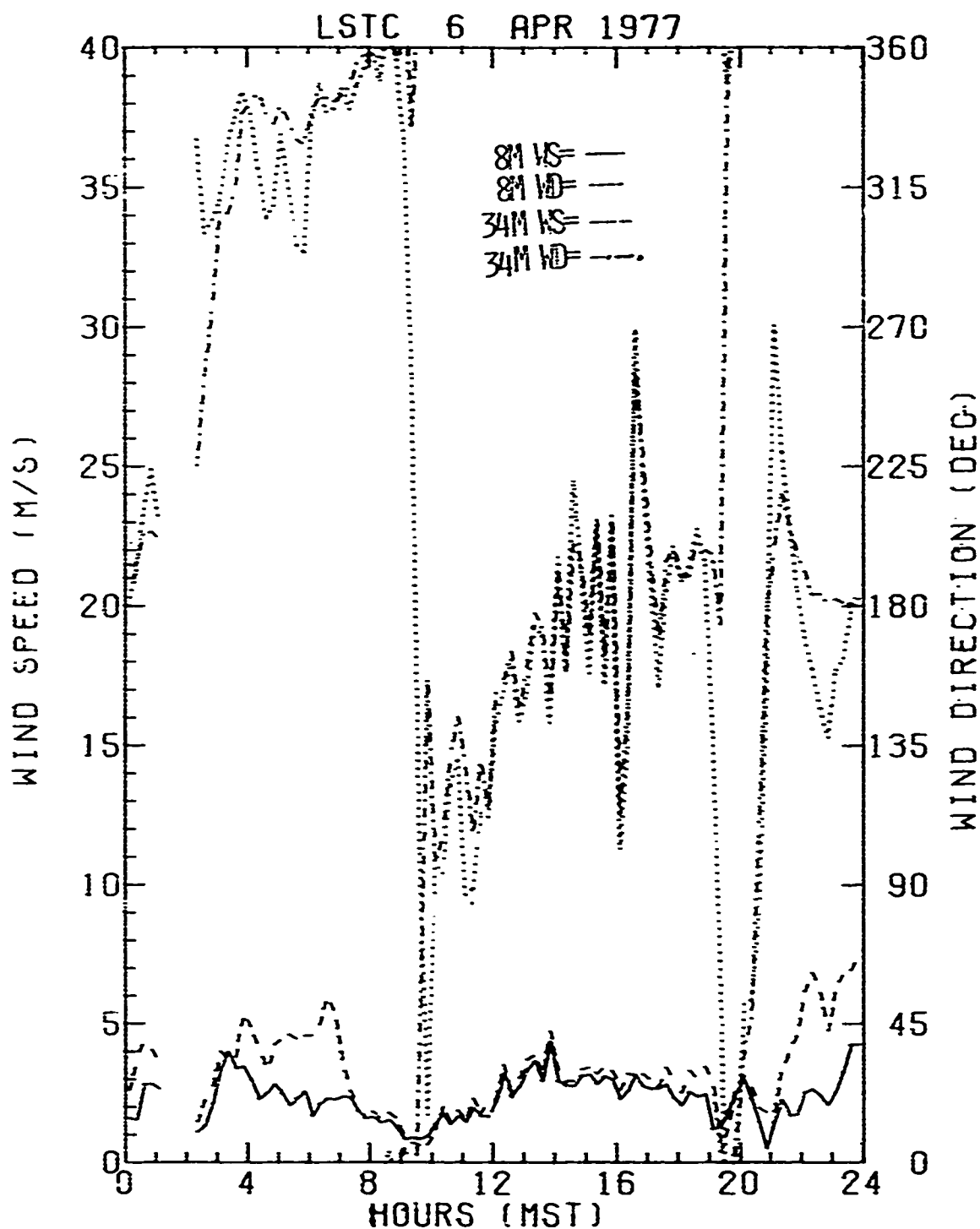


Figure 141. Diurnal variation of windspeed and wind direction at the 8 and 34 tower levels, LSTC, 6 April 1977.

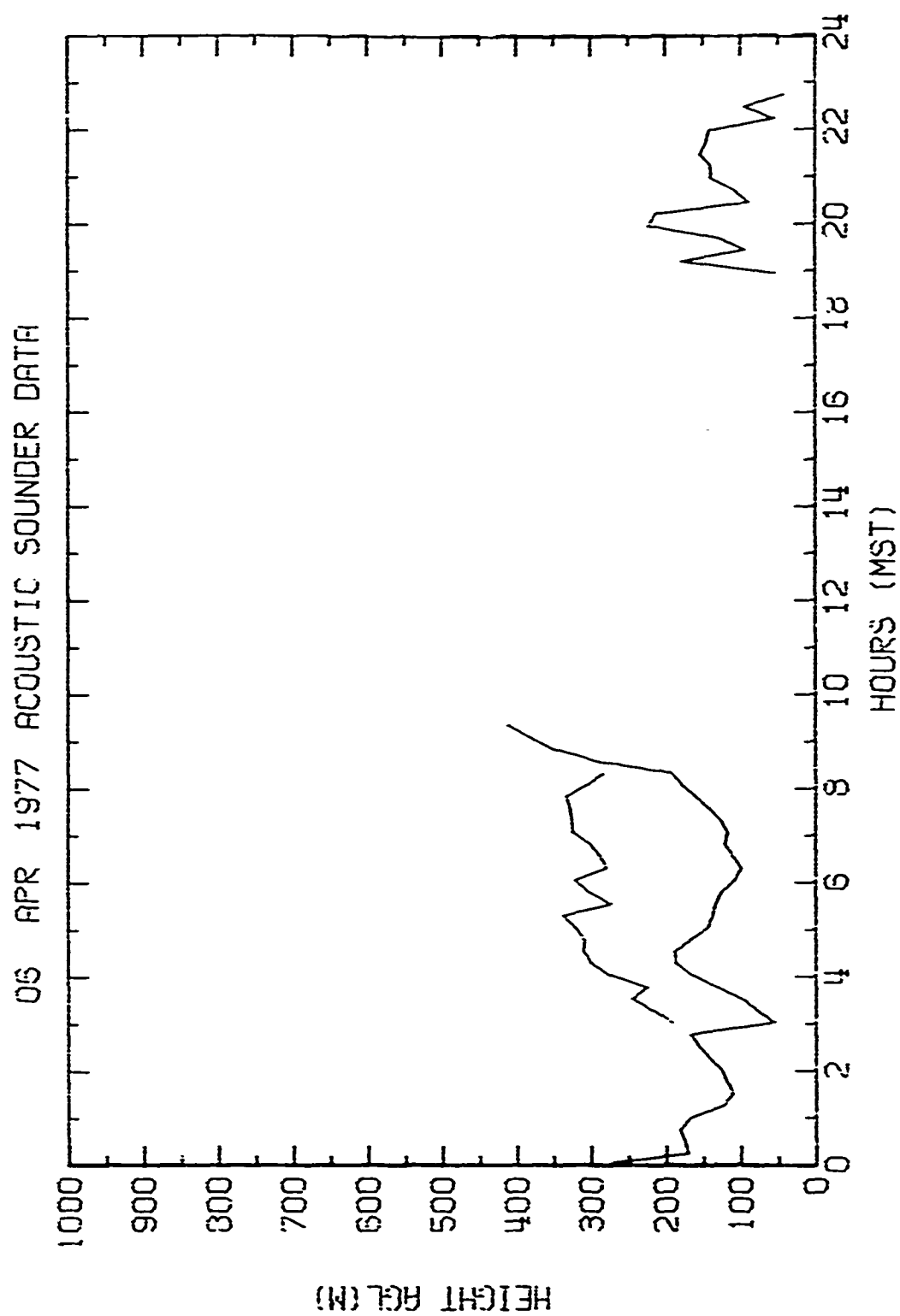


Figure 142. Inversion heights, LSTC, 6 April 1977

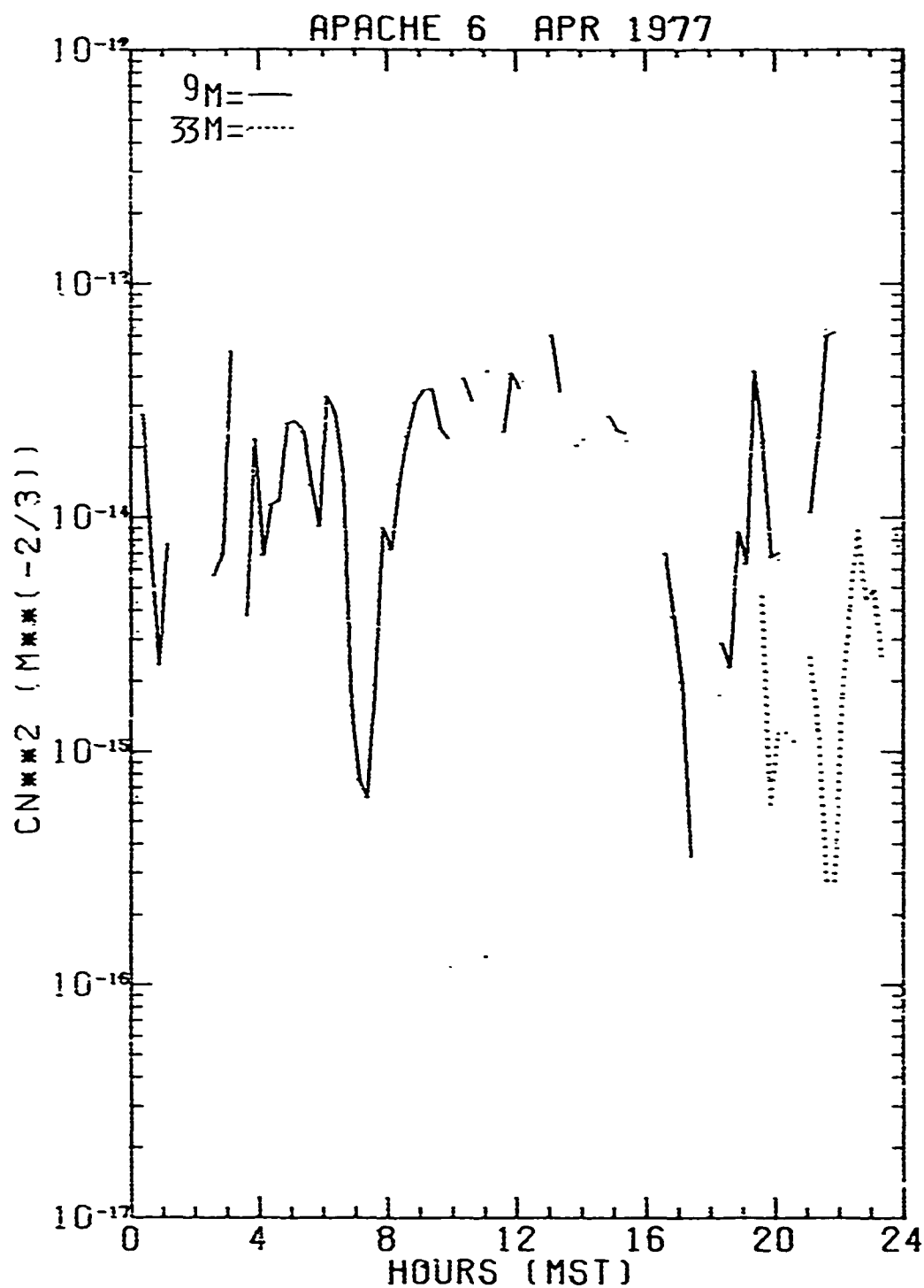


Figure 143. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 6 April 1977.

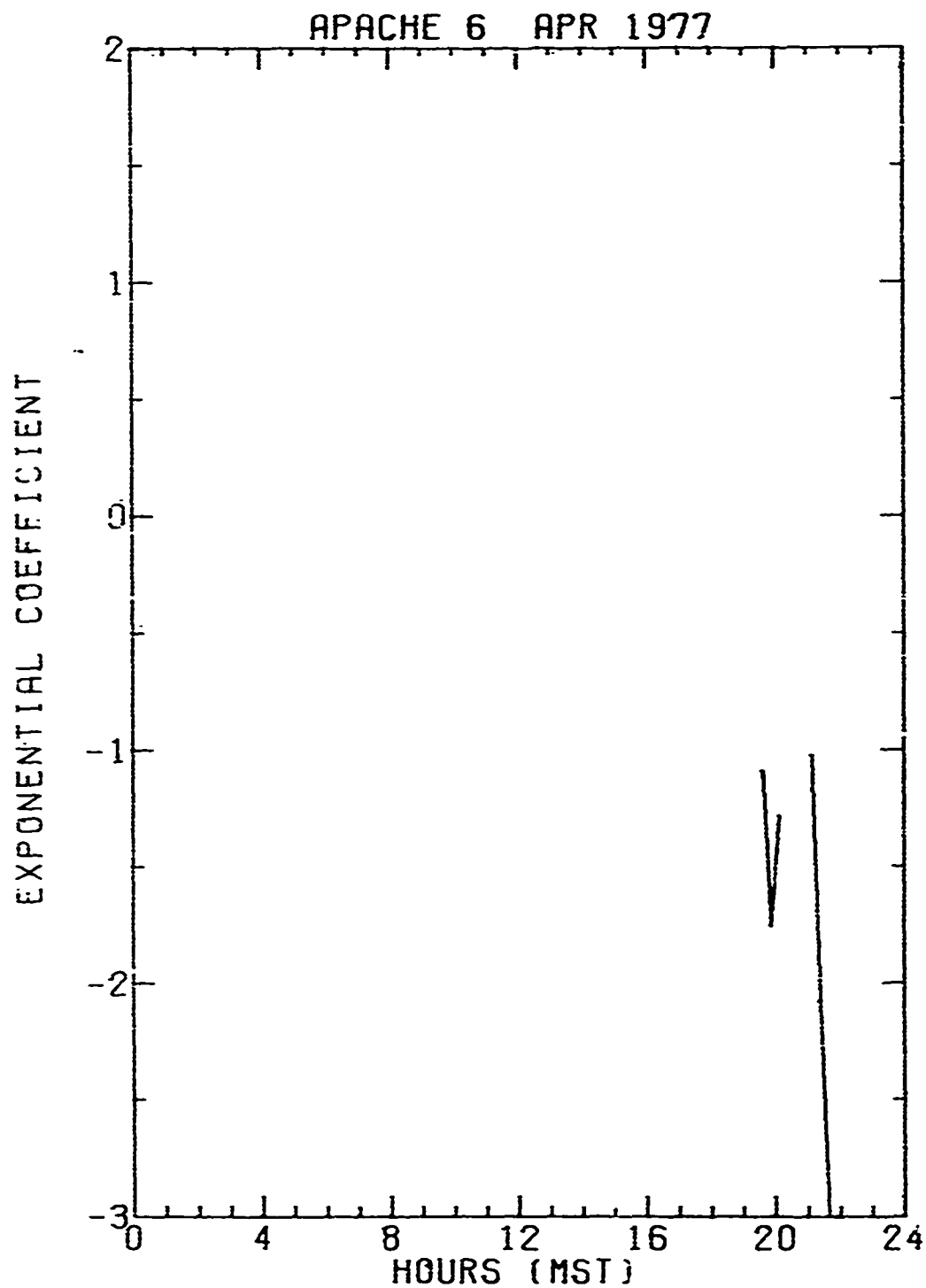


Figure 144. Diurnal variation of the altitude change of C_H^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_H^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_H^2 value, Apache Site, 6 Apr 1977.

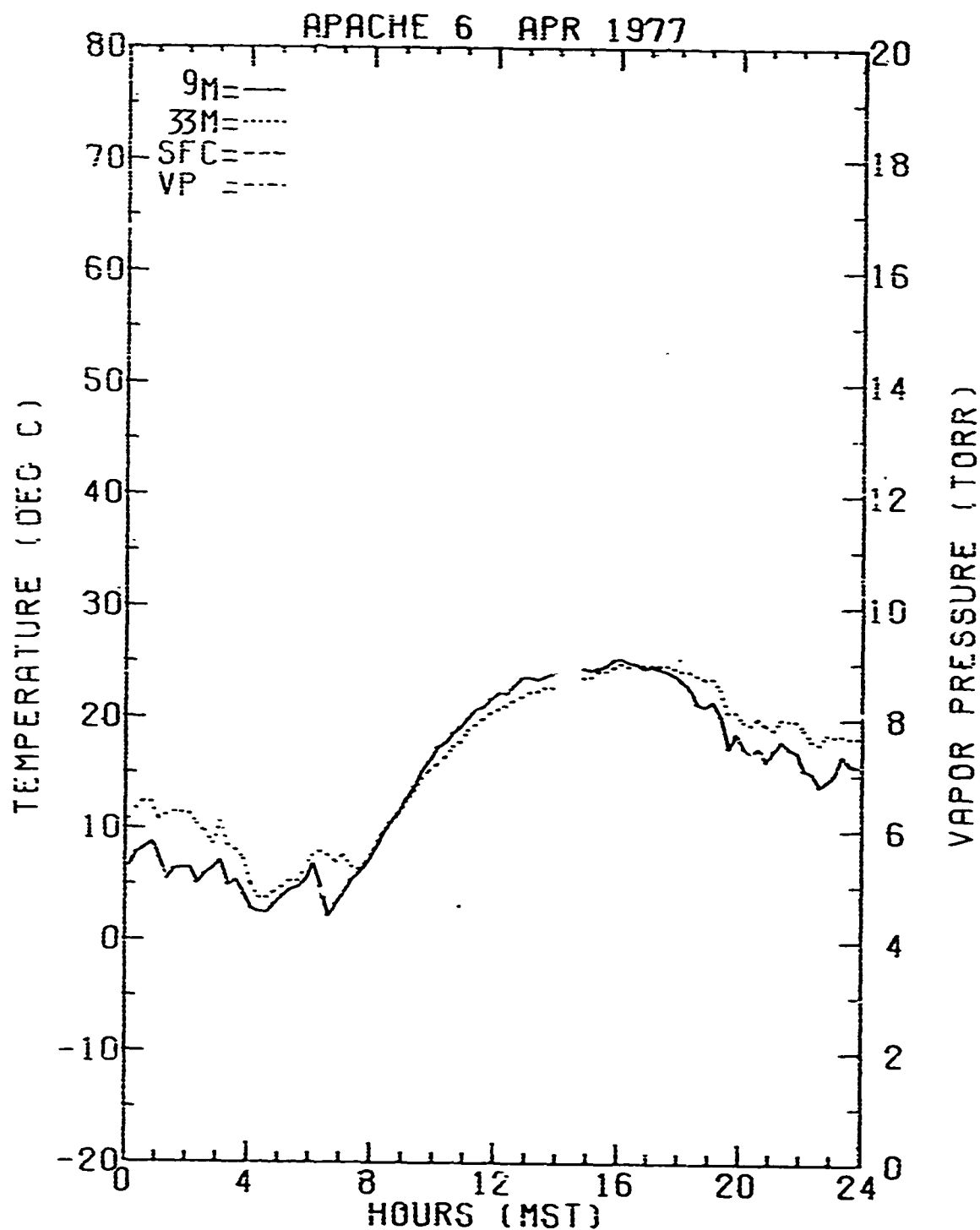


Figure 145. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 6 April 1977.

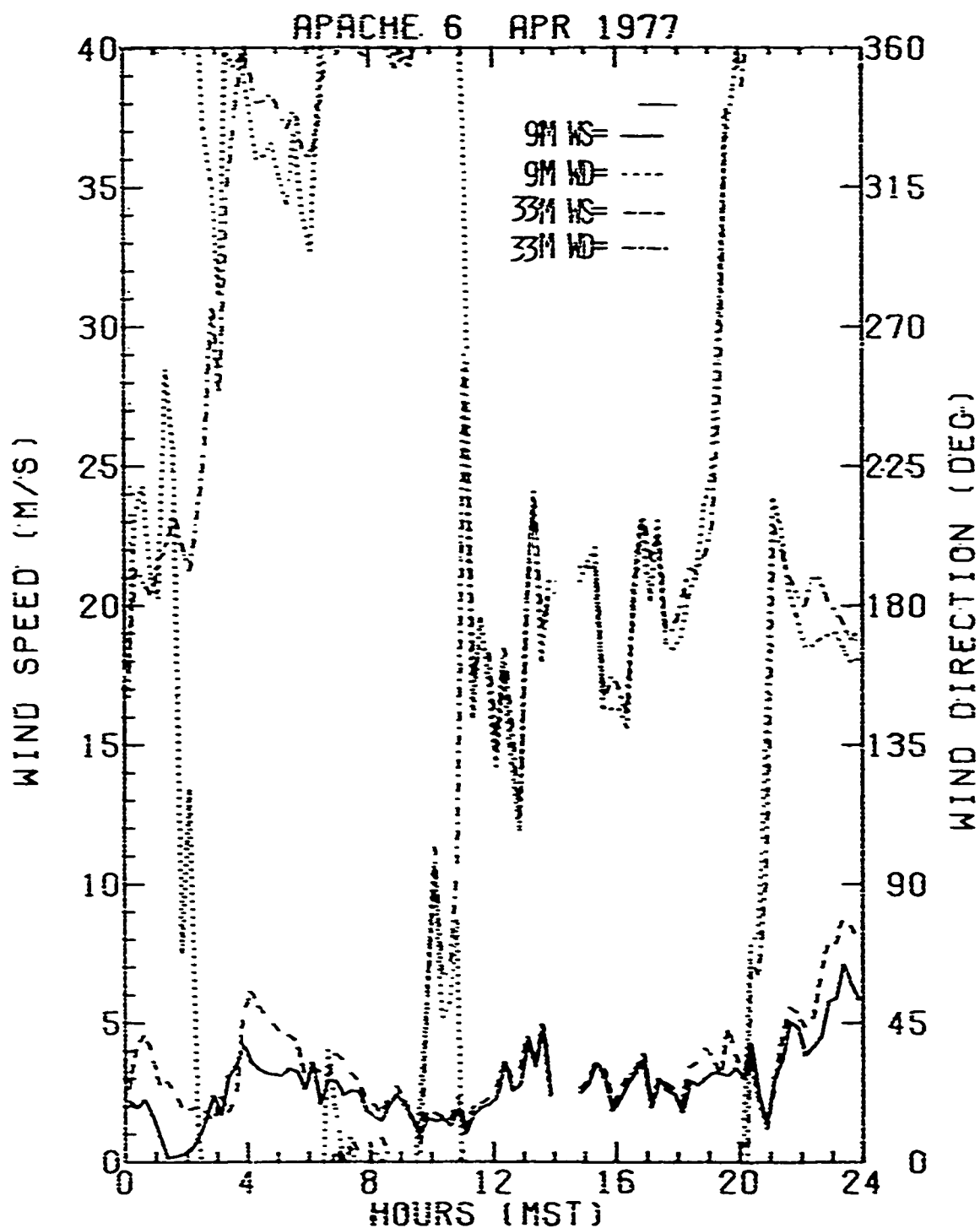


Figure 146. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 6 April 1977.

TABLE 79
APACHE SITE RAWINSONDE DATA

DATE: 06 APR 77 RELEASE NO. 46 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	665.6	1.7	2.2	310.0	1.0
56.0	661.0	5.6	2.7	305.0	0.5
182.6	651.0	10.4	3.2	170.0	0.5
357.1	637.5	10.4	3.0	149.0	1.5
731.7	609.4	10.1	2.8	145.0	3.6
1299.0	569.1	7.5	2.2	151.0	5.2
1956.2	525.0	1.1	1.8	119.0	5.2
3003.8	460.0	-7.2	1.1	250.1	4.0

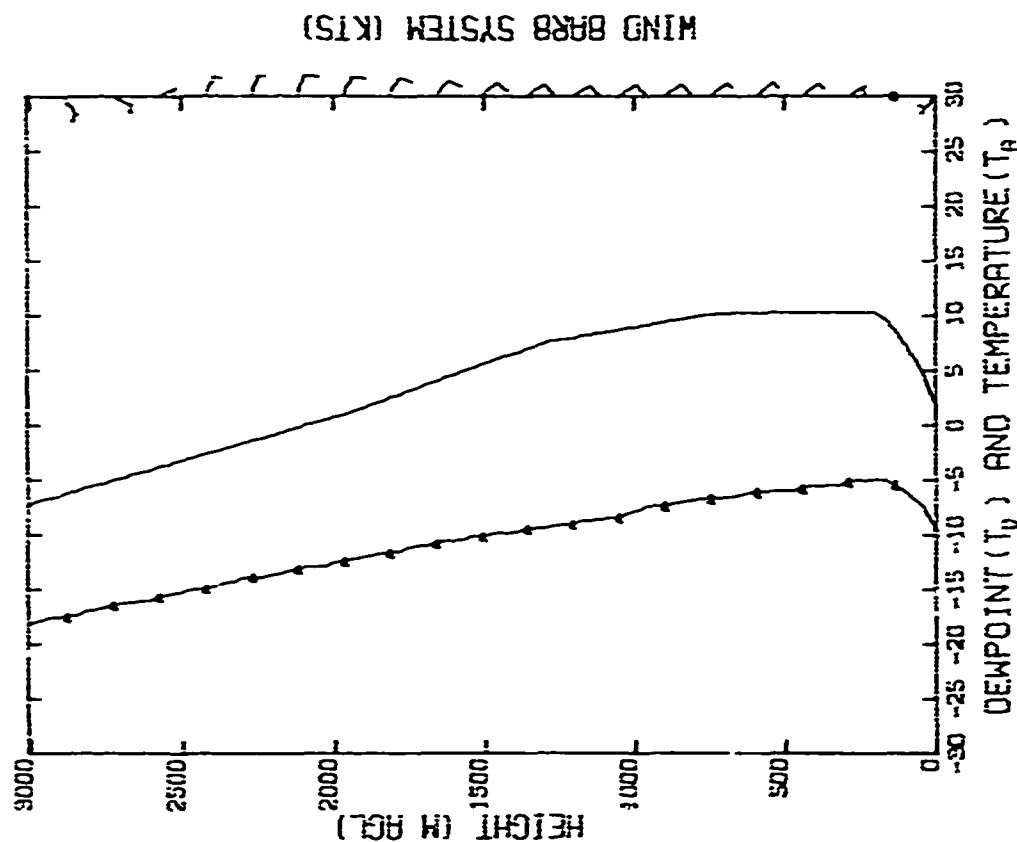


TABLE 80
APACHE SITE RAWINSONDE DATA

DATE: 06 APR 77 RELEASE NO.: 117 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	665.3	21.0	3.5	170.0	2.1
379.1	637.5	17.0	2.6	130.0	2.6
1111.7	584.2	8.8	1.7	124.0	5.7
1582.1	551.8	6.5	1.5	154.0	6.7
1988.8	525.0	2.7	1.2	179.0	6.2
3110.8	456.0	-6.5	0.5	207.2	3.6

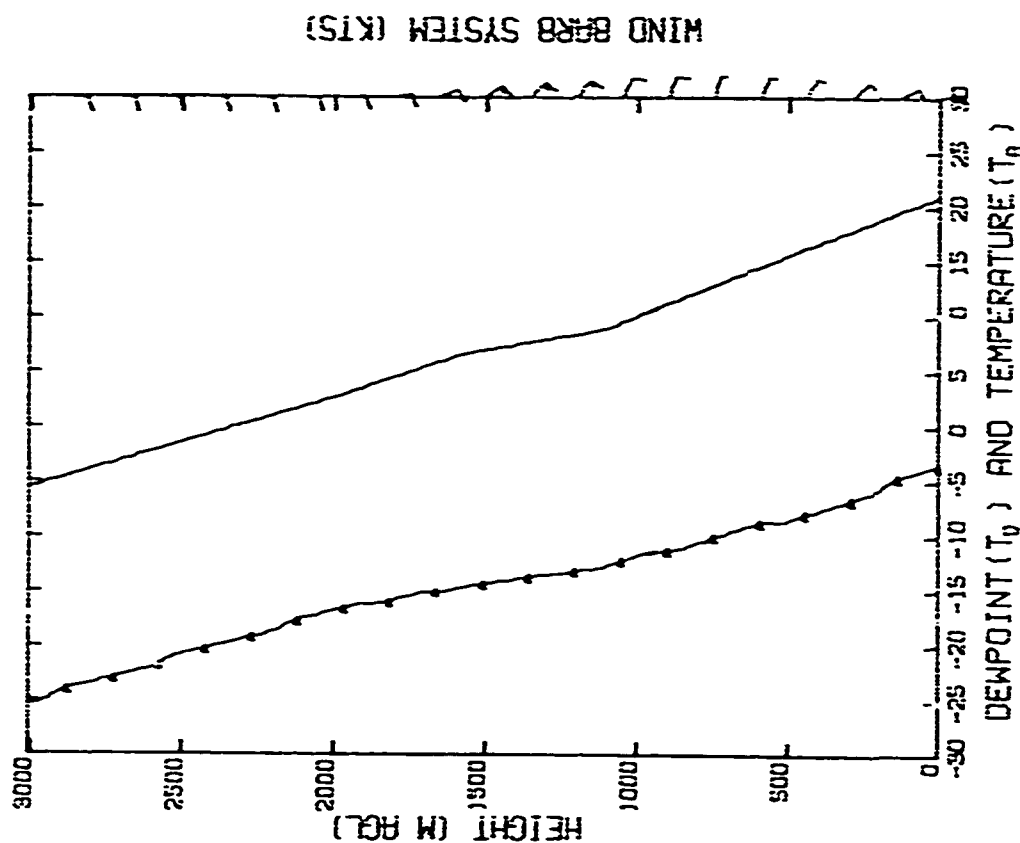


TABLE 81
APACHE SITE RAWINSONDE DATA

DATE: 06 APR 77 RELEASE NO.: 48 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR SPEED (DEG) (M/S)
0.0	663.8	25.2	2.6	0.0 0.0
98.4	656.4	24.1	3.8	198.0 0.5
352.3	637.5	21.1	3.2	198.0 1.5
1983.4	525.0	4.8	1.4	167.0 3.6
3478.7	435.0	-9.5	0.9	252.6 6.2

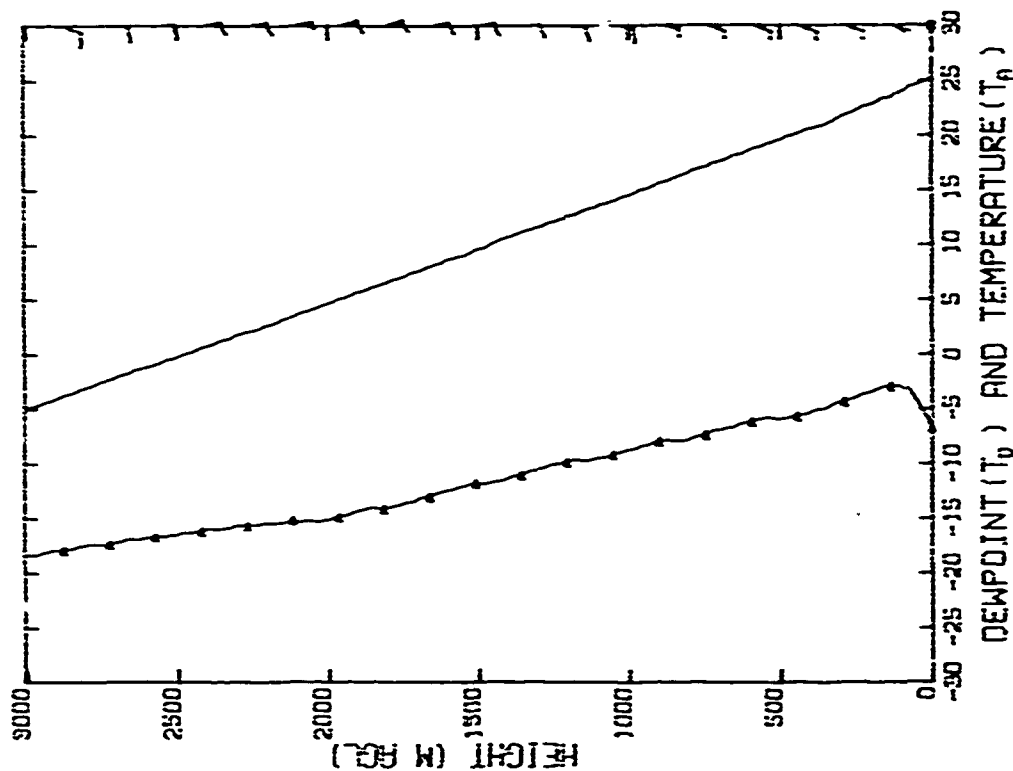
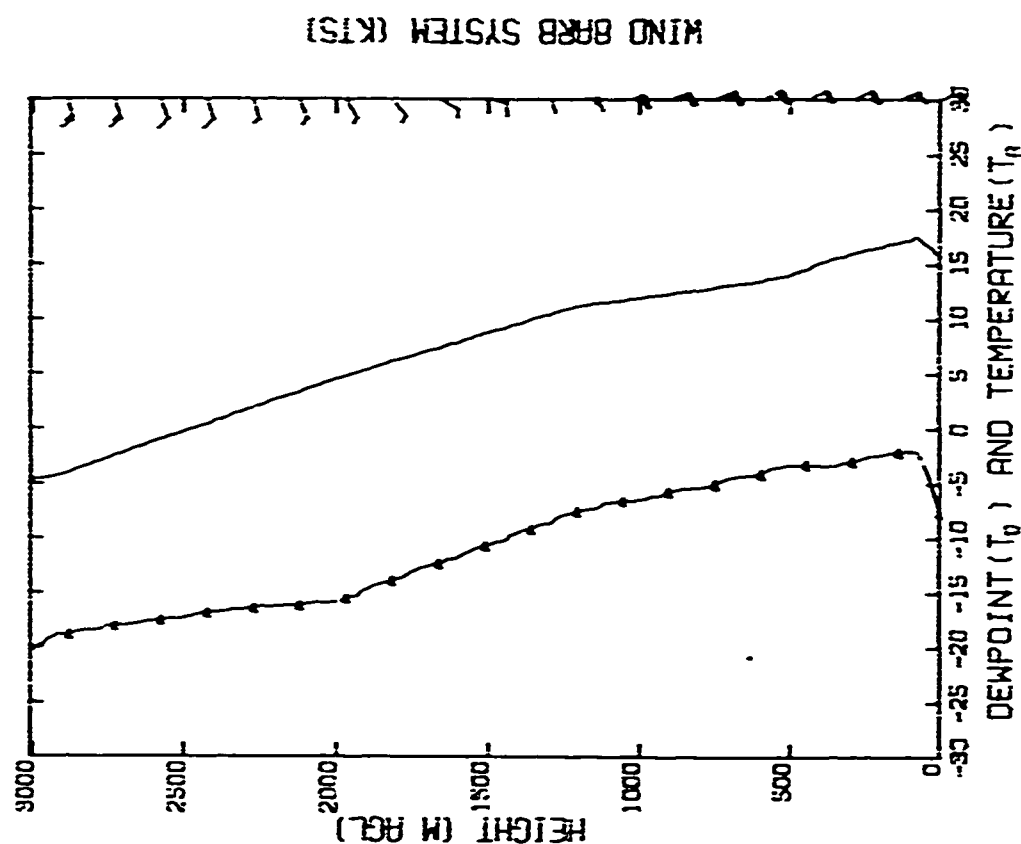


TABLE 82 APACHE SITE RAWINSONDE DATA

DATE: 06 APR 77 RELEASE NO. 49 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	665.8	15.8	2.4	160.0	6.2
70.3	660.3	17.5	4.0	159.0	7.2
369.3	637.5	15.4	3.5	158.0	10.3
499.7	627.7	14.0	3.6	157.0	11.9
631.6	618.0	13.3	3.3	157.0	12.9
1212.9	576.6	11.1	2.6	176.0	8.2
1986.6	525.0	4.6	1.3	240.0	2.6
2947.0	465.7	-4.6	1.0	261.0	9.3
3062.2	459.0	-4.5	0.8	263.3	10.8



WIND BRB SYSTEM (KTS)

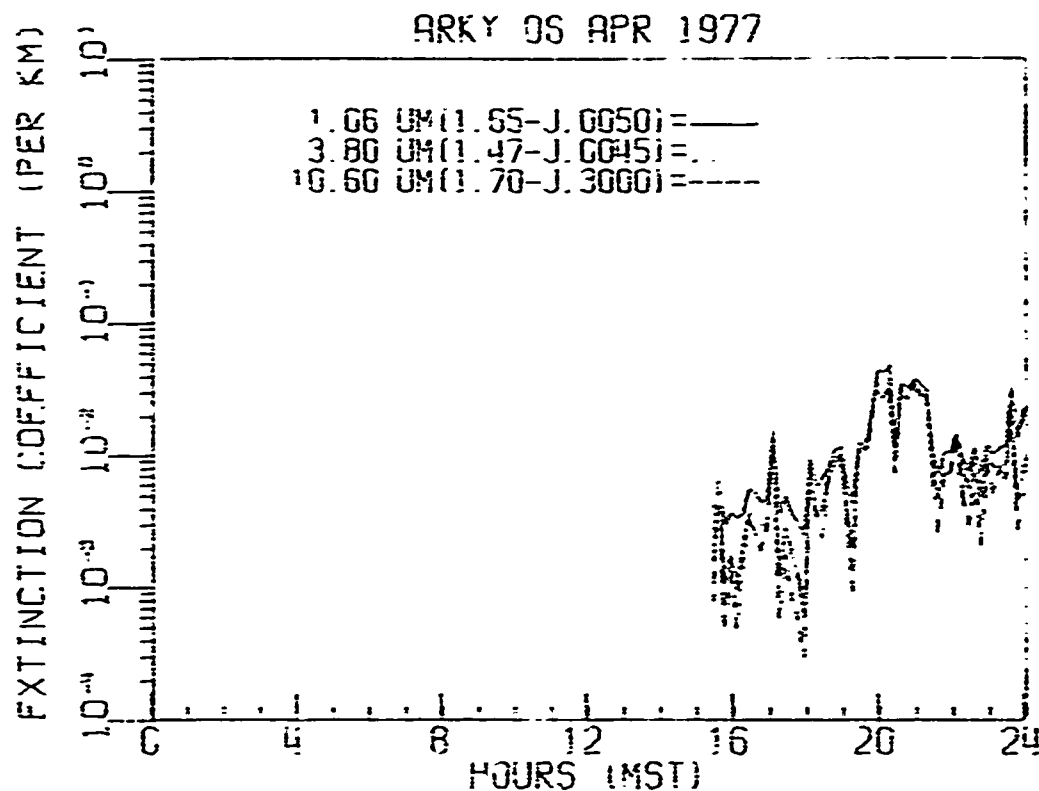


Figure 147. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 6 April 1977.

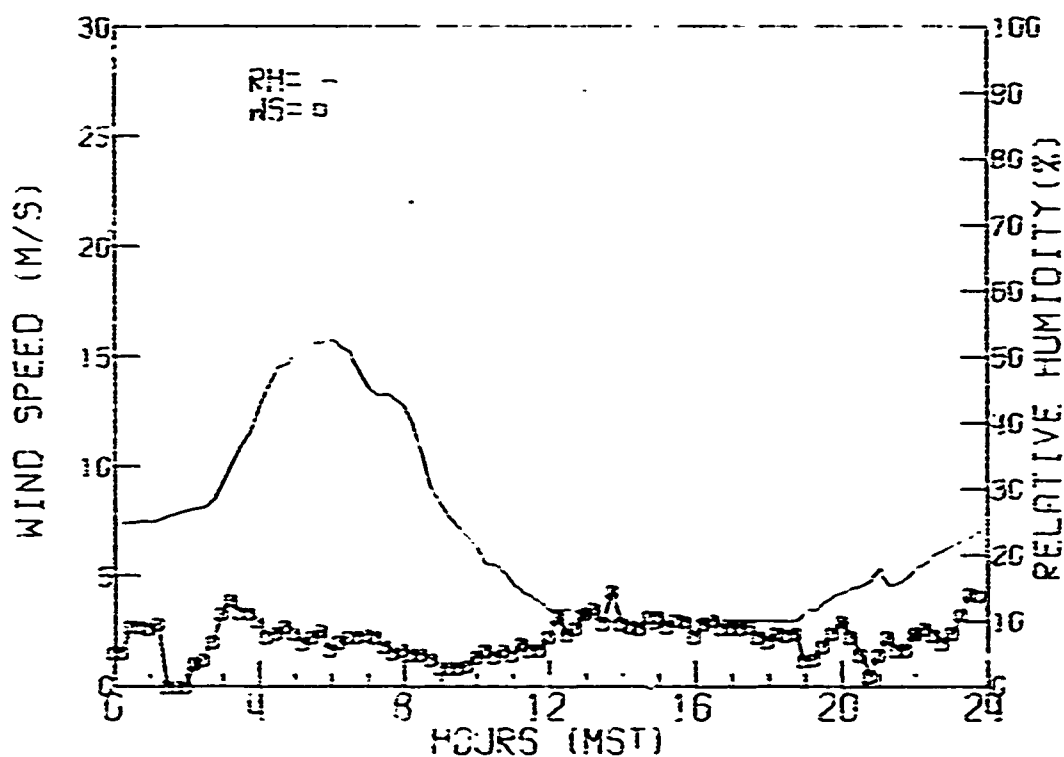


Figure 148. Diurnal variation of windspeed and relative humidity, Arky Site, 6 April 1977.

TABLE U3
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, W12

DATE TIME SAMPLE TIME (MST) (SEC)	CHANNEL										EXTINCTION (PER K4)		MASS LOADING (UG/MOO3)
	1	2	3	4	5	6	7	8	9	10	1.06	3.8	17.6
06 APR 77													
15:25:00	600	.45+00	.21+00	.61+01	.00	.00	.00	.00	.00	.00	.35-02	.16-02	.74-03
15:25:30	600	.39+00	.19+00	.12+00	.00	.00	.00	.00	.00	.00	.79-02	.73-02	.56-02
15:26:00	600	.51+00	.15+00	.16+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.71-03
15:26:30	600	.49+00	.11+00	.00	.00	.00	.00	.00	.00	.00	.37-01	.15-02	.14-02
16:04:00	600	.57+00	.21+00	.00	.00	.00	.00	.00	.00	.00	.34-02	.09-03	.47-03
16:11:30	600	.53+00	.11+00	.12+01	.00	.00	.00	.00	.00	.00	.38-02	.21-02	.15-02
16:24:00	600	.43+00	.24+00	.01+01	.00	.00	.00	.00	.00	.00	.56-02	.36-02	.34-02
16:31:30	600	.59+00	.17+00	.61+01	.00	.00	.00	.00	.00	.00	.71-02	.39-02	.28-02
16:44:00	600	.39+00	.24+00	.01+01	.00	.00	.00	.00	.00	.00	.44-02	.32-02	.19-02
16:51:30	600	.51+00	.17+00	.33+01	.00	.00	.00	.00	.00	.00	.71-02	.27-02	.31-02
17:04:00	600	.49+00	.17+00	.33+01	.00	.00	.00	.00	.00	.00	.15-01	.15-01	.16-01
17:11:30	600	.47+00	.19+00	.33+01	.00	.00	.00	.00	.00	.00	.77-02	.29-02	.60-03
17:24:00	600	.40+00	.24+00	.01+01	.00	.00	.00	.00	.00	.00	.50-02	.29-02	.13-02
17:31:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.37-02	.19-02	.00
17:44:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
17:51:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.37-02	.19-02	.00
18:04:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
18:11:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
18:24:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
18:31:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
18:44:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
18:51:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
19:04:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
19:11:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
19:24:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
19:31:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
19:44:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
19:51:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
20:04:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
20:11:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
20:24:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
20:31:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
20:44:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
20:51:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
21:04:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
21:11:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
21:24:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
21:31:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
21:44:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
21:51:30	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00
22:04:00	600	.49+00	.19+00	.41+01	.00	.00	.00	.00	.00	.00	.31-02	.13-02	.00

TABLE B3 (CONT.)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARRY SITE, WY87

DATE TIME SAMPLE (MST) TIME (SEC)	CHANNEL										EXTINCTION (PER K)		MASS LOADING (UG/M ³)
	1	2	3	4	5	6	7	8	9	10	1.26	3.0	12.6
06 APR 77													
22:35:00 ACU	.75+00	.36+00	.24+00	.44+01	.00	.00	.00	.00	.00	.00	.78-02	.50-02	.91
22:35:30 ACU	.61+00	.43+00	.29+00	.19+01	.00	.00	.00	.00	.00	.00	.78-02	.50-02	.24
22:36:00 ACU	.62+00	.47+00	.37+00	.30+01	.44-01	.00	.00	.00	.00	.00	.99-02	.72-02	.95
22:36:30 ACU	.73+00	.43+00	.27+00	.00	.00	.00	.00	.00	.00	.00	.78-02	.22-02	.17
22:37:00 ACU	.69+00	.19+00	.35+00	.30+01	.00	.00	.00	.00	.00	.00	.12-01	.89-02	.12
22:37:30 ACU	.78+00	.28+00	.21+00	.16+01	.00	.00	.00	.00	.00	.00	.12-01	.72-02	.43
22:38:00 ACU	.74+00	.47+00	.30+00	.30+01	.44-01	.00	.00	.00	.00	.00	.12-01	.79-02	.42
22:38:30 ACU	.99+00	.49+00	.24+00	.30+01	.43+01	.00	.00	.00	.00	.00	.12-01	.68-02	.95
22:39:00 ACU	.38+01	.39+00	.21+00	.19+01	.14+00	.00	.00	.00	.00	.00	.33-01	.20-01	.232
22:39:30 ACU	.23+01	.49+00	.61+00	.14+01	.00	.00	.00	.00	.00	.00	.12-01	.41-02	.33
22:39:00 ACU	.43+01	.41+00	.27+00	.30+01	.00	.00	.00	.00	.00	.00	.23-01	.86-02	.17

Weather Summary

Date: 7 April 1977

Synoptic

Surface: Weak pressure gradient over New Mexico.

500 Millibar: Weak ridge over western United States with light westerly flow over New Mexico.

Holloman AFB

Clouds: Clear to thin scattered high clouds (cirrus) with patches of low clouds (cumulus) at 1800 m AGL during the afternoon.

Wind: Light and variable with peak gust of 6 m sec^{-1} from the west about midmorning.

Visibility: Greater than 60 km.

Maximum temperature: 28.3°C

Corresponding vapor pressure: 3.6 Torr

Minimum temperature: 5.6°C

Corresponding vapor pressure: 2.5 Torr

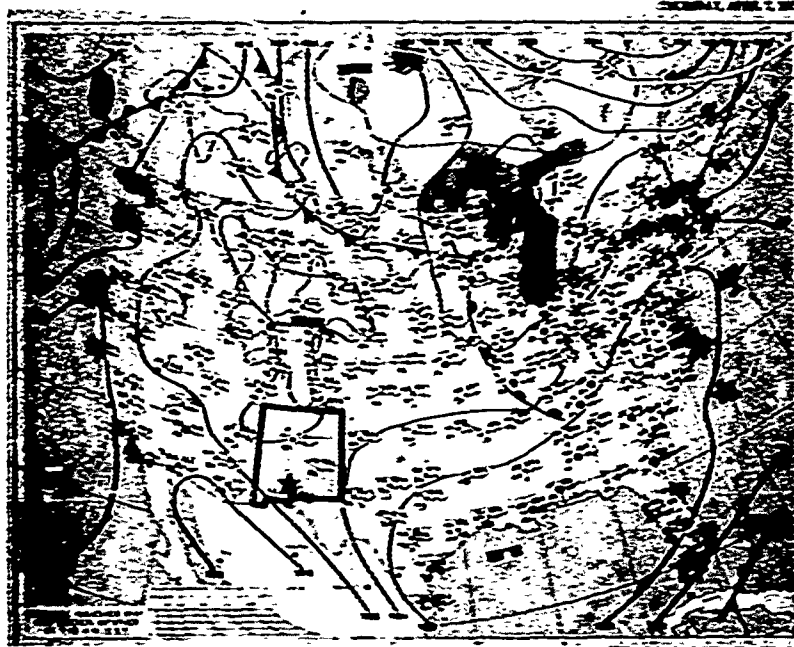


Figure 149a. Surface weather map for 7 April 1977.



Figure 149b. 500-millibar height contours for 7 April 1977.

TABLE 84. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	11.1	2.8	-6.6	0	0	0	
0200	10.0	2.9	-6.0	0	0	0	
0300	7.8	3.0	-5.8	0	0	0	
0400	4.5	2.5	-7.9	0	0	0	
0500	2.7	2.4	-8.3	0	0	0	
0600	1.8	2.1	-10.1	0	0	20 Ci	
0700	7.2	2.8	-6.8	0	0	10 Ci	Checked Apache - all ok
0800	11.7	3.0	-5.5	0	0	10 Ci	
0900	16.7	3.4	-4.0	0	0	10 Ci	
1000	20.1	4.0	-1.6	0	0	10 Ci	
1100	21.5	3.6	-3.4	0	0	10 Ci	Few Cu ENE of station
1200	23.7	3.6	-3.1	10 Cu	0	10 Ci	
1300	26.3	3.4	-4.2	10 Cu	0	10 Ci	Checked Apache - all ok
1400	26.6	3.0	-5.6	10 Cu	0	20 Ci	
1500	27.2	2.7	-6.9	10 Cu	0	10 Ci	Ci is opaque 32 m AT at Apache
1600	27.1	2.8	-6.9	10 Cu	0	0	back on line 2 loose probes
1700	26.8	2.8	-6.8	10 Cu	0	0	
1800							Missed reading working on 32 m AT
1900	23.3	3.2	-4.9	10 Cu	0	0	32 m AT out of commission suspect
2000	17.8	2.3	-8.9	0	0	0	bad coax at AT box
2100	15.6	2.4	-8.6	0	0	0	Few Cu S of station
2200	12.7	2.2	-9.9	0	0	0	Checked Apache site - no data on
2300	12.2	2.3	-9.1	0	0	0	32 m AT, wrong button pressed
2400	11.3	2.3	-9.3	0	0	0	

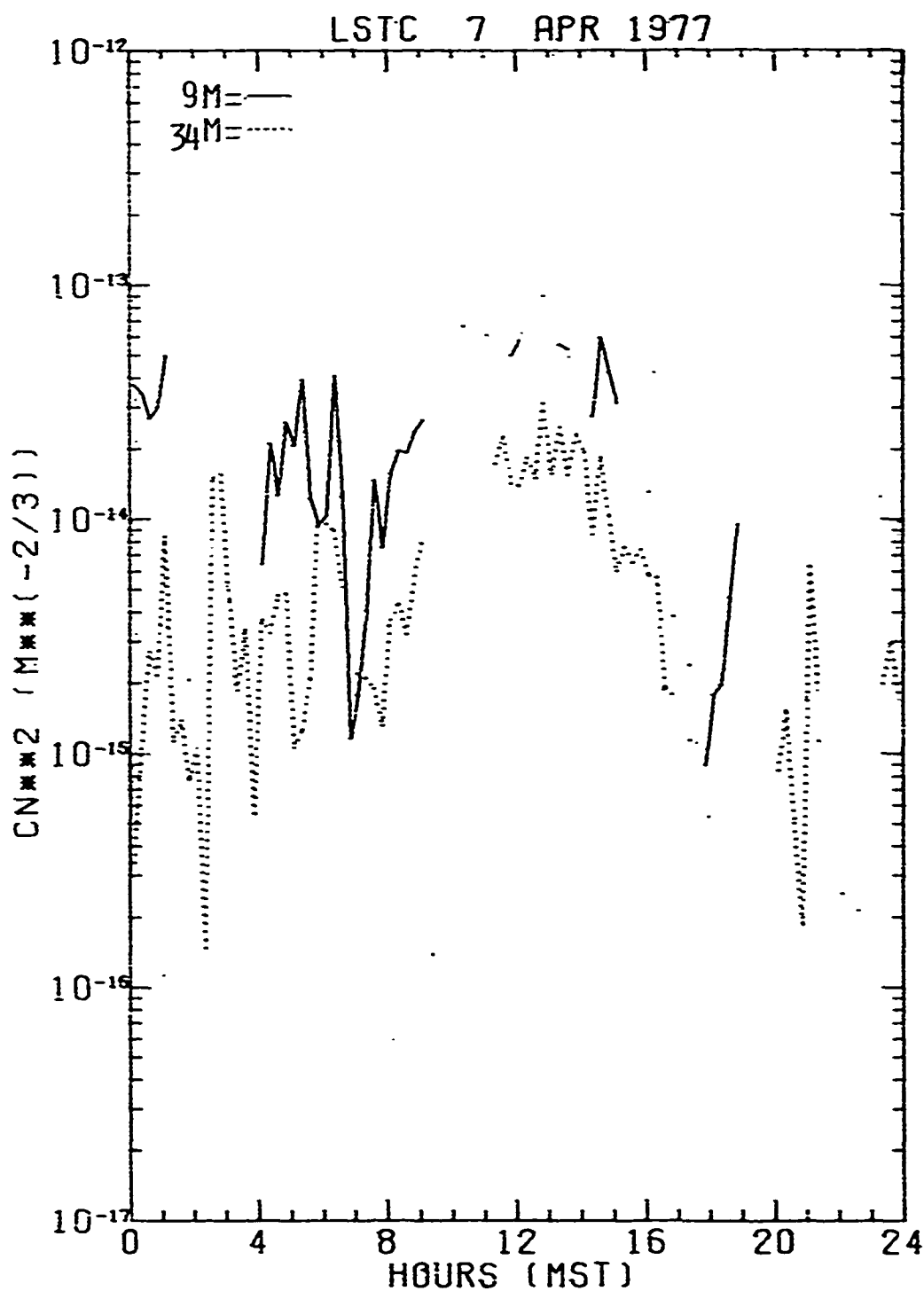


Figure 150. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the LSTC for the 9 and 34 m tower levels, 7 April 1977.

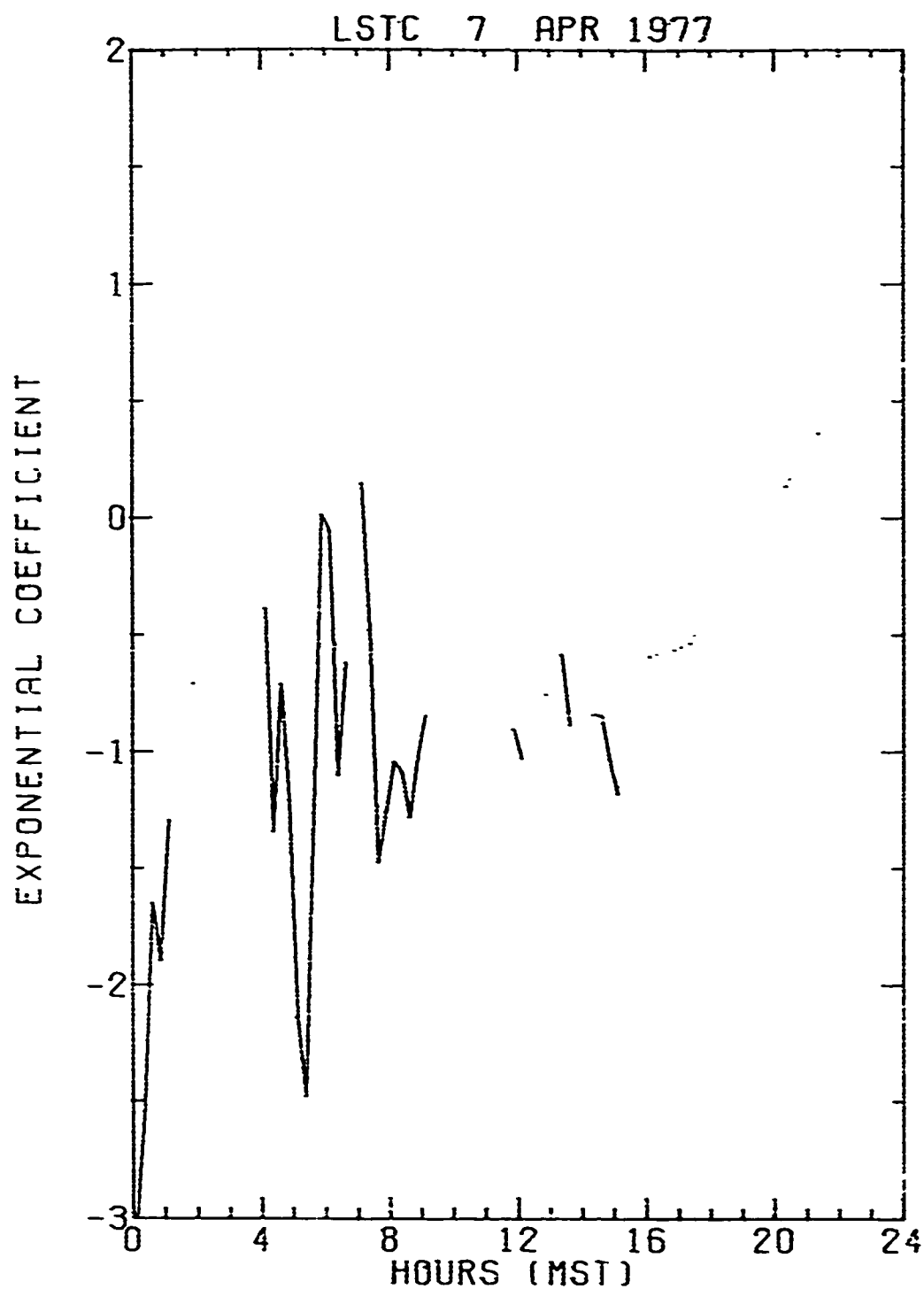


Figure 151. Diurnal variation of the altitude change of C_H^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_H^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_H^2 value, LSTC, 7 April 1977.

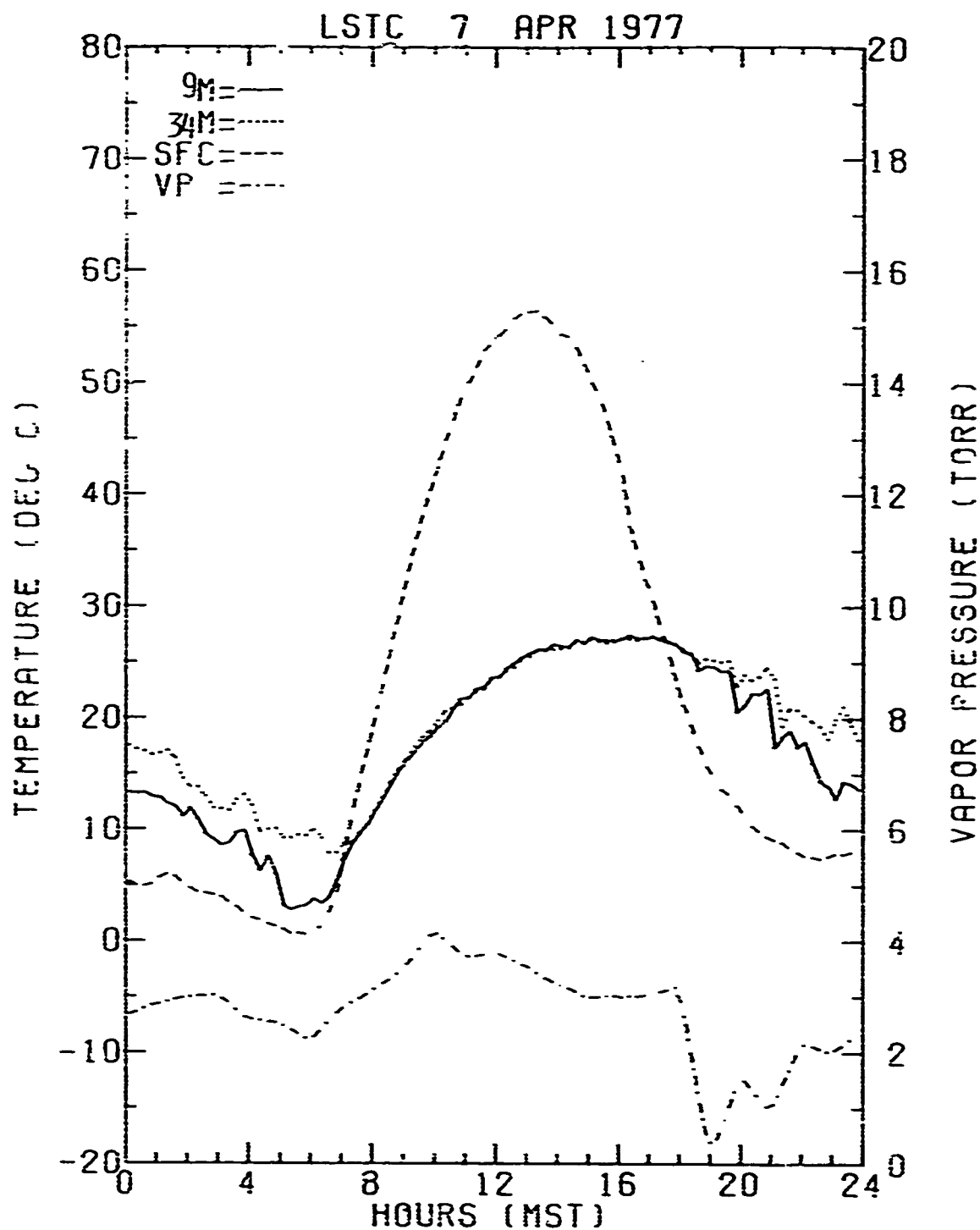


Figure 152. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 7 April 1977.

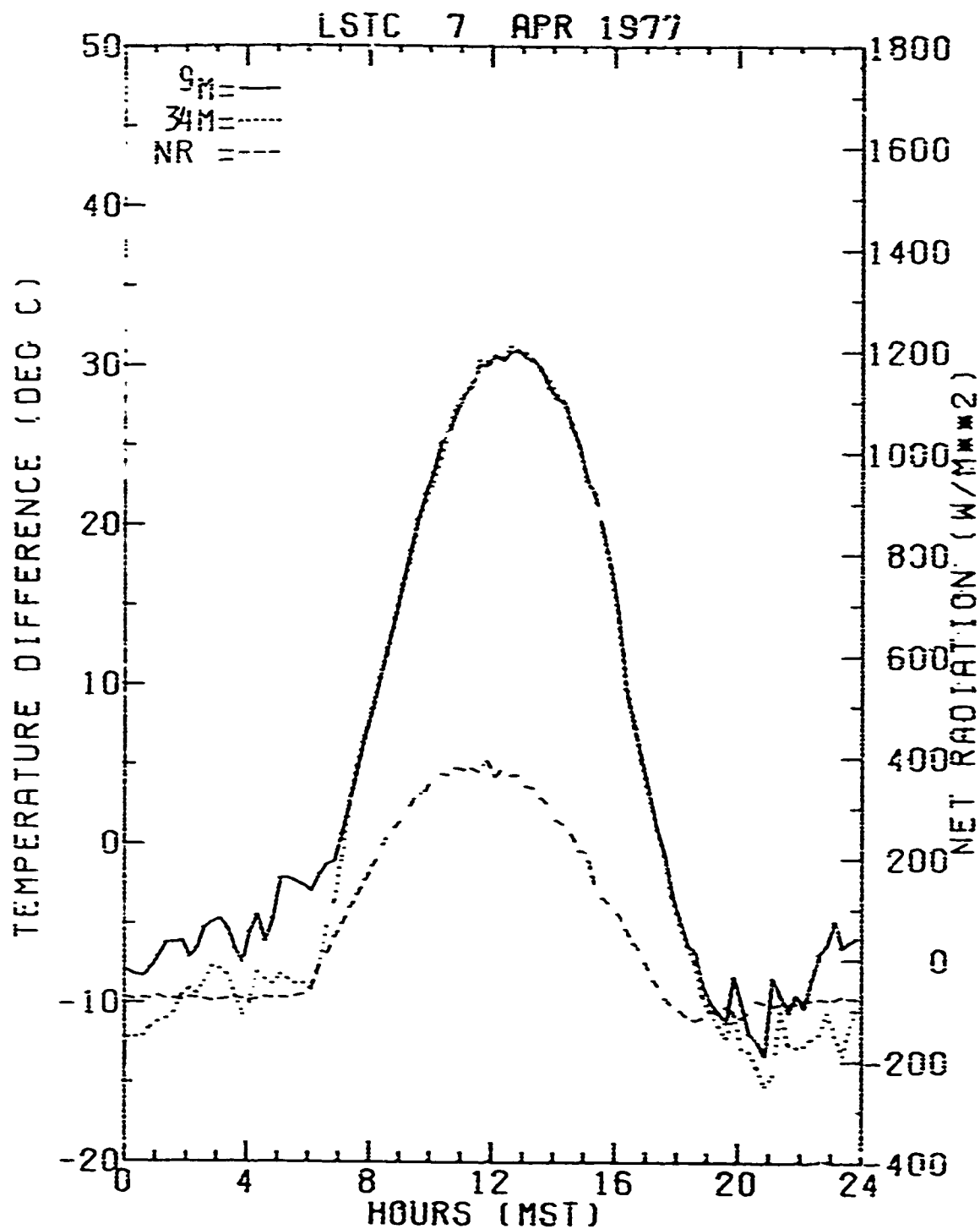


Figure 153. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 7 April 1977.

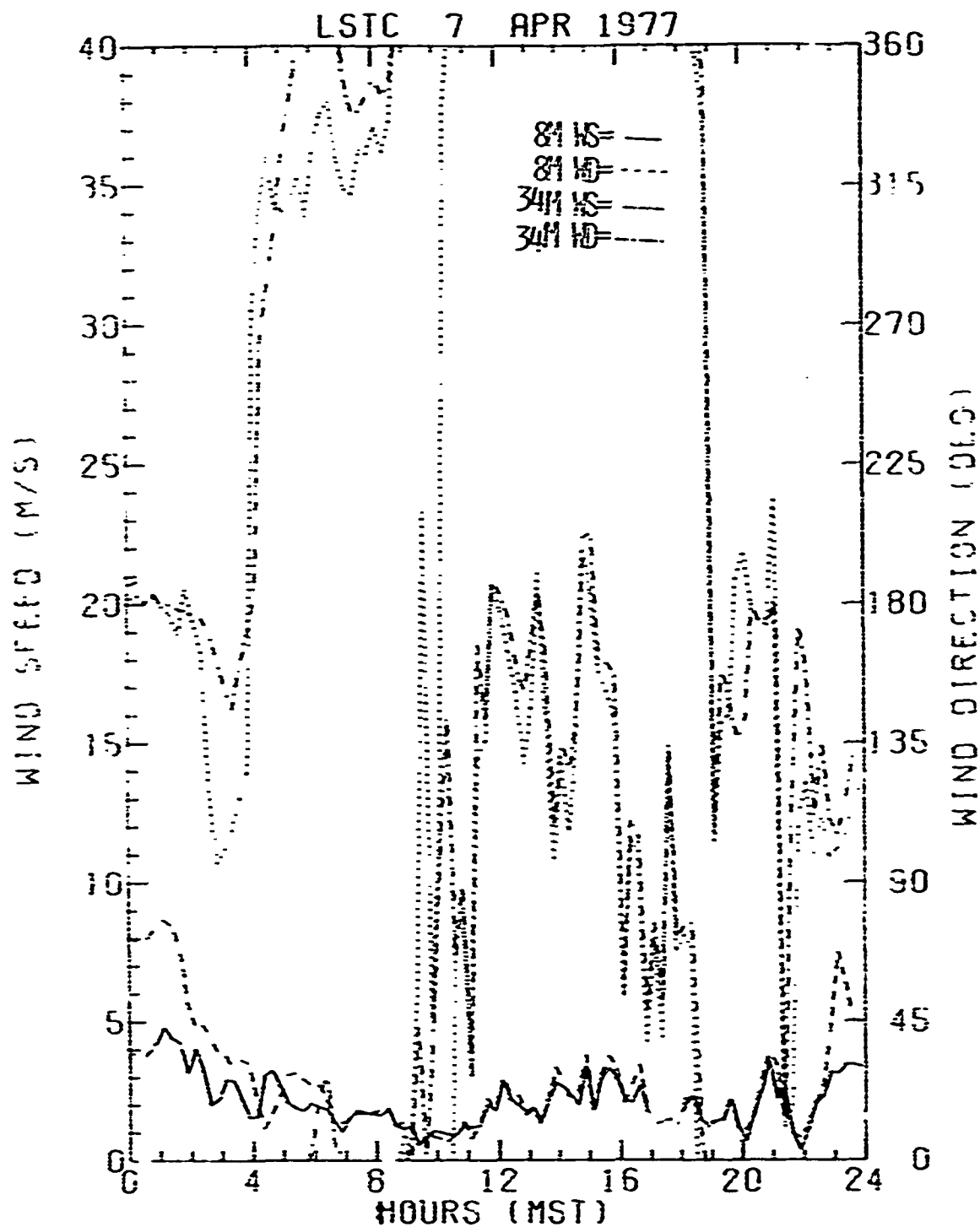


Figure 154. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 7 April 1977.

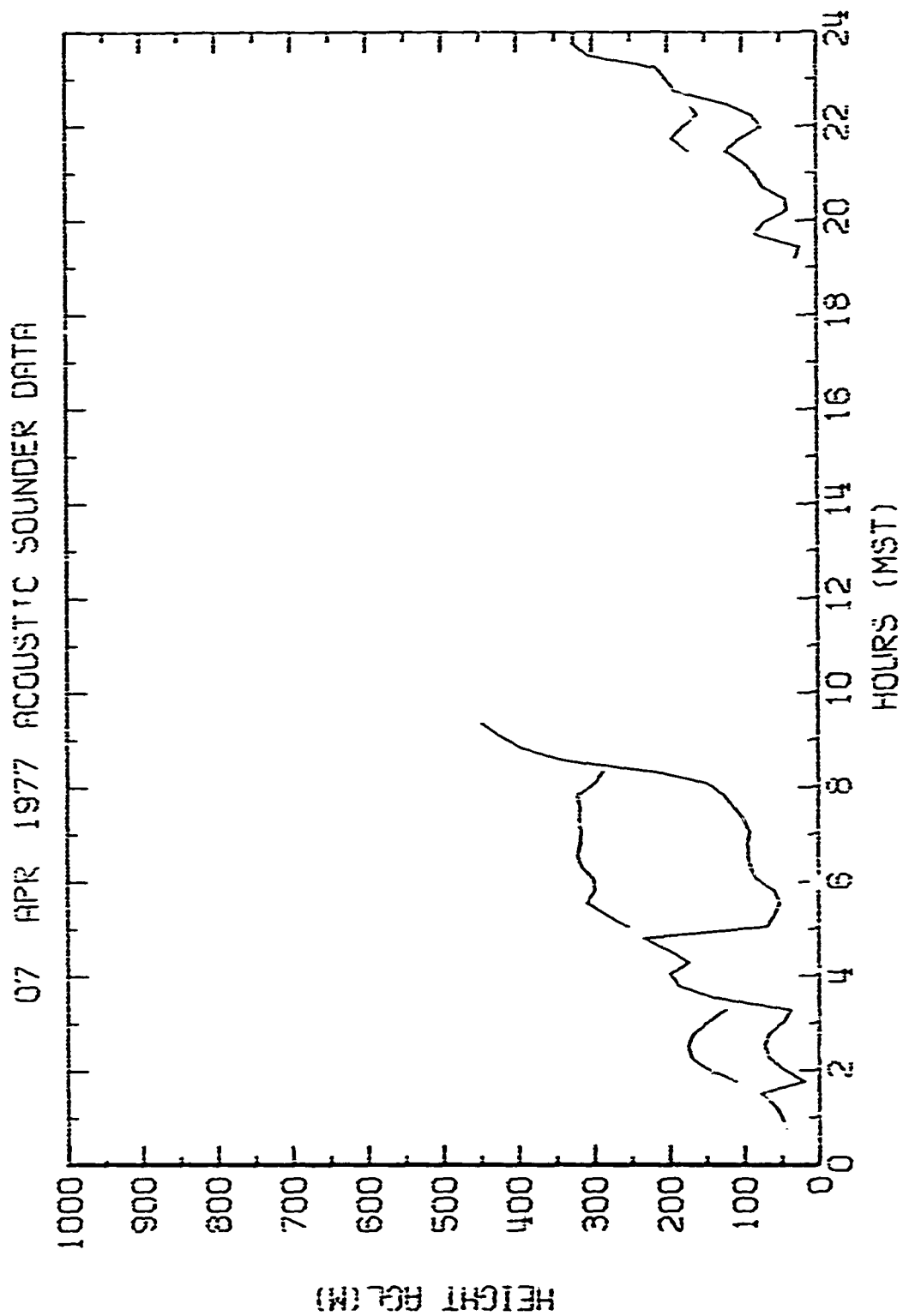


Figure 155. Inversion height, LSTC, 7 April 1977.

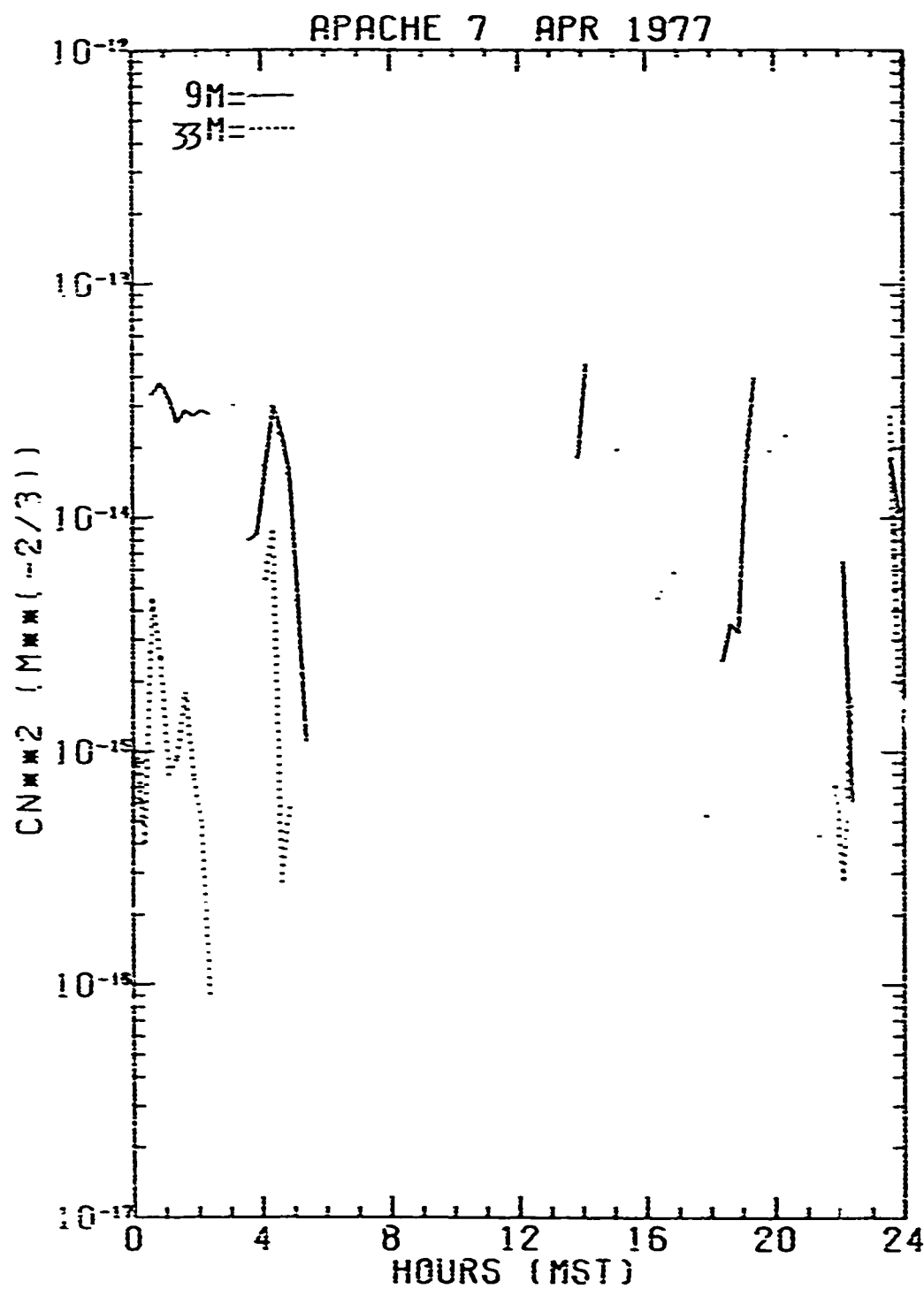


Figure 156. Diurnal variation of the atmospheric structure parameter, C_{η}^2 , at the Apache Site for the 9 and 33 m tower levels, 7 April 1977.

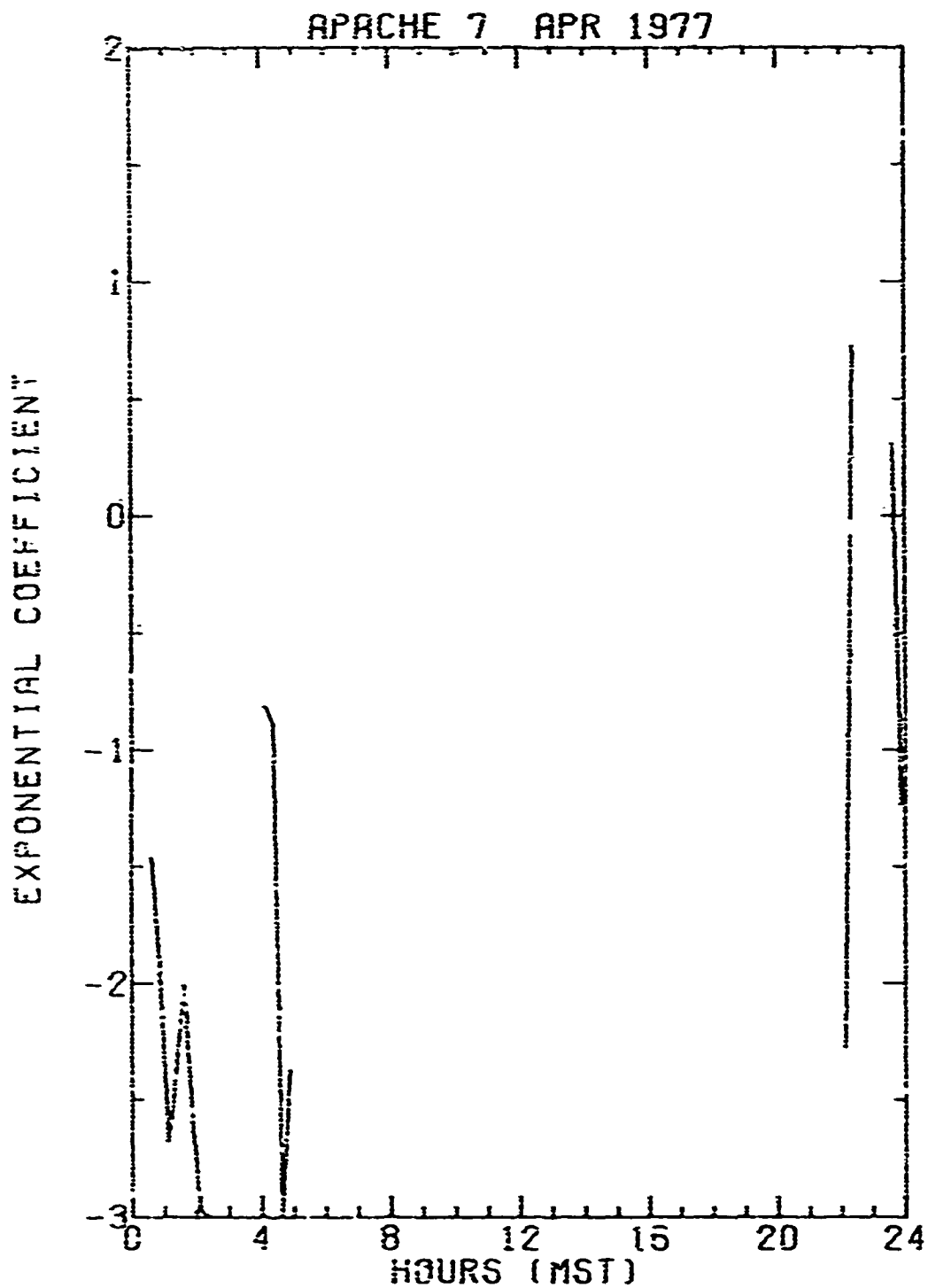


Figure 157. Diurnal variation of the altitude change of C_H^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_H^2(z) = z^2 k$ is plotted where z is the altitude and k is the $1 \approx C_H^2$ value, Apache Site, 7 April 1977.

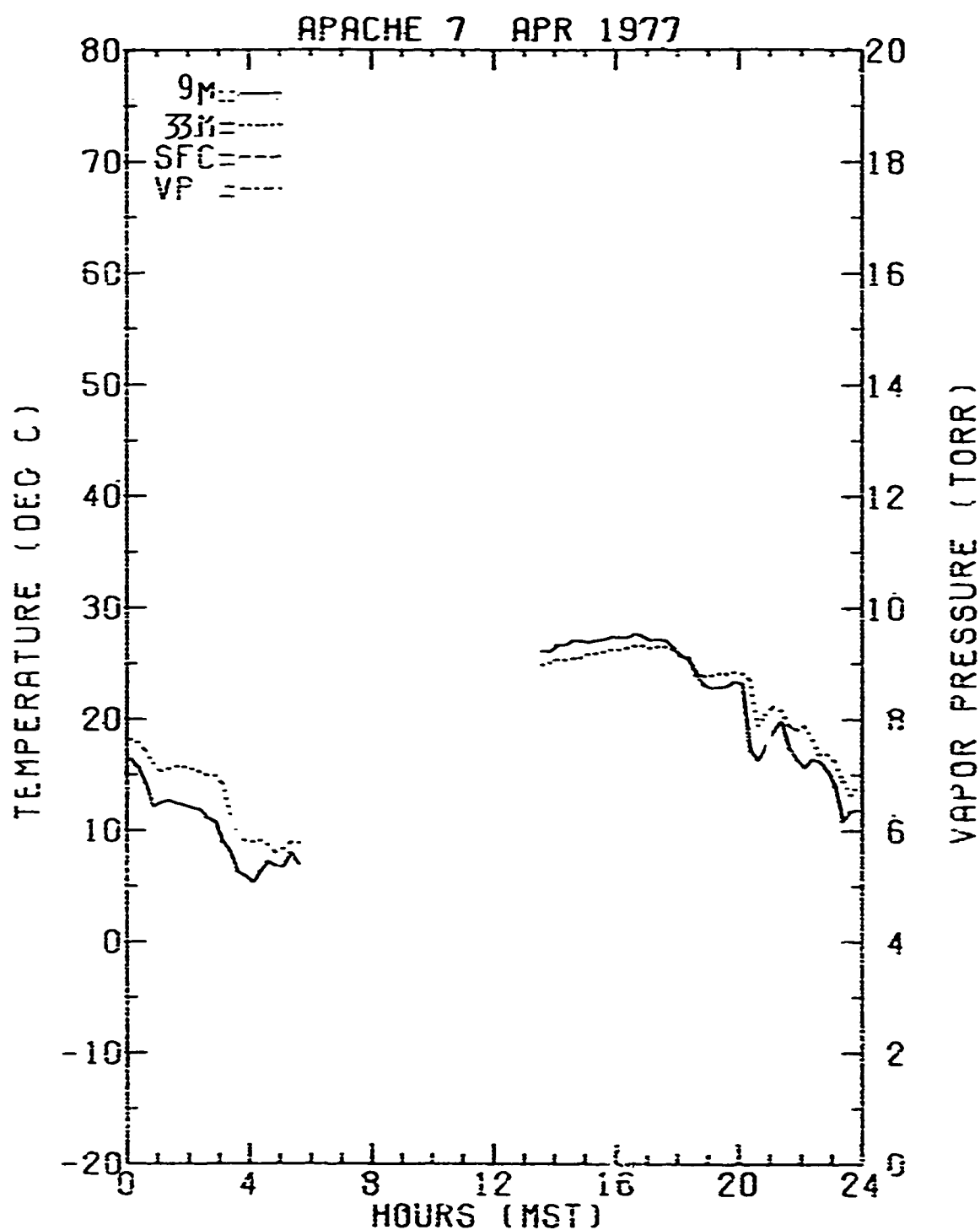


Figure 158. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 7 April 1977.

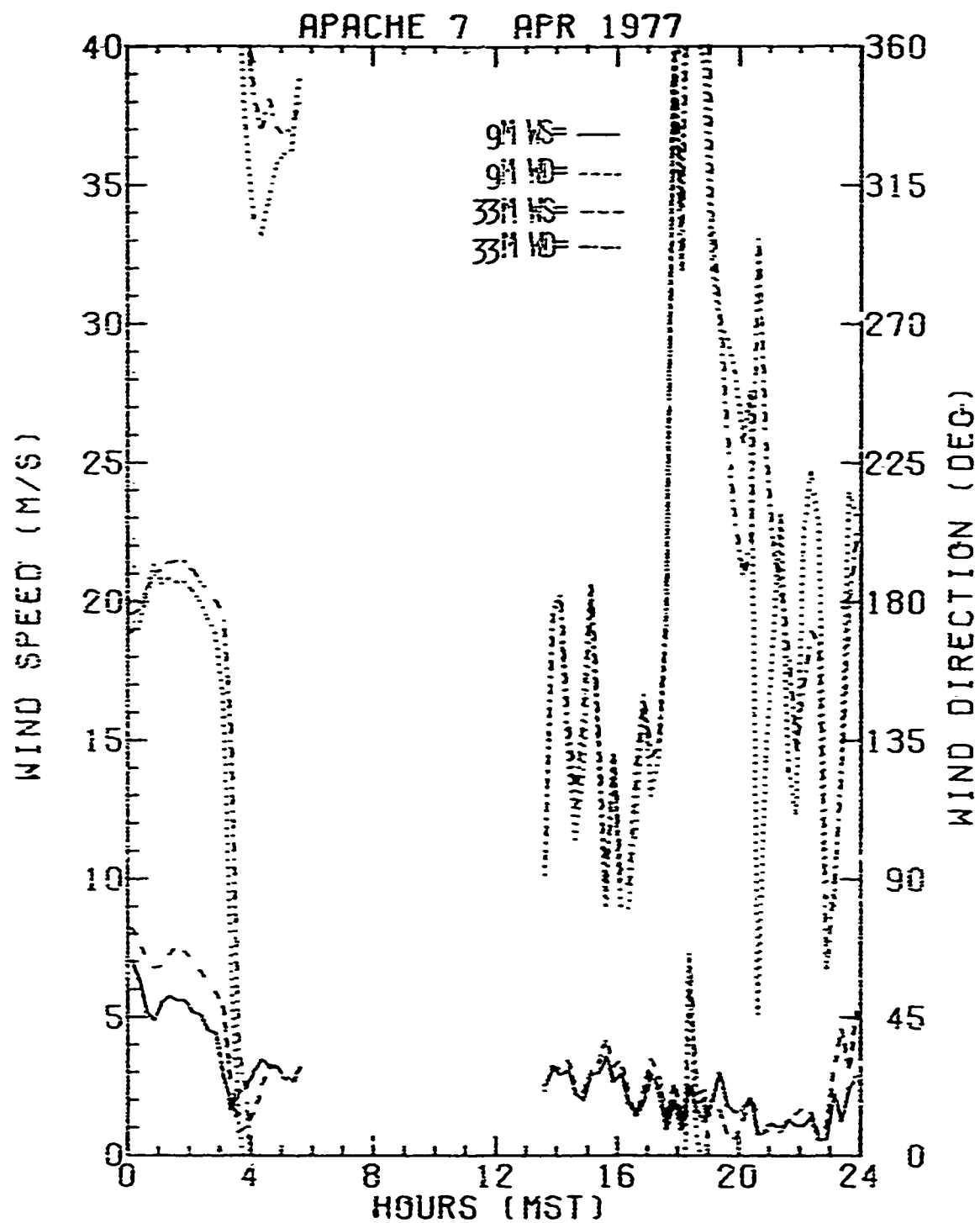


Figure 159. Diurnal variation of windspeed and wind direction at the 9 and 33 m tower levels, Apache Site, 7 April 1977.

