United States Department of the Interior
Geological Survey

Seismic Engineering Data Report

PROCESSED ACCELEROGRAMS FROM COYOTE DAM, CALIFORNIA, MARCH 25, 1978

by

A. G. Brady and V. Perez

OPEN-FILE REPORT 83-166

Prepared on behalf of the National Science Foundation

Grant CA-114

Menlo Park, California

Jan 1983

CONTENTS

Coyote Dam Record Processing

Summary

This report serves two purposes: the documentation of a digital magnetic tape containing the results of processing the strong-motion data from Coyote Dam, California, during the March 25, 1978 event, and the reproduction of the graphical results.

The description of the March 25 event as written by R. L. Porcella (1978) is as follows:

> "A magnitude 4.5 (m_b) earthquake on March 25, 16:27 local time triggered three accelerographs located at Coyote Dam (18 km from the epicenter), a U.S. Army Corps of Engineers (COE) facility approximately 175 km northeast of San Francisco near the town of Ukian. The earthquake occurred off the coast of northern California at a depth of about 5 km and was felt in the Ukiah area; no damage was reported. The instrumentation is owned by the COE and operated by the U.S. Geological Survey (USGS) as part of the cooperative National Strong-Motion Network supported by the National Science Foundation.
>
> Coyote Dam is an earthfill embankment approximately 1070 m long and 50 m high; the axis is alined in a nearly north-south direction. Accelerographs are located at the center crest, center toe, and south abutment and are equipped with horizontal starters; thus, the relatively short trigger minus S-wave intervals (approximately 0.5 s) recorded at the crest, toe, and abutment stations are the result of the accelerographs being triggered by horizontal ground motion perhaps 2 to 3 s after the arrival of the first P-wave (fig. 1). Maximum accelerations recorded at the crest, toe, and south abutment stations are 0.30 g, 0.34 g, and 0.20 g, respectively (see table 1).
>
> In addition to the magnitude 4.5 earthquake, three smaller aftershocks produced minor records at Coyote Dam (table 1). The maximum acceleration (0.11 g) was recorded on the crest instrument. Additionally, the California Division of Mines and Geology (CDMG) recovered several strong-motion records from CDMG stations located in the Willits-Ukian area (Toppozada, 1978)."

The coordinates of the stations are 39.20 N, 123.18 W and the epicentral distance from the identified shock is about 18 km.

Digitizing of the three recordings was carried out by IOM-TOWILL of Santa Clara, California, and the USGS processing of the data has resulted in plots of the corrected ground acceleration, velocity and displacement. The linear plots and tripartite log-log plots of response spectra were generated using the 100 pts/sec corrected acceleration. In the future, whenever possible, corrected acceleration data will be generated at 200 samples per sec. The

Fourier amplitude spectrum appears in the linear plots, calculated at the same period values as the response spectra. The long period content is removed with a ramp starting at 1.43 sec and finishing at 10 sec. Note that in the tripartite spectra plots, the velocity is the pseudo-velocity response and that the acceleration is the pseudo-absolute acceleration response. The Fourier spectra by FFT methods were plotted on linear and log-log axes to accent the particular characteristics at each end of the spectrum. The location of both the low and high frequency ramps are indicated by the position of F_C and F_T.

The response spectra answers the question "what is the maximum response of a single-degree-of-freedom viscously damped linear oscillator subjected to strong earthquake motion?" Although the maximum response is of great importance, it does not provide any information about the rest of the history of the response.

The various response amplitudes that occur during an earthquake can be measured and interpreted in terms of the number of cycles experienced during an earthquake if the envelope of the response is used (Perez, 1973). The contour plots of chosen amplitudes of the envelope of the response and the cumulative duration of these amplitudes, are explained as follows:

The contour plot of the velocity response envelope spectrum indicates at which times the envelope of the velocity response of a 5 percent-damped oscillator passes through various levels of velocity; the drawing on the right of the contour plot represents the maximum values of the response, calculated at the same period values as the contour plot. The oscillators chosen have periods in the range of 0.05 to 4 sec. Their response for the entire duration of the record are studied. The discrete velocity levels chosen, defined by the contour interval, are suitable fractions of the peak velocity response.

The duration spectrum is obtained from this velocity response envelope spectrum by adding up the total time for which the velocity envelope is greater than each of the velocity levels. On this spectrum is drawn a series of radial straight lines indicating the number of cycles of oscillation for any oscillator, so that the duration can be quoted in cycles. Although not labelled specifically, these lines represent 1, 2, 4, 8,... cycles, as can be readily checked against the axes.

A slightly different approach to studying the amplitudes of the response can be accomplished if the calculations for the duration spectra can be arranged so as to answer questions similar to the following: "What is the relative displacement response amplitude, or more specifically the envelope amplitude, that is sustained or exceeded for a duration equal to a particular number of cycles, say four, and what fraction is this amplitude of the maximum amplitude?" The required amplitudes are picked off from the envelope plot when a horizontal line drawn on the plot has a cumulative length, below the envelope, equal to the number of cycles desired (Perez, 1981). Using the relative displacement, a tripartite description of displacement, velocity, and acceleration amplitudes is possible, in the same way as the tripartite response spectrum is portrayed, assuming only that the response is approximately sinusoidal.

In the plots reproduced here the topmost curve is the maximum response, obtained directly from the response spectra for 5 percent damping, while under this are drawn the curves for the amplitudes sustained for one complete cycle, and for 2, 4, 8, 16 and 32 cycles. These additional six spectral curves give a fairly comprehensive coverage for most of the amplitudes that occur during the history of the response.

Contents of Magnetic Tape

The tape delivered to EDIS, Boulder, Colorado for dissemination purposes contains 27 files:

1. Nine files containing 9 components for the three accelerograms for the raw uncorrected ground acceleration data.
2. Nine files containing 9 components, each component consisting of the corrected ground acceleration, velocity and displacement.
3. Nine files containing the response spectra and the Fourier amplitude spectra for each of the 9 components.

REFERENCES

Perez, V., (1981), "Spectra of amplitudes sustained for a given number of cycles: an interpretation of response duration for strong-motion earthquake records". Bull. Seism. Soc. Am., Vol. 70, No. 5, p. 1943-1954.

Porcella, R. L., (1978), Seismic Engineering Program Report, January-April 1978, U.S. Geological Survey Circular 785-A.

Toppozada, T. R., (1978), Earthquakes in the Willits-Ukiah area: California Division of Mines and Geology, California Geology, June 1978, p. 146-147.

Perez, V., (1973), "Velocity response envelope spectrum as a function of time, for the Pacoima Dam, San Fernando Earthquake, February 9, 1971". Bull. Seism. Soc. Am., Vol. 63, No. 1, p. 299-313.

Table 1. Summary of accelerograms recovered during January-April 1978

Event	Station name (owner)[1]	Station coord.	S-t[2] (s)	Direction[3]	Max accl[4] (g)	Duration[5] (s)
26 March 1978	Coyote Dam, abut.	39.19 N	*	270°	.20	0.8
0027 UTC	Ukiah, Calif.	123.18 W		Up	.07	-
N. California	(ACOE)			180°	.11	1-peak
39.09N, 123.34W						
Magnitude 4.5	Coyote Dam, toe	39.20 N	*	270°	.34	1.1
	Ukiah, Calif.	123.18 W		Up	.09	-
	(ACOE)			180°	.22	1.2
	Coyote Dam, crest	39.20 N	*	270°	.25	1.0
	Ukiah, Calif.	123.18 W		Up	.14	0.3
	(ACOE)			180°	.30	1.3
26 March 1978-	Coyote Dam, crest	39.20 N	*	270°	.11	1-peak
27 March 1978	Ukiah, Calif.	123.18 W		Up	.04	-
N. California	(ACOE)			180°	.07	-
Epicenters and magnitudes unknown	Note: Two additional aftershocks recorded at crest station and three aftershocks each recorded at abutment and toe stations. Maximum acceleration less than 0.05 g.					

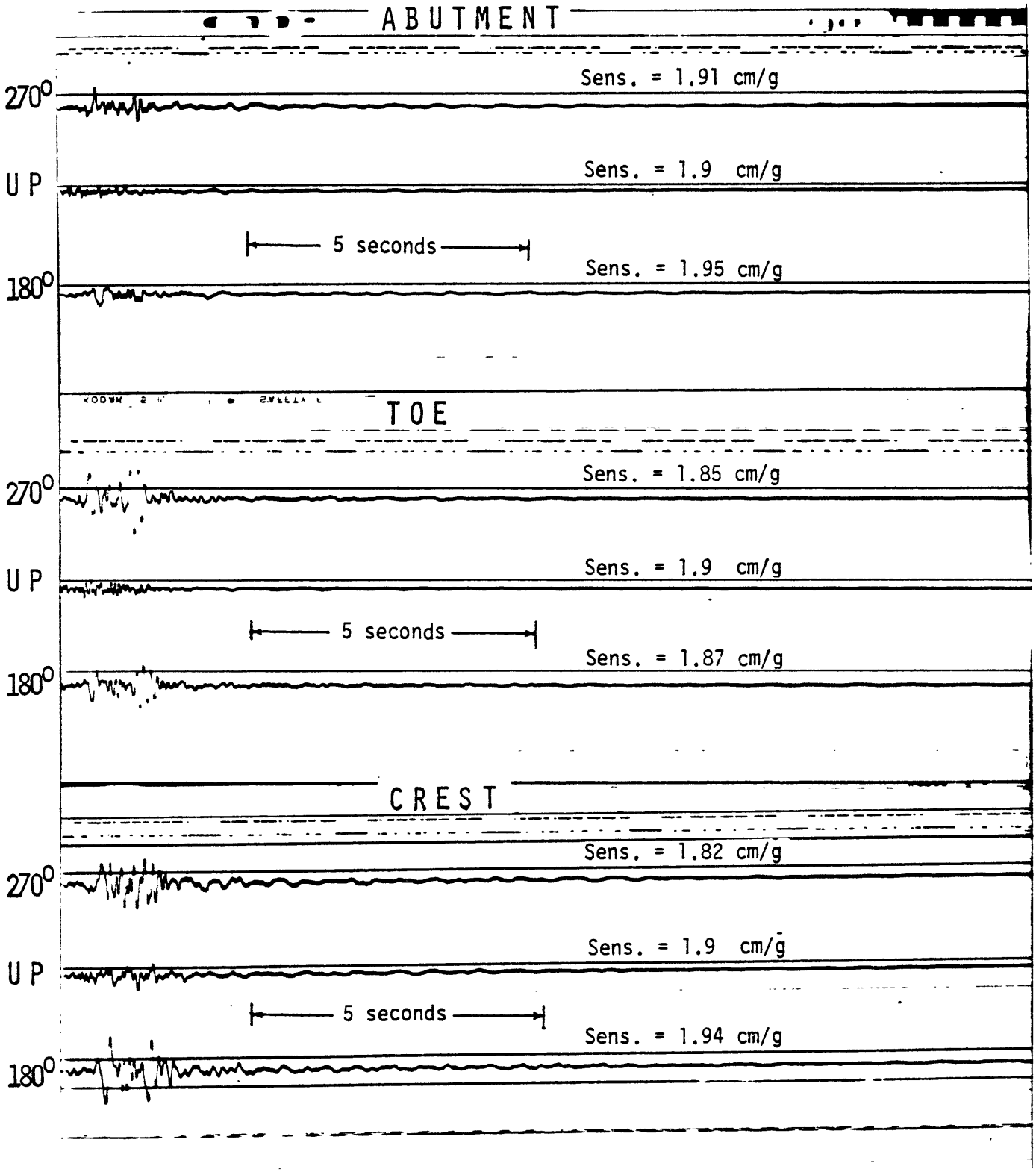
[1] ACOE - U.S. Army Corps of Engineers

[2] S-wave minus trigger time.
*Accelerograph equipped with horizontal starter; S-t time is not significant.

[3] Azimuthal direction of case acceleration for upward trace deflection on accelerogram (opposite direction to pendulum motion).

[4] Unless otherwise noted, maximum acceleration recorded at ground or basement level.

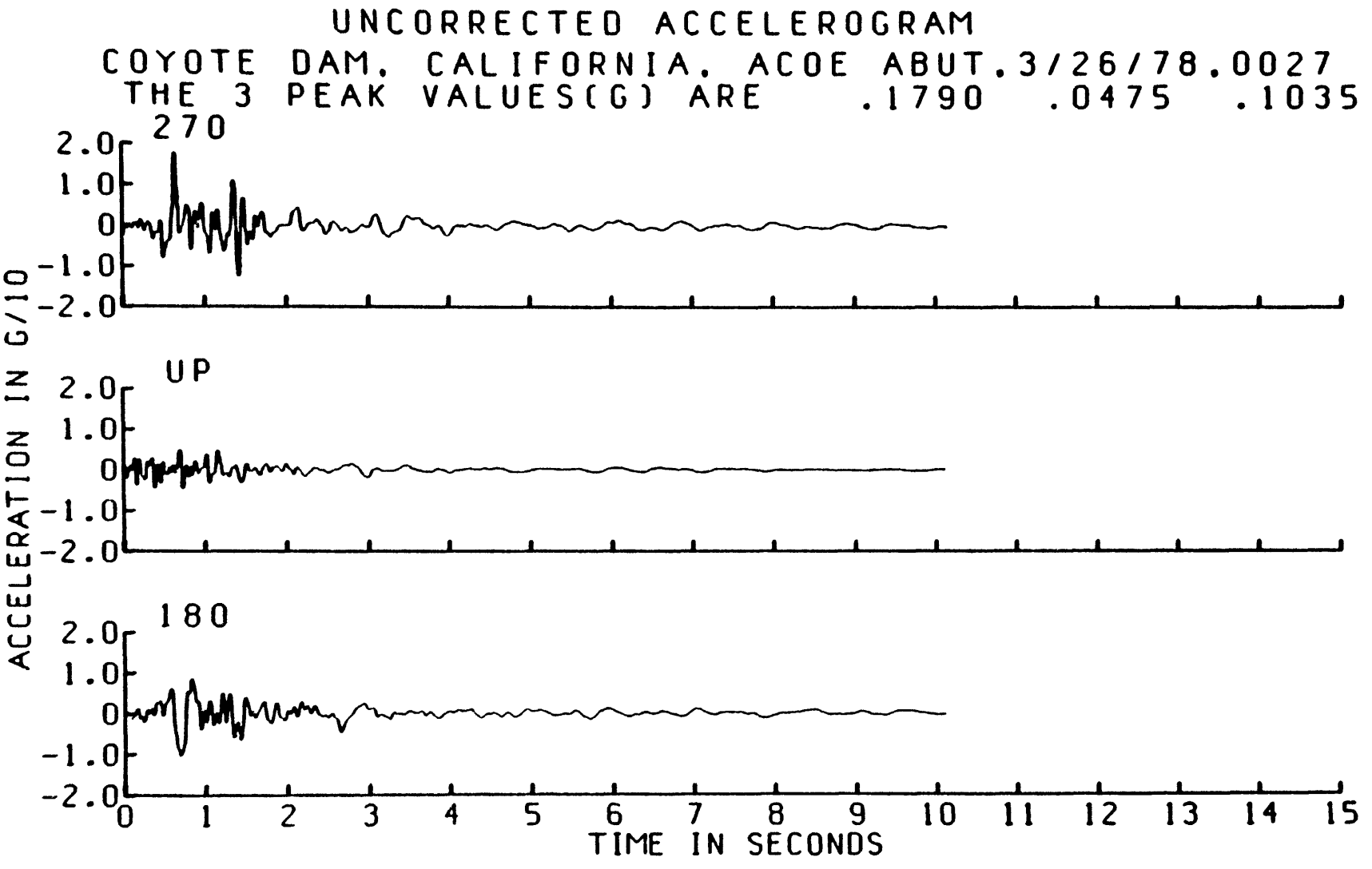
[5] Duration for which peaks of acceleration exceed 0.10 g.

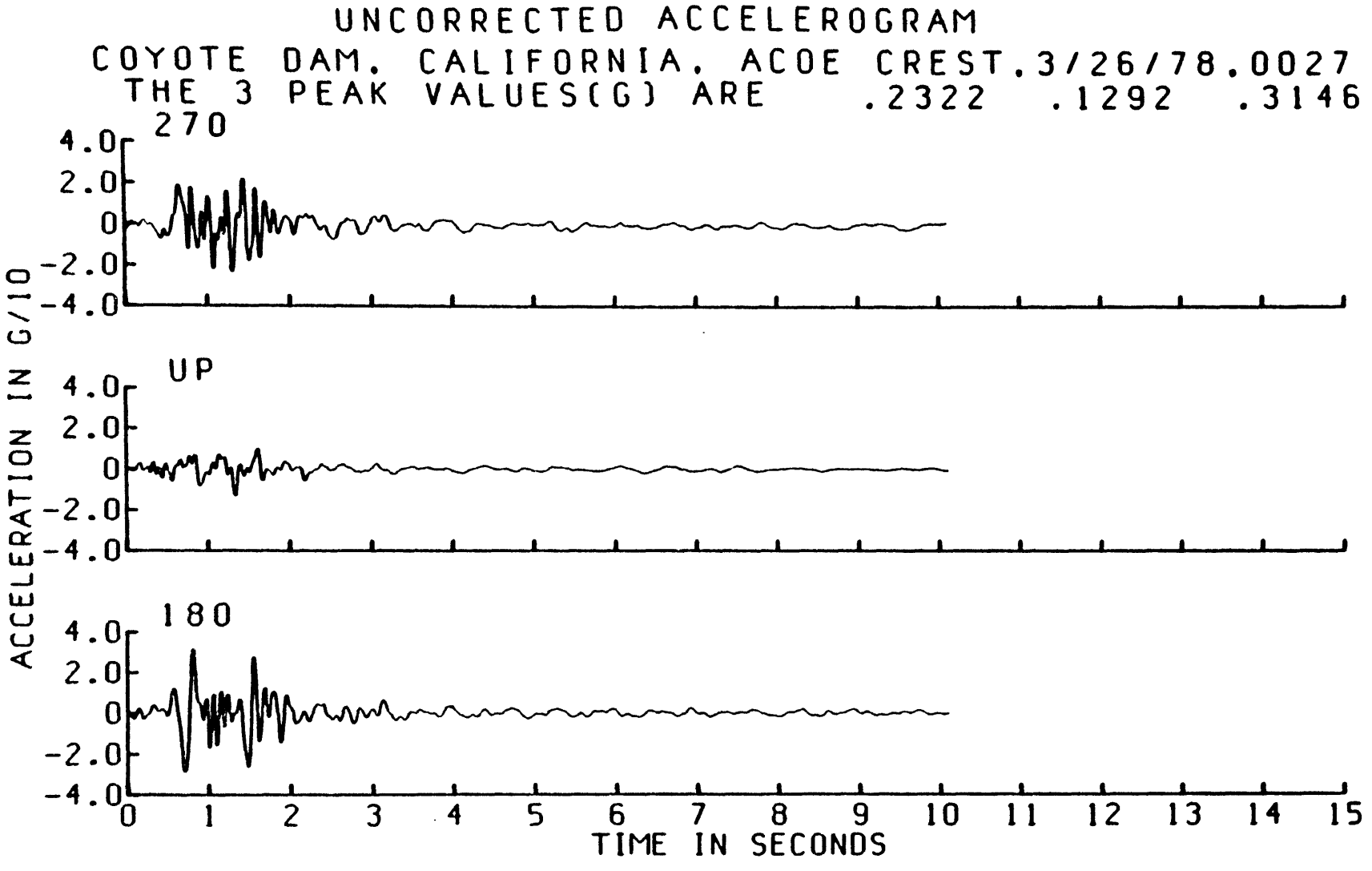

ABUTMENT
Sens. = 1.91 cm/g
270°
Sens. = 1.9 cm/g
UP
5 seconds
Sens. = 1.95 cm/g
180°
TOE
Sens. = 1.85 cm/g
270°
Sens. = 1.9 cm/g
UP
5 seconds
Sens. = 1.87 cm/g
180°
CREST
Sens. = 1.82 cm/g
270°
Sens. = 1.9 cm/g
UP
5 seconds
Sens. = 1.94 cm/g
180°

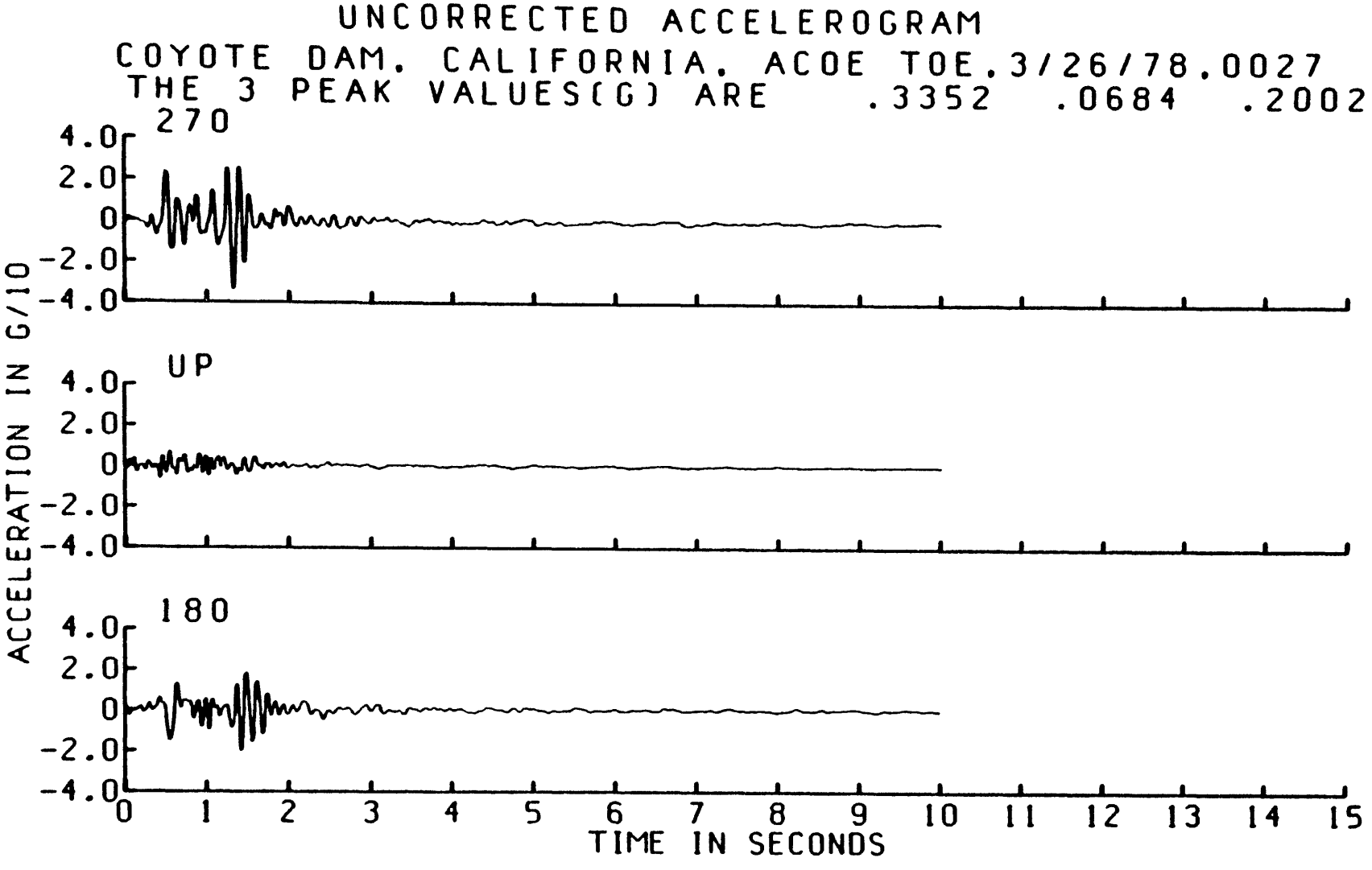
APPENDIX

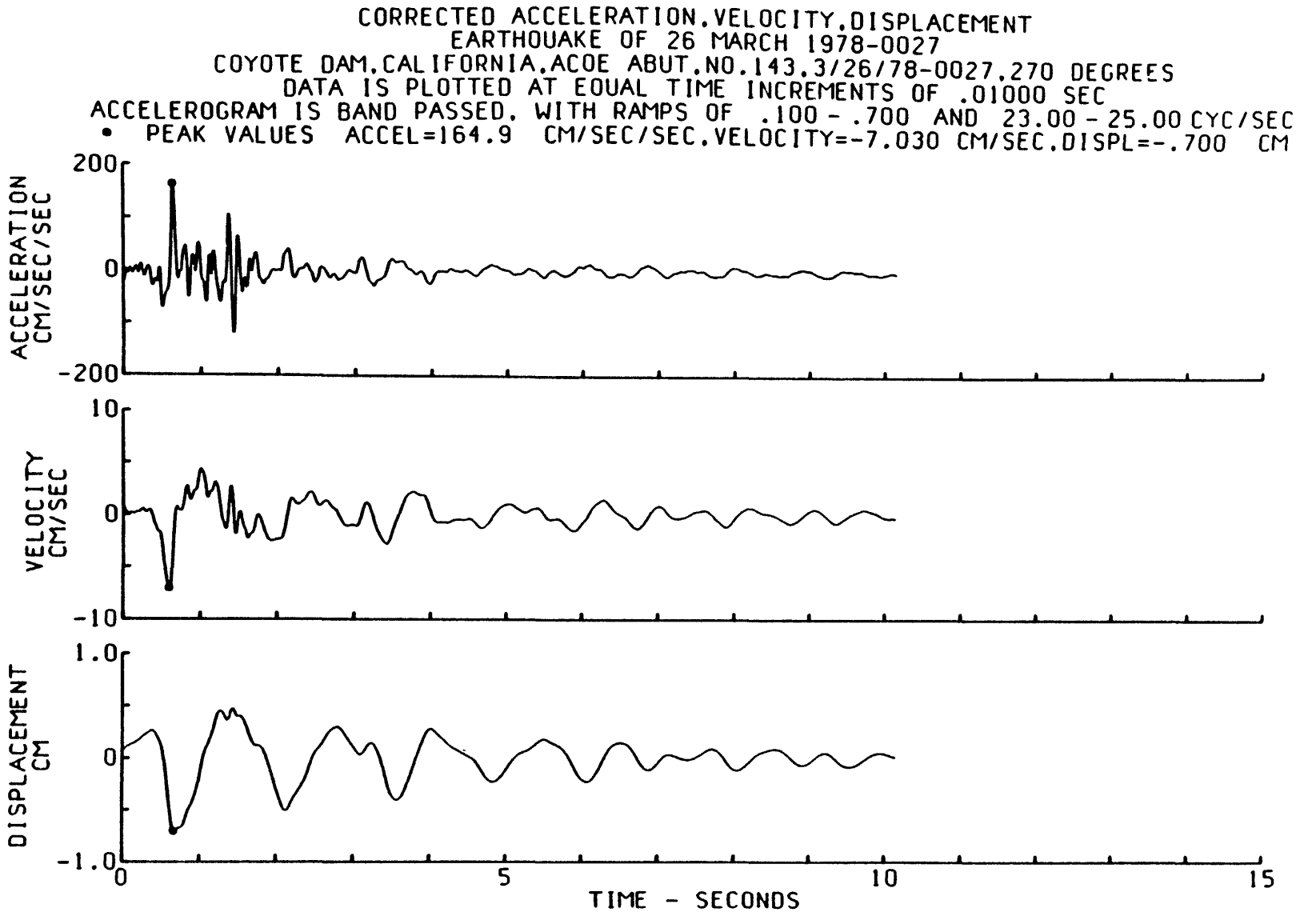
The appendix contains the following plots:

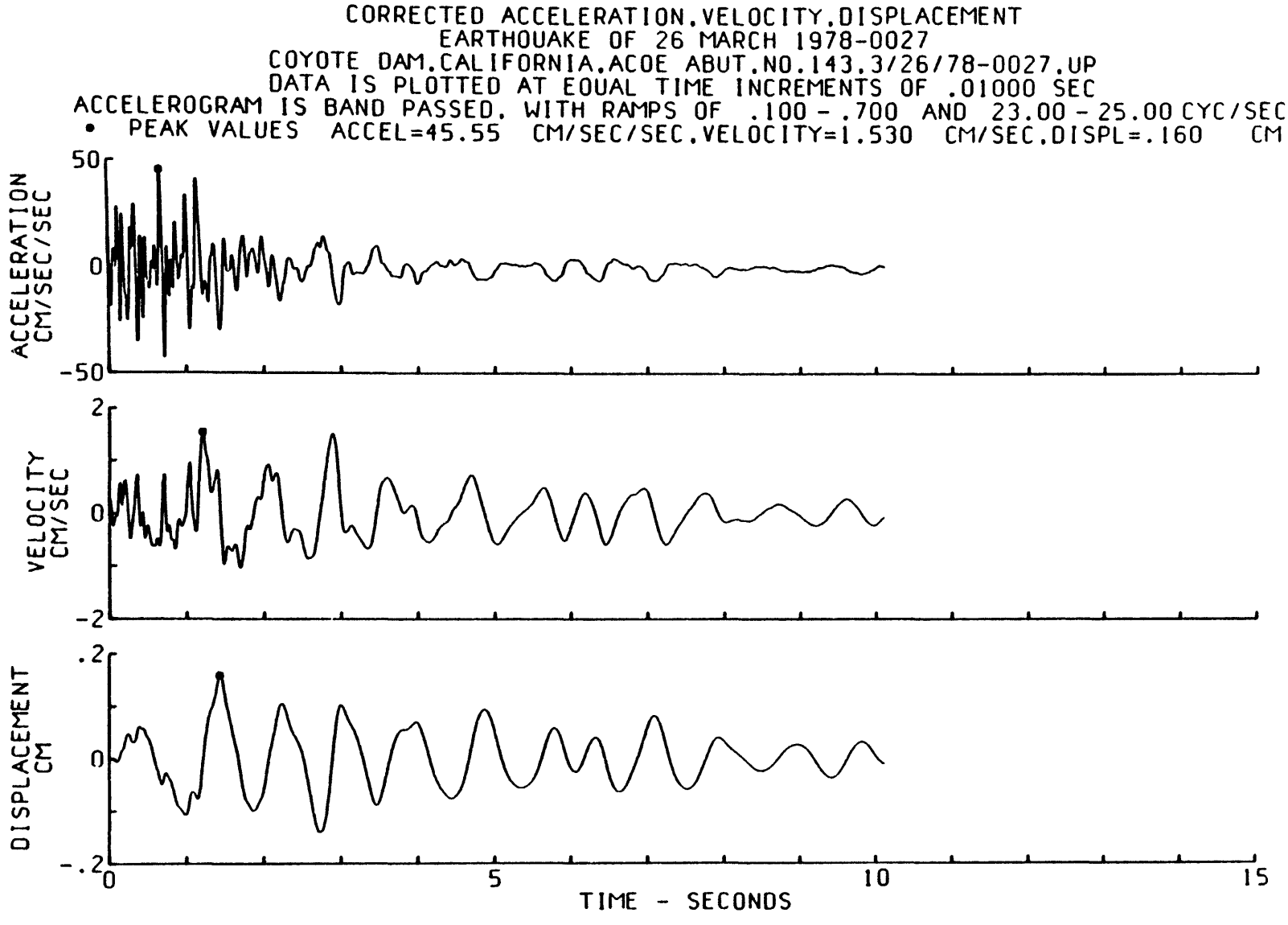
1. Uncorrected data: This is the input to the correction processing.
2. Corrected data: Raw data is band-pass filtered from .700 to 23.0 Hz, with ramps from 0.1 to 0.7 Hz, and from 23 to 25 Hz.
3. Response spectra.
4. Fourier spectra by FFT.
5. Duration Spectra.
6. Amplitudes sustained for specific cycles.

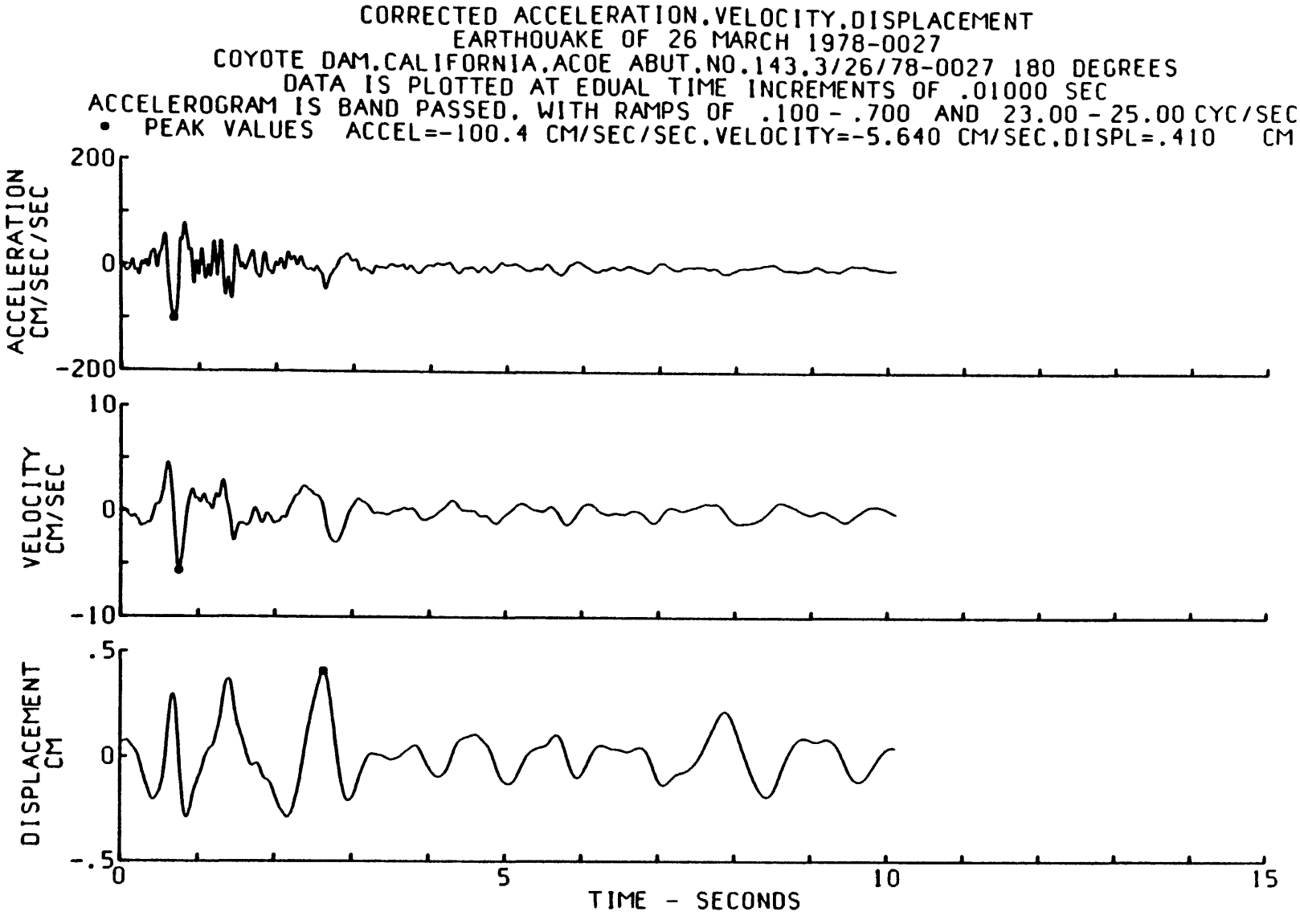

UNCORRECTED ACCELEROGRAM
COYOTE DAM, CALIFORNIA, ACOE ABUT.3/26/78.0027
THE 3 PEAK VALUES(G) ARE .1790 .0475 .1035
270
UP
180
2.0
1.0
0
-1.0
-2.0
ACCELERATION IN G/10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TIME IN SECONDS

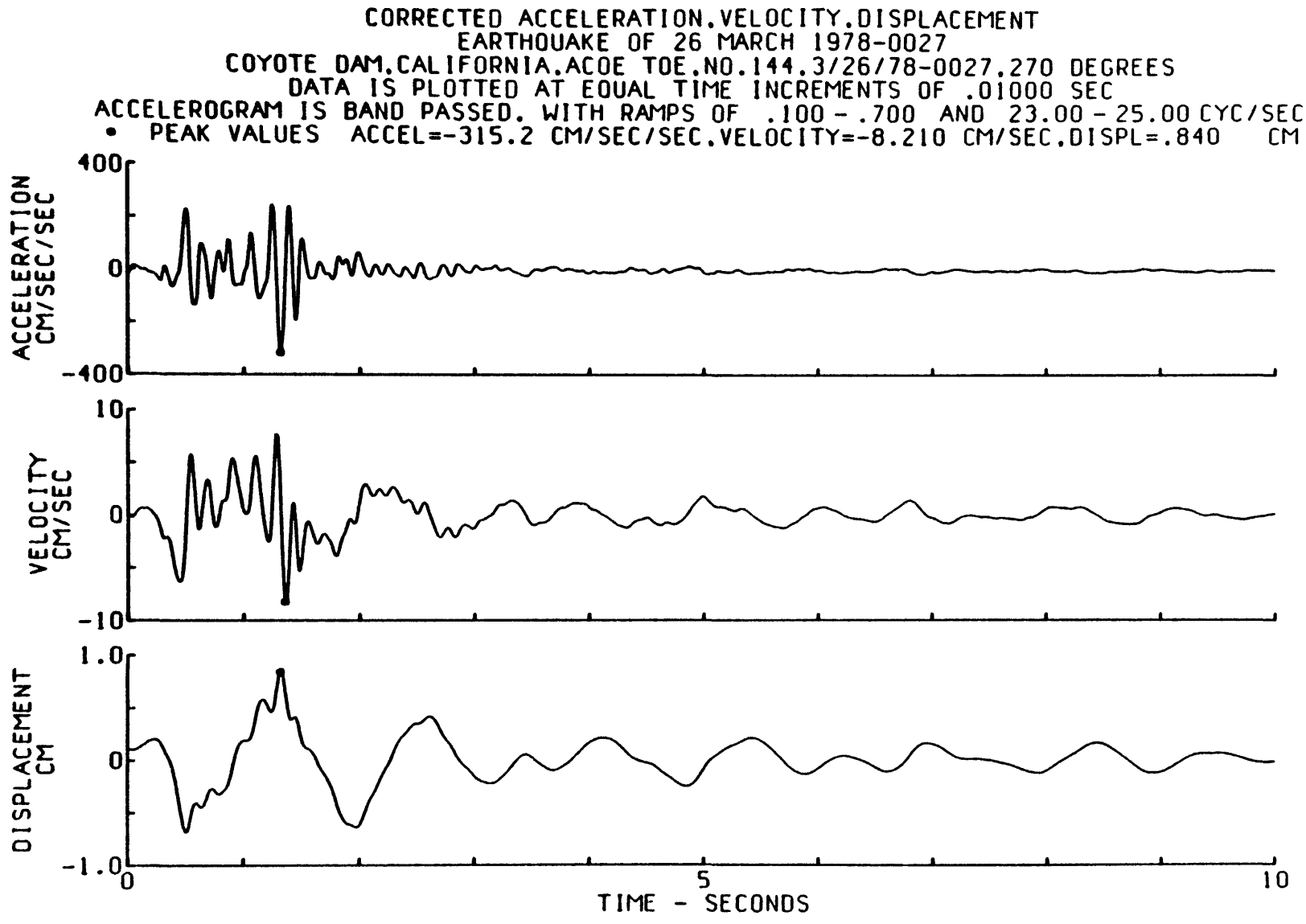

UNCORRECTED ACCELEROGRAM
COYOTE DAM. CALIFORNIA. ACOE CREST.3/26/78.0027
THE 3 PEAK VALUES(G) ARE .2322 .1292 .3146
270
UP
180
4.0
2.0
0
-2.0
-4.0
ACCELERATION IN G/10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TIME IN SECONDS

