DEPARTMENT OF THE INTERIOR

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Processed Strong-Motion Data for the Central Chile Aftershock of April 9, 1985: Nine Accelerograph Sites Owned by CHILECTRA, ENDESA, and the Department of Geology and Geophysics, University of Chile

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PROCESSED STRONG-MOTION DATA FOR THE CENTRAL CHILE AFTERSHOCK OF APRIL 9, 1985: NINE ACCELEROGRAPH SITES OWNED BY CHILECTRA, ENDESA, AND THE DEPARTMENT OF GEOLOGY AND GEOPHYSICS, UNIVERSITY OF CHILE

INTRODUCTION

The April 9, 1985 (M_S = 7.2) earthquake that occurred off the coast of central Chile is known to have triggered at least 10 accelerographs located throughout the region (Fig. 1). This report presents processed records from 9 accelerographs owned and operated by CHILECTRA, Empresa Nacional de Electricidad (ENDESA), and the Department of Geology and Geophysics, University of Chile. Processed records from an additional site owned by the Department of Engineering, University of Chile, are presented by Celebi (1987). This event was the largest aftershock of the March 3, 1985 (M_S = 7.8) earthquake that occurred near Valparaíso. Strong-motion data recorded during the mainshock, including processed records from 26 sites, are available in Saragoni *et al.* (1985), Wyllie *et al.* (1985), Celebi (1987), and Campbell *et al.* (1989). A general description of the effects of the March 3 mainshock are given by Algermissen *et al.* (1985) and Wyllie *et al.* (1985).

The aftershock occurred at 01:57 UTC on April 9, 1985. The U.S. National Earthquake Information Center (NEIC) located the epicenter near the coast of central Chile approximately 12 km south of the Rapel accelerograph site (Fig. 1). NEIC reported several people injured and some damage (Modified Mercalli Intensities of about VI) in the Santiago-Valparaíso area. The earthquake was felt throughout much of central Chile from La Serena to Osorno. It was also felt (IV) in Mendoza, Argentina, as well as in San Juan, San Luis, Cordoba, Tucuman, and Santa Fe Provinces, Argentina.

NEIC reported the following data for the earthquake:

Earthquake Parameters:

Origin Time:	01:56:59.4 UTC
Location:	34.131°S, 71.618°W
Depth:	38 km
Magnitude:	6.3 m_b, 7.2 M_S
Moment:	6.1×10^{26} dyne-cm (7.2 M_W)

Preferred Fault Plane:

Strike:	343°
Dip:	23°
Slip:	90°

P-axis:

Azimuth:	253°
Plunge:	22°

The focal mechanism is poorly controlled, and corresponds to thrusting of the Nazca plate beneath the continent of South America. This mechanism is consistent with that determined for the mainshock.

RECORDING SITES AND INSTRUMENTATION

The locations of all accelerographs that are known to have recorded the earthquake are indicated on Figure 1. The squares identify the 9 sites analyzed in this report. Coordinates, site conditions, and instrument characteristics for each site are summarized in Tables 1 and 2. Epicentral distances, peak amplitudes, and filter parameters for each accelerogram are listed in Table 3.

All but two of the recording sites were equipped with *Kinemetrics* SMA-1 strong-motion accelerographs. The exceptions were Santiago (ENDESA building), which housed a *Katsujima* PK-130 accelerograph, and Rapel, where a *Teledyne* RFT-250 accelerograph was installed.

The SMA-1 and RFT-250 accelerographs are fixed-gain instruments that record acceleration on 70-mm film with a recording speed of 1 cm/sec. Nominal values for the recording sensitivity, natural frequency, and damping are 19 mm/*g*, 25 Hz, and 60 percent of critical, respectively, for the SMA-1 accelerographs. The RFT-250 accelerograph is a one-half *g* full scale instrument, with sensitivities roughly a factor of two higher than those associated with the SMA-1 recorders. The PK-130 accelerograph is an automatic gain-ranging accelerograph that records acceleration on 90-mm light-sensitive paper with a recording speed of 5 cm/sec. The natural frequency and damping of the PK-130 accelerograph are not known; however, its frequency response is designed to be flat over the frequency range 0.3-30 Hz.

PROCESSING METHODOLOGY

Processing was performed with AGRAM, an accelerogram processing package developed by the U.S. Geological Survey (Converse, 1984). The relatively poor condition of the original film records made it necessary to digitize the recordings by hand rather than by the laser trace-following device usually used by the U.S. Geological Survey to process strong-motion records. Therefore, four AGRAM routines--IOMTAP, BUTTER, REFORM, and SCALE--could not be used in their present form and were replaced with similar routines designed to perform the same basic functions. Details of the processing steps are summarized below.

Digitization. The 70-mm film records were photographically enlarged to five times there original size to insure adequate signal-to-noise ratios. For long records, this required that the film be photographed in 100 cm frames, representing about 20 sec of record time. The frames were overlapped by about 5-10 cm during the photographic process to allow accurate reconstruction of the accelerogram after digitization. Because of the large sensitivity and fragile nature of the PK-130 recording, it was not enlarged prior to digitization.

Each frame was digitized by means of a hand-held cursor on a digitizing table having a resolution of 0.001 in (0.00254 cm). This process resulted in a sample rate of about 250-350 samples per second and an amplitude resolution of about 0.3 cm/sec^2 (about 0.0003*g*) for the film records and 0.03-0.4 cm/sec^2 (about 0.00003-0.0004*g*), depending on the gain of the instrument, for the paper record. When possible, six traces were digitized for each accelerogram: three acceleration traces (one vertical and two horizontal components), two fixed traces, and one set of timing marks. There were no fixed traces on the accelerogram obtained at Ventanas, so only the acceleration traces and timing marks were digitized for this record. Timing marks were written every 0.5 sec on the film records and every 0.1 sec on the paper records.

Phase I (Uncorrected Acceleration). Starting times for each trace were adjusted to minimize phasing errors and the timing trace was interpolated to determine relative time for each data point. Each trace was then adjusted to have an average amplitude of zero, after which absolute amplitudes were computed from instrument sensitivities. The sensitivity of the Santiago (Univ. of Chile) accelerograph was not known; therefore, its sensitivity was taken as the average sensitivity of all SMA-1 accelerographs whose instrument parameters were known at the time of this report (Campbell *et al.*, 1989).

Phase II (Corrected Time Series). Phase I data were interpolated to 200 samples per second, and in the case of the film records, a frequency domain instrument-correction operator was applied to remove the response of the recording system. Since the high-frequency response of the PK-130 accelerograph is flat to about 30 Hz, no instrument correction was applied to this time series.

When fixed traces were available, high-frequency noise was identified from ratios of the Fourier amplitude spectra of the acceleration and fixed traces. The ratios were plotted as a linear function of frequency to emphasize the high-frequency tail of the spectra. When fixed traces were not available, high-frequency noise was identified directly from the Fourier amplitude spectra of the acceleration time series. High-frequency noise was removed by applying a 5 Hz bandwidth cosine taper to the Fourier amplitude spectra.

When fixed traces were available, low-frequency noise was identified from ratios of the pseudorelative velocity (PSRV) response spectra of the acceleration and fixed traces. The ratios were plotted as a logarithmic function of period to emphasize the low-frequency tail of the spectra. The filter parameter was chosen to give a minimum

signal-to-noise ratio of 2:1, corresponding to signal-to-noise ratios ranging from about 3:1 to 8:1 for peak displacement. When fixed traces were not available, low-frequency noise was identified directly from the PSRV spectra of the acceleration time series. In this latter case, the filter parameter was selected to correspond to the frequency at which the presence of noise became visible on the PSRV spectra. Low-frequency noise was removed with a bidirectional (zero phase), fourth-order Butterworth filter applied in the time domain.

The PK-130 recording system applies a lowcut filter to the acceleration time series as it is recorded. As a result, the low-frequency response of this system begins to roll off at a frequency of about 0.4 Hz (2.5 sec). However, since the response of the system at 0.2 Hz (5.0 sec)--the approximate upper limit of useable signal (Table 3)--is still 85 percent of the unfiltered response, a low-frequency correction was not applied.

The instrument-corrected acceleration time series were padded with zeros, integrated, and filtered to obtain velocity. The resulting velocity records were then integrated to obtain displacement. Finally, the padded acceleration time series were filtered and all traces were unpadded to obtain corrected acceleration, velocity, and displacement.

Phase III and IV. Fourier amplitude spectra (FAS) and response spectra in the form of relative displacement (RD), relative velocity (RV), pseudorelative velocity (PSRV), absolute acceleration (AA), and pseudoabsolute acceleration (PSAA) were computed from the corrected acceleration time series at 91 periods ranging from 0.04 to 15 sec. The response spectra were calculated for five values of critical damping: 0, 2, 5, 10, and 20 percent.

Processed Data. Plots of the processed time series, Fourier amplitude spectra, and response spectra are displayed in the *Appendix*. These plots include uncorrected acceleration time series; corrected acceleration, velocity, and displacement time series; Fourier amplitude spectra, and PSRV response spectra. The plots of response spectra include both a logarithmic tripartite plot of pseudorelative velocity and a linear plot of relative velocity. The Fourier spectra are plotted as a function of both logarithmic and linear functions of frequency.

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DATA AVAILABILITY

A magnetic tape of the processed data described in this report can be obtained from the National Geophysical Data Center in Boulder, Colorado. All requests should be forwarded to:

National Geophysical Data Center/NOAA
World Data Center-A for Solid Earth Geophysics
325 Broadway, Code E/GC1
Boulder, CO 80303

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TABLE 1

Station Locations and Site Conditions

Recording Station	Latitude (°S)	Longitude (°W)	Structure	Location	Site Geology*	Owner**
Cauquenes	36.00	72.22	2-story bldg.	Ground level	Quaternary alluvium	DGG
Constitución	35.30	72.32	2-story bldg.	Ground level	Paleozoic intrusives	DGG
Iloca	34.92	72.22	1-story bldg.	Ground level	Quaternary alluvium	DGG
Quintay	33.20	71.68	Small shelter	Ground level	Paleozoic intrusives	ENDESA
Rapel	34.03	71.58	Tunnel	Subgrade	Paleozoic intrusives	ENDESA
San Fernando	34.60	71.00	1-story bldg.	Ground level	Quaternary alluvium	DGG
Santiago (ENDESA Bldg.)	33.45	70.67	6-story bldg.	Basement	Quaternary alluvium	ENDESA
Santiago (DGG Bldg.)	33.47	70.67	3-story bldg.	Basement	Quaternary alluvium	DGG
Ventanas	32.75	71.49	6-story bldg.	Ground level	Quaternary alluvium	CHILECTRA

*Servicio National de Geología y Minería (1982)

**DGG: Stations owned by the Department of Geology and Geophysics, University of Chile
ENDESA: Stations owned by the Empresa Nacional de Electricidad
CHILECTRA: Stations owned by CHILECTRA

TABLE 2

Instrument Characteristics

Recording Station	Instrument Type	Component	Sensitivity (mm/g)	Natural Frequency (Hz)	Damping (%)
Cauquenes	SMA-1	North-South	18.5	25.6	57.9
		Vertical	19.5	25.4	60.3
		East-West	18.0	25.7	60.0*
Constitución	SMA-1	North-South	17.3	25.6	58.5
		Vertical	17.6	26.1	58.5
		East-West	16.9	27.0	61.5
Iloca	SMA-1	North-South	17.5	25.7	60.6
		Vertical	18.2	26.3	63.3
		East-West	19.8	24.7	60.0
Quintay	SMA-1	Longitudinal	17.2	26.2	60.0*
		Vertical	19.2	24.8	60.0*
		Transverse	19.8	25.1	60.0*
Rapel	RFT-250	North-South	37.4	17.8	60.0*
		Vertical	35.6	19.0	60.0*
		East-West	36.2	18.3	60.0*
San Fernando	SMA-1	North-South	18.4	25.9	67.4
		Vertical	16.9	27.7	60.8
		East-West	18.0	25.6	63.8
Santiago (ENDESA)	PK-130	Longitudinal	61.3-980.7**	--	--
		Vertical	61.3-980.7**	--	--
		Transverse	61.3-980.7**	--	--
Santiago (U.C.)	SMA-1	Longitudinal	18.3*	25.0*	60.0*
		Vertical	18.3*	25.0*	60.0*
		Transverse	18.3*	25.0*	60.0*
Ventanas	SMA-1	North-South	17.8	25.0*	62.6
		Vertical	17.4	25.0*	60.4
		East-West	17.5	25.0*	59.3

*Estimated

**Automatic gain ranging

TABLE 3

Summary of Ground Motion Data

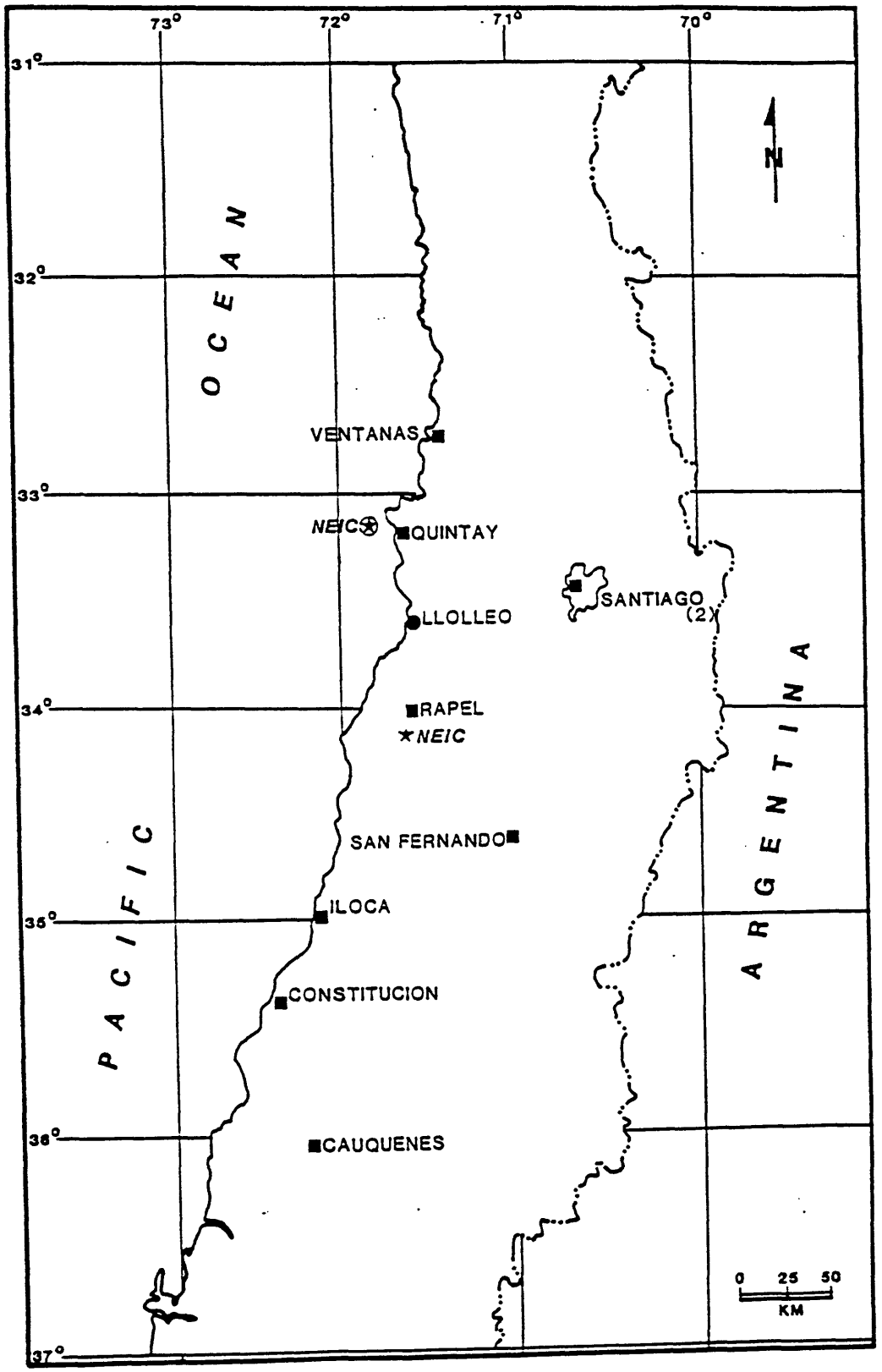
Recording Station	Epicentral Distance (km)	Highcut Filter Limit (Hz)	Lowcut Filter Limit (sec)	Component	Peak Accel. (cm/sec^2) Uncorr.	Peak Accel. (cm/sec^2) Corr.	Peak Vel. (cm/sec)	Peak Disp. (cm)
Cauquenes	214.7	13.0	1.9	North-South	55.2	54.3	3.86	0.283
		18.0	1.4	Vertical	38.0	37.1	2.00	0.173
		11.0	1.9	East-West	72.3	72.7	4.62	0.437
Constitución	144.9	9.5	3.0	North-South	50.2	48.3	4.80	0.845
		9.5	1.2	Vertical	25.0	24.4	1.86	0.137
		9.5	3.0	East-West	44.2	43.1	3.52	0.746
Iloca	103.6	19.0	3.3	North-South	162.5	158.7	8.88	0.763
		31.0	3.3	Vertical	53.8	56.2	3.06	0.654
		20.0	4.0	East-West	111.5	110.1	8.89	1.38
Quintay	103.5	25.0	1.5	Longitudinal	30.1	31.5	1.31	0.143
		35.0	1.5	Vertical	20.7	18.4	1.31	0.141
		25.0	3.0	Transverse	24.2	22.3	1.86	0.630
Rapel	11.8	15.0	5.7	North-South	51.0	49.7	5.21	2.18
		25.0	3.4	Vertical	48.2	44.8	2.78	0.553
		20.0	5.7	East-West	105.7	107.8	6.70	3.40
San Fernando	77.1	25.0	4.0	North-South	60.2	60.7	3.98	1.11
		35.0	2.7	Vertical	44.9	42.8	2.11	0.527
		25.0	2.7	East-West	64.2	65.0	3.63	0.478

TABLE 3 (Continued)

Summary of Ground Motion Data

Recording Station	Epicentral Distance (km)	Highcut Filter Limit (Hz)	Lowcut Filter Limit (sec)	Component	Peak Accel. (cm/sec^2) Uncorr.	Peak Accel. (cm/sec^2) Corr.	Peak Vel. (cm/sec)	Peak Disp. (cm)
Santiago (ENDESA)	115.9	30.0	3.0	Longitudinal	32.9	32.5	3.99	1.23
		30.0	3.2	Vertical	16.8	17.3	1.47	0.914
		30.0	4.5	Transverse	21.2	20.8	2.18	0.581
Santiago (DGG)	114.5	26.0	2.7	Longitudinal	40.4	38.7	4.29	0.907
		26.0	2.0	Vertical	29.4	24.9	1.11	0.158
		27.0	2.7	Transverse	34.4	33.2	2.39	0.480
Ventanas	153.8	17.0	3.1	Longitudinal	67.7	66.9	8.38	1.26
		15.0	1.7	Vertical	35.3	30.9	2.54	0.403
		17.0	2.0	Transverse	75.0	73.8	6.58	1.18

Figure 1 (*Overleaf*). Map of Central Chile showing the known locations of accelerographs that recorded the April 9, 1985 aftershock (circles and squares). The squares represent accelerograms processed in this report. The star and circle mark the NEIC location of the M_S 7.8 mainshock of March 3; the star marks the NEIC location of the M_S 7.2 aftershock.


73°
72°
71°
70°
31°
32°
33°
34°
35°
36°
37°
OCEAN
PACIFIC
ARGENTINA
N
VENTANAS
NEIC
QUINTAY
SANTIAGO (2X)
LLOLLEO
RAPEL
★NEIC
SAN FERNANDO
ILOCA
CONSTITUCION
CAUQUENES
0 25 50
KM

APPENDIX

Processed Strong-Motion Data

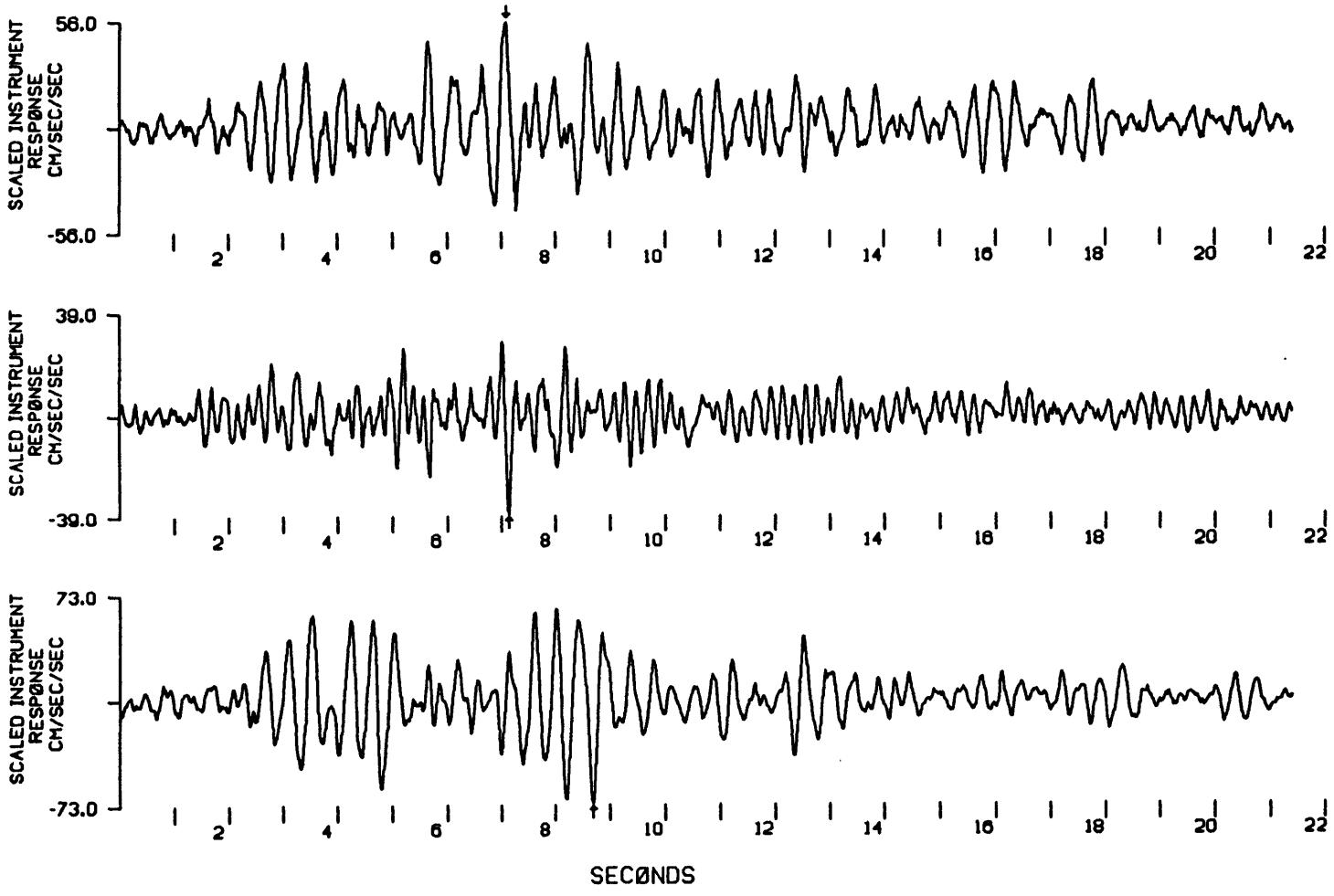
SUMMARY OF STRONG-MOTION RECORD PROCESSING

Central Chile earthquake, 4/9/85
01:56:59 UTC, M_S=7.2

Cauquenes, Chile

DESCRIPTION	COMPONENT		
	North-South	Vertical	East-West
Instrument Characteristics:			
Frequency (Hz)	25.6	25.4	25.7
Damping (% Critical)	57.9	60.3	60.0*
Filter Parameters:			
Highcut (Hz)	13.0	18.0	11.0
Lowcut (Hz)	0.526	0.714	0.526
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	55.2	-38.0	-72.3
Peak Acceleration, A (cm/s/s)	54.3	-37.1	-72.7
Peak Velocity, V (cm/s)	-3.86	2.00	4.62
Peak Displacement, D (cm)	-0.283	0.173	0.437
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.071	0.054	0.064
$\lvert AD/V^2 \rvert$	1.0	1.6	1.5

*Nominal value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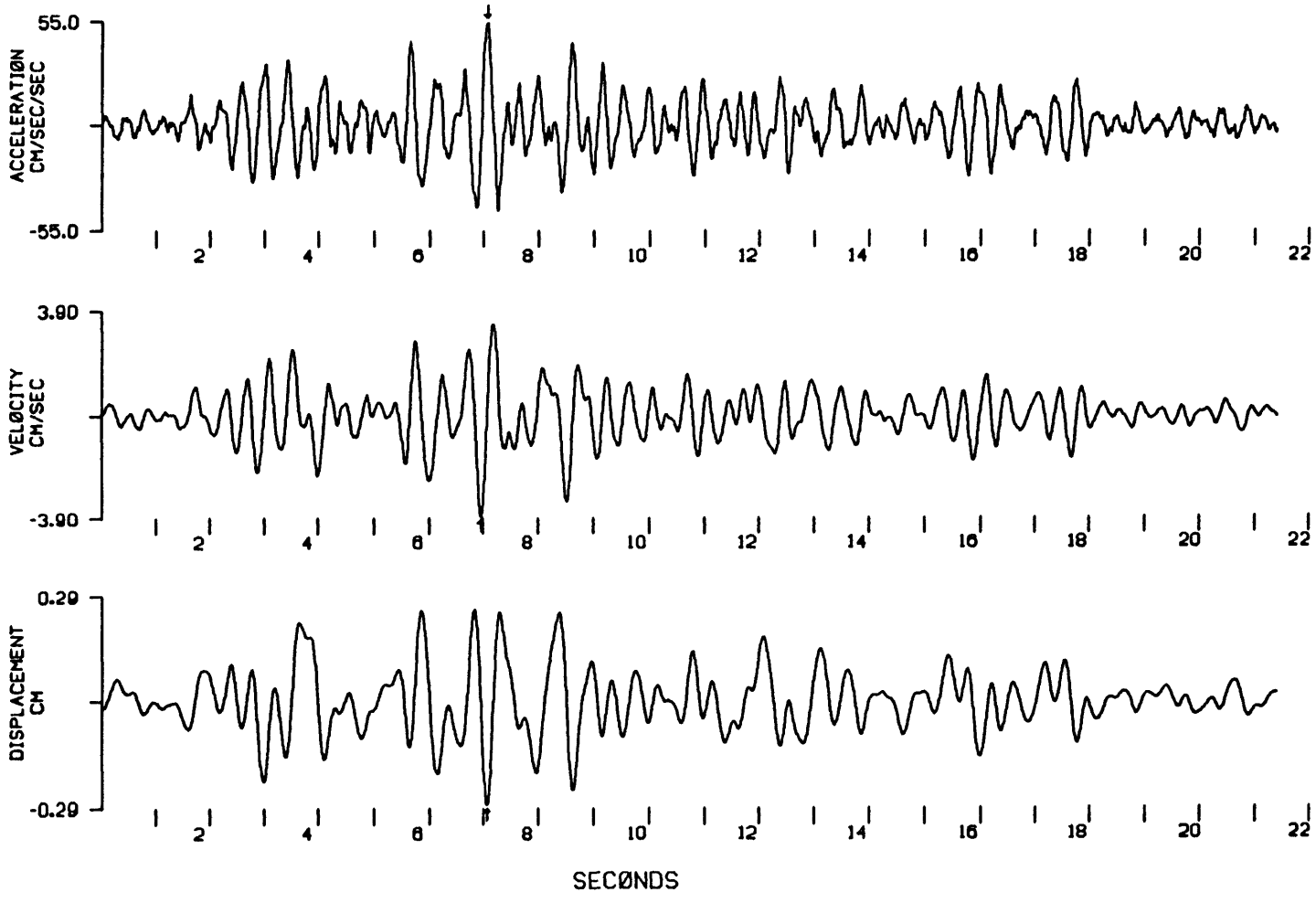
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, NØRTH-SØUTH, VERTICAL, EAST-WEST
PEAK VALUES(CM/SEC/SEC): 55.17 -38.02 -72.30
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
56.0
-56.0
39.0
-39.0
73.0
-73.0
2
4
6
8
10
12
14
16
18
20
22
SECØNDS


CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, NØRTH-SØUTH
PEAK VALUES: ACCEL=54.34 CM/SEC/SEC, VELØCITY=-3.86 CM/SEC, DISPL=-0.28 CM
ACCELERATIØN CM/SEC/SEC
55.0
-55.0
VELØCITY CM/SEC
3.90
-3.90
DISPLACEMENT CM
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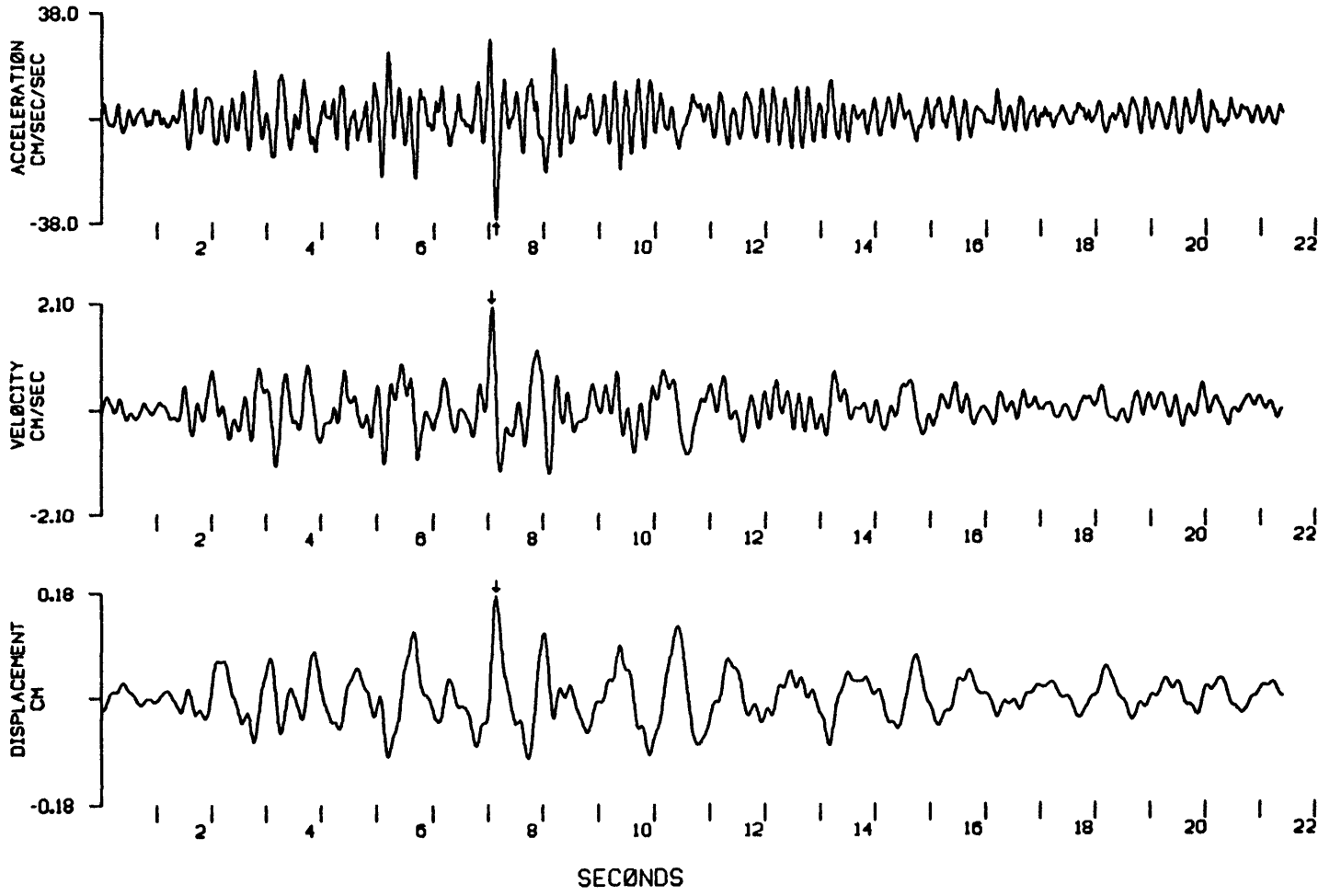
8
10
12
14
16
18
20
22
SECØNDS


CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, VERTICAL
PEAK VALUES: ACCEL=-37.08 CM/SEC/SEC, VELØCITY=2.00 CM/SEC, DISPL=0.17 CM
ACCELERATIØN CM/SEC/SEC
38.0
-38.0
VELØCITY CM/SEC
2.10
-2.10
DISPLACEMENT CM
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2
4
6
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10
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18
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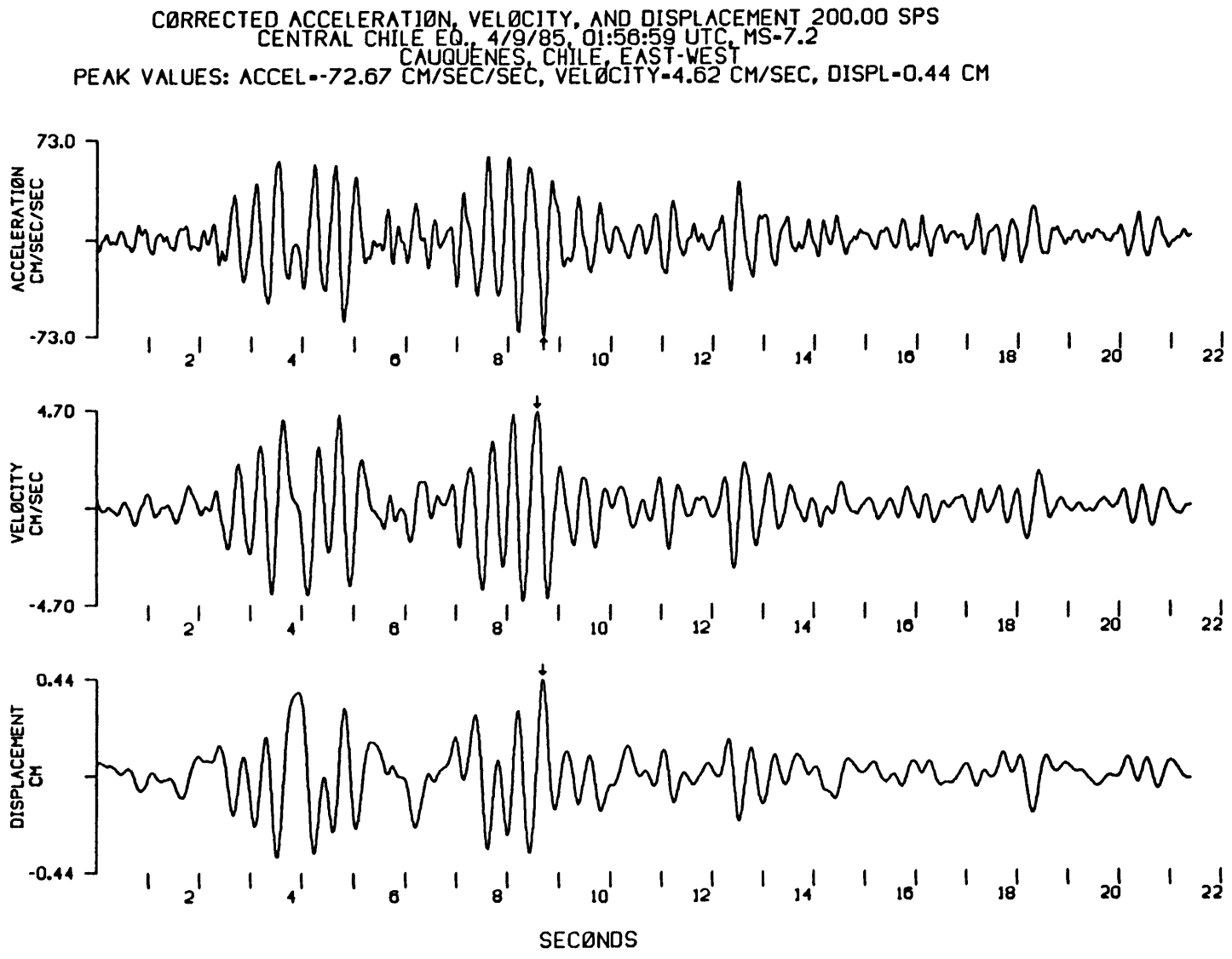
22
SECØNDS


CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:58:59 UTC, MS-7.2
CAUQUENES, CHILE, EAST-WEST
PEAK VALUES: ACCEL=-72.67 CM/SEC/SEC, VELØCITY=4.62 CM/SEC, DISPL=0.44 CM
ACCELERATIØN CM/SEC/SEC
73.0
-73.0
VELØCITY CM/SEC
4.70
-4.70
DISPLACEMENT CM
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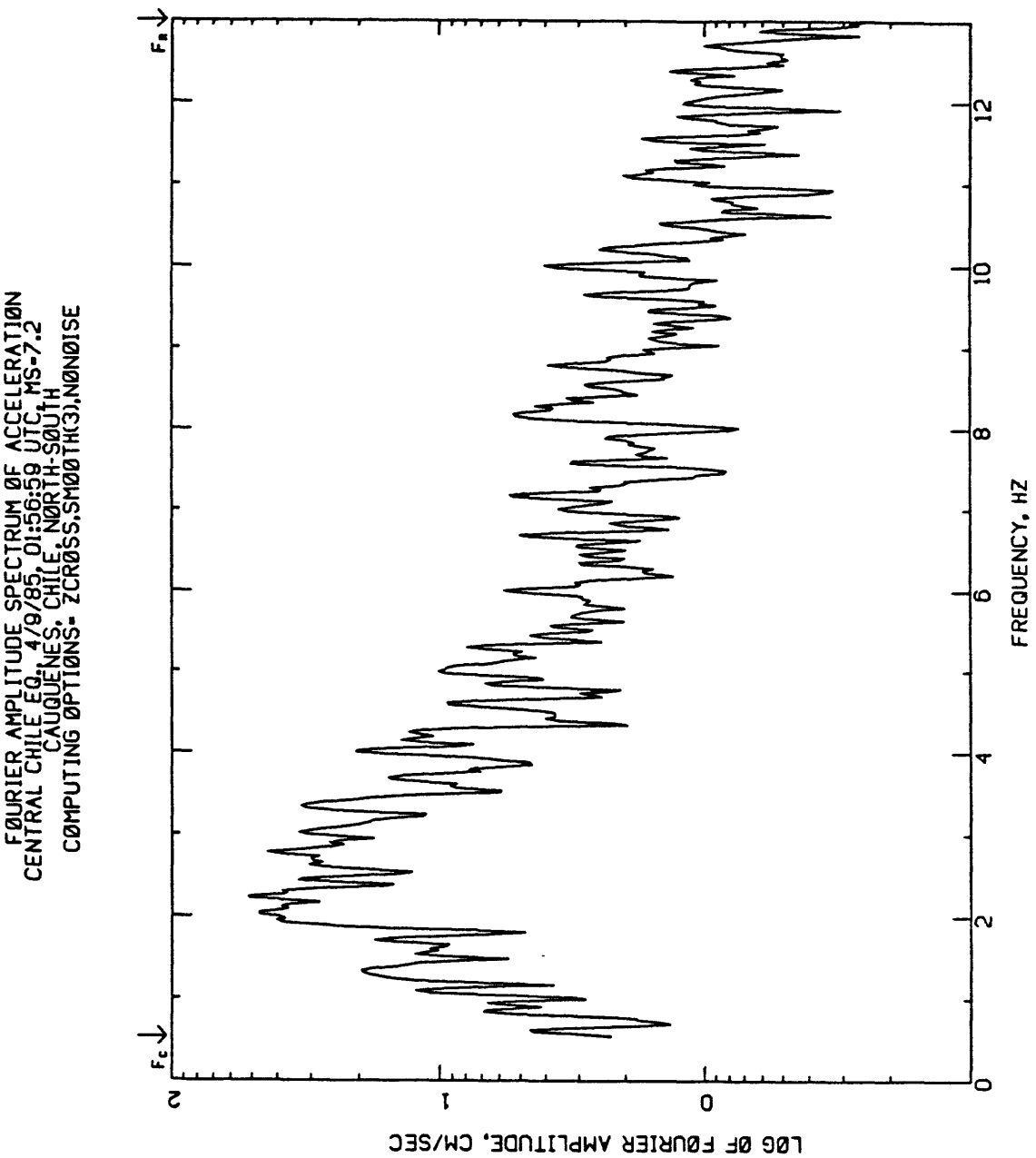
SECØNDS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CENTRAL CHILE EQ, 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
LØG ØF FØURIER AMPLITUDE, CM/SEC
FREQUENCY, HZ
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F_a
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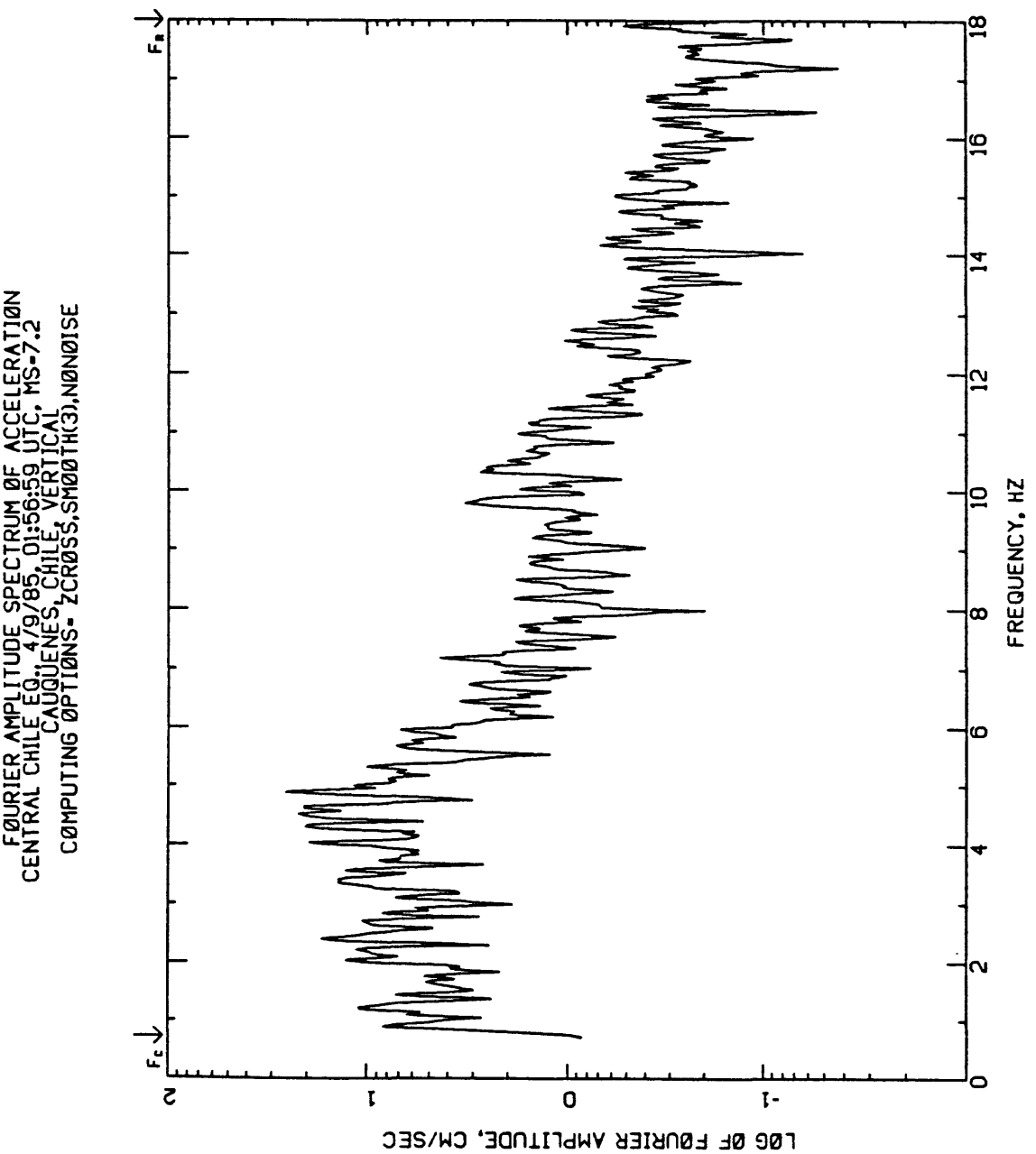
0
0
2
4
6
8
10
12


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
LØG ØF FØURIER AMPLITUDE, CM/SEC
FREQUENCY, HZ
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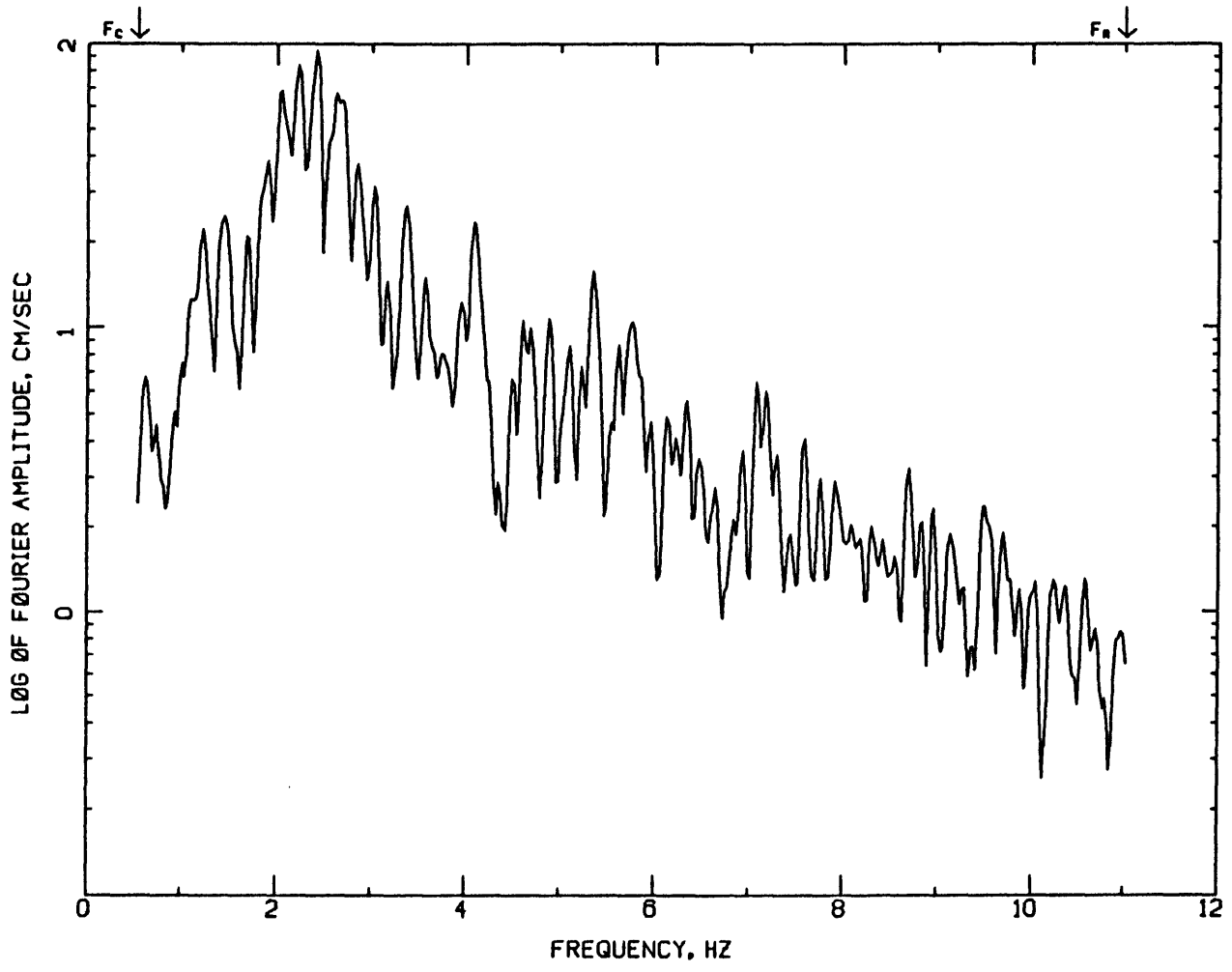
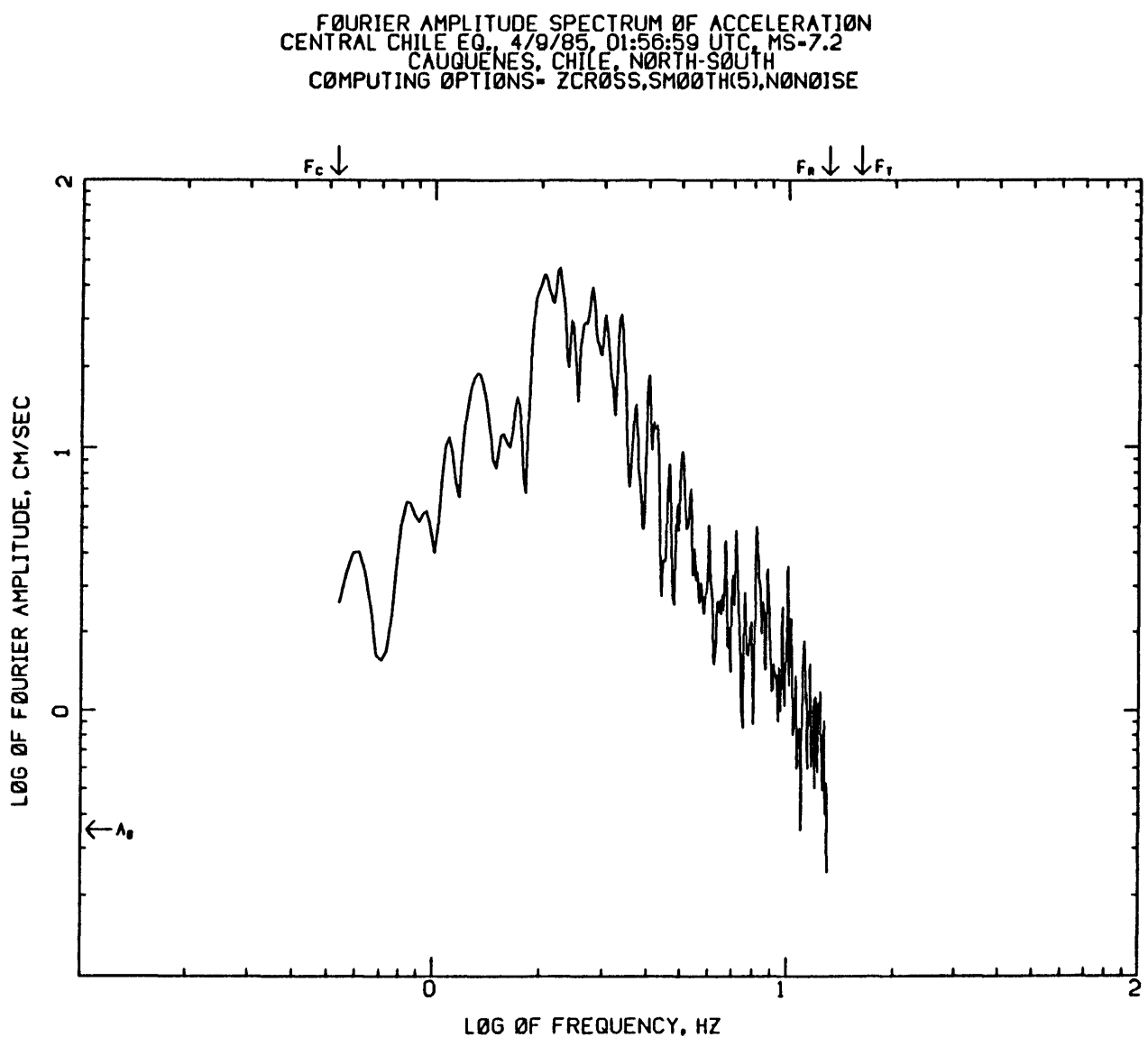
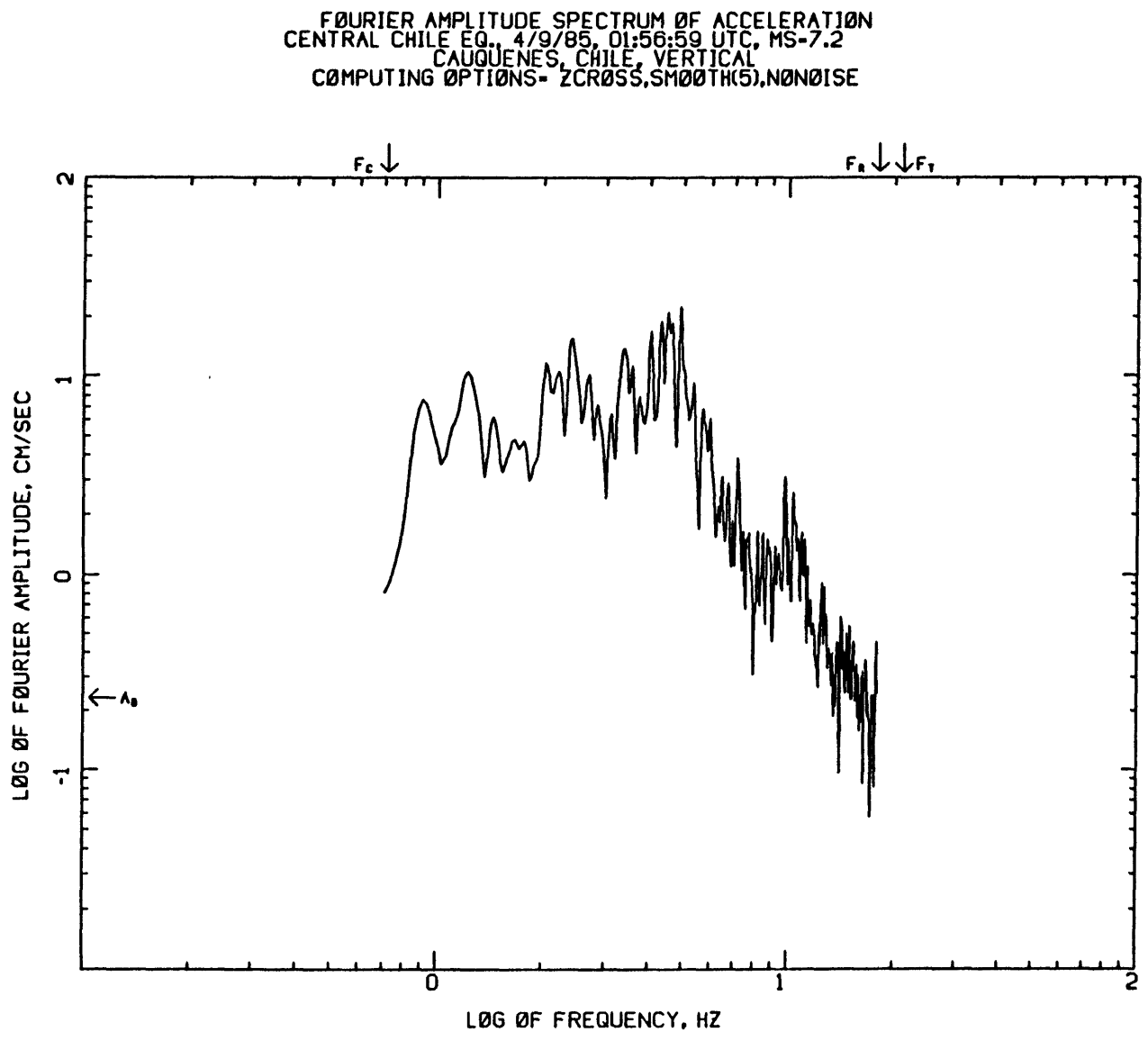
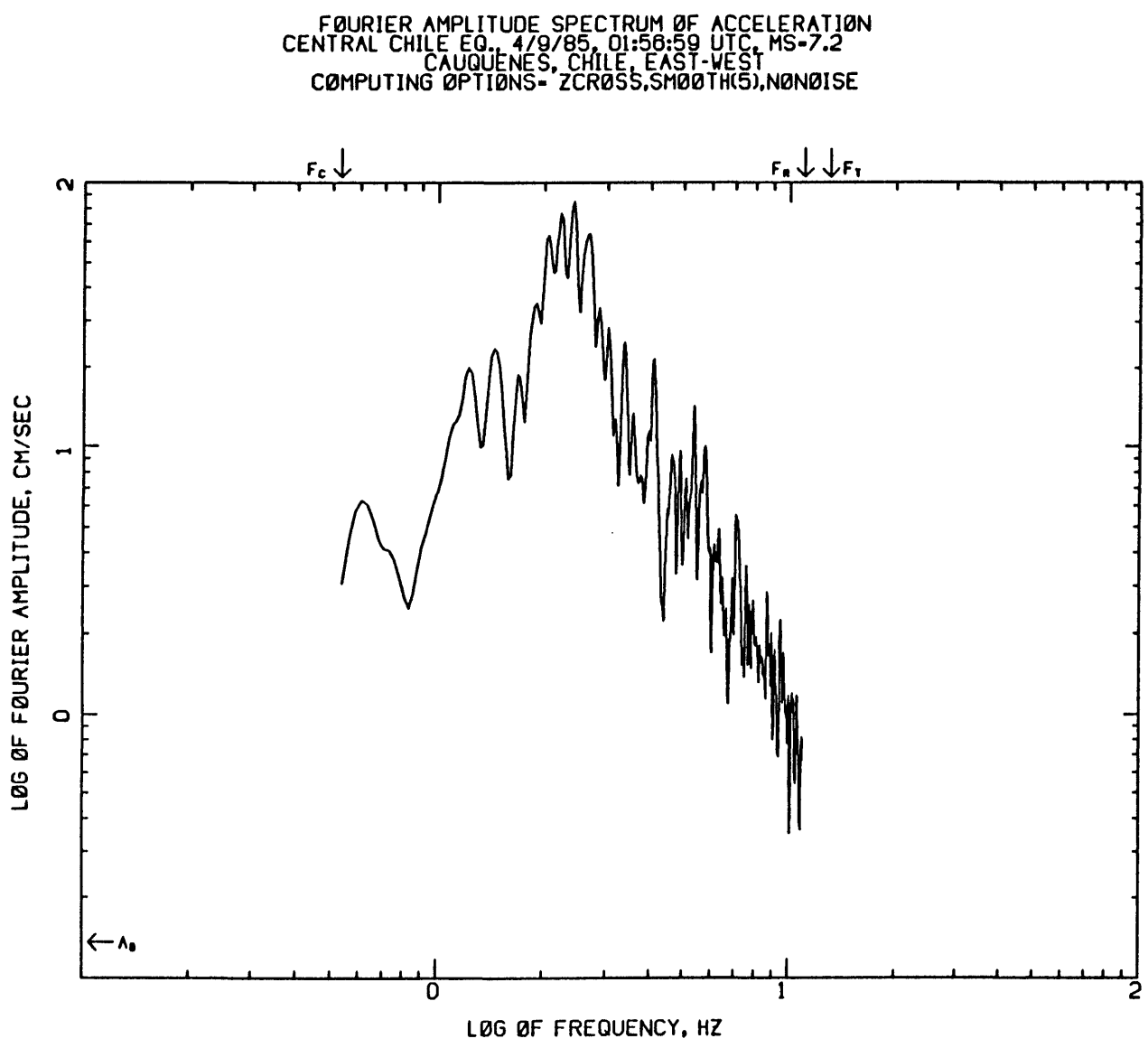

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
Fn
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
2
4
6
8
10
12
FREQUENCY, HZ

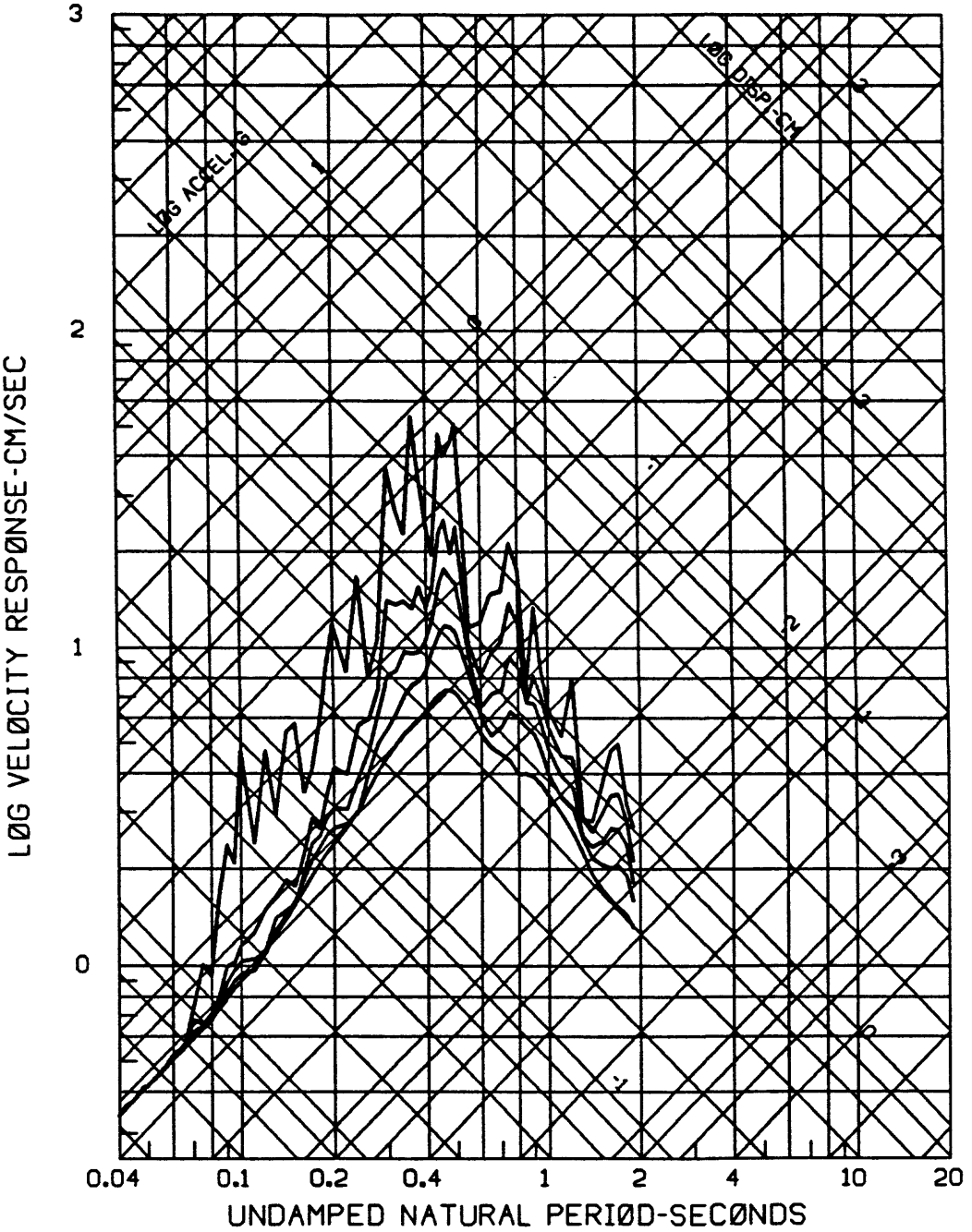

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
AR
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
Fa
Fr
A0
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
-1
0
1
2

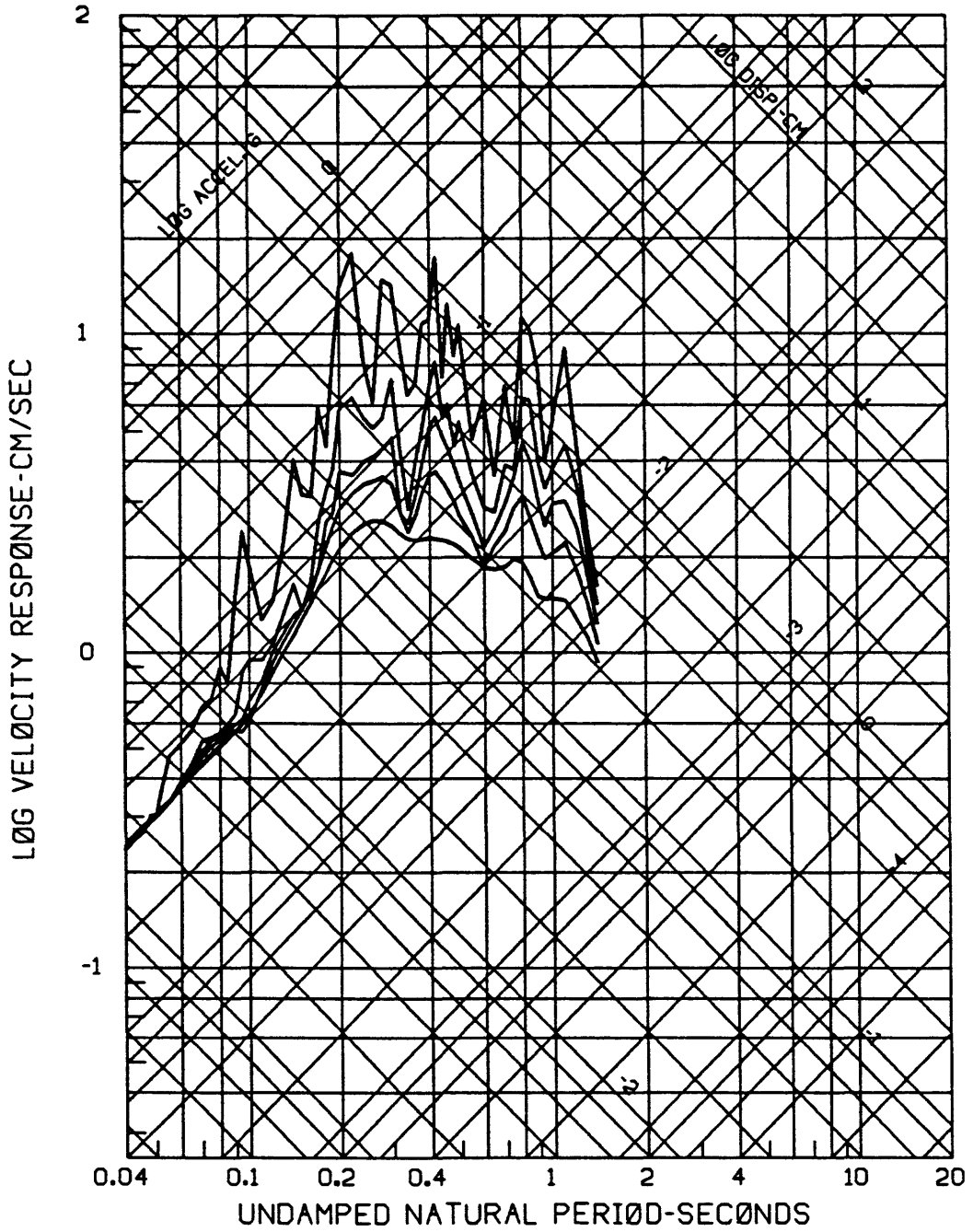

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CAUQUENES, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2

PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

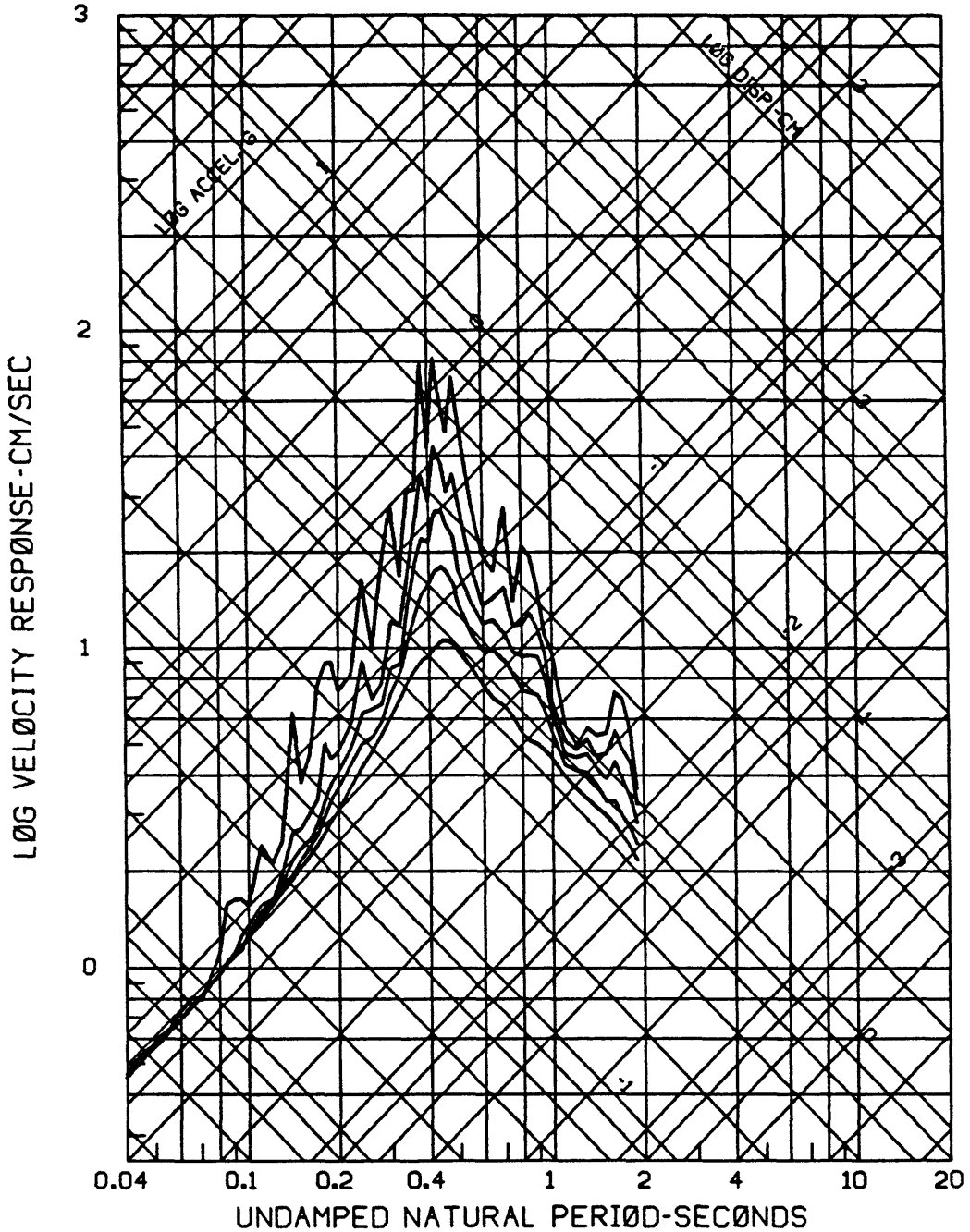
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CAUQUENES, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING

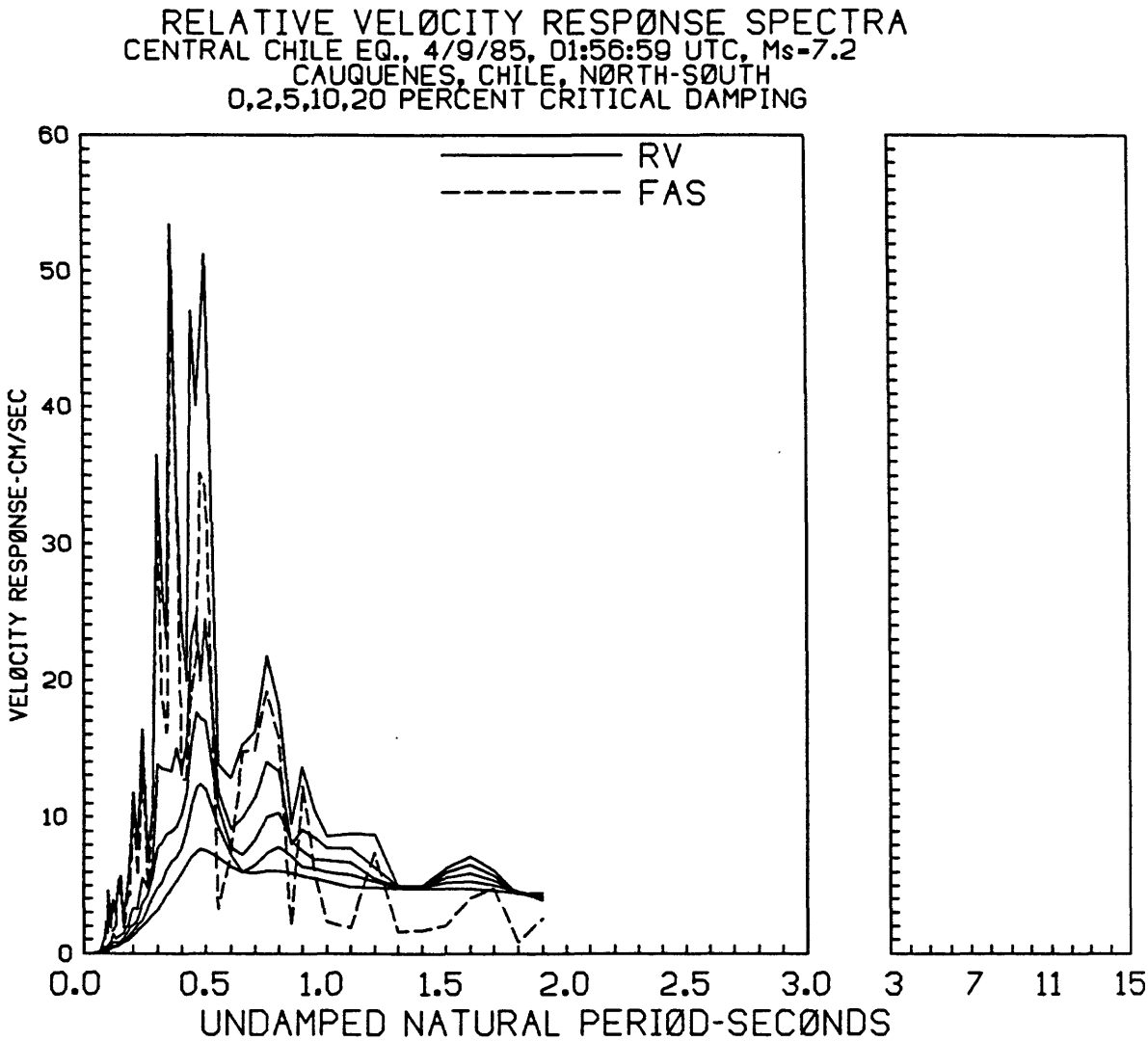


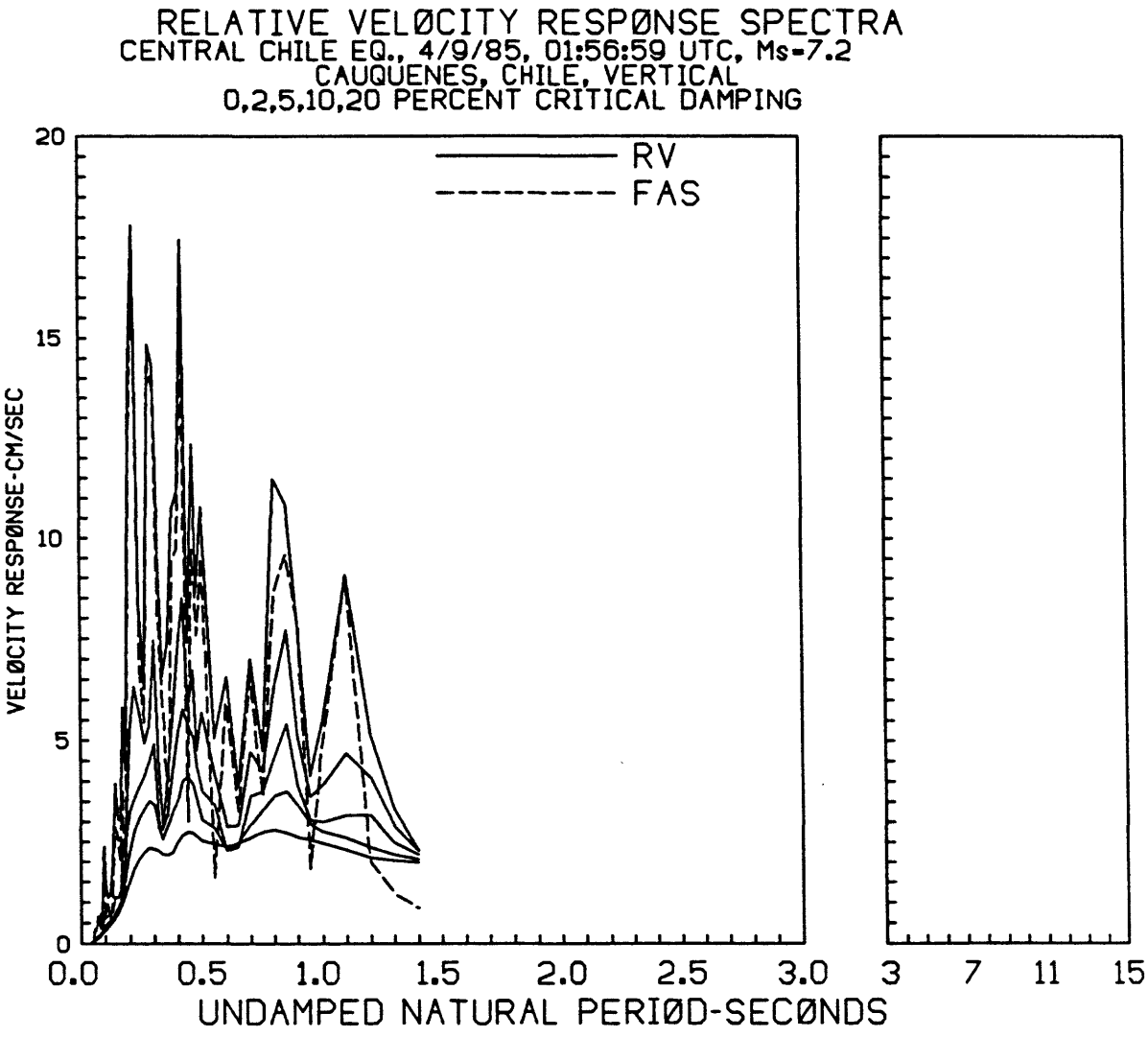
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CAUQUENES, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