TABLE 85
APACHE SITE RAWINSONDE DATA

DATE: 07 APR 77 RELEASE NO.: 50 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRY ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	636.4	5.2	2.5	300.0	2.1
85.3	659.5	12.5	4.4	271.0	1.0
371.2	637.5	13.4	4.5	162.0	4.1
1310.3	569.8	9.9	3.2	168.0	5.2
1984.9	525.0	9.9	2.2	229.0	3.1
3102.0	456.4	-6.6	1.1	287.5	9.2

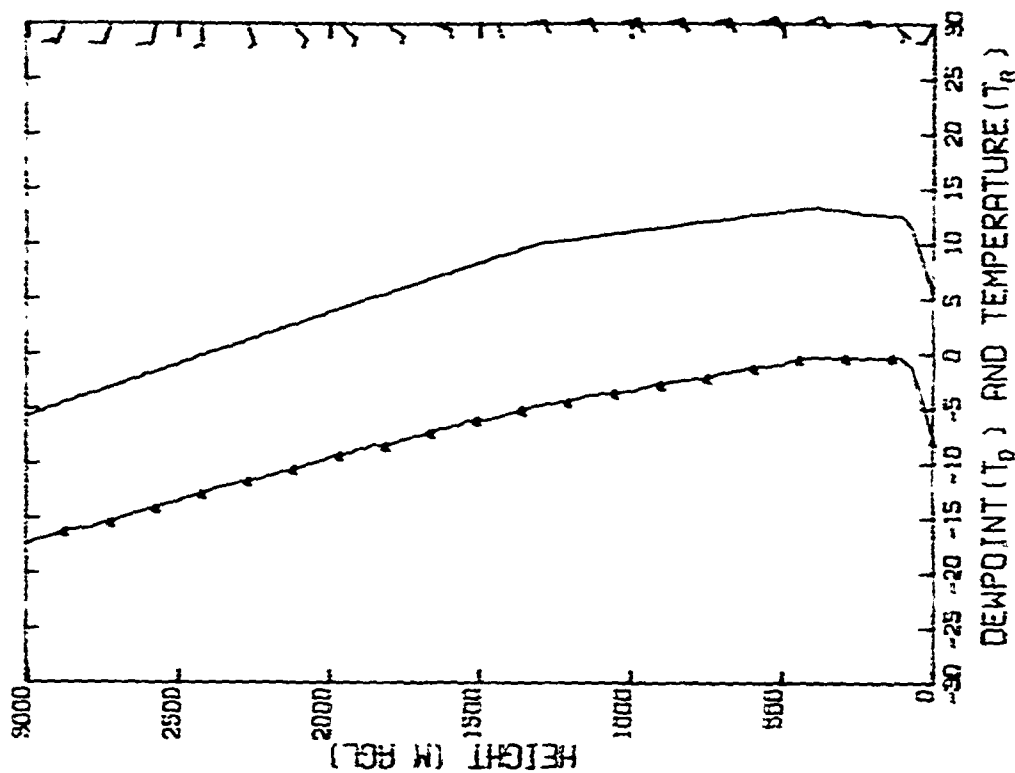


TABLE 86
APACHE SITE RAWINSONDE DATA

DATE: 07 APR 77 RELEASE NO.: 51 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	666.1	24.2	4.3	0.0	0.0
381.2	537.5	19.6	3.6	151.0	1.5
1150.3	582.3	12.3	2.2	167.0	3.6
1404.1	564.9	11.3	1.8	163.0	4.1
2009.3	525.0	5.1	1.0	157.0	2.6
4083.8	404.1	-11.4	0.3	273.5	7.4

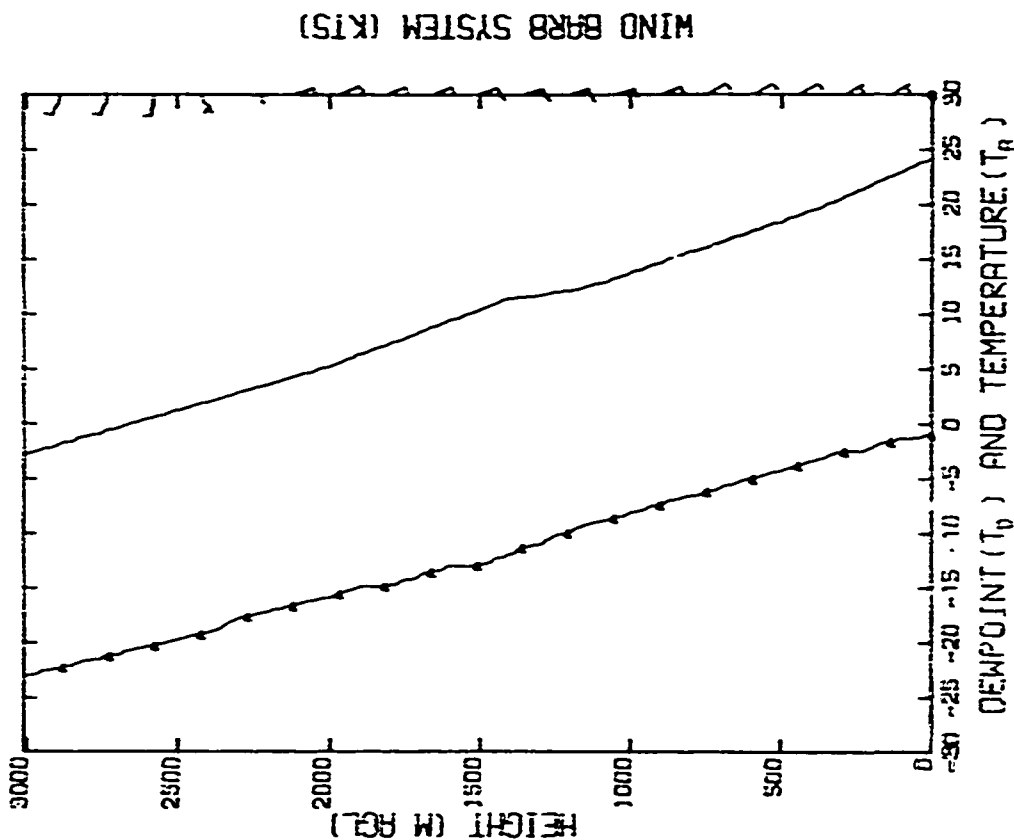


TABLE 87 APACHE SITE RAWINSONDE DATA

DATE: 07 APR 77 RELEASE NO. 52 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR	SPEED (M/S)
0.0	663.5	28.0	4.0	0.0	0.0
351.4	637.5	23.4	3.9	162.0	1.0
1994.7	525.0	6.6	1.7	282.0	4.6
3241.9	449.5	-5.5	1.1	0.0	0.0
3818.0	417.4	-11.3	0.9	244.1	7.6

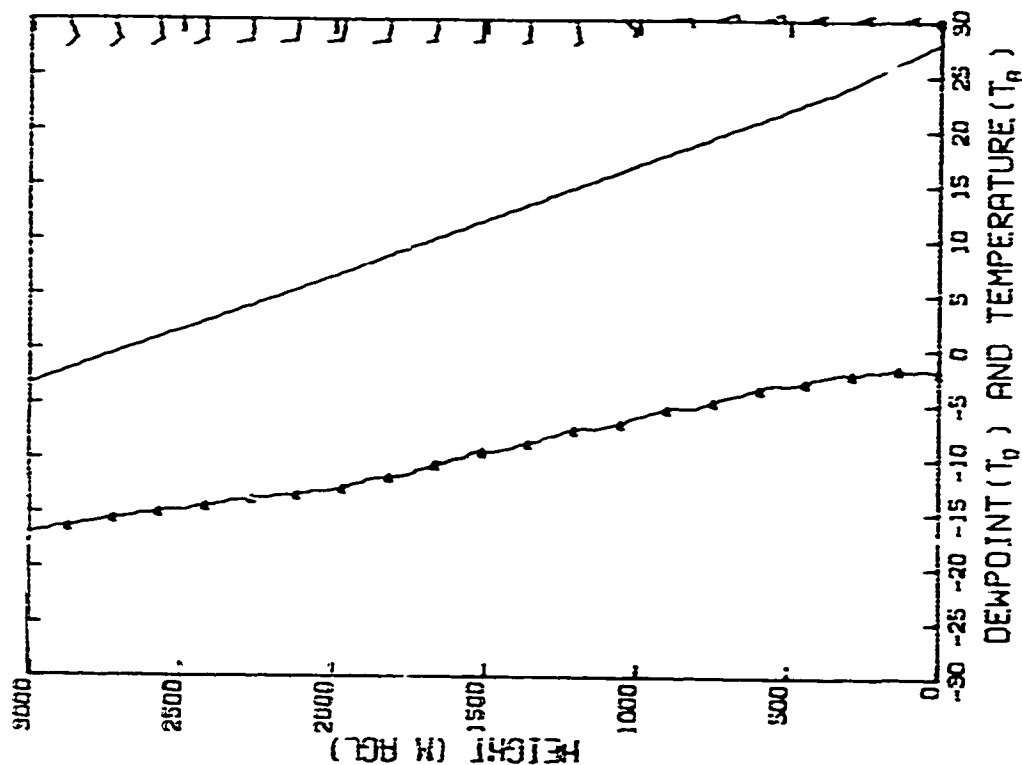
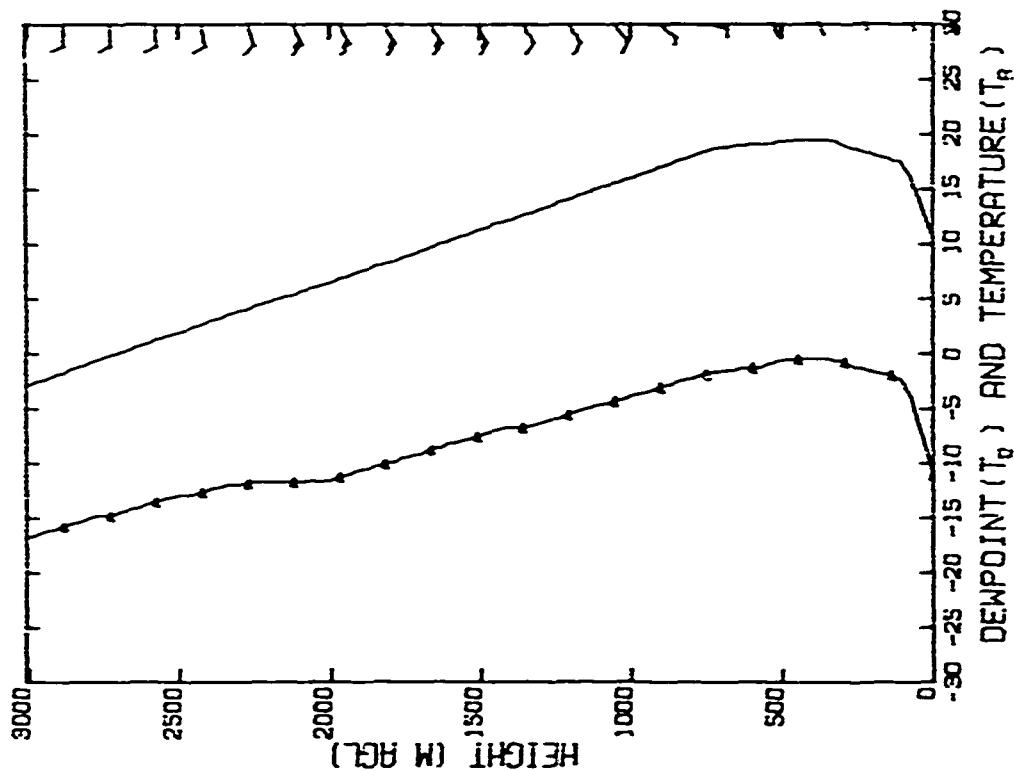


TABLE 88
APACHE SITE RAWINSONDE DATA

DATE: 07 APR 77 RELEASE NO.: 53 RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	664.7	10.6	1.9	180.0	2.1
92.8	657.4	17.4	3.9	178.0	2.6
357.0	637.5	19.7	4.5	175.0	3.6
722.6	610.9	18.7	4.0	189.0	3.6
1995.5	525.0	6.5	1.9	241.0	7.2
2343.7	503.1	3.5	1.8	254.0	5.7
3677.9	425.2	-9.4	0.8	260.6	3.0



WIND BARB SYSTEM (KTS)

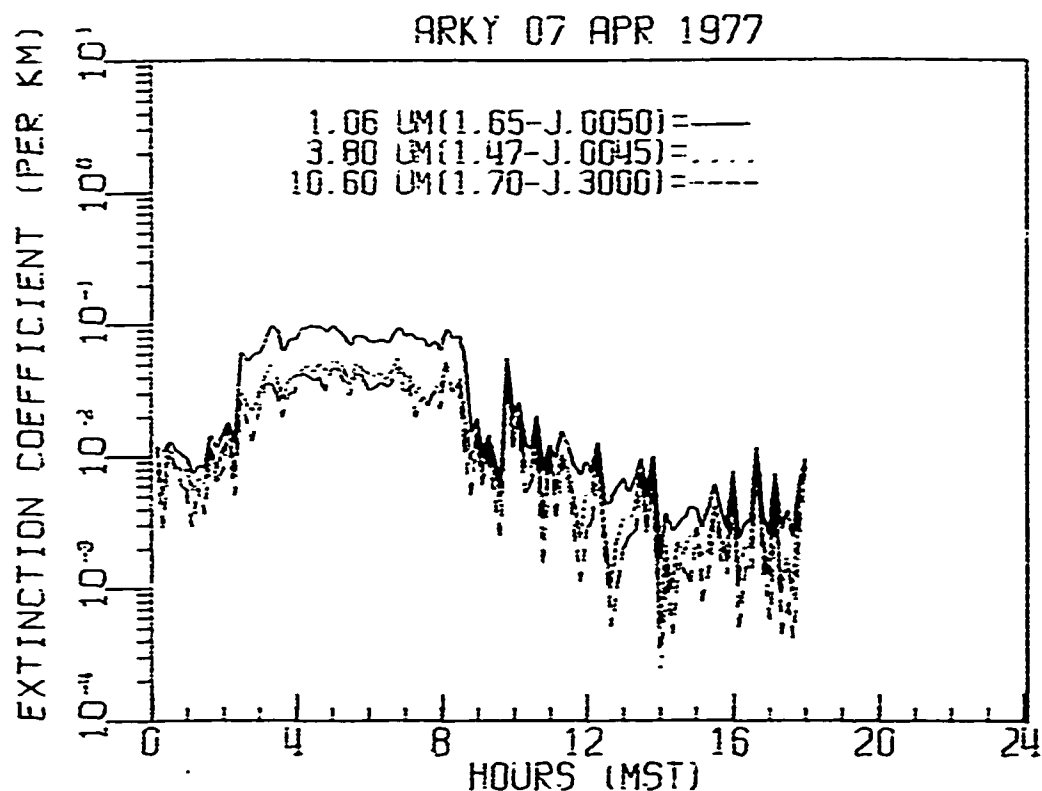


Figure 160. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 7 April 1977.

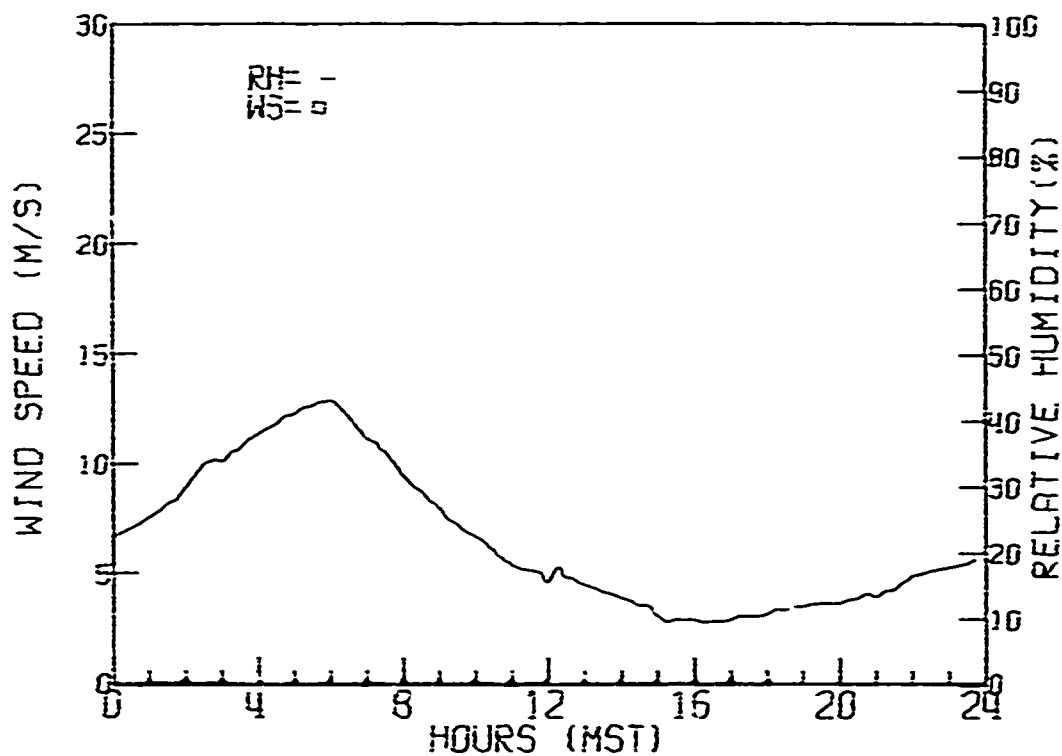


Figure 161. Diurnal variation of windspeed and relative humidity, Arky Site, 7 April 1977.

TABLE B9 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WENT

DATE	TIME (MST)	SAMPLE TIME (SEC)	CHANNEL										EXTINCTION (PER K4)			MASS LOADING (UM/M003)	
			1	2	3	4	5	6	7	8	9	10	1.06	3.0	10.5		
07 APR 77																	
07:04:00	600		.12+02	.24+01	.12+01	.7A-C1	.14+00	.20-C1	.50	.00	.45-01	.42-01	.42-01	.42-01	.37-01	295.	
07:05:00	500		.13+02	.21+01	.13+01	.7A-C1	.20+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	304.	
07:06:00	600		.13+02	.24+01	.13+01	.7A-C1	.20+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	244.	
07:07:00	500		.11+02	.20+01	.11+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	271.	
07:08:00	600		.10+02	.14+01	.10+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	263.	
07:09:00	500		.11+02	.16+01	.11+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	439.	
07:10:00	600		.10+02	.17+01	.10+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	204.	
07:11:00	500		.11+02	.20+01	.11+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	390.	
07:12:00	600		.12+02	.19+01	.12+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	375.	
07:13:00	500		.11+02	.21+01	.11+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	365.	
07:14:00	600		.11+02	.19+01	.11+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	144.	
07:15:00	500		.13+01	.22+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	46.	
07:16:00	600		.13+01	.24+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	84.	
07:17:00	500		.13+01	.26+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	123.	
07:18:00	600		.13+01	.28+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	20.	
07:19:00	500		.13+01	.30+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	422.	
07:20:00	600		.13+01	.32+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	79.	
07:21:00	500		.13+01	.34+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	209.	
07:22:00	600		.13+01	.36+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	46.	
07:23:00	500		.13+01	.38+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	161.	
07:24:00	600		.13+01	.40+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	16.	
07:25:00	500		.13+01	.42+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	112.	
07:26:00	600		.13+01	.44+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	73.	
07:27:00	500		.13+01	.46+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	109.	
07:28:00	600		.13+01	.48+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	38.	
07:29:00	500		.13+01	.50+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	25.	
07:30:00	600		.13+01	.52+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	15.	
07:31:00	500		.13+01	.54+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	26.	
07:32:00	600		.13+01	.56+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	30.	
07:33:00	500		.13+01	.58+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	117.	
07:34:00	600		.13+01	.60+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	16.	
07:35:00	500		.13+01	.62+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	9.	
07:36:00	600		.13+01	.64+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	12.	
07:37:00	500		.13+01	.66+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	20.	
07:38:00	600		.13+01	.68+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	24.	
07:39:00	500		.13+01	.70+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	27.	
07:40:00	600		.13+01	.72+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	94.	
07:41:00	500		.13+01	.74+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	16.	
07:42:00	600		.13+01	.76+01	.13+01	.7A-C1	.14+00	.20-C1	.00	.00	.45-01	.42-01	.42-01	.42-01	.37-01	105.	

TABLE 09 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARMY SITE, WIND

DATE TIME SAMPLE (MST) TIME (SEC)	CHANNEL										EXTINCTION (PER K4)		MASS LOADING (UG/M ³)	
	1	2	3	4	5	6	7	8	9	10	1.26	3.0	13.6	
07 APR 77														
13:05:00	600	.37+00	.00	.30-C1	.00	.00	.00	.00	.00	.00	.17-02	.49-03	.26-03	3.
14:05:00	600	.43+00	.13+00	.33-01	.00	.00	.00	.00	.00	.00	.38-02	.22-02	.15-02	14.
15:05:00	600	.44+00	.13+00	.30-C1	.00	.00	.00	.00	.00	.00	.20-02	.09-03	.47-03	6.
16:05:00	600	.33+00	.06-01	.61-01	.15-01	.00	.00	.00	.00	.00	.31-02	.23-02	.14-02	13.
17:05:00	600	.48+00	.13+00	.00	.15-C1	.00	.00	.00	.00	.00	.34-02	.18-02	.14-02	13.
18:05:00	600	.45+00	.19+00	.19+00	.00	.00	.00	.00	.00	.00	.41-02	.25-02	.11-02	9.
19:05:00	600	.35+00	.11+00	.30-C1	.00	.00	.00	.00	.00	.00	.41-02	.24-02	.24-02	14.
20:05:00	600	.37+00	.06-01	.12+00	.00	.00	.00	.00	.00	.00	.14-02	.19-02	.12-02	5.
21:05:00	600	.42+00	.15+00	.00	.15-C1	.00	.00	.00	.00	.00	.41-02	.20-02	.14-02	15.
22:05:00	600	.45+00	.15+00	.61-01	.19-01	.00	.00	.00	.00	.00	.42-02	.42-02	.42-02	24.
23:05:00	600	.42+00	.17+00	.61-01	.15-C1	.00	.00	.00	.00	.00	.39-02	.26-02	.17-02	14.
24:05:00	600	.41+00	.06-01	.00	.15-01	.00	.00	.00	.00	.00	.29-02	.15-02	.13-02	12.
25:05:00	600	.44+00	.23+00	.30-C1	.46-01	.00	.00	.00	.00	.00	.77-02	.64-02	.62-02	41.
26:05:00	600	.41+00	.06-01	.61-01	.00	.00	.00	.00	.00	.00	.24-02	.11-02	.11-02	5.
27:05:00	600	.33+00	.13+00	.30-C1	.15-01	.00	.00	.00	.00	.00	.31-02	.21-02	.15-02	13.
28:05:00	600	.45+00	.11+00	.33-01	.15-01	.00	.00	.00	.00	.00	.35-02	.21-02	.15-02	10.
29:05:00	600	.47+00	.13+00	.61-01	.15-C1	.00	.00	.00	.00	.00	.12-02	.17-02	.17-02	148.
30:05:00	600	.35+00	.13+00	.61-01	.15-01	.00	.00	.00	.00	.00	.34-02	.21-02	.16-02	14.
31:05:00	600	.35+00	.13+00	.61-01	.15-01	.00	.00	.00	.00	.00	.26-02	.13-02	.13-02	5.
32:05:00	600	.40+00	.06-01	.00	.00	.00	.00	.00	.00	.00	.74-02	.11-02	.11-02	47.
33:05:00	600	.42+00	.11+00	.30-C1	.15-01	.00	.00	.00	.00	.00	.29-02	.09-03	.45-03	6.
34:05:00	600	.45+00	.13+00	.61-01	.15-C1	.00	.00	.00	.00	.00	.39-02	.17-02	.17-02	9.
35:05:00	600	.43+00	.11+00	.61-01	.15-01	.00	.00	.00	.00	.00	.25-02	.09-03	.43-03	5.
36:05:00	600	.43+00	.11+00	.61-01	.15-01	.00	.00	.00	.00	.00	.61-02	.43-02	.29-02	26.
37:05:00	600	.41+00	.21+00	.30-C1	.15-01	.00	.00	.00	.00	.00	.95-02	.75-02	.44-02	96.

Weather Summary

Date: 8 April 1977

Synoptic

Surface: Weak high centered over central Colorado.

500 Millibar: Weak ridge over Rocky Mountains with light northwesterly flow over New Mexico.

Holloman AFB

Clouds: Clear early morning. Scattered cumulus 1200-2000 m AGL during daylight hours.

Wind: Light and variable with peak wind of 7 m sec⁻¹ from the northwest during midafternoon.

Visibility: Greater than 60 km.

Maximum temperature: 29.4°C

Corresponding vapor pressure: 5.0 Torr

Minimum temperature: 7.2°C

Corresponding vapor pressure: 2.5 Torr

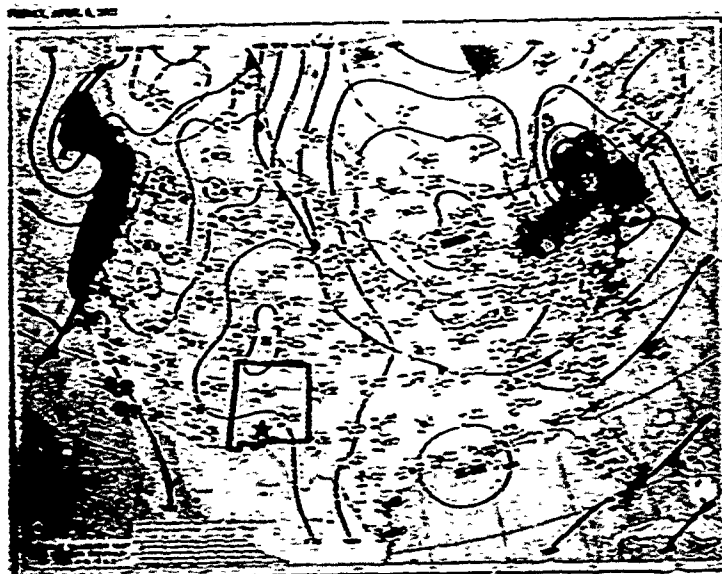


Figure 162a. Surface weather map for 8 April 1977.

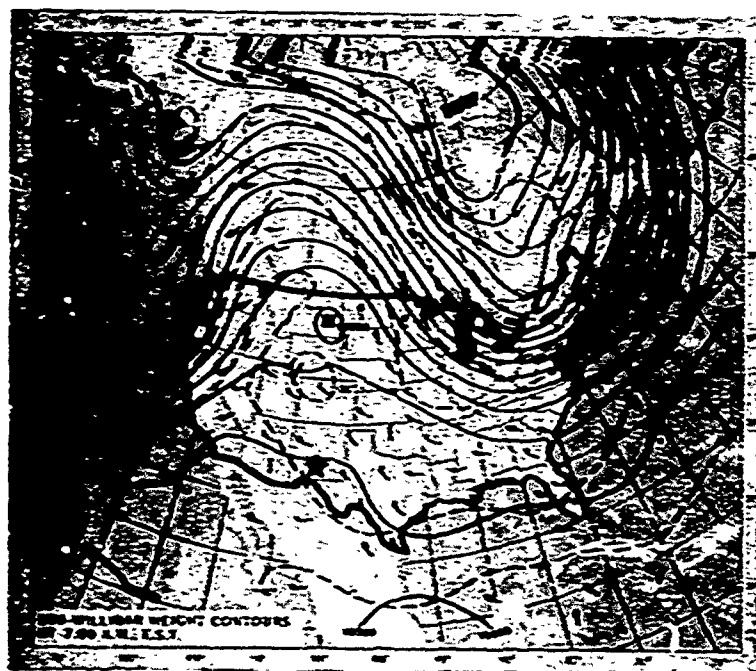


Figure 162b. 500-millibar height contours for 8 April 1977.

TABLE 90. LSTC DAILY LOG OF TEMPERATURE, MOISTURE, CLOUD COVER, AND REMARKS

Hour	Dry Bulb Temp (°C)	Vapor Pressure (Torr)	Dew Point (°C)	Clouds			Remarks
				Low %/Type	Mid %/Type	High %/Type	
0100	11.7	2.1	-10.3	0	0	0	
0200	11.6	2.7	-7.3	0	0	0	
0300	9.6	2.4	-8.4	0	0	0	0300-1800 shift all parameters at LSTC
0400	5.7	2.1	-10.4	0	0	0	
0500	2.2	1.7	-12.7	0	0	0	
0600	2.2	2.1	-10.2	0	0	0	
0700	8.9	2.5	-8.1	0	0	0	
0800	13.3	2.9	-6.3	0	0	0	
0900	17.0	3.1	-5.3	0	0	0	
1000	21.8	3.2	-4.7	0	0	0	
1100	24.0	3.7	-2.8	0	0	0	Few Cu E Apache ok - cal ΔT/C's and Bul ΔT's 0928-0950
1200	26.5	5.7	3.0	10 Cu	0	0	Few Cu E LSTC 32 ΔT out - could not recal
1300	27.5	2.6	-7.5	10 Cu	0	0	
1400	27.5	2.7	-7.0	10 Cu	0	0	
1500	29.4	2.5	-7.9	10 Cu	0	0	
1600	28.0	3.0	-5.5	10 Cu	0	0	
1700	28.0	3.0	-5.5	10 Cu	0	0	
1800	26.7	2.9	-5.9	10 Cu	0	0	
1900	23.9	3.3	-4.3	0	0	0	Few Cu S
2000	19.1	2.6	-7.4	0	0	0	
2100	17.5	3.1	-5.1	0	0	0	
2200	16.6	2.8	-6.7	0	0	0	
2300	14.4	2.7	-7.3	0	0	0	
2400	13.3	2.3	-8.9	0	0	0	

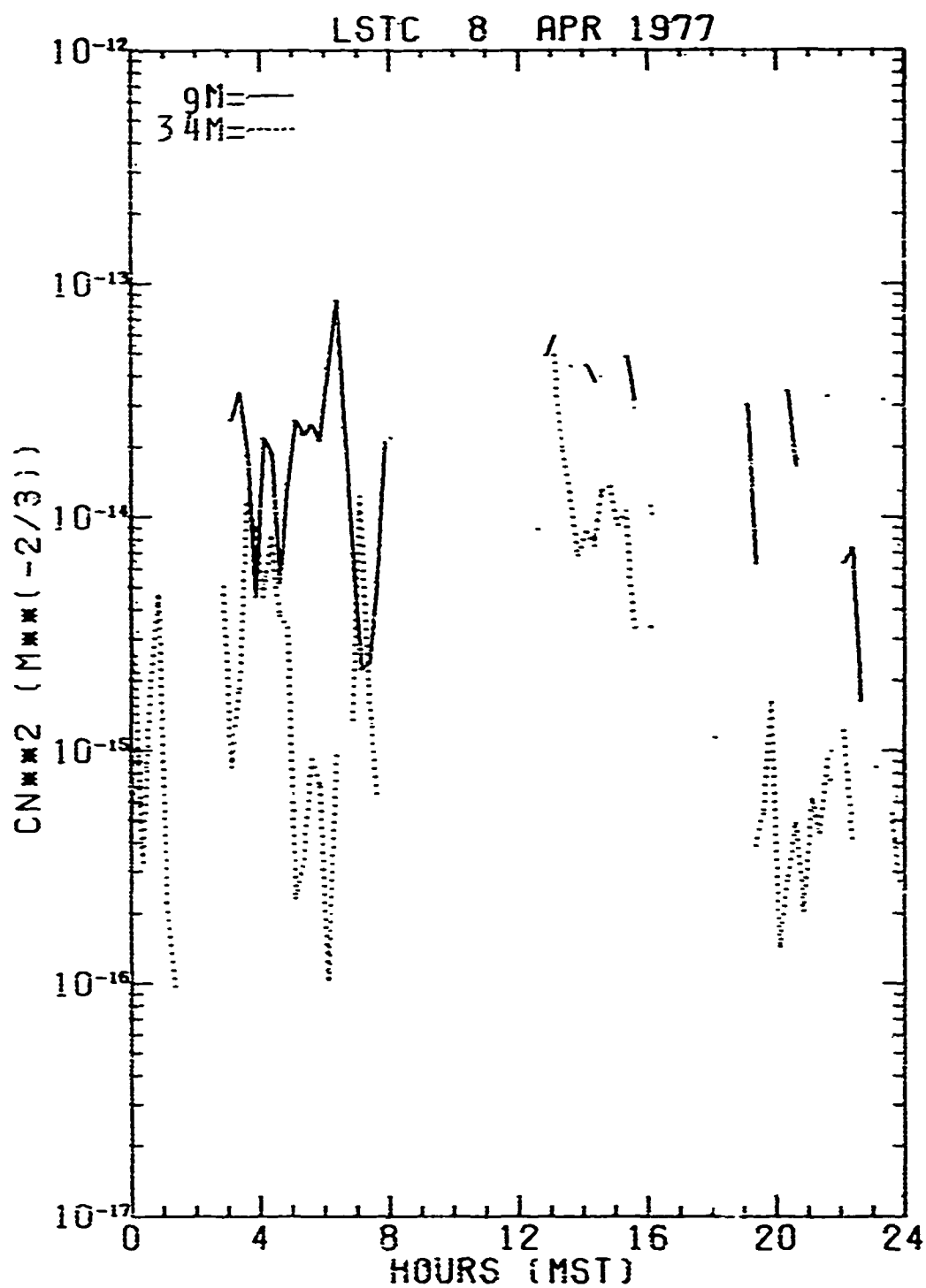


Figure 163. Diurnal variation of the atmospheric structure parameter, C_n^2 , at the LSTC for the 9 and 34 m tower levels, 8 April 1977.

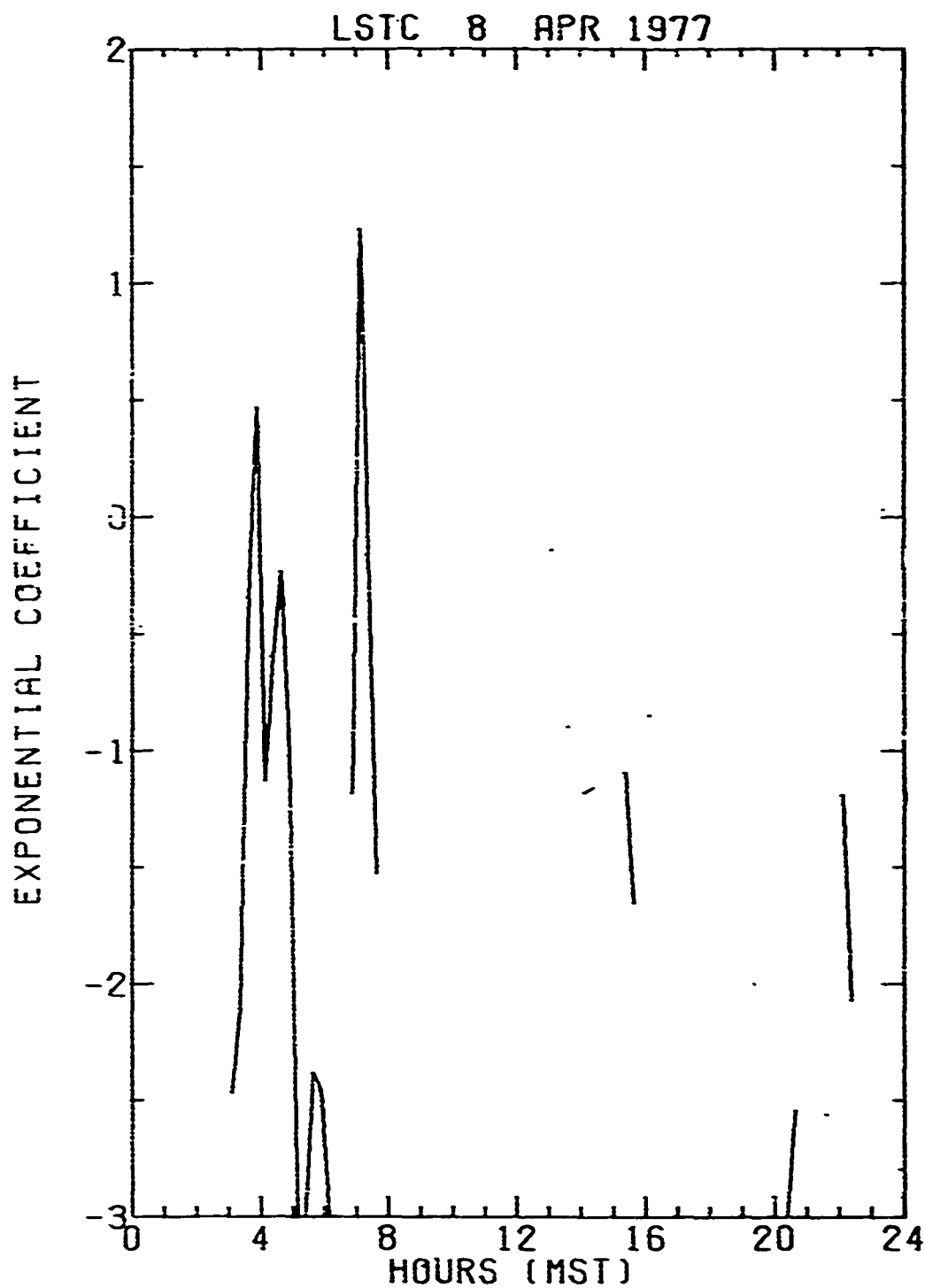


Figure 164. Diurnal variation of the altitude change of C_N^2 between the 9 and 34 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, LSTC, 8 April 1977.

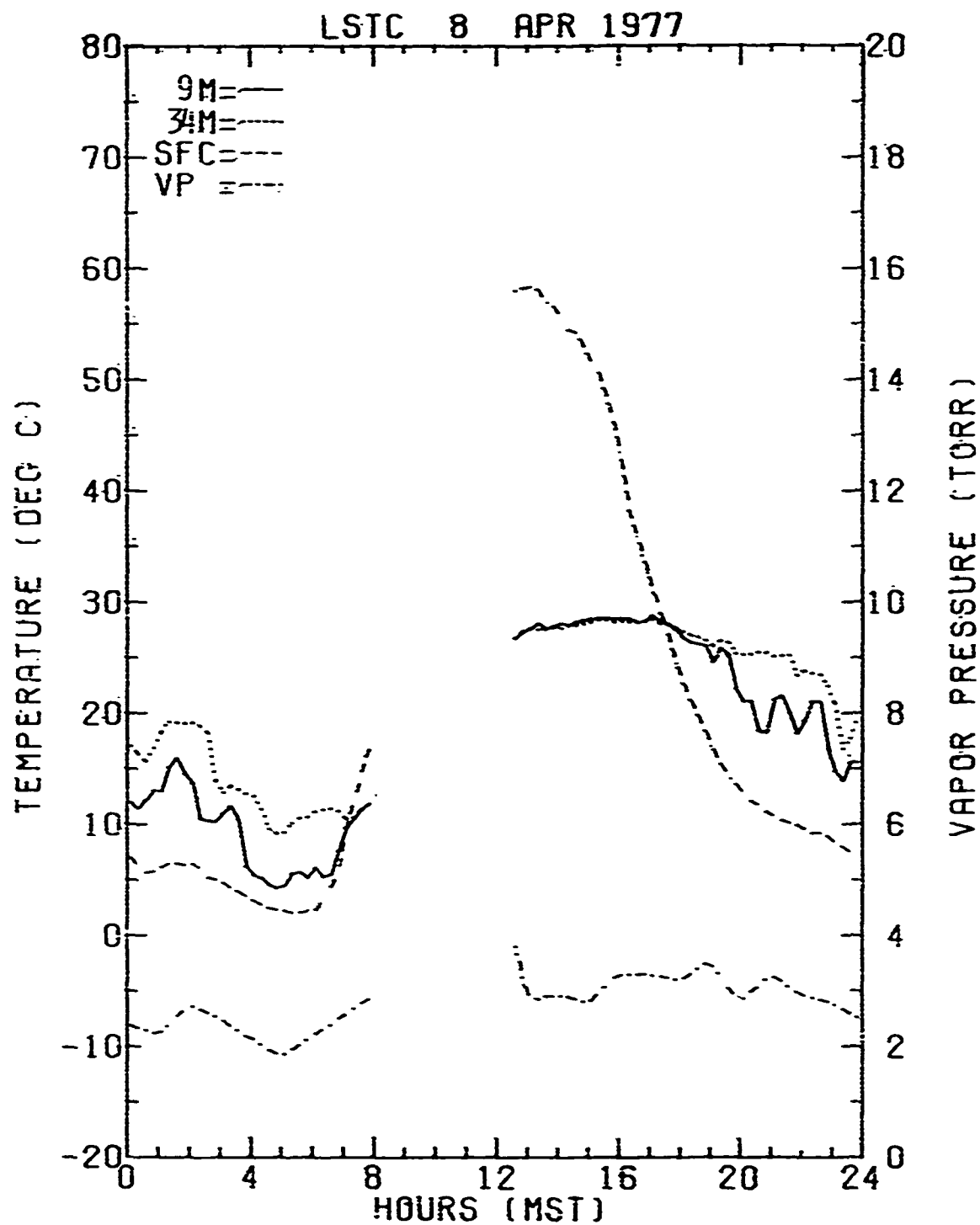


Figure 165. Diurnal variation of surface soil temperature, air temperatures at the 9 and 34 m tower levels, and vapor pressure at 2 m level, LSTC, 8 April 1977.

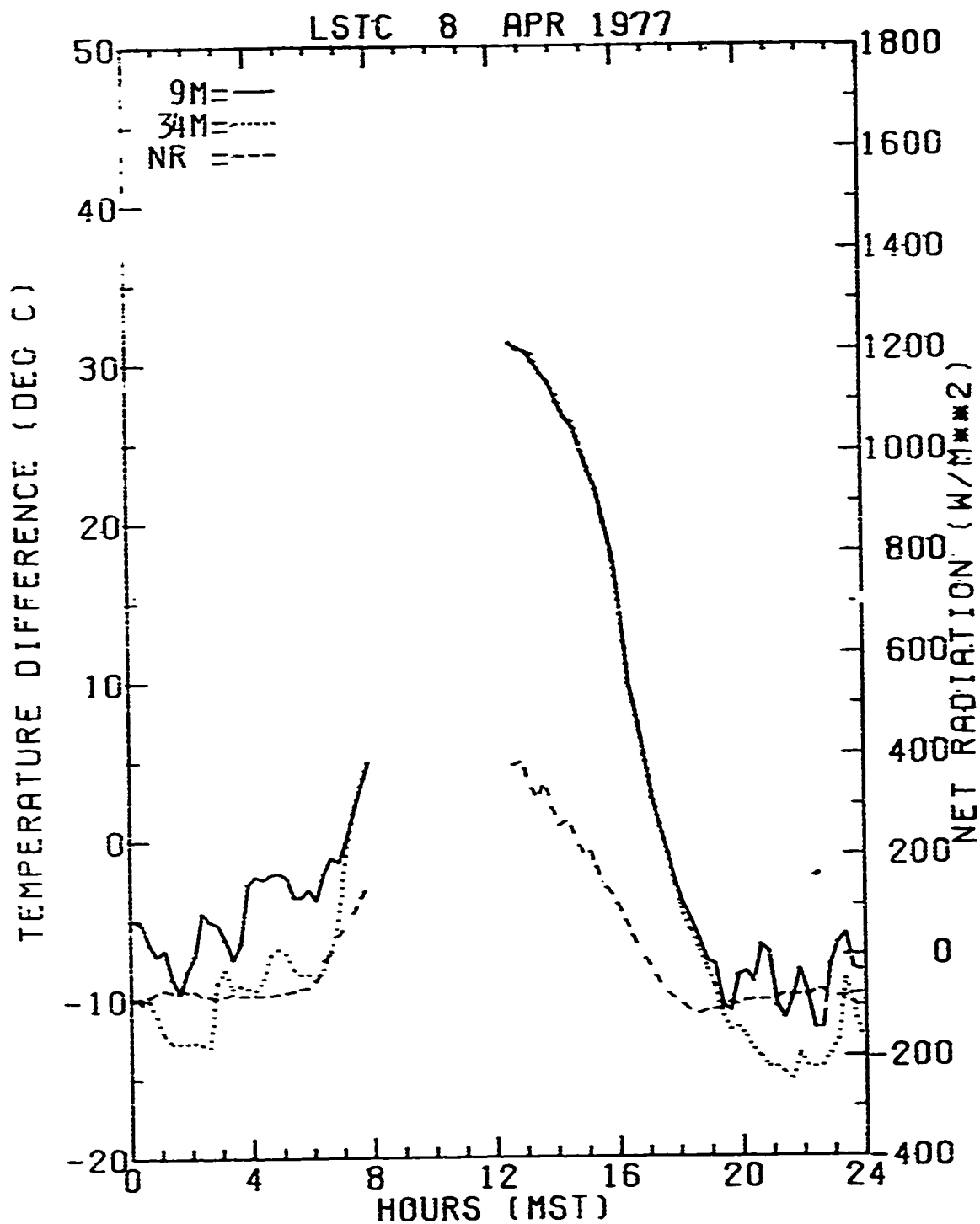


Figure 166. Diurnal variation of the difference in temperature between soil surface and 9 m and soil surface and 34 m, and net radiation at the 1 m level, LSTC, 8 April 1977.

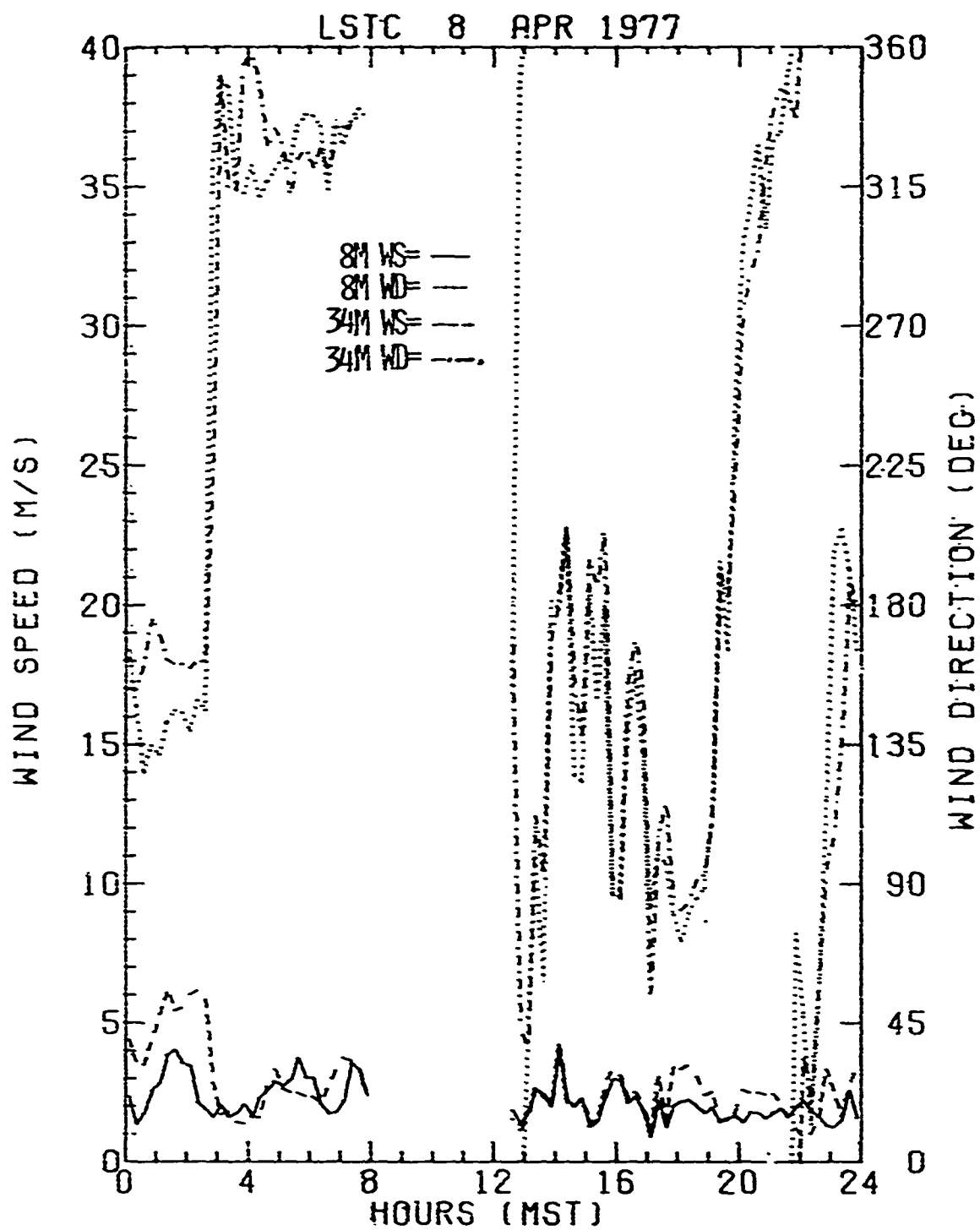


Figure 167. Diurnal variation of windspeed and wind direction at the 8 and 34 m tower levels, LSTC, 8 April 1977.

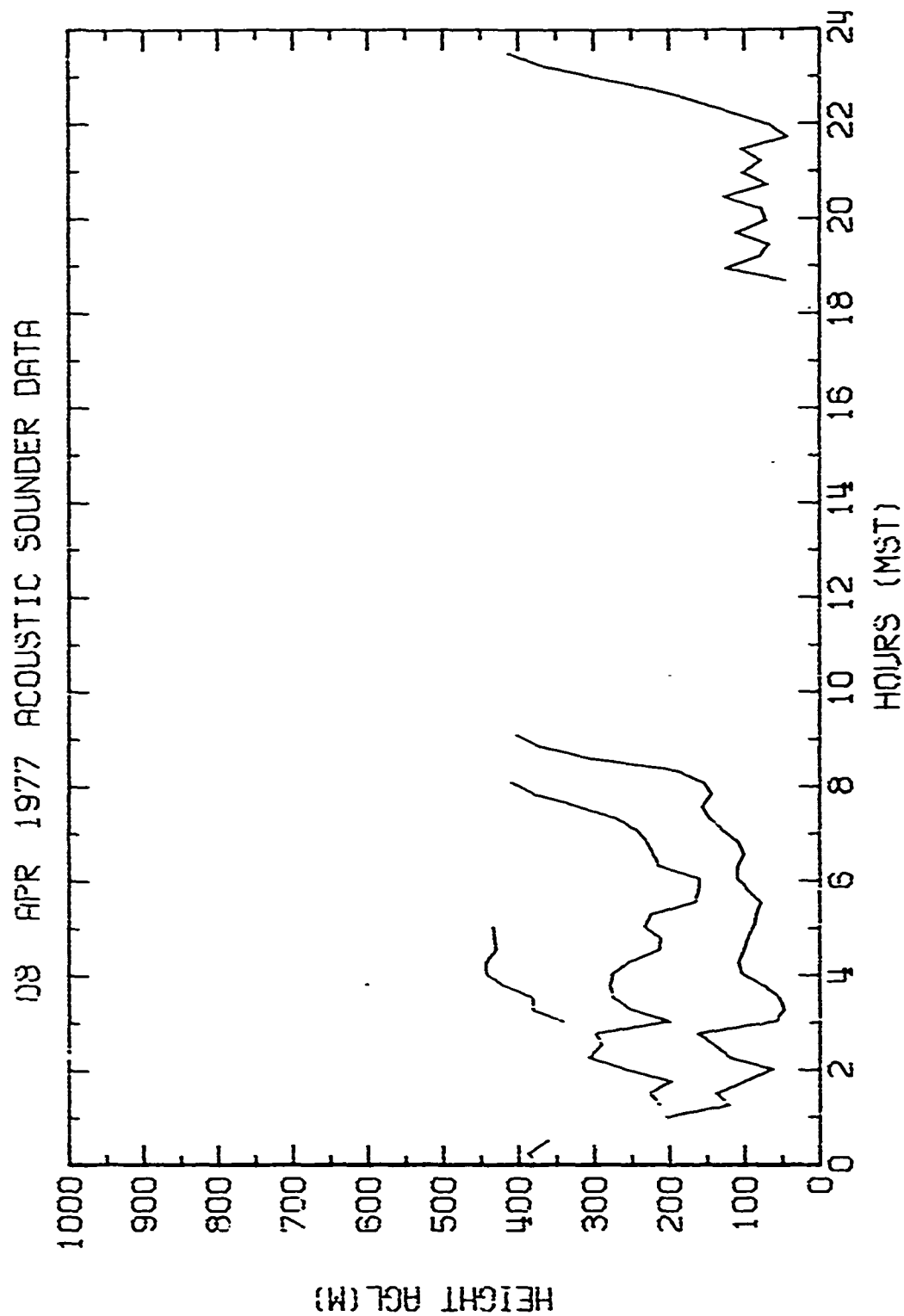


Figure 168. Inversion heights, LSTC, 8 April 1977.

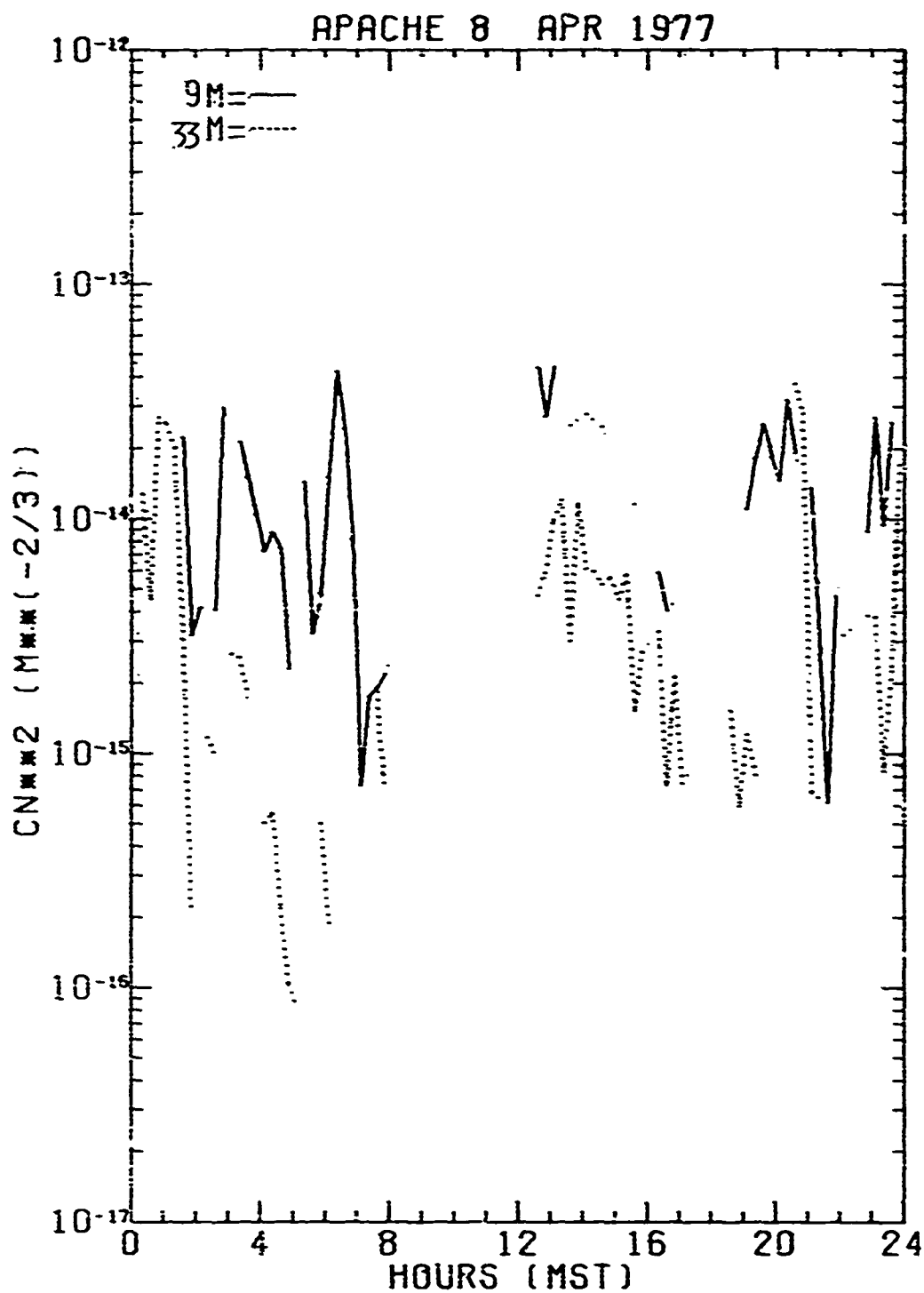


Figure 169. Diurnal variation of the atmospheric structure parameter, C_N^2 , at the Apache Site for the 9 and 33 m tower levels, 8 April 1977.

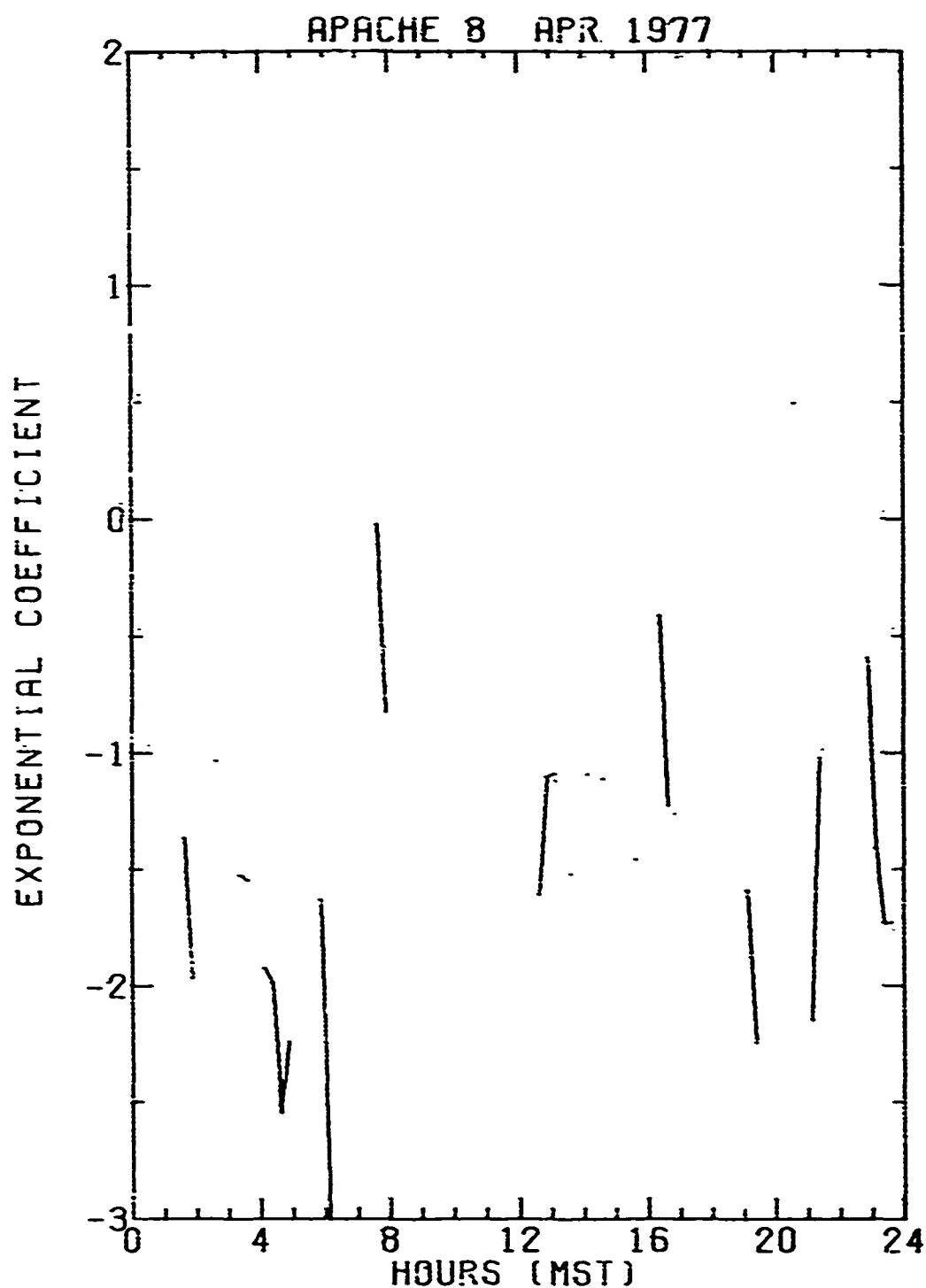


Figure 170. Diurnal variation of the altitude change of C_N^2 between the 9 and 33 m levels. The exponential coefficient (a) for $C_N^2(z) = z^a k$ is plotted where z is the altitude and k is the 1 m C_N^2 value, Apache Site, 8 April 1977.

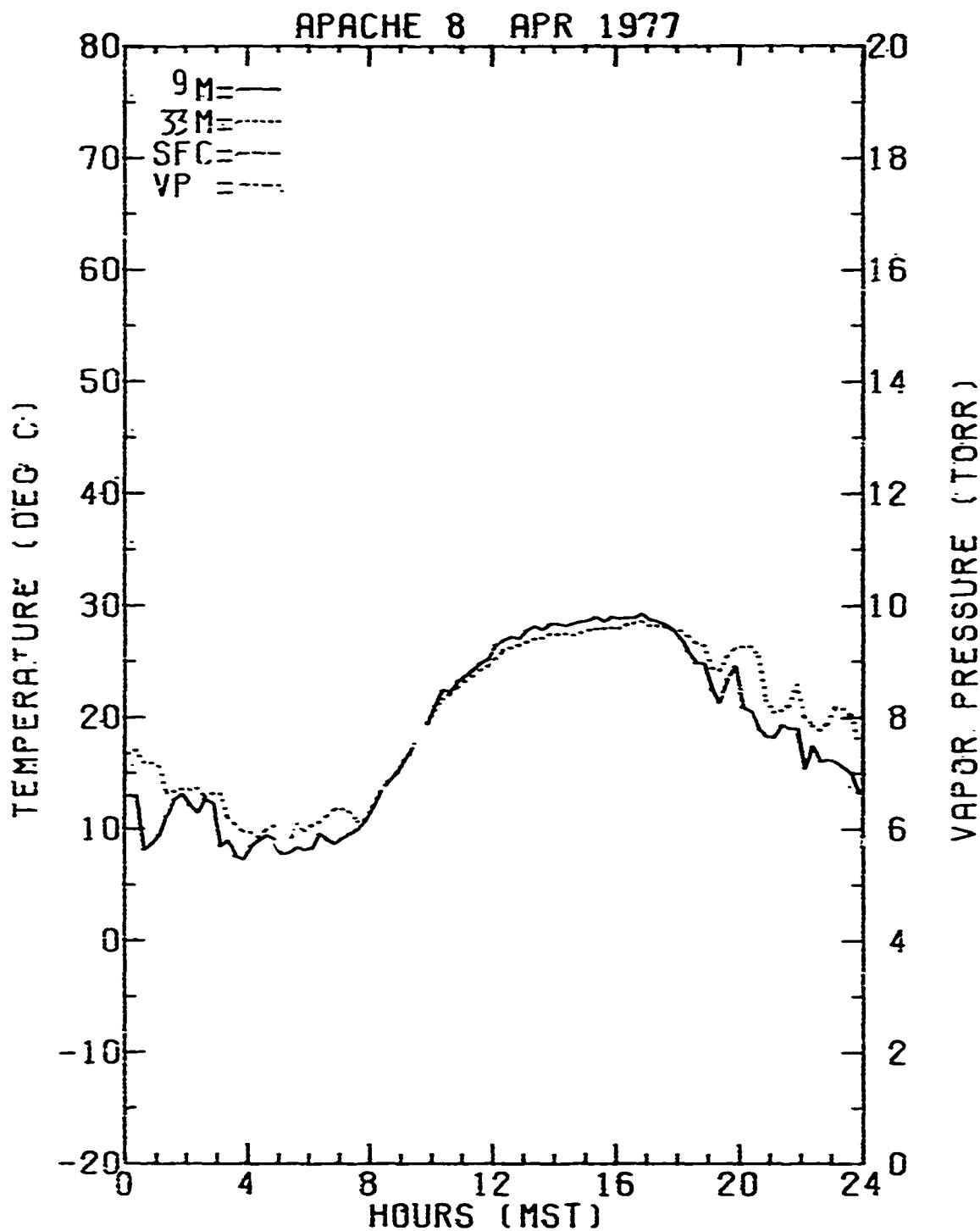


Figure 17i. Diurnal variation of surface soil temperature, air temperatures at the 9 and 33 m tower levels, and vapor pressure at 2 m level, Apache Site, 8 April 1977.

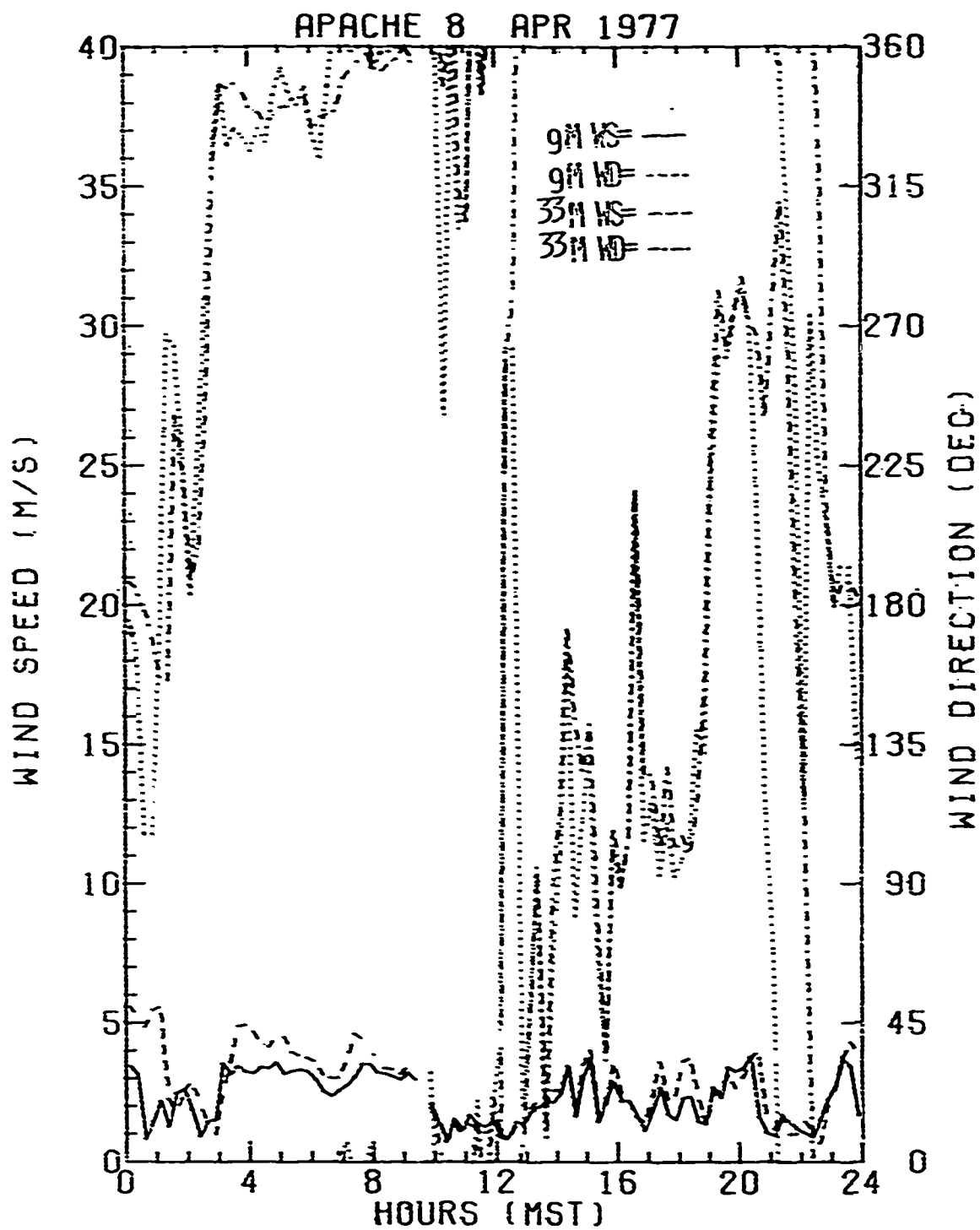


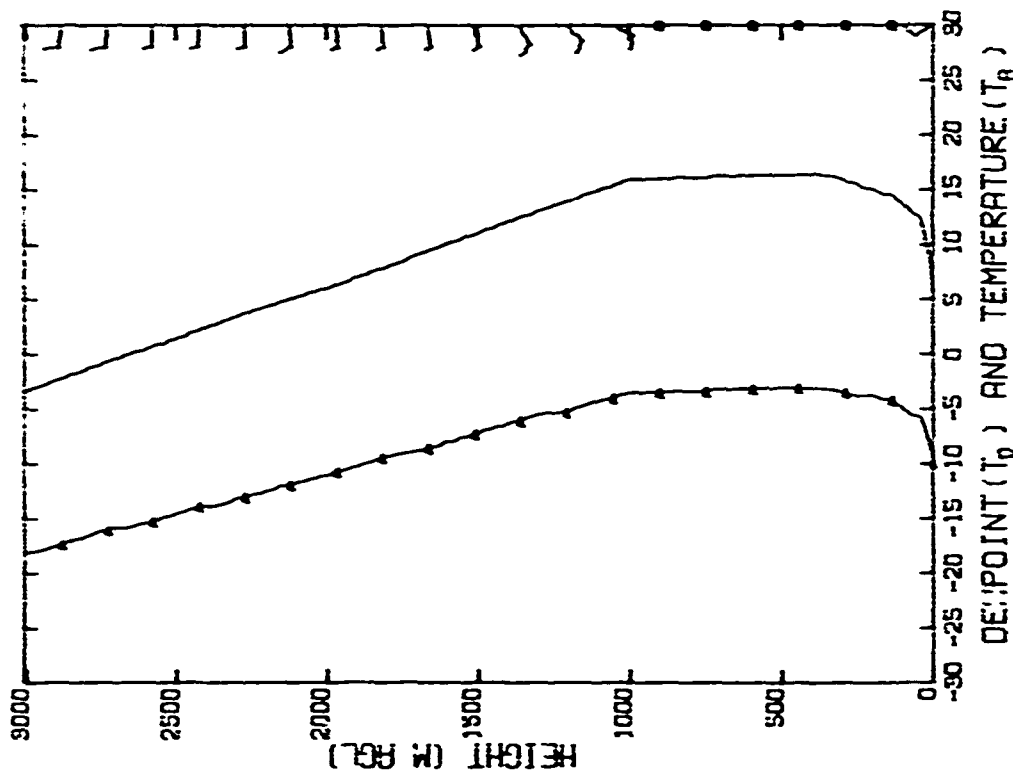
Figure 172. Diurnal variation of windspeed and wind direction at the 8 and 32 m tower levels, Apache Site, 8 April 1977.

TABLE 91
APACHE SITE RAWINSONDE DATA

DATE: 08 APR 77 RELEASE NO.: 54 RELEASE TIME: 0500 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR (DEG)	SPEED (M/S)
0.0	665.0	5.8	2.2	330.0	4.1
32.7	662.4	12.1	2.9	0.0	0.0
134.3	654.4	14.5	3.4	0.0	0.0
356.9	637.5	16.5	3.7	0.0	0.0
1000.9	591.0	15.9	3.5	0.0	0.0
1989.5	525.0	6.1	2.0	266.0	3.6
2250.5	508.5	3.9	1.7	271.0	3.6
3723.7	422.2	-10.4	0.7	292.9	4.3



WIND BARB SYSTEM (KTS)

TABLE 92
APACHE SITE RAWINSONDE DATA

DATE: 03 APR 77 RELEASE NO.: 55 RELEASE TIME: 1200 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	665.1	25.8	3.5	0.0	0.0
370.0	637.5	22.1	3.8	163.0	0.5
2010.0	525.0	6.8	1.5	178.0	2.6
3608.3	429.9	-8.4	0.9	213.5	1.4

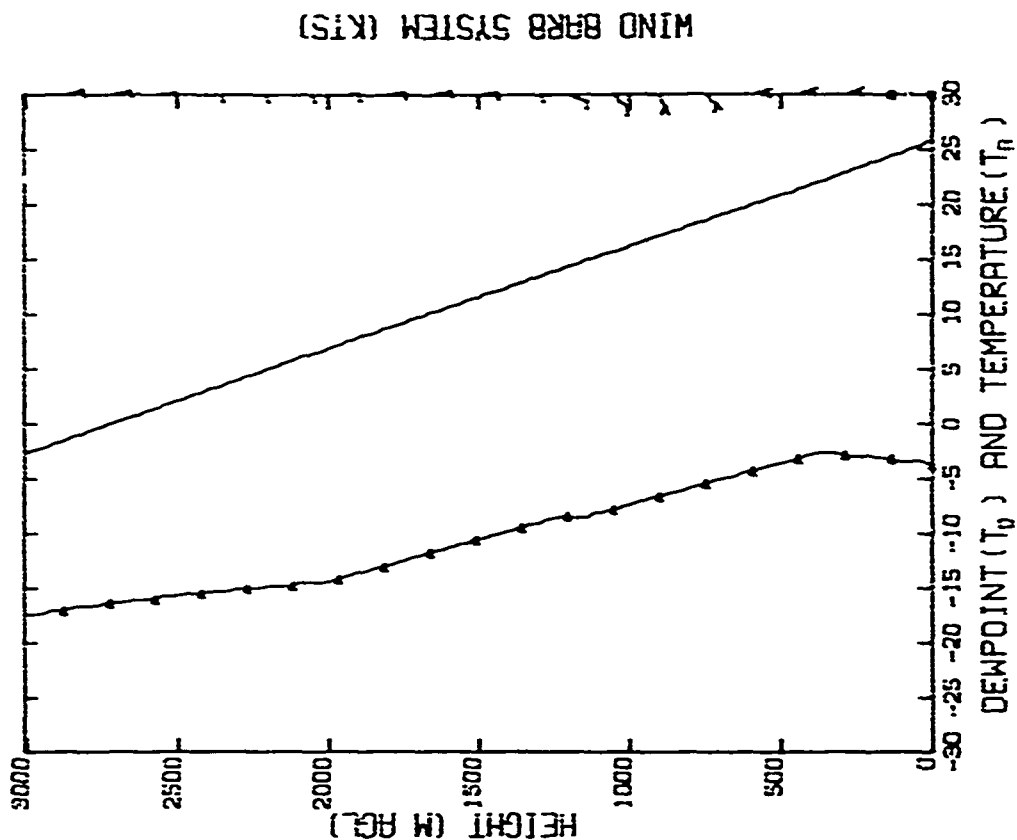


TABLE 93
APACHE SITE RAWINSONDE DATA

DATE: 08 APR '77 RELEASE NO.: 56 RELEASE TIME: 1800 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	WIND DIR	SPEED (M/S)
0.0	661.9	27.5	8.0	90.0	2.1
331.3	637.5	24.4	5.3	0.0	0.0
1353.1	566.1	14.6	2.6	0.0	0.0
1983.2	525.0	8.2	2.1	0.0	0.0
3023.8	461.8	-1.7	1.5	0.0	0.0
3934.5	411.2	-10.6	1.0	243.1	4.3

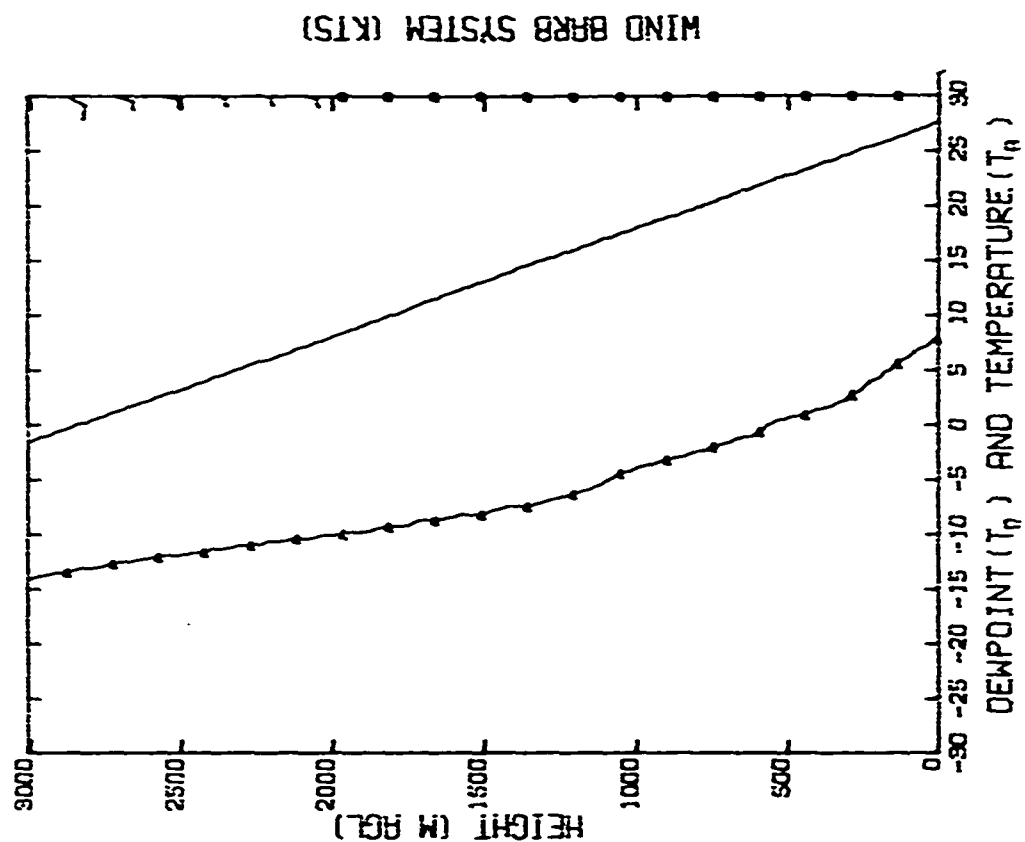


TABLE 94 APACHE SITE RAWINSONDE DATA

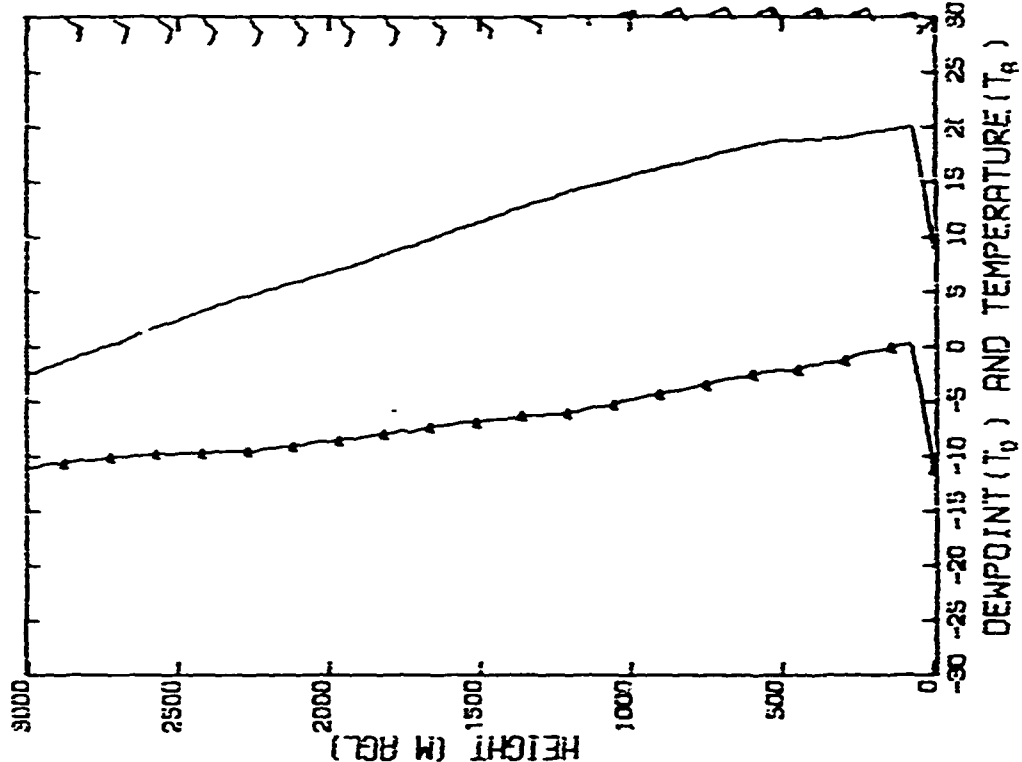
DATE: 08 APR 77

RELEASE NO.: 57

RELEASE TIME: 2359 MST

SIGNIFICANT AND MANDATORY LEVELS

GEOMETRIC ALTITUDE (M AGL)	PRES (TORR)	TEMP (C)	VAPOR PRES (TORR)	DIR (DEG)	WIND SPEED (M/S)
0.0	662.0	9.0	1.9	310.0	1.0
72.1	656.4	20.0	4.8	199.0	0.5
323.4	637.5	18.9	4.1	158.0	4.6
550.4	620.8	18.6	3.9	156.0	7.2
1203.8	574.9	14.1	2.9	182.0	2.6
1961.5	525.0	7.0	2.4	225.0	4.6
2298.4	503.8	4.4	2.2	226.0	4.6
3197.5	450.4	-4.5	1.9	220.7	9.1



APPENDIX A

AIRCRAFT MEASUREMENTS OF THE ATMOSPHERIC STRUCTURE PARAMETER

Aircraft measurements of the atmospheric structure parameter measure of optical turbulence were performed by the Wave Propagation Laboratory, Environmental Research Laboratories, National Oceanic and Atmospheric Administration. The report covering these measurements is included as Appendix A.

Temperature irregularities may be noted where the ambient temperature is within $\pm 1^\circ$ of 0°C . This is an instrumental effect (related to the tape recorder) and should be overlooked.

NOAA Technical Memorandum ERL WPL-27

WSMR ATMOSPHERIC STRUCTURE CONSTANT (C_n^2) SURVEY

R. B. Fritz
R. S. Lawrence

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White Sands, NM 88002, under W43P6S 77-8029
Mr. G. Hoidale was the ASL-WSMR Technical Representative.

Wave Propagation Laboratory
Boulder, Colorado
September 1977

WSMR ATMOSPHERIC STRUCTURE CONSTANT (C_n^2) SURVEY

R. B. Fritz and R. S. Lawrence

1. INTRODUCTION

Between March 25 and April 5, 1977, a multi-sensor cooperative atmospheric survey was carried out at White Sands Missile Range, New Mexico. The Atmospheric Sciences Laboratory of WSMR conducted ground-based and rawinsonde measurements of the refractive index structure constant C_n^2 (at heights of 8 and 32 meters on two meteorological towers), wind, temperature, humidity, and pressure. The Optical Propagation Group of the NOAA/ERL Wave Propagation Laboratory (Boulder, Colorado) carried out measurements of C_n^2 using an aircraft-mounted temperature probe, including vertical profiles to 3000 meters above ground and constant altitude circuit surveys. The aircraft measurements and concurrent rawinsonde launches took place at approximately local midnight, dawn, noon, and sunset. This report describes and summarizes the aircraft measurements only.

The area surveyed is between Alamogordo and Las Cruces, New Mexico, and is illustrated in the accompanying map (Fig. 1). The terrain is relatively flat with a mean altitude of approximately 1200 meters above sea level. The north-south ridge of the San Andres mountains, at an altitude of 2100-2400 meters, is 15 kilometers west of the center of the area. 32-meter meteorological towers are located at the sites denoted Apache and LSTC, which are 5.5 km apart. At the northern corner of the area is the dry lake, Lake Lucero, and the beginning of the White Sands National Monument.

2. AIRCRAFT MEASUREMENTS

The objective of the aircraft measurements was to obtain vertical profiles and constant altitude surveys of the optical refractive index structure constant, C_n^2 . This parameter is derived from the

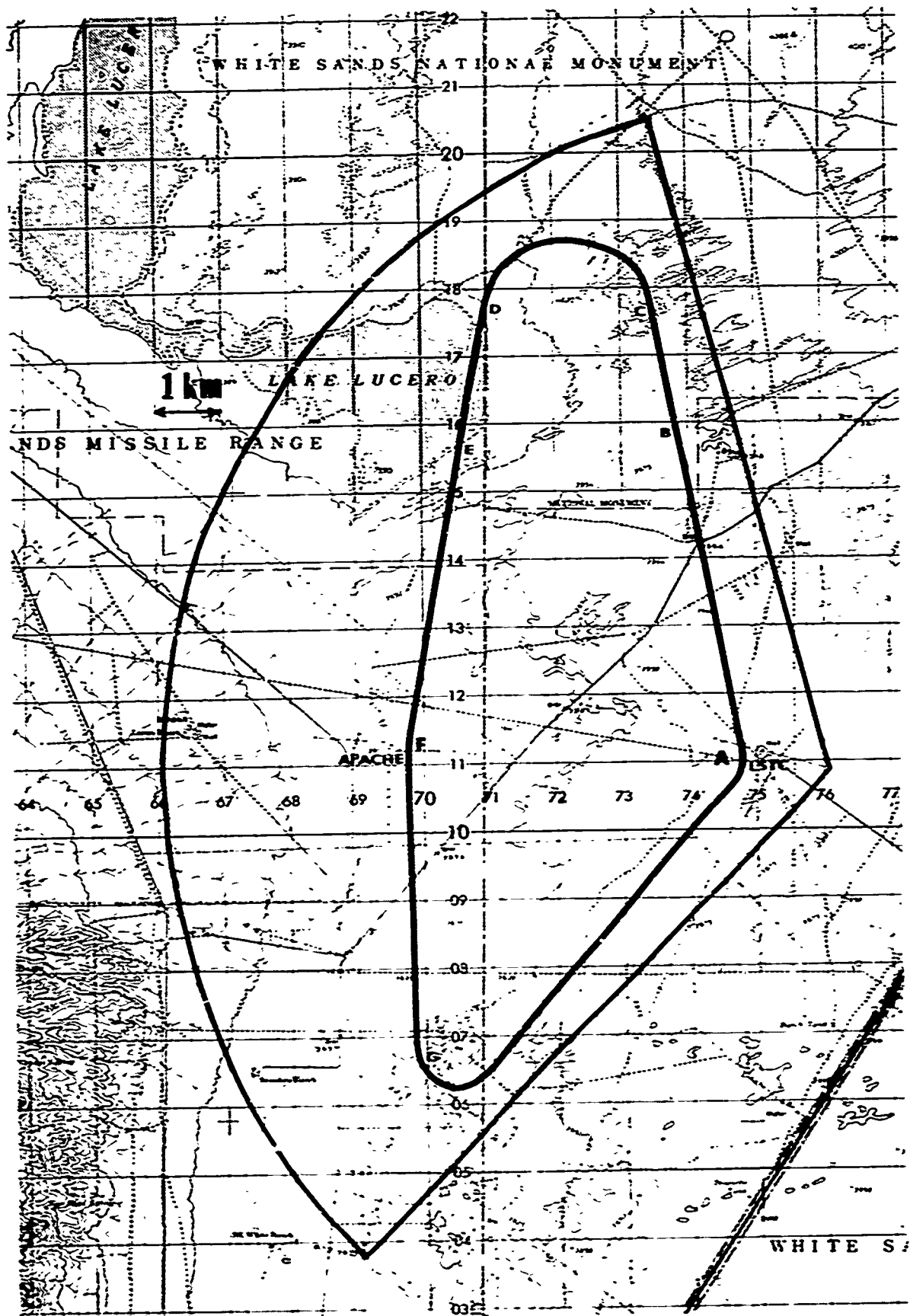


Figure 1. Map of surveyed area (Map courtesy of U.S. Army Topographic Command).

temperature structure parameter, C_T^2 , through the relation:

$$C_n^2 = \left(\frac{79 P}{T^2} \right)^2 10^{-12} C_T^2 \quad (1)$$

where P is pressure in millibars and T is the absolute temperature. Units of C_n^2 and C_T^2 are $m^{-2/3}$.

Equation 1 is based on the assumption that over small scale sizes, temperature rather than humidity fluctuations affect the refractive index structure. In turn, C_T^2 is determined from a temperature sensor mounted on the right wing of a Cessna 205, about 3 meters from the engine. The sensor consists of a 6 μm platinum wire wound on an open square, .35 cm on a side and 2 cm long in the direction of flight. The sensor and its mounting are shown in Fig. 2 and Fig. 3. Sensor resistance fluctuations can be related to corresponding temperature fluctuations, and by assuming that the spectrum of turbulence follows the Kolmogorov Law, it can be shown that:

$$C_T^2 = \frac{2.68 (T - \bar{T})^2}{\left(\frac{v}{2\pi f_L} \right)^{2/3} - \left(\frac{v}{2\pi f_H} \right)^{2/3}} \quad (2)$$

where $\bar{T}^2$ is the mean square temperature fluctuation,

$\bar{N}^2$ is the mean square aircraft and system noise fluctuation,

v is aircraft air speed,

f_L is the low frequency response limit (0.23 Hz), and

f_H is the high frequency response limit (320 Hz).

Derivation and discussion of these equations are available in the reference by Lawrence *et al.* (1970).

The use of this system in previous surveys is described by Ochs and Lawrence (1972) and Ochs *et al.* (1976).

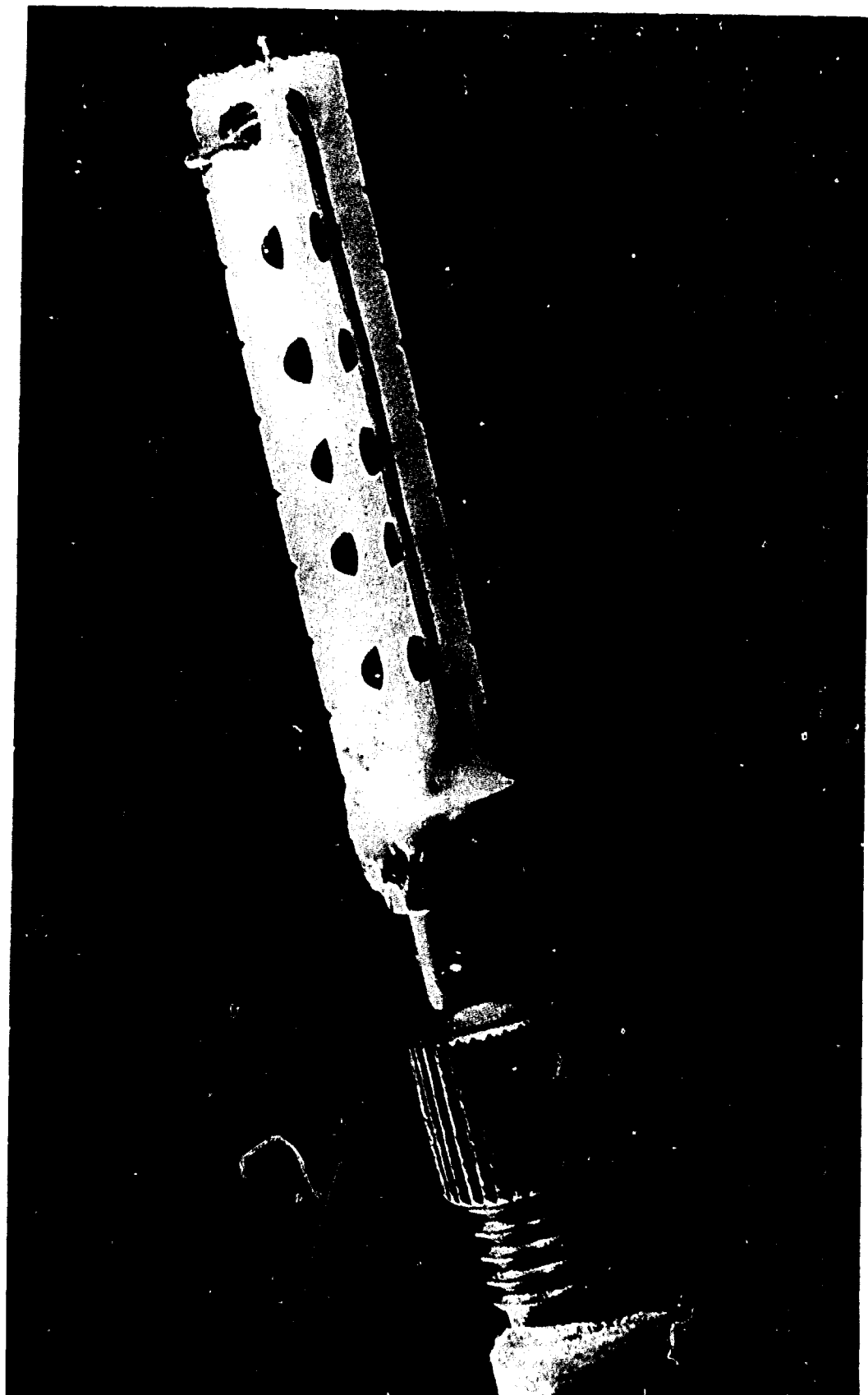


Figure 2. The C_T^2 probe consisting of a 6 μ m platinum wire wound on a form 2 cm in length.

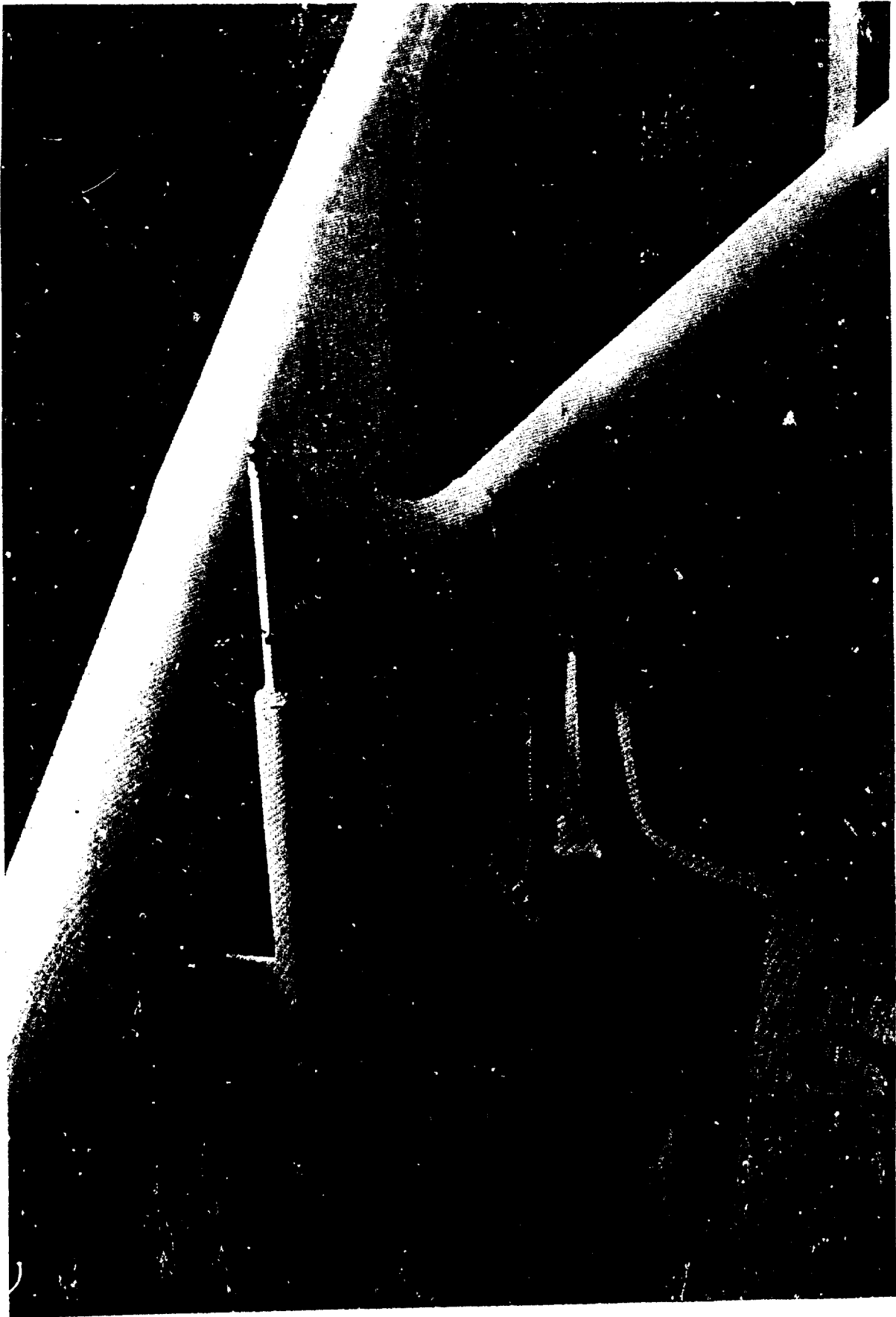


Figure 3. Mounting of the C_T^2 probe on the Cessna 205

The system was calibrated on the ground with the sensor covered and the aircraft motor off to minimize all fluctuations, and again in the air before beginning the surveys. Corrections to account for temperature dependence of calibration were derived by G. R. Ochs and D. Walters.

In addition to the temperature fluctuation data, temperature itself was simultaneously recorded on the airborne tape recorder. Altitude, pressure, air speed, and other information were recorded verbally on the same recorder.

3. DATA REDUCTION

Data were recorded on an instrumentation tape recorder on board the Cossna and subsequently digitized at 5 second intervals. The digitized data were edited to add related information such as altitude, location, air speed, etc., and to remove erroneous data caused by voice information over-riding the temperature channel or aircraft radio interference on the C_n^2 channel.

3.1 Vertical Profile Data

To obtain data for the vertical profiles, the Cossna was flown in a descending spiral from 3 km above ground. Air speed was approximately 50 meters per second and the descent rate was 2 1/2 meters per second. The temperature and C_n^2 data were processed by averaging all points within a 75 meter altitude range and representing that interval by one point in the vertical profile plots.

3.2 Constant Altitude Circuit Flights

The circuit flights at 61, 122, and 244 meters above ground could have started at any point on the path indicated on the map (Fig. 1), and the ground speed on a leg would differ from one run to another

depending on winds speeds and directions. In order to present a consistent representation of these surveys, the data are "normalized" to show LSTC at the start and end of each graph, with passage of Apache site at 60% of the way around. In practice, Apache was within 5% of this fractional flight time. The "checkpoints" around the circuit are noted on the map and on the graphs as follows:

- A: LSTC site
- B: South edge of drifted white sand (more distinct than indicated on map)
- C: North edge of drifted white sand
- D: North edge of Lake Lucero
- E: South edge of Lake Lucero
- F: Apache site
- G: South end turn

On many graphs, not all checkpoints are noted, but their approximate locations can be estimated easily.