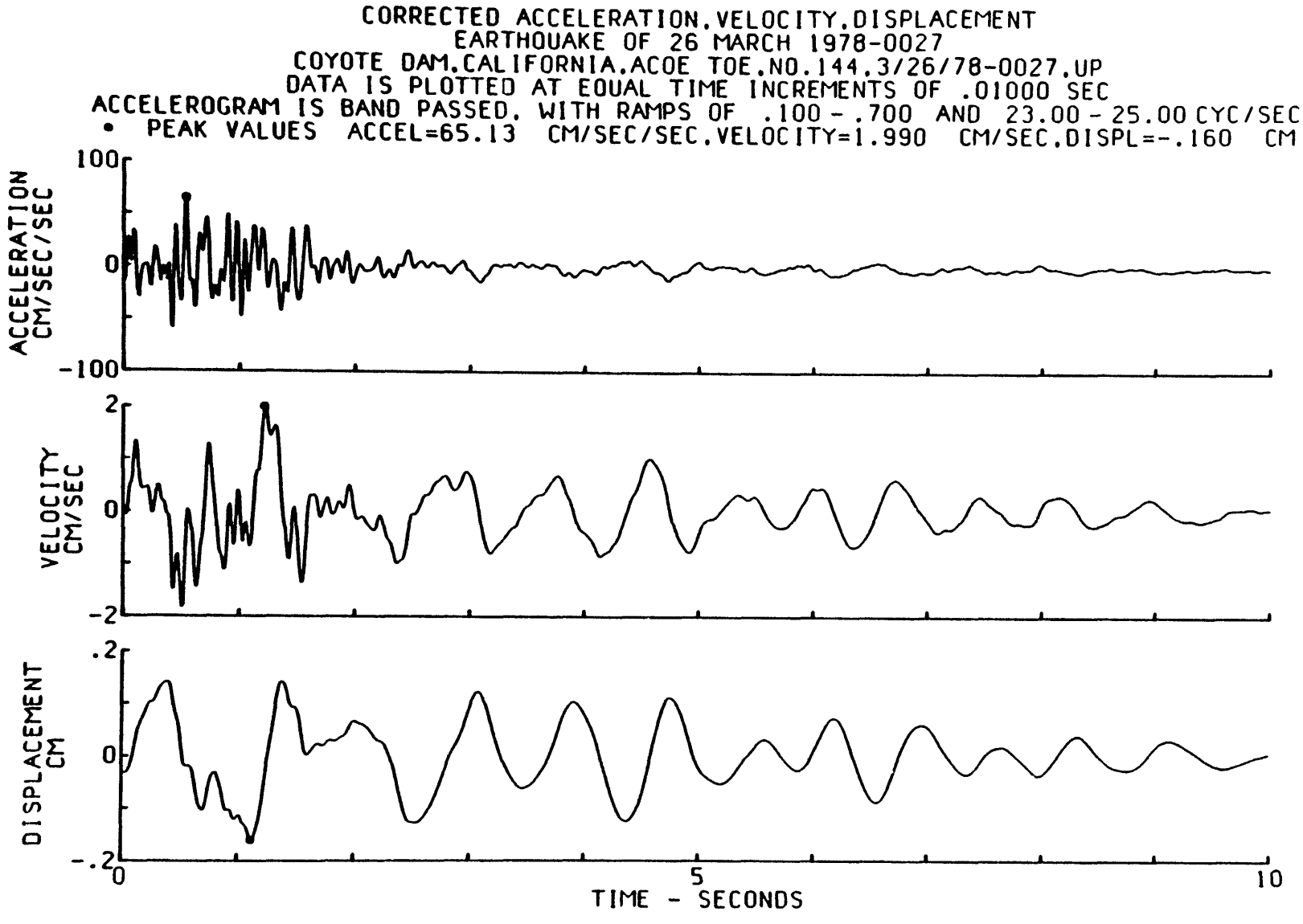

UNCORRECTED ACCELEROGRAM
COYOTE DAM, CALIFORNIA, ACOE TOE,3/26/78,0027
THE 3 PEAK VALUES(G) ARE .3352 .0684 .2002
270
UP
180
4.0
2.0
0
-2.0
-4.0
ACCELERATION IN G/10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TIME IN SECONDS

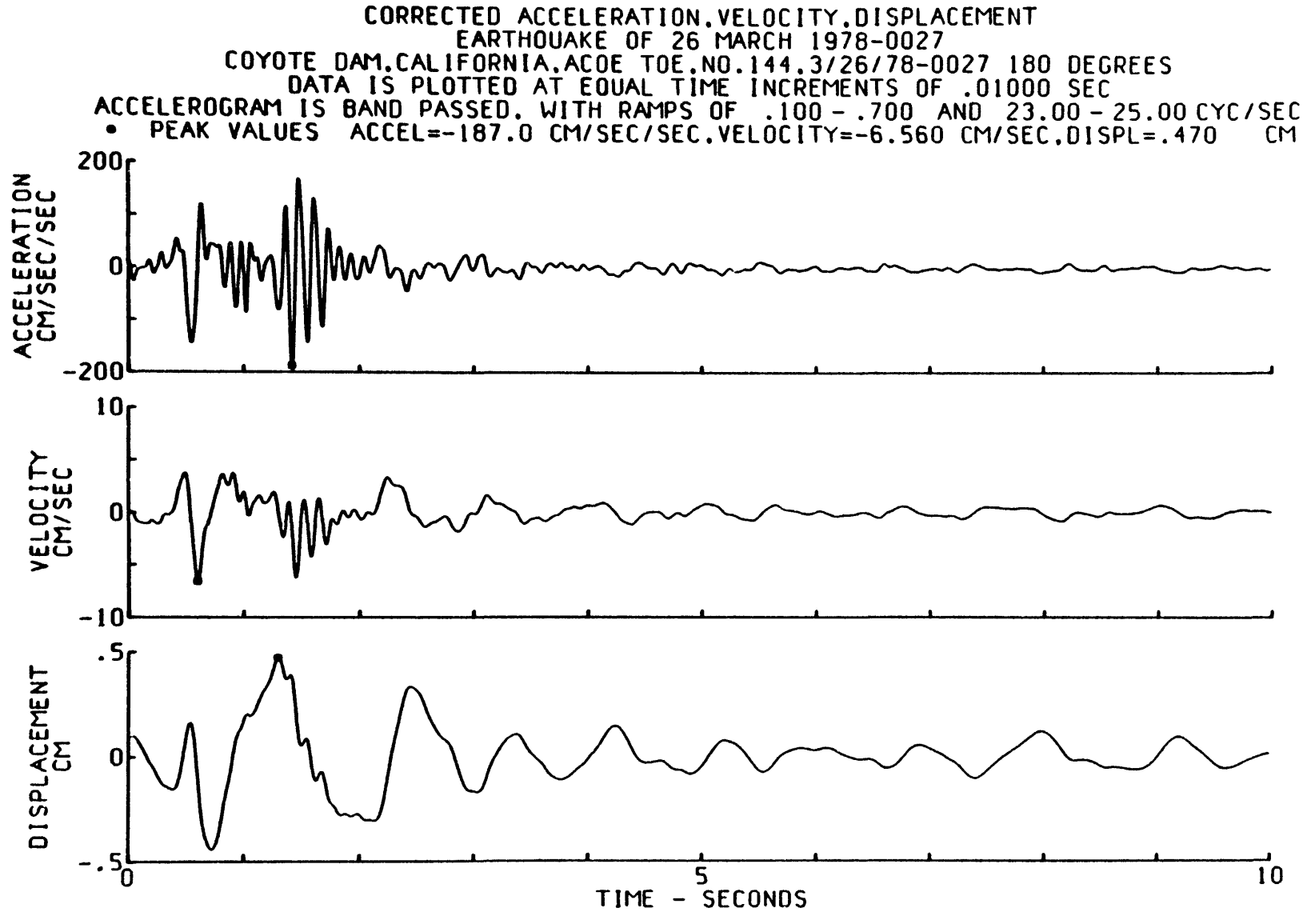

CORRECTED ACCELERATION,VELOCITY,DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE ABUT,NO.143,3/26/78-0027,270 DEGREES
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=164.9 CM/SEC/SEC,VELOCITY=-7.030 CM/SEC,DISPL=-.700 CM
ACCELERATION CM/SEC/SEC
200
0
-200
VELOCITY CM/SEC
10
0
-10
DISPLACEMENT CM
1.0
0
-1.0
0
5
10
15
TIME - SECONDS

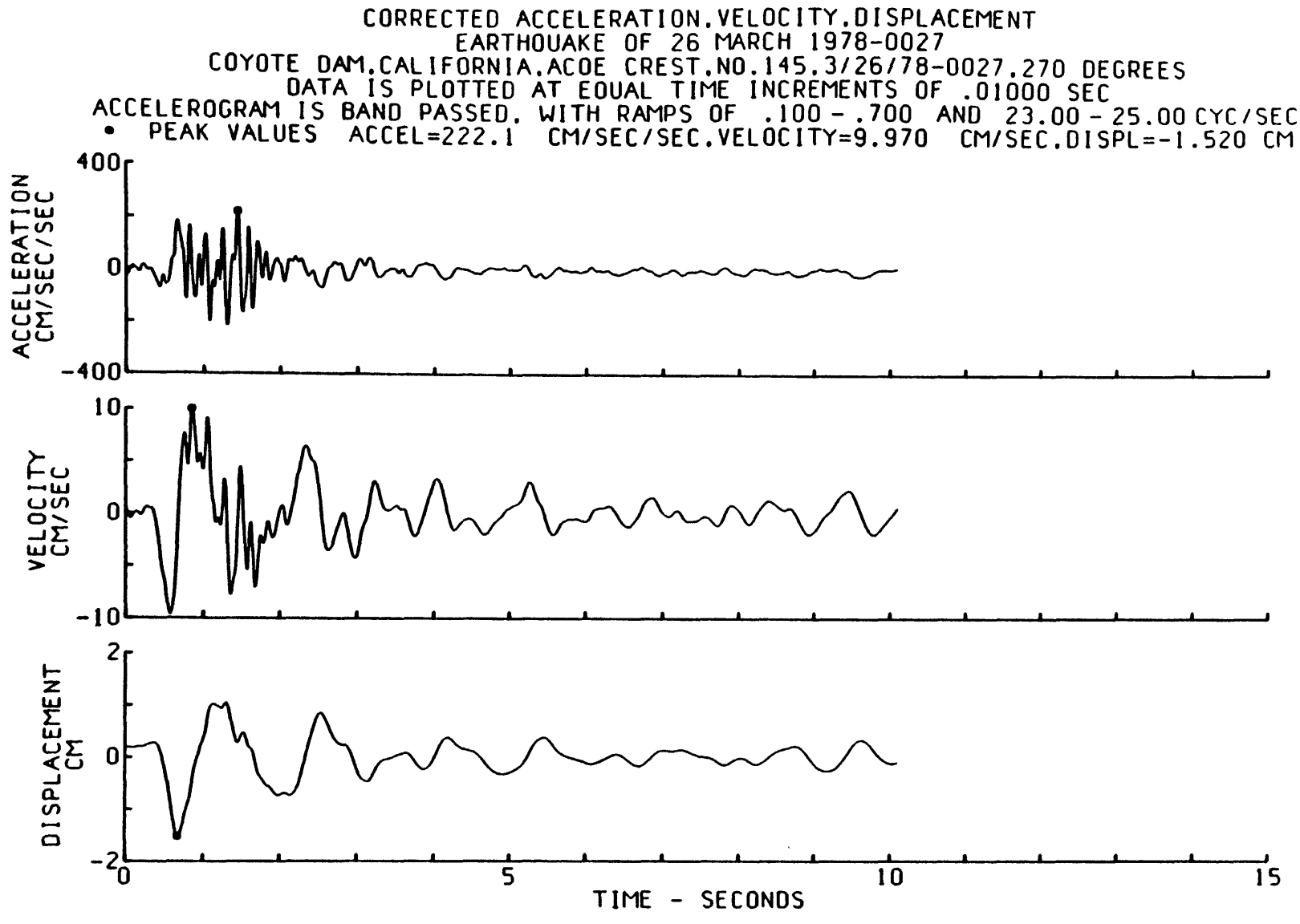

CORRECTED ACCELERATION.VELOCITY.DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM.CALIFORNIA.ACOE ABUT.NO.143.3/26/78-0027.UP
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=45.55 CM/SEC/SEC.VELOCITY=1.530 CM/SEC.DISPL=.160 CM
ACCELERATION CM/SEC/SEC
50
0
-50
VELOCITY CM/SEC
2
0
-2
DISPLACEMENT CM
.2
0
-.2
0
5
10
15
TIME - SECONDS

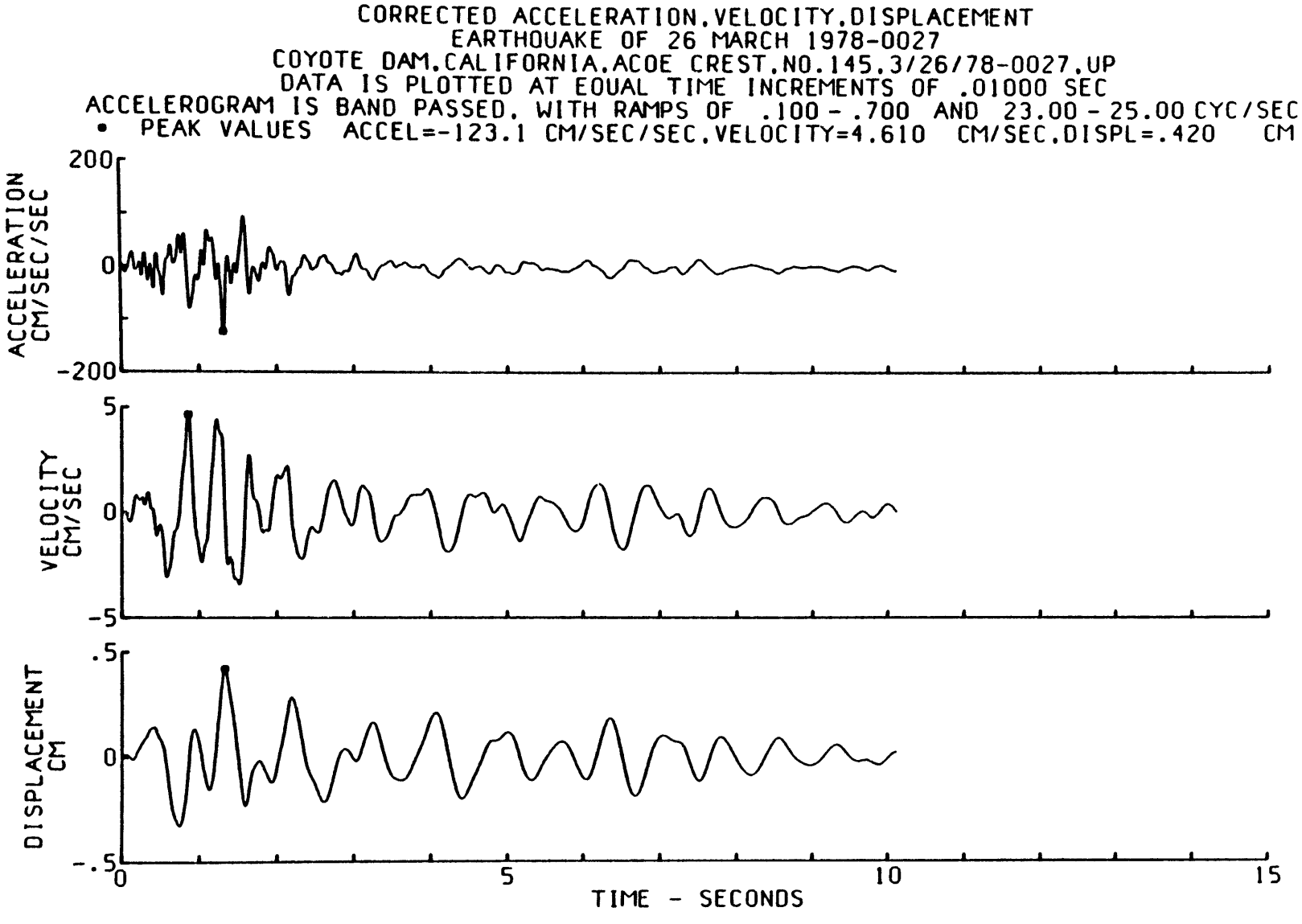

CORRECTED ACCELERATION.VELOCITY.DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM.CALIFORNIA.ACOE ABUT.NO.143.3/26/78-0027 180 DEGREES
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=-100.4 CM/SEC/SEC.VELOCITY=-5.640 CM/SEC.DISPL=.410 CM
ACCELERATION CM/SEC/SEC
200
0
-200
VELOCITY CM/SEC
10
0
-10
DISPLACEMENT CM
.5
0
-.5
0
5
10
15
TIME - SECONDS

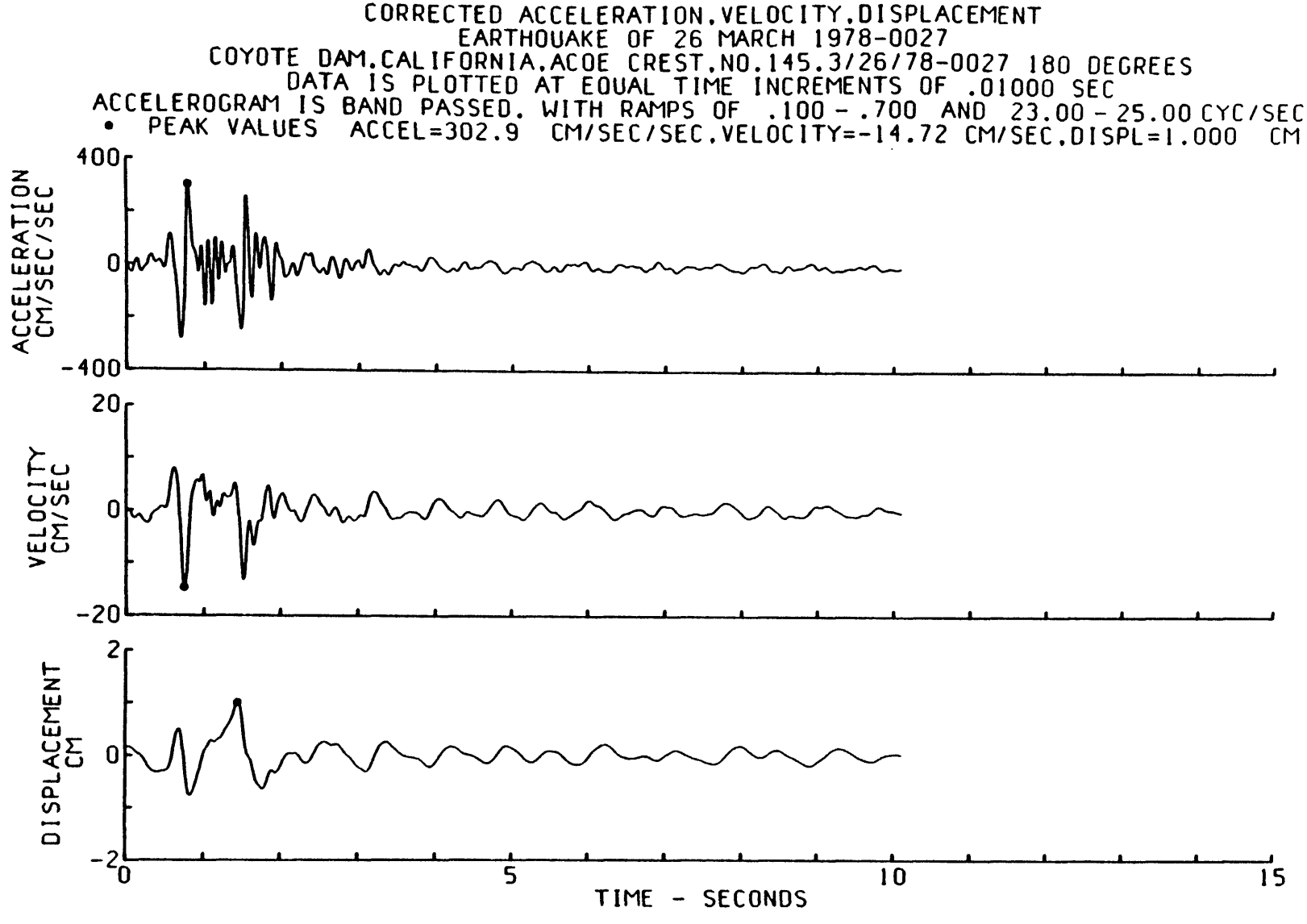

CORRECTED ACCELERATION.VELOCITY.DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM.CALIFORNIA.ACOE TOE.NO.144.3/26/78-0027.270 DEGREES
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=-315.2 CM/SEC/SEC.VELOCITY=-8.210 CM/SEC.DISPL=.840 CM
ACCELERATION CM/SEC/SEC
400
0
-400
VELOCITY CM/SEC
10
0
-10
DISPLACEMENT CM
1.0
0
-1.0
0
5
10
TIME - SECONDS

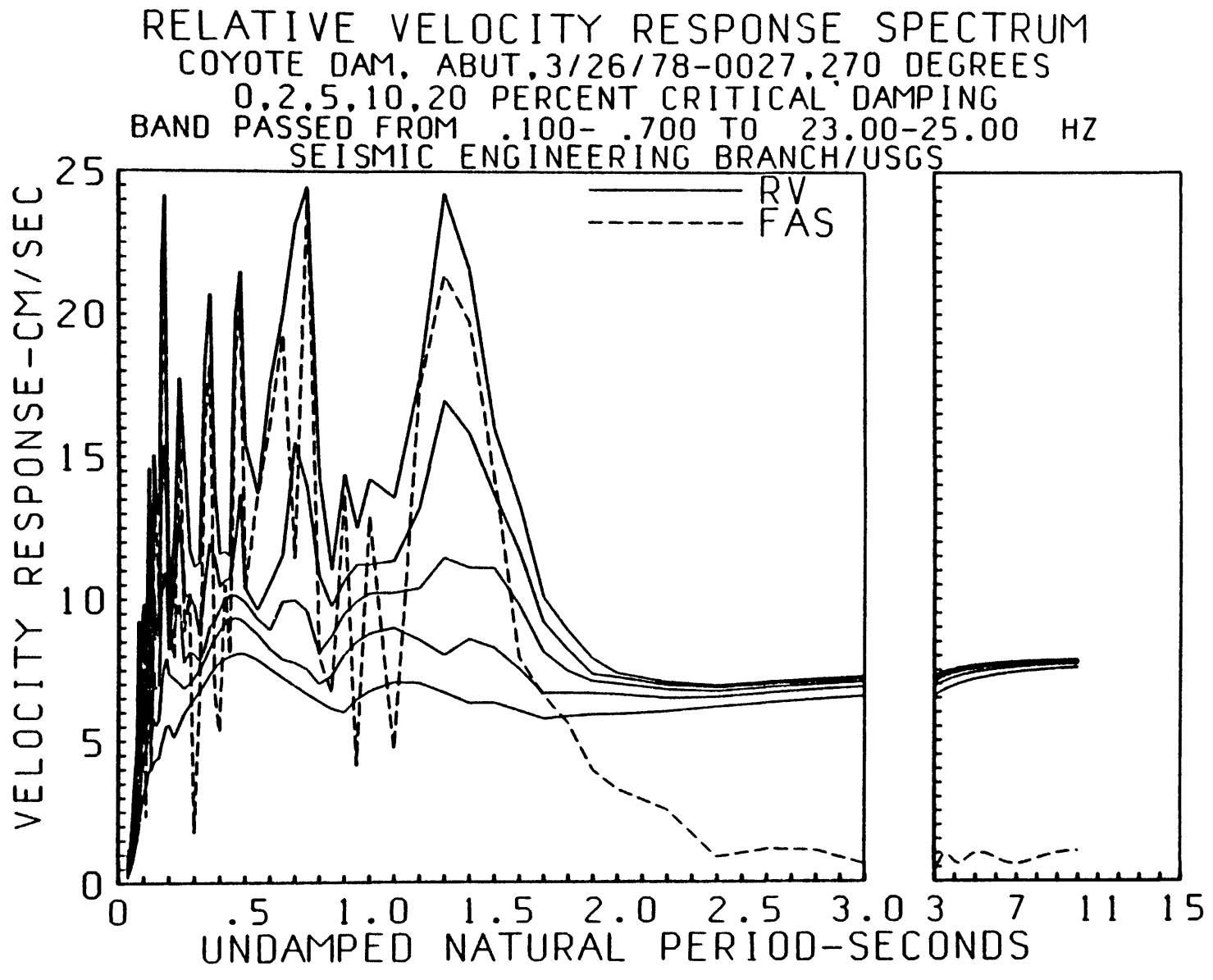

CORRECTED ACCELERATION,VELOCITY,DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE TOE,NO.144,3/26/78-0027,UP
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=65.13 CM/SEC/SEC,VELOCITY=1.990 CM/SEC,DISPL=-.160 CM
ACCELERATION CM/SEC/SEC
100
0
-100
VELOCITY CM/SEC
2
0
-2
DISPLACEMENT CM
.2
0
-.2
0
5
10
TIME - SECONDS

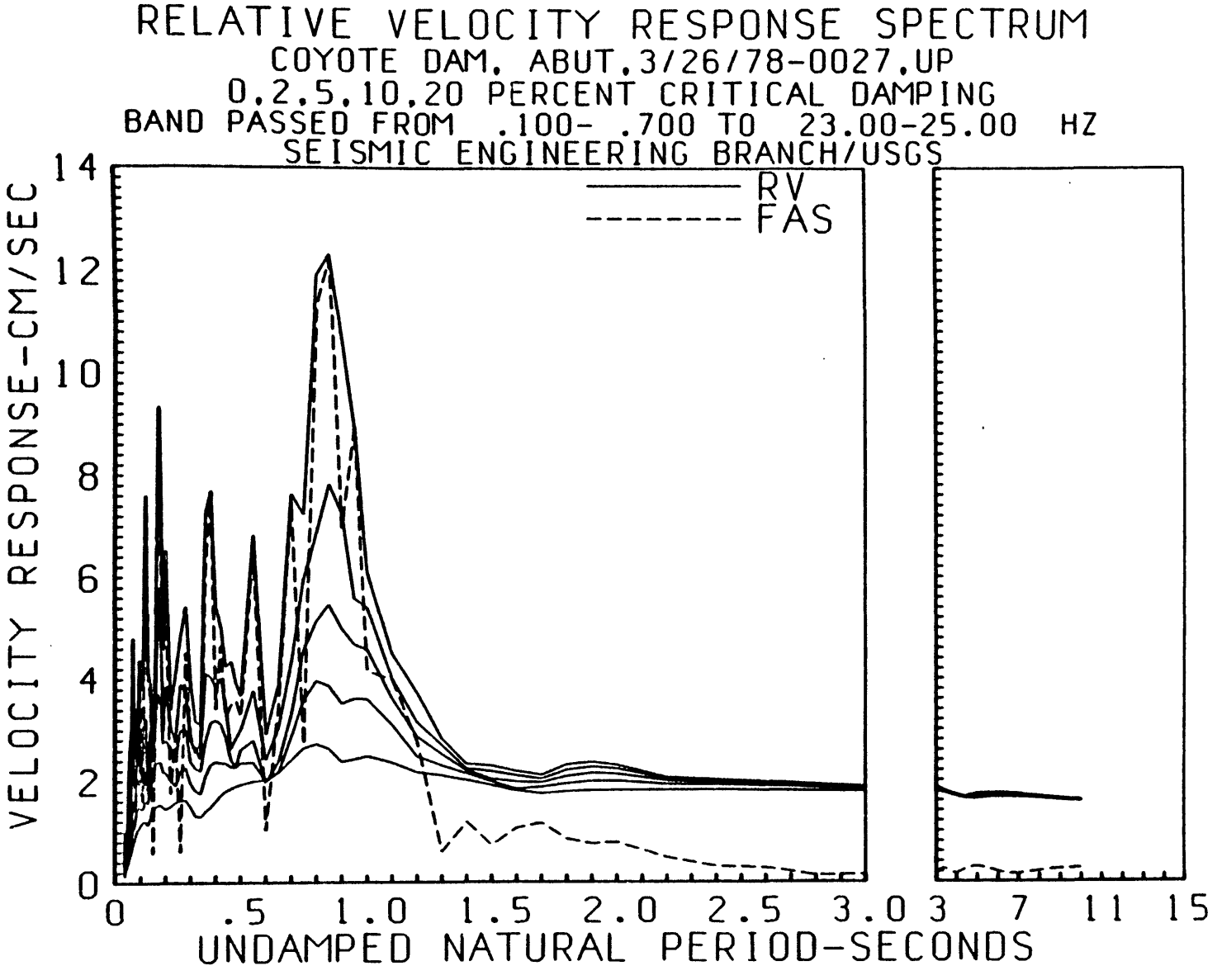

CORRECTED ACCELERATION.VELOCITY.DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM.CALIFORNIA.ACOE TOE.NO.144.3/26/78-0027 180 DEGREES
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=-187.0 CM/SEC/SEC.VELOCITY=-6.560 CM/SEC.DISPL=.470 CM
ACCELERATION CM/SEC/SEC
200
0
-200
VELOCITY CM/SEC
10
0
-10
DISPLACEMENT CM
.5
0
-.5
0
5
10
TIME - SECONDS

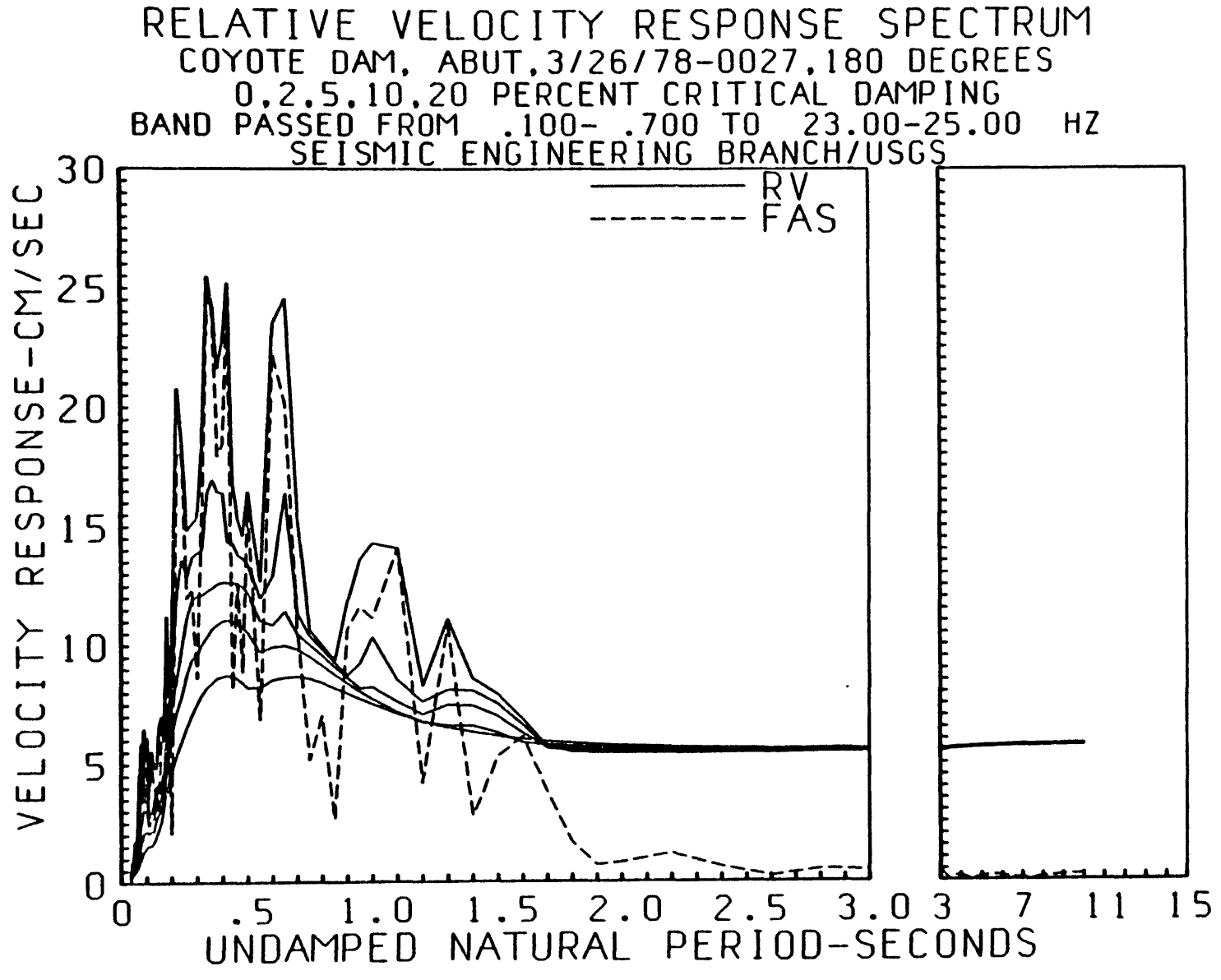

CORRECTED ACCELERATION,VELOCITY,DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145,3/26/78-0027,270 DEGREES
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED, WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=222.1 CM/SEC/SEC,VELOCITY=9.970 CM/SEC,DISPL=-1.520 CM
ACCELERATION CM/SEC/SEC
400
0
-400
VELOCITY CM/SEC
10
0
-10
DISPLACEMENT CM
2
0
-2
0
5
10
15
TIME - SECONDS

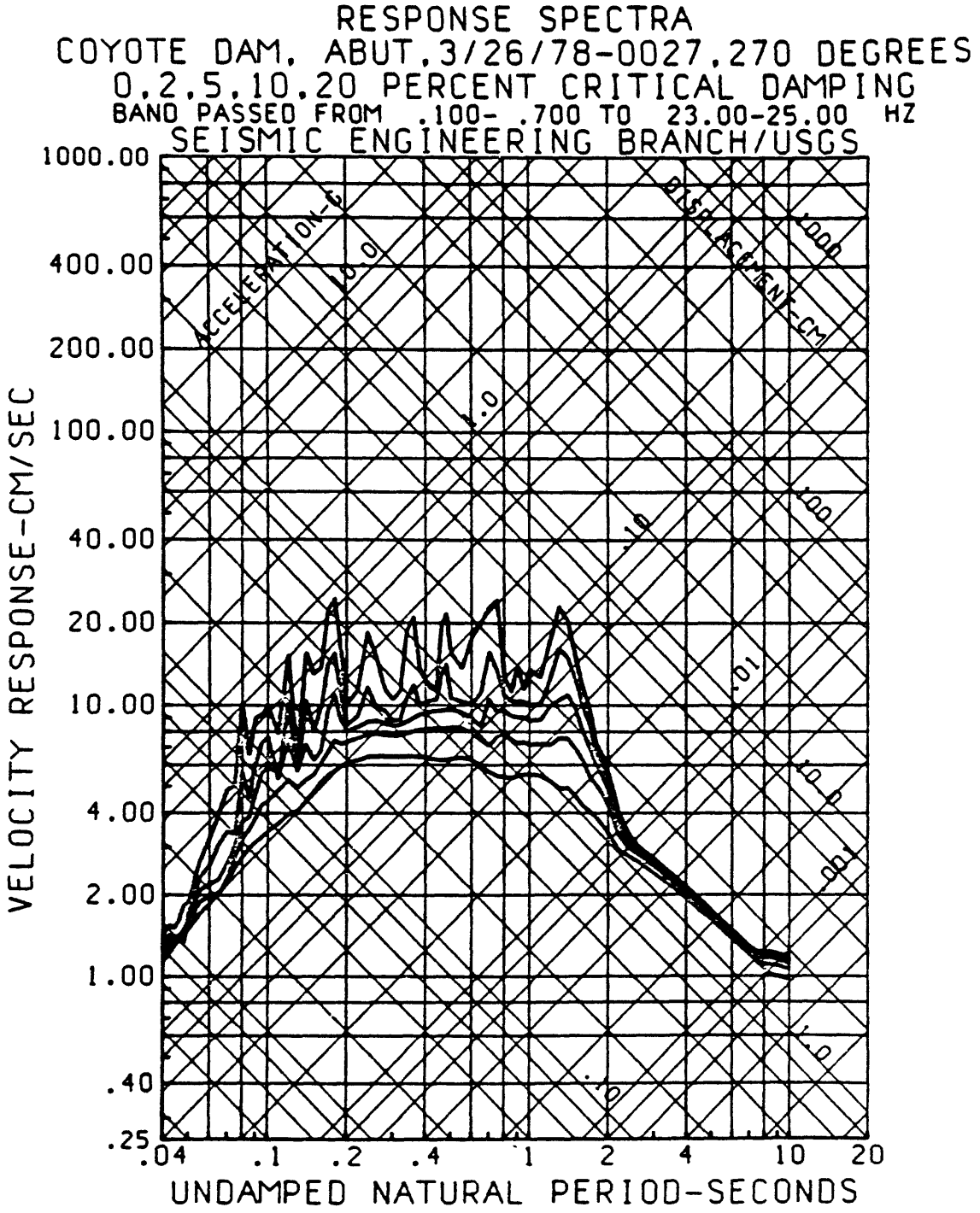

CORRECTED ACCELERATION.VELOCITY.DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM.CALIFORNIA.ACOE CREST.NO.145.3/26/78-0027.UP
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=-123.1 CM/SEC/SEC.VELOCITY=4.610 CM/SEC.DISPL=.420 CM
ACCELERATION CM/SEC/SEC
200
0
-200
VELOCITY CM/SEC
5
0
-5
DISPLACEMENT CM
.5
0
-.5
0
5
10
15
TIME - SECONDS