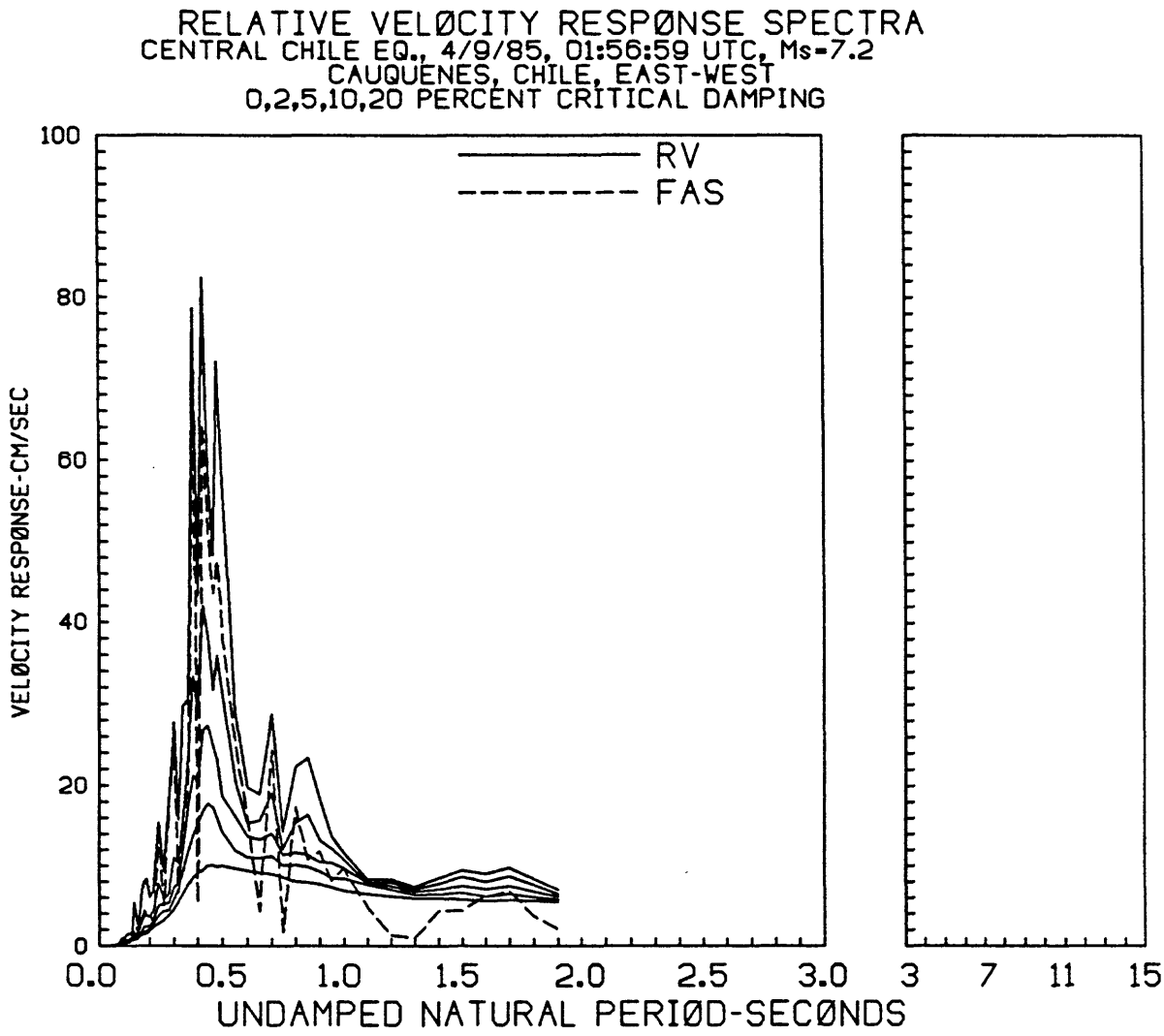


PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CAUQUENES, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CAUQUENES, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
60
50
40
30
20
10
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
CAUQUENES, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

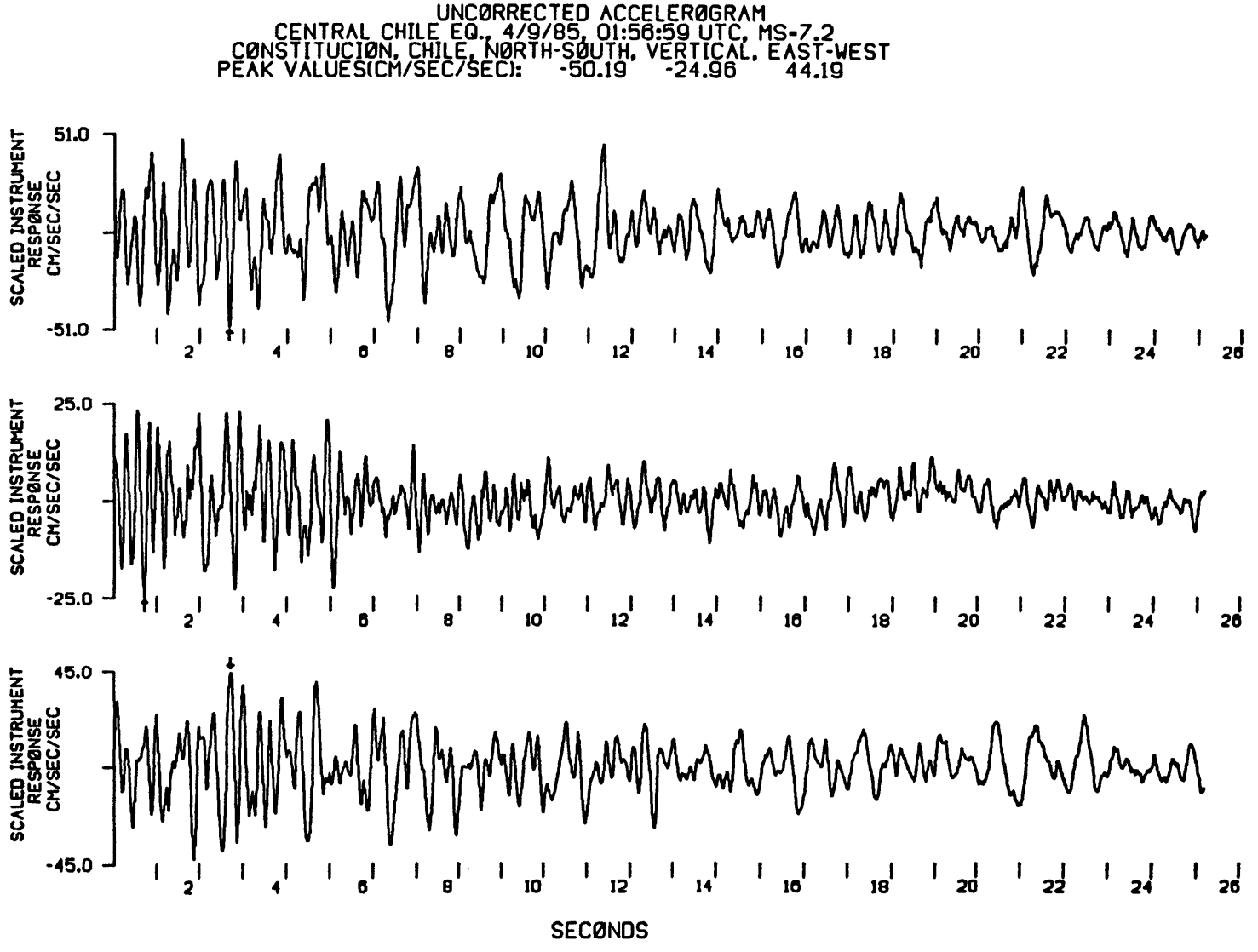

RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
CAUQUENES, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

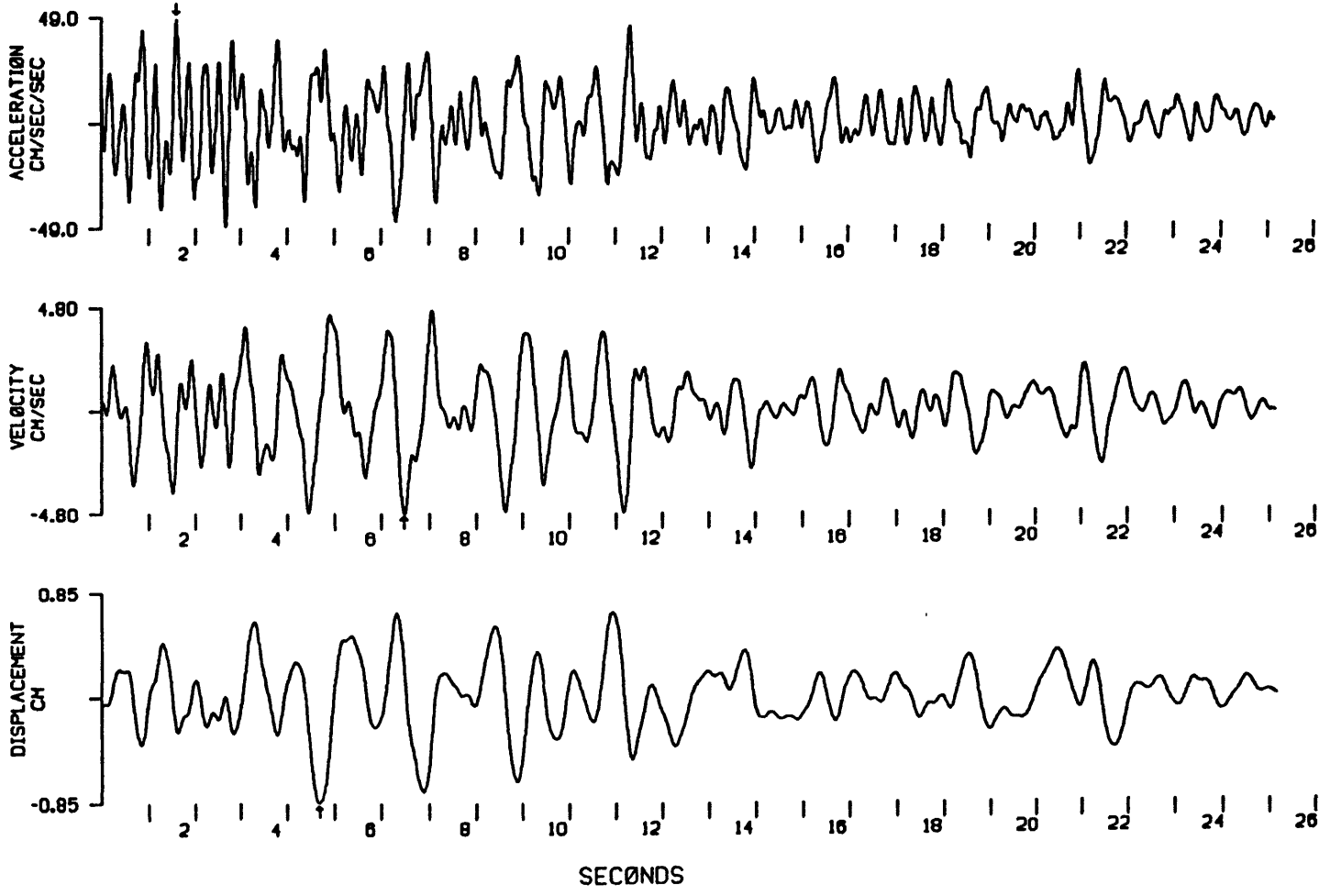
SUMMARY OF STRONG-MOTION RECORD PROCESSING

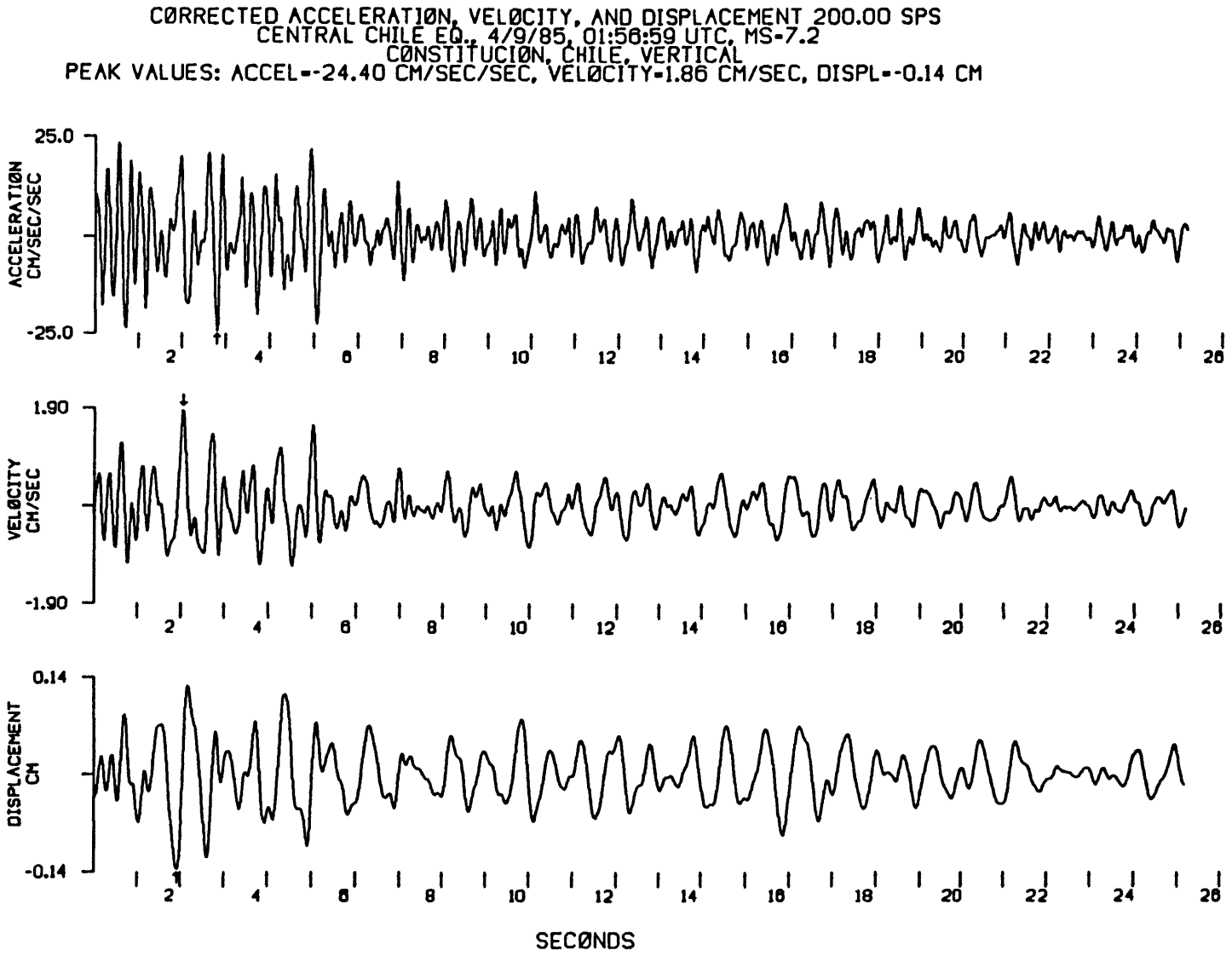
Central Chile earthquake, 4/9/85
01:56:59 UTC, M_S=7.2

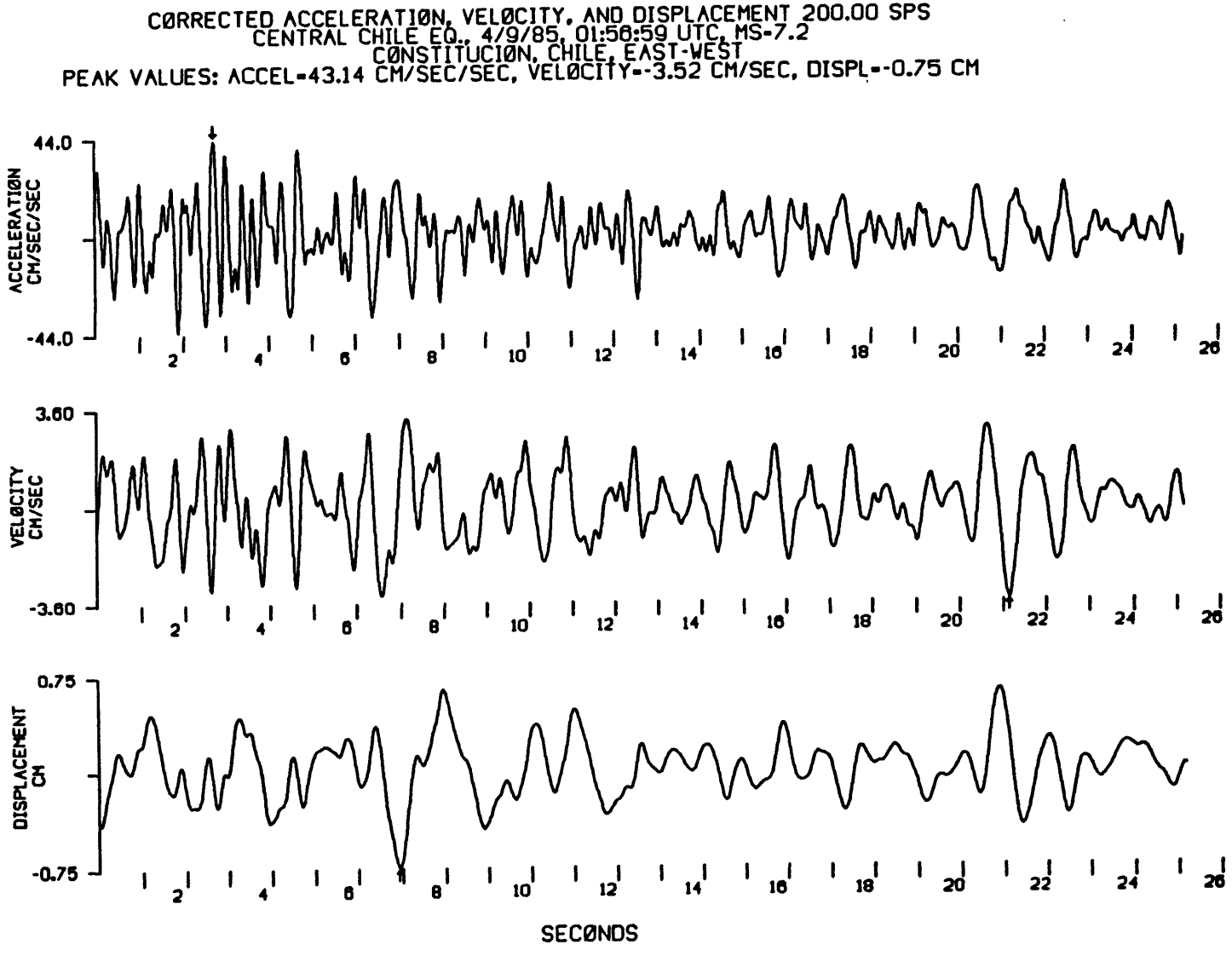
Constitucion, Chile

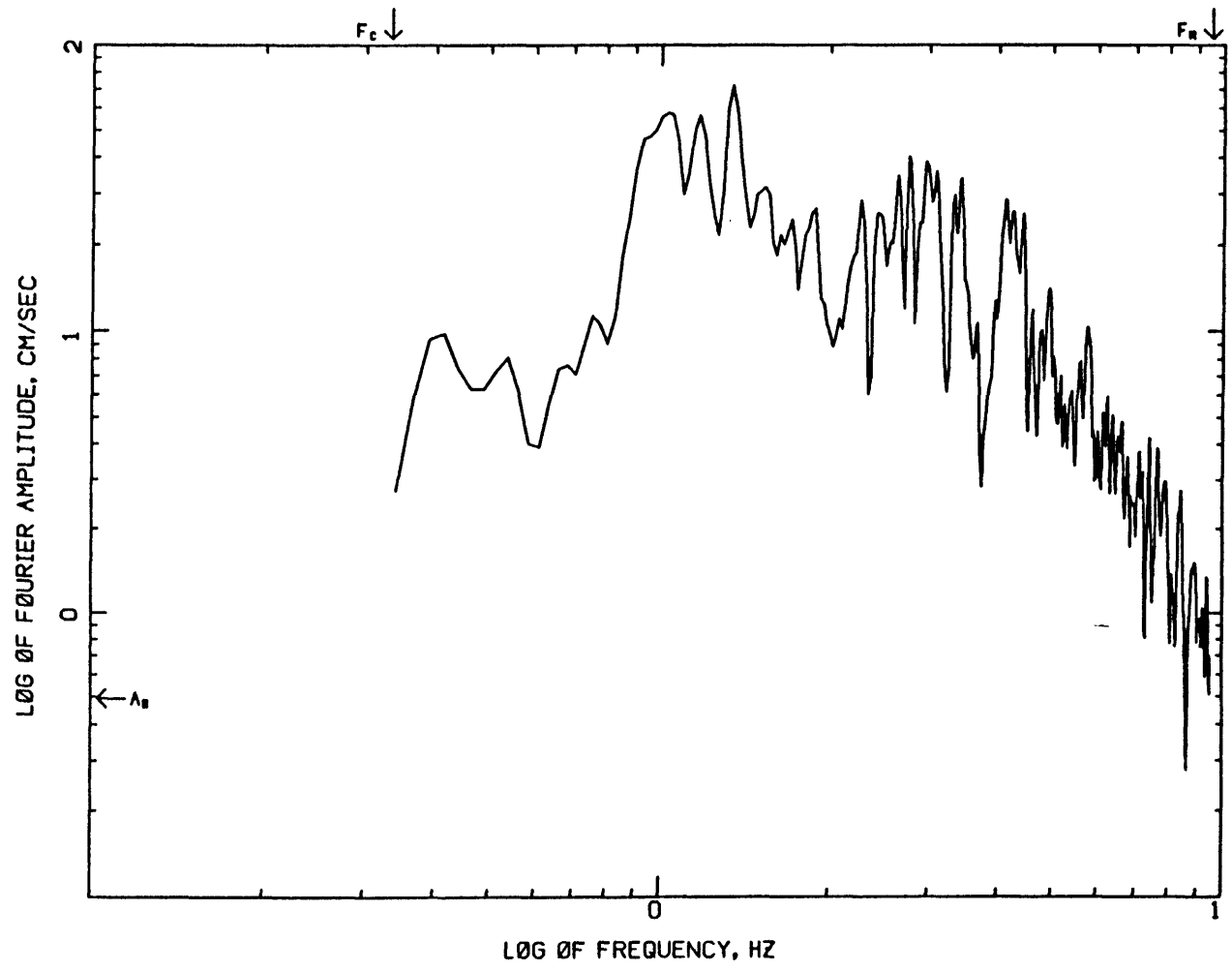
DESCRIPTION	COMPONENT		
	North-South	Vertical	East-West
Instrument Characteristics:			
Frequency (Hz)	25.6	26.1	27.0
Damping (% Critical)	58.5	58.5	61.5
Filter Parameters:			
Highcut (Hz)	9.5	9.5	9.5
Lowcut (Hz)	0.333	0.833	0.333
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	-50.2	-25.0	44.2
Peak Acceleration, A (cm/s/s)	48.3	-24.4	43.1
Peak Velocity, V (cm/s)	-4.80	1.86	-3.52
Peak Displacement, D (cm)	-0.845	-0.137	-0.746
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.099	0.076	0.082
$\lvert AD/V^2 \rvert$	1.8	1.0	2.6

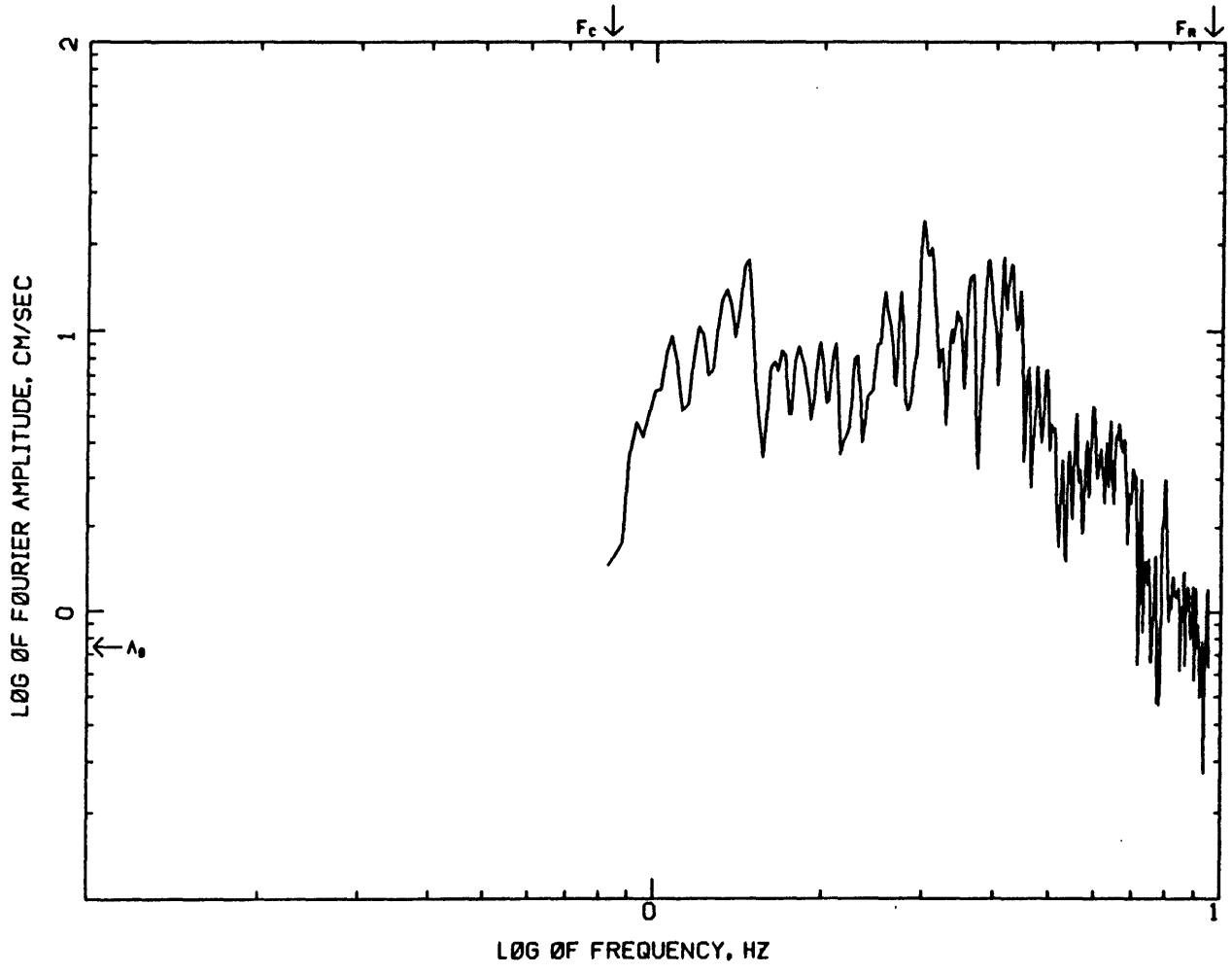

UNCØRRECTED ACCELERØGRAM
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, NØRTH-SØUTH, VERTICAL, EAST-WEST
PEAK VALUES(CM/SEC/SEC): -50.19 -24.96 44.19
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
51.0
-51.0
25.0
-25.0
45.0
-45.0
2
4
6
8
10
12
14
16
18
20
22
24
26
SECØNDS

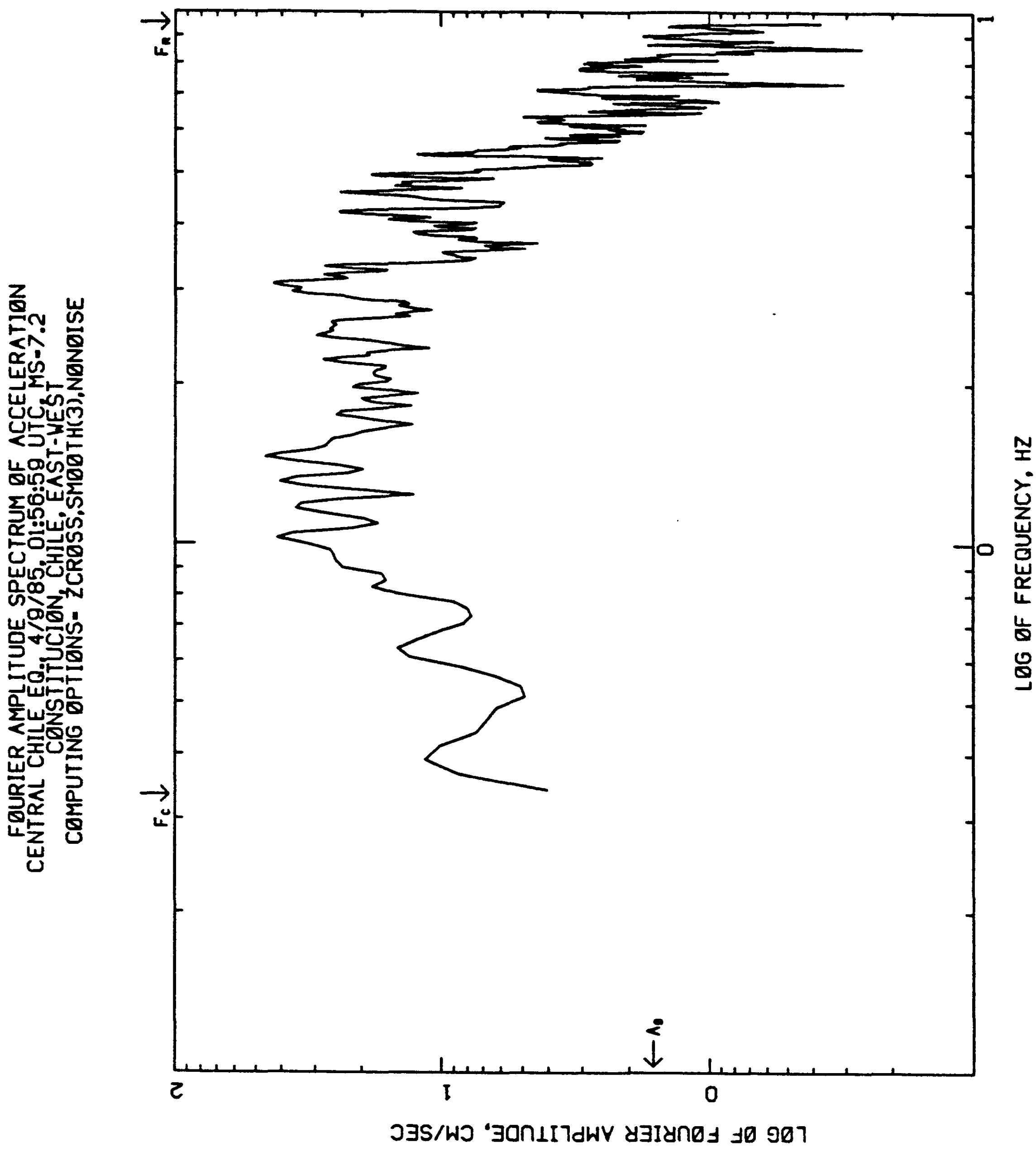

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:58:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, NØRTH-SØUTH
PEAK VALUES: ACCEL=48.32 CM/SEC/SEC, VELØCITY=-4.80 CM/SEC, DISPL=-0.85 CM
ACCELERATIØN CM/SEC/SEC
49.0
-49.0
VELØCITY CM/SEC
4.80
-4.80
DISPLACEMENT CM
0.85
-0.85
2
4
6
8
10
12
14
16
18
20
22
24
26
SECØNDS

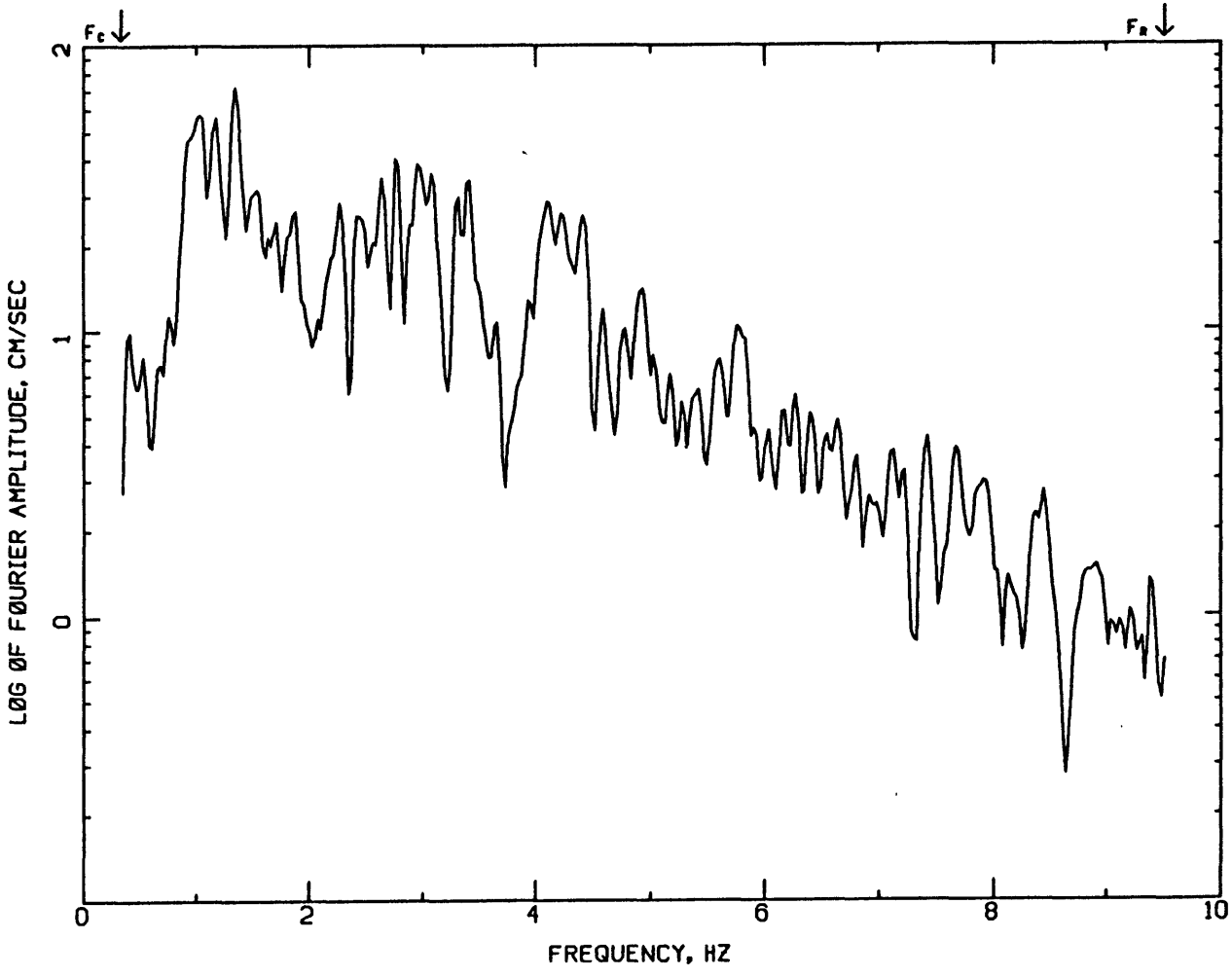

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, VERTICAL
PEAK VALUES: ACCEL=-24.40 CM/SEC/SEC, VELØCITY=1.86 CM/SEC, DISPL=-0.14 CM
ACCELERATIØN CM/SEC/SEC
25.0
-25.0
VELØCITY CM/SEC
1.90
-1.90
DISPLACEMENT CM
0.14
-0.14
2
4
6
8
10
12
14
16
18
20
22
24
26
SECØNDS

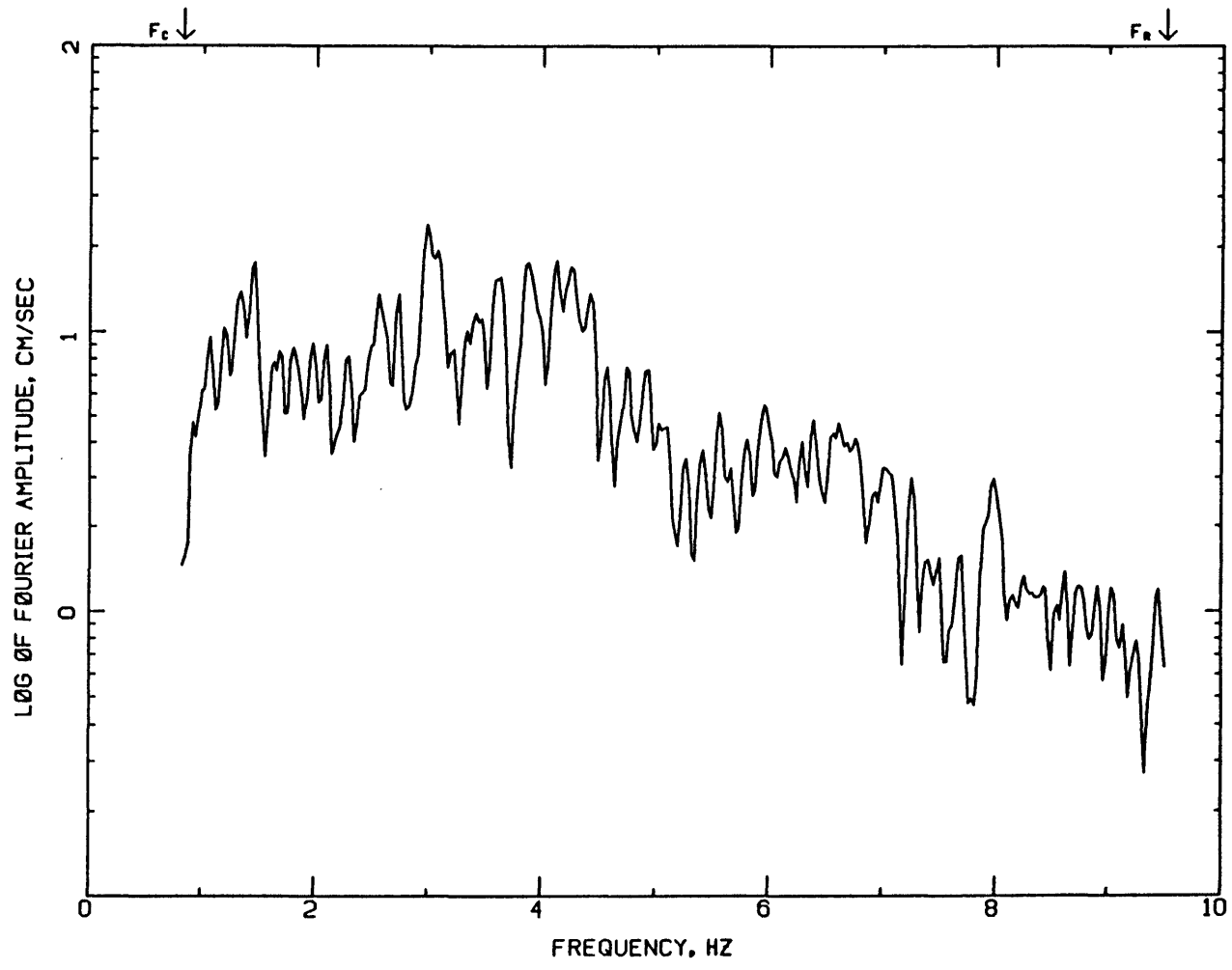

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, EAST-WEST
PEAK VALUES: ACCEL=43.14 CM/SEC/SEC, VELØCITY=-3.52 CM/SEC, DISPL=-0.75 CM
ACCELERATIØN CM/SEC/SEC
44.0
-44.0
VELØCITY CM/SEC
3.60
-3.60
DISPLACEMENT CM
0.75
-0.75
2
4
6
8
10
12
14
16
18
20
22
24
26
SECØNDS

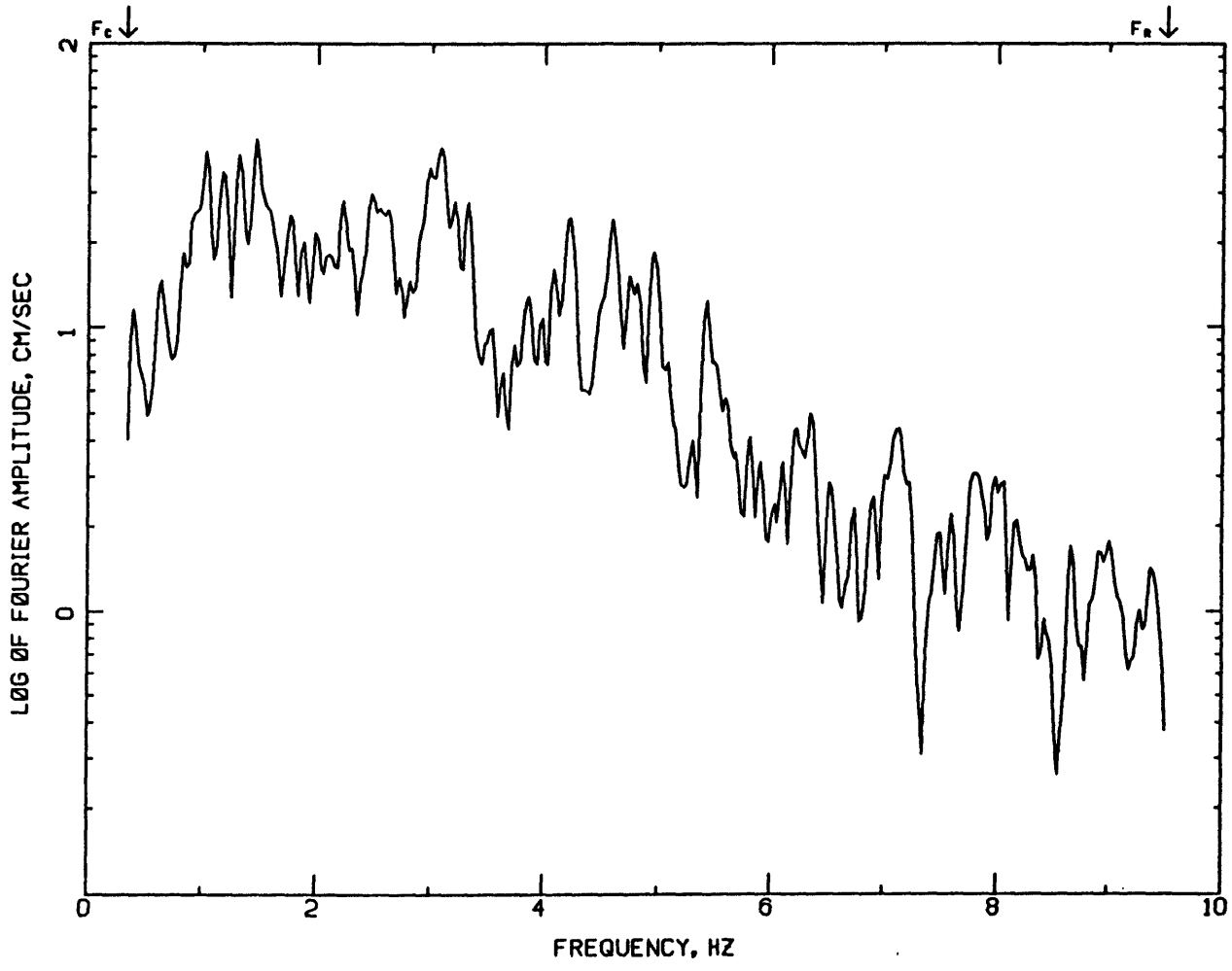

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FN
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
AN
0
1
LØG ØF FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FR
2
1
0
A0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
1
LØG ØF FREQUENCY, HZ

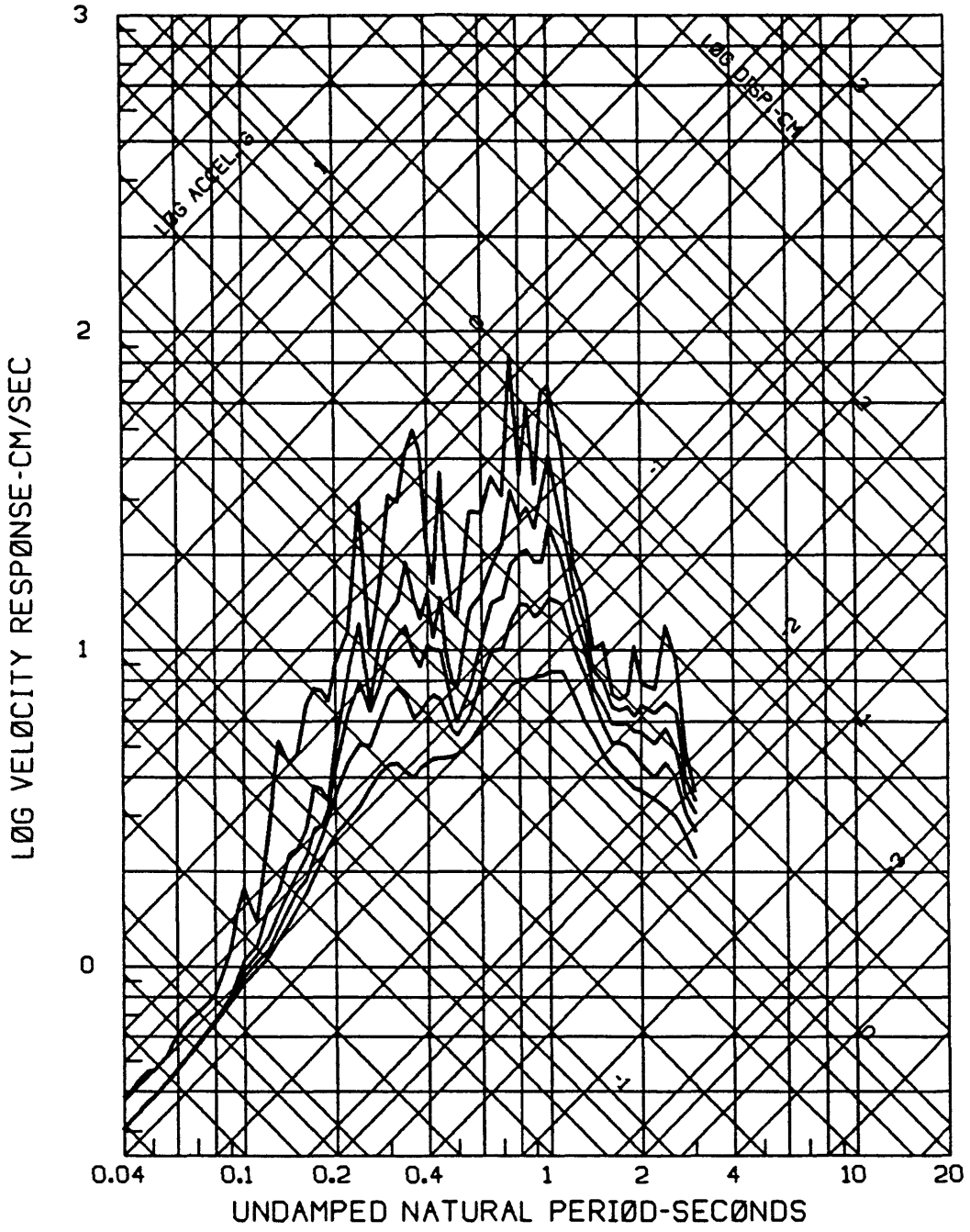

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ. 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
LØG ØF FREQUENCY, HZ
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
1
2
0
1
Fc
Fn
Ao


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
Fn
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
2
4
6
8
10
FREQUENCY, HZ

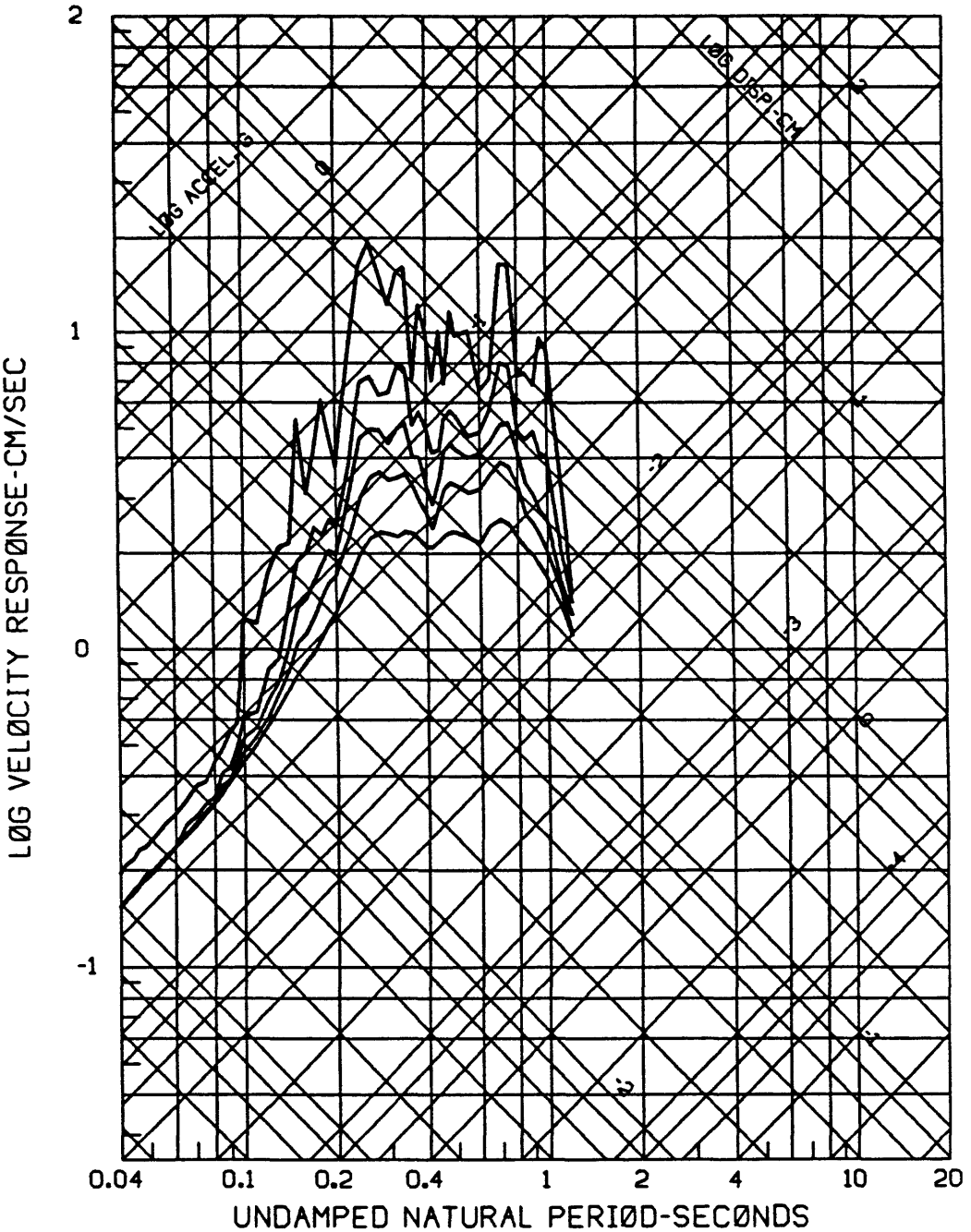

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
Fn
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
2
4
6
8
10
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
CØNSTITUCIØN, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
Fn
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
2
4
6
8
10
FREQUENCY, HZ

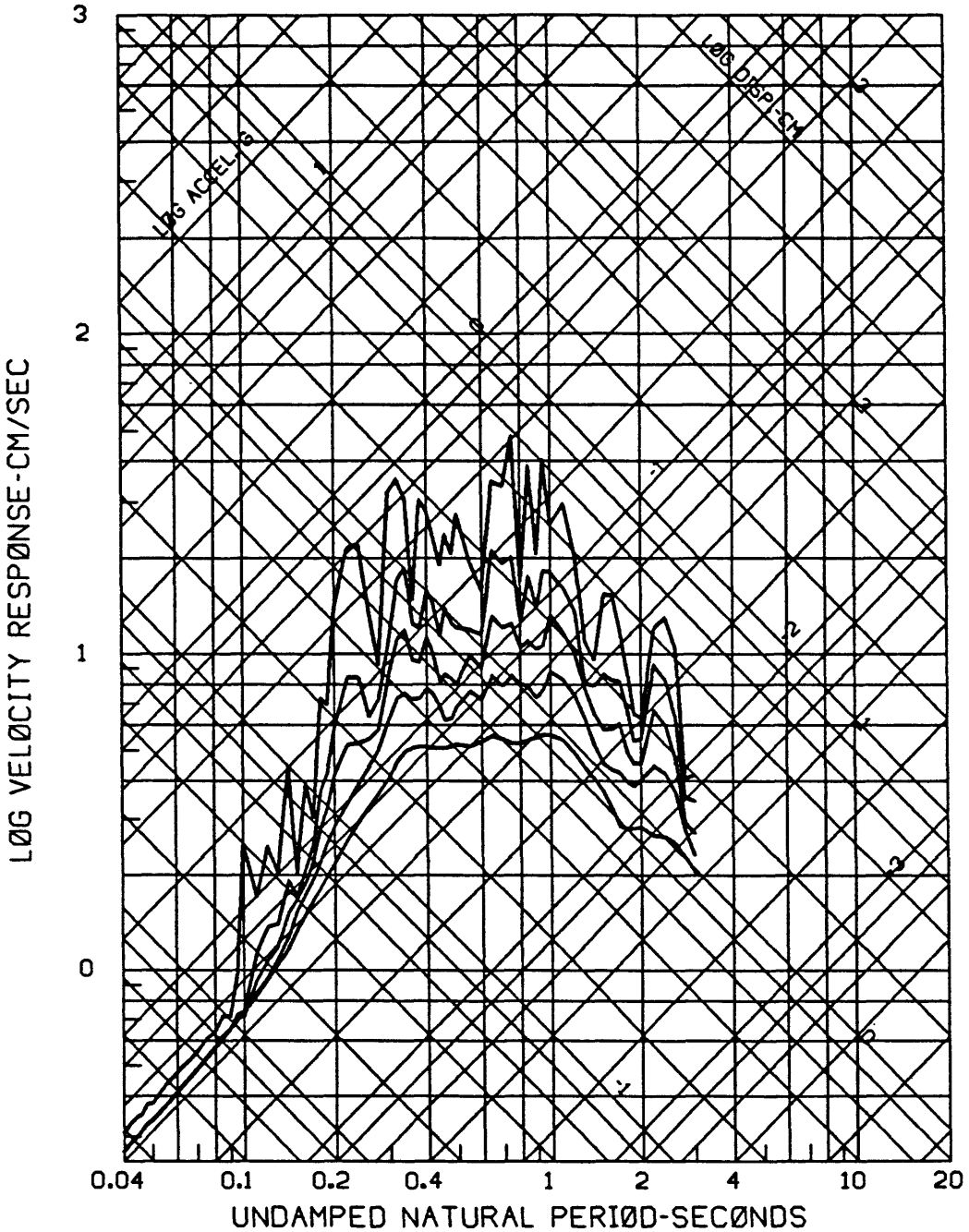
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CØNSTITUCIØN, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING

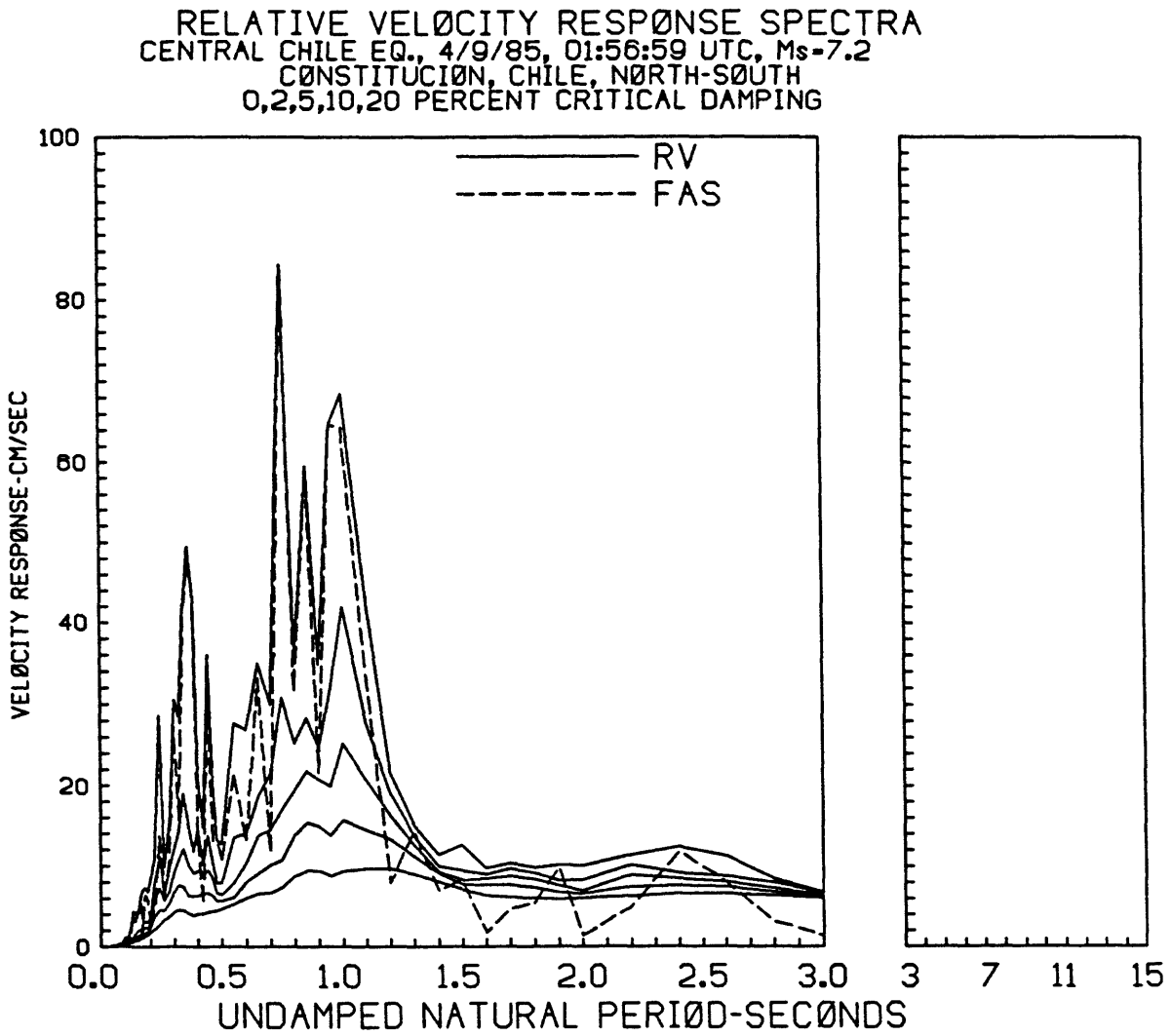


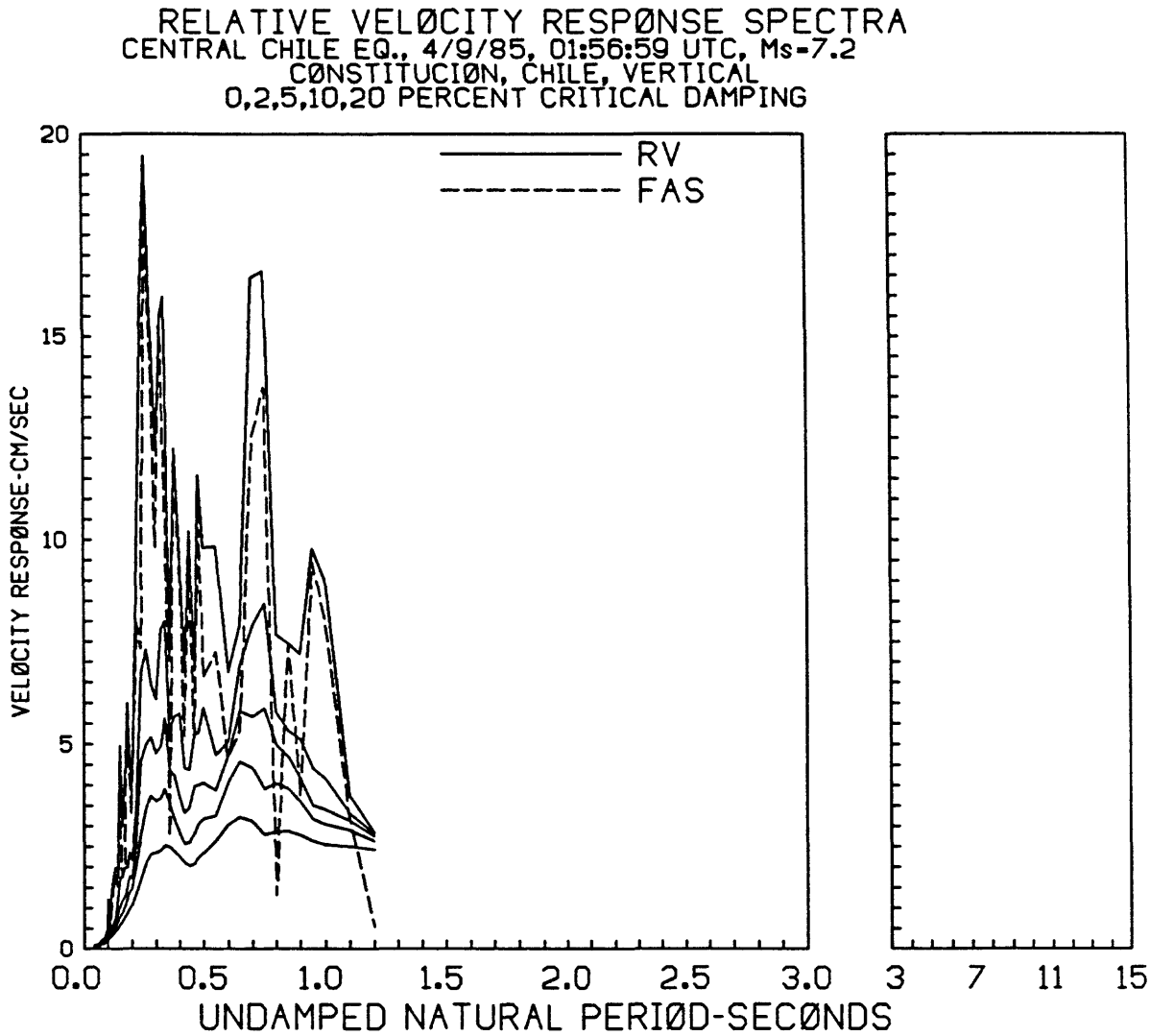
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CØNSTITUCIØN, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

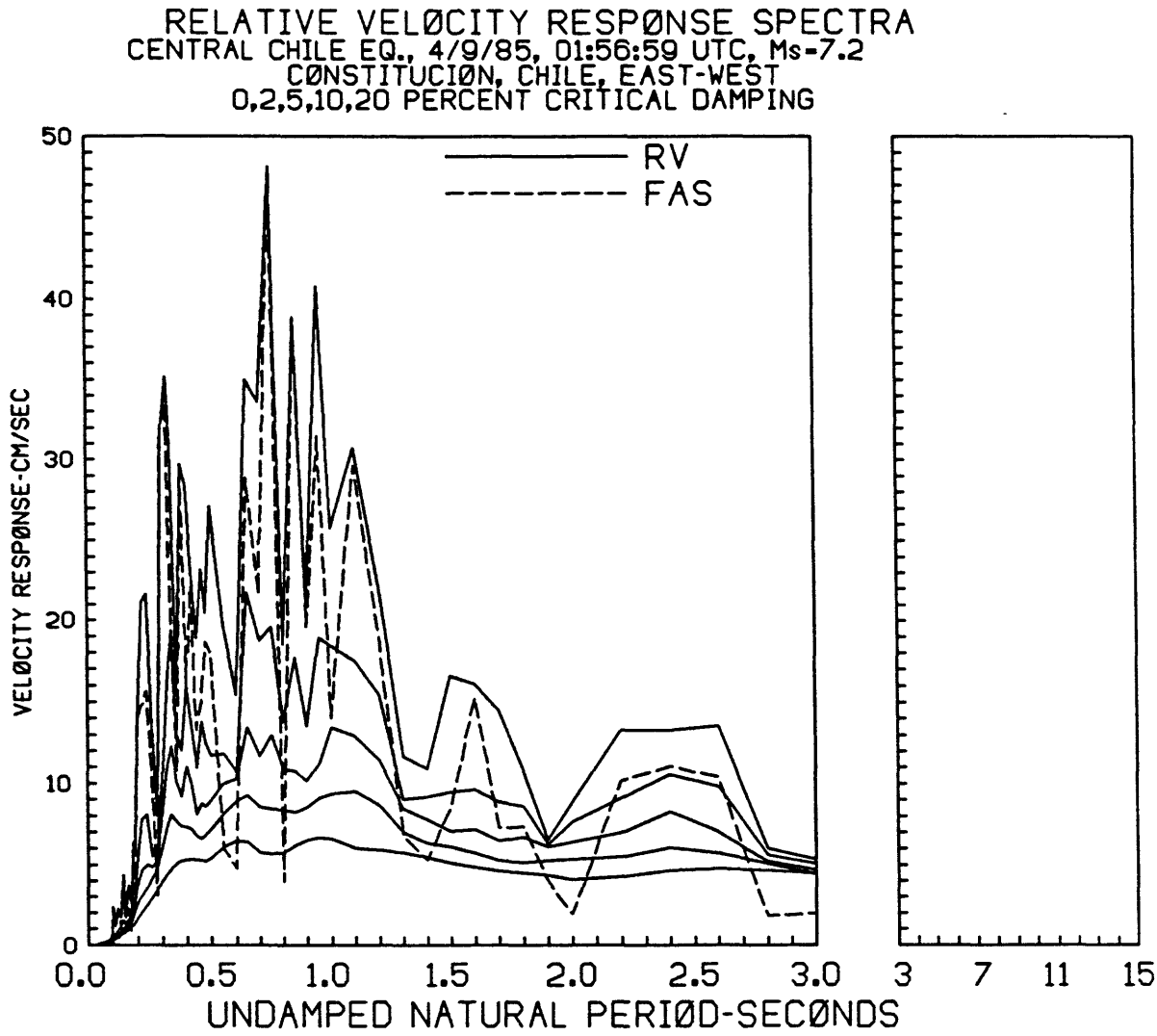


PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CØNSTITUCIØN, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
CØNSTITUCIØN, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
CØNSTITUCIØN, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

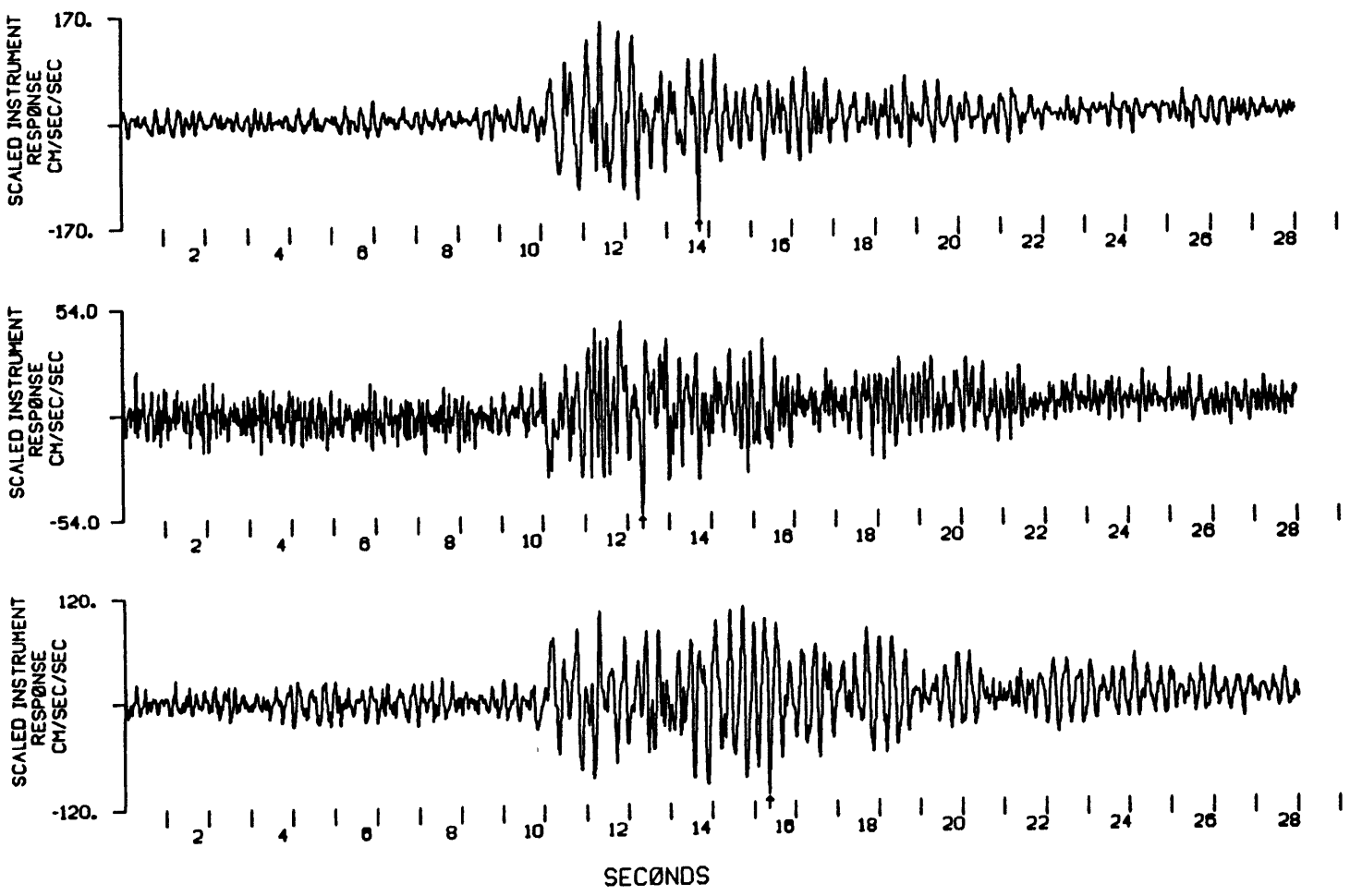

RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
CØNSTITUCIØN, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
10
20
30
40
50
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