4. FLIGHT SCHEDULES

Flights were scheduled within the two-hour time frames centered at 0000, 0500, 1200, and 1800 MST starting with the 0500 flight on March 25th and ending with the 0000 flight on April 5th. Two pilot/data recorder teams permitted operating around the clock.

The usual flight program consisted of the spiral descent from 3000 meters above ground to near the ground followed by constant altitude circuits of the area, at altitudes corresponding to 61, 122, and 244 meters above the ground. The 61-meter circuits were generally omitted on the midnight flights. The path of the counter-clockwise circuit flights is shown on the map (Fig. 1).

On a number of occasions, weather conditions or equipment problems prevented making the complete set of measurements described above. The times of several flights were altered to meet range air space scheduling requirements.

WHITE SANDS C² SURVEY n

Summary of Flight Schedules and Data Obtained

Flight number	Date 1977 Mar-Apr	Time MST	Descent phase	Level flight phases	Notes (reasons for lost data)
1	25	0500	Y	Y ¹	
2	25	1000		Y	Tape recorder problem at start
3	25	1800	Y	Y	
4	26	0000	Y	Y	
5	26	0500			Sensor broken in flight
6	26	1200	Y	Y	Sensor replaced; vertical profile data from ascending run
7	26	1800			Thunderstorm
8	27	0000	Y	Y	
9	27	0500	Y	Y	
10	27	1200			Sensor broken in flight
11	27	1800			Poor weather - overcast with showers
12	28	0000			Tower instruments out (blowing sand)
13	28	0500			" " " " "
14	28	1200			Temperature data erratic
15	28	1800	Y	Y	
16	29	0000	Y	Y	
17	29	0500	Y	Y	
18	29	1200	Y	Y	
19	29	1800	Y	Y	
20	30	0000	Y	Y	
21	30	0500	Y	Y	
22	30	1200	Y	Y	
23	30	1800	Y	Y	
24	31	0000	Y	Y	
25	31	0500	Y	Y	
26	31	1100	Y	Y	
27	31	1800	Y	Y	
28	01	0000			Recorder microphone problem
29	01	0500			" " " "
30	01	1200			No flights: blowing sand at ground
31	01	1800	Y	Y	
32	02	0000	Y	Y	
33	02	0500			No voice data on tape
34	02	1200	Y	Y	
35	02	1800	Y	Y	
36	03	0000	Y	Y	
37	03	0500	Y	Y	
38	03	1200		Y	Cloud build-up over mountains
39	03	1800		Y	Rain in area, overcast
40	04	0000			No back-up flight crew
41	04	0500	Y	Y	
42	04	1200	Y	Y	
43	04	1800	Y	Y	
44	05	0000	Y	Y	

¹"Y" indicates data obtained and processed

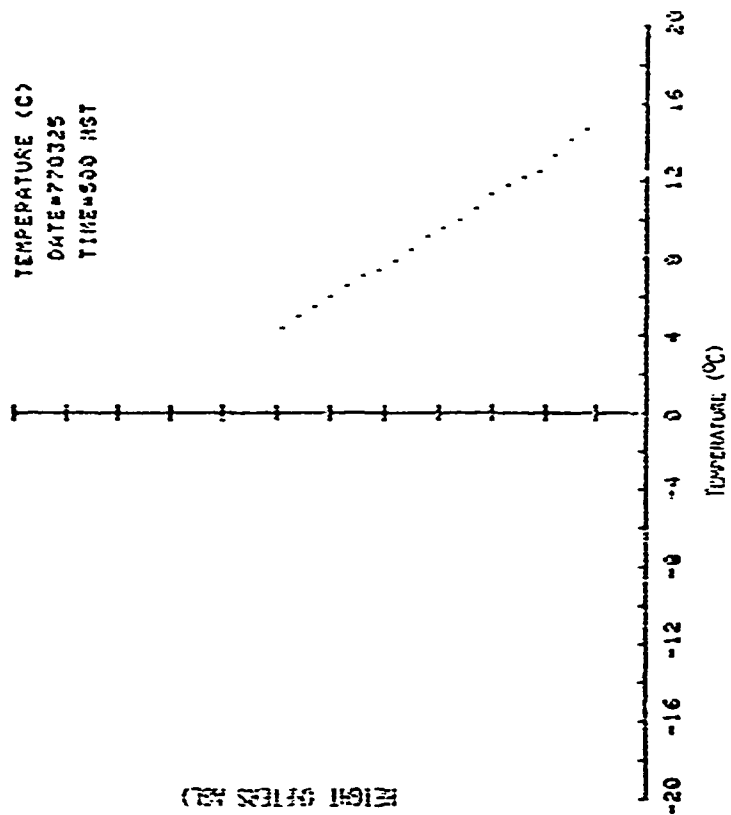
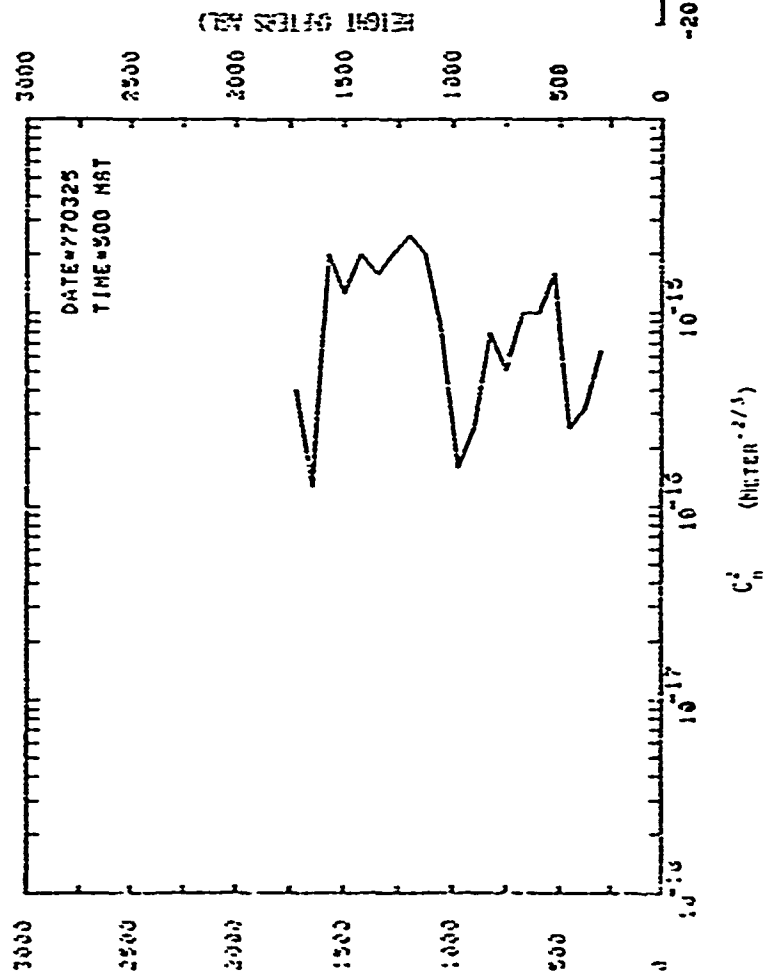
5. ACKNOWLEDGMENTS

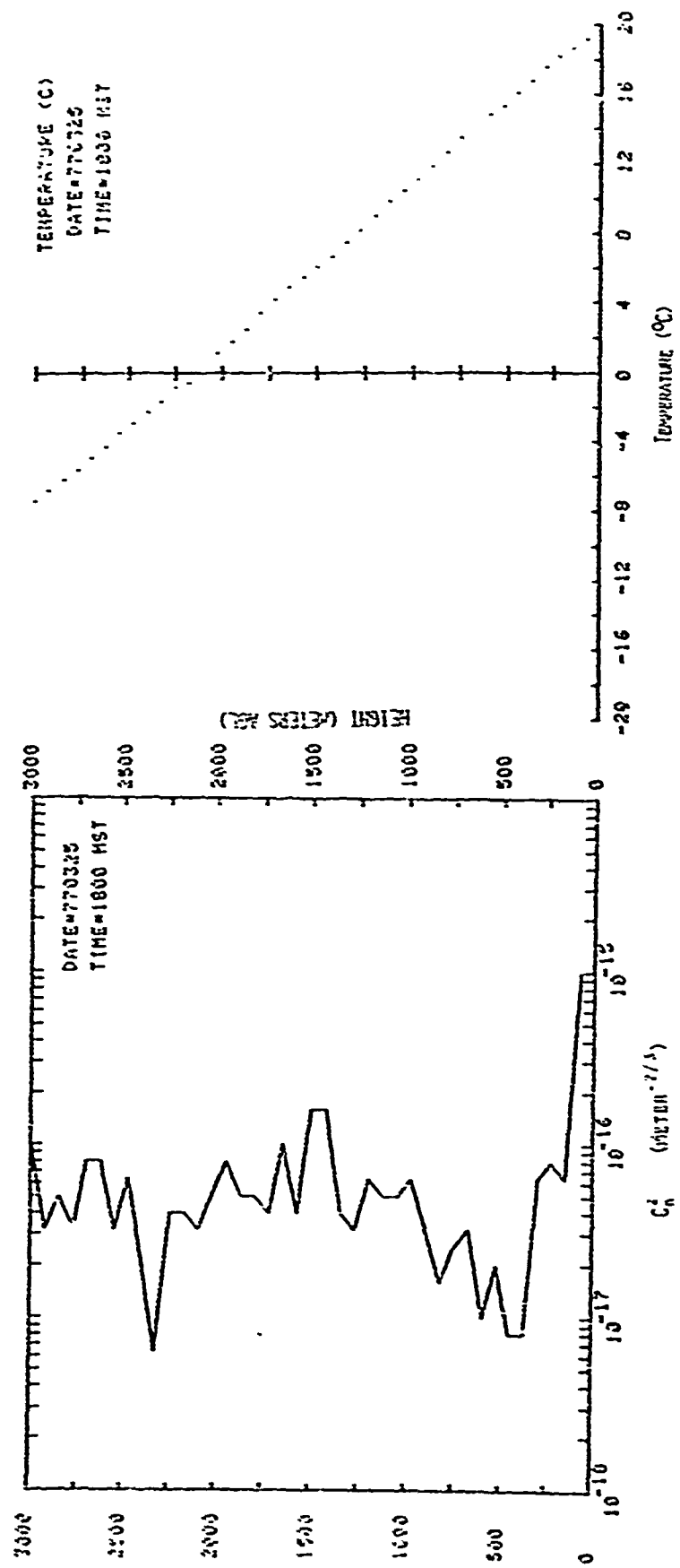
The following individuals assisted in carrying out this experiment:

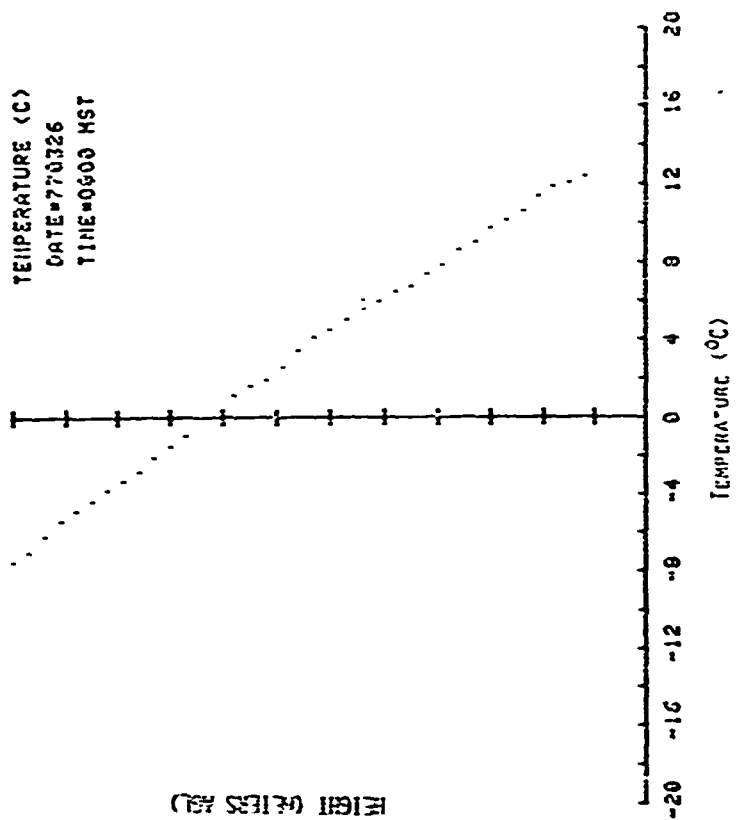
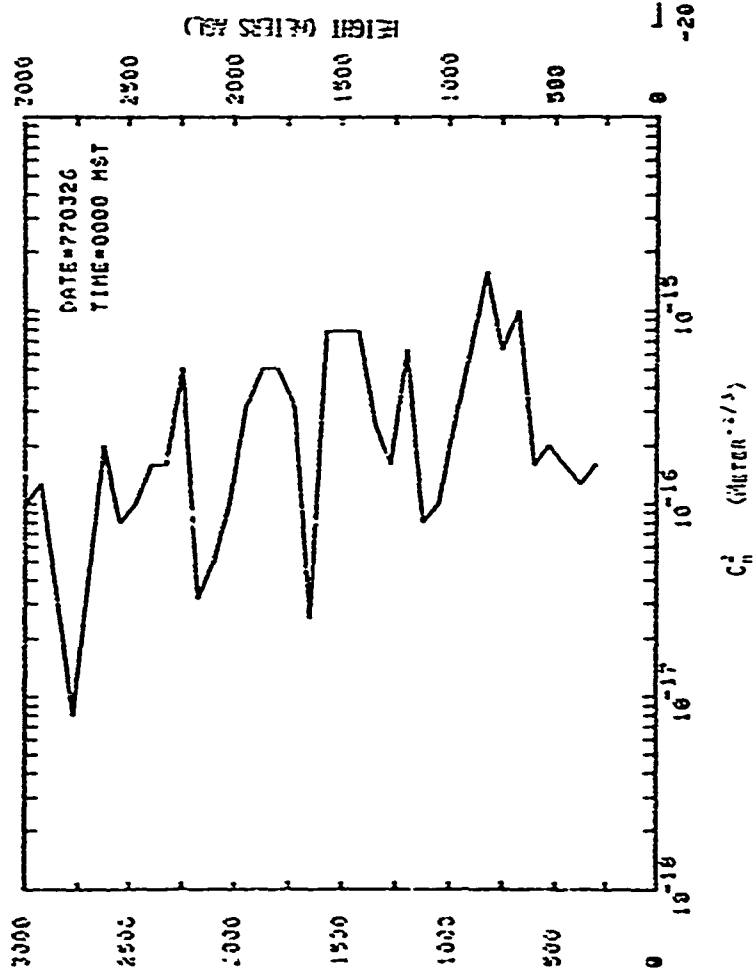
Glenn Holdale (ASL.-WSMR)	White Sands Experiment Coordinator
Colbourn Norton (ASL.-WSMR)	Project Scientist
Thomas Prios (ASL.-WSMR)	Project Scientist
Glen F. Millor (WPL.-NOAA)	Aircraft equipment operations
Gerard Ochs (WPL.-NOAA)	Project Scientist
G. T. McNico (WPL.-NOAA)	Pilot
Arthur Estlin (NBS-Boulder)	Pilot
Wm. Rotwillack (SEL.-NOAA)	Data Presentation

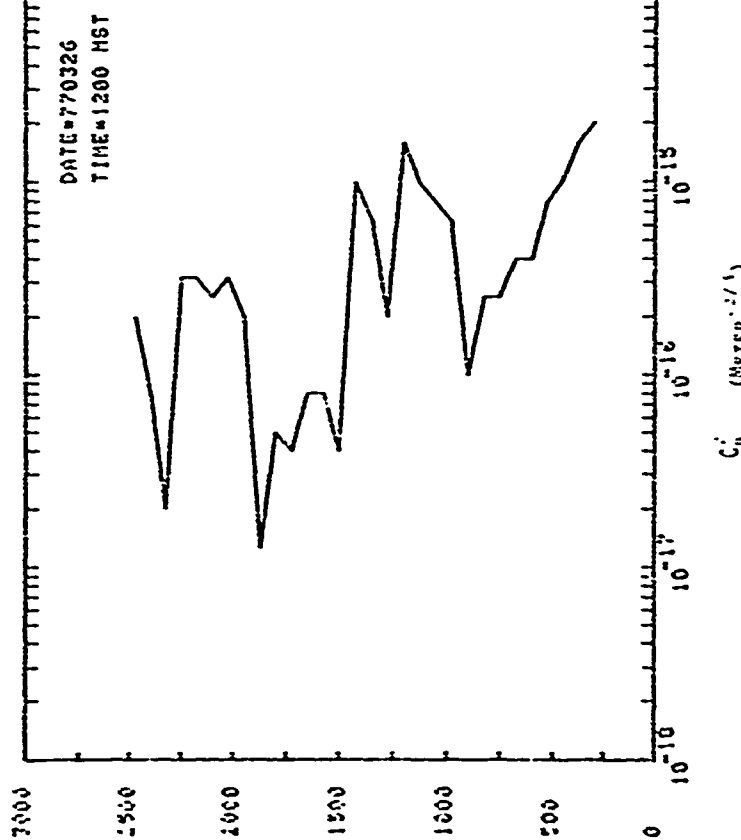
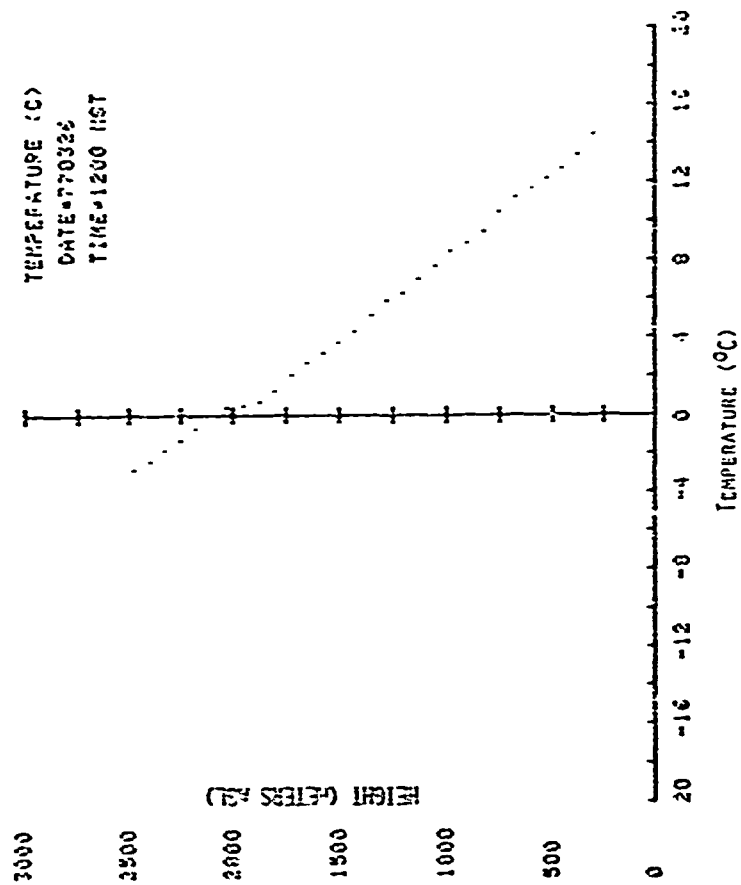
6. REFERENCES

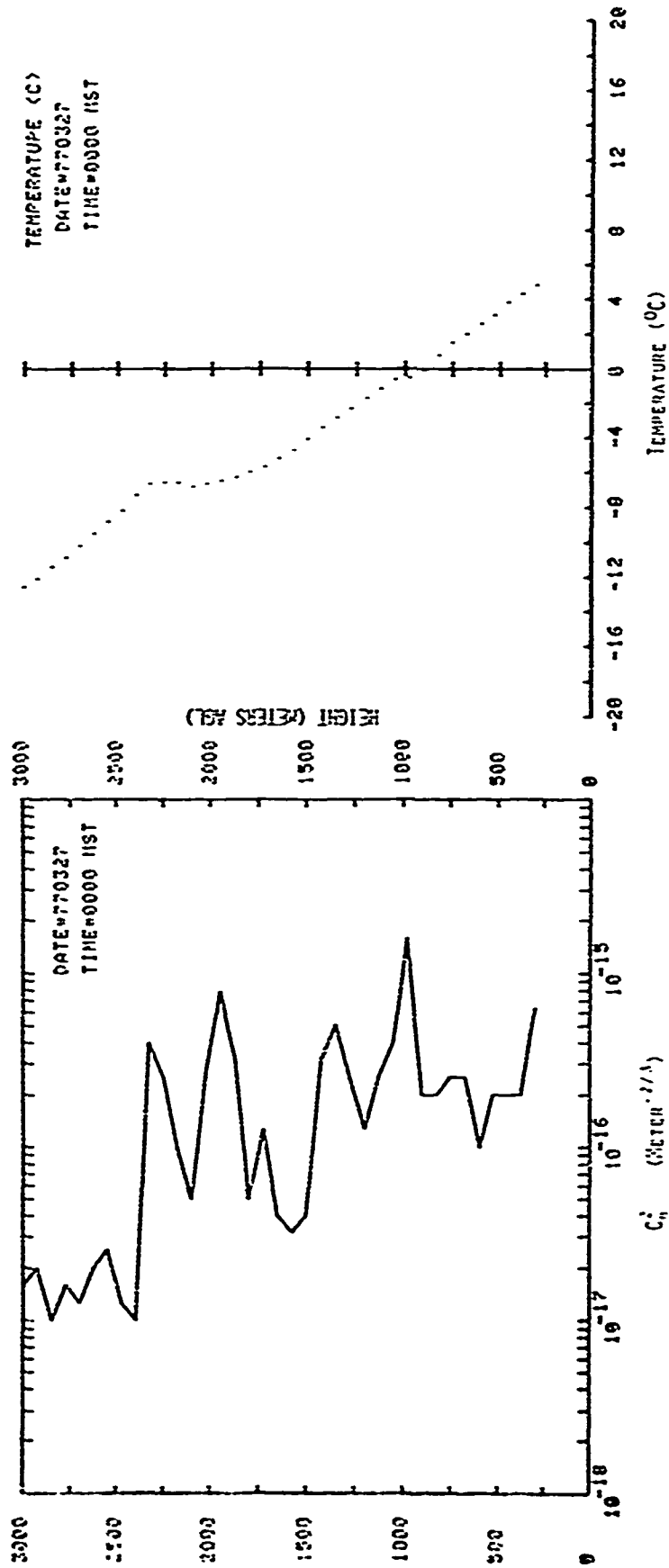
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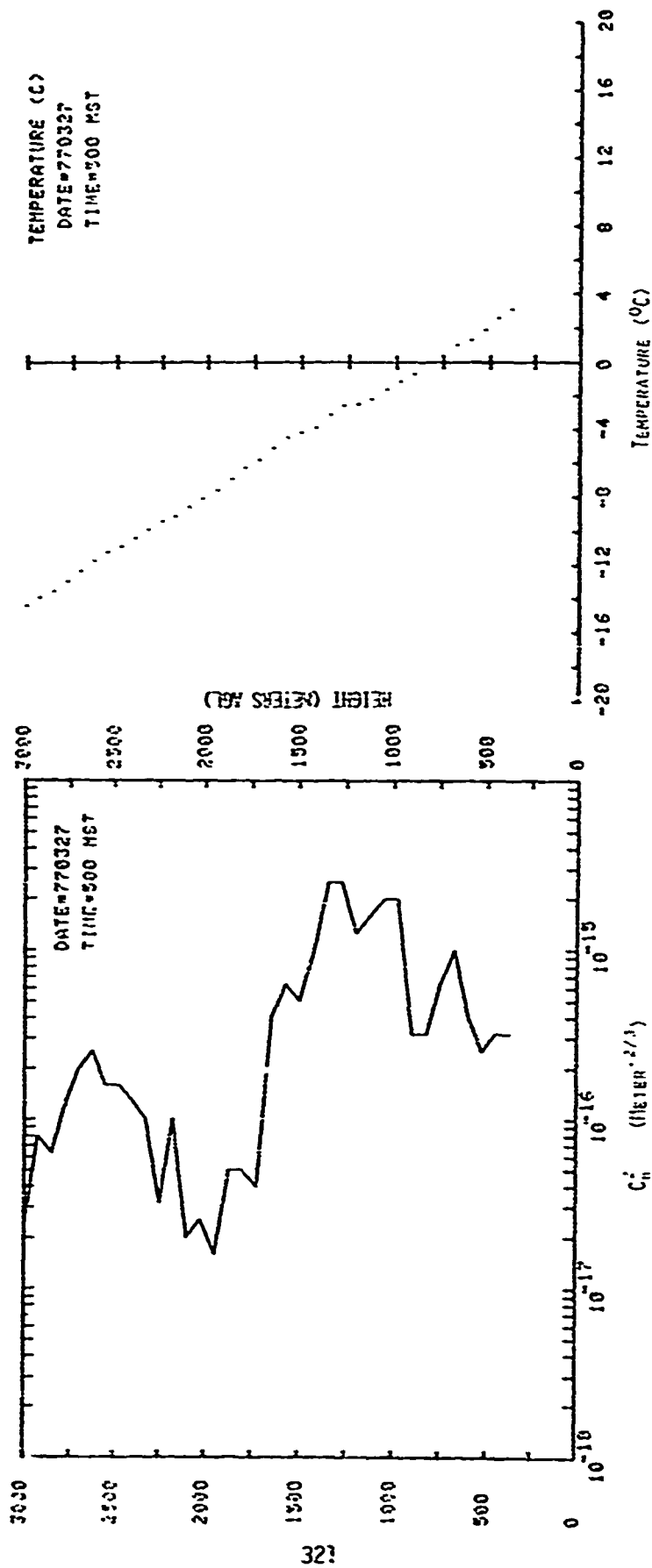


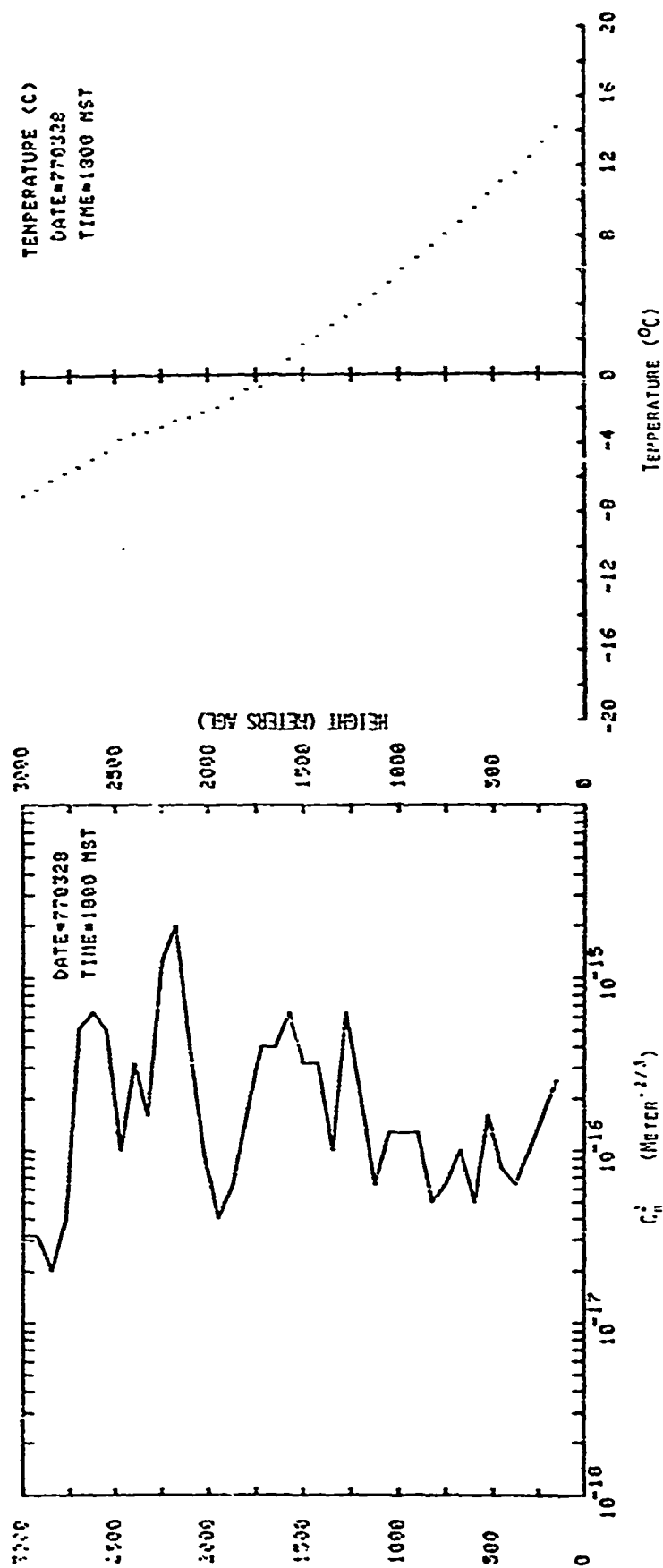


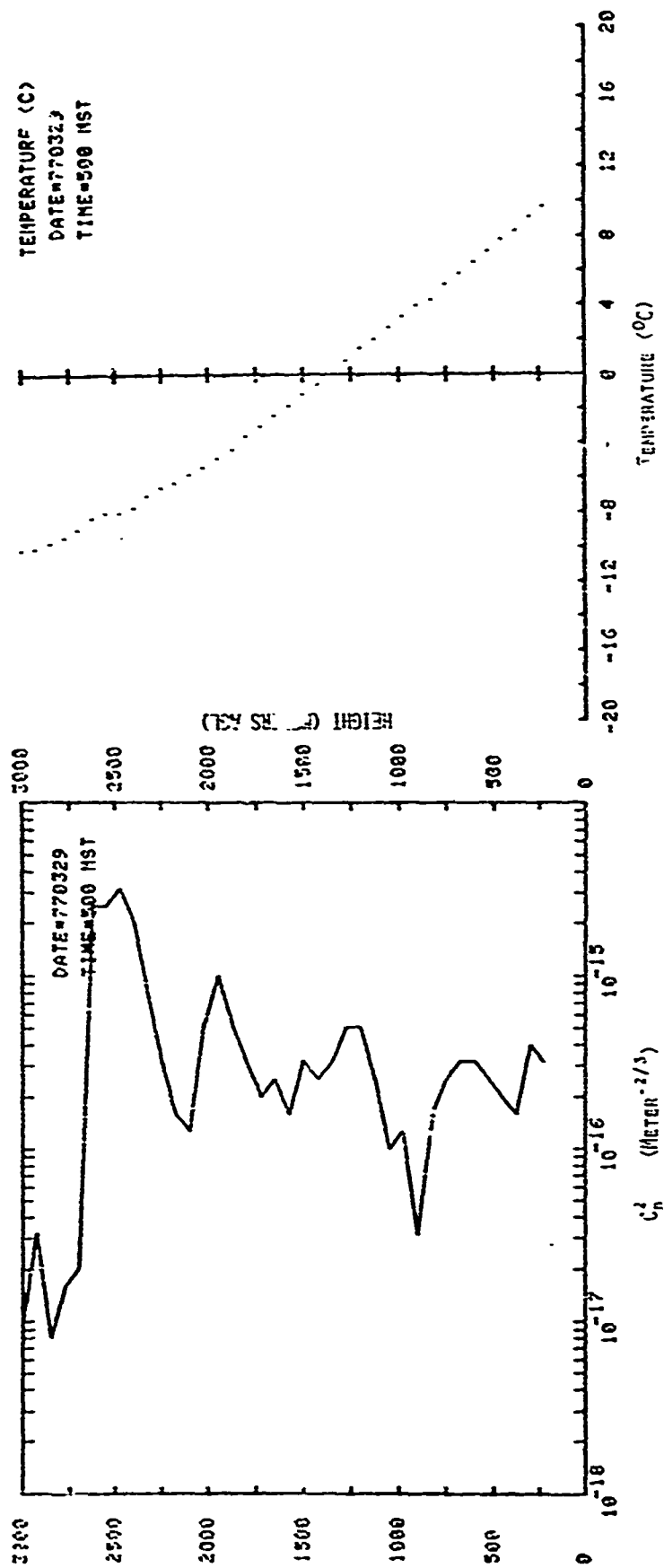


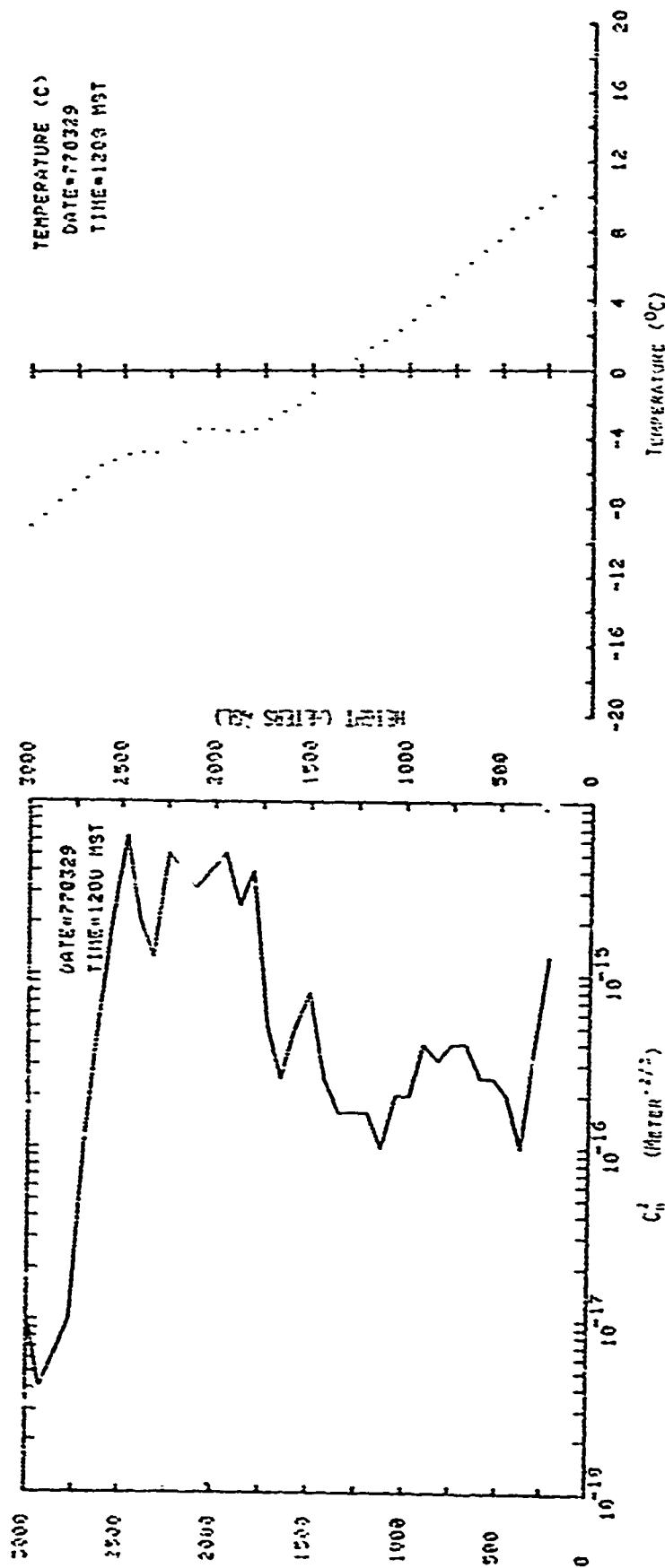


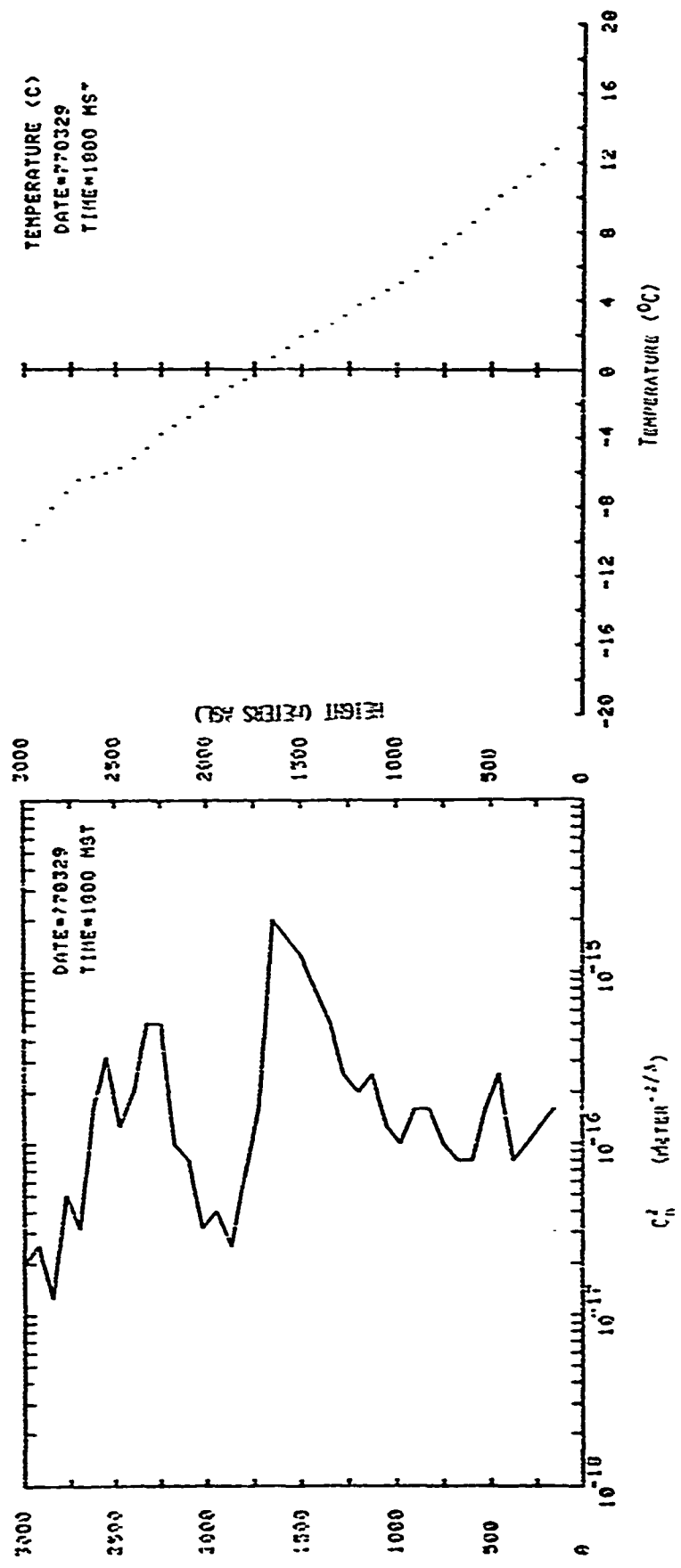


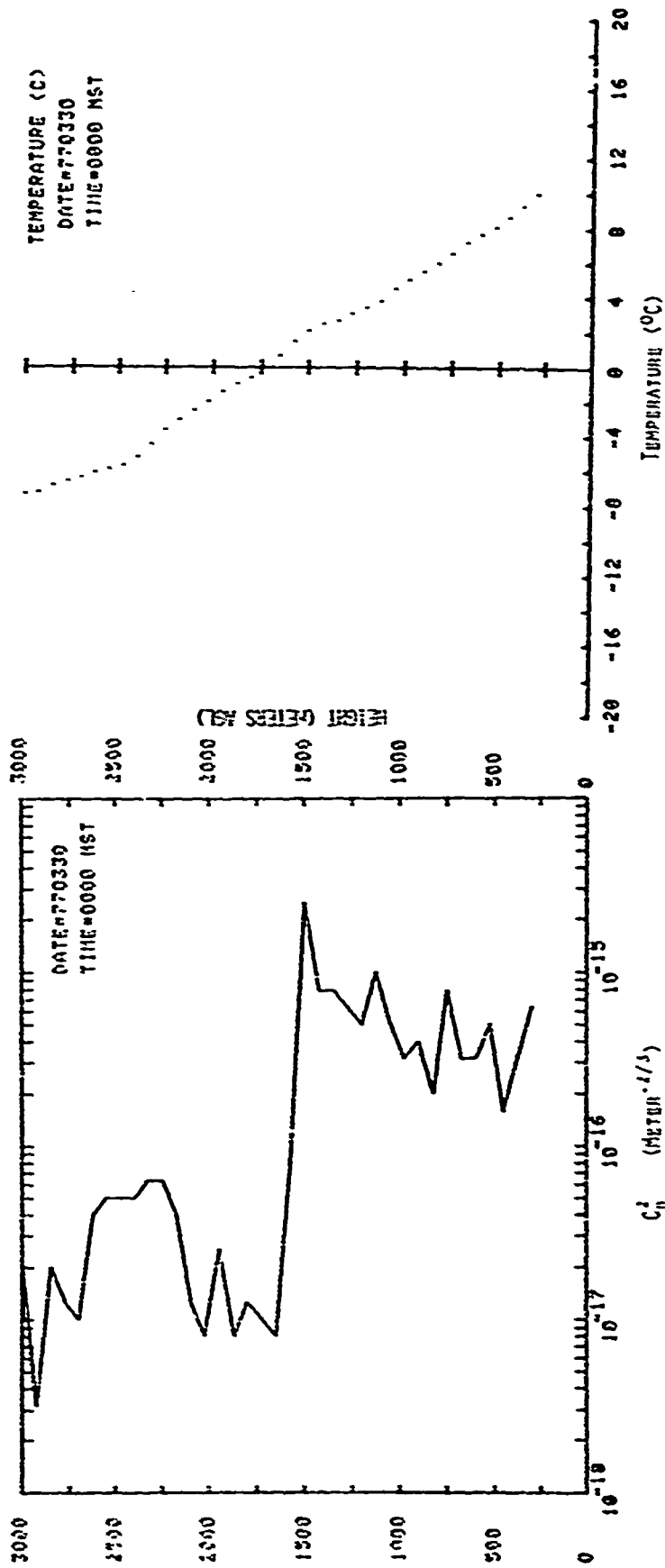


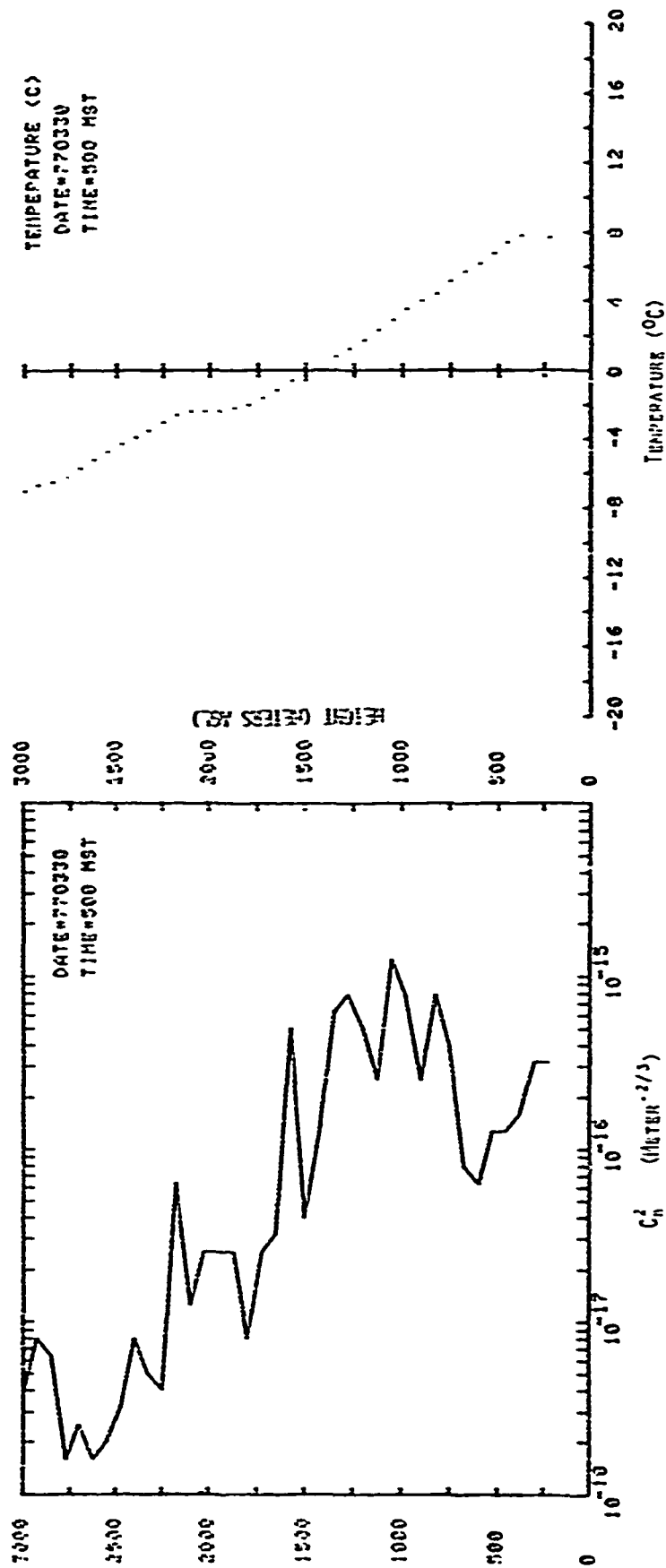


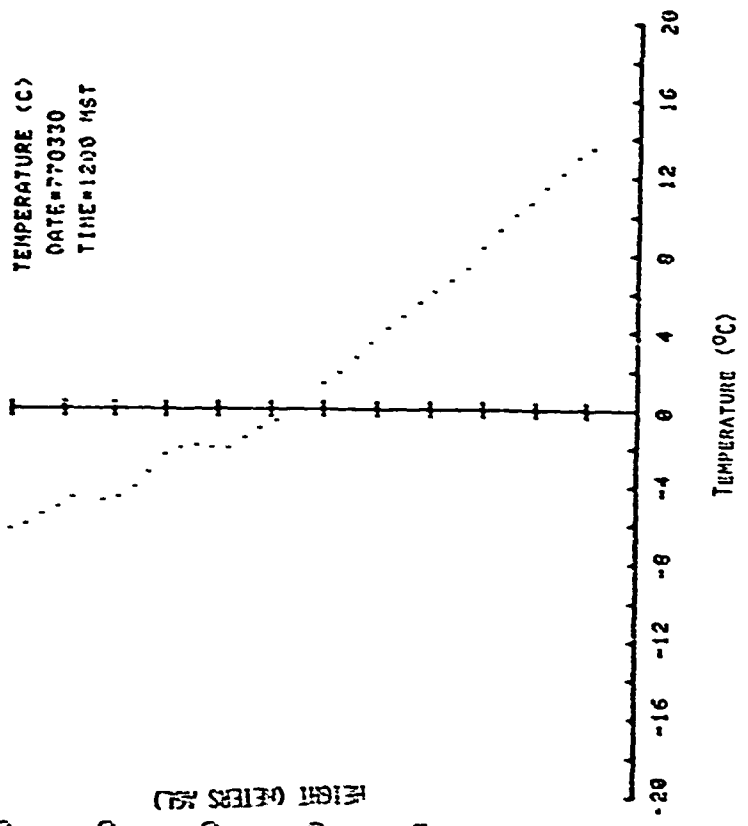
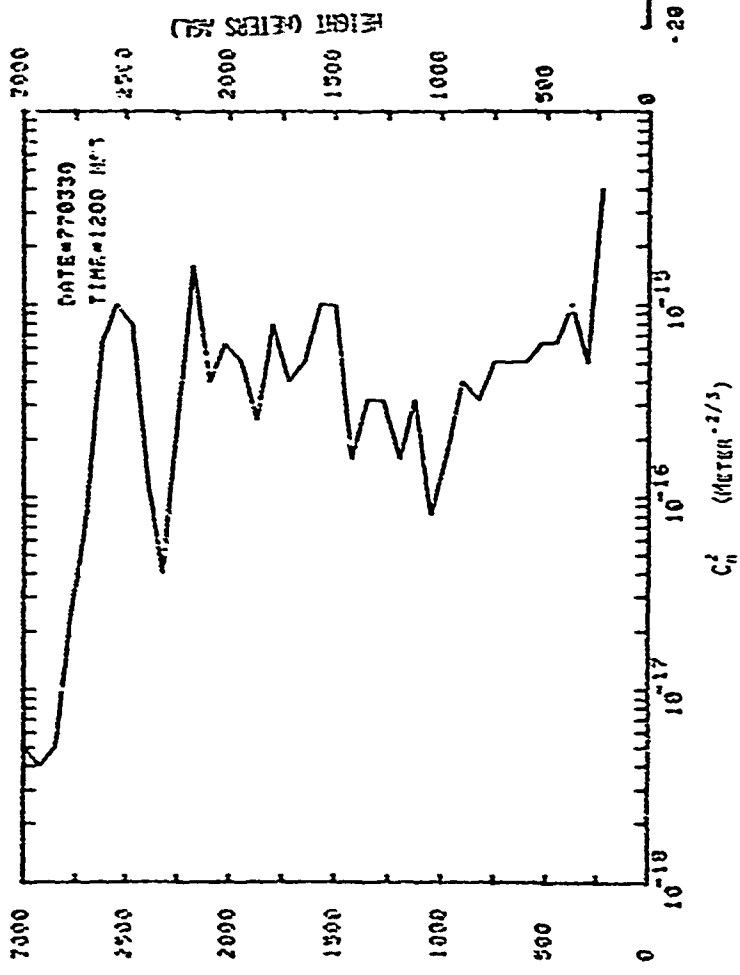


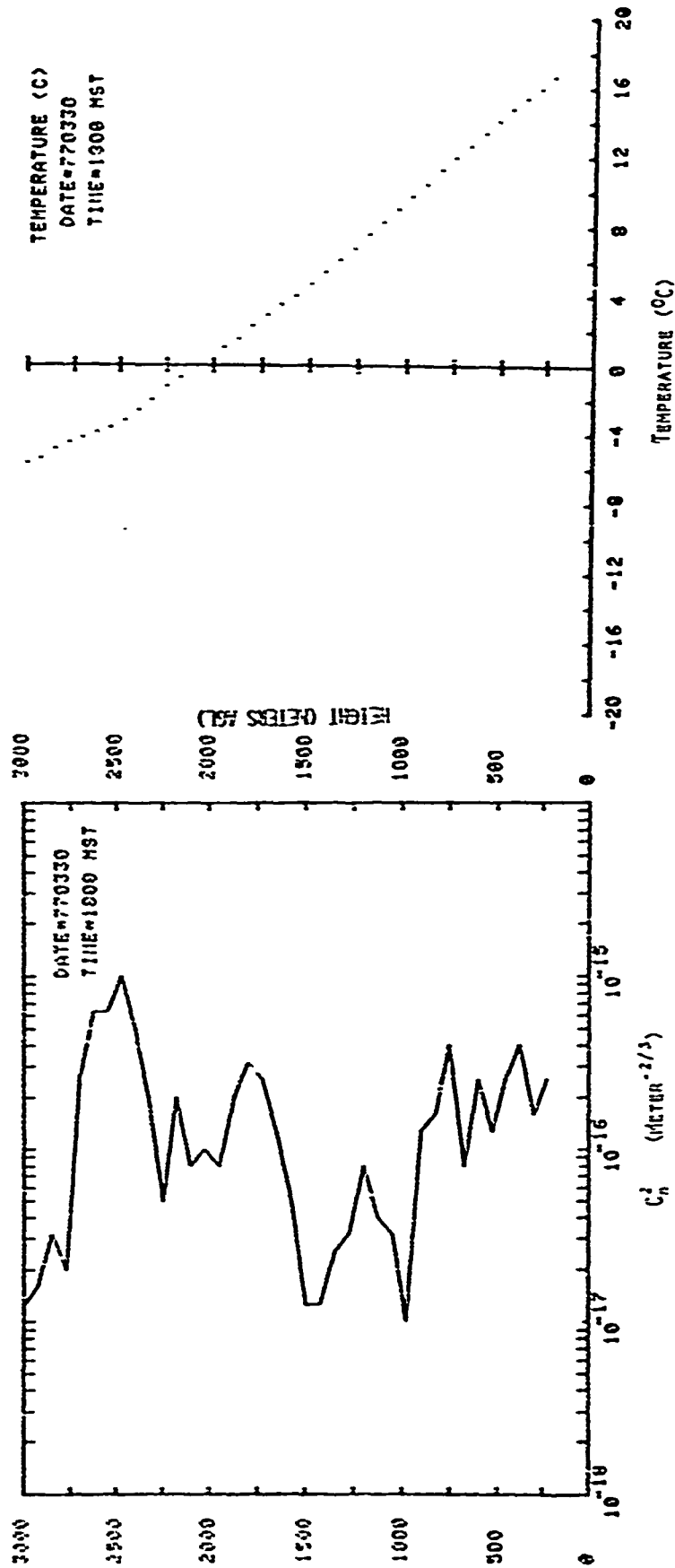


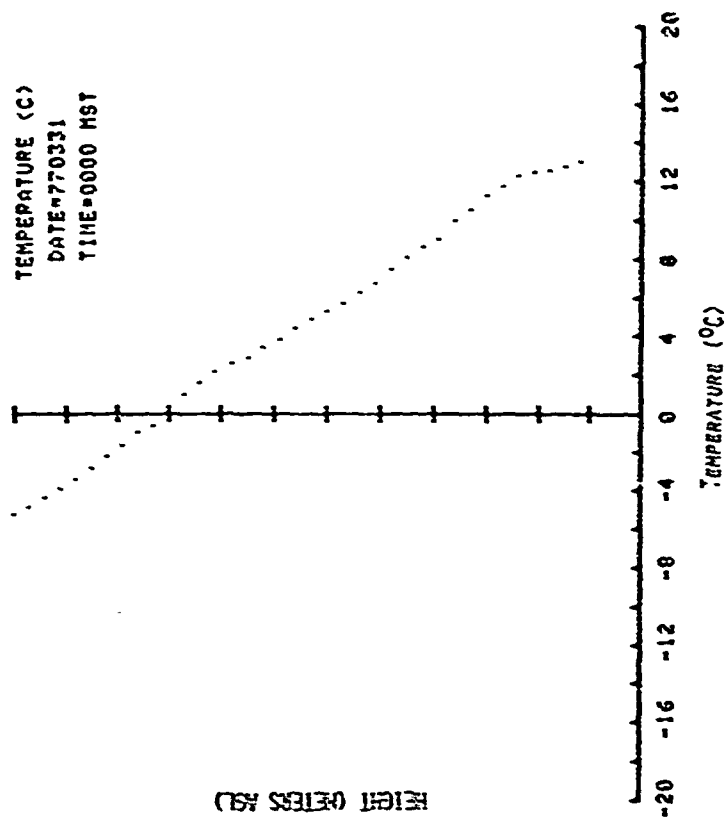
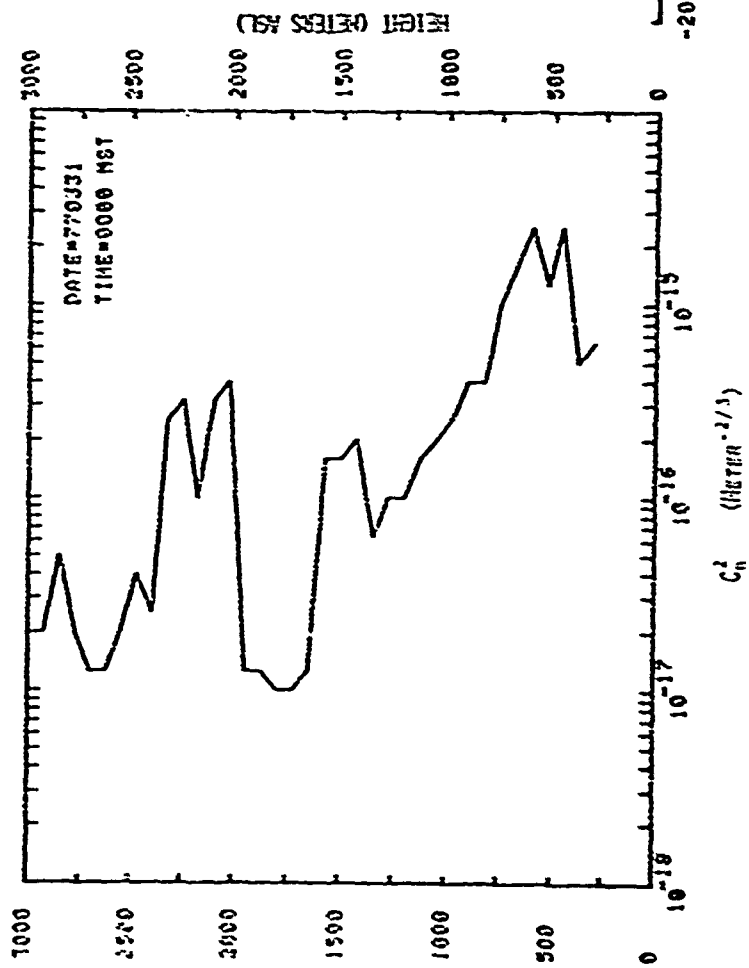


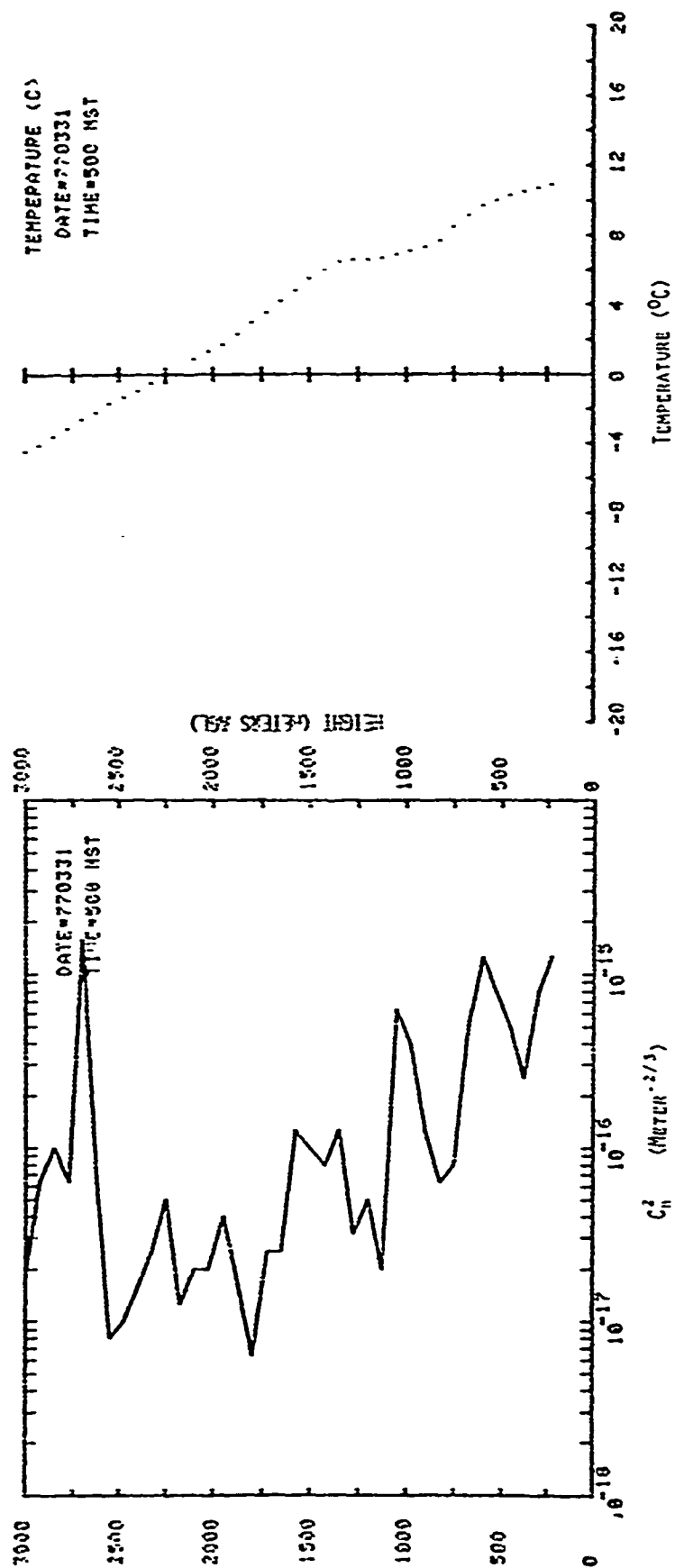


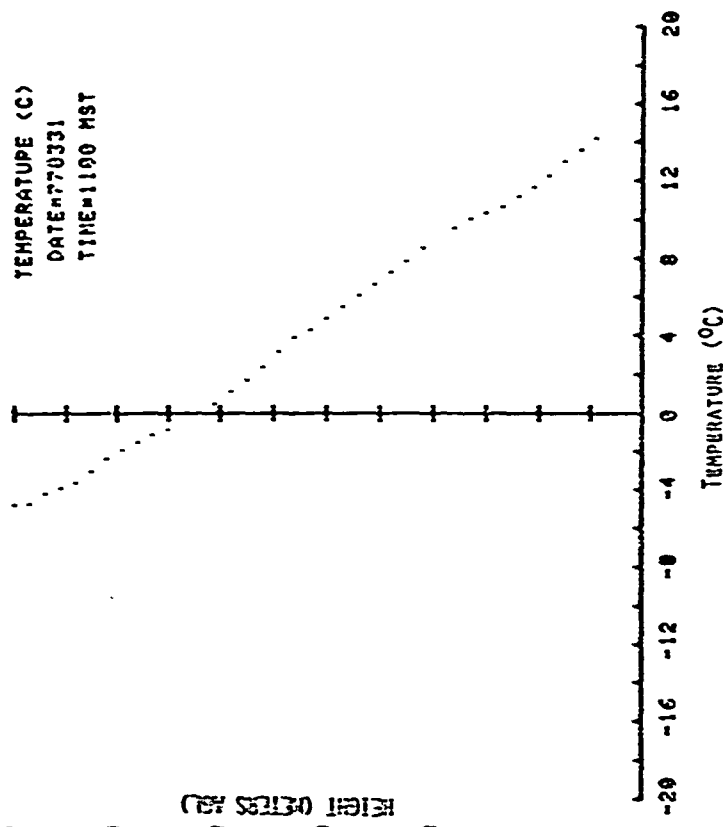
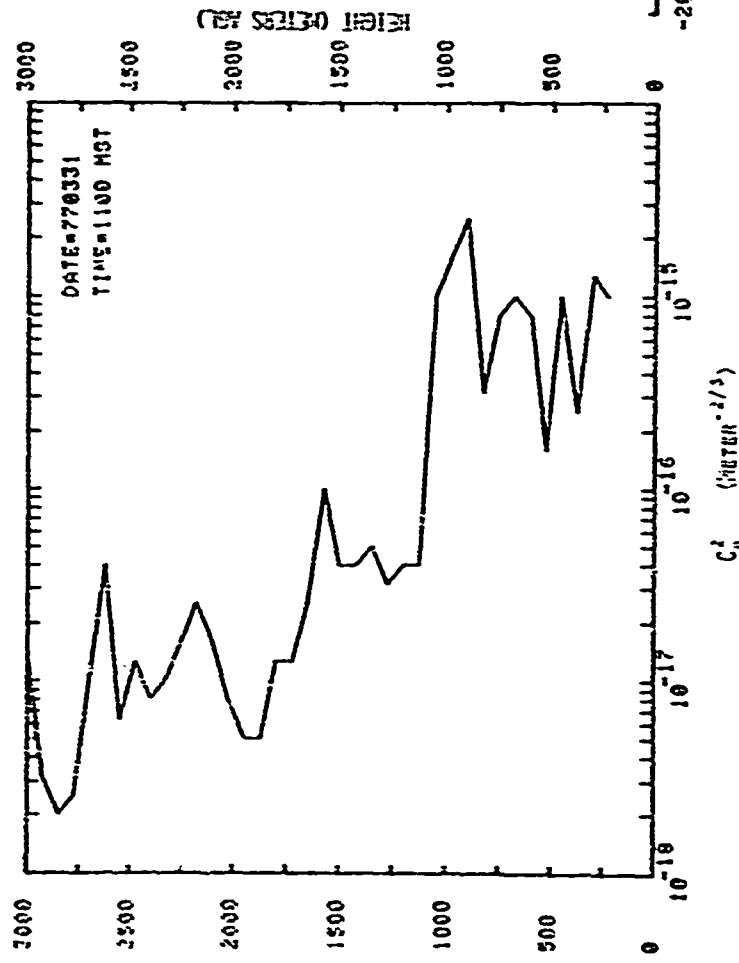


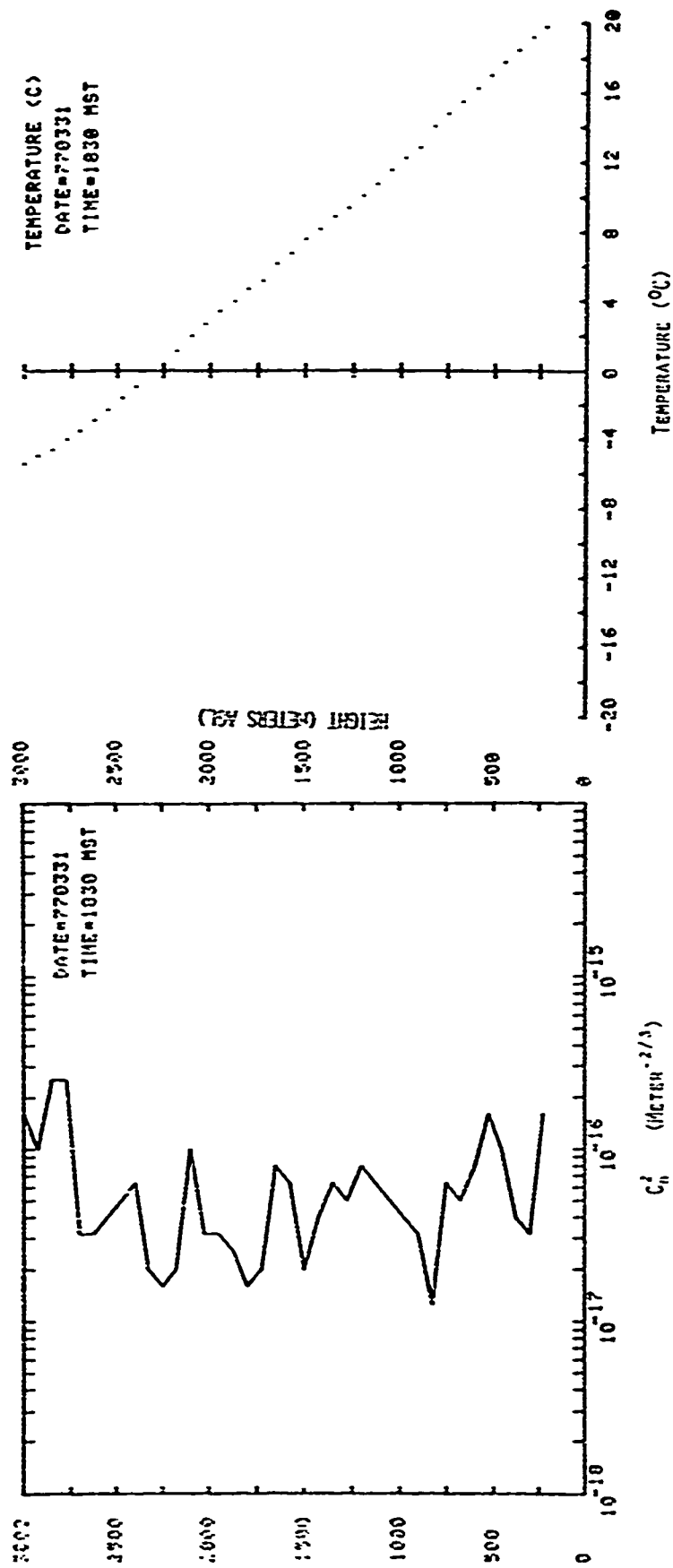


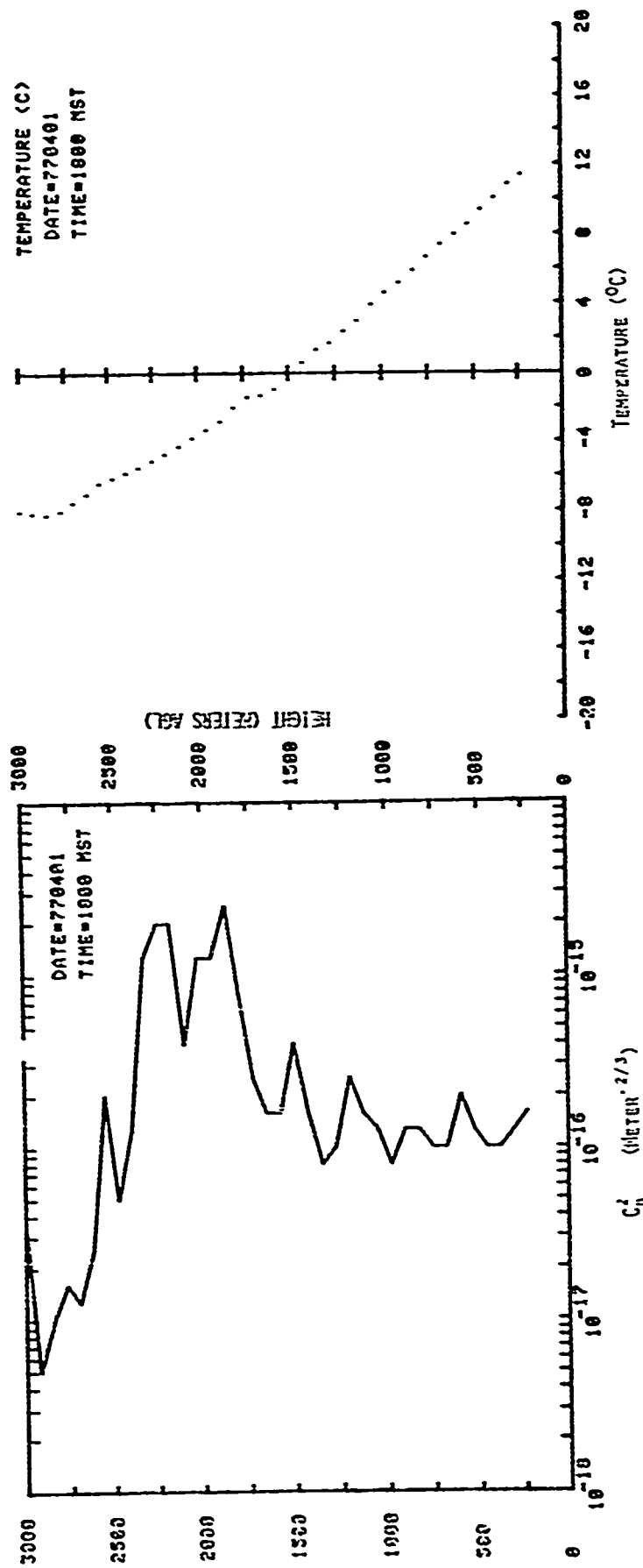


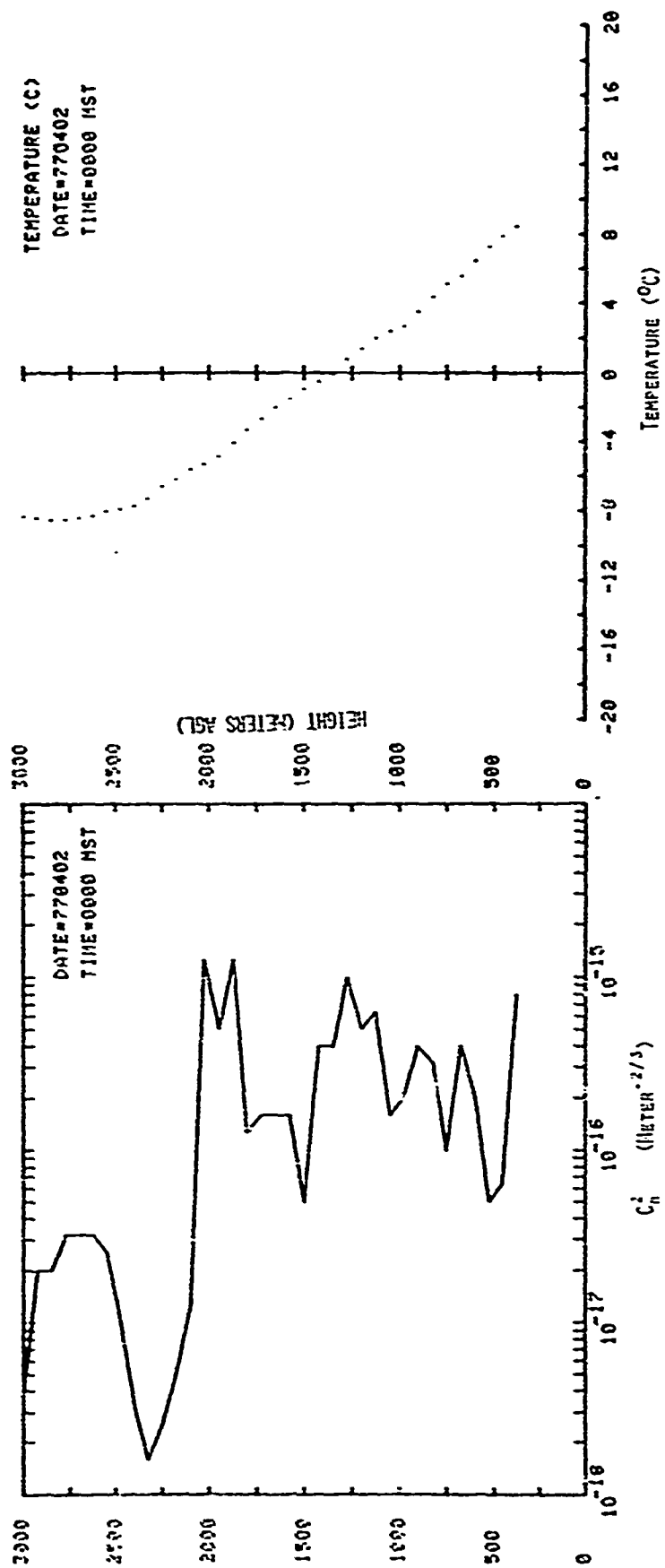


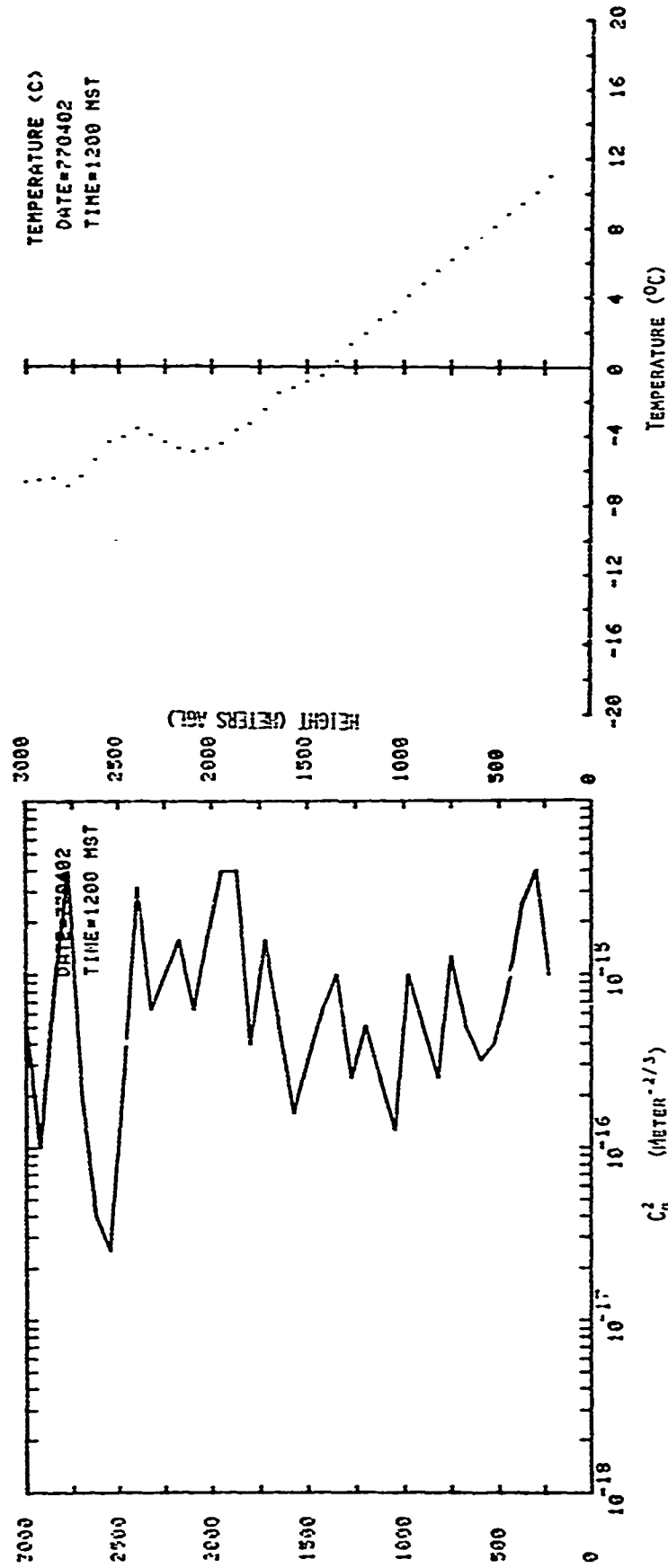


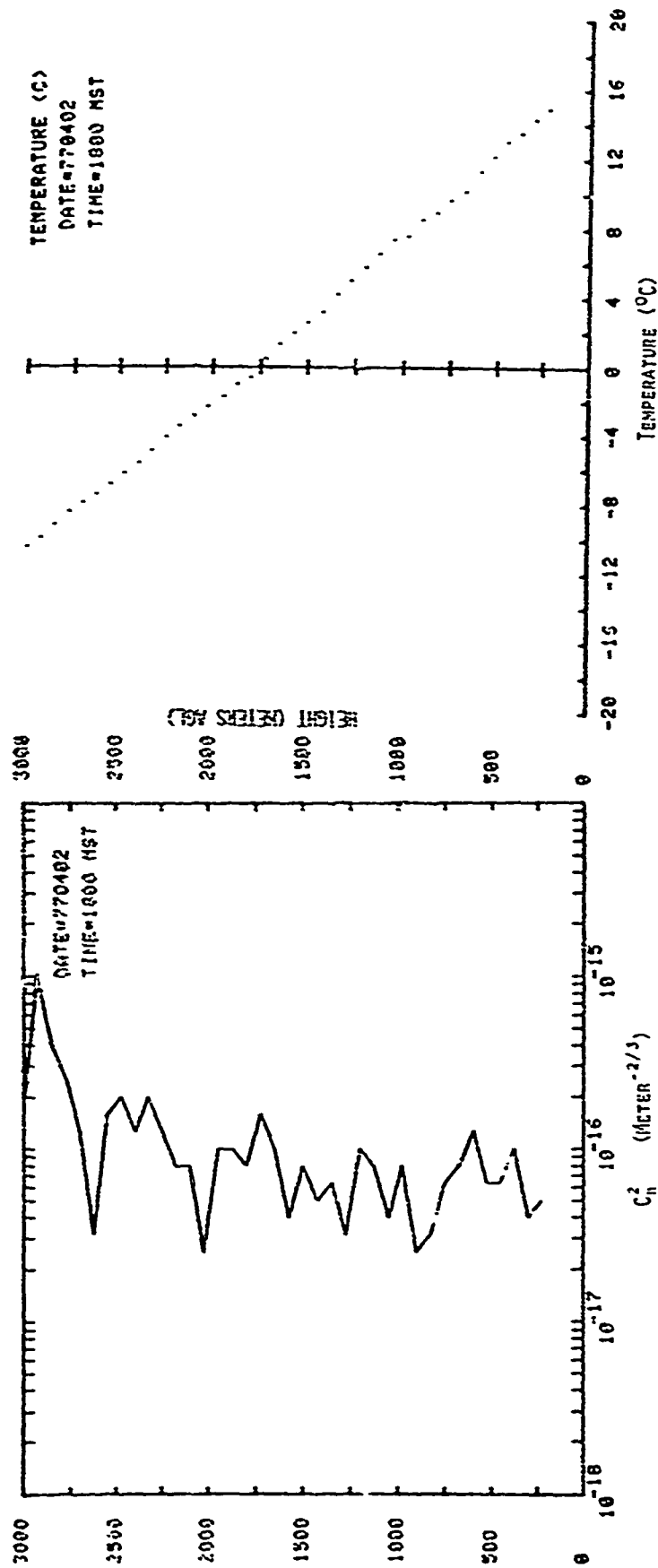


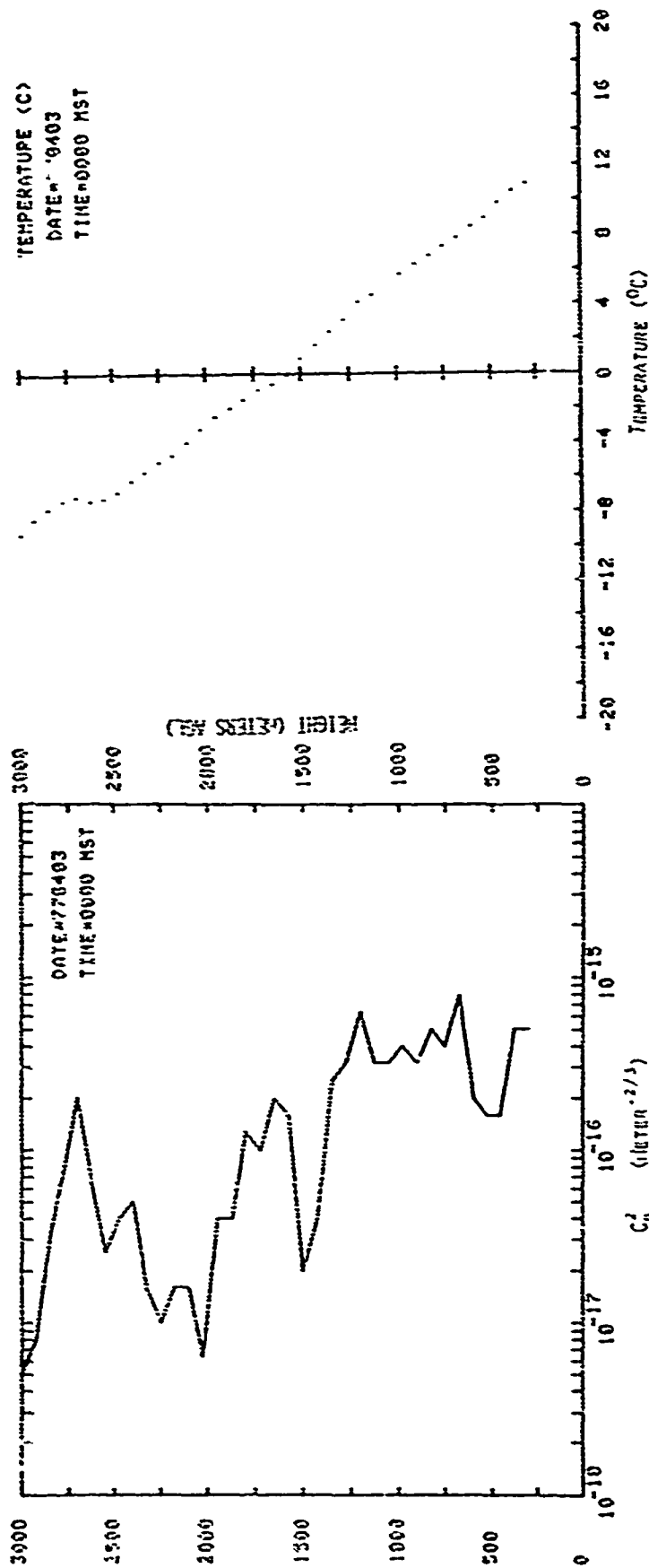


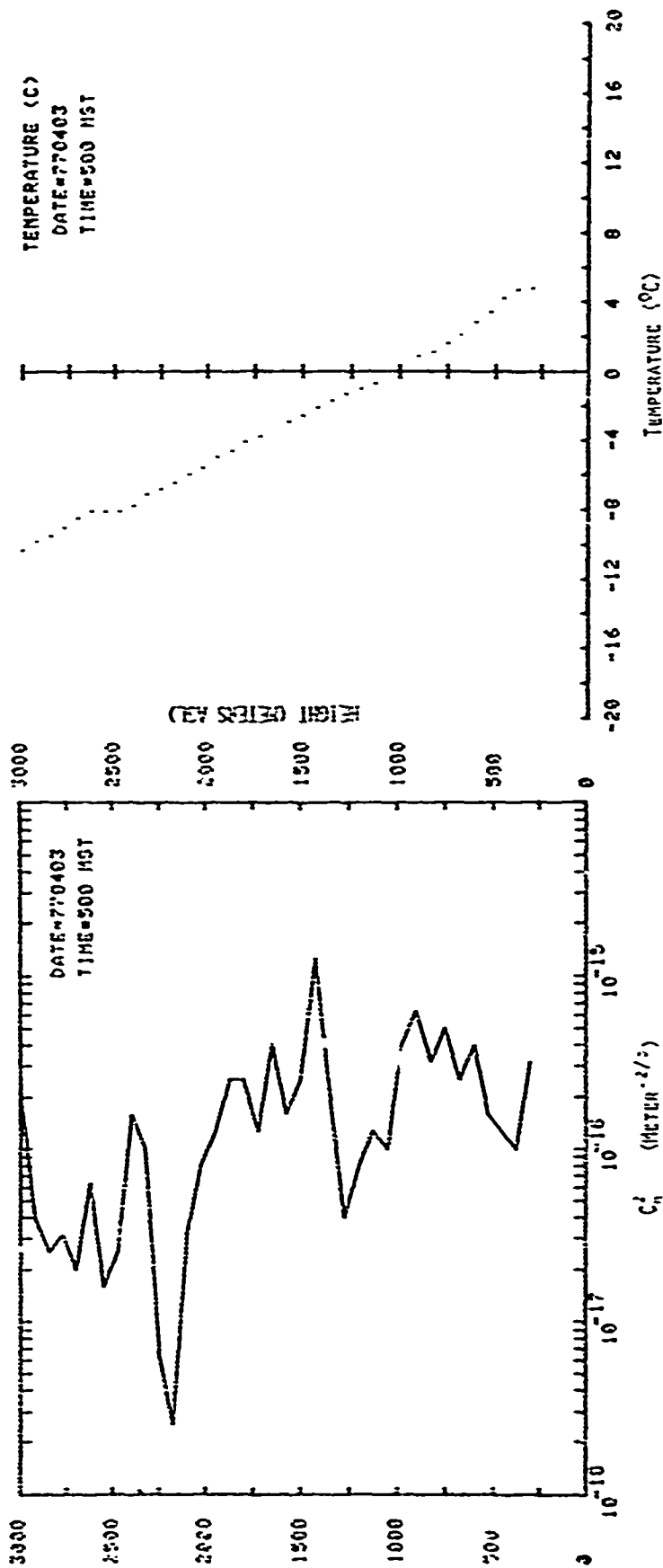


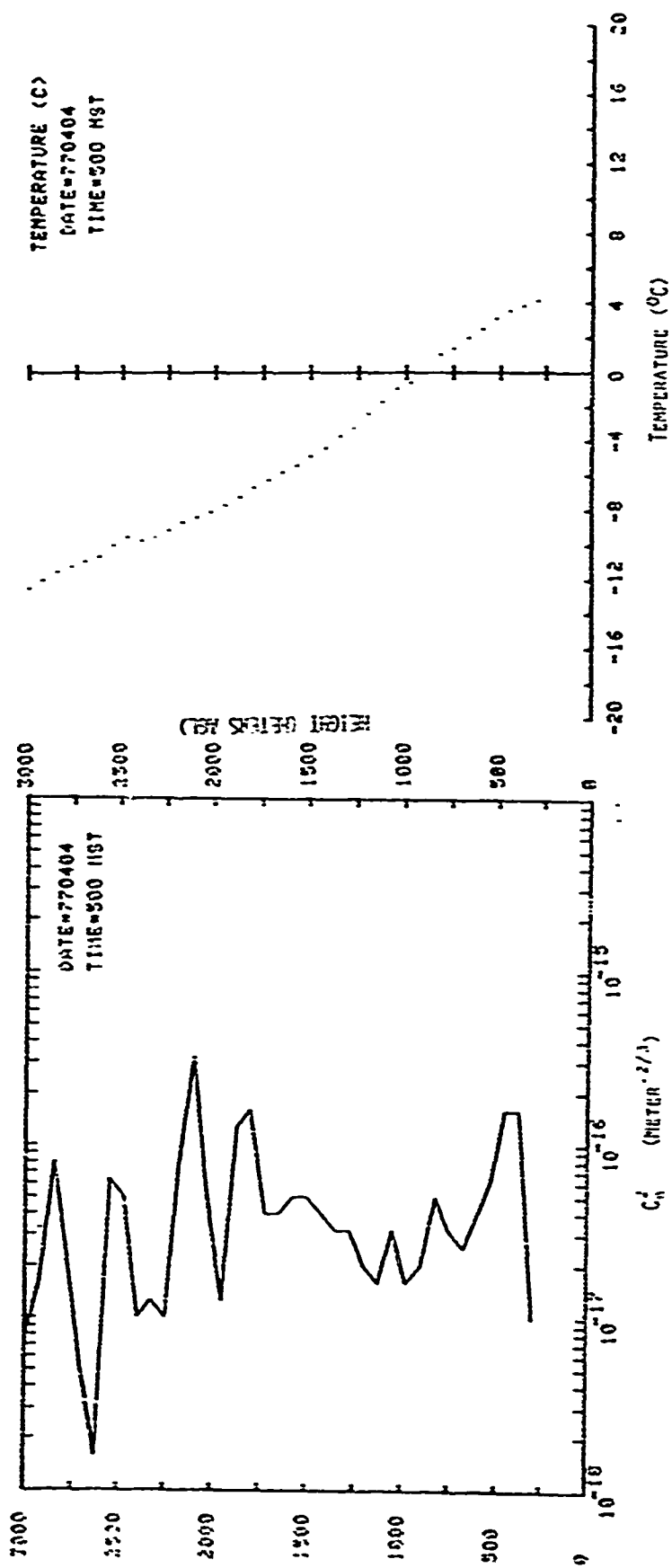


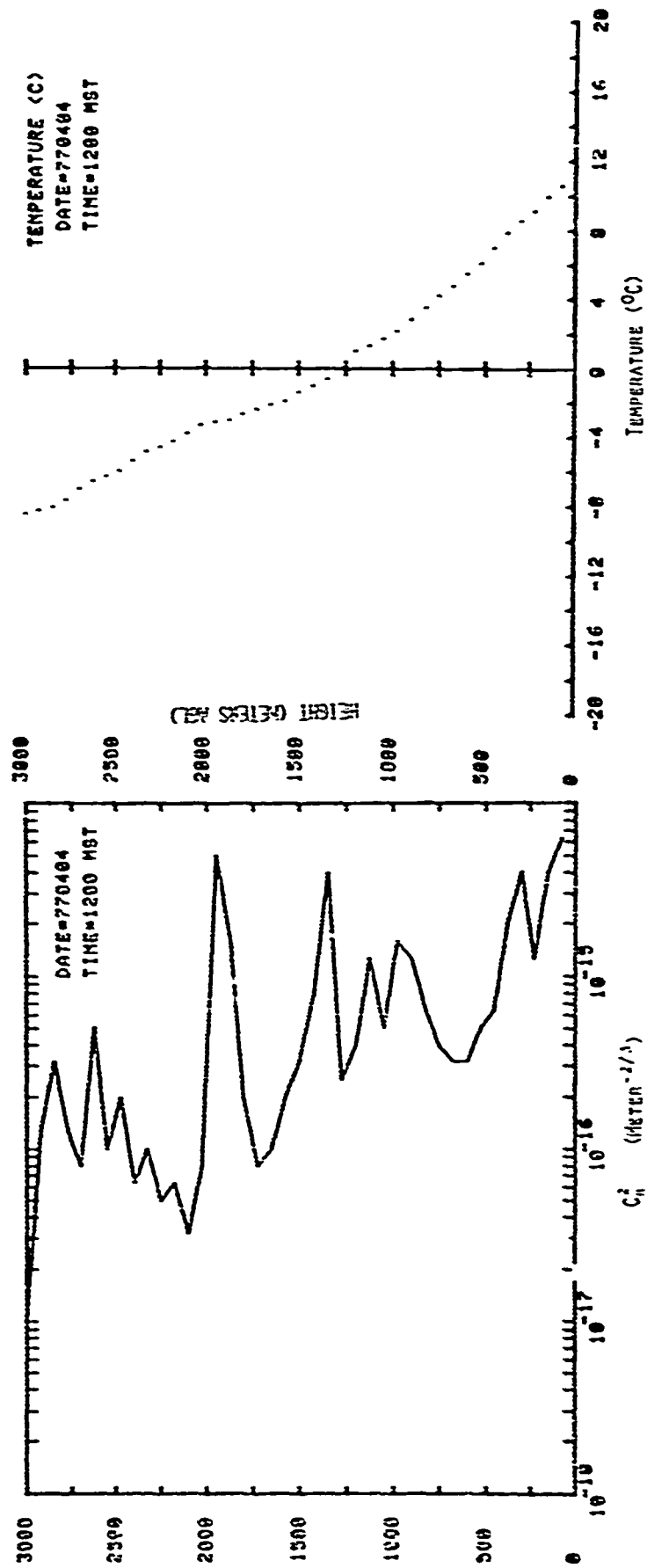


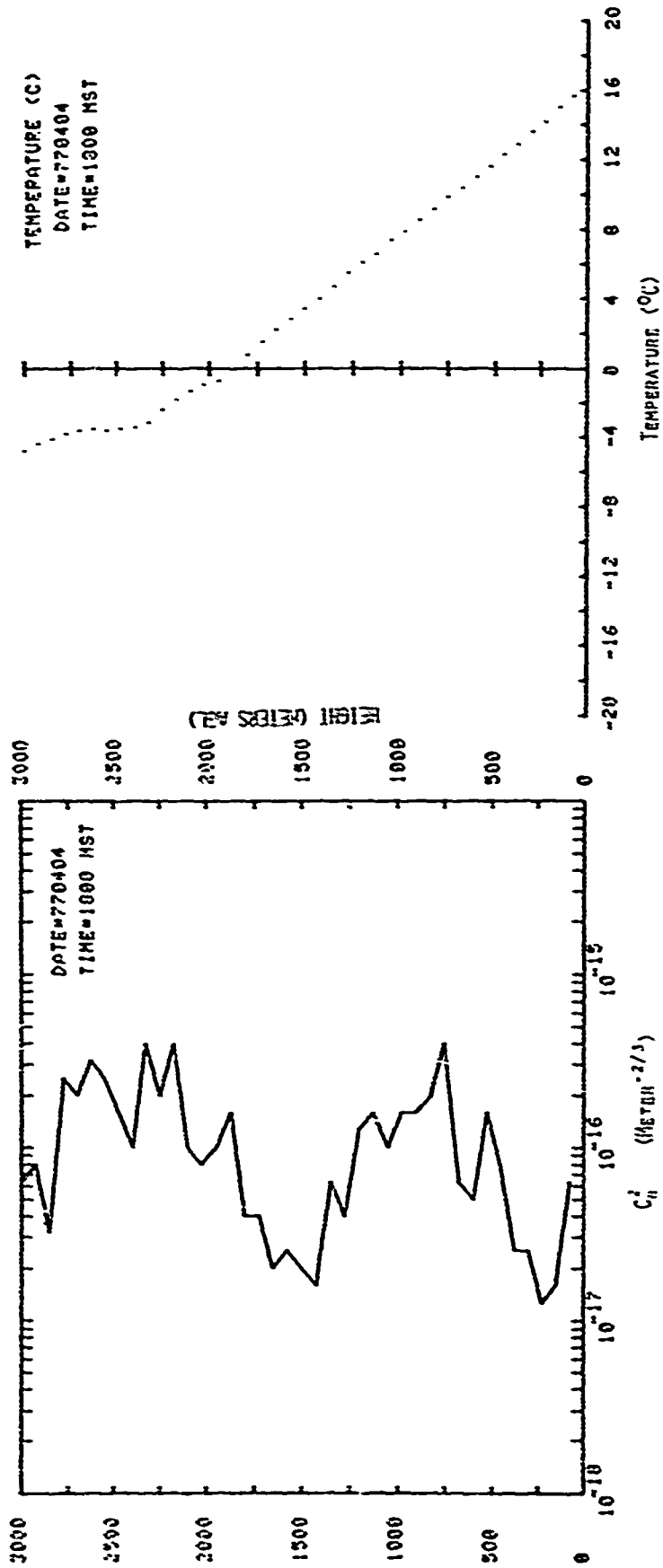


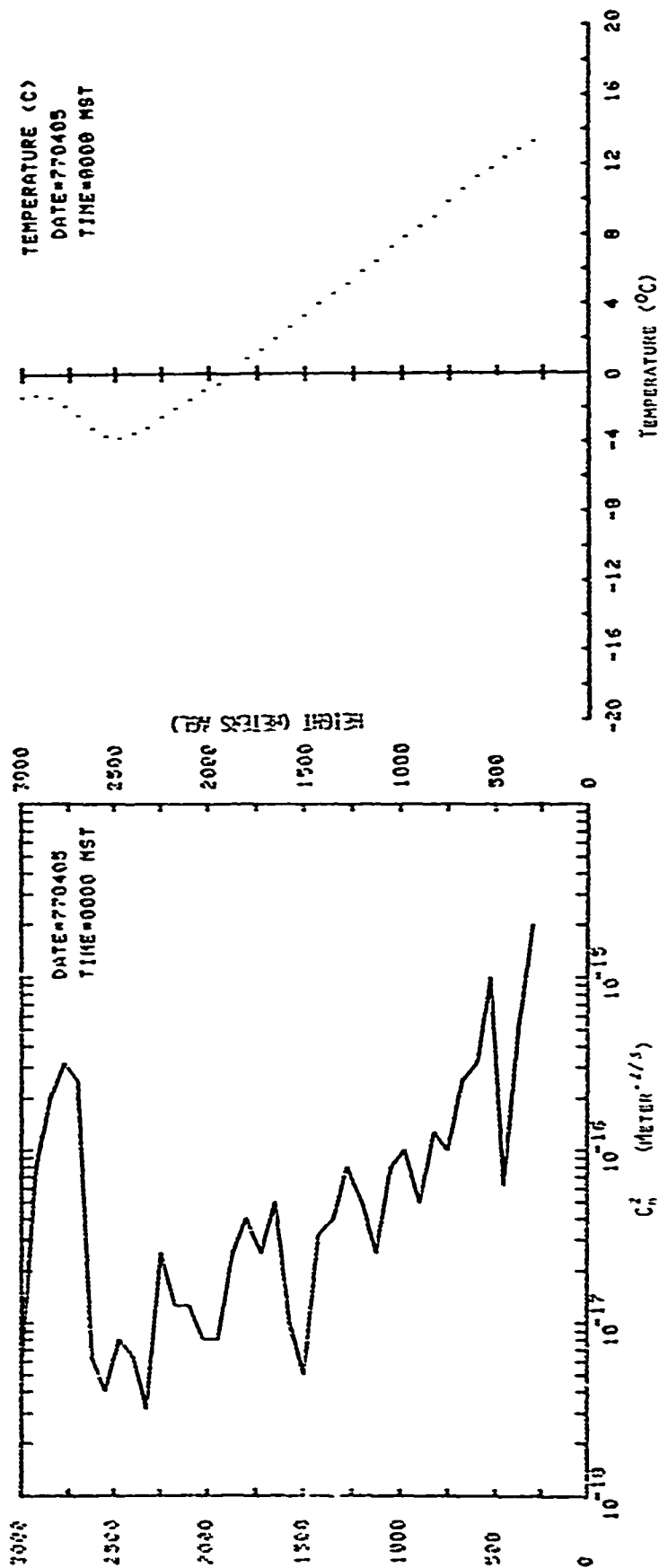












WDMR 770325 500 MBT
 NOISE LEVEL = .0002
 IAS = 115 MPH
 ALTITUDE SETTING = 29.70

HEIGHT (M AGL)	T	CN2	LOO10 CN2
225 - 300	14.7	6.3E-16	-13.2
300 - 375	14.1	7E-16	-13.5
375 - 450	13.3	2.7E-16	-13.6
450 - 525	12.5	1.4E-15	-14.0
525 - 600	12.2	7.2E-16	-13
600 - 675	11.0	1E-15	-13
675 - 750	11.3	4.4E-16	-13.3
750 - 825	10.6	0.4E-16	-13.1
825 - 900	10	2.7E-16	-13.6
900 - 975	9.4	1.7E-16	-13.0
975 - 1050	9.3	7.2E-16	-13.1
1050 - 1125	8.5	1.0E-15	-14.7
1125 - 1200	7.9	2.4E-15	-14.6
1200 - 1275	7.4	1.9E-15	-14.7
1275 - 1350	7.1	1.7E-15	-14.0
1350 - 1425	6.6	2.1E-15	-14.7
1425 - 1500	6	1.2E-15	-14.9
1500 - 1575	5.5	2.1E-15	-14.7
1575 - 1650	5	1.2E-16	-13.9
1650 - 1725	4.4	3.9E-16	-13.4