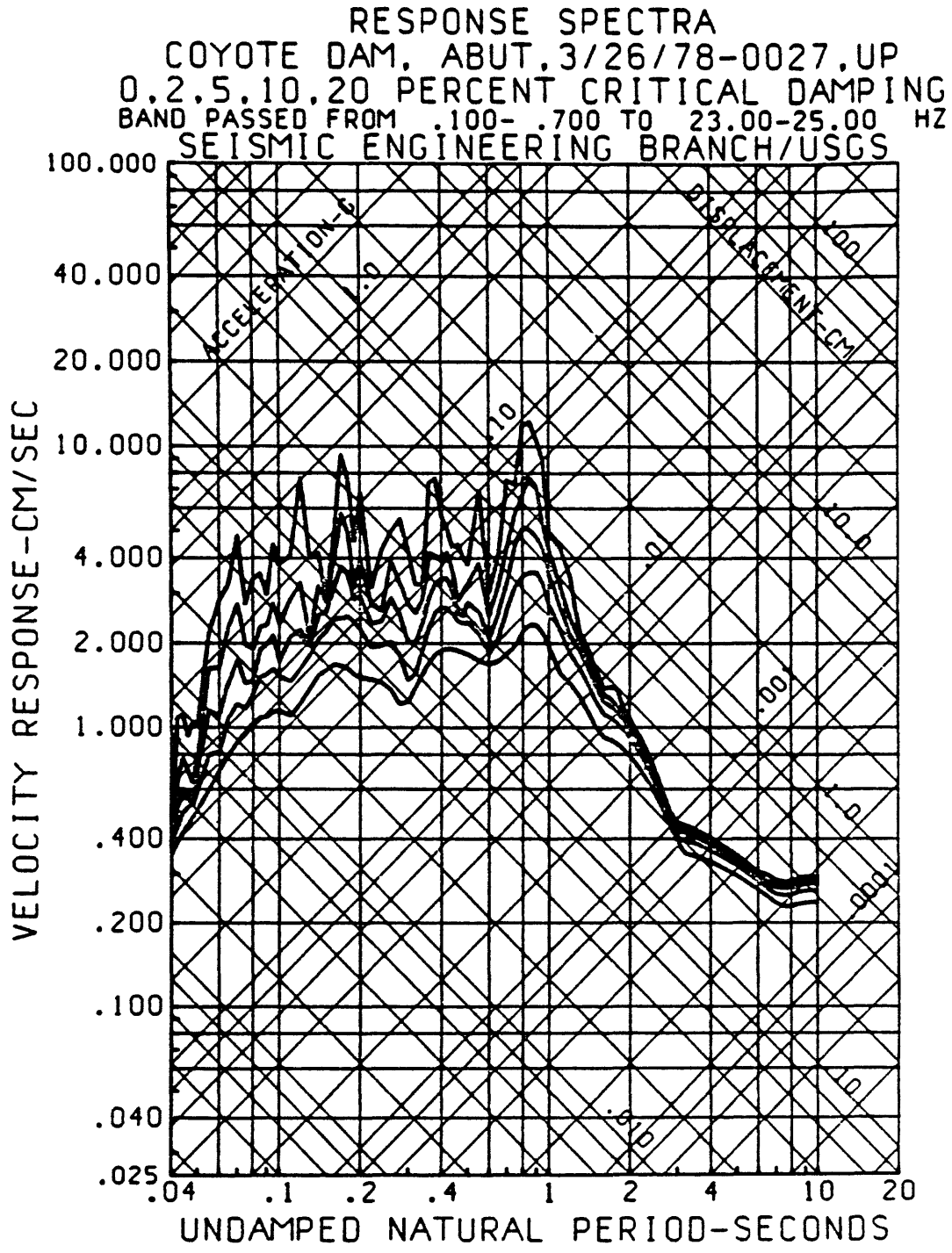

CORRECTED ACCELERATION,VELOCITY,DISPLACEMENT
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145.3/26/78-0027 180 DEGREES
DATA IS PLOTTED AT EQUAL TIME INCREMENTS OF .01000 SEC
ACCELEROGRAM IS BAND PASSED. WITH RAMPS OF .100 - .700 AND 23.00 - 25.00 CYC/SEC
• PEAK VALUES ACCEL=302.9 CM/SEC/SEC,VELOCITY=-14.72 CM/SEC,DISPL=1.000 CM
ACCELERATION CM/SEC/SEC
400
0
-400
VELOCITY CM/SEC
20
0
-20
DISPLACEMENT CM
2
0
-2
0
5
10
15
TIME - SECONDS

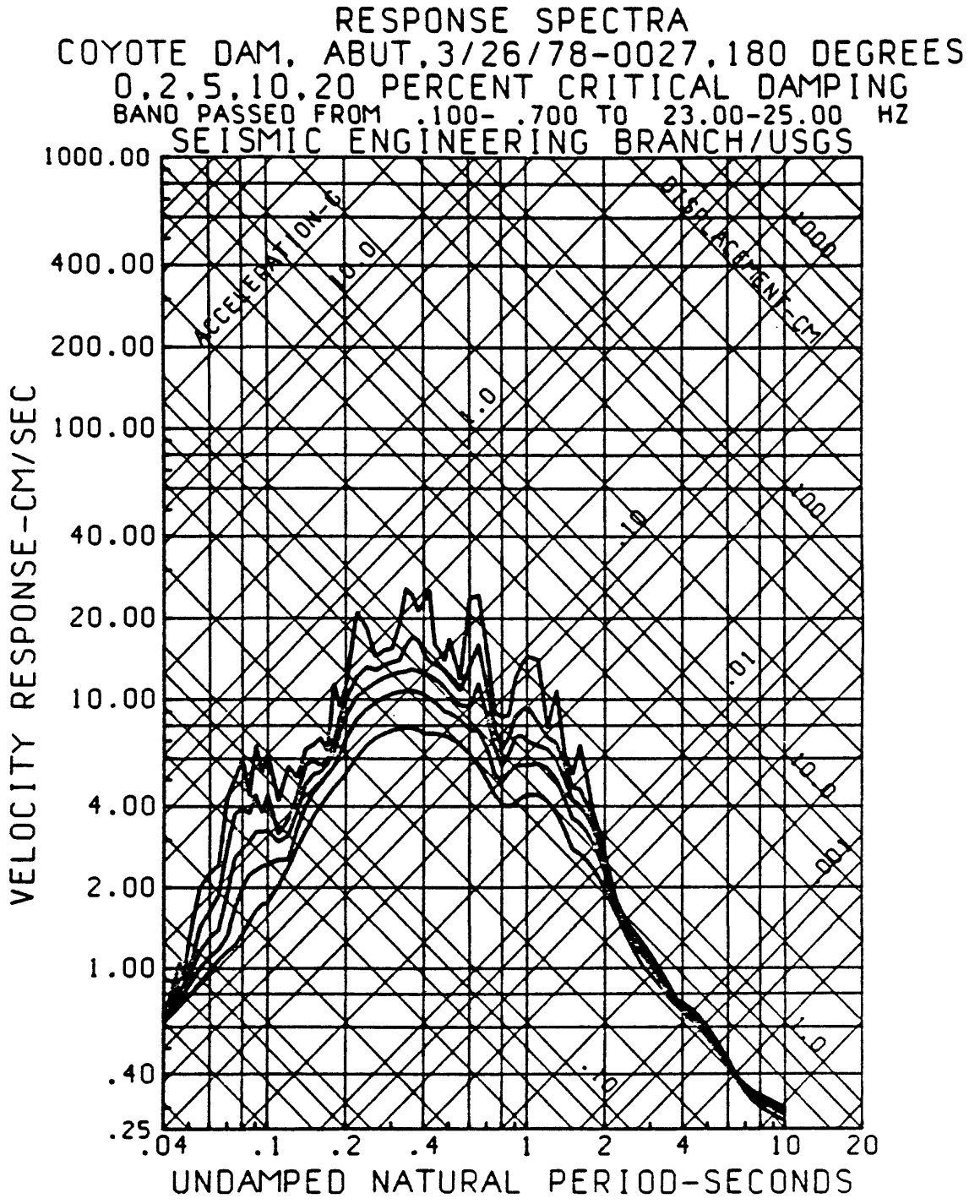

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, ABUT,3/26/78-0027,270 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
5
10
15
20
25
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

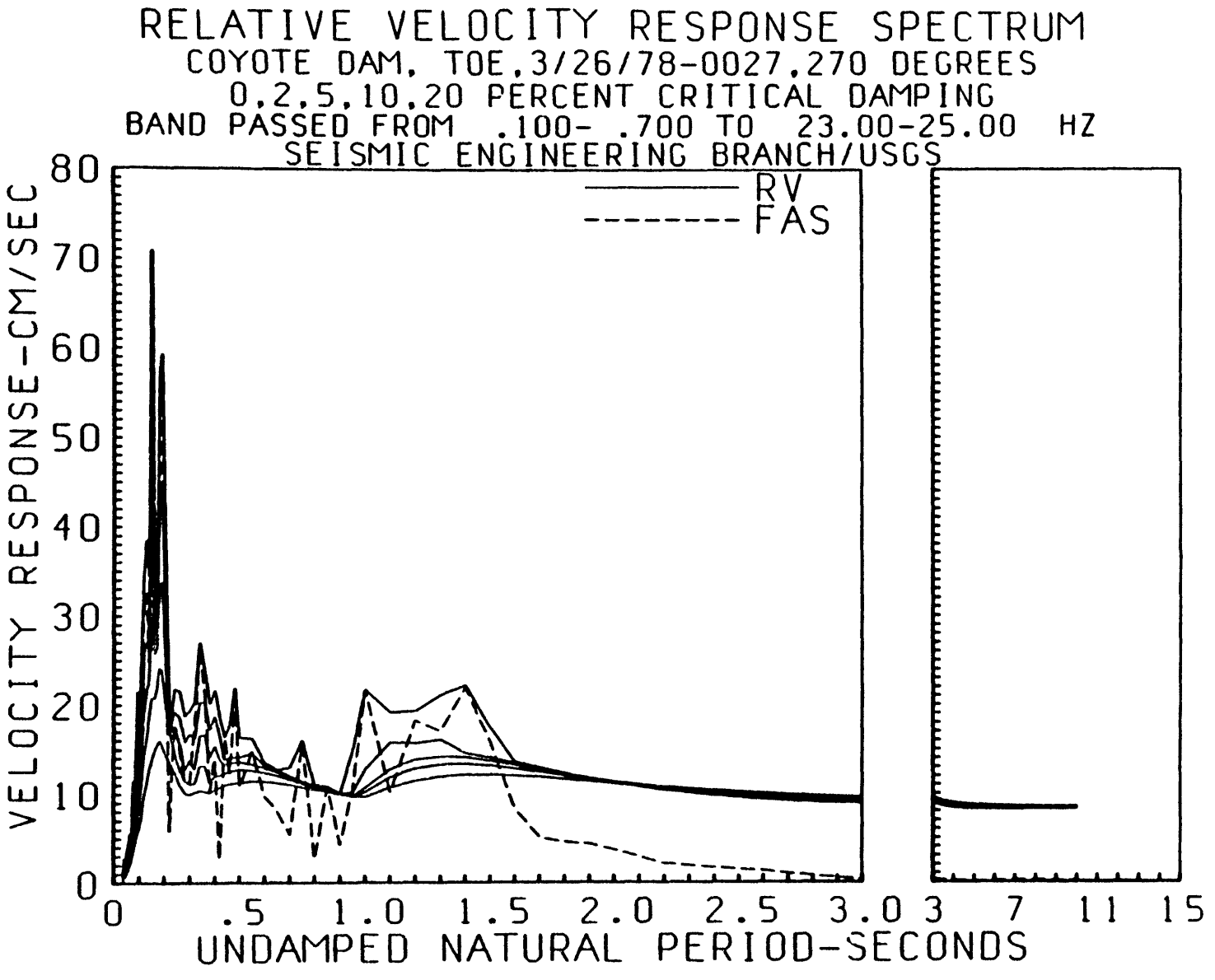

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, ABUT,3/26/78-0027,UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
2
4
6
8
10
12
14
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

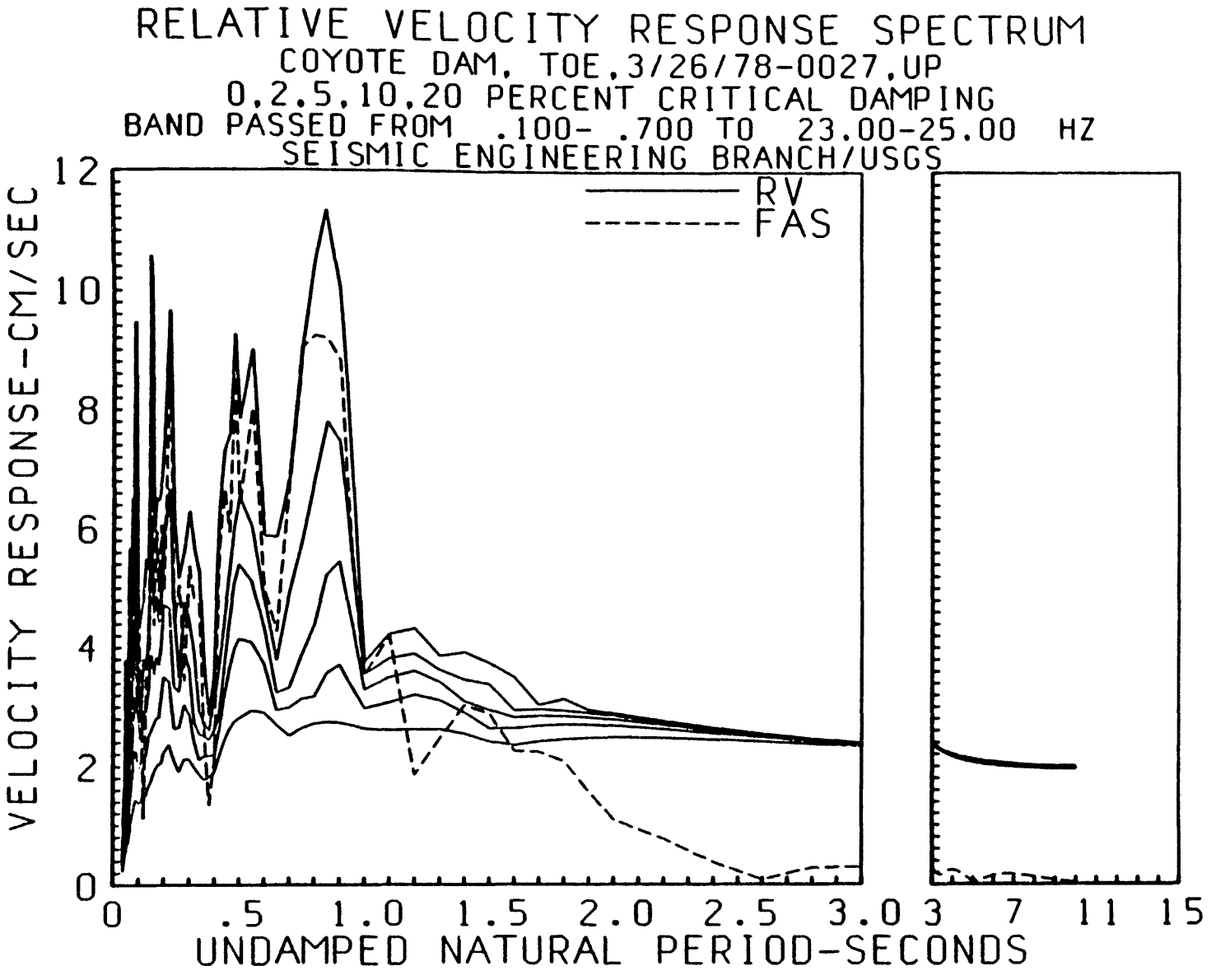

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, ABUT,3/26/78-0027,180 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
5
10
15
20
25
30
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

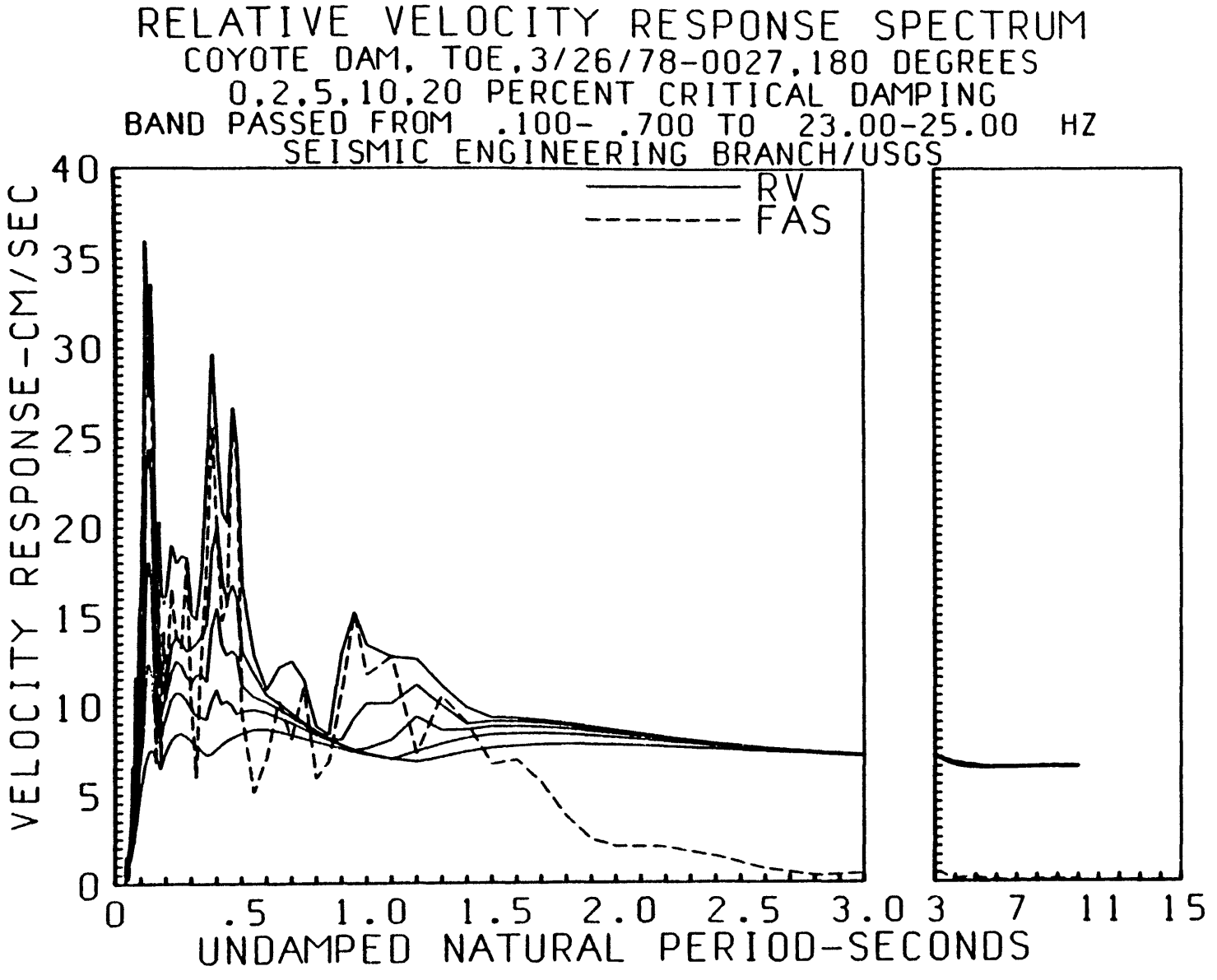

RESPONSE SPECTRA
COYOTE DAM, ABUT,3/26/78-0027,270 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
.40
.25
ACCELERATION-G
10.0
1.0
.10
.01
DISPLACEMENT-CM
1000
100
10.0
1.0
.01
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

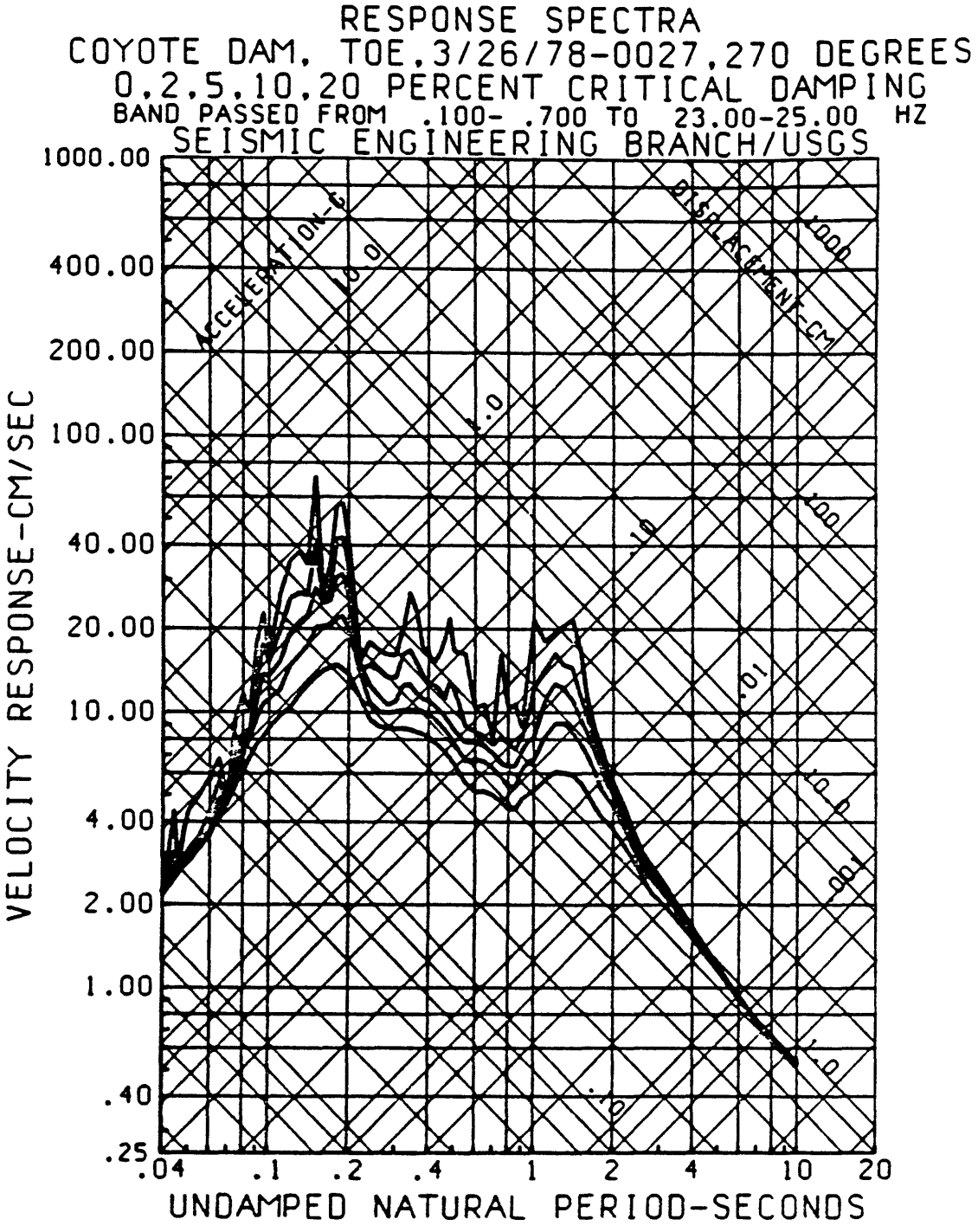

RESPONSE SPECTRA
COYOTE DAM, ABUT,3/26/78-0027,UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
ACCELERATION-G
1.0
.10
.01
DISPLACEMENT-CM
100
10.0
1.0
.100
.010
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

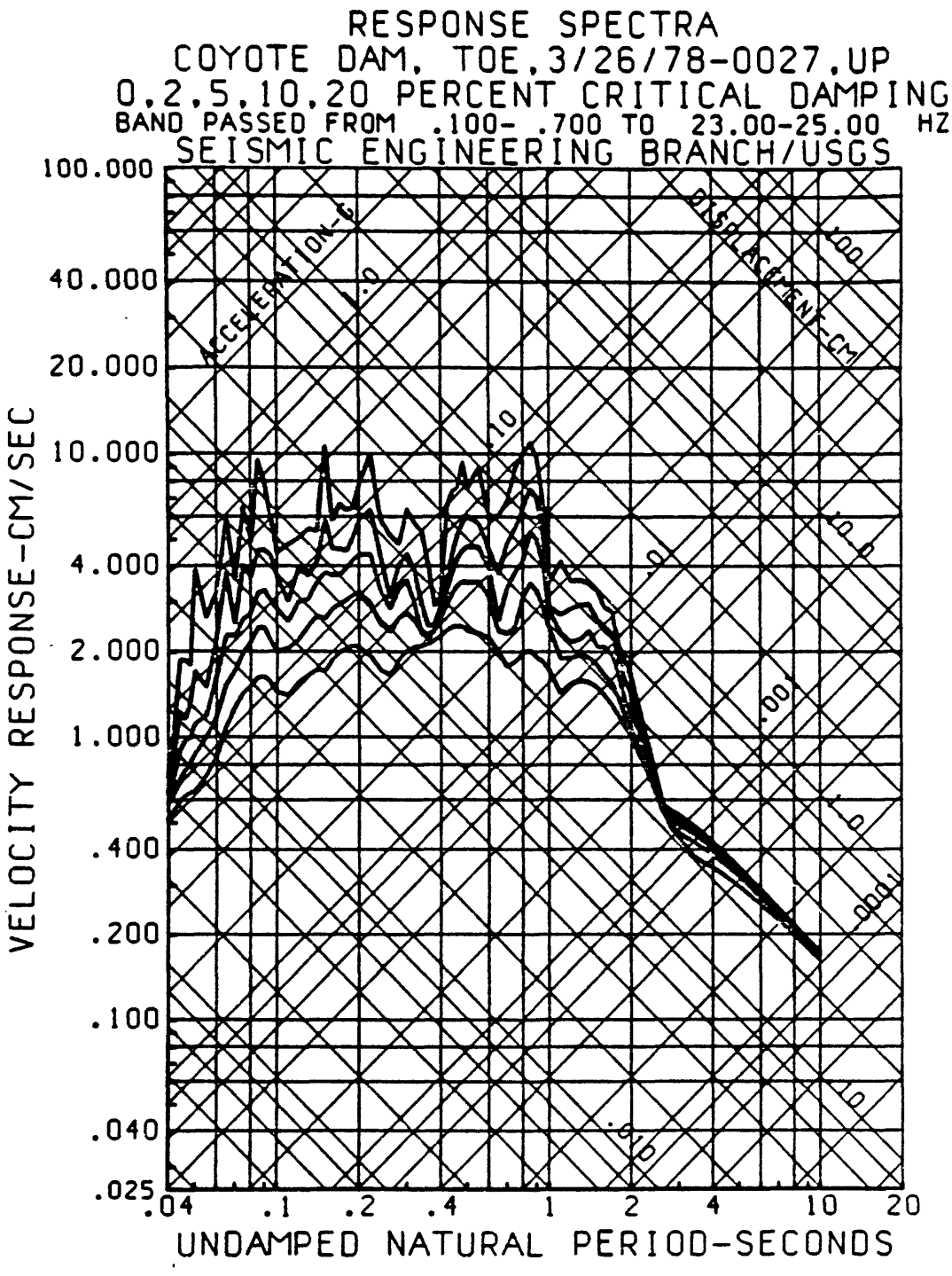

RESPONSE SPECTRA
COYOTE DAM, ABUT,3/26/78-0027,180 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
.40
.25
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM

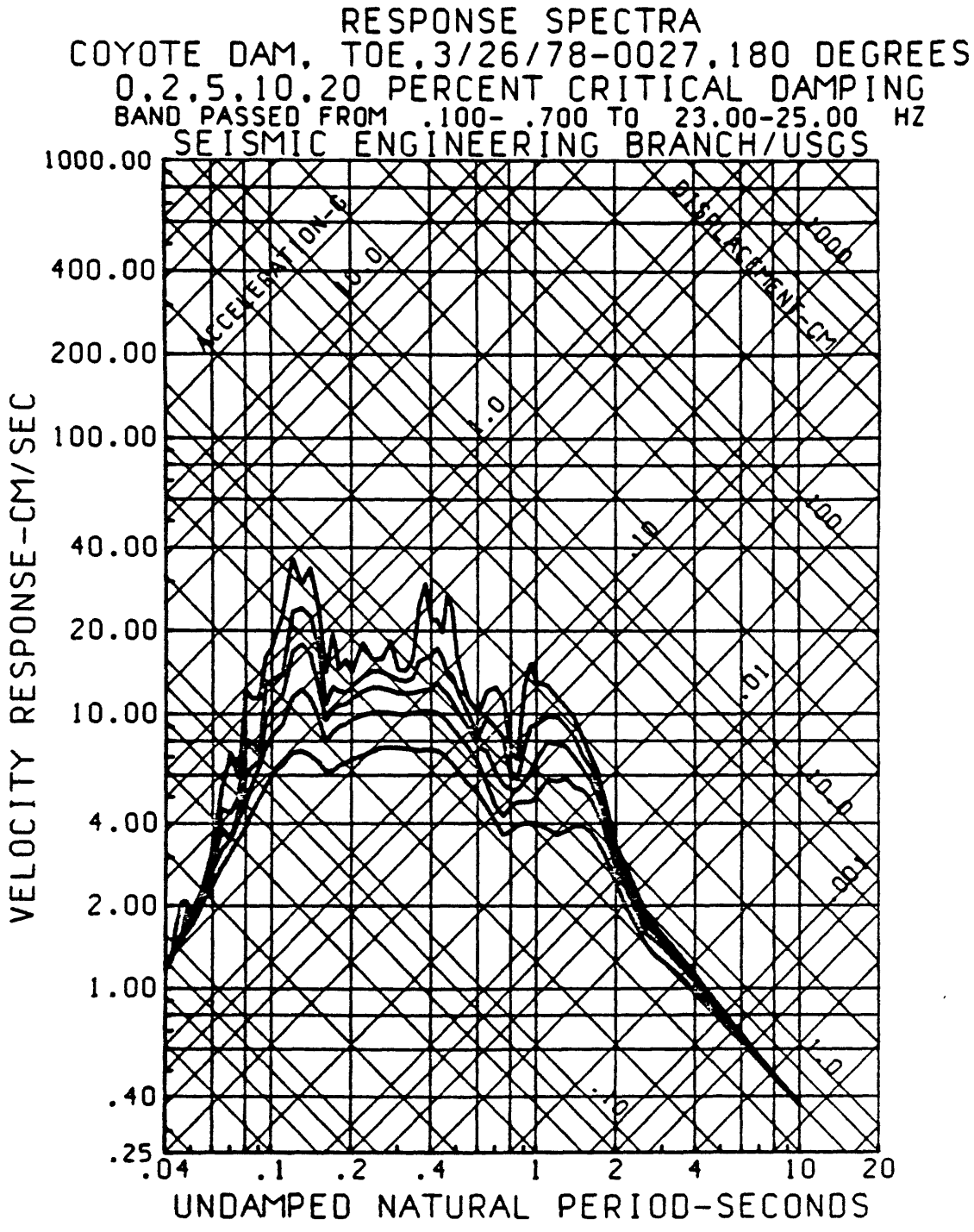

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, TOE,3/26/78-0027,270 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
70
80
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

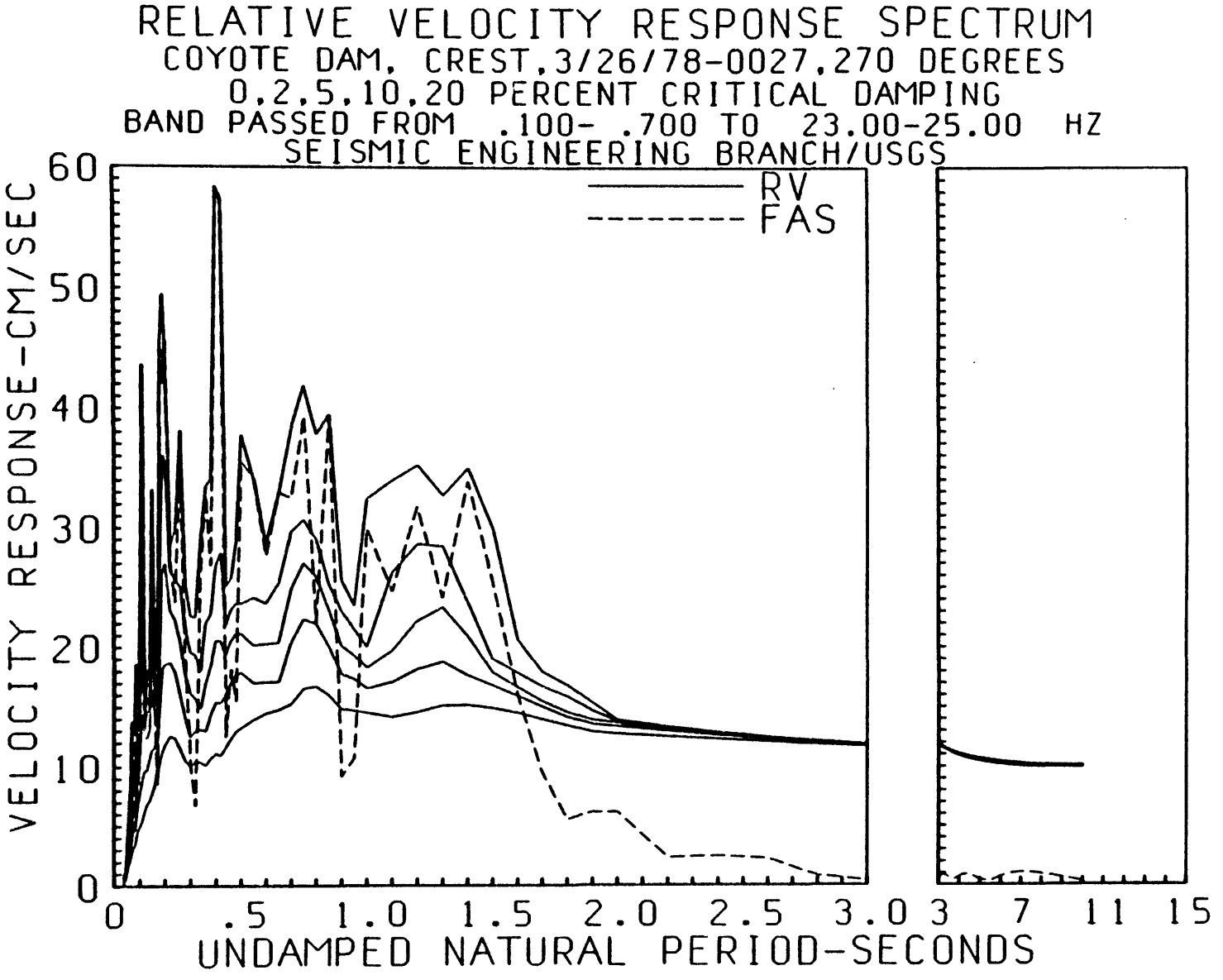

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, TOE,3/26/78-0027,UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
2
4
6
8
10
12
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

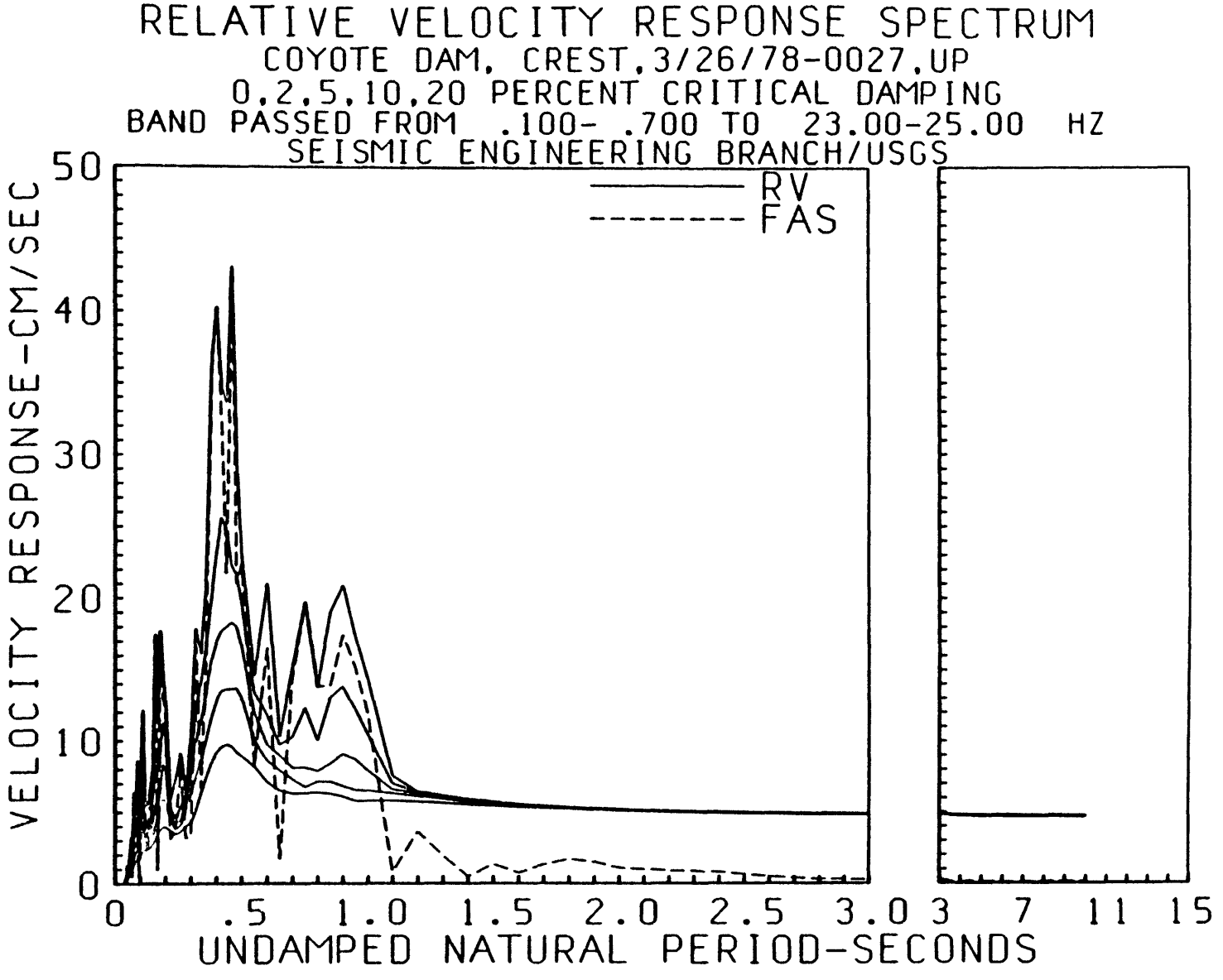

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, TOE,3/26/78-0027,180 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
5
10
15
20
25
30
35
40
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