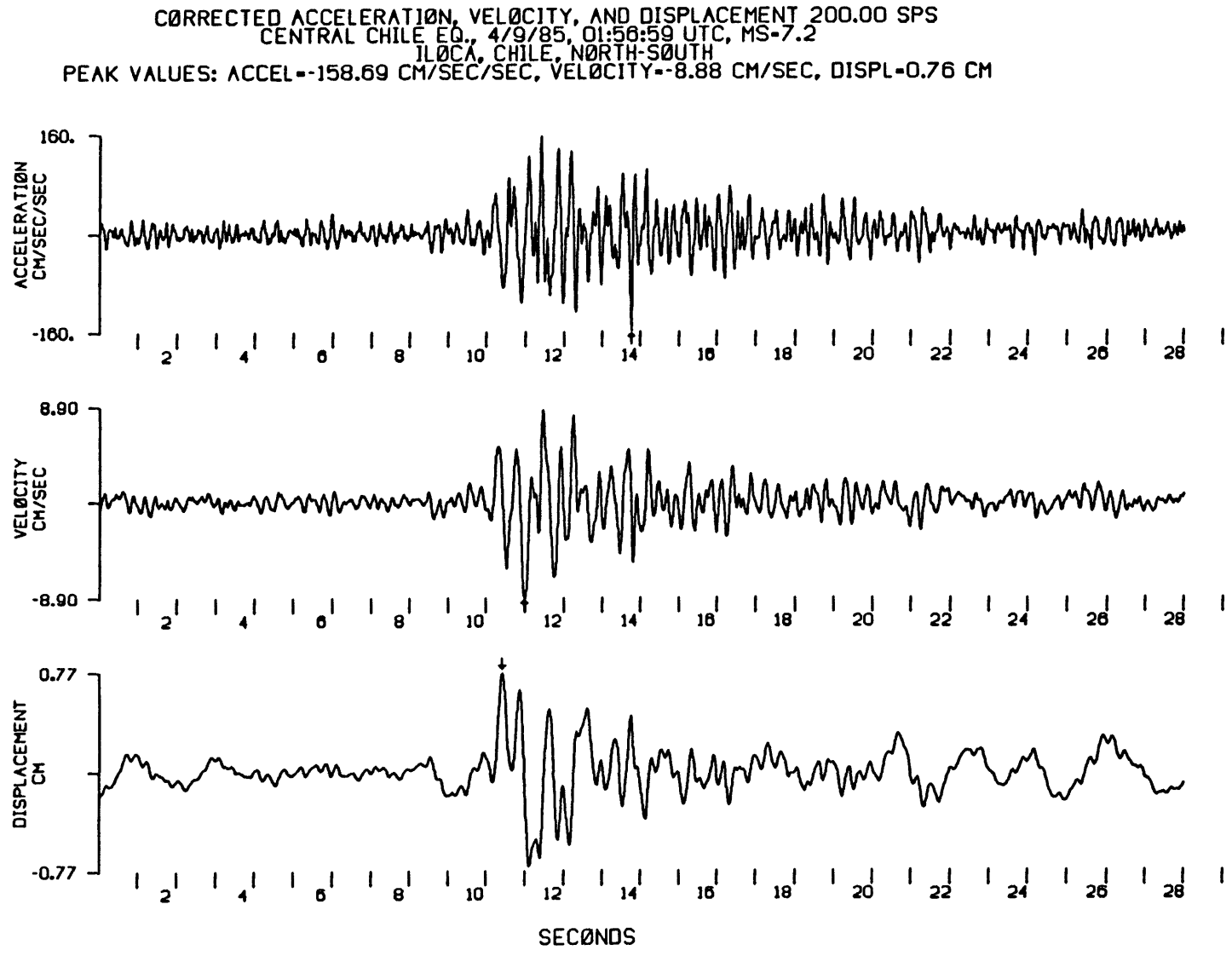
SUMMARY OF STRONG-MOTION RECORD PROCESSING

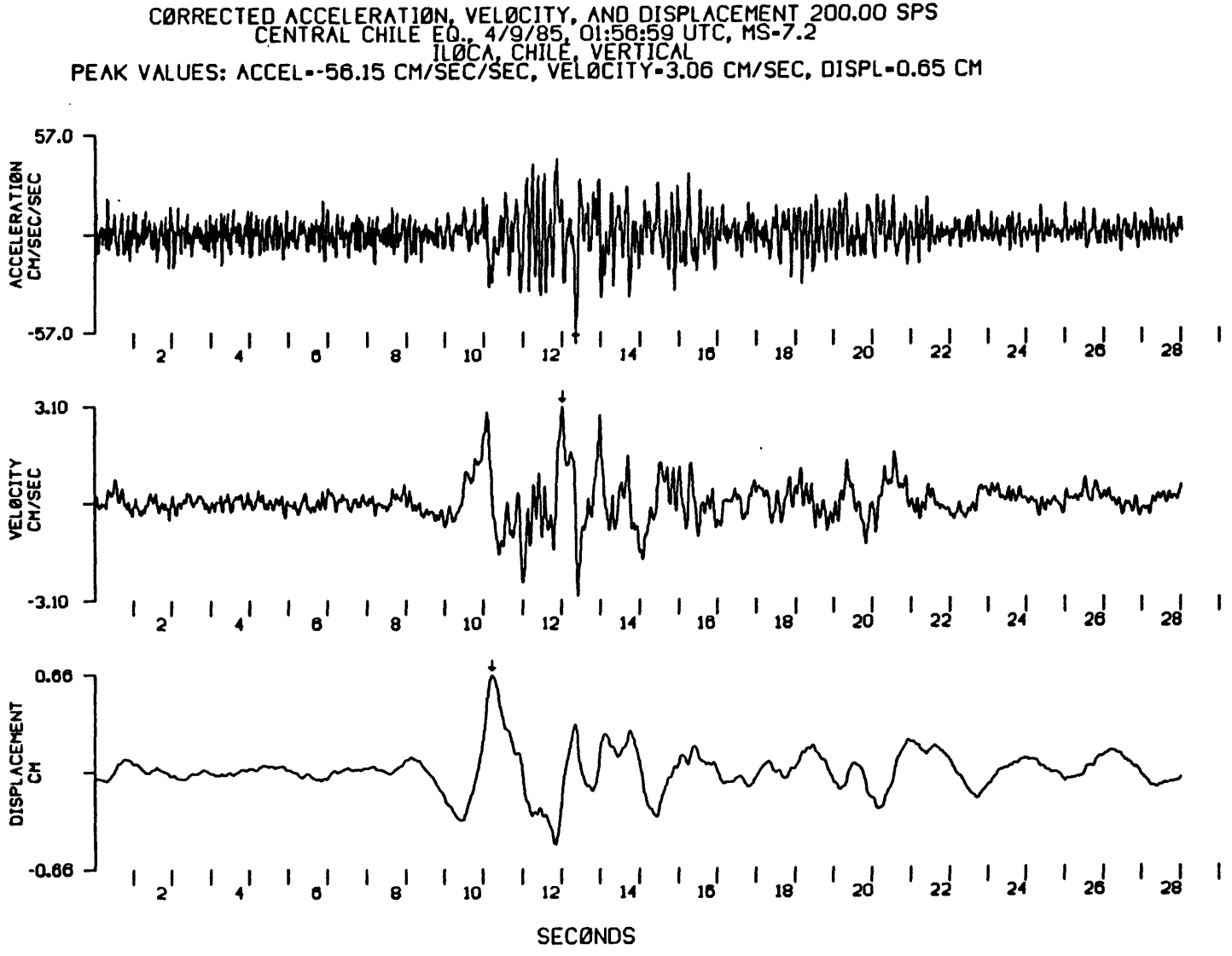
Central Chile earthquake, 4/9/85
01:56:59 UTC, M_S=7.2

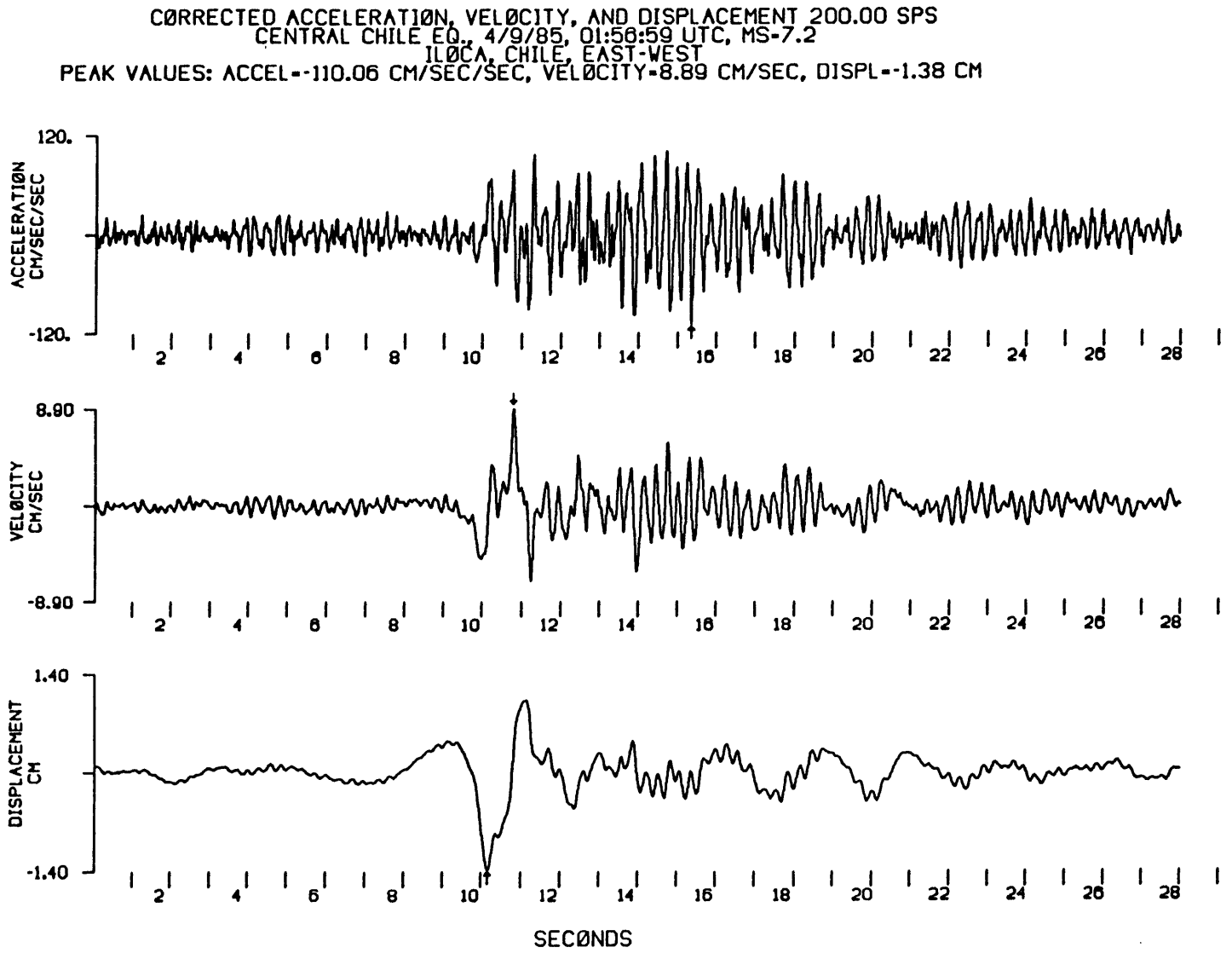
Iloca, Chile

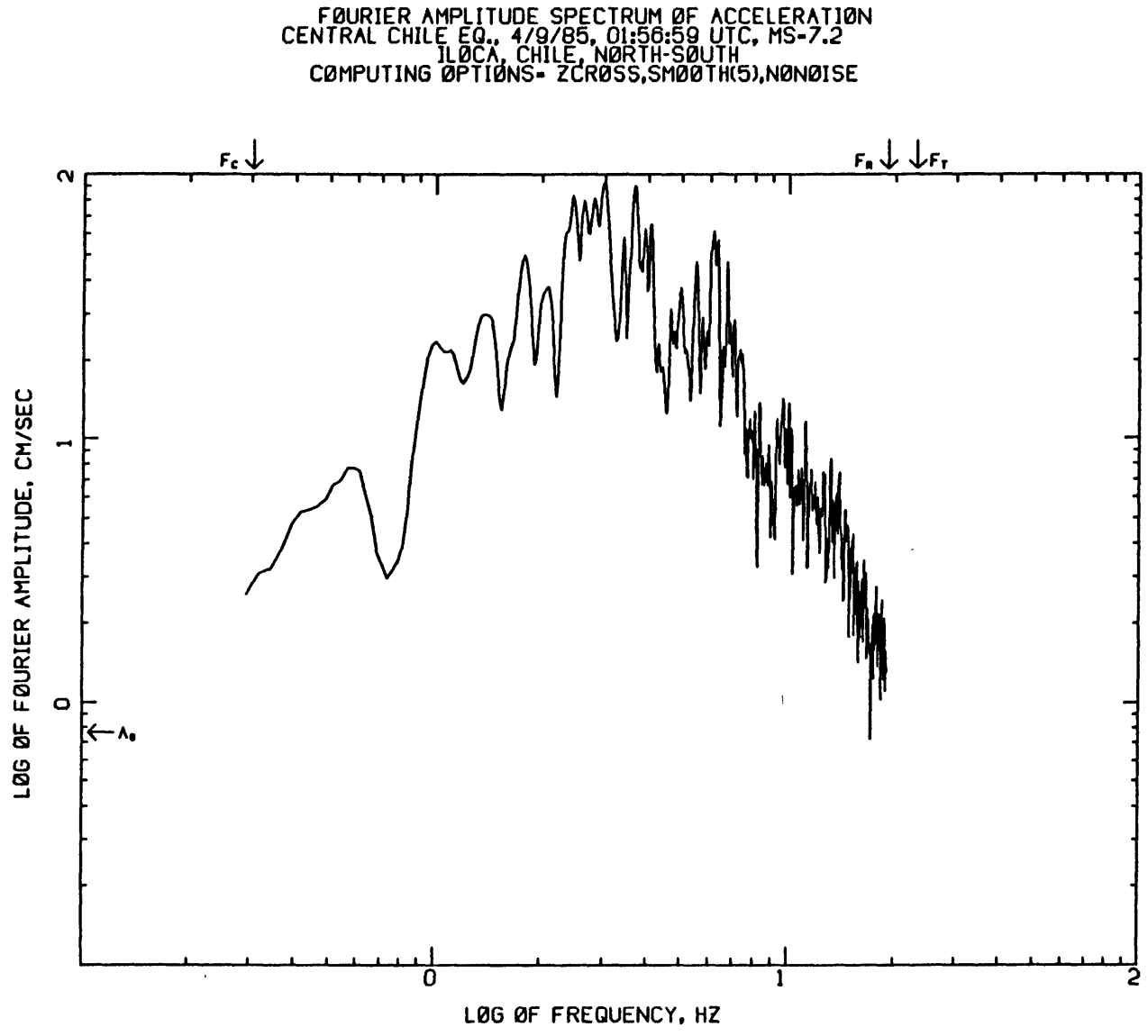
DESCRIPTION	COMPONENT		
	North-South	Vertical	North-South
Instrument Characteristics:			
Frequency (Hz)	25.7	26.3	24.7
Damping (% Critical)	60.6	63.3	60.0
Filter Parameters:			
Highcut (Hz)	19.0	31.0	20.0
Lowcut (Hz)	0.303	0.303	0.250
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	-162.5	-53.8	-111.5
Peak Acceleration, A (cm/s/s)	-158.7	-56.2	-110.1
Peak Velocity, V (cm/s)	-8.88	3.06	8.89
Peak Displacement, D (cm)	0.763	0.654	-1.38
Parameter Ratios:			
$\|V/A\|$ (sec)	0.056	0.054	0.081
$\|AD/V^2\|$	1.5	3.9	1.9

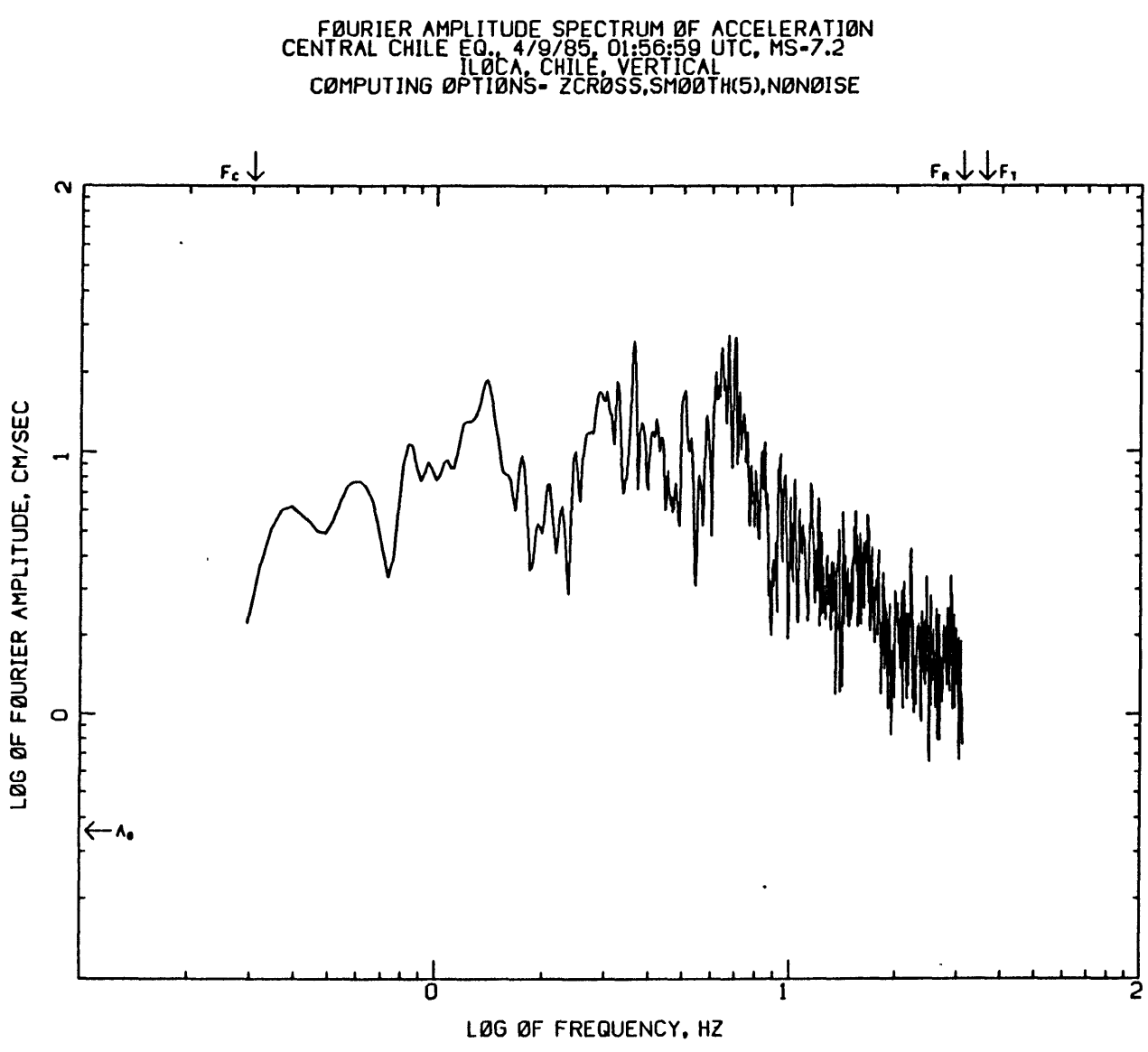

UNCØRRECTED ACCELERØGRAM
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, NØRTH-SØUTH, VERTICAL, EAST-WEST
PEAK VALUES(CM/SEC/SEC): -162.49 -53.81 -111.54
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
170.
-170.
54.0
-54.0
120.
-120.
2
4
6
8
10
12
14
16
18
20
22
24
26
28
SECØNDS

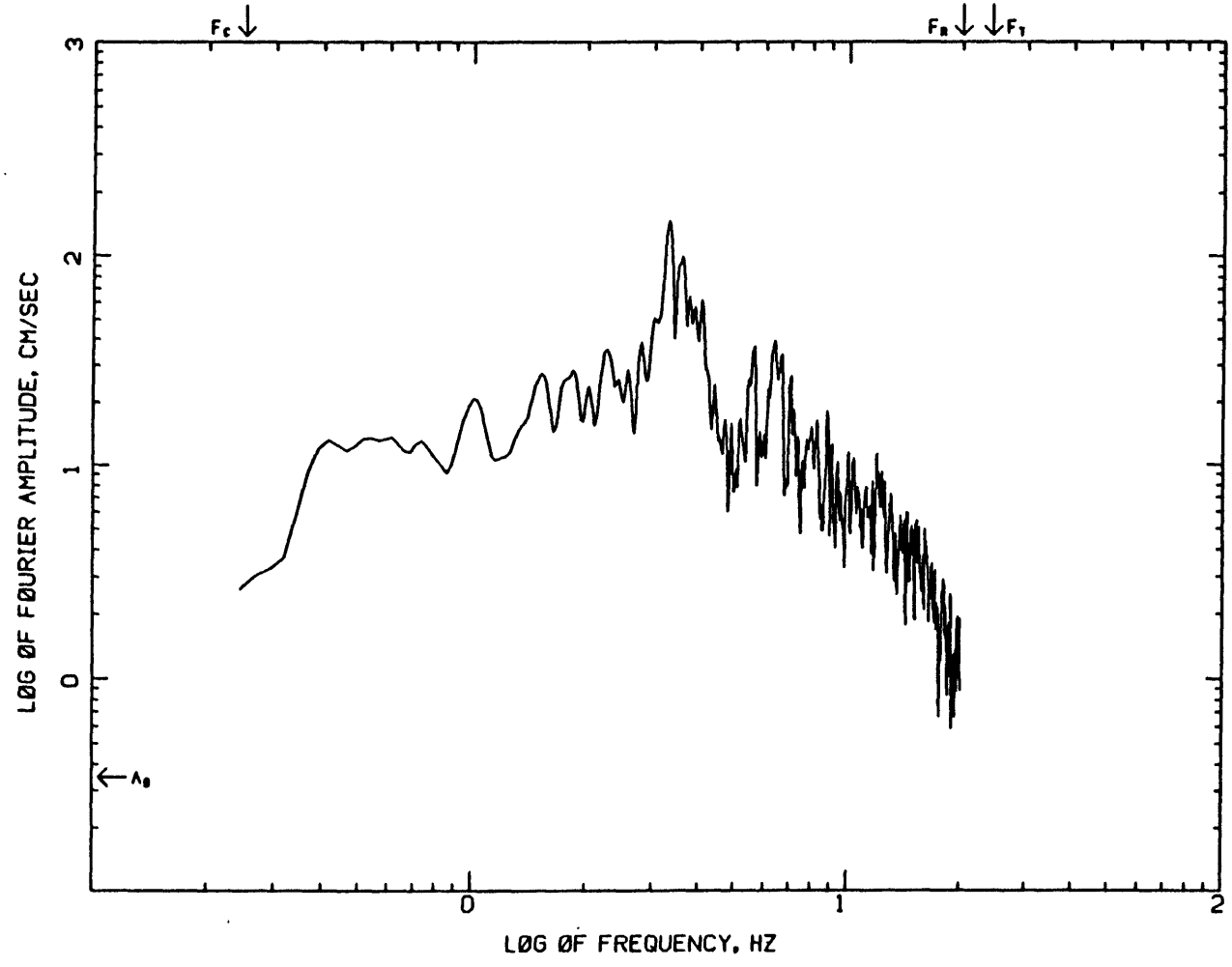

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, NØRTH-SØUTH
PEAK VALUES: ACCEL=-158.69 CM/SEC/SEC, VELØCITY=-8.88 CM/SEC, DISPL=0.76 CM
ACCELERATIØN CM/SEC/SEC
160.
-160.
VELØCITY CM/SEC
8.90
-8.90
DISPLACEMENT CM
0.77
-0.77
2
4
6
8
10
12
14
16
18
20
22
24
26
28
SECØNDS

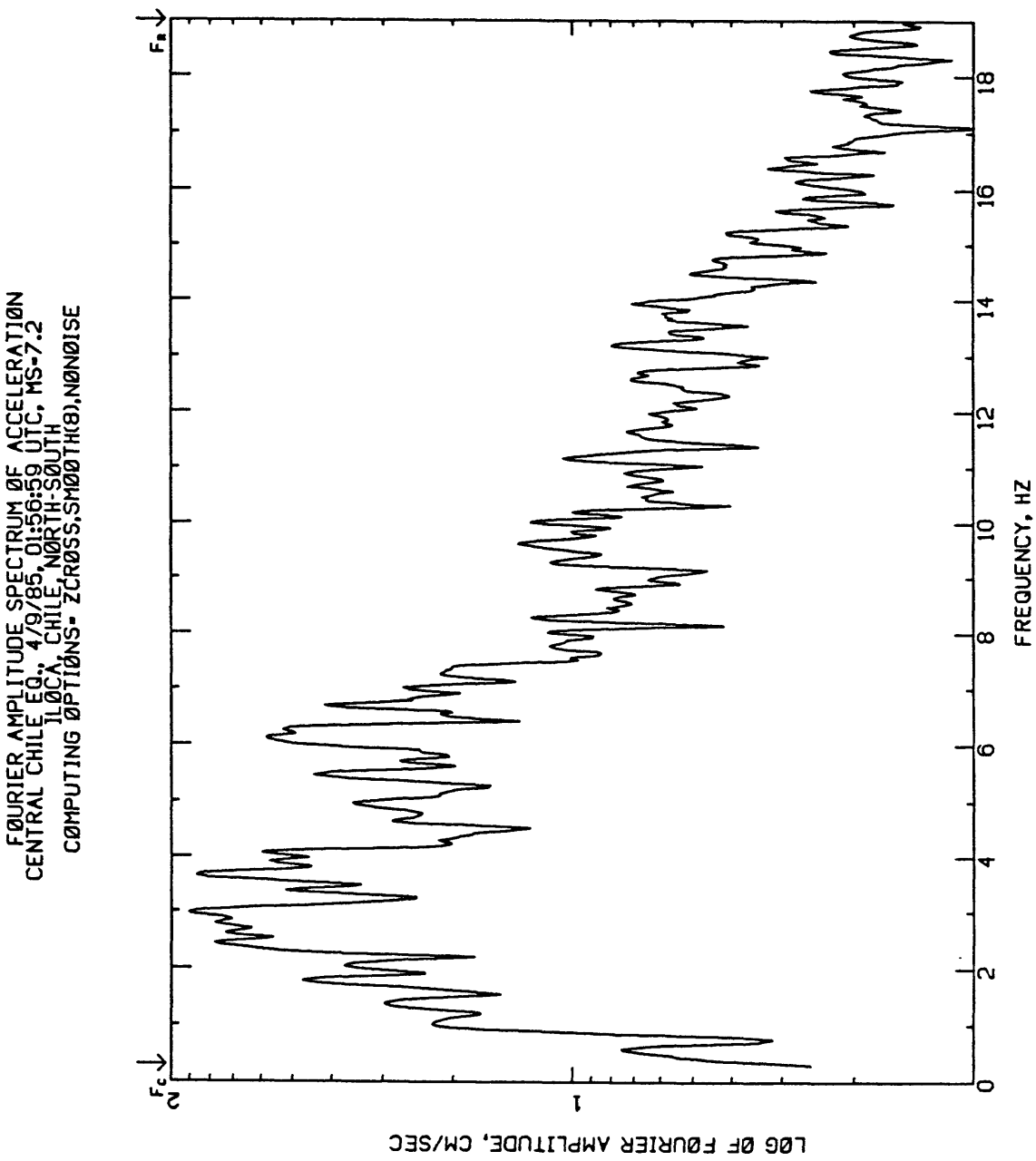

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, VERTICAL
PEAK VALUES: ACCEL=-56.15 CM/SEC/SEC, VELØCITY=3.06 CM/SEC, DISPL=0.65 CM
ACCELERATIØN CM/SEC/SEC
57.0
-57.0
VELØCITY CM/SEC
3.10
-3.10
DISPLACEMENT CM
0.66
-0.66
2
4
6
8
10
12
14
16
18
20
22
24
26
28
SECØNDS

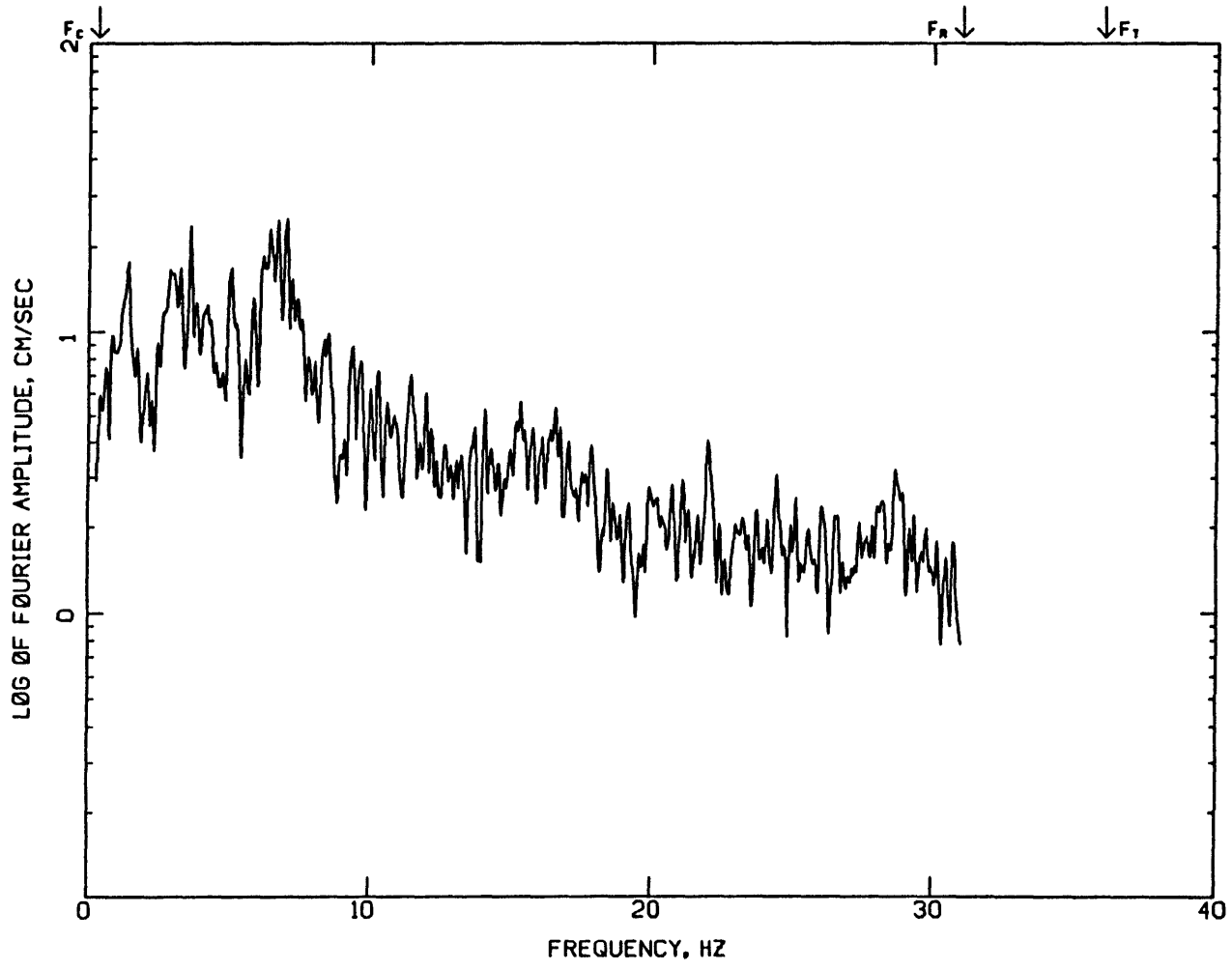

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:58:59 UTC, MS-7.2
ILØCA, CHILE, EAST-WEST
PEAK VALUES: ACCEL=-110.06 CM/SEC/SEC, VELØCITY=8.89 CM/SEC, DISPL=-1.38 CM
ACCELERATIØN CM/SEC/SEC
120.
-120.
VELØCITY CM/SEC
8.90
-8.90
DISPLACEMENT CM
1.40
-1.40
2
4
6
8
10
12
14
16
18
20
22
24
26
28
SECØNDS

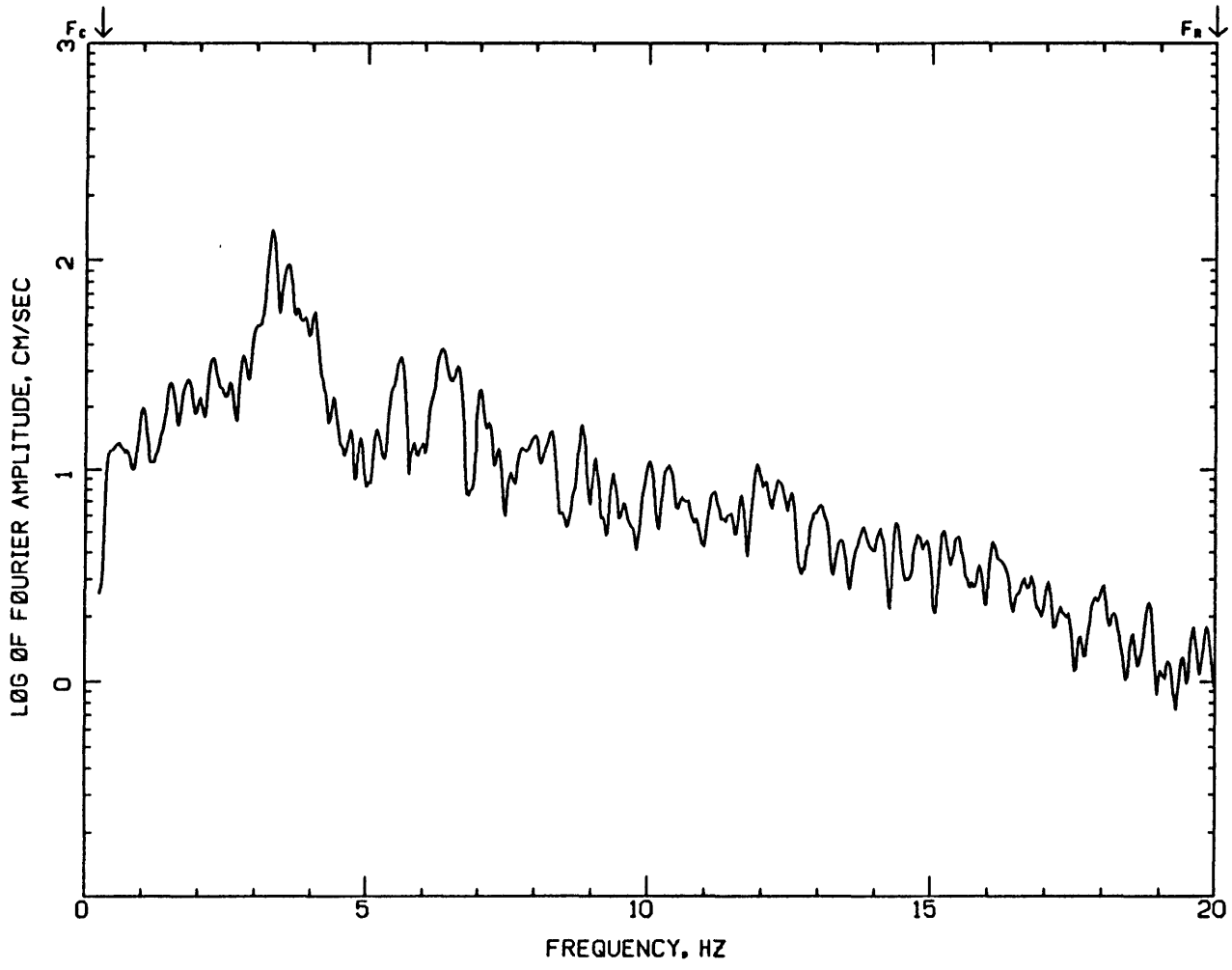

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
Ao
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
F1
A0
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2

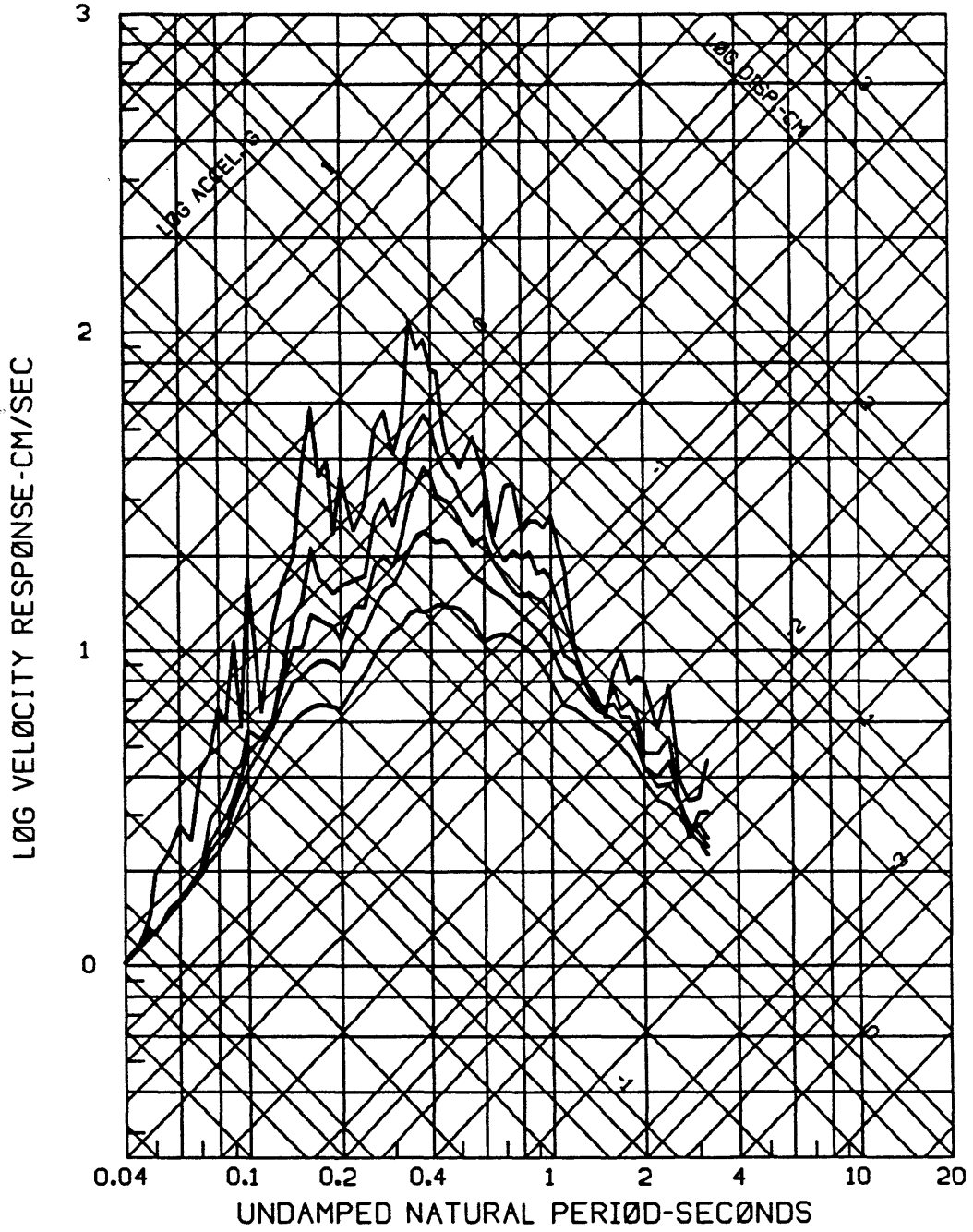

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
Fs
F1
A0
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
3
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(8),NØNØISE
LØG ØF FØURIER AMPLITUDE, CM/SEC
FREQUENCY, HZ
2
1
0
2
4
6
8
10
12
14
16
18
Fc
Fn

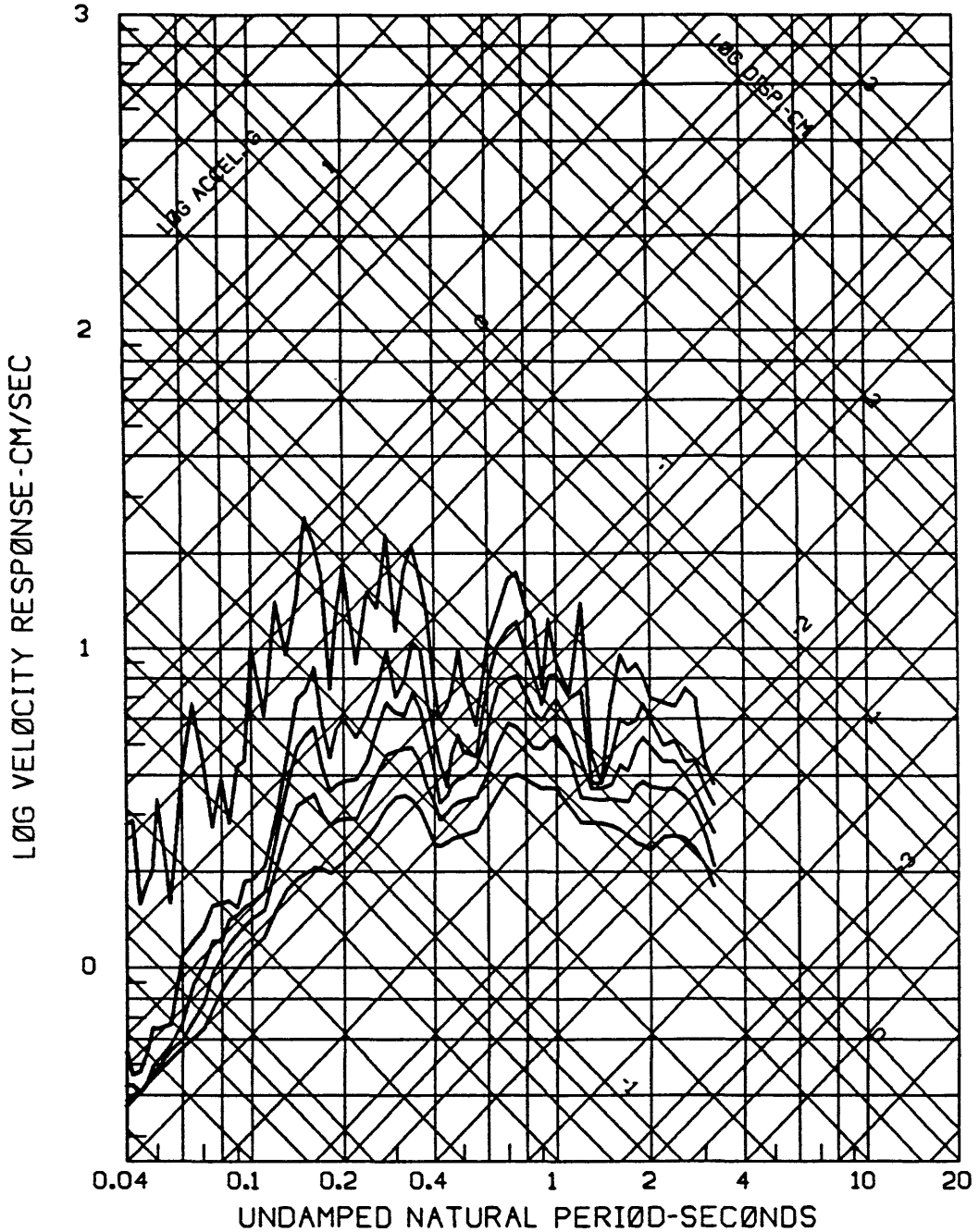

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(8),NØNØISE
Fc
FR
FT
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
10
20
30
40
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
ILØCA, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(8),NØNØISE
Fc
FN
3
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
FREQUENCY, HZ

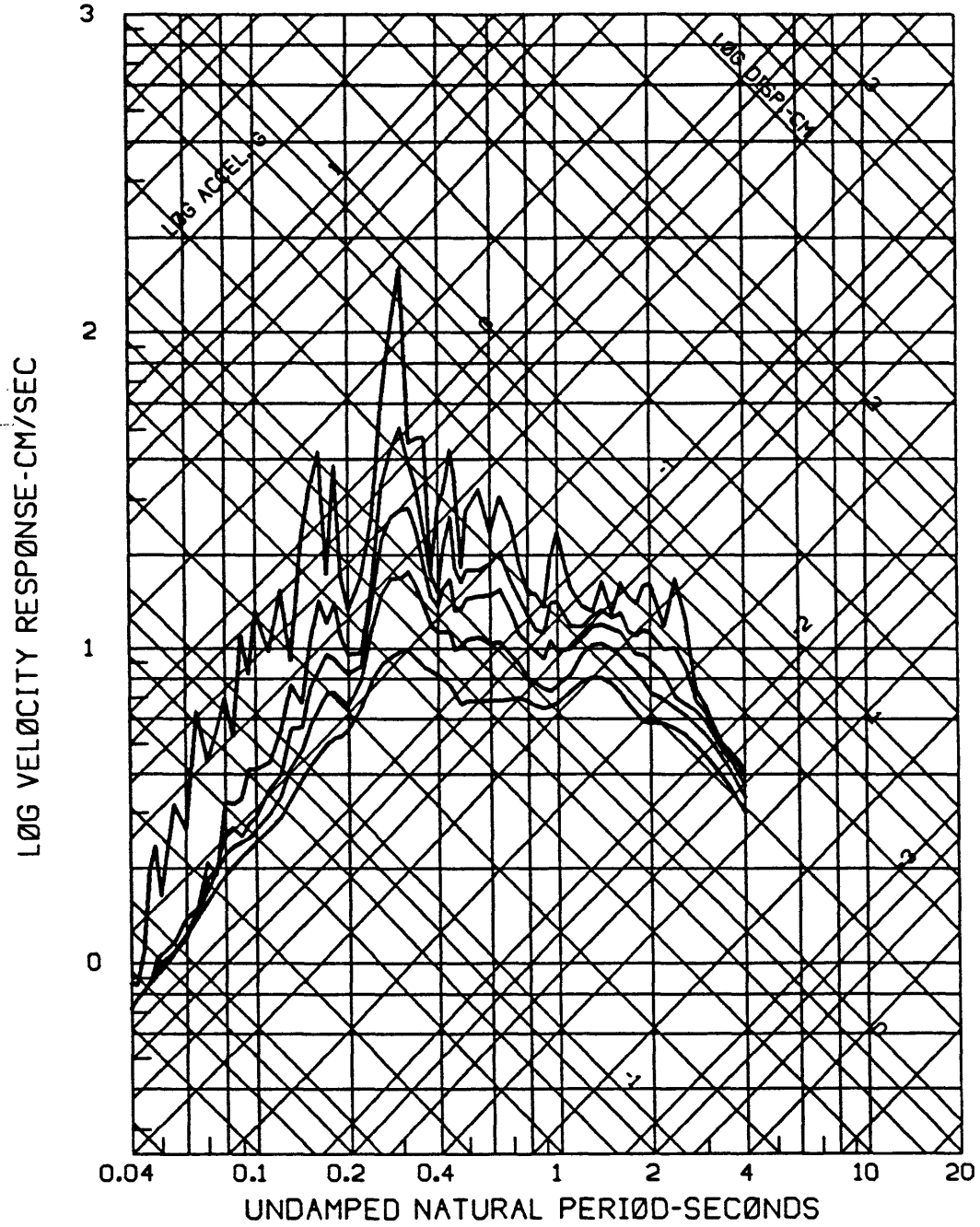
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
ILØCA, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING

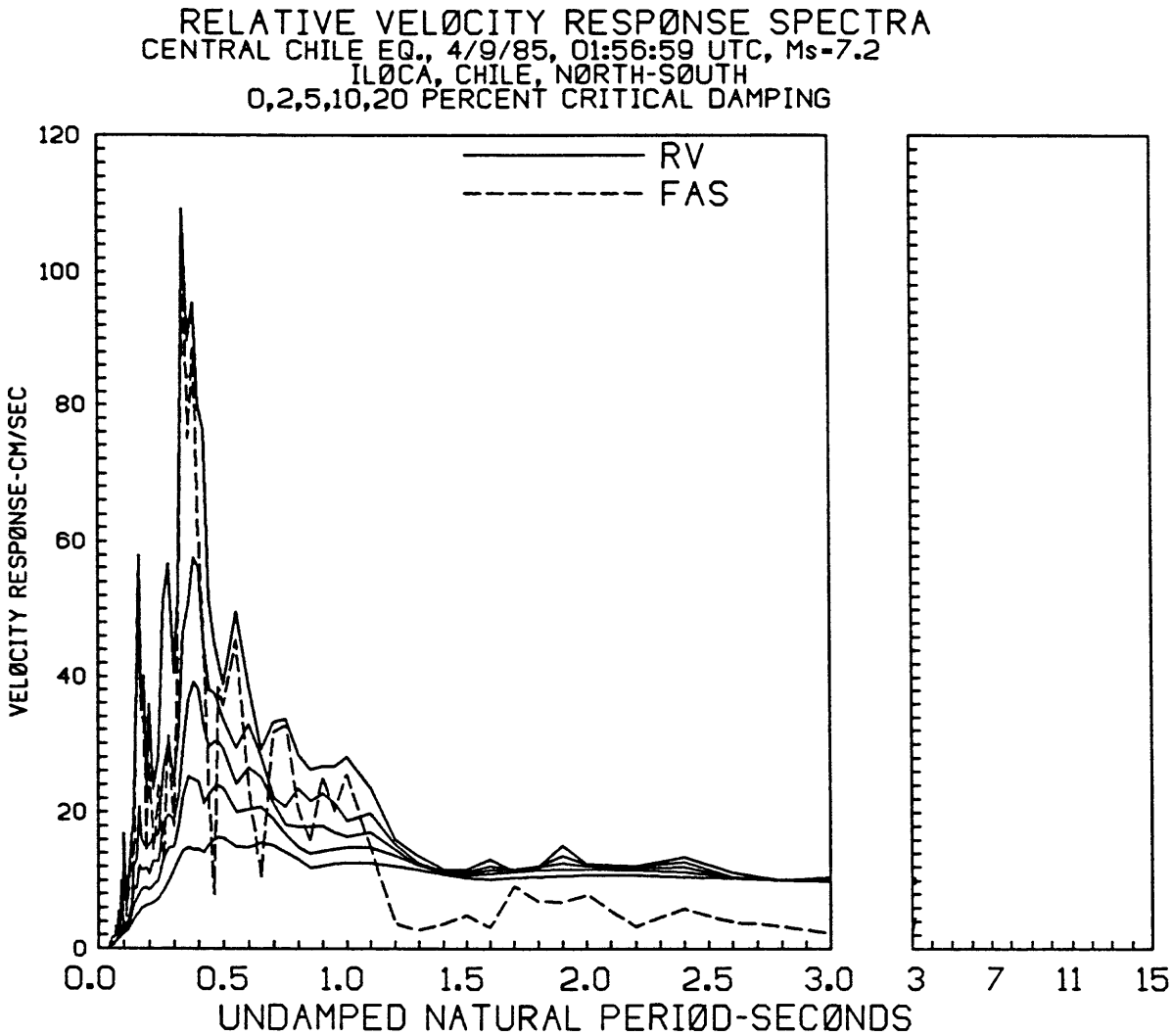


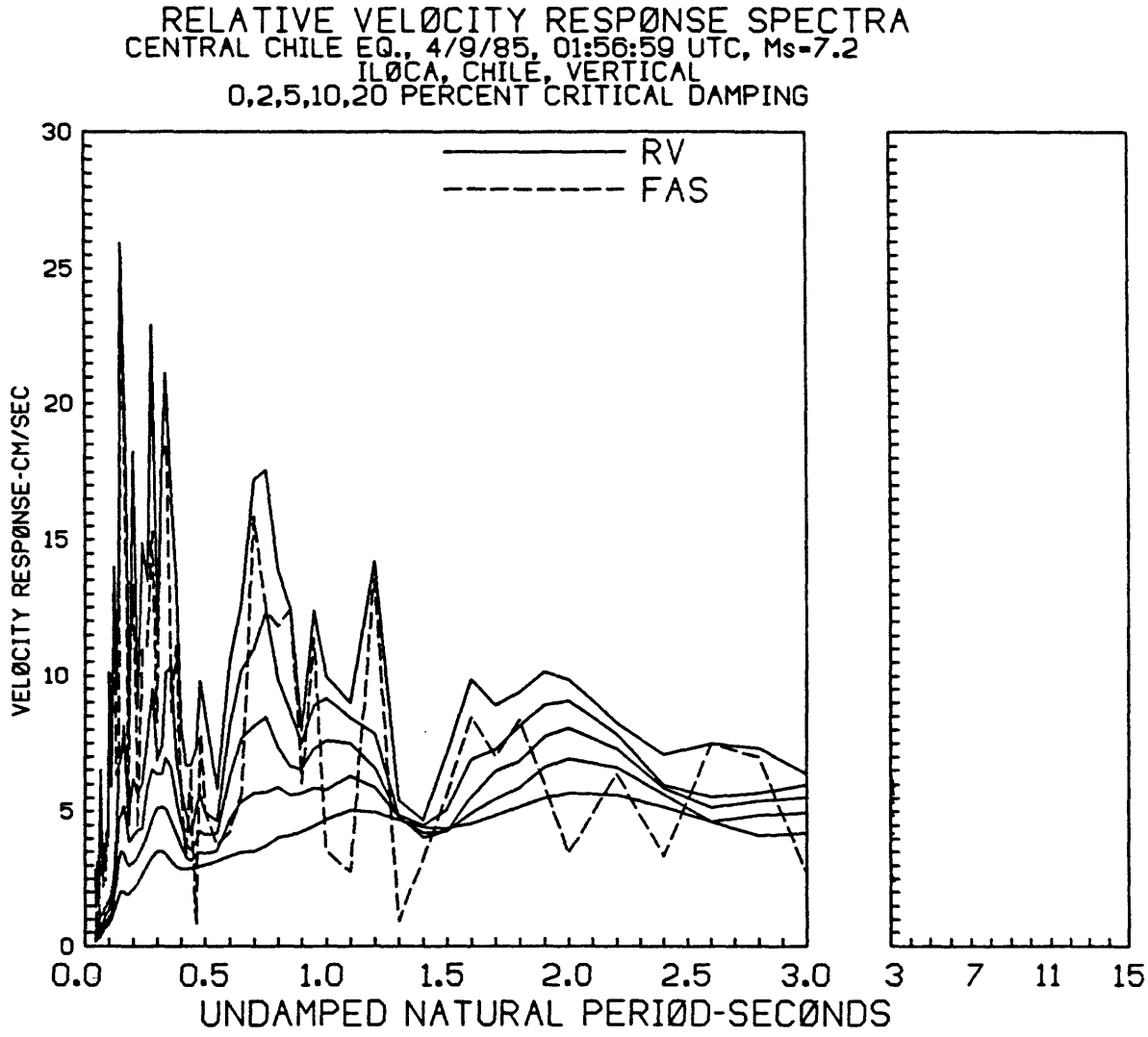
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
ILØCA, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

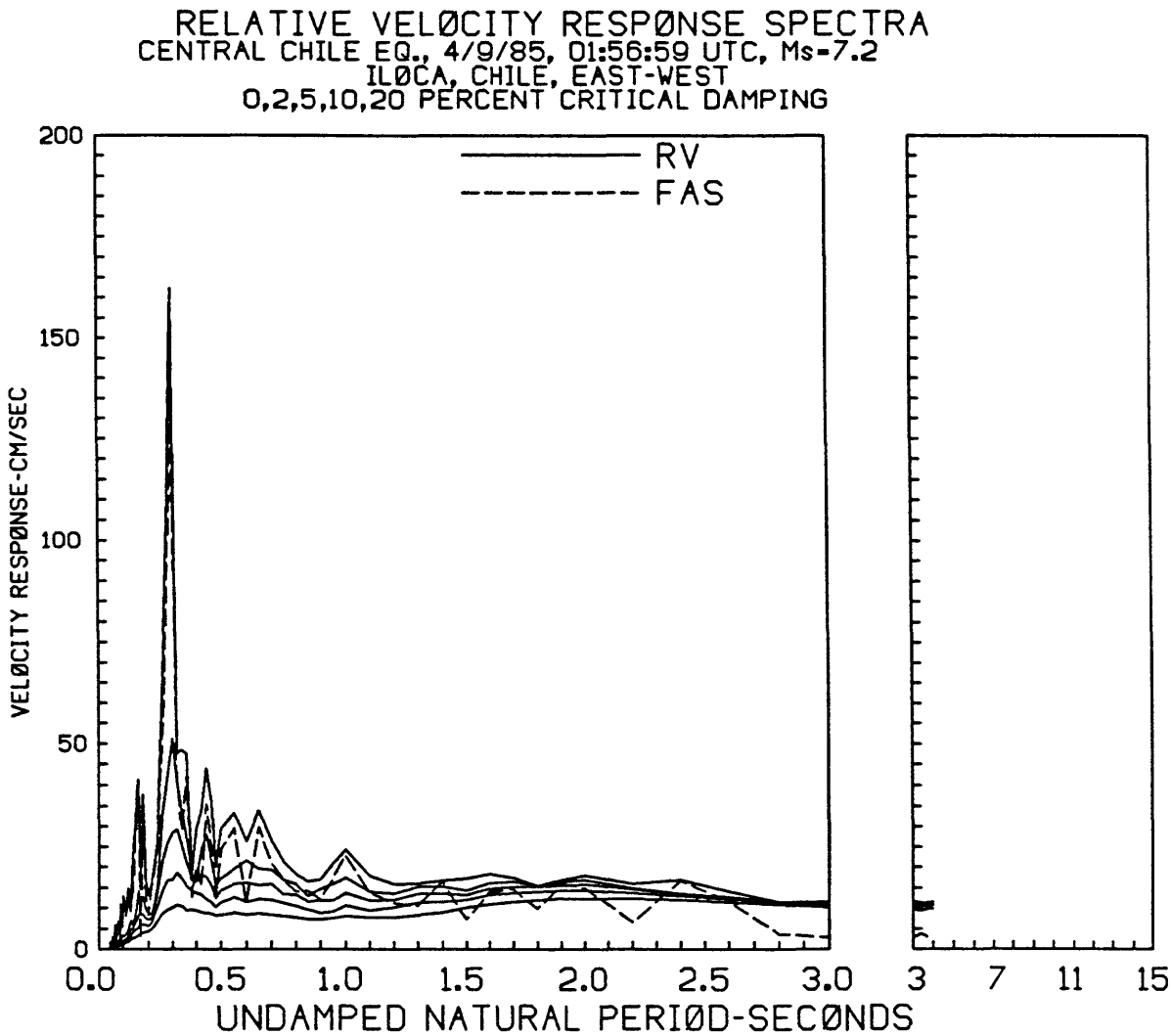


PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
ILØCA, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
ILØCA, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
120
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
ILØCA, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
30
25
20
15
10
5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

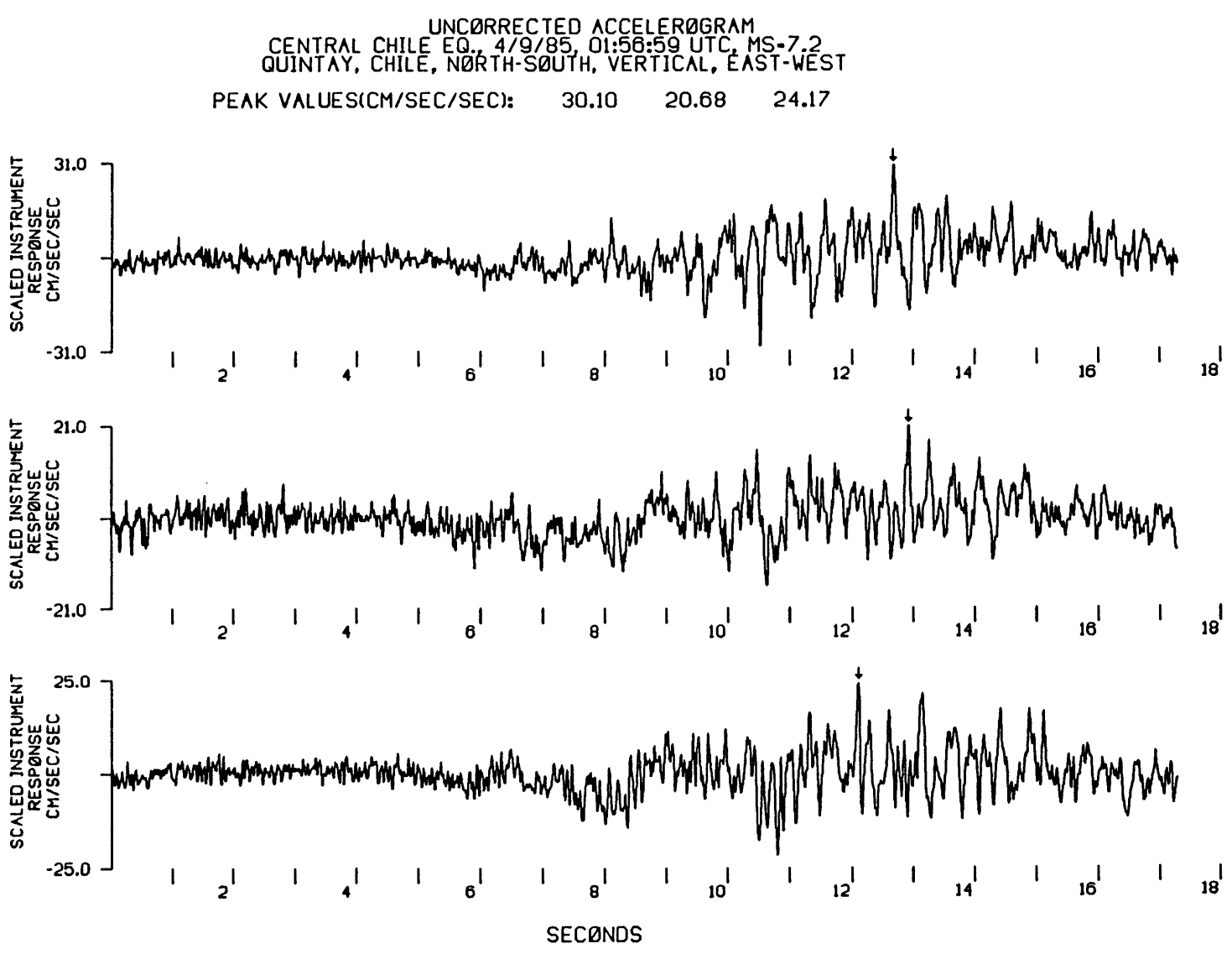

RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
ILØCA, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

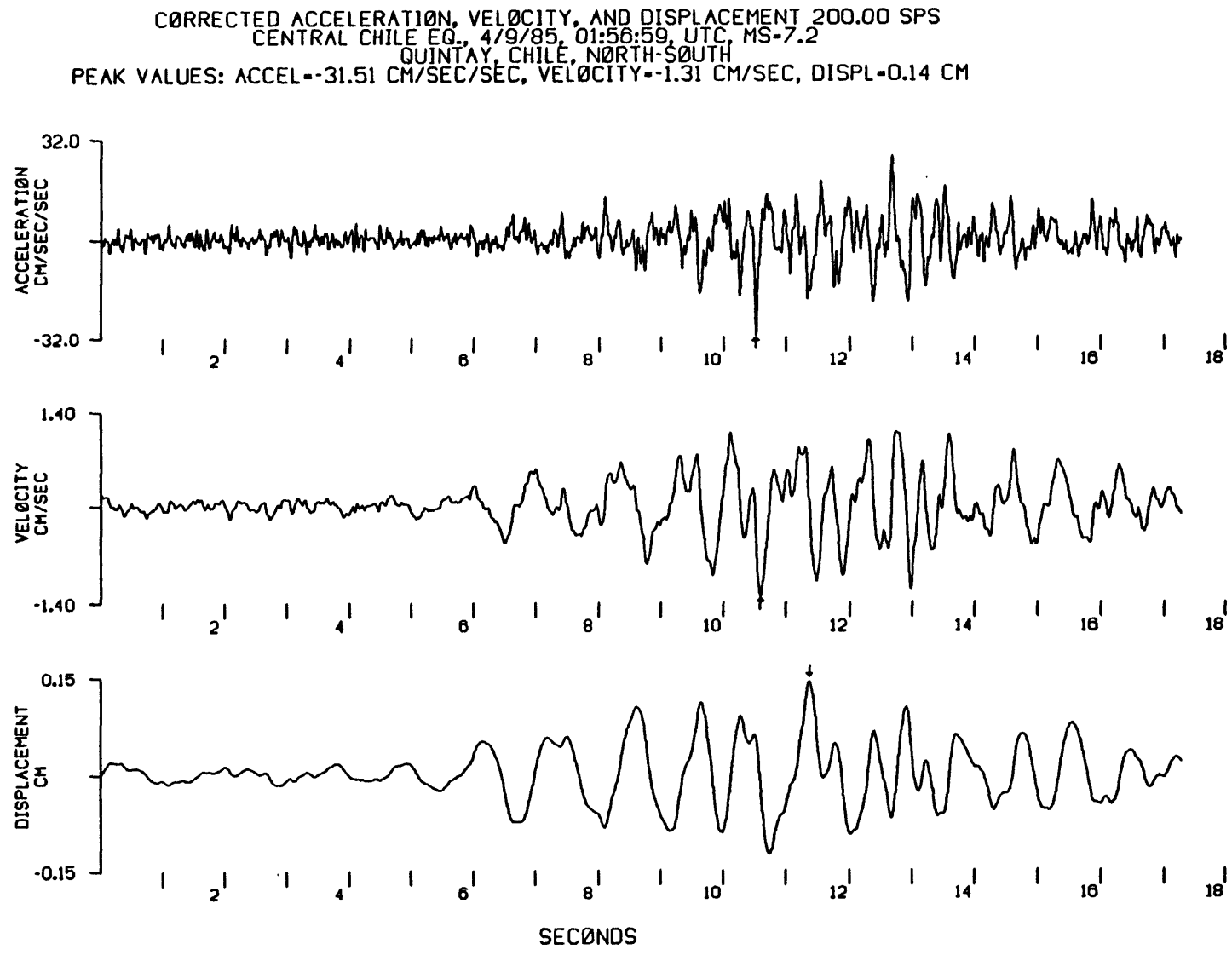
SUMMARY OF STRONG-MOTION RECORD PROCESSING

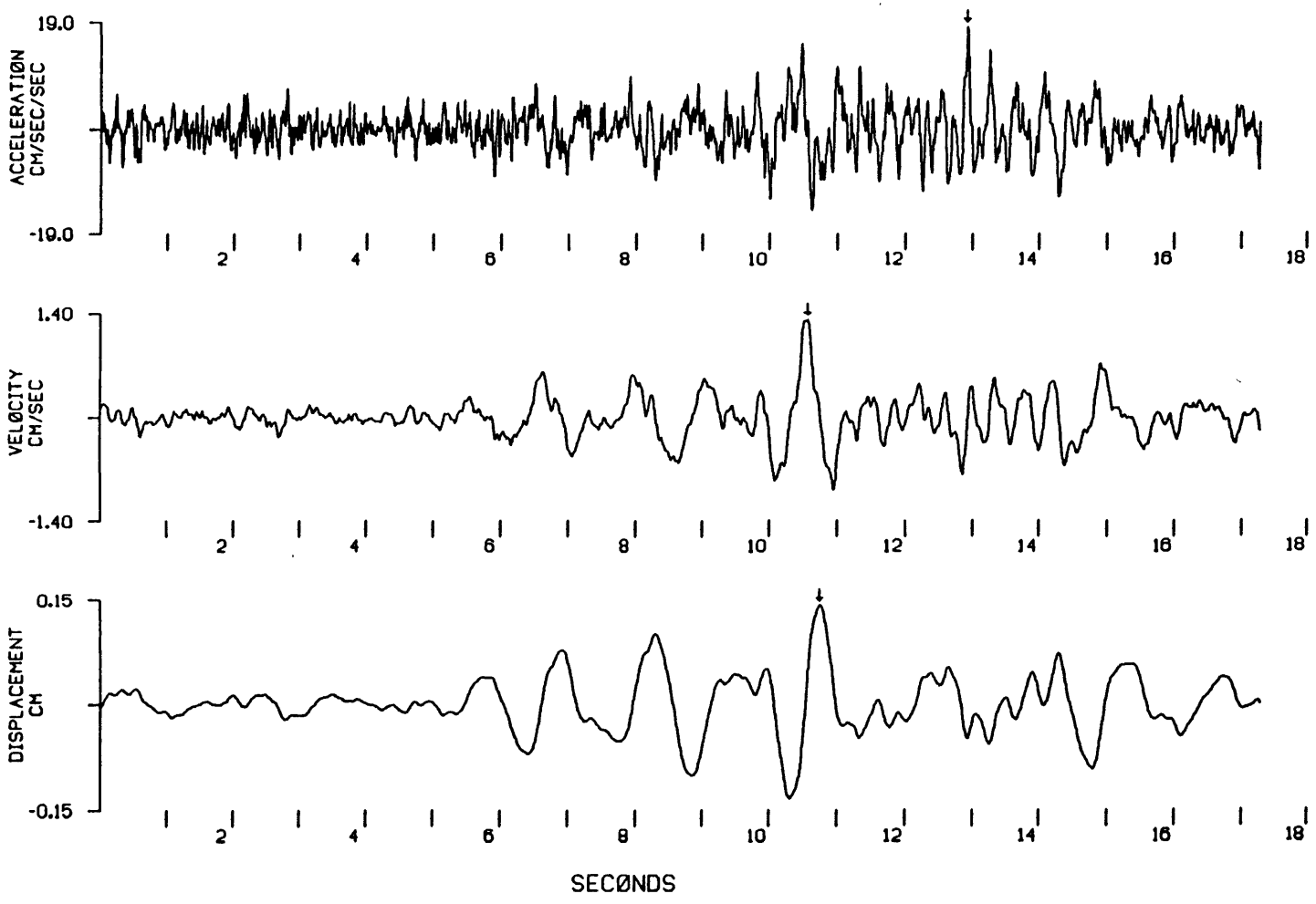
Central Chile earthquake, 4/9/85
01:56:59 UTC, M_S=7.2

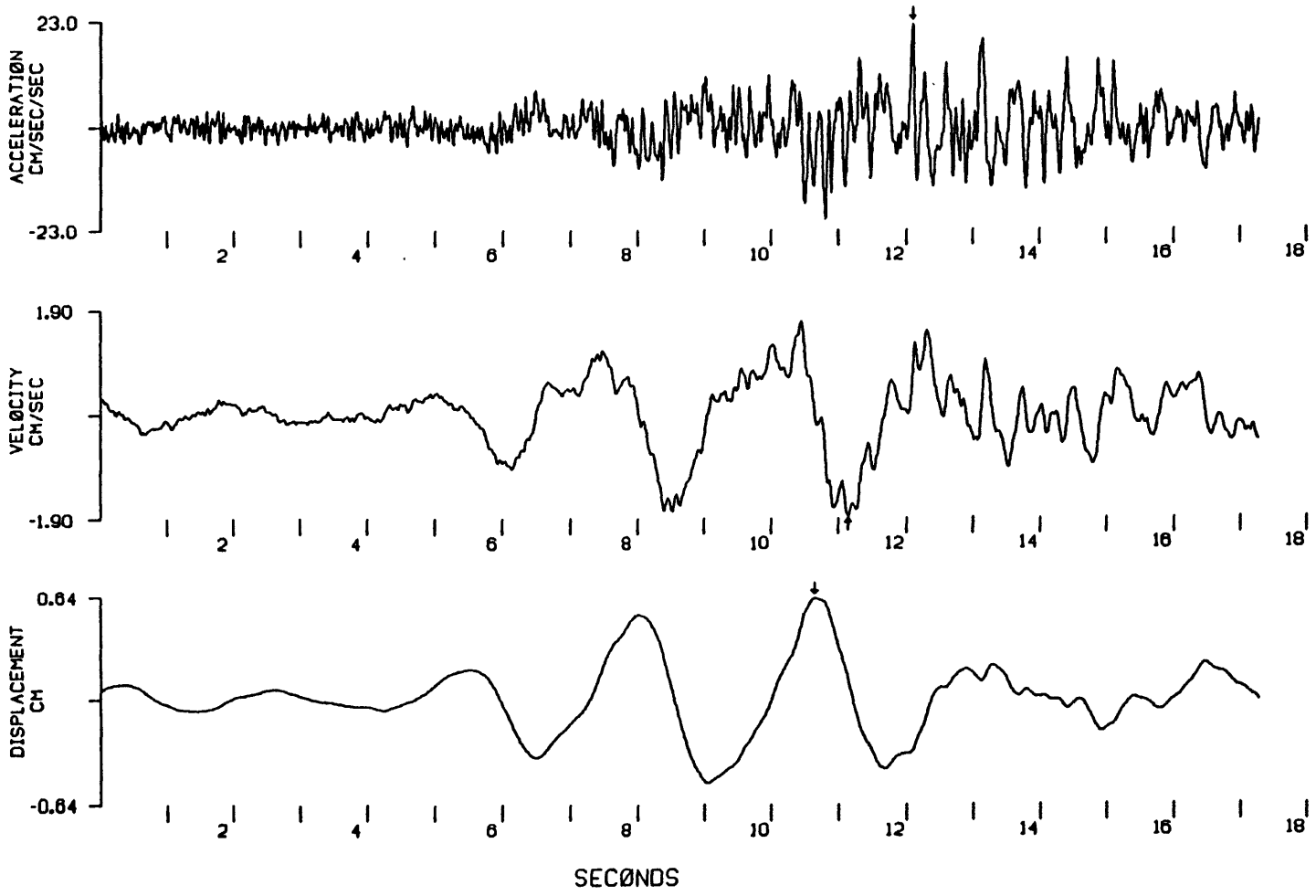
Quintay, Chile

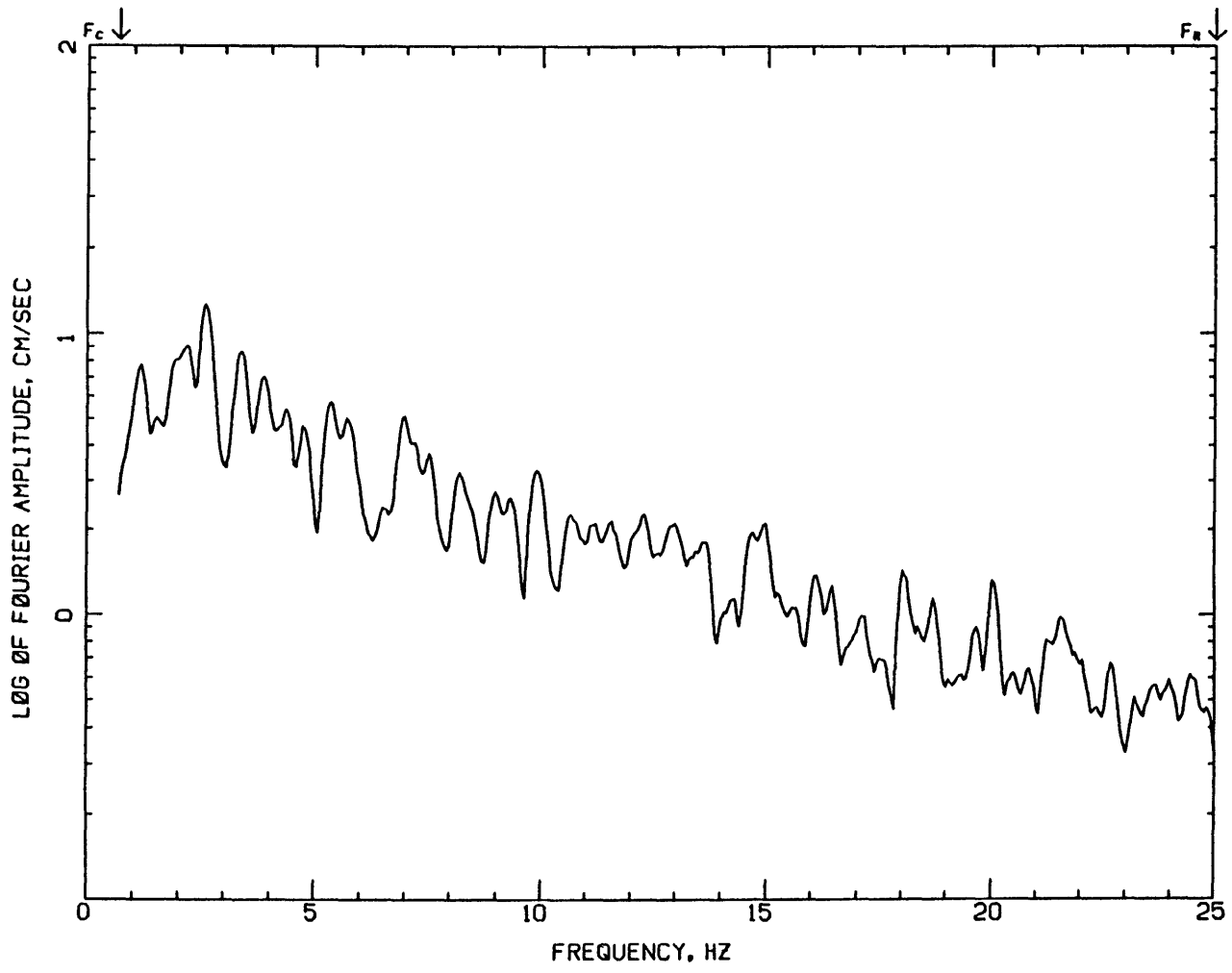
DESCRIPTION	COMPONENT		
	North-South	Vertical	East-West
Instrument Characteristics:			
Frequency (Hz)	26.2	24.8	25.1
Damping (% Critical)	60.0	60.0	60.0
Filter Parameters:			
Highcut (Hz)	25.0	35.0	25.0
Lowcut (Hz)	0.667	0.667	0.333
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	30.1	20.7	24.2
Peak Acceleration, A (cm/s/s)	-31.5	18.4	22.3
Peak Velocity, V (cm/s)	-1.31	1.31	-1.86
Peak Displacement, D (cm)	0.143	0.141	0.630
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.042	0.071	0.083
$\lvert AD/V^2 \rvert$	2.6	1.5	4.1