WDMR 770325 1000 MBT
 NOISE LEVEL = .000032
 IAS = 125 MPH
 ALTITUDE SETTING = 29.74

HEIGHT (M AGL)	T	CN2	LOO10 CN2
0 - 75	14.2	9.3E-16	-13
75 - 150	13.7	6.2E-17	-16.2
150 - 225	10.2	0.3E-17	-16.1
225 - 300	17.6	6.4E-17	-16.2
300 - 375	16.0	0.3E-10	-17.1
375 - 450	16.1	0.4E-10	-17.1
450 - 525	15.3	1.9E-17	-16.7
525 - 600	14.0	1.1E-17	-17
600 - 675	14.1	3.3E-17	-16.5
675 - 750	13.5	2.3E-17	-16.6
750 - 825	12.7	1.6E-17	-16.0
825 - 900	11.9	3.3E-17	-16.5
900 - 975	11.1	6.2E-17	-16.2
975 - 1050	10.5	4.6E-17	-16.3
1050 - 1125	9.9	5.3E-17	-16.3
1125 - 1200	9.1	6.3E-17	-16.2
1200 - 1275	0.2	2.9E-17	-16.3
1275 - 1350	7.5	3.7E-17	-16.4
1350 - 1425	6.7	1.7E-16	-15.0
1425 - 1500	6.1	1.7E-16	-15.0
1500 - 1575	5.5	3.4E-17	-16.4
1575 - 1650	4.9	1.1E-16	-16
1650 - 1725	4.2	3.4E-17	-16.4
1725 - 1800	3.4	5.1E-17	-16.3
1800 - 1875	2.5	4.4E-17	-16.3
1875 - 1950	1.0	7.4E-17	-16.1
1950 - 2025	1.1	5.1E-17	-16.3
2025 - 2100	-1.2	2.3E-17	-16.5
2100 - 2175	-1.6	4.1E-17	-16.4
2175 - 2250	-1.0	4.4E-17	-16.4
2250 - 2325	-1.7	6.9E-10	-17.2
2325 - 2400	-2.3	1.9E-17	-16.7
2400 - 2475	-2.9	6.1E-17	-16.2
2475 - 2550	-3.5	3.2E-17	-16.5
2550 - 2625	-4.3	7.5E-17	-16.1
2625 - 2700	-5	0.3E-17	-16.1
2700 - 2775	-5.4	3.1E-17	-16.5
2775 - 2850	-6.2	4.7E-17	-16.3
2850 - 2925	-6.0	3.3E-17	-16.5
2925 - 3000	-7.4	9.0E-17	-16

WDMR 770326 1200 MST

NOISE LEVEL = .00016

IAS = 120 MPH

ALTIMETER SETTING = 29.74

HEIGHT (M AGL)	T	CNR	LOG10 CNR
225 - 300	14.5	1.0E-15	-14.7
300 - 375	13.4	1.7E-15	-14.8
375 - 450	12.7	1.1E-15	-15
450 - 525	12.2	0.3E-16	-15.1
525 - 600	11.7	4.2E-16	-15.4
600 - 675	11.2	2.6E-16	-15.4
675 - 750	10.5	2.5E-16	-15.6
750 - 825	9.5	2.3E-16	-15.6
825 - 900	0.9	1.1E-16	-16
900 - 975	0.5	6.9E-16	-15.2
975 - 1050	7.7	0.3E-16	-15.1
1050 - 1125	7	9.0E-16	-15
1125 - 1200	6.3	1.5E-15	-14.0
1200 - 1275	5.9	2.1E-16	-15.7
1275 - 1350	5.1	5.7E-16	-15.2
1350 - 1425	4.3	9.1E-16	-15
1425 - 1500	3.7	4.1E-17	-16.4
1500 - 1575	3.2	7.1E-17	-16.1
1575 - 1650	2.7	7.0E-17	-16.1
1650 - 1725	2.1	3.7E-17	-16.4
1725 - 1800	1.2	4.7E-17	-16.3
1800 - 1875	.7	1.3E-17	-16.9
1875 - 1950	.5	1.9E-16	-15.7
1950 - 2025	.4	3E-16	-15.5
2025 - 2100	.4	2.4E-16	-15.5
2100 - 2175	-.7	3E-16	-15.5
2175 - 2250	-1.3	3.3E-16	-15.5
2250 - 2325	-1.0	1.9E-17	-16.7
2325 - 2400	-2.4	0.4E-17	-16.1
2400 - 2475	-2.0	1.9E-16	-15.7

WDMR 770326 0 MST

NOISE LEVEL = .000125

IAS = 120 MPH

ALTIMETER SETTING = 29.02

HEIGHT (M AGL)	T	CNR	LOG10 CNR
225 - 300	12.4	1.7E-16	-15.0
300 - 375	12.1	1.1E-16	-15.9
375 - 450	11.9	1.0E-16	-15.0
450 - 525	11.4	1.0E-16	-15.0
525 - 600	10.7	1.3E-16	-15.0
600 - 675	10.2	1E-15	-15
675 - 750	9.0	6E-16	-15.2
750 - 825	9.1	1.6E-15	-14.0
825 - 900	0.7	6.2E-16	-15.2
900 - 975	7.9	2.5E-16	-15.6
975 - 1050	7.4	9.7E-17	-16
1050 - 1125	6.8	0.7E-17	-16.1
1125 - 1200	6.5	7.1E-16	-15.2
1200 - 1275	6	1.5E-16	-15.0
1275 - 1350	5.6	2.6E-16	-15.5
1350 - 1425	5	7.4E-16	-15.1
1425 - 1500	4.5	7.4E-16	-15.1
1500 - 1575	4.1	0E-16	-15.1
1575 - 1650	3.4	3.0E-17	-16.6
1650 - 1725	2.6	3.3E-16	-15.5
1725 - 1800	1.9	5.6E-16	-15.3
1800 - 1875	1.6	5.5E-16	-15.5
1875 - 1950	1.1	3.9E-16	-15.5
1950 - 2025	-.9	1.1E-16	-16
2025 - 2100	-.9	5.3E-17	-16.3
2100 - 2175	-1.5	3E-17	-16.5
2175 - 2250	-2.1	4.6E-16	-15.3
2250 - 2325	-2.1	1.6E-16	-15.0
2325 - 2400	-3.0	1.9E-16	-15.0
2400 - 2475	-3.3	1E-16	-16
2475 - 2550	-3.0	7.2E-17	-16.1
2550 - 2625	-4.4	2.1E-16	-15.7
2625 - 2700	-4.9	4.1E-17	-16.4
2700 - 2775	-5.4	0.4E-10	-17.1
2775 - 2850	-6.2	3.2E-17	-16.5
2850 - 2925	-7	1.3E-16	-15.9
2925 - 3000	-7.5	9.4E-17	-16

WDMR 770327 0 MBT
 NOISE LEVEL " 000063
 IAS " 120 MPH
 ALTIMETER SETTING " 29.0

HEIGHT (M AGL)	T	CNR	LOG10 CNR
300 - 375	4.0	6.3E-16	-15.2
375 - 450	4.3	2E-16	-15.7
450 - 525	3.0	1.7E-16	-15.7
525 - 600	3.1	2.2E-16	-15.7
600 - 675	3.6	9.0E-17	-16.1
675 - 750	3	2.4E-16	-15.6
750 - 825	1.9	2.4E-16	-15.5
825 - 900	0	2E-16	-15.7
900 - 975	-1	2E-16	-15.7
975 - 1050	-5	1.9E-15	-14.8
1050 - 1125	-6	3.0E-16	-15.4
1125 - 1200	-1.1	2.4E-16	-15.6
1200 - 1275	-1.7	1.3E-16	-15.9
1275 - 1350	-2.3	2.7E-16	-15.4
1350 - 1425	-2.0	9.2E-16	-15.3
1425 - 1500	-3.4	2.9E-16	-15.3
1500 - 1575	-4.1	4E-17	-16.4
1575 - 1650	-4.7	3.2E-17	-16.5
1650 - 1725	-5.2	3.6E-17	-16.4
1725 - 1800	-5.7	1.2E-16	-15.9
1800 - 1875	-6.3	4.0E-17	-16.3
1875 - 1950	-6.3	3.5E-16	-15.5
1950 - 2025	-6.3	0.9E-16	-15.1
2025 - 2100	-6.7	2.5E-16	-15.5
2100 - 2175	-6.0	5.6E-17	-16.3
2175 - 2250	-6.6	9.3E-17	-16.1
2250 - 2325	-6.6	2.2E-16	-15.6
2325 - 2400	-5.7	4.3E-16	-15.4
2400 - 2475	-7.3	0.9E-16	-17.9
2475 - 2550	-0.2	1.2E-17	-16.6
2550 - 2625	-0.8	3.3E-17	-16.6
2625 - 2700	-9.9	1.9E-17	-16.7
2700 - 2775	-10.2	1.2E-17	-16.9
2775 - 2850	-10.9	1.7E-17	-16.8
2850 - 2925	-11.4	1.1E-17	-17.1
2925 - 3000	-12.1	2.1E-17	-16.7
3000 - 3075	-12.6	1.3E-17	-16.8

WDMR 770327 300 MBT
 NOISE LEVEL " 000009
 IAS " 120 MPH
 ALTIMETER SETTING " 29.70

HEIGHT (M AGL)	T	CNR	LOG10 CNR
300 - 375	3.1	3E-16	-15.9
375 - 450	2.6	3.1E-16	-15.5
450 - 525	1.4	2.3E-16	-15.6
525 - 600	1.3	4.1E-16	-15.4
600 - 675	1	9.7E-16	-15.1
675 - 750	0	6.7E-16	-15.2
750 - 825	-7	3E-16	-15.9
825 - 900	-7.7	3.5E-16	-15.5
900 - 975	-1.1	1.9E-15	-14.7
975 - 1050	-1.6	2E-15	-14.7
1050 - 1125	-2.2	1.7E-15	-14.8
1125 - 1200	-2.5	1.3E-15	-14.9
1200 - 1275	-2.6	2.6E-15	-14.6
1275 - 1350	-3.1	2.0E-15	-14.5
1350 - 1425	-3.9	1E-15	-15.1
1425 - 1500	-4.2	5.4E-16	-15.3
1500 - 1575	-4.5	6.4E-16	-15.2
1575 - 1650	-5.1	4.3E-16	-15.4
1650 - 1725	-5.0	3.9E-17	-16.4
1725 - 1800	-6.3	5.3E-17	-16.3
1800 - 1875	-6.9	4.7E-17	-16.3
1875 - 1950	-7.6	1.6E-17	-16.6
1950 - 2025	-0.1	2.3E-17	-16.6
2025 - 2100	-0.6	1.9E-17	-16.7
2100 - 2175	-9.1	9.3E-17	-16.1
2175 - 2250	-9.4	3.5E-17	-16.5
2250 - 2325	-9.9	9E-17	-16.1
2325 - 2400	-10.4	1.2E-16	-15.9
2400 - 2475	-10.9	1.6E-16	-15.8
2475 - 2550	-11.2	1.9E-16	-15.8
2550 - 2625	-11.7	2.6E-16	-15.6
2625 - 2700	-12.3	2E-16	-15.7
2700 - 2775	-12.9	1.3E-16	-15.9
2775 - 2850	-13.5	5.0E-17	-16.2
2850 - 2925	-13.9	8.3E-17	-16.1
2925 - 3000	-14.4	2.4E-17	-16.6

WEMR 770320 1000 MST
 NOISE LEVEL = .00000
 IAS = 120 MPH
 ALTIMETER BETTING = 29.7

HEIGHT (M AGL)	T	CNR	LOG10 CNR
75 - 150	14.3	2 7E-16	-15.6
150 - 225	13.3	1 7E-16	-15.6
225 - 300	12.5	1 1E-16	-16
300 - 375	11.6	5 7E-17	-16.2
375 - 450	11.1	7 1E-17	-16.1
450 - 525	10.4	1 7E-16	-15.8
525 - 600	9.6	4 7E-17	-16.3
600 - 675	8.0	1 1E-16	-16
675 - 750	8.1	6 0E-17	-16.2
750 - 825	7.4	5 1E-17	-16.3
825 - 900	6.8	1 3E-16	-15.9
900 - 975	6.1	1 2E-16	-15.9
975 - 1050	5.3	1 2E-16	-15.9
1050 - 1125	4.6	6 1E-17	-16.2
1125 - 1200	4	1 0E-16	-15.7
1200 - 1275	3.3	5 9E-16	-15.2
1275 - 1350	2.8	9 1E-17	-16
1350 - 1425	2.2	2 9E-16	-15.9
1425 - 1500	1.7	3E-16	-15.9
1500 - 1575	.9	5 9E-16	-15.9
1575 - 1650	.4	3 7E-16	-15.4
1650 - 1725	.7	3 9E-16	-15.4
1725 - 1800	.8	1 6E-16	-15.8
1800 - 1875	1.4	6 6E-17	-16.2
1875 - 1950	1.9	4 1E-17	-16.4
1950 - 2025	2.2	1E-16	-16
2025 - 2100	2.5	4E-16	-15.4
2100 - 2175	2.7	2 1E-15	-14.7
2175 - 2250	3	1 2E-15	-14.9
2250 - 2325	3.3	1 6E-16	-15.0
2325 - 2400	3.4	2 0E-16	-15.5
2400 - 2475	3.7	1 1E-16	-16
2475 - 2550	4.5	4 0E-16	-15.3
2550 - 2625	4.9	5 7E-16	-15.2
2625 - 2700	5.3	5 4E-16	-15.3
2700 - 2775	5.7	4 4E-17	-16.4
2775 - 2850	6.1	2E-17	-16.7
2850 - 2925	6.6	3 1E-17	-16.5
2925 - 3000	6.9	3 2E-17	-16.5

WEMR 770329 0 MST
 NOISE LEVEL = .000063
 IAS = 120 MPH
 ALTIMETER BETTING = 29.67

HEIGHT (M AGL)	T	CNR	LOG10 CNR
225 - 300	11.3	2 3E-15	-14.6
300 - 375	11	7E-16	-15.2
375 - 450	10.2	3 2E-16	-15.5
450 - 525	9.3	6 5E-16	-15.2
525 - 600	8.4	5 2E-16	-15.3
600 - 675	8	3 1E-16	-15.5
675 - 750	7.5	1 0E-16	-15.7
750 - 825	7	1 4E-16	-15.9
825 - 900	6.3	2E-16	-15.7
900 - 975	5.8	2 4E-16	-15.4
975 - 1050	5.3	1 3E-16	-15.9
1050 - 1125	4.5	1 4E-16	-15.9
1125 - 1200	3.7	2 4E-16	-15.6
1200 - 1275	3	2 3E-16	-15.6
1275 - 1350	2.5	2 7E-17	-16.6
1350 - 1425	1.8	2 1E-17	-16.7
1425 - 1500	1.2	4 1E-17	-16.4
1500 - 1575	.3	2E-16	-15.7
1575 - 1650	.8	1 1E-17	-17
1650 - 1725	.8	0 5E-18	-17.1
1725 - 1800	1.3	2 9E-17	-16.5
1800 - 1875	2	7 5E-17	-16.1
1875 - 1950	2.5	6 4E-17	-16.2
1950 - 2025	3.1	5E-18	-17.3
2025 - 2100	3.7	2 6E-17	-16.6
2100 - 2175	4.2	2 3E-17	-16.6
2175 - 2250	4.7	1 5E-16	-15.8
2250 - 2325	5.4	3 4E-17	-16.5
2325 - 2400	5.9	5 0E-17	-16.2
2400 - 2475	6.3	3E-17	-16.5
2475 - 2550	6.6	2 4E-17	-16.6
2550 - 2625	7	6 4E-17	-16.2
2625 - 2700	7.7	7 7E-17	-16.1
2700 - 2775	8.4	4 0E-17	-16.3
2775 - 2850	9	3 4E-17	-16.5
2850 - 2925	9.7	7 2E-17	-16.1
2925 - 3000	10.5	5 9E-17	-16.2

WNR 770329 500 MBT
 NOISE LEVEL = .000129
 IAS = 120 MPH
 ALTIMETER SETTING = 29.72

HEIGHT (M AGL)	T	CN2	LOG10 CN2
150 - 225	9.7	2.0E-16	-15.5
225 - 300	9.1	4.2E-16	-15.4
300 - 375	8.3	1.5E-16	-15.8
375 - 450	7.0	2E-16	-15.7
450 - 525	7.1	2.5E-16	-15.6
525 - 600	6.5	2.9E-16	-15.5
600 - 675	5.8	2.0E-16	-15.5
675 - 750	5.2	2.7E-16	-15.6
750 - 825	4.3	1.7E-16	-15.8
825 - 900	3.9	3.4E-17	-16.5
900 - 975	3.3	1.5E-16	-15.9
975 - 1050	2.7	9E-17	-16
1050 - 1125	2	2.5E-16	-15.6
1125 - 1200	1.5	4.5E-16	-15.3
1200 - 1275	.8	4.0E-16	-15.3
1275 - 1350	.6	3.4E-16	-15.5
1350 - 1425	.6	2.7E-16	-15.6
1425 - 1500	1.1	3.4E-16	-15.5
1500 - 1575	1.0	1.4E-16	-15.8
1575 - 1650	3.4	2.5E-16	-15.7
1650 - 1725	3.6	3.1E-16	-15.5
1725 - 1800	4.4	5.5E-16	-15.3
1800 - 1875	4.9	1.1E-15	-15
1875 - 1950	4.4	5.4E-16	-15.3
1950 - 2025	5.4	1.3E-16	-15.9
2025 - 2100	5.0	1.5E-16	-15.8
2100 - 2175	6.3	3.4E-16	-15.5
2175 - 2250	6.6	7.5E-16	-15.1
2250 - 2325	7	2E-15	-14.5
2325 - 2400	7.7	3.2E-15	-14.5
2400 - 2475	8	2.7E-15	-14.6
2475 - 2550	8.3	2.7E-15	-14.6
2550 - 2625	8.9	2.2E-17	-16.8
2625 - 2700	9.4	1.7E-17	-17.1
2700 - 2775	9.7	0.2E-18	-17.5
2775 - 2850	10.1	1.1E-17	-16.5
2850 - 3000			-17

WNR 770329 1200 MBT
 NOISE LEVEL = .00004
 IAS = 120 MPH
 ALTIMETER SETTING = 29.77

HEIGHT (M AGL)	T	CN2	LOG10 CN2
150 - 225	10	1.1E-15	-14.9
225 - 300	9	3.7E-16	-15.4
300 - 375	8.8	9.2E-17	-16
375 - 450	8.2	1.8E-16	-15.7
450 - 525	7.5	2.5E-16	-15.6
525 - 600	6.9	2.7E-16	-15.6
600 - 675	6.2	3.4E-16	-15.4
675 - 750	5.5	3.6E-16	-15.4
750 - 825	4.2	3E-16	-15.5
825 - 900	3.7	4.3E-16	-15.4
900 - 975	2.9	2.2E-16	-15.7
975 - 1050	2.3	2.2E-16	-15.7
1050 - 1125	1.7	1.1E-16	-16
1125 - 1200	1.3	1.7E-16	-15.8
1200 - 1275	.7	1.6E-16	-15.8
1275 - 1350	.8	1.6E-16	-15.8
1350 - 1425	.8	2.7E-16	-15.6
1425 - 1500	1.3	7.5E-16	-15.1
1500 - 1575	2	5E-16	-15.3
1575 - 1650	2.4	2.7E-16	-15.6
1650 - 1725	2.8	4.5E-16	-15.3
1725 - 1800	3.4	4.2E-15	-14.4
1800 - 1875	3.6	2.5E-15	-14.5
1875 - 1950	3.5	5.3E-15	-14.3
1950 - 2025	3.4	4.2E-15	-14.4
2025 - 2100	3.4	3.2E-15	-14.5
2100 - 2175	4.2	3.9E-15	-14.5
2175 - 2250	4.8	5.1E-15	-14.3
2250 - 2325	4.8	1.3E-15	-14.7
2325 - 2400	4.7	2.1E-15	-14.7
2400 - 2475	4.9	4.9E-15	-14.2
2475 - 2550	5.2	2.2E-15	-14.7
2550 - 2625	5.5	5.1E-16	-15.3
2625 - 2700	6.2	9.3E-17	-16
2700 - 2775	6.9	1E-17	-17
2775 - 2850	7.5	6.7E-18	-17.2
2850 - 2925	8.3	4.2E-18	-17.4
2925 - 3000	8.9	9.8E-18	-17

W8MR 770329 1600 MBT
 NOISE LEVEL = .0001
 IAS = 120 MPH
 ALTIMETER SETTING = 29.79

HEIGHT (M AGL)	T	CNR	LOG10 CNR
75 - 150	12.0	1.8E-16	-15.0
150 - 225	11.9	1.5E-16	-15.9
225 - 300	11.2	1.1E-16	-16.1
300 - 375	10.6	0.5E-17	-16.1
375 - 450	10.1	2.3E-16	-15.6
450 - 525	9.3	1.4E-16	-15.0
525 - 600	8.6	0.6E-17	-16.1
600 - 675	7.9	0.2E-17	-16.1
675 - 750	7.3	9.9E-17	-16.1
750 - 825	6.9	1.5E-16	-15.0
825 - 900	5.7	1.4E-16	-15.0
900 - 975	5	1E-16	-16.1
975 - 1050	4.4	1.2E-16	-15.9
1050 - 1125	4.1	2.5E-16	-15.6
1125 - 1200	3.7	2E-16	-15.7
1200 - 1275	3.1	2.4E-16	-15.6
1275 - 1350	2.6	5E-16	-15.3
1350 - 1425	2.2	7.5E-16	-15.1
1425 - 1500	1.9	1.4E-15	-14.9
1500 - 1575	1.2	1.4E-15	-14.0
1575 - 1650	.7	1.9E-15	-14.7
1650 - 1725	-.6	1.4E-16	-15.0
1725 - 1800	-.6	4.2E-17	-16.2
1800 - 1875	-1	2.0E-17	-16.6
1875 - 1950	-1.4	3.7E-17	-16.4
1950 - 2025	-2.2	3.5E-17	-16.5
2025 - 2100	-2.0	7.9E-17	-16.1
2100 - 2175	-3.3	9.5E-17	-16.1
2175 - 2250	-3.0	5.5E-16	-15.3
2250 - 2325	-4.6	5E-16	-15.3
2325 - 2400	-5.2	2.1E-16	-15.7
2400 - 2475	-5.0	1.4E-16	-15.9
2475 - 2550	-6.1	3.5E-16	-15.5
2550 - 2625	-6.3	1.0E-16	-15.0
2625 - 2700	-6.5	3.5E-17	-16.5
2700 - 2775	-7.3	4.0E-17	-16.3
2775 - 2850	-0.1	1.3E-17	-16.9
2850 - 2925	-9	2.4E-17	-16.6
2925 - 3000	-9.9	1.9E-17	-16.7

W8MR 770330 0 MBT
 NOISE LEVEL = .00007
 IAS = 130 MPH
 ALTIMETER SETTING = 29.9

HEIGHT (M AGL)	T	CNR	LOG10 CNR
225 - 300	10	6.2E-16	-15.2
300 - 375	9.3	3.1E-16	-15.5
375 - 450	8.7	1.8E-16	-15.3
450 - 525	8.1	4.9E-16	-15.3
525 - 600	7.7	3.4E-16	-15.5
600 - 675	7.2	3.4E-16	-15.5
675 - 750	6.6	7.3E-16	-15.1
750 - 825	6	2.2E-16	-15.7
825 - 900	5.0	3.0E-16	-15.4
900 - 975	5	3.1E-16	-15.5
975 - 1050	4.5	5E-16	-15.3
1050 - 1125	3.0	9.7E-16	-15.1
1125 - 1200	3.4	5.4E-16	-15.3
1200 - 1275	3.1	5.9E-16	-15.2
1275 - 1350	2.7	0.4E-16	-15.1
1350 - 1425	2.5	7.2E-16	-15.1
1425 - 1500	2.1	2.7E-15	-14.6
1500 - 1575	1.5	7.6E-17	-16.1
1575 - 1650	.7	0.6E-18	-17.1
1650 - 1725	-.6	1.1E-17	-17
1725 - 1800	-.6	1.3E-17	-16.9
1800 - 1875	-.9	8E-10	-17.1
1875 - 1950	-1.4	2.5E-17	-16.6
1950 - 2025	-2	8E-10	-17.1
2025 - 2100	-2.5	1.3E-17	-16.9
2100 - 2175	-3	4.2E-17	-16.4
2175 - 2250	-3.6	5.7E-17	-16.2
2250 - 2325	-4.5	6.9E-17	-16.2
2325 - 2400	-5.2	4.0E-17	-16.3
2400 - 2475	-5.7	4.6E-17	-16.3
2475 - 2550	-5.9	5.5E-17	-16.3
2550 - 2625	-6.1	3.6E-17	-16.4
2625 - 2700	-6.4	1.1E-17	-17
2700 - 2775	-6.6	1.3E-17	-16.9
2775 - 2850	-6.9	2E-17	-16.7
2850 - 2925	-7.2	3.5E-18	-17.5
2925 - 3000	-7.3	1.0E-17	-16.7

WBR 770330 900 MBT
 NOISE LEVEL = .00002
 IAS = 120 MPH
 ALTITUDE SETTING = 30

HEIGHT (M AGL)	T	CN2	LOG10 CN2
150 - 325	7.7	2.7E-16	-15.5
225 - 300	7.8	3.3E-16	-15.5
300 - 375	7.8	1.6E-16	-15.8
375 - 450	7.4	1.4E-16	-15.9
450 - 525	6.0	1.2E-16	-15.9
525 - 600	6.2	5.6E-17	-16.2
600 - 675	5.7	7.5E-17	-16.1
675 - 750	5.1	3.7E-16	-15.4
750 - 825	4.4	7.9E-16	-15.1
825 - 900	4	2.0E-16	-15.6
900 - 975	3.5	7.6E-16	-15.1
975 - 1050	2.9	1.3E-15	-14.9
1050 - 1125	2.3	2.0E-16	-15.6
1125 - 1200	1.7	4.5E-16	-15.3
1200 - 1275	1.2	7.3E-16	-15.1
1275 - 1350	.8	7E-16	-15.2
1350 - 1425	0	1.3E-16	-15.9
1425 - 1500	-.6	3.7E-17	-16.4
1500 - 1575	-.6	4.0E-16	-15.3
1575 - 1650	-1.1	3.1E-17	-16.5
1650 - 1725	-1.6	2.4E-17	-16.6
1725 - 1800	-2	8.7E-18	-17.1
1800 - 1875	-2.2	2.4E-17	-16.6
1875 - 1950	-2.4	2.7E-17	-16.6
1950 - 2025	-2.4	2.3E-17	-16.6
2025 - 2100	-2.4	1.4E-17	-16.9
2100 - 2175	-2.6	6.9E-17	-16.2
2175 - 2250	-3	3.6E-18	-17.3
2250 - 2325	-3.5	9E-18	-17.1
2325 - 2400	-3.9	7.6E-18	-17.5
2400 - 2475	-4.3	3.4E-18	-17.5
2475 - 2550	-4.7	2E-18	-17.7
2550 - 2625	-5.2	1.6E-18	-17.8
2625 - 2700	-5.7	2.6E-18	-17.6
2700 - 2775	-6.2	1.9E-18	-17.8
2775 - 2850	-6.5	5.8E-18	-17.2
2850 - 2925	-6.7	7.9E-18	-17.1
2925 - 3000	-7	4.3E-18	-17.4

WBR 770330 1200 MBT
 NOISE LEVEL = .00007
 IAS = 125 MPH
 ALTITUDE SETTING = 30.12

HEIGHT (M AGL)	T	CN2	LOG10 CN2
150 - 225	13.5	4.2E-15	-14.4
225 - 300	13	4.9E-16	-15.3
300 - 375	12.2	9.2E-16	-15
375 - 450	11.5	5.7E-16	-15.2
450 - 525	10.7	6E-16	-15.2
525 - 600	10.1	4.6E-16	-15.3
600 - 675	9.3	5.3E-16	-15.3
675 - 750	8.4	4.7E-16	-15.3
750 - 825	7.3	2.9E-16	-15.5
825 - 900	6.7	3.8E-16	-15.4
900 - 975	6.1	1.6E-16	-15.8
975 - 1050	5.5	7.7E-17	-16.1
1050 - 1125	4.8	3.4E-16	-15.5
1125 - 1200	4.2	1.4E-16	-15.8
1200 - 1275	3.4	3.3E-16	-15.5
1275 - 1350	2.7	3E-16	-15.5
1350 - 1425	1.9	1.9E-16	-15.8
1425 - 1500	1.3	9.2E-16	-15
1500 - 1575	-.2	9.4E-16	-15
1575 - 1650	-.6	5.1E-16	-15.3
1650 - 1725	-.6	3.8E-16	-15.4
1725 - 1800	-1	7.4E-16	-15.1
1800 - 1875	-1.5	2.7E-16	-15.3
1875 - 1950	-2	5.3E-16	-15.3
1950 - 2025	-2	7E-16	-15.2
2025 - 2100	-1.9	3.7E-16	-15.4
2100 - 2175	-2	1.7E-15	-14.8
2175 - 2250	-2.4	2.4E-16	-15.5
2250 - 2325	-3.3	4.1E-17	-16.4
2325 - 2400	-4.1	1.1E-16	-15.9
2400 - 2475	-4.6	8E-16	-15.1
2475 - 2550	-4.8	1.1E-15	-15
2550 - 2625	-4.3	5.9E-16	-15.2
2625 - 2700	-4.6	8.1E-17	-16.1
2700 - 2775	-5.1	2.3E-17	-16.6
2775 - 2850	-5.5	4.0E-18	-17.3
2850 - 2925	-6	3.6E-18	-17.4
2925 - 3000	-6.3	4.5E-18	-17.3

WSMR 770330 1000 MST
 NOISE LEVEL = .00003
 IAS = 120 MPH
 ALTIMETER SETTING = 30.01

HEIGHT (M AGL)	T	CN2	LOG10 CN2
150 - 325	16.7	2.2E-16	-15.6
325 - 300	16	1.9E-16	-15.8
300 - 375	19.4	3.0E-16	-15.4
375 - 450	14.8	2.4E-16	-15.6
450 - 525	14.1	1.9E-16	-15.9
525 - 600	13.4	2.4E-16	-15.6
600 - 675	12.7	7.4E-17	-16.1
675 - 750	12	4.4E-16	-15.4
750 - 825	11.3	1.7E-16	-15.8
825 - 900	10.5	1.3E-16	-15.9
900 - 975	9.8	1E-17	-17
975 - 1050	9.1	2.9E-17	-16.5
1050 - 1125	8.3	4E-17	-16.4
1125 - 1200	7.6	8.4E-17	-16.1
1200 - 1275	6.8	3.3E-17	-16.5
1275 - 1350	6.1	2.3E-17	-16.6
1350 - 1425	5.4	1.4E-17	-16.9
1425 - 1500	4.7	1.3E-17	-16.9
1500 - 1575	4	4.4E-17	-16.3
1575 - 1650	3.5	1.2E-16	-15.9
1650 - 1725	2.9	2.4E-16	-15.6
1725 - 1800	2.3	3.2E-16	-15.5
1800 - 1875	1.5	1.9E-16	-15.7
1875 - 1950	1	8.3E-17	-16.1
1950 - 2025	0	1E-16	-16
2025 - 2100	-1.7	8.4E-17	-16.1
2100 - 2175	-1.7	2E-16	-15.7
2175 - 2250	-1.2	5.4E-17	-16.3
2250 - 2325	-2	2E-16	-15.7
2325 - 2400	-2.5	2.4E-16	-15.3
2400 - 2475	-3.2	1E-15	-15
2475 - 2550	-3.6	6.8E-16	-15.2
2550 - 2625	-3.9	4E-16	-15.2
2625 - 2700	-4.2	2.3E-16	-15.6
2700 - 2775	-4.5	2E-17	-16.7
2775 - 2850	-4.9	3E-17	-16.5
2850 - 2925	-5.4	1.7E-17	-16.8
2925 - 3000	-5.7	1.3E-17	-16.9

WSMR 770331 0 MST
 NOISE LEVEL = .0001
 IAS = 130 MPH
 ALTIMETER SETTING = 30.03

HEIGHT (M AGL)	T	CN2	LOG10 CN2
225 - 300	13	6.2E-16	-15.2
300 - 375	12.8	4.0E-16	-15.3
375 - 450	12.6	2.3E-15	-14.6
450 - 525	12.5	1.3E-15	-14.7
525 - 600	12.3	2.5E-15	-14.6
600 - 675	11.8	1.5E-15	-14.8
675 - 750	11.3	1E-15	-15
750 - 825	10.6	3.7E-16	-15.4
825 - 900	10	4.2E-16	-15.4
900 - 975	9.1	2.4E-16	-15.6
975 - 1050	8.7	2E-16	-15.7
1050 - 1125	8.1	1.4E-16	-15.8
1125 - 1200	7.5	1E-16	-16
1200 - 1275	6.8	9.2E-17	-16
1275 - 1350	6.3	6.4E-17	-16.2
1350 - 1425	5.7	1.9E-16	-15.7
1425 - 1500	5.3	1.9E-16	-15.8
1500 - 1575	4.9	1.7E-16	-15.8
1575 - 1650	4.4	1.3E-17	-16.9
1650 - 1725	3.8	9.7E-18	-17
1725 - 1800	3.4	9.1E-18	-17
1800 - 1875	2.9	1.3E-17	-16.9
1875 - 1950	2.5	1.4E-17	-16.9
1950 - 2025	2.2	3.8E-16	-15.4
2025 - 2100	1.6	2.9E-16	-15.5
2100 - 2175	1	1.1E-16	-15
2175 - 2250	-1.1	3.3E-16	-15.5
2250 - 2325	-1.6	2.5E-16	-15.6
2325 - 2400	-1.9	2.8E-17	-16.6
2400 - 2475	-1.6	4.1E-17	-16.4
2475 - 2550	-2.2	2E-17	-16.7
2550 - 2625	-2.8	1.3E-17	-16.9
2625 - 2700	-3.4	1.2E-17	-16.9
2700 - 2775	-3.9	1.1E-17	-16.7
2775 - 2850	-4.4	4.0E-17	-16.3
2850 - 2925	-4.9	1.9E-17	-16.7
2925 - 3000	-5.2	2E-17	-16.7

WSMR 770331 000 MBT
 NOISE LEVEL = .00006
 IAS = 120 MPH
 ALTIMETER SETTING = 30.02

HEIGHT (M AGL)	T	CN2	LOO10 CN2
150 - 225	10.9	1.1E-15	-14.9
225 - 300	10.7	0.8E-16	-15.1
300 - 375	10.5	2.3E-16	-15.6
375 - 450	10.3	5.3E-16	-15.3
450 - 525	10	0.7E-16	-15.1
525 - 600	9.7	1.3E-15	-14.9
600 - 675	9.2	4.6E-16	-15.3
675 - 750	8.5	0.3E-17	-16.1
750 - 825	7.7	7E-17	-16.2
825 - 900	7.3	1.3E-16	-15.9
900 - 975	7.1	3.9E-16	-15.4
975 - 1050	6.9	6.0E-16	-15.7
1050 - 1125	6.7	2.1E-17	-16.7
1125 - 1200	6.6	3E-17	-16.3
1200 - 1275	6.6	3.3E-17	-16.5
1275 - 1350	6.5	1.3E-16	-15.9
1350 - 1425	6	7.0E-17	-16.1
1425 - 1500	5.8	9.4E-17	-16
1500 - 1575	4.8	1.3E-16	-15.9
1575 - 1650	4.2	2.6E-17	-16.6
1650 - 1725	3.5	2.9E-17	-16.6
1725 - 1800	3	6.9E-18	-17.2
1800 - 1875	2.3	1.7E-17	-16.8
1875 - 1950	1.7	3.7E-17	-16.4
1950 - 2025	1.3	2E-17	-16.7
2025 - 2100	.9	2.1E-17	-16.7
2100 - 2175	-.5	1.1E-17	-16.7
2175 - 2250	-.5	5.4E-17	-16.3
2250 - 2325	-.5	2.6E-17	-16.6
2325 - 2400	-.9	1.7E-17	-16.8
2400 - 2475	-1.3	1E-17	-17
2475 - 2550	-1.7	8.6E-18	-17.1
2550 - 2625	-2.2	6E-17	-16.2
2625 - 2700	-2.6	1.6E-15	-14.8
2700 - 2775	-3.1	5.9E-17	-16.2
2775 - 2850	-3.6	1.1E-16	-16
2850 - 2925	-4.1	5.7E-17	-16.2
2925 - 3000	-4.5	2.1E-17	-16.7

WSMR 770331 1100 MBT
 NOISE LEVEL = .00006
 IAS = 120 MPH
 ALTIMETER SETTING = 30.07

HEIGHT (M AGL)	T	CN2	LOO10 CN2
150 - 225	14.2	7.5E-16	-15
225 - 300	13.6	1.2E-15	-14.9
300 - 375	13	2.7E-16	-15.6
375 - 450	12.3	9E-16	-15
450 - 525	11.7	1.7E-16	-15.8
525 - 600	11.2	8.4E-16	-15.1
600 - 675	10.7	7.5E-16	-15
675 - 750	10.4	8.1E-16	-15.1
750 - 825	10.1	3E-16	-15.5
825 - 900	9.6	2.9E-15	-14.6
900 - 975	9.1	1.0E-15	-14.8
975 - 1050	8.6	7.7E-16	-15
1050 - 1125	7.9	4E-17	-16.4
1125 - 1200	7.3	3.7E-17	-16.4
1200 - 1275	6.7	3E-17	-16.5
1275 - 1350	6.1	5.4E-17	-16.3
1350 - 1425	5.5	3.0E-17	-16.4
1425 - 1500	4.9	4.3E-17	-16.4
1500 - 1575	4.3	1E-16	-16
1575 - 1650	3.9	2.3E-17	-16.6
1650 - 1725	3.2	1.3E-17	-16.9
1725 - 1800	2.4	1.2E-17	-16.9
1800 - 1875	1.7	5.3E-18	-17.3
1875 - 1950	1.1	4.0E-18	-17.3
1950 - 2025	.9	8E-18	-17.1
2025 - 2100	-.0	1.3E-17	-16.8
2100 - 2175	-.8	2.3E-17	-16.6
2175 - 2250	-.8	1.6E-17	-16.8
2250 - 2325	-1.1	9.3E-18	-17
2325 - 2400	-1.5	7.1E-18	-17.1
2400 - 2475	-1.9	1.2E-17	-16.9
2475 - 2550	-2.4	5.0E-18	-17.2
2550 - 2625	-3	3.6E-17	-16.4
2625 - 2700	-3.6	1.1E-17	-17
2700 - 2775	-3.9	2.5E-18	-17.6
2775 - 2850	-4.2	2.1E-18	-17.7
2850 - 2925	-4.7	3.4E-18	-17.5
2925 - 3000	-4.8	1.4E-17	-16.9

WSPR 770731 1840 MST
 NOISE LEVEL ~ 000063
 IAS ~ 125 MPH
 ALTIMETER SETTING ~ 29.83

HEIGHT (M AGL)	T	CNR	LOSS CNR
150 - 225	19.0	1.7E-16	-15.8
225 - 300	19.3	3.4E-17	-16.5
300 - 375	18.5	3.0E-17	-16.4
375 - 450	17.0	9.0E-17	-16.1
450 - 525	17.1	1.3E-16	-15.0
525 - 600	16.3	5.0E-17	-16.1
600 - 675	15.5	5.4E-17	-16.3
675 - 750	14.1	6.4E-17	-16.2
750 - 825	14.1	1.3E-17	-16.2
825 - 900	12.9	3.4E-17	-16.5
900 - 975	12.3	4.3E-17	-16.4
975 - 1050	11.6	5.4E-17	-16.3
1050 - 1125	10.0	6.3E-17	-16.2
1125 - 1200	10.1	7.7E-17	-16.1
1200 - 1275	9.4	4.4E-17	-16.3
1275 - 1350	8.9	6.1E-17	-16.2
1350 - 1425	8.3	3.9E-17	-16.4
1425 - 1500	7.6	2.1E-17	-16.7
1500 - 1575	6.0	5.7E-17	-16.8
1575 - 1650	6.3	7.1E-17	-16.1
1650 - 1725	5.2	1.0E-17	-16.7
1725 - 1800	4.7	1.4E-17	-16.0
1800 - 1875	4.1	2.4E-17	-16.6
1875 - 1950	3.4	3.4E-17	-16.5
1950 - 2025	2.7	2.9E-17	-16.5
2025 - 2100	2.1	9.9E-17	-16.1
2100 - 2175	1.1	2.3E-17	-16.7
2175 - 2250	1	1.0E-17	-16.0
2250 - 2325	1	1.9E-17	-16.7
2325 - 2400	1	7E-17	-16.2
2400 - 2475	1	4.7E-17	-16.3
2475 - 2550	1	3.9E-17	-16.4
2550 - 2625	1	2.9E-17	-16.5
2625 - 2700	1	3.4E-17	-16.5
2700 - 2775	1	2.5E-16	-15.6
2775 - 2850	1	2.3E-16	-15.6
2850 - 2925	1	1E-16	-16.1
2925 - 3000	1	1.7E-16	-15.8

WSPR 770401 1000 MST
 NOISE LEVEL ~ 000004
 IAS ~ 120 MPH
 ALTIMETER SETTING ~ 29.79

HEIGHT (M AGL)	T	CNR	LOSS CNR
150 - 225	11.4	1.5E-16	-15.0
225 - 300	10.9	1.1E-16	-15.9
300 - 375	10.1	9.3E-17	-16.1
375 - 450	9.4	9.4E-17	-16.1
450 - 525	8.6	1.1E-16	-15.9
525 - 600	8	1.9E-16	-15.7
600 - 675	7.4	1E-16	-16.1
675 - 750	6.7	7.0E-17	-16.1
750 - 825	5.9	1.3E-16	-15.9
825 - 900	5.2	1.3E-16	-15.9
900 - 975	4.6	0.4E-17	-16.1
975 - 1050	3.9	1.3E-16	-15.9
1050 - 1125	3	1.5E-16	-15.8
1125 - 1200	2.4	2.2E-16	-15.6
1200 - 1275	1.7	1.1E-16	-16.1
1275 - 1350	1.3	0.3E-17	-16.1
1350 - 1425	1.6	1.4E-16	-15.8
1425 - 1500	1	4E-16	-15.4
1500 - 1575	1	1.7E-16	-15.0
1575 - 1650	1.3	1.7E-16	-15.0
1650 - 1725	1.4	2.4E-16	-15.6
1725 - 1800	2	7.2E-16	-15.1
1800 - 1875	2.0	2.4E-15	-14.6
1875 - 1950	3.3	1.2E-15	-14.7
1950 - 2025	3.0	1.2E-15	-14.7
2025 - 2100	4.3	4E-16	-15.4
2100 - 2175	4.7	2.1E-15	-14.7
2175 - 2250	5.1	2.1E-15	-14.7
2250 - 2325	5.5	1.4E-15	-14.9
2325 - 2400	5.8	1.3E-16	-15.9
2400 - 2475	6.1	5.1E-17	-16.3
2475 - 2550	6.4	2E-16	-15.7
2550 - 2625	7	2.7E-17	-16.6
2625 - 2700	7.5	1.1E-17	-16.9
2700 - 2775	8	1.5E-17	-16.0
2775 - 2850	8.2	9E-10	-17.3
2850 - 2925	8.1	5.1E-10	-17.3
2925 - 3000	8	3.5E-17	-16.5

WDRR 770402 1200 MDT
 NOISE LEVEL = .00003
 IAS = 120 MPH
 ALTITUDE SETTING = 27 04

HEIGHT (M AGL)	T	CN2	LOG10 CN2
150 - 225	11	9.3E-16	-15
225 - 300	10.1	4.2E-15	-14.4
300 - 375	9.4	2.0E-15	-14.6
375 - 450	8.8	0.2E-16	-15.1
450 - 525	8.1	4.1E-16	-15.4
525 - 600	7.5	3.2E-16	-15.5
600 - 675	6.9	4.9E-16	-15.3
675 - 750	6.2	1.1E-15	-14.9
750 - 825	5.5	2.0E-16	-15.6
825 - 900	4.8	5.1E-16	-15.3
900 - 975	4.1	0.9E-16	-15.9
975 - 1050	3.2	1.2E-15	-15.9
1050 - 1125	2.7	2.6E-16	-15.6
1125 - 1200	1.9	4.0E-16	-15.3
1200 - 1275	1.3	2.6E-16	-15.6
1275 - 1350	0.9	9.0E-16	-15
1350 - 1425	0.5	7E-16	-15.2
1425 - 1500	0.0	3.1E-16	-15.5
1500 - 1575	-1.2	1.7E-16	-15.8
1575 - 1650	-1.5	4.0E-16	-15.3
1650 - 1725	-2.0	1.4E-15	-14.8
1725 - 1800	-3.3	0.9E-15	-15.4
1800 - 1875	-3.7	3.9E-15	-14.4
1875 - 1950	-4.5	4.2E-15	-14.4
1950 - 2025	-4.8	1.0E-15	-14.0
2025 - 2100	-5	5.9E-16	-15.2
2100 - 2175	-4.8	1.0E-15	-14.0
2175 - 2250	-4.4	9E-16	-15
2250 - 2325	-4	7E-16	-15.2
2325 - 2400	-3.6	0.2E-15	-14.5
2400 - 2475	-4.1	2.7E-16	-15.6
2475 - 2550	-4.4	3.0E-17	-16.6
2550 - 2625	-5.4	3.7E-17	-16.4
2625 - 2700	-6.4	2.2E-16	-15.7
2700 - 2775	-6.9	3.9E-15	-14.4
2775 - 2850	-6.5	7.6E-16	-15.1
2850 - 2925	-6.6	9.0E-17	-16
2925 - 3000	-6.7	5.1E-16	-15.3

WDRR 770402 0 MDT
 NOISE LEVEL = .00002
 IAS = 120 MPH
 ALTITUDE SETTING = 29 03

HEIGHT (M AGL)	T	CN2	LOG10 CN2
300 - 375	0.5	7.1E-16	-15.1
375 - 450	7.9	7E-17	-16.2
450 - 525	7.3	5E-17	-16.3
525 - 600	6.5	2.2E-16	-15.7
600 - 675	5.6	3.9E-16	-15.4
675 - 750	5.1	1.1E-16	-16
750 - 825	4.4	3.9E-16	-15.5
825 - 900	3.5	4.1E-16	-15.4
900 - 975	2.7	1.0E-16	-15.7
975 - 1050	2.4	1.5E-16	-15.8
1050 - 1125	2	6.0E-16	-15.2
1125 - 1200	1.4	5.4E-16	-15.3
1200 - 1275	0	9.0E-16	-15
1275 - 1350	-1.1	3.7E-16	-15.4
1350 - 1425	-1.5	4.0E-16	-15.4
1425 - 1500	-1.9	4.0E-17	-16.3
1500 - 1575	-1.5	1.4E-16	-15.8
1575 - 1650	-2	1.4E-16	-15.8
1650 - 1725	-2.7	1.0E-16	-16.0
1725 - 1800	-3.3	1.4E-16	-15.9
1800 - 1875	-4.1	1.2E-15	-14.9
1875 - 1950	-4.9	5.0E-16	-15.3
1950 - 2025	-5.3	1.2E-15	-14.9
2025 - 2100	-6.2	4.9E-10	-17.3
2100 - 2175	-6.6	2.4E-10	-17.6
2175 - 2250	-7.3	1.9E-11	-17.8
2250 - 2325	-7.7	3.2E-10	-17.5
2325 - 2400	-7.9	9.9E-10	-17
2400 - 2475	-8	2.6E-17	-16.6
2475 - 2550	-8.3	3.7E-17	-16.5
2550 - 2625	-8.4	3E-17	-16.5
2625 - 2700	-8.5	2.0E-17	-16.7
2700 - 2775	-8.4	2.1E-17	-16.7
2775 - 2850	-8.3	3.7E-10	-17.4
2850 - 2925	-8.3	3.7E-10	-17.4
2925 - 3000	-8.3	3.7E-10	-17.4

WEIR 770402 1000 MAY
INDIG LEVEL " 0000
LVS " 120 MPH
ALTIMETER BEARING " 29 72

REGIONAL

14-00000-1347

ALTIMETER GETTING - 29 76

HEIGHT (M AGL)	T	CNR	LOG10 CNR
225 - 300	10.7	4.3E-16	-15.5
300 - 375	10.5	5.3E-16	-15.5
375 - 450	9.8	1.6E-16	-15.8
450 - 525	8.5	1.4E-16	-15.8
525 - 600	8.5	2E-16	-15.7
600 - 675	7.8	7.4E-16	-15.1
675 - 750	7.3	4.3E-16	-15.4
750 - 825	6.8	5.6E-16	-15.5
825 - 900	6.5	3.3E-16	-15.5
900 - 975	5.7	3.6E-16	-15.4
975 - 1050	5.1	3.4E-16	-15.5
1050 - 1125	4.5	3.3E-16	-15.5
1125 - 1200	4.1	5.0E-16	-15.2
1200 - 1275	3.1	2.9E-16	-15.5
1275 - 1350	2.4	2.4E-16	-15.6
1350 - 1425	1.6	4.2E-17	-16.4
1425 - 1500	.9	3.1E-17	-15.7
1500 - 1575	.1	1.5E-16	-15.8
1575 - 1650	.6	1.0E-16	-15.7
1650 - 1725	.9	9.9E-17	-16
1725 - 1800	1.5	1.3E-16	-15.9
1800 - 1875	.2	4.2E-17	-16.4
1875 - 1950	3.5	4E-17	-16.4
1950 - 2025	3.2	6.0E-18	-17.2
2025 - 2100	4	1.0E-17	-16.8
2100 - 2175	4.7	1.5E-17	-16.8
2175 - 2250	5.1	9.0E-18	-17
2250 - 2325	5.7	1.5E-17	-16.8
2325 - 2400	6.2	4.6E-17	-16.5
2400 - 2475	6.8	4.3E-17	-16.4
2475 - 2550	7.3	2.6E-17	-16.6
2550 - 2625	7.5	3.0E-17	-16.2
2625 - 2700	7.1	1.0E-16	-15.7
2700 - 2775	7.3	7.3E-17	-16.1
2775 - 2850	7.8	3.2E-17	-16.5
2850 - 2925	8.4	7.7E-18	-17.1
2925 - 3000	9.2	5.6E-18	-17.3

HEIGHT (M)	1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15	CH16	CH17	CH18	CH19	CH20	CH21	CH22	CH23	CH24	CH25	CH26	CH27	CH28	CH29	CH30	CH31	CH32	CH33	CH34	CH35	CH36	CH37	CH38	CH39	CH40	CH41	CH42	CH43	CH44	CH45	CH46	CH47	CH48	CH49	CH50	CH51	CH52	CH53	CH54	CH55	CH56	CH57	CH58	CH59	CH60	CH61	CH62	CH63	CH64	CH65	CH66	CH67	CH68	CH69	CH70	CH71	CH72	CH73	CH74	CH75	CH76	CH77	CH78	CH79	CH80	CH81	CH82	CH83	CH84	CH85	CH86	CH87	CH88	CH89	CH90	CH91	CH92	CH93	CH94	CH95	CH96	CH97	CH98	CH99	CH100	CH101	CH102	CH103	CH104	CH105	CH106	CH107	CH108	CH109	CH110	CH111	CH112	CH113	CH114	CH115	CH116	CH117	CH118	CH119	CH120	CH121	CH122	CH123	CH124	CH125	CH126	CH127	CH128	CH129	CH130	CH131	CH132	CH133	CH134	CH135	CH136	CH137	CH138	CH139	CH140	CH141	CH142	CH143	CH144	CH145	CH146	CH147	CH148	CH149	CH150	CH151	CH152	CH153	CH154	CH155	CH156	CH157	CH158	CH159	CH160	CH161	CH162	CH163	CH164	CH165	CH166	CH167	CH168	CH169	CH170	CH171	CH172	CH173	CH174	CH175	CH176	CH177	CH178	CH179	CH180	CH181	CH182	CH183	CH184	CH185	CH186	CH187	CH188	CH189	CH190	CH191	CH192	CH193	CH194	CH195	CH196	CH197	CH198	CH199	CH200	CH201	CH202	CH203	CH204	CH205	CH206	CH207	CH208	CH209	CH210	CH211	CH212	CH213	CH214	CH215	CH216	CH217	CH218	CH219	CH220	CH221	CH222	CH223	CH224	CH225	CH226	CH227	CH228	CH229	CH230	CH231	CH232	CH233	CH234	CH235	CH236	CH237	CH238	CH239	CH240	CH241	CH242	CH243	CH244	CH245	CH246	CH247	CH248	CH249	CH250	CH251	CH252	CH253	CH254	CH255	CH256	CH257	CH258	CH259	CH260	CH261	CH262	CH263	CH264	CH265	CH266	CH267	CH268	CH269	CH270	CH271	CH272	CH273	CH274	CH275	CH276	CH277	CH278	CH279	CH280	CH281	CH282	CH283	CH284	CH285	CH286	CH287	CH288	CH289	CH290	CH291	CH292	CH293	CH294	CH295	CH296	CH297	CH298	CH299	CH300	CH301	CH302	CH303	CH304	CH305	CH306	CH307	CH308	CH309	CH310	CH311	CH312	CH313	CH314	CH315	CH316	CH317	CH318	CH319	CH320	CH321	CH322	CH323	CH324	CH325	CH326	CH327	CH328	CH329	CH330	CH331	CH332	CH333	CH334	CH335	CH336	CH337	CH338	CH339	CH340	CH341	CH342	CH343	CH344	CH345	CH346	CH347	CH348	CH349	CH350	CH351	CH352	CH353	CH354	CH355	CH356	CH357	CH358	CH359	CH360	CH361	CH362	CH363	CH364	CH365	CH366	CH367	CH368	CH369	CH370	CH371	CH372	CH373	CH374	CH375	CH376	CH377	CH378	CH379	CH380	CH381	CH382	CH383	CH384	CH385	CH386	CH387	CH388	CH389	CH390	CH391	CH392	CH393	CH394	CH395	CH396	CH397	CH398	CH399	CH400	CH401	CH402	CH403	CH404	CH405	CH406	CH407	CH408	CH409	CH410	CH411	CH412	CH413	CH414	CH415	CH416	CH417	CH418	CH4

WEMR 770404 300 MBT
 NOISE LEVEL ~ .000023
 IAS ~ 129 MPH
 ALTITUDE BETTING ~ 29.97

HEIGHT (M AGL)	T	CNR	LOG10 CNR
225 - 300	4.1	9.3E-10	-17
300 - 375	3.0	1.7E-16	-15.0
375 - 450	3.5	1.6E-16	-15.0
450 - 525	3.1	6.2E-17	-16.2
525 - 600	2.5	4.3E-17	-16.4
600 - 675	2	2.6E-17	-16.6
675 - 750	1.4	2.9E-17	-16.5
750 - 825	1	5.6E-17	-16.5
825 - 900	-.6	1.0E-17	-16.7
900 - 975	-.6	1.7E-17	-16.0
975 - 1050	-.9	3E-17	-16.5
1050 - 1125	-1.7	1.5E-17	-16.0
1125 - 1200	-2.4	2.2E-17	-16.7
1200 - 1275	-3.2	2.9E-17	-16.5
1275 - 1350	-3.7	3.2E-17	-16.5
1350 - 1425	-4.4	4.1E-17	-16.4
1425 - 1500	-4.9	4.7E-17	-16.3
1500 - 1575	-5.4	4.5E-17	-16.3
1575 - 1650	-5.0	4.1E-17	-16.4
1650 - 1725	-6.3	4.1E-17	-16.4
1725 - 1800	-6.7	1.7E-16	-15.0
1800 - 1875	-7.2	1.4E-16	-15.9
1875 - 1950	-7.7	1.4E-17	-16.9
1950 - 2025	-8.1	4.7E-17	-16.3
2025 - 2100	-8.4	3.3E-16	-15.5
2100 - 2175	-8.7	7.5E-17	-16.1
2175 - 2250	-9.1	10E-10	-17
2250 - 2325	-9.5	1.2E-17	-16.9
2325 - 2400	-9.7	1.1E-17	-17
2400 - 2475	-9.5	4.0E-17	-16.3
2475 - 2550	-10	7E-17	-16.2
2550 - 2625	-10.6	1.7E-10	-17.0
2625 - 2700	-10.9	4.5E-10	-17.3
2700 - 2775	-11.2	2.1E-17	-16.7
2775 - 2850	-11.5	0E-17	-16.1
2850 - 2925	-12	1.7E-17	-16.0
2925 - 3000	-12.5	7.4E-10	-17.1

WEMR 770405 300 MBT
 NOISE LEVEL ~ 1.25E-9
 IAS ~ 120 MPH
 ALTITUDE BETTING ~ 30.02

HEIGHT (M AGL)	T	CNR	LOG10 CNR
225 - 300	4.0	2.4E-16	-15.5
300 - 375	4.7	1.1E-16	-16
375 - 450	4.2	1.5E-16	-15.9
450 - 525	3.4	1.4E-16	-15.0
525 - 600	2.0	3.0E-16	-15.4
600 - 675	2.1	2.5E-16	-15.6
675 - 750	1.6	5.3E-16	-15.3
750 - 825	1.1	3.5E-16	-15.5
825 - 900	.9	6.4E-16	-15.2
900 - 975	-.3	3.5E-16	-15.4
975 - 1050	-.7	9.7E-17	-16
1050 - 1125	-.7	1.4E-16	-15.9
1125 - 1200	-1	7.9E-17	-16.1
1200 - 1275	-1.3	4.3E-17	-16.4
1275 - 1350	-1.7	2.1E-16	-15.7
1350 - 1425	-2.1	1.3E-15	-14.9
1425 - 1500	-2.6	2.8E-16	-15.4
1500 - 1575	-2.9	1.6E-16	-15.0
1575 - 1650	-3.3	4.3E-16	-15.4
1650 - 1725	-3.0	1.2E-16	-15.9
1725 - 1800	-4.1	2.4E-16	-15.6
1800 - 1875	-4.6	2.3E-16	-15.6
1875 - 1950	-5	1.3E-16	-15.9
1950 - 2025	-5.6	0.1E-17	-16.1
2025 - 2100	-6	2.9E-17	-16.5
2100 - 2175	-6.5	2.5E-10	-17.6
2175 - 2250	-6.0	6.2E-10	-17.2
2250 - 2325	-7.1	9.6E-17	-16
2325 - 2400	-7.0	1.7E-16	-15.0
2400 - 2475	-8.1	2.7E-17	-16.0
2475 - 2550	-8.1	1.6E-17	-16.3
2550 - 2625	-8.0	6.4E-17	-16.7
2625 - 2700	-8.5	2.7E-17	-16.5
2700 - 2775	-9.5	2.5E-17	-16.6
2775 - 2850	-9.0	4.3E-17	-16.4
2850 - 2925	-10.3	2.2E-16	-15.7
2925 - 3000			

WIMR 770404 1200 MBT
 NOISE LEVEL ~ 000063
 IAS ~ 120 MPH
 ALTITUDE SETTING ~ 30.07

HEIGHT (M AGL)	T	CN2	LOG10 CN2
0 - 75	10.6	6.9E-19	-14.2
75 - 150	10	4.9E-19	-14.4
150 - 225	9.8	1.9E-19	-14.7
225 - 300	9.6	4E-19	-14.4
300 - 375	7.9	1.0E-19	-14.7
375 - 450	7	6.4E-16	-15.2
450 - 525	6.1	5.4E-16	-15.3
525 - 600	5.5	3.2E-16	-15.5
600 - 675	4.8	3.5E-16	-15.5
675 - 750	4.2	3.4E-16	-15.4
750 - 825	3.5	9.9E-16	-15.2
825 - 900	2.8	1.5E-19	-14.9
900 - 975	2.2	1.7E-19	-14.8
975 - 1050	1.7	5.5E-16	-15.3
1050 - 1125	1.3	1.3E-19	-14.9
1125 - 1200	1	4.5E-16	-15.4
1200 - 1275	-.9	2.3E-16	-15.6
1275 - 1350	-.6	4.1E-19	-14.4
1350 - 1425	-.1	0.7E-16	-15.1
1425 - 1500	-1.4	3.2E-16	-15.5
1500 - 1575	-1.9	1.9E-16	-15.7
1575 - 1650	-2.1	1.1E-16	-16.1
1650 - 1725	-2.4	0.6E-17	-16.2
1725 - 1800	-2.7	2E-16	-15.7
1800 - 1875	-3	1.4E-19	-14.8
1875 - 1950	-3.1	4.4E-19	-14.3
1950 - 2025	-3.3	0.5E-17	-16.1
2025 - 2100	-3.6	3.4E-17	-16.5
2100 - 2175	-4	5.1E-17	-16.3
2175 - 2250	-4.9	1E-16	-16.2
2250 - 2325	5.4	4E-17	-16.2
2325 - 2400	6	1.9E-16	-15.7
2400 - 2475	-6.3	1.1E-16	-16
2475 - 2550	-6.6	9.9E-16	-15.3
2550 - 2625	-7	0.9E-17	-16.1
2625 - 2700	-7.7	1.2E-16	-15.9
2700 - 2775	-8.1	3.5E-16	-15.5
2775 - 2850	-8.3	1.5E-16	-15.9
2850 - 2925	-8.5	1.5E-16	-15.9
2925 - 3000	-8.5	1.5E-17	-15.9

WIMR 770404 1000 MBT
 NOISE LEVEL ~ 000025
 IAS ~ 120 MPH
 ALTITUDE SETTING ~ 30.02

HEIGHT (M AGL)	T	CN2	LOG10 CN2
0 - 75	13.7	5.9E-17	-16.2
75 - 150	15	1.7E-17	-16.8
150 - 225	14.2	1.3E-17	-16.9
225 - 300	13.6	2.6E-17	-16.6
300 - 375	12.9	2.7E-17	-16.6
375 - 450	12.3	7.7E-17	-16.1
450 - 525	11.6	1.4E-16	-15.8
525 - 600	11	5.1E-17	-16.3
600 - 675	10.4	6.0E-17	-16.2
675 - 750	9.9	3.7E-16	-15.4
750 - 825	9.2	1.9E-16	-15.7
825 - 900	8.6	1.6E-16	-15.8
900 - 975	7.9	1.0E-16	-15.8
975 - 1050	7.4	1.1E-16	-15.8
1050 - 1125	6.6	1.5E-16	-15.8
1125 - 1200	6.1	1.1E-16	-15.9
1200 - 1275	5.7	4.5E-17	-16.4
1275 - 1350	4.7	6.3E-17	-16.2
1350 - 1425	4	1.4E-17	-16.8
1425 - 1500	3.4	2E-17	-16.7
1500 - 1575	2.8	2.9E-17	-16.6
1575 - 1650	2.2	2.1E-17	-16.7
1650 - 1725	1.5	4E-17	-16.4
1725 - 1800	.8	3.0E-17	-16.4
1800 - 1875	-.7	1.5E-16	-15.8
1875 - 1950	-.7	9.0E-17	-15
1950 - 2025	-.9	7.3E-17	-16.1
2025 - 2100	-1.3	1E-16	-16
2100 - 2175	-1.8	4.1E-16	-15.4
2175 - 2250	-2.4	1.9E-16	-15.7
2250 - 2325	-3.2	3.7E-16	-15.4
2325 - 2400	-3.4	0.9E-17	-16
2400 - 2475	-3.5	1.7E-16	-15.9
2475 - 2550	-3.6	2.4E-16	-15.6
2550 - 2625	-3.5	2.9E-16	-15.5
2625 - 2700	-3.6	2.2E-16	-15.7
2700 - 2775	-3.8	2.6E-16	-15.6
2775 - 2850	-4.1	3.5E-17	-16.5
2850 - 2925	-4.4	7.5E-17	-16.1
2925 - 3000	-4.8	6.2E-17	-16.2

WJMR 770405 0 MIB

NOISE LEVEL " 000000"

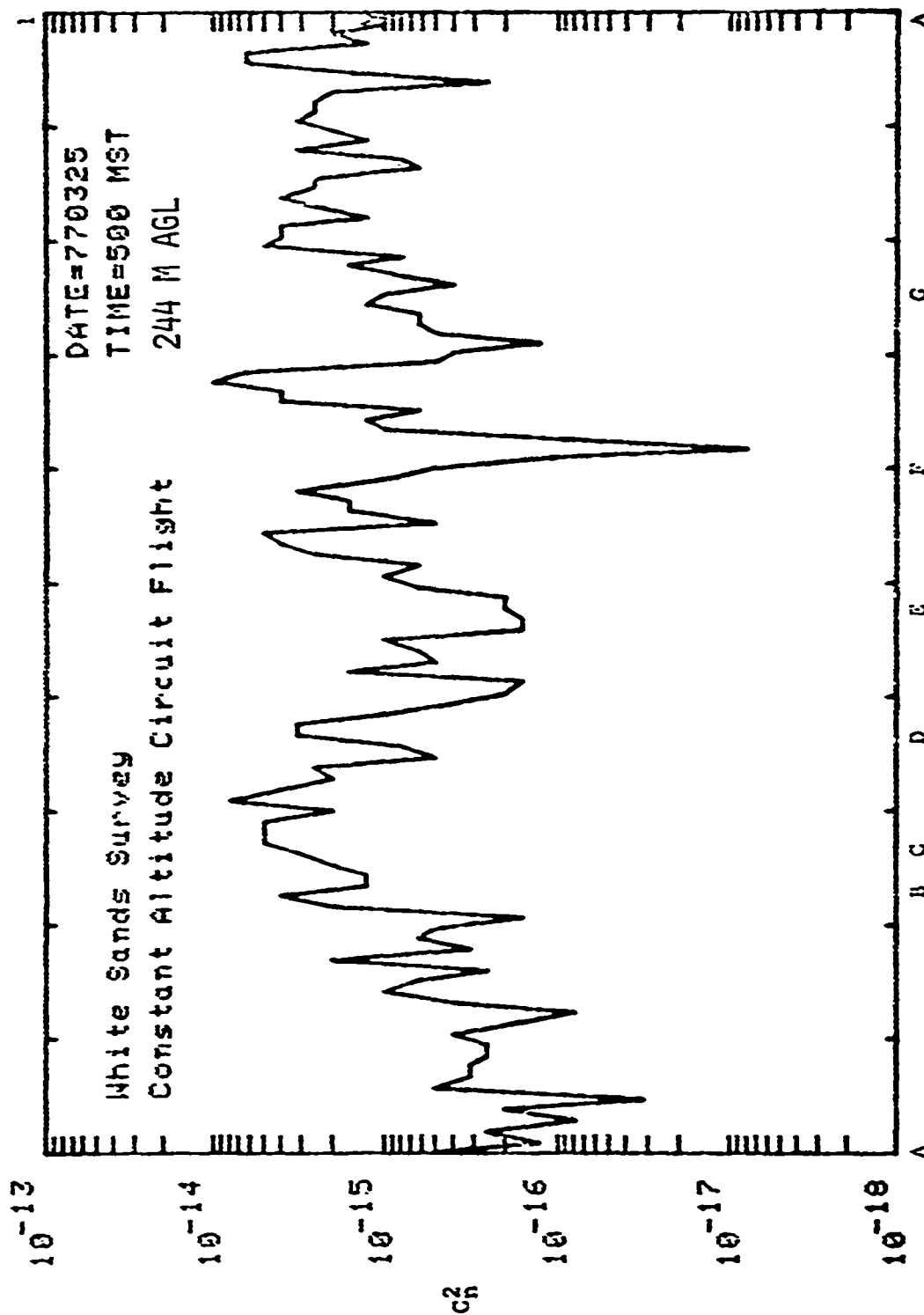
IAS = 125 MPH

ALTIMETER SETTING = 30 12

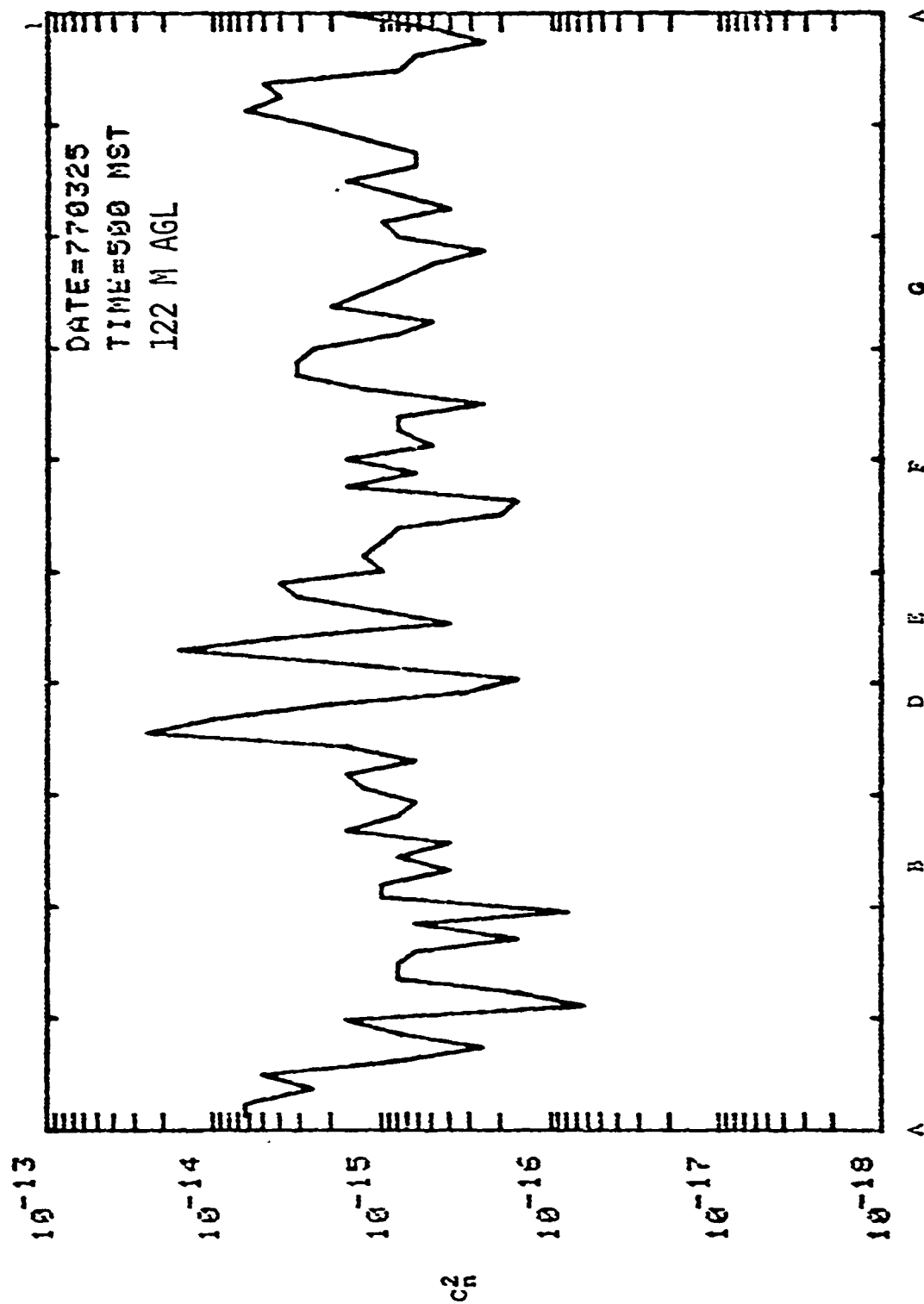
HEIGHT (M AGL)	F	CN2	LOG10 CN2
225 - 300	12.3	2E-15	-14.7
300 - 375	12.9	4.5E-16	-15.3
375 - 450	12.4	5.0E-17	-16.2
450 - 525	11.0	9.1E-16	-15.9
525 - 600	11.3	5.1E-16	-15.6
600 - 675	10.6	2.7E-16	-15.6
675 - 750	9.9	9.1E-17	-16.0
750 - 825	9.1	1.2E-16	-15.9
825 - 900	8.8	5.4E-17	-16.3
900 - 975	7.9	1.1E-16	-16.0
975 - 1050	7.3	0.9E-17	-16.1
1050 - 1125	6.5	2.7E-17	-16.6
1125 - 1200	5.9	4.6E-17	-16.3
1200 - 1275	5.2	0.9E-17	-16.1
1275 - 1350	4.6	4.1E-17	-16.4
1350 - 1425	4	2.9E-17	-16.5
1425 - 1500	3.3	5.5E-18	-17.3
1500 - 1575	2.7	9.2E-18	-17.0
1575 - 1650	2	5.1E-17	-16.3
1650 - 1725	1.4	2.6E-17	-16.6
1725 - 1800	.9	3.6E-17	-16.4
1800 - 1875	.4	2.7E-17	-16.6
1875 - 1950	.6	7.5E-18	-17.1
1950 - 2025	-1	7.8E-18	-17.1
2025 - 2100	-1.5	1.2E-17	-16.9
2100 - 2175	-2	1.3E-17	-16.9
2175 - 2250	-2.5	2.4E-17	-16.6
2250 - 2325	-3.1	2.9E-18	-17.5
2325 - 2400	-3.4	9.7E-18	-17.2
2400 - 2475	-3.7	7.5E-18	-17.1
2475 - 2550	-3.6	3.7E-18	-17.4
2550 - 2625	-3.1	7E-18	-17.2
2625 - 2700	-2.4	2.5E-16	-15.6
2700 - 2775	-1.8	3E-16	-15.5
2775 - 2850	-1.3	1.9E-16	-15.7
2850 - 2925	-1.2	8.5E-17	-16.1
2925 - 3000	-1.3	5.9E-18	-17.2

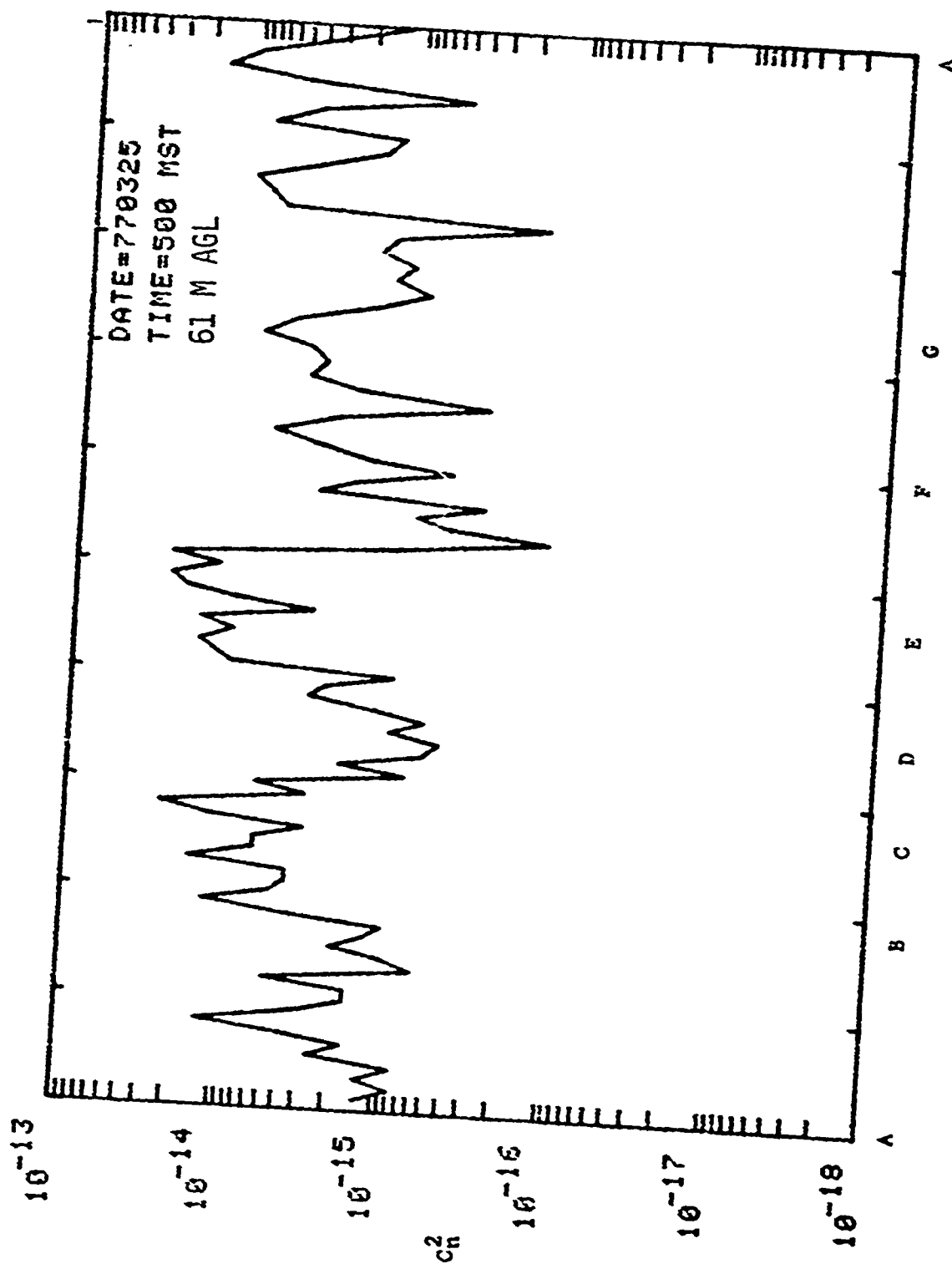
White Sands C _n ² Survey		Constant Altitude Flights, Log Average G _R ²											
Date	Time	0000				0500				1200			
		61 m AGL	122 m	244 m	61 m AGL	122 m	244 m	61 m AGL	122 m	244 m	61 m AGL	122 m	244 m
Mar-Apr	MYT												
25	0500				-14.3	-14.7	-14.8						
25	1000							-14.3	-14.7	-15.1			
25	1800										-15.4	-15.6	-15.5
26	0000		-15.1	-15.2				-14.2	-14.4	-14.9			
26	1200												
27	0000		-15.0	-15.3									
27	0500					-15.1	-15.0						
28	1800										-15.4	-15.7	φ
29	0000		-14.6	-15.0									
29	0500				-14.9	-15.3	φ						
29	1200							-14.2	-14.6	φ			
29	1800										-15.3	φ	-15.3
30	0000		-15.1	-15.5									
30	0500				-13.5	-13.1	-13.5						
30	1200							-14.2	-14.3	-14.7			
30	1800										-15.3	-15.9	-15.8
31	0000		-15.1	-15.2									
31	0500				φ	-15.1	-15.1	-14.1	φ	φ			
31	1100										-15.0	-15.4	-15.6
31	1830										-15.6	-15.7	-15.7
01	1800												
02	0000		-14.9	-15.0				-14.0	-14.3	-14.6			
02	1200												
02	1800										-15.9	-15.2	-15.3
03	0000	-15.0	-15.1	-15.4									
03	0500					-15.5	-15.5						
03	1200							-14.1	-14.4	-14.8			
03	1800										-15.4	-15.6	-15.5
04	0500				-15.2	-15.6	-16.1						
04	1200							-14.2	-14.4	-14.7			
04	1800										-16.5	-16.7	-16.7
05	0000		-14.9	-15.1									

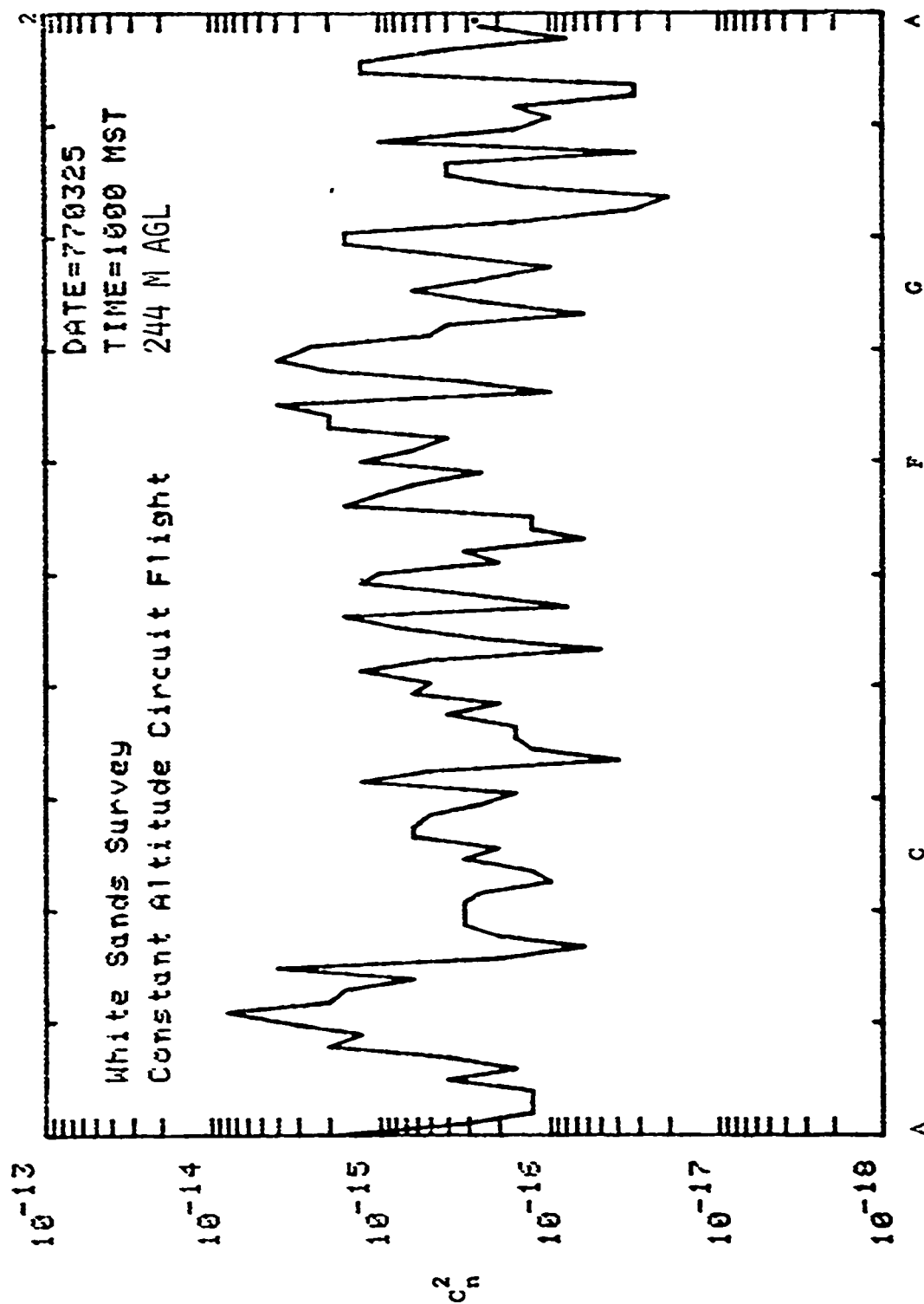
φ : Aircraft radio interference

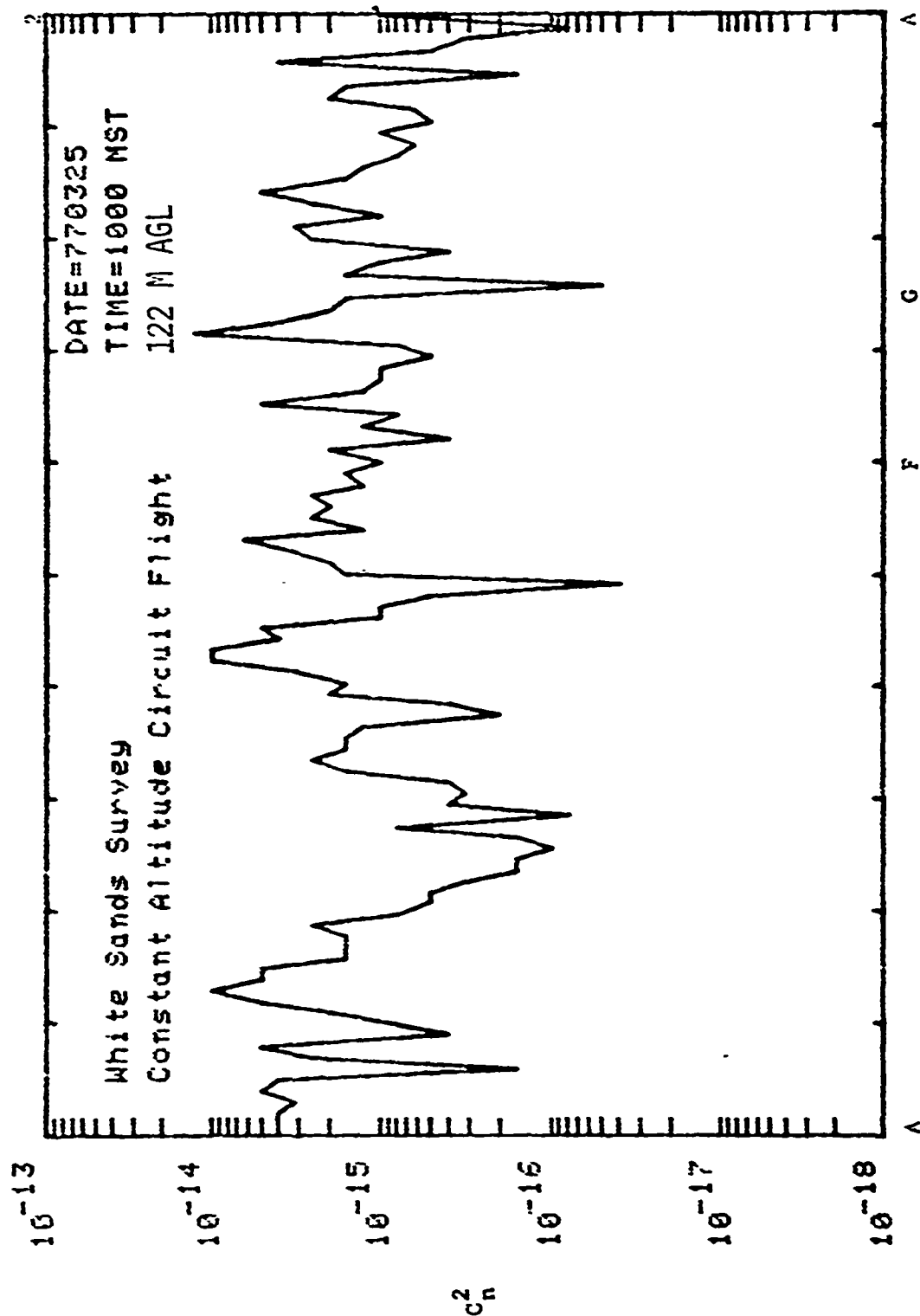


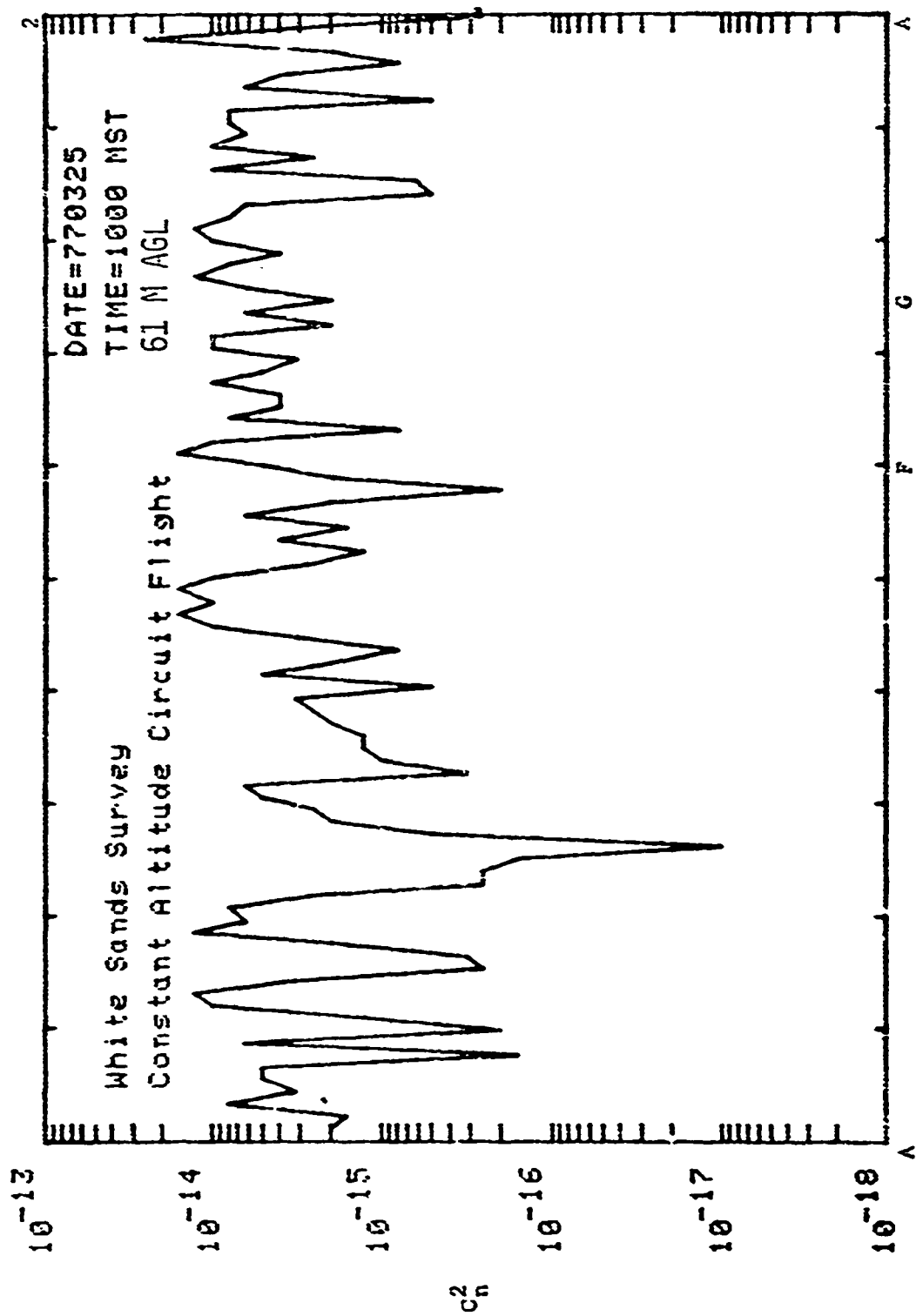
A: LSTC
B: So. edge, White Sand
C: No. edge, White Sand
D: No. edge, Lake Lucero
E: So. edge, Lake Lucero
F: Apache Mts
G: So. end turn