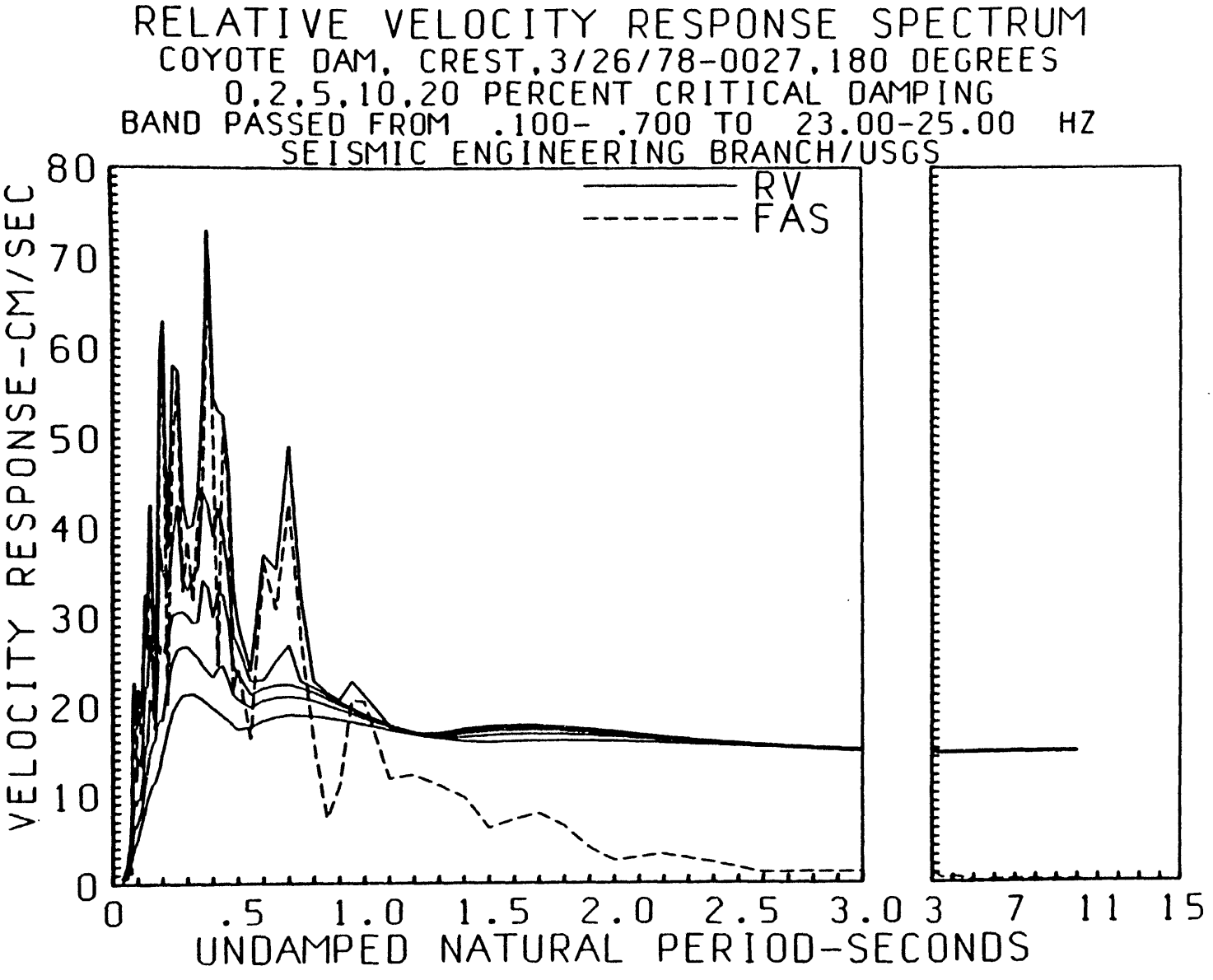

RESPONSE SPECTRA
COYOTE DAM, TOE,3/26/78-0027,270 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
.40
.25
ACCELERATION-G
10.0
1.0
.1
.01
DISPLACEMENT-CM
1000.
100.
10.0
1.0
.1
.01
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

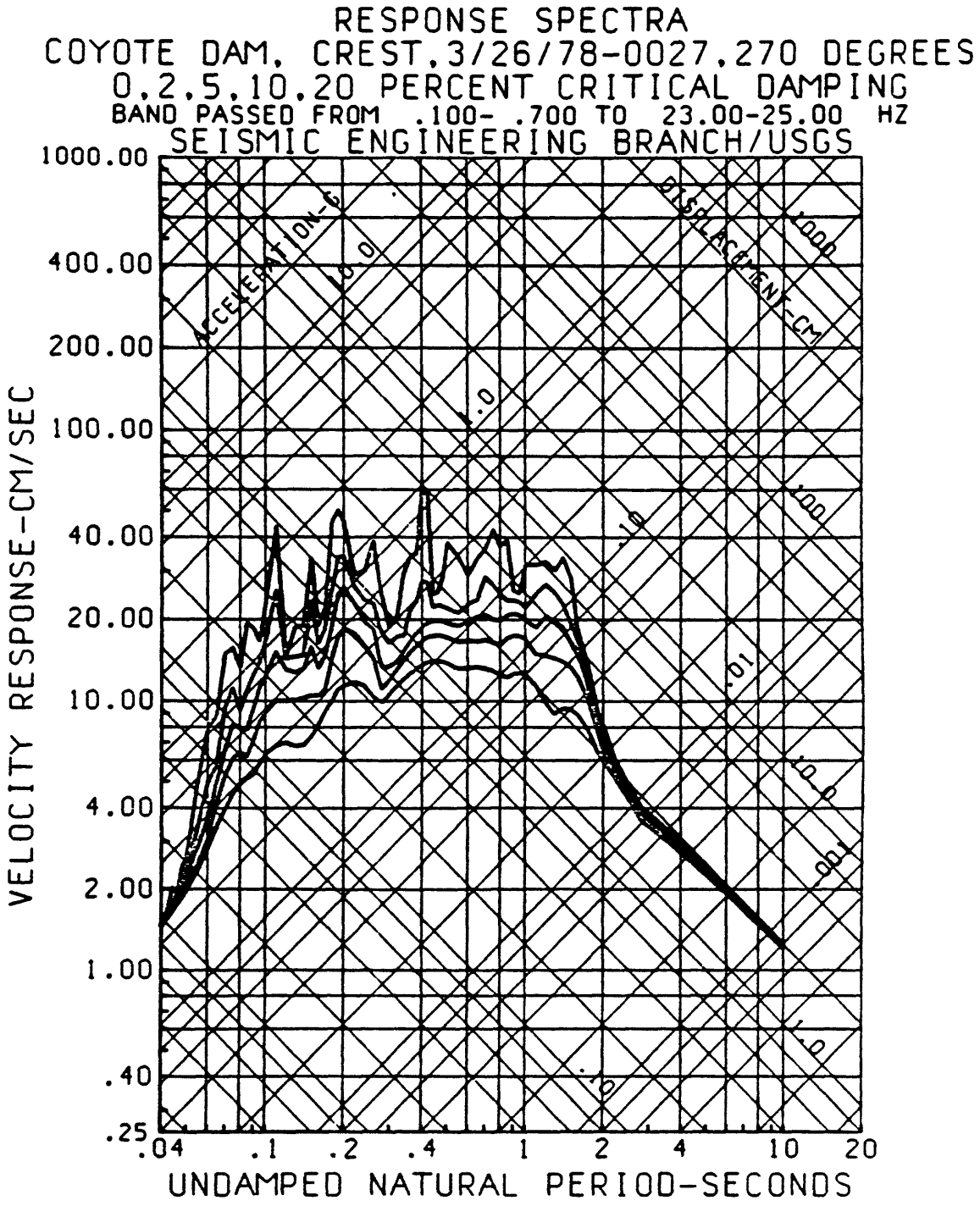

RESPONSE SPECTRA
COYOTE DAM, TOE,3/26/78-0027,UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM

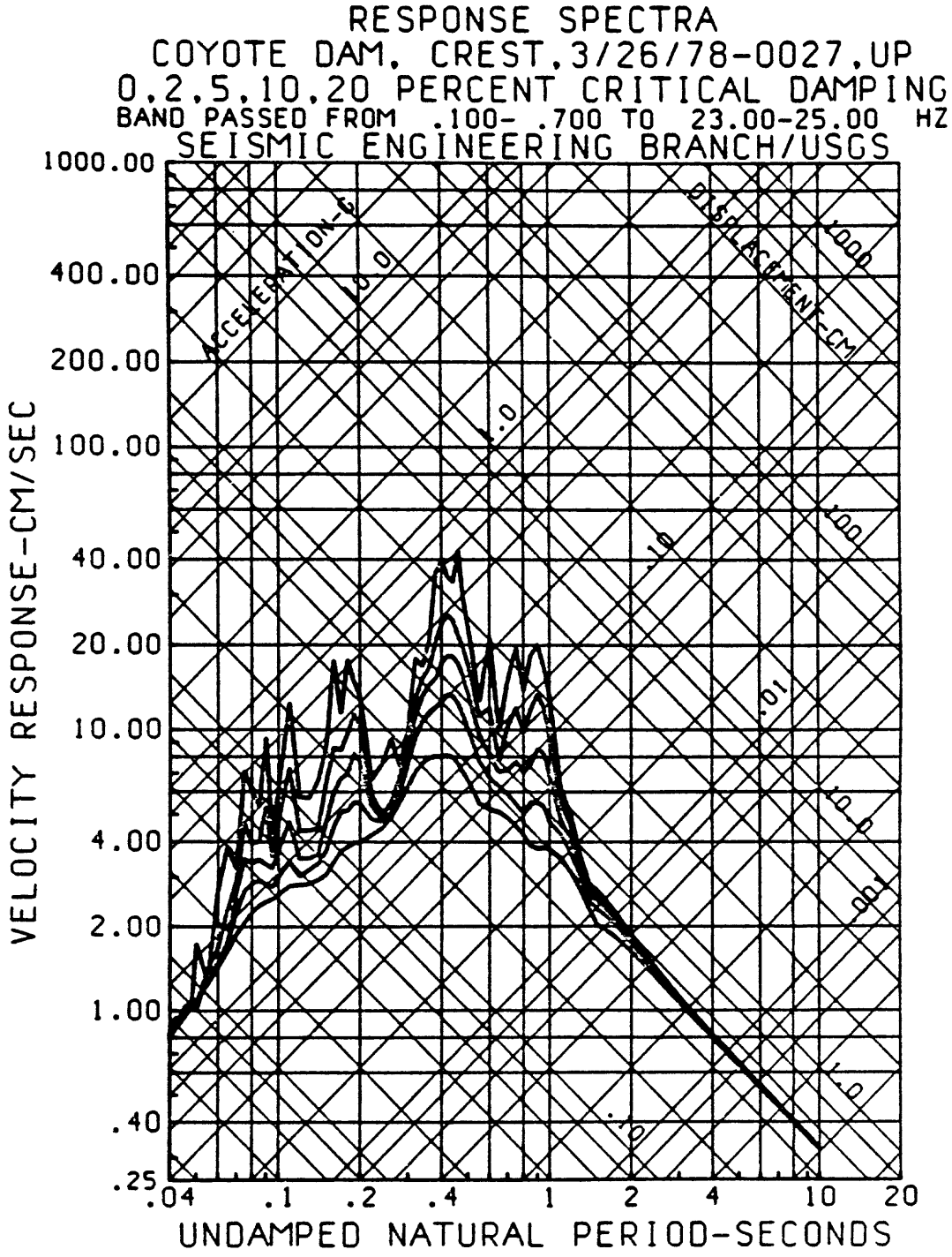

RESPONSE SPECTRA
COYOTE DAM, TOE,3/26/78-0027,180 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
.40
.25
ACCELERATION-G
DISPLACEMENT-CM
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

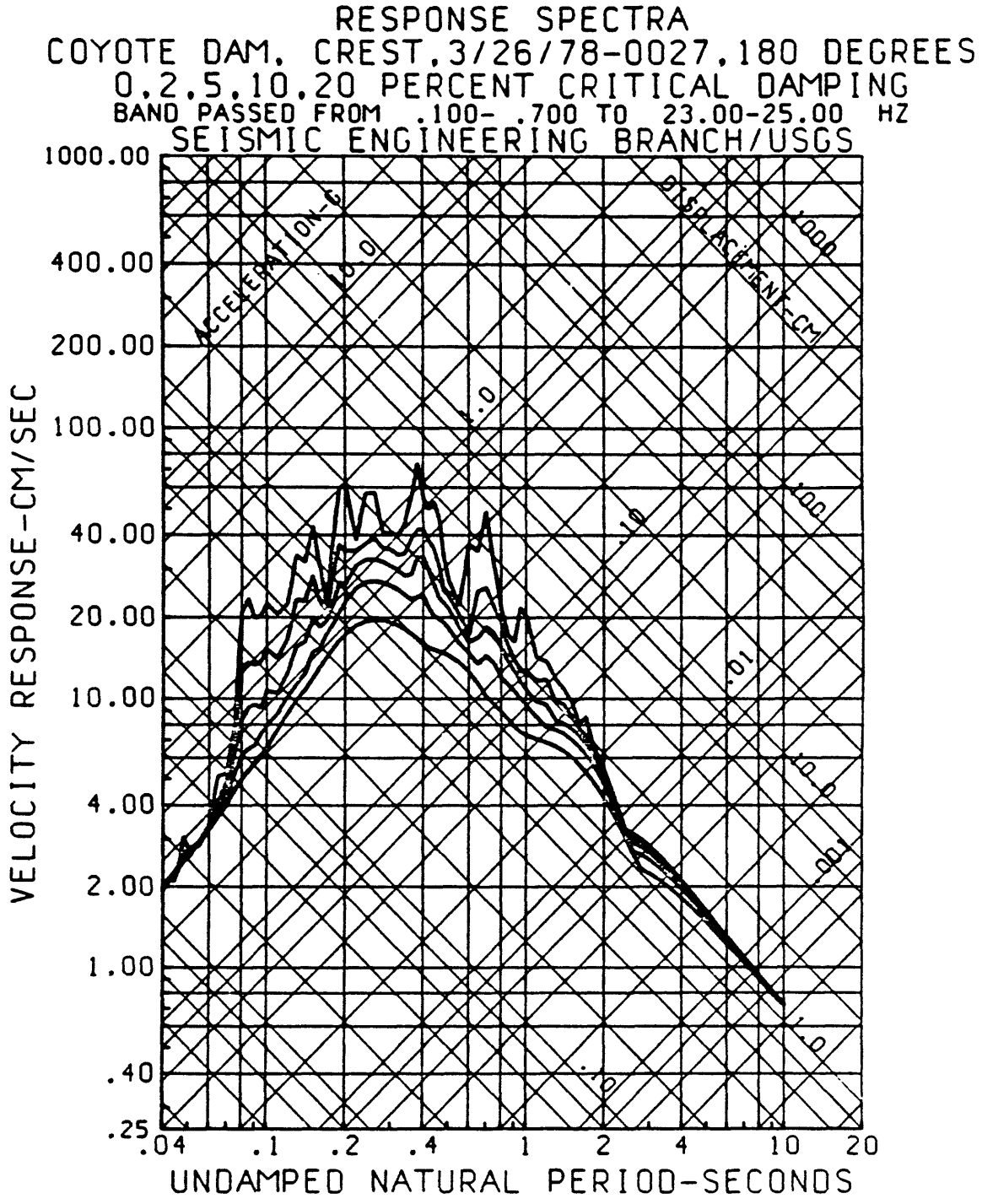

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, CREST,3/26/78-0027,270 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

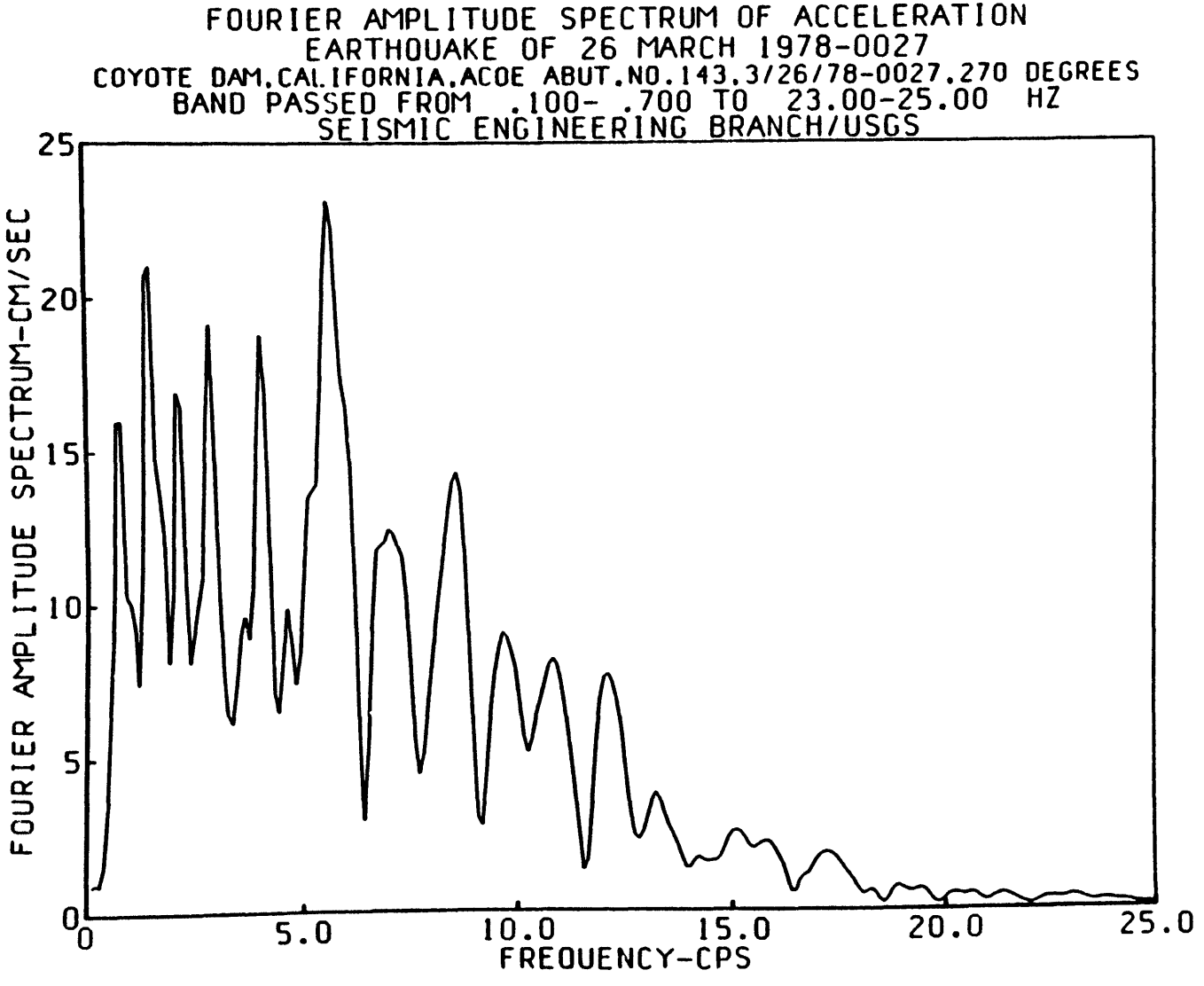

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, CREST,3/26/78-0027,UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

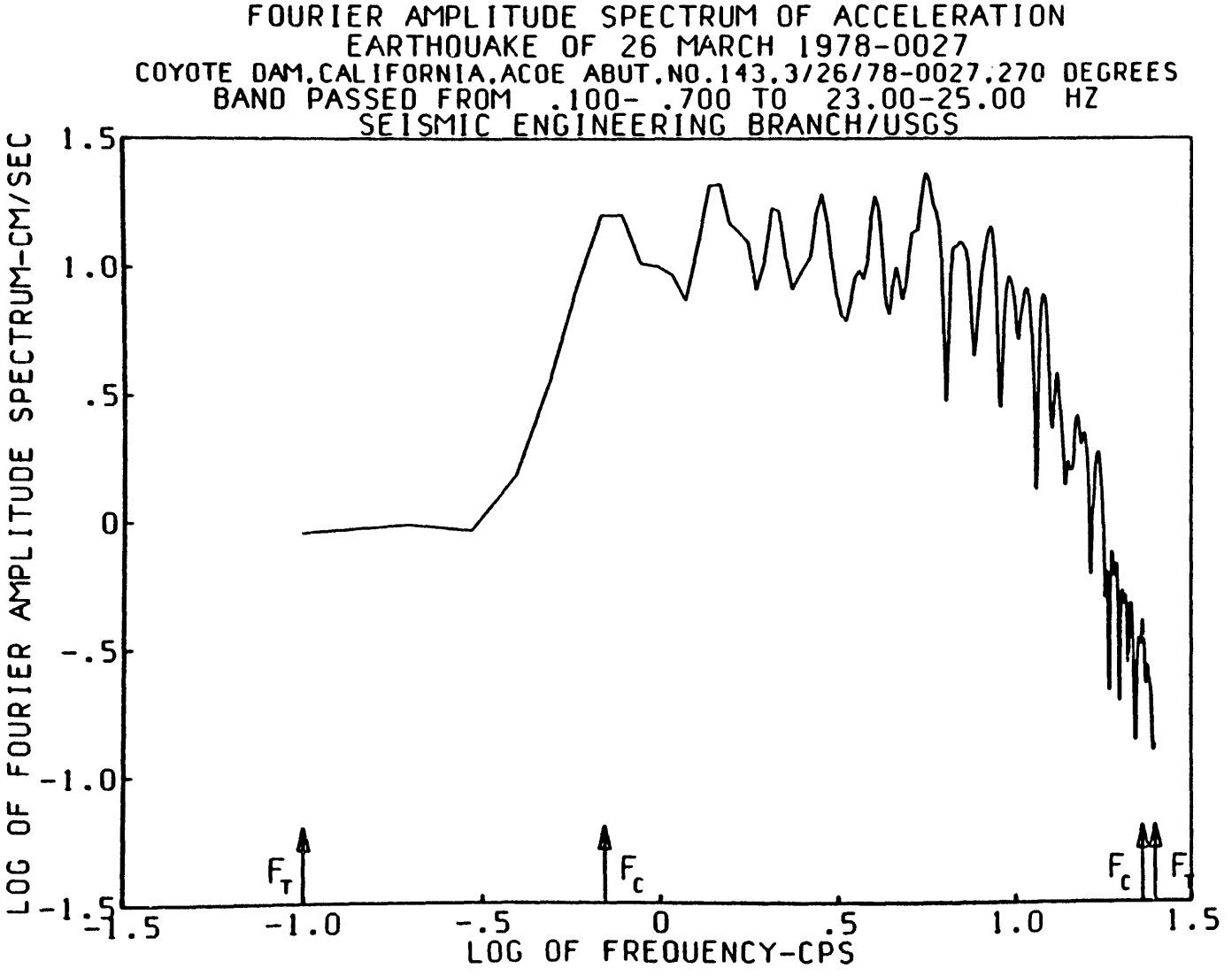

RELATIVE VELOCITY RESPONSE SPECTRUM
COYOTE DAM, CREST,3/26/78-0027,180 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
70
80
0
.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

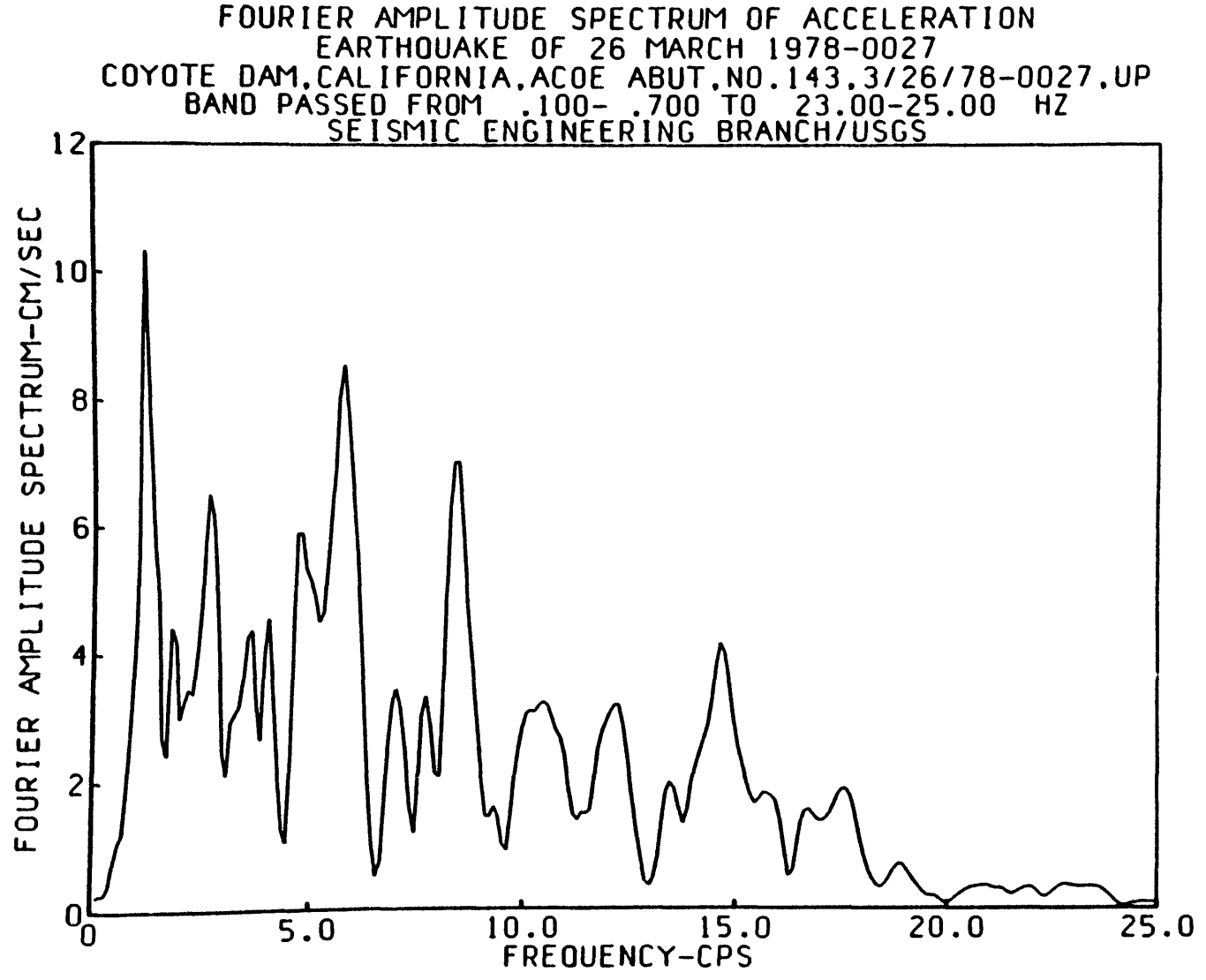

RESPONSE SPECTRA
COYOTE DAM, CREST,3/26/78-0027,270 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
.40
.25
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM

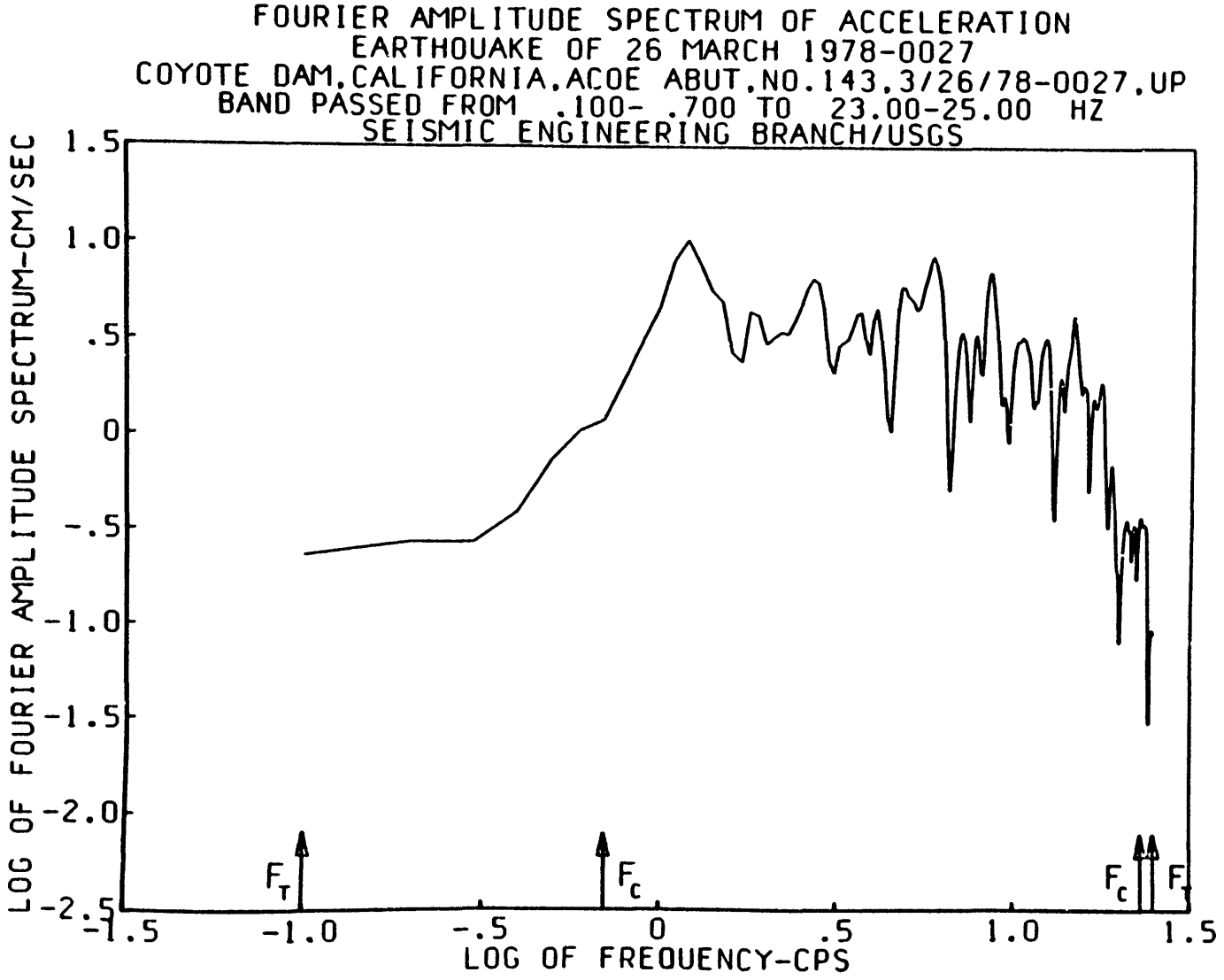

RESPONSE SPECTRA
COYOTE DAM, CREST,3/26/78-0027,UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
.40
.25
ACCELERATION-G
DISPLACEMENT-CM
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

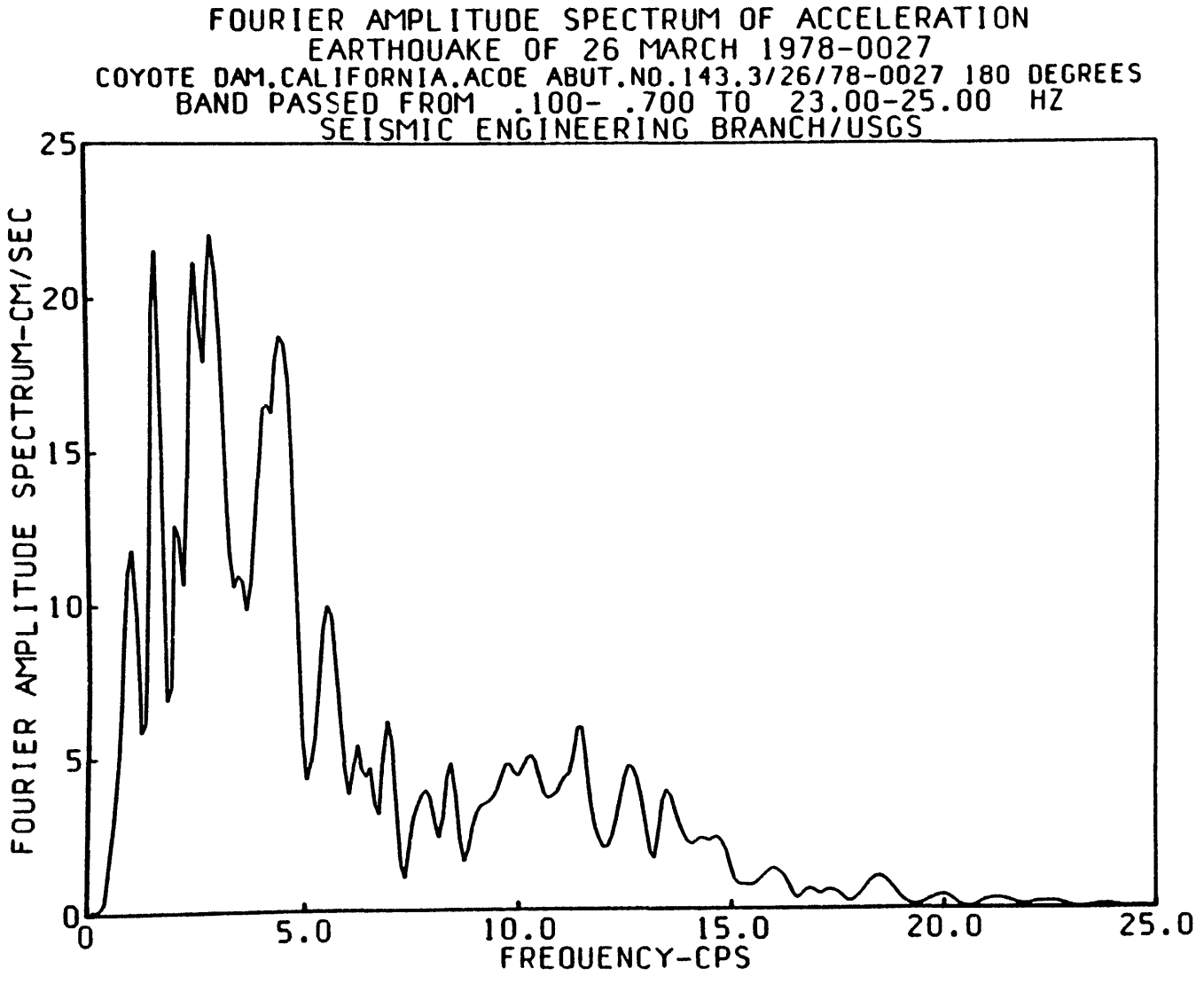

RESPONSE SPECTRA
COYOTE DAM, CREST,3/26/78-0027,180 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
.40
.25
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM

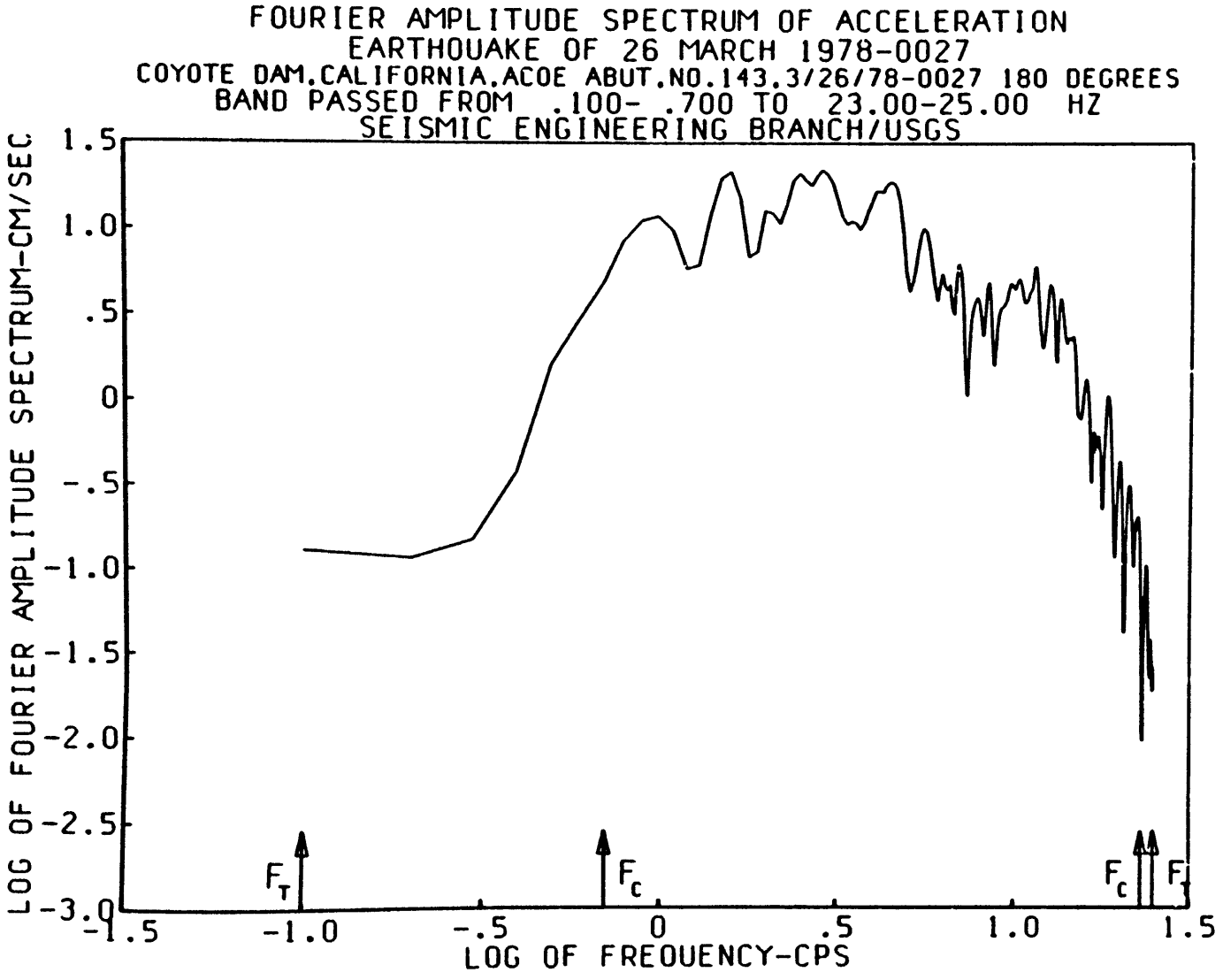

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE ABUT,NO.143,3/26/78-0027,270 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
FREQUENCY-CPS
0
5
10
15
20
25
0
5.0
10.0
15.0
20.0
25.0