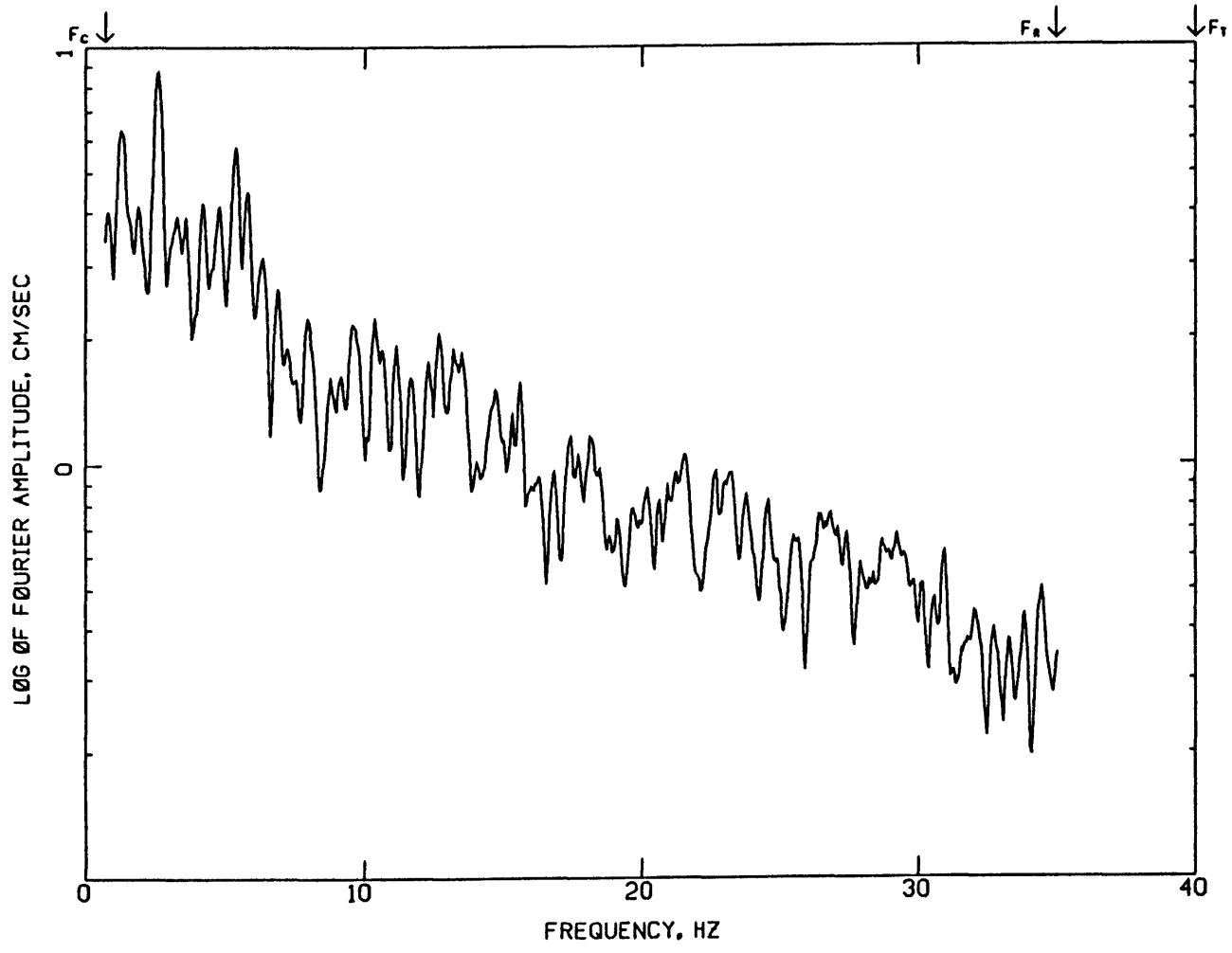

UNCØRRECTED ACCELERØGRAM
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
QUINTAY, CHILE, NØRTH-SØUTH, VERTICAL, EAST-WEST
PEAK VALUES(CM/SEC/SEC): 30.10 20.68 24.17
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
31.0
-31.0
21.0
-21.0
25.0
-25.0
2
4
6
8
10
12
14
16
18
SECØNDS

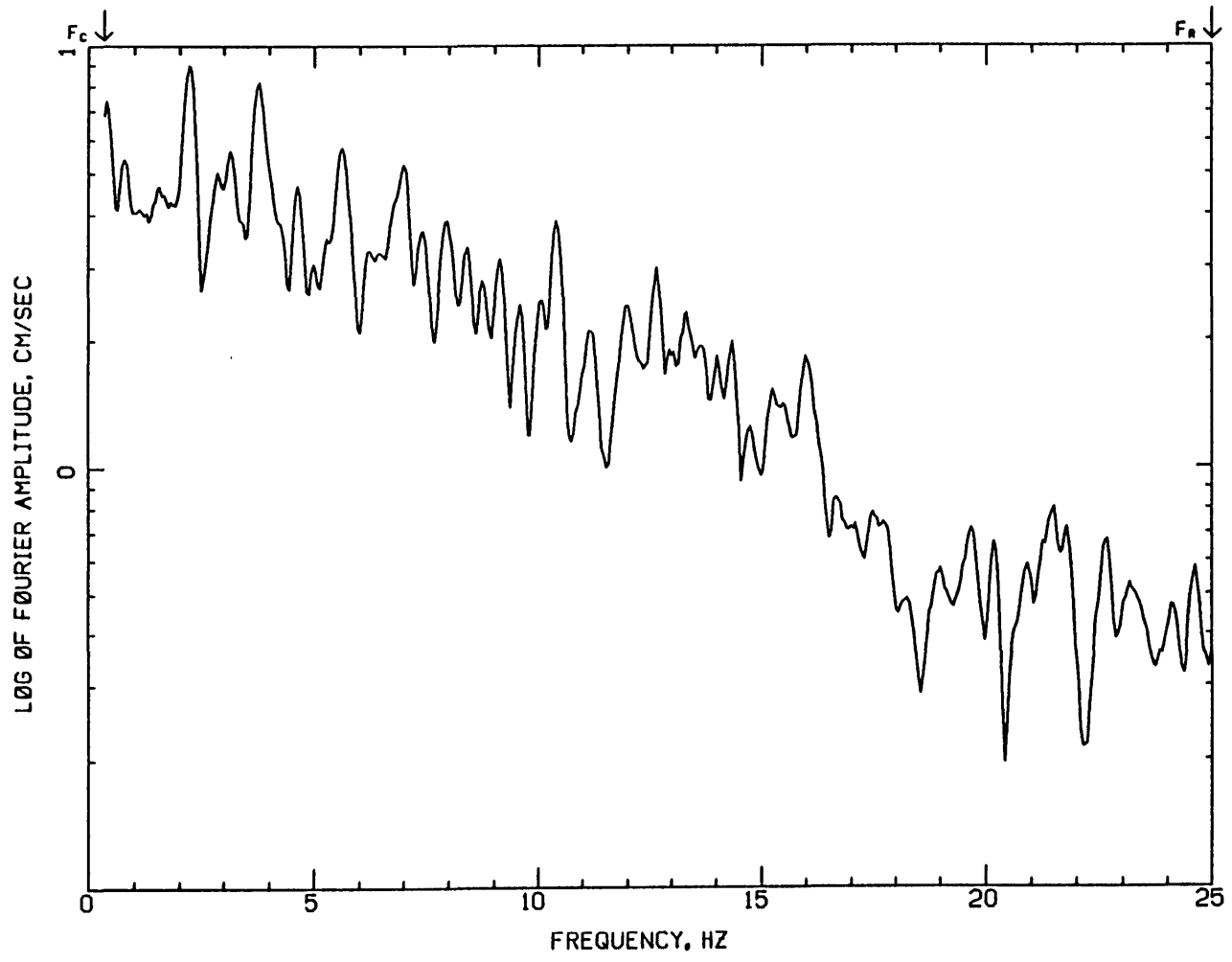

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, NØRTH-SØUTH
PEAK VALUES: ACCEL=-31.51 CM/SEC/SEC, VELØCITY=-1.31 CM/SEC, DISPL=0.14 CM
ACCELERATIØN CM/SEC/SEC
32.0
-32.0
VELØCITY CM/SEC
1.40
-1.40
DISPLACEMENT CM
0.15
-0.15
2
4
6
8
10
12
14
16
18
SECØNDS

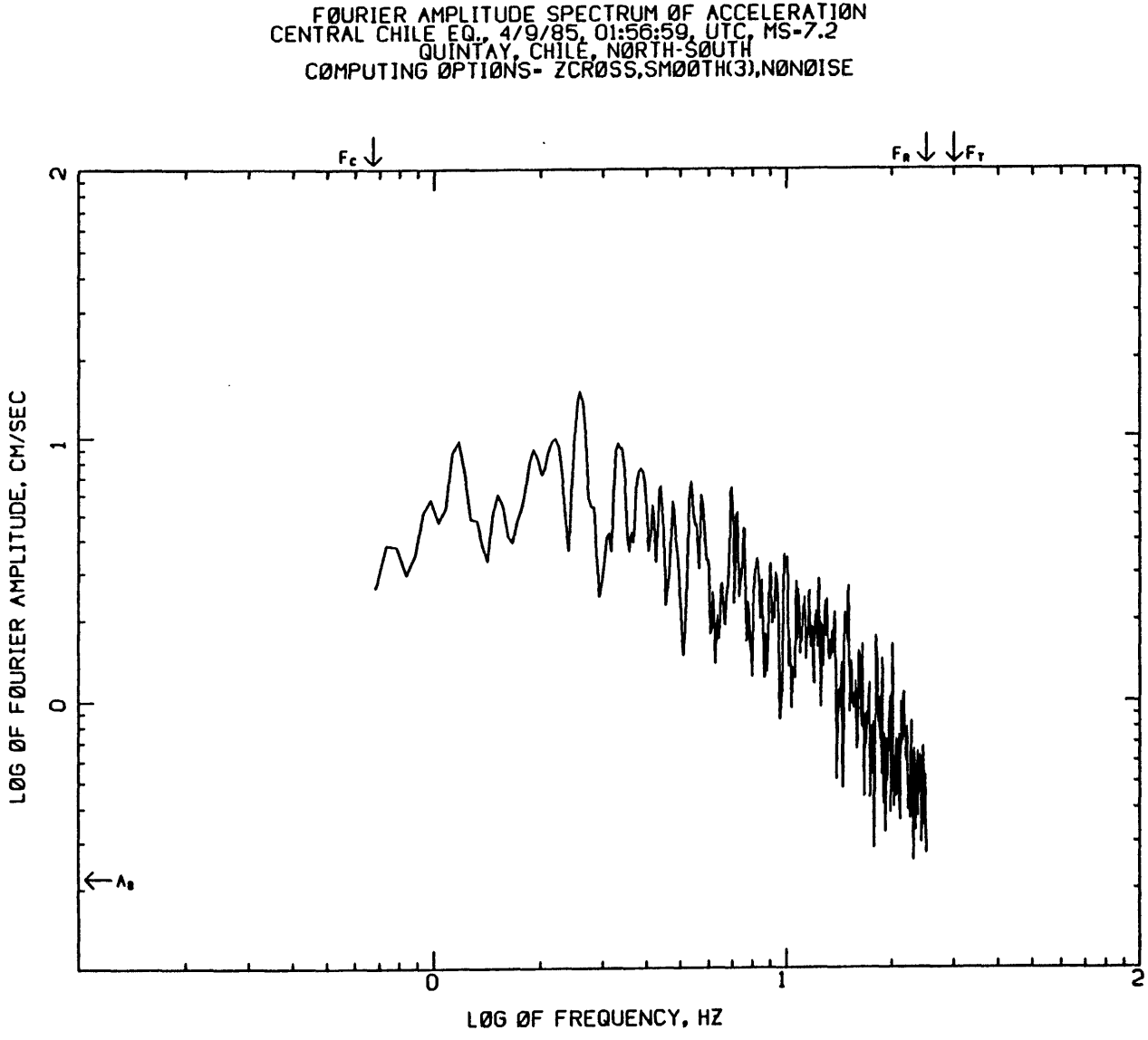

19.0
ACCELERATIØN
CM/SEC/SEC
-19.0
2
4
6
8
10
12
14
16
18
1.40
VELØCITY
CM/SEC
-1.40
2
4
6
8
10
12
14
16
18
0.15
DISPLACEMENT
CM
-0.15
2
4
6
8
10
12
14
16
18
SECØNDS

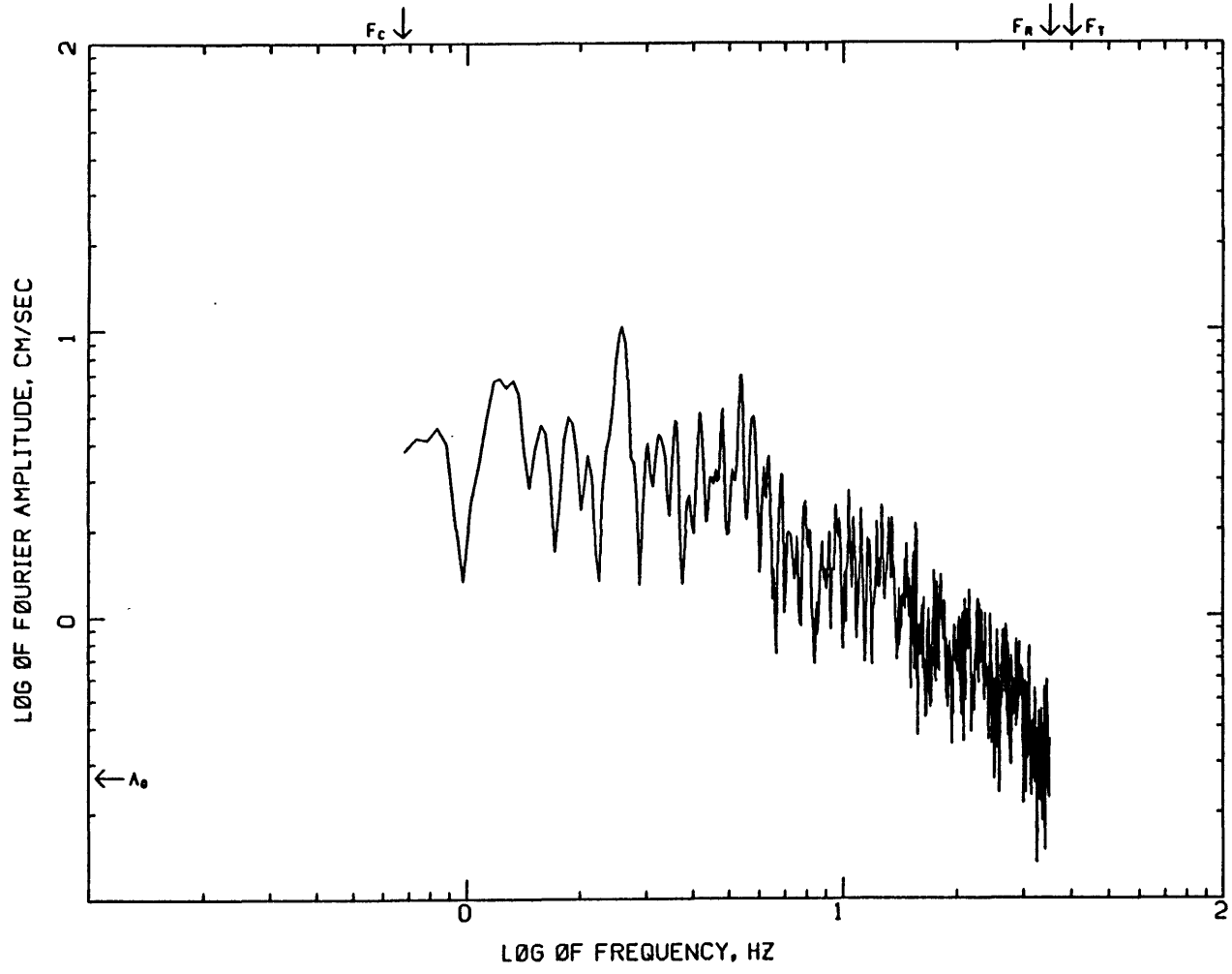

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 9/4/85, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, EAST-WEST
PEAK VALUES: ACCEL=22.29 CM/SEC/SEC, VELØCITY=-1.86 CM/SEC, DISPL=0.63 CM
ACCELERATIØN CM/SEC/SEC
23.0
-23.0
VELØCITY CM/SEC
1.90
-1.90
DISPLACEMENT CM
0.64
-0.64
2
4
6
8
10
12
14
16
18
SECØNDS

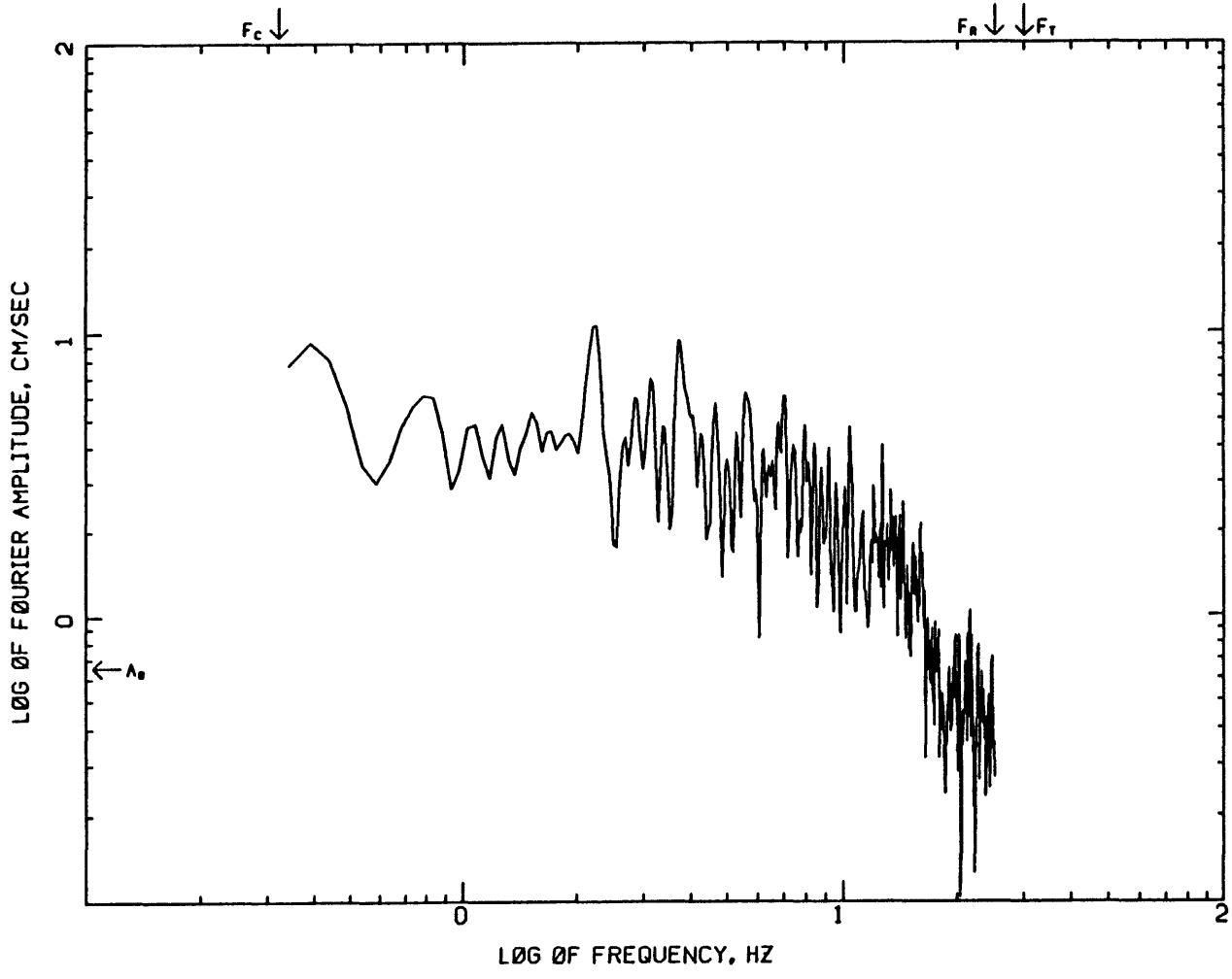

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(7),NØNØISE
Fc
FR
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
5
10
15
20
25
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/1985, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(7),NØNØISE
Fc
Fa
FT
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
10
20
30
40
FREQUENCY, HZ

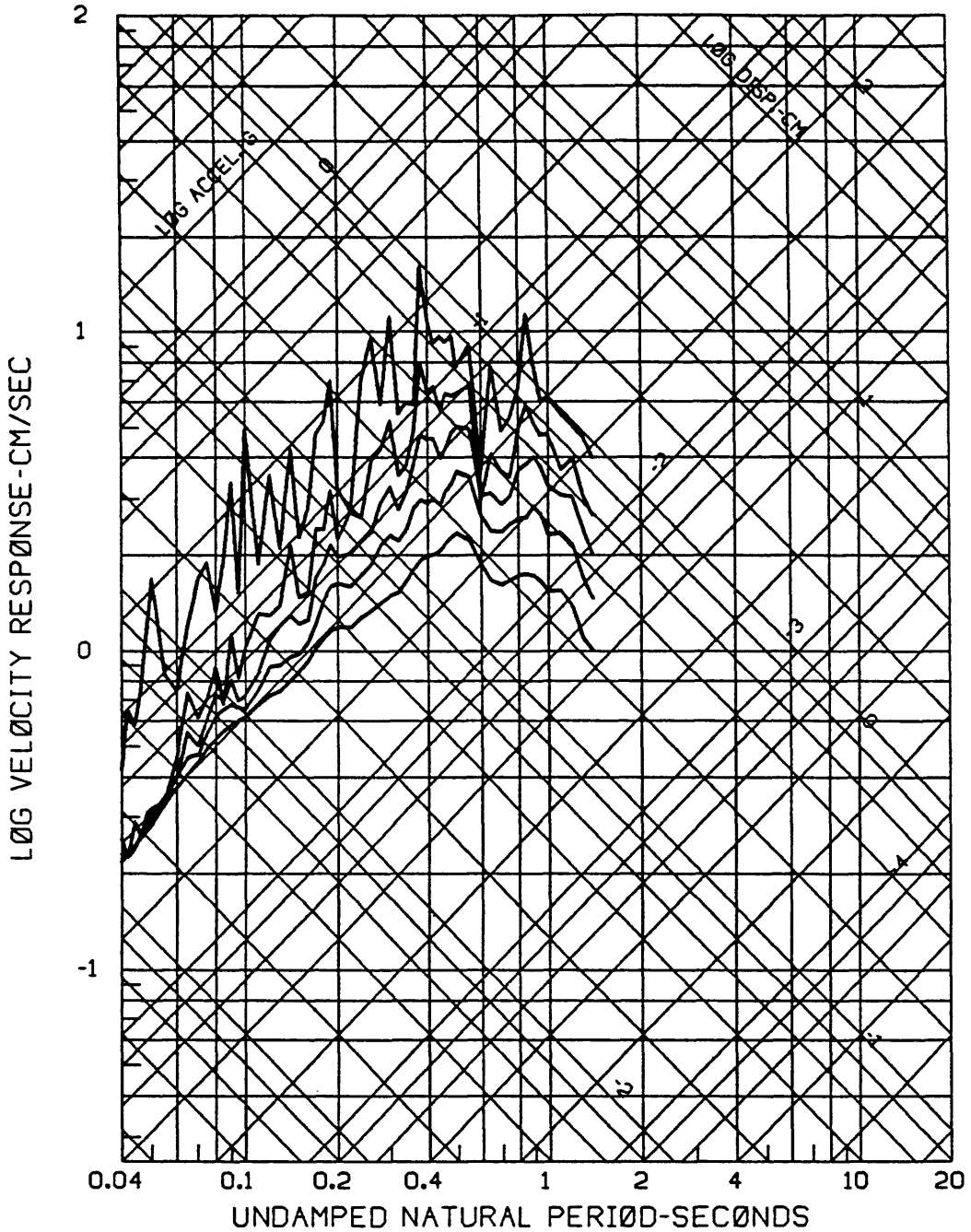

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 9/4/85, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(7),NØNØISE
Fc
Fn
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
25
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
AR
2
1
0
0
1
2

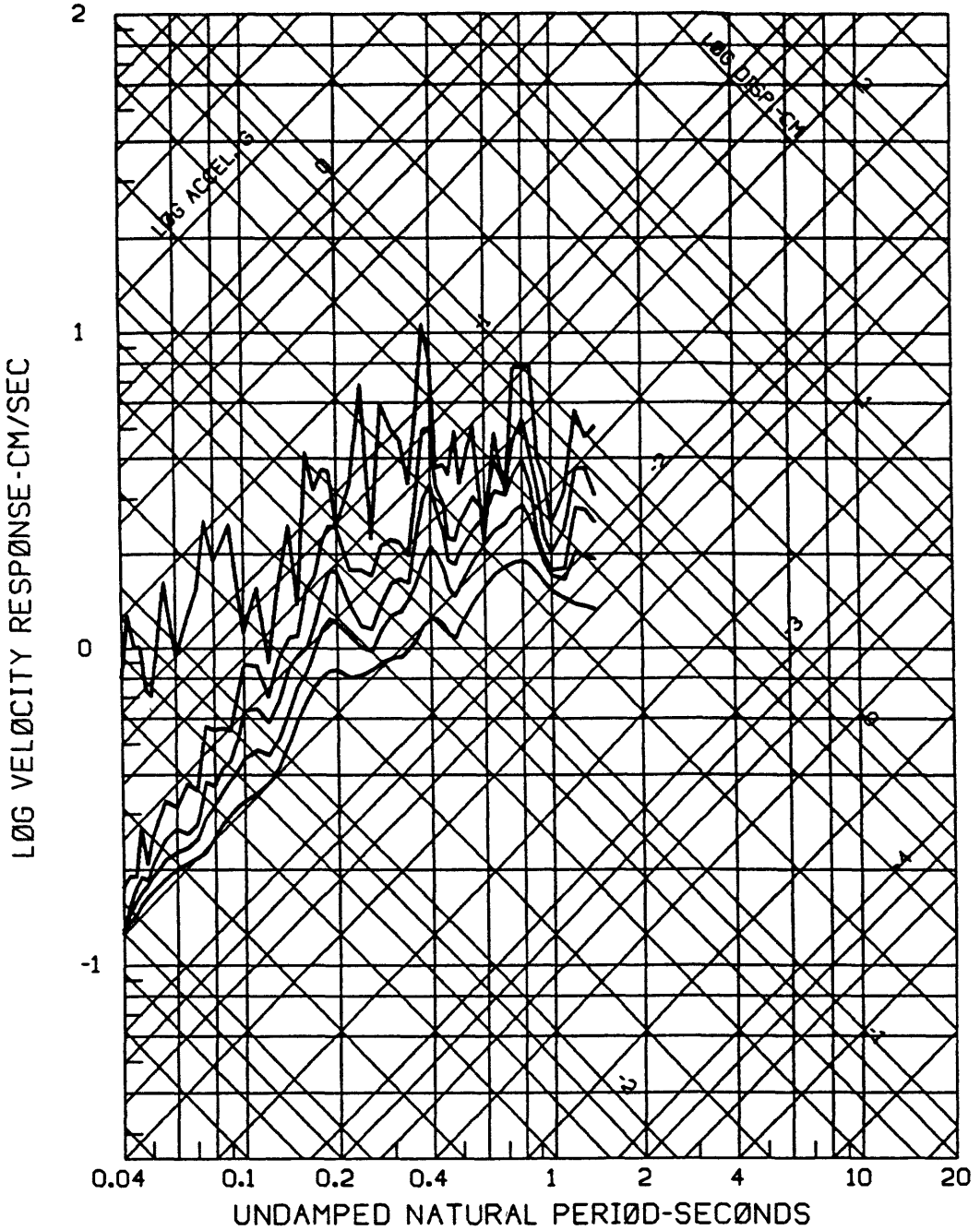

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/1985, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
Ao
2
1
0
0
1
2

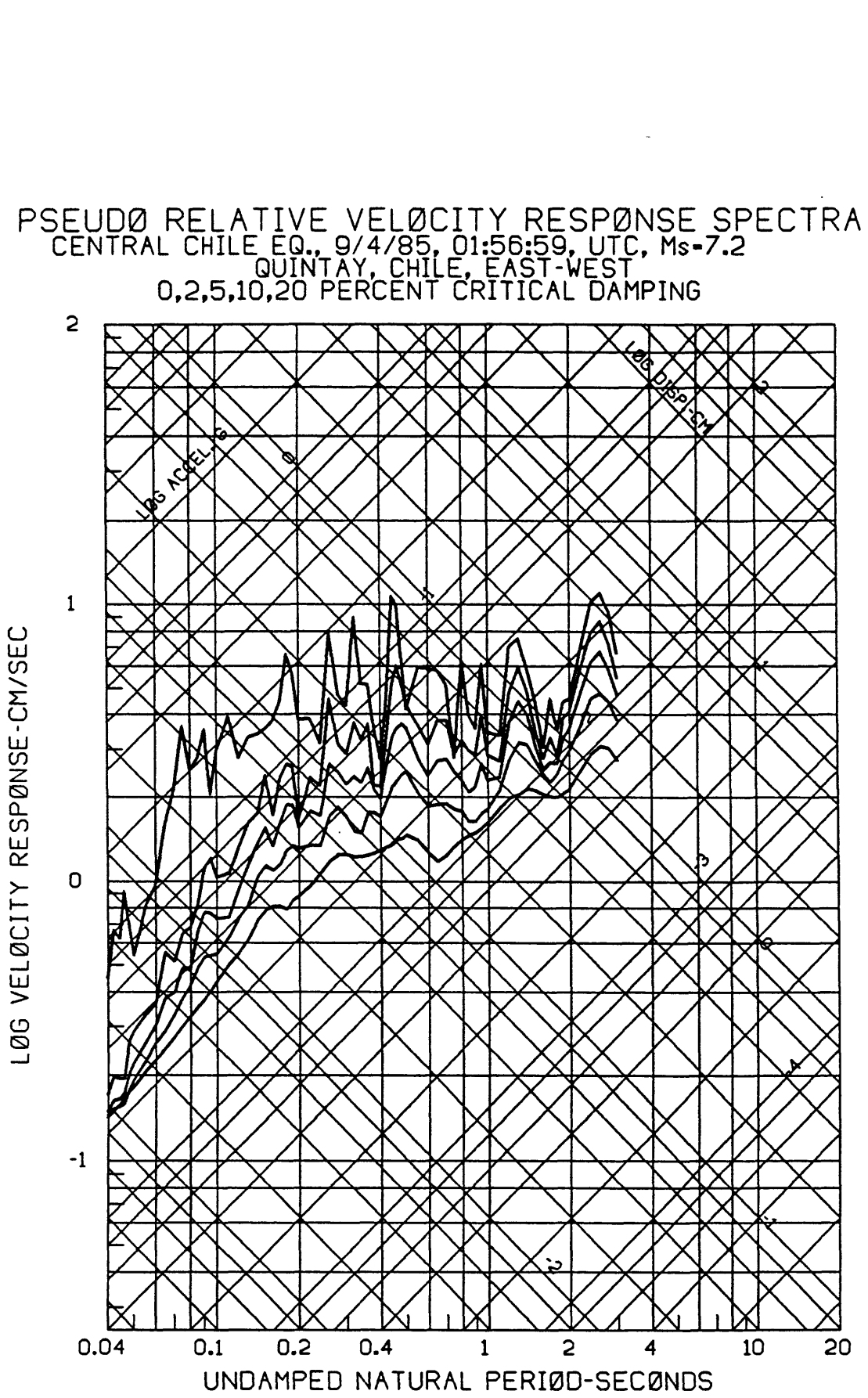

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 9/4/85, 01:56:59, UTC, MS-7.2
QUINTAY, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
Fa
Ft
2
1
0
←Aa
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
1
2
LØG ØF FREQUENCY, HZ

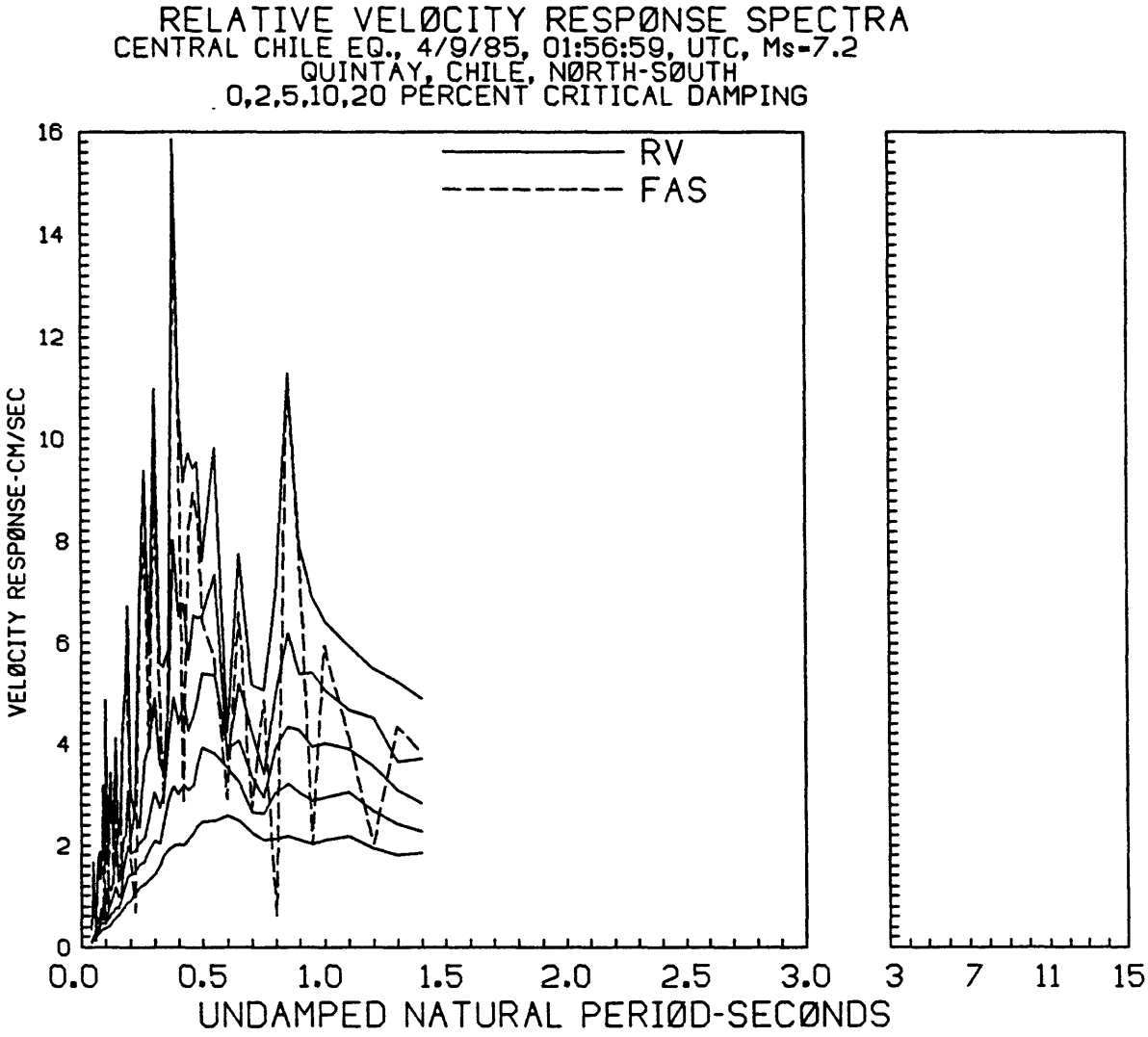
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59, UTC, Ms-7.2
QUINTAY, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING

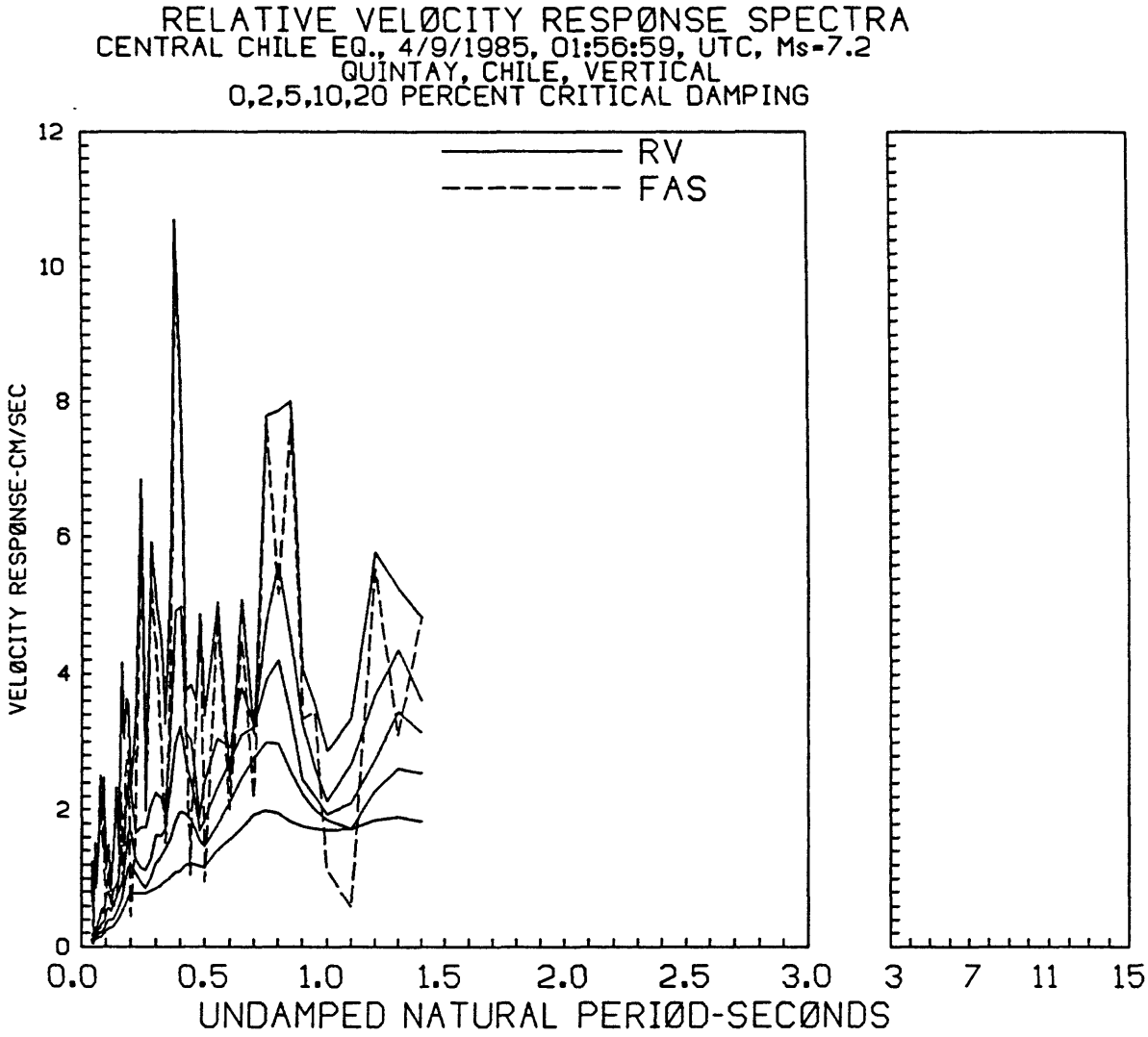


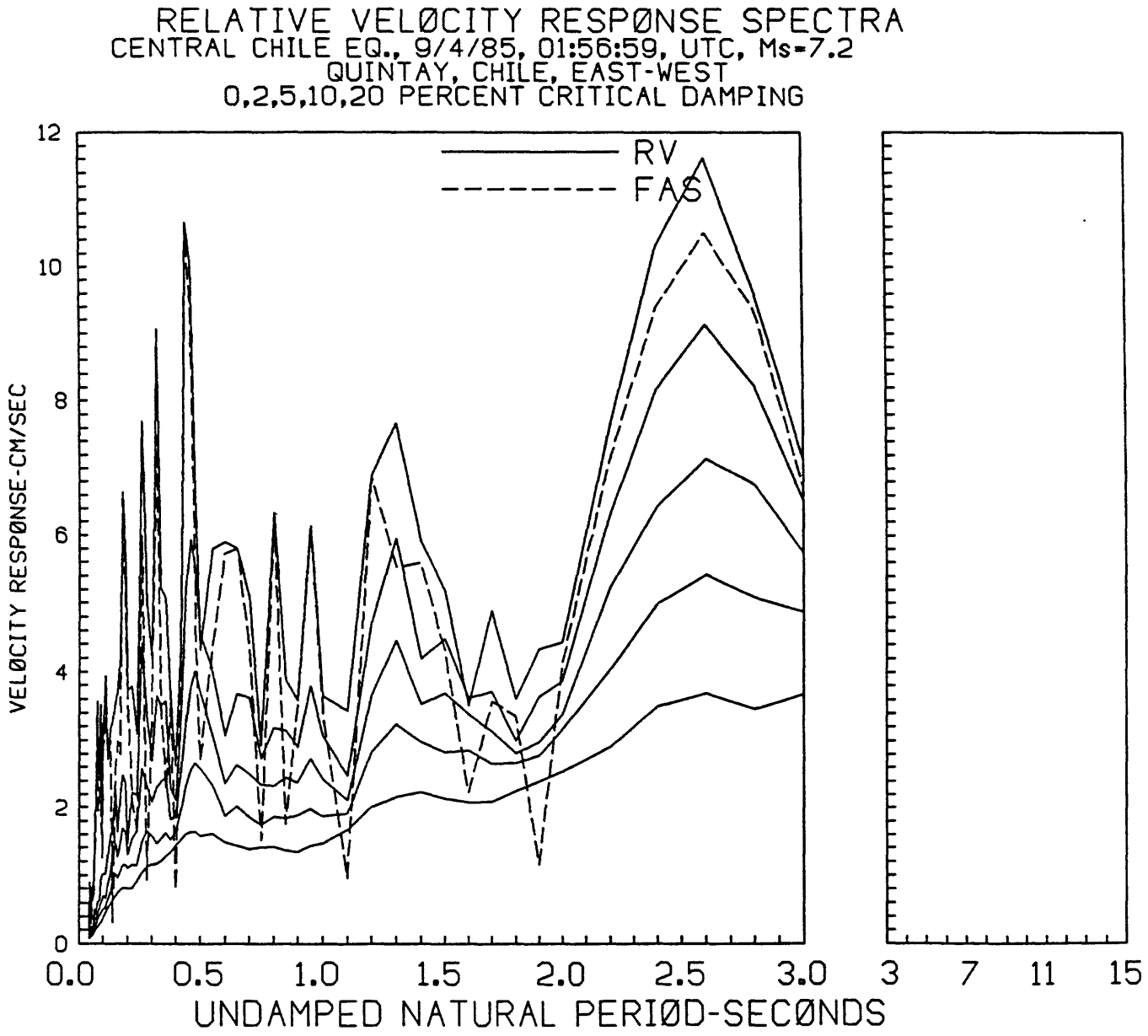
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/1985, 01:56:59, UTC, Ms-7.2
QUINTAY, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING




PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 9/4/85, 01:56:59, UTC, Ms-7.2
QUINTAY, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING
LØG VELØCITY RESPØNSE-CM/SEC
2
1
0
-1
LØG ACCEL-G
LØG DISP-CM
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59, UTC, Ms=7.2
QUINTAY, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
2
4
6
8
10
12
14
16
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/1985, 01:56:59, UTC, Ms-7.2
QUINTAY, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
2
4
6
8
10
12
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 9/4/85, 01:56:59, UTC, Ms=7.2
QUINTAY, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
2
4
6
8
10
12
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

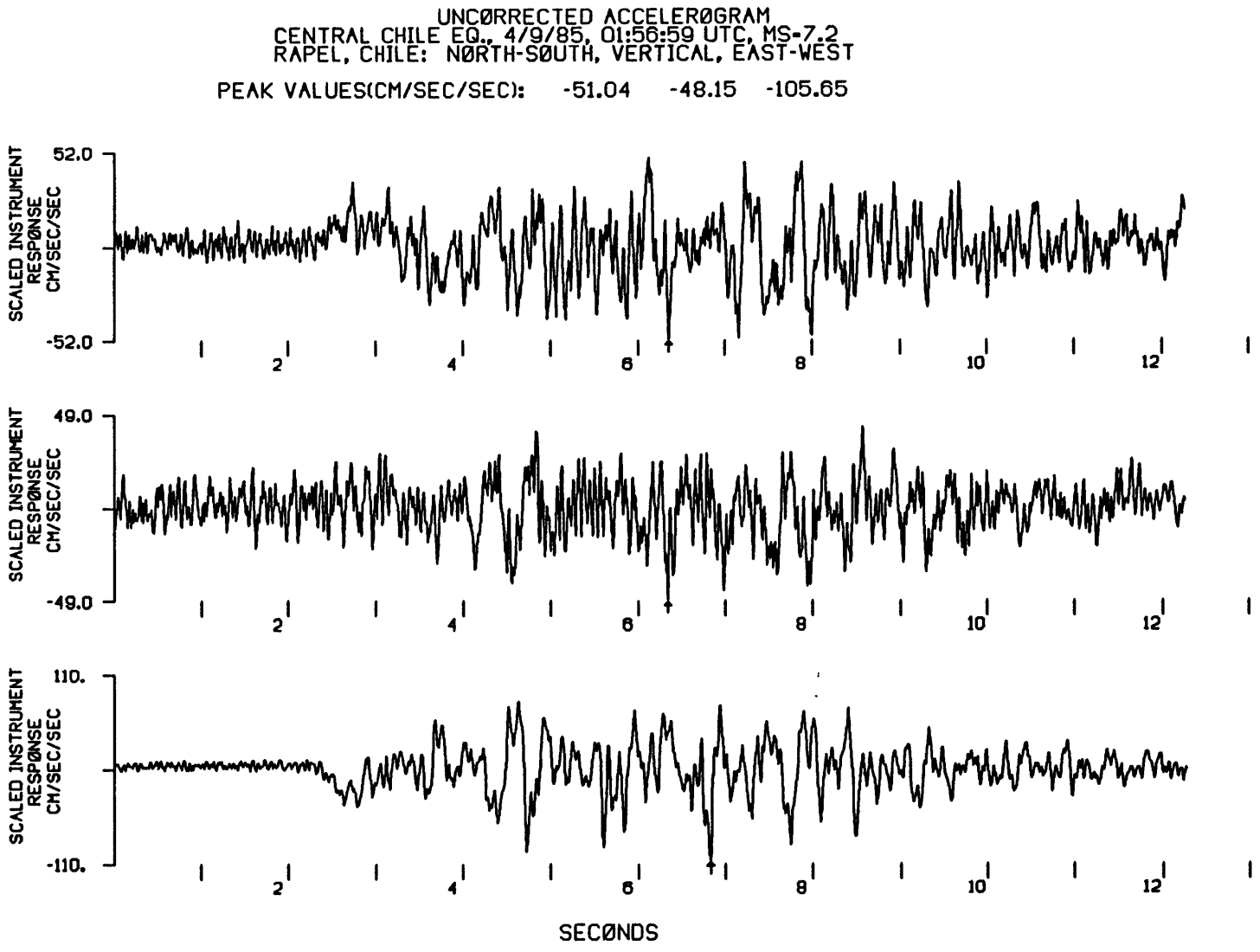
SUMMARY OF STRONG-MOTION RECORD PROCESSING

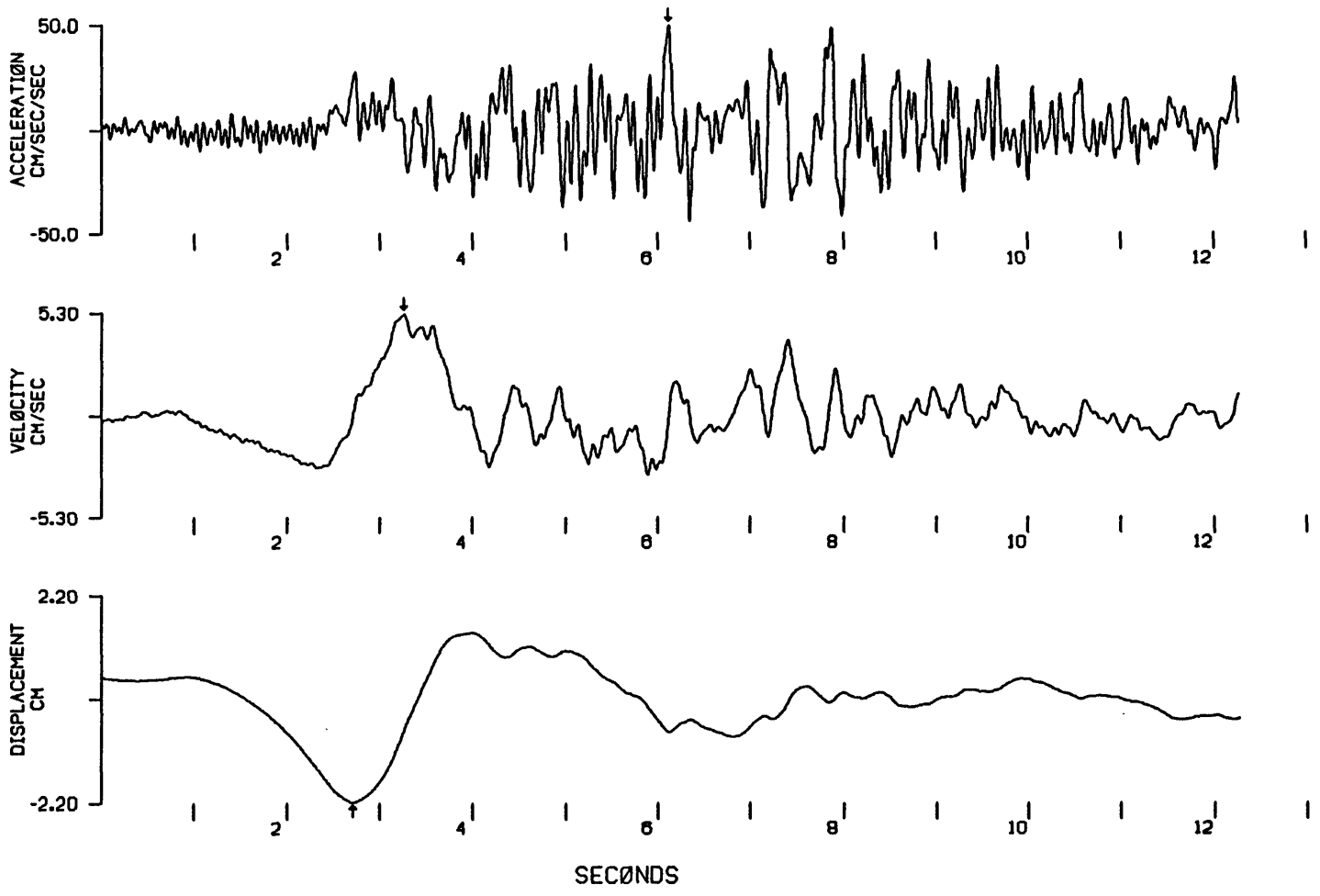
Central Chile earthquake of 4/9/85
01:56:59 UTC, M_S=7.2

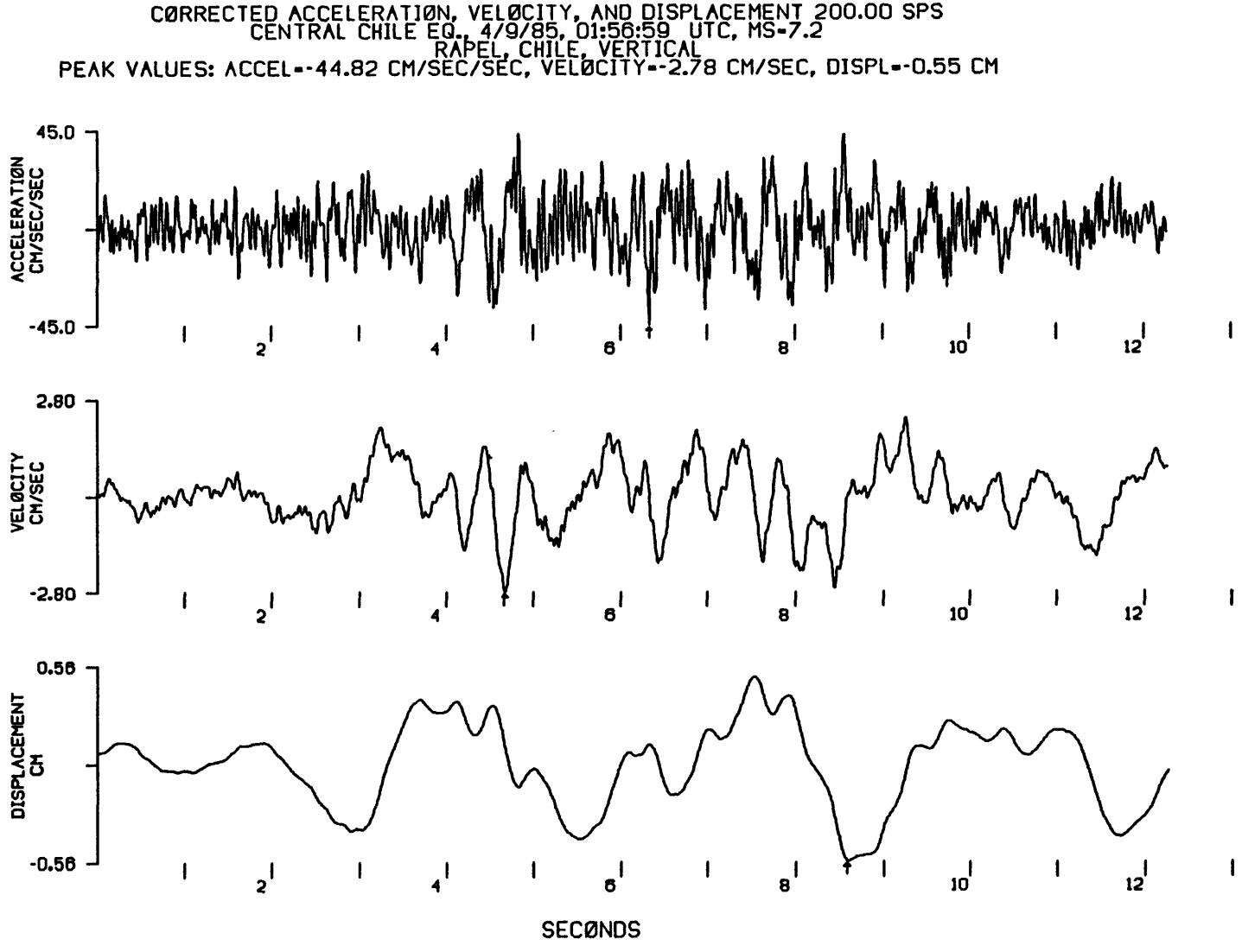
Rapel, Chile

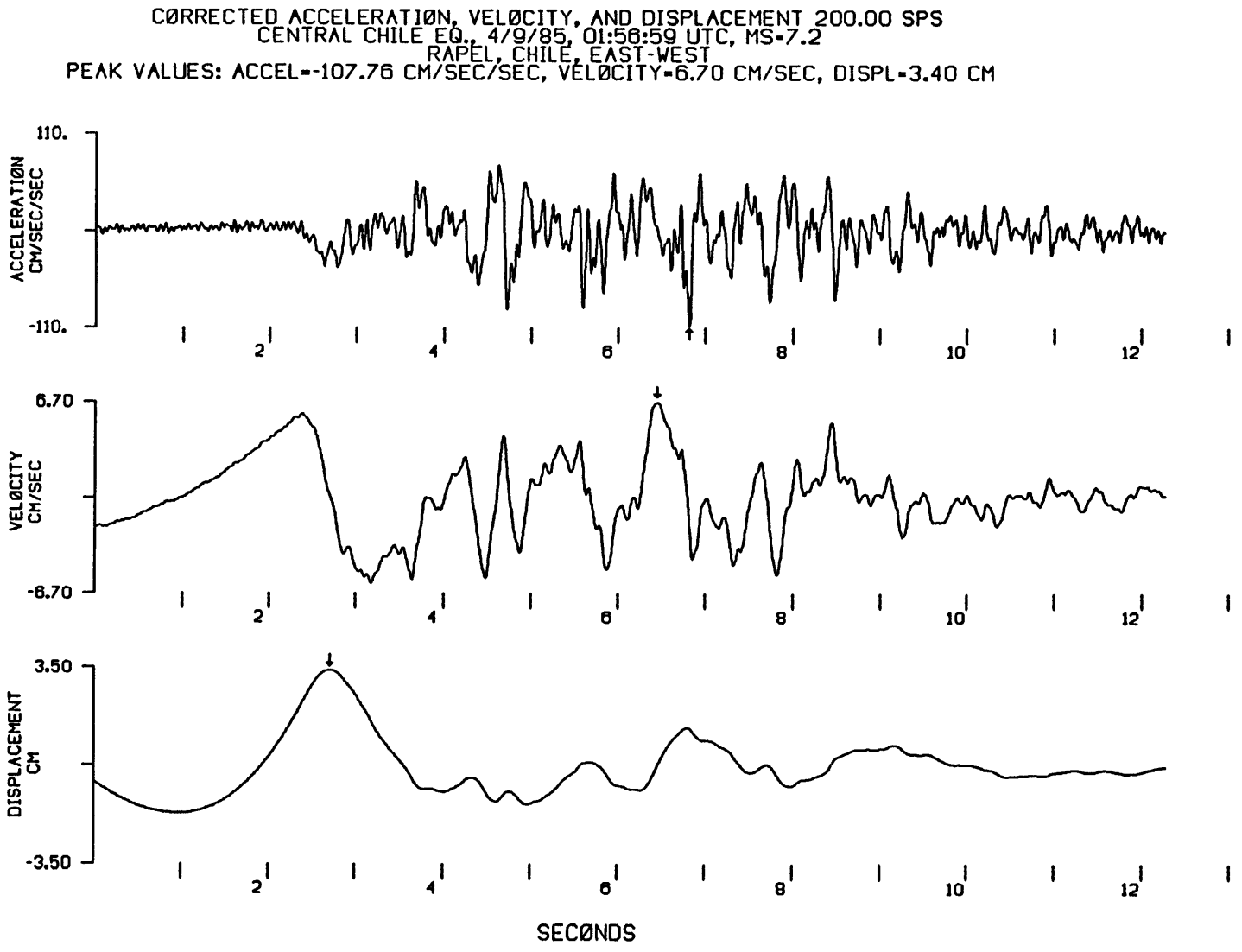
DESCRIPTION	COMPONENT		
	North-South	Vertical	East-West
Instrument Characteristics:			
Frequency (Hz)	17.8	19.0	18.3
Damping (% Critical)	60.0*	60.0*	60.0*
Filter Parameters:			
Highcut (Hz)	15.0	25.0	20.0
Lowcut (Hz)	0.175	0.294	0.175
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	-51.0	-48.2	-105.7
Peak Acceleration, A (cm/s/s)	49.7	-44.8	-107.8
Peak Velocity, V (cm/s)	5.21	-2.78	6.70
Peak Displacement, D (cm)	-2.18	-0.553	3.40
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.10	0.062	0.062
$\lvert AD/V^2 \rvert$	4.0	3.2	8.2

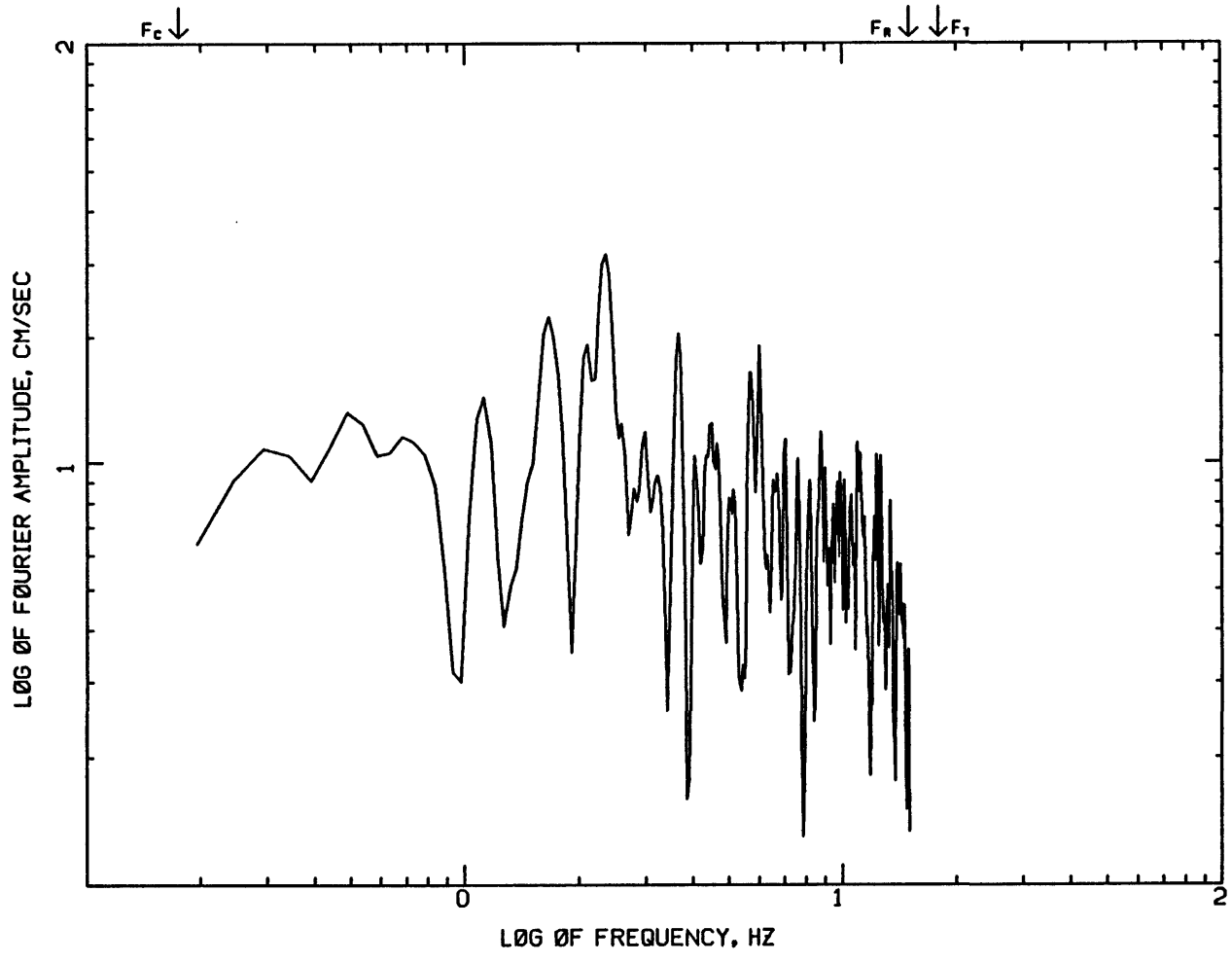
* Nominal Value

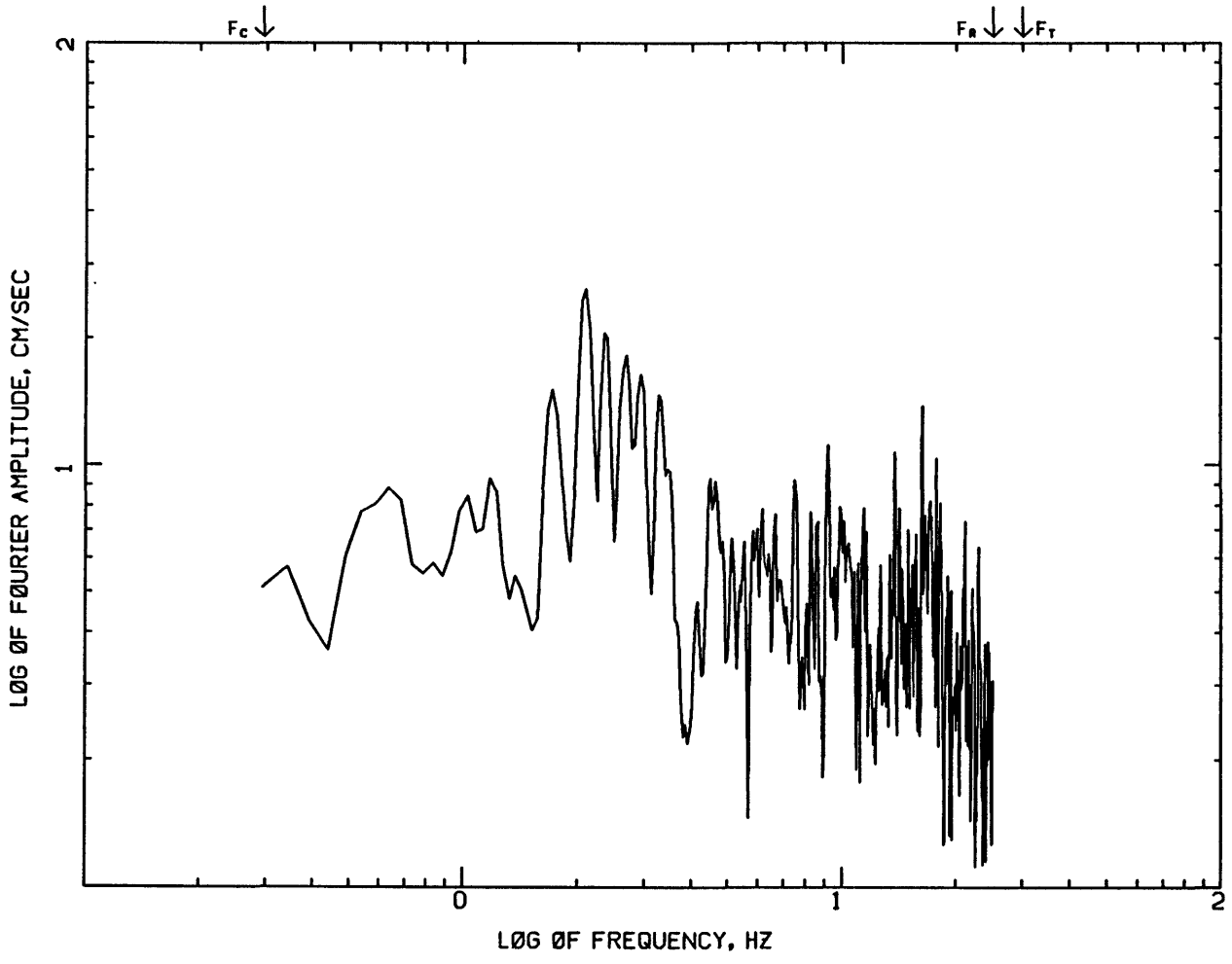

UNCØRRECTED ACCELERØGRAM
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE: NØRTH-SØUTH, VERTICAL, EAST-WEST
PEAK VALUES(CM/SEC/SEC): -51.04 -48.15 -105.65
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
52.0
-52.0
49.0
-49.0
110.
-110.
2
4
6
8
10
12
SECØNDS

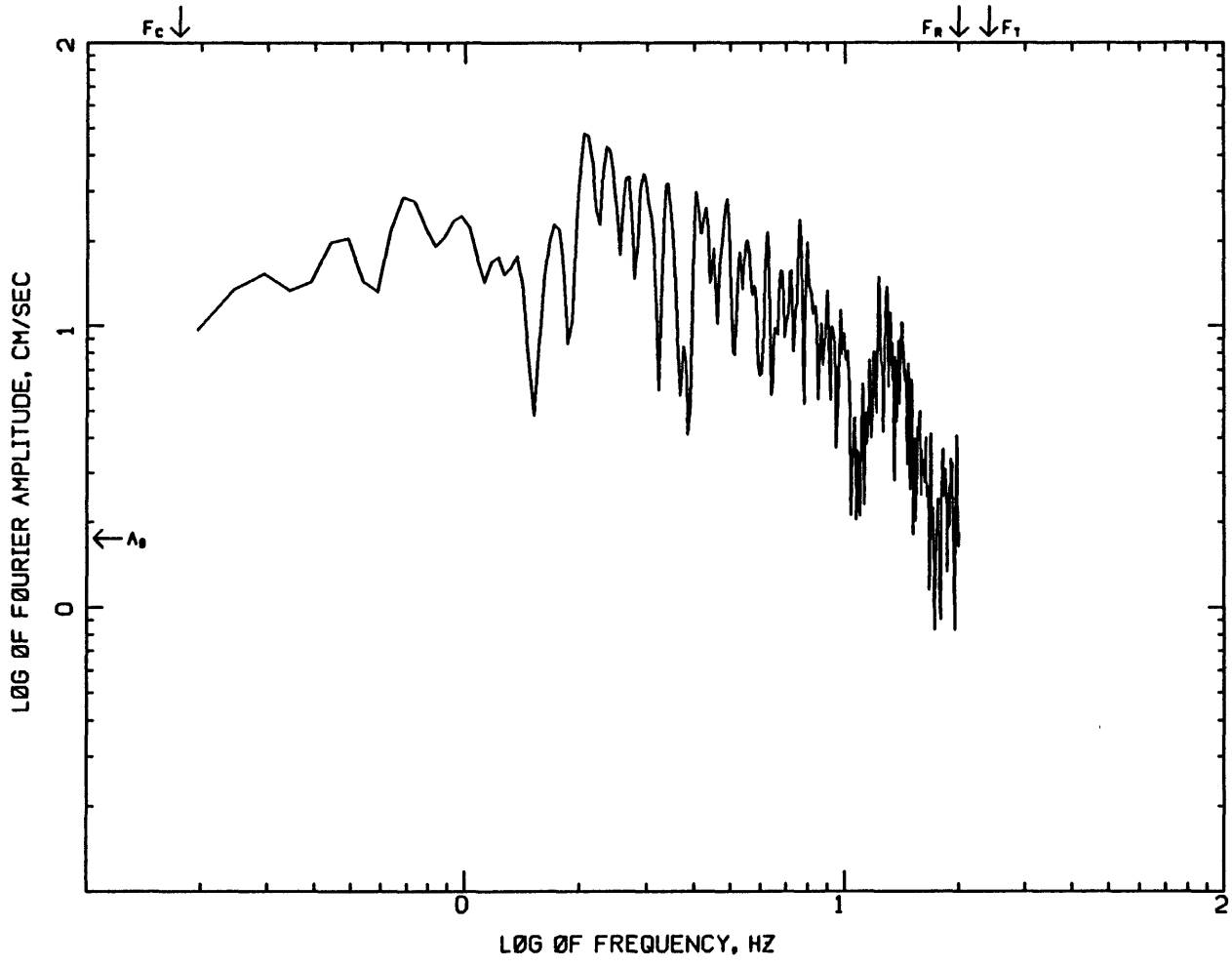

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, NØRTH-SØUTH
PEAK VALUES: ACCEL=49.71 CM/SEC/SEC, VELØCITY=5.21 CM/SEC, DISPL=-2.18 CM
ACCELERATIØN CM/SEC/SEC
50.0
-50.0
VELØCITY CM/SEC
5.30
-5.30
DISPLACEMENT CM
2.20
-2.20
2
4
6
8
10
12
SECØNDS

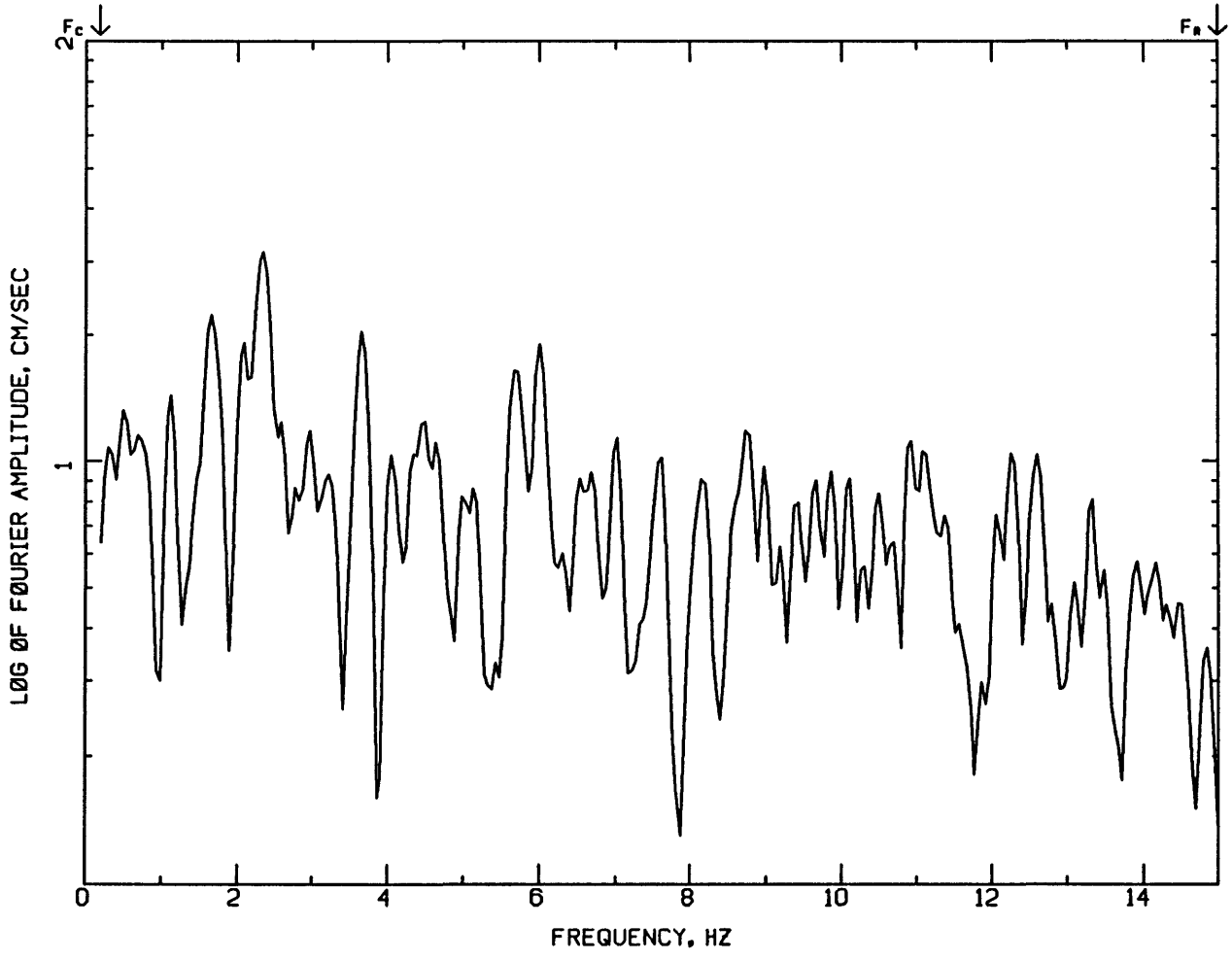

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, VERTICAL
PEAK VALUES: ACCEL=-44.82 CM/SEC/SEC, VELØCITY=-2.78 CM/SEC, DISPL=-0.55 CM
ACCELERATIØN CM/SEC/SEC
45.0
-45.0
VELØCITY CM/SEC
2.80
-2.80
DISPLACEMENT CM
0.56
-0.56
2
4
6
8
10
12
SECØNDS

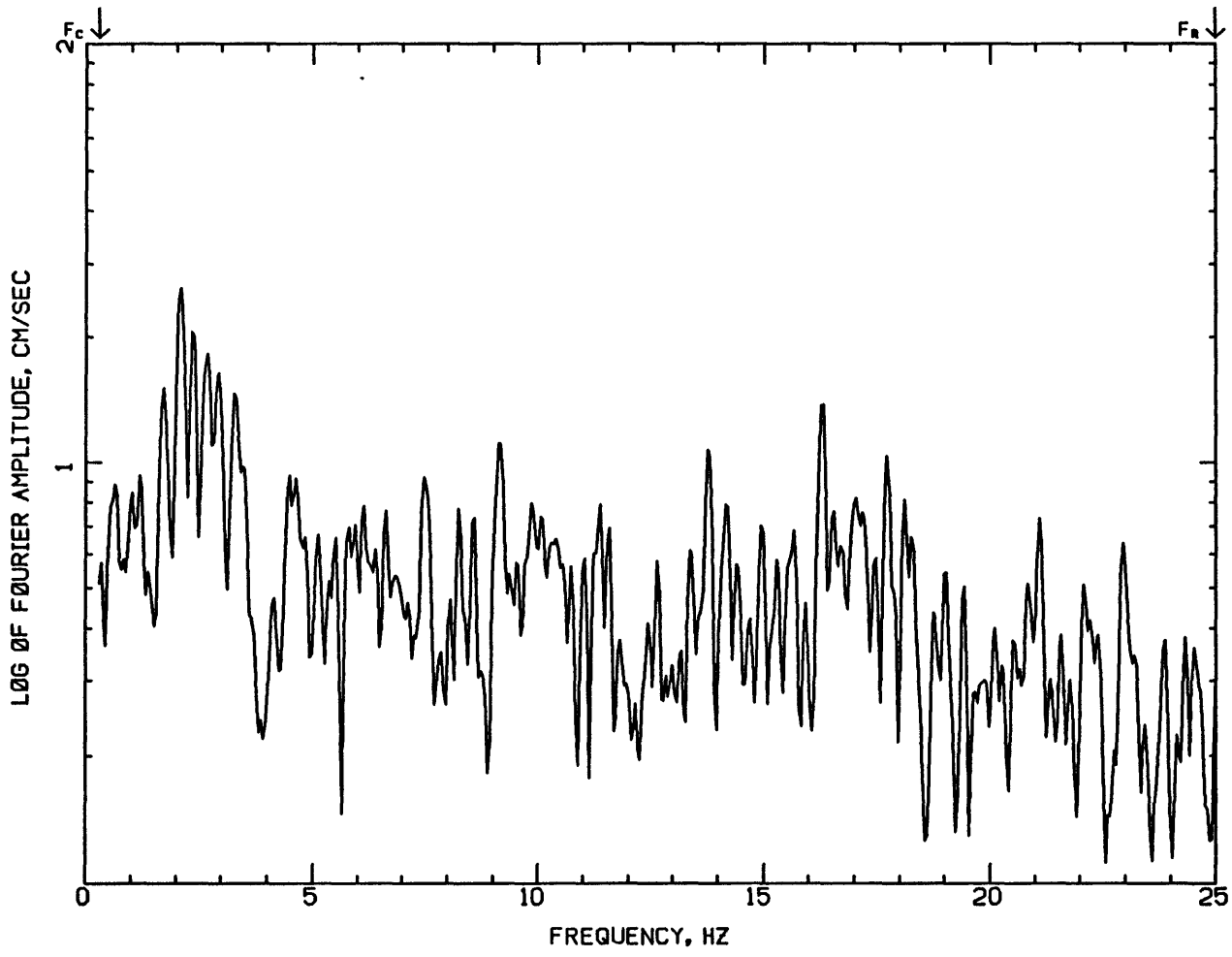

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, EAST-WEST
PEAK VALUES: ACCEL=-107.76 CM/SEC/SEC, VELØCITY=6.70 CM/SEC, DISPL=3.40 CM
ACCELERATIØN CM/SEC/SEC
110.
-110.
VELØCITY CM/SEC
6.70
-6.70
DISPLACEMENT CM
3.50
-3.50
2
4
6
8
10
12
SECØNDS

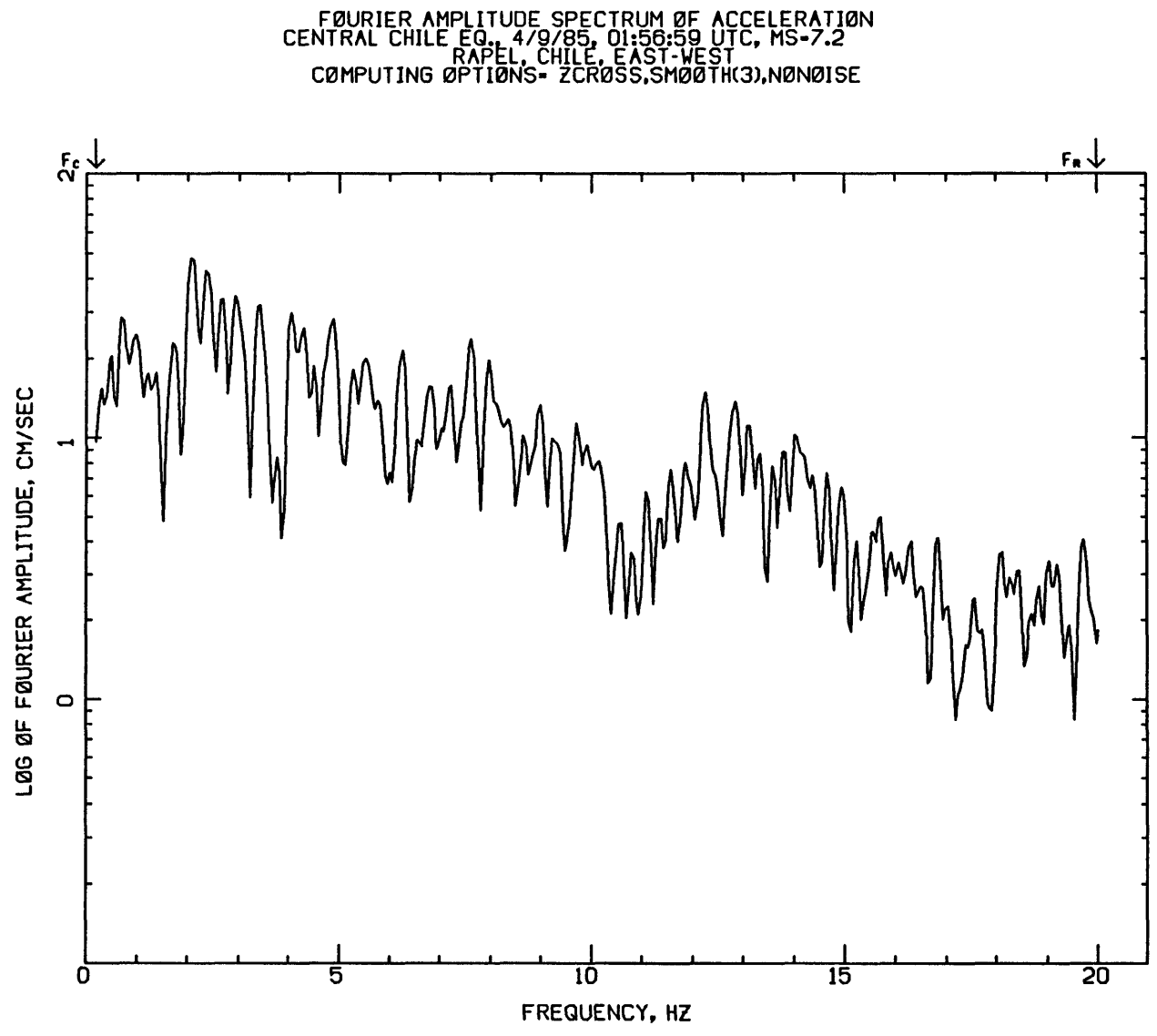

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FR
FT
2
1
0
1
2
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FR
FT
2
1
0
1
2
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FR
FT
A0
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2

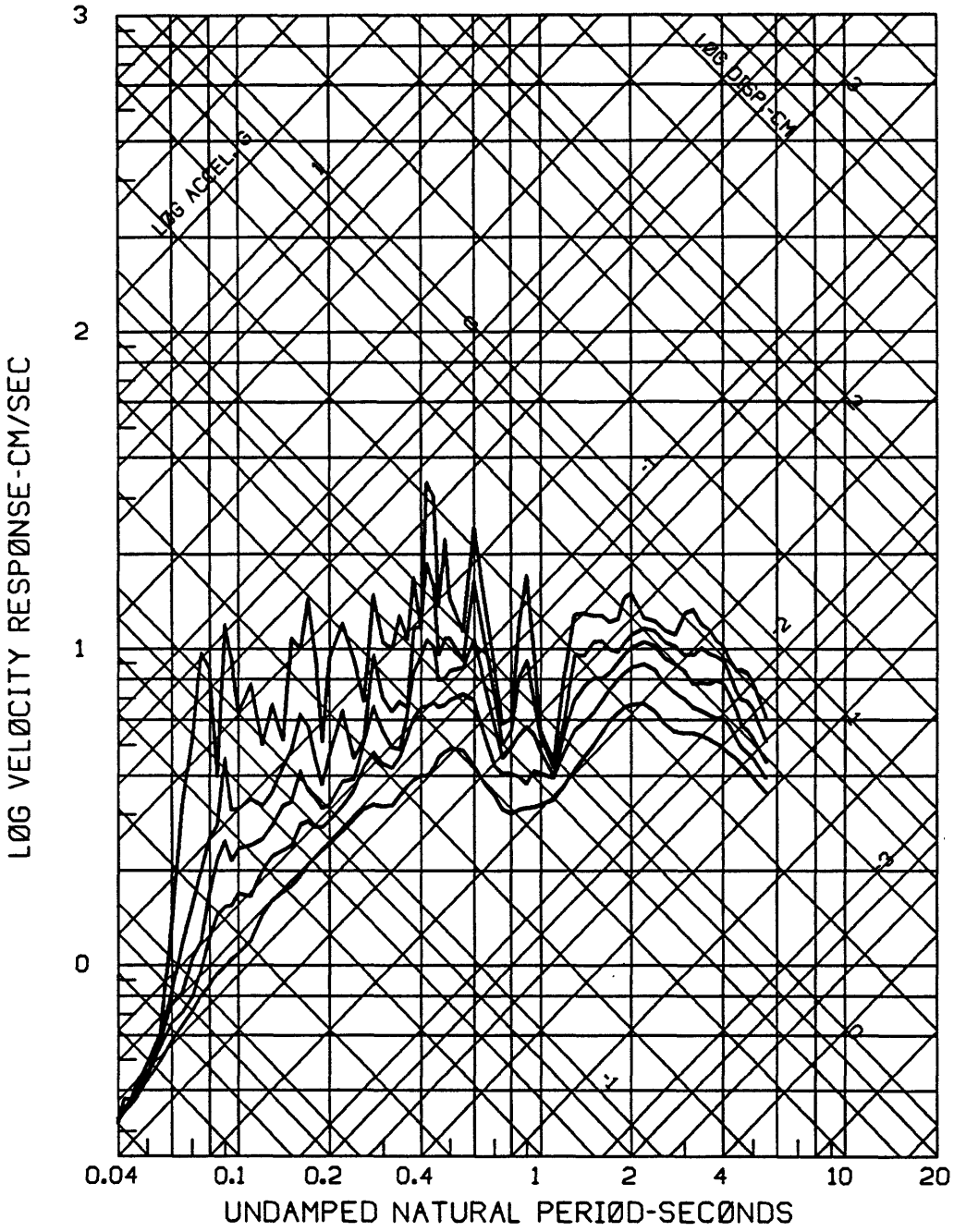

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
Fn
2
1
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
2
4
6
8
10
12
14
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
Fn
2
1
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
25
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
RAPEL, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(3),NØNØISE
Fc
FN
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
FREQUENCY, HZ

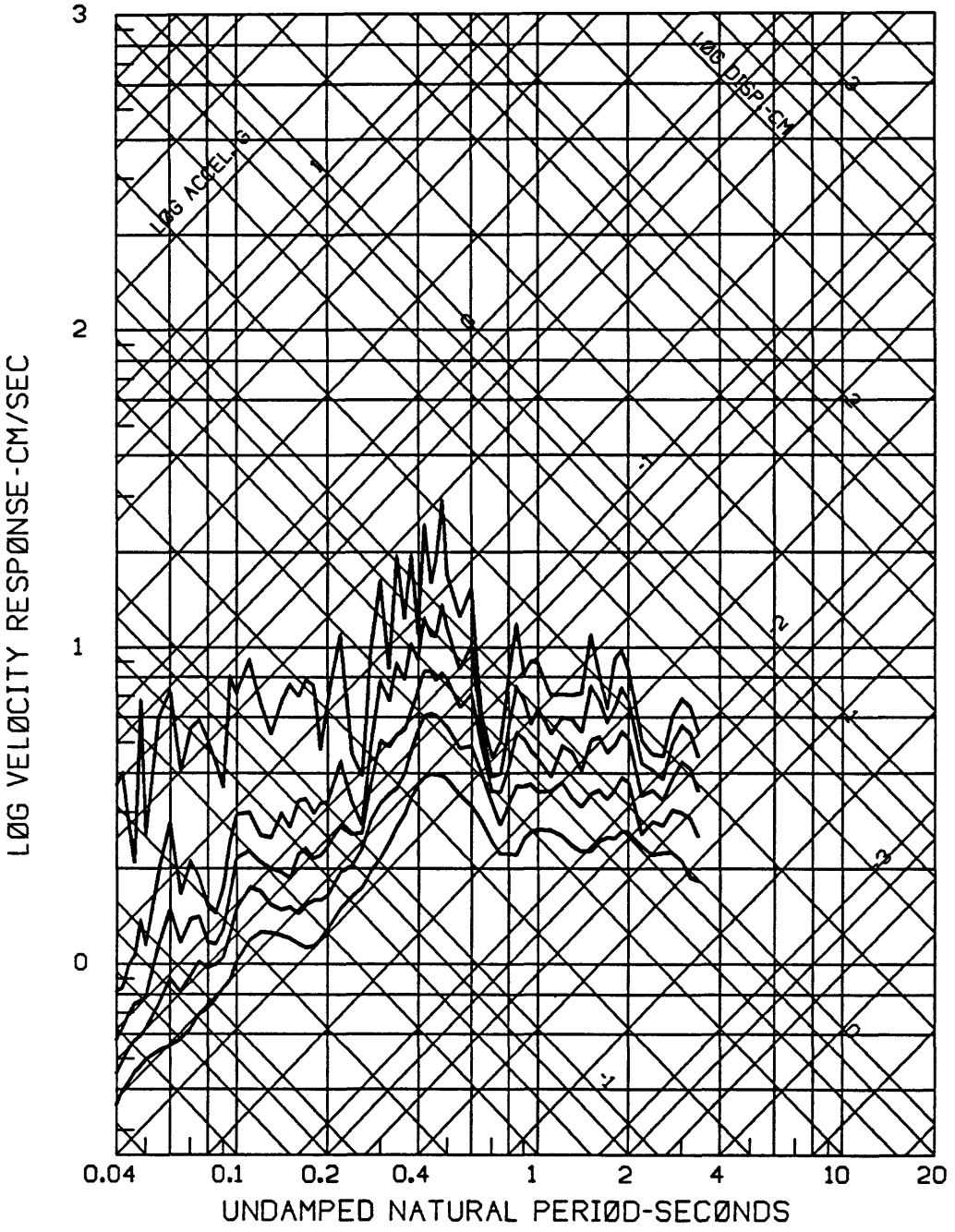
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
RAPEL, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING

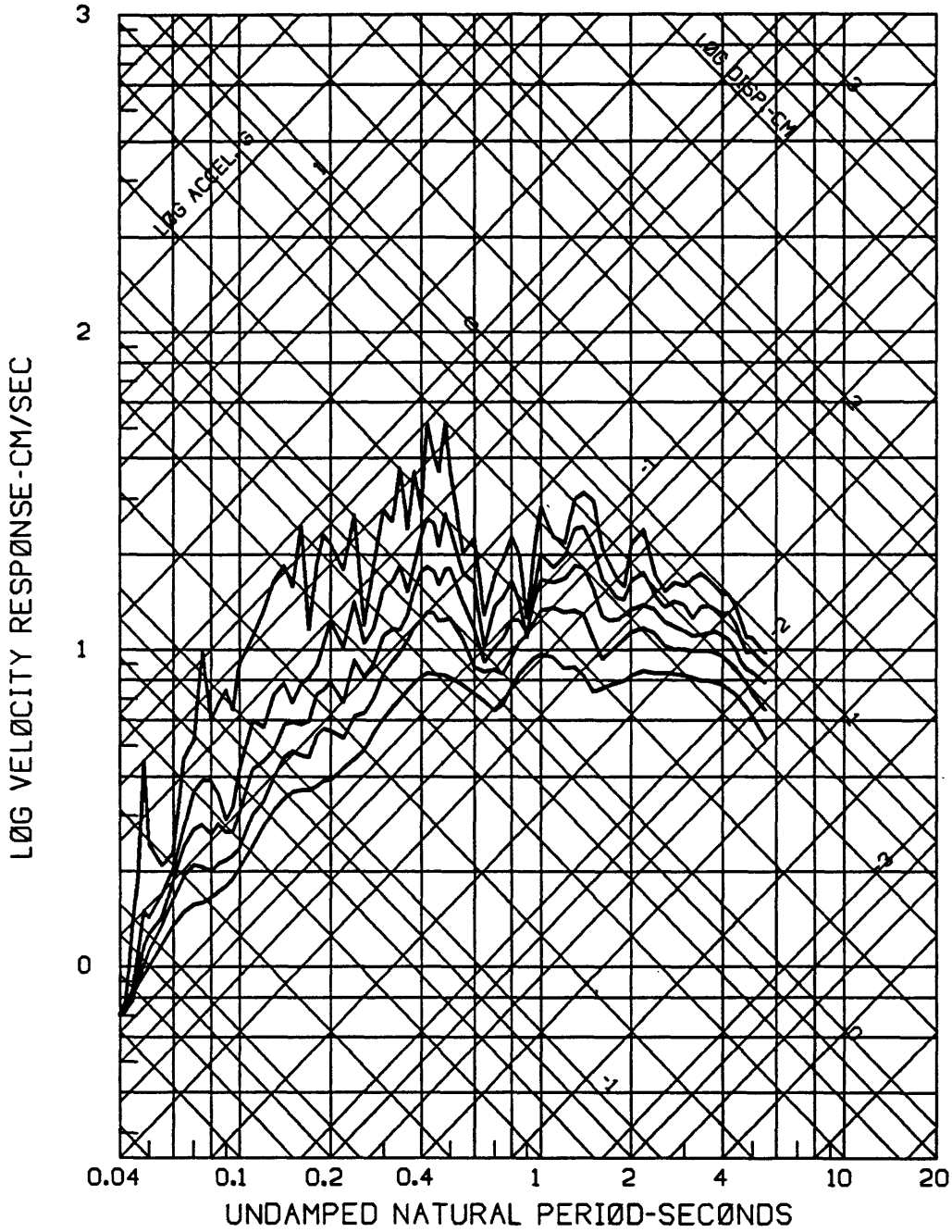


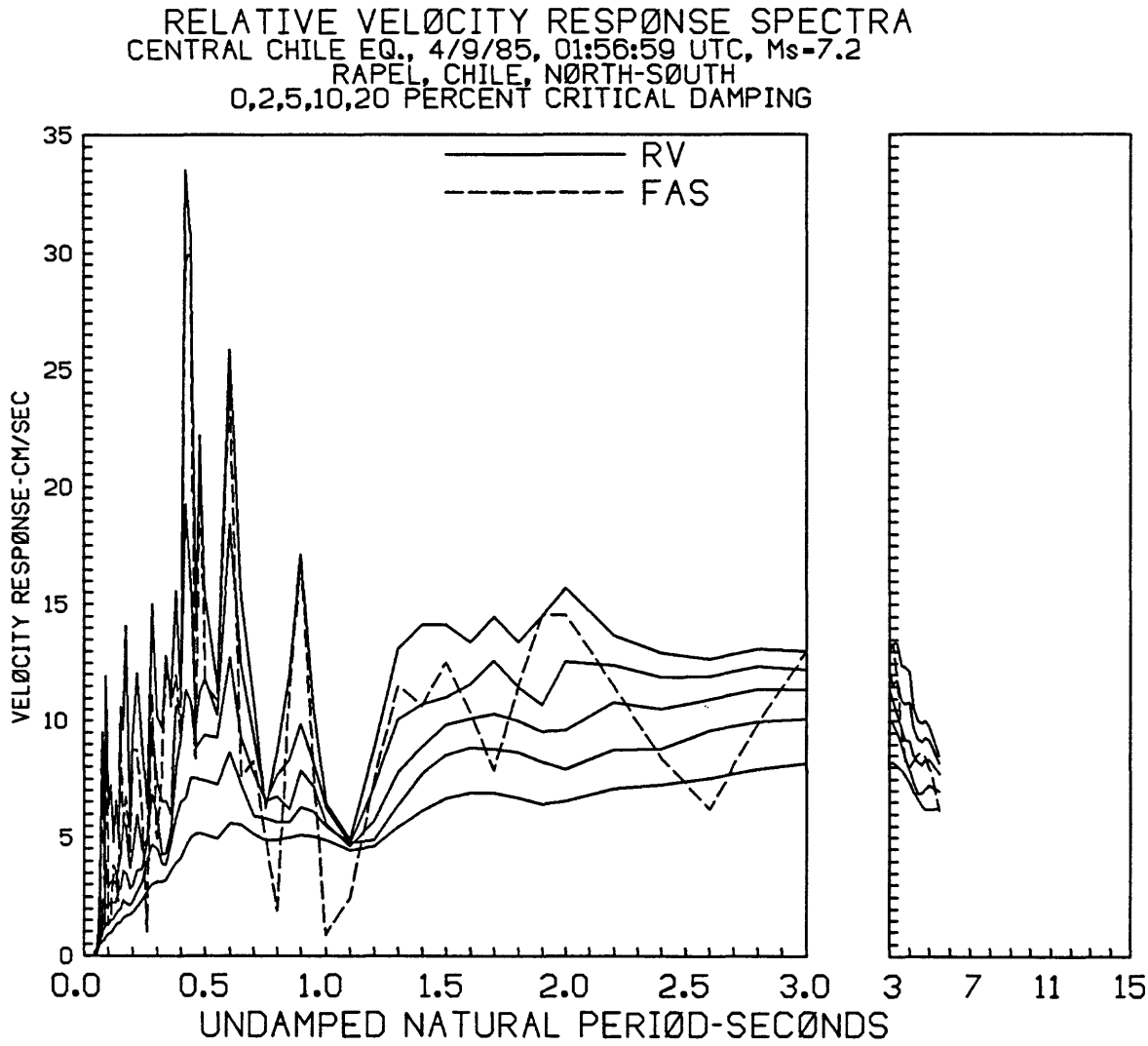
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

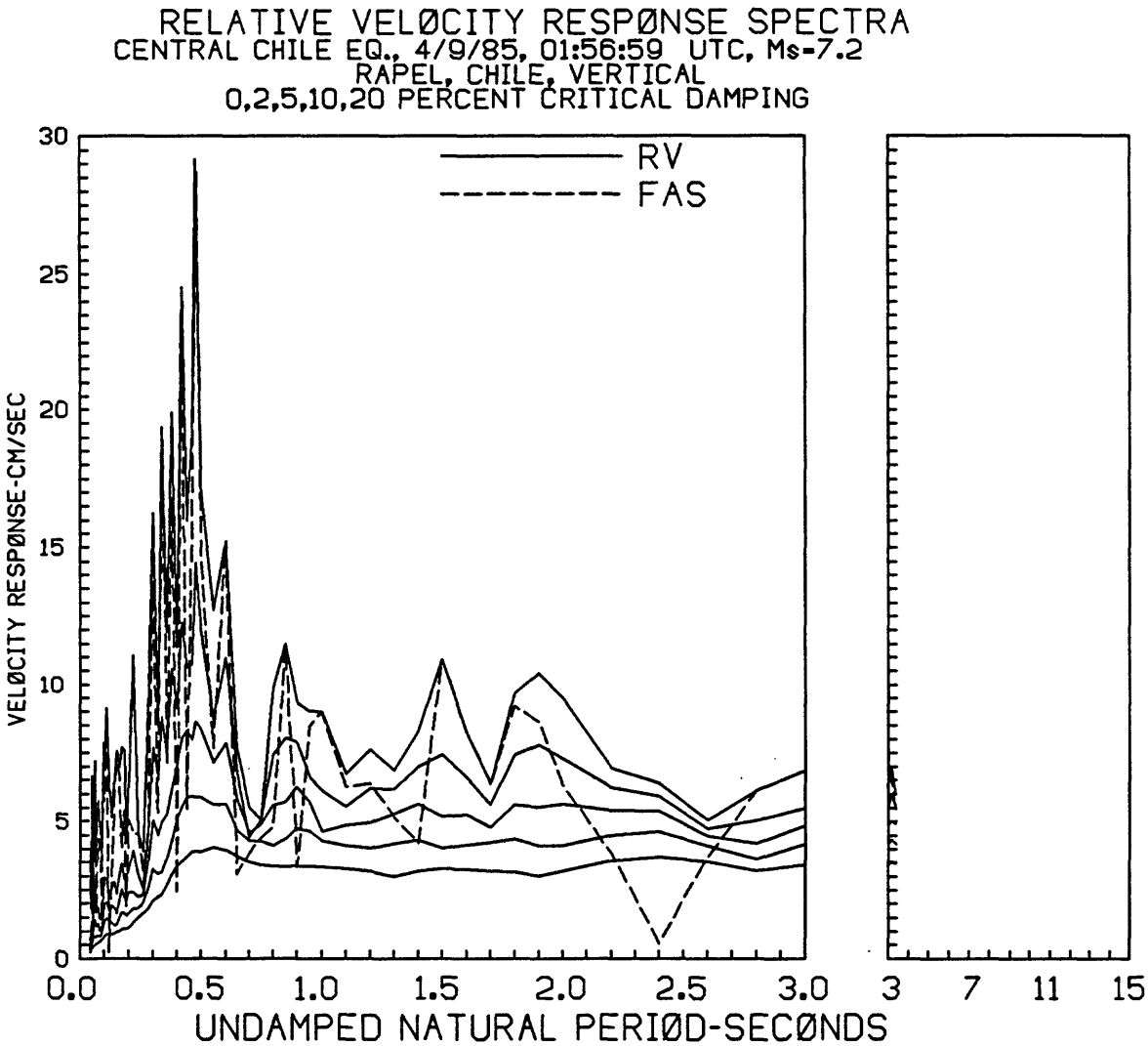
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
RAPEL, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

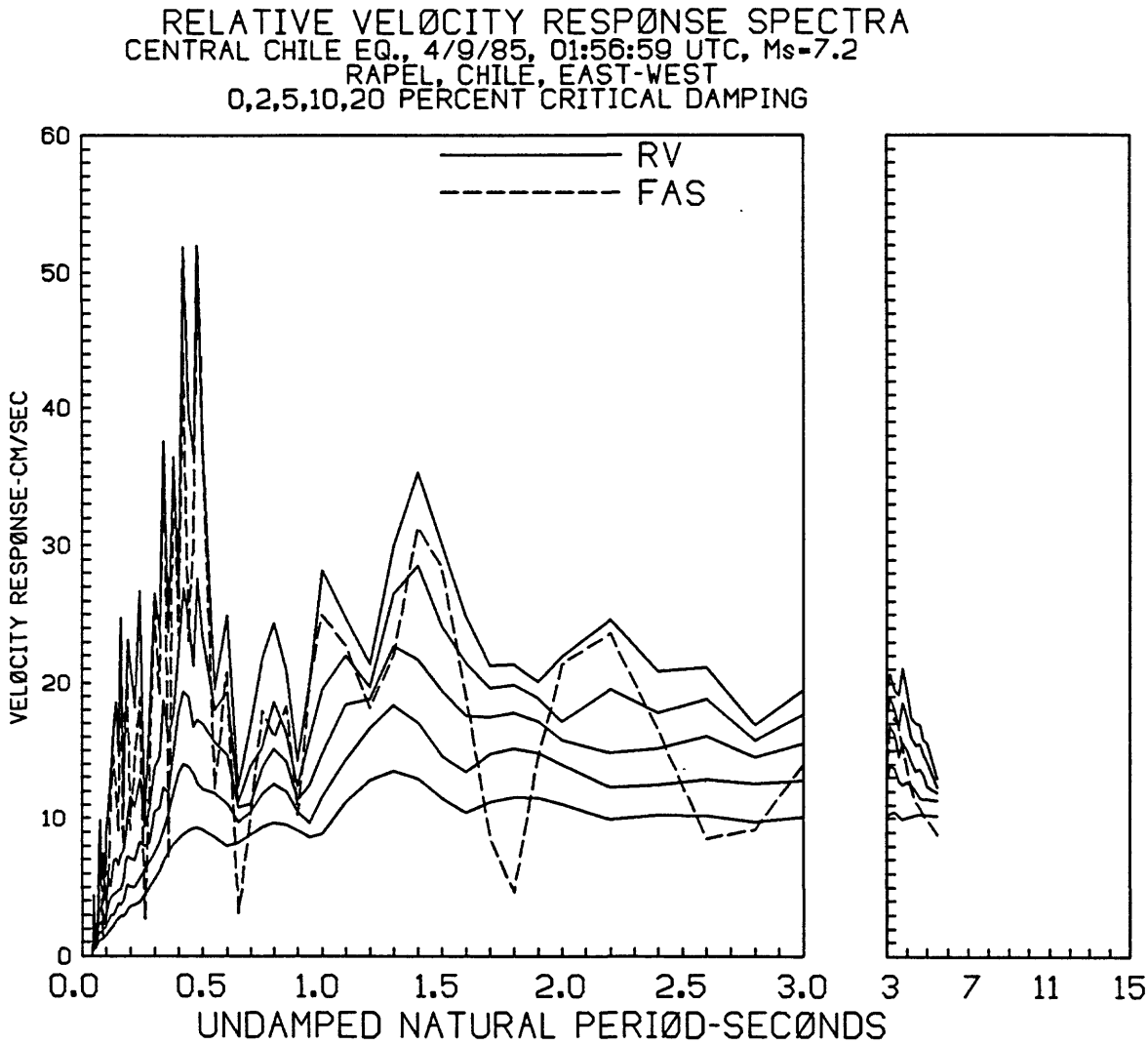


PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
RAPEL, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
RAPEL, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
25
30
35
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
RAPEL, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
25
30
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

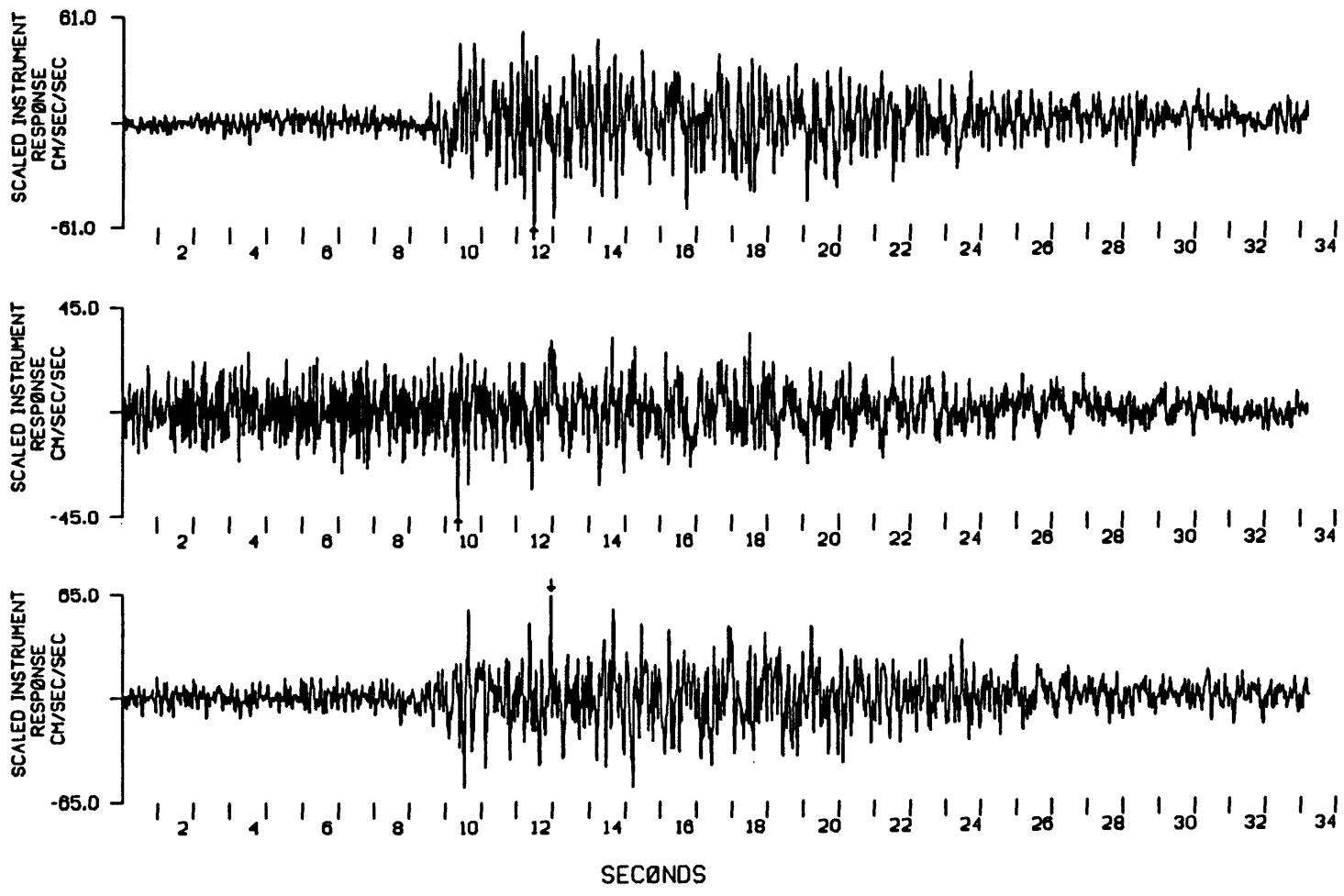

RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
RAPEL, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
60
50
40
30
20
10
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

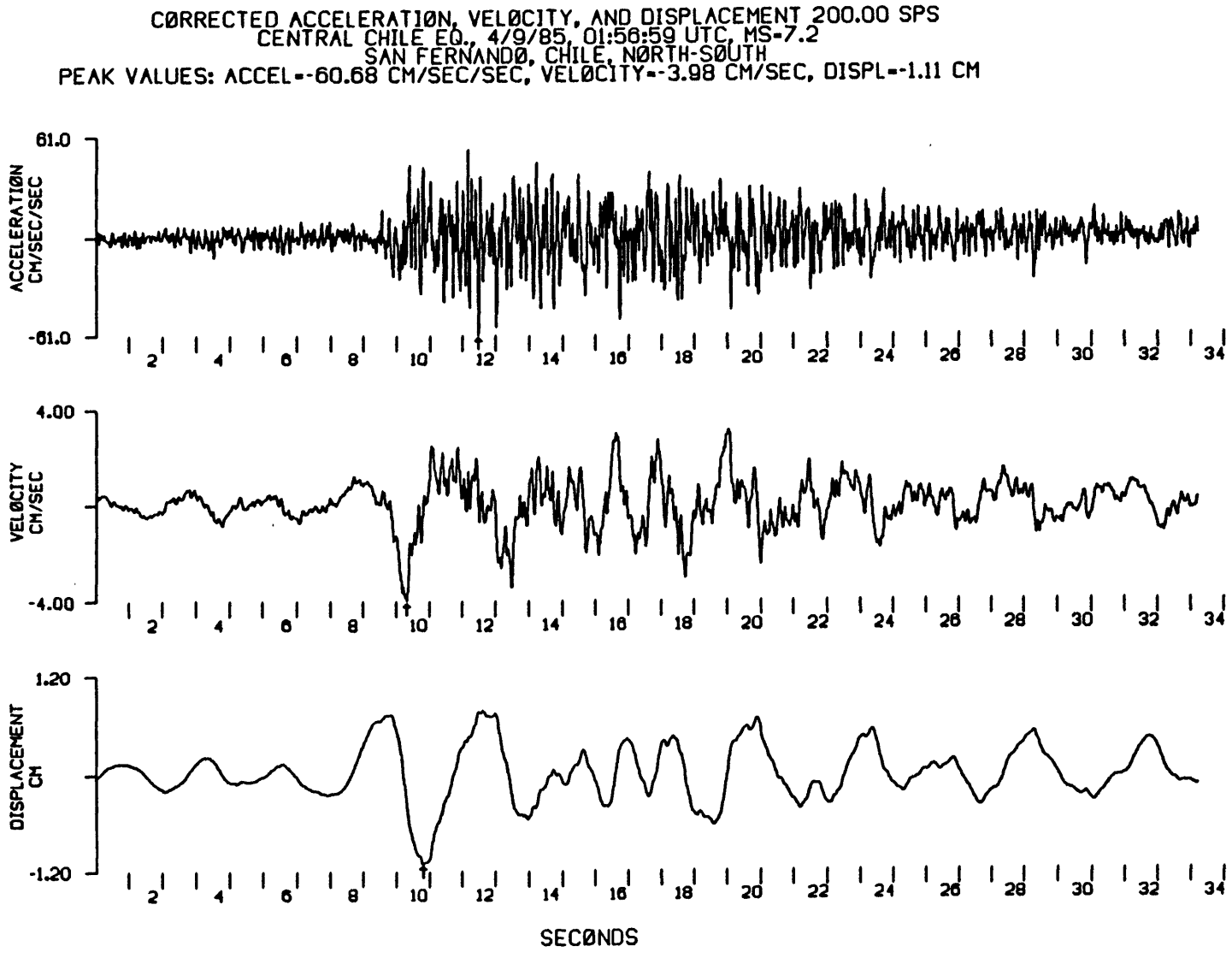
SUMMARY OF STRONG-MOTION RECORD PROCESSING

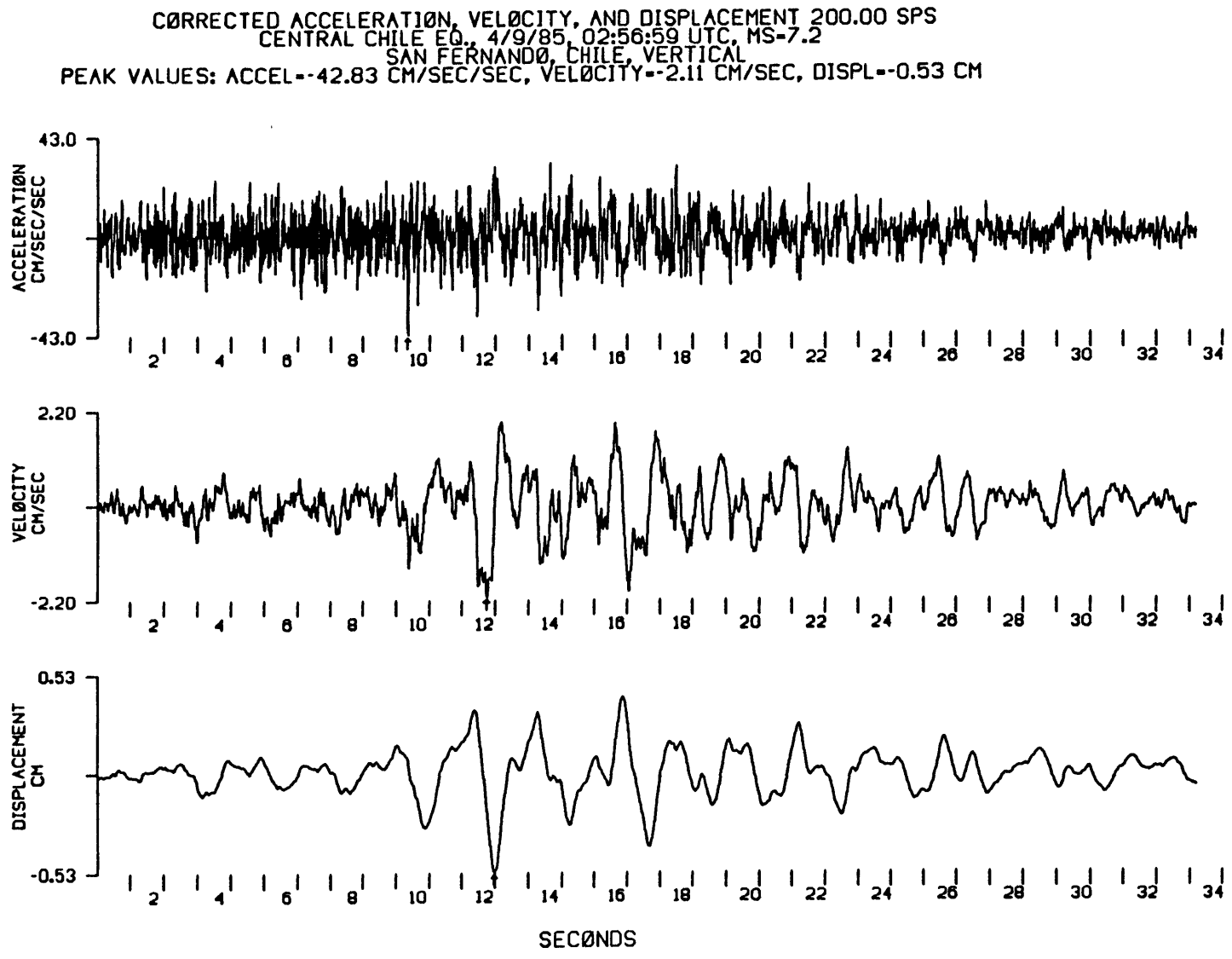
Central Chile earthquake, 4/9/85
01:56:59 UTC, M_S=7.2

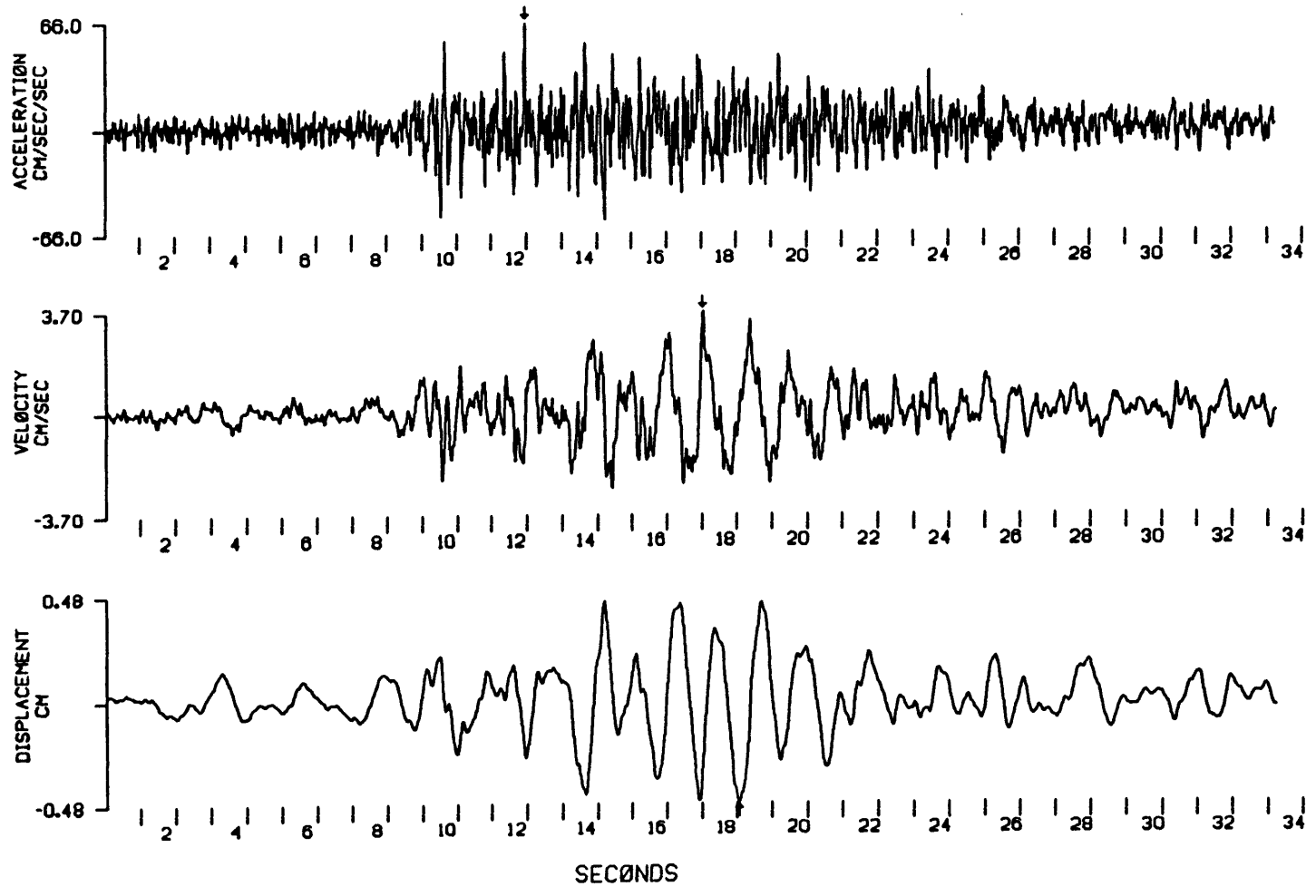
San Fernando, Chile

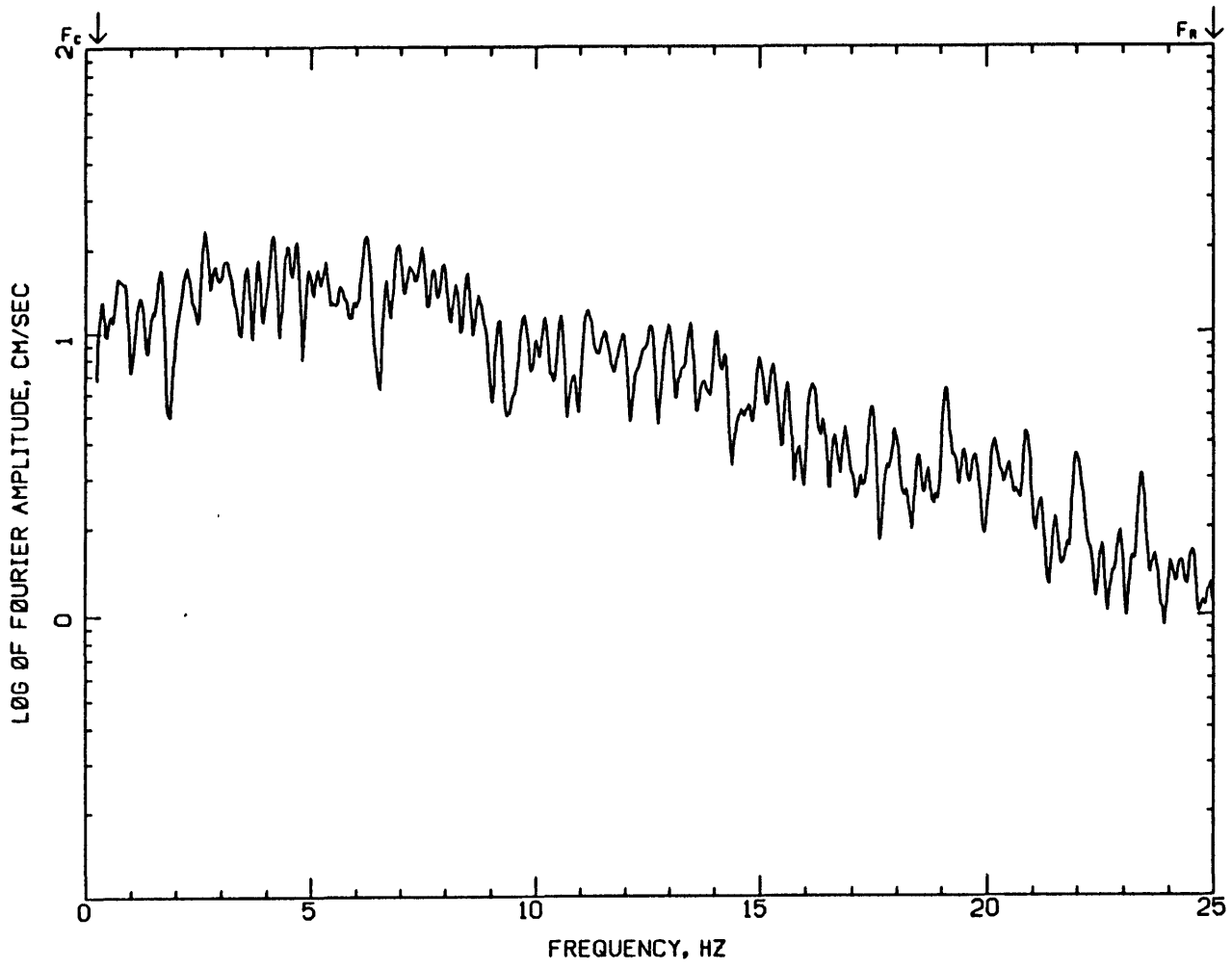
DESCRIPTION	COMPONENT		
	North-South	Vertical	East-West
Instrument Characteristics:			
Frequency (Hz)	25.9	27.7	25.6
Damping (% Critical)	67.4	60.8	63.8
Filter Parameters:			
Highcut (Hz)	25.0	35.0	25.0
Lowcut (Hz)	0.250	0.370	0.370
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	-60.2	-44.9	64.2
Peak Acceleration, A (cm/s/s)	-60.7	-42.8	65.0
Peak Velocity, V (cm/s)	-3.98	-2.11	3.63
Peak Displacement, D (cm)	-1.11	-0.527	-0.478
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.066	0.049	0.056
$\lvert AD/V^2 \rvert$	4.3	5.1	2.4

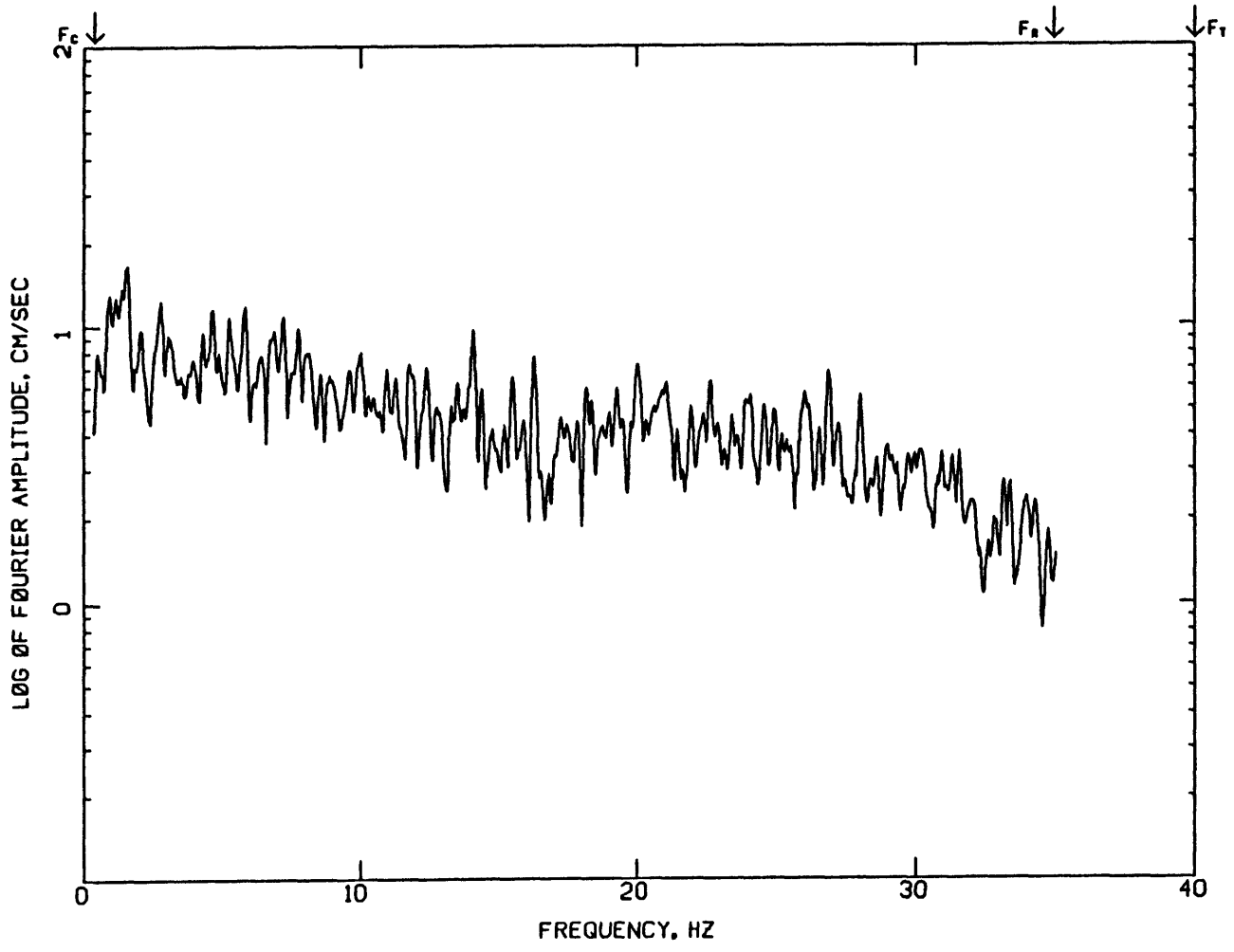

UNCØRRECTED ACCELERØGRAM
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, NØRTH-SØUTH, VERTICAL, EAST-WEST
PEAK VALUES(CM/SEC/SEC): -60.19 -44.91 64.18
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
61.0
-61.0
45.0
-45.0
65.0
-65.0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
SECØNDS

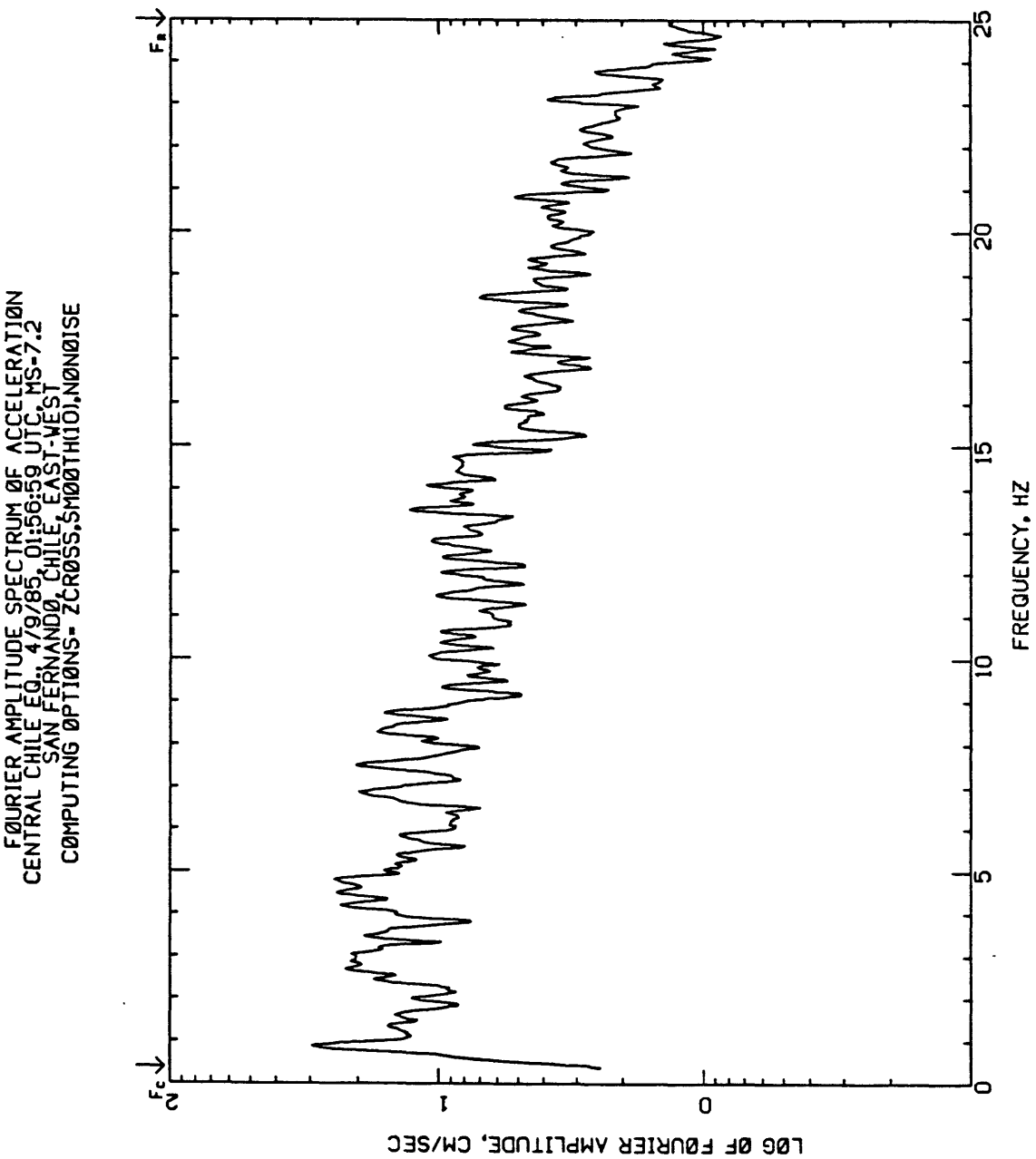

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, NØRTH-SØUTH
PEAK VALUES: ACCEL=-60.68 CM/SEC/SEC, VELØCITY=-3.98 CM/SEC, DISPL=-1.11 CM
ACCELERATIØN CM/SEC/SEC
61.0
-61.0
VELØCITY CM/SEC
4.00
-4.00
DISPLACEMENT CM
1.20
-1.20
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
SECØNDS

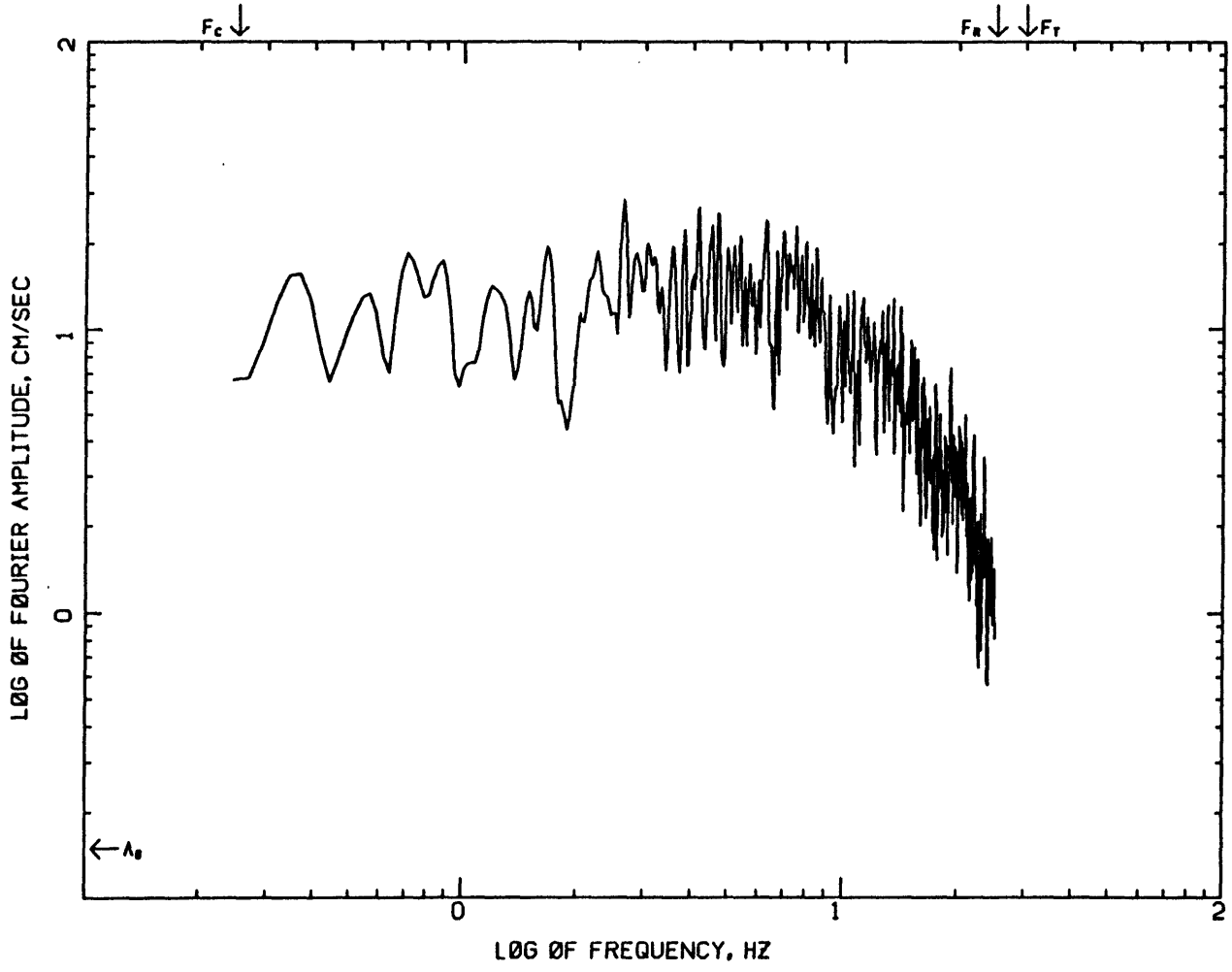

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 02:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, VERTICAL
PEAK VALUES: ACCEL=-42.83 CM/SEC/SEC, VELØCITY=-2.11 CM/SEC, DISPL=-0.53 CM
ACCELERATIØN CM/SEC/SEC
43.0
-43.0
VELØCITY CM/SEC
2.20
-2.20
DISPLACEMENT CM
0.53
-0.53
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
SECØNDS

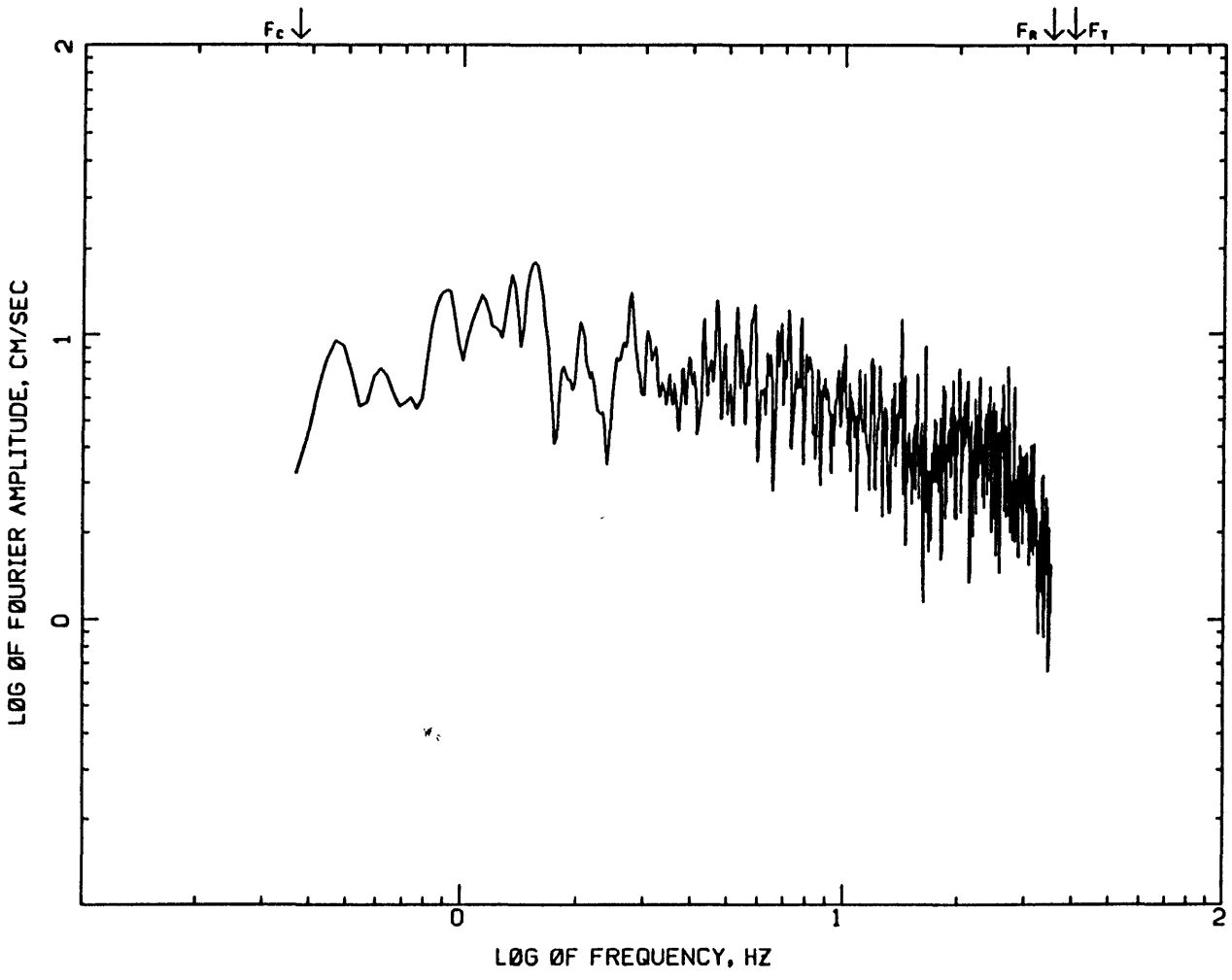

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, EAST-WEST
PEAK VALUES: ACCEL=65.03 CM/SEC/SEC, VELØCITY=3.63 CM/SEC, DISPL=-0.48 CM
ACCELERATIØN CM/SEC/SEC
66.0
-66.0
VELØCITY CM/SEC
3.70
-3.70
DISPLACEMENT CM
0.48
-0.48
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
SECØNDS

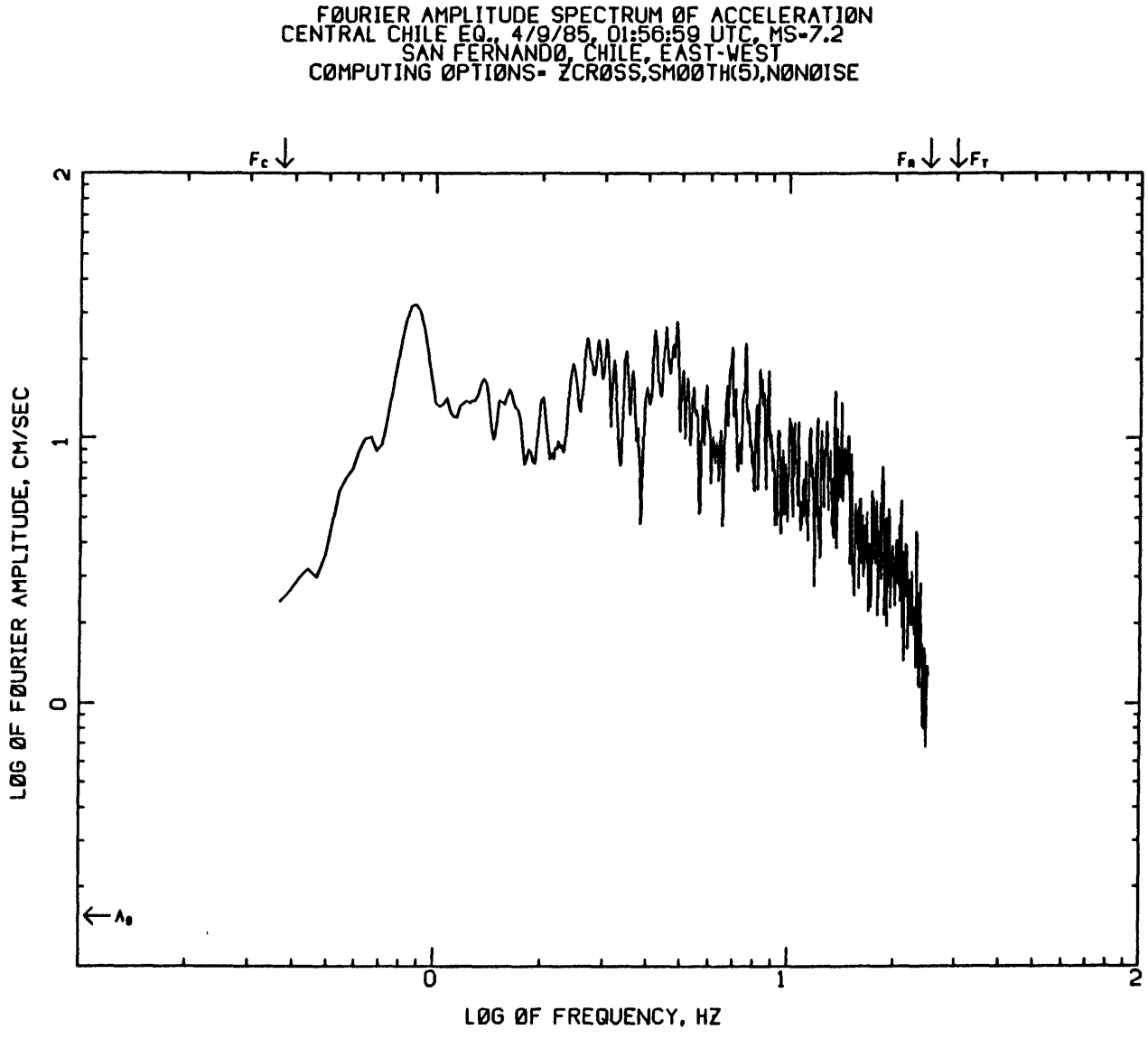

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
2 Fc
FN
LØG ØF FØURIER AMPLITUDE, CM/SEC
1
0
0
5
10
15
20
25
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 02:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
FB
FT
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
10
20
30
40
FREQUENCY, HZ

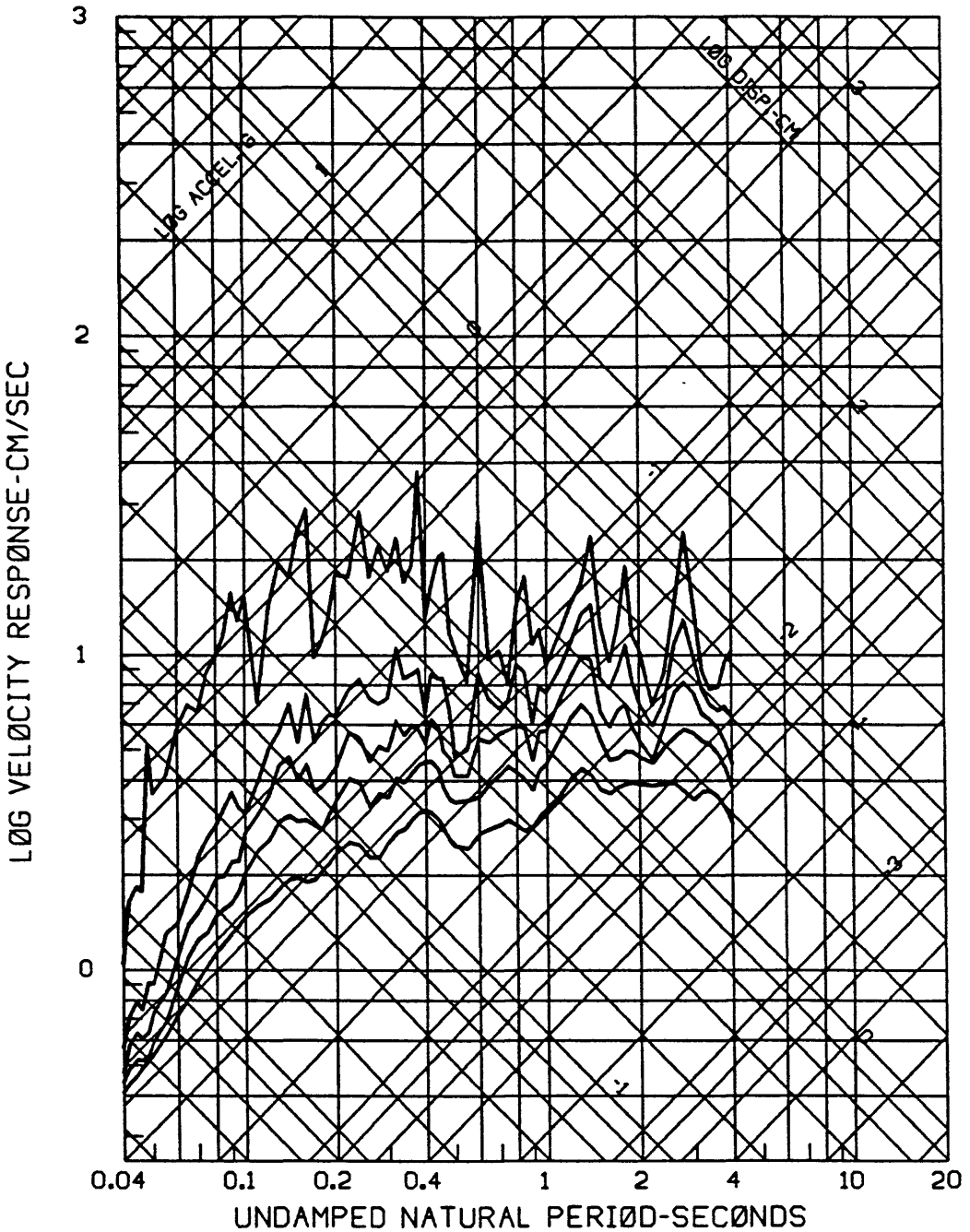

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
CENTRAL CHILE EQ. 4/9/85, 01:56:59 UTC, MS-7.2
SAN FERNANDO, CHILE, EAST-WEST
COMPUTING OPTIONS- ZCROSS,SM00THI01,NONOISE
LOG OF FOURIER AMPLITUDE, CM/SEC
FREQUENCY, HZ
Fc
Fs
2
1
0
0
5
10
15
20
25


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, NØRTH-SØUTH
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2

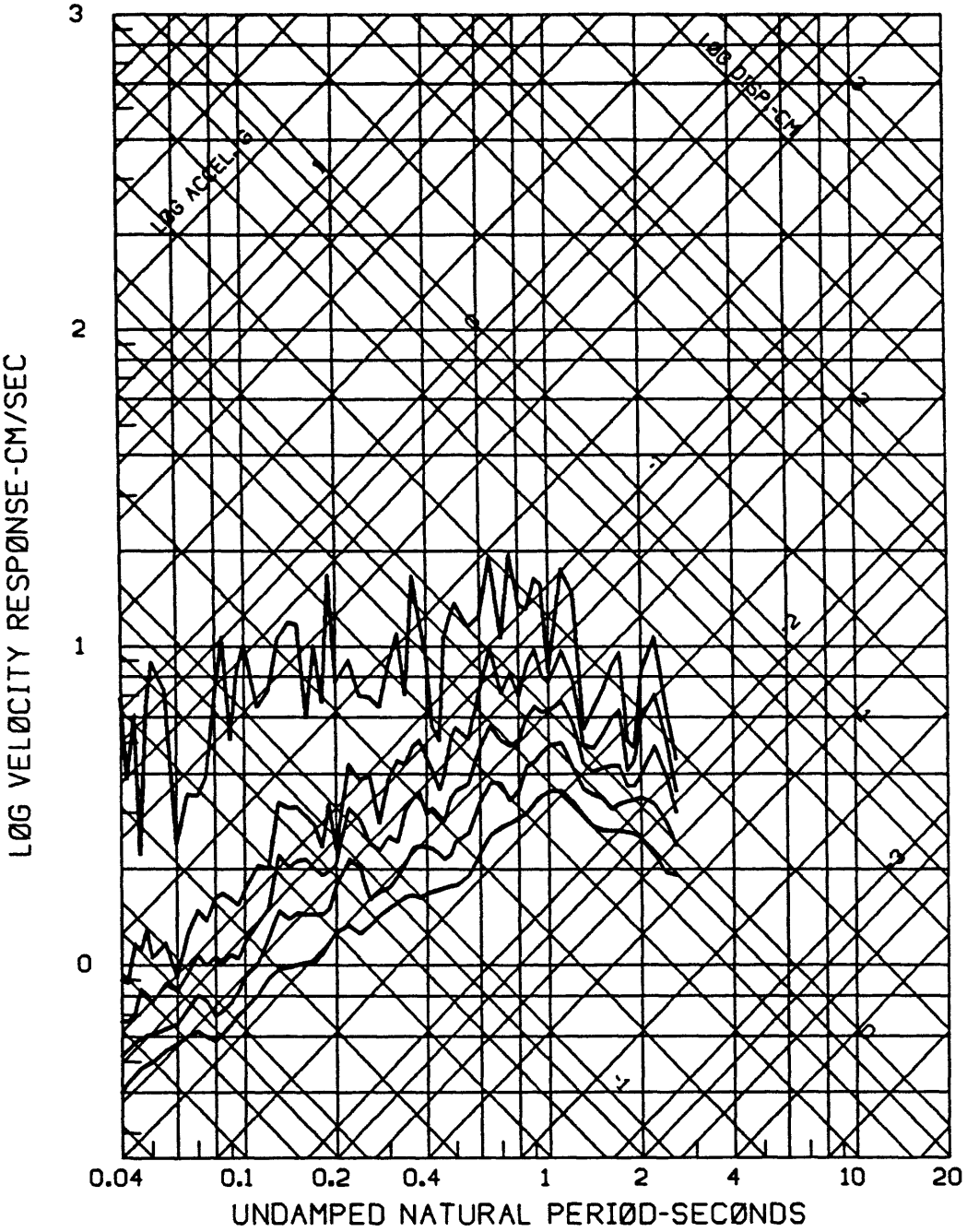

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 02:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SAN FERNANDØ, CHILE, EAST-WEST
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
Fa
FT
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
←A0
0
1
2
LØG ØF FREQUENCY, HZ

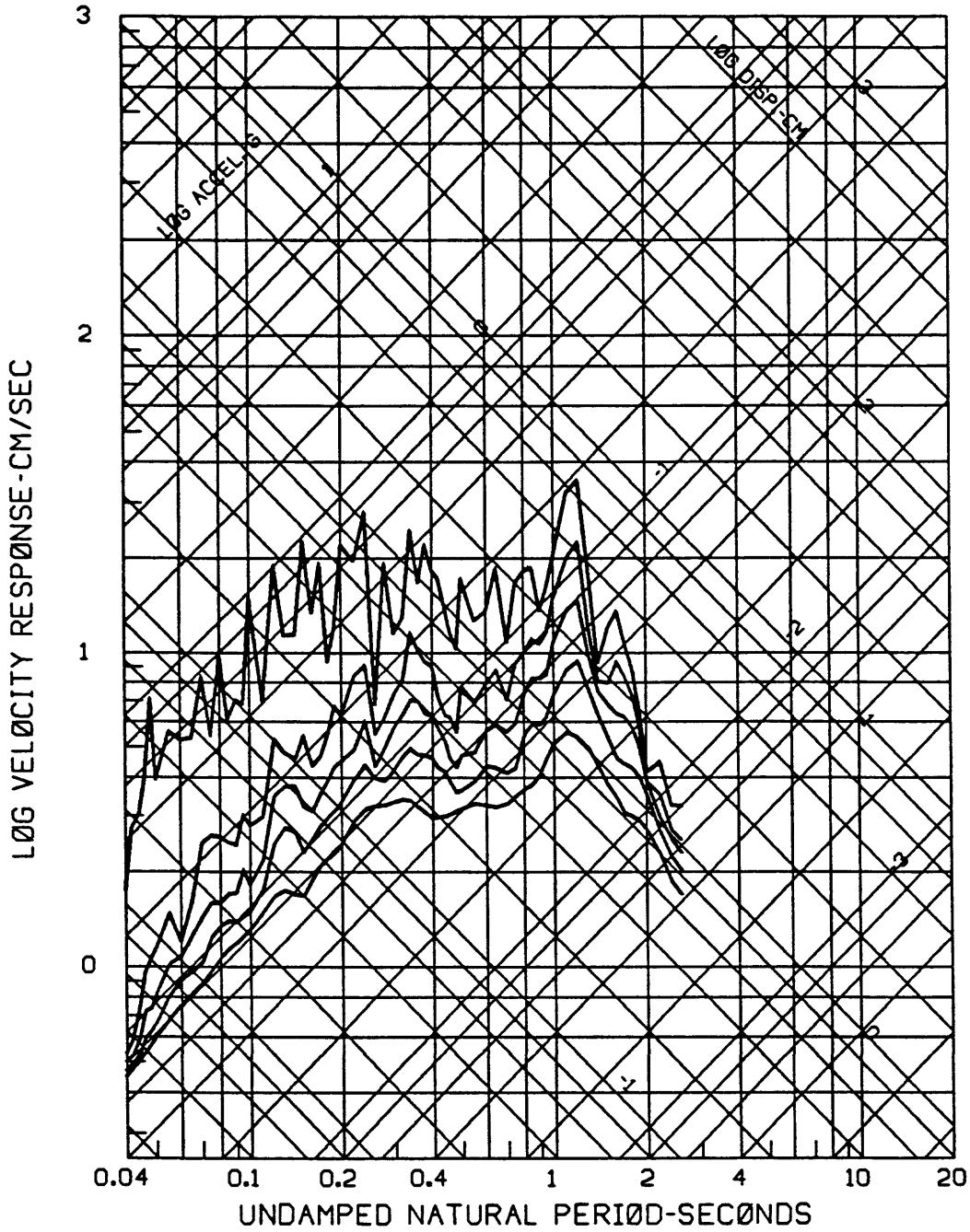
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SAN FERNANDØ, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING

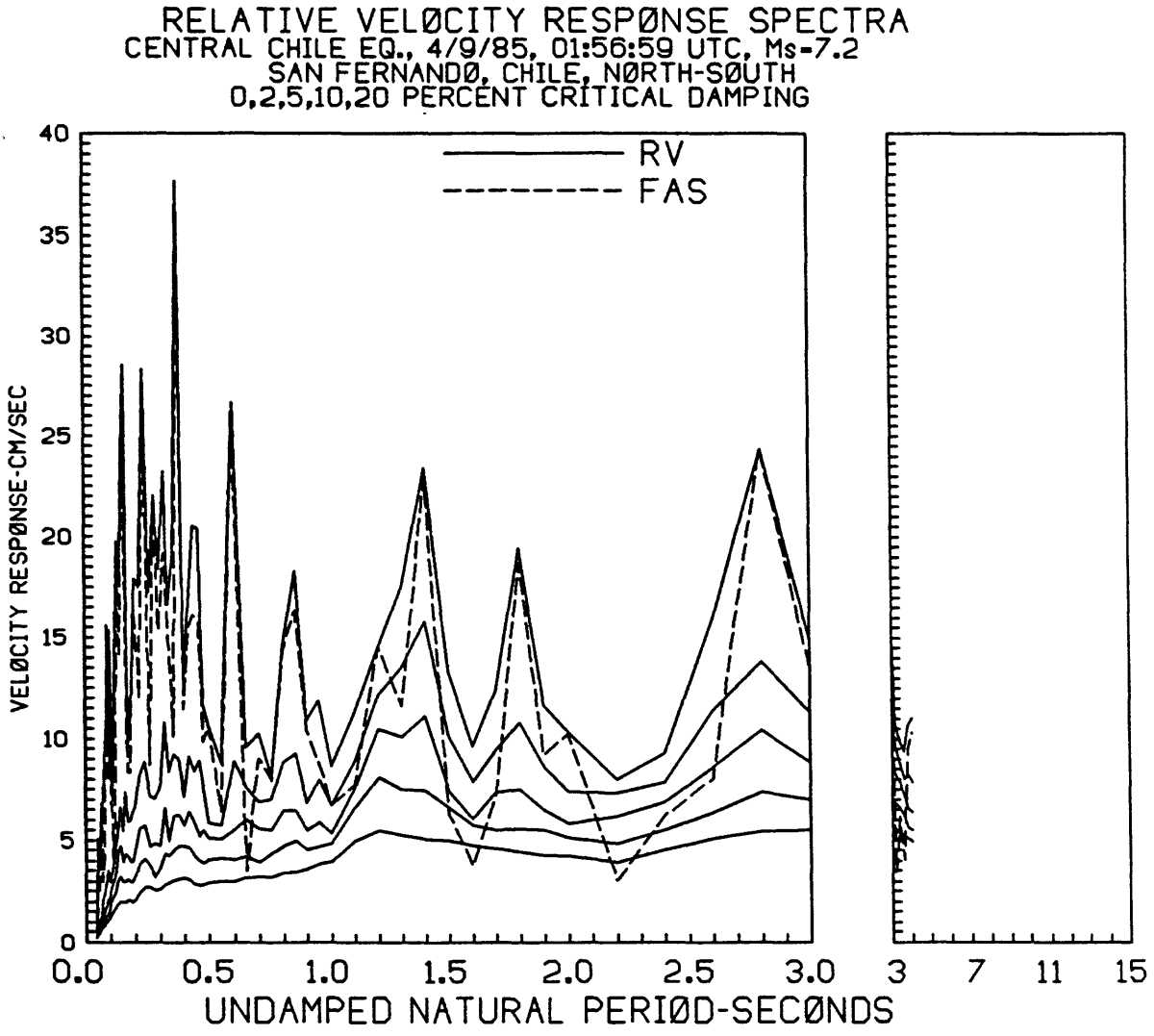


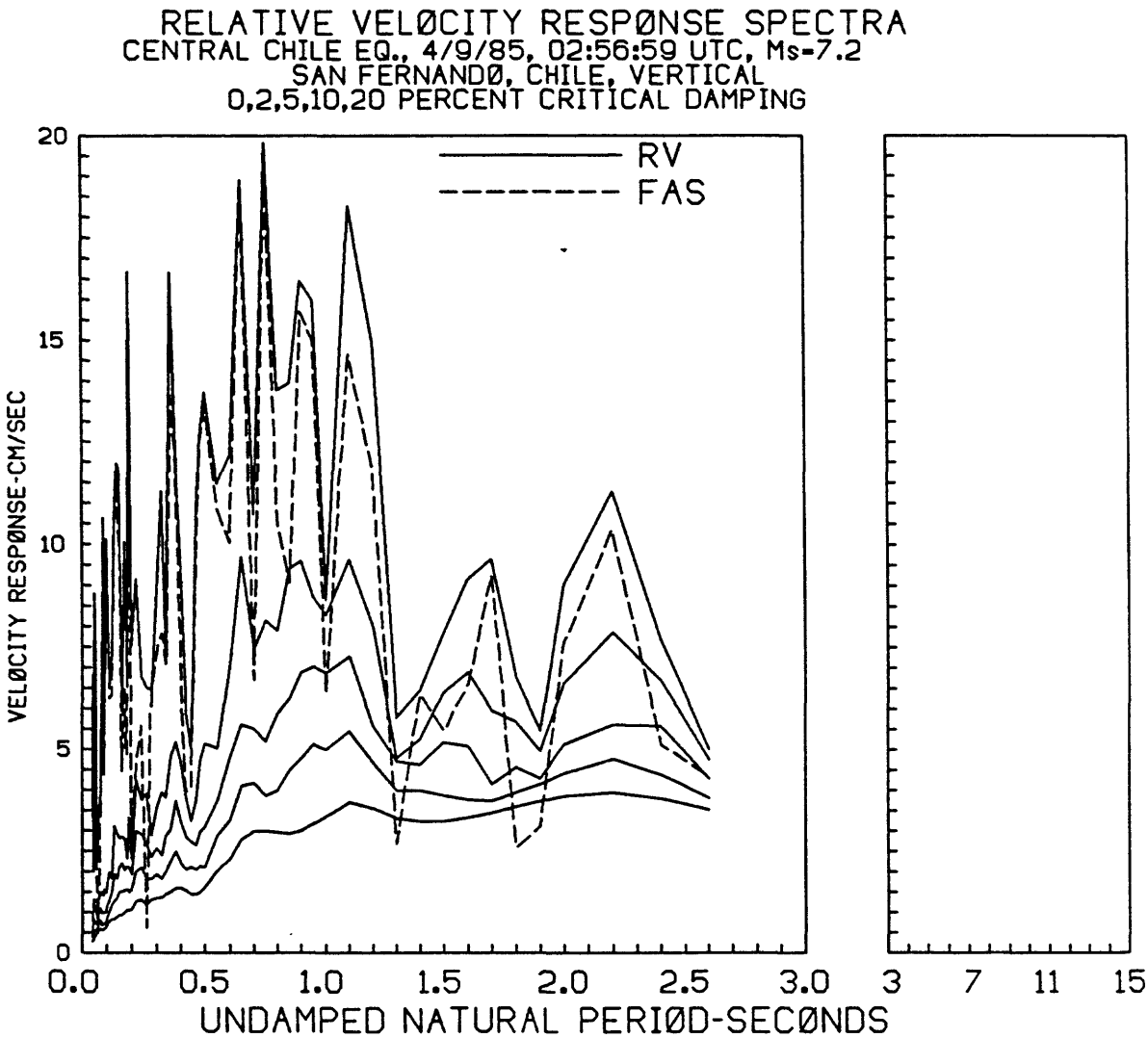
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 02:56:59 UTC, Ms-7.2
SAN FERNANDØ, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

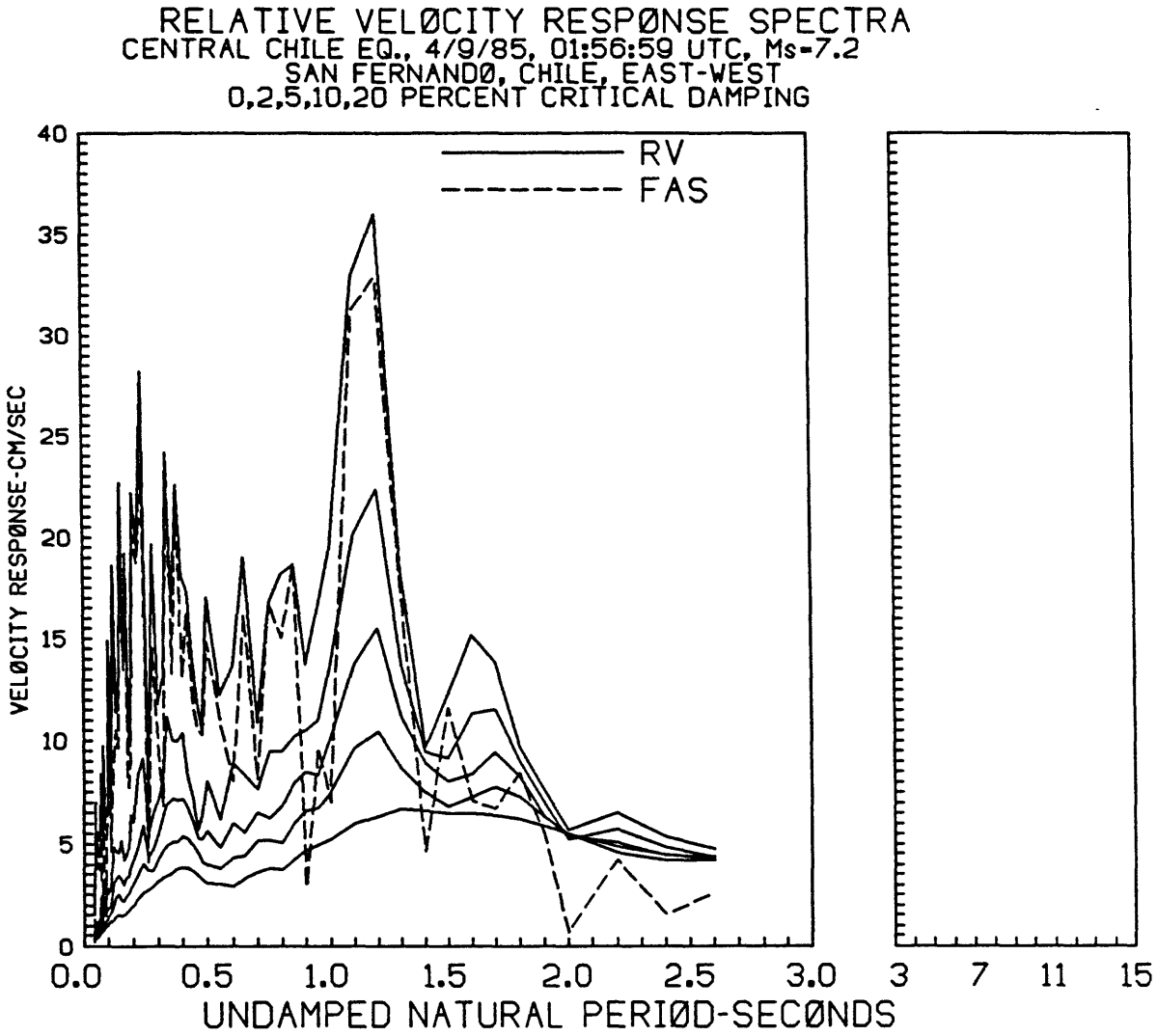


PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SAN FERNANDØ, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SAN FERNANDØ, CHILE, NØRTH-SØUTH
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
25
30
35
40
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 02:56:59 UTC, Ms-7.2
SAN FERNANDØ, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
20
15
10
5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

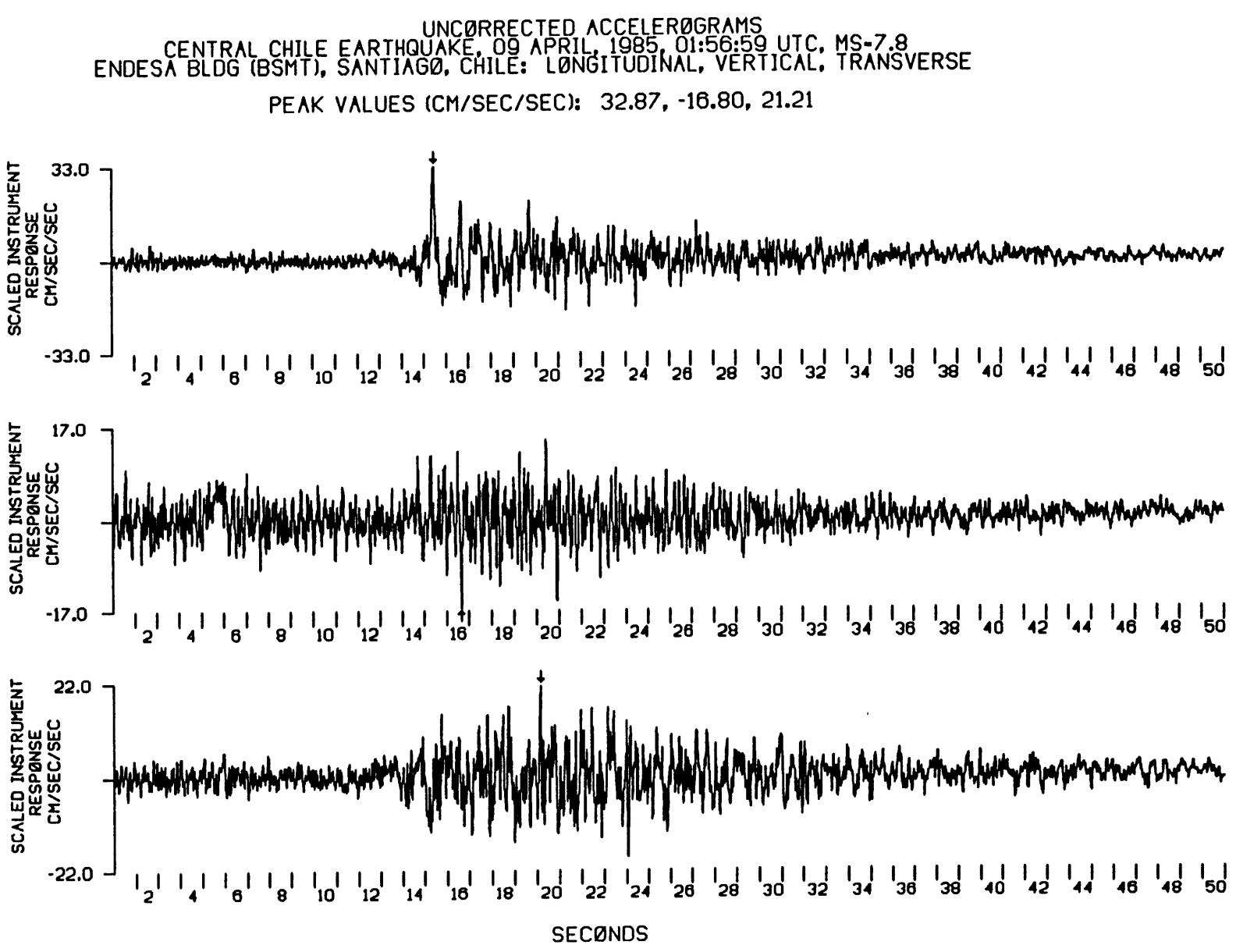

RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SAN FERNANDØ, CHILE, EAST-WEST
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
25
30
35
40
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

SUMMARY OF STRONG-MOTION RECORD PROCESSING

Central Chile earthquake of 4/9/85
01:56:59 UTC, M_S=7.2

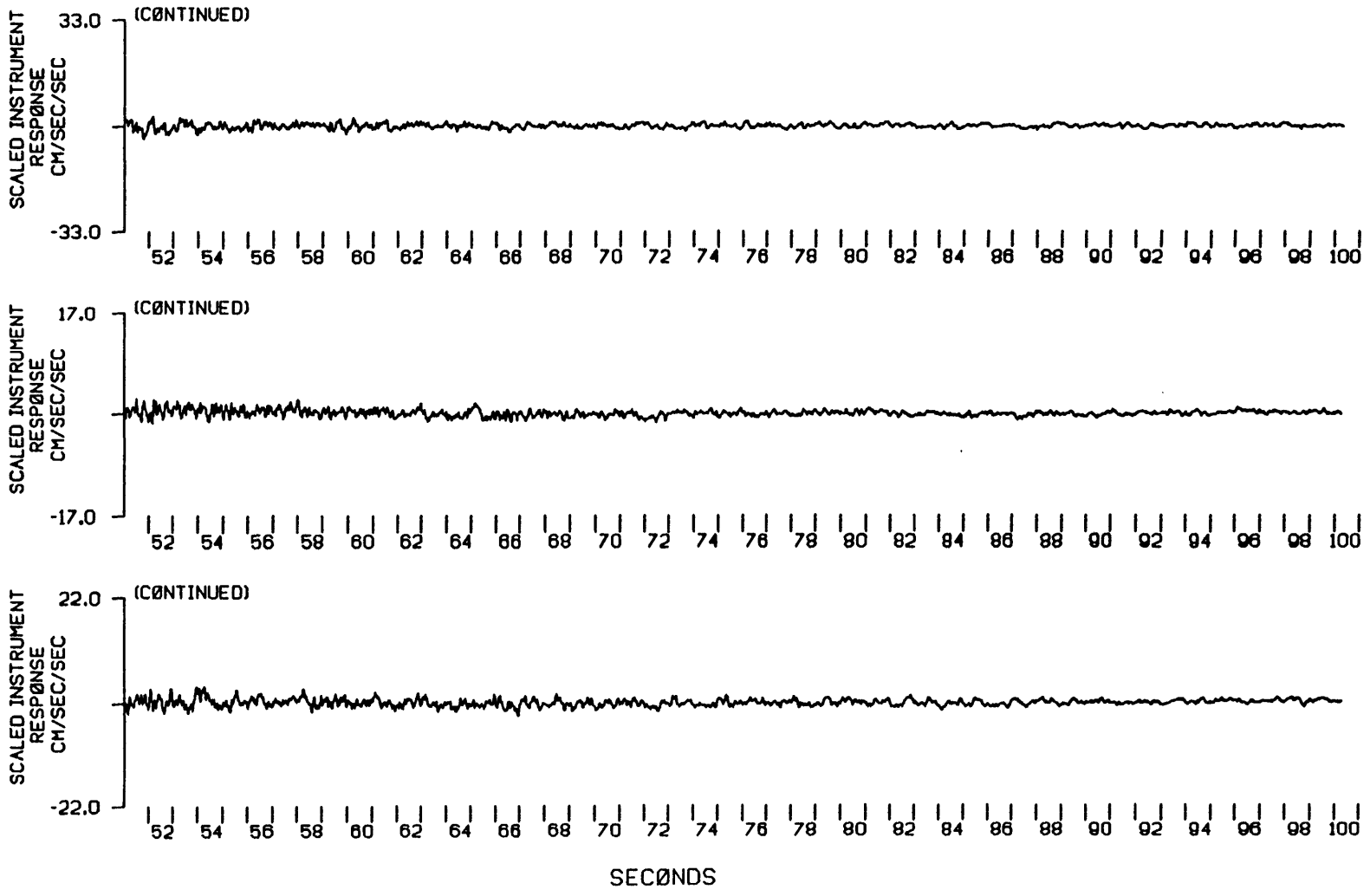
Endesa Bldg. (Bsmt), Santiago, Chile

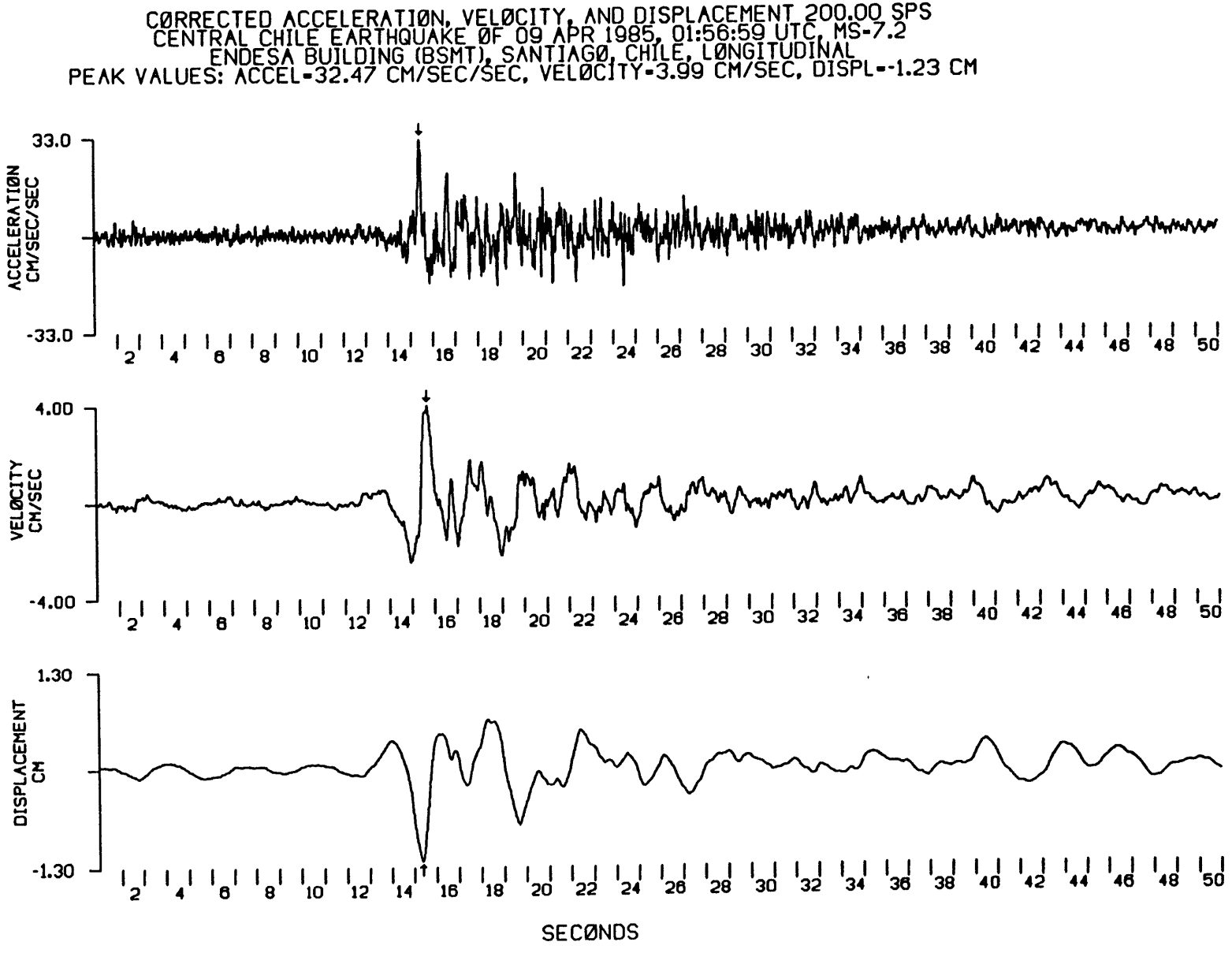
DESCRIPTION	COMPONENT		
	Longitudinal	Vertical	Transverse
Instrument Characteristics:			
Frequency (Hz)	----	----	----
Damping (% Critical)	----	----	----
Filter Parameters:			
Highcut (Hz)	30.0	30.0	30.0
Lowcut (Hz)	0.179	0.179	0.179
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	32.9	-16.8	21.2
Peak Acceleration, A (cm/s/s)	32.5	-17.3	20.8
Peak Velocity, V (cm/s)	3.99	1.47	2.18
Peak Displacement, D (cm)	-1.23	-0.914	0.581
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.12	0.085	0.11
$\lvert AD/V^2 \rvert$	2.5	7.3	2.5

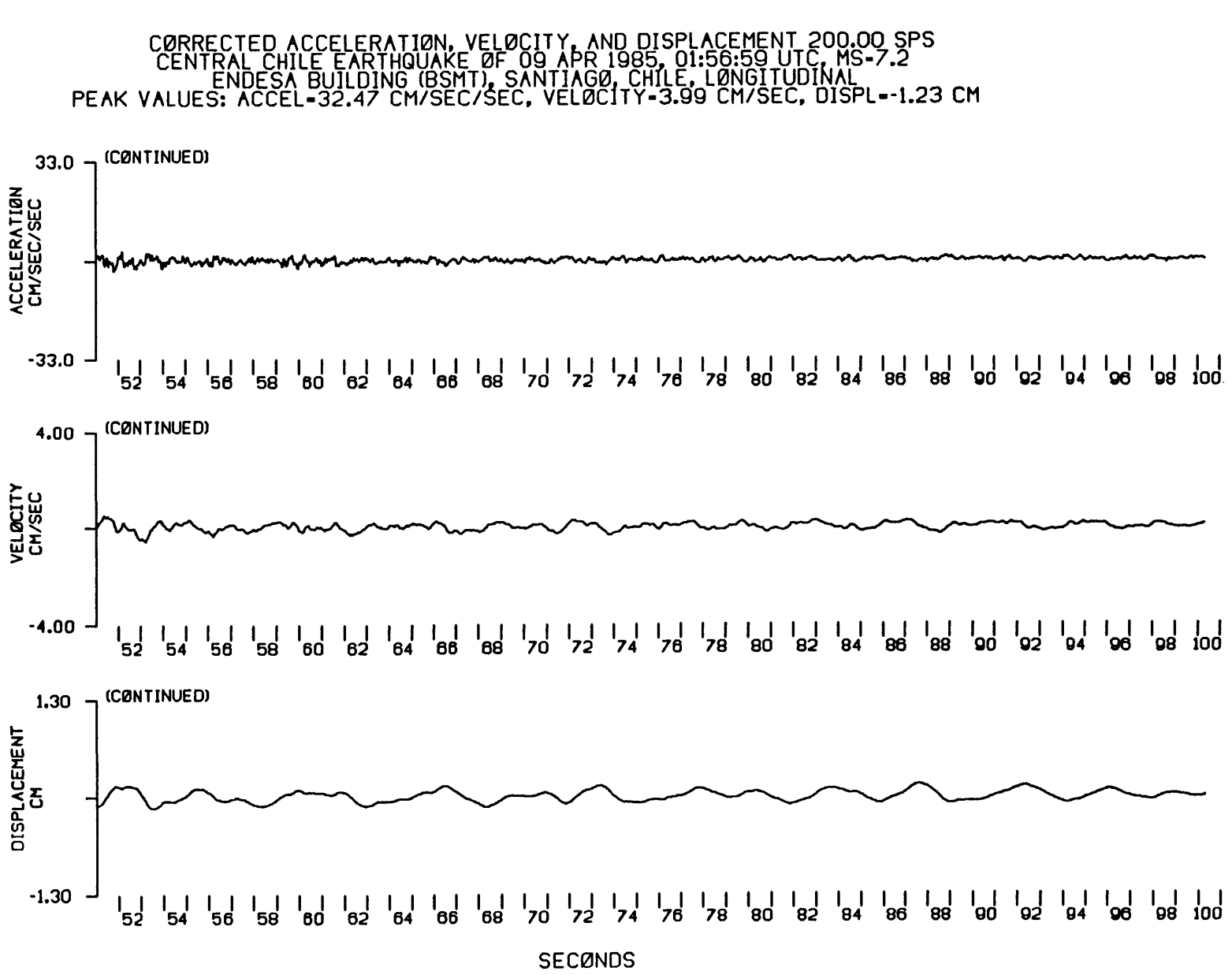

UNCØRRECTED ACCELERØGRAMS
CENTRAL CHILE EARTHQUAKE, 09 APRIL, 1985, 01:56:59 UTC, MS-7.8
ENDESA BLDG (BSMT), SANTIAGØ, CHILE: LØNGITUDINAL, VERTICAL, TRANSVERSE
PEAK VALUES (CM/SEC/SEC): 32.87, -16.80, 21.21
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
33.0
-33.0
17.0
-17.0
22.0
-22.0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
SECØNDS

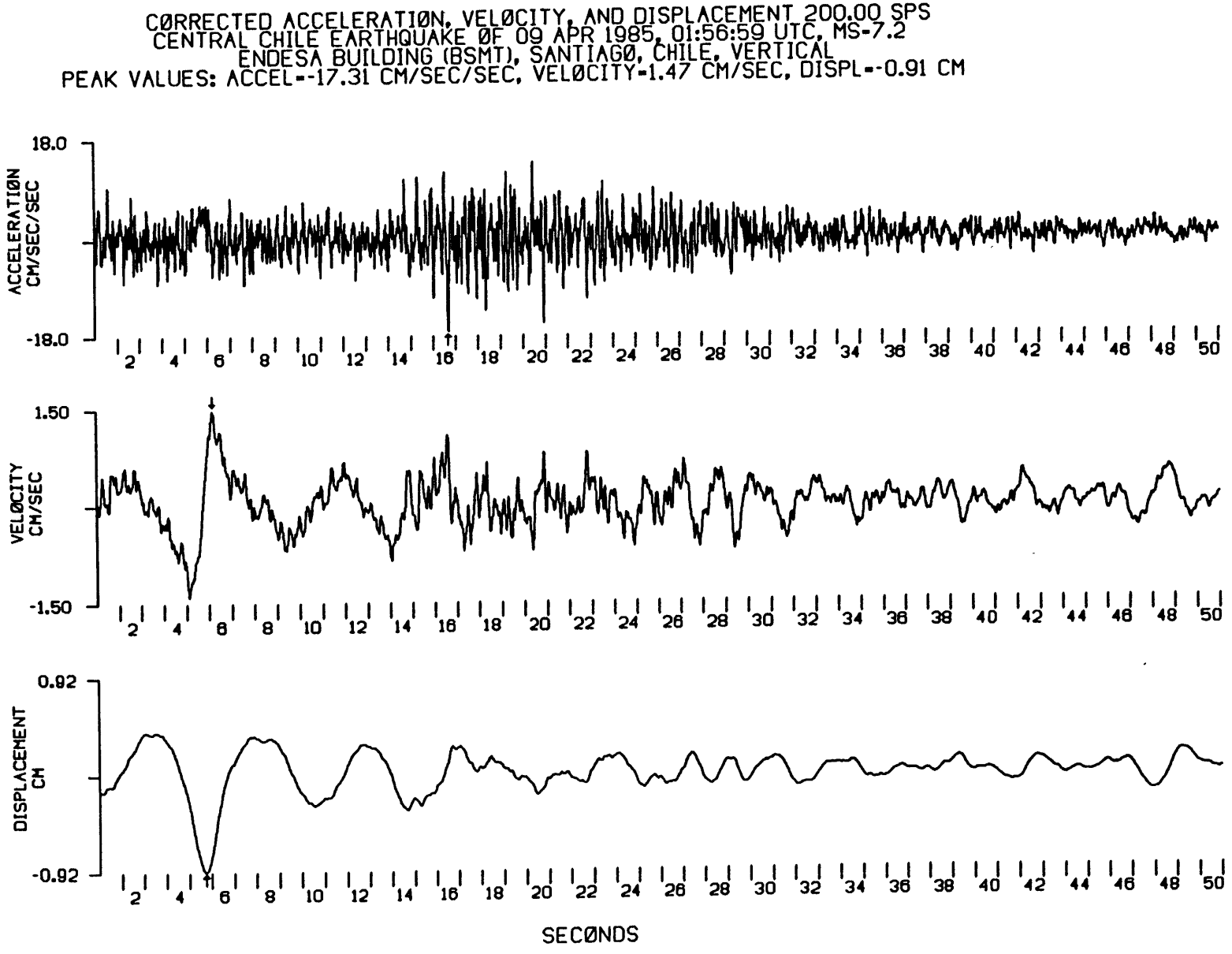
UNCØRRECTED ACCELERØGRAMS
CENTRAL CHILE EARTHQUAKE, 09 APRIL, 1985, 01:56:59 UTC, MS-7.8
ENDESA BLDG (BSMT), SANTIAGØ, CHILE: LØNGITUDINAL, VERTICAL, TRANSVERSE

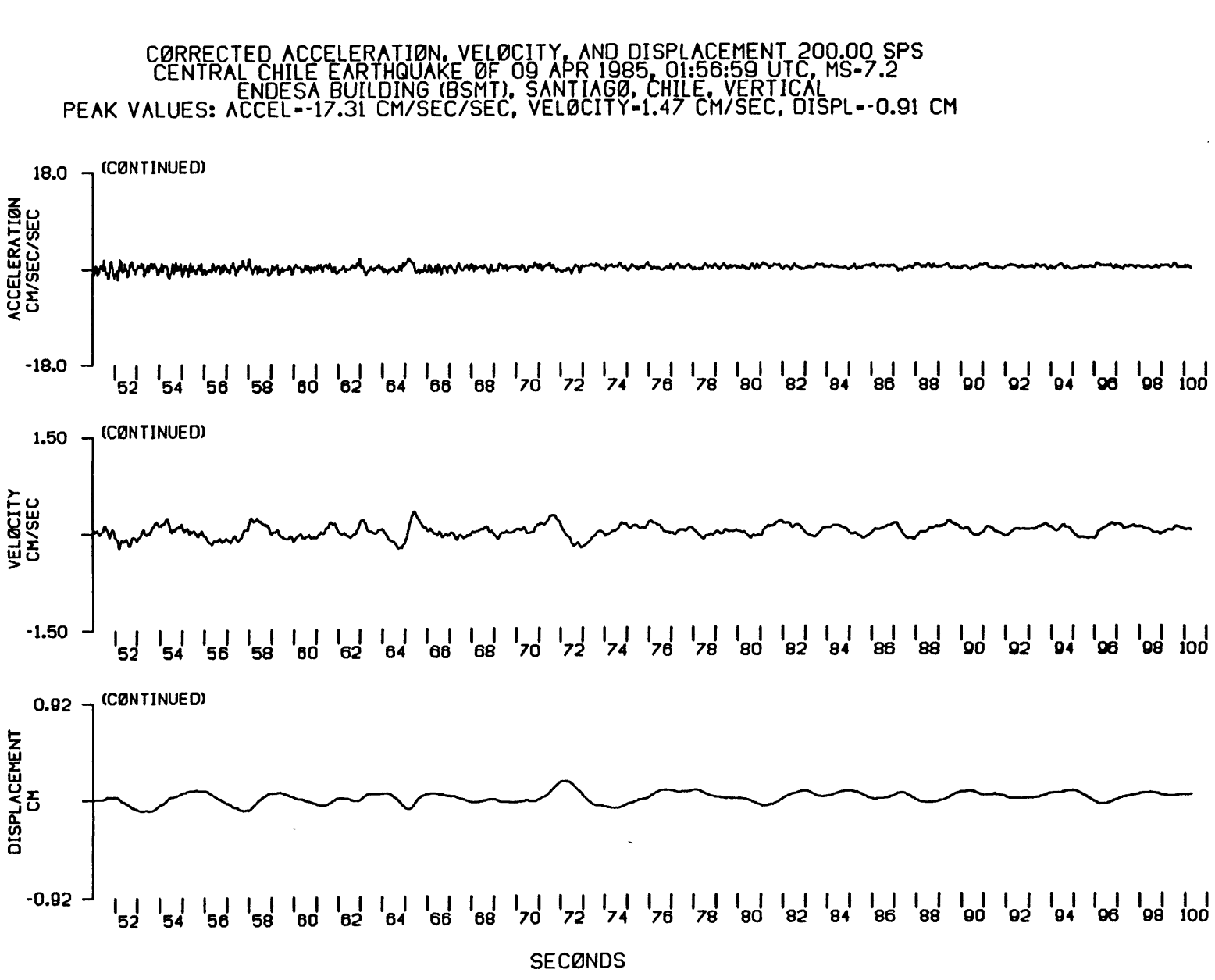
PEAK VALUES (CM/SEC/SEC): 32.87, -16.80, 21.21

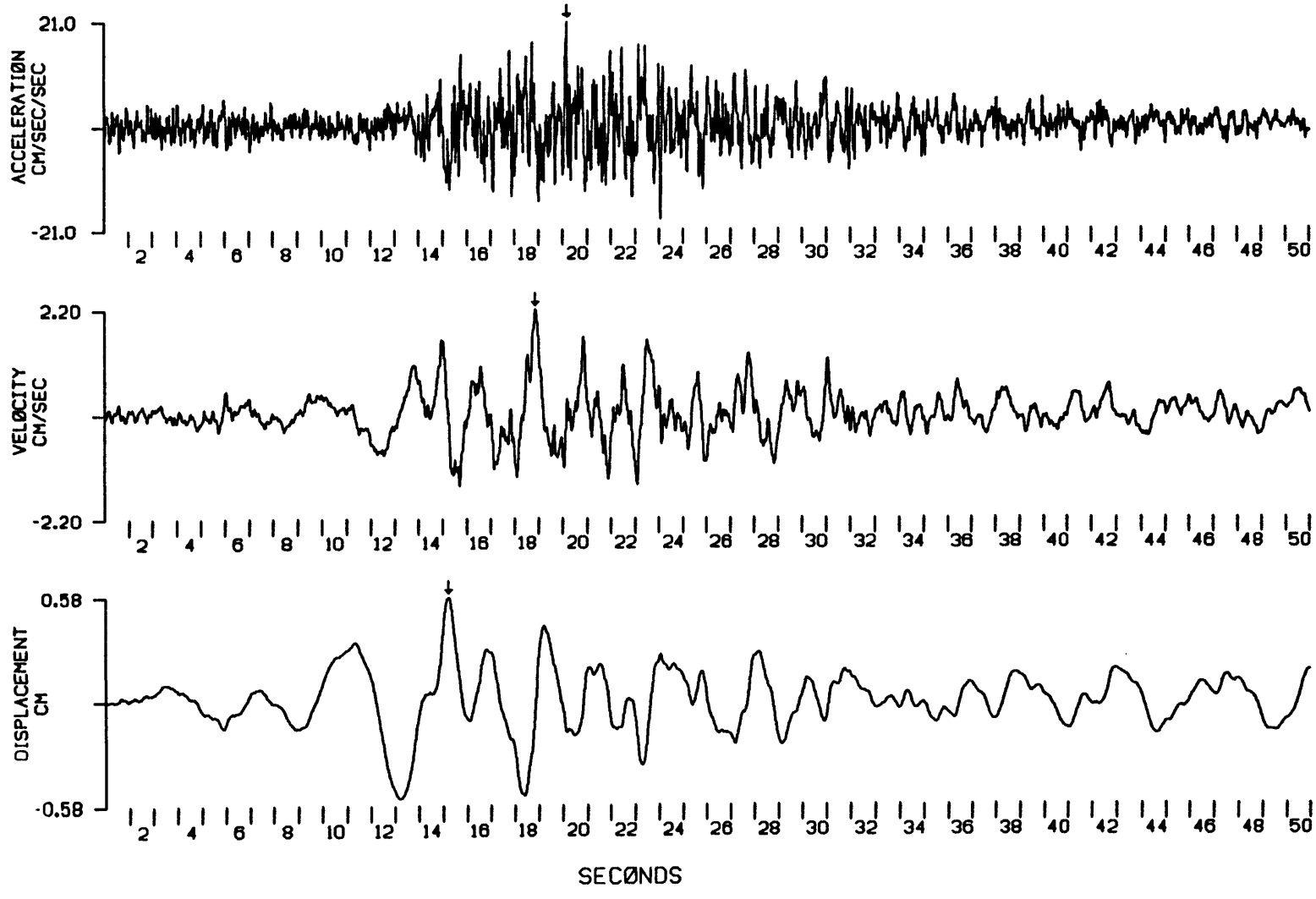


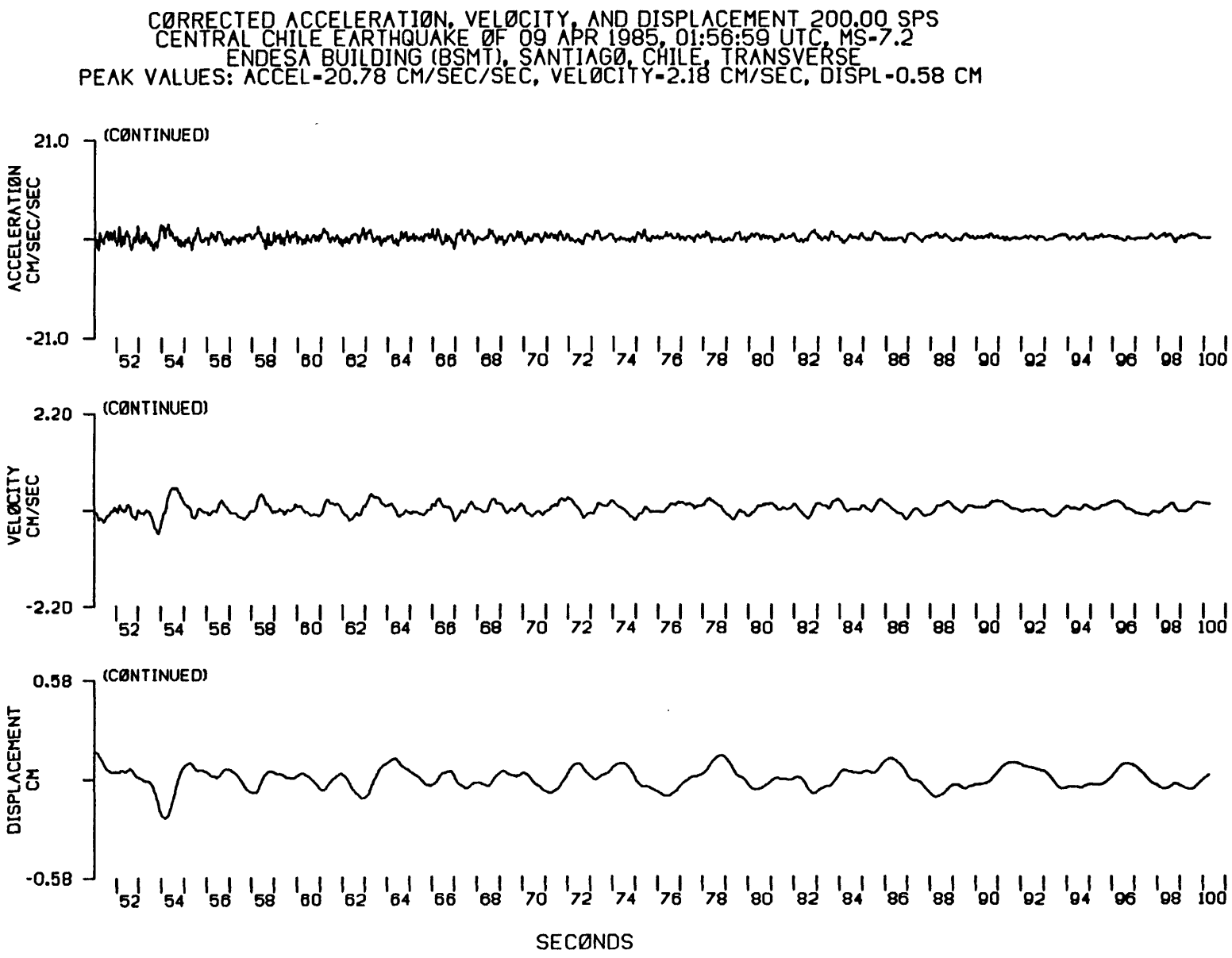

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, LØNGITUDINAL
PEAK VALUES: ACCEL=32.47 CM/SEC/SEC, VELØCITY=3.99 CM/SEC, DISPL=-1.23 CM
ACCELERATIØN CM/SEC/SEC
33.0
-33.0
VELØCITY CM/SEC
4.00
-4.00
DISPLACEMENT CM
1.30
-1.30
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
SECØNDS

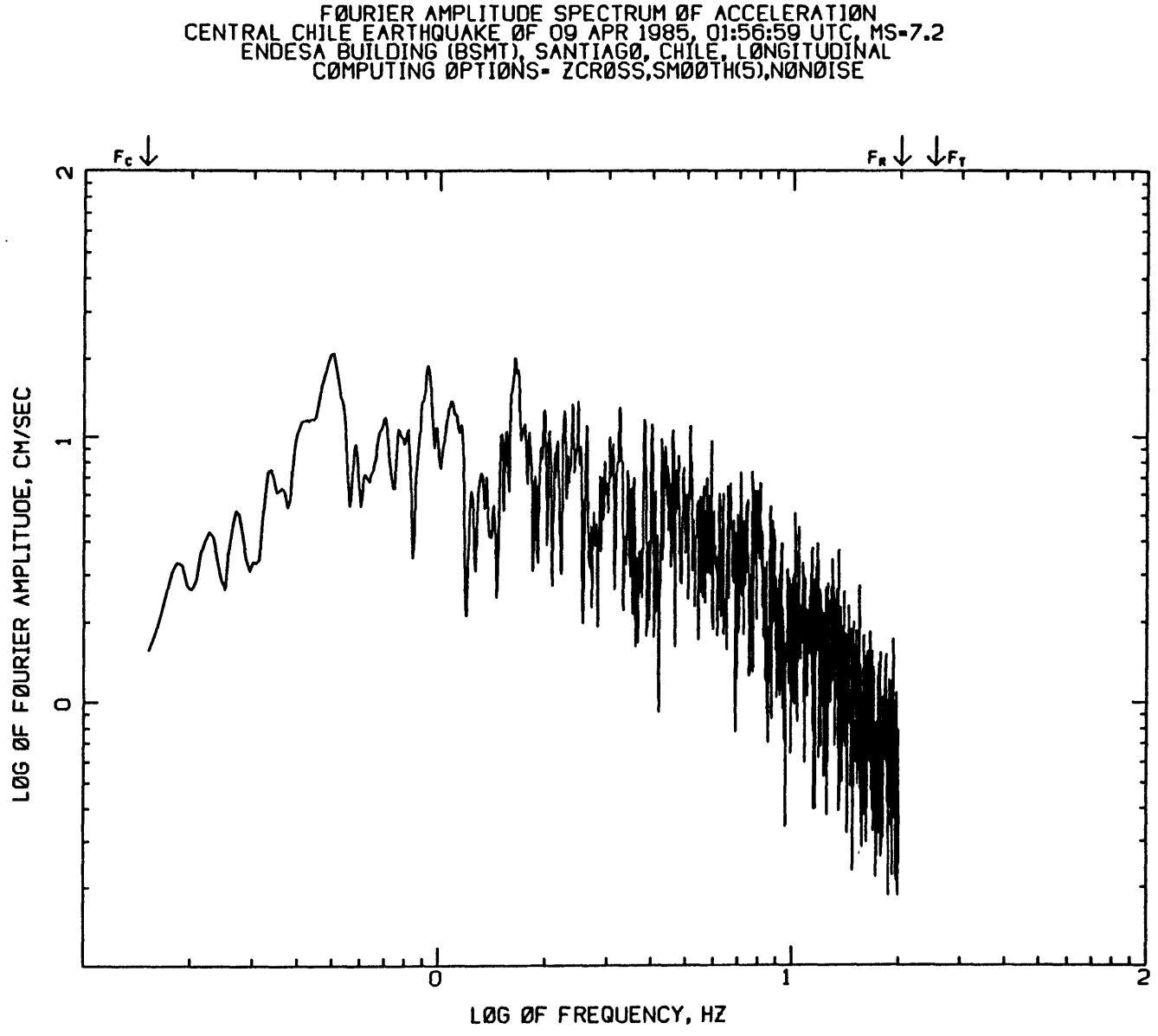

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, LØNGITUDINAL
PEAK VALUES: ACCEL=32.47 CM/SEC/SEC, VELØCITY=3.99 CM/SEC, DISPL=-1.23 CM
33.0
(CØNTINUED)
ACCELERATIØN CM/SEC/SEC
-33.0
4.00
(CØNTINUED)
VELØCITY CM/SEC
-4.00
1.30
(CØNTINUED)
DISPLACEMENT CM
-1.30
52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100
SECØNDS

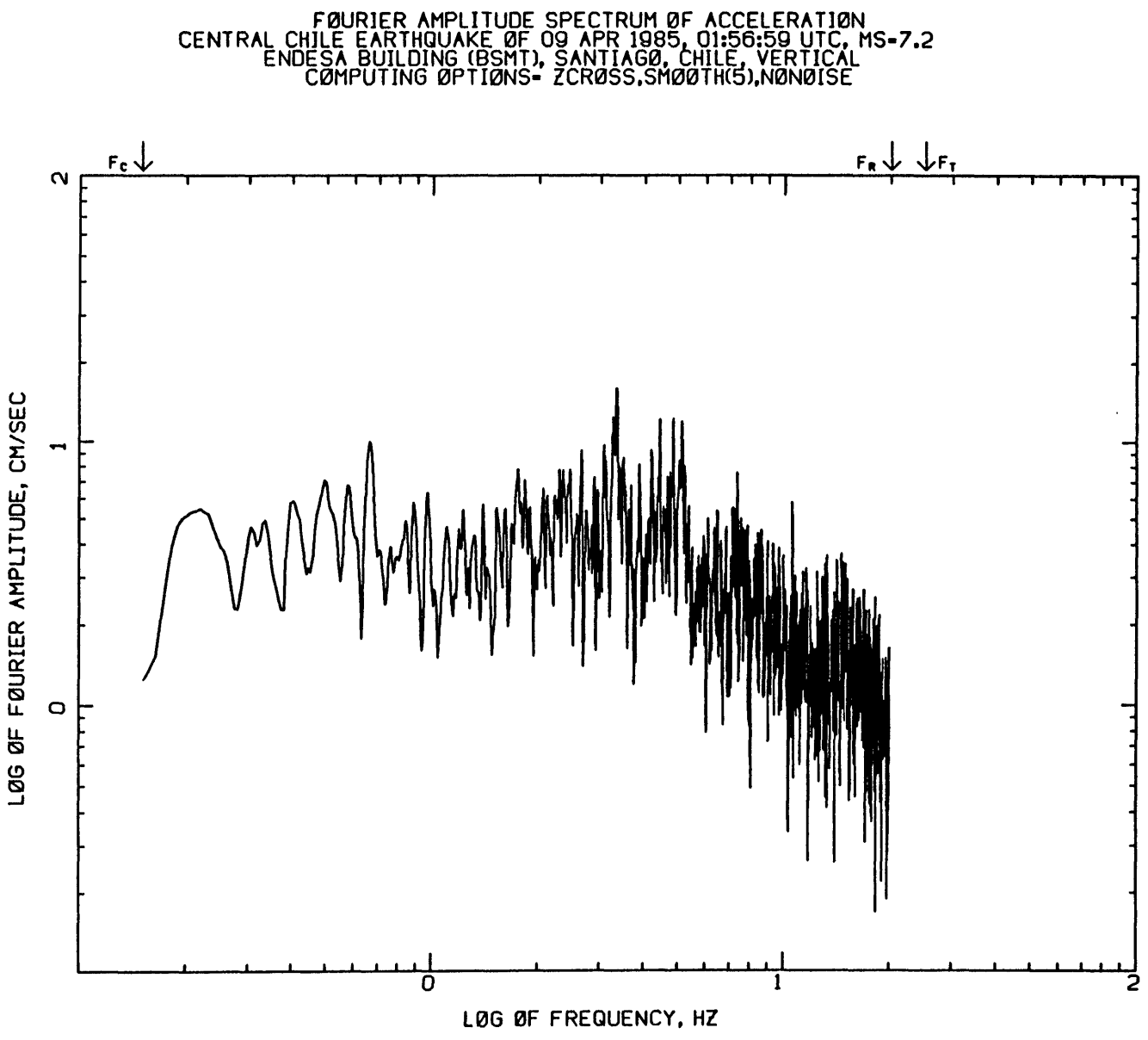

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, VERTICAL
PEAK VALUES: ACCEL=-17.31 CM/SEC/SEC, VELØCITY=1.47 CM/SEC, DISPL=-0.91 CM
ACCELERATIØN CM/SEC/SEC
18.0
-18.0
VELØCITY CM/SEC
1.50
-1.50
DISPLACEMENT CM
0.92
-0.92
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
SECØNDS

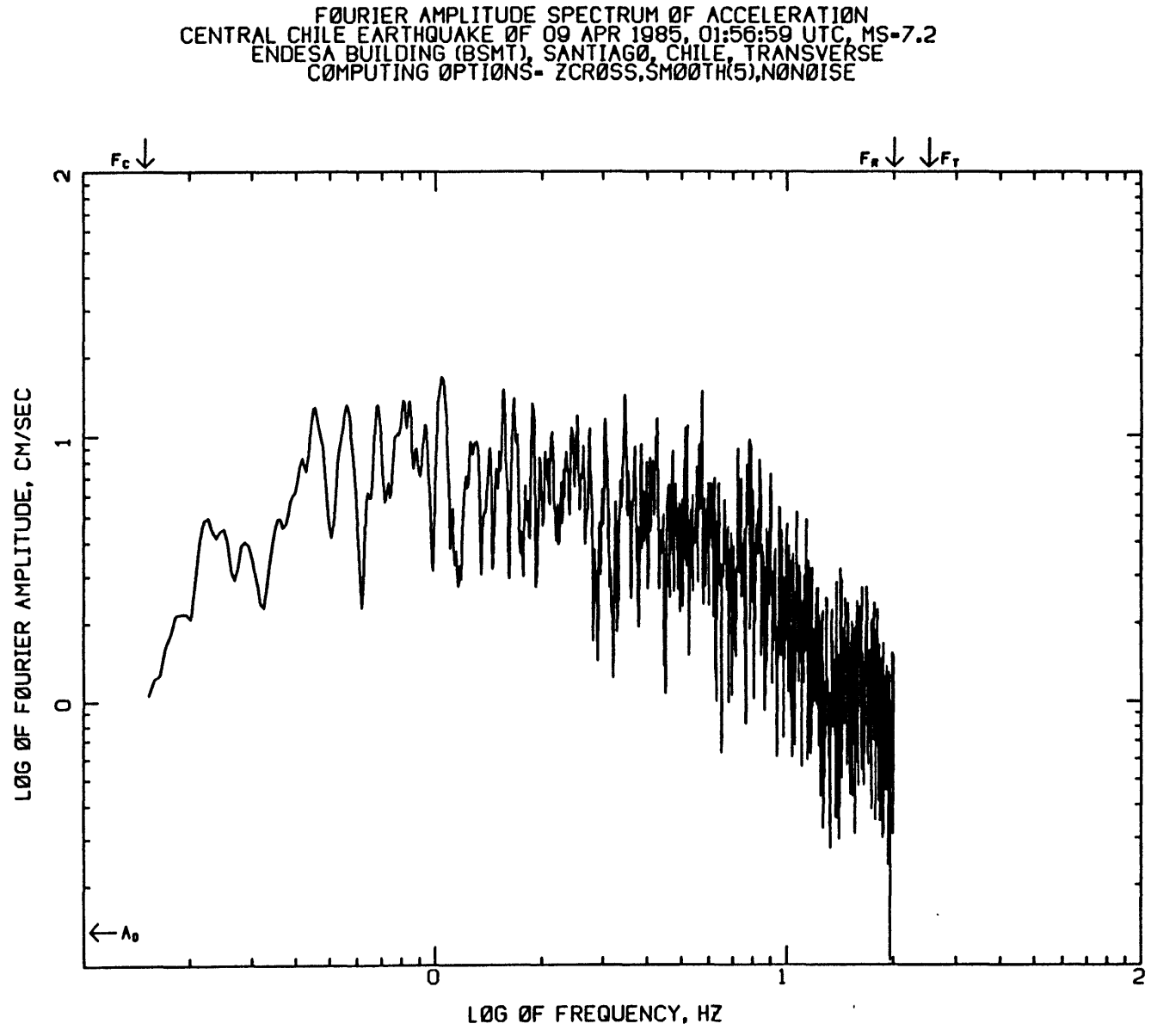

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, VERTICAL
PEAK VALUES: ACCEL=-17.31 CM/SEC/SEC, VELØCITY=1.47 CM/SEC, DISPL=-0.91 CM
18.0
(CØNTINUED)
ACCELERATIØN CM/SEC/SEC
-18.0
1.50
(CØNTINUED)
VELØCITY CM/SEC
-1.50
0.92
(CØNTINUED)
DISPLACEMENT CM
-0.92
52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100
SECØNDS

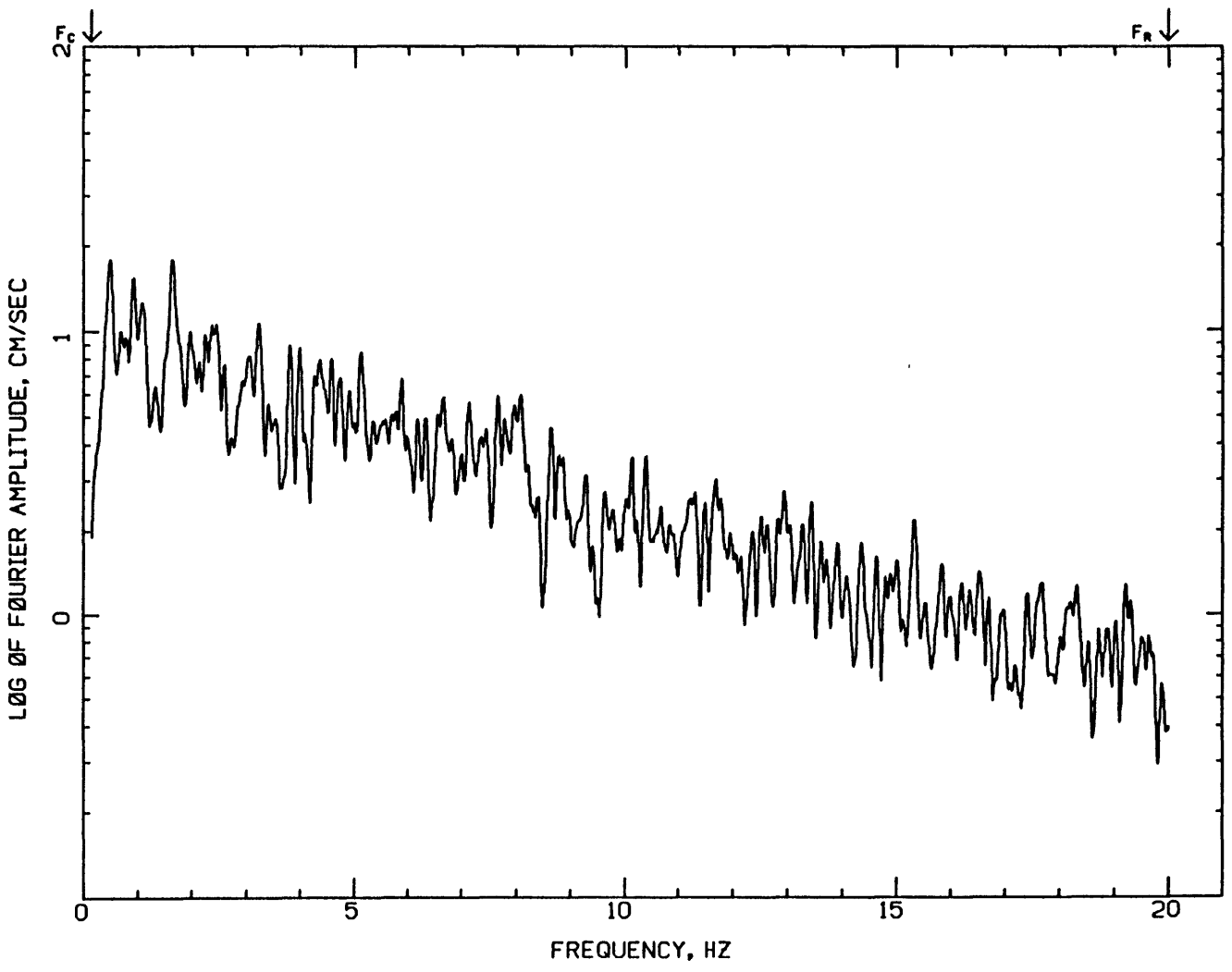

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, TRANSVERSE
PEAK VALUES: ACCEL-20.78 CM/SEC/SEC, VELØCITY-2.18 CM/SEC, DISPL-0.58 CM
ACCELERATIØN CM/SEC/SEC
21.0
-21.0
VELØCITY CM/SEC
2.20
-2.20
DISPLACEMENT CM
0.58
-0.58
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
SECØNDS

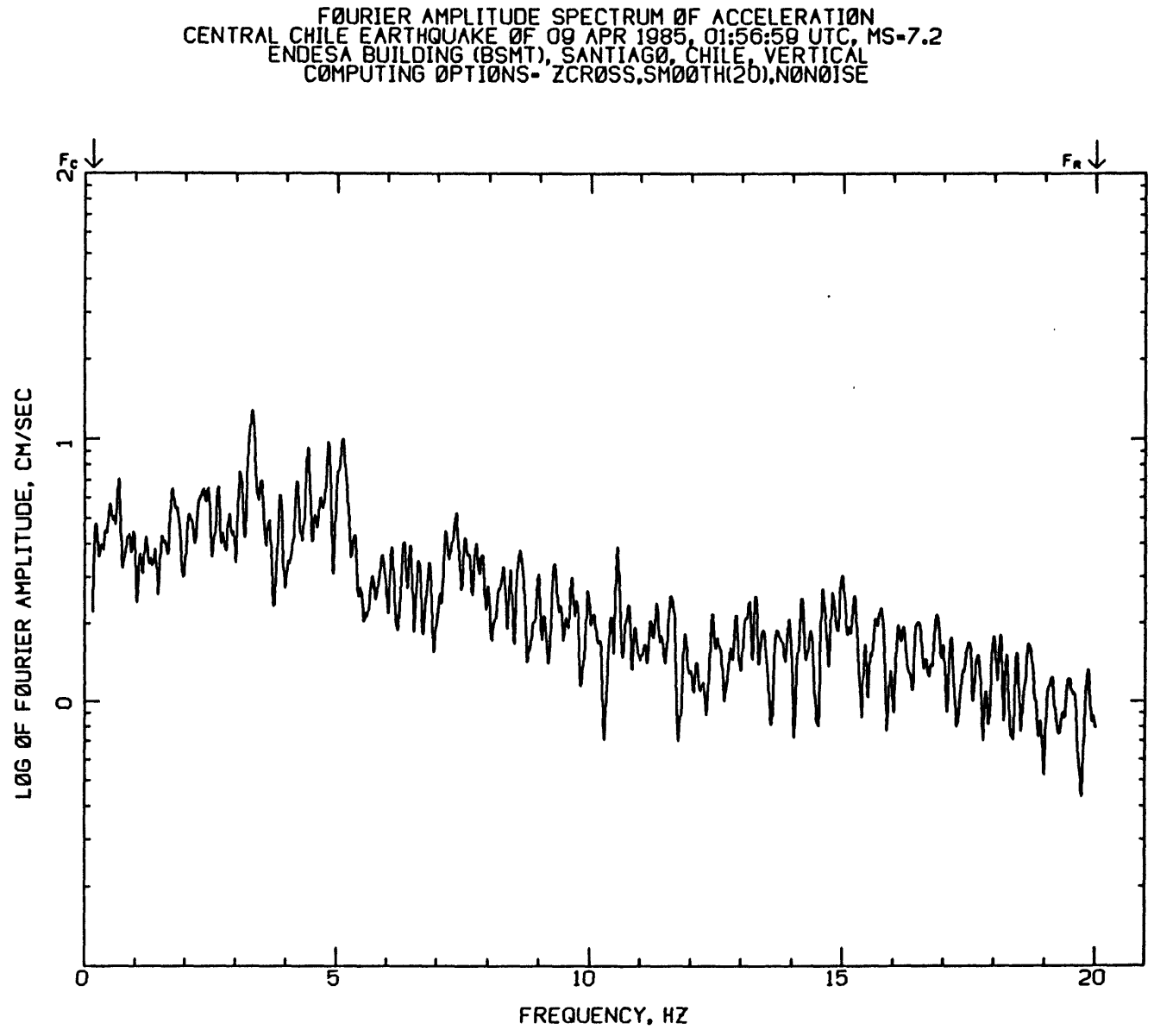

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, TRANSVERSE
PEAK VALUES: ACCEL-20.78 CM/SEC/SEC, VELØCITY-2.18 CM/SEC, DISPL-0.58 CM
21.0
(CØNTINUED)
ACCELERATIØN CM/SEC/SEC
-21.0
2.20
(CØNTINUED)
VELØCITY CM/SEC
-2.20
0.58
(CØNTINUED)
DISPLACEMENT CM
-0.58
52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100
SECØNDS

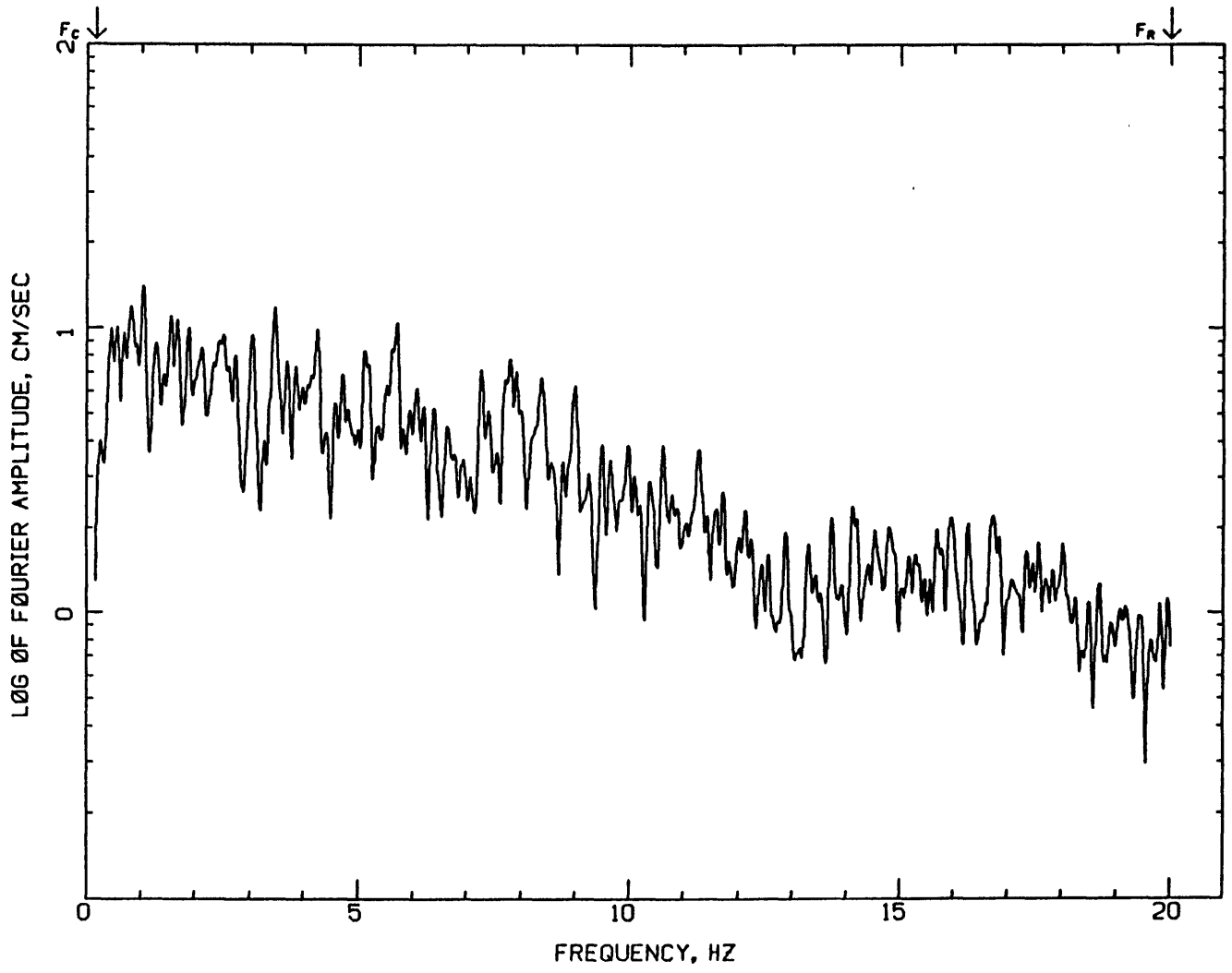

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS=7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, LØNGITUDINAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS=7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, TRANSVERSE
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(5),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
A0
2
1
0
0
1
2

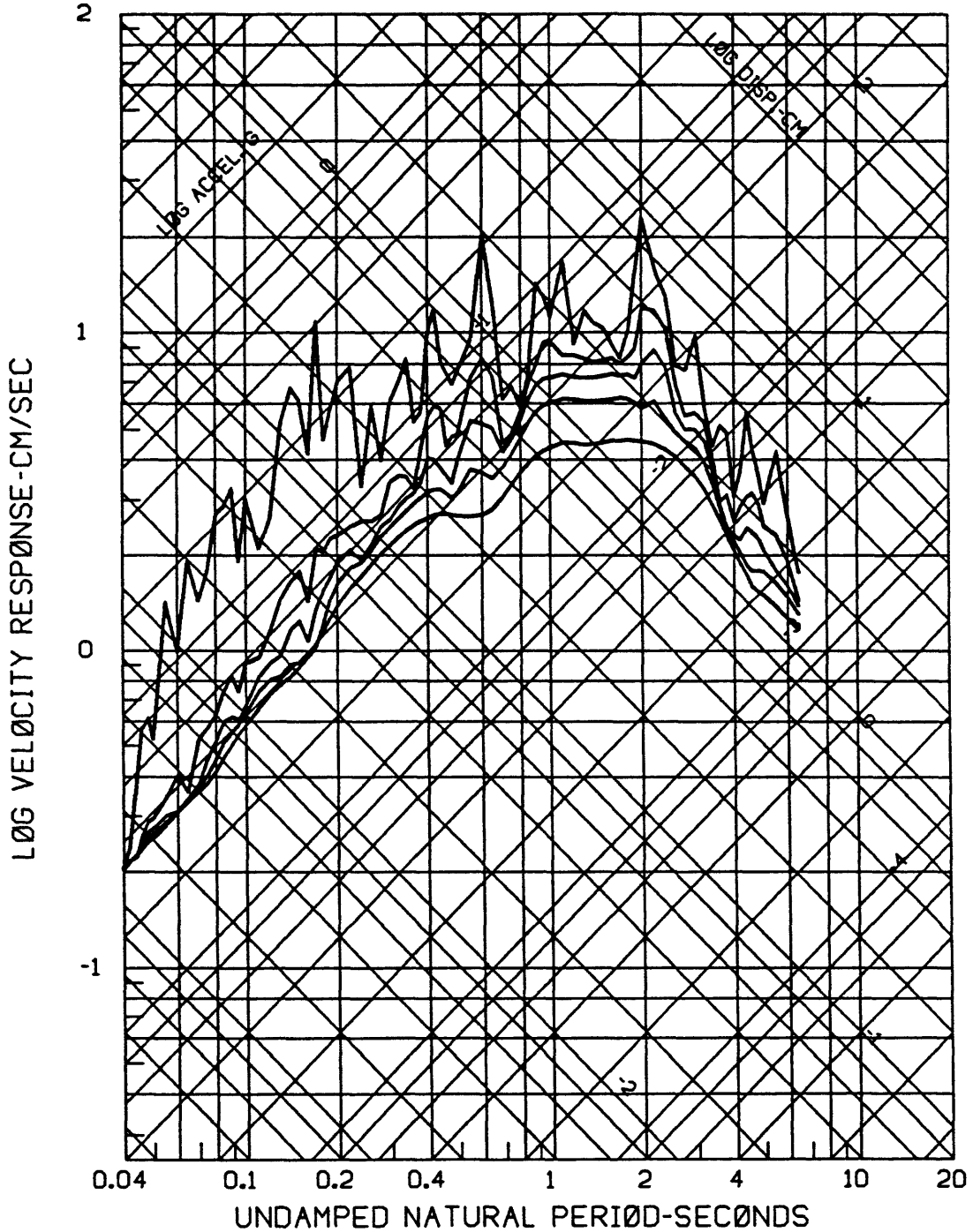

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS=7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, LØNGITUDINAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(20),NØNØISE
Fc
FN
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
5
10
15
20
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS=7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(20),NØNØISE
Fc
FR
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
5
10
15
20
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, MS-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, TRANSVERSE
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(20),NØNØISE
Fc
FR
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
FREQUENCY, HZ

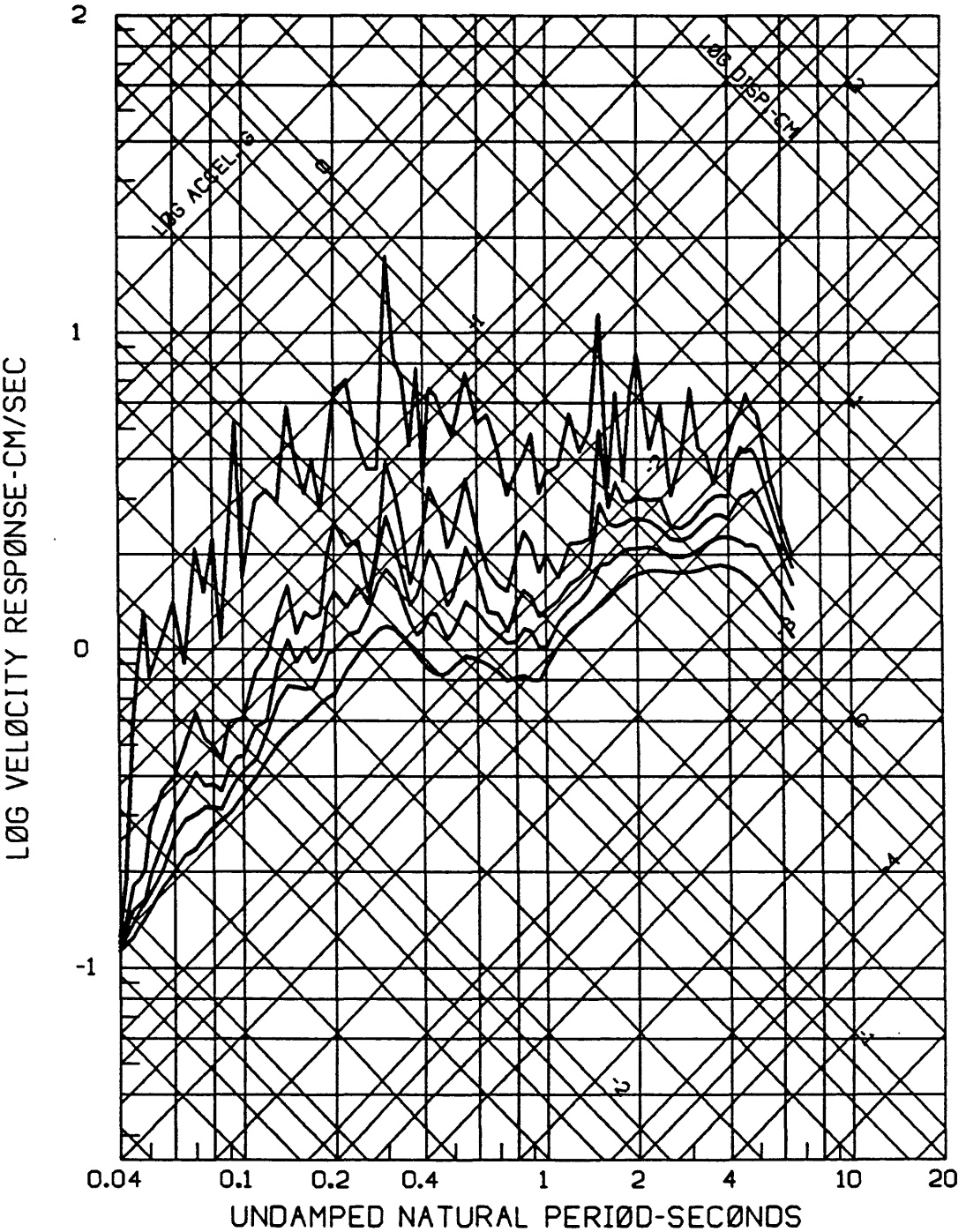
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, Ms-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, LØNGITUDINAL
0,2,5,10,20 PERCENT CRITICAL DAMPING



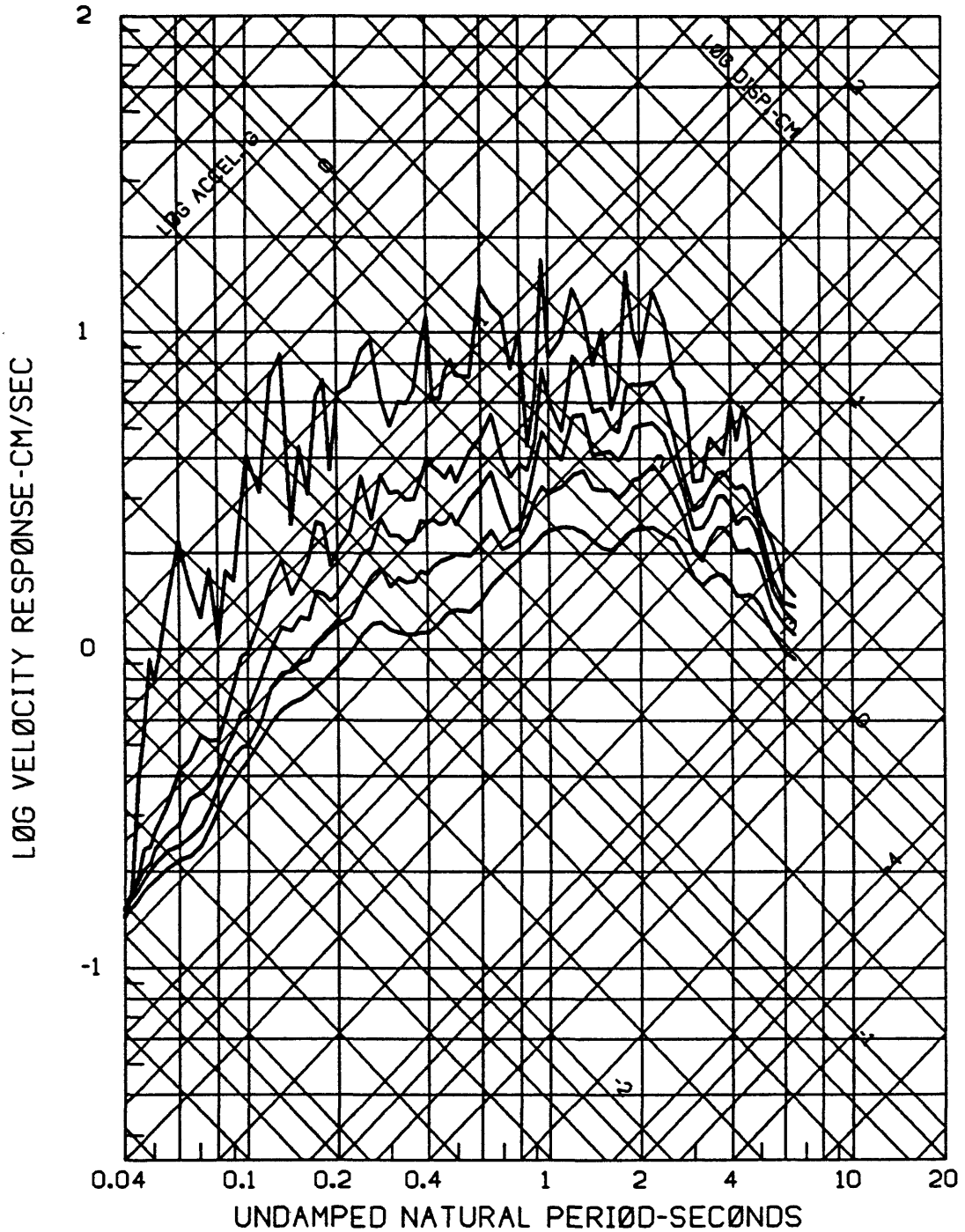
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

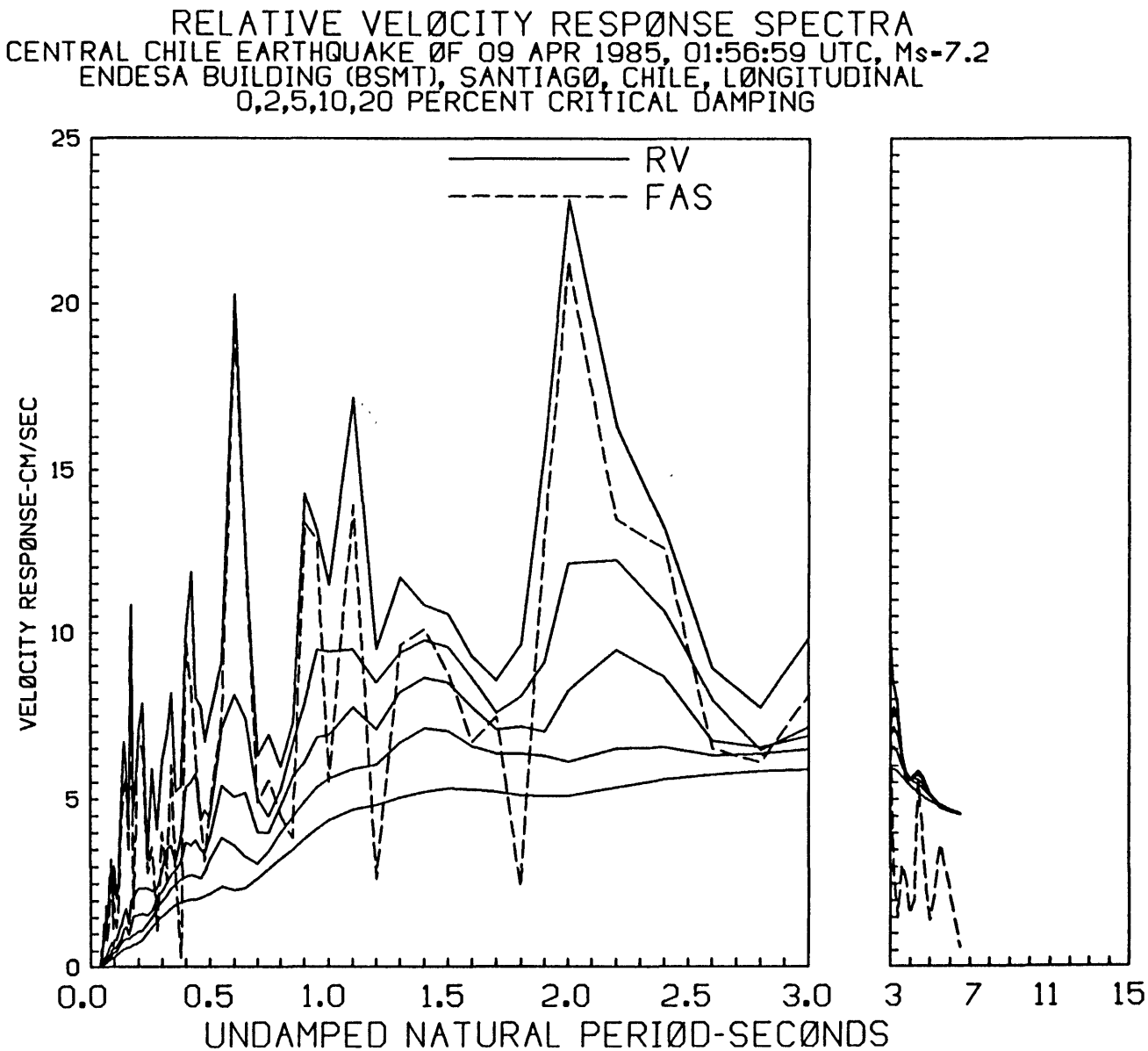
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, Ms-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

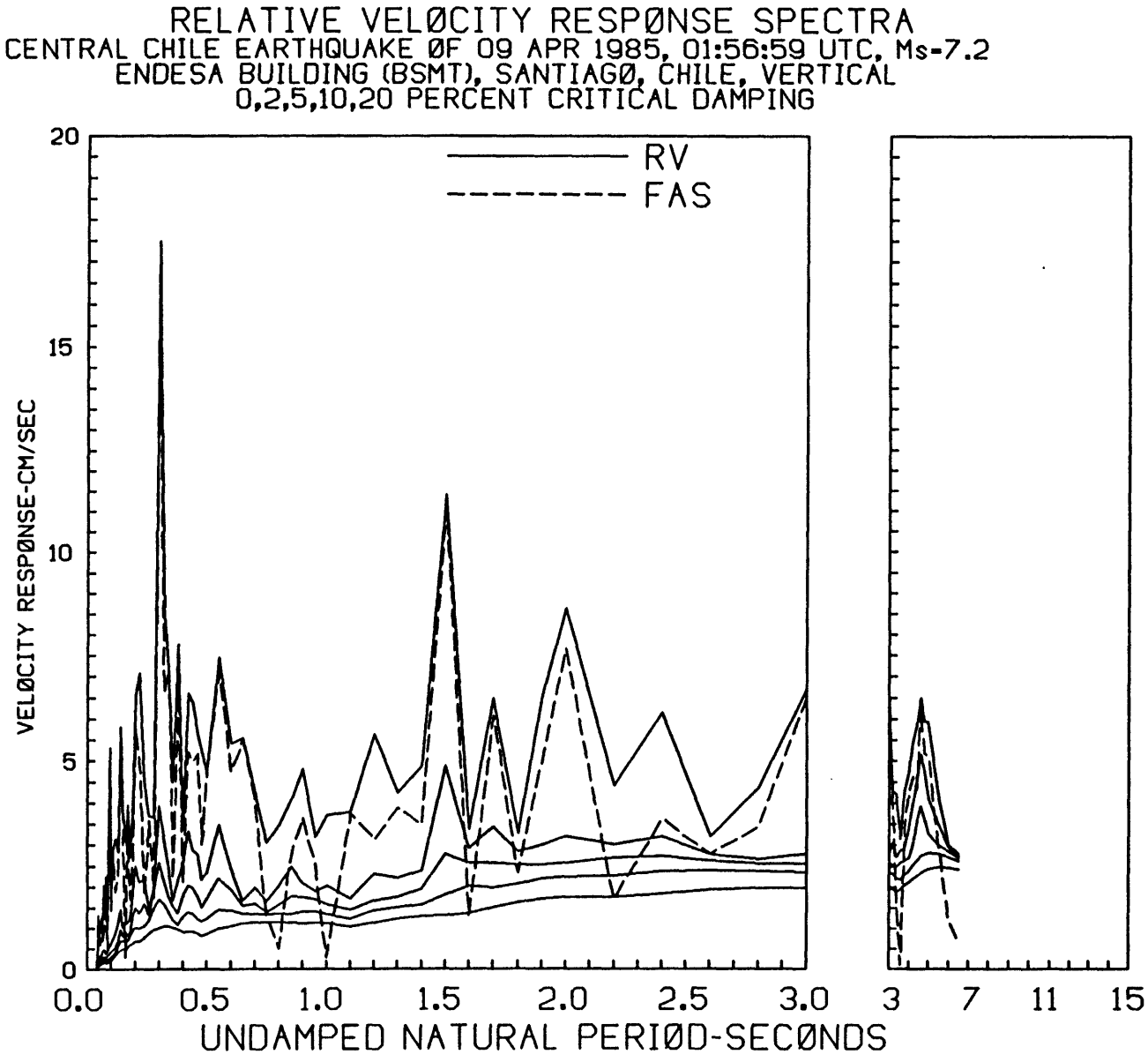


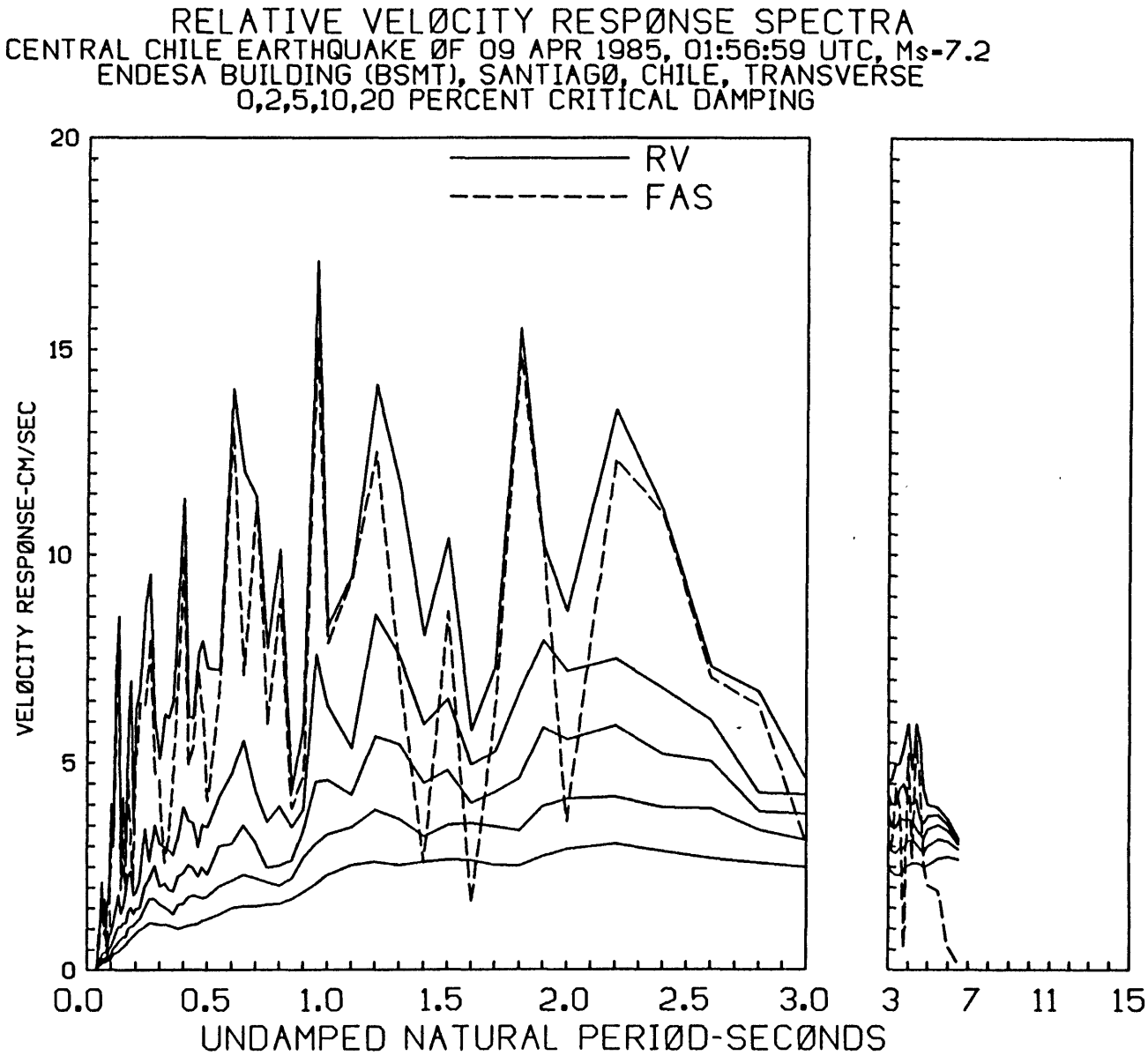
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, Ms-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, TRANSVERSE
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, Ms-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, LØNGITUDINAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
25
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, Ms-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

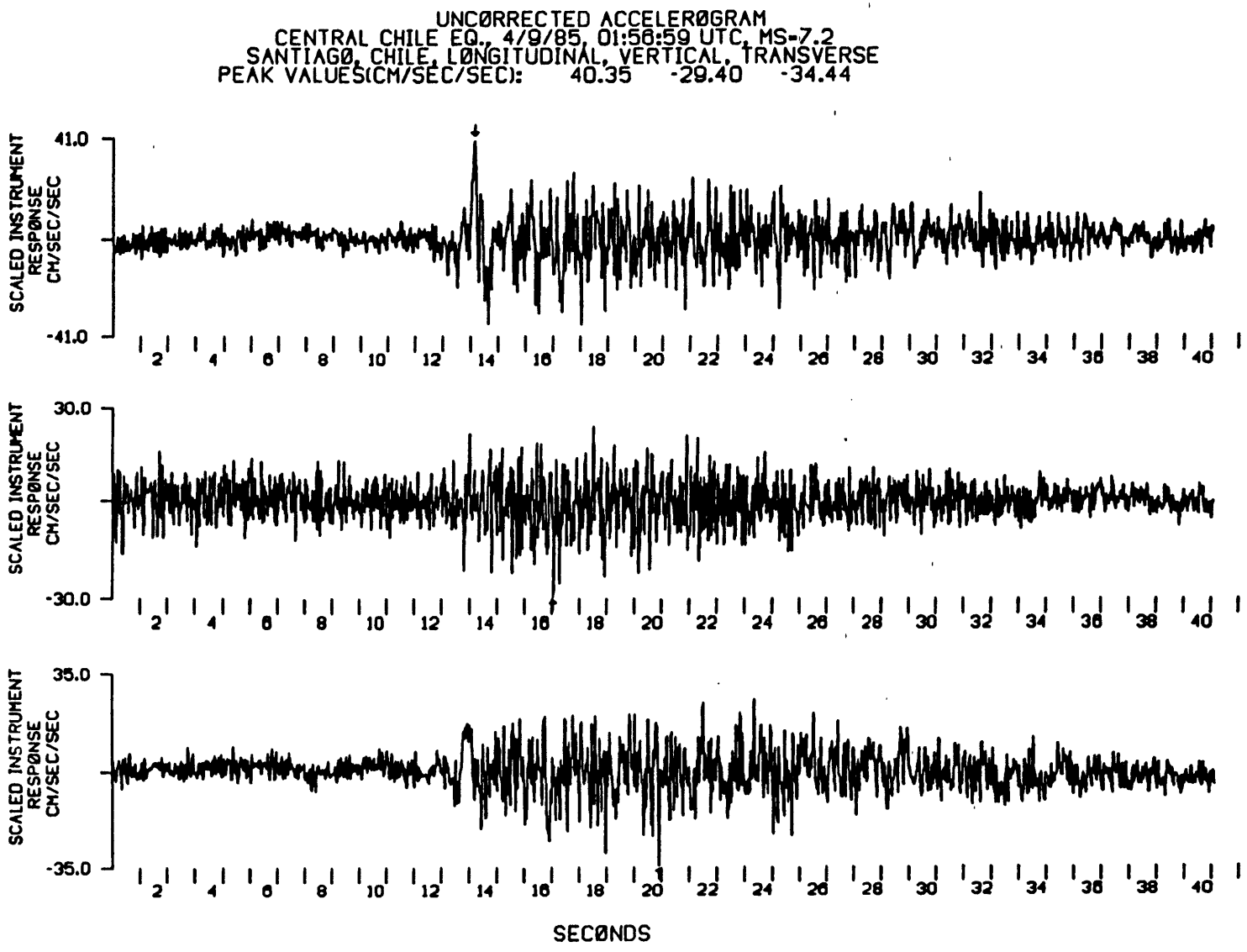

RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EARTHQUAKE ØF 09 APR 1985, 01:56:59 UTC, Ms-7.2
ENDESA BUILDING (BSMT), SANTIAGØ, CHILE, TRANSVERSE
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

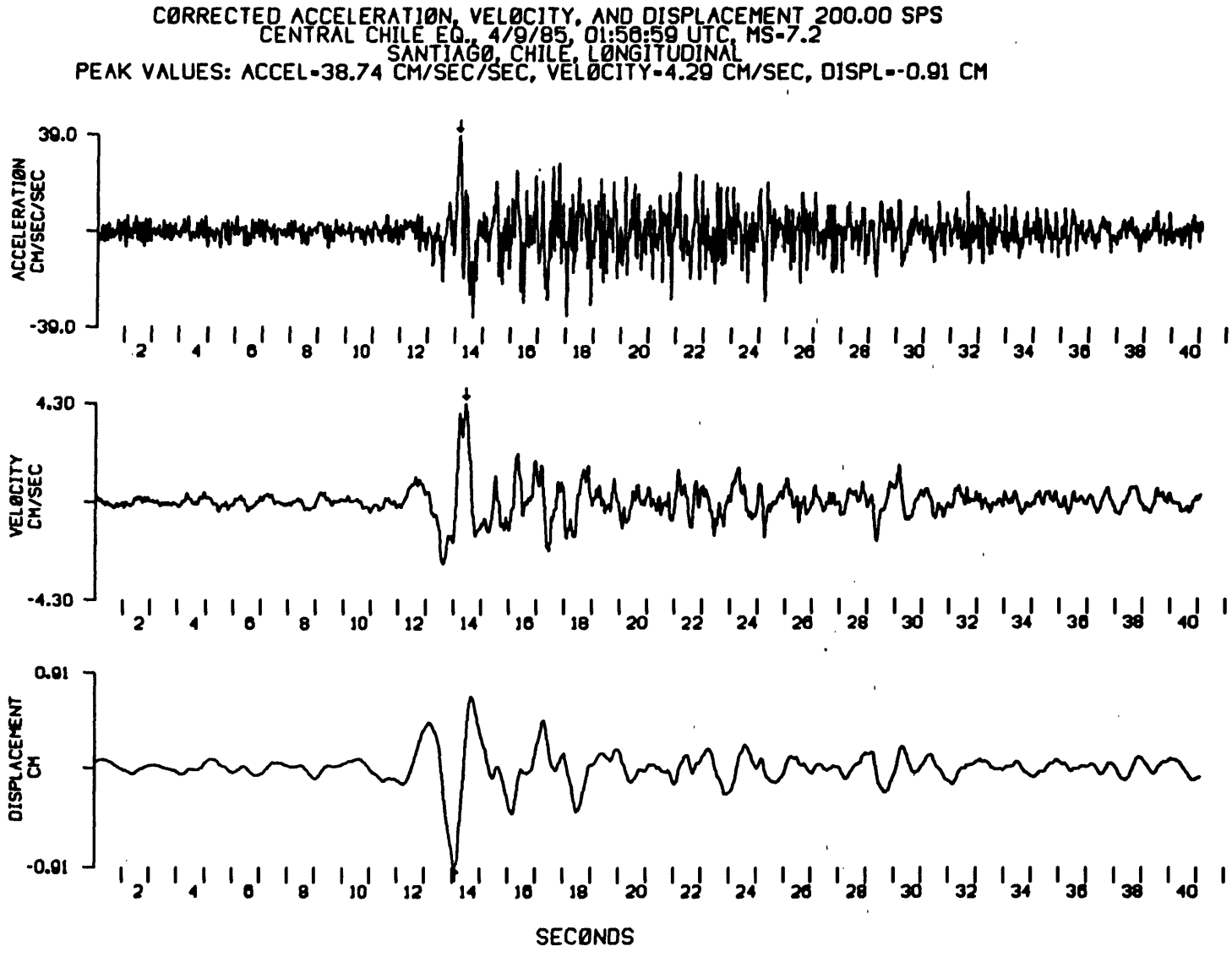
SUMMARY OF STRONG-MOTION RECORD PROCESSING

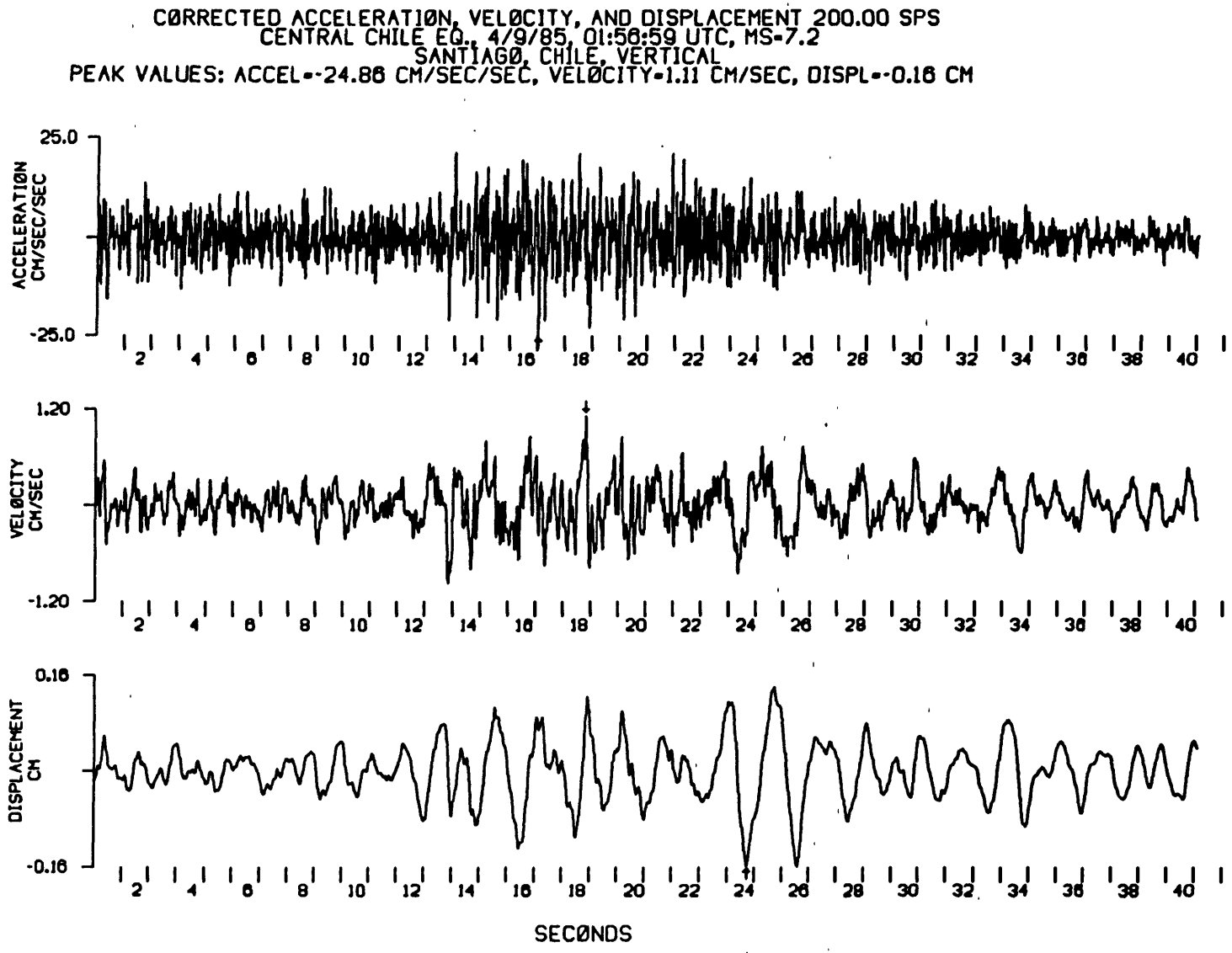
Central Chile earthquake of 4/9/85
01:56:59 UTC, M_S=7.2

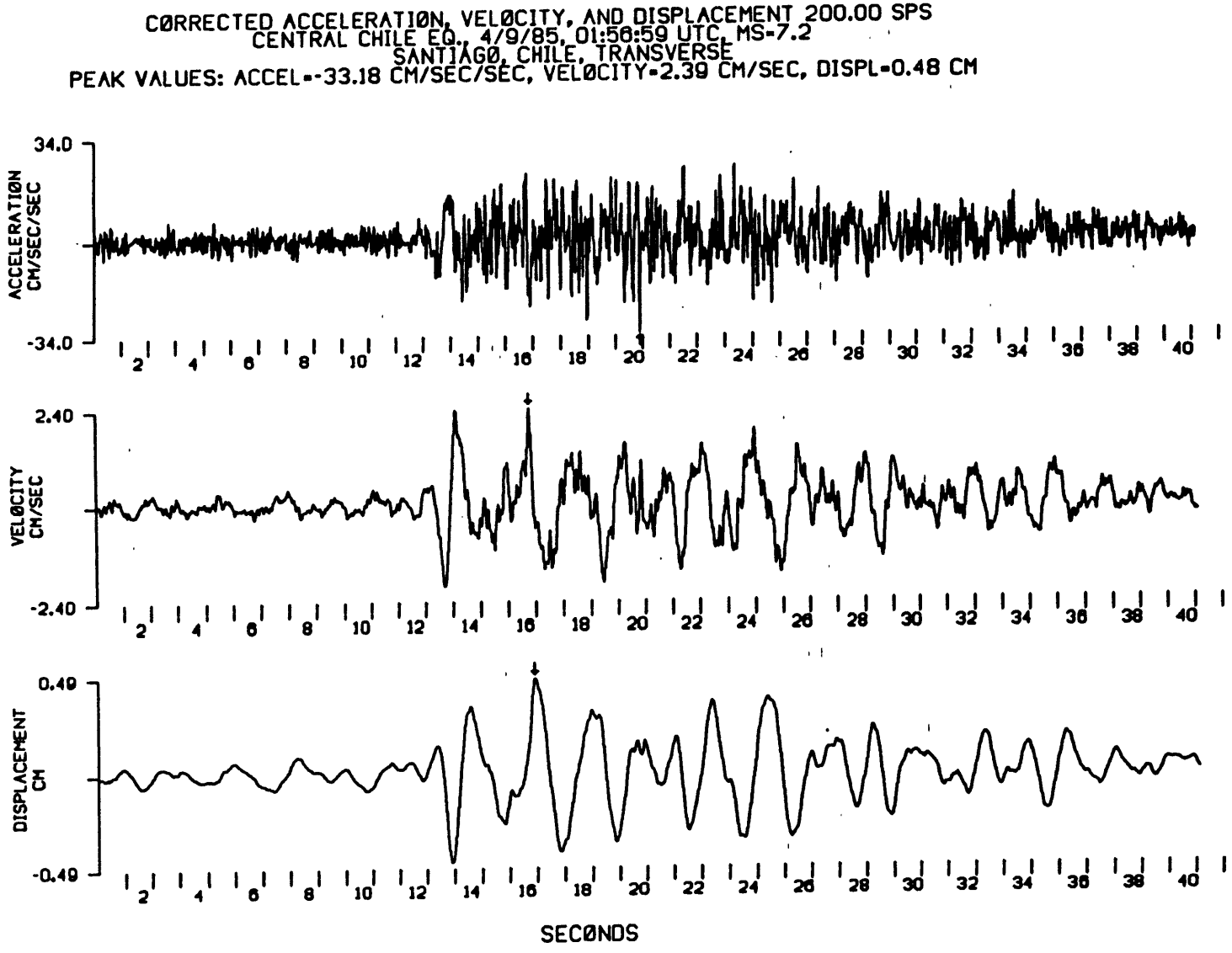
Univ. of Chile (Bsmt), Santiago, Chile

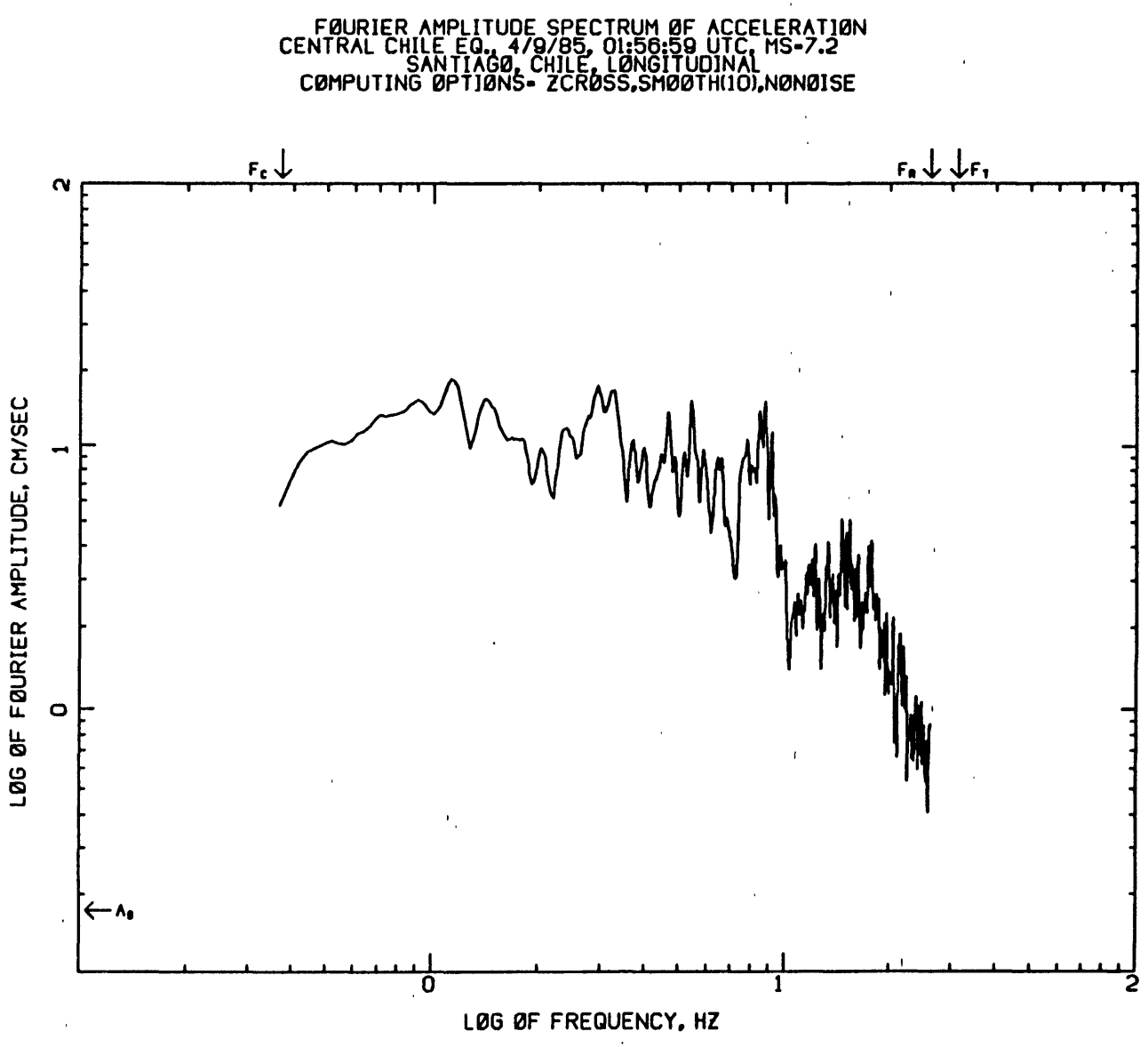
DESCRIPTION	COMPONENT		
	Longitudinal	Vertical	Transverse
Instrument Characteristics:			
Frequency (Hz)	25.0*	25.0*	25.0*
Damping (% Critical)	60.0*	60.0*	60.0*
Filter Parameters:			
Highcut (Hz)	26.0	26.0	27.0
Lowcut (Hz)	0.370	0.500	0.370
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	40.4	-29.4	-34.4
Peak Acceleration, A (cm/s/s)	38.7	-24.9	-33.2
Peak Velocity, V (cm/s)	4.29	1.11	2.39
Peak Displacement, D (cm)	-0.907	-0.158	0.480
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.11	0.045	0.072
$\lvert AD/V^2 \rvert$	1.9	3.2	2.8

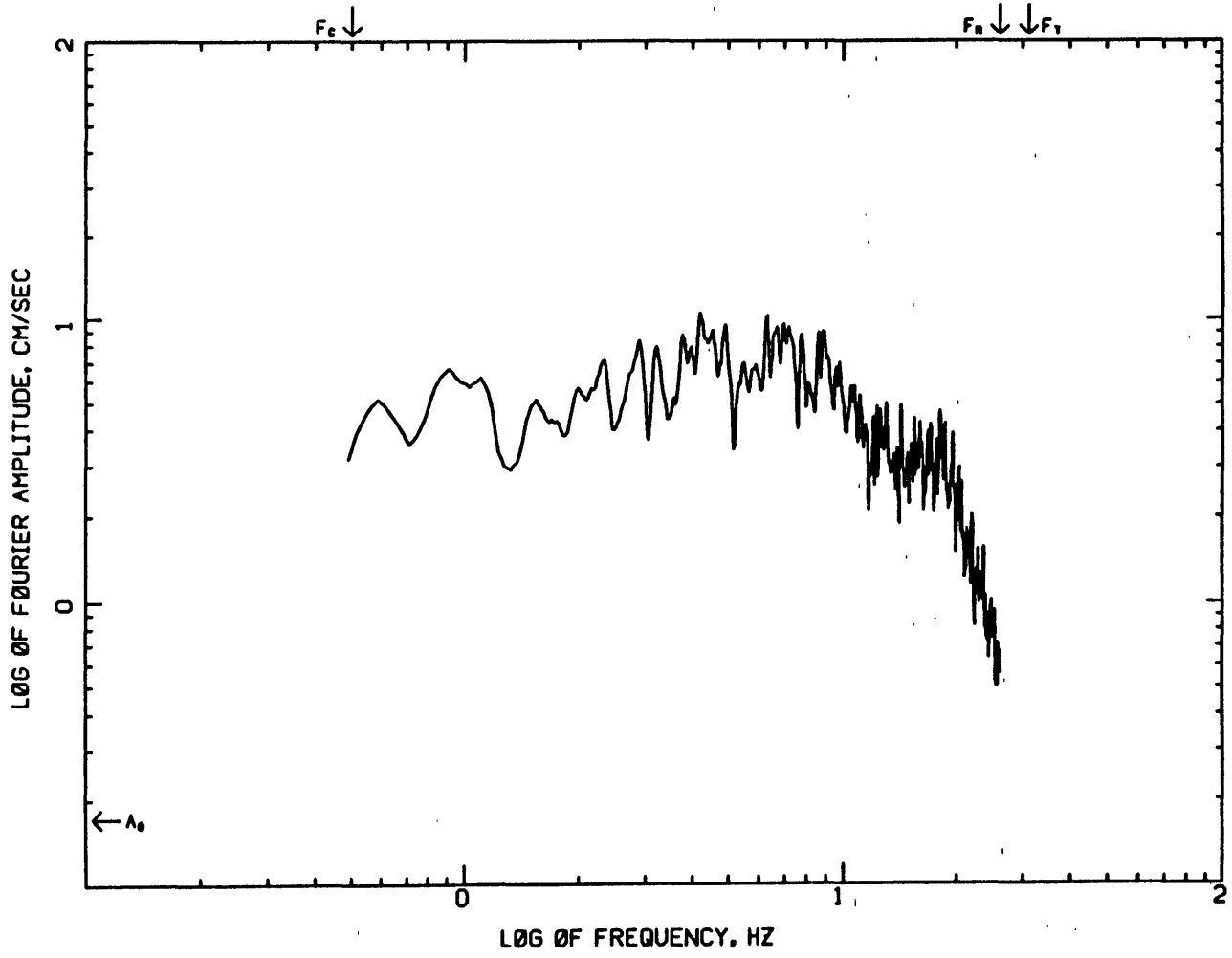

UNCØRRECTED ACCELERØGRAM
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, LØNGITUDINAL, VERTICAL, TRANSVERSE
PEAK VALUES(CM/SEC/SEC): 40.35 -29.40 -34.44
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
41.0
-41.0
30.0
-30.0
35.0
-35.0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECØNDS

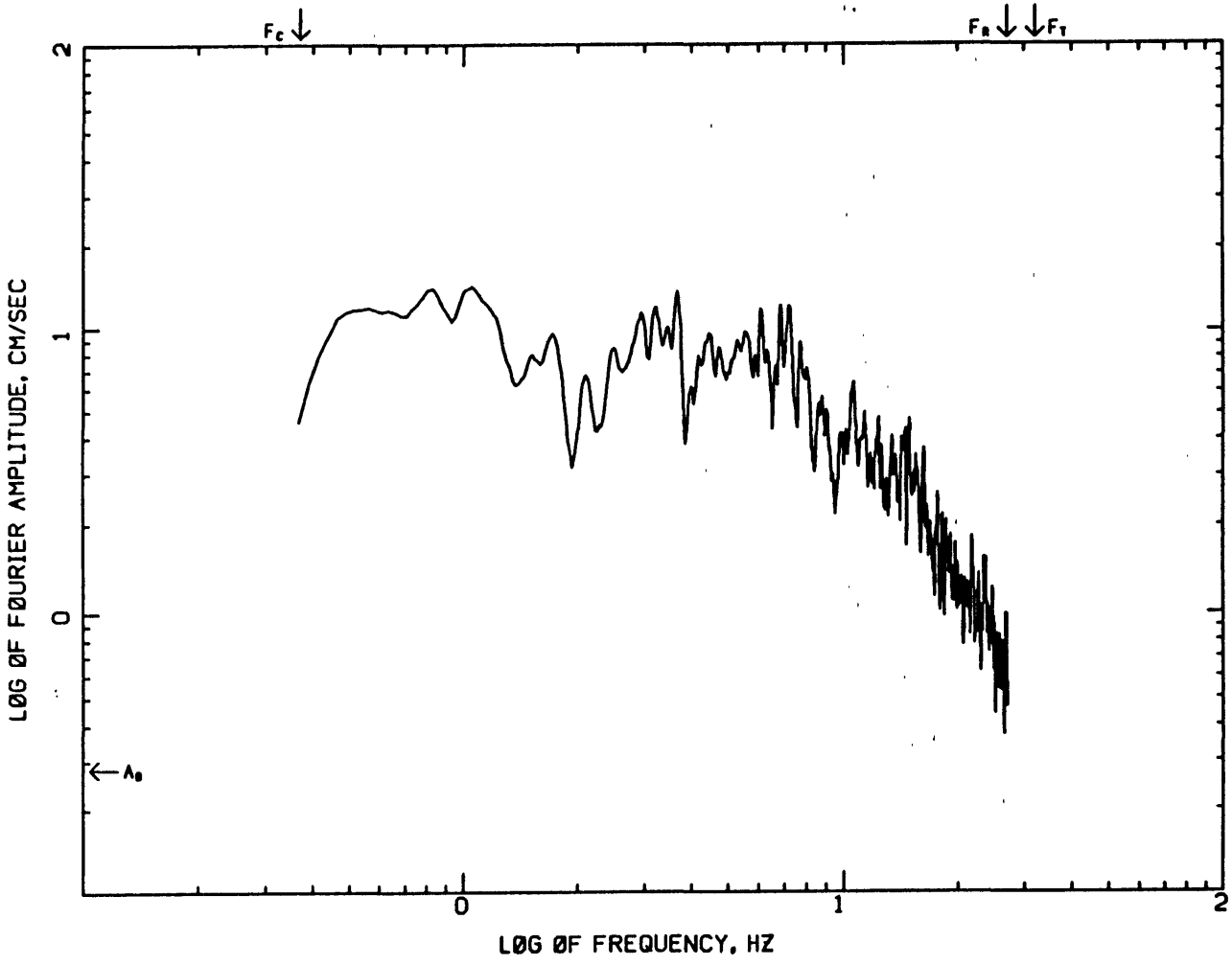

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, LØNGITUDINAL
PEAK VALUES: ACCEL=38.74 CM/SEC/SEC, VELØCITY=4.29 CM/SEC, DISPL=-0.91 CM
ACCELERATIØN CM/SEC/SEC
39.0
-39.0
VELØCITY CM/SEC
4.30
-4.30
DISPLACEMENT CM
0.91
-0.91
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECØNDS

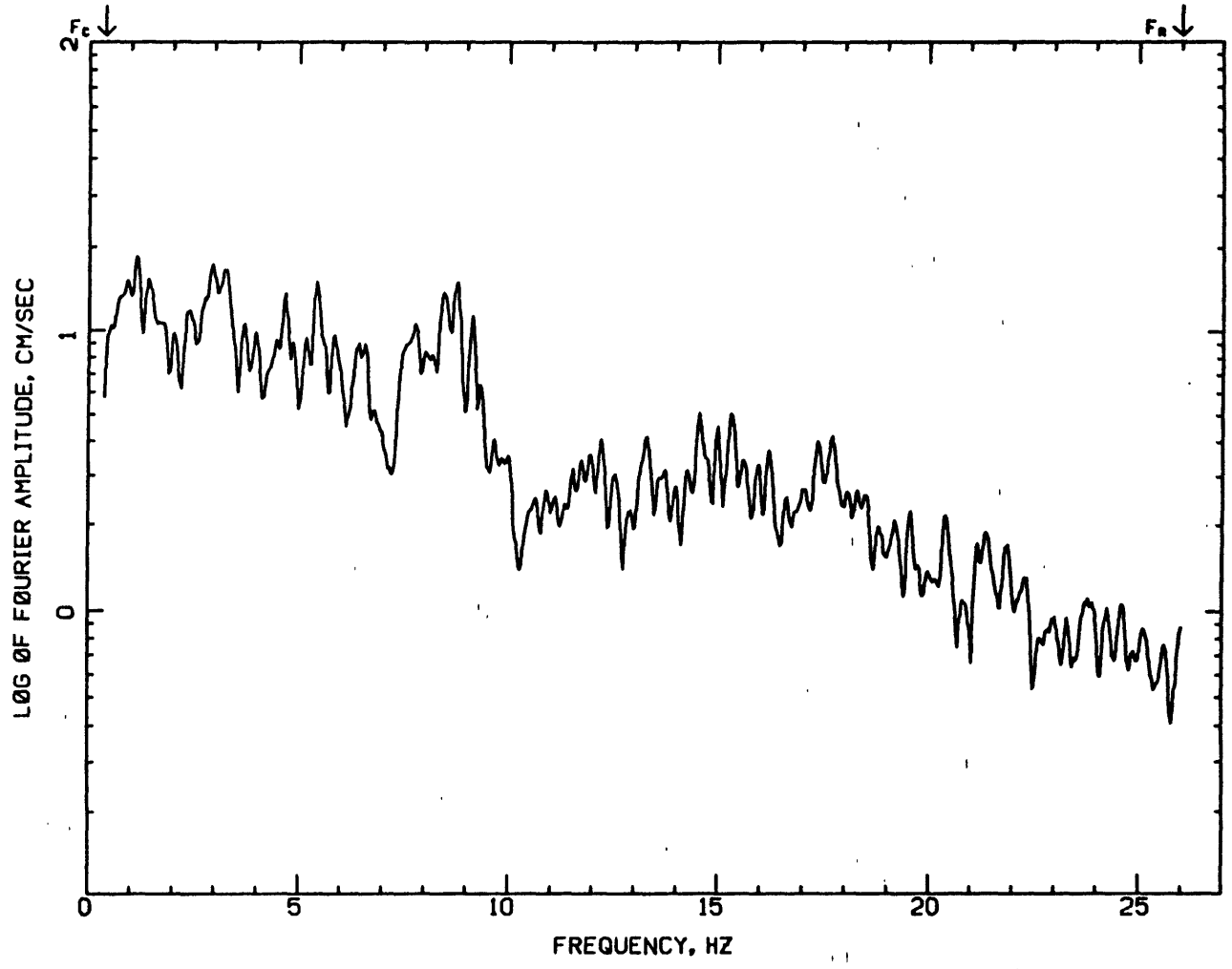

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, VERTICAL
PEAK VALUES: ACCEL=-24.86 CM/SEC/SEC, VELØCITY=1.11 CM/SEC, DISPL=-0.16 CM
ACCELERATIØN CM/SEC/SEC
25.0
-25.0
VELØCITY CM/SEC
1.20
-1.20
DISPLACEMENT CM
0.16
-0.16
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECØNDS

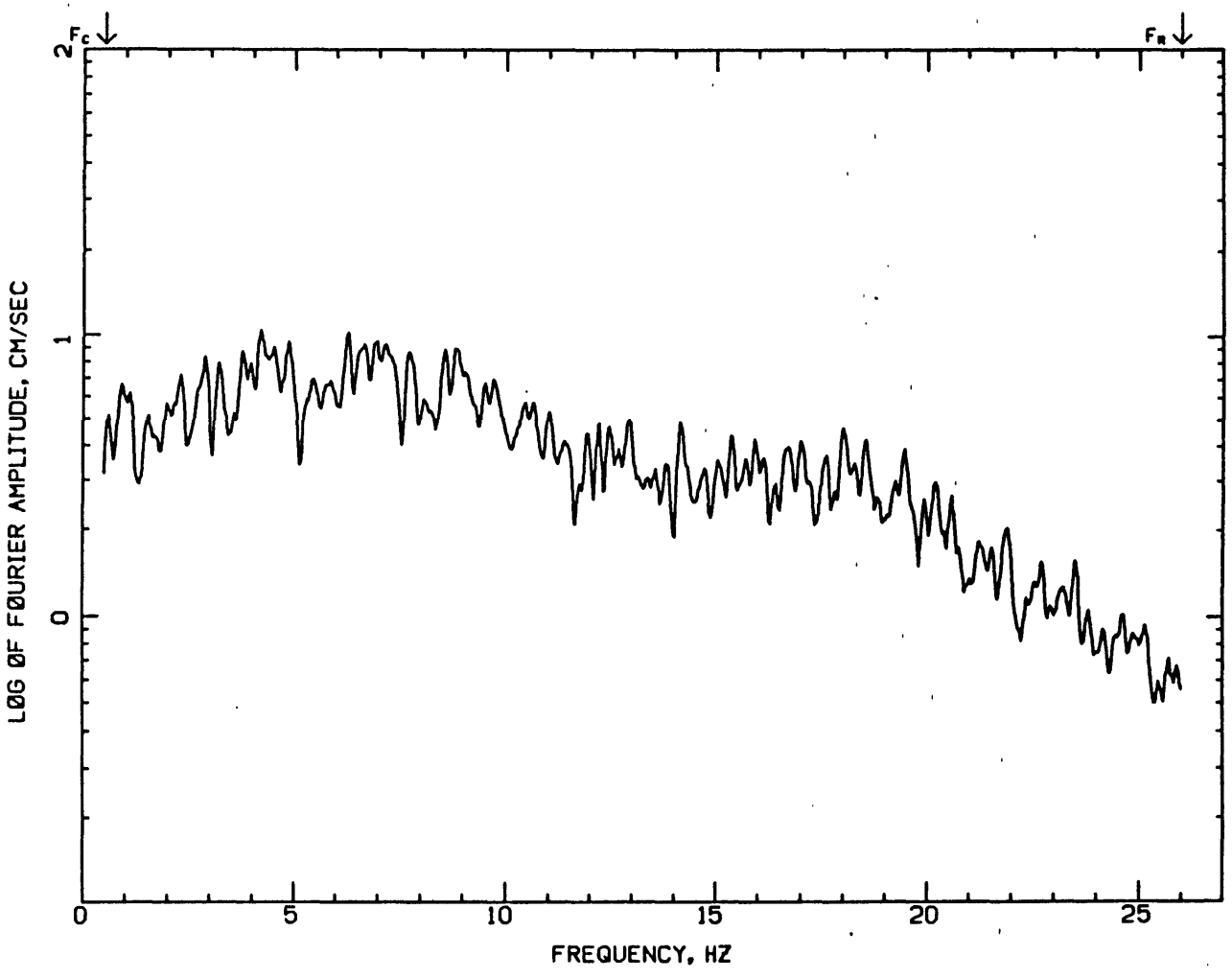

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, TRANSVERSE
PEAK VALUES: ACCEL=-33.18 CM/SEC/SEC, VELØCITY=2.39 CM/SEC, DISPL=0.48 CM
ACCELERATIØN CM/SEC/SEC
34.0
-34.0
VELØCITY CM/SEC
2.40
-2.40
DISPLACEMENT CM
0.49
-0.49
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECØNDS

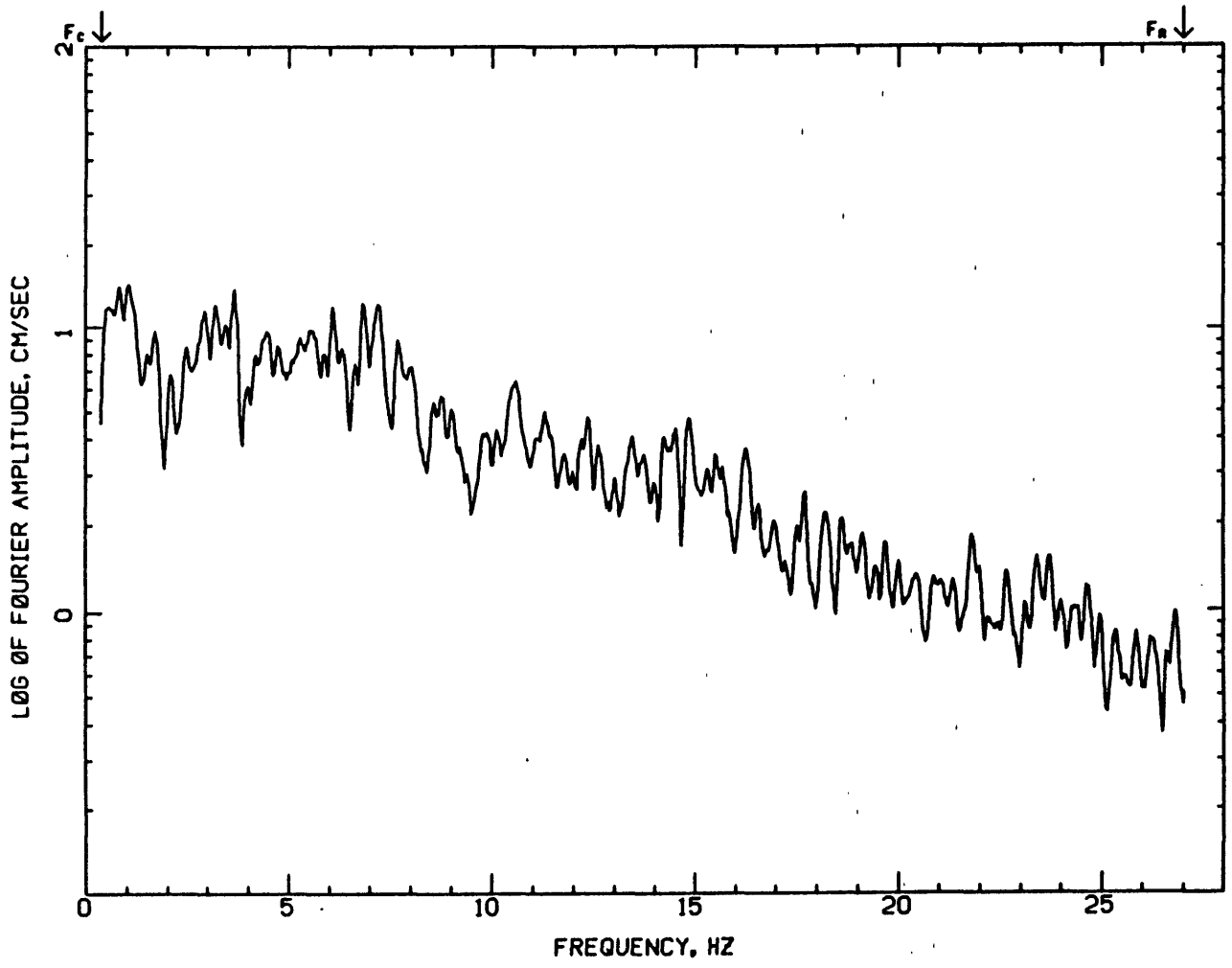

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, LØNGITUDINAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
Fa
F1
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
A0
0
1
2
LØG ØF FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
FB
F1
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, TRANSVERSE
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
Fa
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
Ao
2
1
0
0
1
2

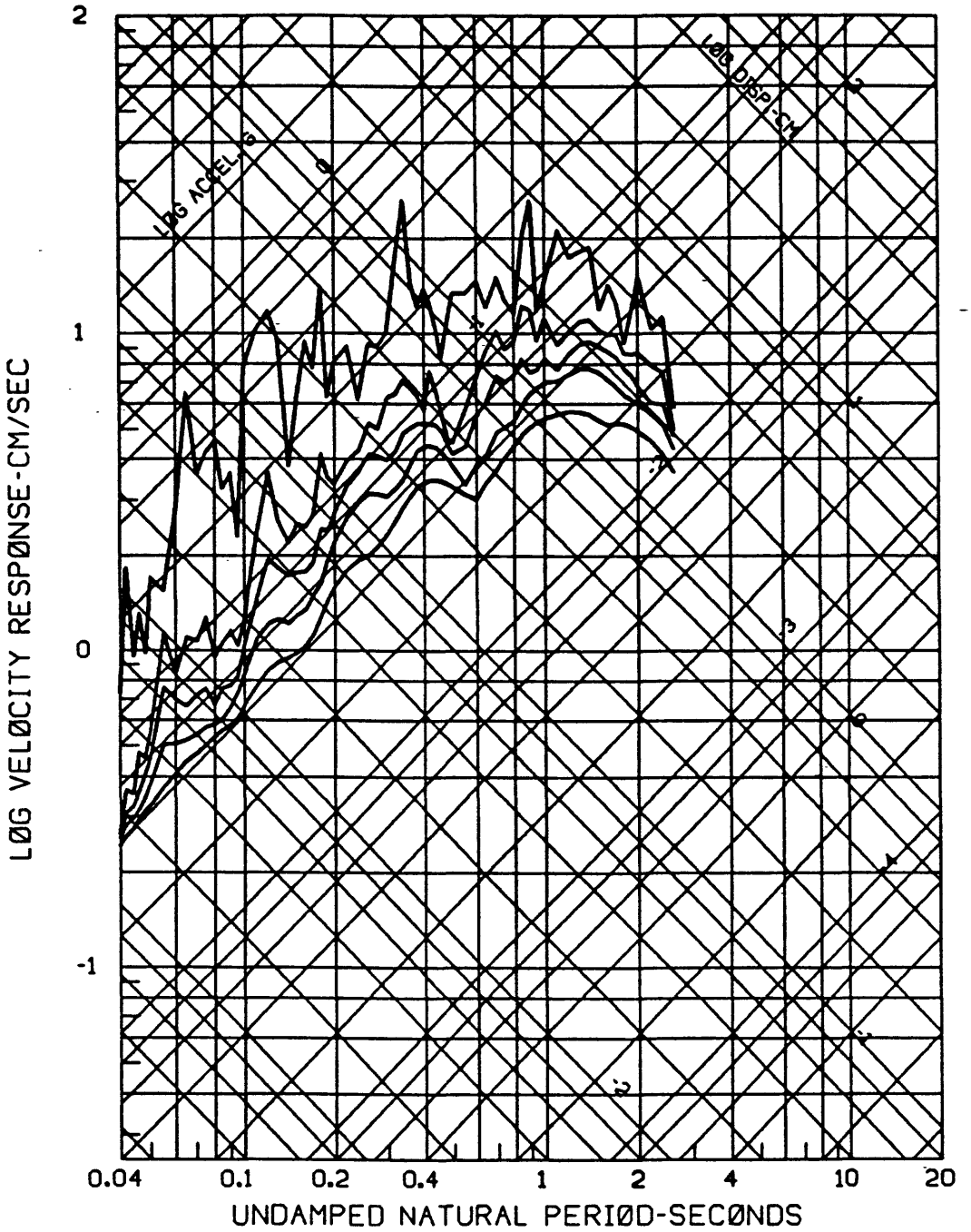

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, LØNGITUDINAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
Fn
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
25
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
Fn
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
25
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
SANTIAGØ, CHILE, TRANSVERSE
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
Fn
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
0
5
10
15
20
25
FREQUENCY, HZ

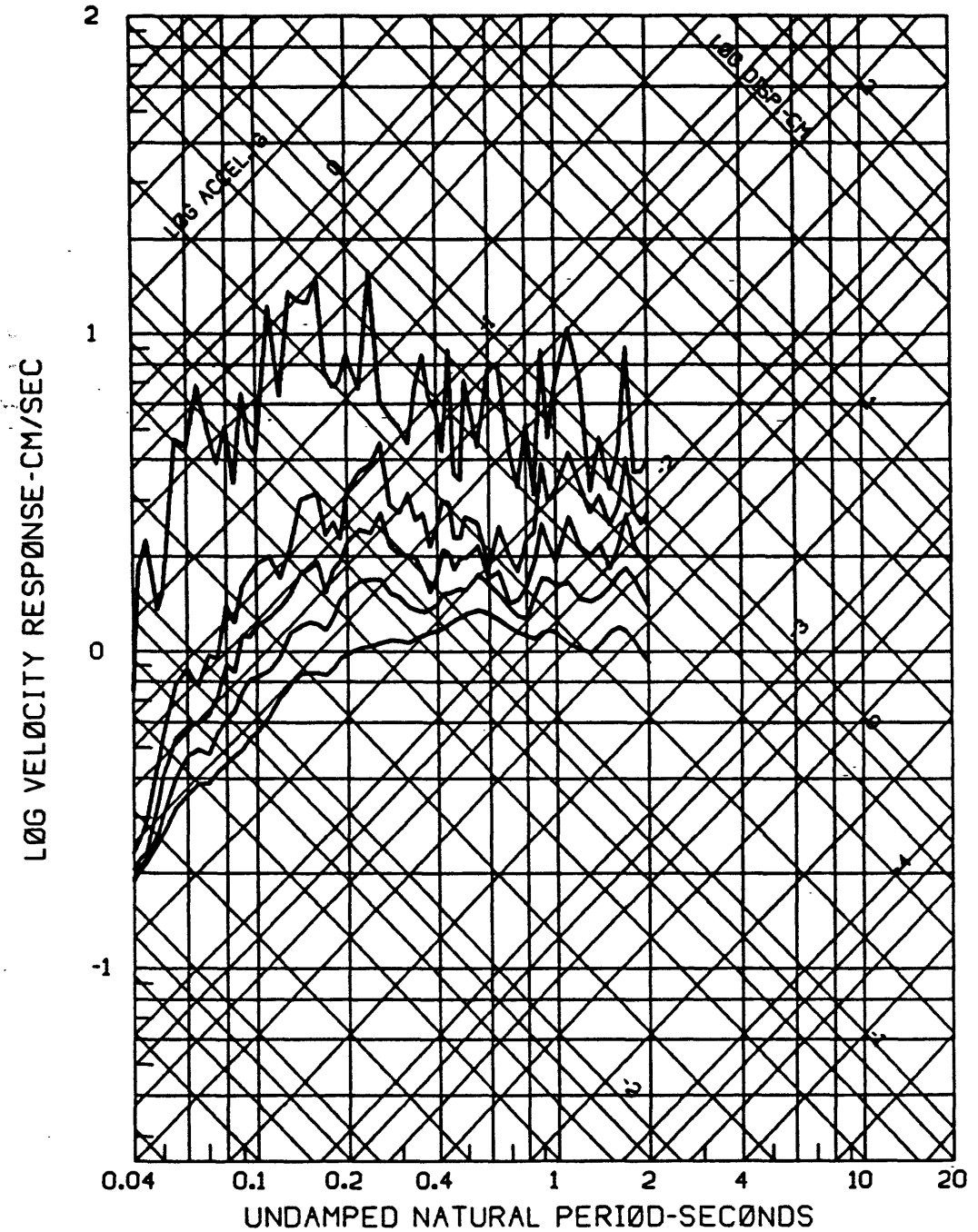
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SANTIAGØ, CHILE, LØNGITUDINAL
0,2,5,10,20 PERCENT CRITICAL DAMPING



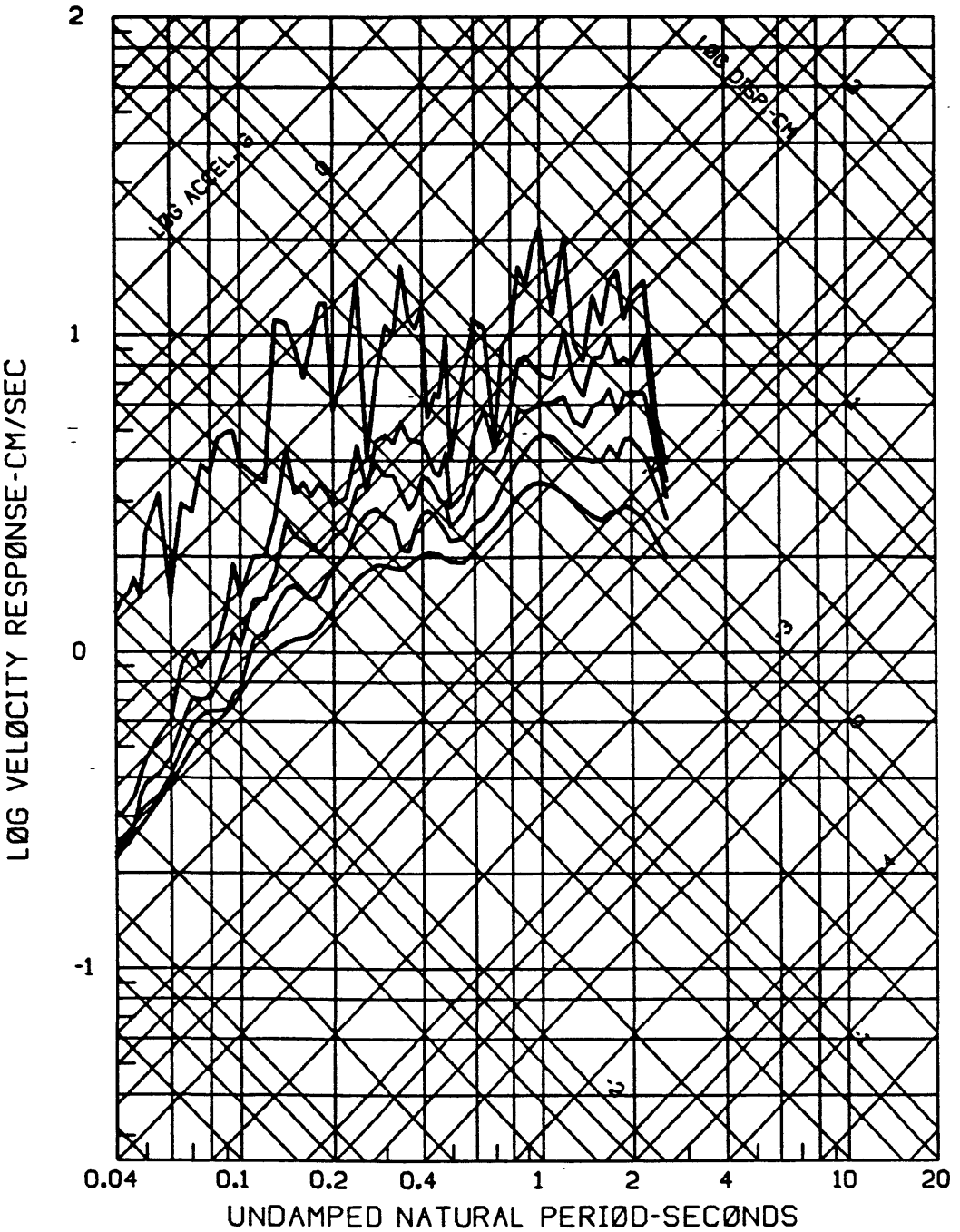
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

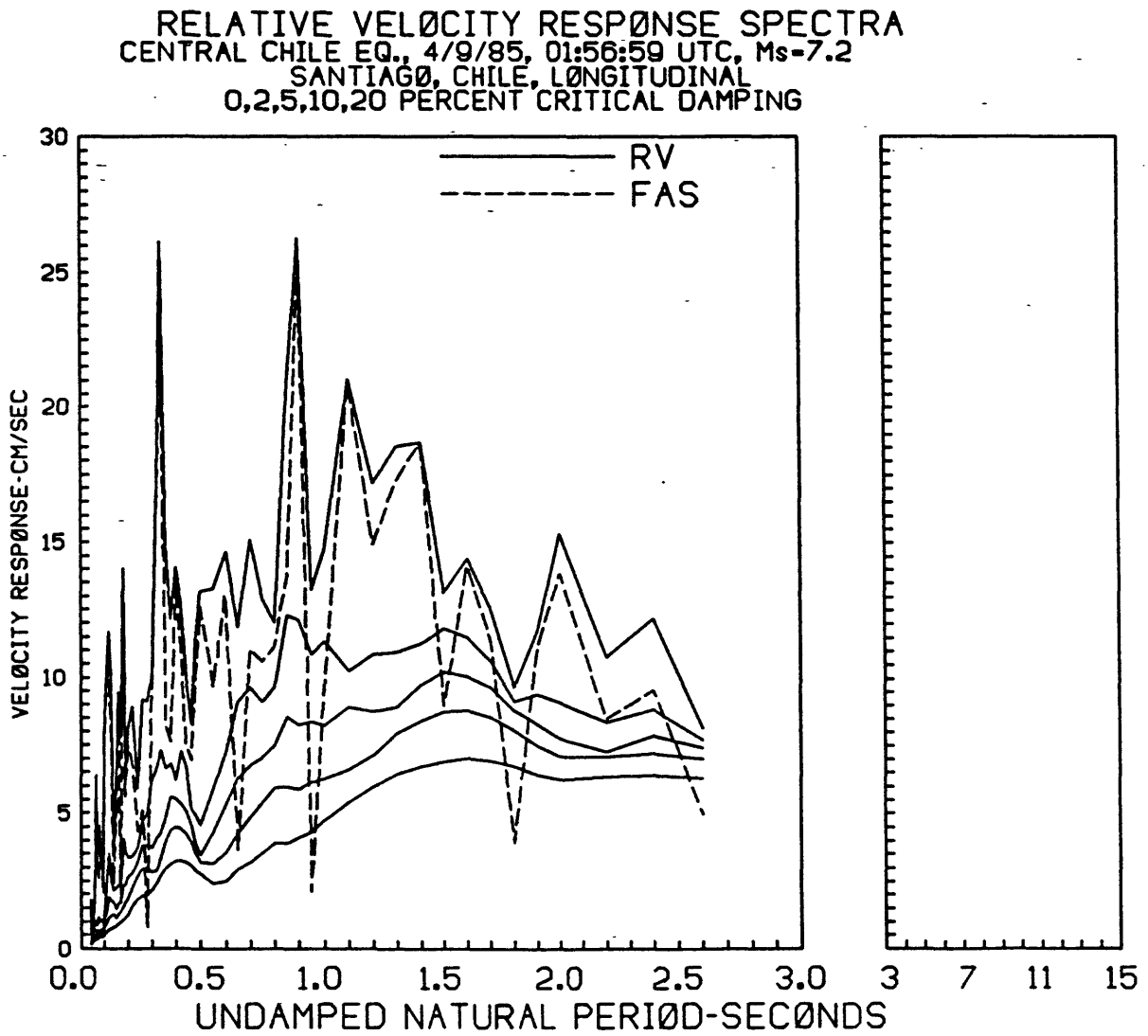
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SANTIAGØ, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

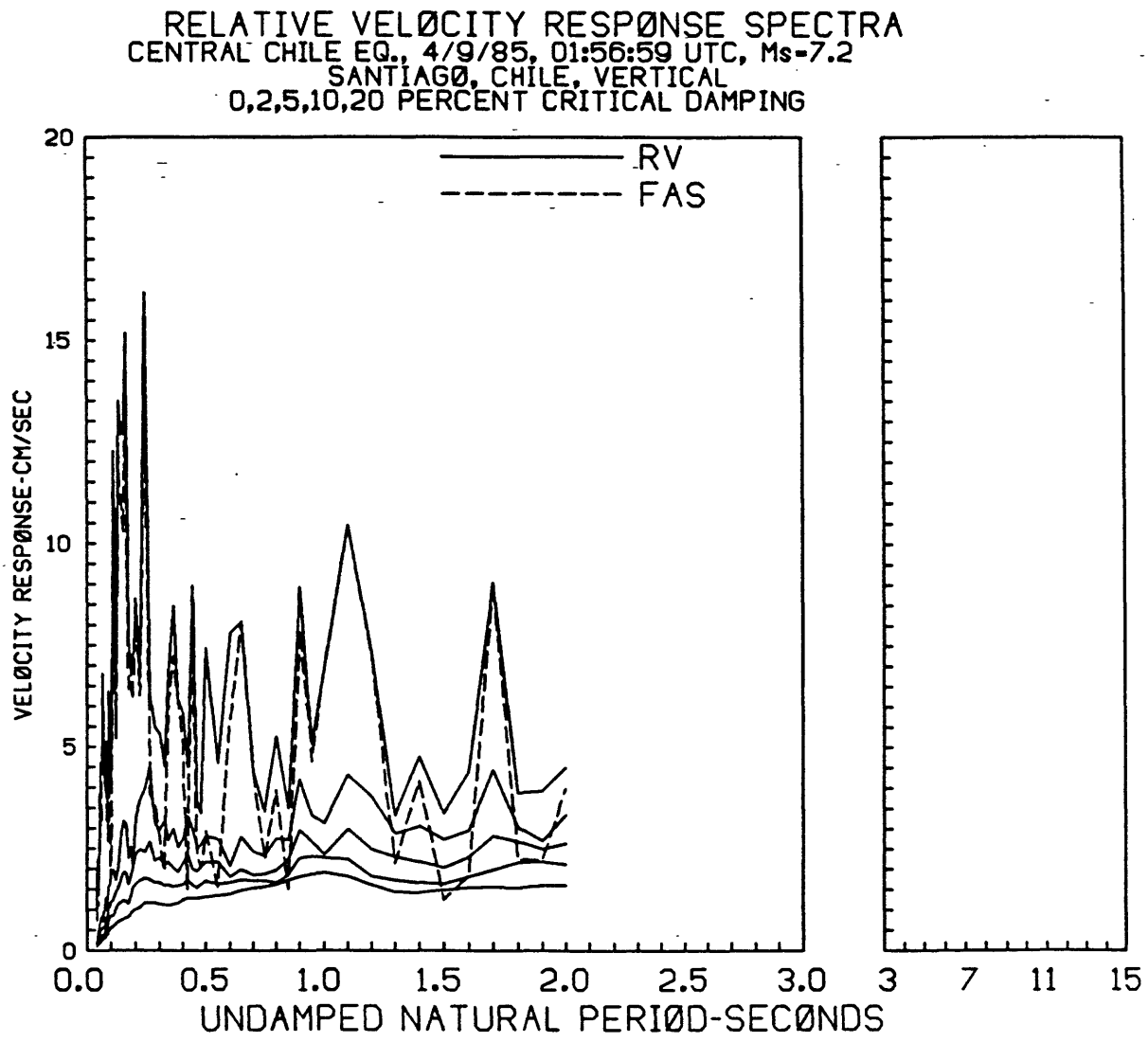


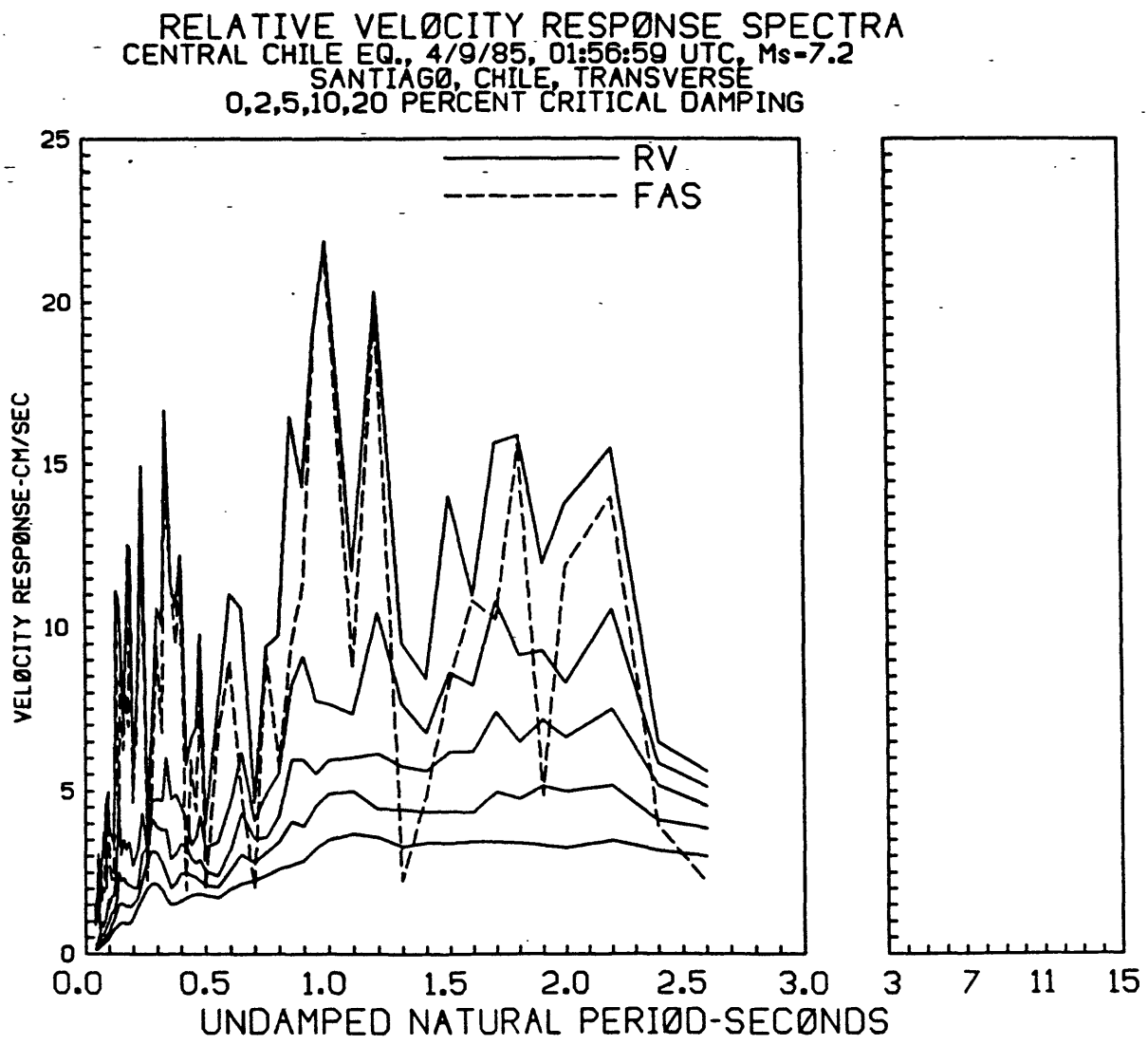
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA

CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SANTIAGØ, CHILE, TRANSVERSE
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SANTIAGØ, CHILE, LØNGITUDINAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
30
25
20
15
10
5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
SANTIAGØ, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
20
15
10
5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms=7.2
SANTIAGØ, CHILE, TRANSVERSE
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
25
20
15
10
5
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS

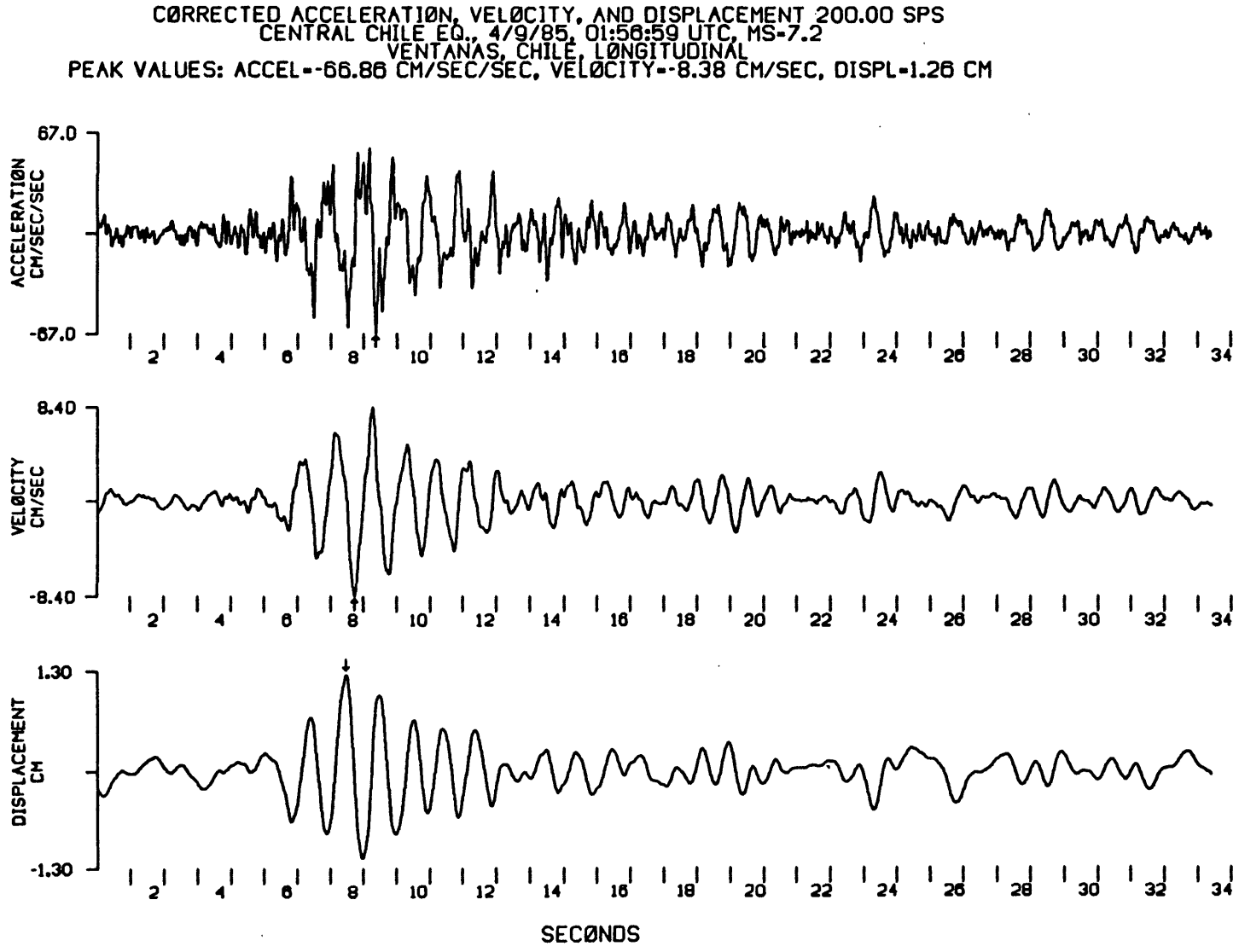
SUMMARY OF STRONG-MOTION RECORD PROCESSING

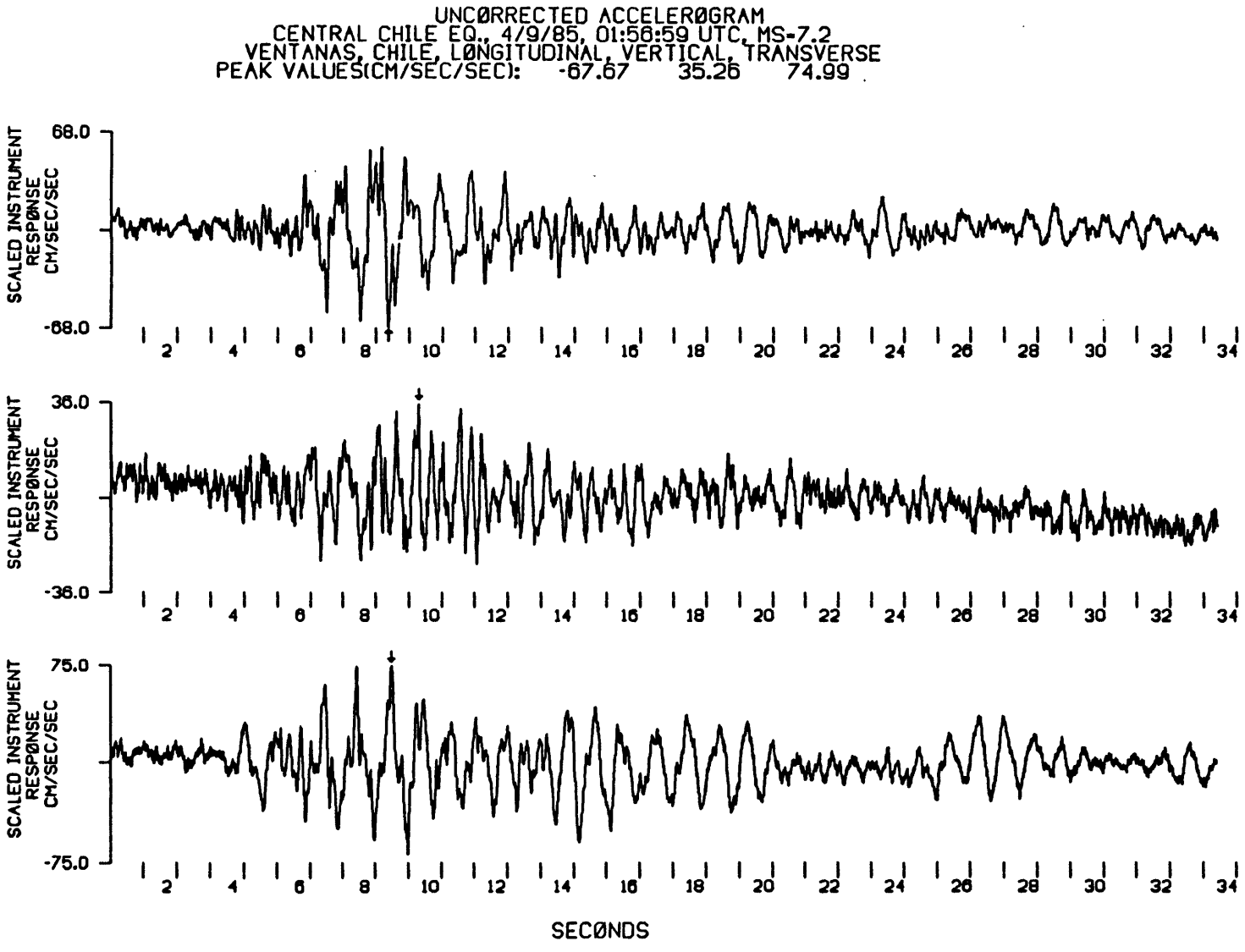
Central Chile earthquake of 4/9/85
01:56:59 UTC, M_S=7.2

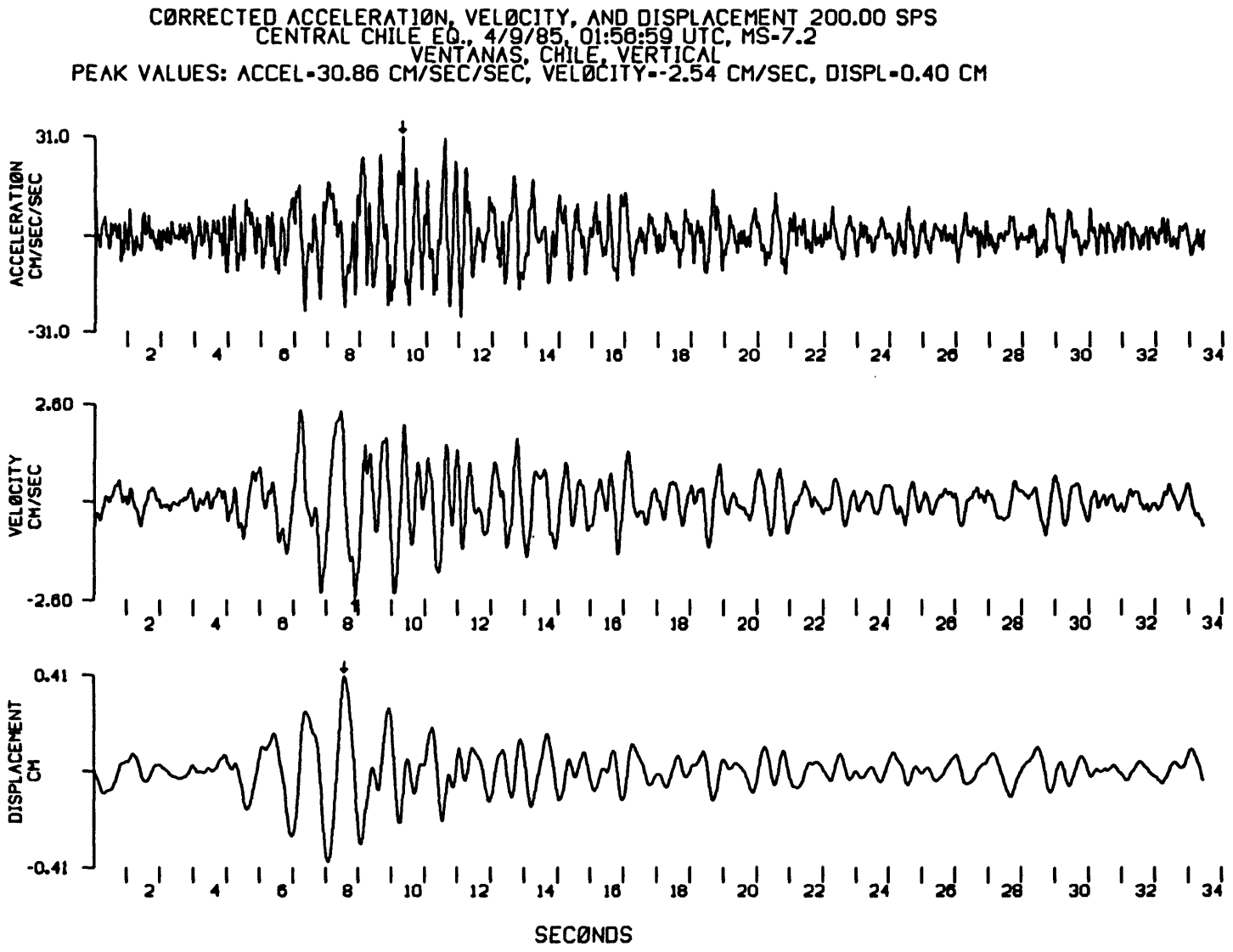
Ventanas, Chile

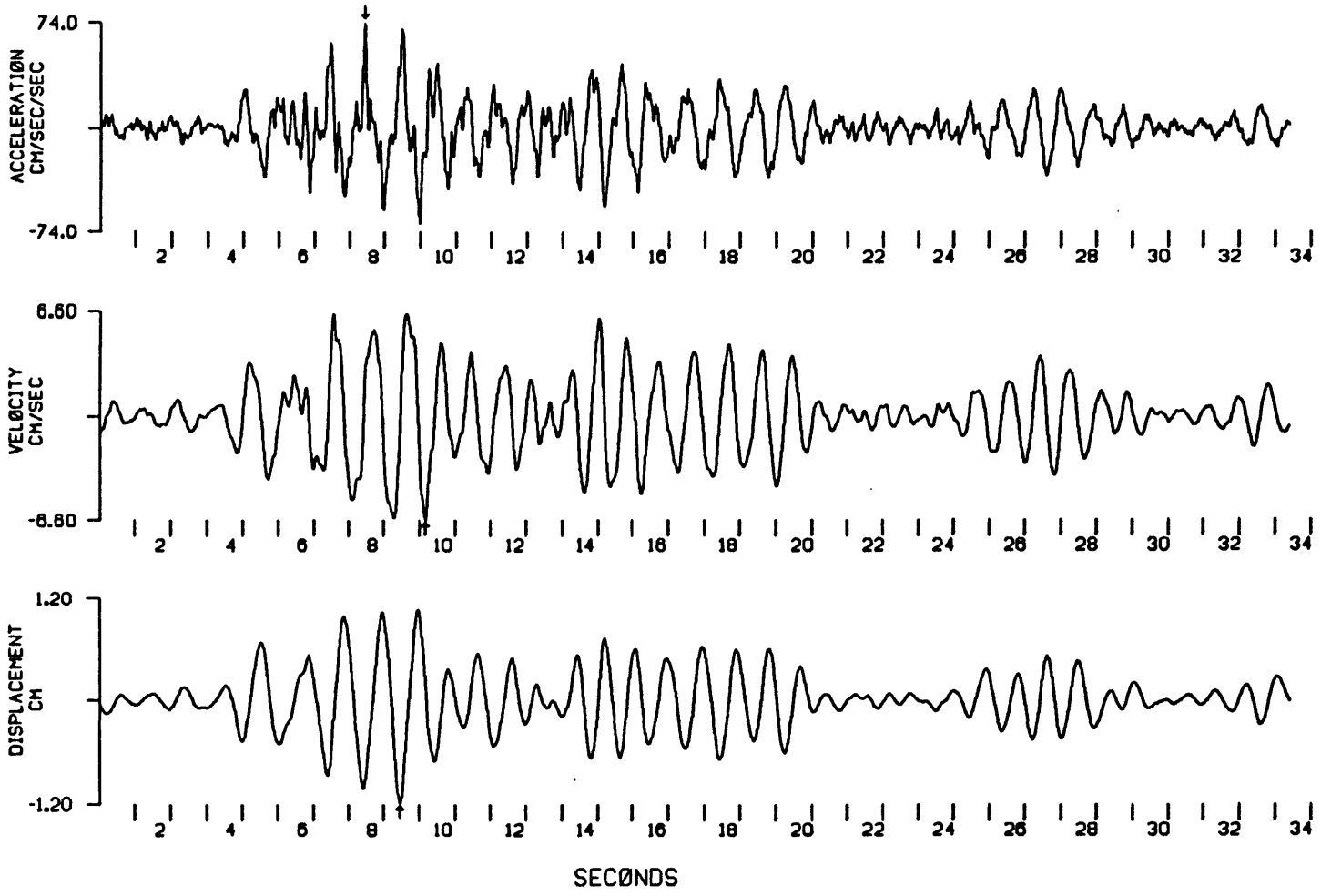
DESCRIPTION	COMPONENT		
	Longitudinal	Vertical	Transverse
Instrument Characteristics:			
Frequency (Hz)	25.0*	25.0*	25.0*
Damping (% Critical)	62.6	60.4	59.3
Filter Parameters:			
Highcut (Hz)	17.0	15.0	17.0
Lowcut (Hz)	0.323	0.588	0.500
Peak Parameters:			
Peak Acceleration, Unc. (cm/s/s)	-67.7	35.3	75.0
Peak Acceleration, A (cm/s/s)	-66.9	30.9	73.8
Peak Velocity, V (cm/s)	-8.38	-2.54	-6.58
Peak Displacement, D (cm)	1.26	0.403	-1.18
Parameter Ratios:			
$\lvert V/A \rvert$ (sec)	0.13	0.082	0.089
$\lvert AD/V^2 \rvert$	1.2	1.9	2.0

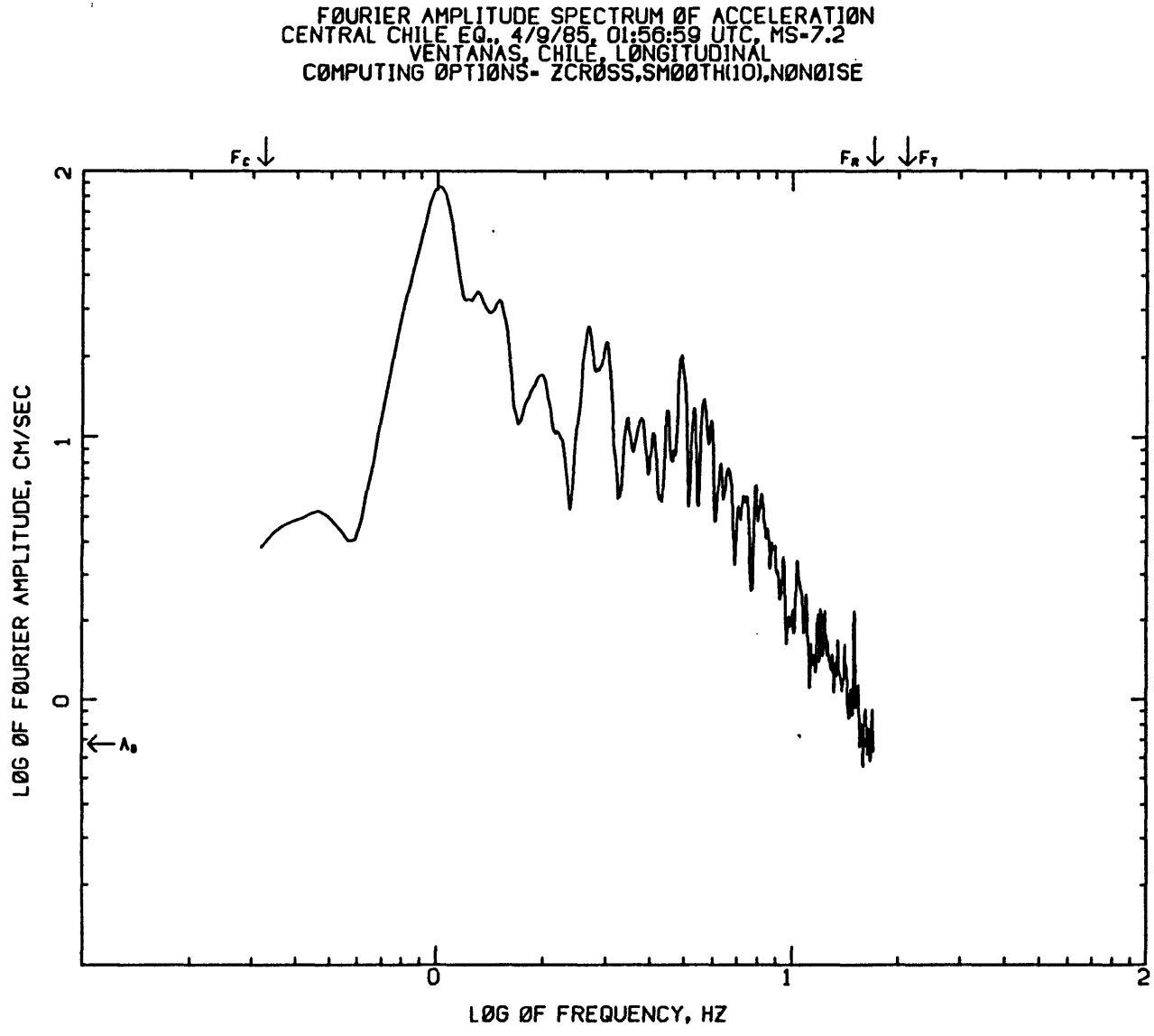
*Nominal value

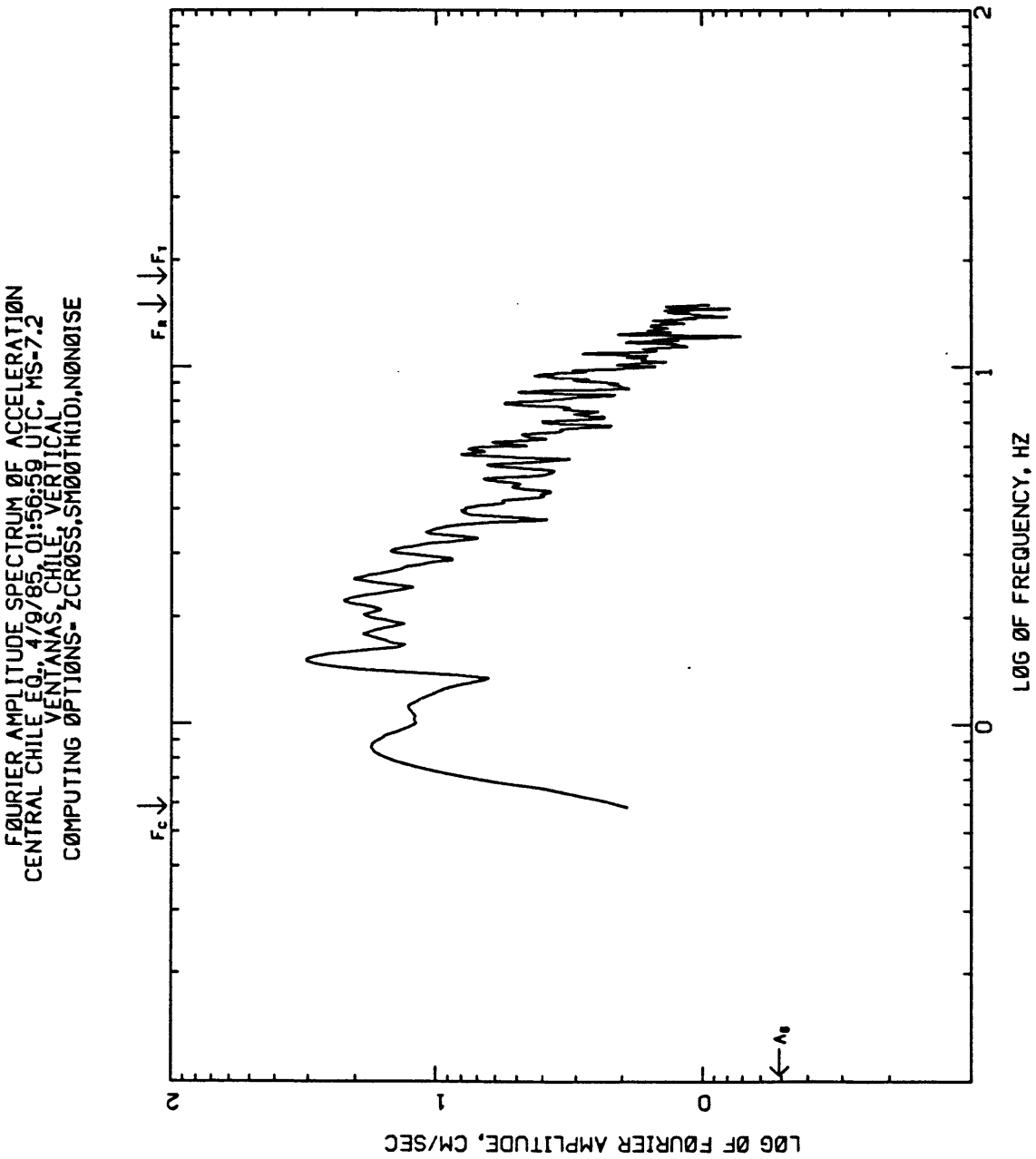

CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, LØNGITUDINAL
PEAK VALUES: ACCEL=-66.86 CM/SEC/SEC, VELØCITY=-8.38 CM/SEC, DISPL=1.26 CM
ACCELERATIØN CM/SEC/SEC
67.0
-67.0
VELØCITY CM/SEC
8.40
-8.40
DISPLACEMENT CM
1.30
-1.30
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
SECØNDS

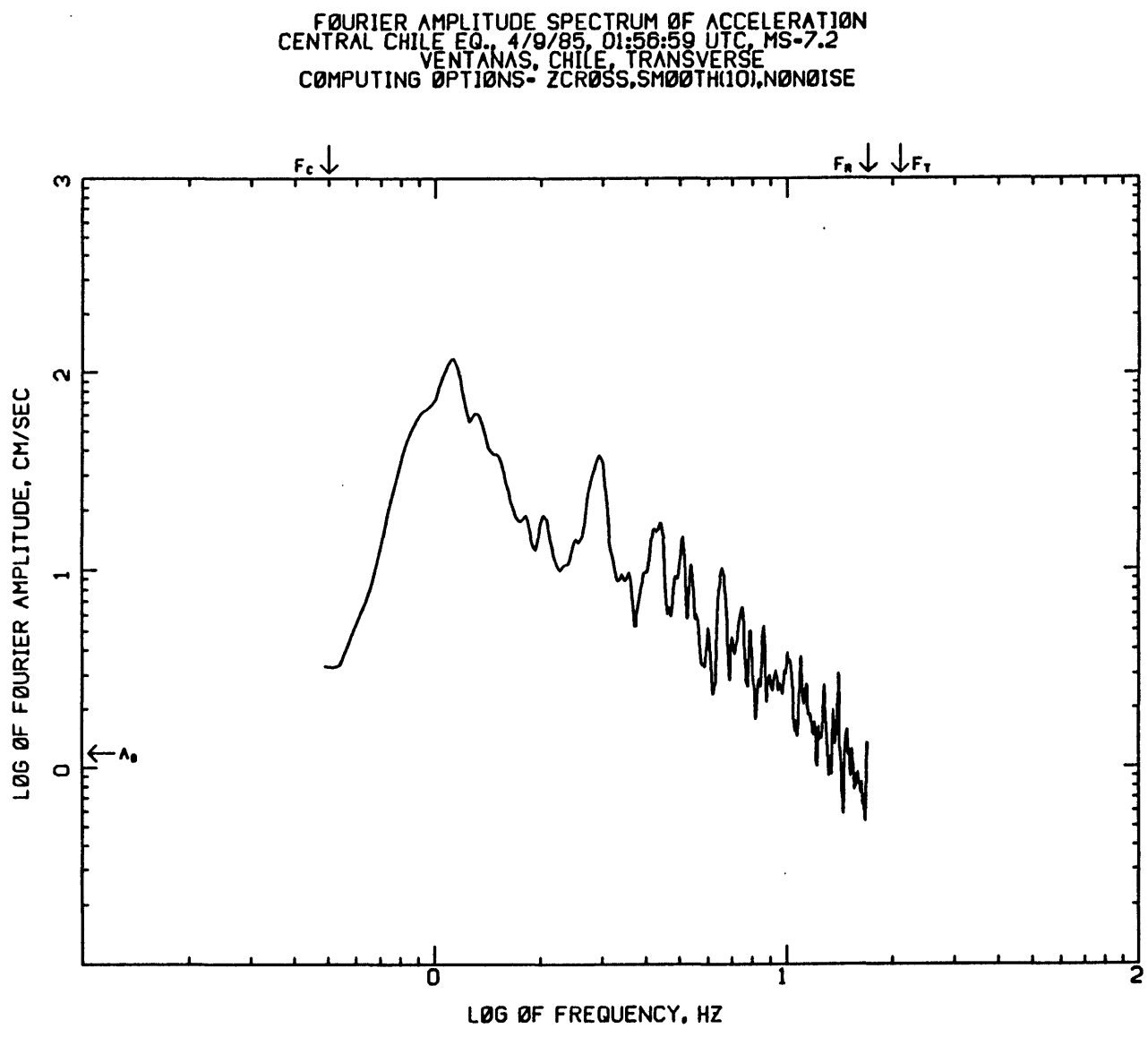

UNCØRRECTED ACCELERØGRAM
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, LØNGITUDINAL, VERTICAL, TRANSVERSE
PEAK VALUES(CM/SEC/SEC): -67.67 35.26 74.99
SCALED INSTRUMENT RESPØNSE CM/SEC/SEC
68.0
-68.0
36.0
-36.0
75.0
-75.0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
SECØNDS


CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:58:59 UTC, MS-7.2
VENTANAS, CHILE, VERTICAL
PEAK VALUES: ACCEL=30.86 CM/SEC/SEC, VELØCITY=-2.54 CM/SEC, DISPL=0.40 CM
ACCELERATIØN CM/SEC/SEC
31.0
-31.0
VELØCITY CM/SEC
2.60
-2.60
DISPLACEMENT CM
0.41
-0.41
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
SECØNDS


CØRRECTED ACCELERATIØN, VELØCITY, AND DISPLACEMENT 200.00 SPS
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, TRANSVERSE
PEAK VALUES: ACCEL=73.79 CM/SEC/SEC, VELØCITY=-6.58 CM/SEC, DISPL=-1.18 CM
ACCELERATIØN CM/SEC/SEC
74.0
-74.0
VELØCITY CM/SEC
6.60
-6.60
DISPLACEMENT CM
1.20
-1.20
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
SECØNDS


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, LØNGITUDINAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
FR
FT
A0
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ
2
1
0
0
1
2


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(1Ø),NØNØISE
Fc
Fa
F1
2
1
0
LØG ØF FØURIER AMPLITUDE, CM/SEC
LØG ØF FREQUENCY, HZ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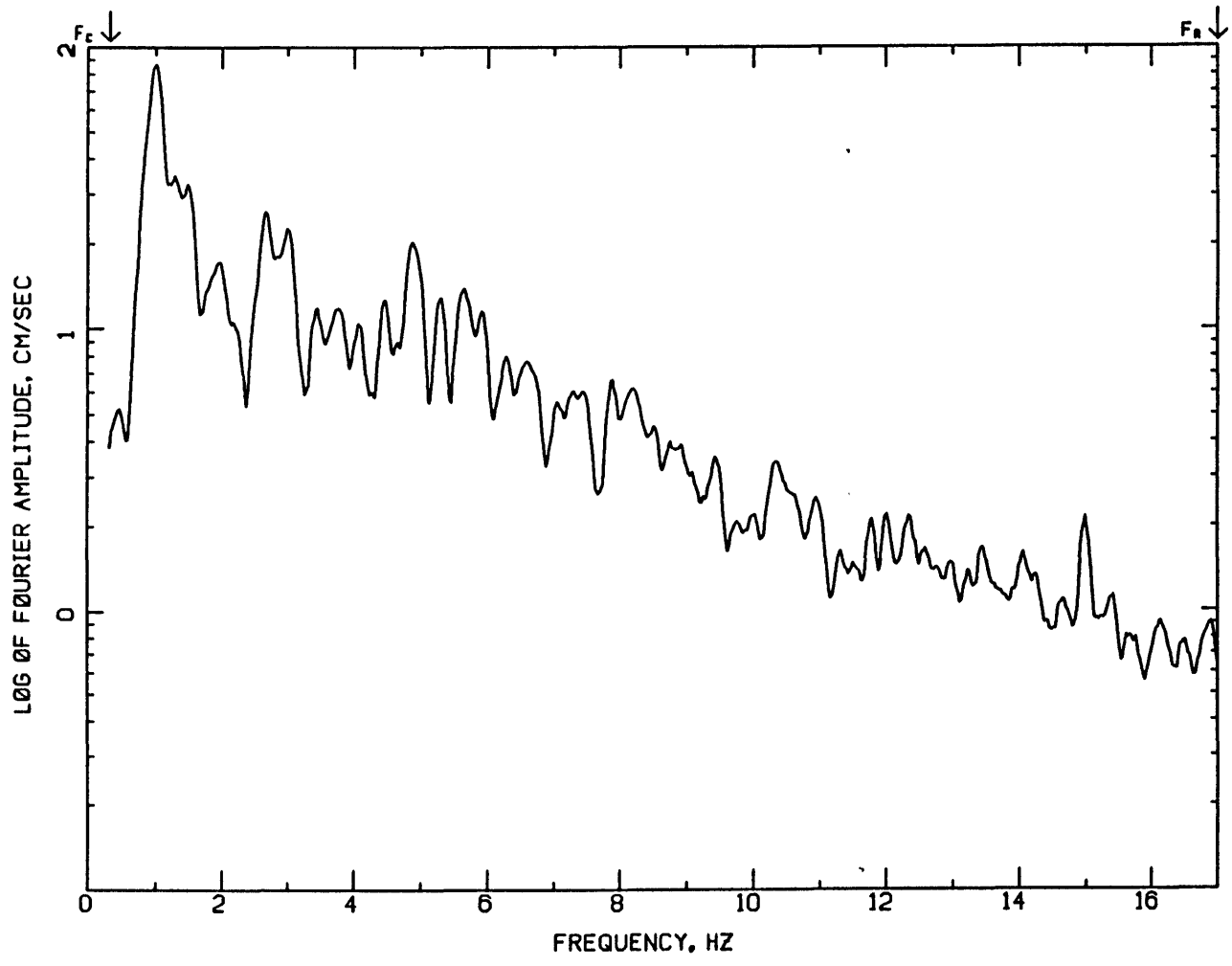
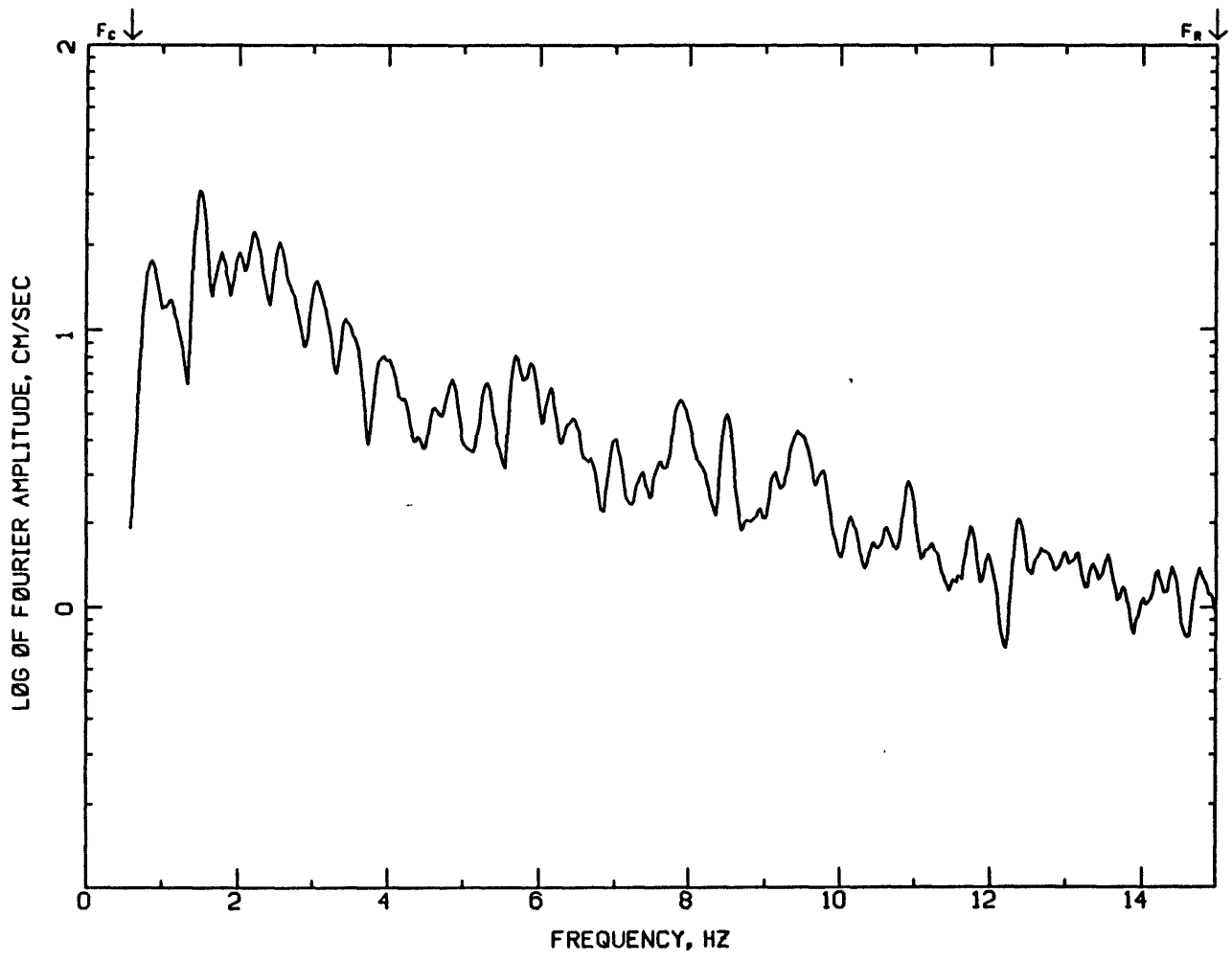
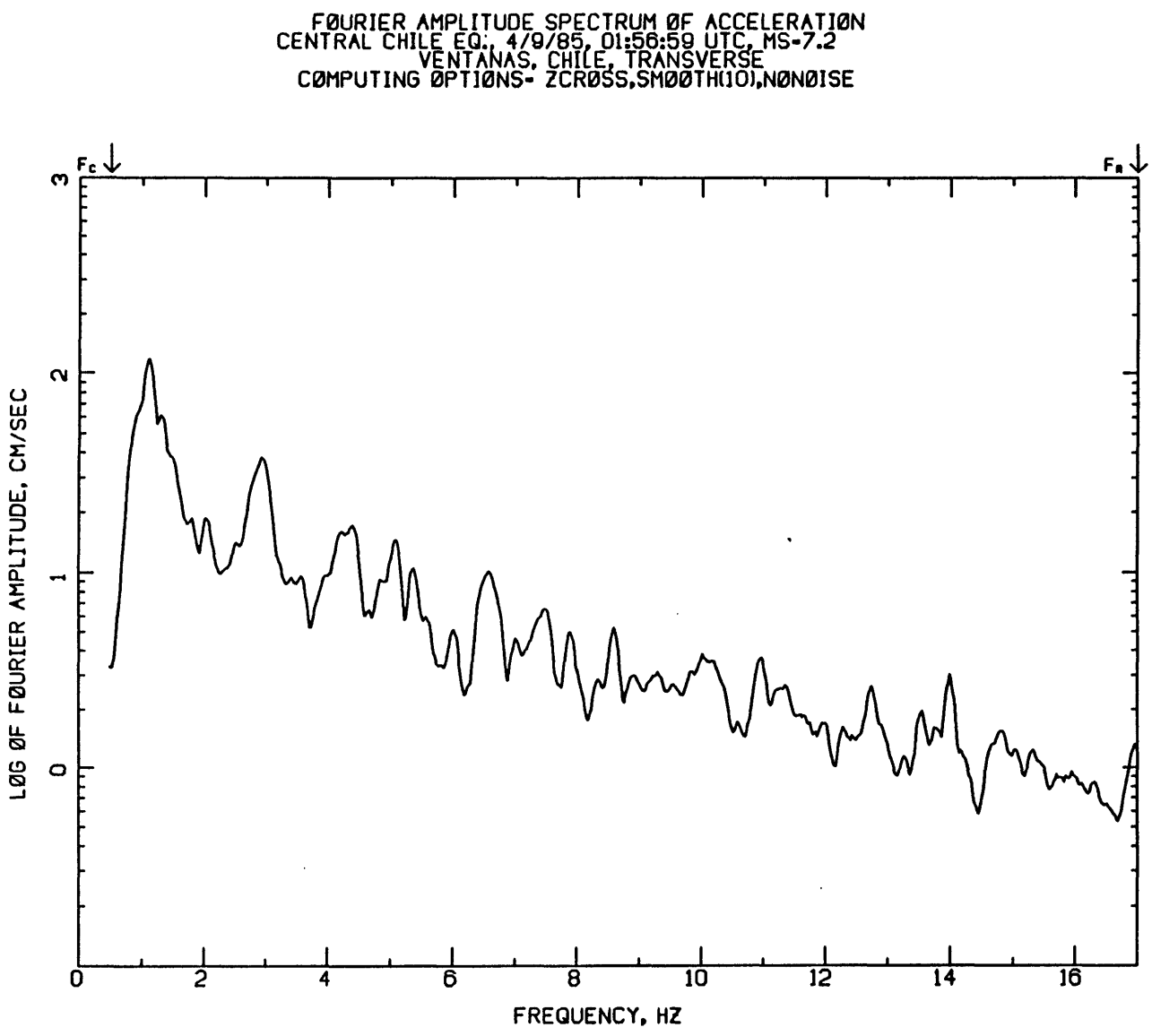
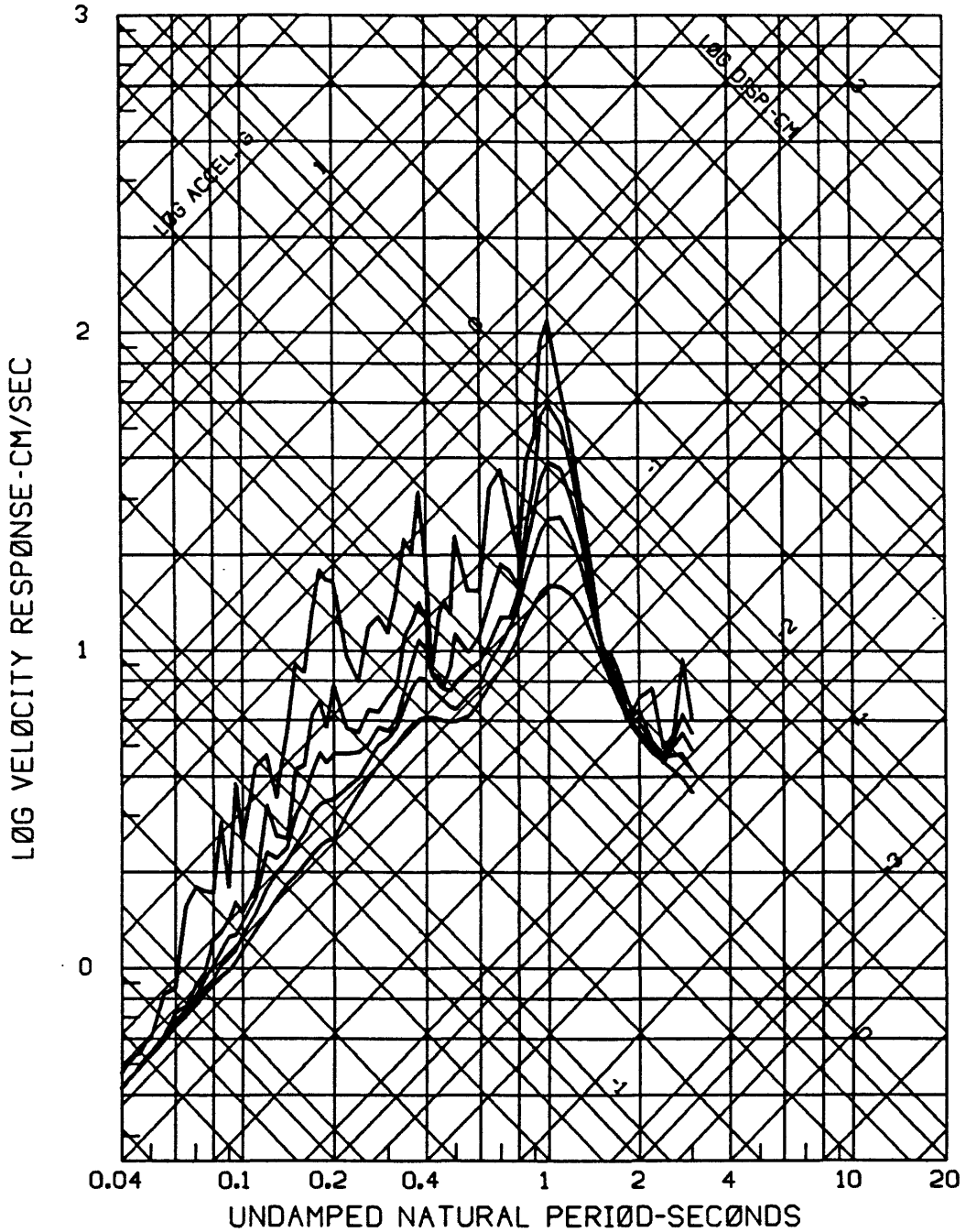
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, TRANSVERSE
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
FR
FT
LØG ØF FØURIER AMPLITUDE, CM/SEC
A0
3
2
1
0
0
1
2
LØG ØF FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS=7.2
VENTANAS, CHILE, LØNGITUDINAL
CØMPUTING ØPTIØNS- ZCRØSS,SM00TH(10),NØNØISE
LØG ØF FØURIER AMPLITUDE, CM/SEC
FREQUENCY, HZ
2
1
0
0
2
4
6
8
10
12
14
16
Fc
Fn

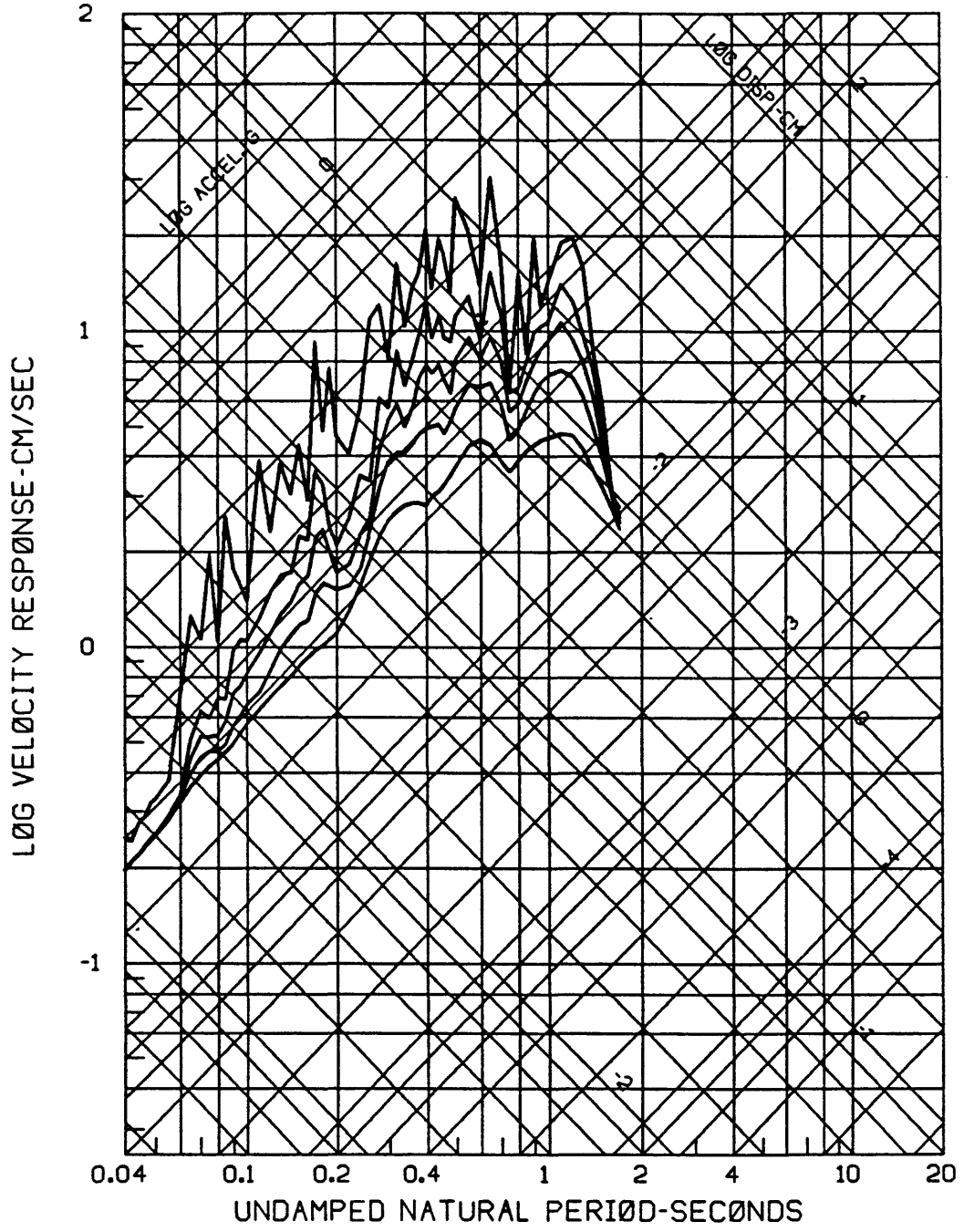

FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, VERTICAL
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
FR
LØG ØF FØURIER AMPLITUDE, CM/SEC
2
1
0
0
2
4
6
8
10
12
14
FREQUENCY, HZ


FØURIER AMPLITUDE SPECTRUM ØF ACCELERATIØN
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, MS-7.2
VENTANAS, CHILE, TRANSVERSE
CØMPUTING ØPTIØNS- ZCRØSS,SMØØTH(10),NØNØISE
Fc
Fn
LØG ØF FØURIER AMPLITUDE, CM/SEC
FREQUENCY, HZ
0
1
2
3
0
2
4
6
8
10
12
14
16

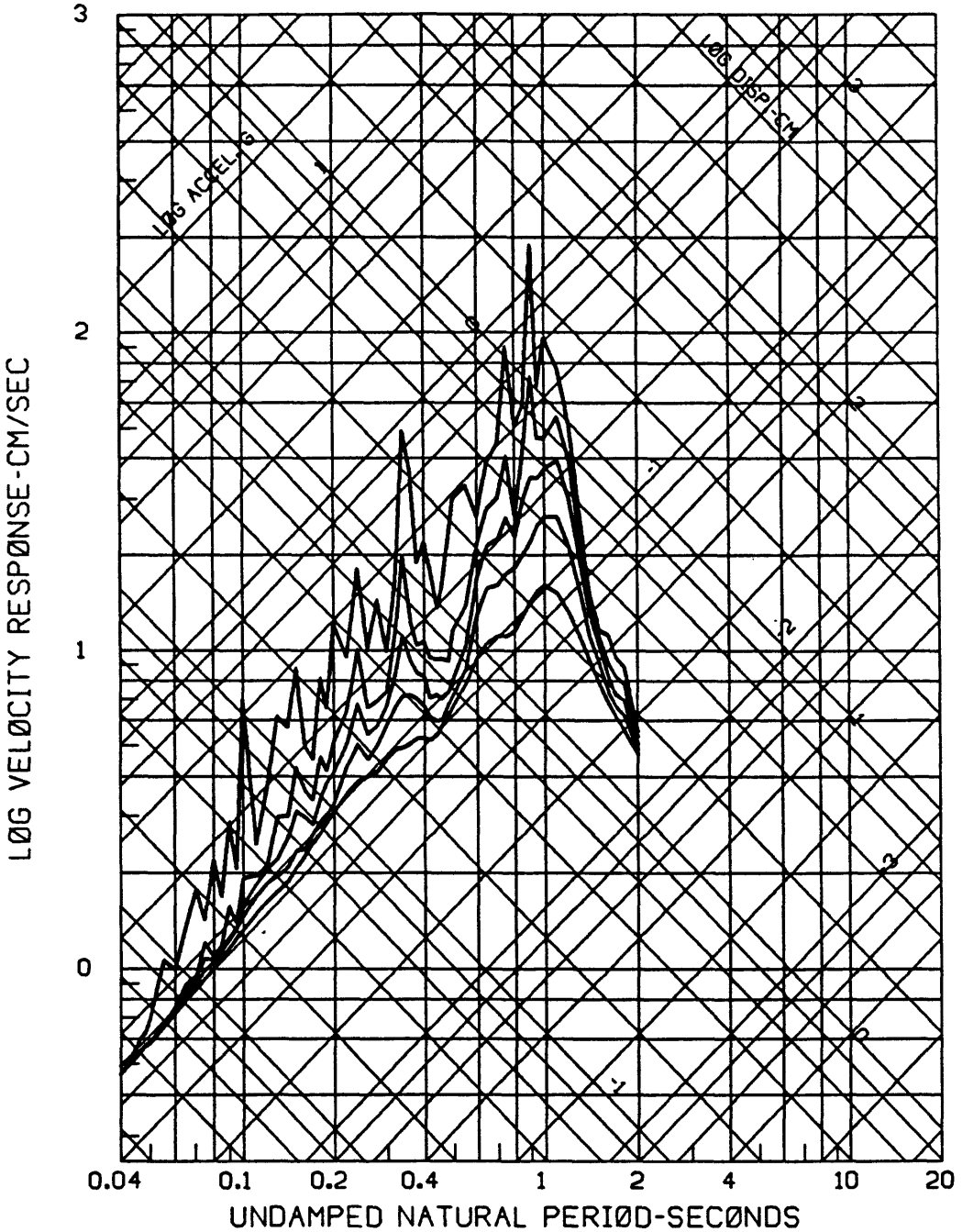
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
VENTANAS, CHILE, LØNGITUDINAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

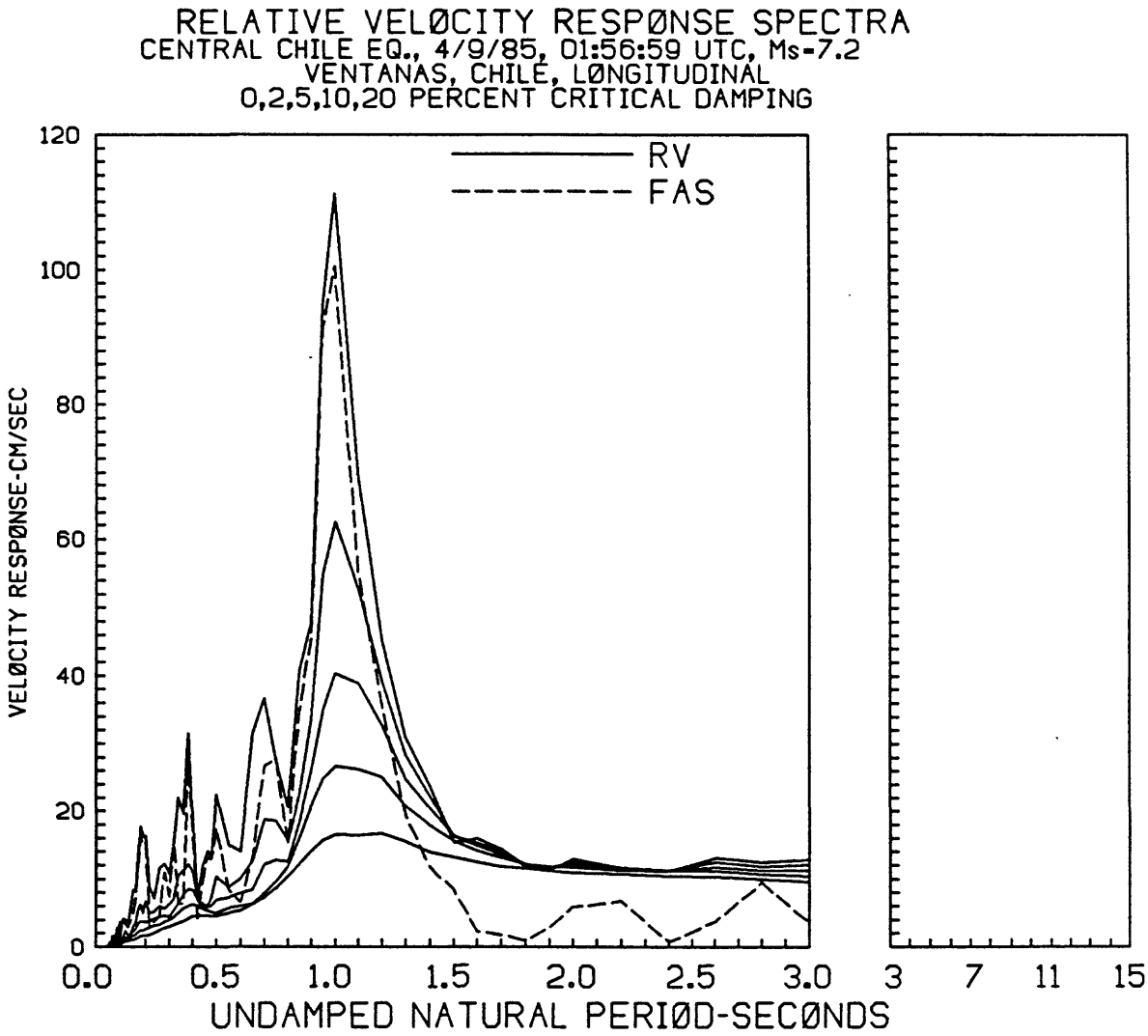


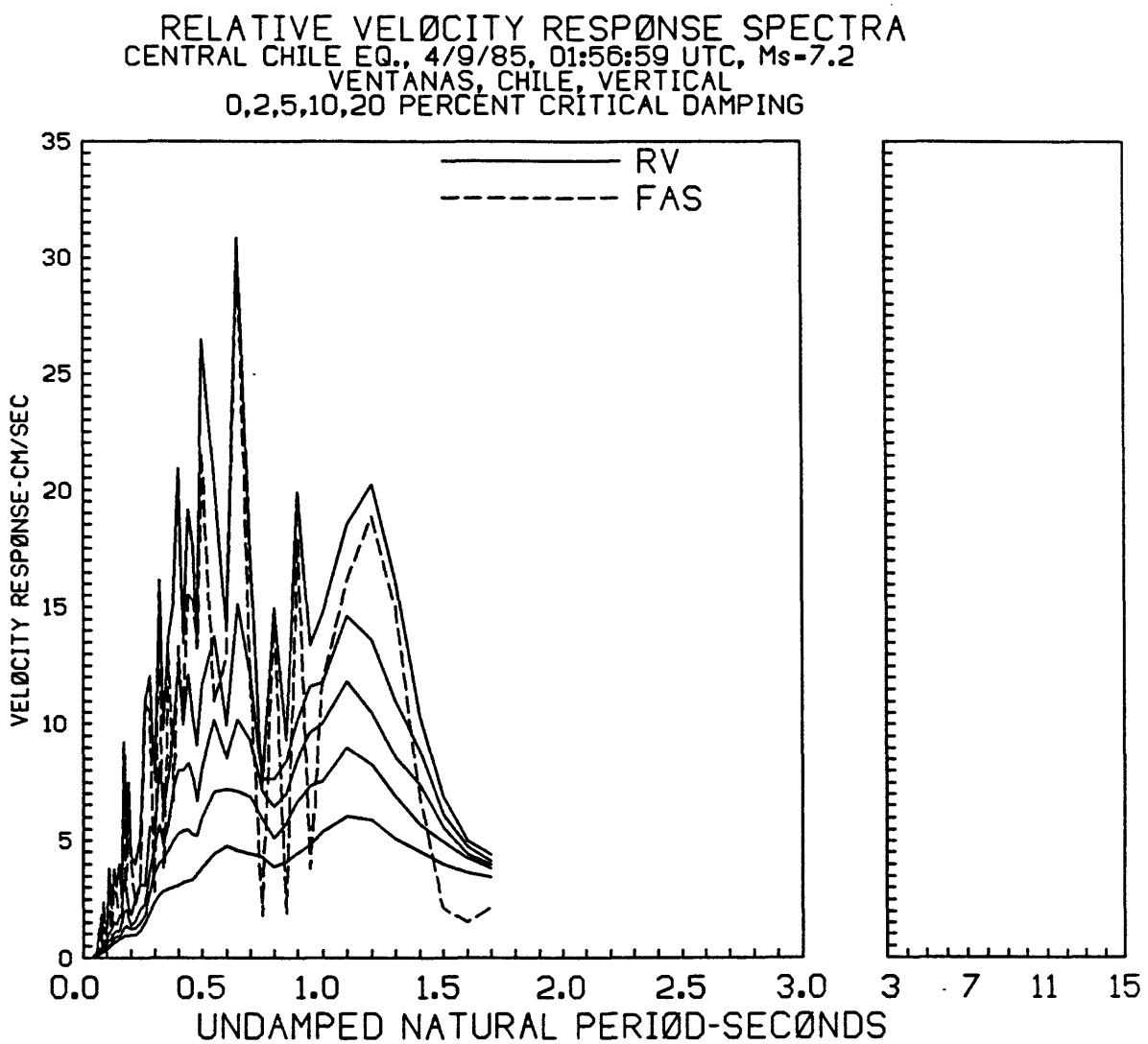
PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
VENTANAS, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING

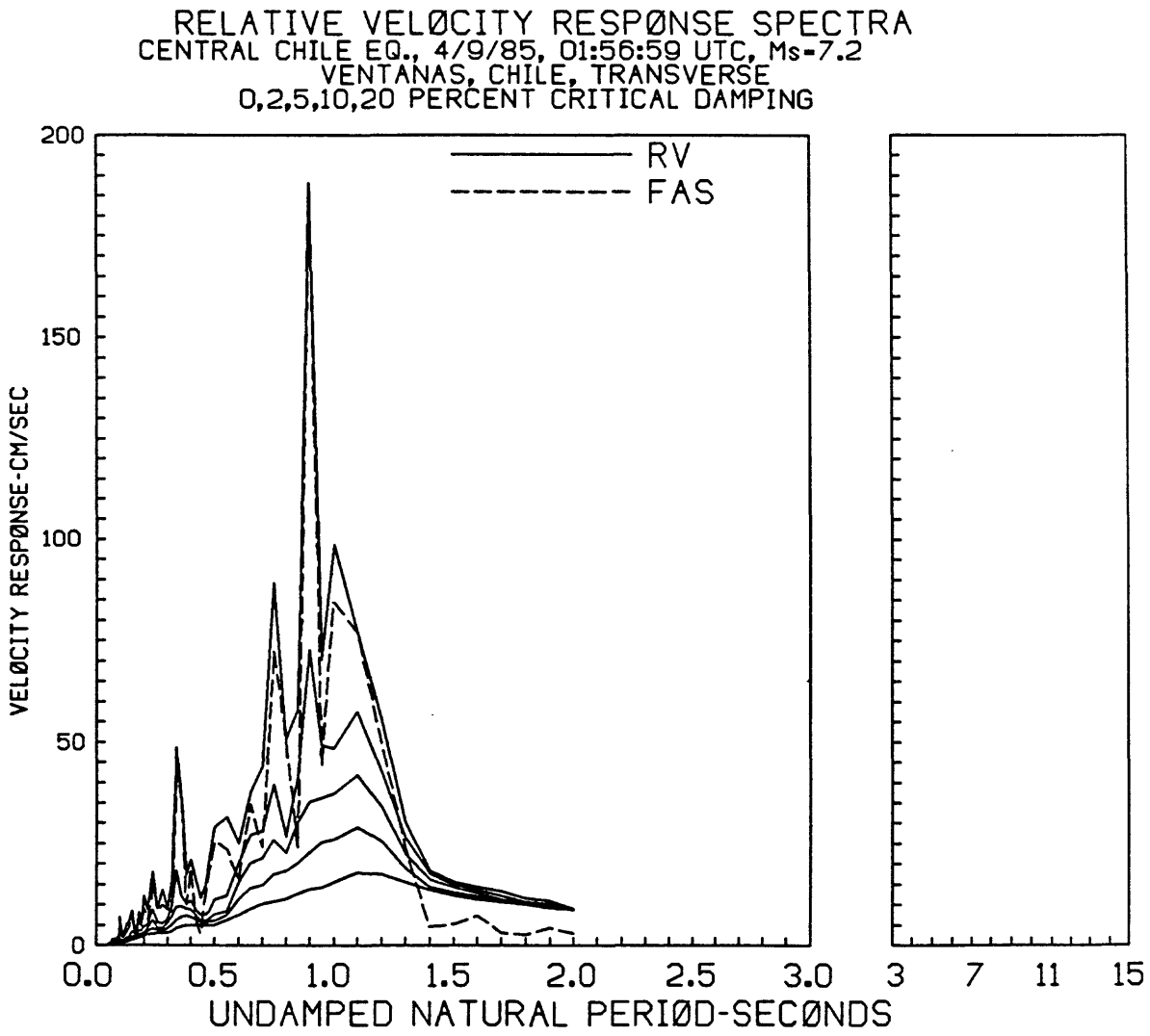


PSEUDØ RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
VENTANAS, CHILE, TRANSVERSE
0,2,5,10,20 PERCENT CRITICAL DAMPING




RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
VENTANAS, CHILE, LØNGITUDINAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
120
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
VENTANAS, CHILE, VERTICAL
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
0
5
10
15
20
25
30
35
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS


RELATIVE VELØCITY RESPØNSE SPECTRA
CENTRAL CHILE EQ., 4/9/85, 01:56:59 UTC, Ms-7.2
VENTANAS, CHILE, TRANSVERSE
0,2,5,10,20 PERCENT CRITICAL DAMPING
RV
FAS
VELØCITY RESPØNSE-CM/SEC
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIØD-SECØNDS