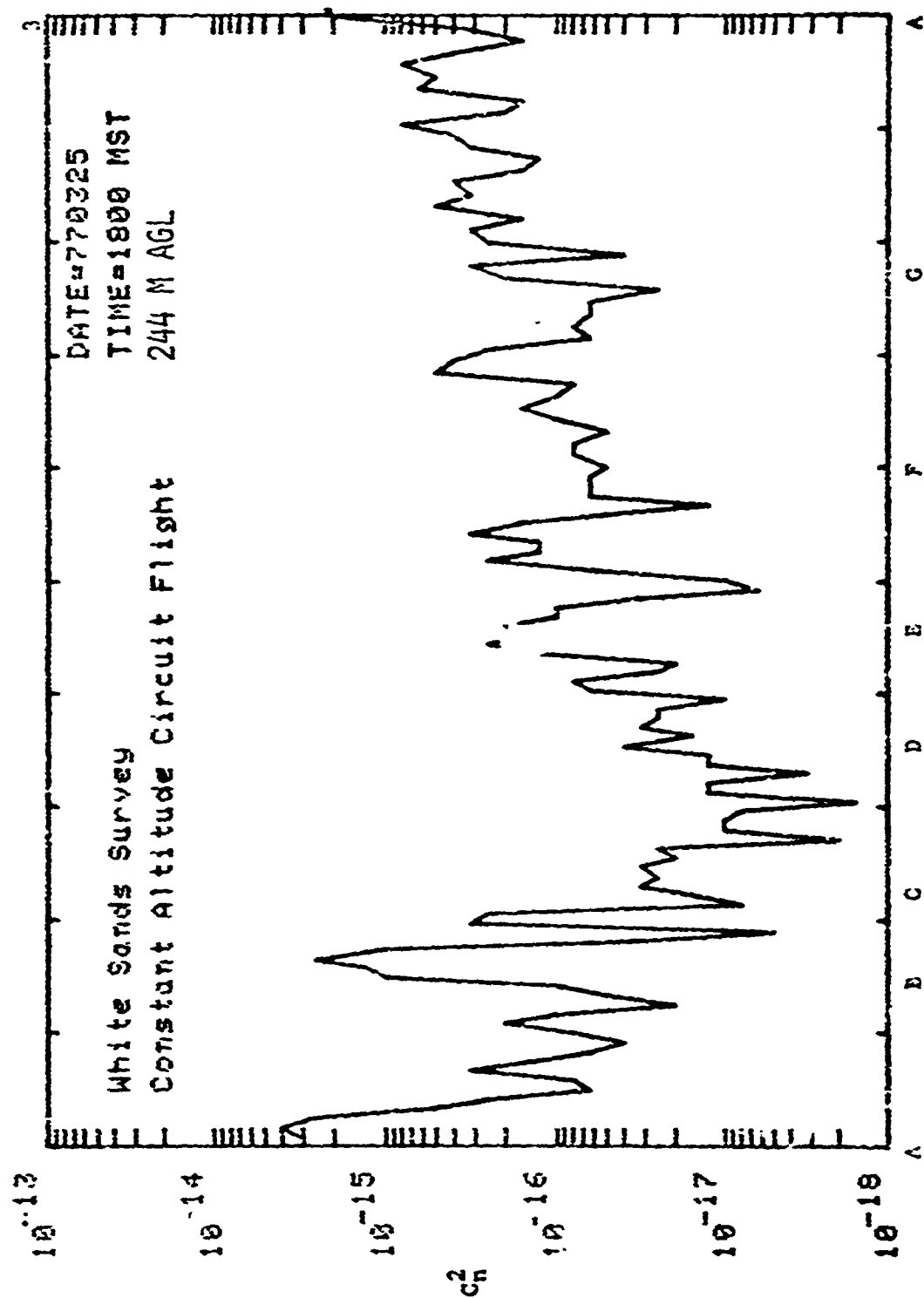


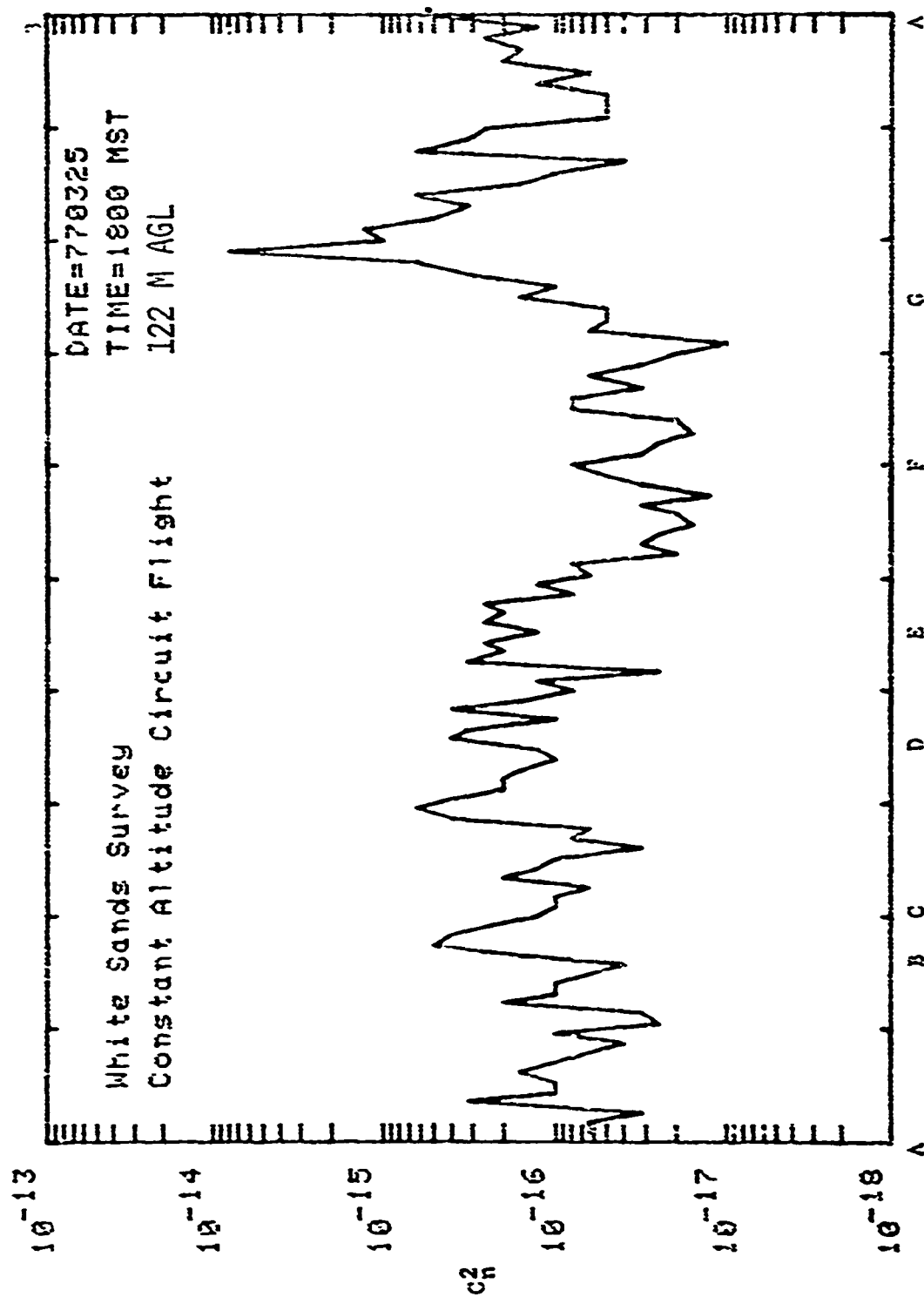


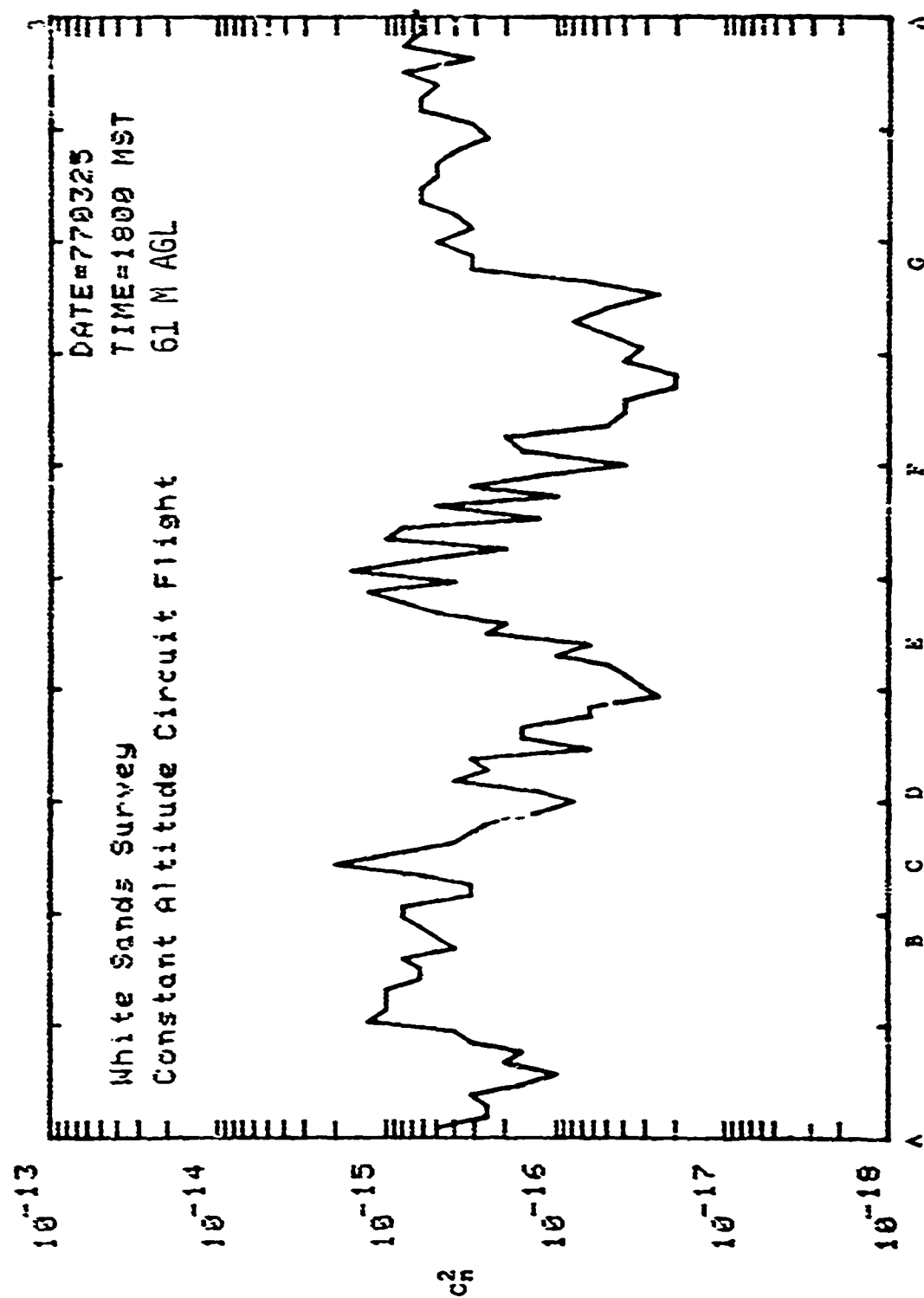


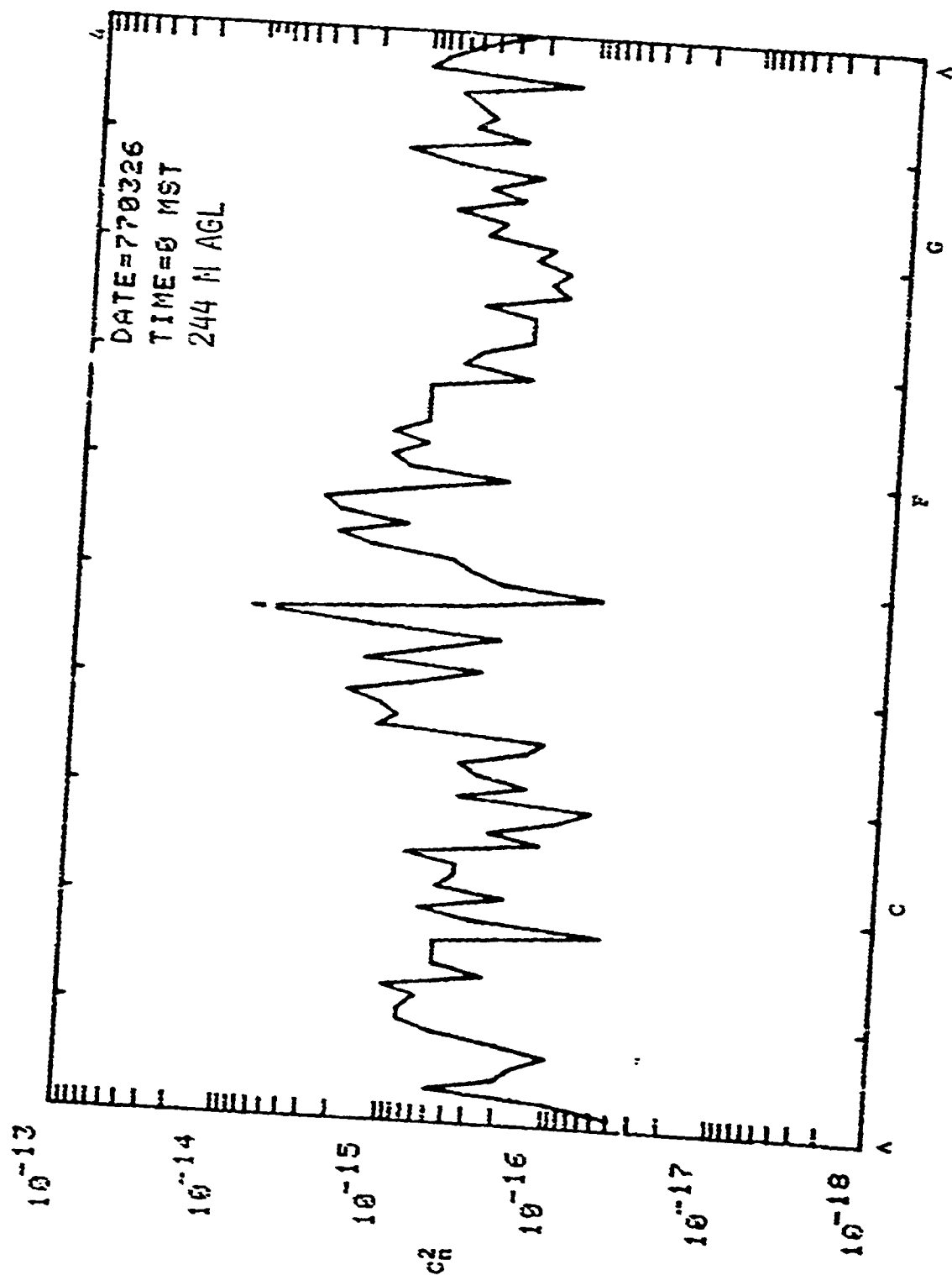


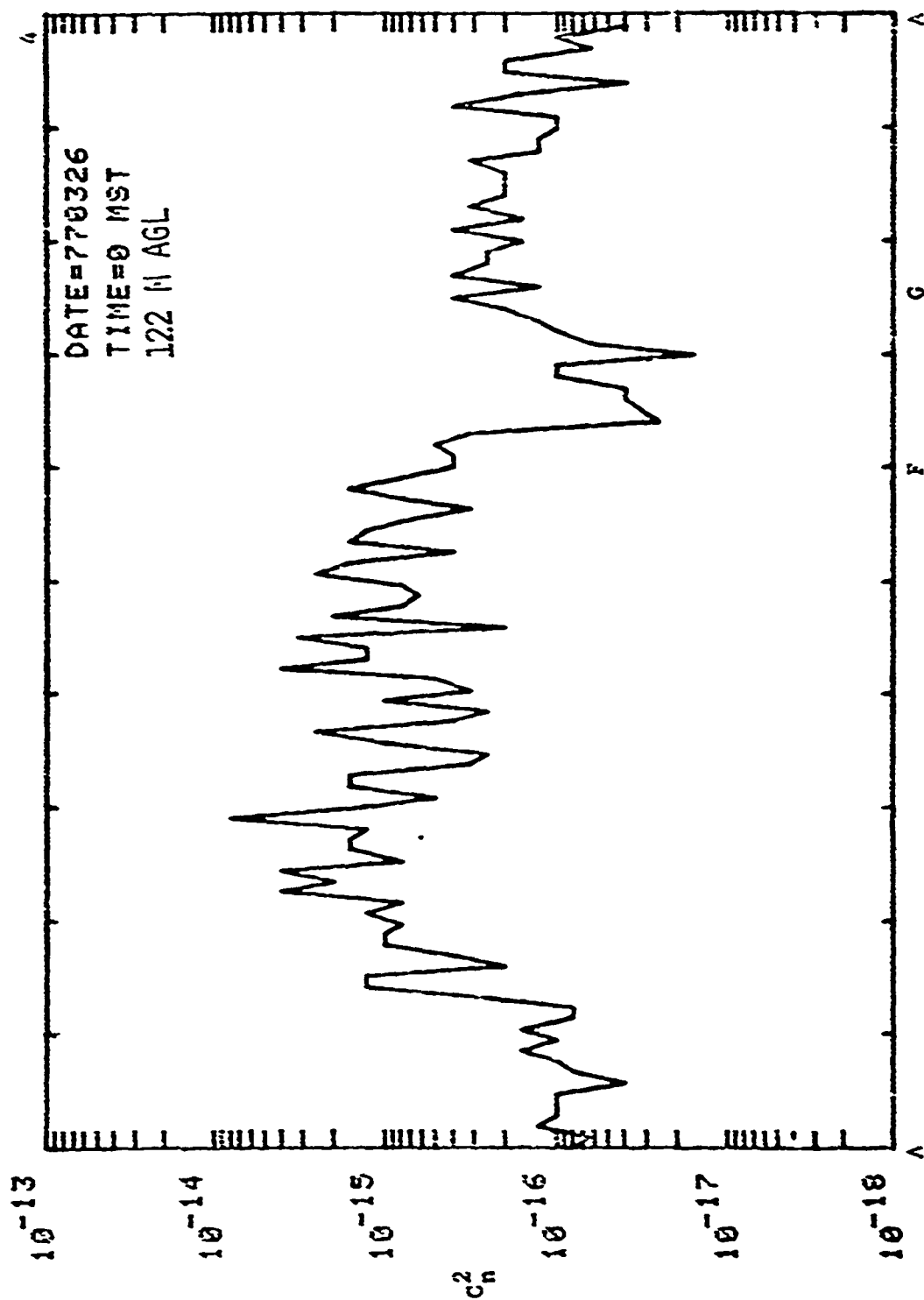


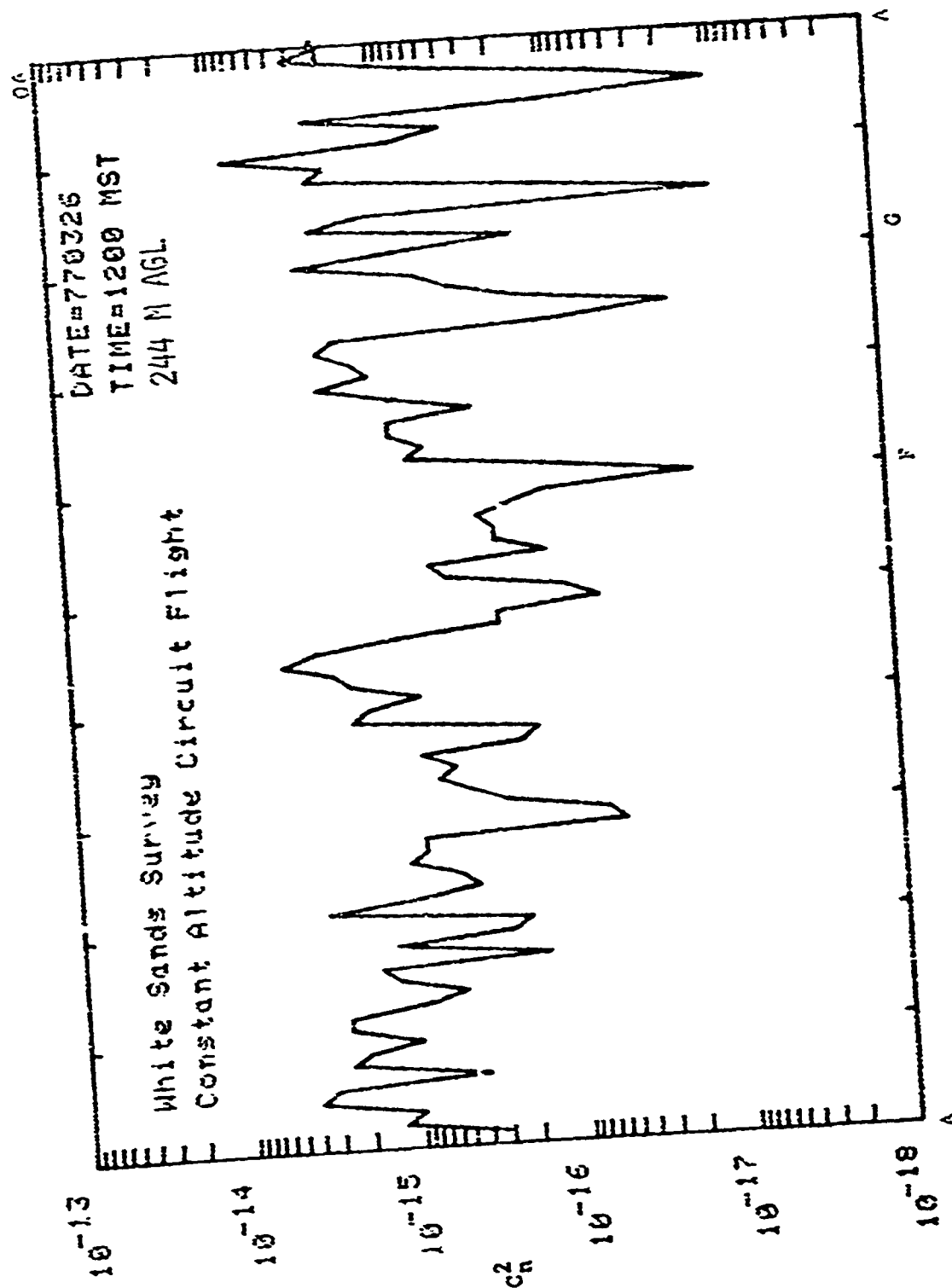


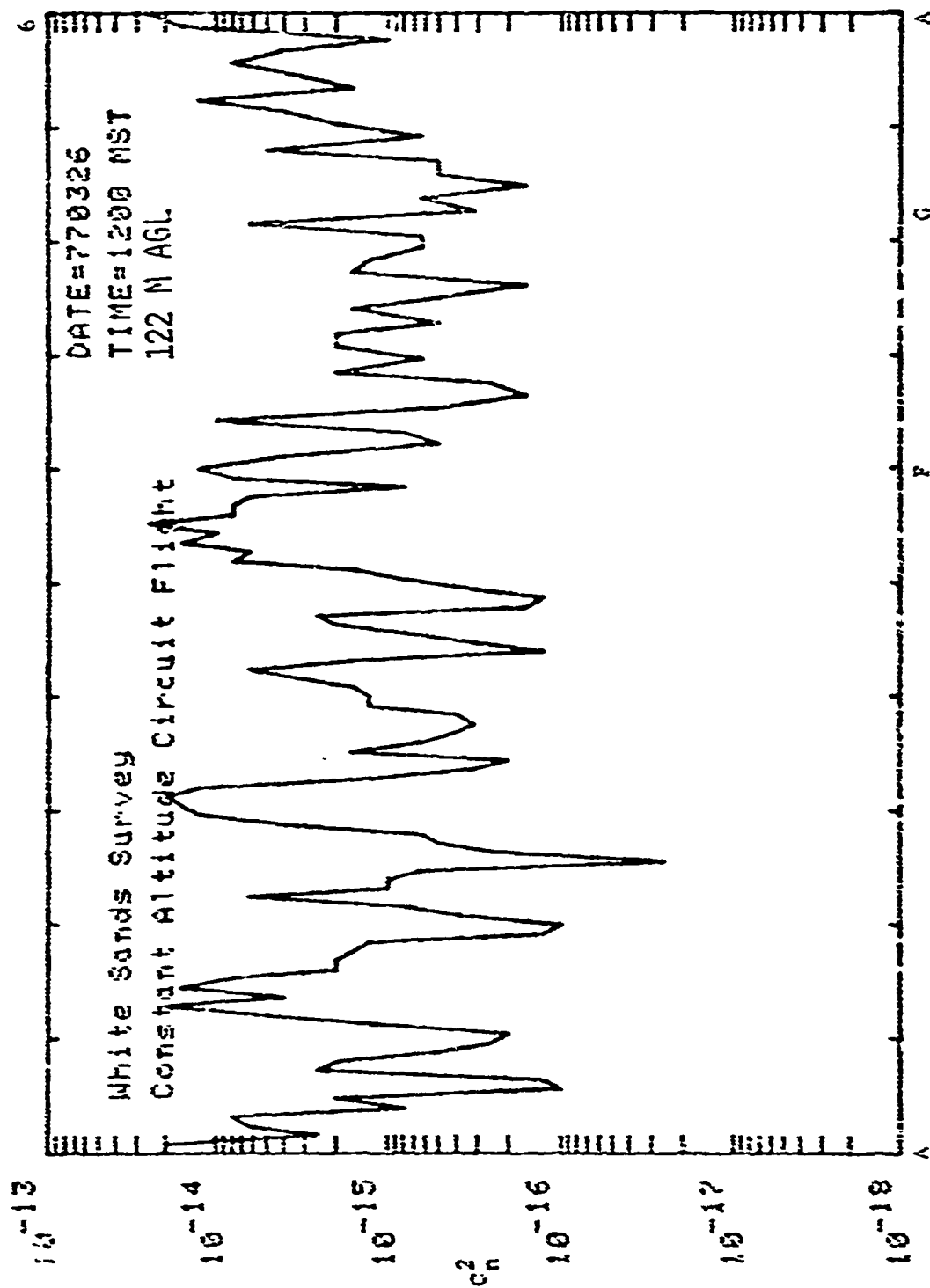


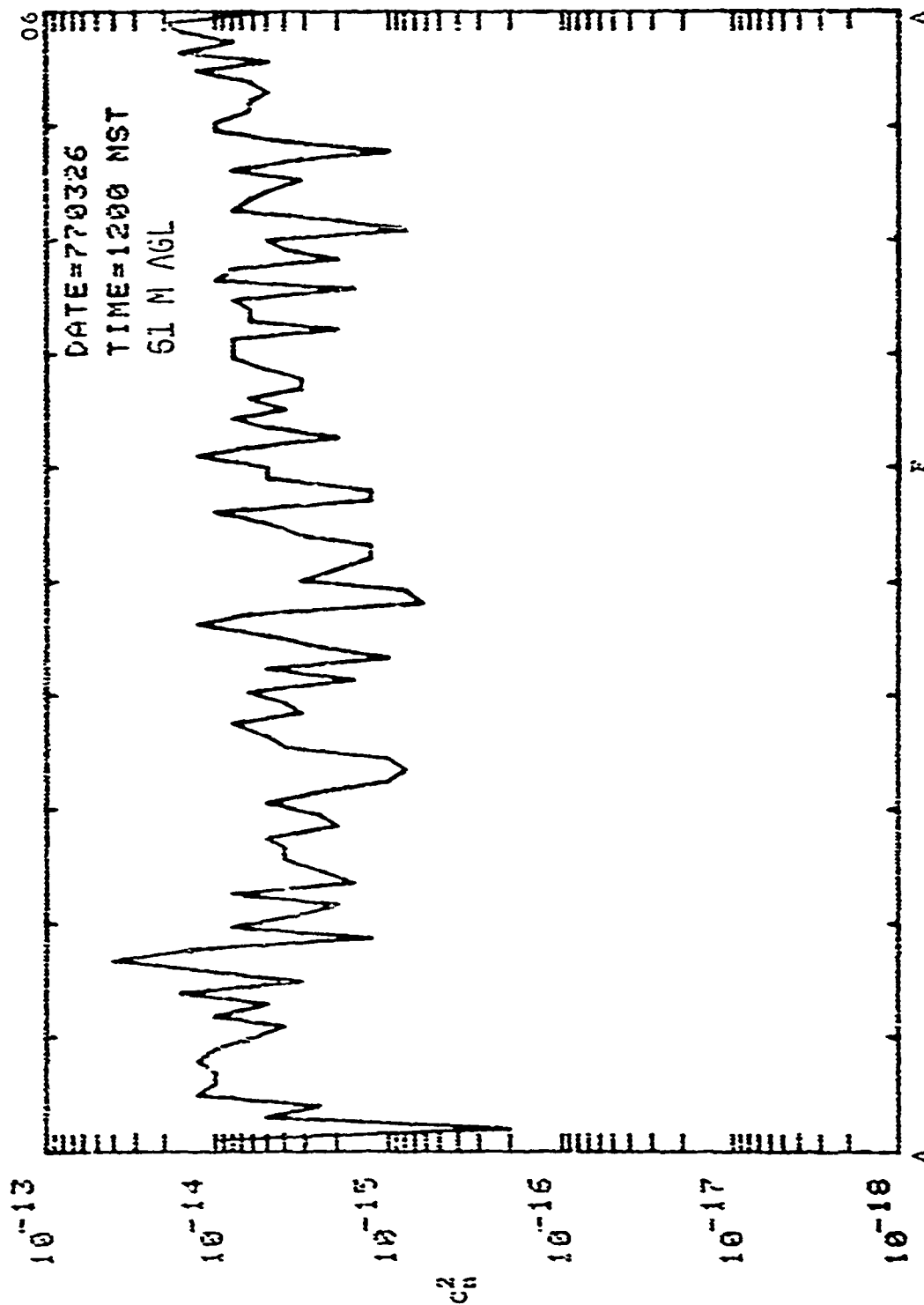


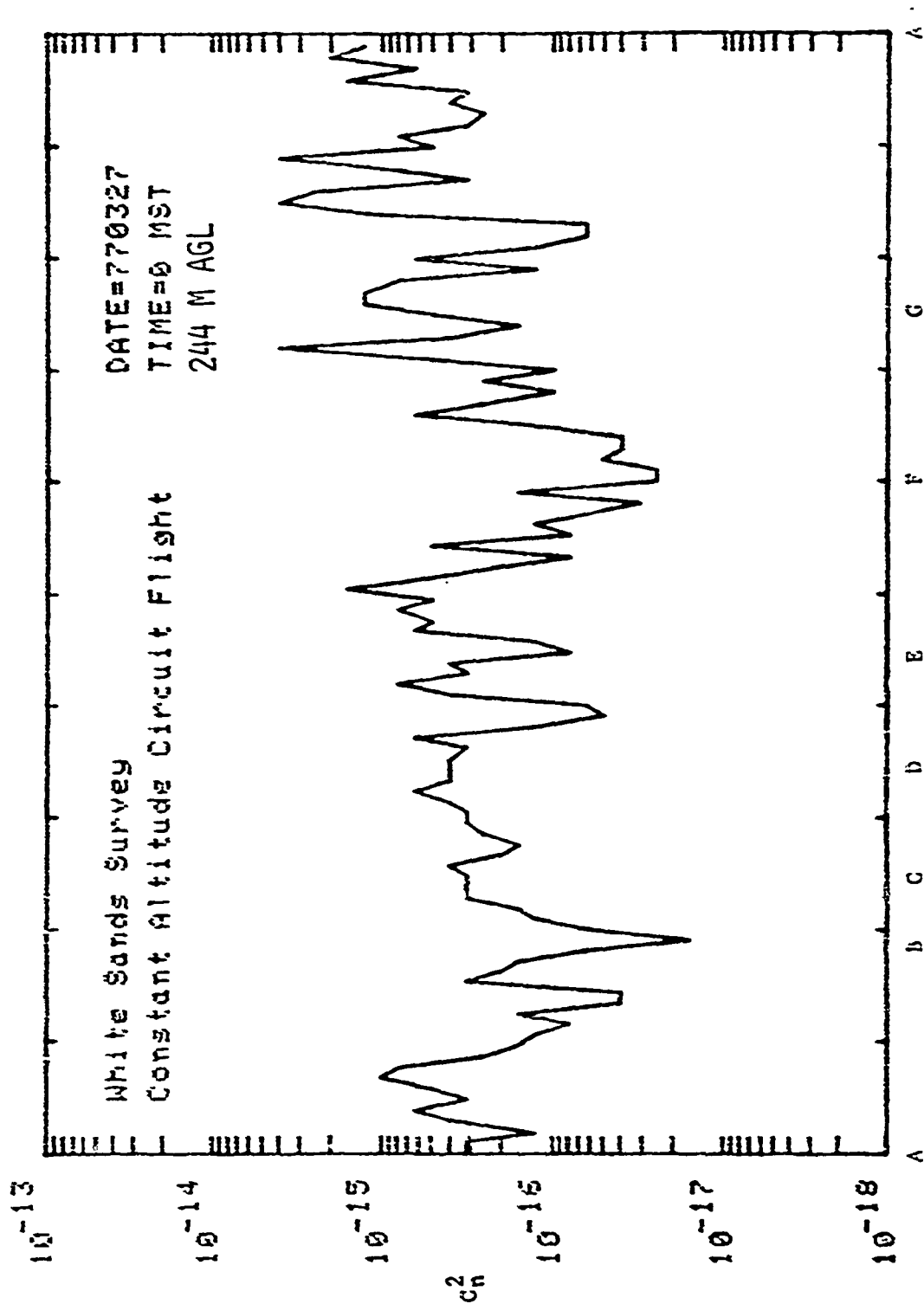


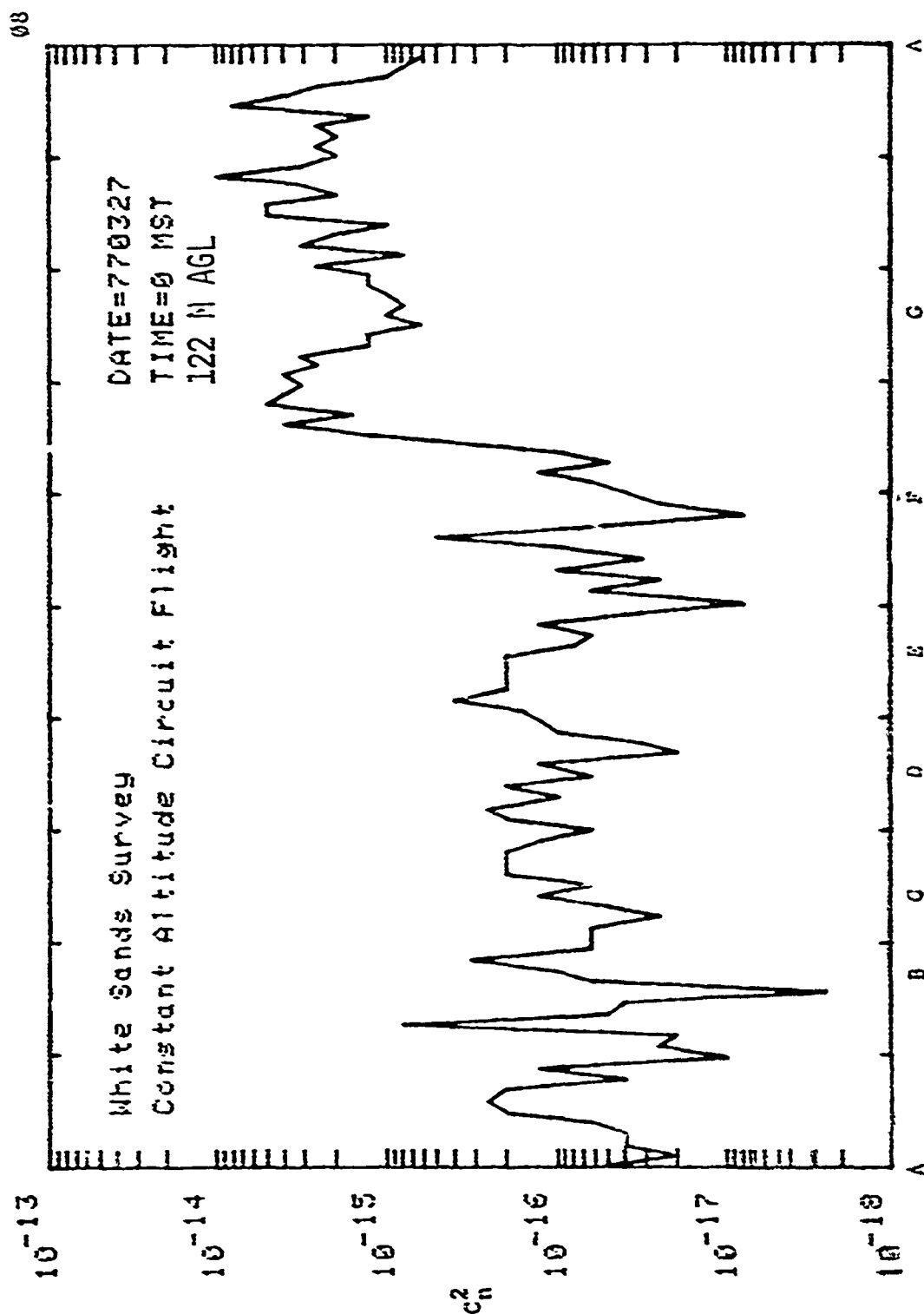


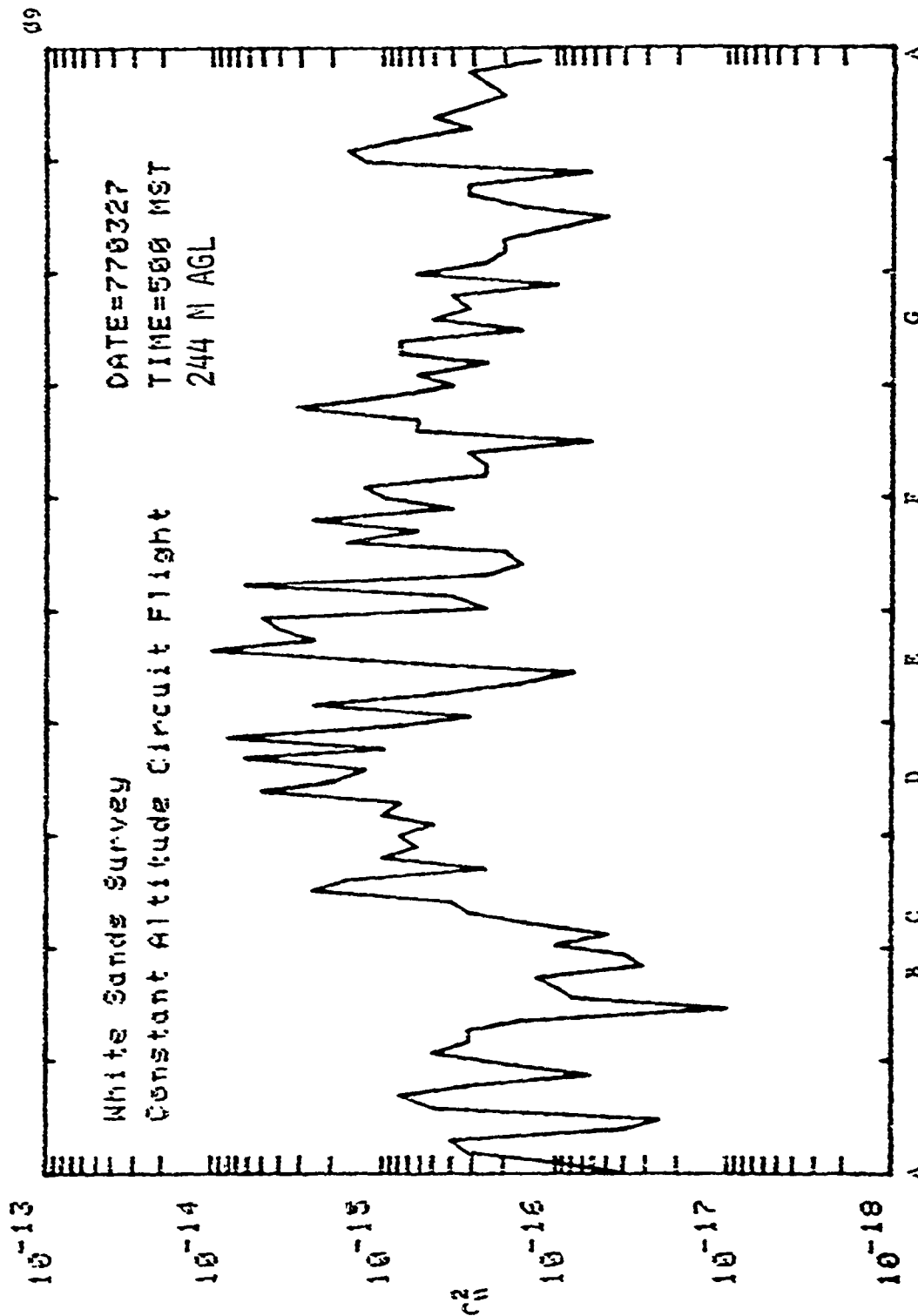


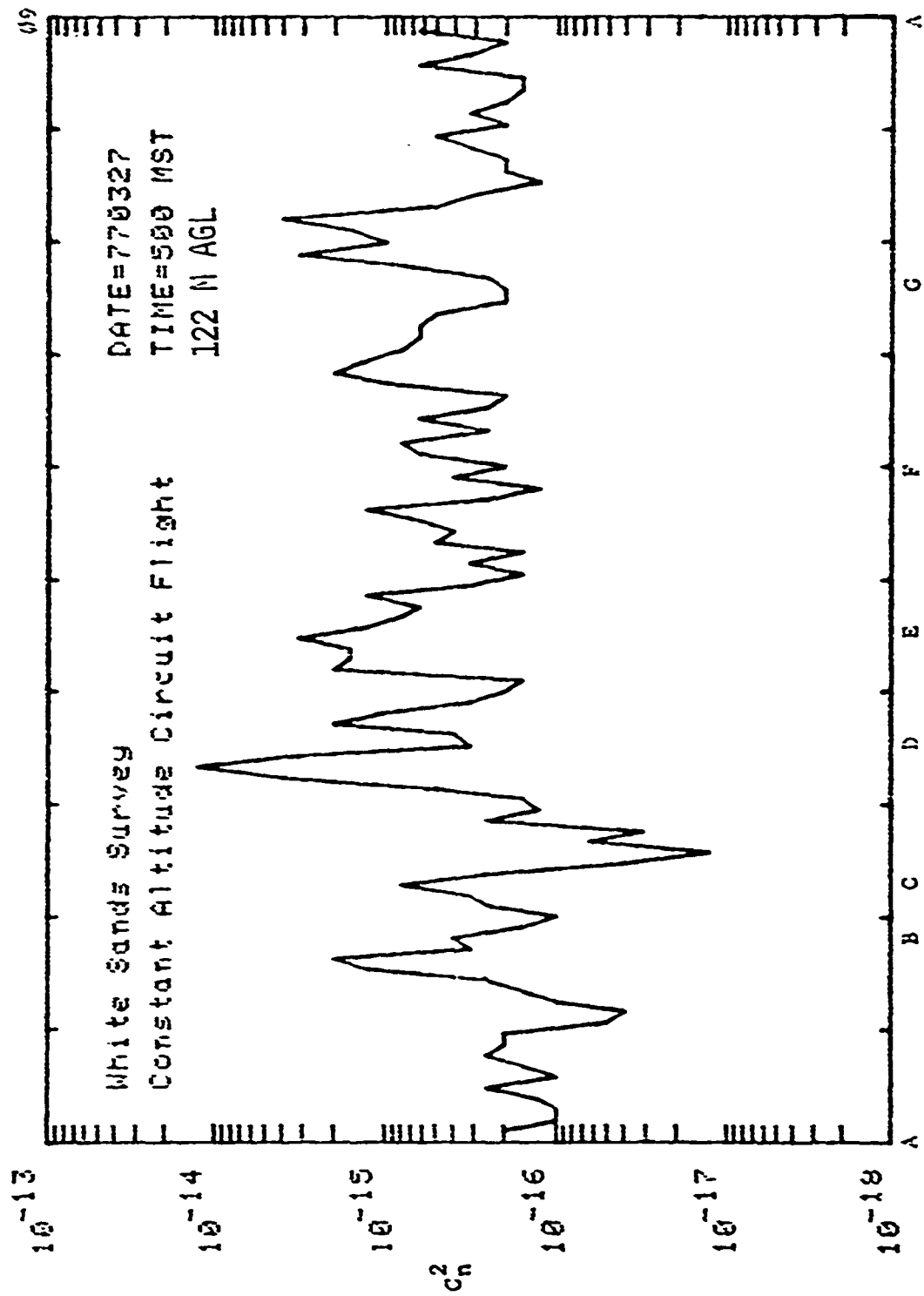


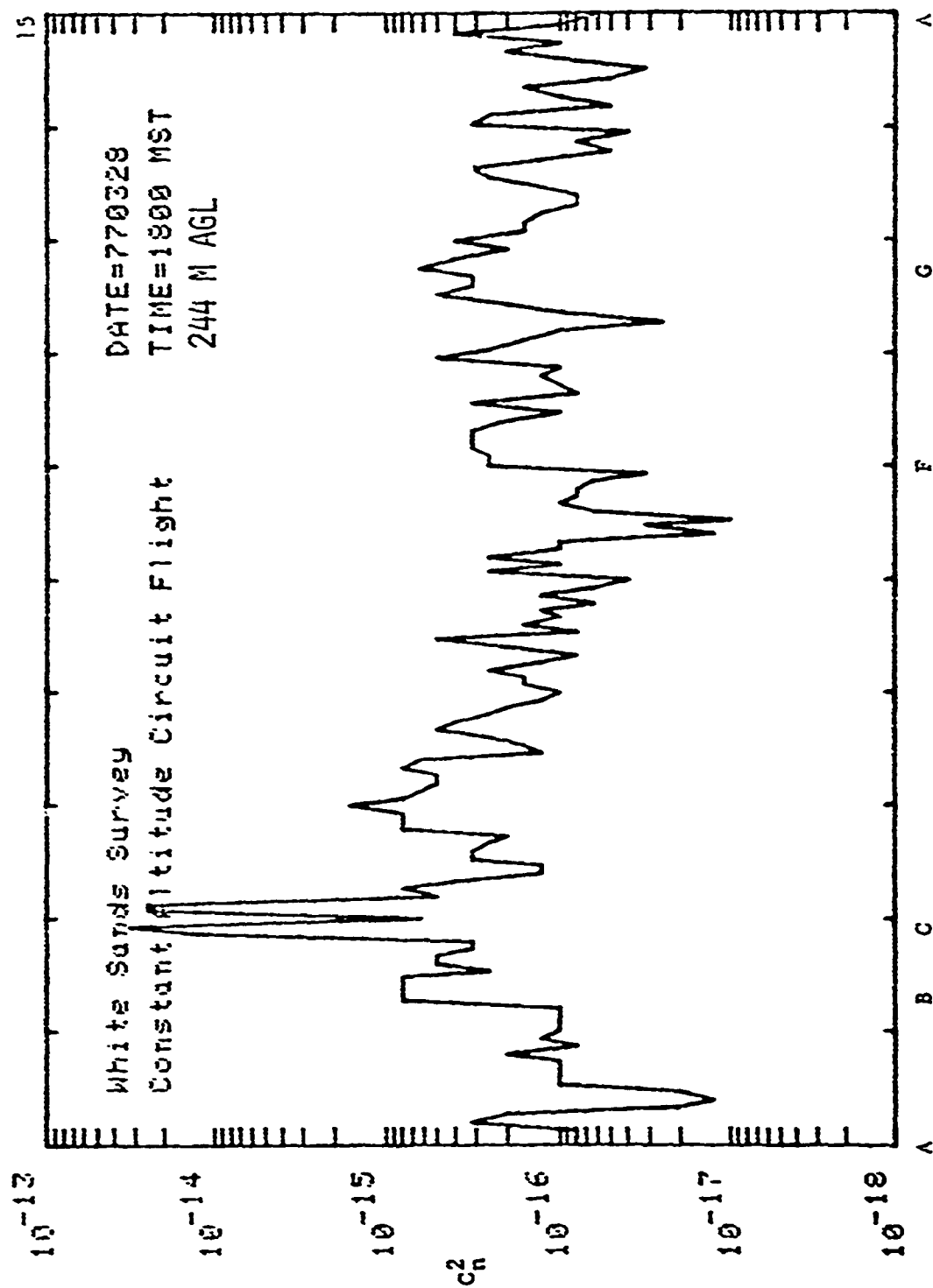


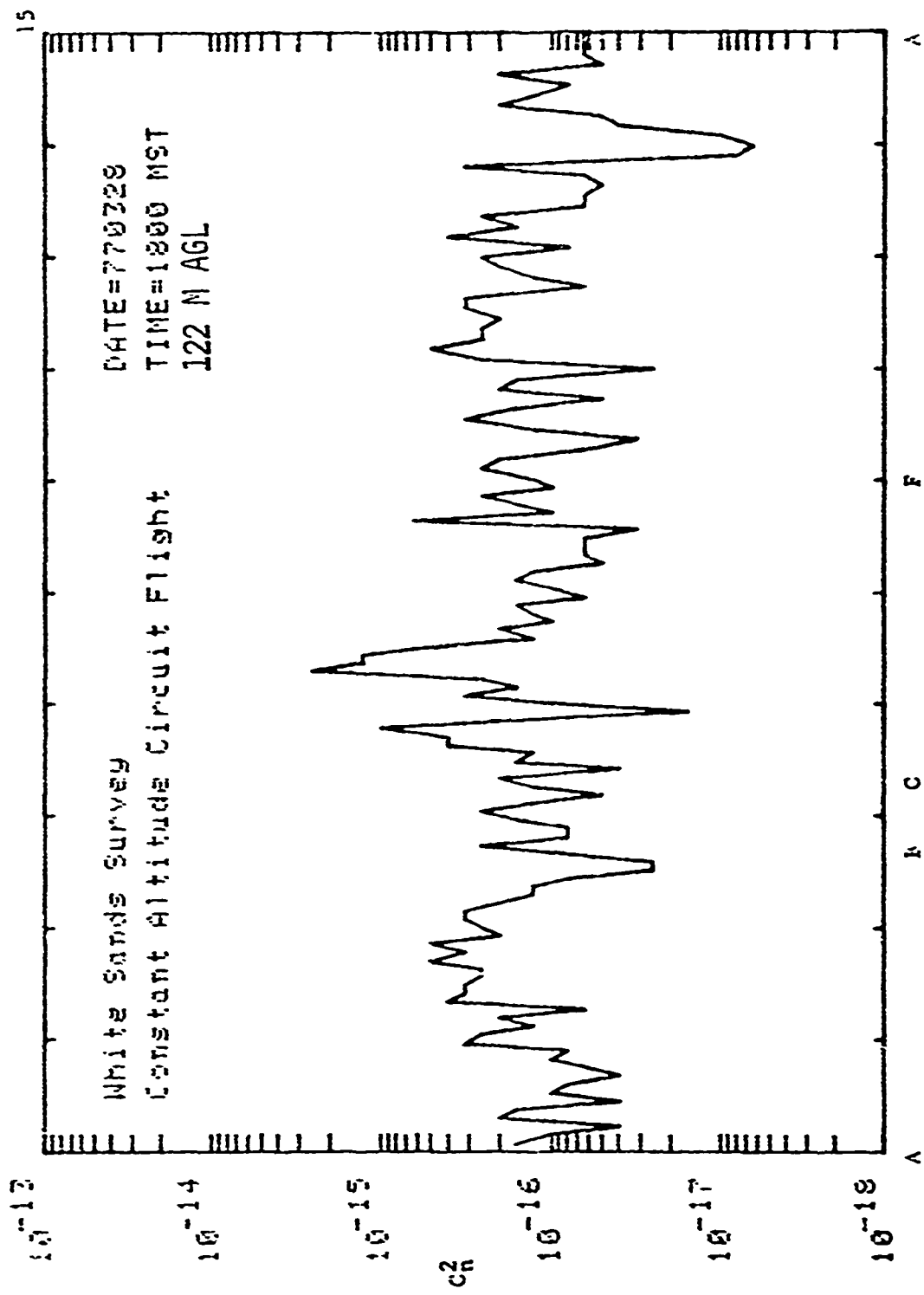


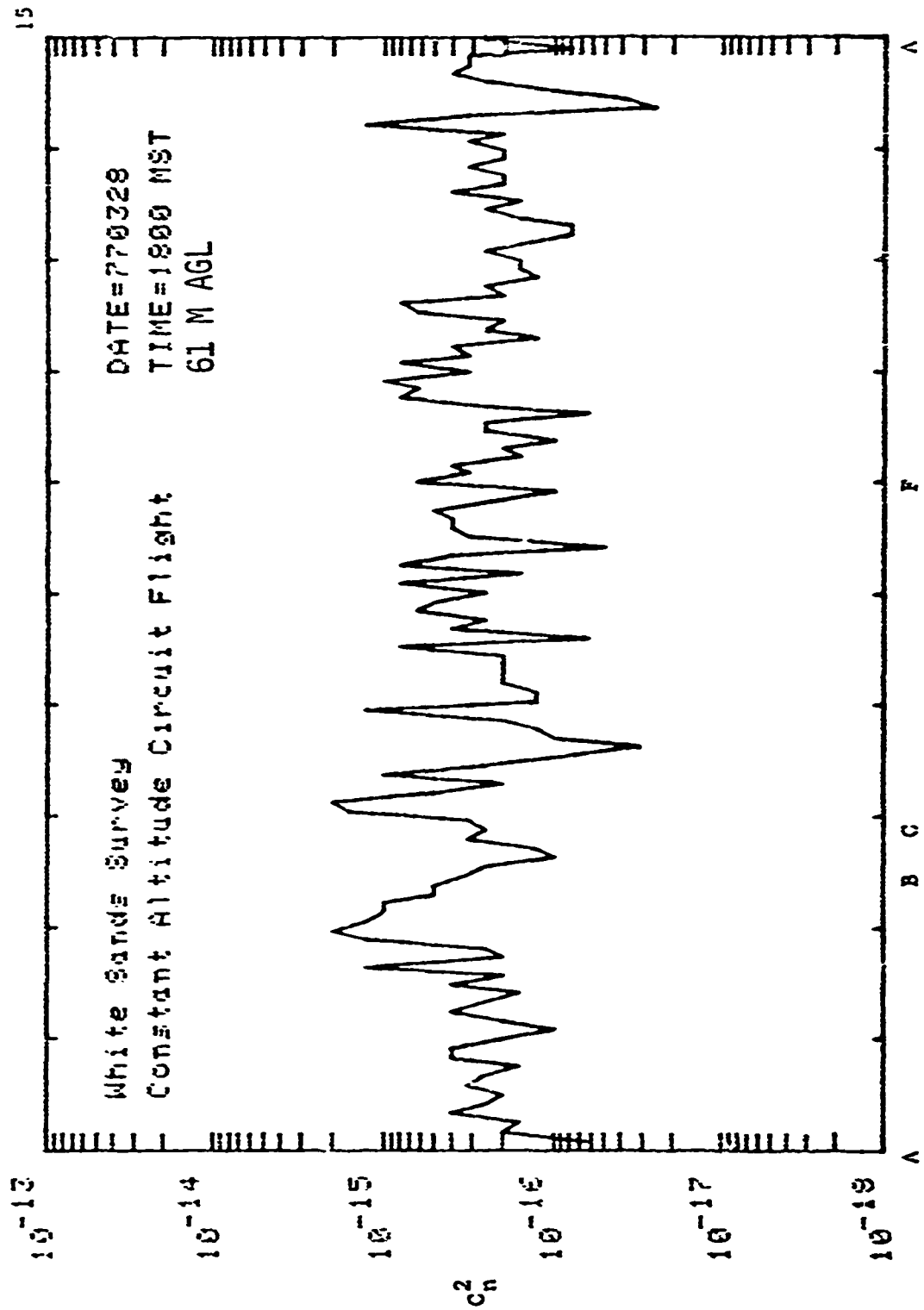




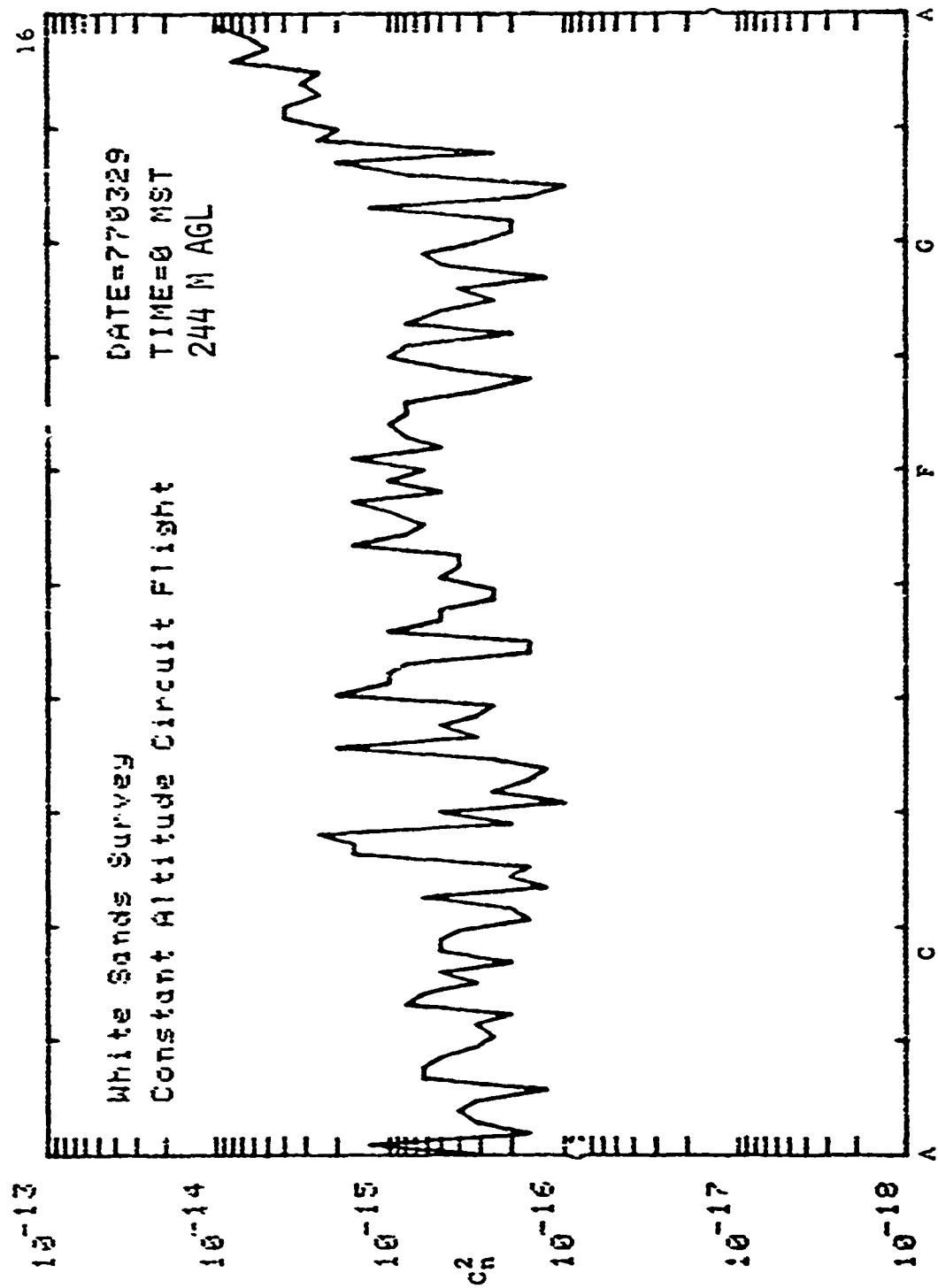


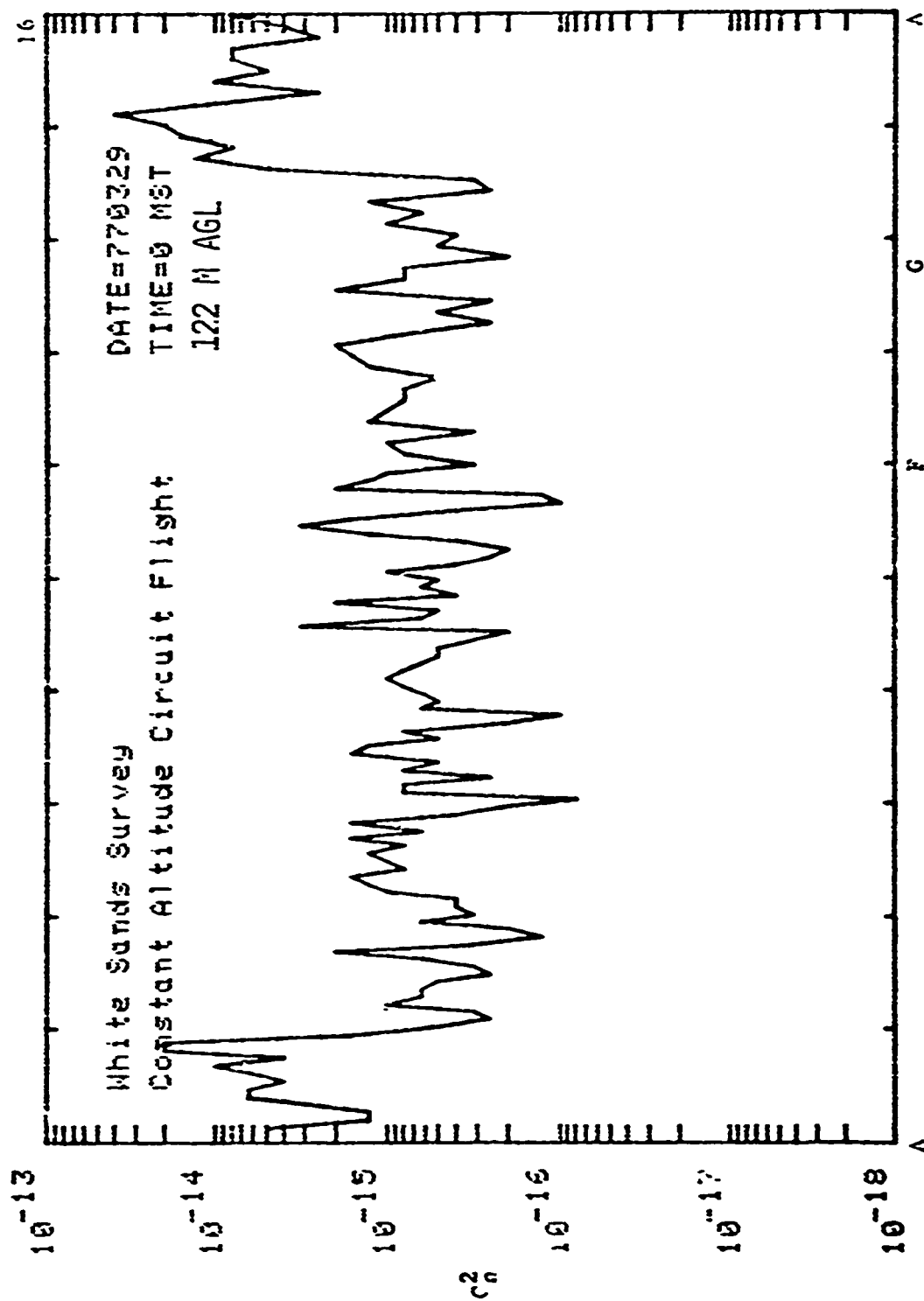


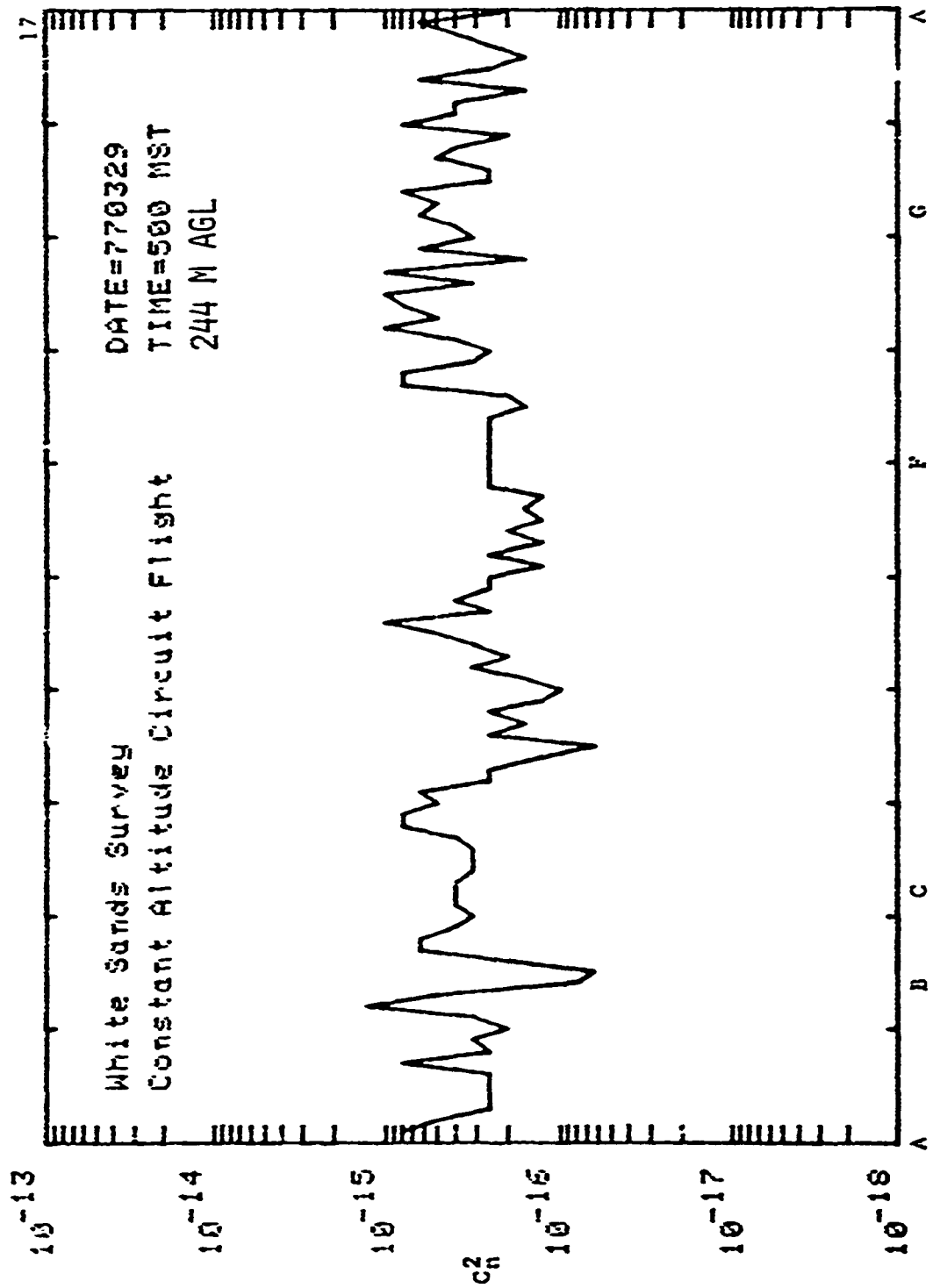


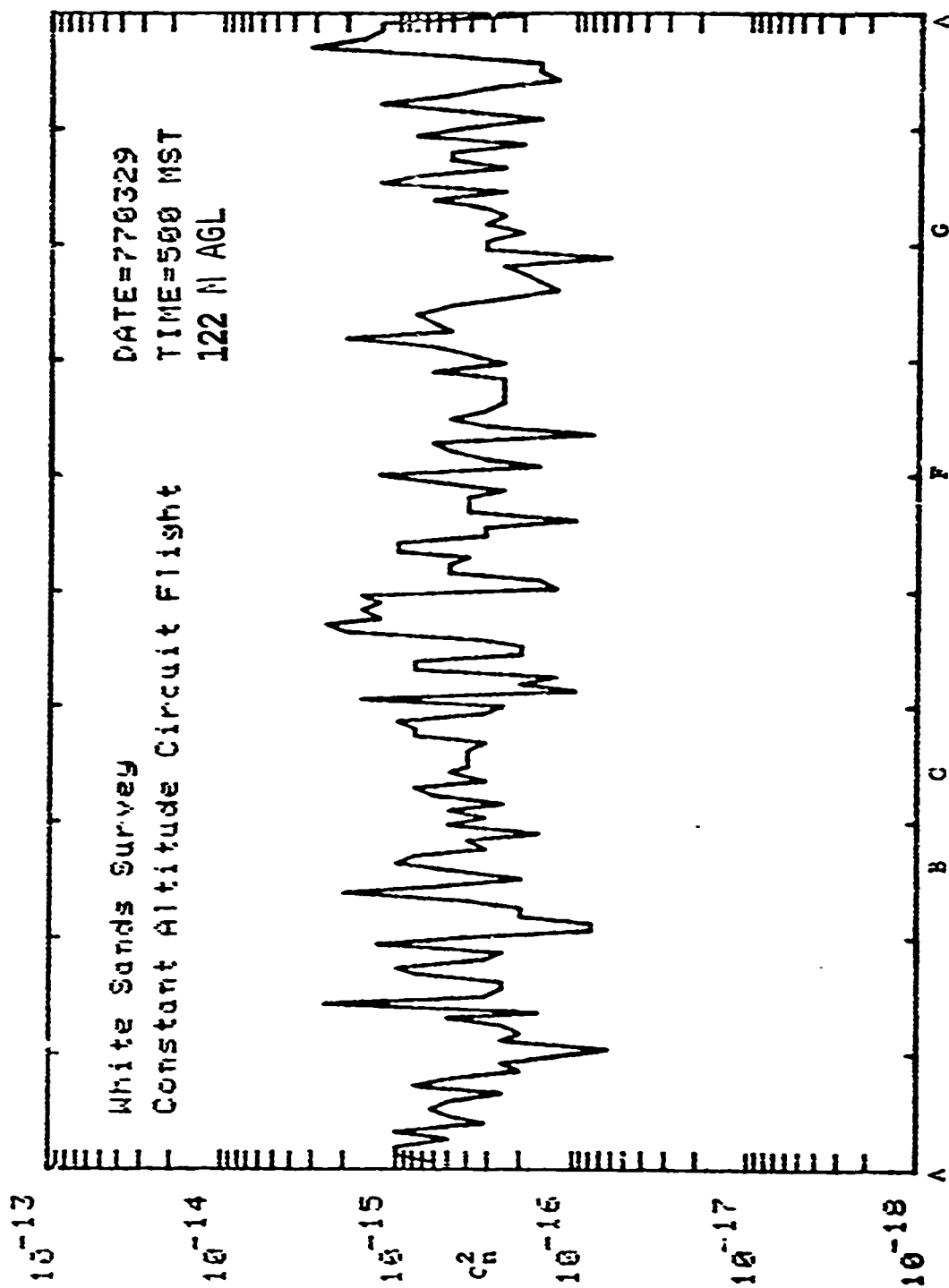


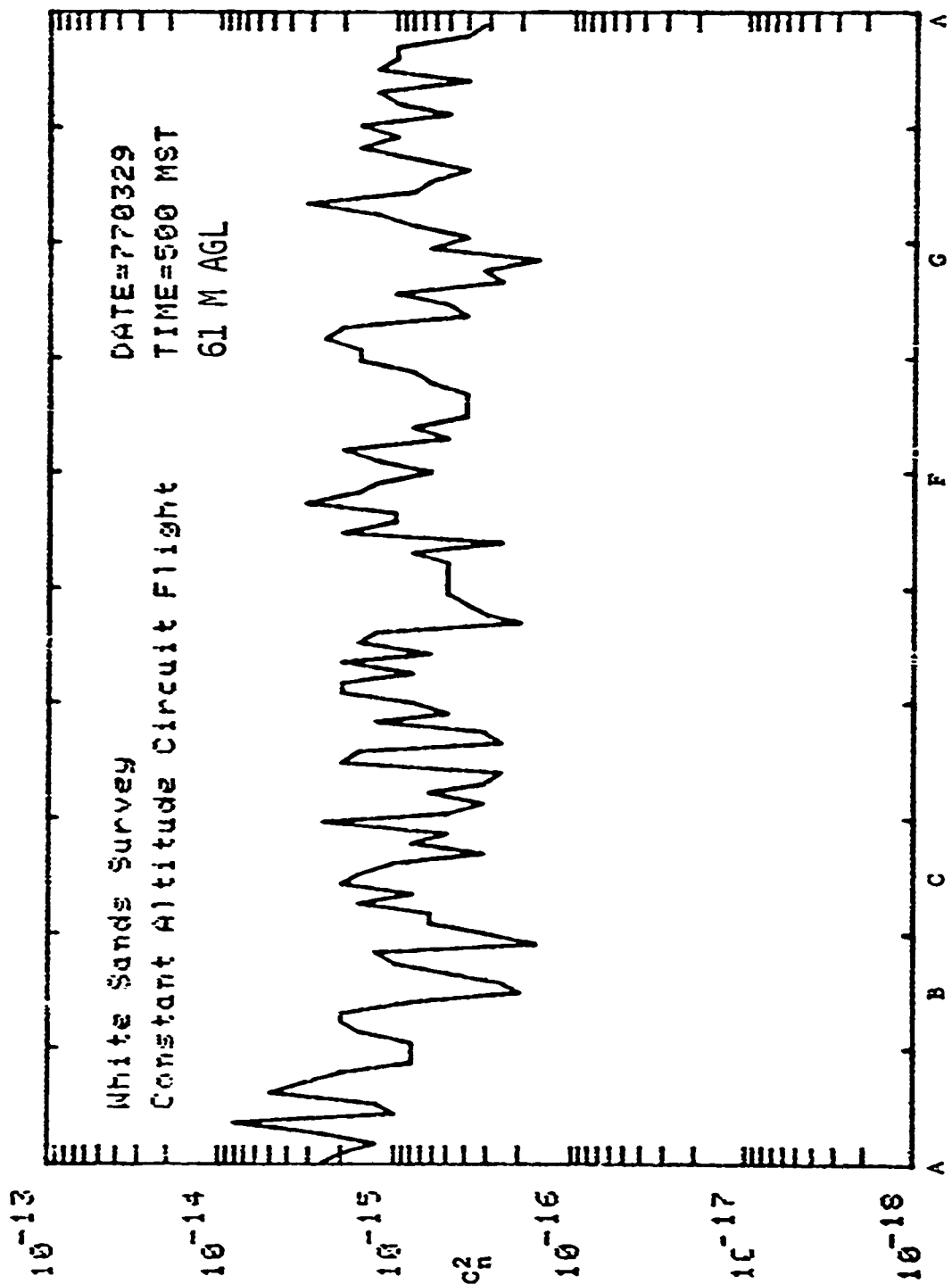
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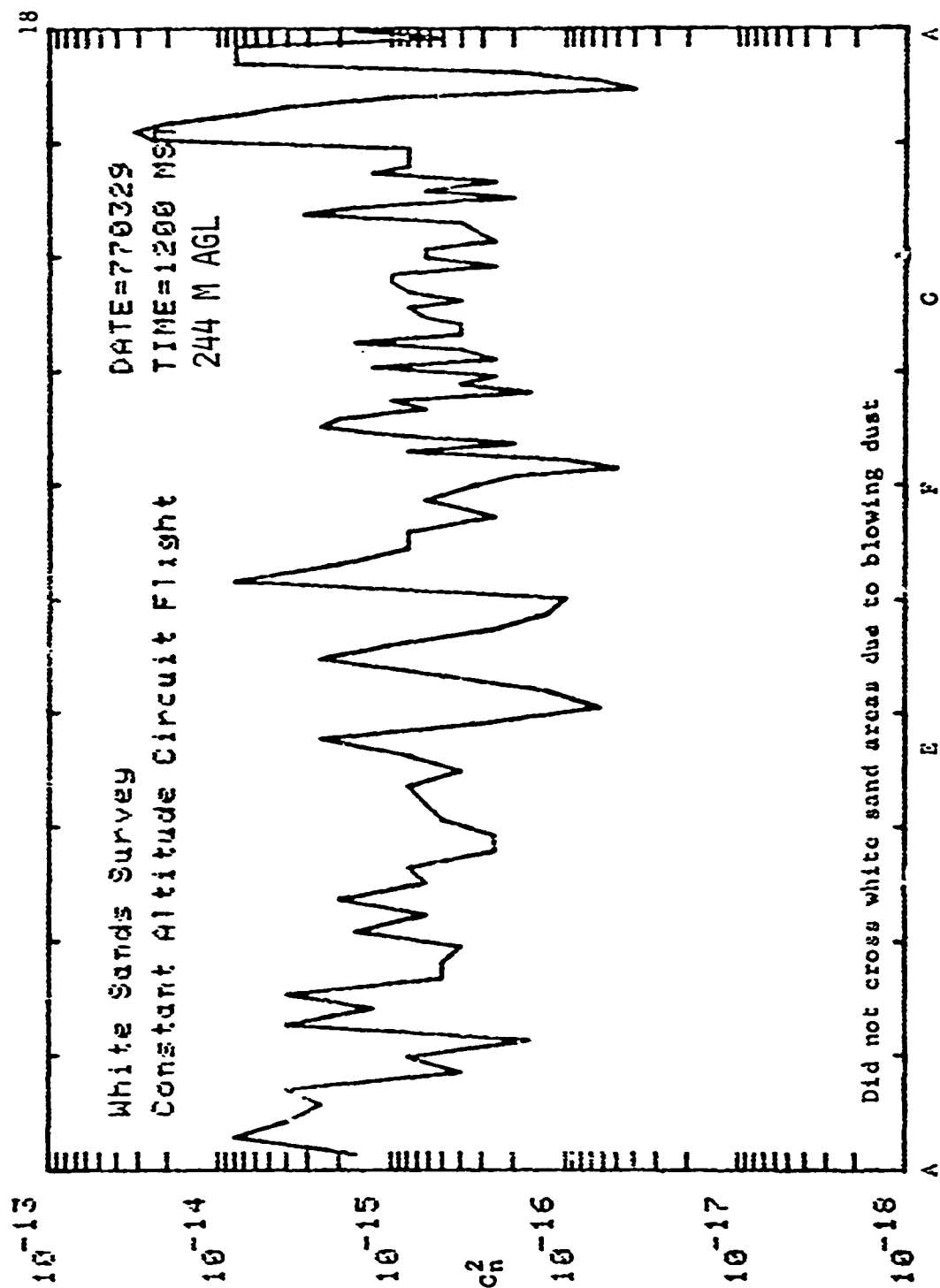