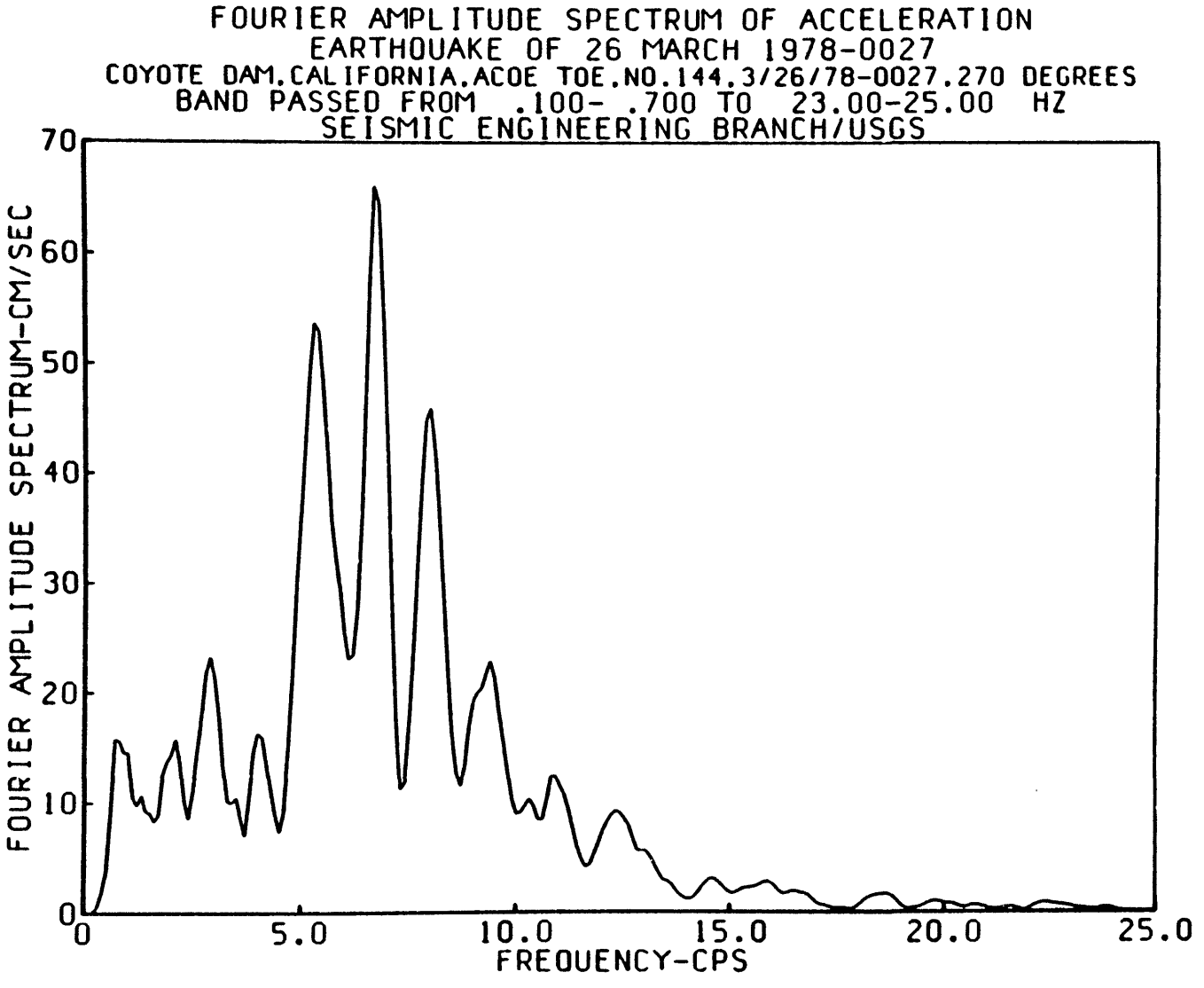

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE ABUT.NO.143,3/26/78-0027,270 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
1.5
1.0
.5
0
-.5
-1.0
-1.5
F_T
F_C
F_C
F_T
-1.5
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS

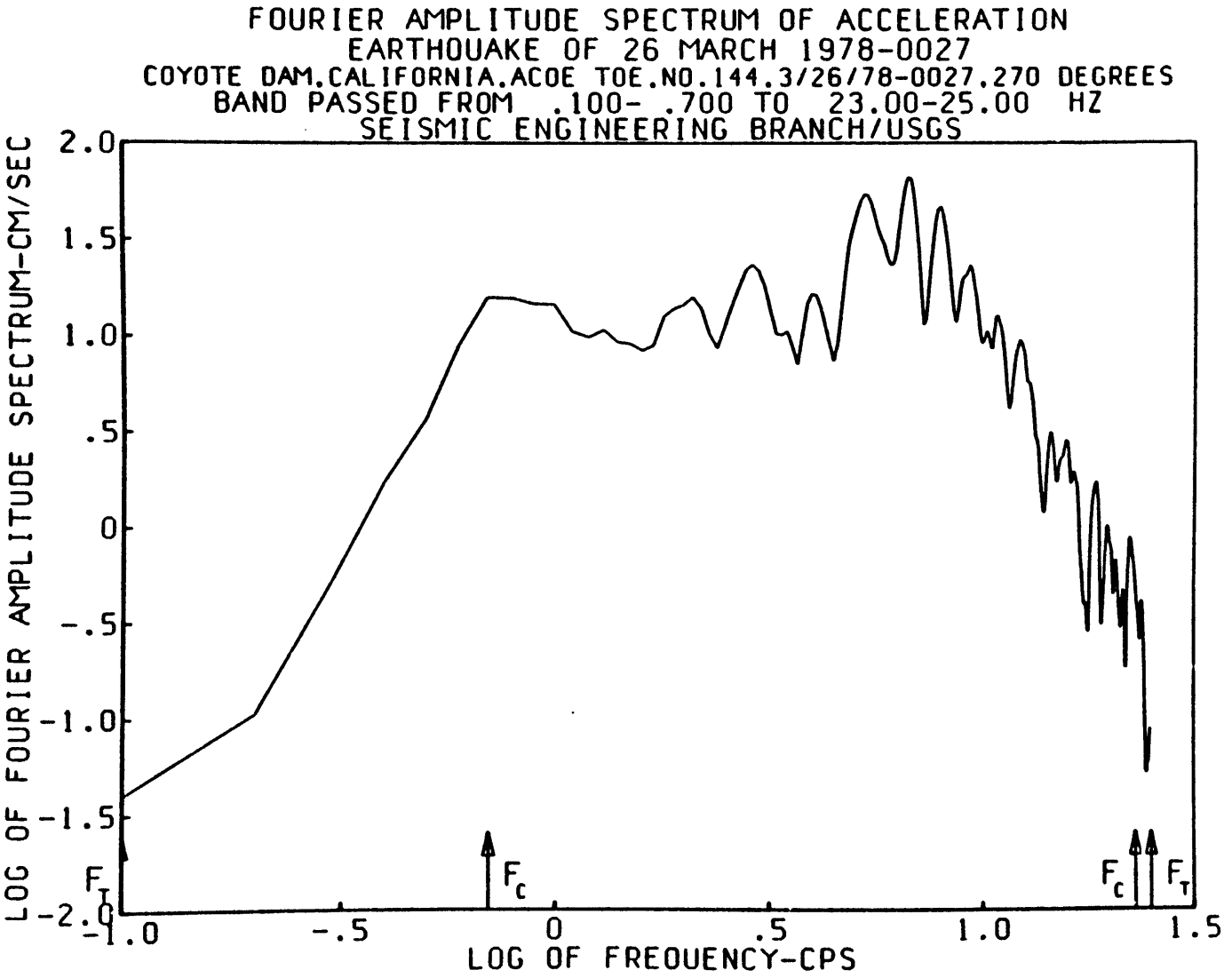

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE ABUT,NO.143,3/26/78-0027,UP
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
0
2
4
6
8
10
12
0
5.0
10.0
15.0
20.0
25.0
FREQUENCY-CPS

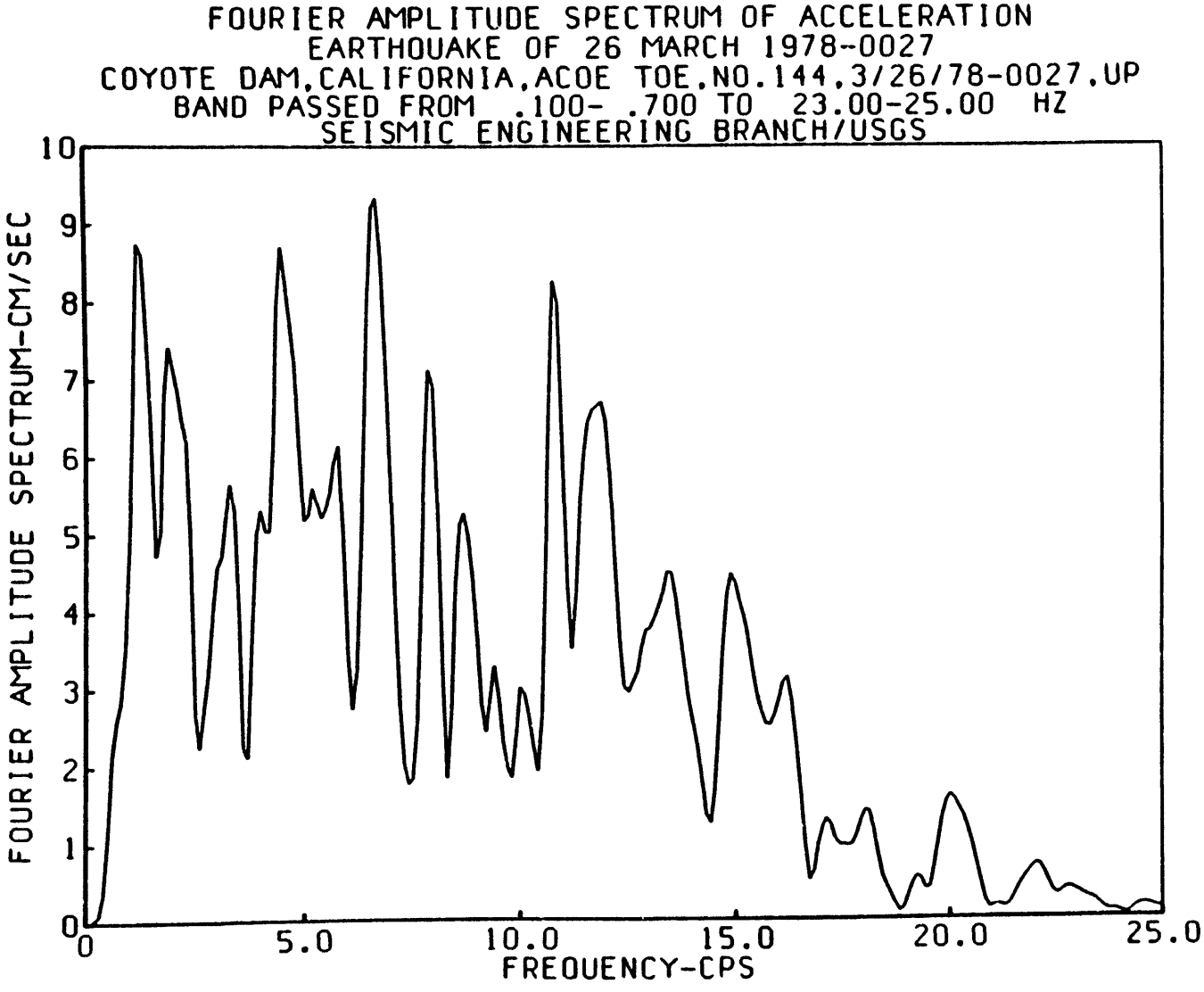

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE ABUT,NO.143,3/26/78-0027,UP
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
1.5
1.0
.5
0
-.5
-1.0
-1.5
-2.0
-2.5
-1.5
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS
F_T
F_C
F_C
F_T

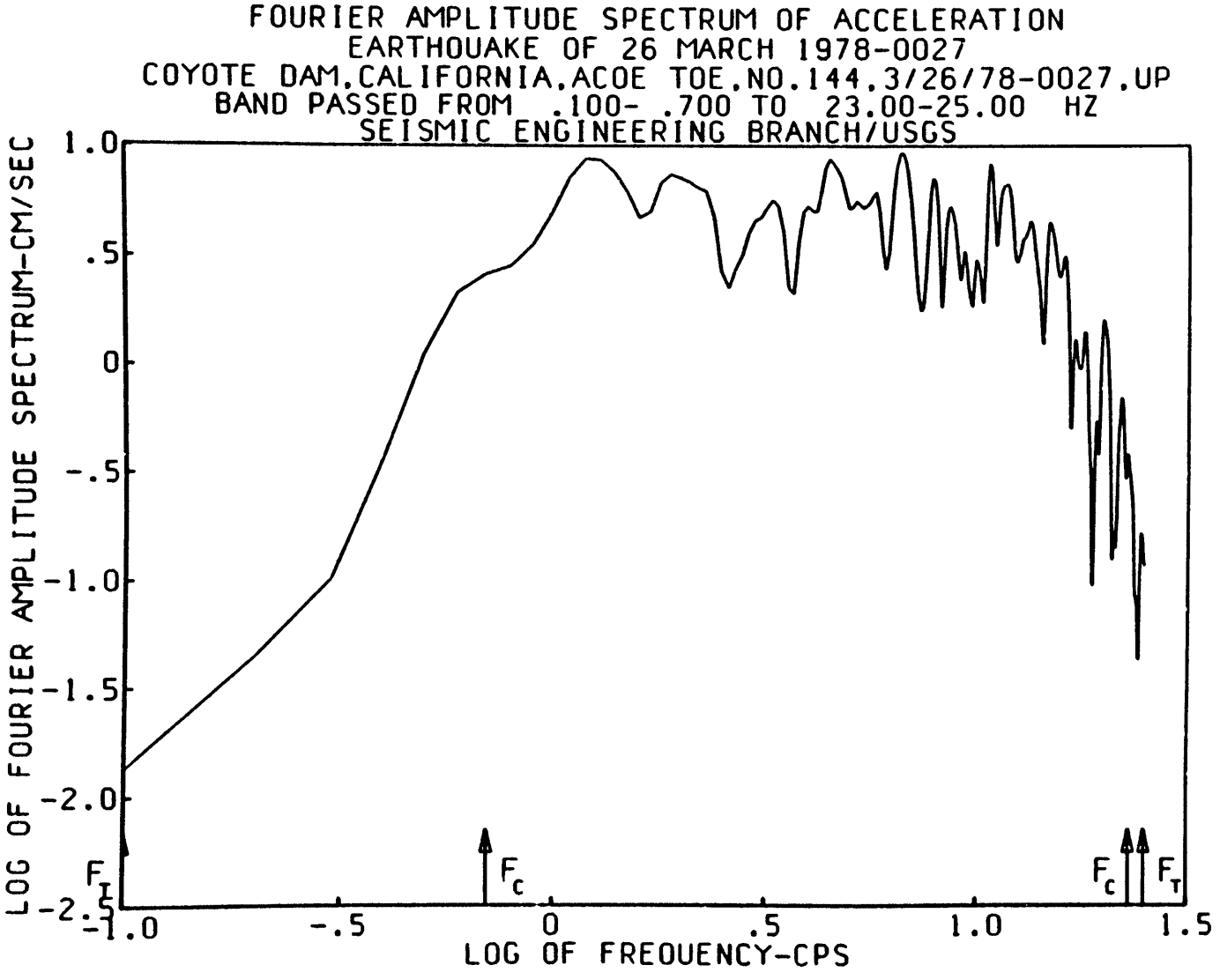

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA.ACOE ABUT.NO.143.3/26/78-0027 180 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
FREQUENCY-CPS
0
5
10
15
20
25
0
5.0
10.0
15.0
20.0
25.0

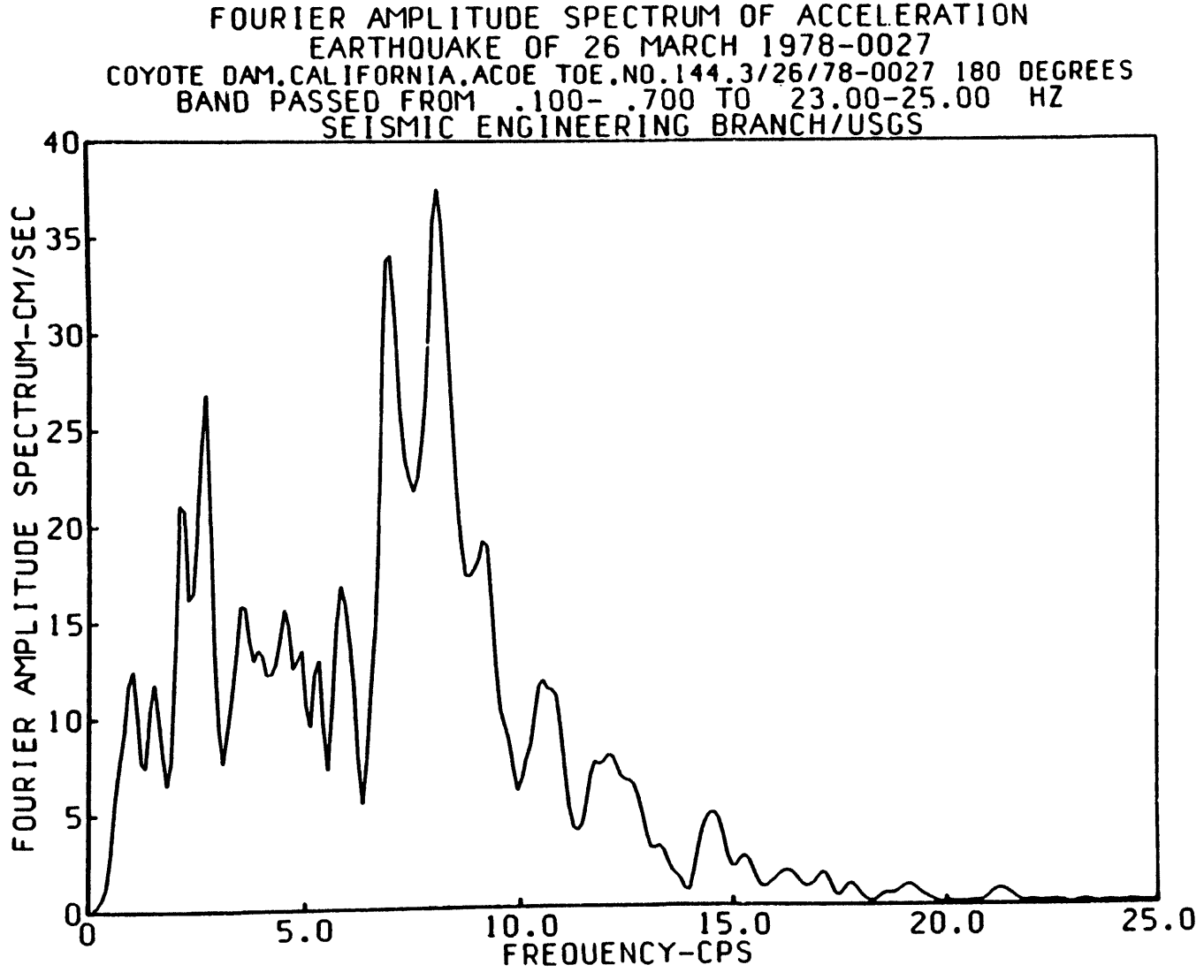

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE ABUT,NO.143,3/26/78-0027 180 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
1.5
1.0
.5
0
-.5
-1.0
-1.5
-2.0
-2.5
-3.0
-1.5
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS
F_T
F_C
F_C
F_T

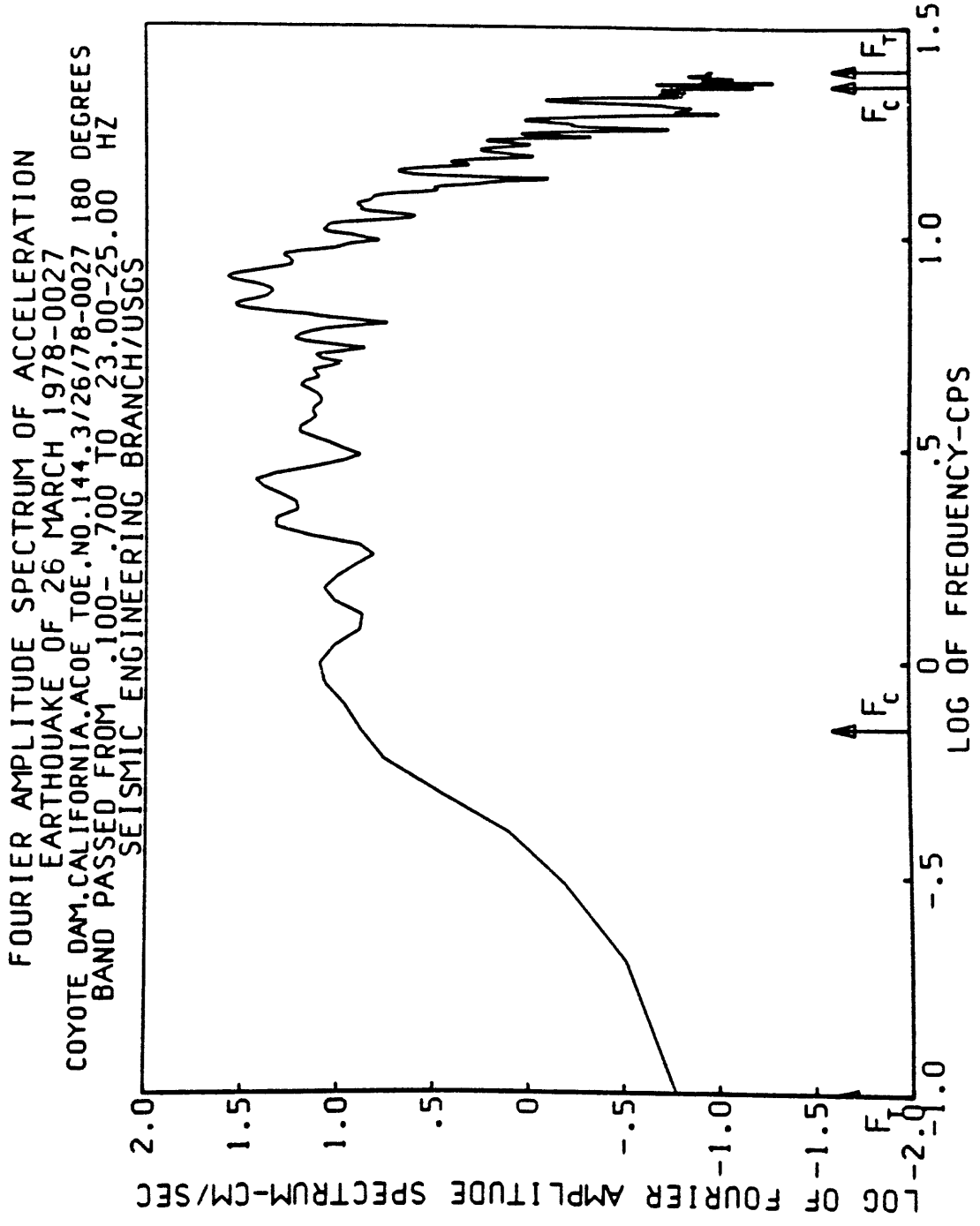

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE TOE,NO.144,3/26/78-0027,270 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
0
10
20
30
40
50
60
70
0
5.0
10.0
15.0
20.0
25.0
FREQUENCY-CPS

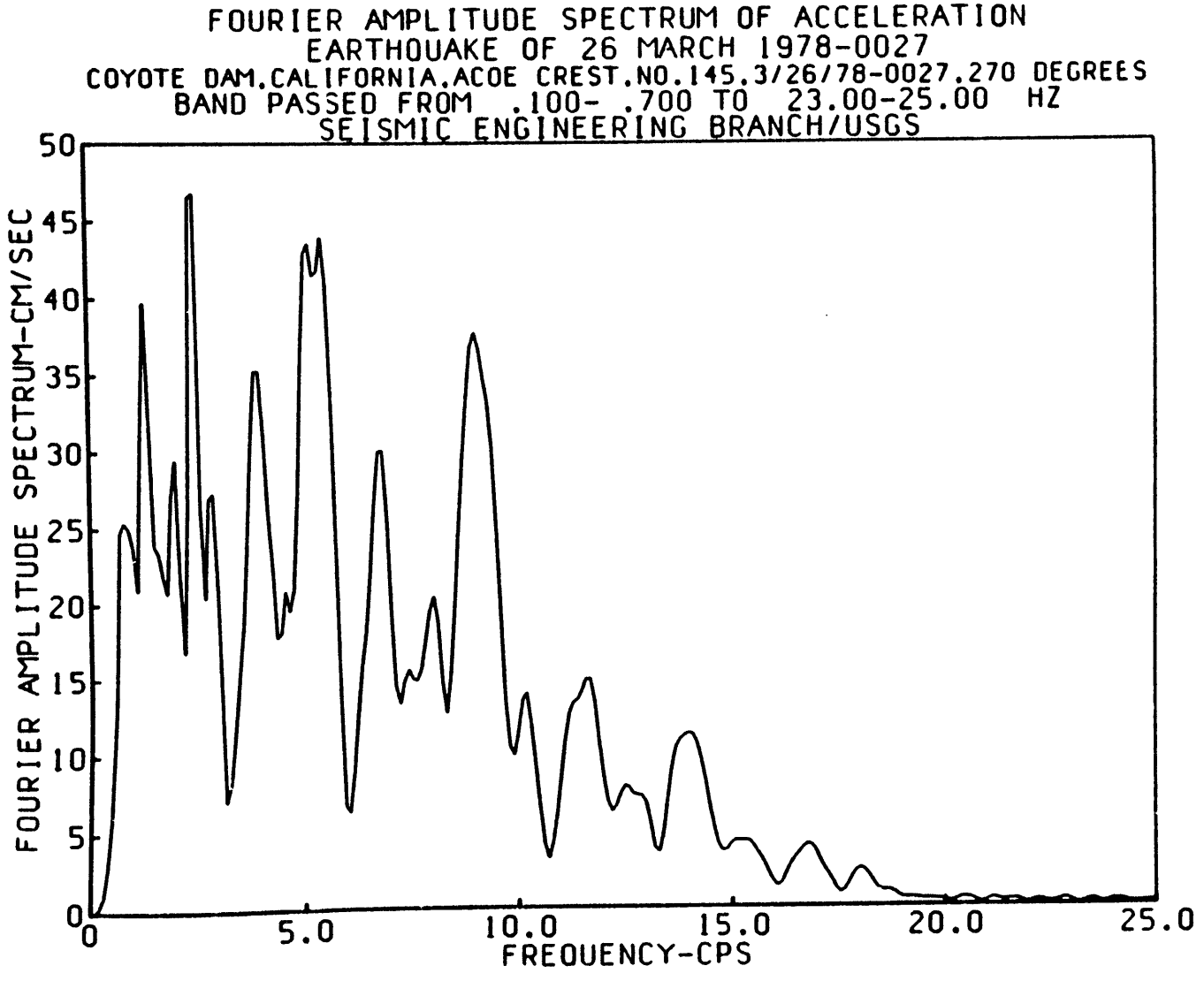

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE TOE,NO.144,3/26/78-0027,270 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
2.0
1.5
1.0
.5
0
-.5
-1.0
-1.5
-2.0
F_T
F_C
F_C
F_T
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS

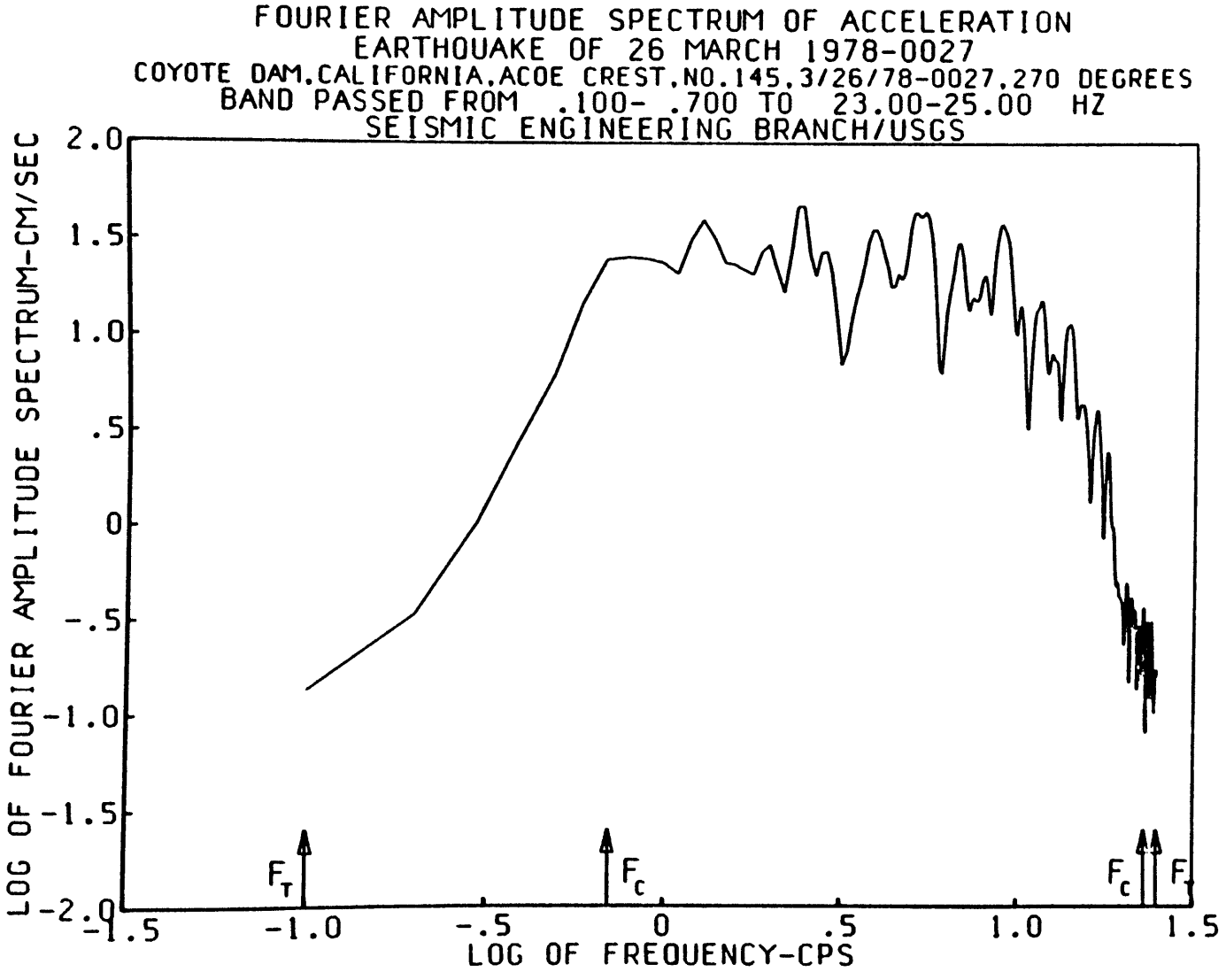

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE TOE,NO.144,3/26/78-0027,UP
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
FREQUENCY-CPS
0
1
2
3
4
5
6
7
8
9
10
0
5.0
10.0
15.0
20.0
25.0

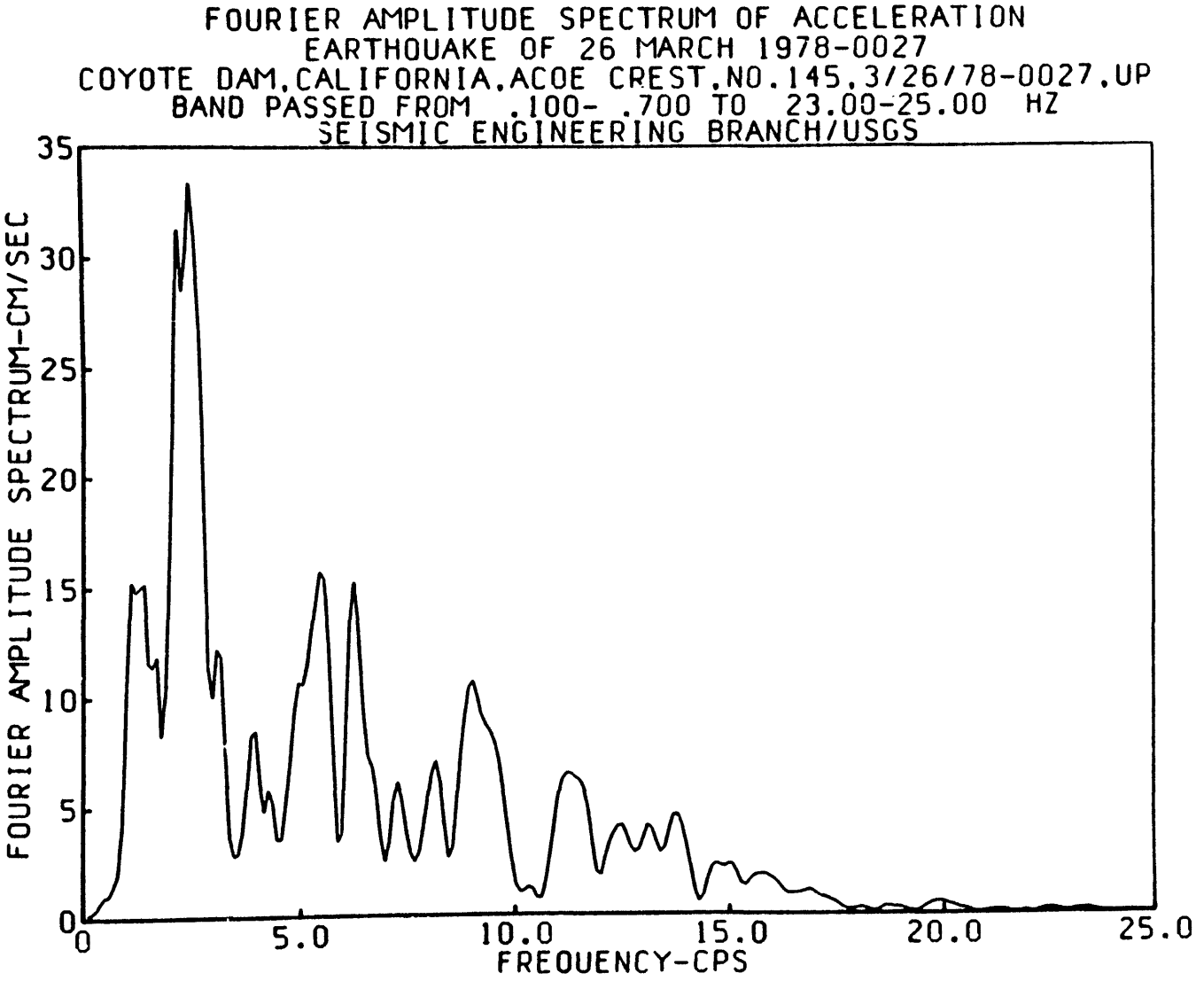

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE TOE,NO.144,3/26/78-0027,UP
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
1.0
.5
0
-.5
-1.0
-1.5
-2.0
-2.5
F_I
F_C
F_C
F_T
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS

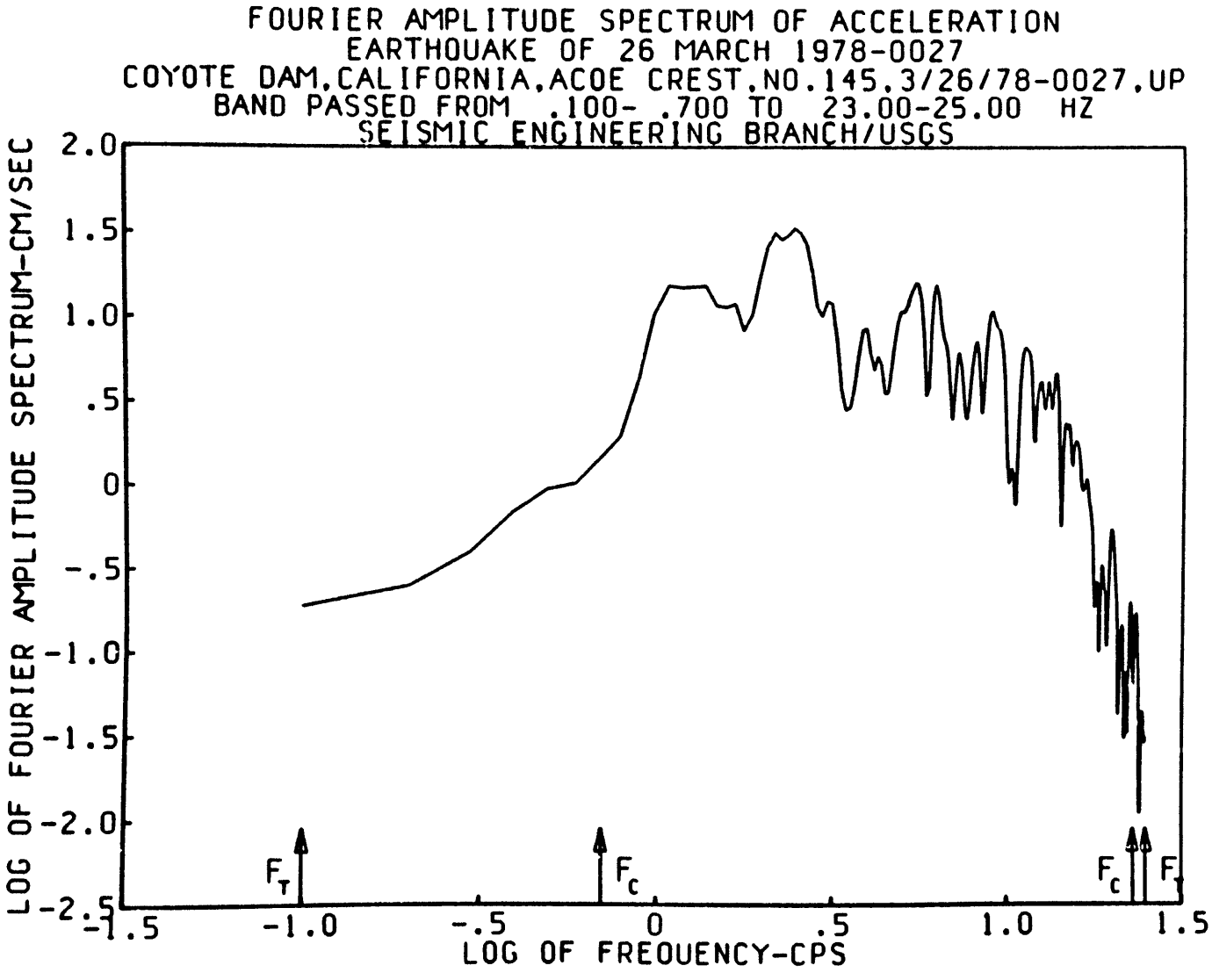

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM.CALIFORNIA.ACOE TOE.NO.144.3/26/78-0027 180 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
0
5
10
15
20
25
30
35
40
0
5.0
10.0
15.0
20.0
25.0
FREQUENCY-CPS

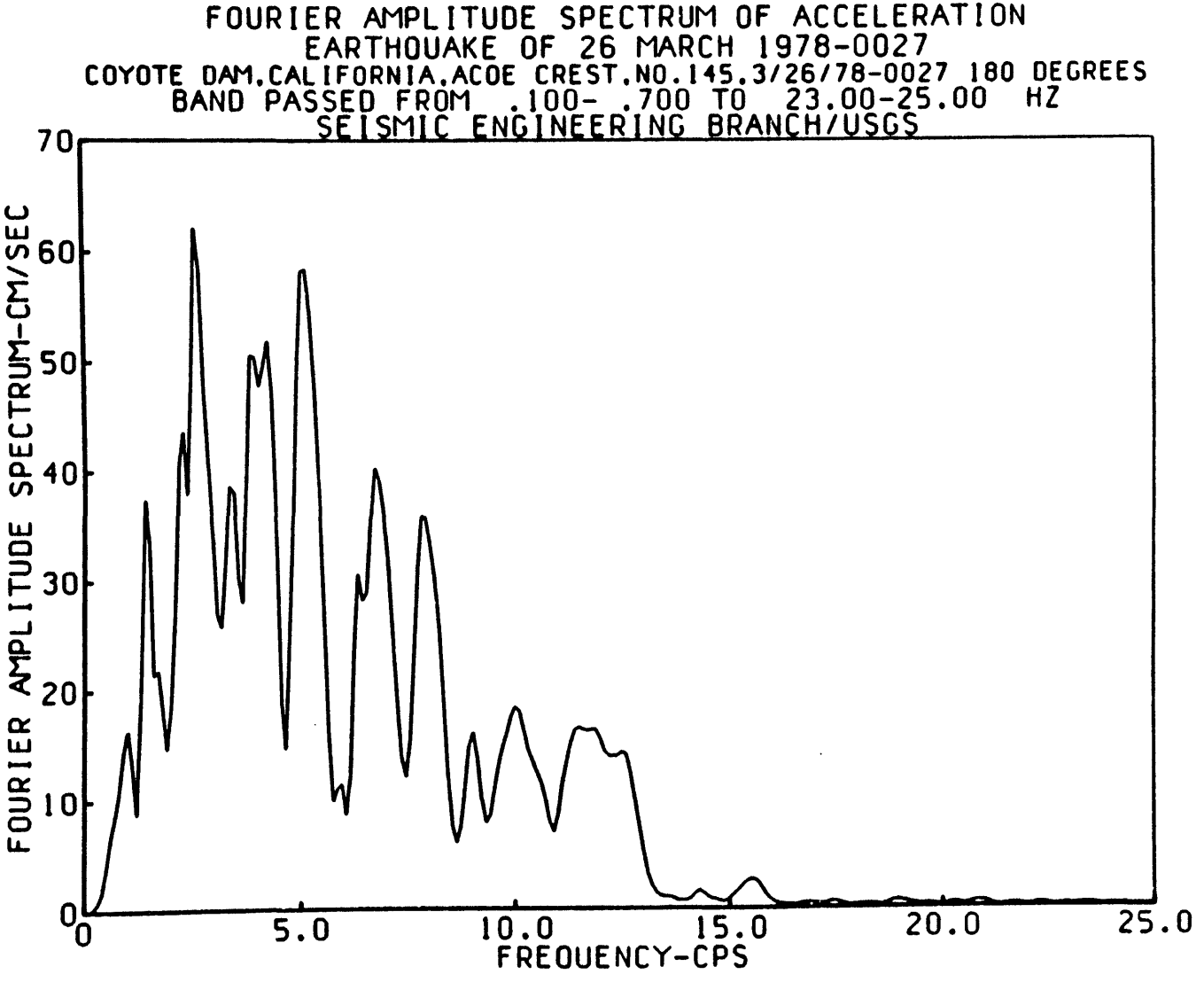

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA.ACOE TOE.NO.144.3/26/78-0027 180 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
LOG OF FREQUENCY-CPS
2.0
1.5
1.0
.5
0
-.5
-1.0
-1.5
-2.0
-1.0
-.5
0
.5
1.0
1.5
F_L
F_c
F_c
F_T

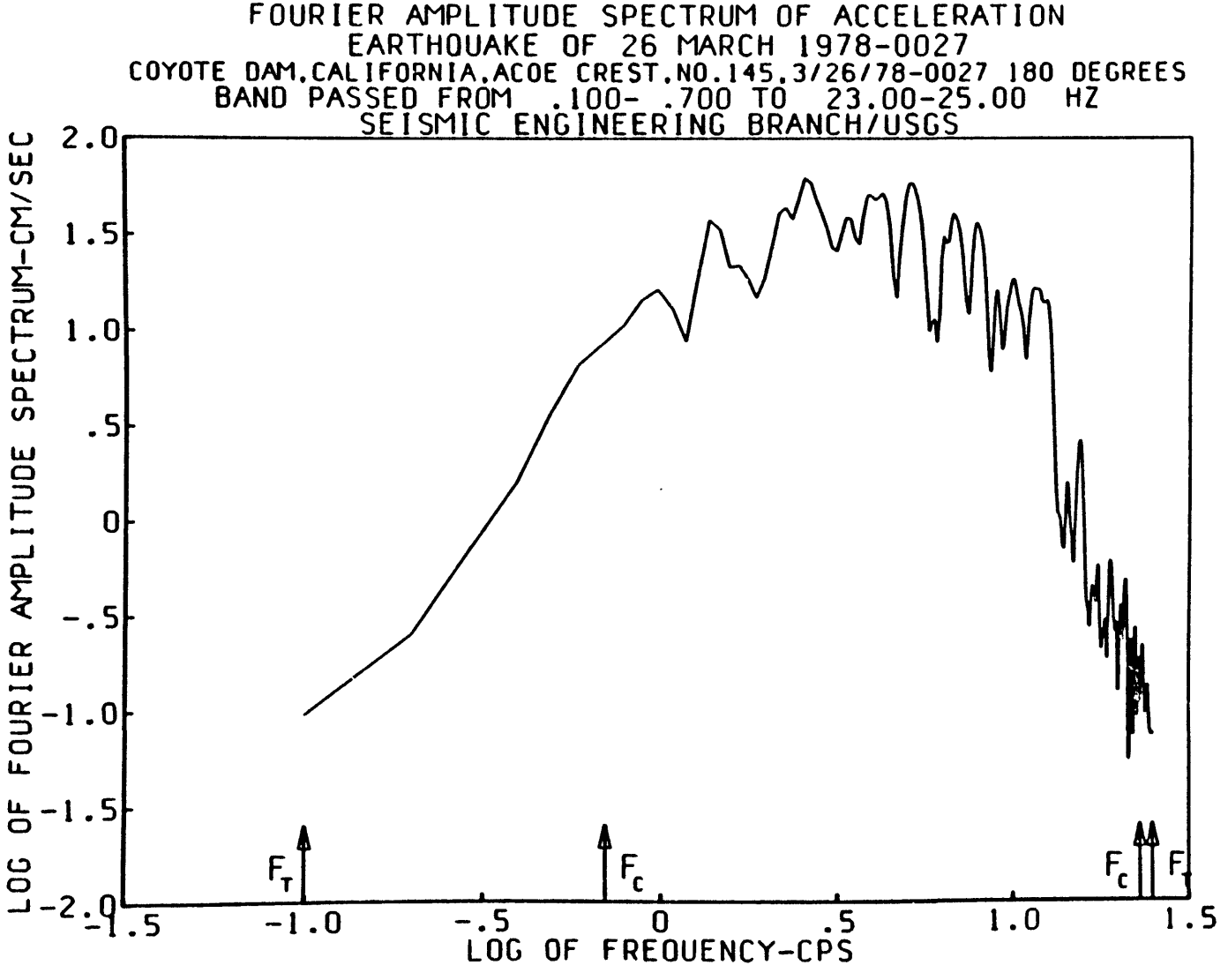

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145,3/26/78-0027,270 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
0
5
10
15
20
25
30
35
40
45
50
0
5.0
10.0
15.0
20.0
25.0
FREQUENCY-CPS

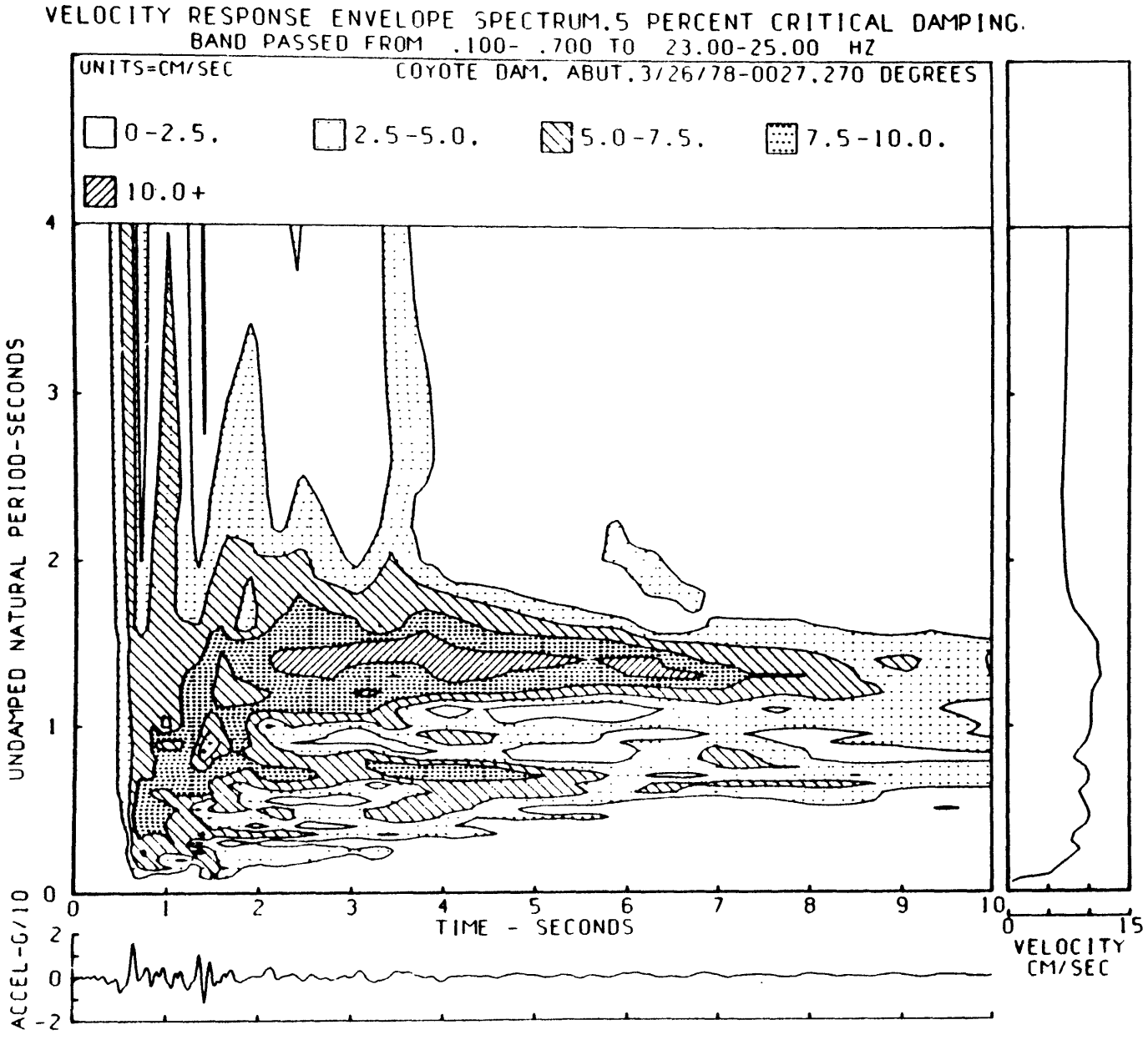

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145,3/26/78-0027,270 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
2.0
1.5
1.0
.5
0
-.5
-1.0
-1.5
-2.0
F_T
F_C
F_C
F_T
-1.5
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS

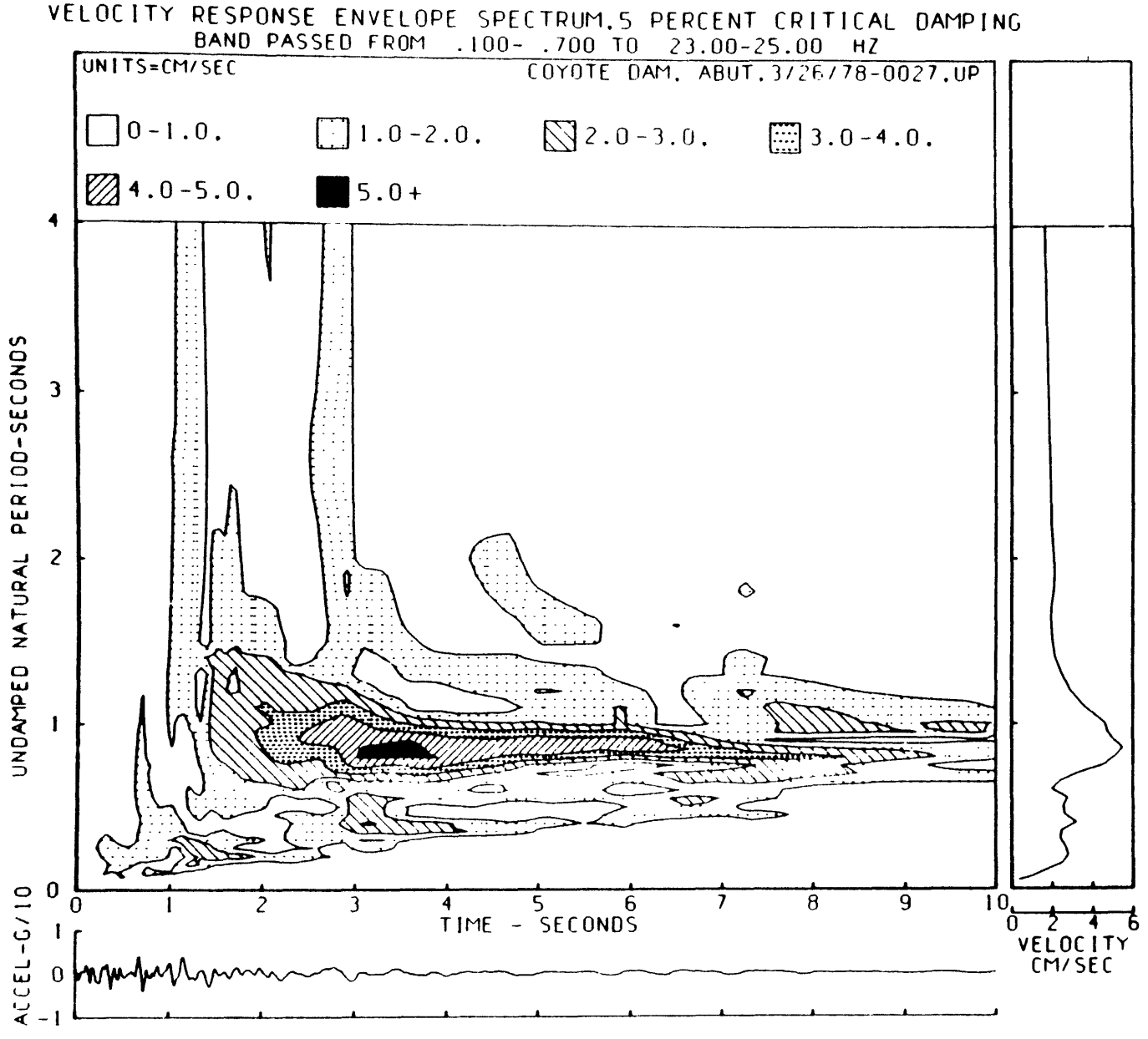

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145,3/26/78-0027,UP
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
FREQUENCY-CPS
0
5
10
15
20
25
30
35
0
5.0
10.0
15.0
20.0
25.0

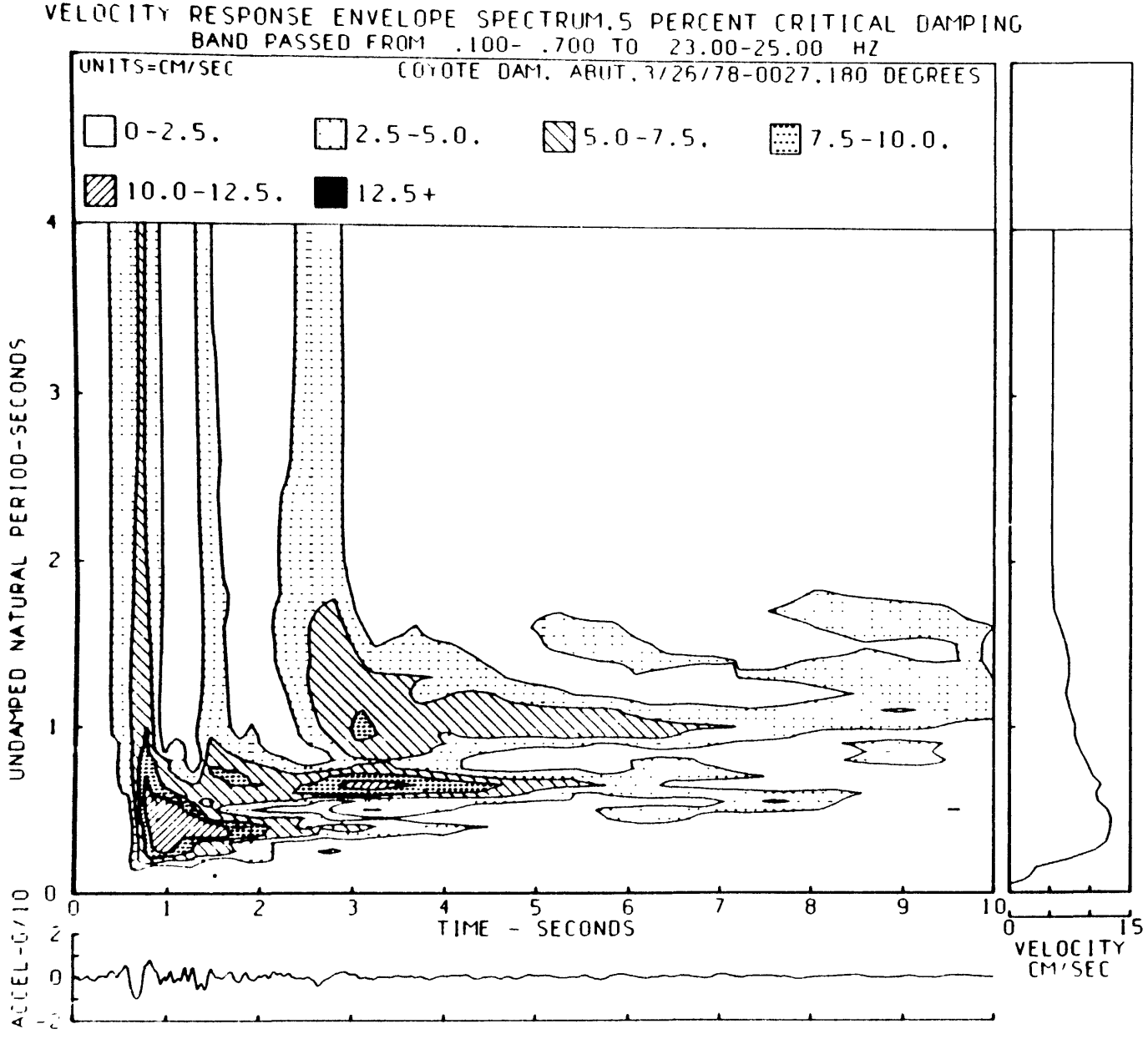

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145,3/26/78-0027,UP
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
2.0
1.5
1.0
.5
0
-.5
-1.0
-1.5
-2.0
-2.5
F_T
F_C
F_C
F_T
-1.5
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS

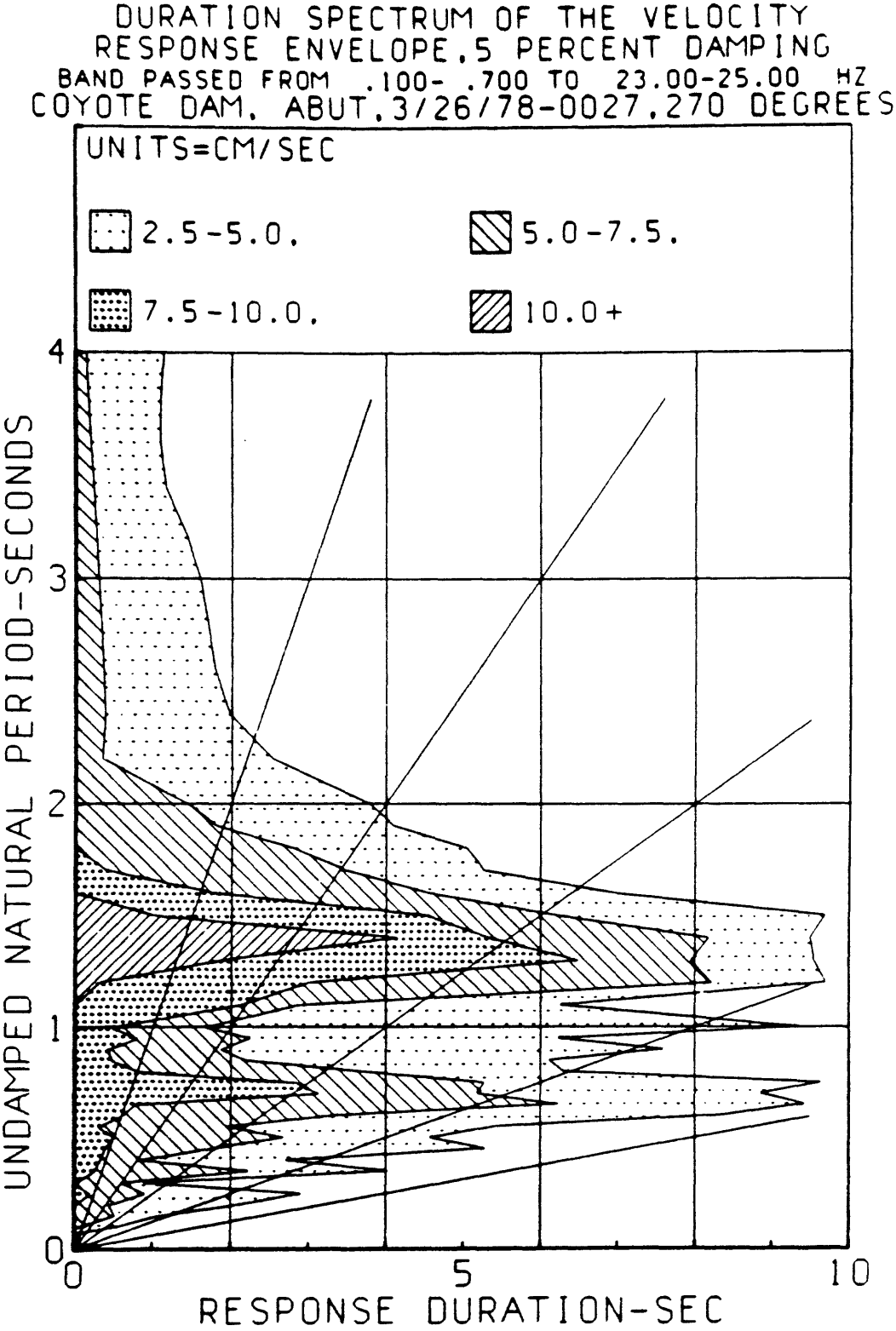

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145,3/26/78-0027 180 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
FOURIER AMPLITUDE SPECTRUM-CM/SEC
0
10
20
30
40
50
60
70
0
5.0
10.0
15.0
20.0
25.0
FREQUENCY-CPS

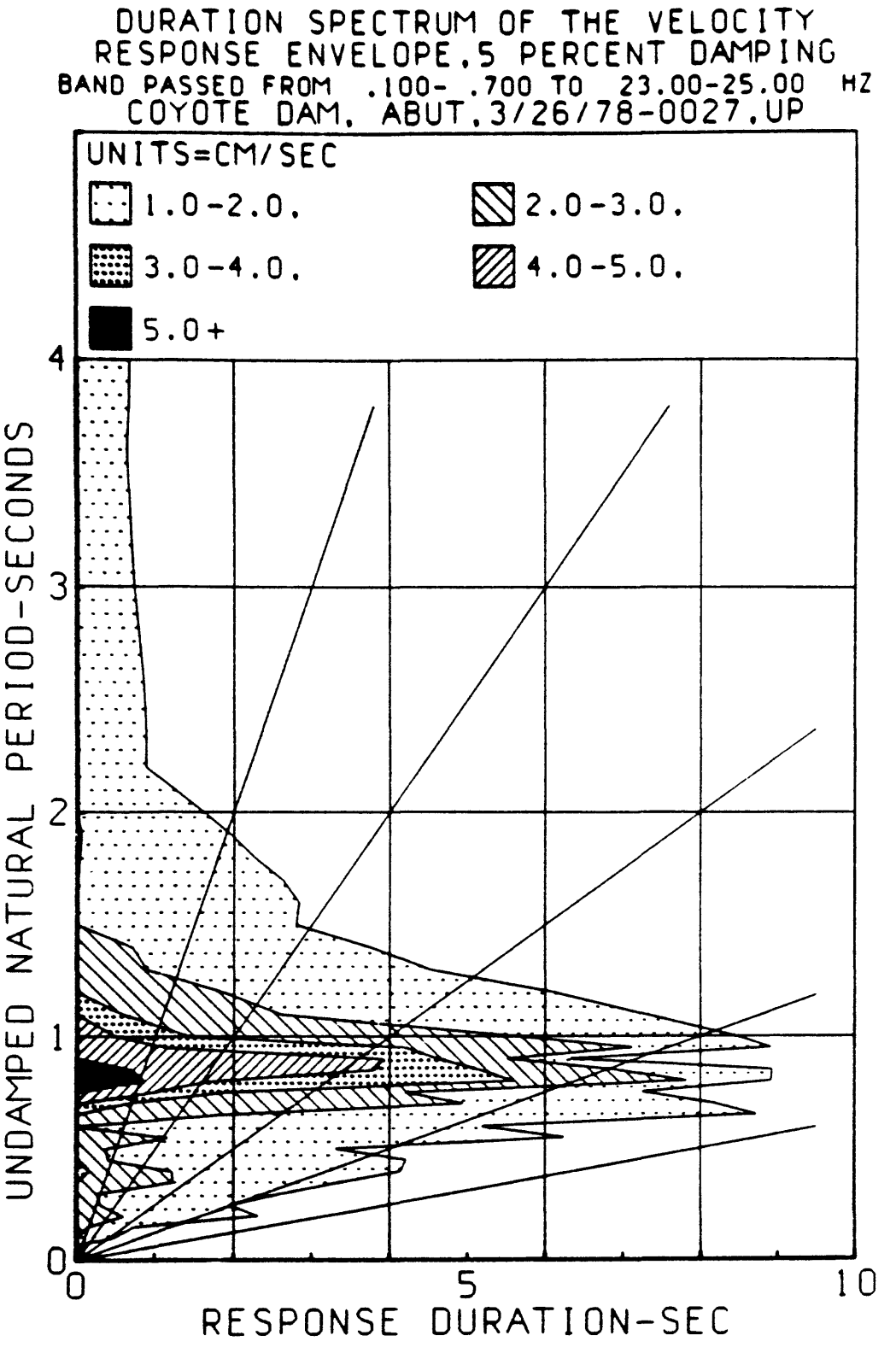

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
EARTHQUAKE OF 26 MARCH 1978-0027
COYOTE DAM,CALIFORNIA,ACOE CREST,NO.145,3/26/78-0027 180 DEGREES
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
LOG OF FOURIER AMPLITUDE SPECTRUM-CM/SEC
2.0
1.5
1.0
.5
0
-.5
-1.0
-1.5
-2.0
-1.5
-1.0
-.5
0
.5
1.0
1.5
LOG OF FREQUENCY-CPS
F_T
F_C
F_C
F_T

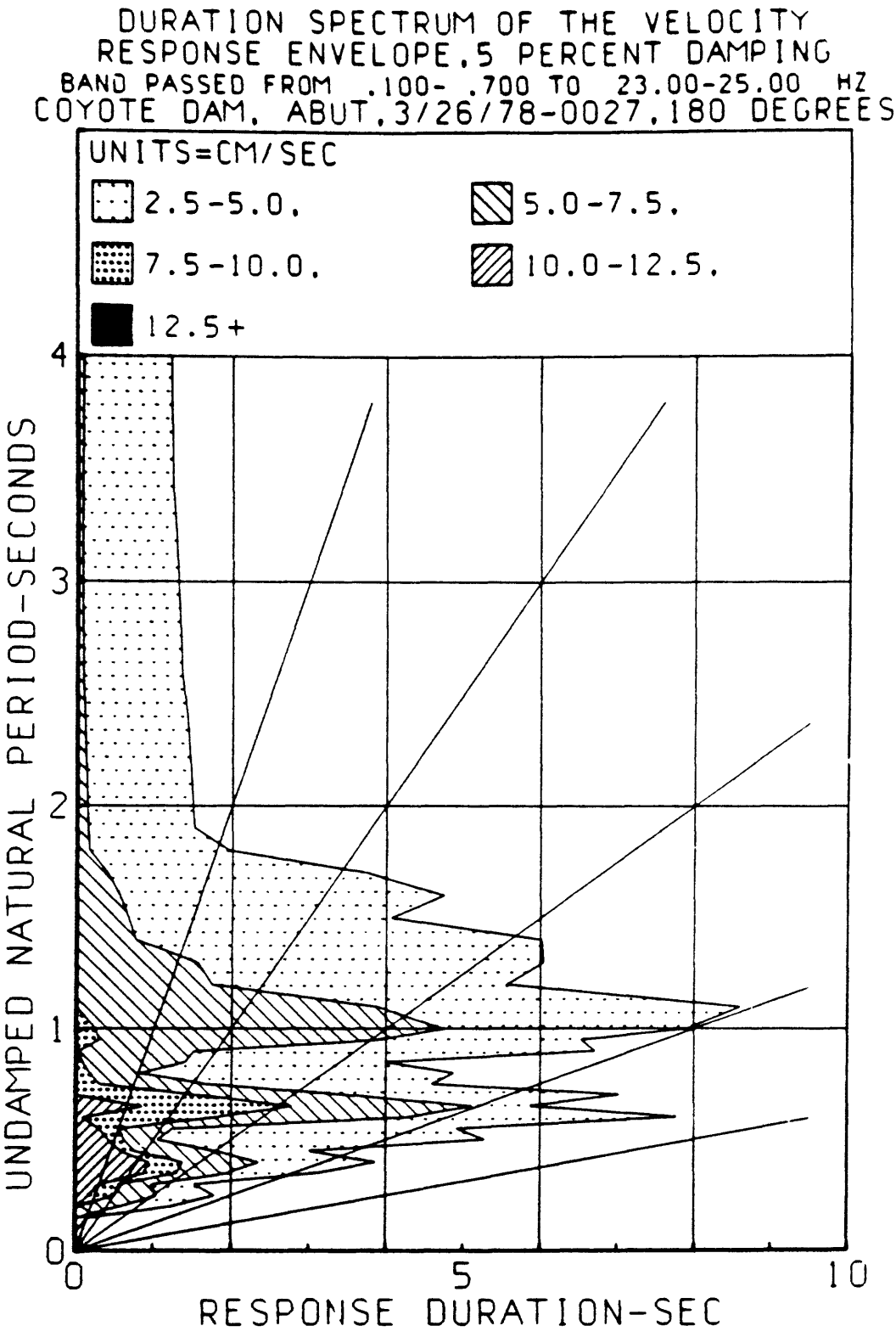

VELOCITY RESPONSE ENVELOPE SPECTRUM.5 PERCENT CRITICAL DAMPING.
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM. ABUT.3/26/78-0027.270 DEGREES
0-2.5.
2.5-5.0.
5.0-7.5.
7.5-10.0.
10.0+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL-G/10

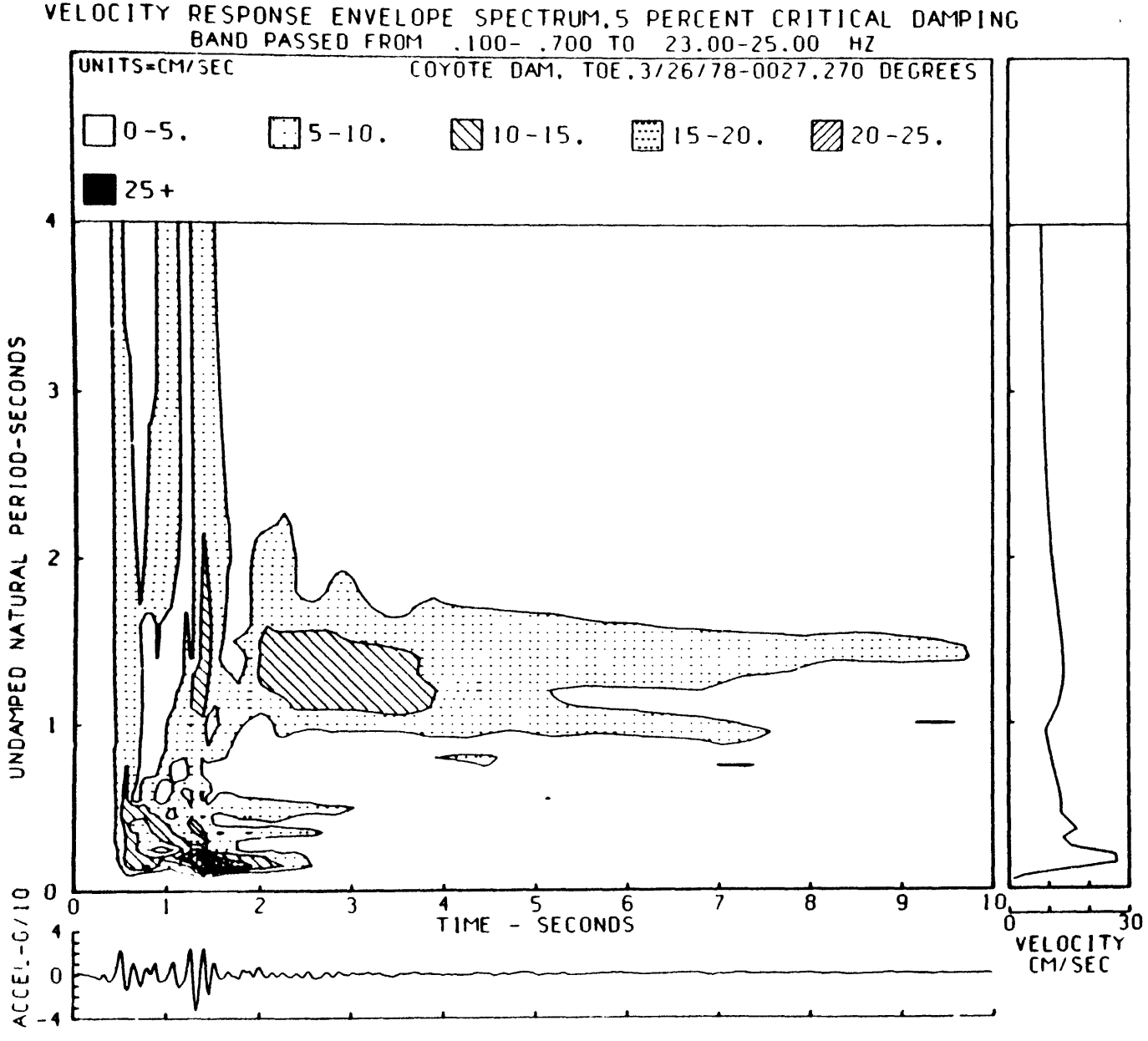

VELOCITY RESPONSE ENVELOPE SPECTRUM,5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM, ABUT,3/26/78-0027,UP
0-1.0.
1.0-2.0.
2.0-3.0.
3.0-4.0.
4.0-5.0.
5.0+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL-G/10

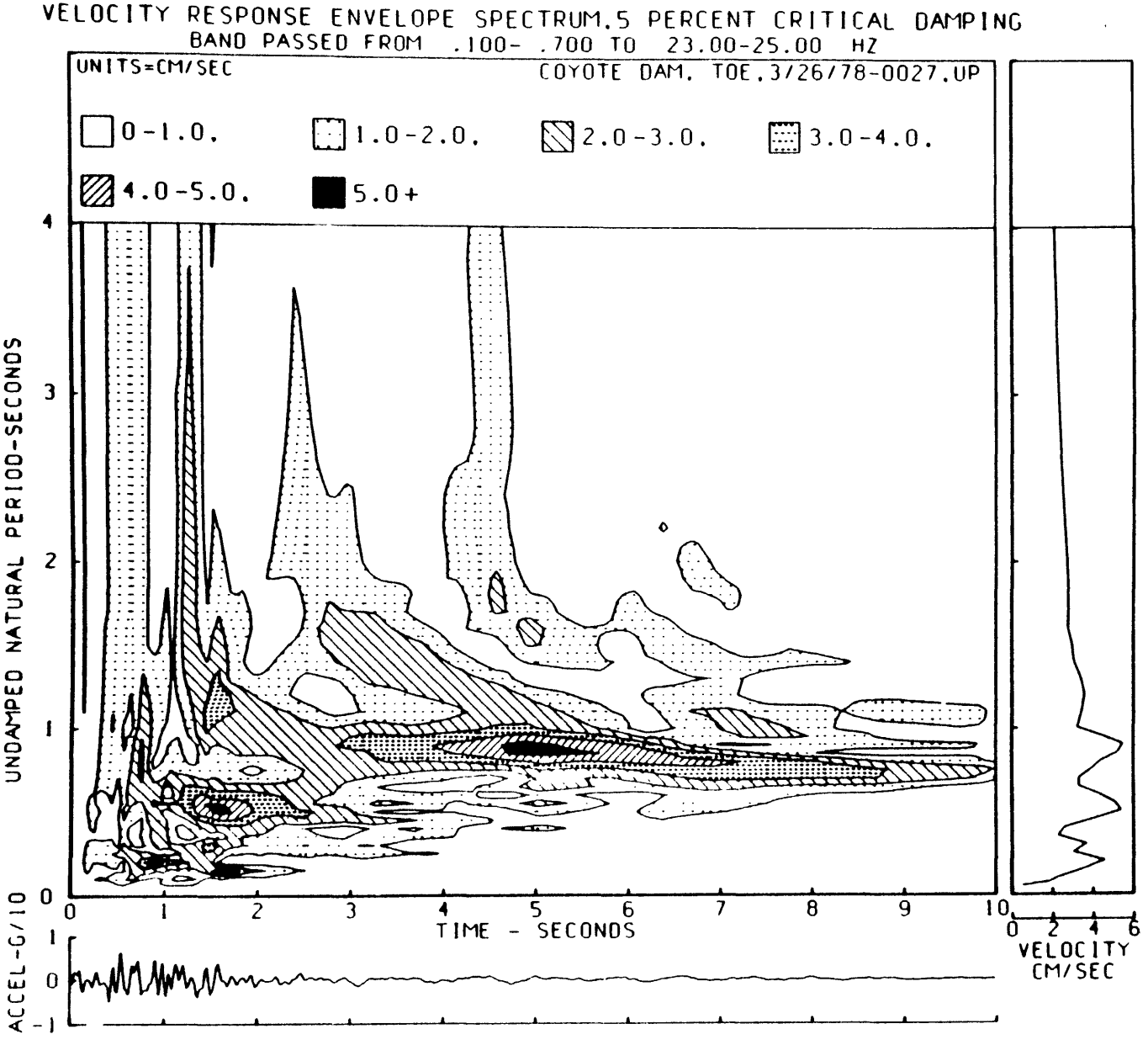

VELOCITY RESPONSE ENVELOPE SPECTRUM.5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM. ABUT.3/26/78-0027.180 DEGREES
0-2.5.
2.5-5.0.
5.0-7.5.
7.5-10.0.
10.0-12.5.
12.5+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL-G/10