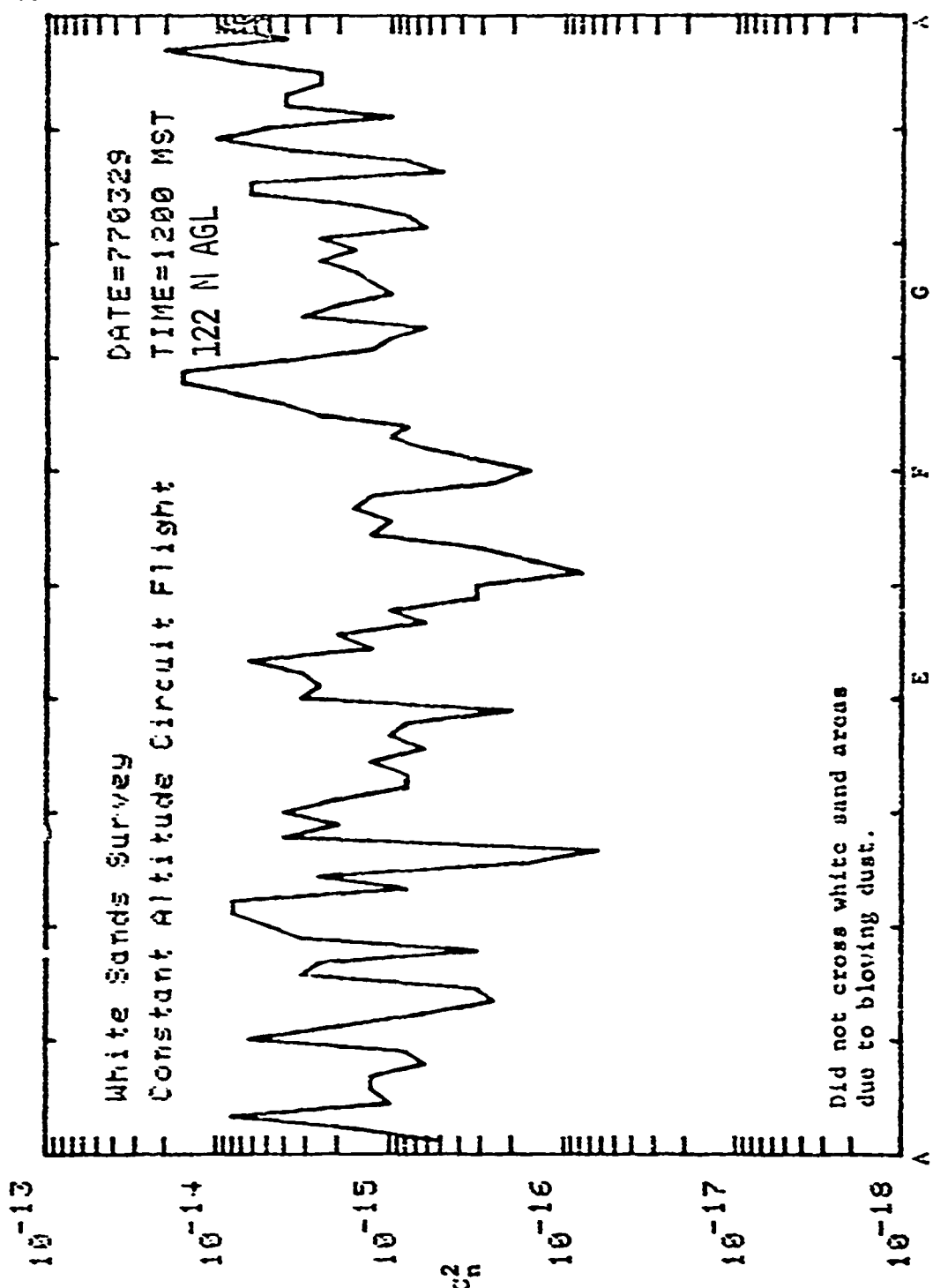


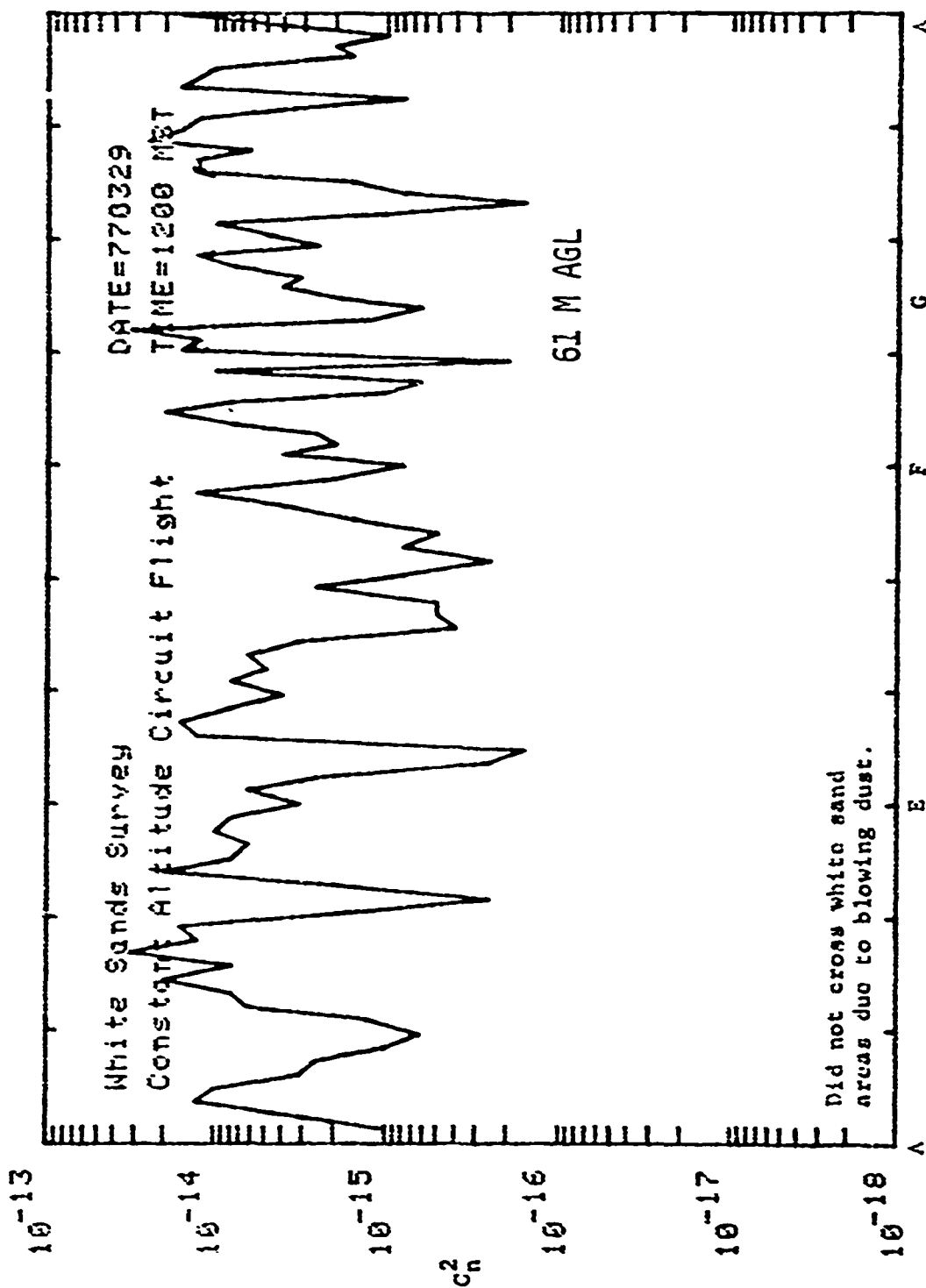


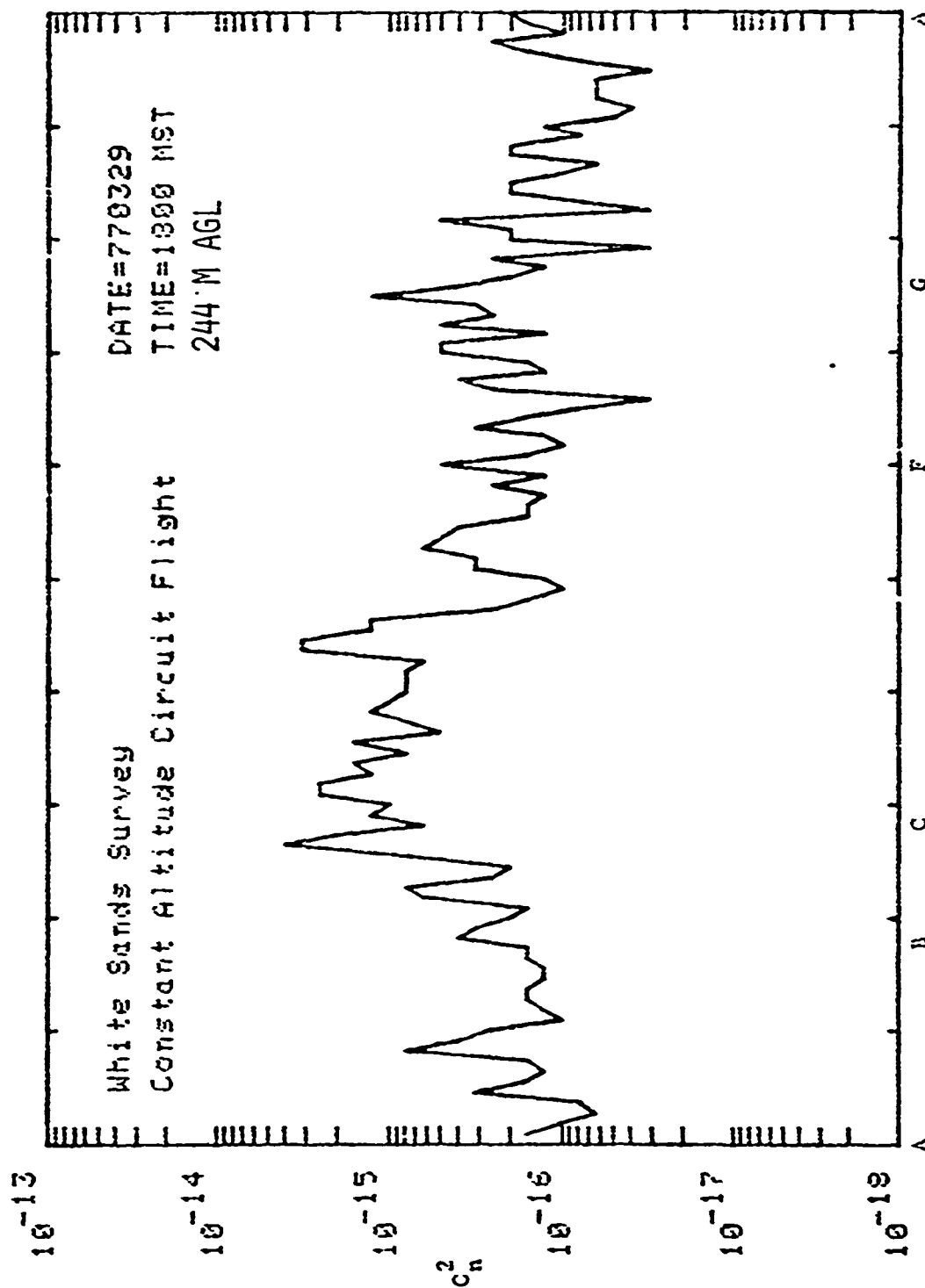


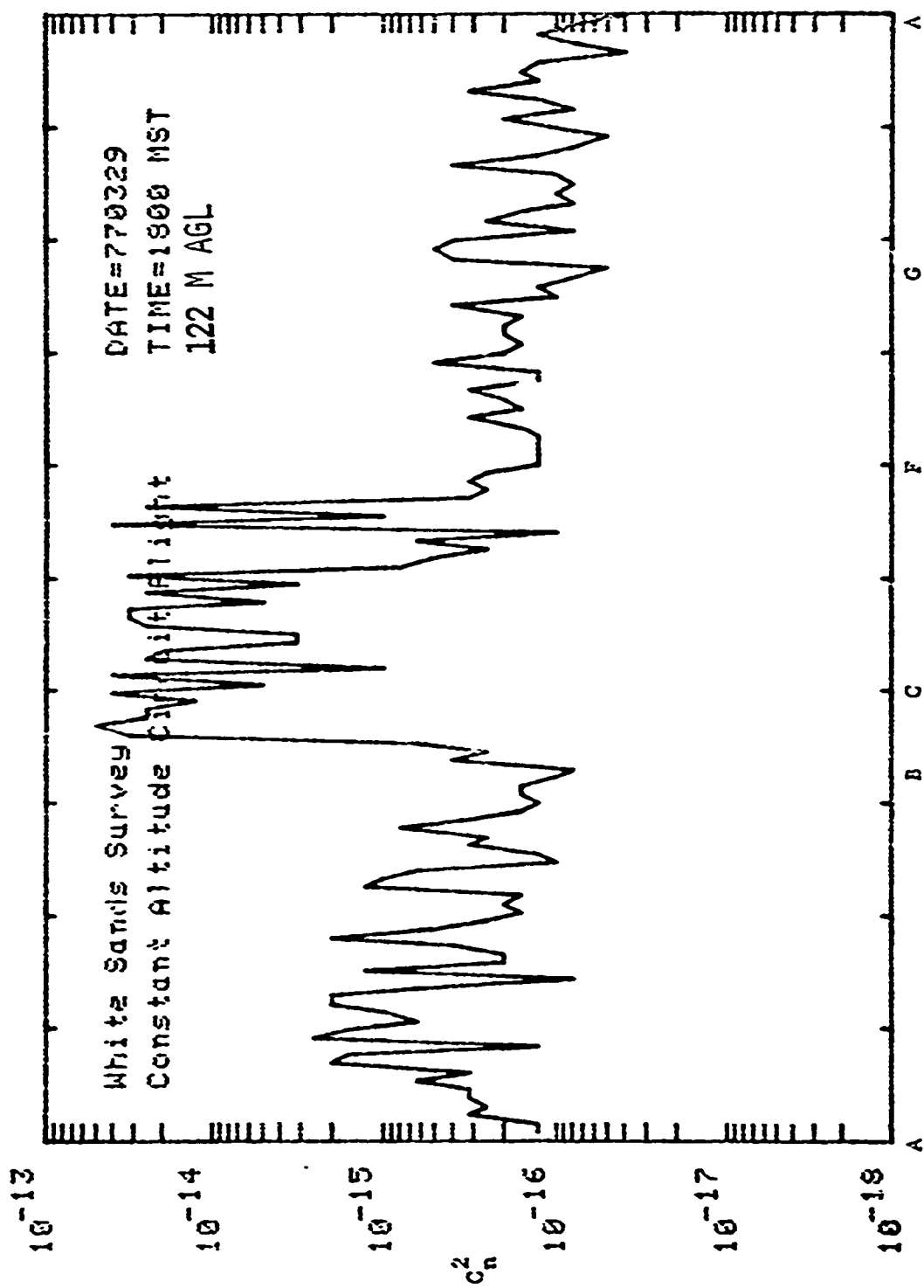


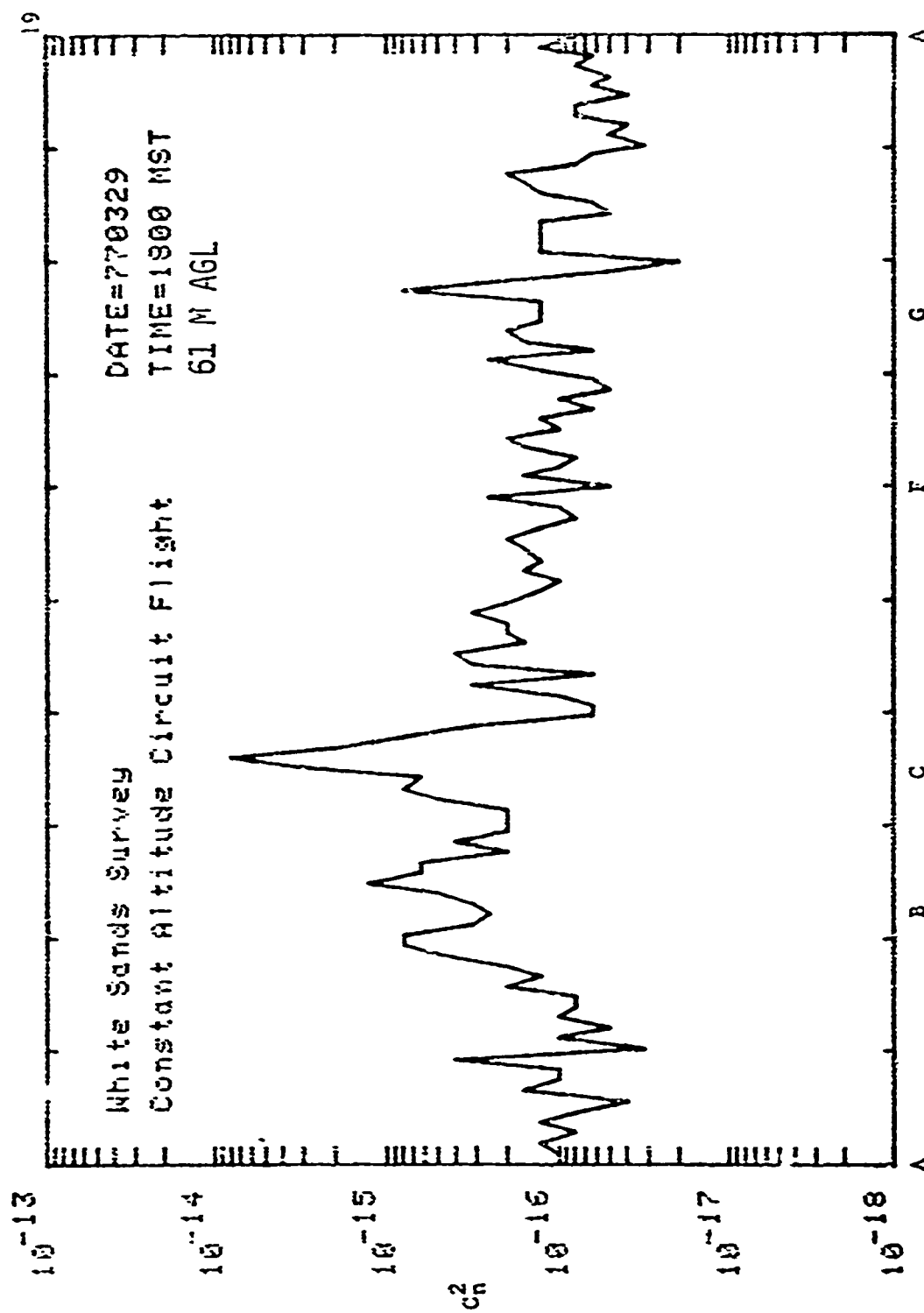


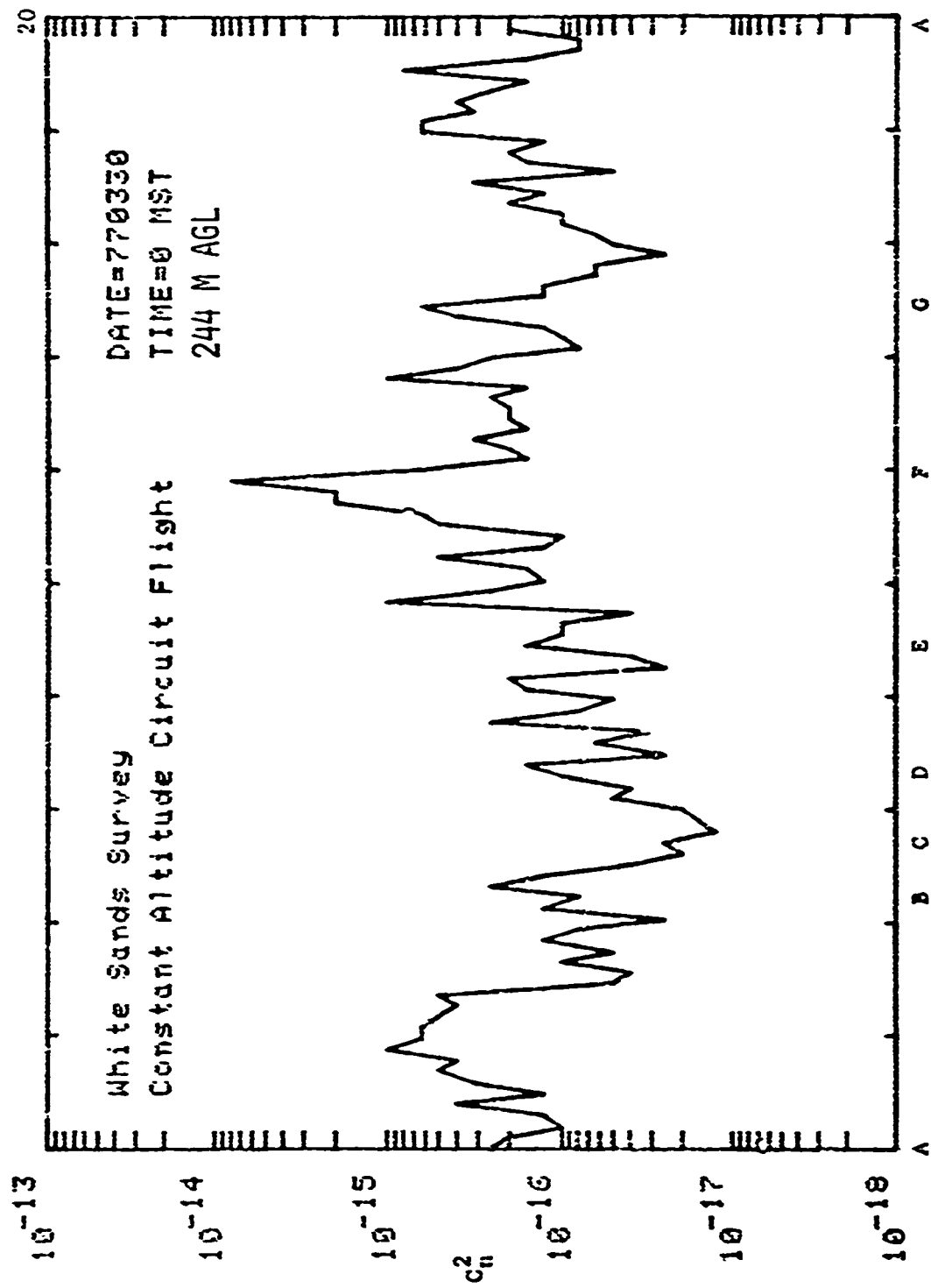


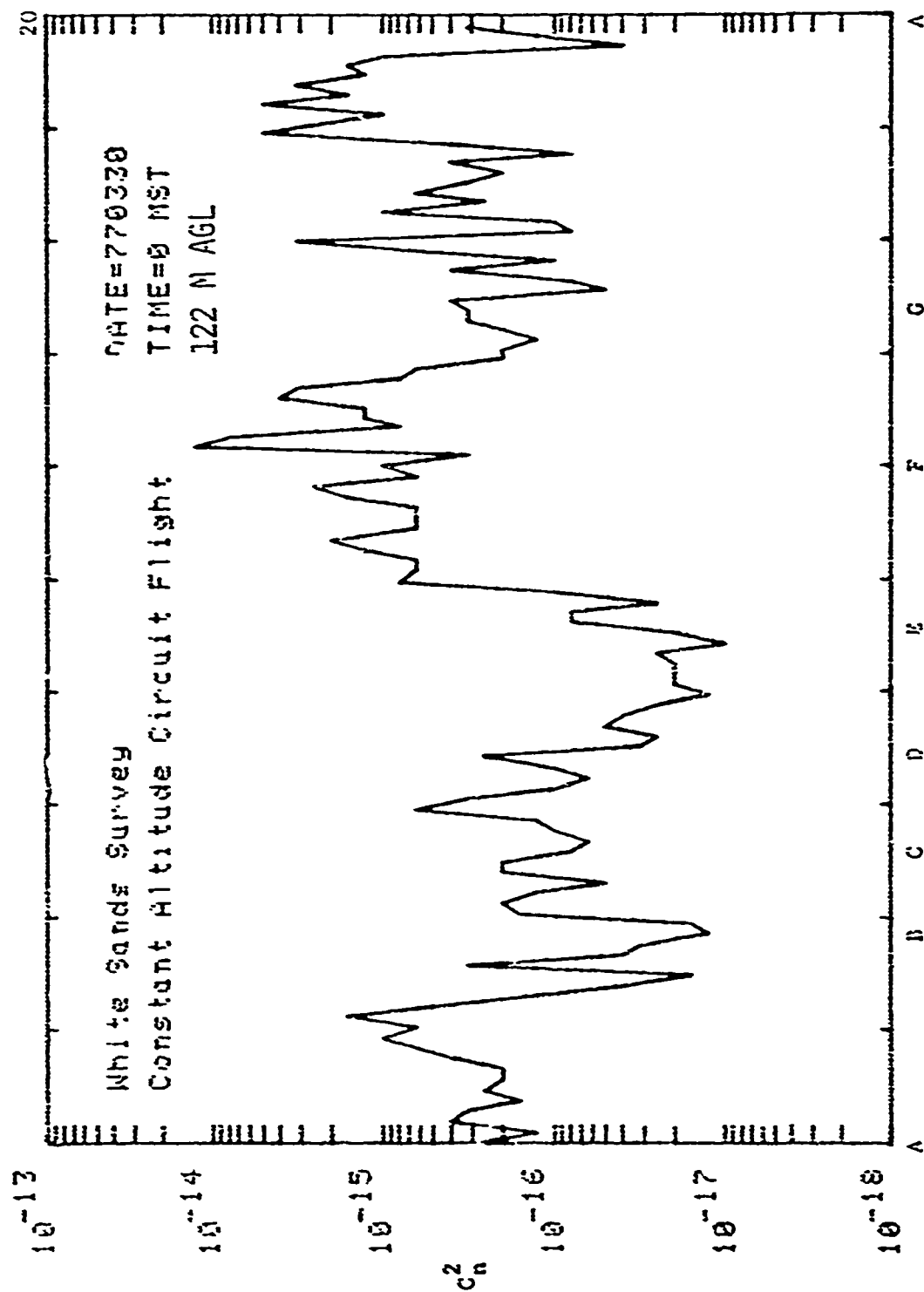


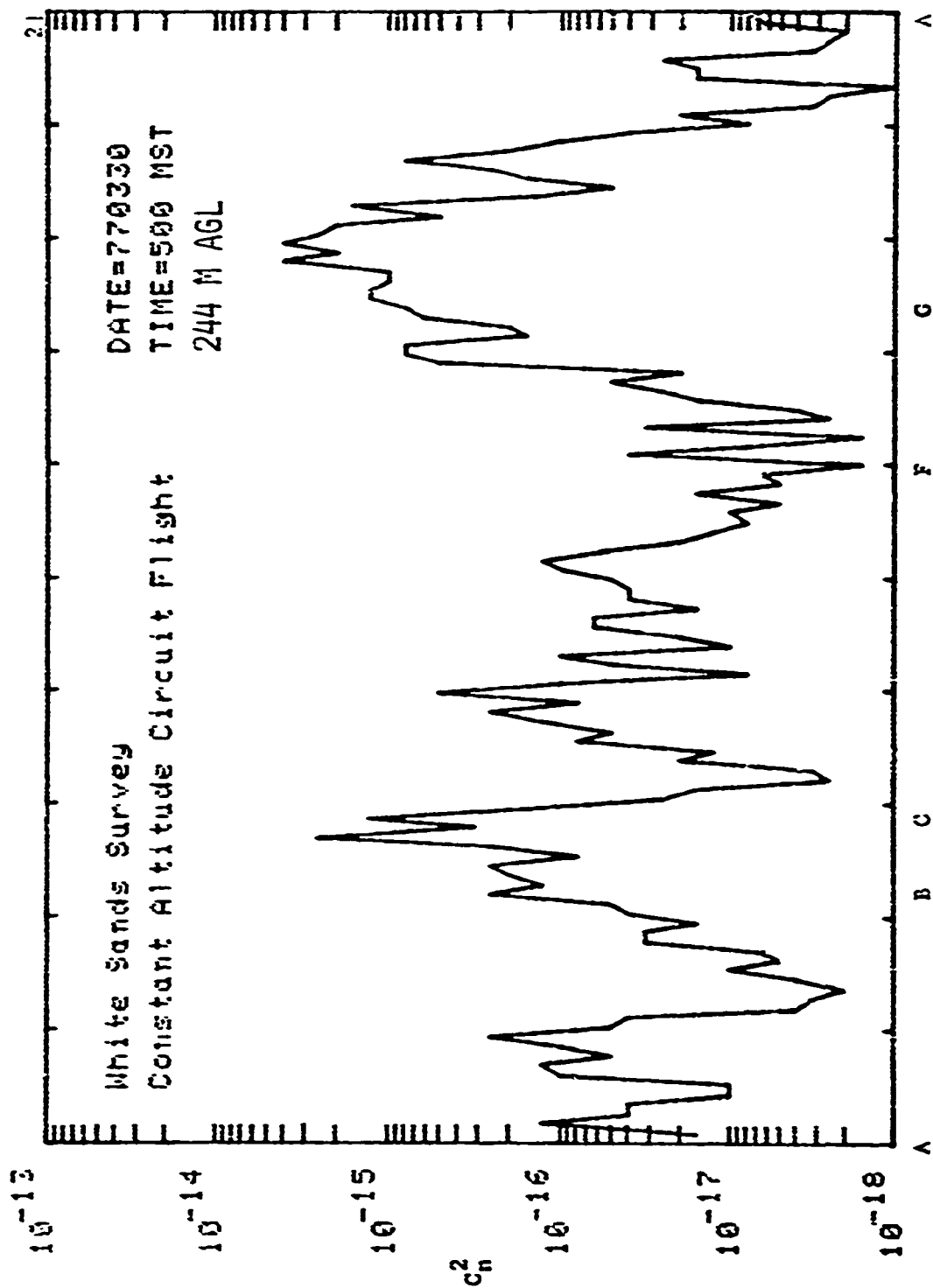


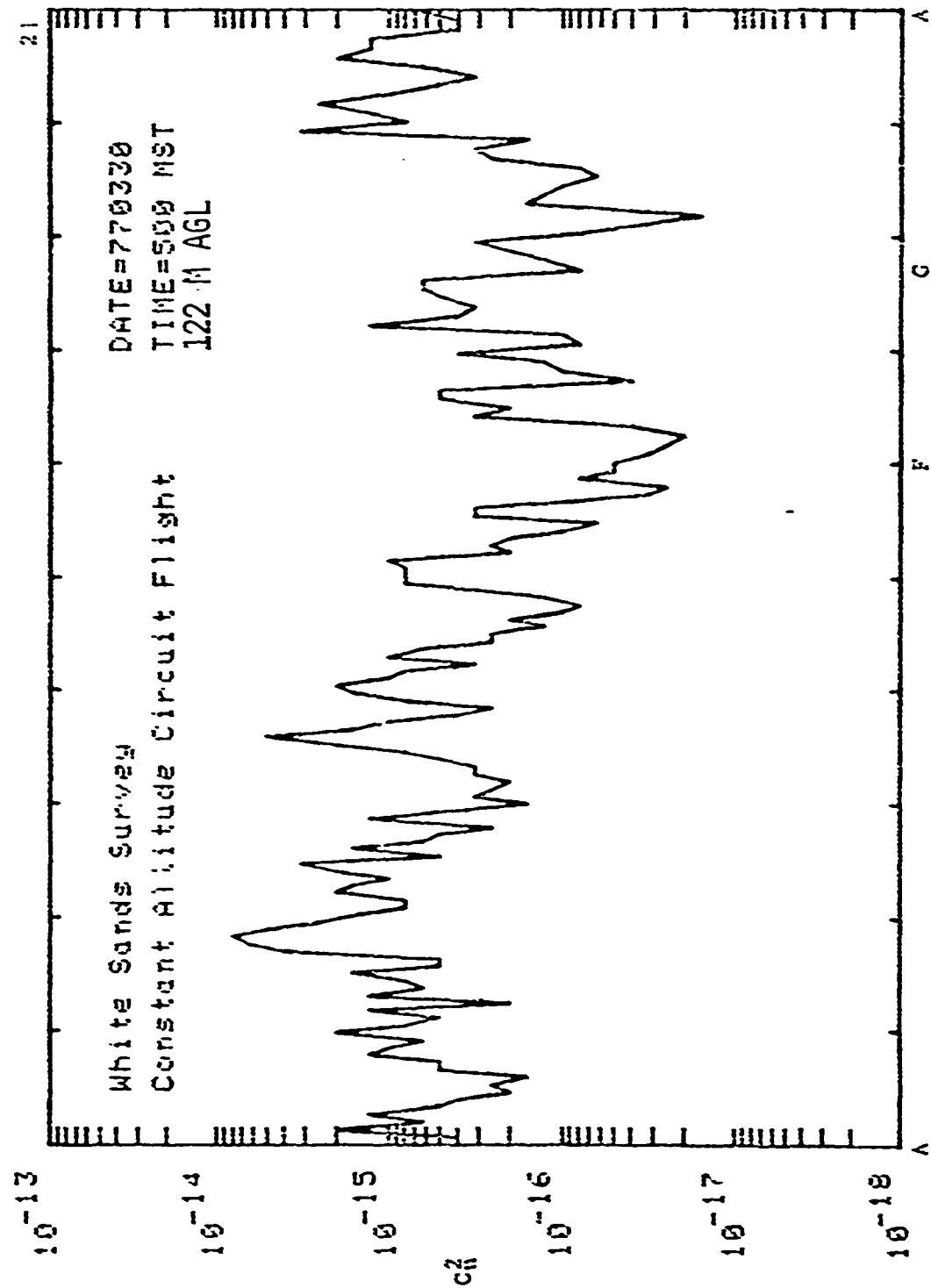


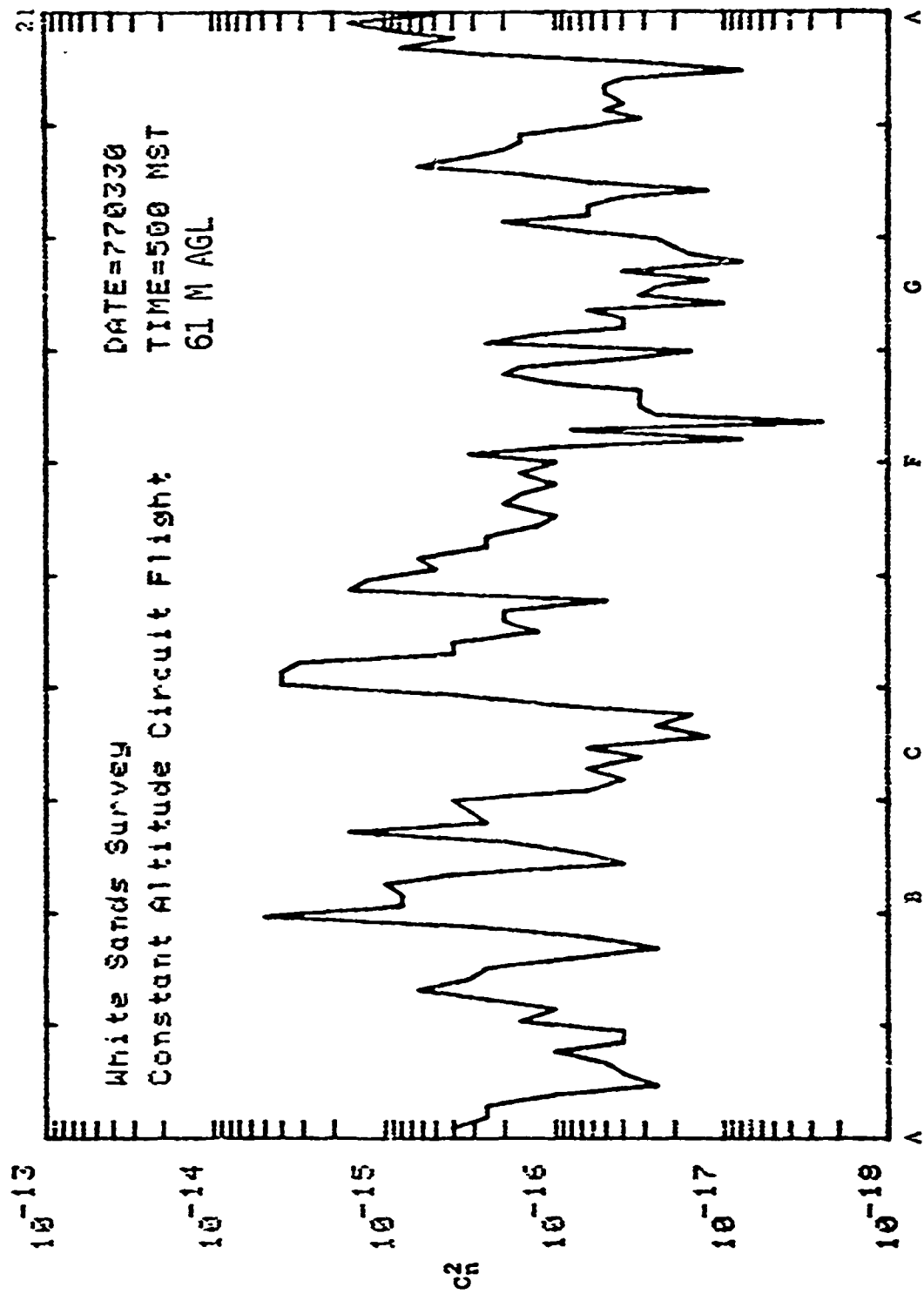


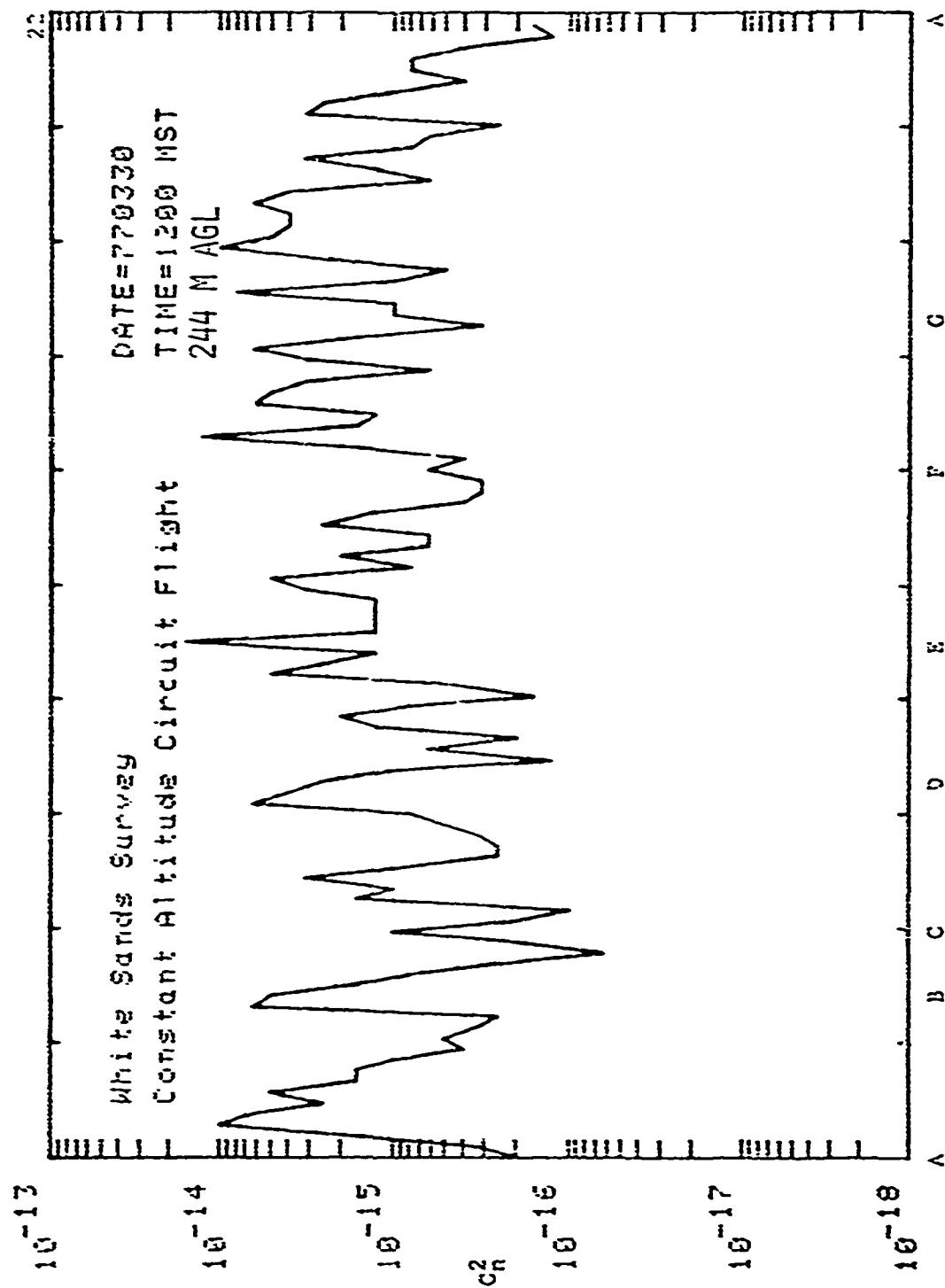


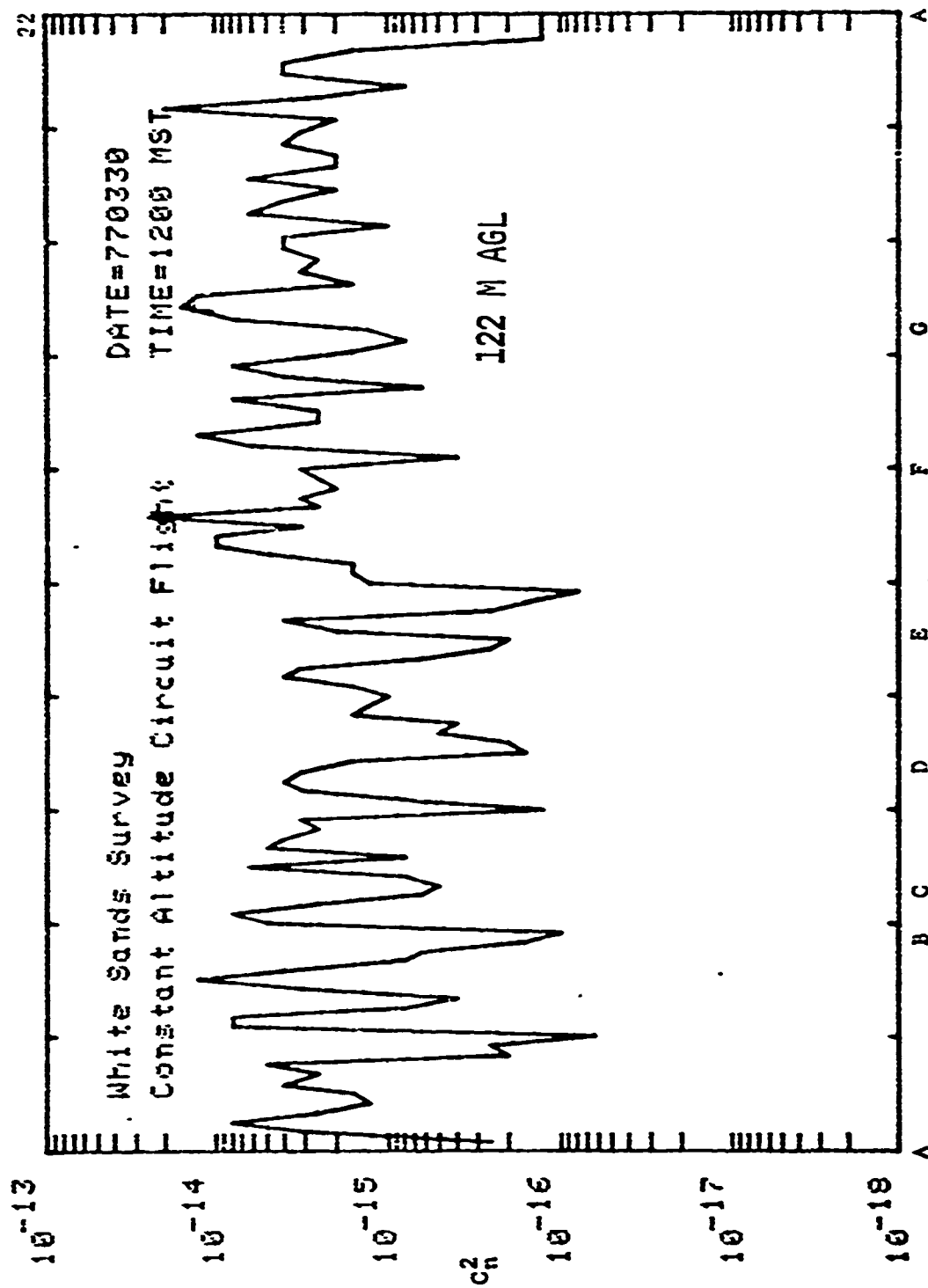


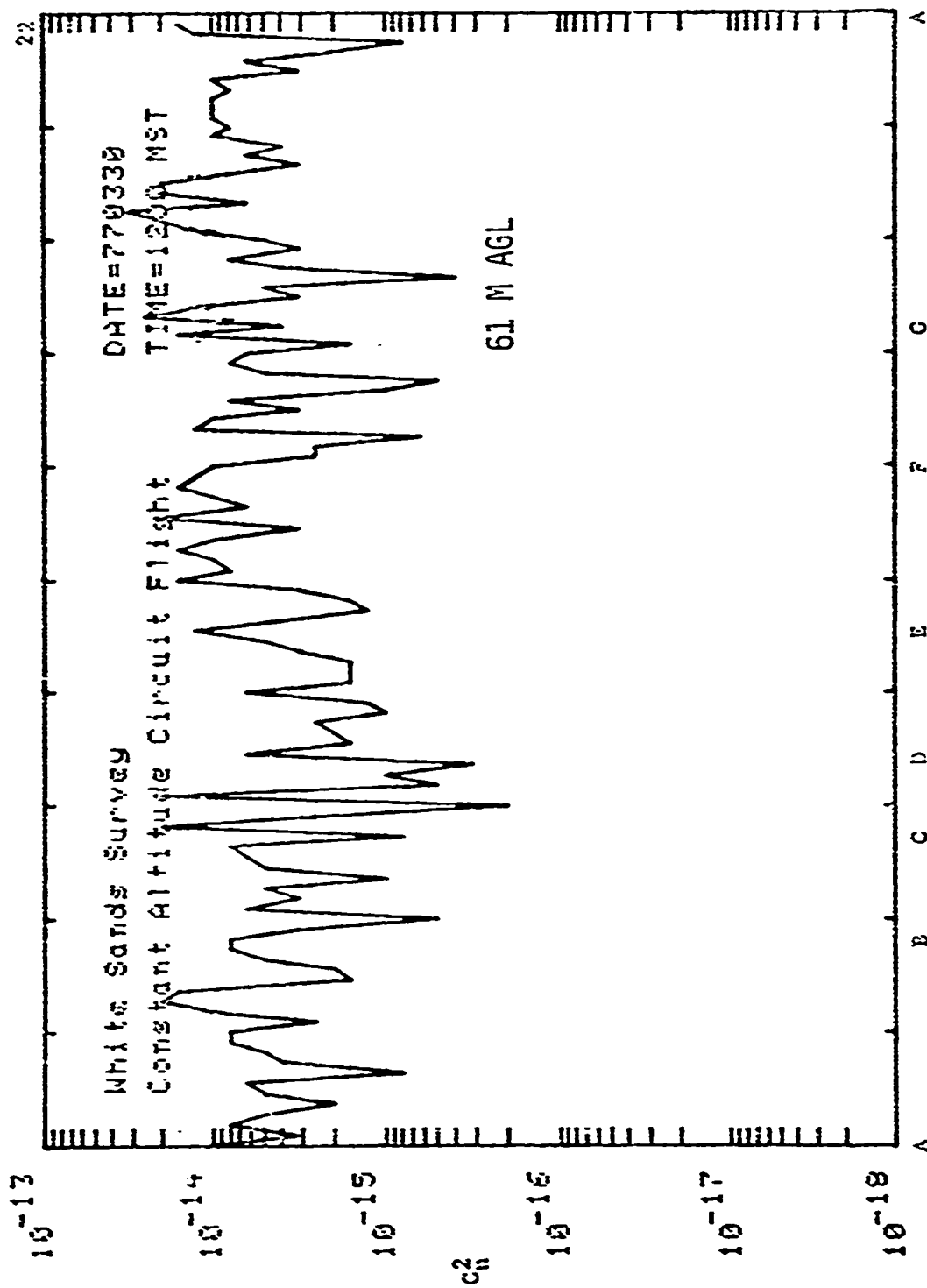


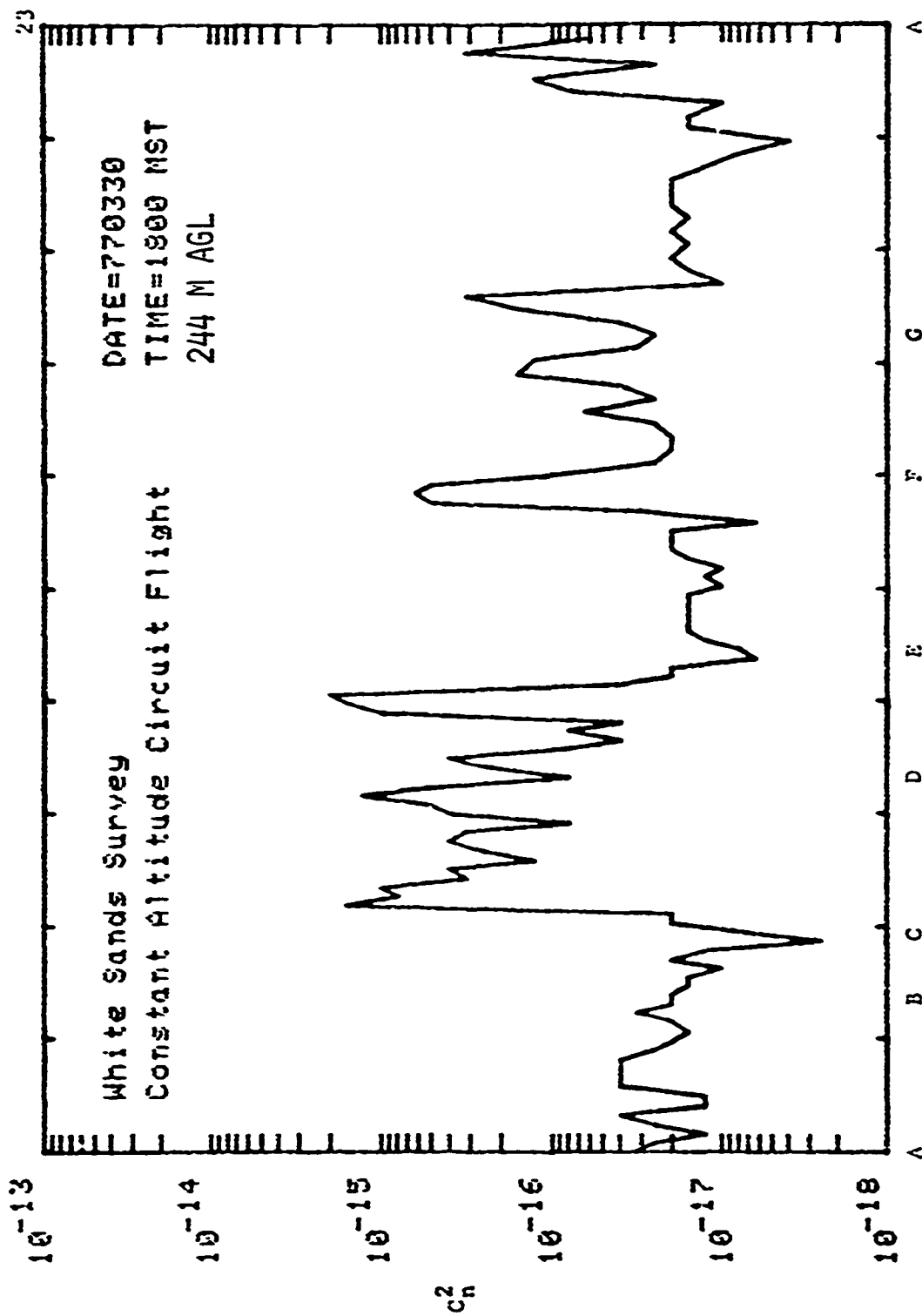


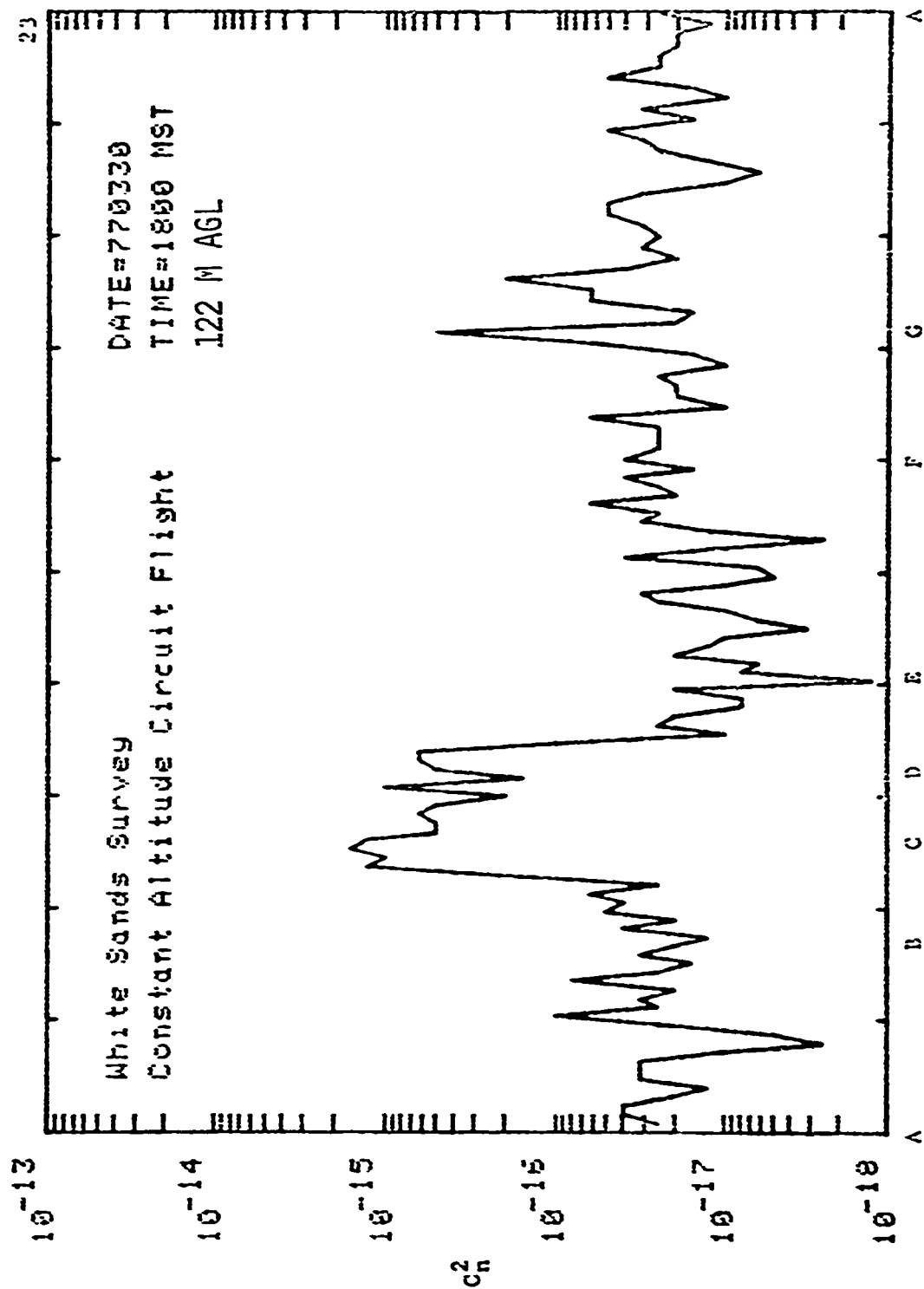


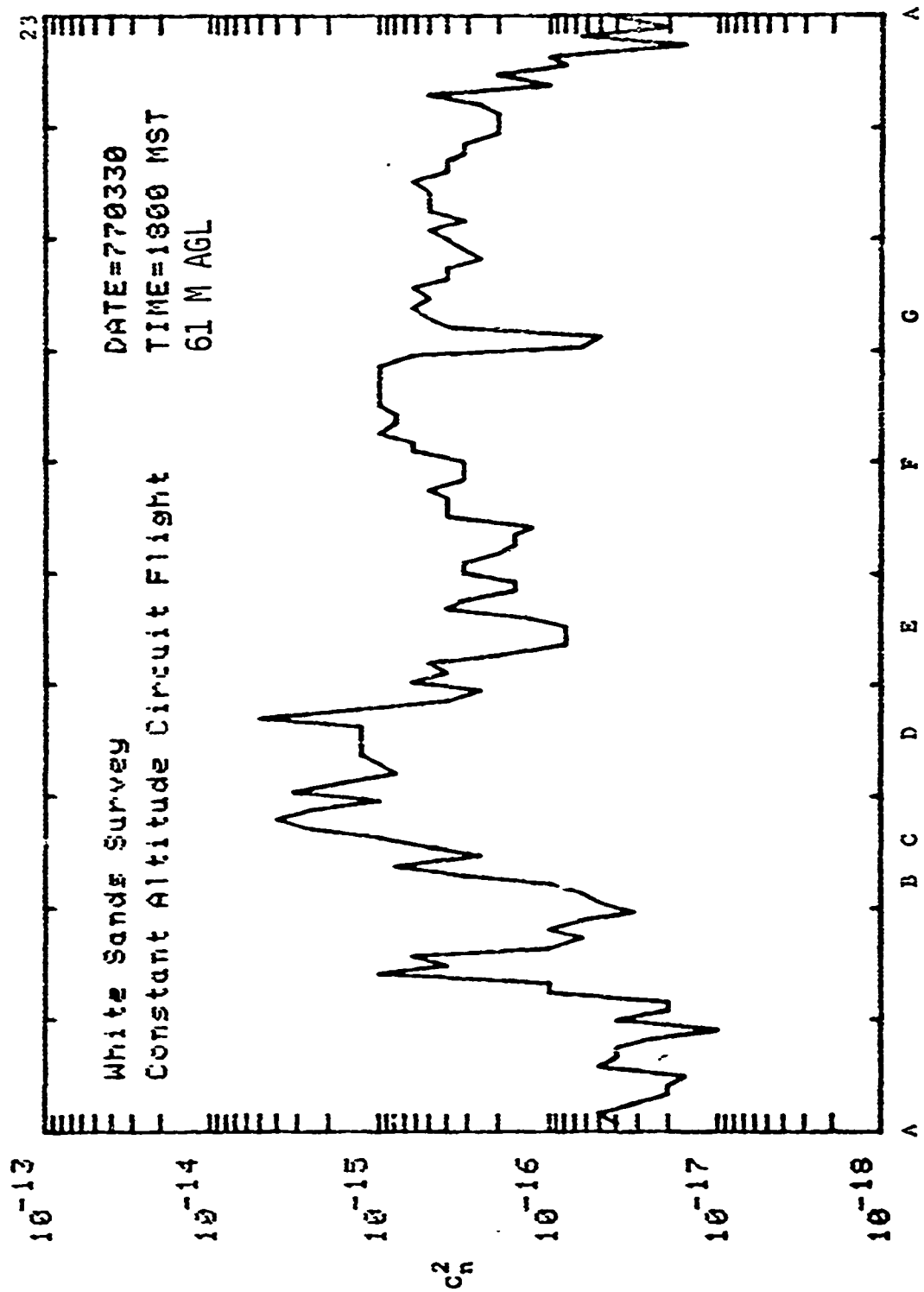


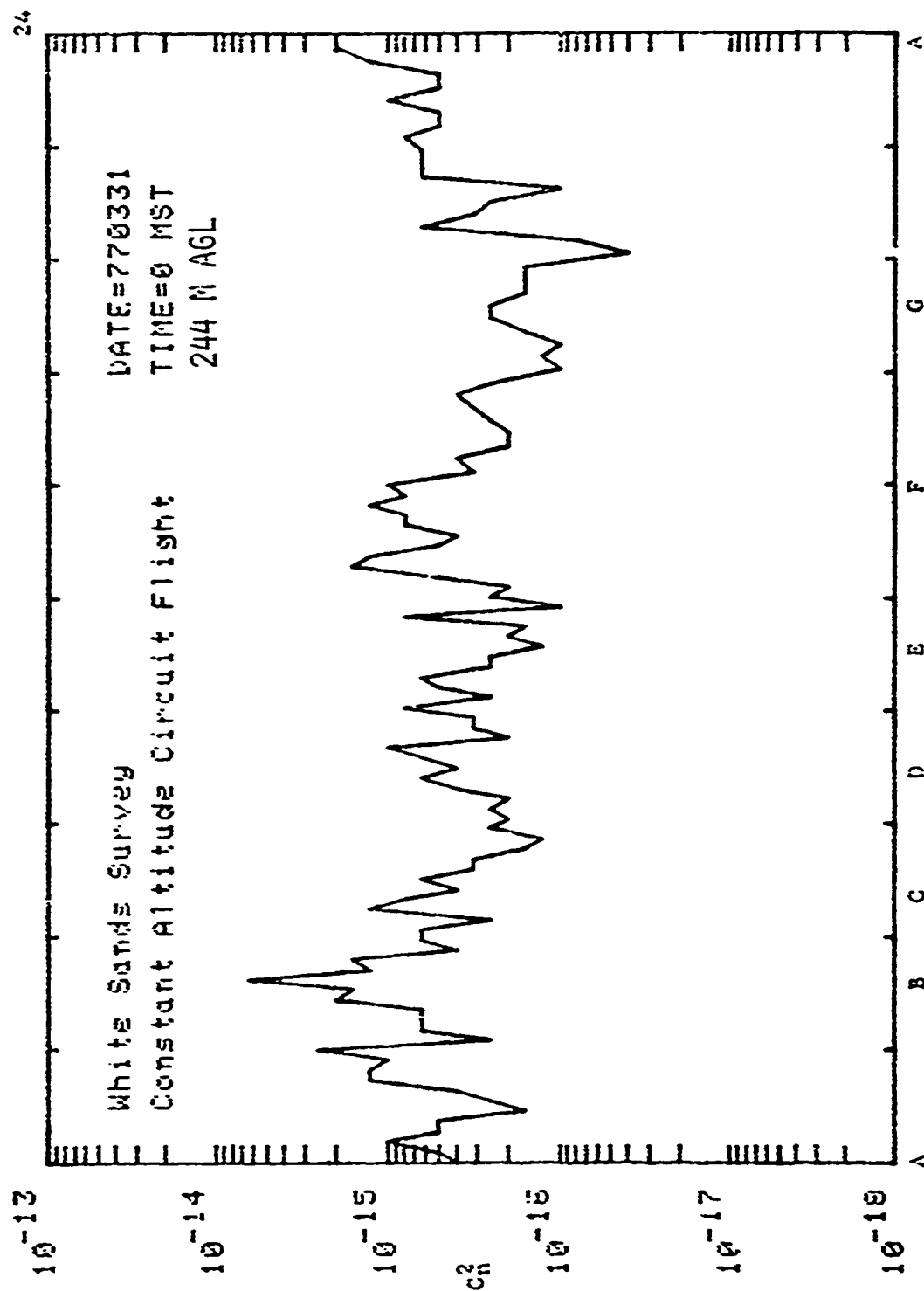


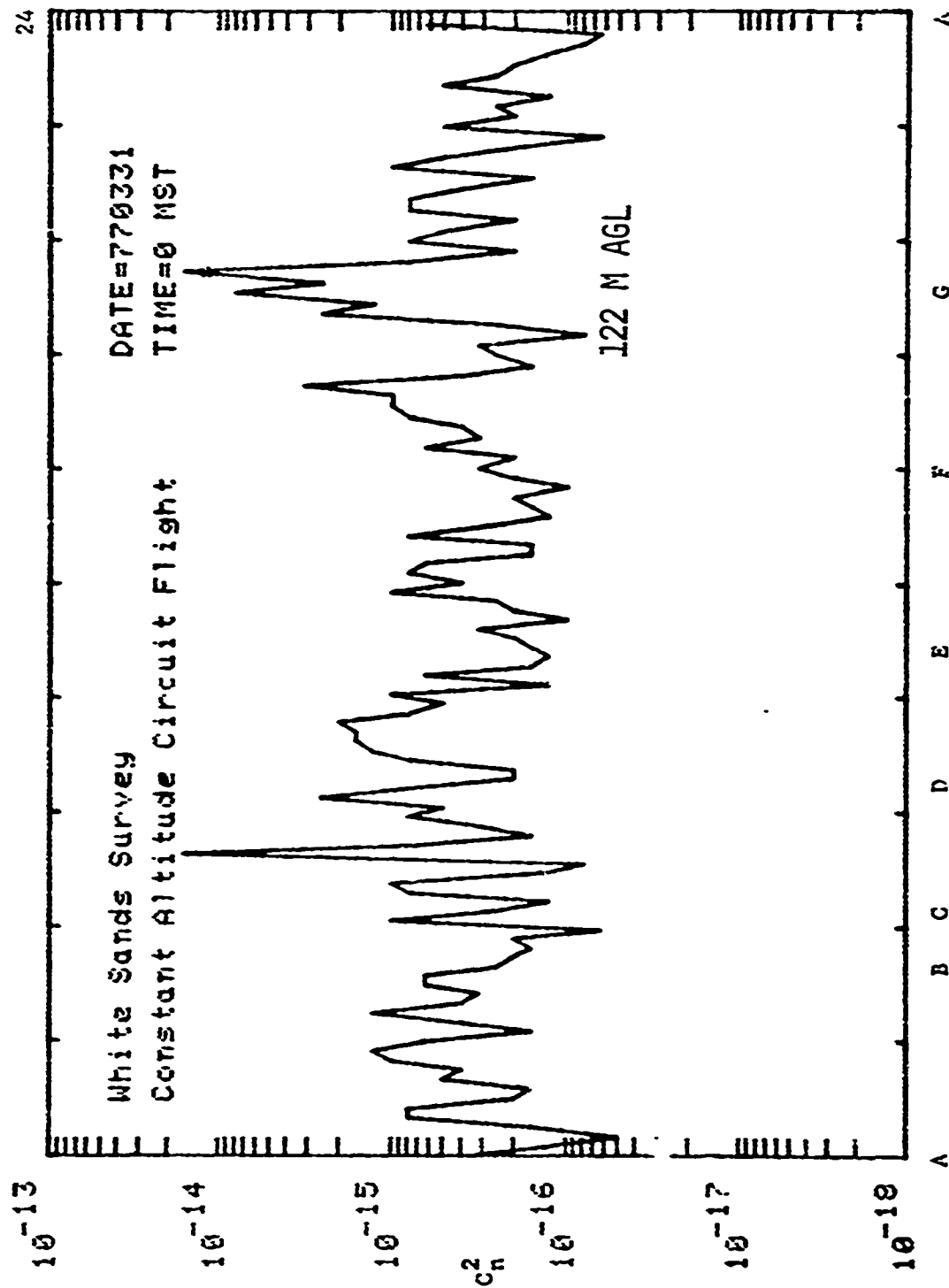


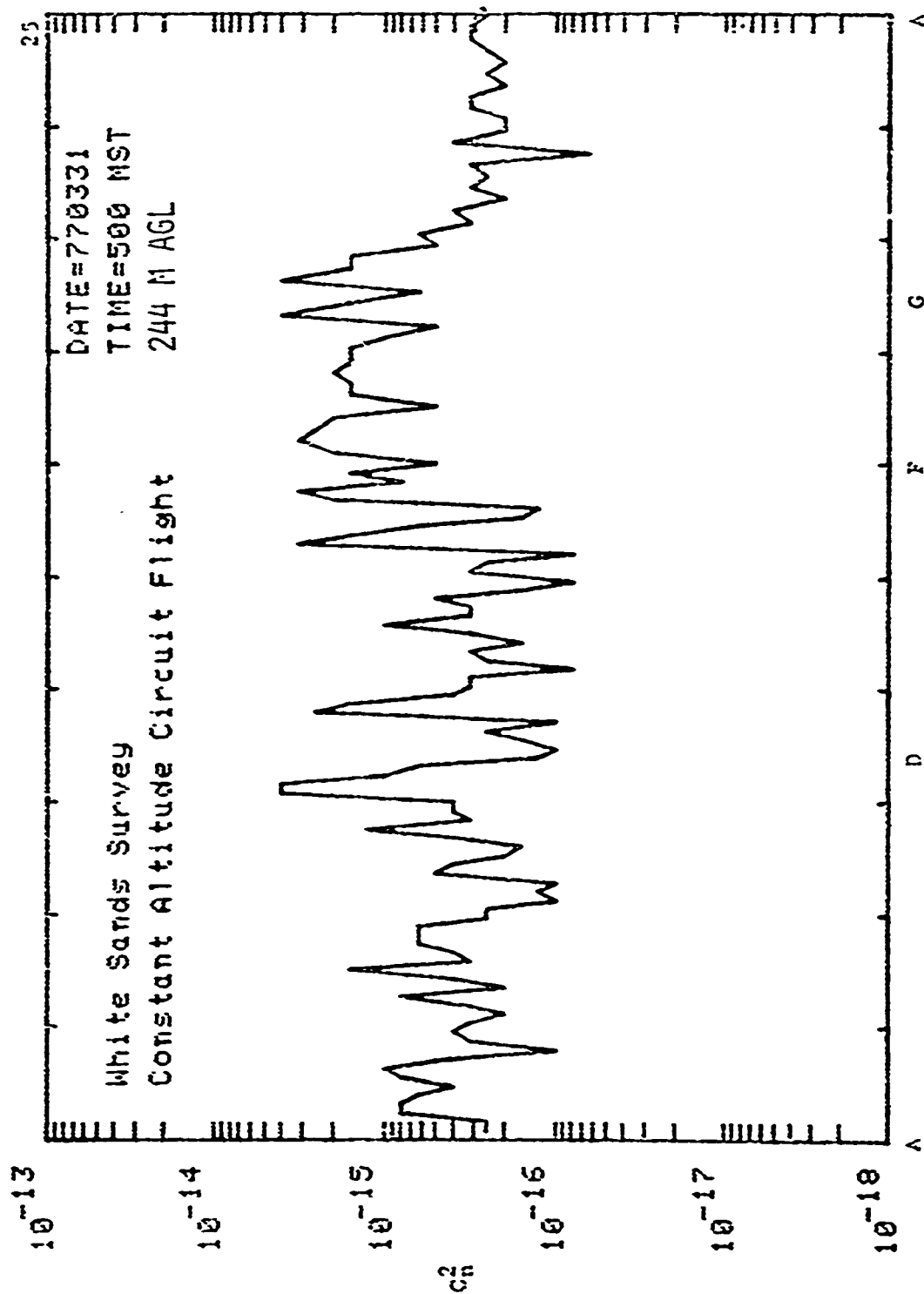


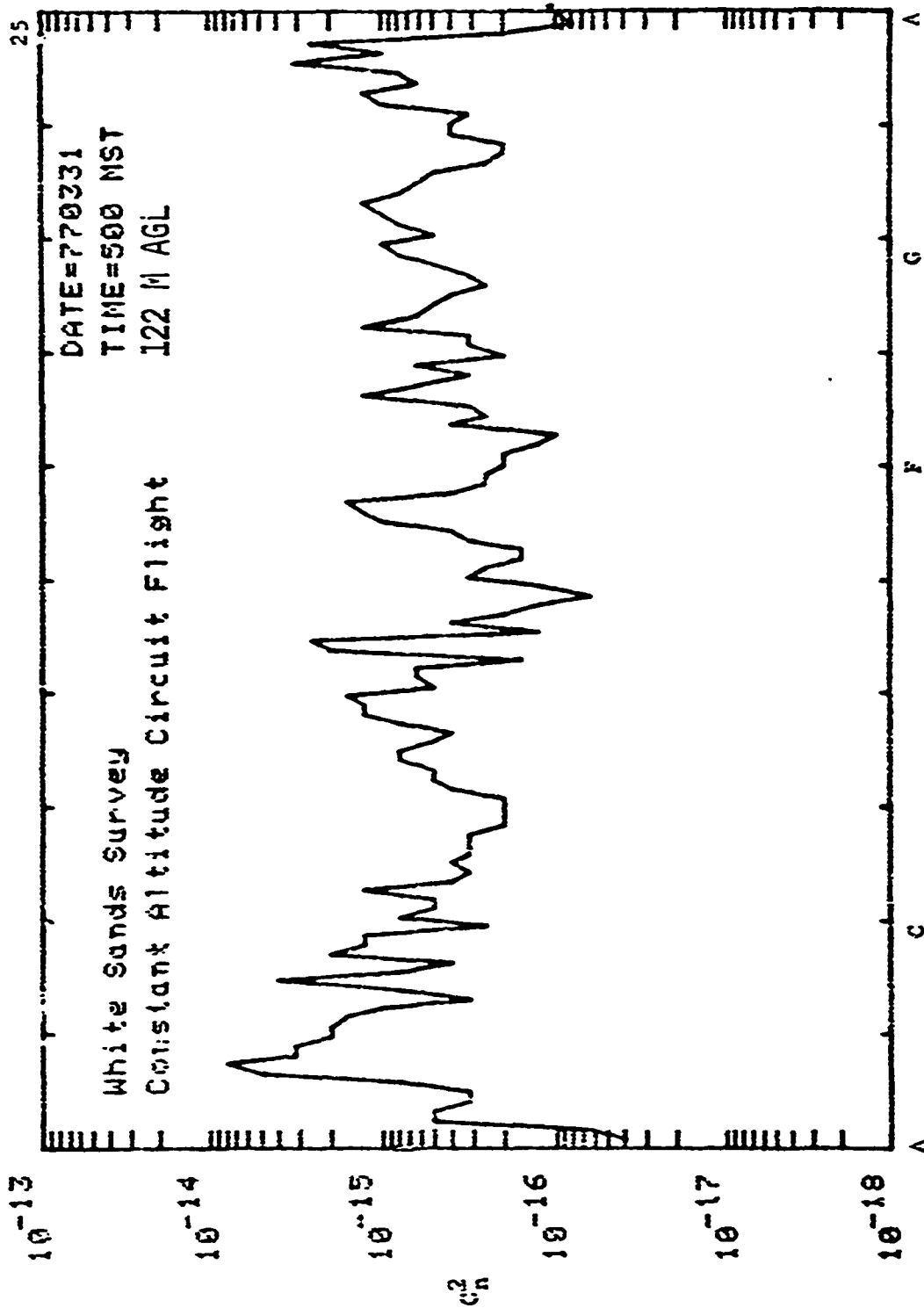


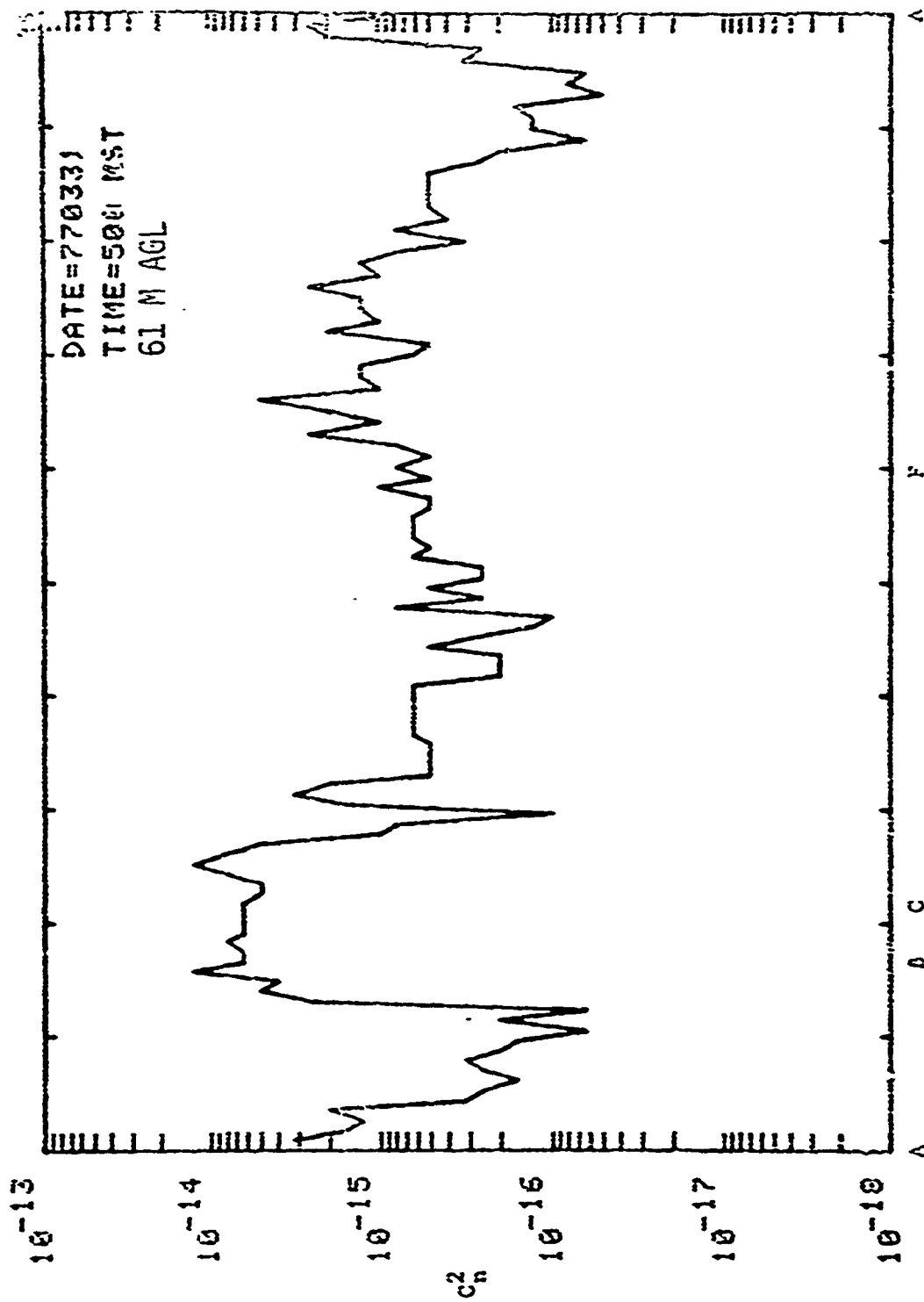


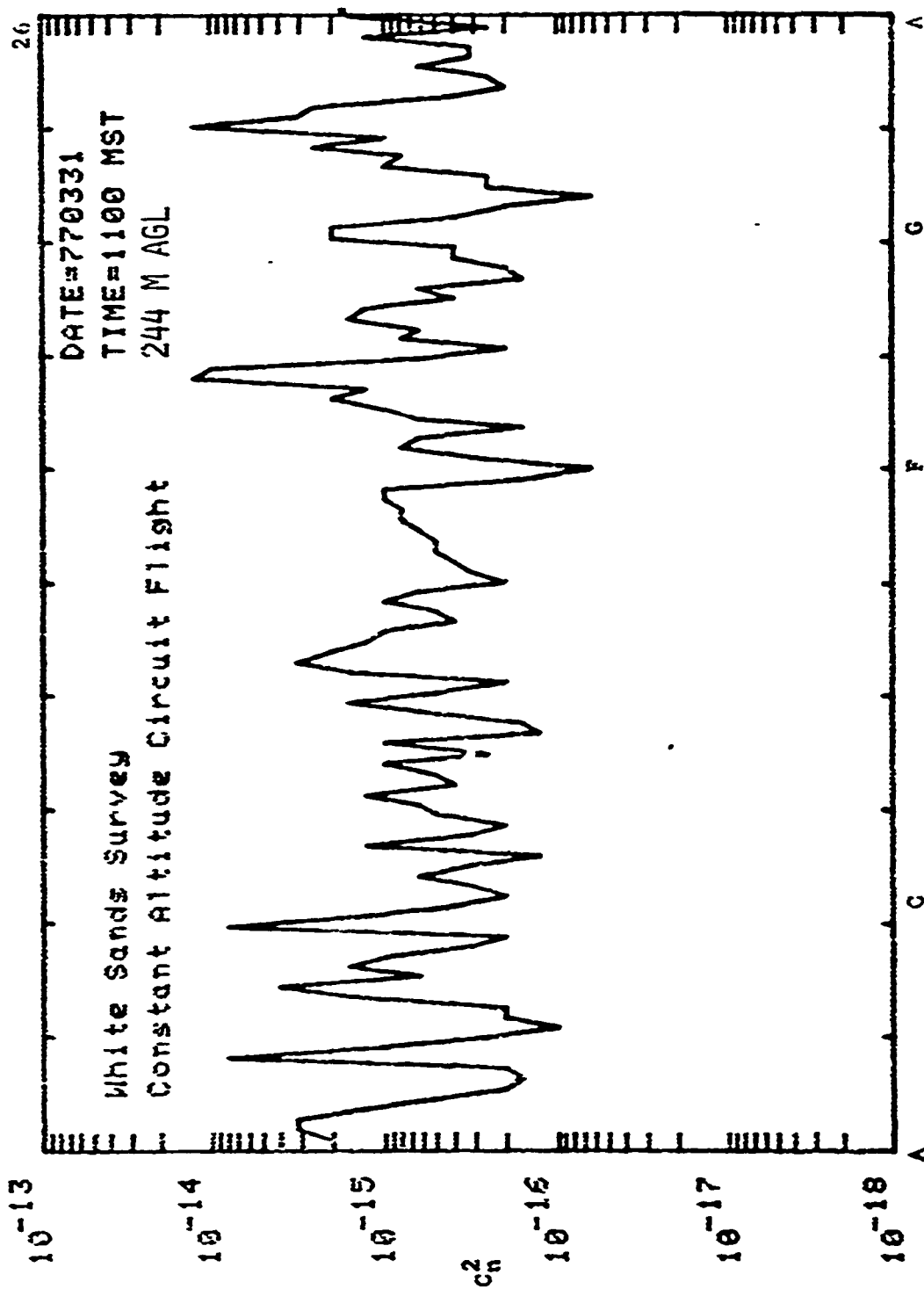


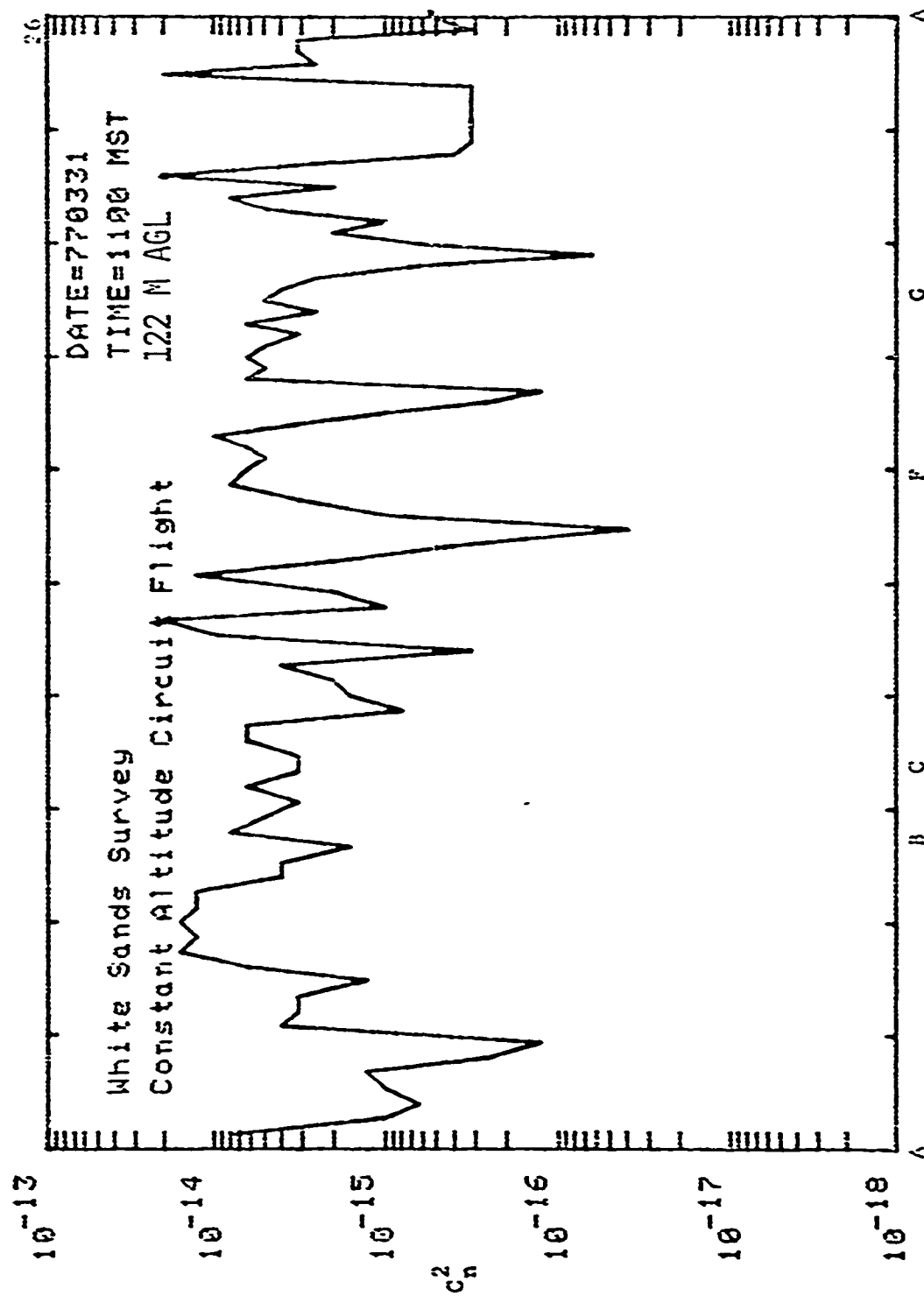


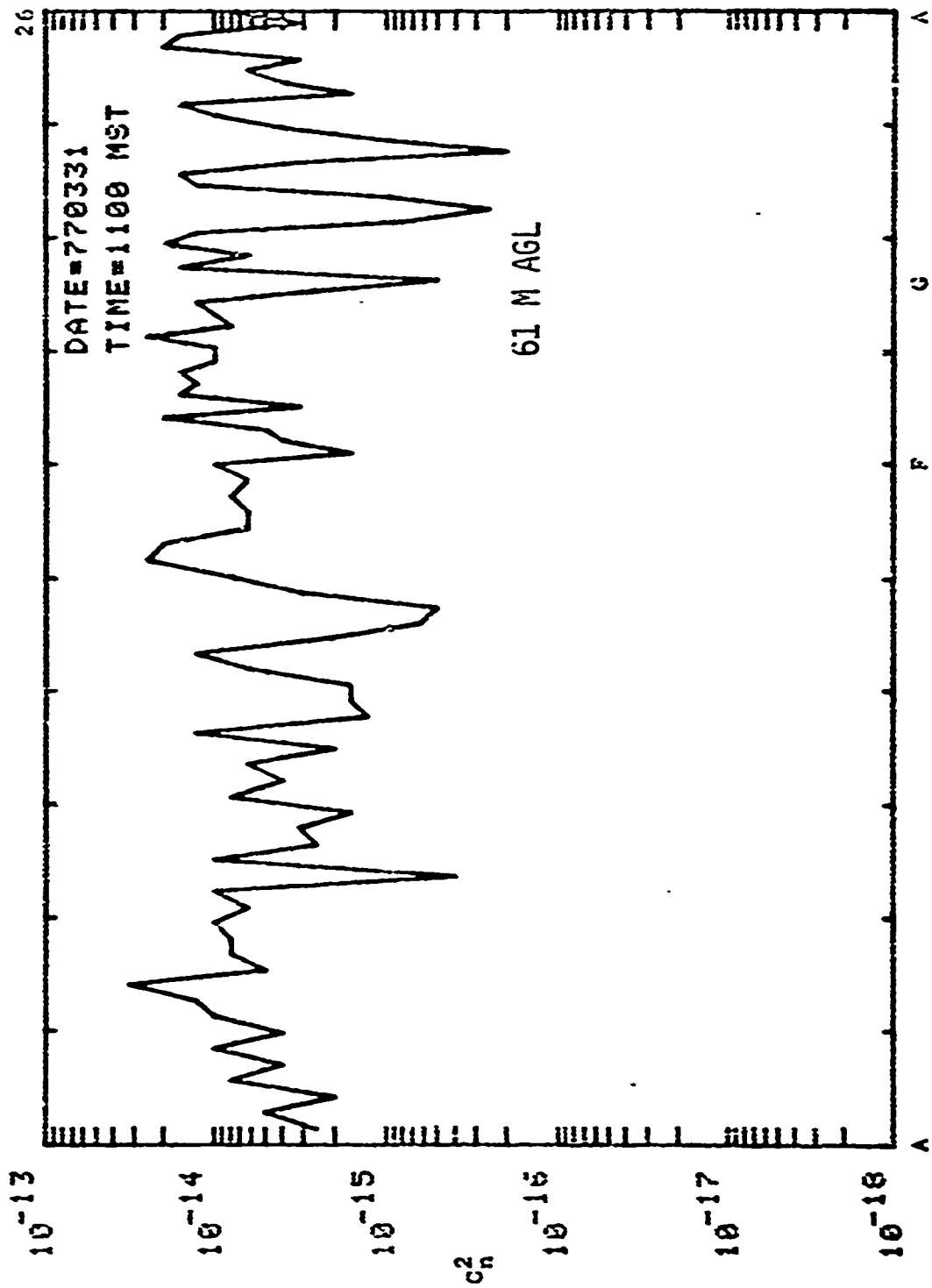


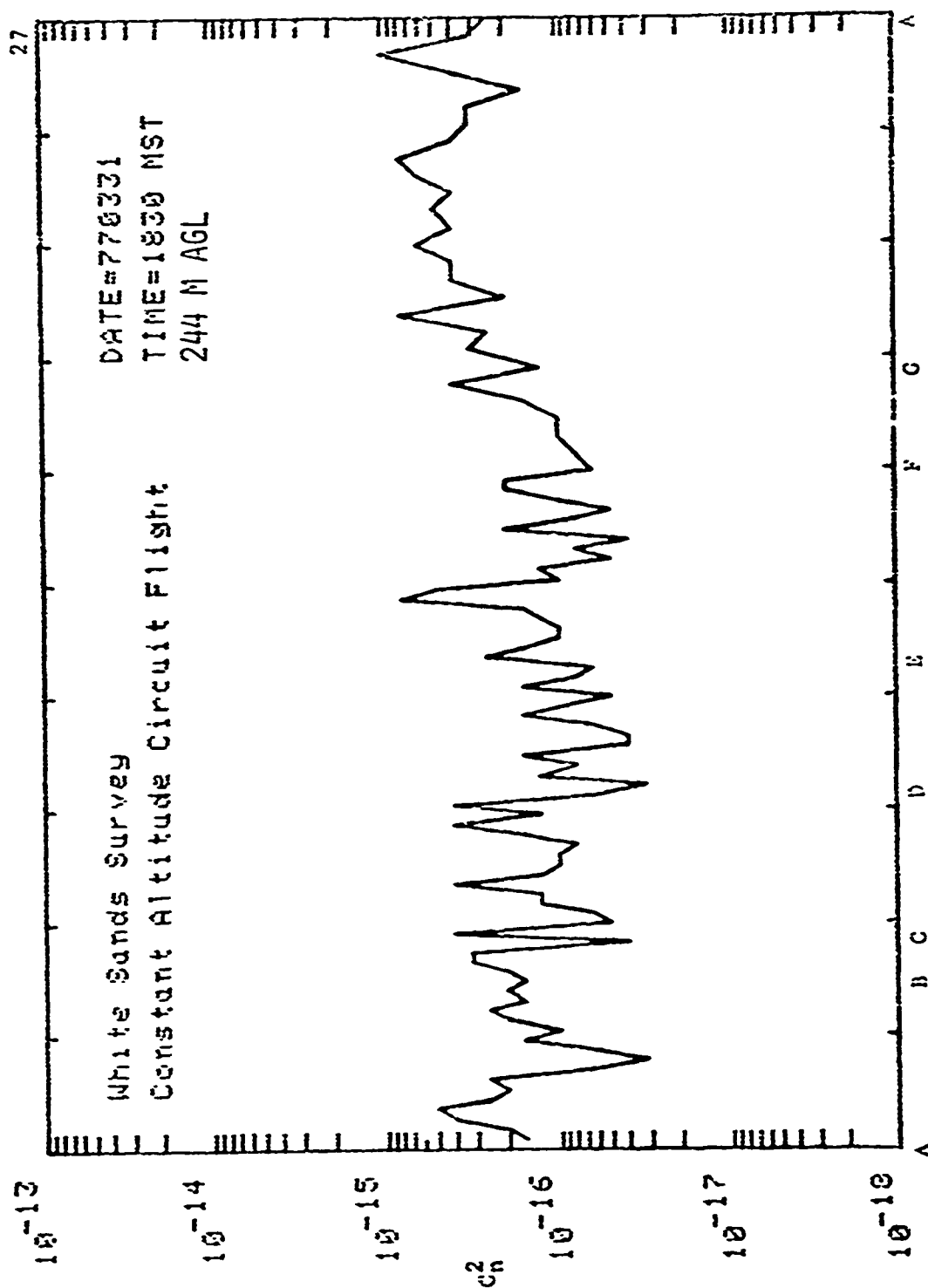


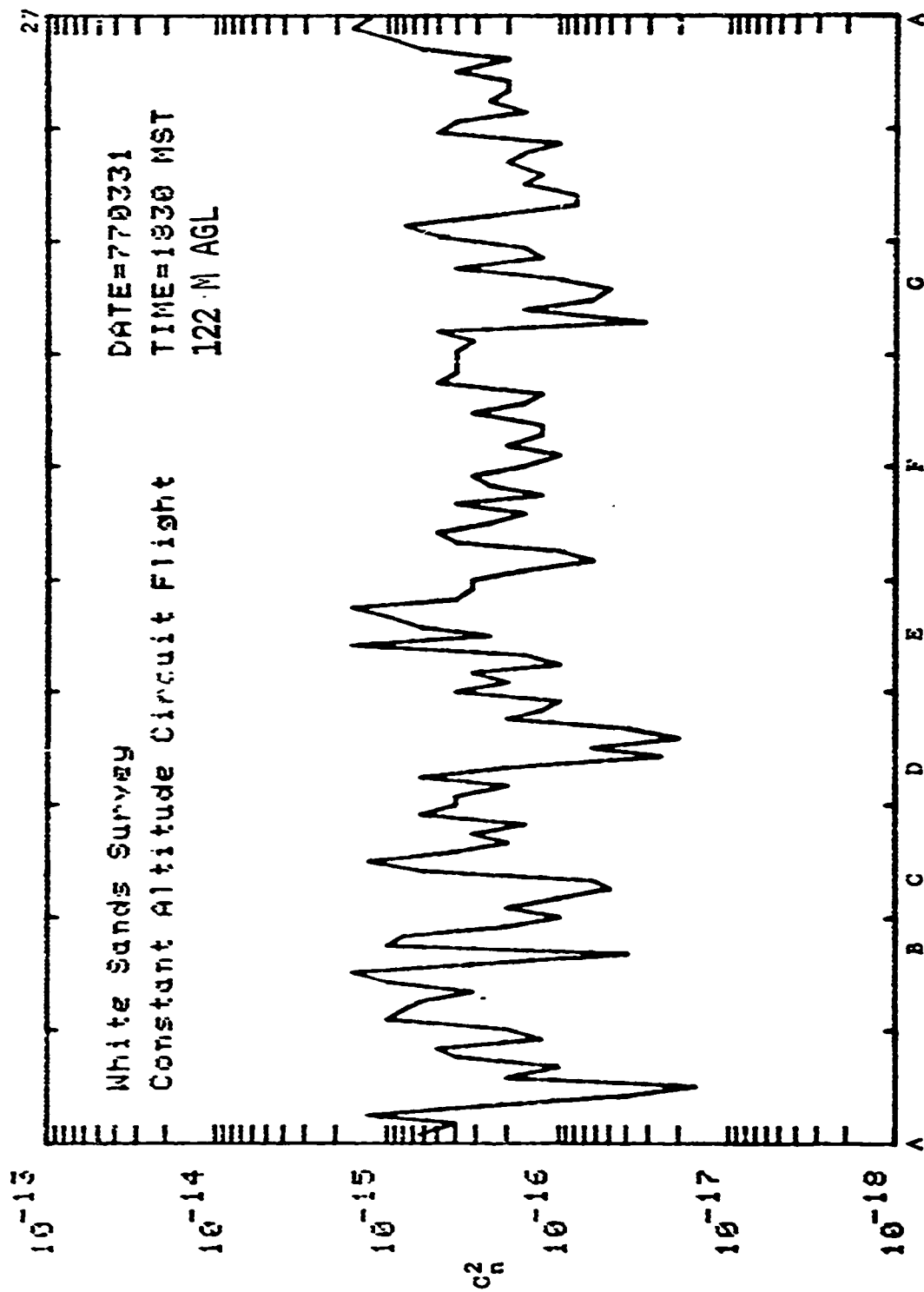


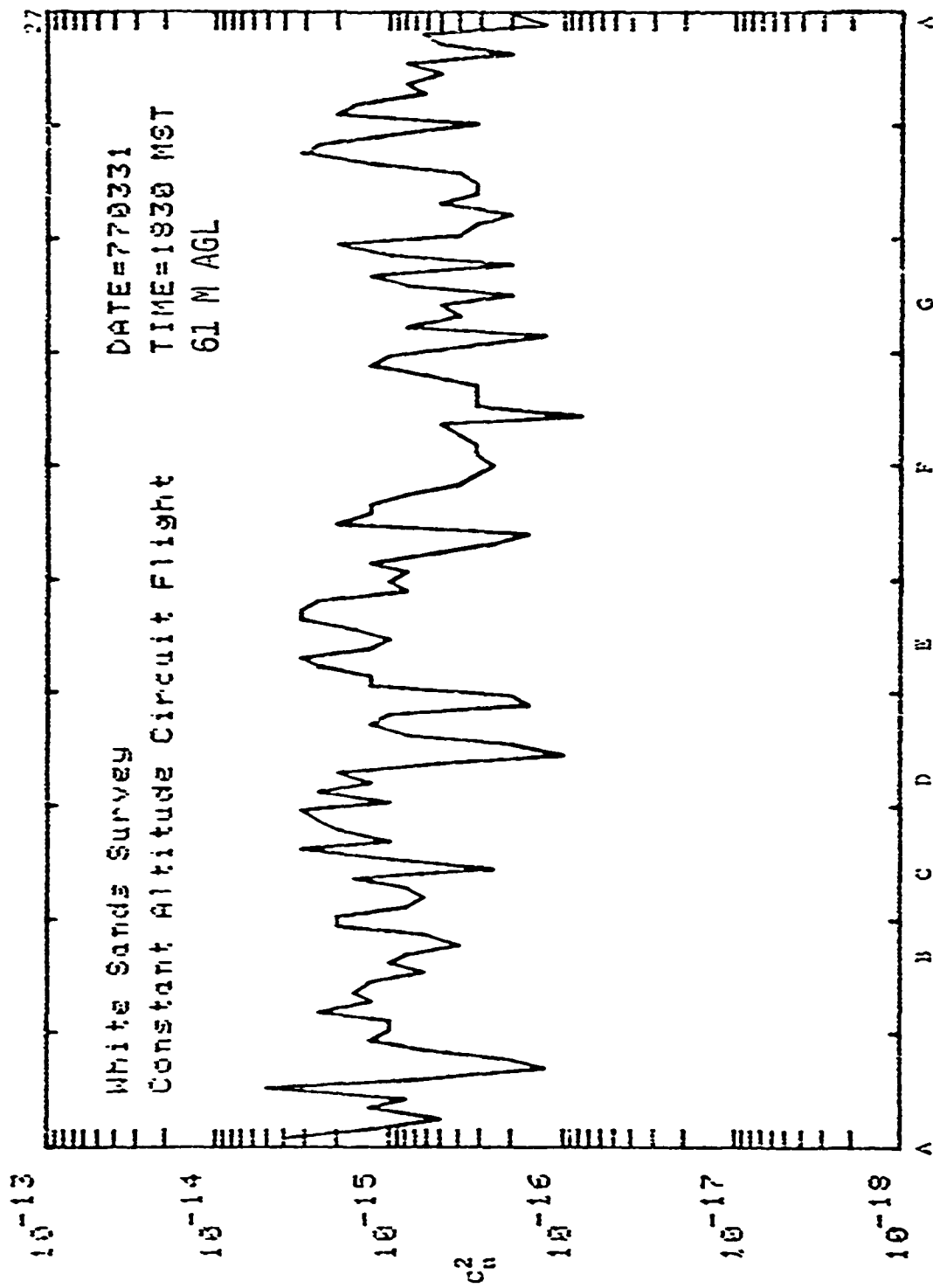


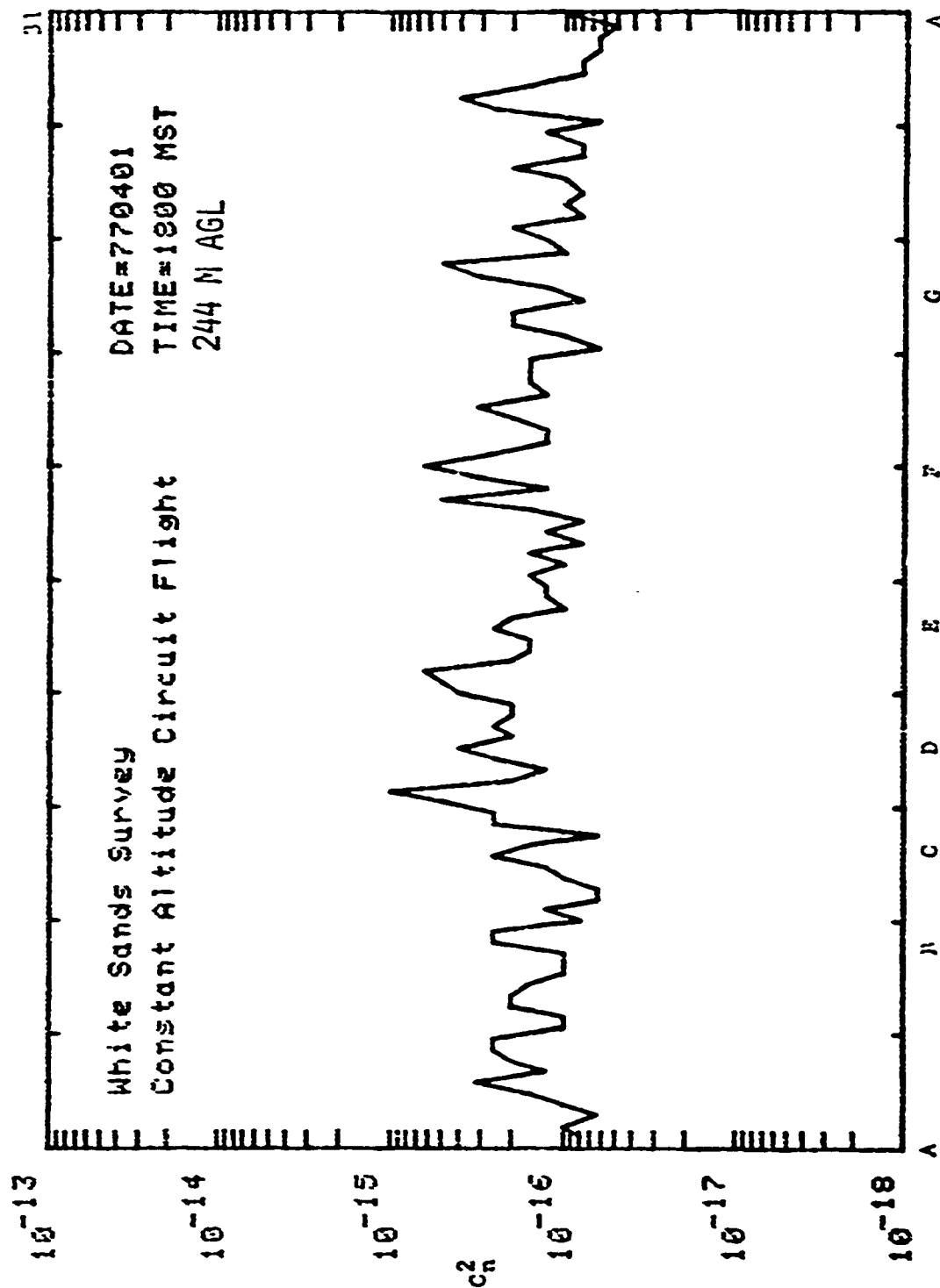


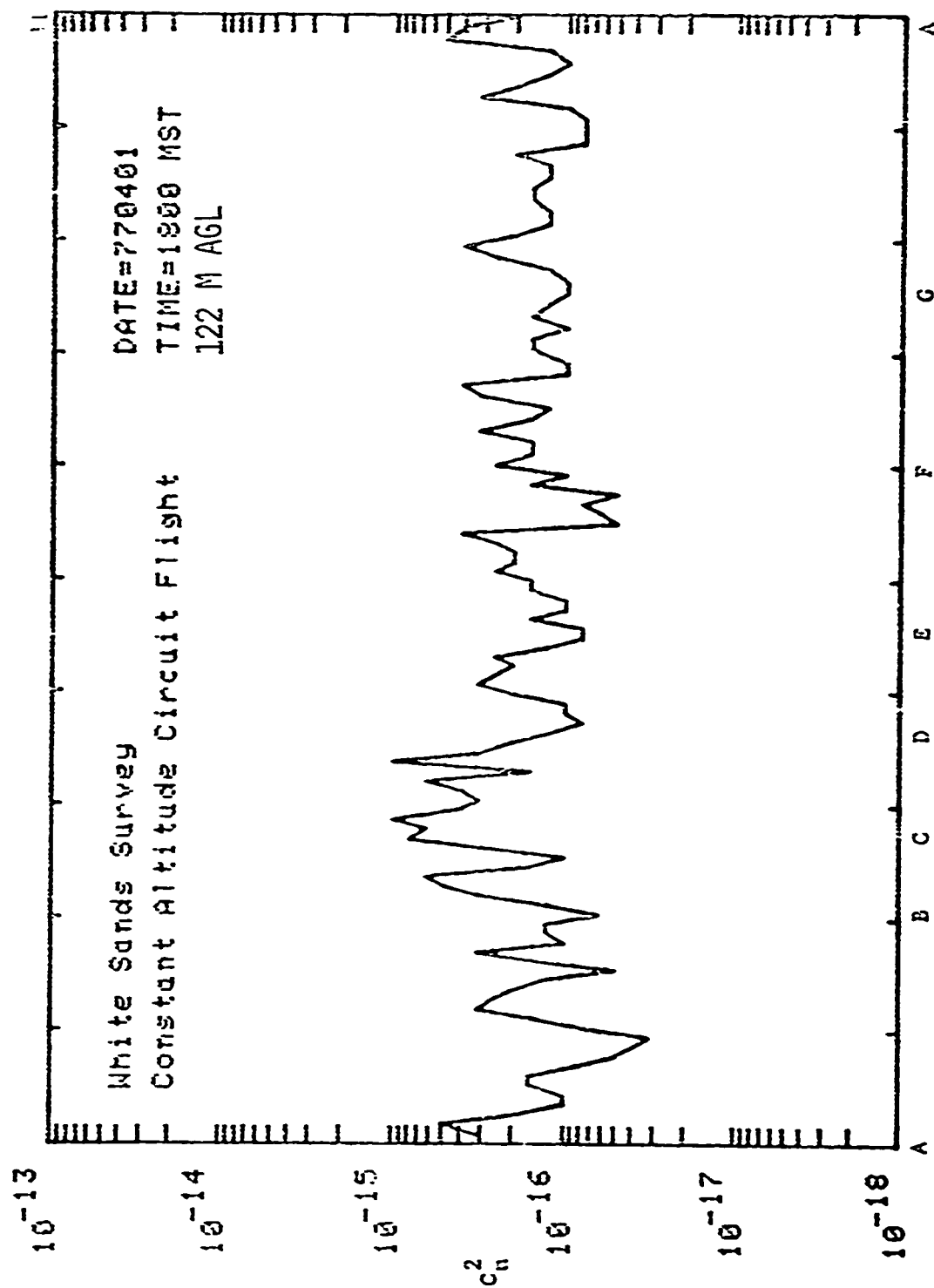


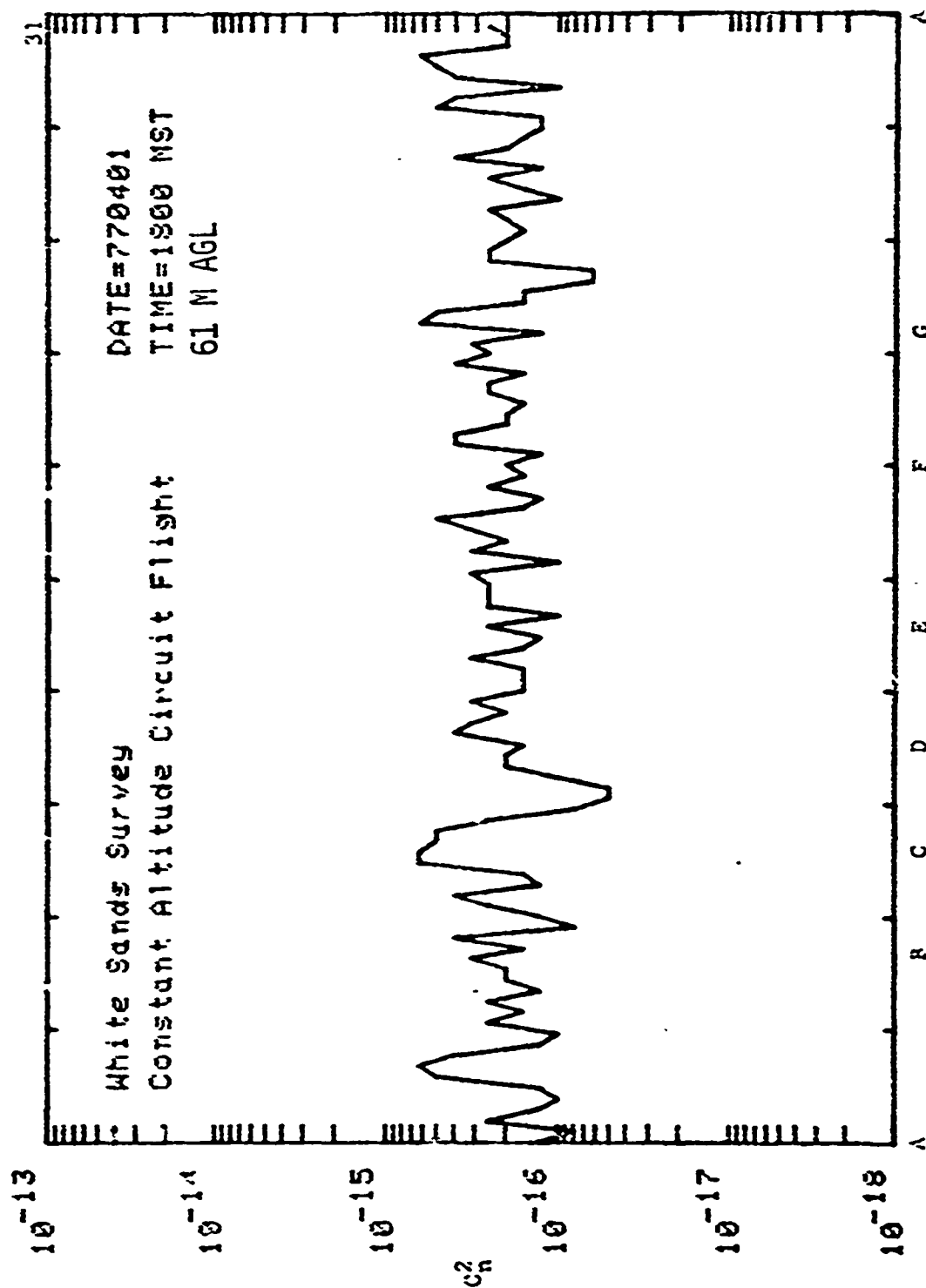


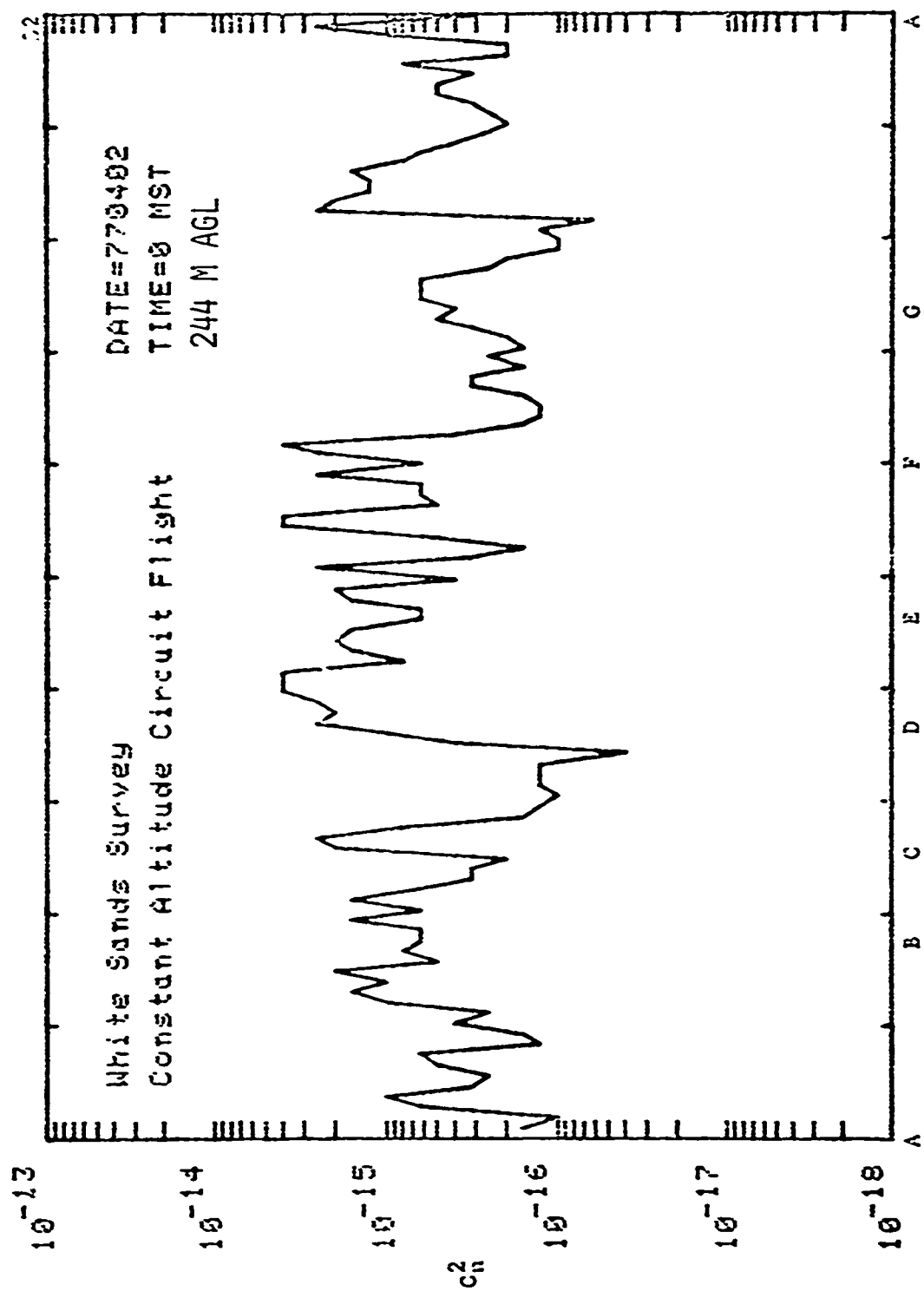


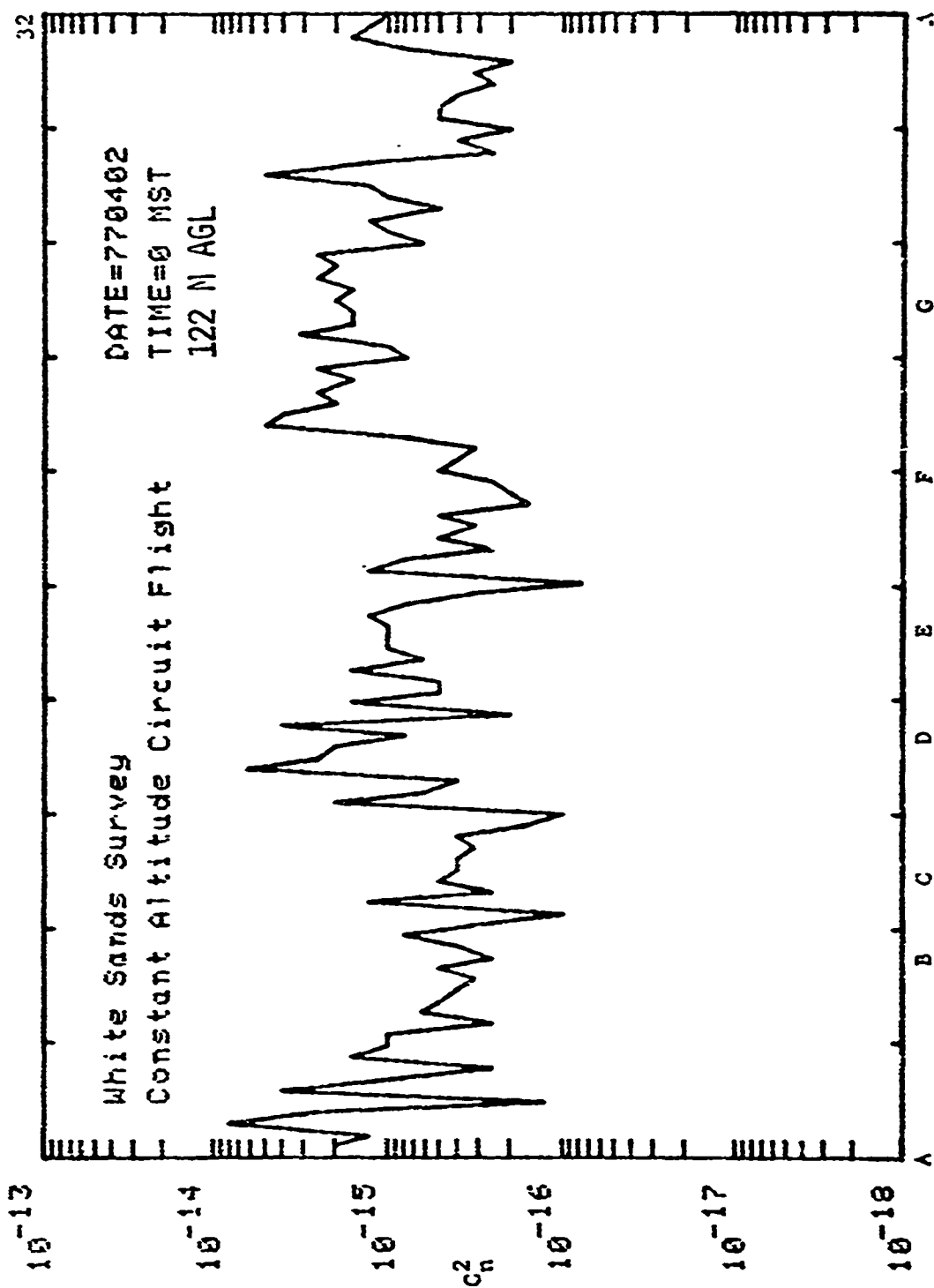


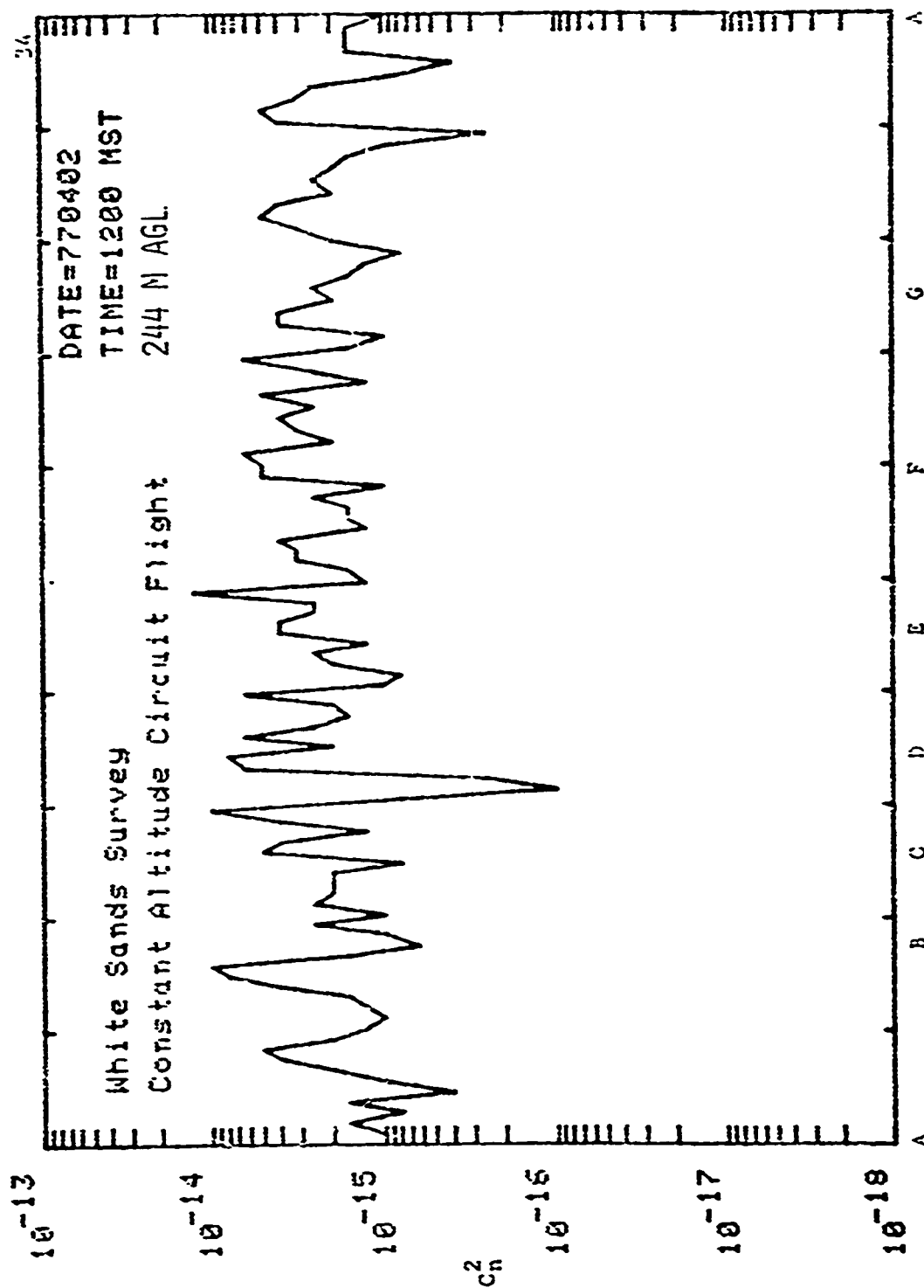


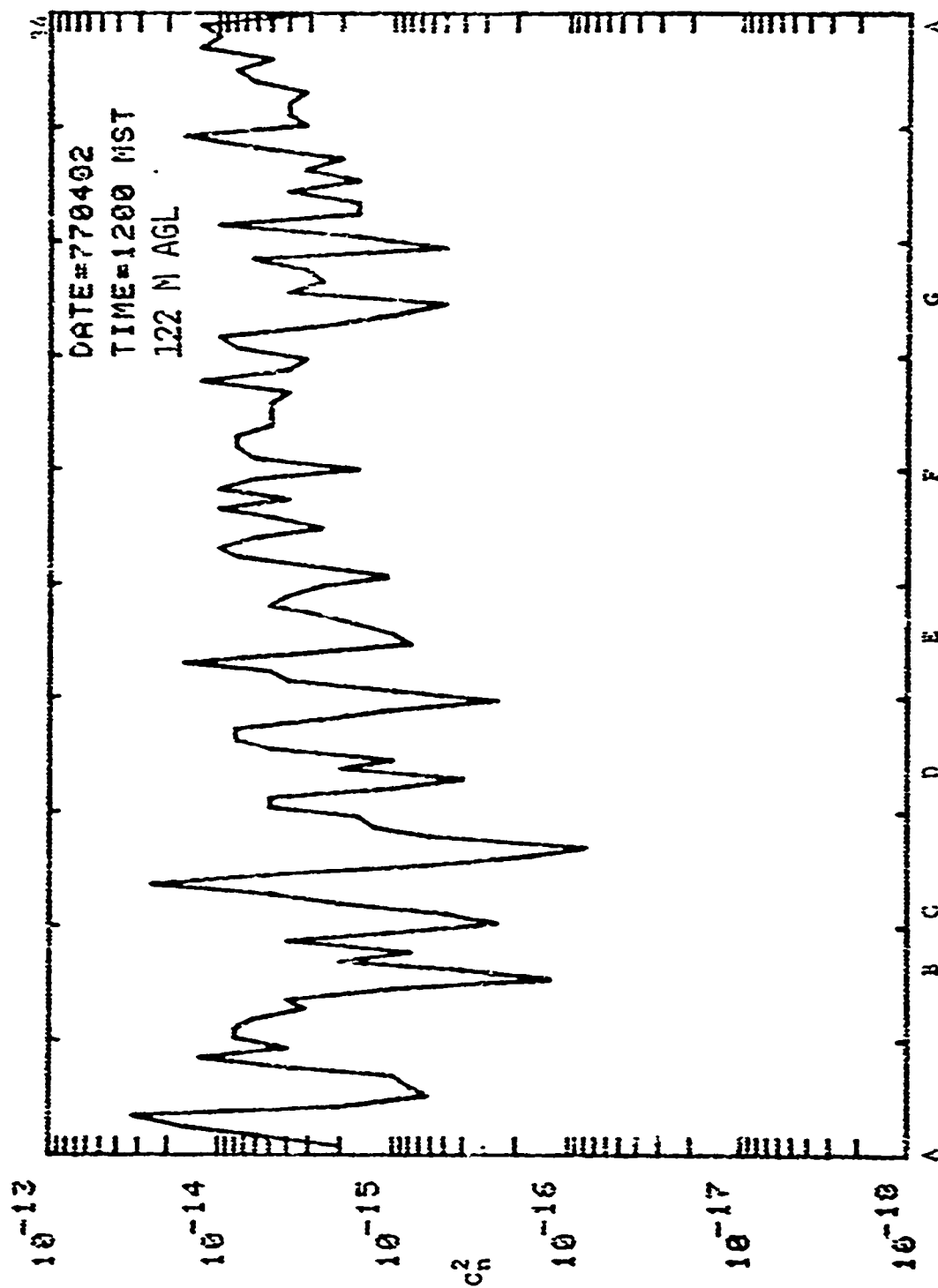


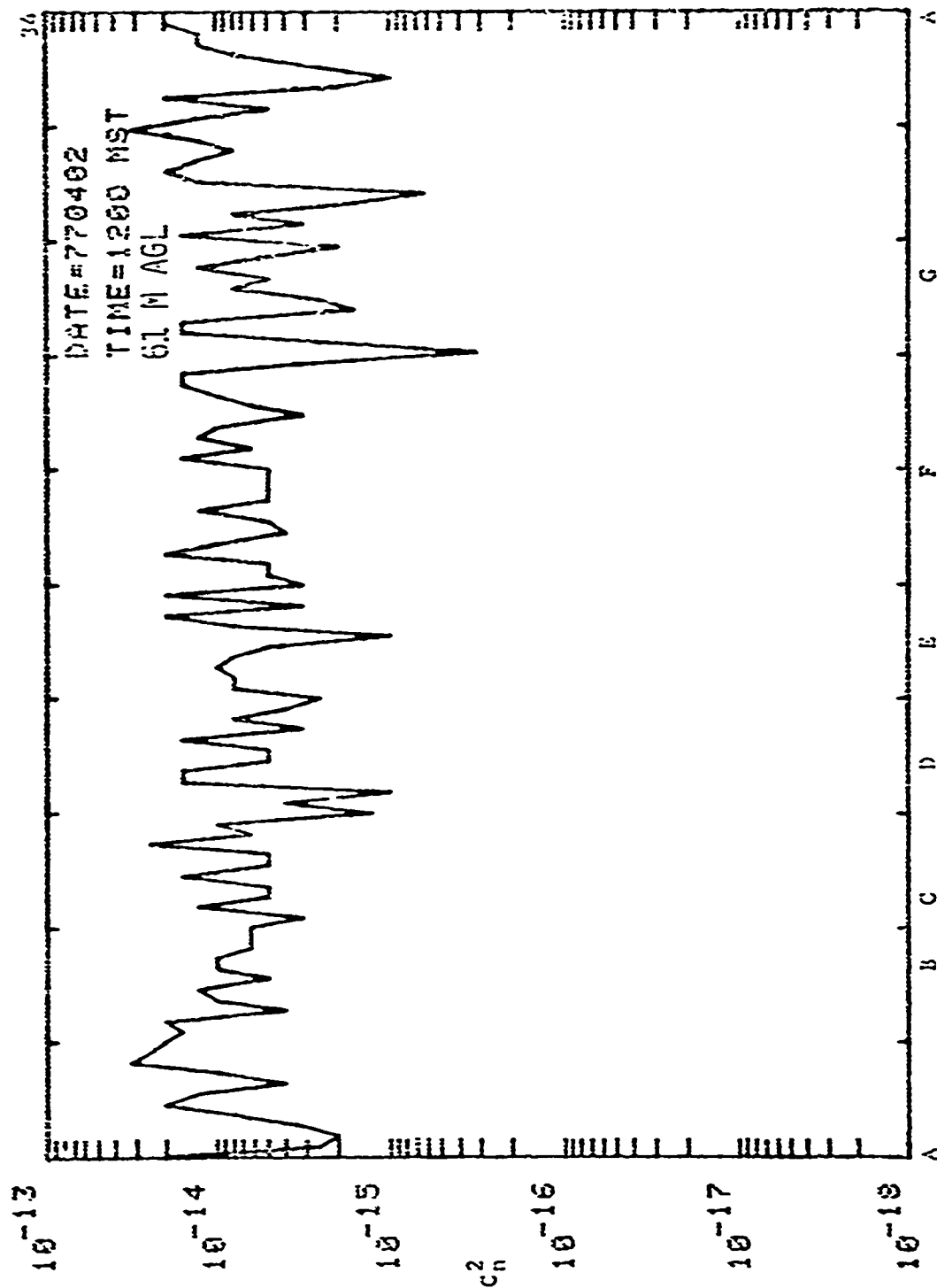


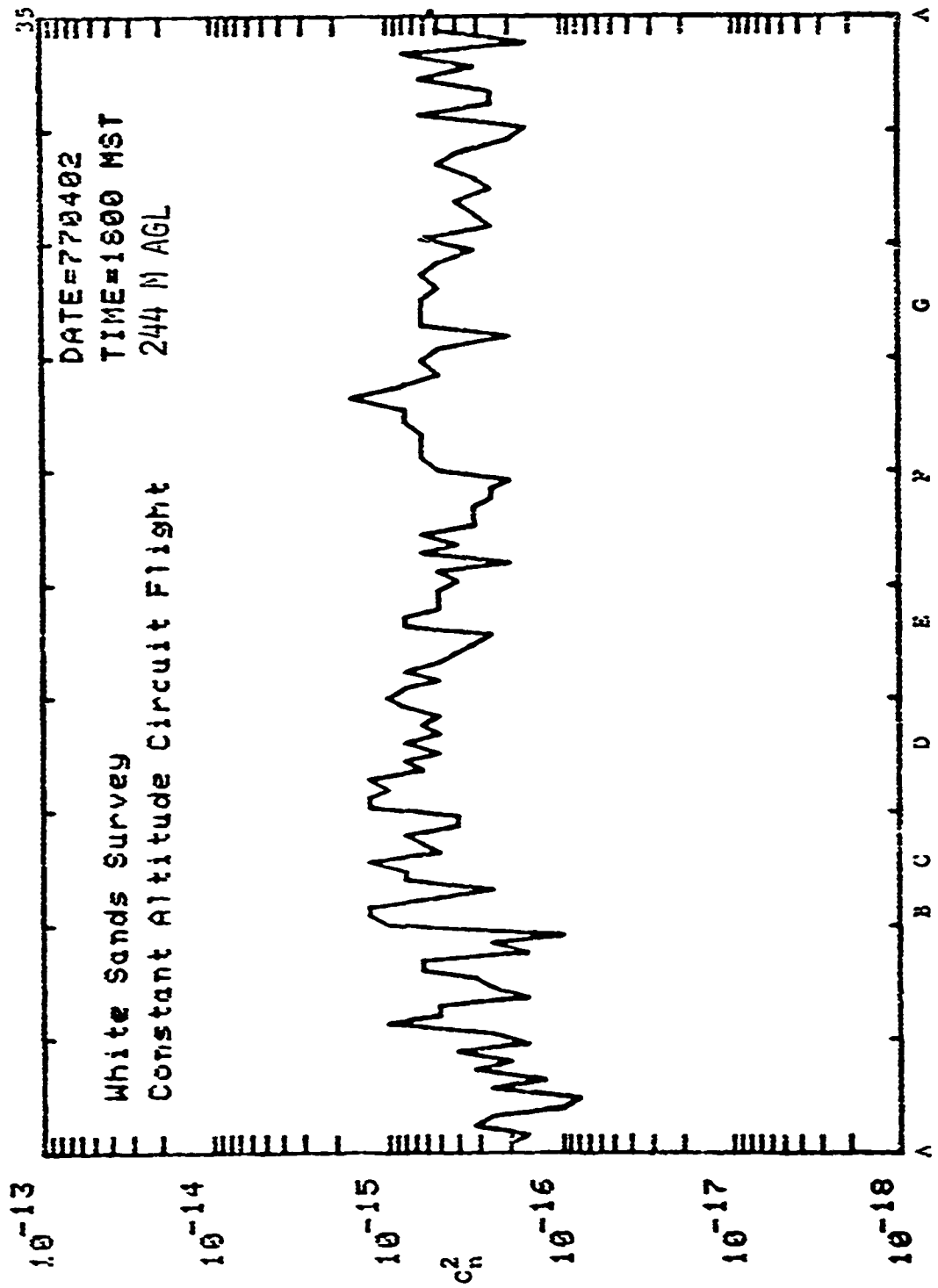


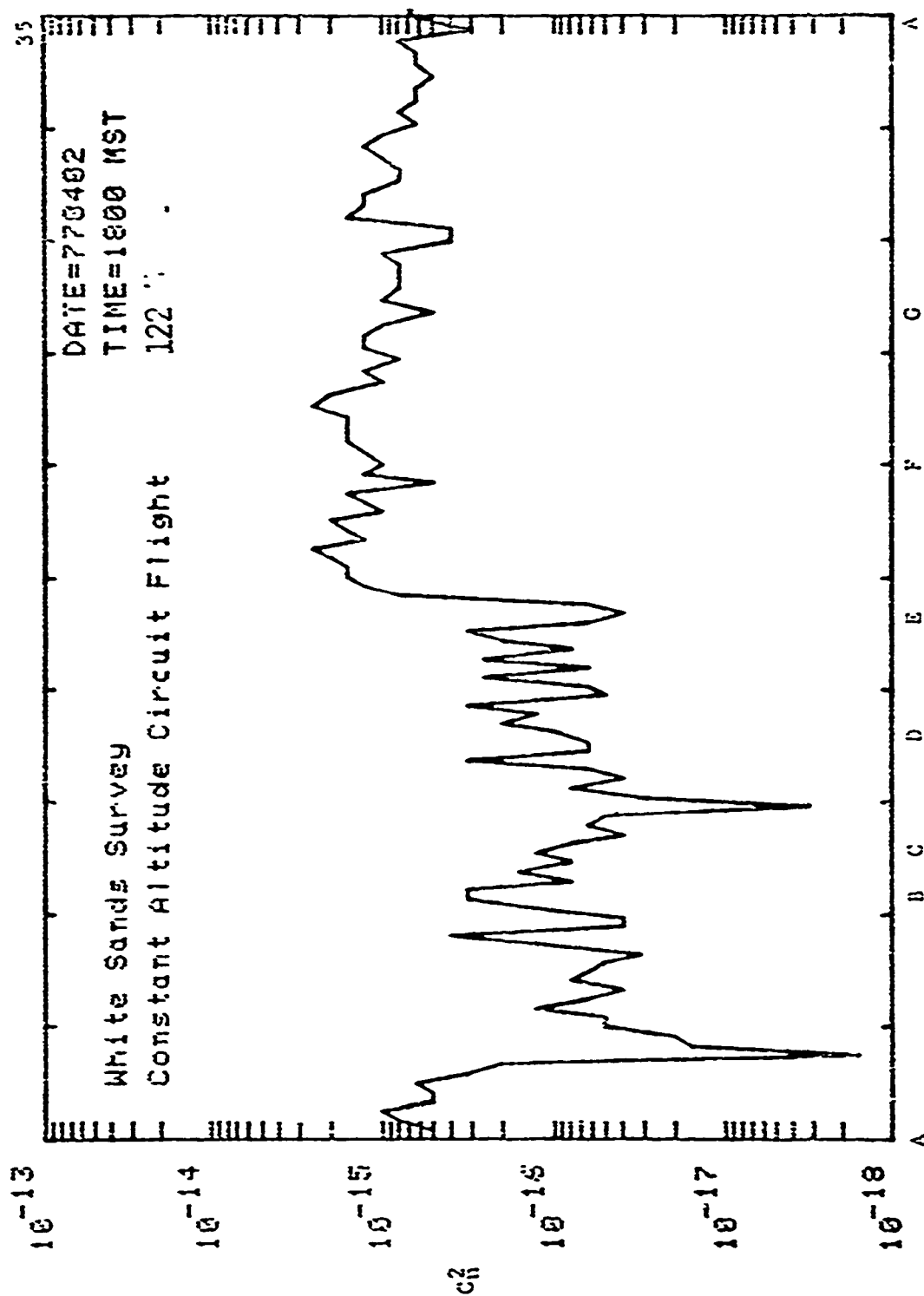


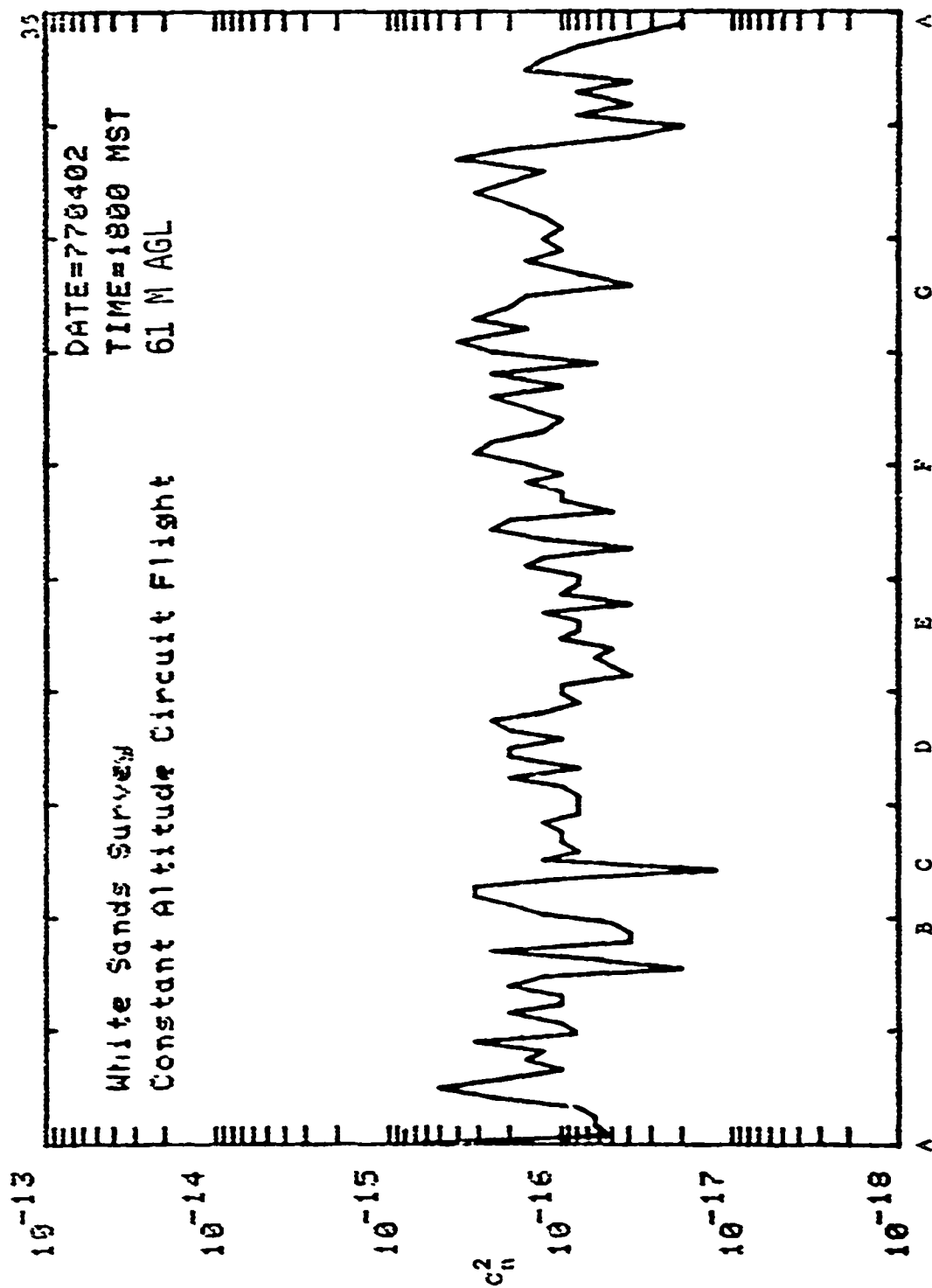


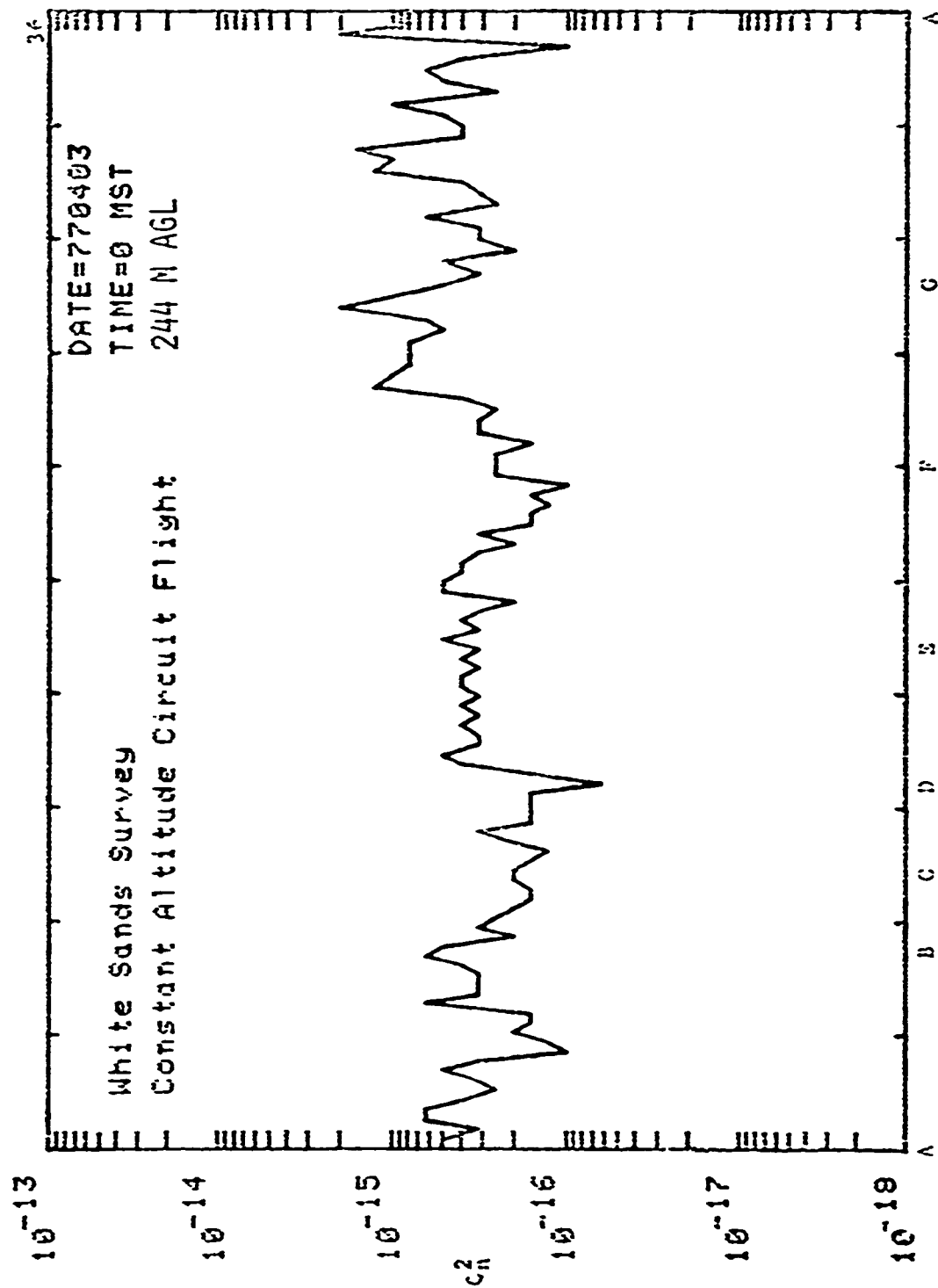


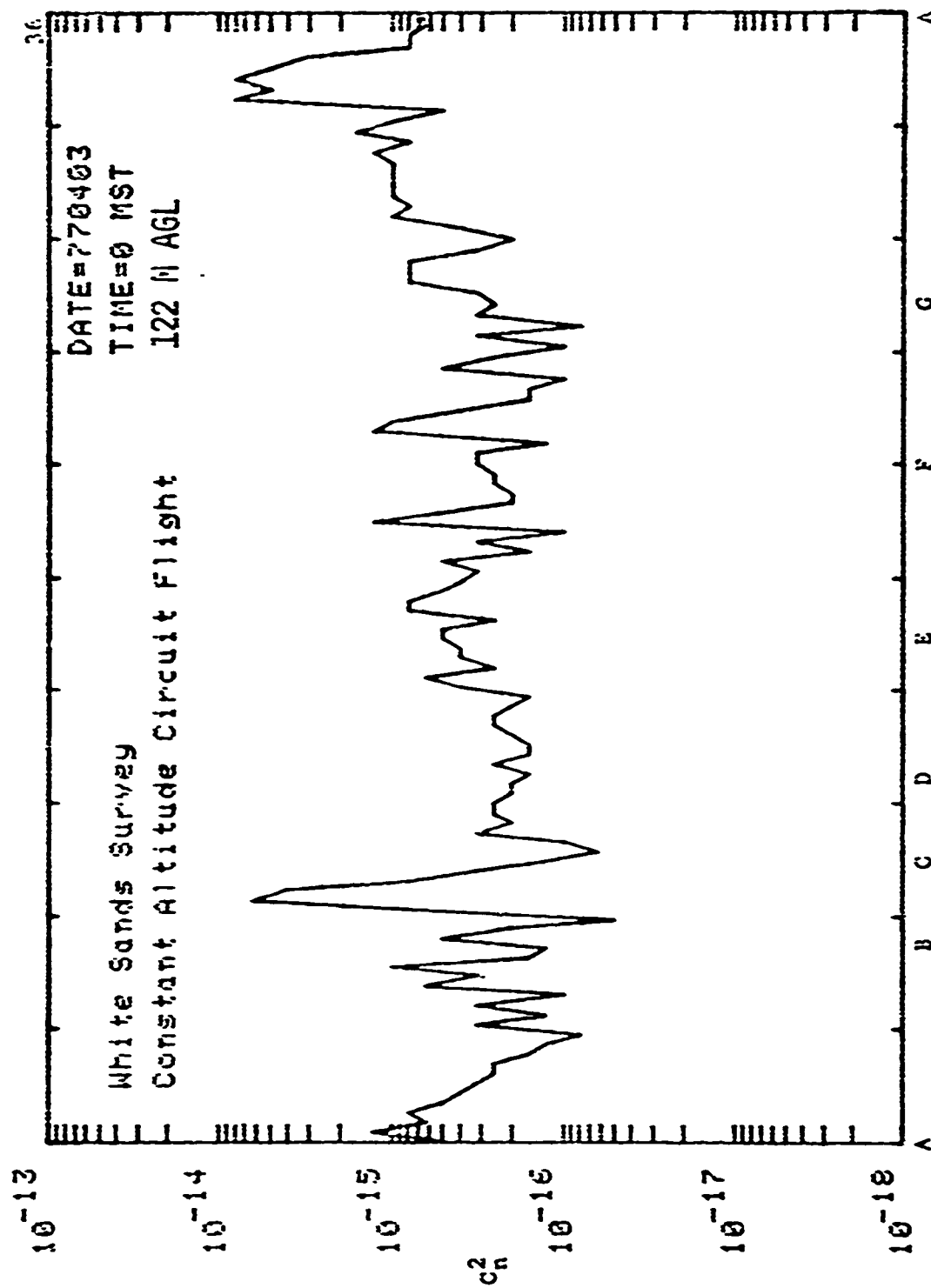


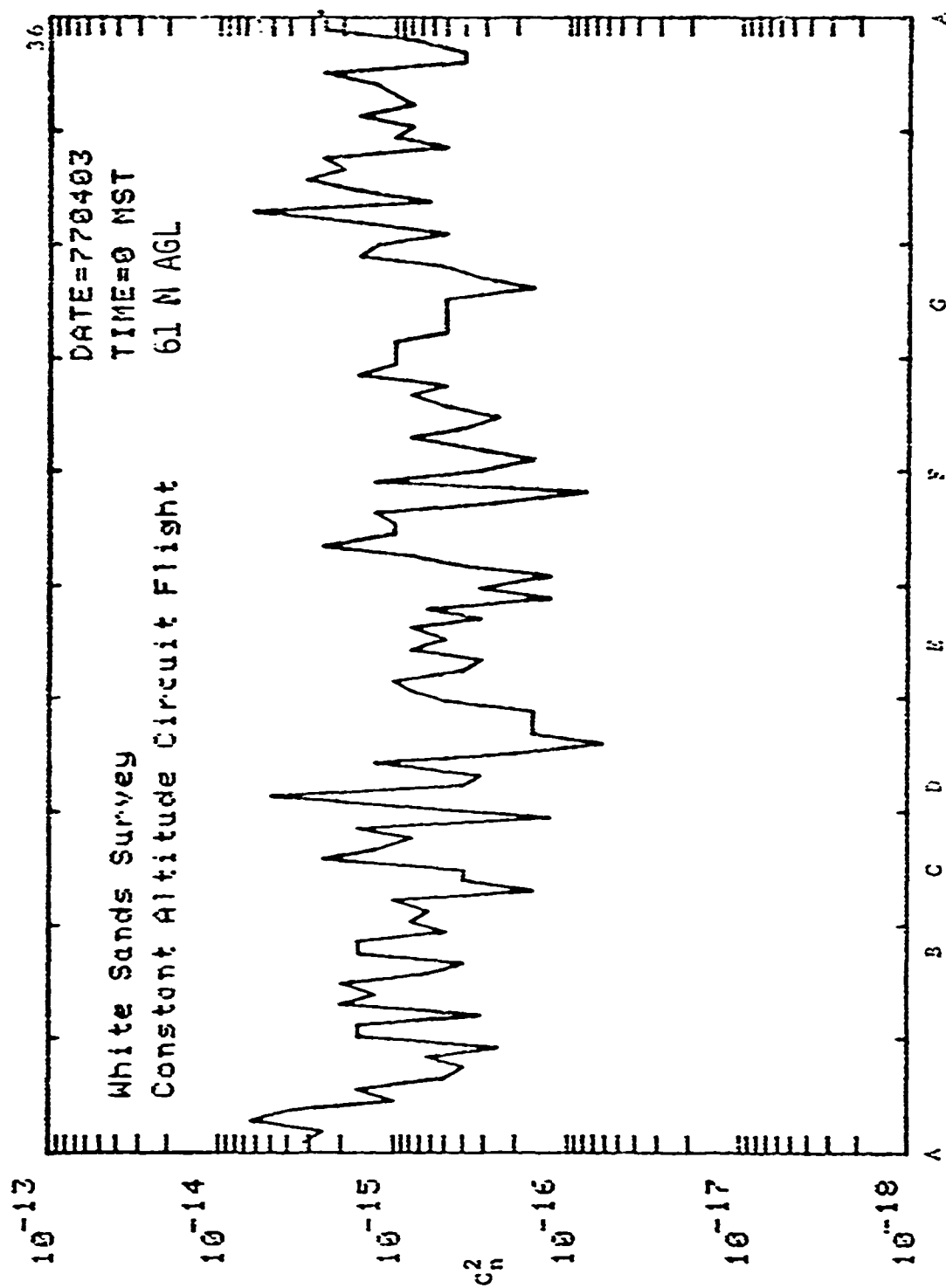


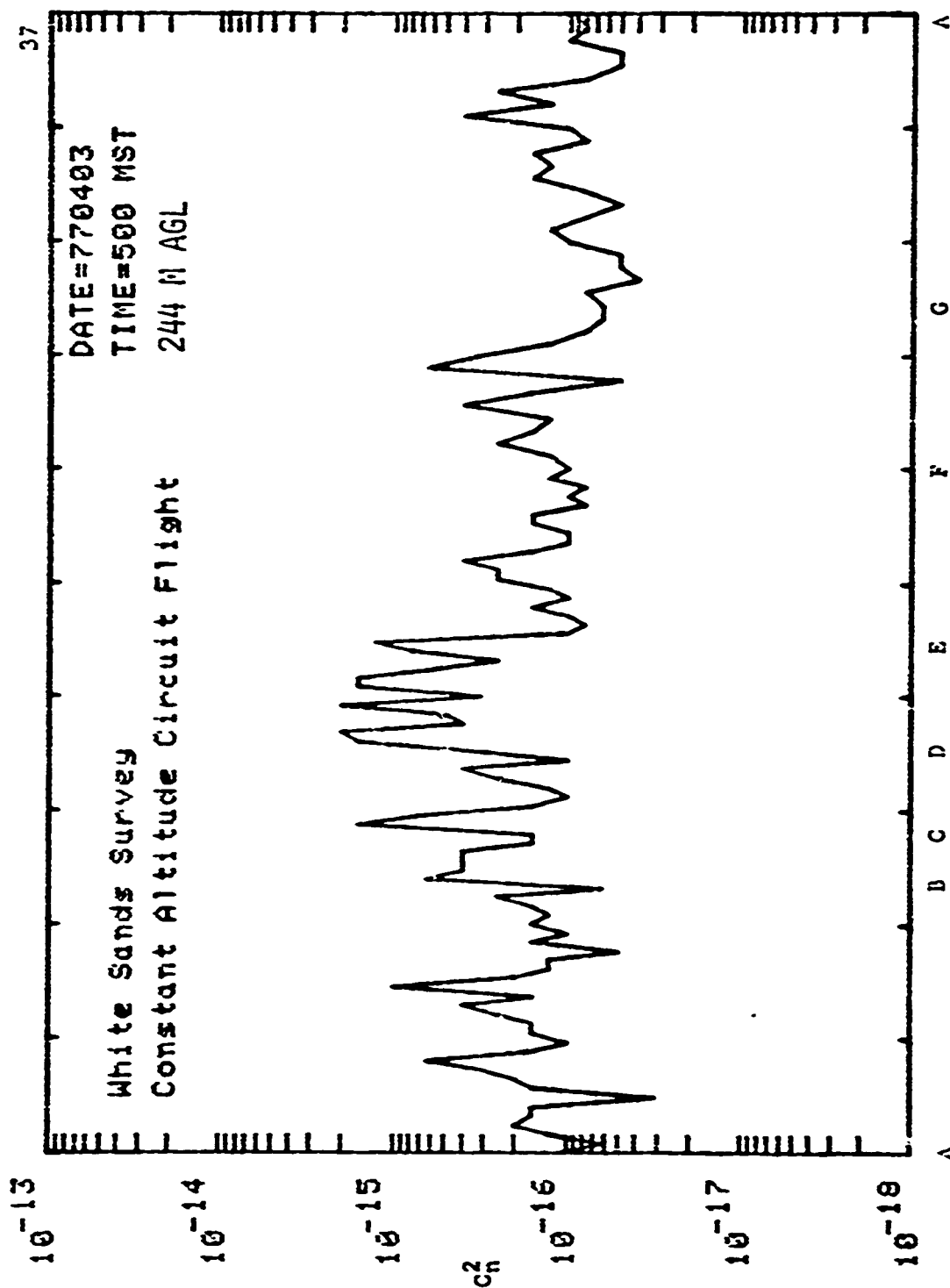


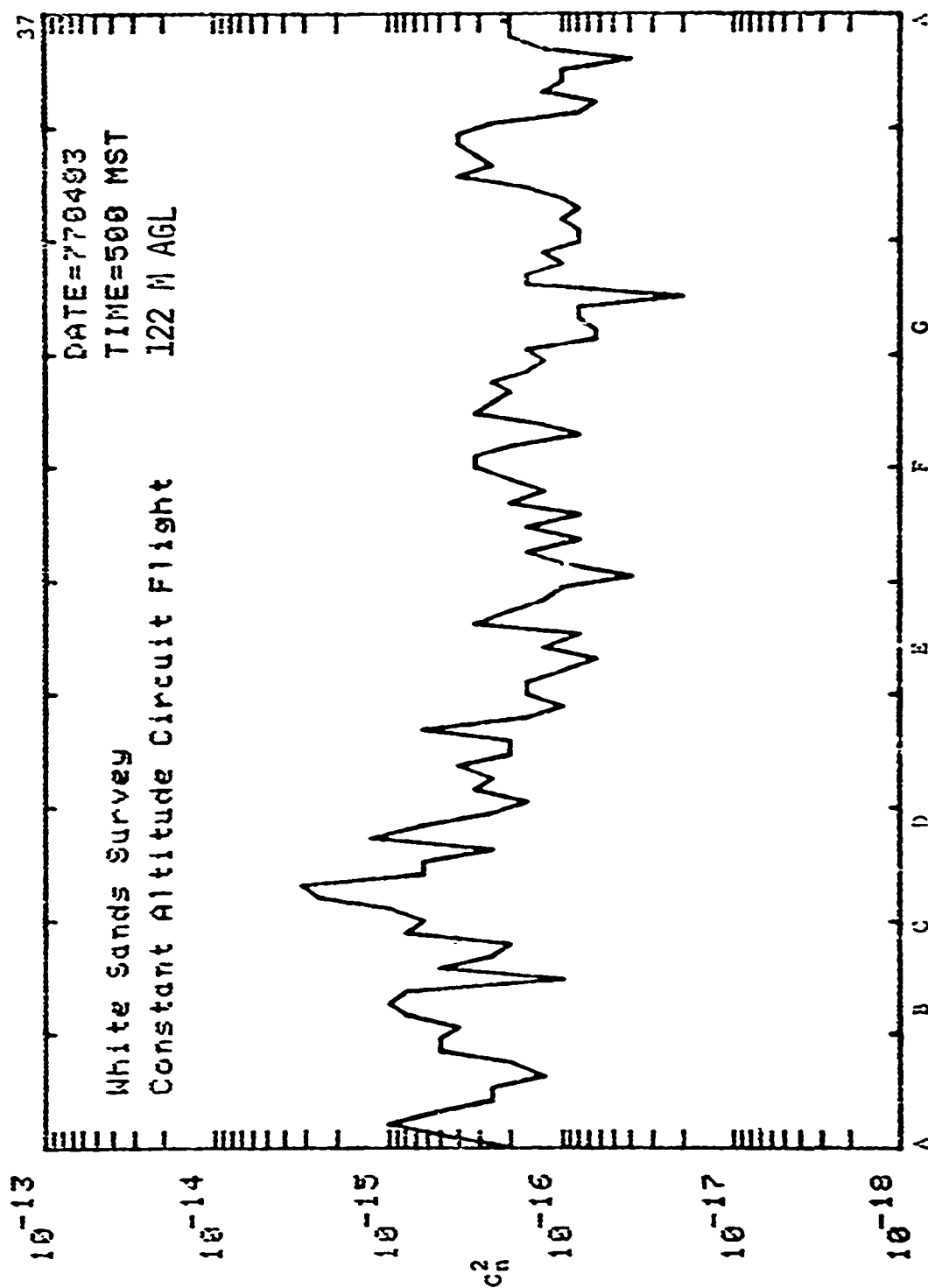


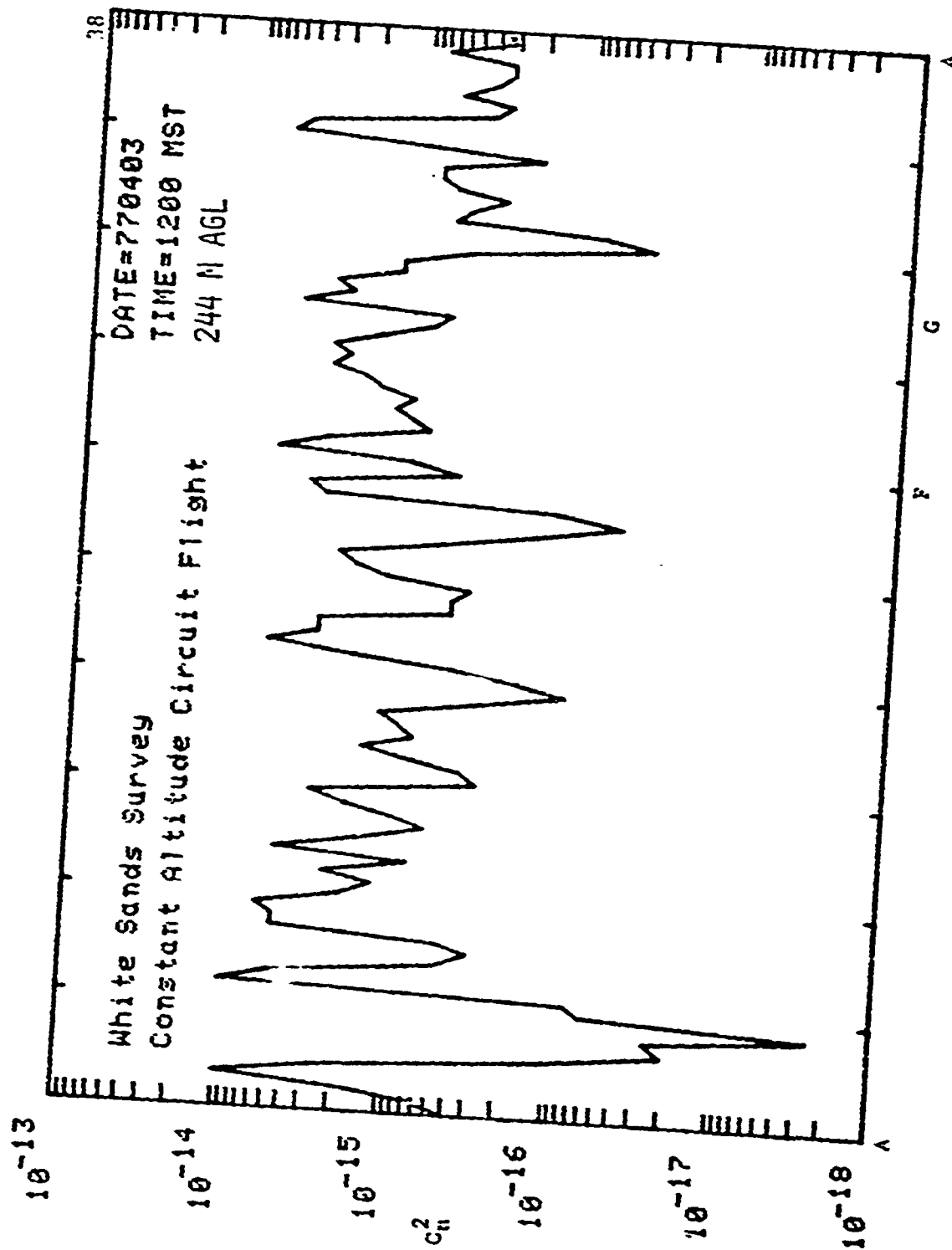


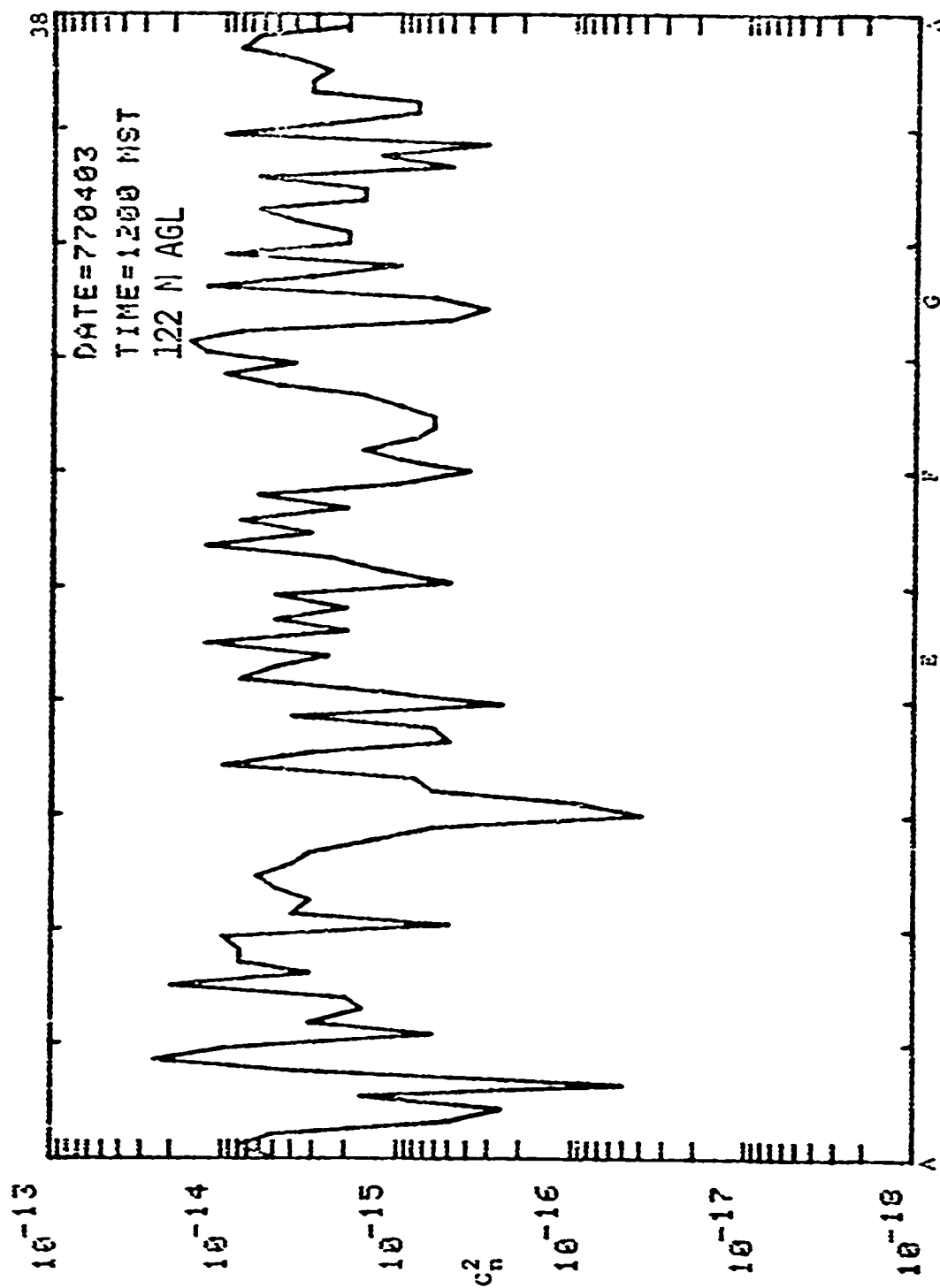


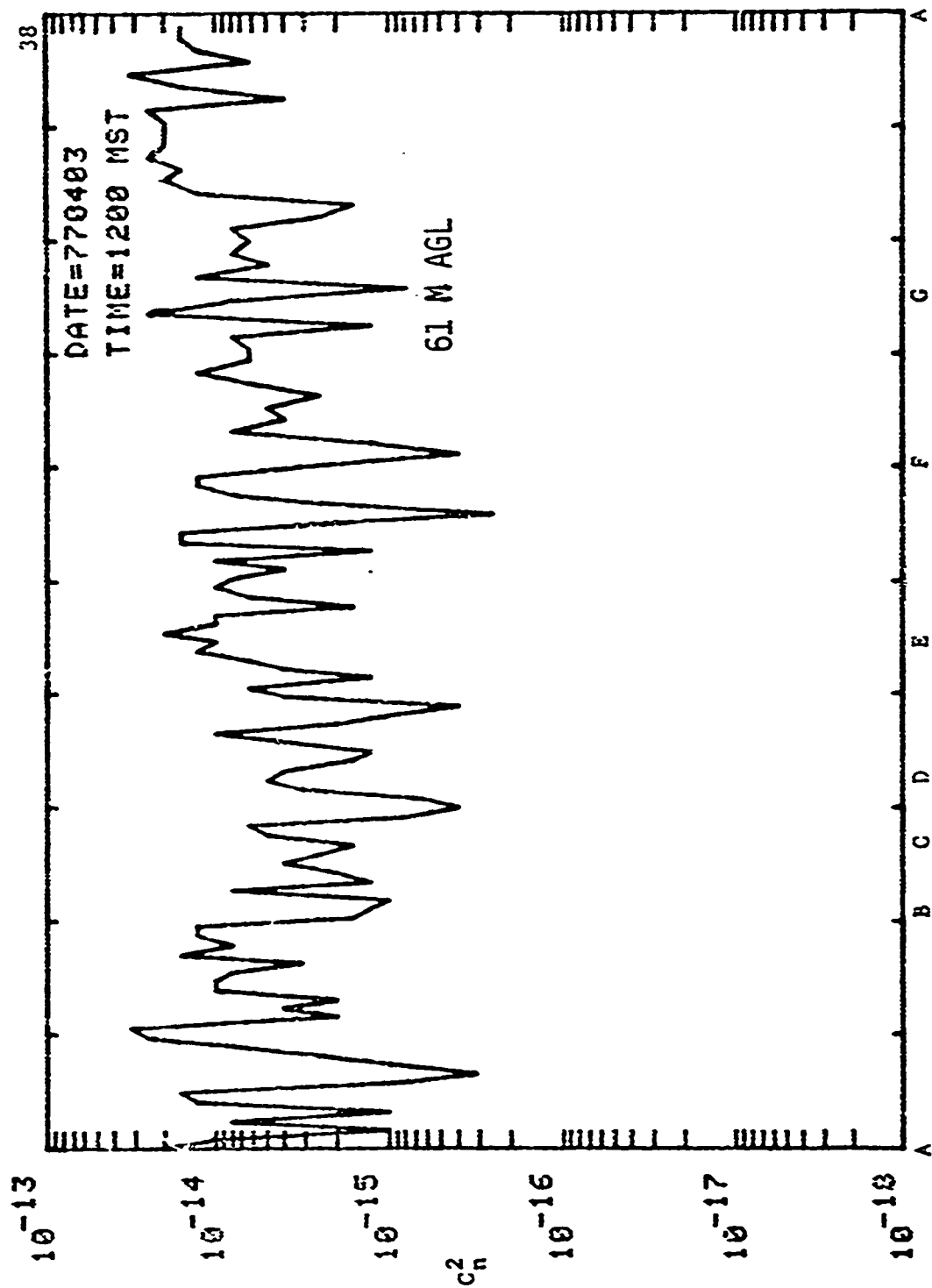


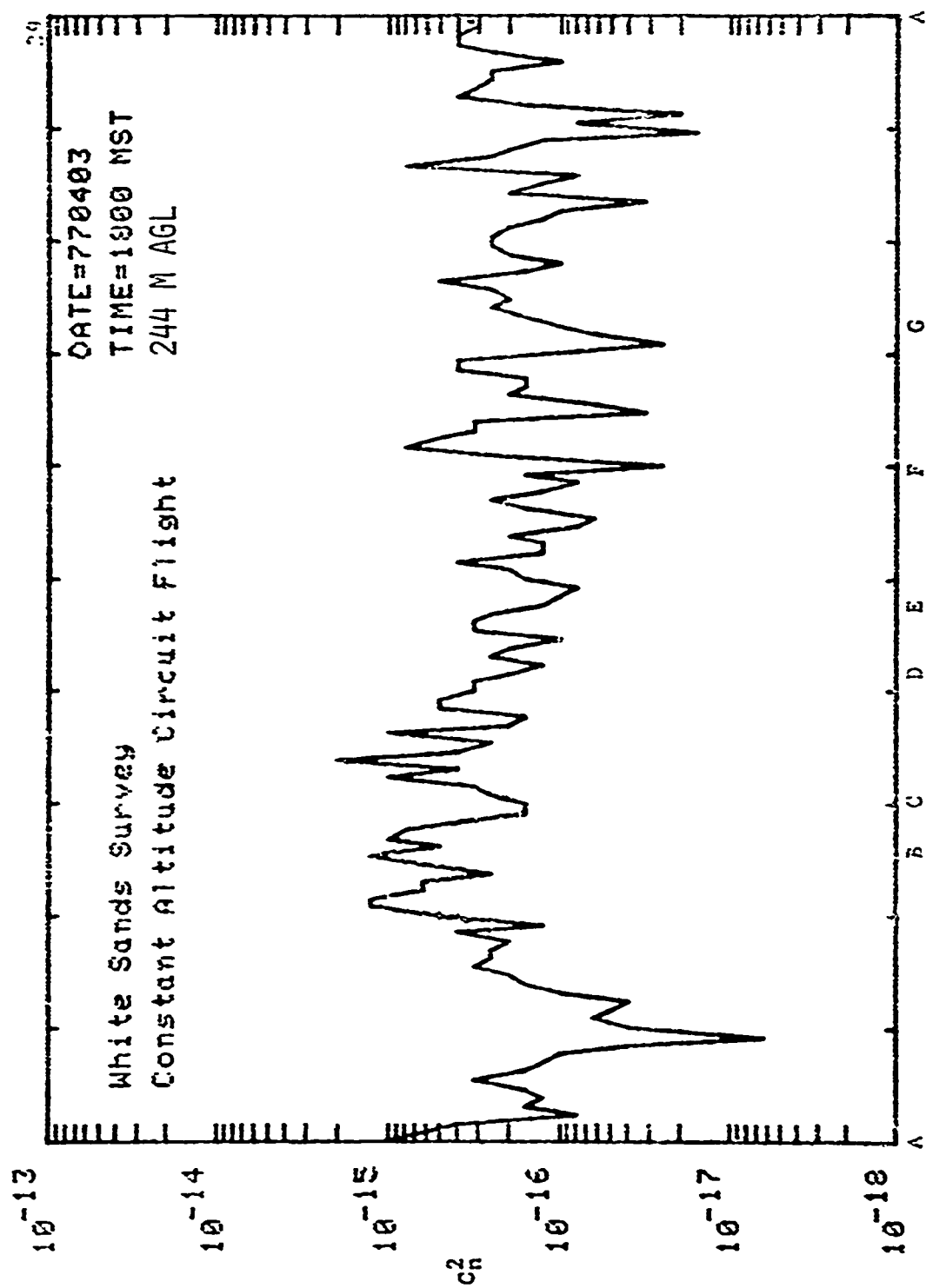


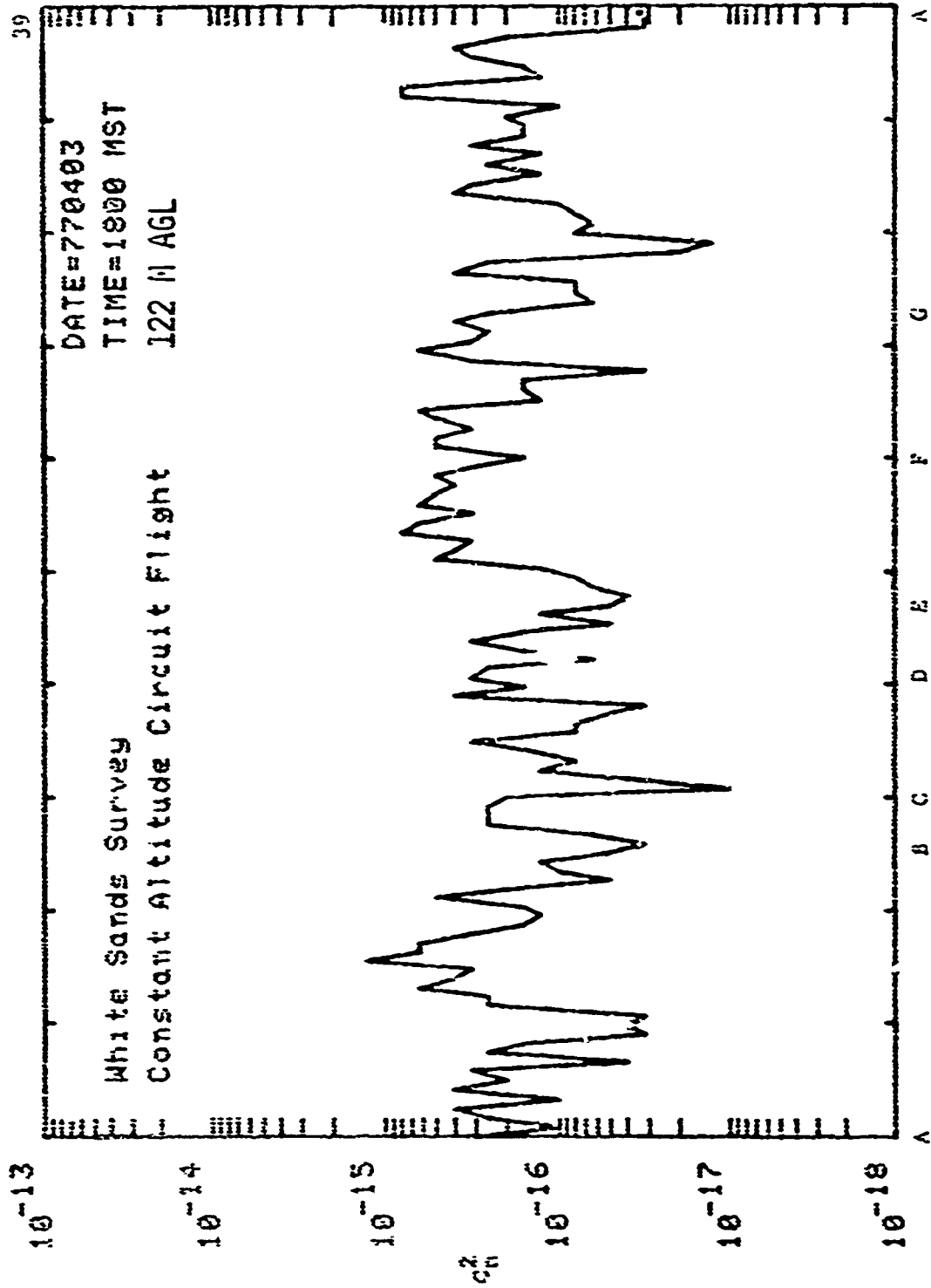


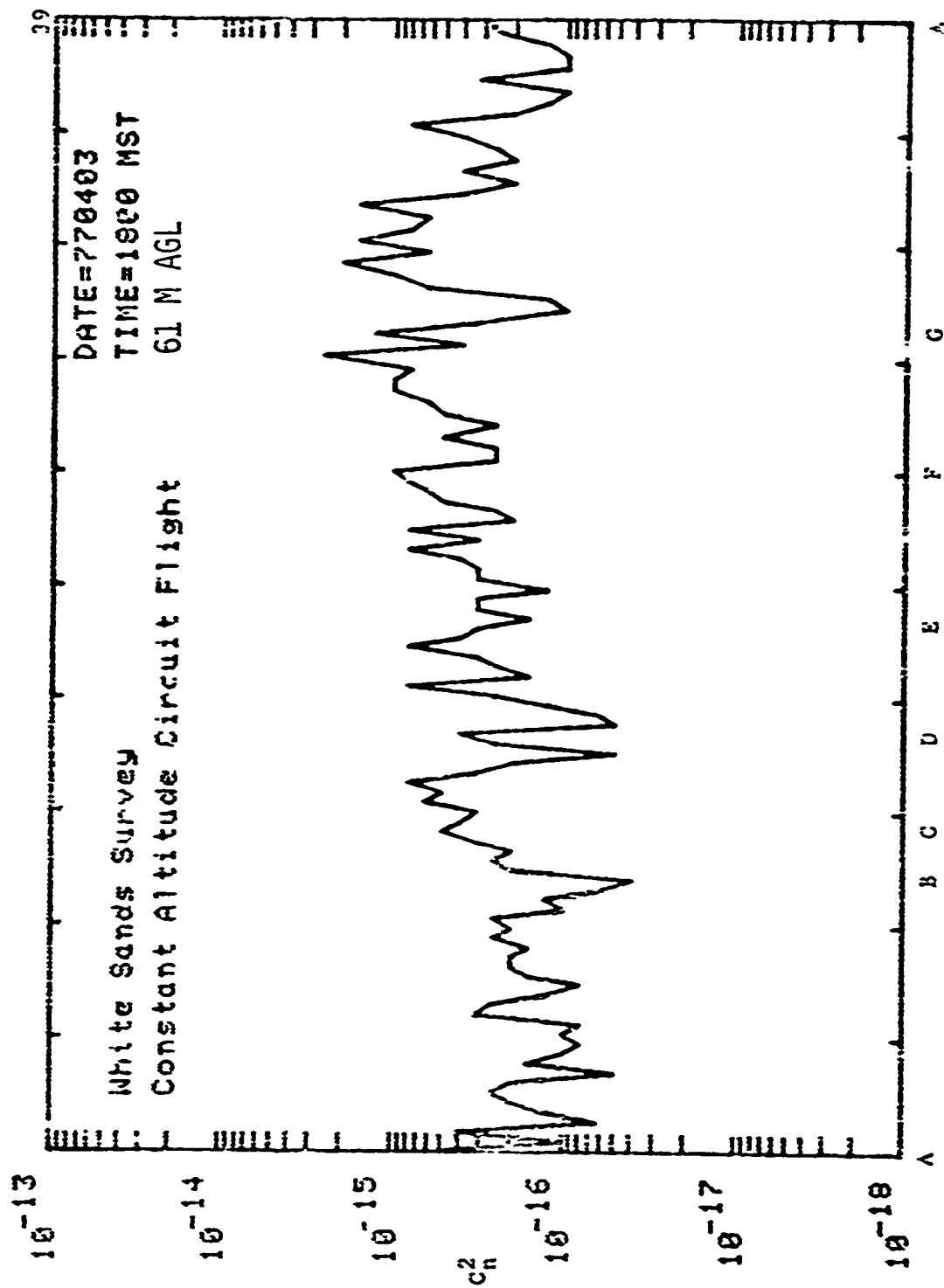


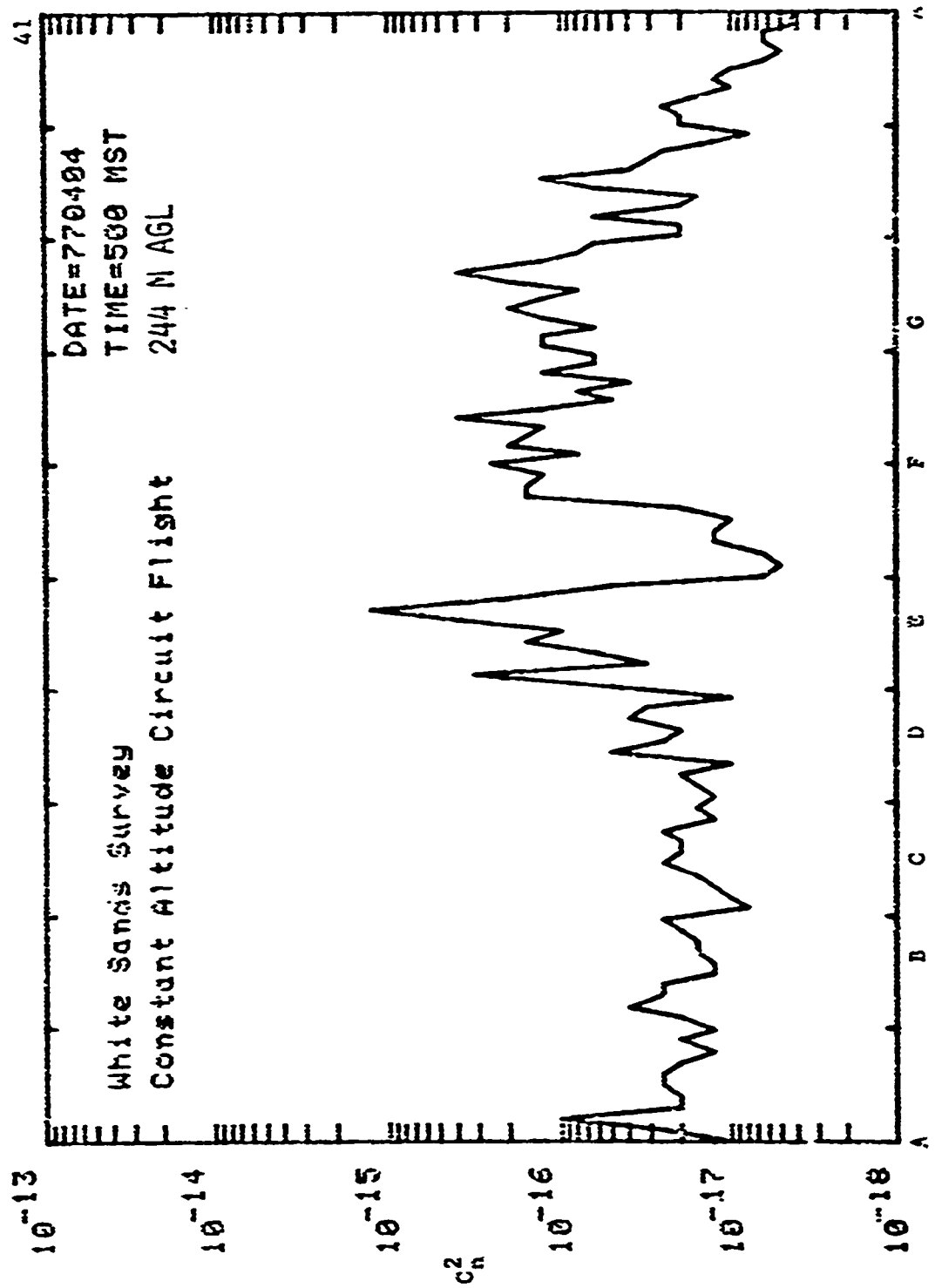


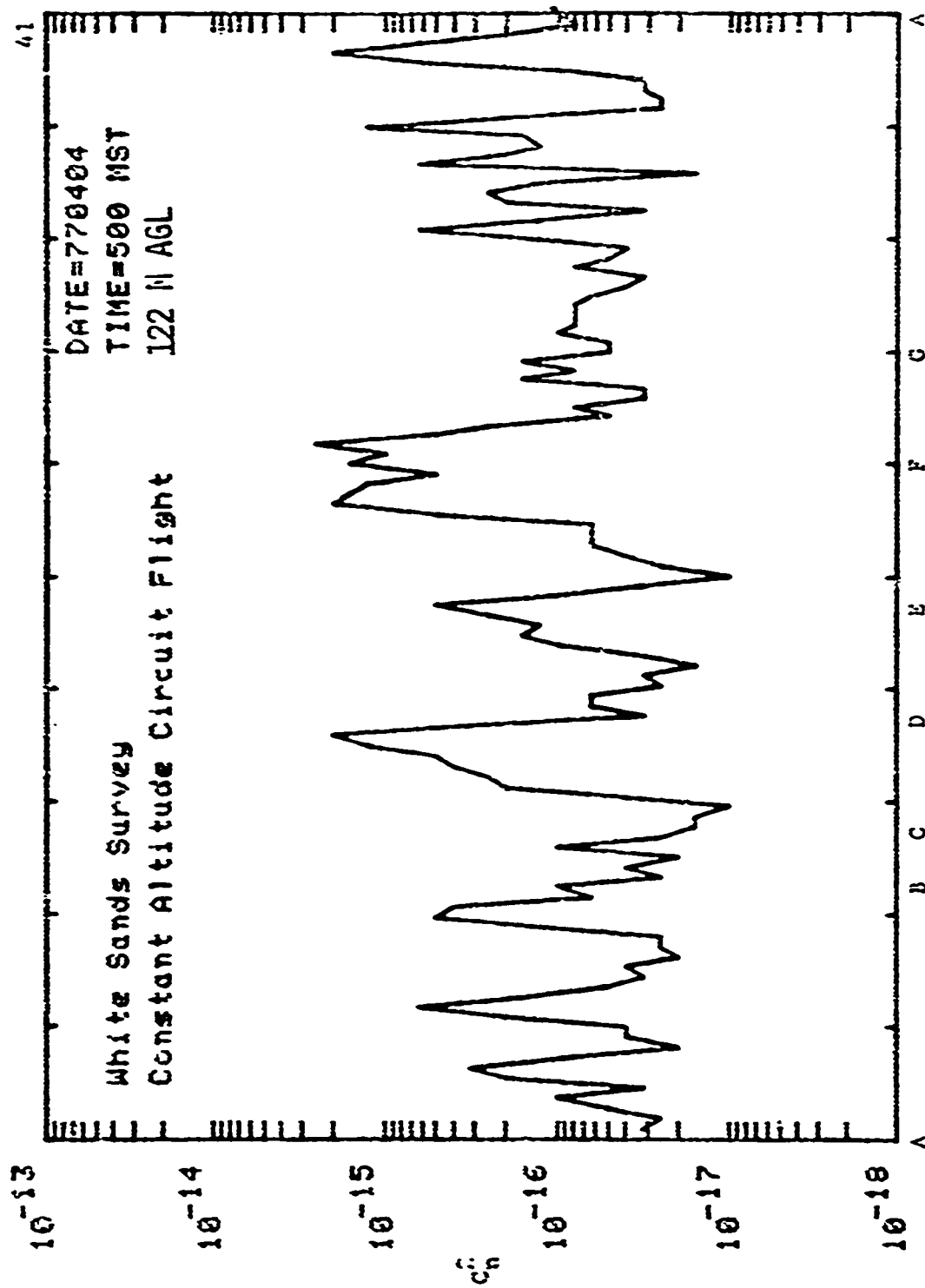


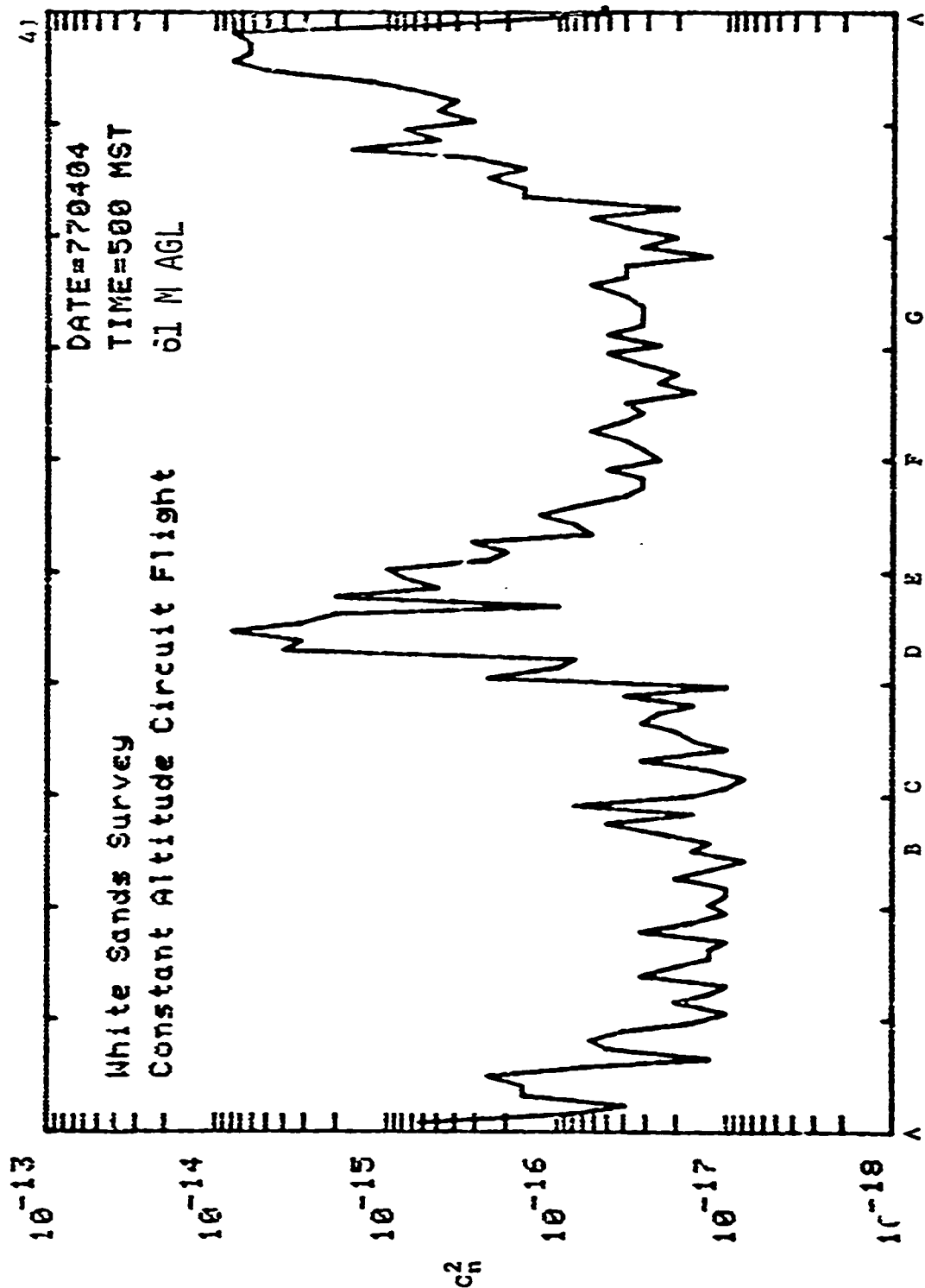


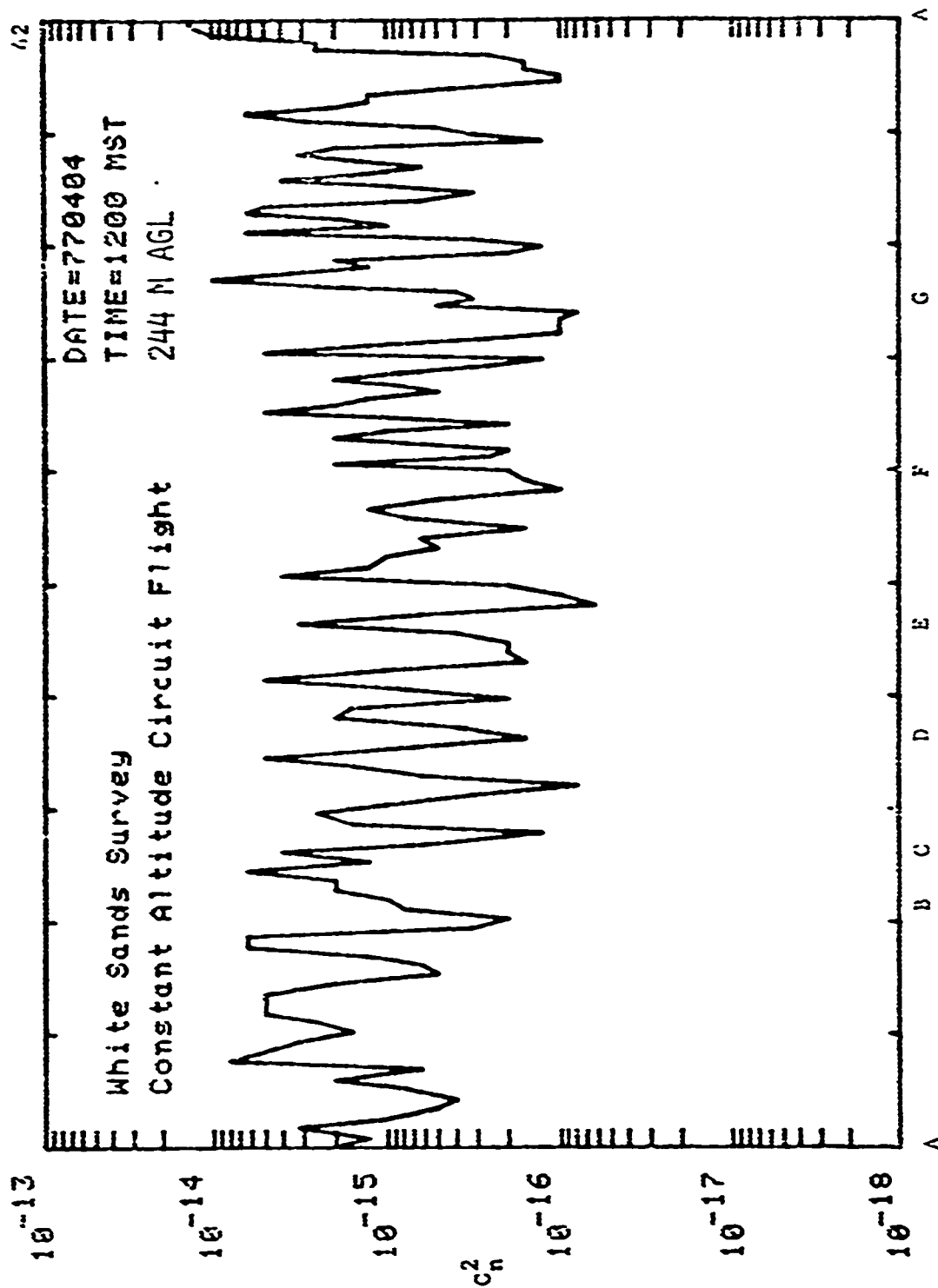


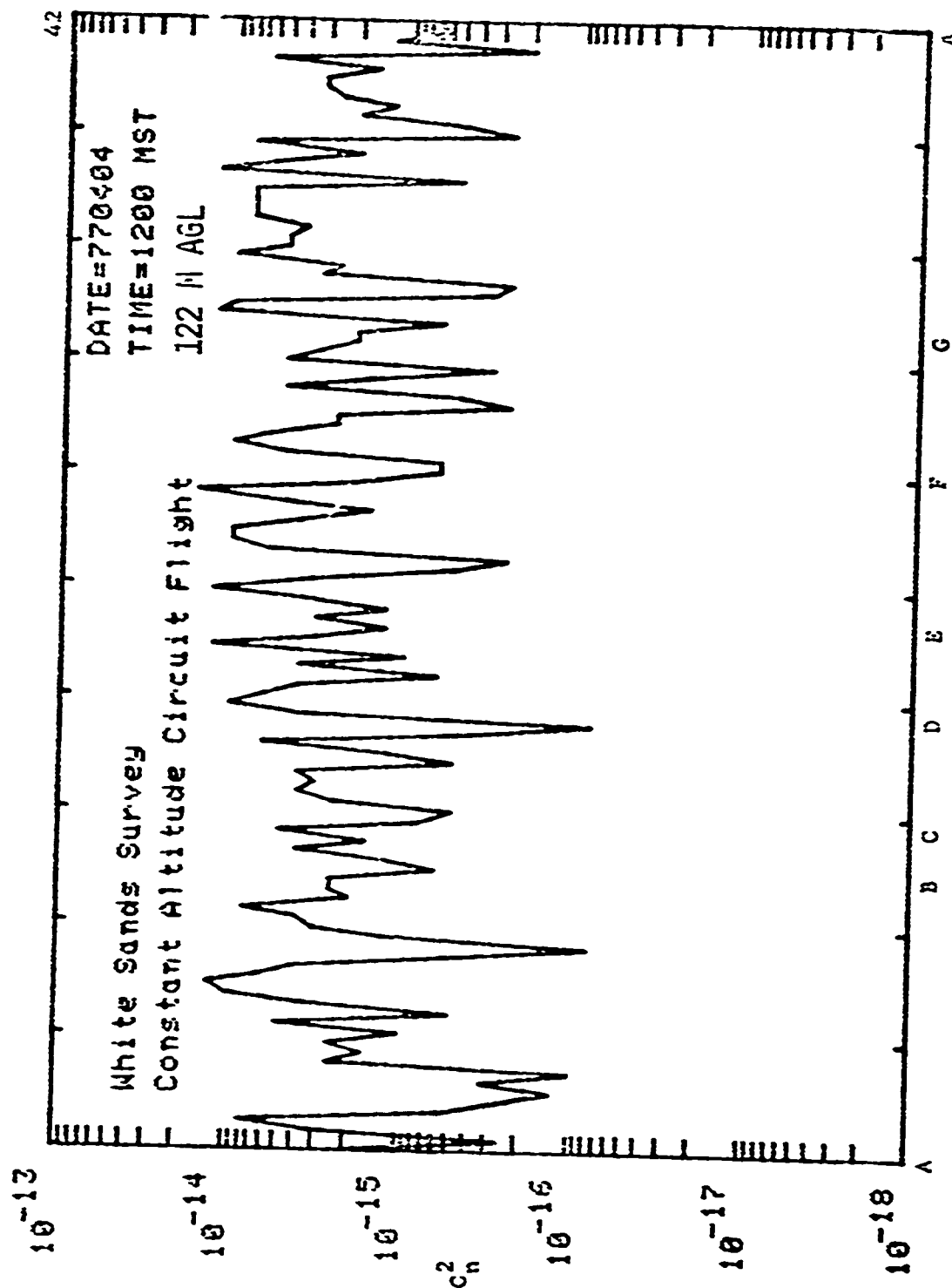


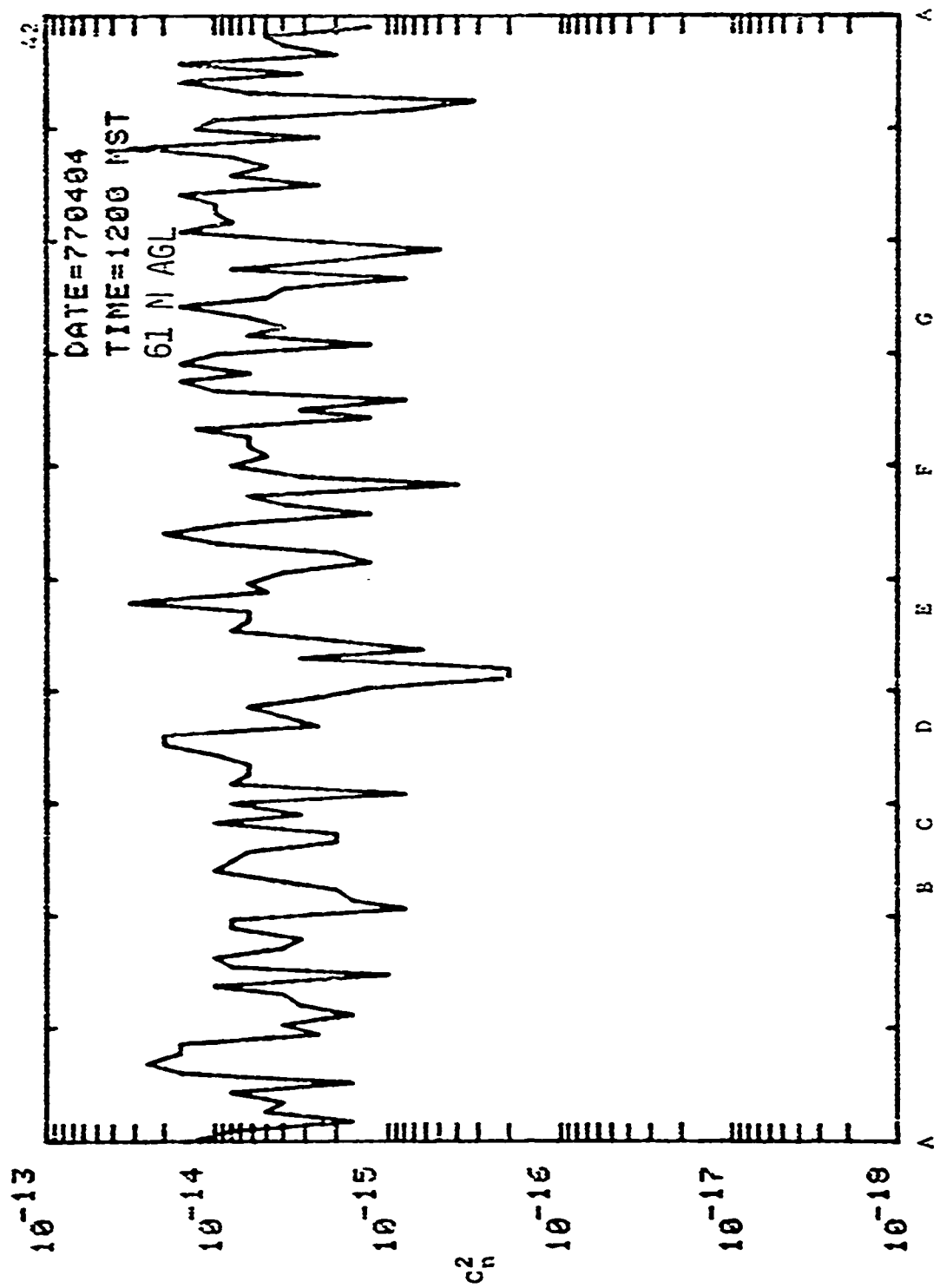


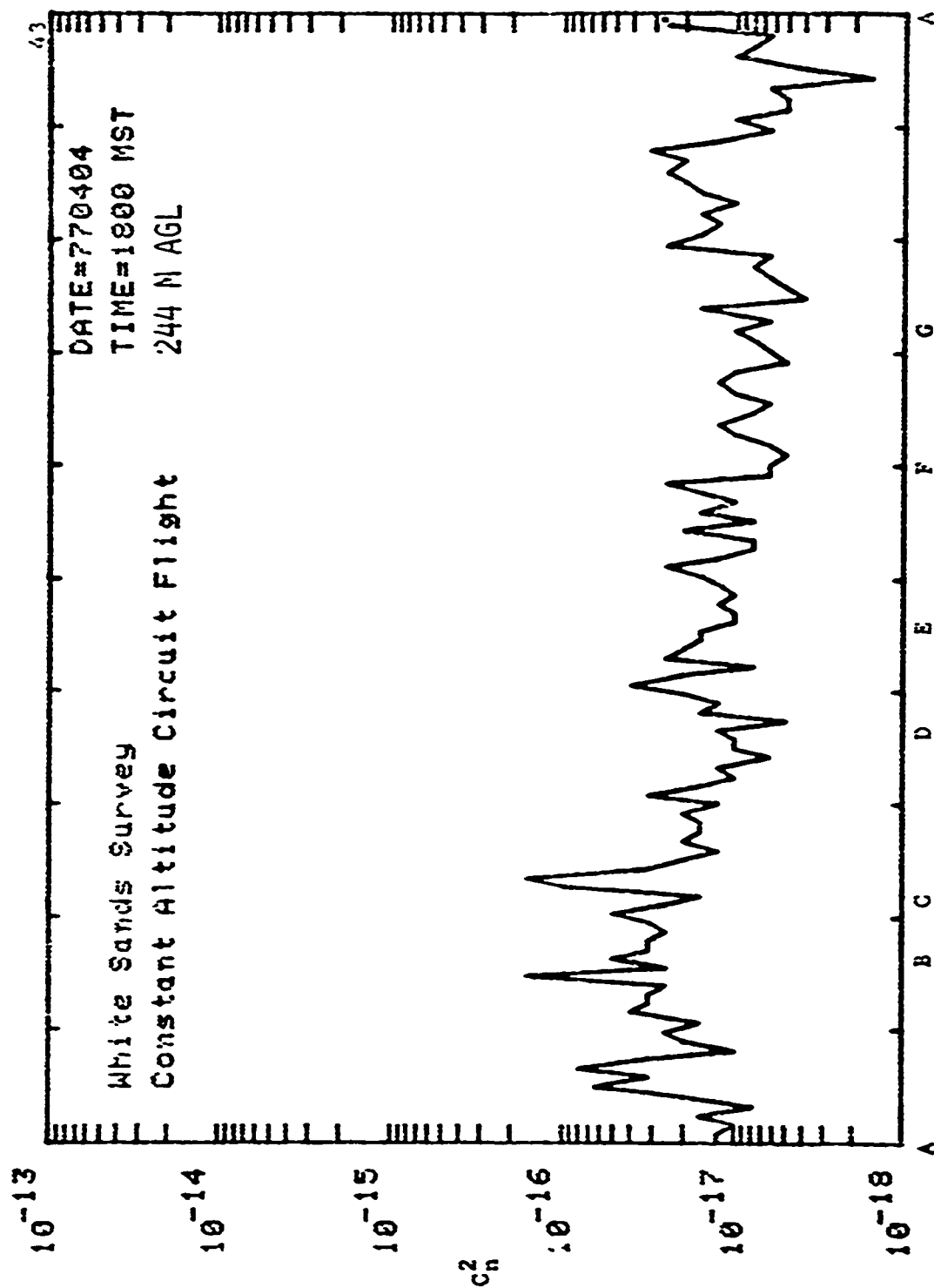


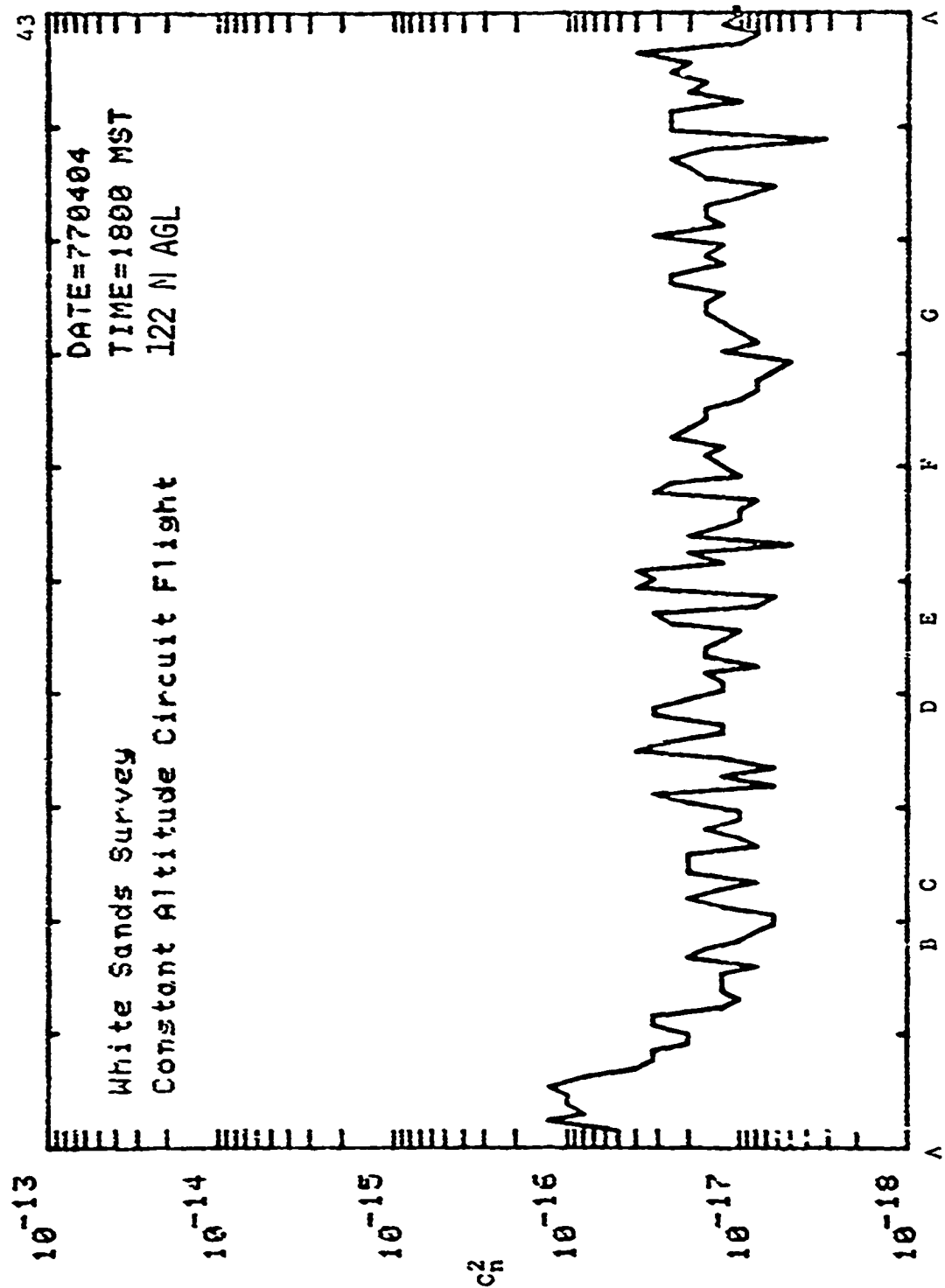


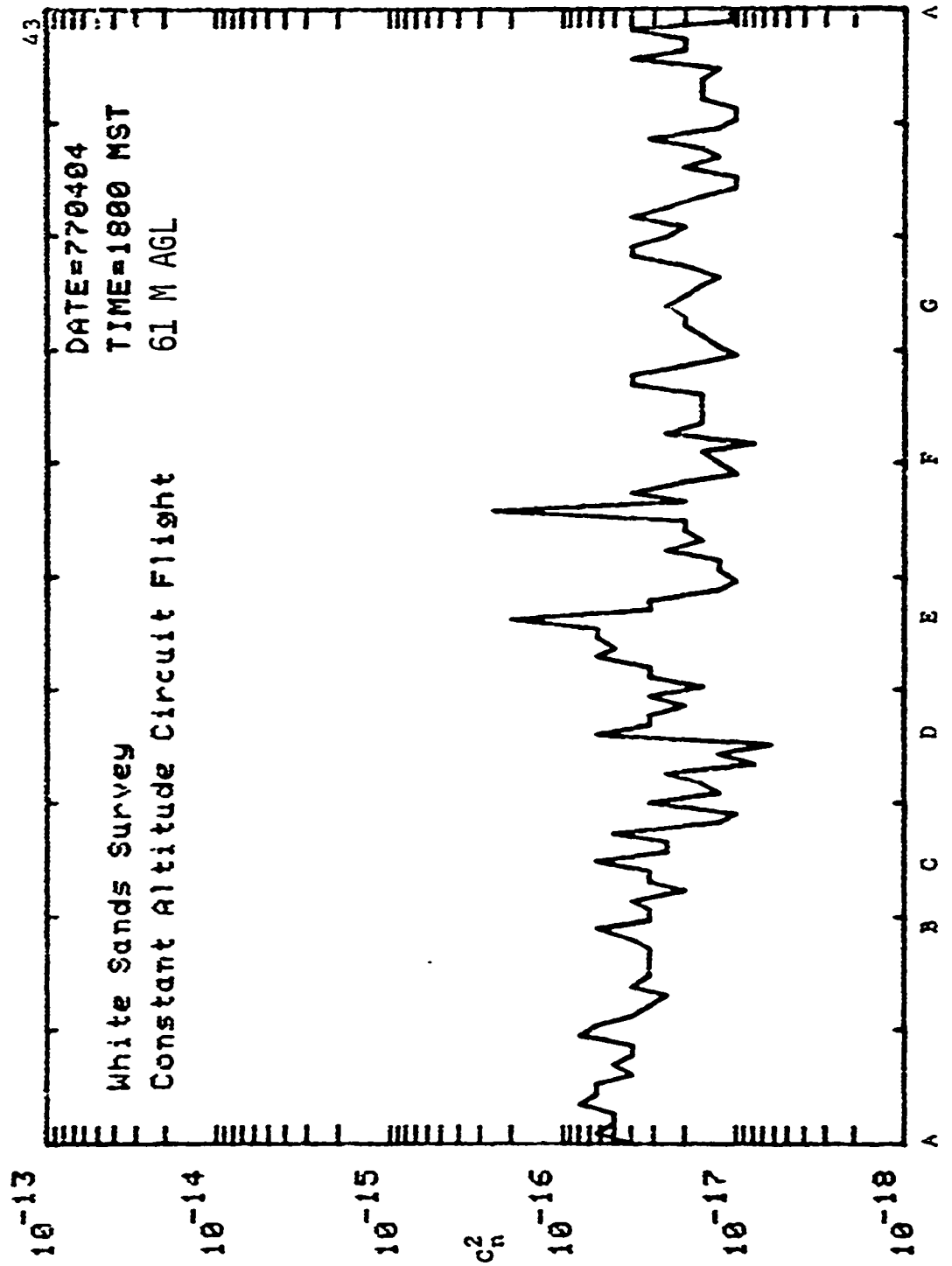


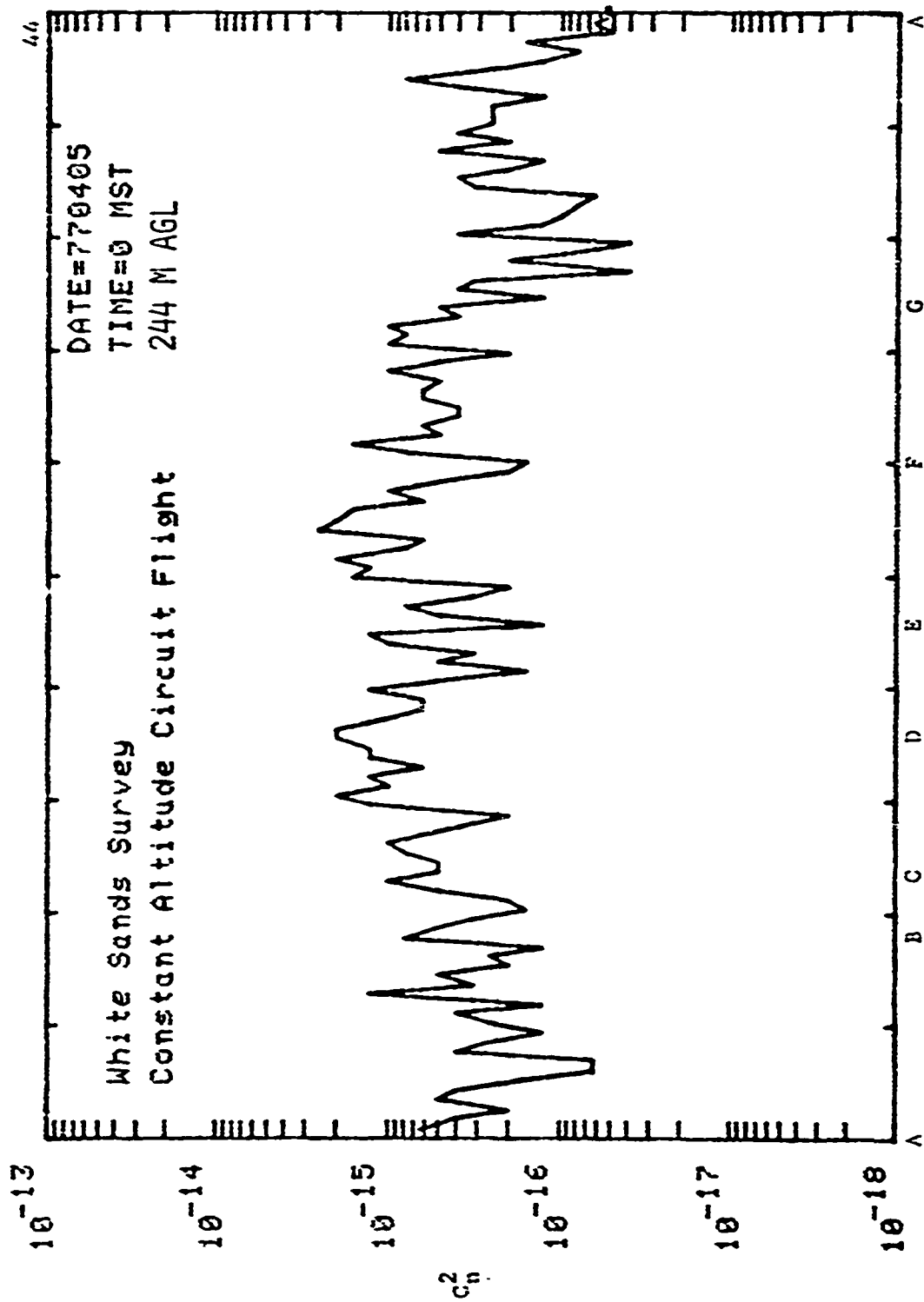


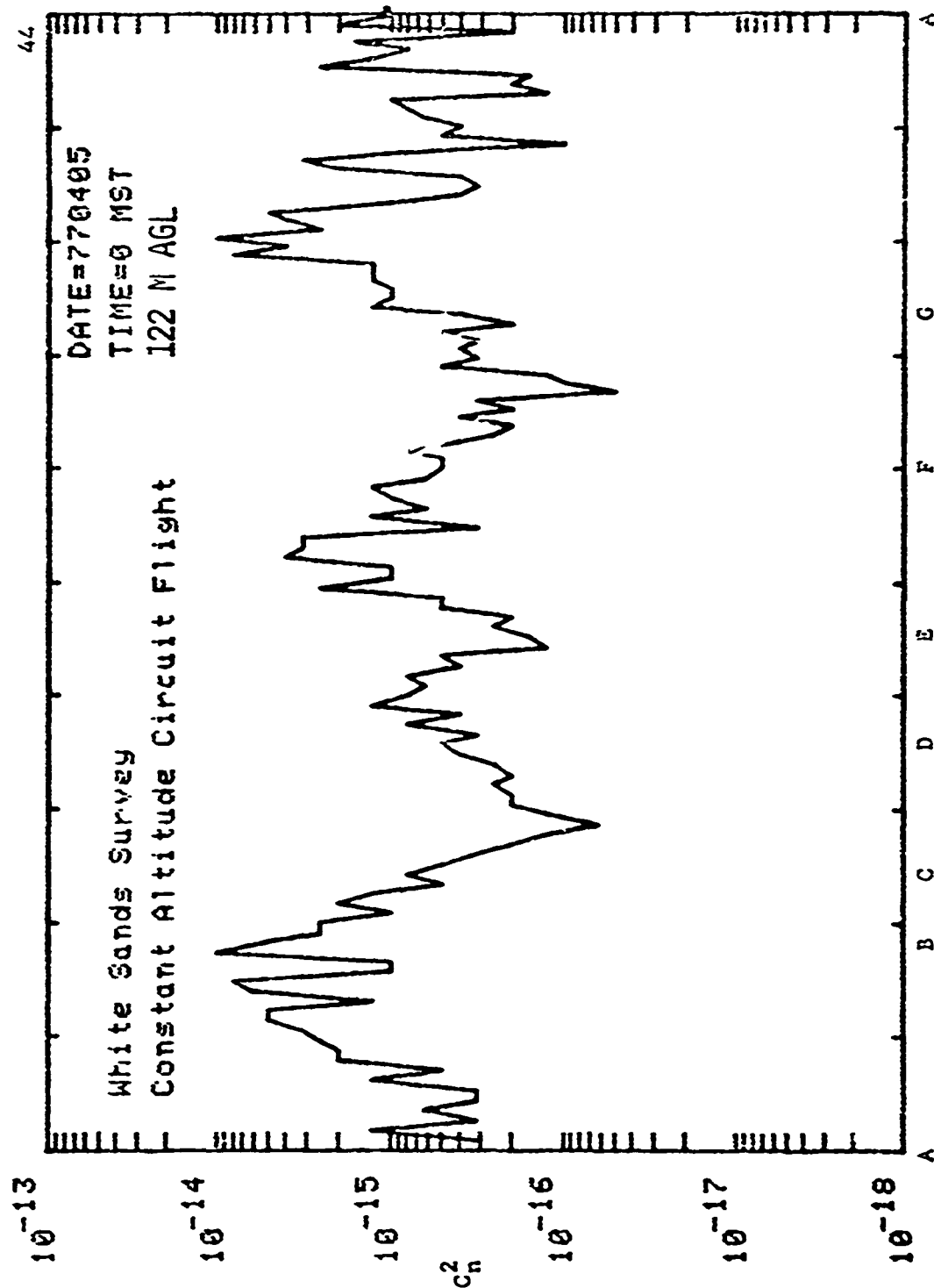












APPENDIX B

DATA EDITING

With respect to measurements of optical turbulence, two types of editing were employed - objective and subjective. The objective editing was concerned with the effect of the towers on the measurements, continuity problems, and power surges. Data deletion was by statistical analysis through appropriate programming. The subjective editing centered on meteorological phenomena and was edited out of the final plot after a thorough analysis of the objectively edited data.

Tower Effect

Turbulence sensors were mounted at approximately the 9 m and 33 m levels of the towers at the LSTC and Apache Site (Fig. 3). It was felt that the tower would have little effect on the measurements at 33 m, but the measurements at 9 m should be edited for tower shadow effect.

Figure B1 shows the orientation of the wind and turbulence probes at the 9 m level at Apache Site. The direct tower effect angle thus ranges from 90° to 155° . Ten degrees was added to either side of the sector to act as a safety factor against tower boundary effects.* Thus, for each 10-second average of C_T^2 , the corresponding 10-second average wind direction was examined. If that wind direction fell between 80° and 165° , the C_T^2 value was eliminated from the data set. As noted in Table 7 there were a maximum of 90 ten-second average data points in a given 15-minute average of C_T^2 which was plotted as C_H^2 . If the elimination of the data effected by the tower resulted in less than 30 data points in a given 15-minute period, then the 15-minute average was eliminated from the daily plot.

Probe Problems

Another source of error resided in the probes themselves. For example, a probe may be broken and not making contact, or it may be broken and making sporadic contact. In the former case, the signal will be low and exhibit very little variation. In the latter case, the standard deviation of C_T^2 will be quite large. Both sources of error were corrected through statistical procedures.

**The same direction criteria were applied to the LSTC data.*

APACHE SITE METEOROLOGICAL TOWER 9m LEVEL

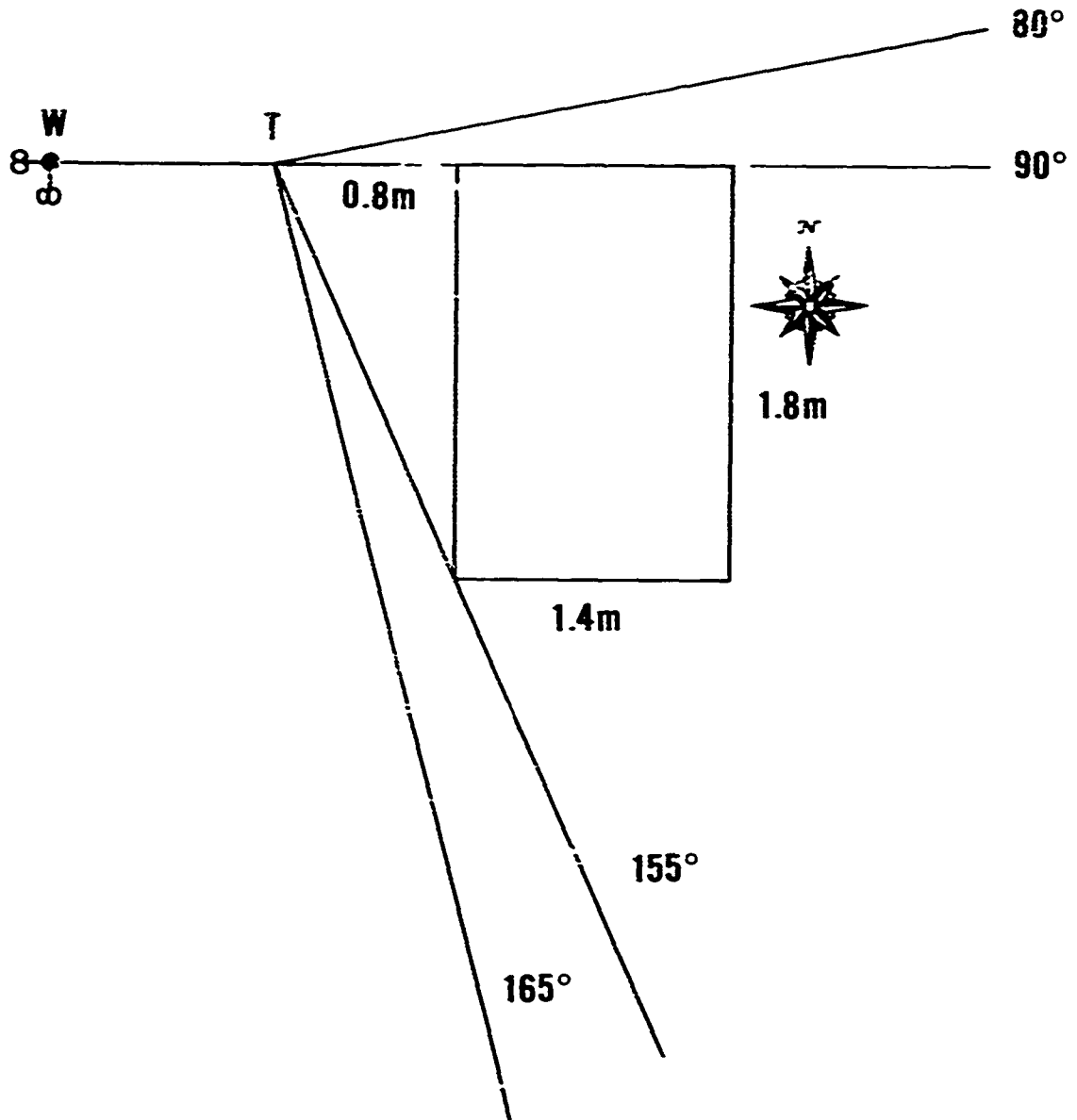


Figure 8i. Orientation of the wind (W) and turbulence (T) probes at the 9 m level of the 33 m tower at Apache Site.

Power Surges

A third source of error is that represented by the effect of power surges. Any 10-second average C_{I}^2 value greater than four standard deviations away from the mean was eliminated from the data set.

Meteorological

The last source of potential error which was treated - meteorological phenomena - was handled subjectively. After the objectively edited data had been tabularized and plotted by day, the data were subjectively analyzed. The question to be resolved was what, if any, meteorological phenomena could cause significant (greater than one decade) short term variations in C_{II}^2 ? The analysis hinged on:

- (1) Wind direction as $f(\text{time})$
- (2) Standard deviation as $f(\text{time})$
- (3) Lapse rate as $f(\text{time})$
- (4) Temperature as $f(\text{time})$

If the significant short term changes in the 15-minute averages of C_{I}^2 were not meteorologically interpretable, then they were deleted from the data set.

The wind data were not edited.

APPENDIX C

TURBULENCE SENSORS AND THEIR CALIBRATION

The turbulence sensors used in this experiment incorporate coiled 8- to 10-micrometer diameter tungsten filaments from Westinghouse and General Electric 3-watt, 120-volt light bulbs as the temperature sensing elements. These sensors operate in a differential configuration with a 20 cm vertical separation. The electronic circuit uses a direct current bridge with 500 microamperes flowing through the probes. The voltage variations across the filaments are amplified about 3000 times by a differential amplifier with a frequency response which is bandwidth limited between 0.016 Hz and 750 Hz at the half power points. The amplified voltage fluctuations feed a root-mean square (RMS) module which has a 10-second averaging period.

At a typical gain setting where a 1°C peak-to-peak temperature fluctuation corresponds to 2 volts peak-to-peak in the RMS module, the sensor package has a C_T^2 dynamic range from the noise level of approximately $4 \times 10^{-17} m^{-2/3}$ to the onset of electronic clipping at about $4 \times 10^{-12} m^{-2/3}$.

Tungsten filaments are used instead of fine platinum wires to achieve an acceptable probe lifetime. Under typical weather conditions with no precipitation, a tungsten filament probe life of one week is realized. Under similar conditions the lifetime of a 1-micrometer platinum wire would be measured in hours.

The use of the 8- to 10-micrometer diameter tungsten probes reduces the high frequency response; however, in practice this does not appear to be significant since the spectrum of C_T^2 (C_H^2) encountered in the atmosphere has most of the energy at low frequencies. This is demonstrated in Fig. C1, where two equivalent turbulence sensors with different probes are compared. One device used 1-micrometer diameter platinum probes as a reference standard. The other instrument used the 8- to 10-micrometer diameter 3-watt to 120-volt tungsten filament probes. The systems were operated with a basic vertical probe separation of 20 cm; however, the two instruments were moved so that corresponding probes were within 2 cm of each other.

The system's calibration depends upon the temperature coefficients of resistance for the probes. The temperature coefficient for the tungsten filaments was measured as 0.00423 ± 0.00001 ohm/°C although some lots were 0.00443 ± 0.00001 ohm/°C. The platinum probe temperature coefficient was measured as 0.00385 ± 0.00001 ohm/°C. As can be seen in Fig. C1, the tungsten sensor response was about 5% higher than the fine wire platinum response. This difference was within the experimental error. A dynamic calibration with an oscilloscope was used and this limits the

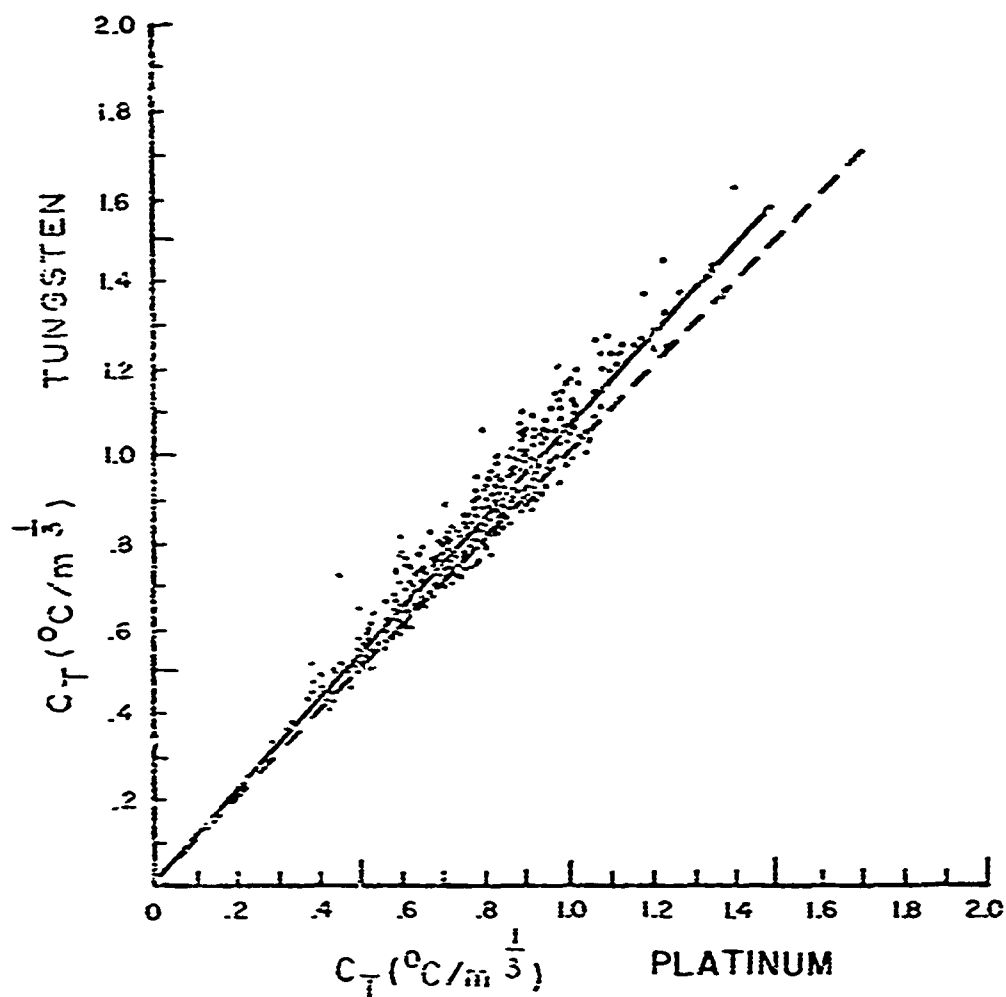


Figure C1. Comparison between turbulence response for two equivalent systems with different probes. The abscissa represents the response of a 1-micrometer diameter platinum wire probe while the ordinate represents the response of an 8- to 10-micrometer diameter 3-watt to 120-volt tungsten filament probe.

calibration accuracy to 2 to 3% per system. For the 20 cm separation used for these sensors, the tungsten filament measurement accuracy does not differ significantly from the results with the 1-micrometer platinum probes. The absolute accuracy of the turbulence sensor can be estimated from this comparison as $\pm 5\%$ for C_T (C_N) or $\pm 10\%$ for C_T^2 (C_N^2).

APPENDIX D

ADDITIONAL PARTICULATE INFORMATION 16-19, 23 March 1977

Prior to the 24 March to 8 April 1977 sampling period, particulate size distribution, windspeed, and relative humidity measurements were made at the Arky Site. The resultant graphical depictions of extinction coefficient, windspeed, and relative humidity are shown in Figs. D1 through D10.

Tabular listings of the size distribution, extinction coefficient at $\lambda = 1.06$, $\lambda = 3.8$, and $\lambda = 10.6$ and mass loadings are covered in Table D1.

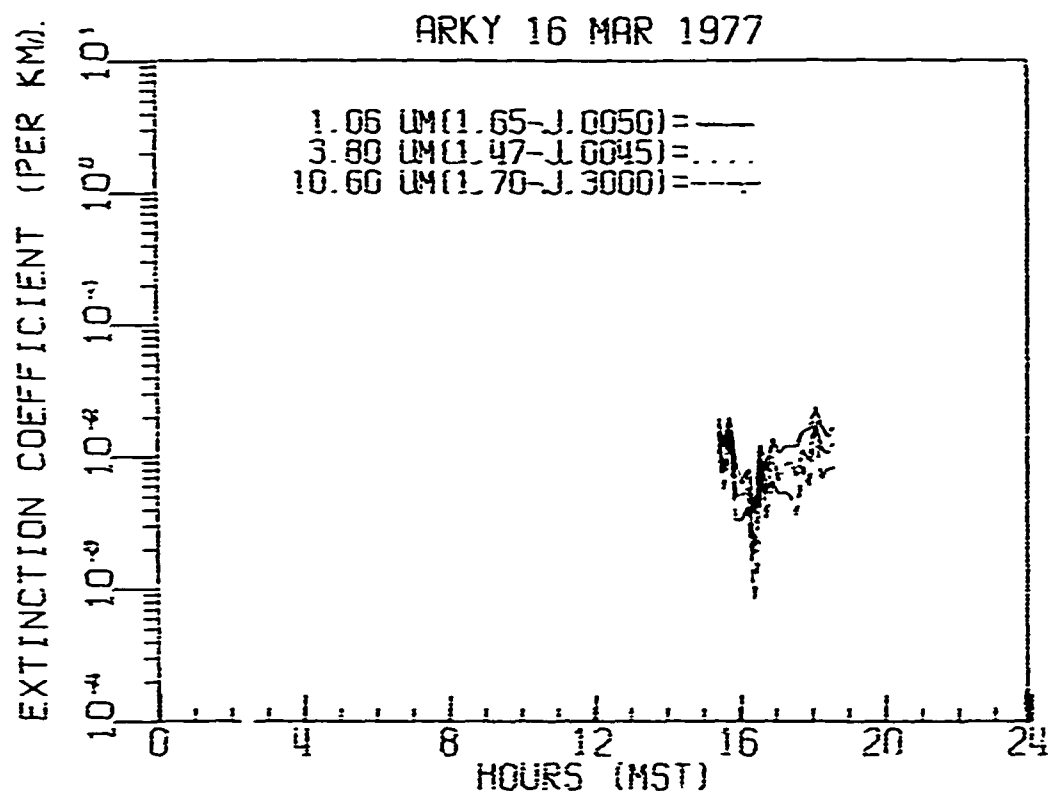


Figure D1. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 16 March 1977.

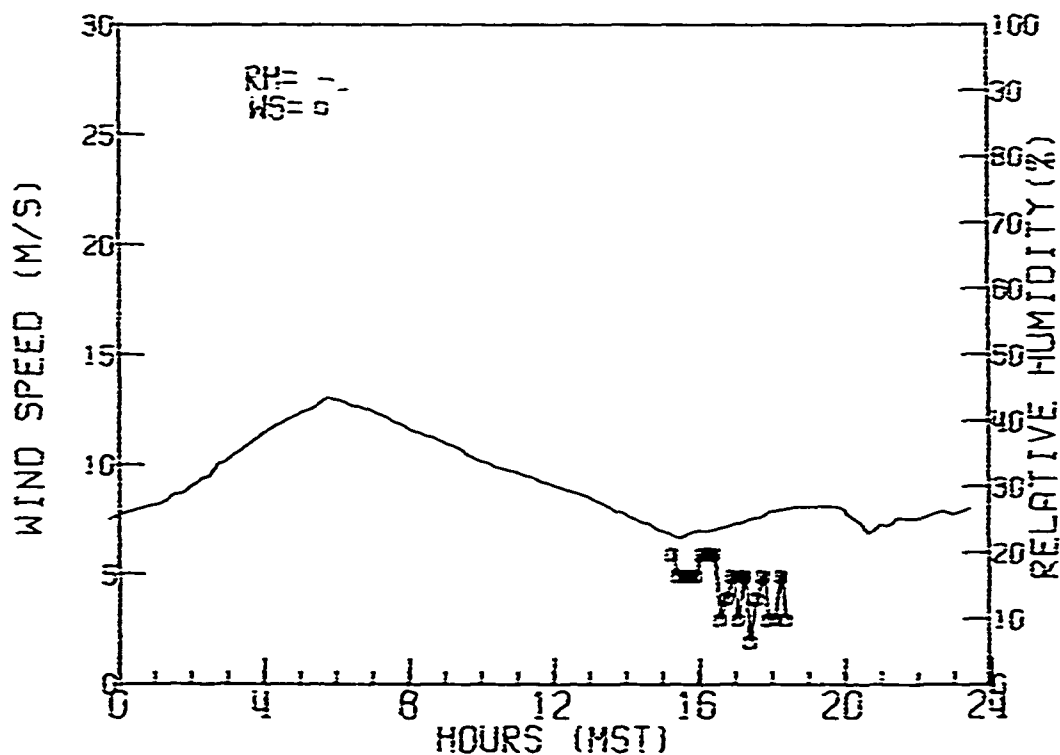


Figure D2. Diurnal variation of windspeed and relative humidity, Arky site, 16 March 1977.

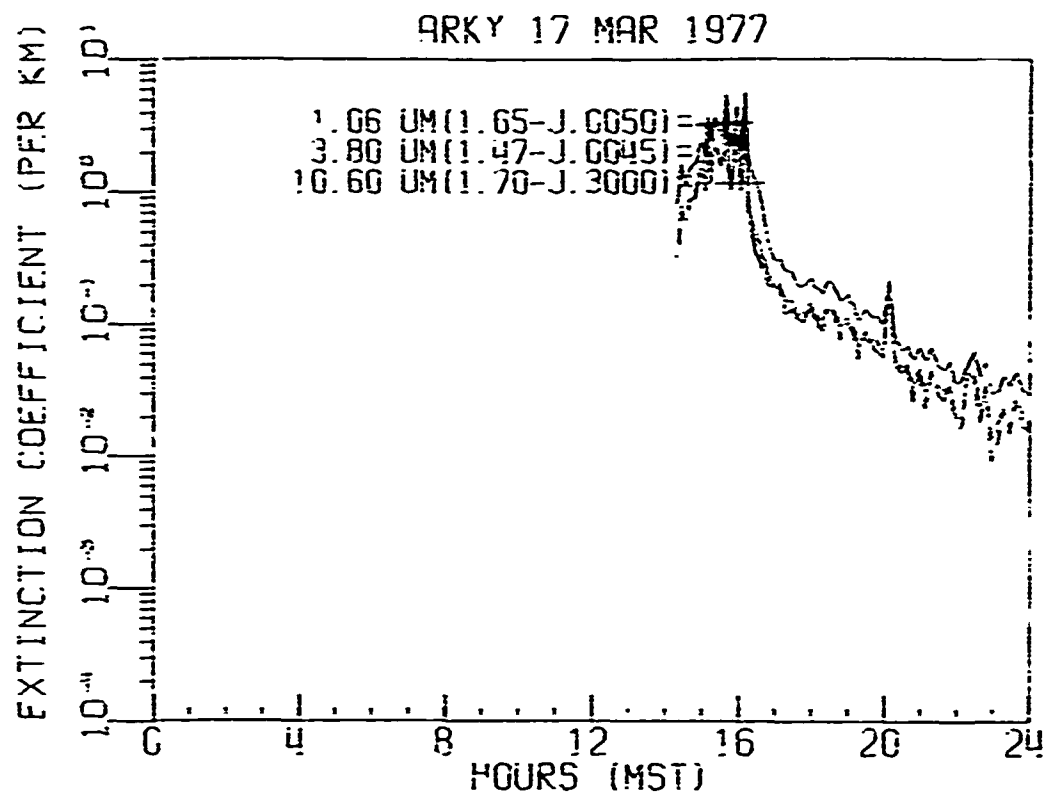


Figure D3. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 17 March 1977.

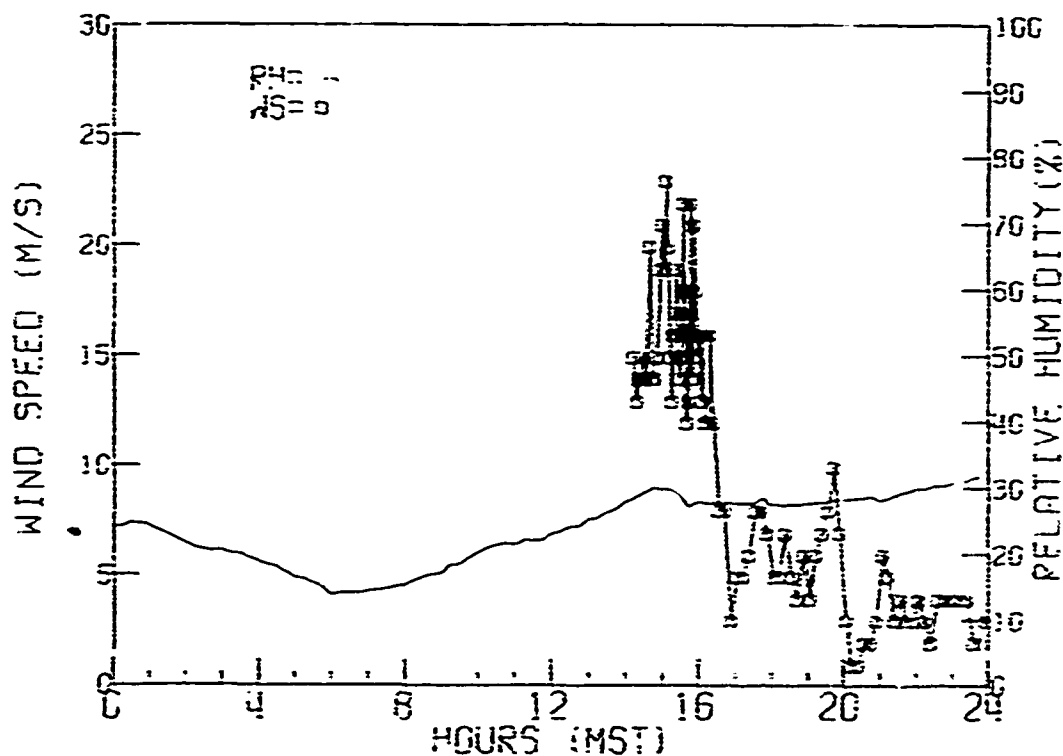


Figure D4. Diurnal variation of windspeed and relative humidity, Arky Site, 17 March 1977.

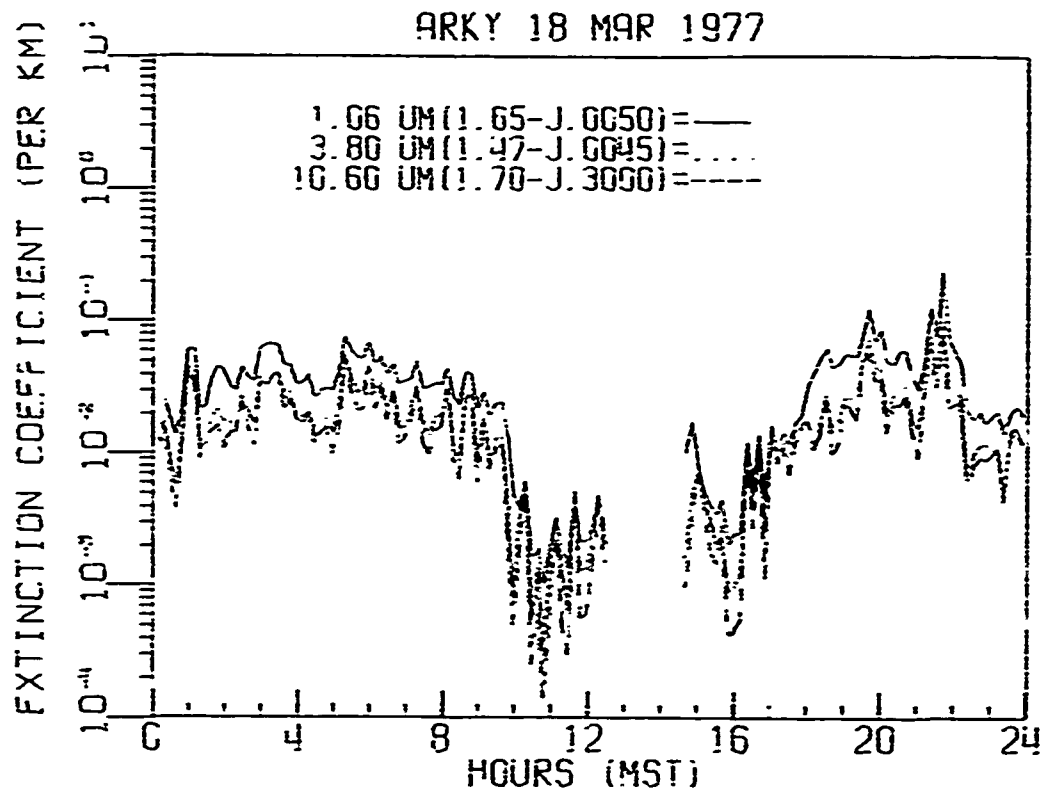


Figure D5. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 18 March 1977.

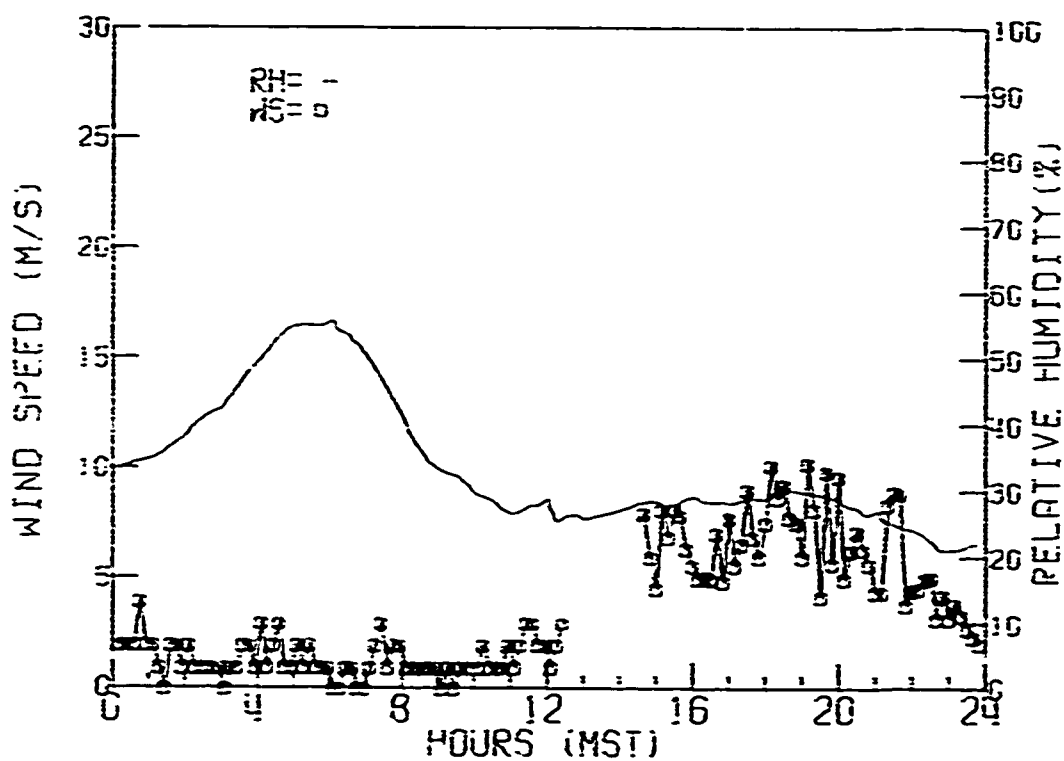


Figure D6. Diurnal variation of windspeed and relative humidity, Arky Site, 18 March 1977.

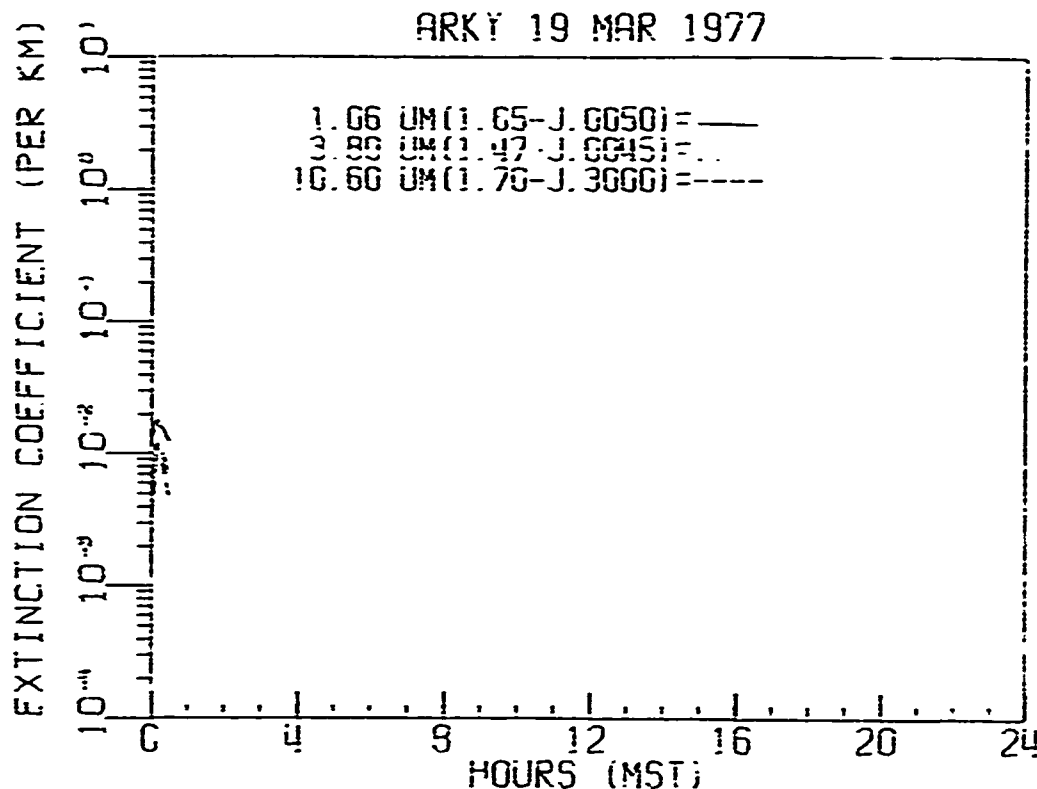


Figure D7. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 19 March 1977.

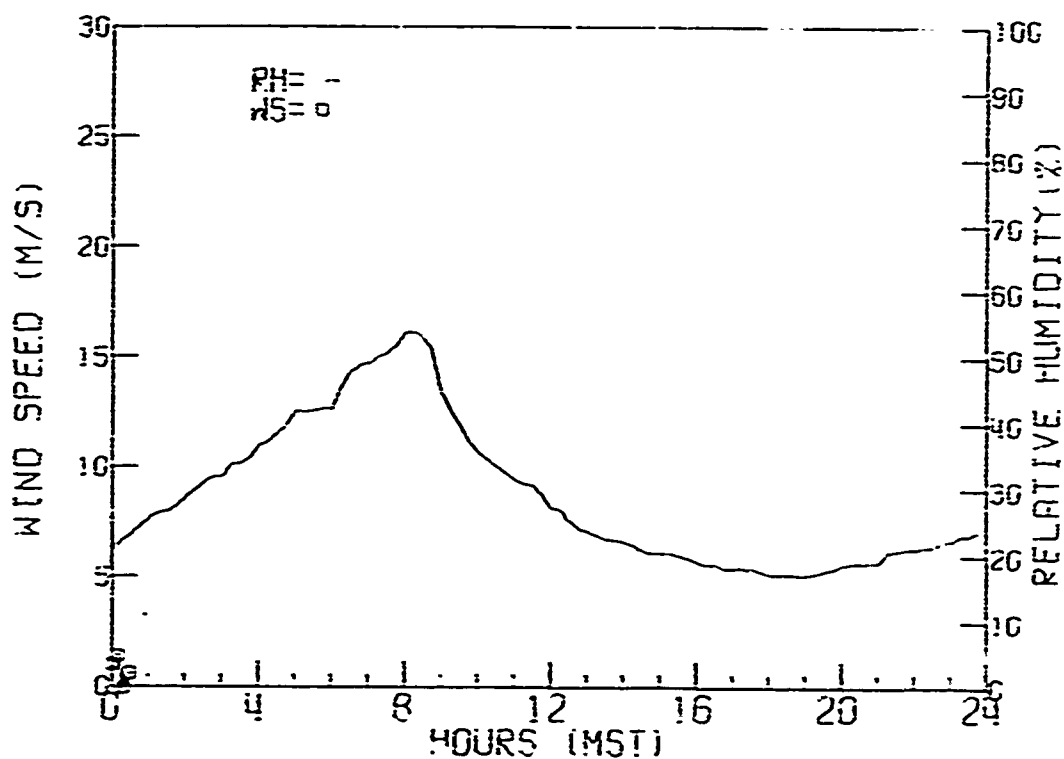


Figure D8. Diurnal variation of windspeed and relative humidity, Arky Site, 19 March 1977.

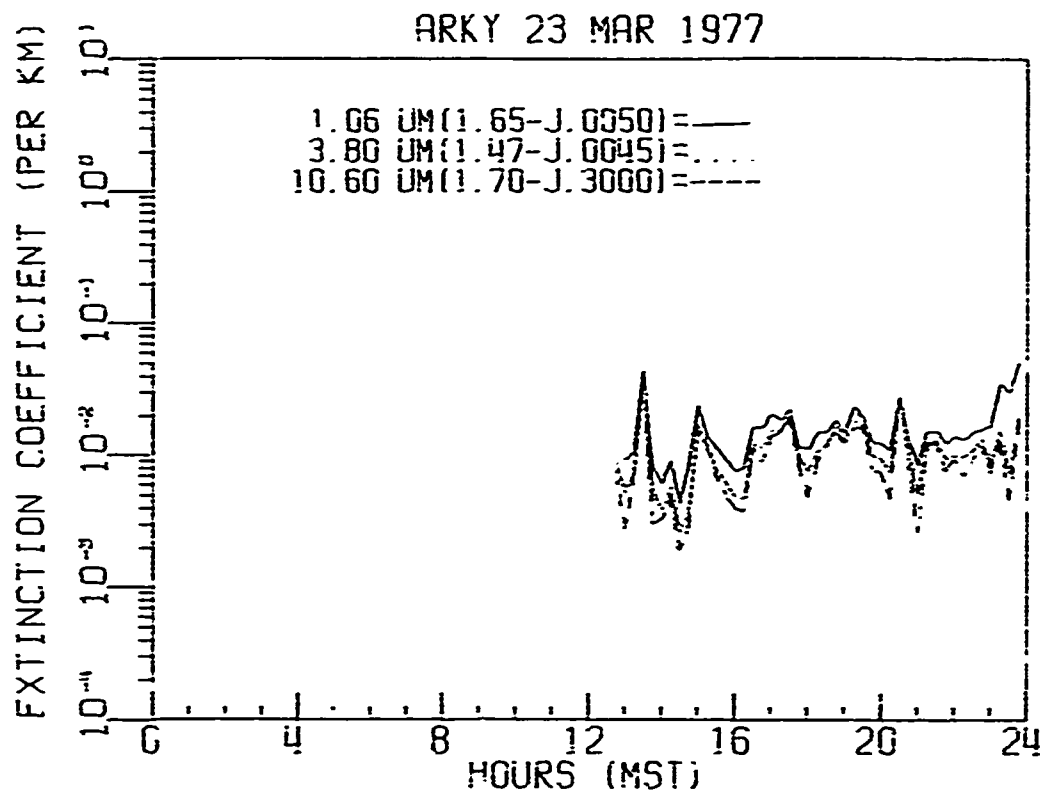


Figure D9. Diurnal variation of the particulate extinction coefficient for $\lambda=1.06 \mu\text{m}$, $\lambda=3.8 \mu\text{m}$ and $\lambda=10.6 \mu\text{m}$ for Arky Site, 23 March 1977.

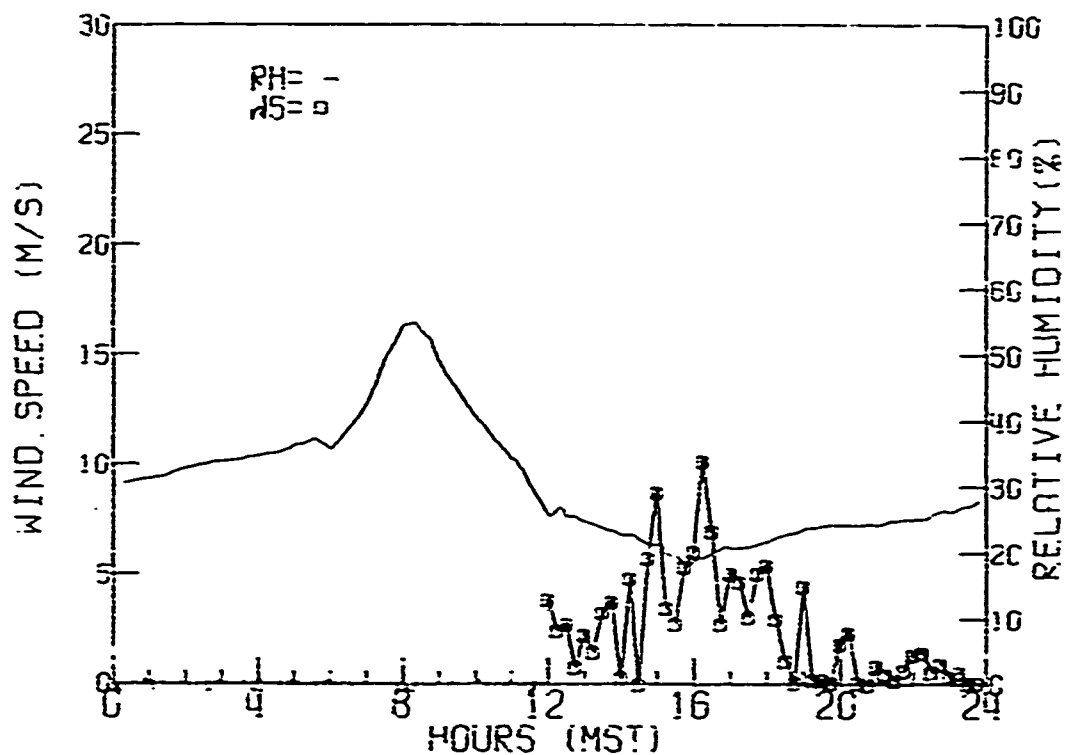


Figure D10. Diurnal variation of windspeed and relative humidity, Arky Site, 23 March 1977.

TABLE D1.
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
AT RYK SITE, WSHR

CHANNEL										EXTINCTION (PER KM)			MASS LOADING (UG/M ³)	
DATE	TIME	SAMPLE TIME (SEC)	1	2	3	4	5	6	7	8	1.06	3.8	10.6	
16 MAR 77														
15:31:00		600	.11+01	.90+00	.37+00	.15+01	.40+01	.20+01	.00	.00	.19+01	.15+01	.12+01	1.5.
15:41:00		600	.12+01	.47+00	.24+00	.15+01	.46+01	.00	.00	.00	.12+01	.76+02	.58+02	.7.
15:51:00		600	.13+01	.04+00	.33+00	.30+01	.48+01	.20+01	.00	.00	.20+01	.16+01	.13+01	134.
16:01:00		600	.07+00	.51+00	.61+01	.30+01	.00	.00	.00	.00	.05+02	.52+02	.34+02	31.
16:11:00		600	.49+00	.26+00	.15+00	.30+01	.00	.00	.00	.00	.63+02	.52+02	.33+02	27.
16:21:00		600	.73+00	.41+00	.61+01	.46+01	.00	.00	.00	.00	.02+02	.54+02	.42+02	37.
16:31:00		600	.50+00	.19+00	.71+01	.00	.00	.00	.00	.00	.38+02	.19+02	.87+03	8.
16:41:00		600	.79+00	.56+00	.12+00	.15+01	.00	.20+01	.00	.00	.12+01	.94+02	.79+02	104.
16:51:00		600	.90+00	.20+00	.15+00	.30+01	.00	.00	.00	.00	.00+02	.54+02	.35+02	30.
17:01:00		600	.14+01	.40+00	.24+00	.41+01	.00	.00	.00	.00	.14+01	.10+01	.66+02	56.
17:11:00		600	.11+01	.45+00	.15+00	.15+01	.40+01	.00	.00	.00	.11+01	.65+02	.53+02	34.
17:21:00		600	.10+01	.67+00	.21+00	.46+01	.00	.00	.00	.00	.12+01	.07+02	.54+02	46.
17:31:00		600	.10+01	.58+00	.40+00	.30+01	.00	.00	.00	.00	.12+01	.92+02	.51+02	40.
17:41:00		600	.14+01	.64+00	.27+00	.15+01	.00	.00	.00	.00	.12+01	.71+02	.37+02	32.
17:51:00		600	.13+01	.67+00	.30+00	.46+01	.00	.00	.00	.00	.16+01	.11+01	.85+02	59.
18:01:00		600	.18+01	.00+00	.37+00	.00	.40+01	.00	.00	.00	.17+01	.95+02	.61+02	41.
18:11:00		600	.14+01	.00+00	.27+00	.15+01	.00	.39+01	.00	.00	.24+01	.19+01	.17+01	206.
18:21:00		600	.15+01	.94+00	.40+00	.46+01	.00	.00	.00	.00	.17+01	.12+01	.68+02	57.
18:31:00		600	.12+01	.60+00	.24+00	.46+01	.00	.00	.00	.00	.14+01	.10+01	.80+02	56.
18:41:00		600	.12+01	.44+00	.44+00	.39+01	.48+01	.00	.00	.00	.17+01	.13+01	.84+02	55.
17 MAR 77														
14:16:57		600	.10+03	.12+02	.44+01	.64+00	.96+00	.51+00	.00	.00	.69+00	.33+00	.30+00	3573.
14:22:33		336	.18+03	.20+02	.71+01	.12+01	.21+01	.60+00	.00	.00	.12+01	.53+00	.47+00	5152.
14:26:43		280	.25+03	.30+02	.10+02	.14+01	.31+01	.11+01	.00	.00	.17+01	.82+00	.75+00	8346.
14:33:28		405	.15+03	.18+02	.67+01	.15+01	.25+01	.90+00	.00	.00	.11+01	.61+00	.50+00	6381.
14:38:45		317	.19+03	.33+02	.12+02	.24+01	.19+01	.13+01	.00	.00	.15+01	.88+00	.77+00	8963.
14:43:50		305	.20+03	.33+02	.13+02	.22+01	.47+01	.14+01	.00	.00	.16+01	.98+00	.92+00	9663.
14:48:37		287	.20+03	.40+02	.16+02	.26+01	.43+01	.11+01	.00	.00	.17+01	.10+01	.89+00	9018.
14:53:05		268	.22+03	.41+02	.15+02	.30+01	.60+01	.16+01	.00	.00	.14+01	.12+01	.11+01	11644.
14:58:48		223	.26+03	.59+02	.22+02	.37+01	.43+01	.23+01	.00	.00	.24+01	.15+01	.14+01	15381.
15:03:46		438	.24+03	.58+02	.22+02	.42+01	.74+01	.18+01	.00	.00	.23+01	.15+01	.14+01	13856.
15:08:52		246	.24+03	.47+02	.18+02	.25+01	.46+01	.14+01	.00	.00	.19+01	.11+01	.10+01	10706.
15:13:30		158	.30+03	.80+02	.34+02	.41+01	.11+02	.33+01	.00	.00	.37+01	.25+01	.23+01	23388.
15:18:45		181	.30+03	.67+02	.24+02	.47+01	.79+01	.25+01	.00	.00	.33+01	.23+01	.22+01	22459.
15:19:14		154	.32+03	.71+02	.30+02	.47+01	.44+01	.13+01	.00	.00	.24+01	.14+01	.12+01	12241.
15:16:45		178	.35+03	.11+03	.44+02	.74+01	.44+01	.25+01	.00	.00	.30+01	.20+01	.18+01	18624.
15:22:08		169	.33+03	.90+02	.36+02	.65+01	.63+01	.25+01	.00	.00	.37+01	.26+01	.22+01	21487.
15:24:50		162	.34+03	.40+02	.34+02	.65+01	.12+02	.25+01	.00	.00	.35+01	.23+01	.22+01	20321.
15:27:56		186	.31+03	.63+02	.29+02	.44+01	.67+01	.23+01	.00	.00	.28+01	.18+01	.16+01	16949.
15:31:00		192	.30+03	.60+02	.23+02	.44+01	.60+01	.21+01	.00	.00	.28+01	.18+01	.17+01	19286.
15:34:01		173	.33+03	.75+02	.28+02	.51+01	.70+01	.27+01	.00	.00	.31+01	.20+01	.18+01	19262.

TABLE D1 (cont)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
ARKY SITE, WSMR

DATE TIME SAMPLE (MST)	TIME (SEC)	CHANNEL										EXTINCTION (PER KM)			MASS LOADING (UG/M ³)	
		1	2	3	4	5	6	7	8	9	10	1.06	3.8	10.6		
17 MAR 77																
15:35:16	135	.0203	.1203	.0803	.0303	.1403	.3103	.00	.00	.00	.00	.00	.3103	.2803	.2903	
15:38:11	115	.0703	.1503	.0903	.1203	.1803	.4903	.00	.00	.00	.00	.00	.4103	.3703	.3673	
15:40:27	136	.0303	.1203	.0503	.0103	.1203	.5103	.00	.00	.00	.00	.00	.5103	.3303	.3503	
15:43:28	201	.3003	.0703	.1703	.3803	.5303	.1803	.00	.00	.00	.00	.00	.1803	.0303	.0303	
15:47:30	192	.3203	.0203	.1603	.2803	.3903	.1103	.00	.00	.00	.00	.00	.1203	.1003	.1003	
15:49:24	144	.3703	.0503	.1803	.4203	.5303	.1803	.00	.00	.00	.00	.00	.1503	.1403	.1403	
15:42:14	151	.3903	.0703	.2603	.1603	.7503	.3703	.00	.00	.00	.00	.00	.2303	.1903	.2732	
15:48:27	132	.4203	.1103	.0503	.0803	.1103	.4003	.00	.00	.00	.00	.00	.3103	.2803	.2476	
15:51:36	129	.4203	.1303	.0203	.0703	.1203	.3703	.00	.00	.00	.00	.00	.3003	.2703	.2703	
15:59:04	148	.3903	.0103	.3103	.2703	.7403	.3703	.00	.00	.00	.00	.00	.2403	.2103	.2403	
16:02:29	235	.3203	.3503	.1103	.2403	.4403	.1103	.00	.00	.00	.00	.00	.1103	.0903	.0903	
16:05:40	191	.3103	.0703	.1703	.2903	.4703	.1103	.00	.00	.00	.00	.00	.1303	.1203	.1203	
16:07:31	111	.4703	.1603	.5103	.9503	.1803	.4103	.00	.00	.00	.00	.00	.3103	.3003	.3125	
16:09:31	100	.5003	.1903	.6803	.1103	.1303	.5103	.00	.00	.00	.00	.00	.4103	.3503	.3663	
16:11:19	128	.6303	.1303	.4203	.8103	.9703	.2103	.00	.00	.00	.00	.00	.2503	.2203	.2071	
16:14:45	204	.2903	.4903	.1703	.3703	.3203	.1603	.00	.00	.00	.00	.00	.1003	.0803	.0756	
16:15:38	263	.2803	.2003	.0803	.1603	.1503	.4703	.00	.00	.00	.00	.00	.5303	.5203	.6042	
16:21:59	291	.2103	.2503	.0803	.1103	.1803	.5703	.00	.00	.00	.00	.00	.1303	.0603	.5225	
16:23:55	296	.2103	.2503	.0803	.1203	.1503	.3703	.00	.00	.00	.00	.00	.1203	.0603	.3733	
16:37:01	486	.1103	.1803	.6803	.4203	.1203	.2903	.00	.00	.00	.00	.00	.3603	.2903	.3803	
16:47:30	509	.5103	.1103	.4403	.7903	.9103	.2103	.00	.00	.00	.00	.00	.2503	.2103	.2249	
16:57:00	600	.3303	.0703	.3503	.4903	.1303	.2203	.00	.00	.00	.00	.00	.2003	.1903	.1778	
17:01:30	633	.3803	.0703	.2903	.4403	.4203	.3703	.00	.00	.00	.00	.00	.2103	.2003	.2071	
17:17:00	600	.3803	.0603	.3303	.5803	.3803	.1203	.00	.00	.00	.00	.00	.1603	.1303	.1259	
17:22:30	533	.2303	.5903	.4403	.4403	.4403	.1103	.00	.00	.00	.00	.00	.1503	.1303	.1392	
17:37:00	600	.2303	.4403	.1803	.2003	.4703	.1603	.00	.00	.00	.00	.00	.1203	.1103	.1131	
17:47:30	633	.2803	.4303	.2603	.3803	.4303	.1703	.00	.00	.00	.00	.00	.1203	.1103	.1049	
17:57:00	600	.2503	.4403	.2203	.3003	.3803	.2203	.00	.00	.00	.00	.00	.1503	.1403	.1506	
18:07:30	633	.2303	.4403	.2103	.3303	.4403	.1103	.00	.00	.00	.00	.00	.1203	.1103	.1049	
18:17:00	600	.2103	.4203	.2103	.3303	.4303	.0903	.00	.00	.00	.00	.00	.1303	.0903	.0903	
18:27:30	633	.2303	.4403	.3303	.4703	.4303	.1103	.00	.00	.00	.00	.00	.1503	.1303	.1303	
18:37:00	600	.1803	.4303	.2103	.2903	.5803	.2003	.00	.00	.00	.00	.00	.1203	.1203	.1290	
18:47:30	633	.1803	.4103	.2103	.3203	.2903	.7703	.00	.00	.00	.00	.00	.0803	.0703	.0775	
18:57:00	600	.1703	.4403	.1503	.4403	.4303	.0903	.00	.00	.00	.00	.00	.1103	.1103	.0968	
19:07:30	633	.1803	.3203	.1403	.3503	.5103	.0903	.00	.00	.00	.00	.00	.1003	.0803	.0803	
19:17:00	600	.1203	.3103	.1603	.2703	.2903	.2003	.00	.00	.00	.00	.00	.0803	.0503	.0495	
19:27:30	633	.1203	.2703	.1303	.3203	.3403	.1203	.00	.00	.00	.00	.00	.1303	.0903	.0795	
19:37:00	600	.1203	.2503	.1203	.3803	.3403	.0903	.00	.00	.00	.00	.00	.1203	.0703	.0650	
19:47:30	633	.1203	.2503	.1303	.2403	.4303	.0903	.00	.00	.00	.00	.00	.1103	.0603	.0711	
19:57:00	600	.1203	.2503	.1303	.2403	.4303	.0903	.00	.00	.00	.00	.00	.1003	.0503	.0290	
20:07:30	633	.1803	.3603	.2403	.5203	.7703	.3303	.00	.00	.00	.00	.00	.1803	.1803	.1803	

TABLE DI (cont)
 CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SITE, WASH

DATE TIME SAMPLE (MST) (SEC)	CHANNEL					EXTINCTION (PER KM)				MASS LOADING (UG/M ³)		
	1	2	3	4	5	6	7	8	1.06		3.8	10.6
17 MAR 77												
20:17:30 633	.77-31	.17-31	.98-33	.17-33	.12-33	.77-31	.03	.00	.81-01	.57-31	.52-31	58A.
20:27:00 600	.56-31	.15-31	.11-31	.18-31	.43-30	.00	.00	.00	.66-01	.49-31	.45-31	26A.
20:37:30 633	.53-31	.13-31	.76-33	.14-33	.28-33	.77-31	.03	.00	.73-01	.52-31	.50-31	51A.
20:47:00 600	.68-01	.14-31	.85-31	.76-31	.48-31	.39-31	.00	.00	.55-01	.34-31	.26-31	29A.
20:57:30 633	.63-31	.14-31	.61-31	.12-31	.19-31	.77-31	.03	.00	.68-01	.48-31	.46-31	49A.
21:07:00 600	.70-31	.14-31	.10-31	.61-31	.96-31	.20-31	.00	.00	.54-01	.31-31	.23-31	220.
21:17:30 633	.63-31	.13-31	.95-33	.91-31	.27-33	.57-31	.03	.00	.49-01	.48-31	.45-31	427.
21:27:00 600	.54-31	.11-31	.43-31	.20-31	.14-31	.20-31	.00	.00	.51-01	.35-31	.32-31	278.
21:37:30 633	.88-31	.11-31	.58-33	.12-31	.48-31	.37-31	.03	.00	.46-01	.32-31	.27-31	297.
21:47:00 600	.52-31	.08-31	.98-31	.61-31	.14-31	.59-31	.00	.00	.53-01	.37-31	.36-31	371.
21:57:30 633	.83-31	.08-31	.37-33	.11-31	.95-31	.03	.00	.00	.37-01	.21-31	.17-31	13A.
22:07:00 600	.58-31	.07-31	.41-31	.30-31	.94-31	.20-31	.00	.00	.41-01	.20-31	.17-31	176.
22:17:30 633	.22-31	.13-31	.85-33	.76-31	.17-33	.77-31	.00	.00	.41-01	.45-31	.43-31	451.
22:27:00 600	.63-31	.14-31	.58-31	.12-31	.96-31	.79-31	.00	.00	.64-01	.45-31	.43-31	480.
22:37:30 633	.54-31	.09-31	.47-33	.12-31	.03	.20-31	.00	.00	.82-01	.25-31	.19-31	20A.
22:47:00 600	.57-31	.02-31	.46-31	.76-31	.19-31	.50-31	.00	.00	.53-01	.36-31	.36-31	376.
22:57:30 633	.43-31	.02-31	.58-31	.91-31	.48-31	.00	.00	.00	.32-01	.19-31	.14-31	110.
23:07:00 600	.43-31	.02-31	.58-31	.91-31	.48-31	.00	.00	.00	.32-01	.19-31	.14-31	110.
23:17:30 633	.51-31	.02-31	.37-33	.30-31	.14-31	.37-31	.00	.00	.82-01	.28-31	.24-31	24A.
23:27:00 600	.53-31	.04-31	.30-31	.63-31	.48-31	.20-31	.00	.00	.35-01	.18-31	.17-31	172.
23:37:30 633	.51-31	.03-31	.31-33	.12-31	.95-31	.37-31	.00	.00	.84-01	.30-31	.28-31	291.
23:47:00 600	.38-31	.02-31	.46-31	.76-31	.48-31	.20-31	.00	.00	.33-01	.22-31	.17-31	178.
23:57:30 633	.14-31	.60-33	.37-33	.33-31	.95-31	.20-31	.00	.00	.31-01	.18-31	.16-31	157.
18 MAR 77												
0 : 7:30 633	.41-31	.56-33	.43-33	.61-31	.03	.03	.00	.00	.26-01	.13-31	.11-31	77.
0 : 17:00 600	.35-31	.67-33	.38-31	.46-31	.00	.39-31	.00	.00	.30-31	.19-31	.16-31	222.
0 : 27:30 633	.31-31	.34-33	.21-33	.46-31	.43-31	.03	.00	.00	.27-01	.09-31	.01-31	8A.
0 : 37:00 600	.28-31	.30-33	.12-31	.30-31	.00	.00	.00	.00	.14-01	.57-31	.40-31	40.
0 : 47:30 633	.28-31	.32-33	.27-33	.46-31	.03	.20-31	.00	.00	.23-01	.13-31	.11-31	132.
0 : 57:00 600	.53-31	.10-31	.78-31	.11-31	.14-31	.70-31	.00	.00	.41-01	.46-31	.43-31	47A.
01:07:30 633	.71-31	.15-31	.73-33	.17-33	.17-33	.20-31	.00	.00	.61-01	.40-31	.35-31	29A.
01:17:00 600	.38-31	.19-31	.30-31	.14-31	.96-31	.00	.00	.00	.23-01	.10-31	.03-31	6A.
01:27:30 633	.29-31	.07-33	.21-33	.30-31	.11-33	.00	.00	.00	.13-31	.12-31	.12-31	7A.
01:37:00 600	.56-31	.11-31	.33-31	.76-31	.96-31	.00	.00	.00	.39-01	.19-31	.15-31	120.
01:47:30 633	.72-31	.00-33	.40-33	.76-31	.48-31	.00	.00	.00	.42-01	.22-31	.17-31	14A.
01:57:00 600	.67-31	.13-31	.59-31	.30-31	.48-31	.03	.00	.00	.32-01	.17-31	.15-31	161.
02:07:30 633	.45-31	.17-33	.24-33	.46-31	.43-31	.20-31	.00	.00	.32-01	.16-31	.15-31	18A.
02:17:00 600	.81-31	.06-31	.30-31	.15-31	.94-31	.20-31	.00	.00	.30-01	.16-31	.15-31	188.
02:27:30 633	.48-31	.08-33	.48-33	.12-31	.95-31	.20-31	.00	.00	.46-01	.30-31	.25-31	22A.
02:37:00 600	.22-31	.06-31	.55-31	.76-31	.94-31	.00	.00	.00	.37-01	.20-31	.16-31	17A.
02:47:30 633	.48-31	.08-33	.31-33	.46-31	.43-31	.03	.00	.00	.33-31	.17-31	.11-31	9A.
02:57:00 600	.73-31	.13-31	.55-31	.18-31	.00	.59-31	.00	.00	.63-01	.42-31	.35-31	421.

TABLE D1 (cont.)
PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINGUISHION, AND MASS LOADING
ARRAY SIZE, 4096

DATE	TIME	SAMPLE	(MAY; TYPE; C)	CHANNEL										EXTINCTION (PER KSI)		MASS LOADING (U/MH003)	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14
03:07:00	ACO	03:07:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
03:17:00	ACO	03:17:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
03:27:00	ACO	03:27:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
03:37:00	ACO	03:37:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
03:47:00	ACO	03:47:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
03:57:00	ACO	03:57:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
04:07:00	ACO	04:07:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
04:17:00	ACO	04:17:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
04:27:00	ACO	04:27:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
04:37:00	ACO	04:37:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
04:47:00	ACO	04:47:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
04:57:00	ACO	04:57:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
05:07:00	ACO	05:07:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
05:17:00	ACO	05:17:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
05:27:00	ACO	05:27:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
05:37:00	ACO	05:37:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
05:47:00	ACO	05:47:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
05:57:00	ACO	05:57:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
06:07:00	ACO	06:07:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
06:17:00	ACO	06:17:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
06:27:00	ACO	06:27:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
06:37:00	ACO	06:37:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
06:47:00	ACO	06:47:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
06:57:00	ACO	06:57:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
07:07:00	ACO	07:07:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
07:17:00	ACO	07:17:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
07:27:00	ACO	07:27:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
07:37:00	ACO	07:37:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
07:47:00	ACO	07:47:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
07:57:00	ACO	07:57:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
08:07:00	ACO	08:07:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
08:17:00	ACO	08:17:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
08:27:00	ACO	08:27:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
08:37:00	ACO	08:37:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
08:47:00	ACO	08:47:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
08:57:00	ACO	08:57:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
09:07:00	ACO	09:07:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
09:17:00	ACO	09:17:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
09:27:00	ACO	09:27:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
09:37:00	ACO	09:37:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
09:47:00	ACO	09:47:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03
09:57:00	ACO	09:57:00	ACO	06:03	13:03	04:03	09:03	01:03	08:03	05:03	02:03	07:03	04:03	01:03	08:03	05:03	02:03

TABLE VI (cont.)



TABLE D1 (CONT)
 PARTICULATE SIZE DISTRIBUTION, CALCULATED EXTINCTION, AND MASS LOADING
 ARMY SITE, WIMP

DATE TIME SAMPLE TIME (MST) (SEC)	CHANNEL										EXTINCTION (PER KG)		MASS LOADING (UN/MOOS)	
	1	2	3	4	5	6	7	8	9	10	1.36	3.4	13.6	
27 MAR 77														
10:15:00 900	.9900	.1300	.8100	.1000	.1200	.1000	.00	.00	.00	.00	.9300	.5900	.4900	36.
10:15:30 930	.9500	.1700	.8300	.2000	.00	.2000	.00	.00	.00	.00	.8400	.2500	.1500	19.
10:16:00 960	.1200	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.8700	.3800	.3000	21.
10:16:30 990	.1200	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.8700	.3800	.3000	169.
10:17:00 900	.9400	.2400	.8100	.00	.00	.00	.00	.00	.00	.00	.3400	.1100	.1200	110.
10:17:30 930	.1200	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1100	.7800	.7000	88.
10:18:00 900	.8700	.4000	.8100	.00	.3000	.00	.00	.00	.00	.00	.9400	.6300	.5100	36.
10:18:30 930	.7500	.3100	.8100	.00	.3000	.00	.00	.00	.00	.00	.7800	.5300	.4100	29.
10:19:00 960	.9400	.2400	.8100	.00	.3000	.00	.00	.00	.00	.00	.8100	.4700	.3700	25.
10:19:30 990	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1200	.1100	104.
10:20:00 900	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1200	.1100	60.
10:20:30 930	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1200	.1100	149.
10:21:00 960	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1200	.1100	199.
10:21:30 990	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1200	.1100	260.
10:22:00 900	.7200	.3000	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.9400	.4000	129.
10:22:30 930	.1100	.3000	.8100	.00	.3000	.00	.00	.00	.00	.00	.1100	.7700	.4900	82.
10:23:00 960	.1200	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	61.
10:23:30 990	.1200	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	109.
10:24:00 900	.8700	.4000	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	200.
10:24:30 930	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	117.
10:25:00 960	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	170.
10:25:30 990	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	126.
10:26:00 900	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	92.
10:26:30 930	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	97.
10:27:00 960	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	32.
10:27:30 990	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1200	.1100	.1000	362.
10:28:00 900	.9400	.2400	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	93.
10:28:30 930	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	23.
10:29:00 960	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	140.
10:29:30 990	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	144.
10:30:00 900	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	48.
10:30:30 930	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	17.
10:31:00 960	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	40.
10:31:30 990	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	47.
10:32:00 900	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	111.
10:32:30 930	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	145.
10:33:00 960	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	63.
10:33:30 990	.1300	.3700	.8100	.00	.3000	.00	.00	.00	.00	.00	.1400	.1000	.1000	183.

SUPPLEMENTARY

INFORMATION

AD A035028

ERRATA SHEET

ASL DR-0001
ATMOSPHERIC CONDITIONS AT THE HIGH ENERGY
LASER SYSTEMS TEST FACILITY (HELSTF),
WHITE SANDS MISSILE RANGE (WSMR), NEW MEXICO
24 MARCH TO 8 APRIL 1977

Insert table 12 as page 19a of the report.

TABLE 12. NOAA TURBULENCE FLIGHTS

Date		Time (MST)			
		0000	0500	1200	1800
March	24	N	N	N	N
	25	N	C	P	C
	26	C	N	P	N
	27	C	C	N	N
	28	N	N	C	C
	29	C	C	C	C
	30	C	C	C	C
	31	C	C	C	C
April	1	N	N	C	C
	2	C	N	C	C
	3	C	C	P	P
	4	N	C	C	C
	5	C	N	N	N
	6	N	N	N	N
	7	N	N	N	N
	8	N	N	N	N

C = Complete data set

P = Partial data set

N = No data