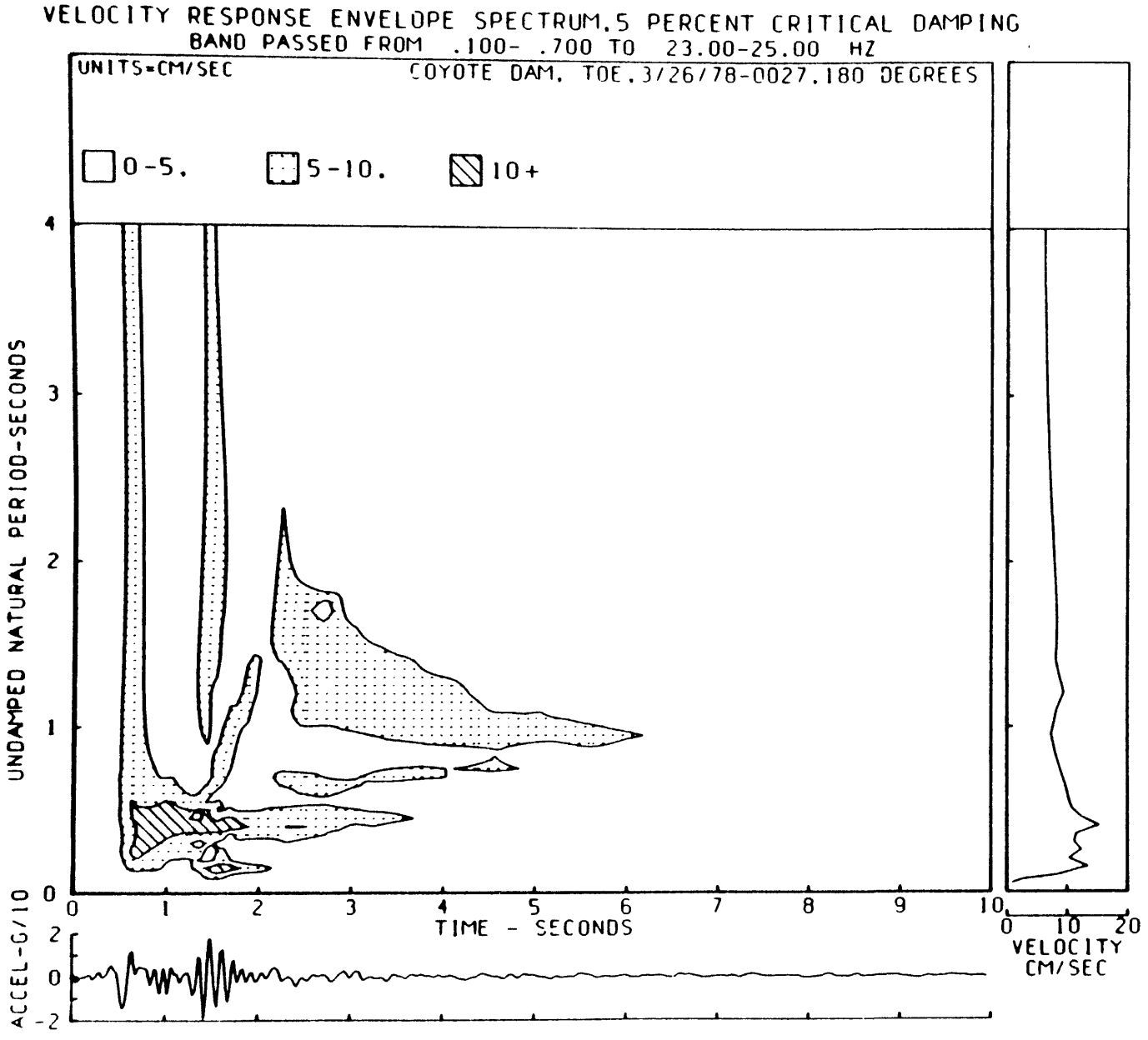

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM, ABUT,3/26/78-0027,270 DEGREES
UNITS=CM/SEC
2.5-5.0.
5.0-7.5.
7.5-10.0.
10.0+
UNDAMPED NATURAL PERIOD-SECONDS
0
1
2
3
4
0
5
10
RESPONSE DURATION-SEC

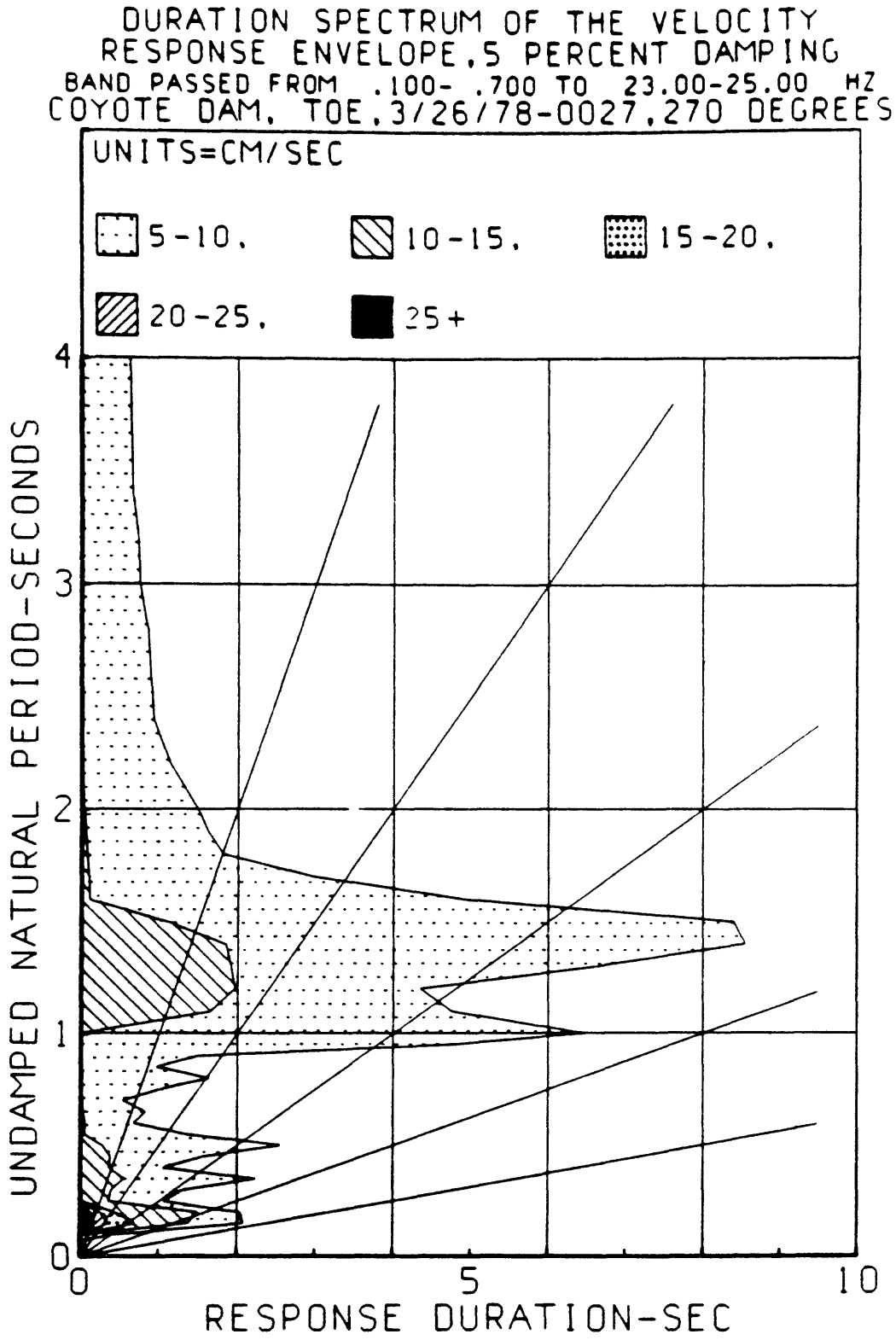

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM, ABUT,3/26/78-0027,UP
UNITS=CM/SEC
1.0-2.0.
2.0-3.0.
3.0-4.0.
4.0-5.0.
5.0+
UNDAMPED NATURAL PERIOD-SECONDS
0
1
2
3
4
0
5
10
RESPONSE DURATION-SEC

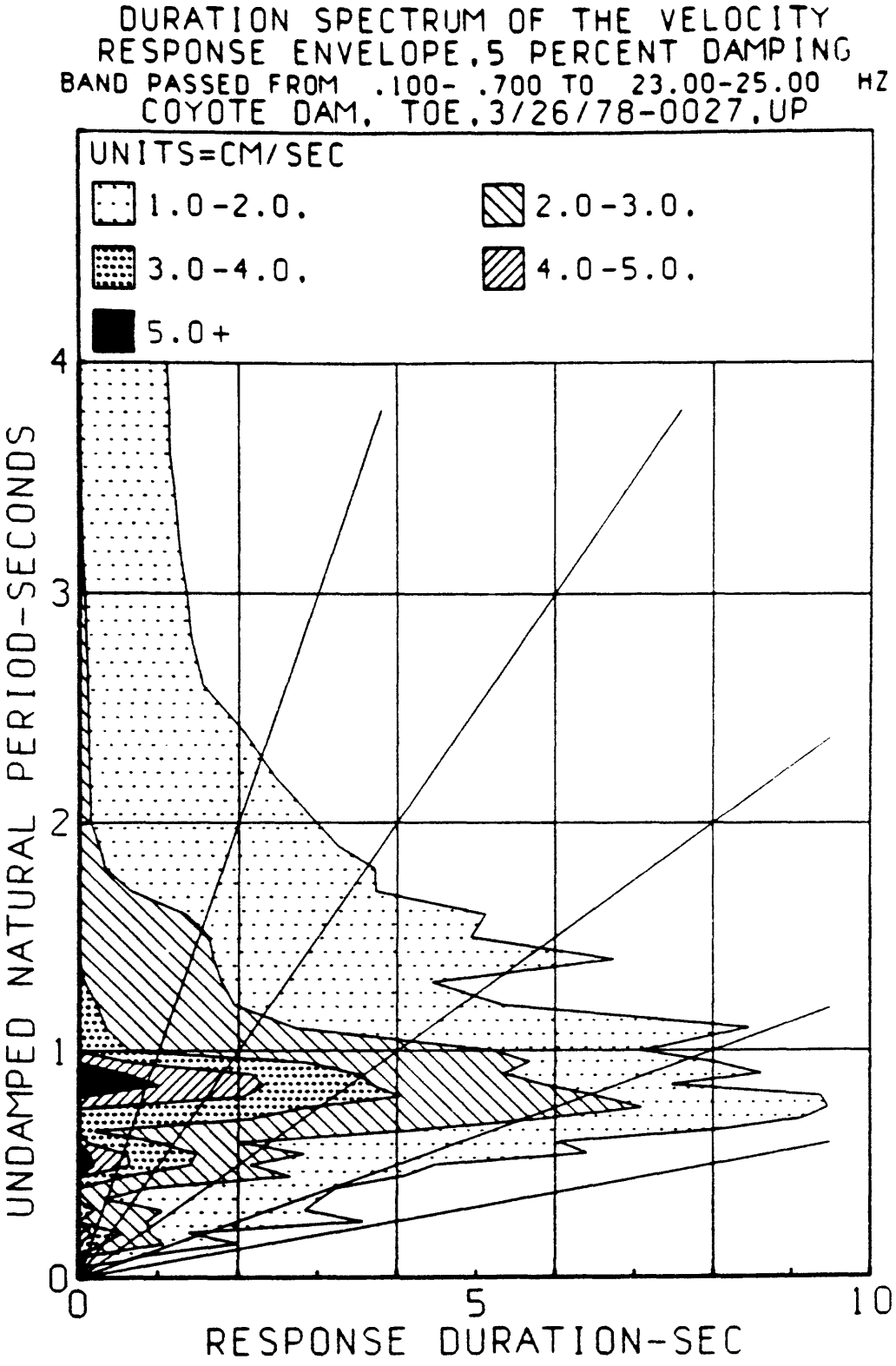

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM, ABUT,3/26/78-0027,180 DEGREES
UNITS=CM/SEC
2.5-5.0,
5.0-7.5,
7.5-10.0,
10.0-12.5,
12.5+
UNDAMPED NATURAL PERIOD-SECONDS
0
1
2
3
4
0
5
10
RESPONSE DURATION-SEC

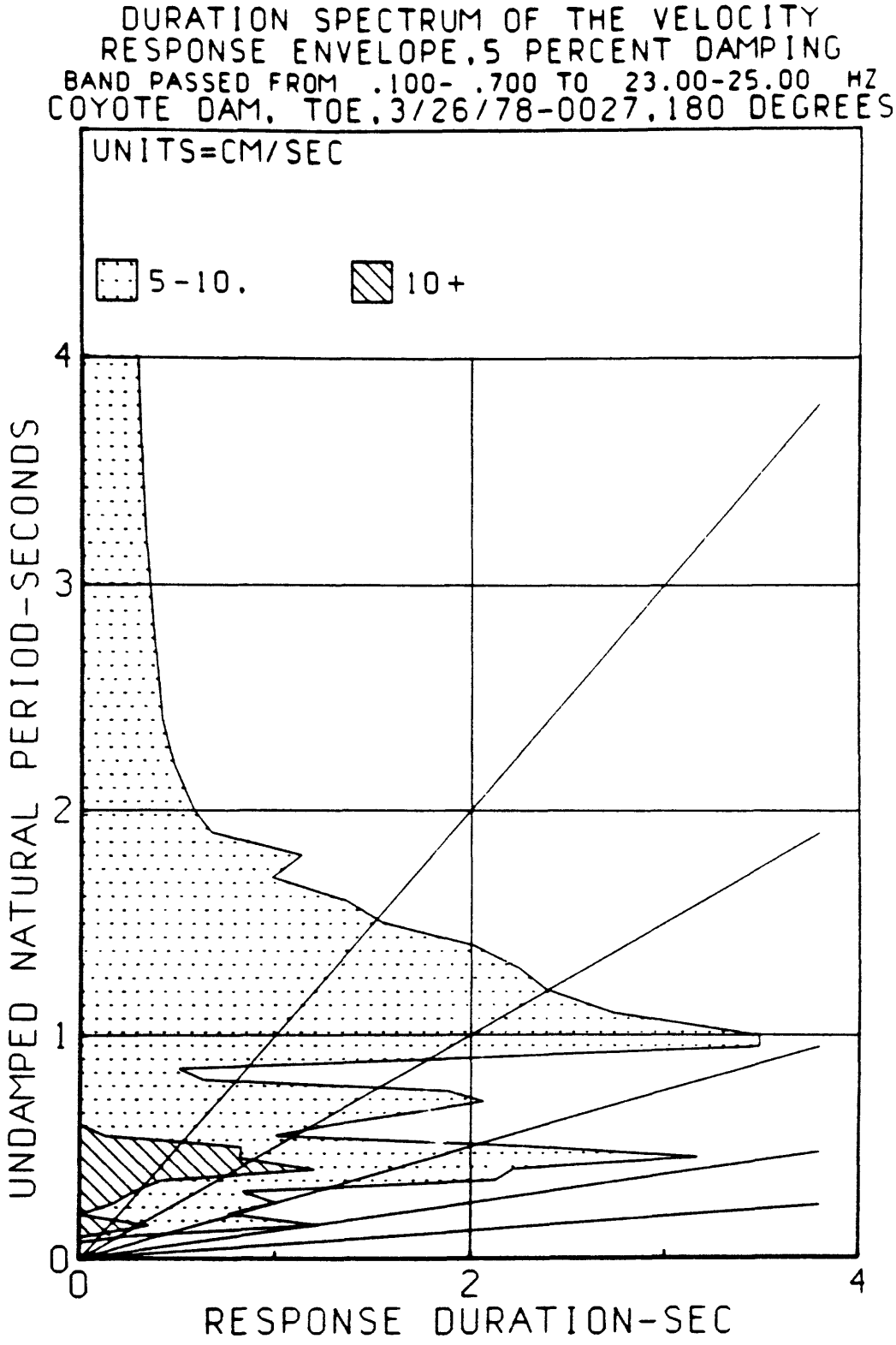

VELOCITY RESPONSE ENVELOPE SPECTRUM,5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM, TOE,3/26/78-0027,270 DEGREES
0-5.
5-10.
10-15.
15-20.
20-25.
25+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL.-G/10

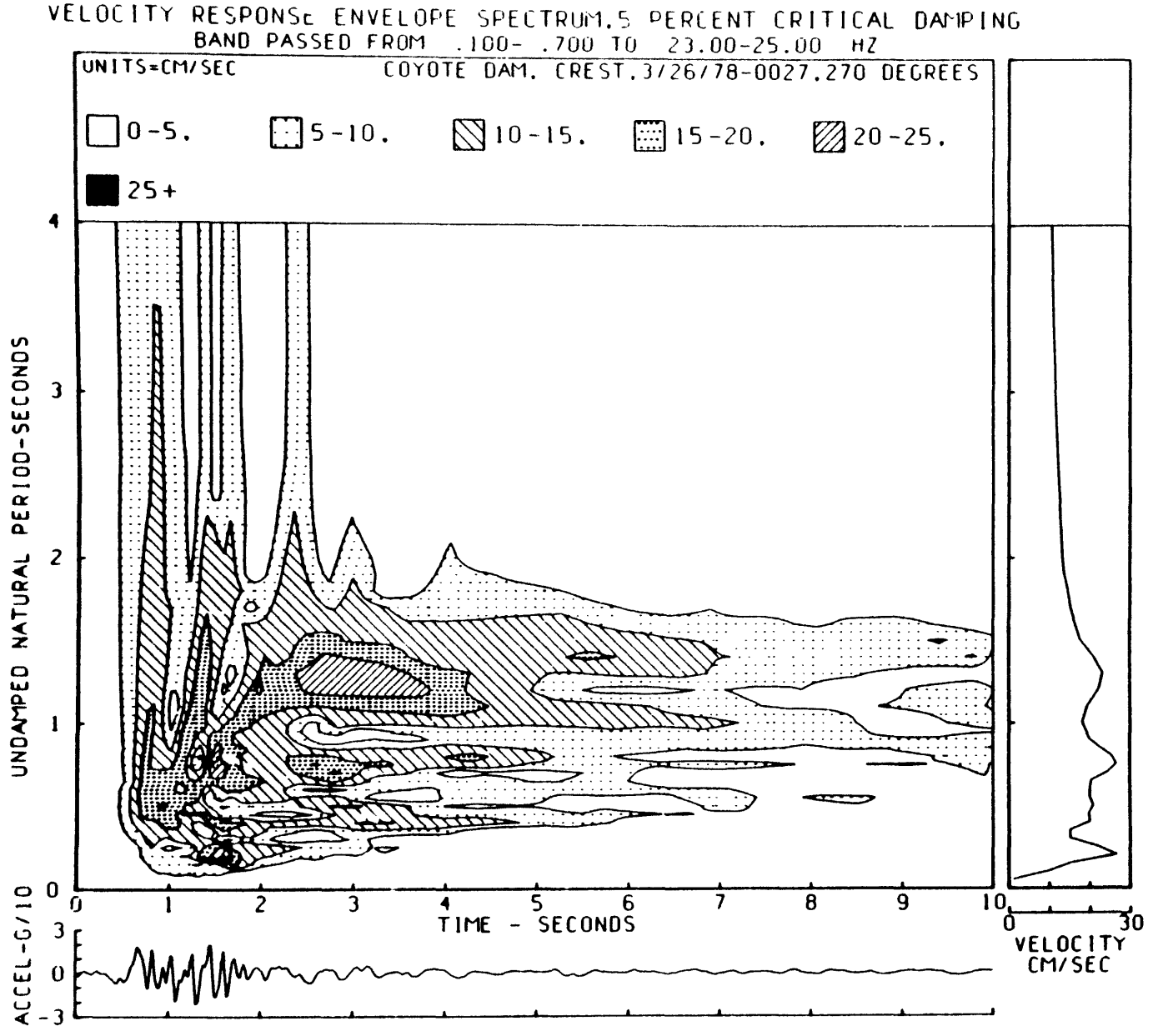

VELOCITY RESPONSE ENVELOPE SPECTRUM.5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM. TOE.3/26/78-0027.UP
0-1.0.
1.0-2.0.
2.0-3.0.
3.0-4.0.
4.0-5.0.
5.0+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL-G/10

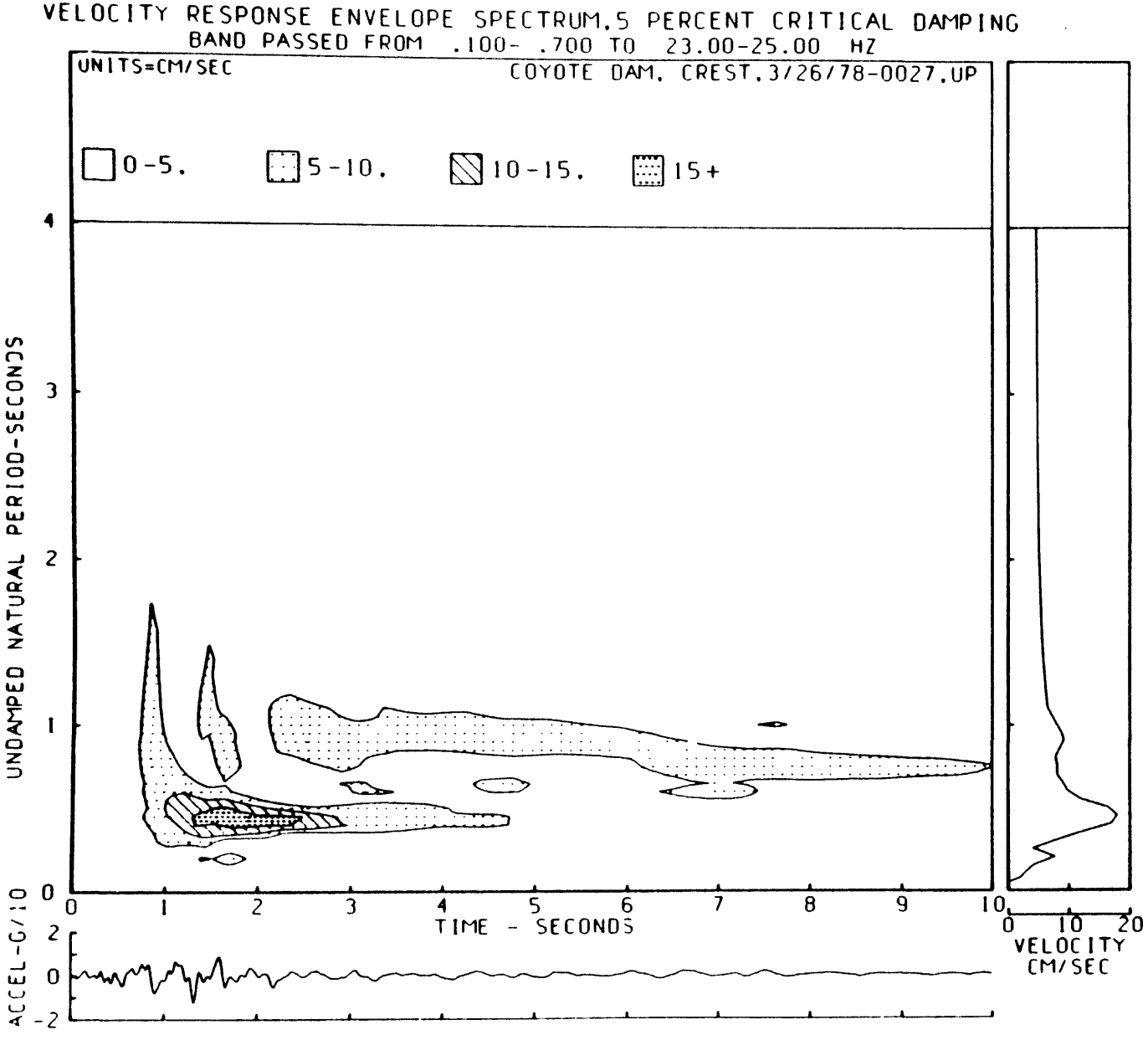

VELOCITY RESPONSE ENVELOPE SPECTRUM,5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM, TOE,3/26/78-0027,180 DEGREES
0-5.
5-10.
10+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL-G/10

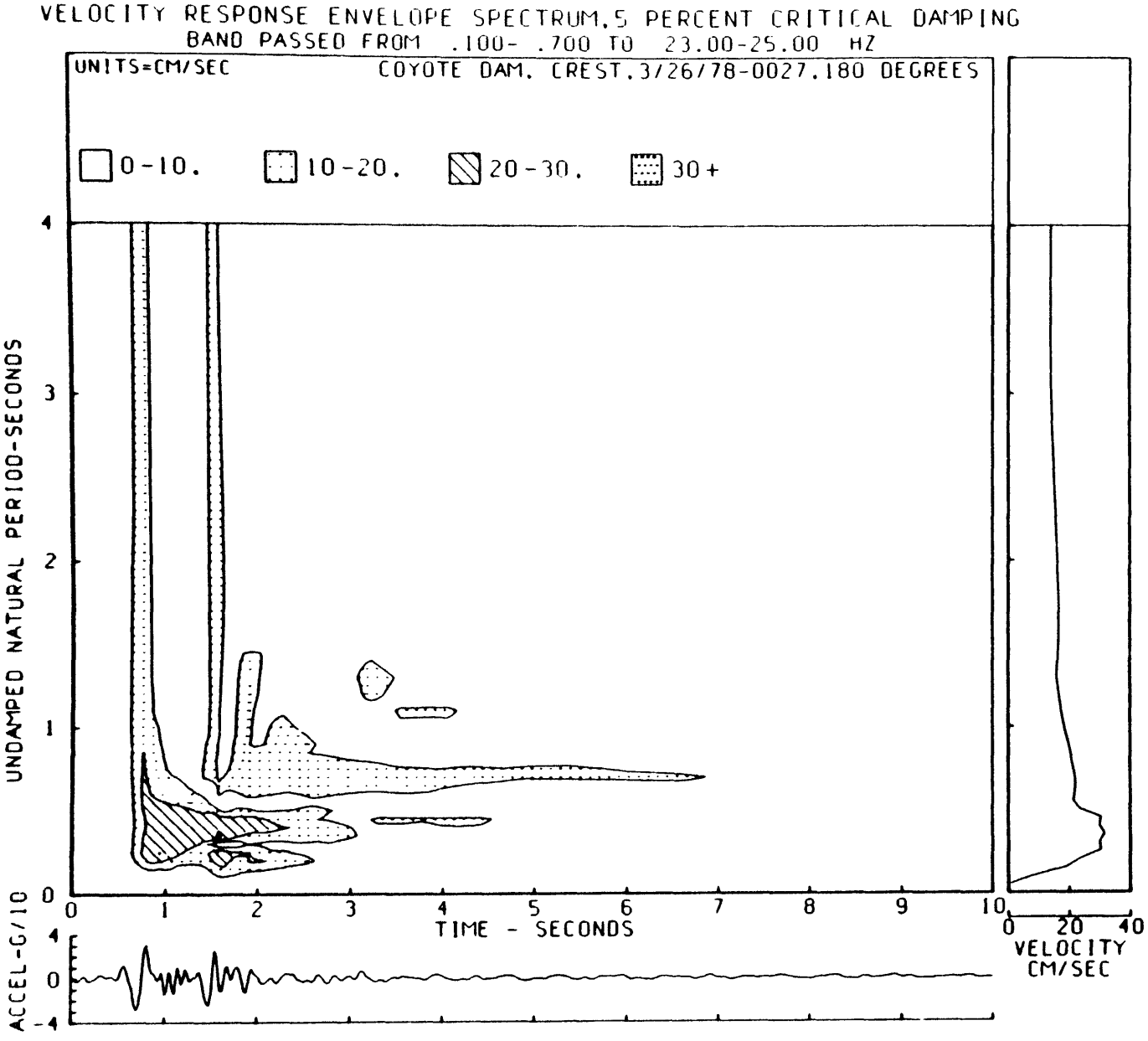

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM, TOE,3/26/78-0027,270 DEGREES
UNITS=CM/SEC
5-10.
10-15.
15-20.
20-25.
25+
UNDAMPED NATURAL PERIOD-SECONDS
0
1
2
3
4
0
5
10
RESPONSE DURATION-SEC

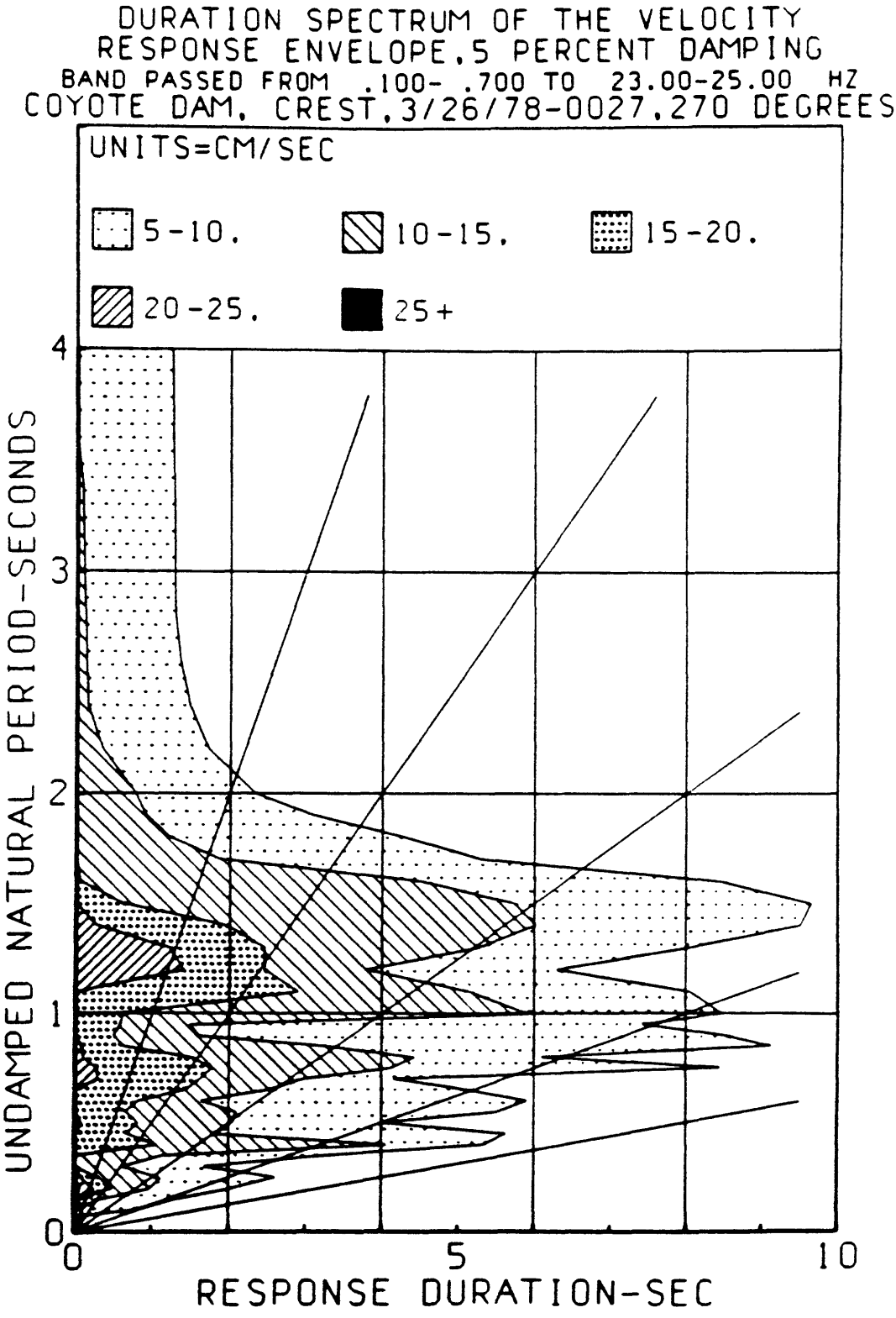

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM, TOE,3/26/78-0027,UP
UNITS=CM/SEC
1.0-2.0.
2.0-3.0.
3.0-4.0.
4.0-5.0.
5.0+
UNDAMPED NATURAL PERIOD-SECONDS
0
1
2
3
4
0
5
10
RESPONSE DURATION-SEC

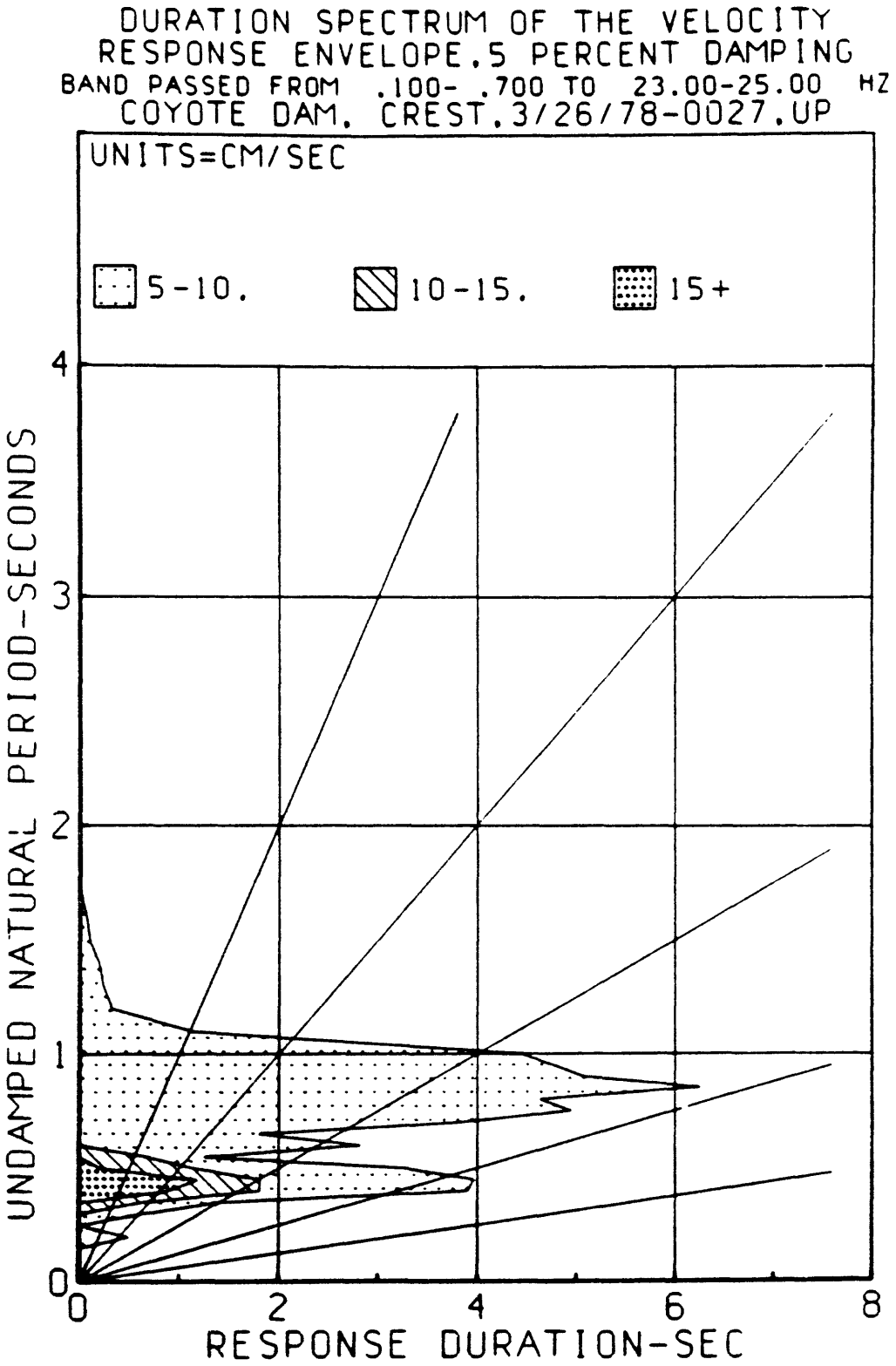

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM, TOE,3/26/78-0027,180 DEGREES
UNITS=CM/SEC
5-10.
10+
UNDAMPED NATURAL PERIOD-SECONDS
RESPONSE DURATION-SEC
0
1
2
3
4
0
2
4

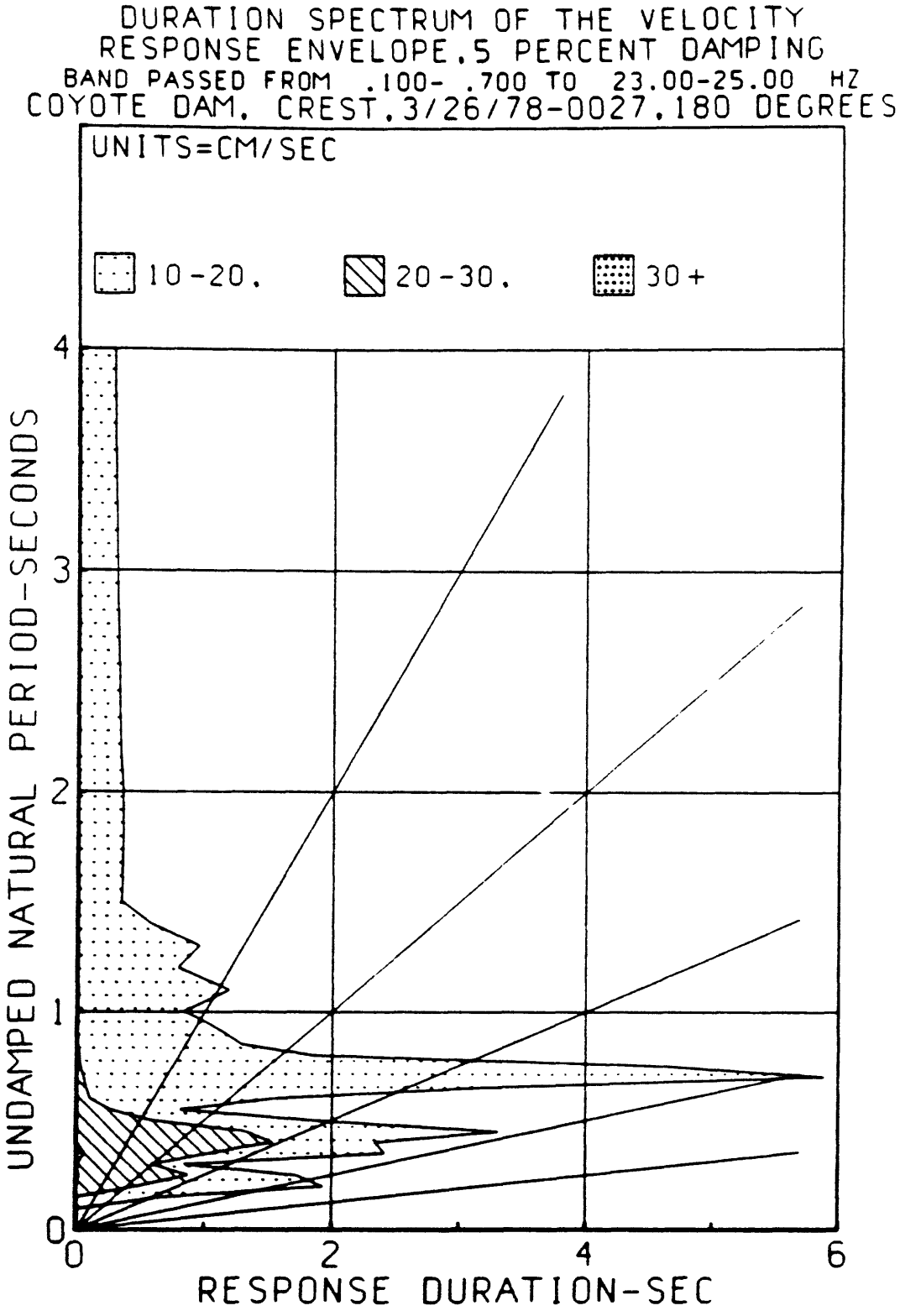

VELOCITY RESPONSE ENVELOPE SPECTRUM.5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM. CREST.3/26/78-0027.270 DEGREES
0-5.
5-10.
10-15.
15-20.
20-25.
25+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
ACCEL-G/10
VELOCITY CM/SEC

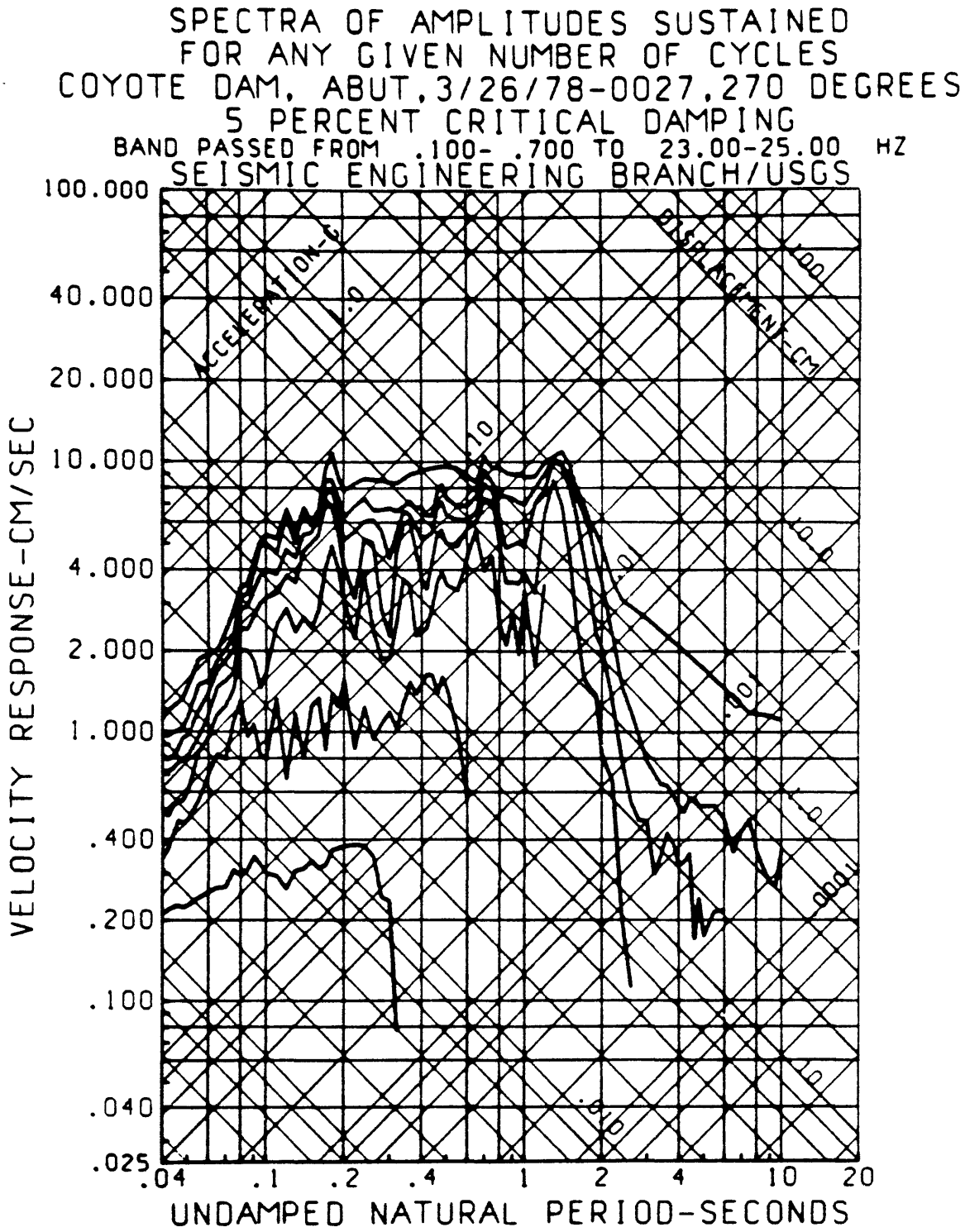

VELOCITY RESPONSE ENVELOPE SPECTRUM.5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM. CREST.3/26/78-0027.UP
0-5.
5-10.
10-15.
15+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL-G/10

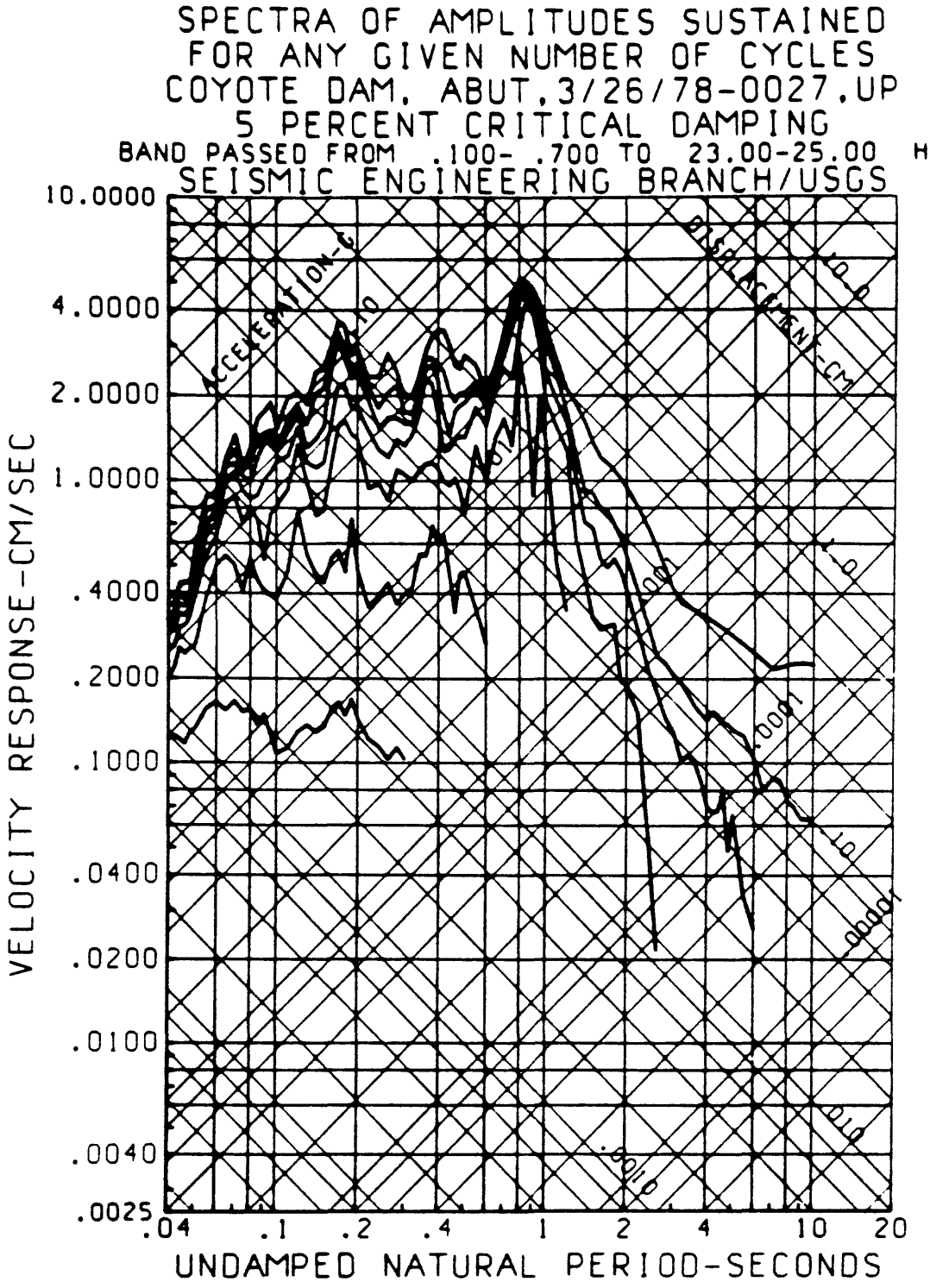

VELOCITY RESPONSE ENVELOPE SPECTRUM,5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
UNITS=CM/SEC
COYOTE DAM. CREST,3/26/78-0027,180 DEGREES
0-10.
10-20.
20-30.
30+
UNDAMPED NATURAL PERIOD-SECONDS
TIME - SECONDS
VELOCITY CM/SEC
ACCEL-G/10

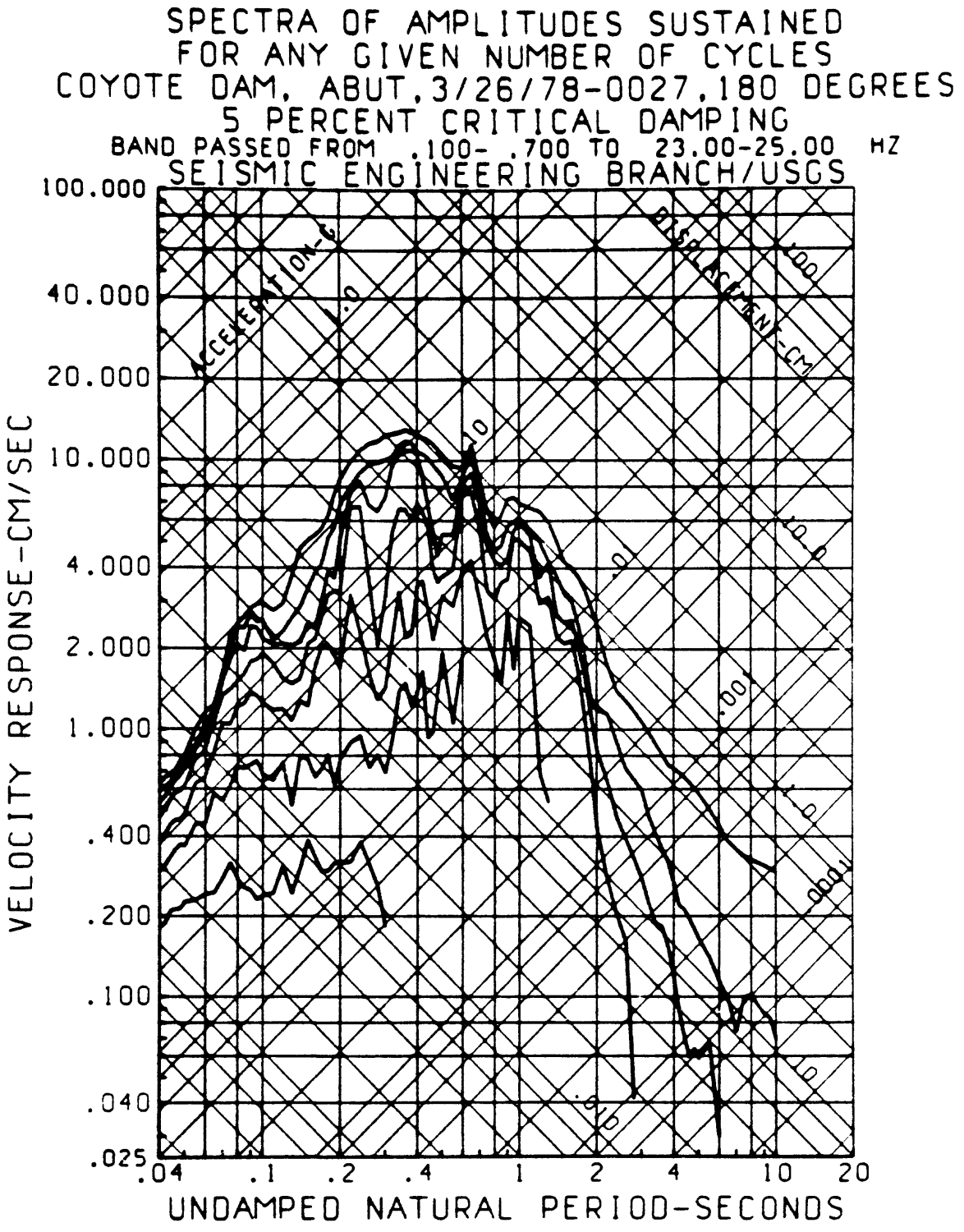

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM, CREST,3/26/78-0027,270 DEGREES
UNITS=CM/SEC
5-10.
10-15.
15-20.
20-25.
25+
UNDAMPED NATURAL PERIOD-SECONDS
0
1
2
3
4
0
5
10
RESPONSE DURATION-SEC

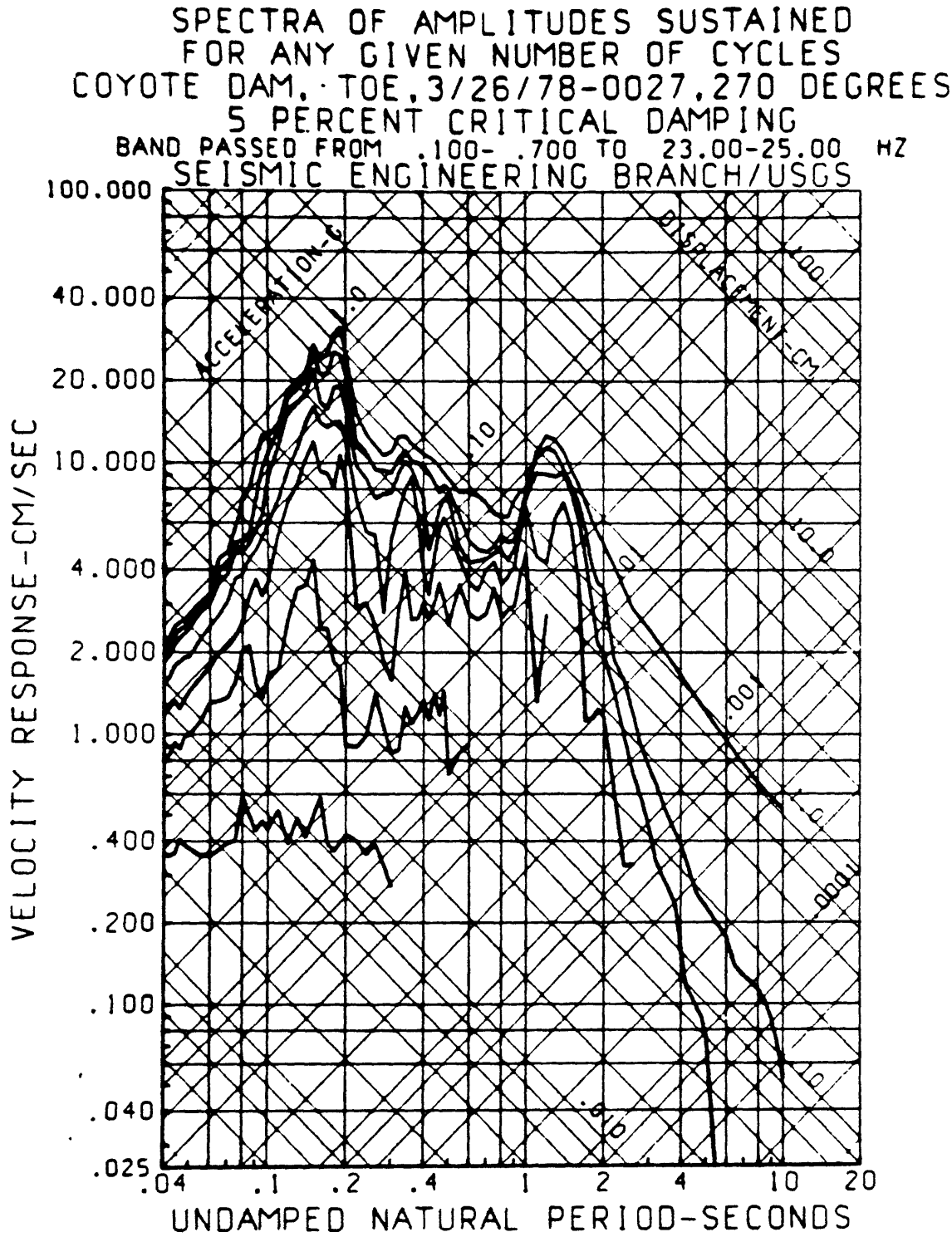

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM. CREST.3/26/78-0027.UP
UNITS=CM/SEC
5-10.
10-15.
15+
UNDAMPED NATURAL PERIOD-SECONDS
RESPONSE DURATION-SEC
0
1
2
3
4
0
2
4
6
8

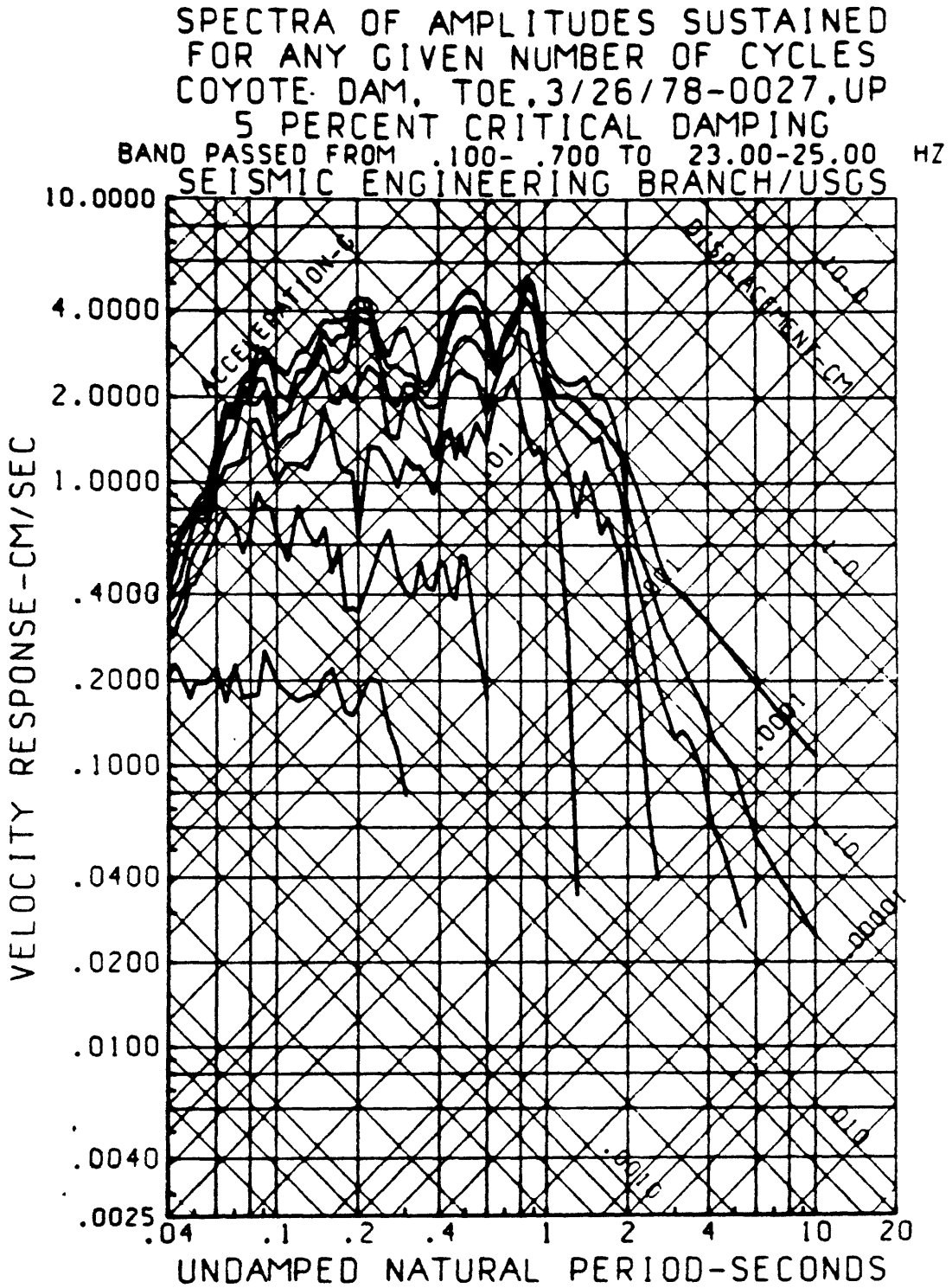

DURATION SPECTRUM OF THE VELOCITY
RESPONSE ENVELOPE,5 PERCENT DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
COYOTE DAM. CREST,3/26/78-0027,180 DEGREES
UNITS=CM/SEC
10-20.
20-30.
30+
UNDAMPED NATURAL PERIOD-SECONDS
0
1
2
3
4
0
2
4
6
RESPONSE DURATION-SEC

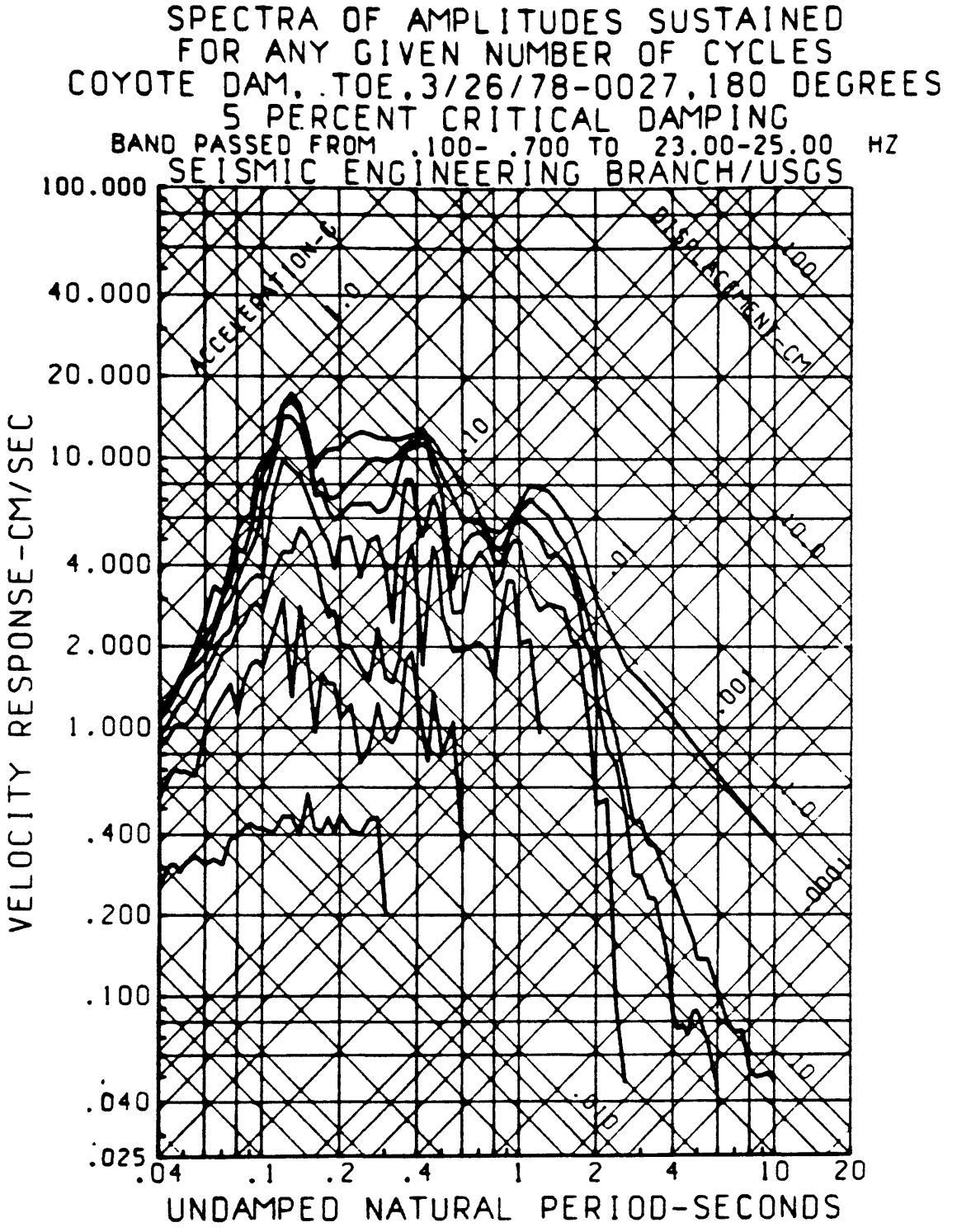

SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, ABUT,3/26/78-0027,270 DEGREES
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM

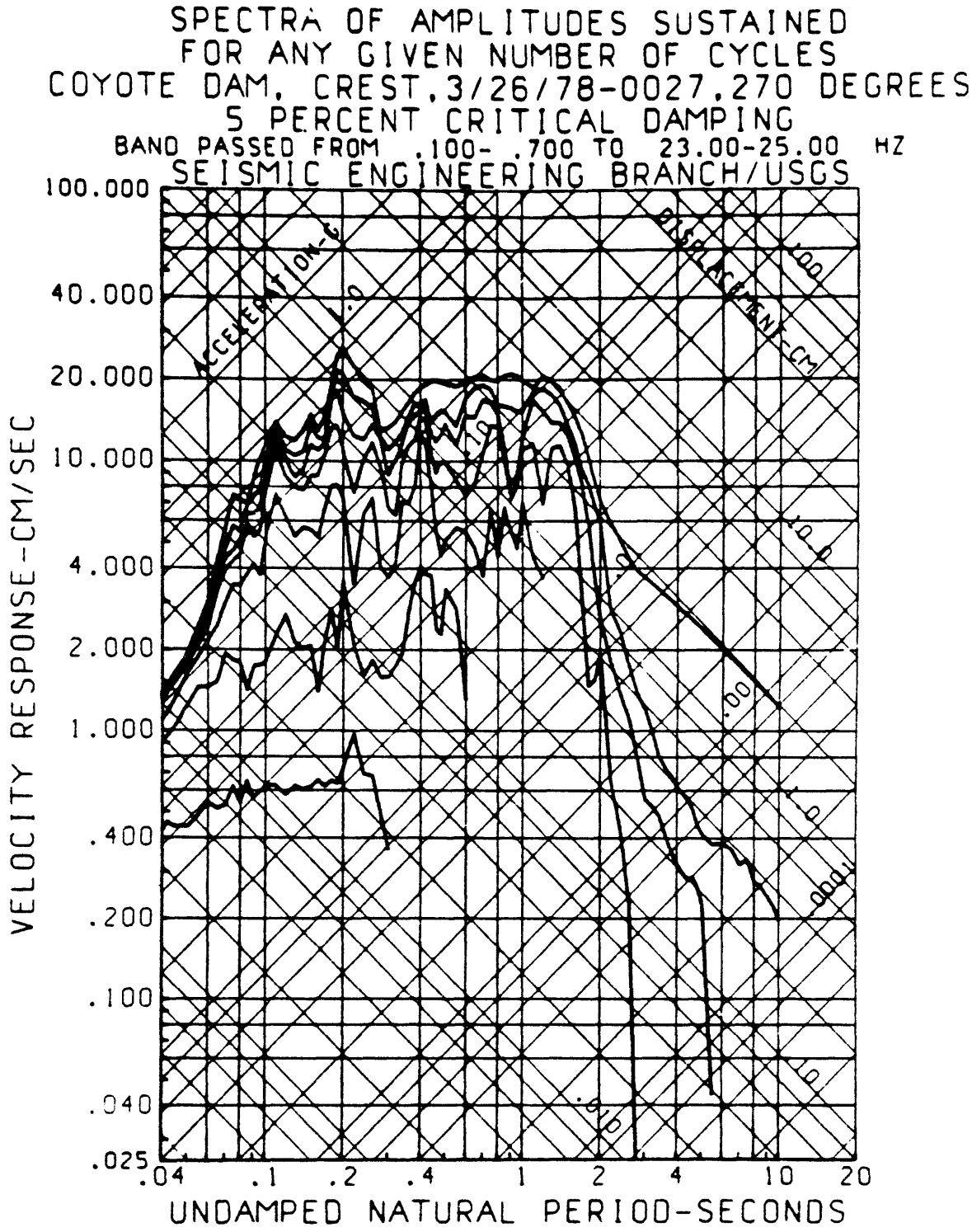

SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, ABUT,3/26/78-0027,UP
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
10.0000
4.0000
2.0000
1.0000
.4000
.2000
.1000
.0400
.0200
.0100
.0040
.0025
ACCELERATION-G
DISPLACEMENT-CM
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

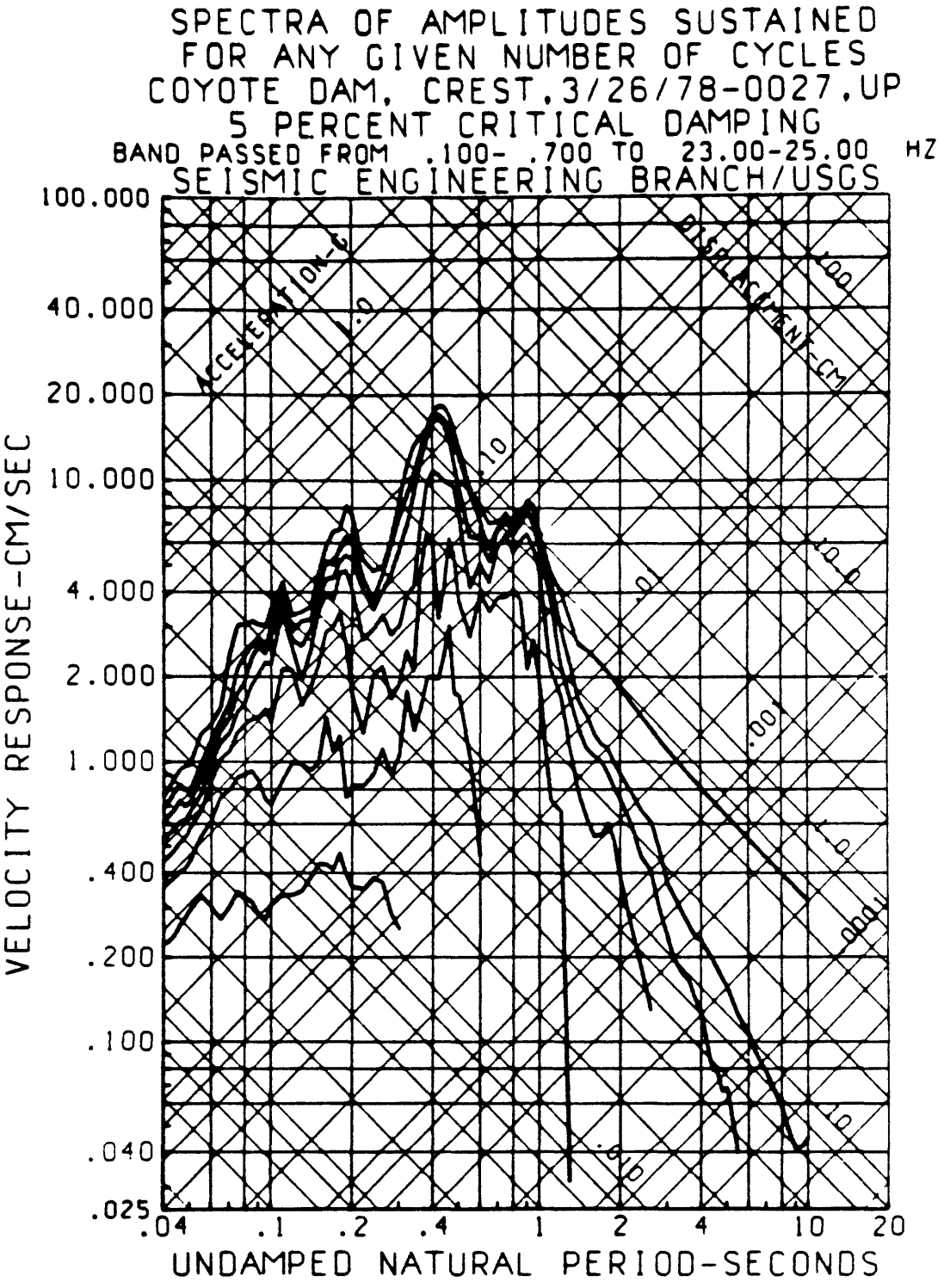

SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, ABUT, 3/26/78-0027, 180 DEGREES
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM

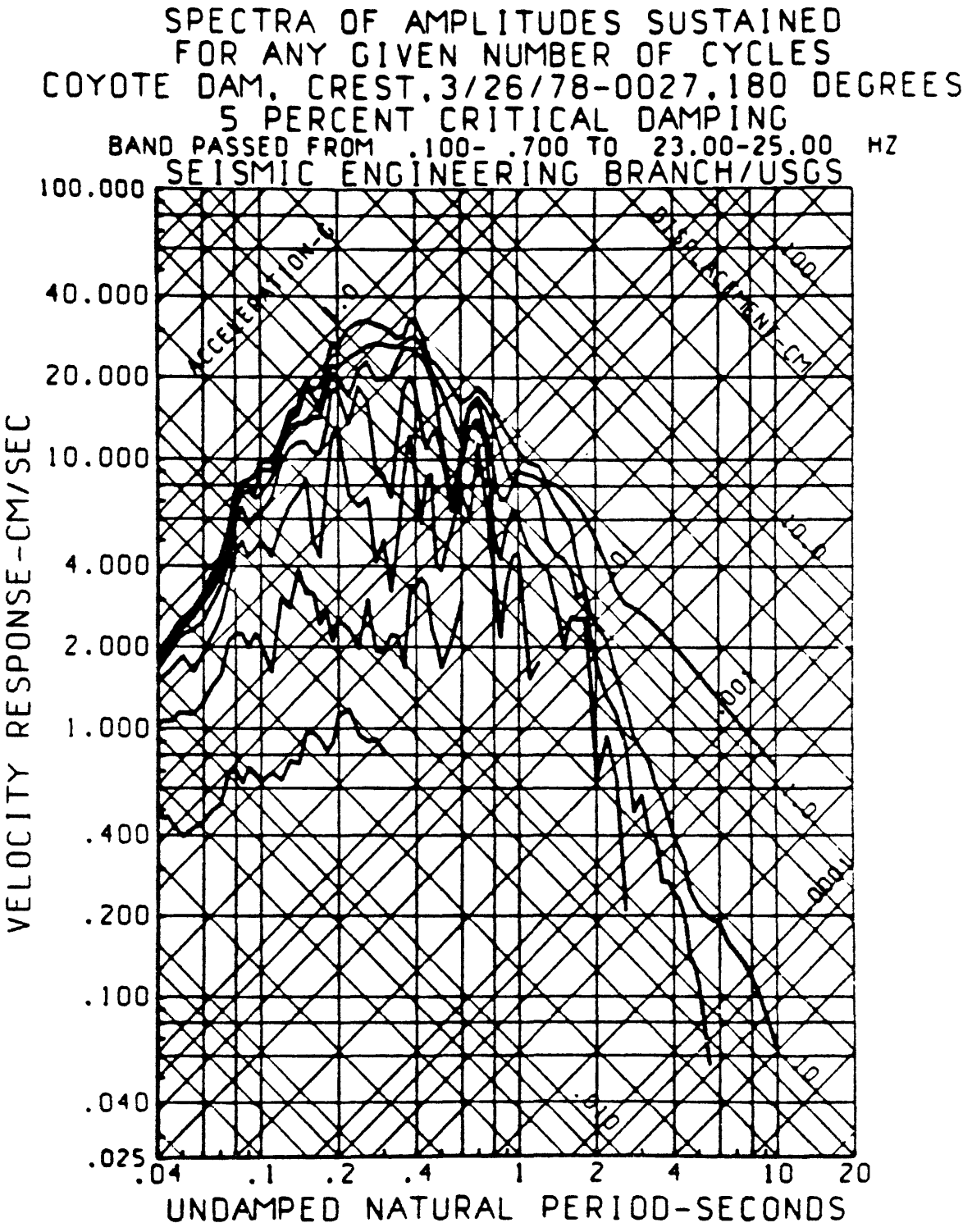

SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, TOE, 3/26/78-0027, 270 DEGREES
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
.10
.01


SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, TOE, 3/26/78-0027, UP
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
10.0000
4.0000
2.0000
1.0000
.4000
.2000
.1000
.0400
.0200
.0100
.0040
.0025
ACCELERATION-G
DISPLACEMENT-CM
.01
.001
.0001
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS


SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, .TOE,3/26/78-0027,180 DEGREES
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM


SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, CREST,3/26/78-0027,270 DEGREES
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM


SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, CREST,3/26/78-0027,UP
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM


SPECTRA OF AMPLITUDES SUSTAINED
FOR ANY GIVEN NUMBER OF CYCLES
COYOTE DAM, CREST,3/26/78-0027,180 DEGREES
5 PERCENT CRITICAL DAMPING
BAND PASSED FROM .100- .700 TO 23.00-25.00 HZ
SEISMIC ENGINEERING BRANCH/USGS
VELOCITY RESPONSE-CM/SEC
100.000
40.000
20.000
10.000
4.000
2.000
1.000
.400
.200
.100
.040
.025
.04
.1
.2
.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS