DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

PROCESSED CHILE EARTHQUAKE RECORDS OF 3 MARCH 1985 AND AFTERSHOCKS

Compiled
by
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This report is preliminary and has not been reviewed for conformity with Geological Survey editorial standards.

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OUTLINE

I. INTRODUCTION

At 22:47:06.9 (GMT) on 3 March 1985, an M_S = 7.8 earthquake occurred offshore near Valparaiso in Central Chile. This earthquake had a foreshock at 22:46:56.4. The hypocenter parameters of the main shock as well as the foreshock are summarized by Algermissen (1985) and repeated in Table 1.

The earthquake was recorded by 31 accelerographs belonging to the Central Chile Accelerograph Network operated by the Geophysics Department and the Civil Engineering Department of the University of Chile (Saragoni and others, 1985). In addition to the recordings of the main shock, several important aftershocks were also recorded.

The 3 March 1985 Central Chile Earthquake is one of the major subduction zone earthquakes of this century. The records of strong-motions obtained in various locations throughout Chile with different site conditions will provide a basis for an in-depth study of this earthquake. The performance of structures in Chile are currently under investigation by several researchers both from Chile and the USA: therefore, the strong-motion records will be of use to them and others.

The purpose of this report is to summarize the various records obtained in Central Chile during the main events of 3 March 1985 as well as the aftershocks and also to present the pertinent digitized data as part of an agreement between the Chilean and USGS scientists. The project was supported by the NSF-USGS Panel convened to review proposals for investigating the earthquake.

This report is not intended to be a complete presentation of all the records and related information about the 3 March 1985 earthquake and aftershocks. To the extent records and related information were made available, the processing was completed and this report was compiled. It should be mentioned that there are additional sets of data that are being digitized elsewhere.

Additional copies of this report may be obtained from the Open-File Services Section, Branch of Distribution, USGS, Box 25425, Federal Center, Denver, Colorado 880225. Digital data corresponding to the plots of the analysis sections 1, 2 and 3 (uncorrected data, corrected data, and response spectra, respectively) may be obtained on magnetic tape from the National Geophysical Data Center, NOAA, Code E/GC4, 325 Broadway, Boulder, Colorado 80303.

TABLE 1.--Hypocenter parameters of the prinicpal shocks from March 3, 1985 (from Algermissen, 1985)

Origin time	Latitude	Longitude	Depth	m_b	M_s	Source
22:46:56.4	33.118°S.	71.822°W.	33*	5.2	--	NEIS (PDE No. 9-85, March 21, 1985).
22:47:06.9	33.155°S.	71.980°W.	33*	6.9	7.8	Do.
22:46:56.9	33.24° S.	71.86° W.	16			University of Chile, Department of Geophysics (E. Kausel, oral commn., 1985) (only initial shock located).

* Normal default depth set by NEIS.

II. DESCRIPTION OF RAW DATA, LOCATION OF INSTRUMENTS, DESCRIPTION OF INSTRUMENTS

All of the strong-motion data acquired in Central Chile during the main shock of 3 March 1985 and the following aftershocks were recorded on film. Although other types of instruments (accelerographs) were also used, all the records that are referred to in this report are from Kinemetrics SMA-1* type accelerographs.

At the time the funds for this project were allocated, the Chilean counterparts of this project had already digitized four of the main shock records obtained from Llolleo, Vina del Mar, Valparaiso (UFSM), and Valparaiso (Almendral). The originals or contact copies of these four records were not available for redigitizing in the U.S. for the purpose of comparing the results of different techniques.

The location of strong motion substations of the Chile network are summarized both in Figure 1 and Table 2 both of which are adopted from Saragoni and others (1985). Figure 1 also provides the orientations and peak accelerations (of the 1985 event) and Table 2 provides the coordinates as well as the peak accelerations. For the sake of completeness, the descriptions, locations, and site conditions of all instruments of stations in Chile are summarized in Table 3.

The four main shock records digitized in Chile and their corresponding spectra are provided in Appendix A.

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* Commercial name only and does not constitute endorsement of the product.

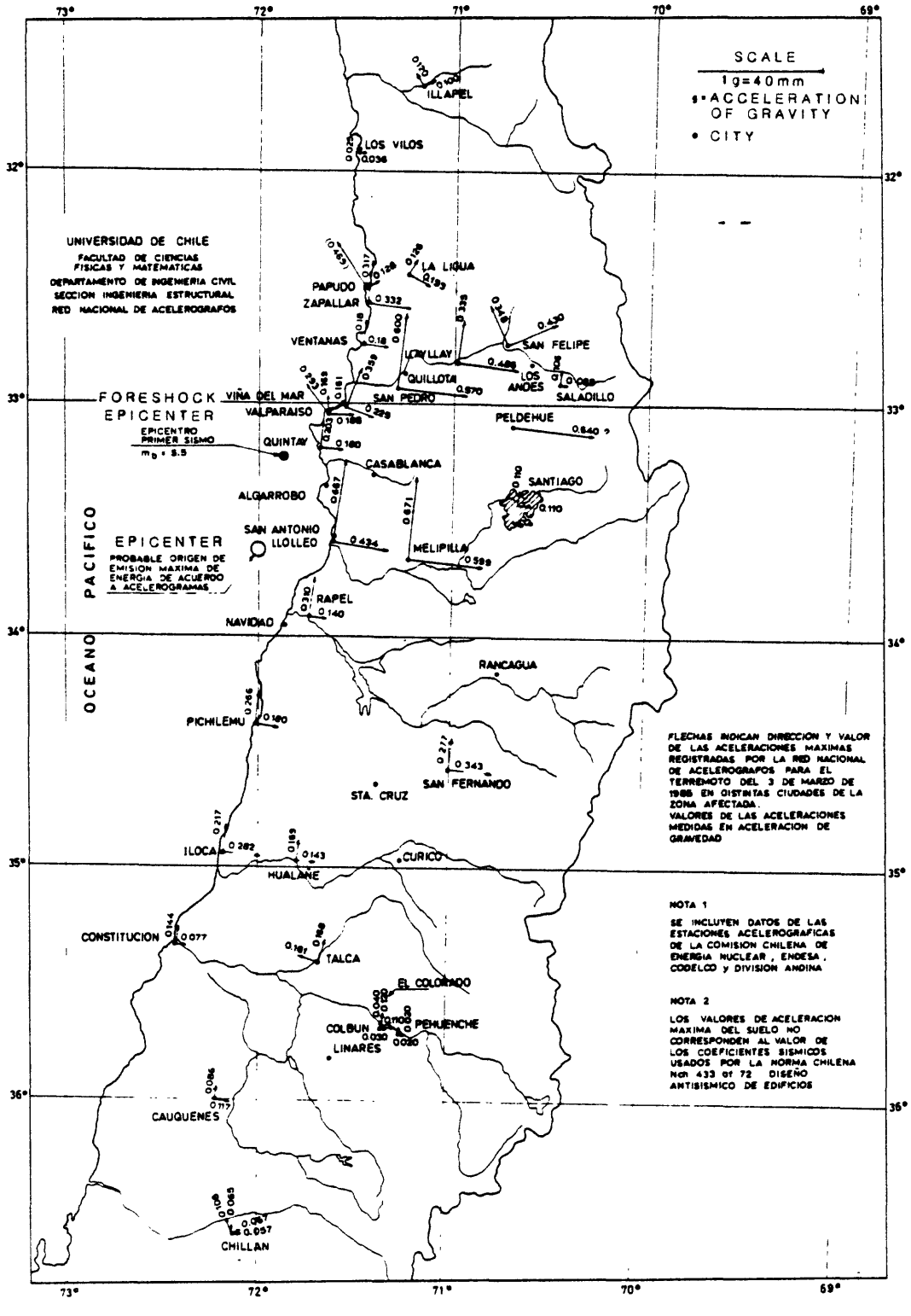


Figure 1. Strong-motion stations of the Chilean strong-motion network (from Saragoni and others, 1985).

Table 2

Registered* Maximum Accelerations of the 3 March 1985 Central Chile Earthquake

(Adopted from Saragoni and others, 1985)

No.	Station	Coordinates	Component	Maximum Acceleration (G)
1	Illapel (D.I.C.)	31°38' 71°10'	N20W	0,120
			S70W	0,100
			Vertical	0,056
2	Los Vilos (D.G.G.)	31°55' 71°30'	NS	0,254
			EW	0,036
			Vertical	0,021
3	La Ligua (D.I.C.)	32°30' 71°06'	N70W	0,193
			S20W	0,126
			Vertical	–
4	Papudo (D.I.C.)	32°31' 71°27'	N50E	0,128
			S40E	(0,469)**
			Vertical	0,110
5	Zapallar (D.G.G.)	32°34' 71°28'	NS	0,317
			EW	0,332
			Vertical	0,228
6	Ventanas (CHILECTRA)	33°02' 71°37'	NS	0,180
			EW	0,180
			Vertical	0,140
7	San Felipe (D.I.C.)	32°45' 70°44'	S10E	0,348
			N80E	0,430
			Vertical	0,208
8	Llay-Llay (D.I.C.)	32°50' 70°58'	N80W	0,335
			S10W	0,486
			Vertical	–
9	Saladillo (ANDINA)	32°55' 70°28'	NS	0,106
			EW	0,085
			Vertical	0,052
10	San Pedro (ENDESA)	34°36' 71°00'	NS	0,600
			EW	0,570
			Vertical	0,375
11	Viña del Mar (D.I.C.)	33°02' 71°35'	N70W	0,228 (+)
			S20W	0,356 (+)
			Vertical	0,171 (+)
12	Valparaíso (El Almendral) (D.I.C.)	33°01' 71°38'	N50E	0,293 (+)
			S40E	0,163 (+)
			Vertical	–
13	Valparaíso (U.F.S.M.) (D.I.C.)	33°01' 71°38'	S20E	0,164 (+)
			N70E	0,179 (+)
			Vertical	0,125 (+)
14	Peldehue (D.I.C.)	33°08' 70°41'	EW	(0,640)(**)
			NS	–
			Vertical	–
15	Quintay (ENDESA)	33°16' 71°19'	NS	0,203
			EW	0,182
			Vertical	0,131
16	Santiago (ENDESA)	33°27' 70°40'	NS	0,114
			EW	0,114
			Vertical	0,073
17	Llolleo (D.I.C.)	33°41' 71°36'	S80E	0,426 (+)
			N10E	0,669 (+)
			Vertical	0,852 (+)
18	Melipilla (D.G.G.)	33°41' 71°13'	EW	0,599
			NS	0,671
			Vertical	0,593
19	Rapel (ENDESA)	34°01' 71°40'	NS	0,310
			EW	0,144
			Vertical	0,110
20	Pichilemu (D.G.G.)	34°23' 72°01'	NS	0,266
			EW	0,180
			Vertical	0,132
21	San Fernando (D.G.G.)	34°36' 71°00'	NS	0,227
			EW	0,343
			Vertical	0,121
22	Iloca (D.G.G.)	34°55' 72°13'	NS	0,216
			EW	0,282
			Vertical	0,087
23	Hualañé (D.G.G.)	34°58' 71°49'	NS	0,169
			EW	0,143
			Vertical	0,100
24	Constitución (D.G.G.)	35°18' 72°19'	NS	0,144
			EW	0,077
			Vertical	0,039
25	Talca (D.I.C.)	35°26' 70°40'	N80W	0,161
			N10E	0,168
			Vertical	0,077
26	Colbún (ENDESA)	35°43' 71°26'	NS	0,037
			EW	0,034
			Vertical	0,022
27	El Colorado (ENDESA)	35°43' 71°26'	NS	0,120
			EW	0,113
			Vertical	0,060
28	Pehuenche (ENDESA)	35°44' 71°14'	NS	0,031
			EW	0,023
			Vertical	0,020
29	Cauquenes (D.G.G.)	36°00' 72°13'	NS	0,086
			EW	0,117
			Vertical	0,046
30	Chillán Viejo (D.I.C.)	36°36' 72°06'	N80E	0,057
			N10W	0,065
			Vertical	0,041
31	Chillán Nuevo (D.I.C.)	36°40' 72°09'	N20W	0,108
			N70E	0,067
			Vertical	0,026

*Read directly from accelerogram.

**Value with instrumental correction.

(+)Value obtained from digitized and corrected accelerograms.

Accelerographs operated and maintained by

(DIC) Departemento de Ingenieria Civil, University of Chile

(DGG) Departamento de Geologia y Geofisica, University of Chile

III. RECORD PROCESSING IN THE UNITED STATES

A. General Remarks

Limited number of records for digitizing at USGS, Menlo Park, were provided by Chilean counterparts. The records provided were contact prints on mylar made from contact negatives of the original records. In both stages of printing, sections of the record of approximately 2 ft (60 cm) length with overlaps were printed separately, and carefully cut and taped in Chile for the final digitizing copy. The digitizing in the U.S. provided by the commercial digitizer, with a least count of 1 micron (10^{-6} m), and an RMS error of 10 microns when working with these records, detected slight changes in trace location and trace clarity at these joins. In some cases, where a join had been made in either the first-generation negative or the second-generation print well after the strong motion portion of the record had finished, digitizing was not continued past the join.

The effect of these joins is difficult to assess. Although it was clear, by eye, that the joins were made carefully, physical movement at the taped joins could be particularly seen in the digitized, enlarged versions of the reference traces. At first it was thought that the effects on the final corrections would not be significant. This, of course, remains true for the visible high-frequency content of the accelerations. But the long-period "noise" content, portrayed visibly only in the displacements, although also present in the accelerations and velocities, is an unknown factor. Any step function disturbance in a digitized record adds noise or errors at all frequencies, and the band-pass filtering, which is a significant portion of the processing here, cannot correct for this exactly. Proper use of the AGRAM program package in the next section, requires that vertical butting lines be placed on contact prints of the original (or the original itself) before printing in sections or cutting. A section of record to be digitized must have a butting line, duplicated on adjacent sections, at its beginning and end, rather than a cut or splice.

Two of the second generation prints were digitized past their joins because these joins occurred during significant accelerations on the record. These are the La Ligua and San Felipe records from the main shock of March 3, 1985. The La Ligua join was 36 seconds into the record. The San Felipe join was 34 seconds into the record. Care should be taken if data beyond these points is included in any analysis using these records.

B. Steps in Processing

The records are processed according to the descriptions in AGRAM (Converse, 1984). Briefly, the steps are as follows:

1. Digitizing of the film records at a commercial digitizing firm (IOM TOWILL in Santa Clara, California; now LS Associates) on a trace-following, computer-controlled laser scanner. Unequal time spacing, at an average of 600 samples per second, is used. The records are divided with vertical butting lines into 10-second (10 cm) frames to fit the digitizer.

2. Butting the separately digitized, 10-second frames together, using the specially inserted vertical lines; each vertical line is digitized twice, once in each adjacent frame.

3. Preparation of uncorrected data by subtracting out the reference traces, subtracting the average value, and using the time marks for adjusting the X-coordinates. Plots of the uncorrected data are prepared.

4. The data are then passed through a high-frequency correction algorithm that applies a high-frequency filter (50 Hz), instrument corrections, and decimation to 200 samples per second. A low-frequency high-pass Butterworth filter removes all periods longer than a predetermined period obtained from the data. This period is chosen after consideration of: (a) the strong-motion duration of the earthquake, indicated by the records, (b) the behavior of the displacements, calculated from the accelerations at specific sites, and (c) the total length of the digitized records.

   Taking the comments in the previous section into consideration, preliminary correction processing and integration for displacements indicate that there are significant ground motions at periods of three to four seconds, and a five-second filter shows no unrealistic content between four- and five-second periods. A long period limit of five-seconds is chosen for this data. Plots of the corrected acceleration, velocity, and displacements for the three components of each recording are prepared.

5. Response spectra are calculated for periods up to the long-period limit. Linear plots of relative velocity response spectra, and the log-log tripartite plots of pseudo-velocity response are prepared.

6. Fourier amplitude spectra, calculated by FFT, are presented on linear axes.

IV. ORGANIZATION OF THE DATA PROCESSED IN THE UNITED STATES

Data processed in the U.S. fall into three categories:

a.) Main shock data of 3 March 1985 (7 stations).
b.) One hour aftershock of 3 March 1985 (2 stations).
c.) One important aftershock (1 station).

A general matrix of the processed data is provided in Table 4. The plots in accordance with the matrix follow.

REFERENCES

Algermissen, S.T., 1985, Preliminary report of investigations of the Central Chile earthquake of March 3, 1985: *U.S. Geological Survey Open-File Report 85-542*.

Converse, A.M., 1984, AGRAM: A series of computer programs for processing digitized strong-motion accelerograms: *U.S. Geological Survey Open-File Report 84-525*.

Saragoni, R., Gonzales, P., and Fresard, M., 1985, Analysis de Los Acelerogrames del Terremoto del 3 De Marzo de 1985: *Publicacion SES I 4/1985 (199)*, December 1985.

TABLE 3

STRONG MOTION ACCELEROGRAPH STATION LIST
(1985)

Name	Number of Instr.	Coordinates	Site Geology	Structure Type/Size	Instrument Location	Model	Operated/ Maintained by
San Felipe	1	32.75 S 70.73 W	Alluvium	1 story building	Ground level	SMA-1	Civil Eng. Dept. (Univ. of Chile)
Quintero (Central Ventanas II) (National Electric Distribution Co.)	2	32.75 S 71.49 W	Loose Sand (Pliocene)	a) Thermoelectric Plant, 6 story Boiler Building (60 meters high)	Ground Level	SMA-1	Geophysics Dept. (Univ. of Chile)
				b) " " "	Top of the structure	SMA-1	" " "
Llay Llay	1	32.83 S 70.98 W	Soft alluvium (Tertiary, Quaternary)	1 story building	Ground Level	SMA-1	Civil Eng. Dept. (Univ. of Chile)
Vina del Mar	1	33.03 S 71.58 W	Alluvium & Sand	10 story building	Basement	SMA-1	" " "
Valparaiso	2	33.08 S 71.63 W	a) Volcanic rock (Precambrian/ Paleozoic)	a) Univ. of Santa Maria Campus 1 story building	Ground Level	SMA-1	" " "
			b) Fill	b) Ave du Argentina	Basement	SMA-1	" " "
Peldehue	1	33.13 S 70.68 W	Volcanic Rock and Alluvium (Tertiary/ Quaternary)	1 story building	Ground Level	DG-2	" " "
Vallenar	1	28.58 S 70.77	Firm Gravel (Tertiary/ Quaternary)	1 story building	Ground Level	DG-1	Geophysics Dept. (Univ. of Chile)

TABLE 3 (CONTINUED)

Name	Number of Instr.	Coordinates	Site Geology	Structure Type/Size	Instrument Location	Model	Operated/ Maintained by
La Serena	1	29.90 S 71.29 W	Soft Alluvium (Tertiary/ Quaternary)	2 story building	Ground Level	DG-2	Civil Eng. Dept. (Univ. of Chile)
Illapel	1	31.63 S 71.17 W	Soft Alluvium (Tertiary/ Quaternary)	1 story building	Basement	SMA-1	Civil Eng. Dept. (Univ. of Chile)
Los Vilos	1	31.92 S 71.50 W	Sedimentary Rock (Middle to Upper Triassic)	1 story building	Ground Level	SMA-1	Geophysics Dept. (Univ. of Chile)
La Ligua	1	32.50 S 71.10 W	Alluvium (Tertiary/ Quaternary)	" " " " "	" "	SMA-1 (2g capacity)	Civil Eng. Dept. (Univ. of Chile)
Papuda	1	32.51 S 71.45 W	Granite (Jurassic)	" " "	" "	SMA-1 (2g capacity)	" "
Zapallar	1	32.57 S 71.47 W	" "	" " "	" "	SMA-1	Geophysics Dept. (Univ. of Chile)
Santiago	2	1) 33.45 S 70.67 W 2) National Electric Co. Bldg.	Firm Gravel (Tertiary/ Quaternary)	3 story building	Basement	1) a) USGS C-12 b) SMA-1 2) Japanese Instr.	Civil Eng. Dept. (Univ. of Chile)
Llolleo	1	32.68 S 71.60 W	Sandstone & volcanic rock (Paleozoic)	3 story building	Basement	SMA-1	" " "

TABLE 3 (CONTINUED)

Name	Number of Instr.	Coordinates	Site Geology	Structure Type/Size	Instrument Location	Model	Operated/ Maintained by
Melipilla	1	33.68 S 71.22 W	Alluvium	1 story building	Ground Level	SMA-1	Geophysics Dept. (Univ. of Chile)
Rapel (Electric Co.)	1	34.03 S 71.58 W	Marine & Continental Sediments (Paleozoic)	Tunnel	" "	RFT-250	(ENDESA)
Rancagua (COYA)	1	34.20 S 70.53 W	Soft Alluvium (Tertiary/ Quaternary)	Tunnel	" "	RFT-250	Geophysics Dept. (Univ. of Chile)
El Teniente (Copper Company)	1	34.21 S 70.54 W	Riolitic Volcanic rock Andesitic (Upper Cretaceous)	1 story building	" "	RFT-250	" "
San Fernando	1	34.60 S 71.00 W	Alluvium (Tertiary/ Quaternary)	1 story building	" "	SMA-1	Geophysics Dept. (Univ. of Chile)
Pichilemu	1 72.02 W	34.38 S	Slates, sandstone, limestone (Precambrian/ Paleozoic)	1 story building	" "	SMA-1	Geophysics Dept. (Univ. of Chile)
Santa Cruz	1	34.65 S 71.68 W	Alluvium (Tertiary/ Quaternary)	1 story building	" "	SMA-1	" " "
Iloca	1	34.92 S 72.22 W	Sandstone, alluvium (Tertiary/ Quaternary)	1 story building	" "	SMA-1	" " "

TABLE 3 (CONTINUED)

Name	Number of Instr.	Coordinates	Site Geology	Structure Type/Size	Instrument Location	Model	Operated/ Maintained by
Hualañé	1	34.97 S 71.82 W	Alluvium (Tertiary/ Quaternary)	" " "	" "	SMA-1	Geophysics Dept. (Univ. of Chile)
Curico	1	34.98 S 71.23 W	Alluvium (Quaternary)	" " "	" "	DG-2	Civil Eng. Dept. (Univ. of Chile)
Constitucion	1	35.20 S 72.32 W	Granite (rock)	2 story building	" "	SMA-1	Geophysics Dept. (Univ. of Chile)
Talca	1	35.43 S 70.67 W	Soft alluvium (Quaternary)	1 story building	Ground Level	SMA-1	Civil Eng. Dept. (Univ. of Chile)
Linares	1	35.82 S 71.72 W	Alluvium (Quaternary)	2 story building	Ground Level	SMA-1	" " "
Chilean Nuevo	2	36.67 S 72.15 W	Alluvium (Quaternary)	2 story building	Ground Level	SMA-1	" " "
Chilean Viejo	1	36.60 S 72.10 W	Soft alluvium (Quaternary)	2 story building	Basement	SMA-1	" " "
Concepcion (Huachipato)	1	36.73 S 73.10 W	Sandstone and lutites (Paleozoic)	1 story building	Ground Level	SMA-1 DG-2*	" " "
Concepcion	1	36.8 S 73.0 W	Sands	1 story building	Basement	SMA-1 DG-2*	" " "
Concepcion	1	36.8 S 73.0 W	Granitic rock	4 story building	Ground Level	SMA-1 DG-2*	" " "

TABLE 3 (CONTINUED)

Name	Number of Instr.	Coordinates	Site Geology	Structure Type/Size	Instrument Location	Model	Operated/ Maintained by
Temuco	1	38.73 S 72.61 W	Consolidated alluvium (Eocene, Miocene)	1 story building	Ground Level	DG-2	Civil Eng. Dept. (Univ. of Chile)
Valdivia	1	39.79 S 73.27 W	Alluvium and sand (Quaternary)	1 story building	Ground Level	DG-1	" " "
Osorno	1	40.07 S 73.14 W	Alluvium and sand (Quaternary)	1 story building	Basement	DG-2	" " "
Puerto Montt	1	41.48 S 72.93 W	Alluvium (Quaternary)	2 story building	Ground Level	DG-2	" " "
Arica	2	18.50 S 70.20 W	Volcanic rock (miocene, pliocene)	2 story building	Basement	SMA-1	Civil Eng. Dept. (Univ. of Chile)
Iquique	2	20.20 S 70.10 W	Alluvium (jurassic)	2 story building	Basement	SMA-1	" " "
Tocopilla	1	22.10 S 70.22 W	Alluvium (jurassic)	1 story building	Ground level	DG-2	" " "
Calama	1	22.46 S 68.92 W	Sedimentary rock (miocene, pliocene)	1 story building	Ground level	DG-2	" " "
Antofagasta	1	23.71 S 70.42 W	Andesitic volcanic rock (jurassic)	1 story building	Ground level	DG-1	" " "
Taltal	1	25.24 S 70.30 W	Andesitic volcanic rock (jurassic)	2 story building	Basement	DG-2	" " "
Copiapo	1	27.36 S 70.35 W	Alluvium (tertiary, quaternary)	Mine tunnel	Ground level	DG-1	" " "

TABLE 4
MATRIX OF PLOTS OF DATA PROCESSED IN THE U.S.

MAIN SHOCK OF 3 MARCH 1985

Station	Uncorrected Accelerograms	Corrected A, V, D	Velocity Response Spectra	Tripartite Response Spectra	Fourier Amplitude Spectrum of Acceleration
	pages				
CHILEAN INST.	U-1				
080 degrees		C-1	V-1	T-1	F01-F02
UP		C-2	V-2	T-1	F03-F04
350 degrees		C-3	V-3	T-3	F05-F06
PAPUDO	U-2				
140 degrees		C-4	V-4	T-4	F07-F08
UP		C-5	V-5	T-5	F09-F10
50 degrees*		C-6	V-6	T-6	F11-F12
TALCA	U-3				
10 degrees		C-7	V-7	T-7	F13-F14
UP		C-8	V-8	T-8	F15-F16
280 degrees		C-9	V-9	T-9	F17-F18
ILLAPEL	U-4				
70 degrees		C-10	V-10	T-10	F19-F20
UP		C-11	V-11	T-11	F21-F22
340 degrees		C-12	V-12	T-12	F23-F24
LA LIGUA	U-5				
290 degrees		C-13	V-13	T-13	F25-F26
UP (**)		----	----	----	-------
200 degrees		C-14	V-14	T-14	F27-F28
LLAY LLAY	U-6				
280 degrees		C-15	V-15	T-15	F29-F30
UP		C-16	V-16	T-16	F31-F32
190 degrees		C-17	V-17	T-17	F33-F34
SAN FELIPE	U-7				
170 degrees		C-18	V-18	T-18	F35-F36
UP		C-19	V-19	T-19	F37-F38
80 degrees		C-20	V-20	T-20	F39-F40

* Note: Papudo (50 degrees) not available.
** Note: La Ligua (vertical) not available.

TABLE 4
MATRIX OF PLOTS OF DATA PROCESSED IN THE U.S.
(continued)

ONE HOUR AFTERSHOCK OF 3 MARCH 1985

Station	Uncorrected Accelerograms	Corrected A, V, D	Velocity Response Spectra	Tripartite Response Spectra	Fourier Amplitude Spectrum of Acceleration
	pages				
LLOLLEO	U-8				
100 degrees		C-21	V-21	T-21	F41-F42
UP		C-22	V-22	T-22	F43-F44
10 degrees		C-12	V-23	T-23	F45-F46
VINA DEL MAR	U-9				
290 degrees		C-24	V-24	T-24	F47-F48
UP		C-25	V-25	T-25	F49-F50
200 degrees		C-26	V-26	T-26	F51-F52
VALAPRAISO (UTFSM)*	U-10				
160 degrees		C-27	V-27	T-27	F53-F54
UP		C-28	V-28	T-28	F55-F56
070 degrees		C-29	V-29	T-29	F57-F58

ANOTHER AFTERSHOCK: April 8, 1985

LLOLLEO	U-11				
100 degrees		C-30	V-30	T-30	F59-F60
UP		C-31	V-31	T-31	F61-F62
010 degrees		C-32	V-32	T-32	F63-F64

* Denoted as UFSM (#3 in Table 2).

APPENDIX A

DATA PROCESSED IN CHILE

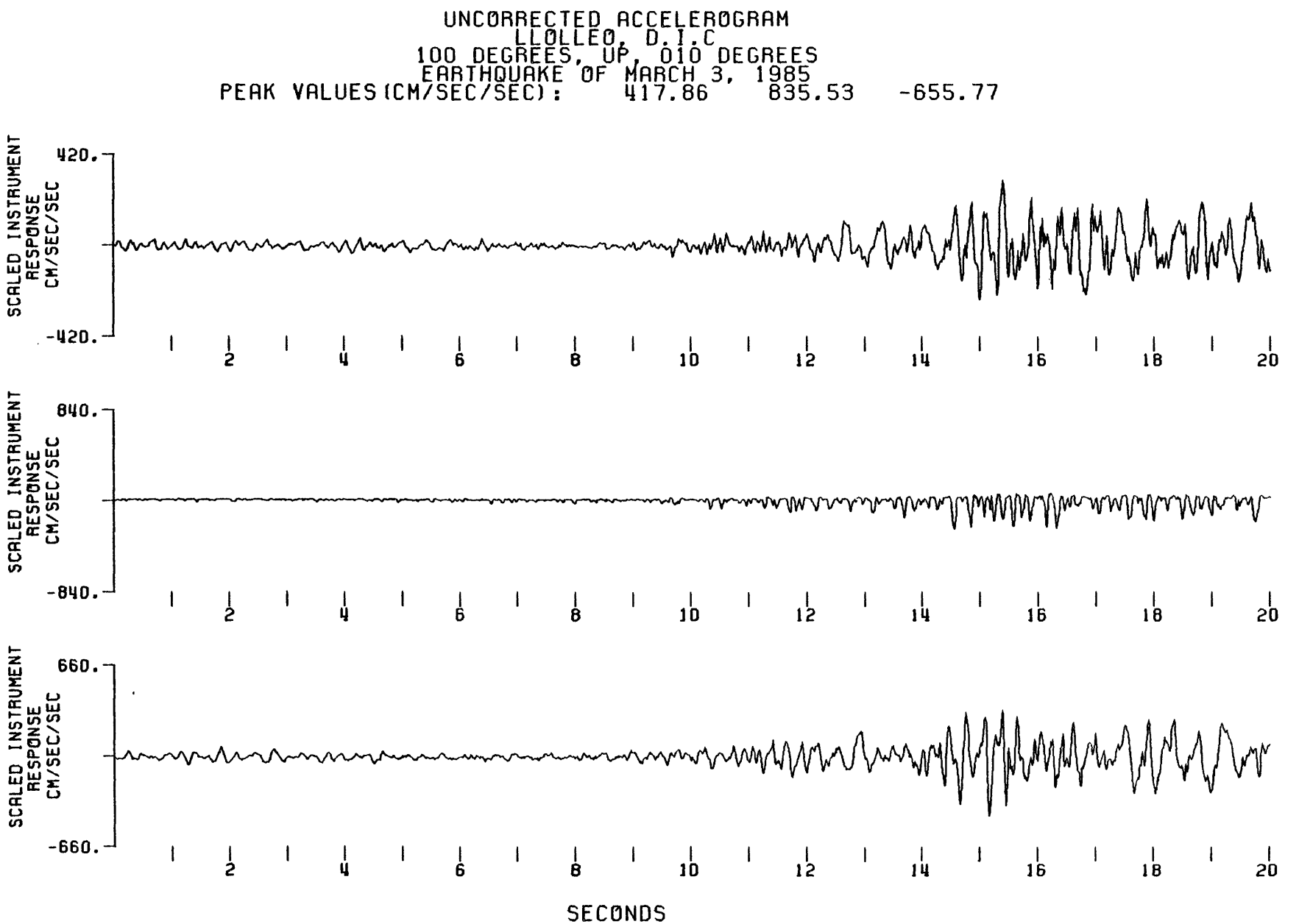
Part of the 3 March 1985 main shock accelerograms were processed in Chile by Saragoni and others (1985). In this appendix, the processed data is presented via the plots made by using the software of the USGS.

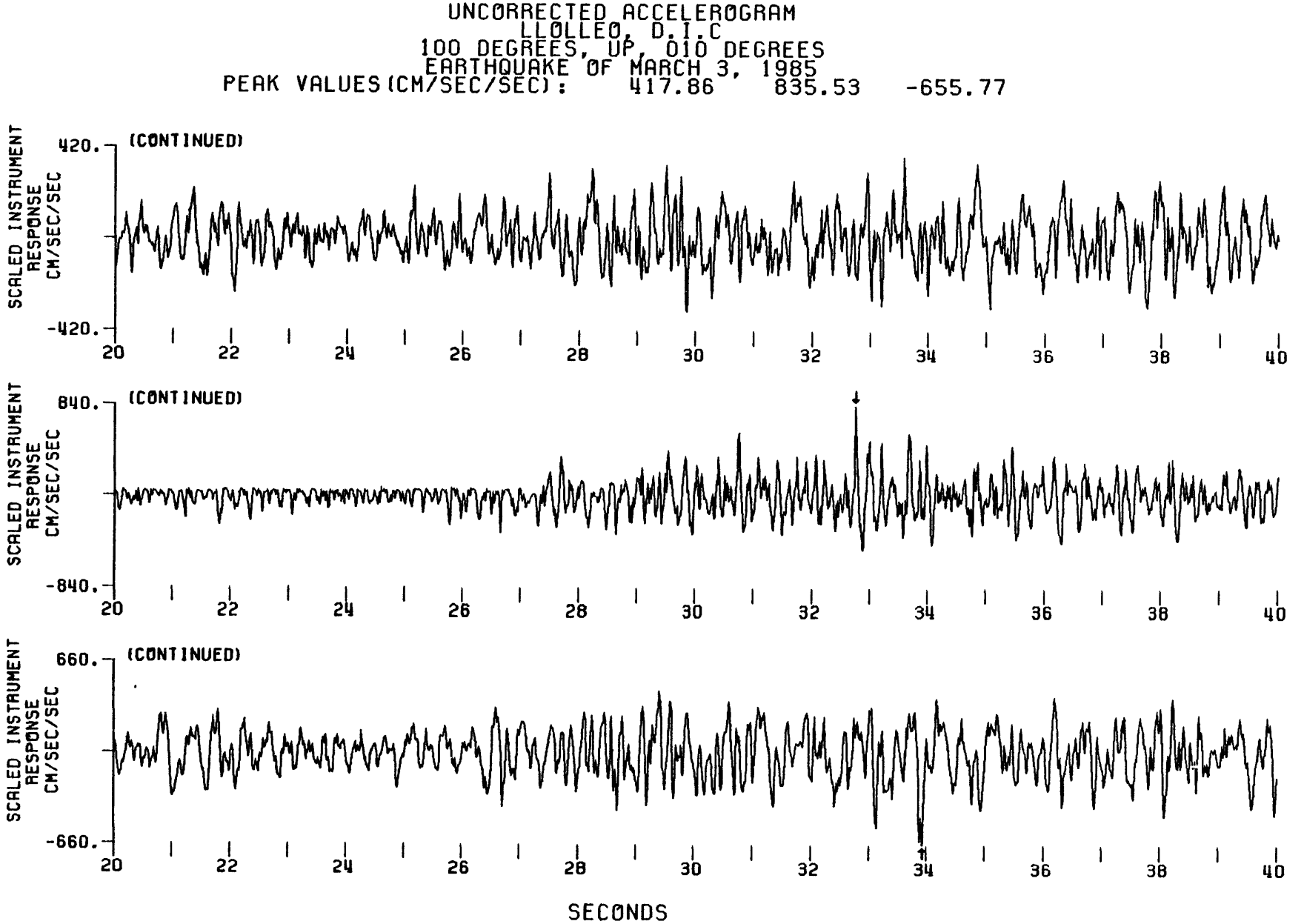
The processed data in this appendix is provided as in the following matrix:

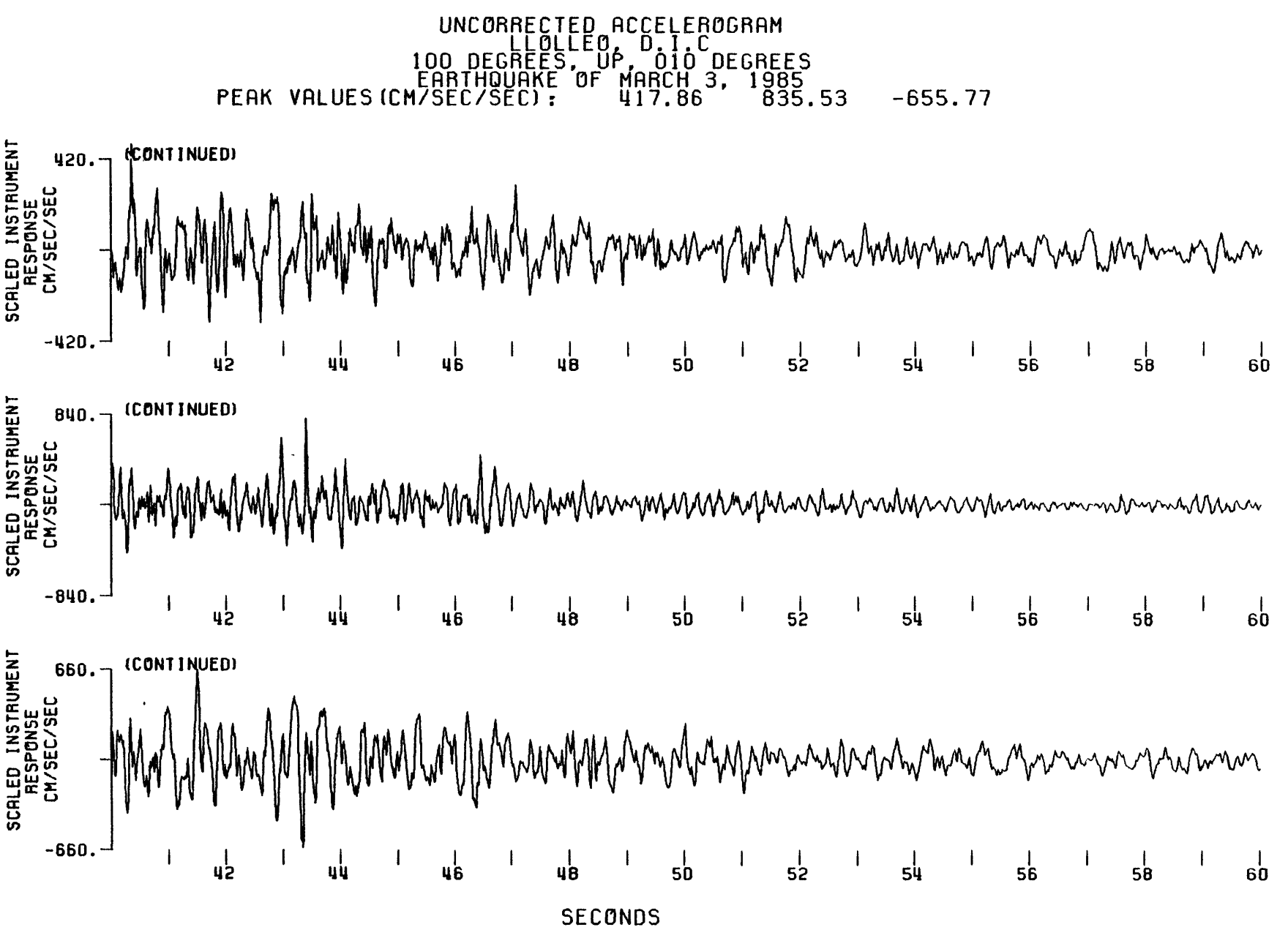
Table A-1
Matrix of Plots

Station	Uncorrected Accelerograms	Relative Velocity Response Spectrum	Tripartite Response Spectrum	Fourier Amplitude Spectrum of Acceleration
Llolleo	pages			
100 degrees	A-1	A-22	A-33	A-44-45
UP	to	A-23	A-34	A-46-47
10 degrees	A-6	A-24	A-35	A-48-49
Vina Del Mar				
290 degrees	A- 7	A-25	A-36	A-50-51
UP	to	A-26	A-37	A-52-53
200 degrees	A-12	A-27	A-38	A-54-55
Valparaiso (UFSM)				
160 degrees	A-13	A-28	A-39	A-56-57
UP	to	A-29	A-40	A-58-59
70 degrees	A-16	A-30	A-41	A-60-61
Valparaiso (El Almandrel)				
50 degrees	A-17	A-31	A-42	A-62-63
UP*	to	----	----	----
140 degrees	A-21	A-32	A-43	A-64-65

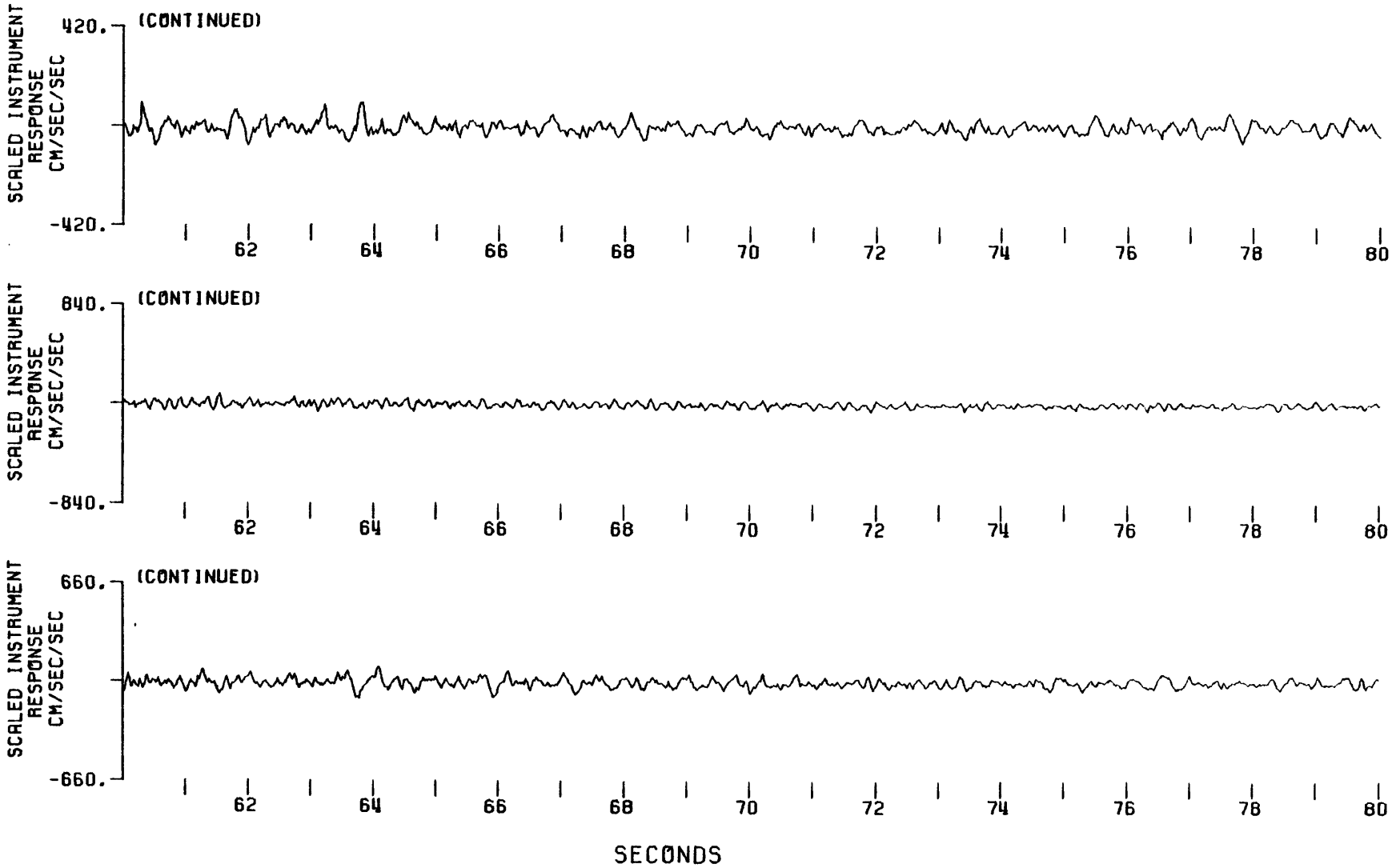
*Not available

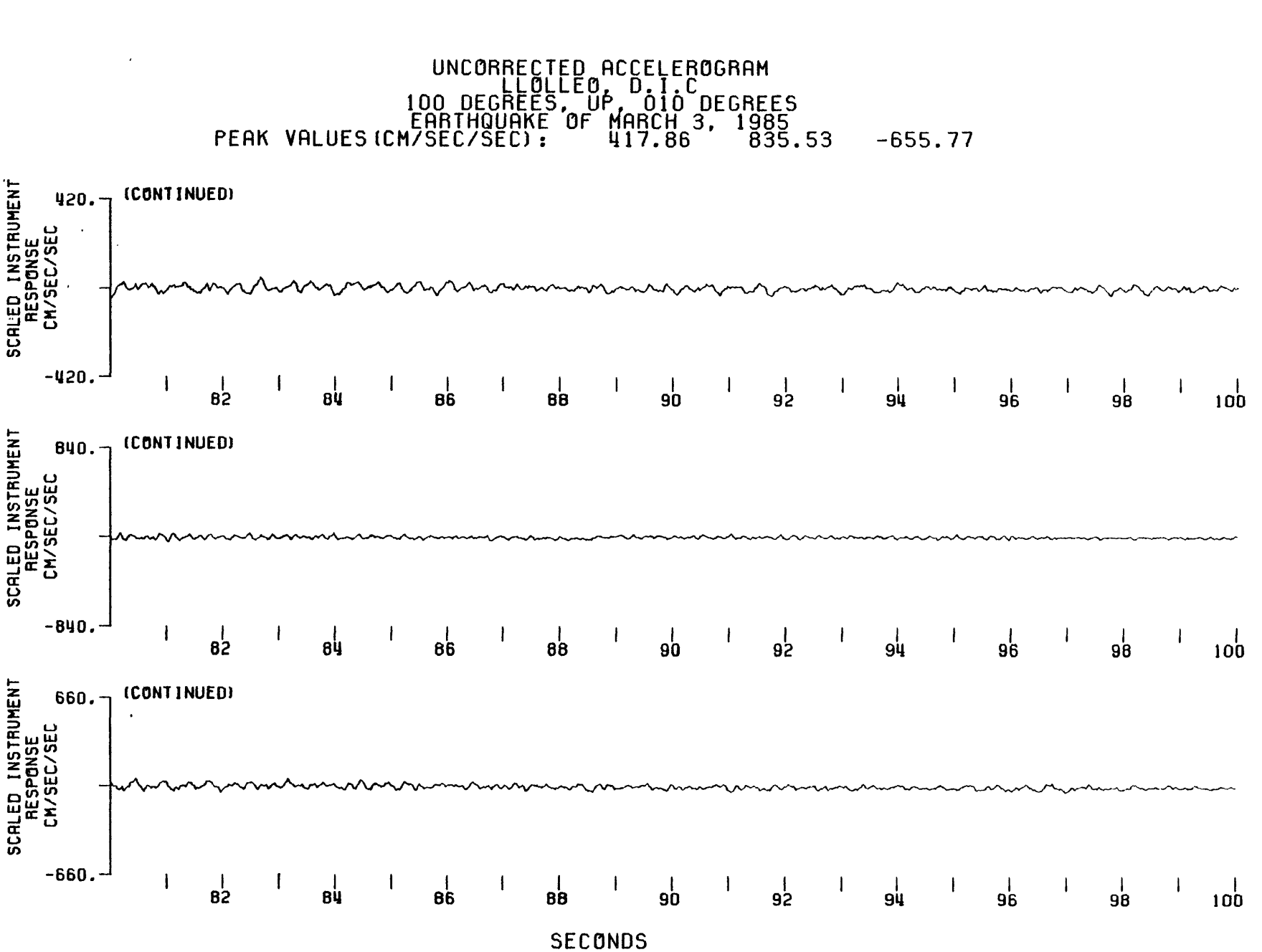

UNCORRECTED ACCELEROGRAM
LLOLLEO, D.I.C
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 417.86 835.53 -655.77
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
420.
-420.
840.
-840.
660.
-660.
2
4
6
8
10
12
14
16
18
20
SECONDS

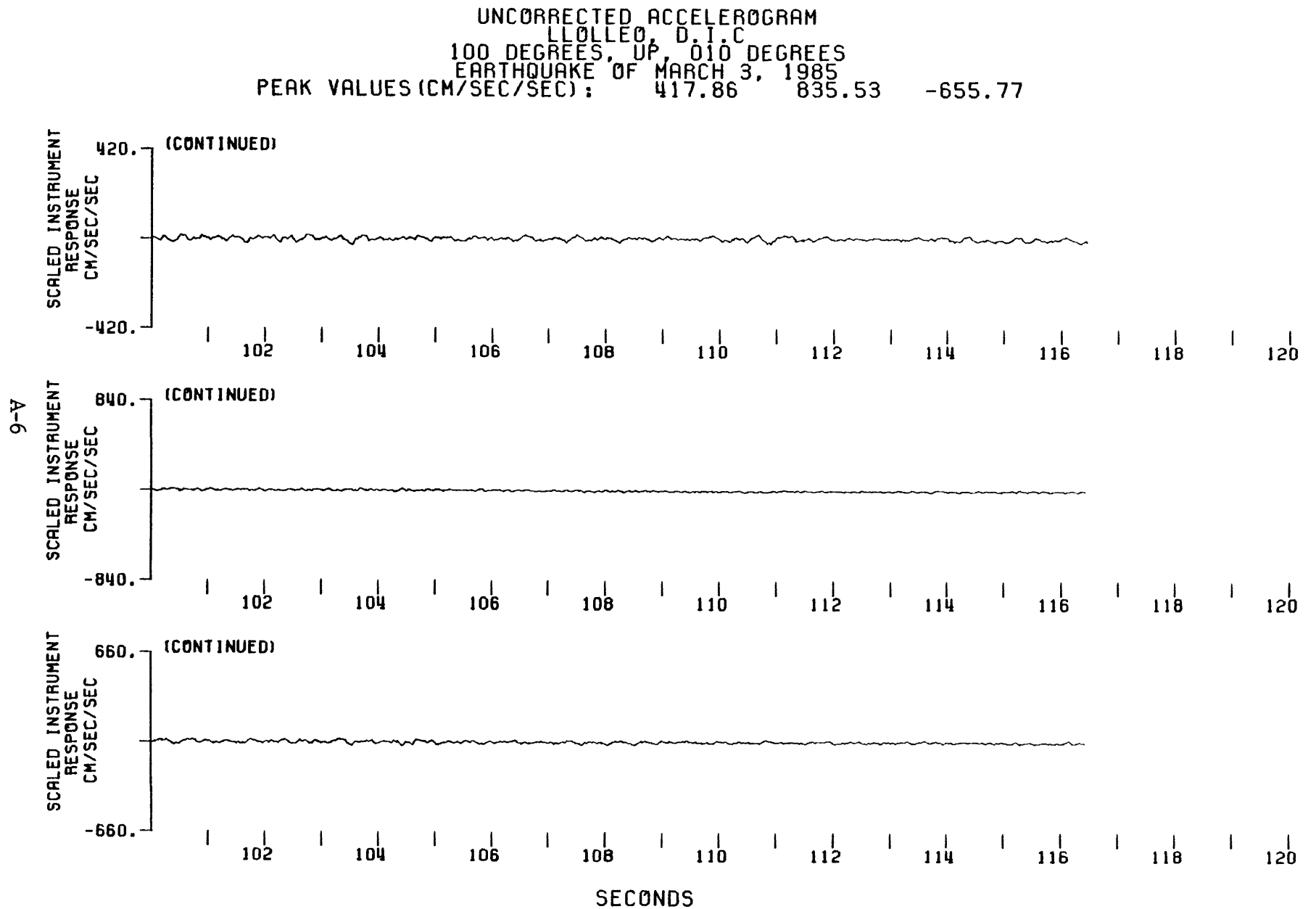

UNCORRECTED ACCELEROGRAM
LLOLLEO, D.I.C
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 417.86 835.53 -655.77
(CONTINUED)
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
420.
-420.
840.
-840.
660.
-660.
20
22
24
26
28
30
32
34
36
38
40
SECONDS

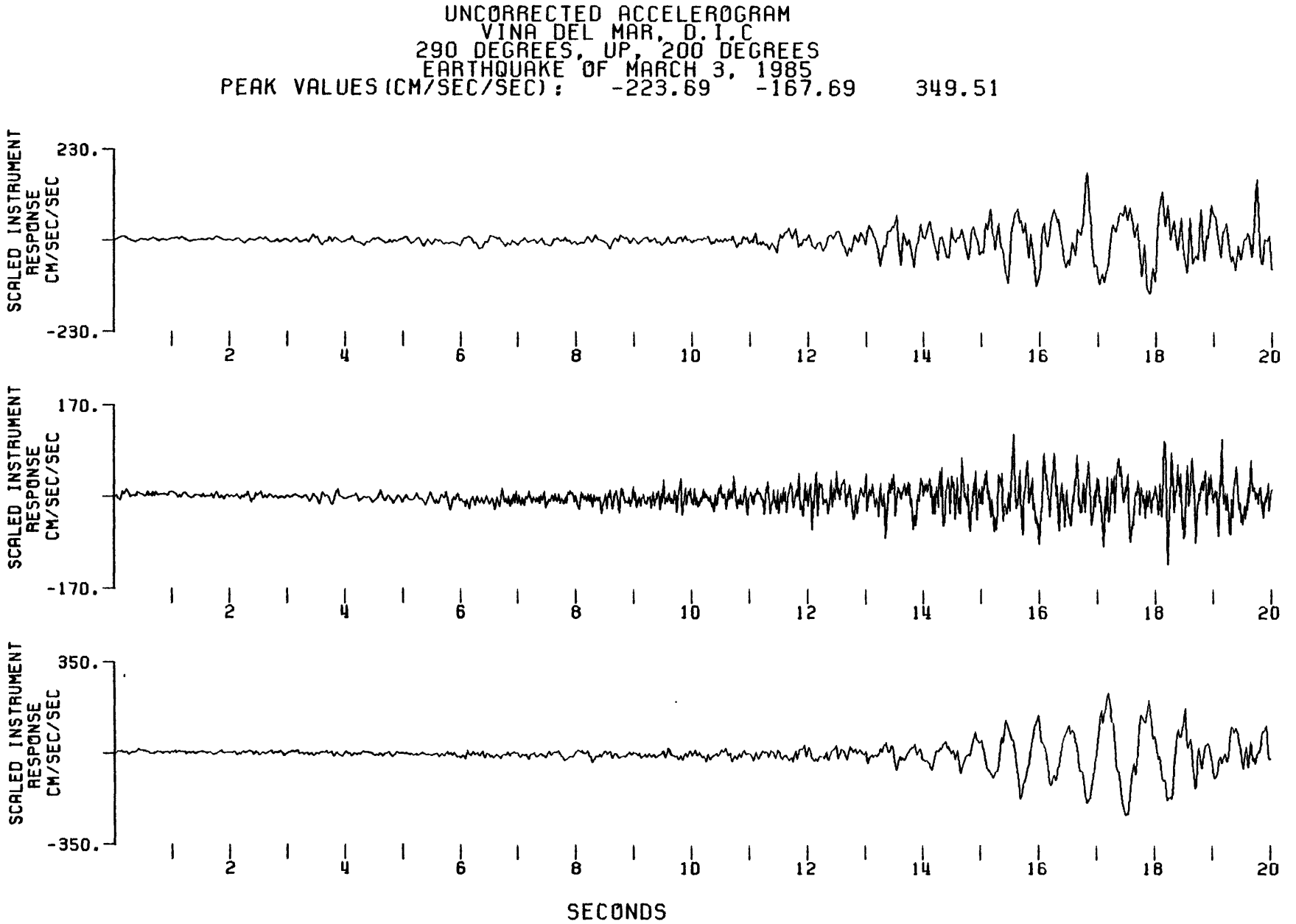

UNCORRECTED ACCELEROGRAM
LLOLLEO, D.I.C
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 417.86 835.53 -655.77
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
420.
-420.
(CONTINUED)
840.
-840.
660.
-660.
42
44
46
48
50
52
54
56
58
60
SECONDS

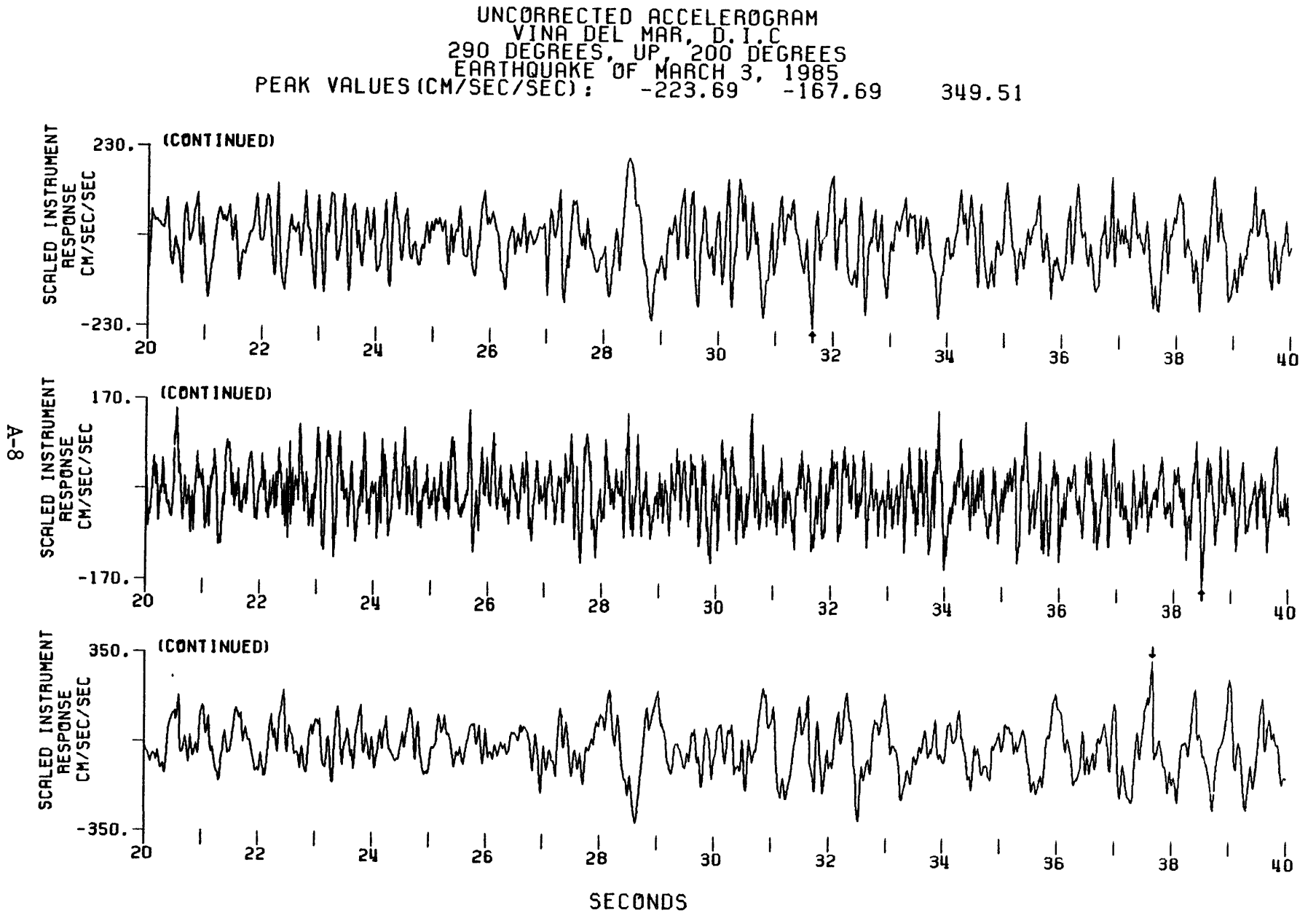
UNCORRECTED ACCELEROGRAM
LLOLLEO, D.I.C
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 417.86 835.53 -655.77




UNCORRECTED ACCELEROGRAM
LLOLLEO, D.I.C
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 417.86 835.53 -655.77
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
420.
-420.
(CONTINUED)
840.
-840.
660.
-660.
82
84
86
88
90
92
94
96
98
100
SECONDS


UNCORRECTED ACCELEROGRAM
LLOLLEO, D.I.C
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 417.86 835.53 -655.77
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
420.
-420.
(CONTINUED)
840.
-840.
660.
-660.
102
104
106
108
110
112
114
116
118
120
SECONDS


UNCORRECTED ACCELEROGRAM
VINA DEL MAR, D.I.C
290 DEGREES, UP, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): -223.69 -167.69 349.51
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
230.
-230.
170.
-170.
350.
-350.
2
4
6
8
10
12
14
16
18
20
SECONDS


UNCORRECTED ACCELEROGRAM
VINA DEL MAR, D.I.C
290 DEGREES, UP, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): -223.69 -167.69 349.51
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
230.
-230.
(CONTINUED)
170.
-170.
350.
-350.
20
22
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26
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30
32
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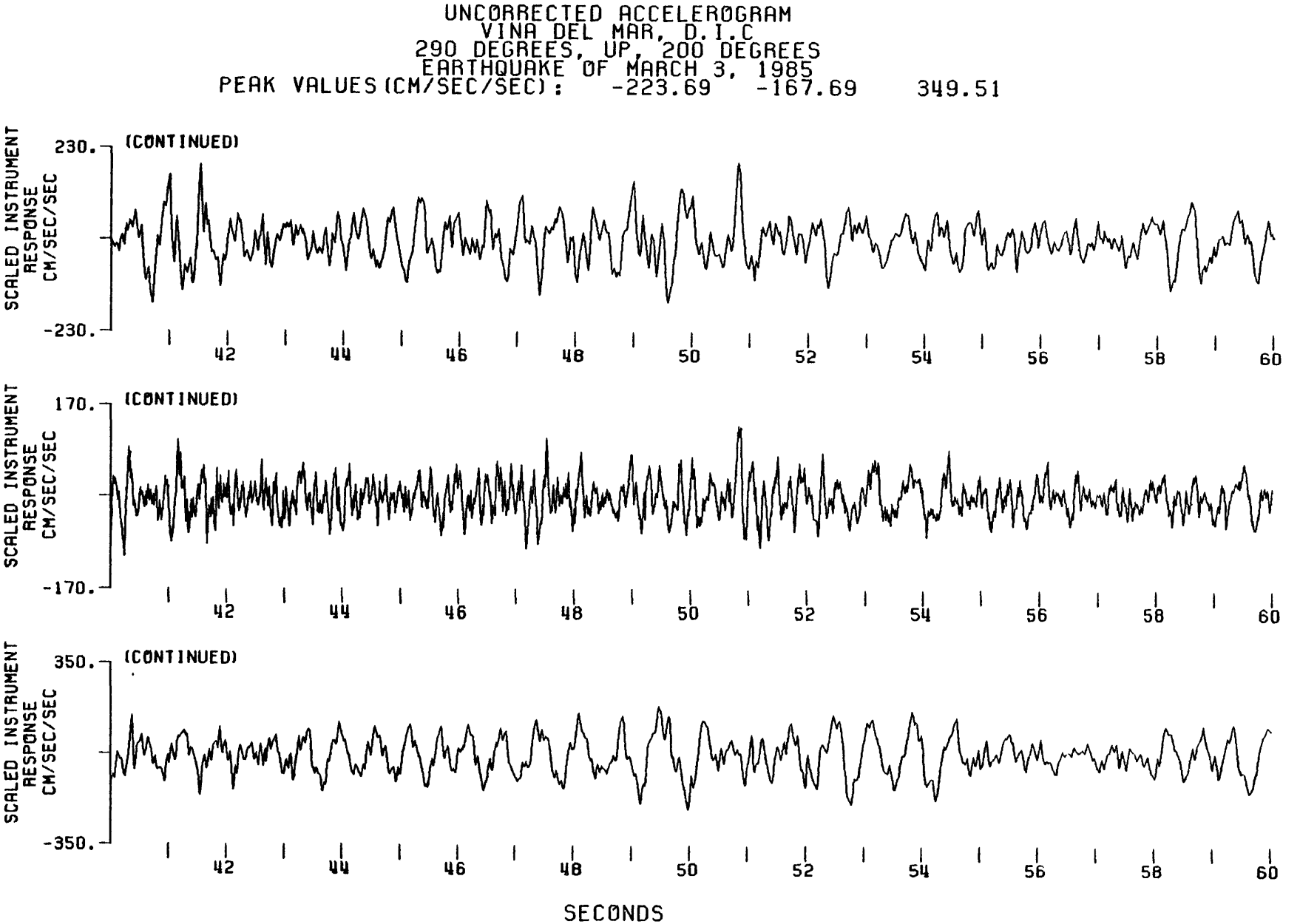
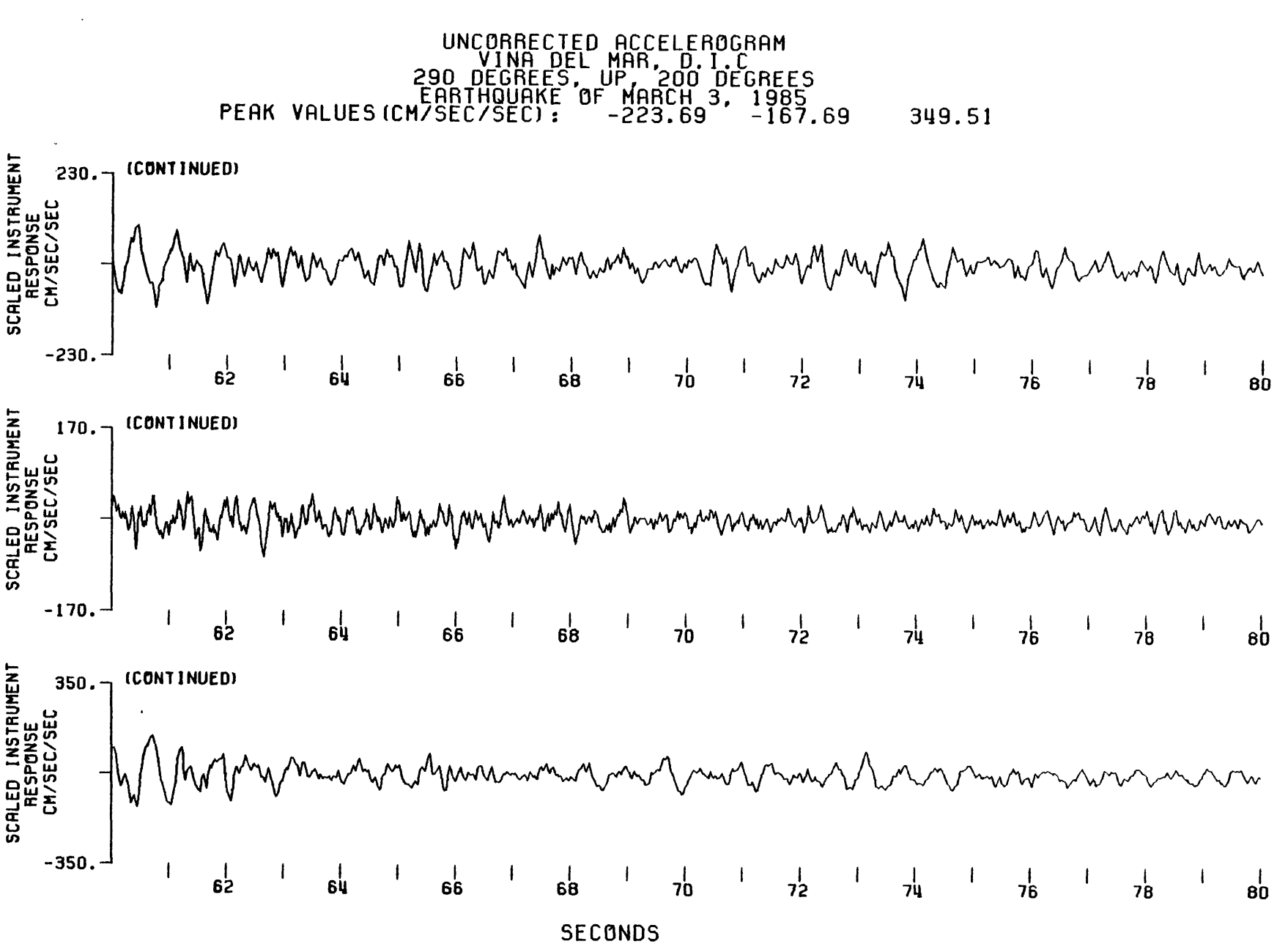
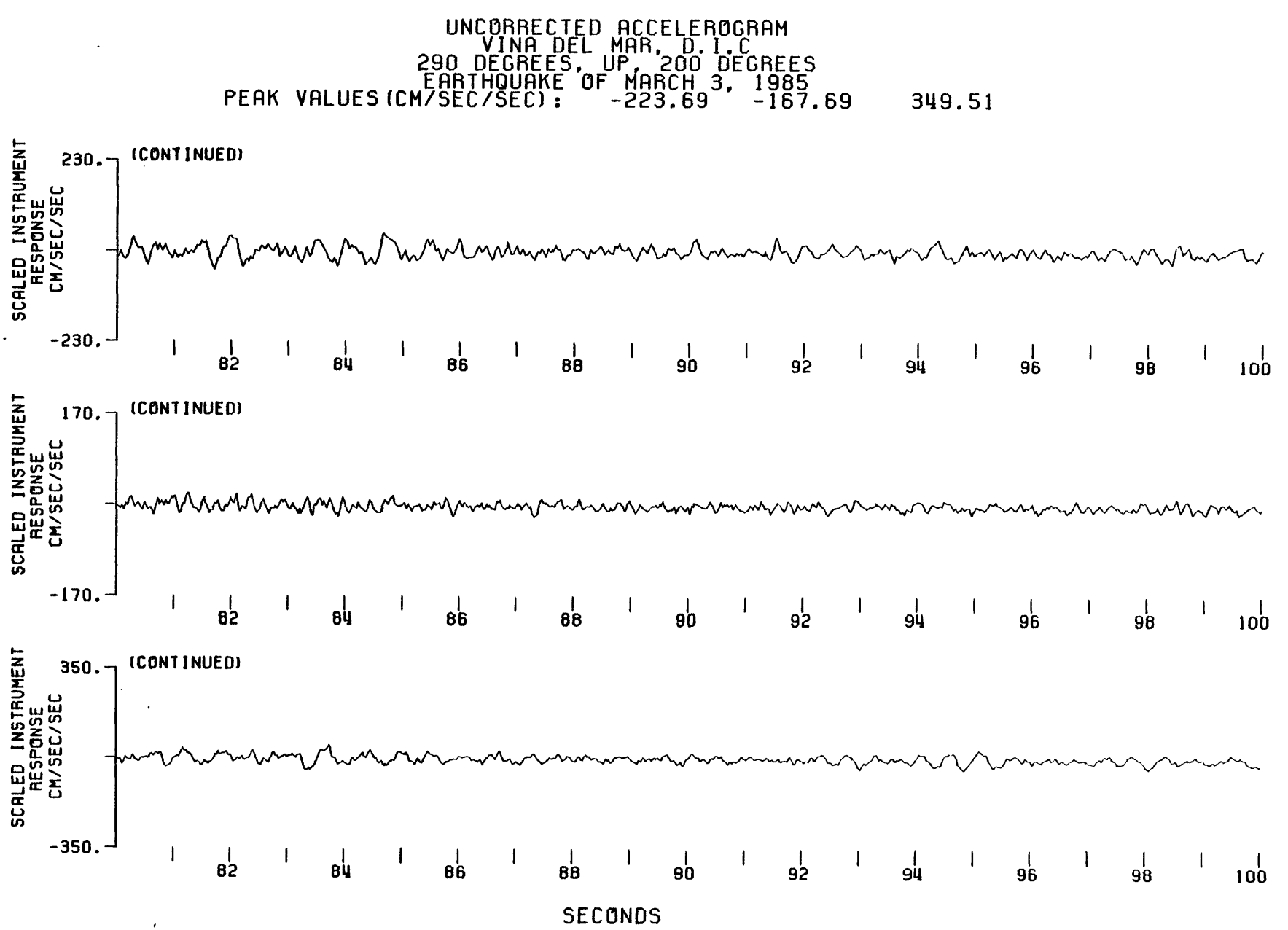
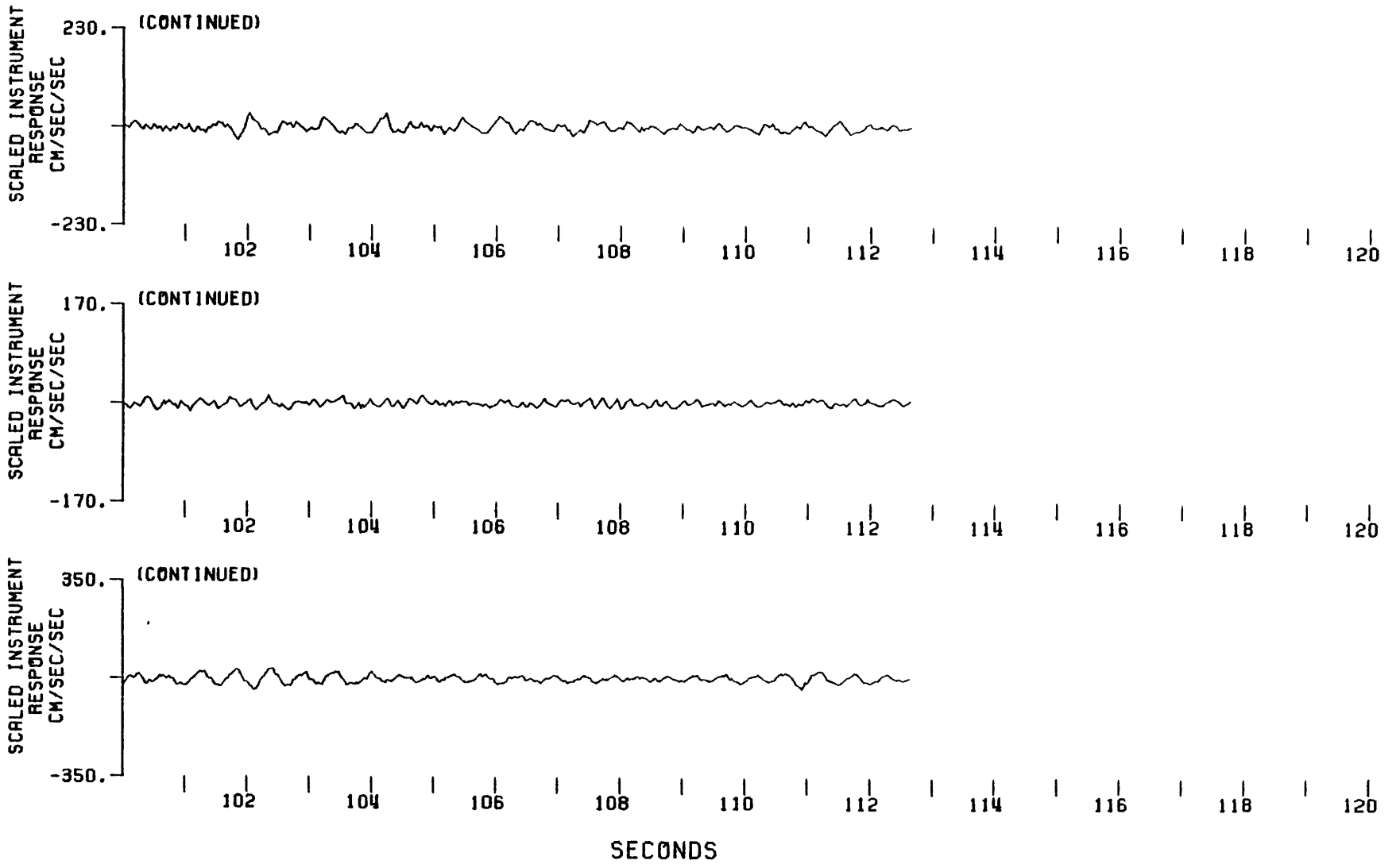
36
38
40
SECONDS

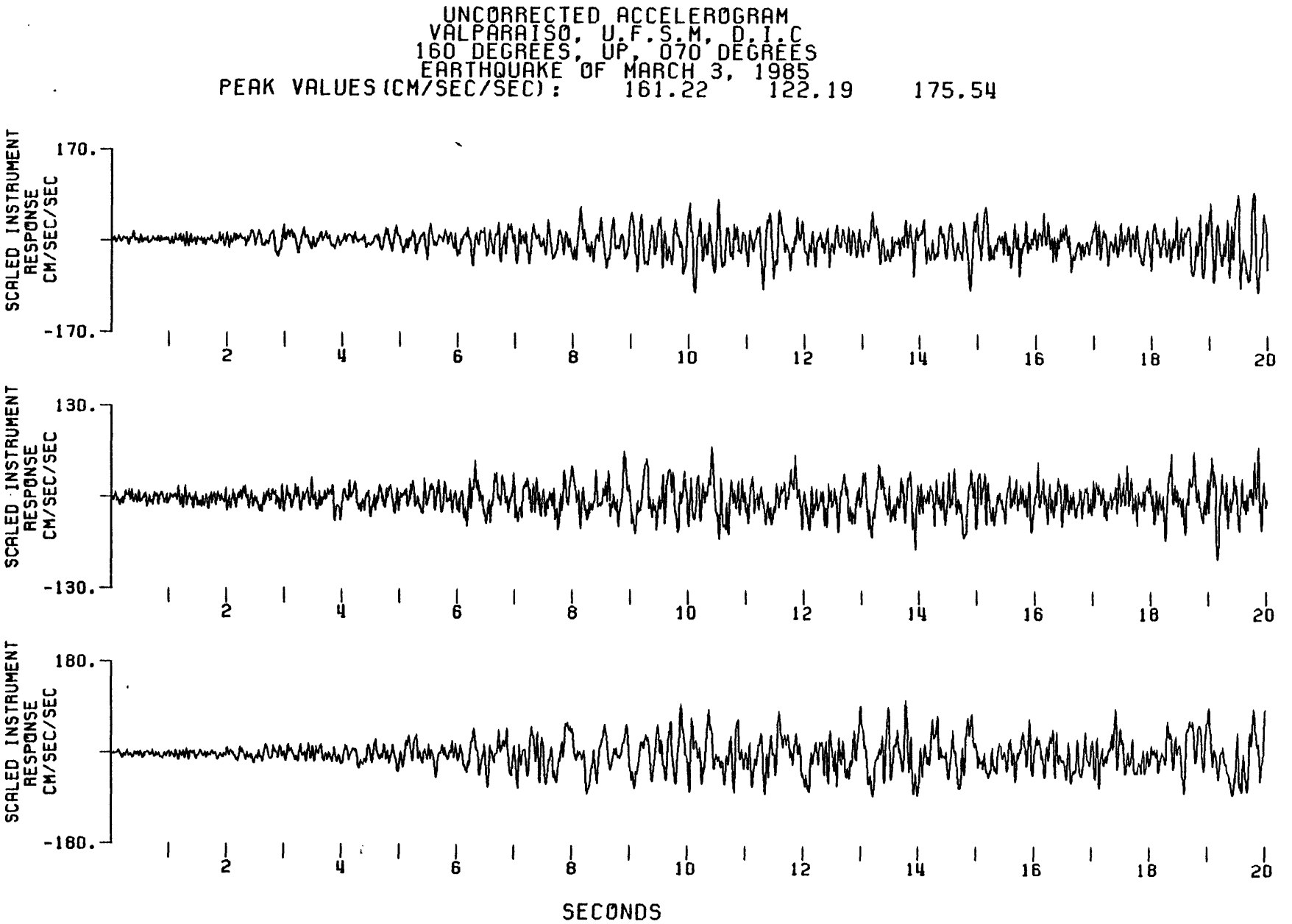

UNCORRECTED ACCELEROGRAM
VINA DEL MAR, D.I.C
290 DEGREES, UP, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): -223.69 -167.69 349.51
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
230.
-230.
(CONTINUED)
170.
-170.
350.
-350.
42
44
46
48
50
52
54
56
58
60
SECONDS

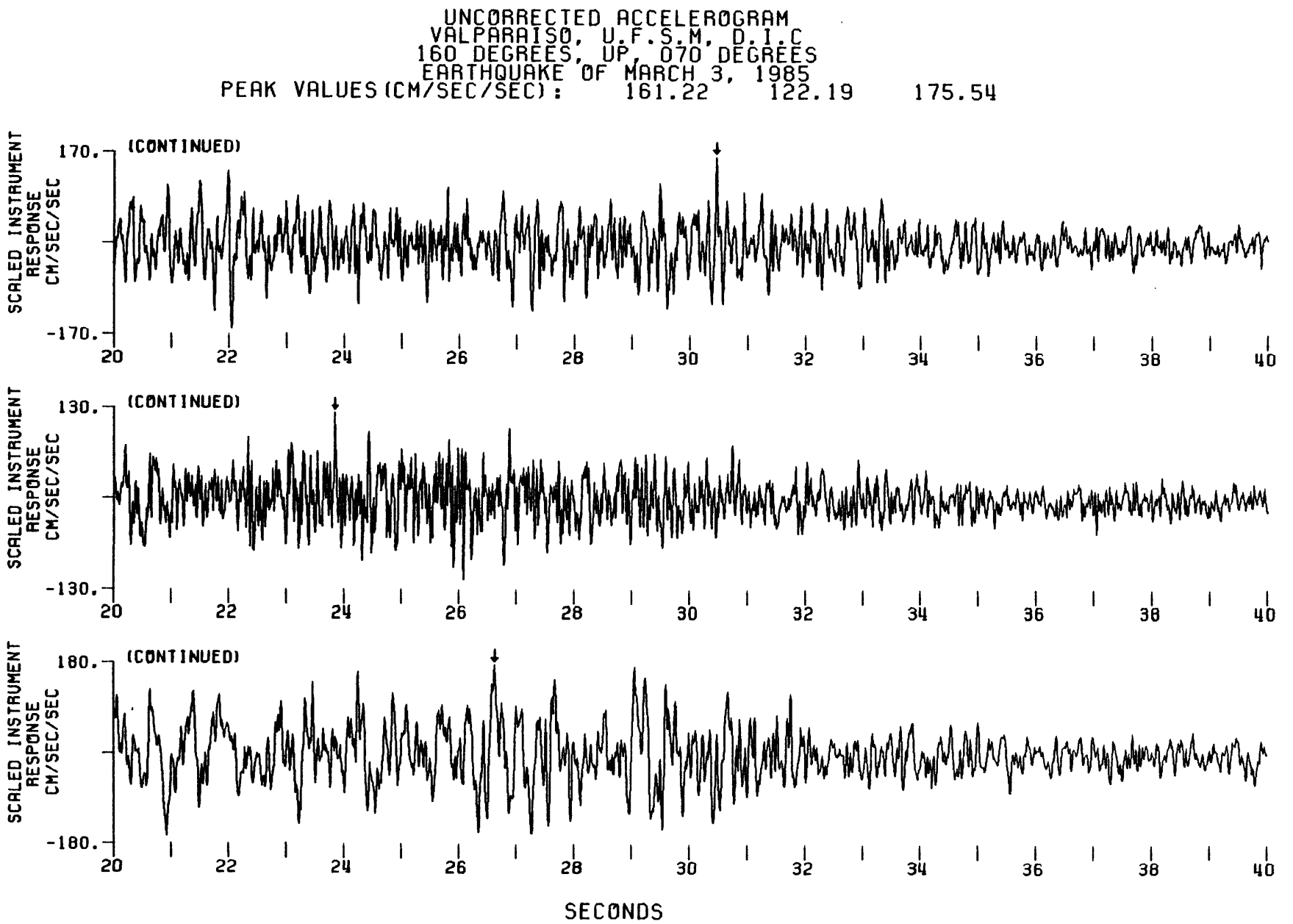

UNCORRECTED ACCELEROGRAM
VINA DEL MAR, D.I.C
290 DEGREES, UP, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): -223.69 -167.69 349.51
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
230.
-230.
(CONTINUED)
170.
-170.
350.
-350.
62
64
66
68
70
72
74
76
78
80
SECONDS


UNCORRECTED ACCELEROGRAM
VINA DEL MAR, D.I.C
290 DEGREES, UP, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): -223.69 -167.69 349.51
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
230.
-230.
(CONTINUED)
170.
-170.
350.
-350.
82
84
86
88
90
92
94
96
98
100
SECONDS

UNCORRECTED ACCELEROGRAM
VINA DEL MAR, D.I.C
290 DEGREES, UP, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): -223.69 -167.69 349.51




UNCORRECTED ACCELEROGRAM
VALPARAISO, U.F.S.M, D.I.C
160 DEGREES, UP, 070 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 161.22 122.19 175.54
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
170.
-170.
130.
-130.
180.
-180.
2
4
6
8
10
12
14
16
18
20
SECONDS


UNCORRECTED ACCELEROGRAM
VALPARAISO, U.F.S.M, D.I.C
160 DEGREES, UP, 070 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 161.22 122.19 175.54
(CONTINUED)
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
170.
-170.
130.
-130.
180.
-180.
20
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32
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38
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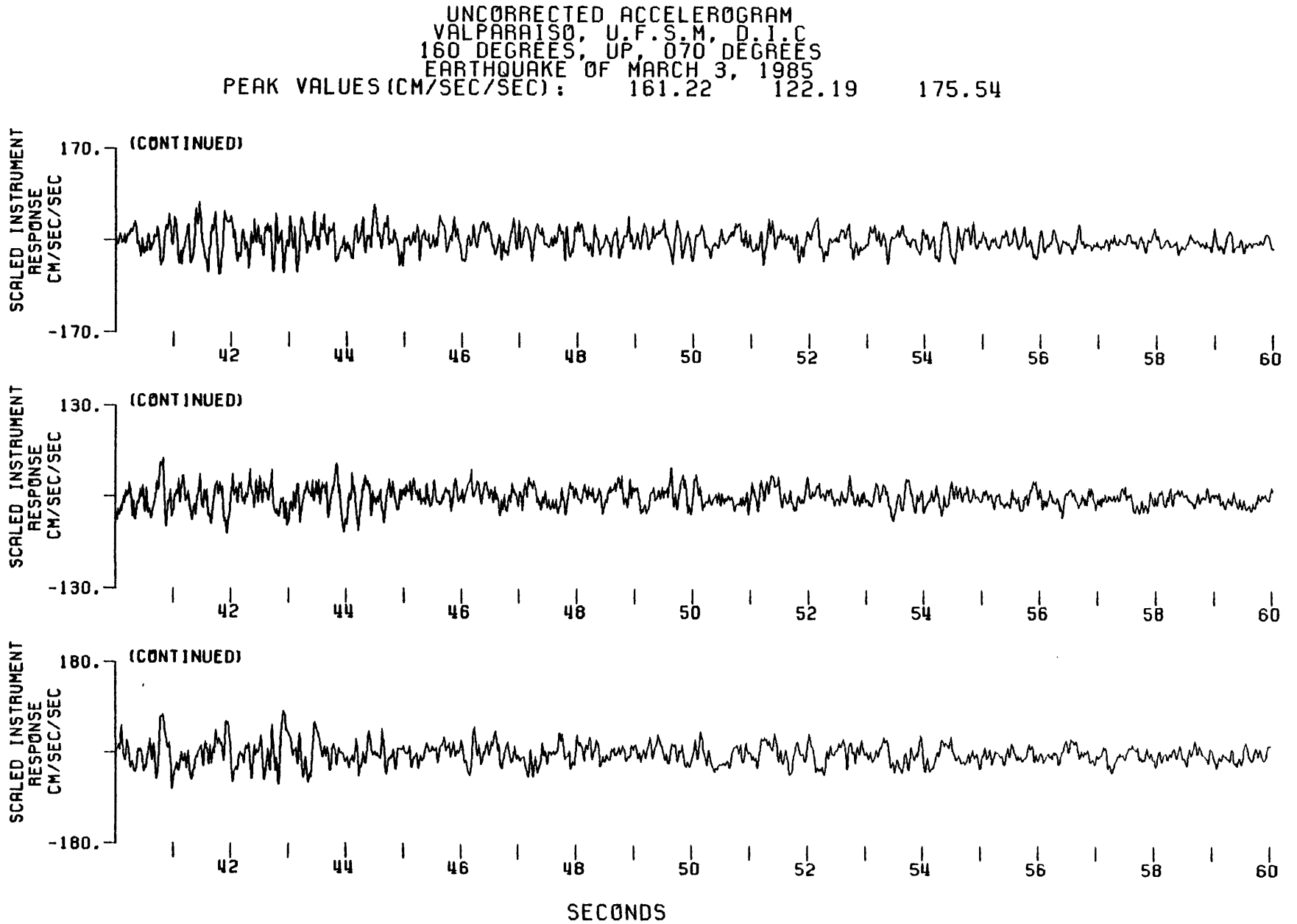
SECONDS


UNCORRECTED ACCELEROGRAM
VALPARAISO, U.F.S.M, D.I.C
160 DEGREES, UP, 070 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 161.22 122.19 175.54
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
170.
-170.
(CONTINUED)
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-130.
180.
-180.
42
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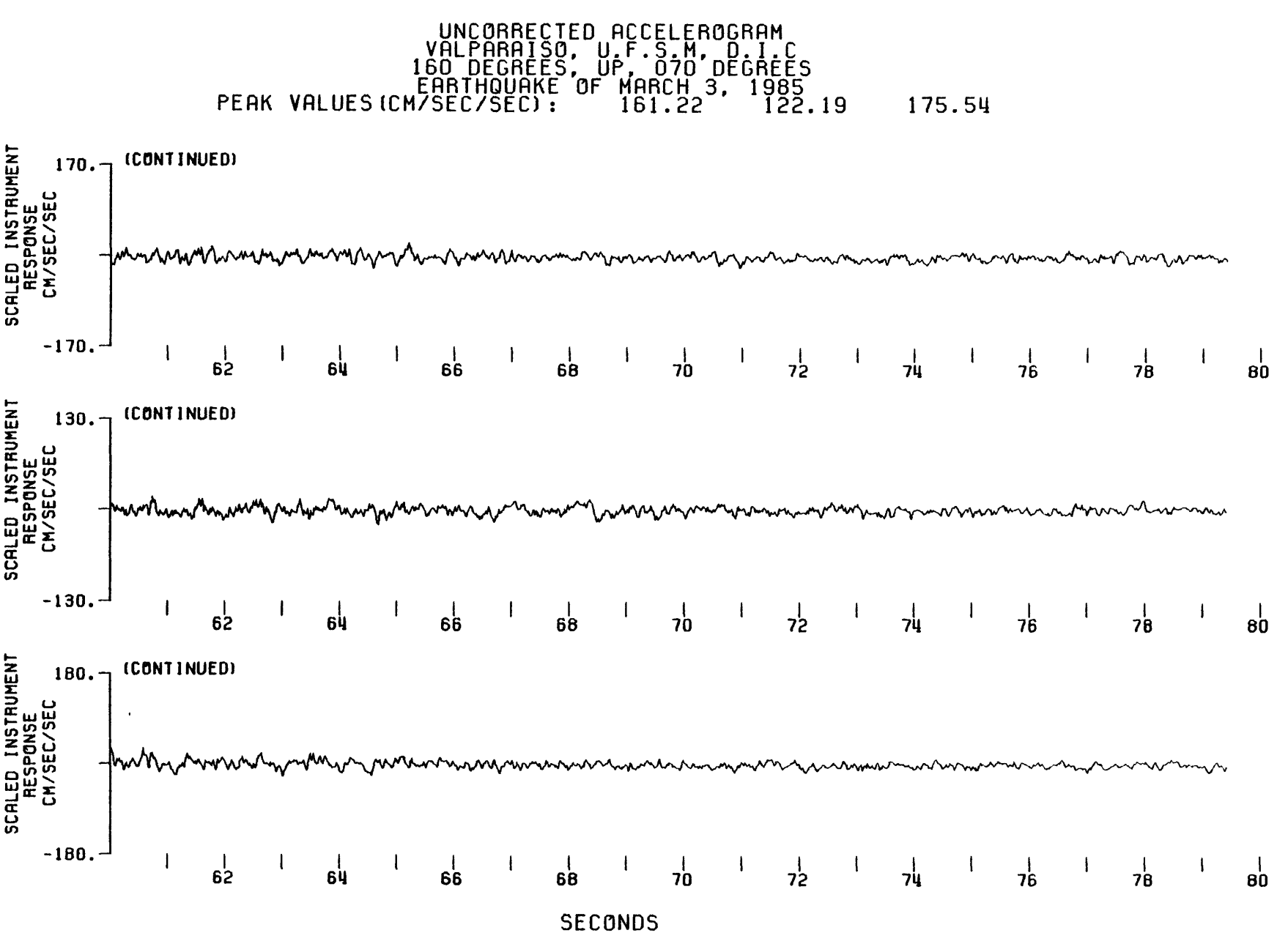
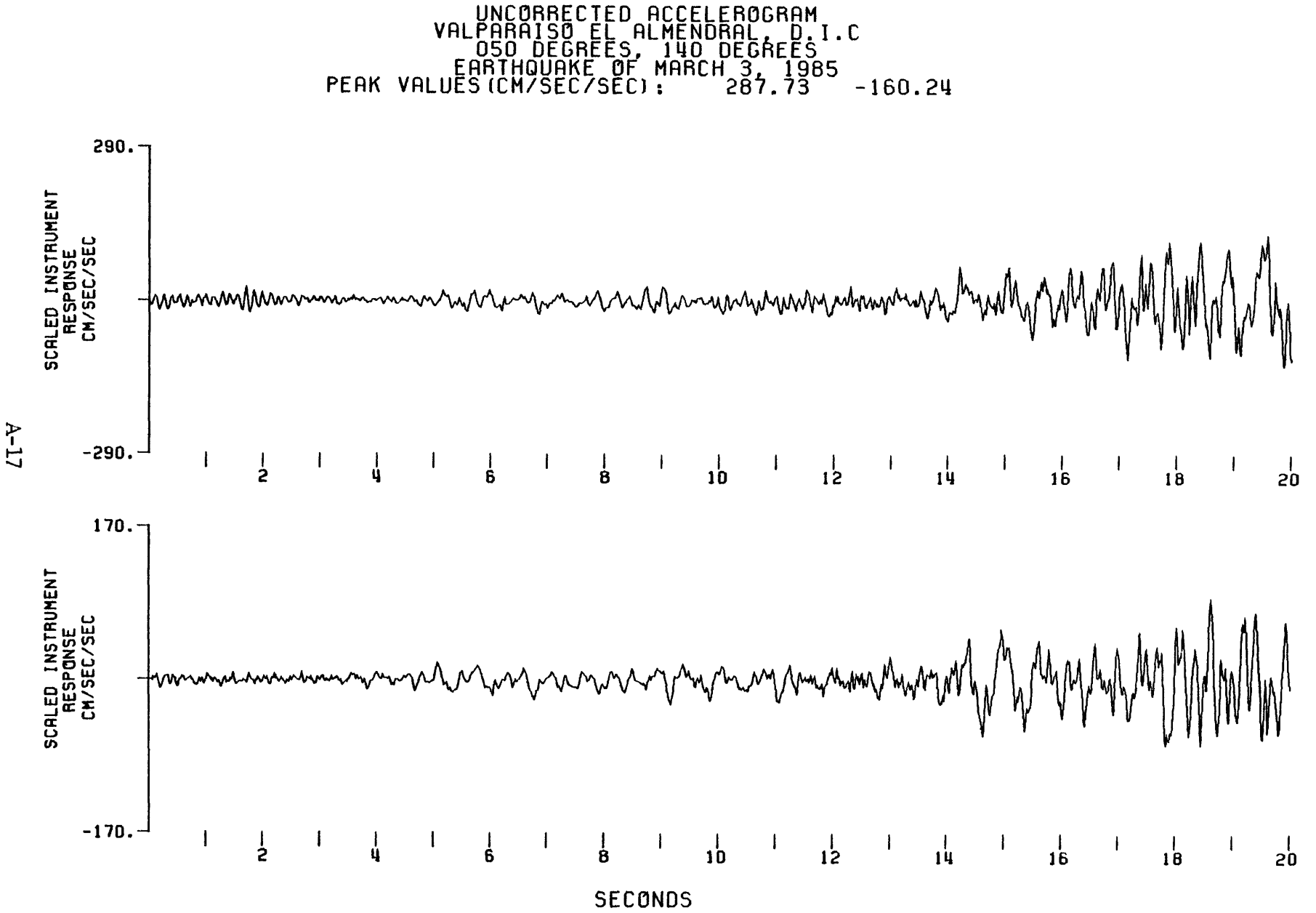
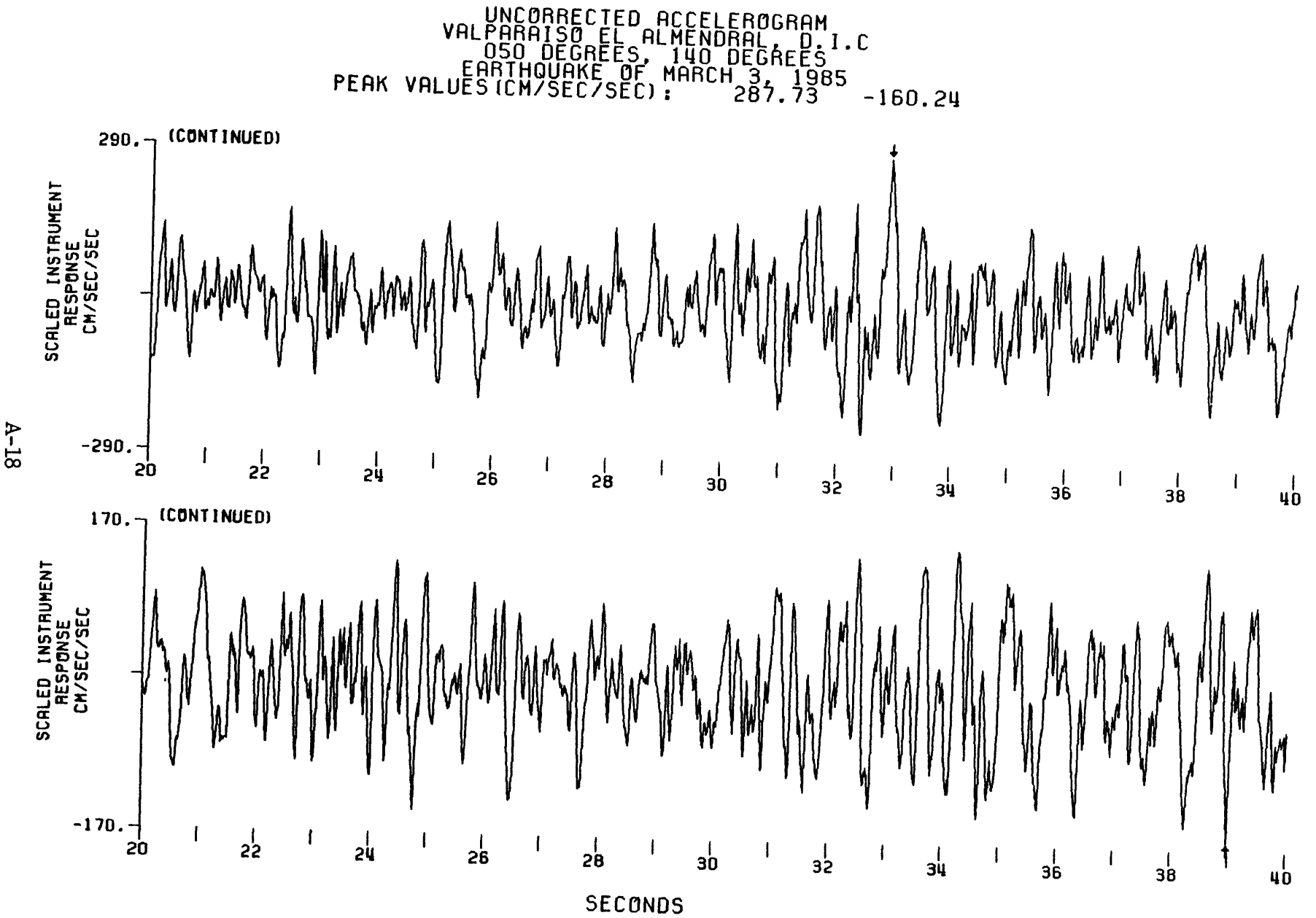
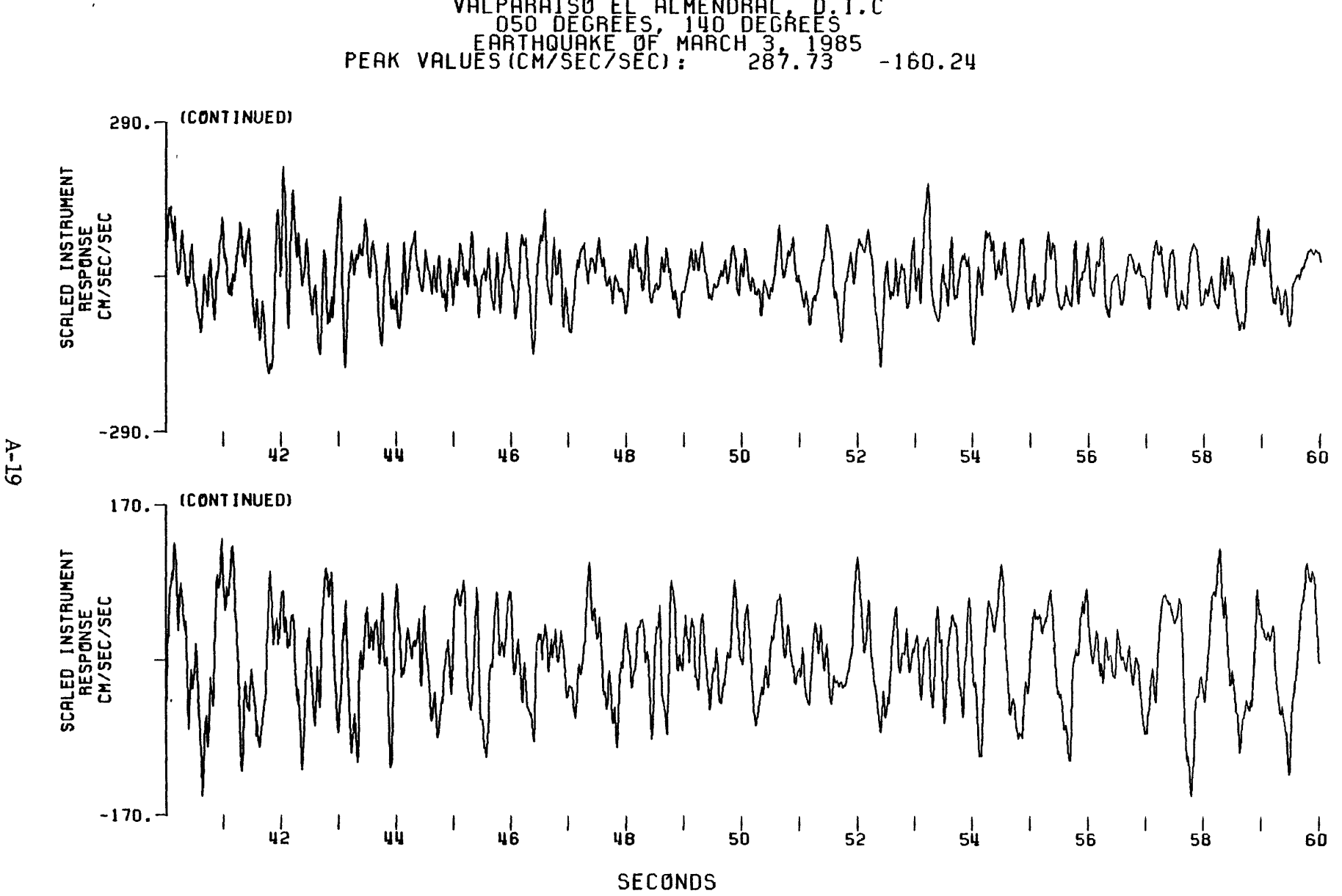
58
60
SECONDS

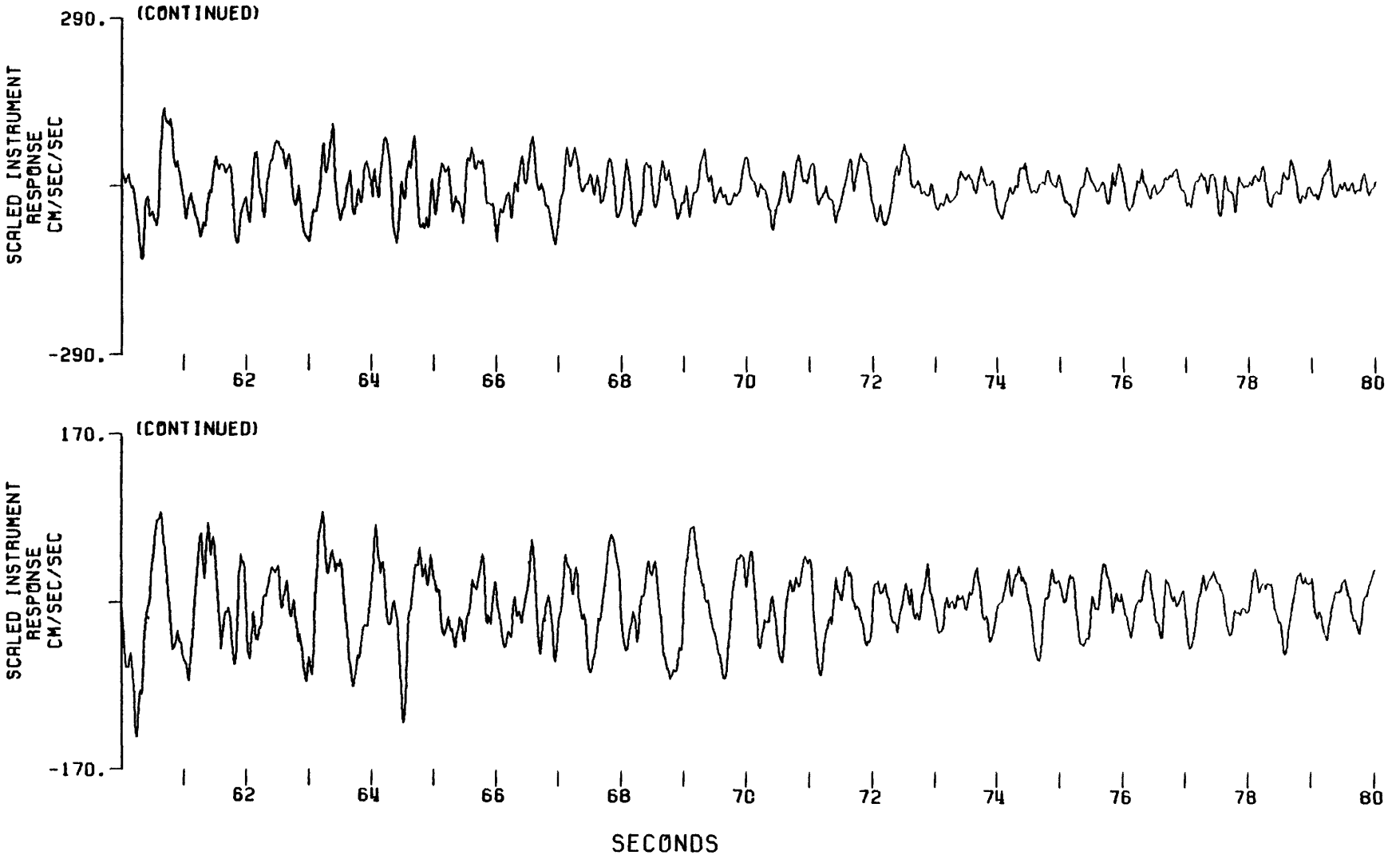

UNCORRECTED ACCELEROGRAM
VALPARAISO, U.F.S.M, D.I.C
160 DEGREES, UP, 070 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 161.22 122.19 175.54
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
170.
-170.
(CONTINUED)
130.
-130.
180.
-180.
62
64
66
68
70
72
74
76
78
80
SECONDS


UNCORRECTED ACCELEROGRAM
VALPARAISO EL ALMENDRAL, D.I.C
050 DEGREES, 140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 287.73 -160.24
290.
-290.
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
170.
-170.
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
2
4
6
8
10
12
14
16
18
20
SECONDS

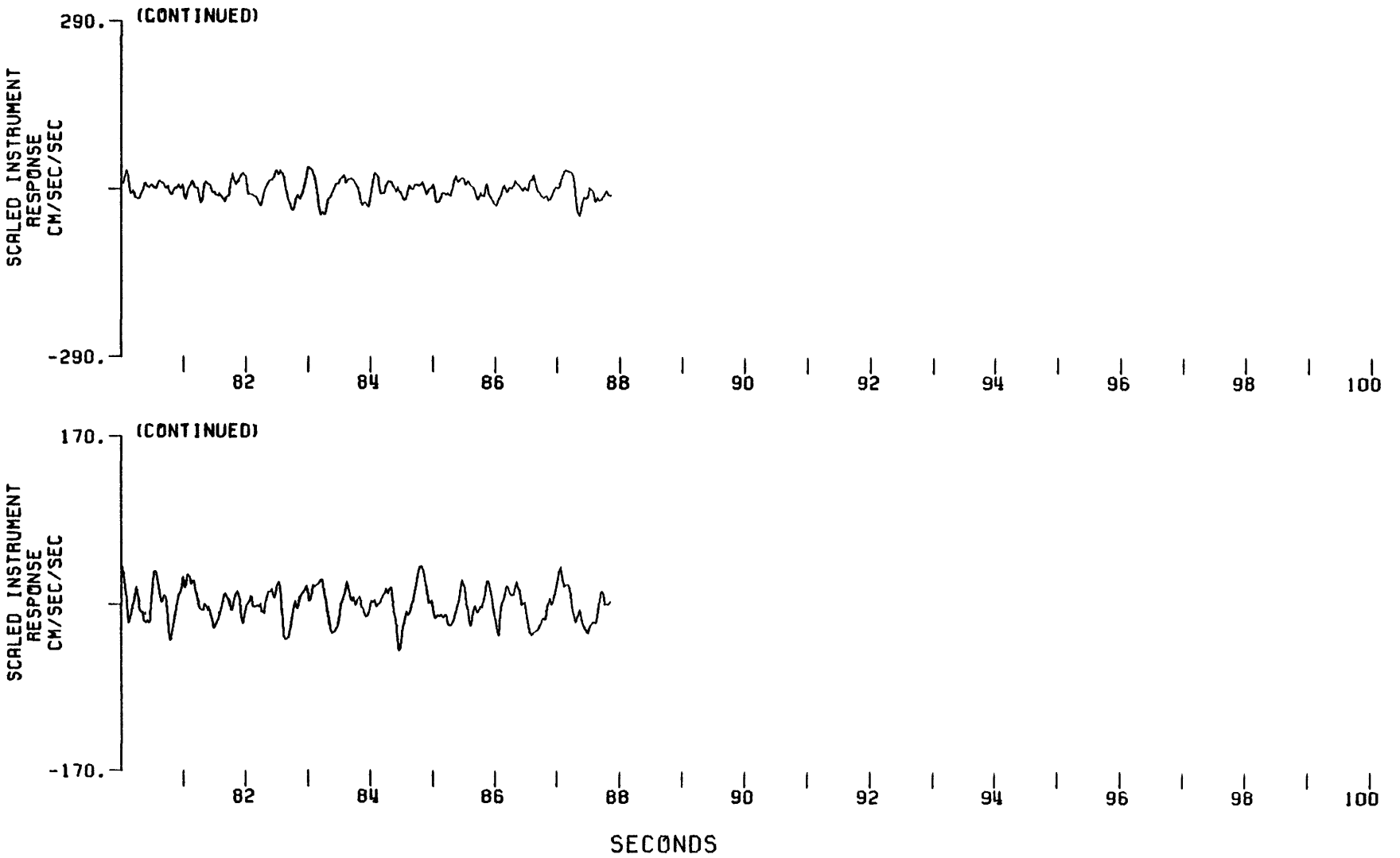

UNCORRECTED ACCELEROGRAM
VALPARAISO EL ALMENDRAL, D.I.C
050 DEGREES, 140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 287.73 -160.24
290.
(CONTINUED)
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
-290.
20
22
24
26
28
30
32
34
36
38
40
170.
(CONTINUED)
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
-170.
SECONDS

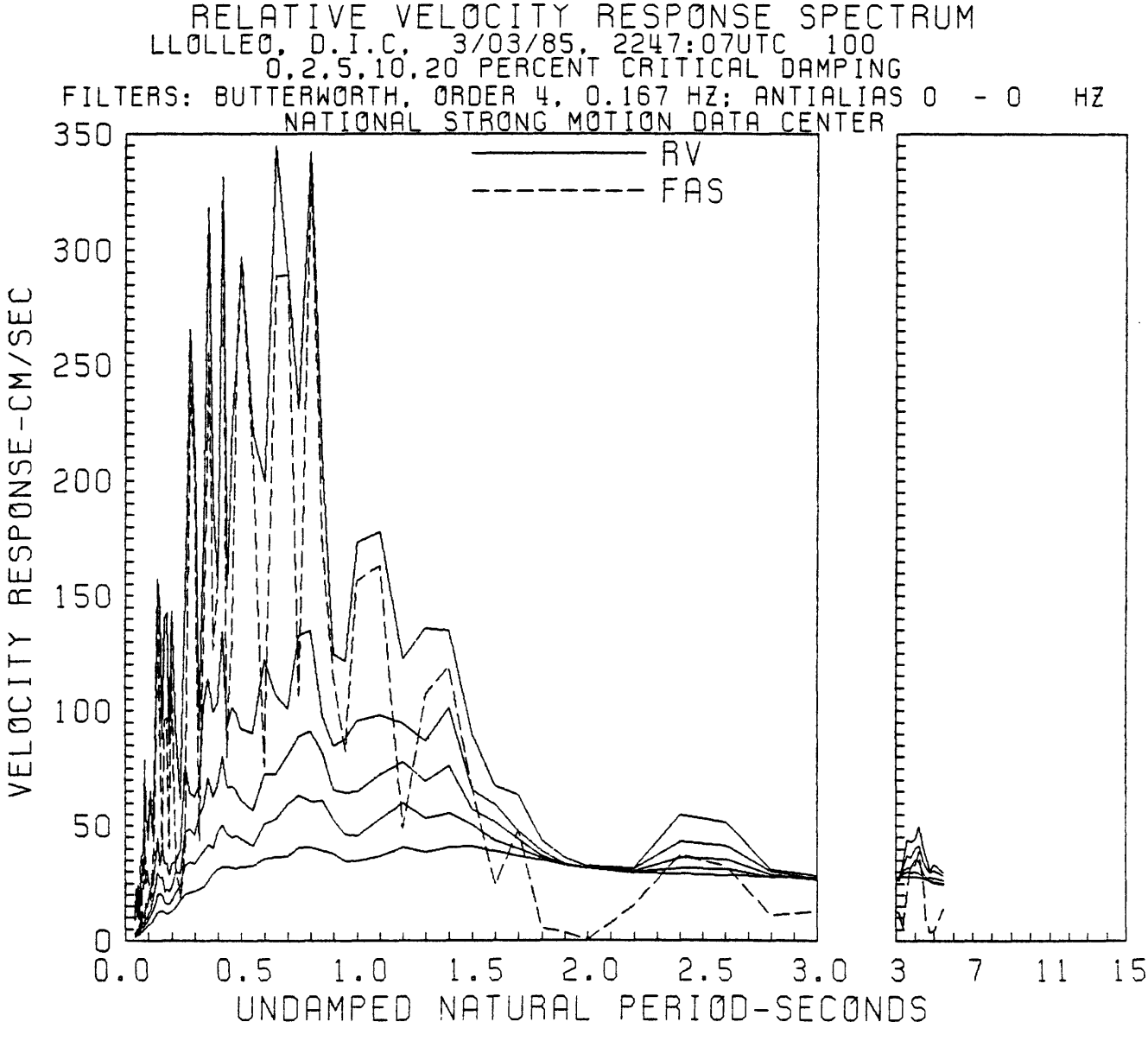

UNCORRECTED ACCELEROGRAM
VALPARAISO EL ALMENDRAL, D.I.C
050 DEGREES, 140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 287.73 -160.24
(CONTINUED)
290.
-290.
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
42
44
46
48
50
52
54
56
58
60
(CONTINUED)
170.
-170.
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
SECONDS

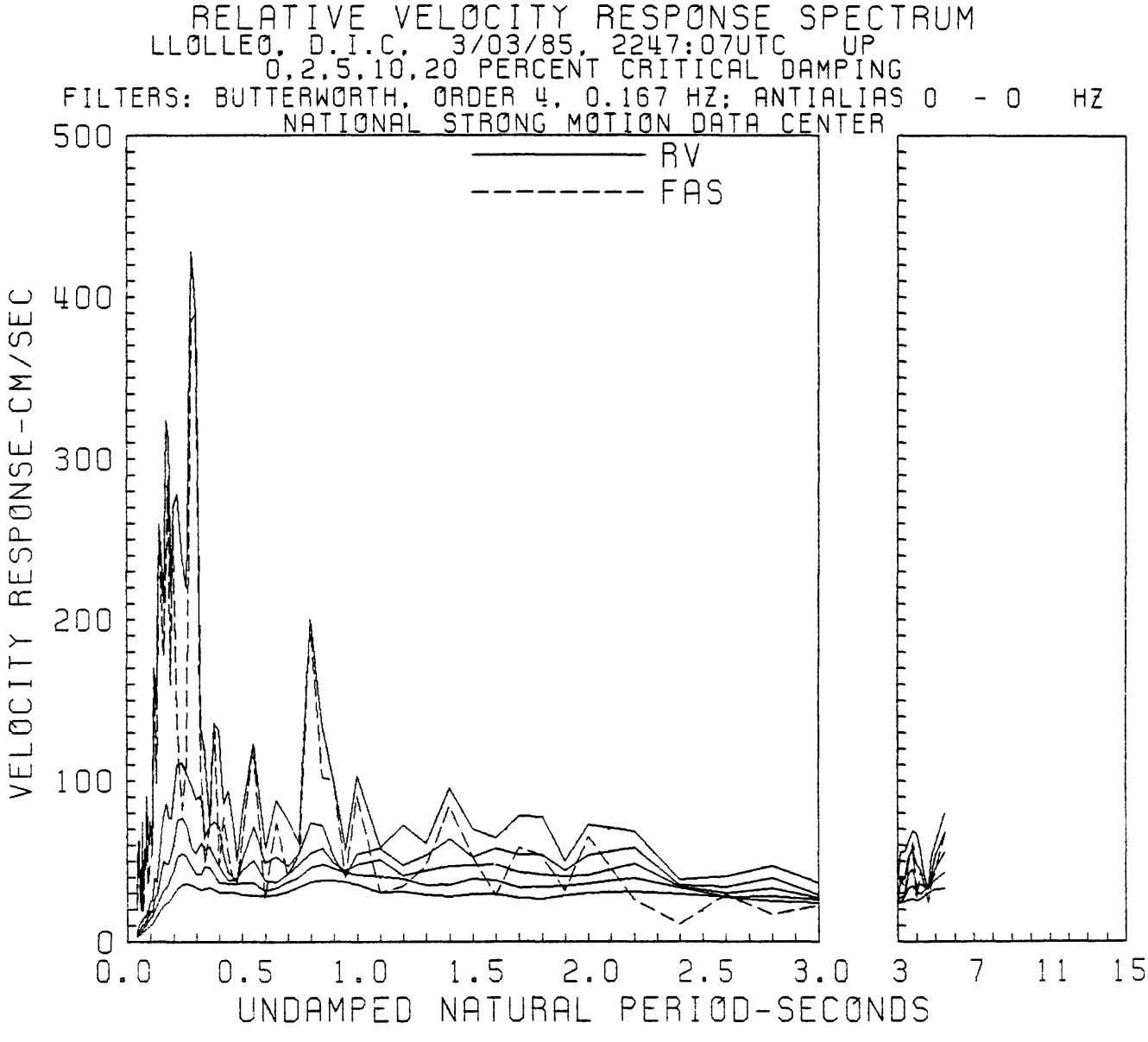
UNCORRECTED ACCELEROGRAM
VALPARAISO EL ALMENDRAL, D.I.C
050 DEGREES, 140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 287.73 -160.24

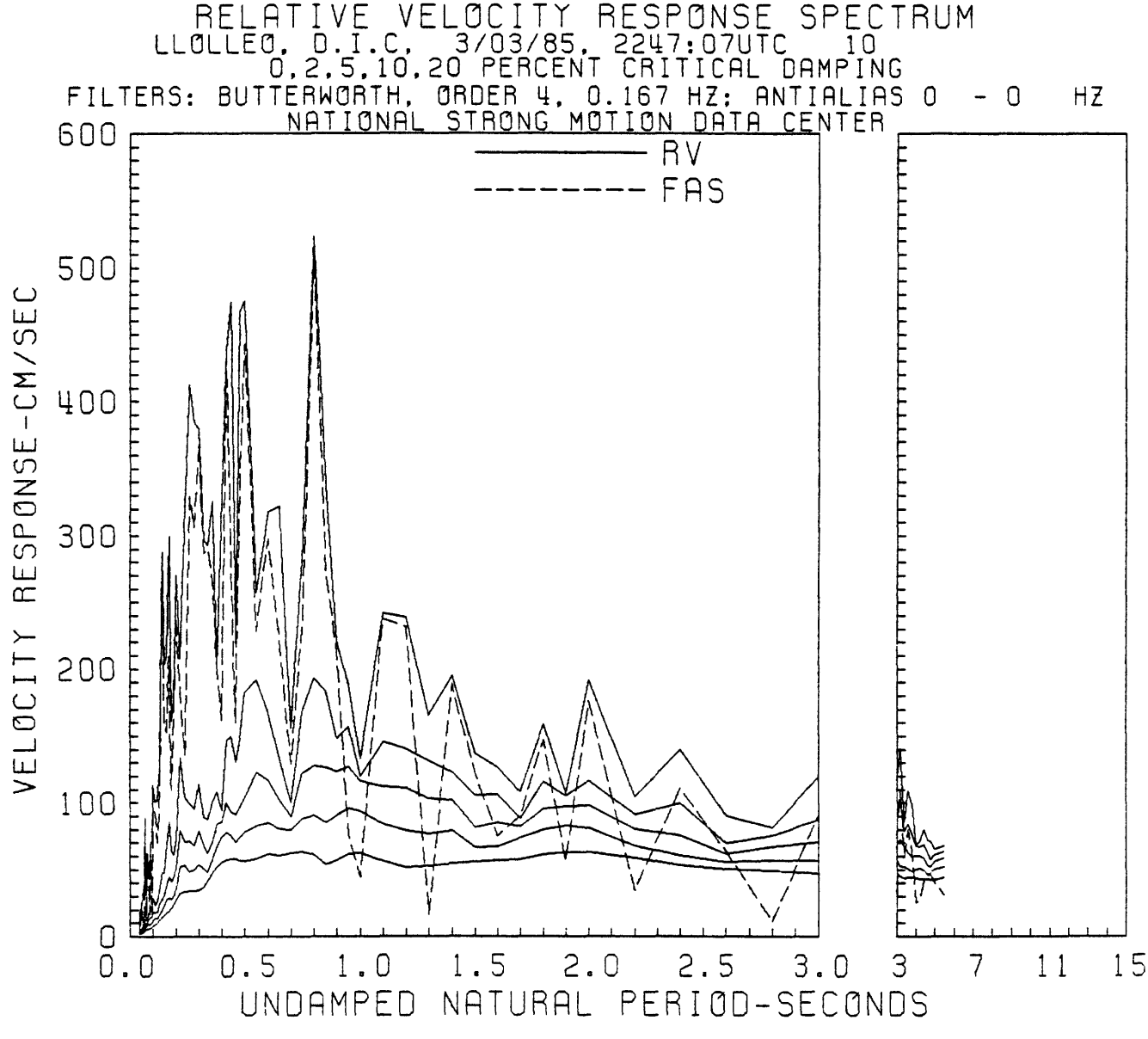


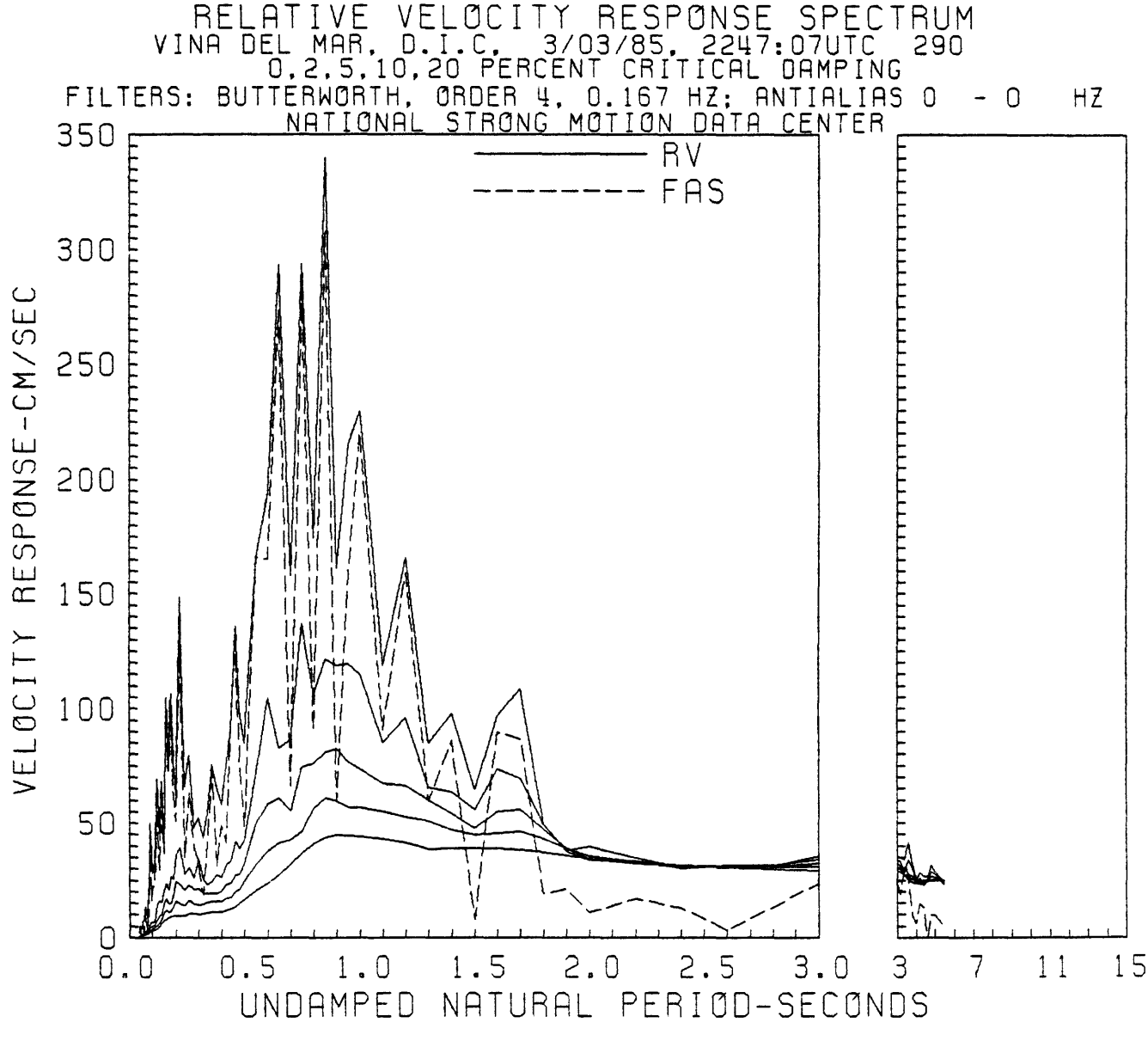
UNCORRECTED ACCELEROGRAM
VALPARAISO EL ALMENDRAL, D.I.C
050 DEGREES, 140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): 287.73 -160.24

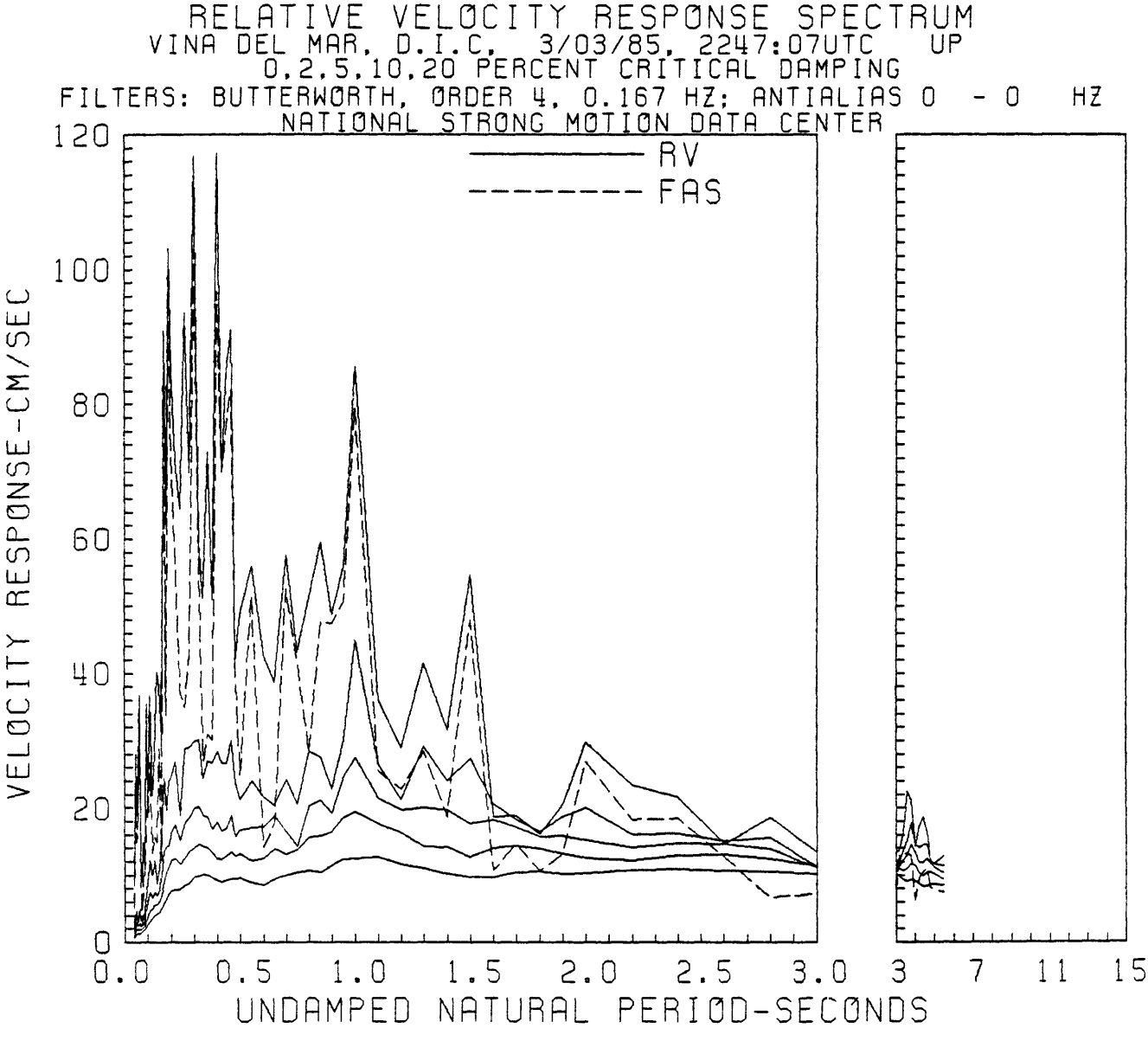


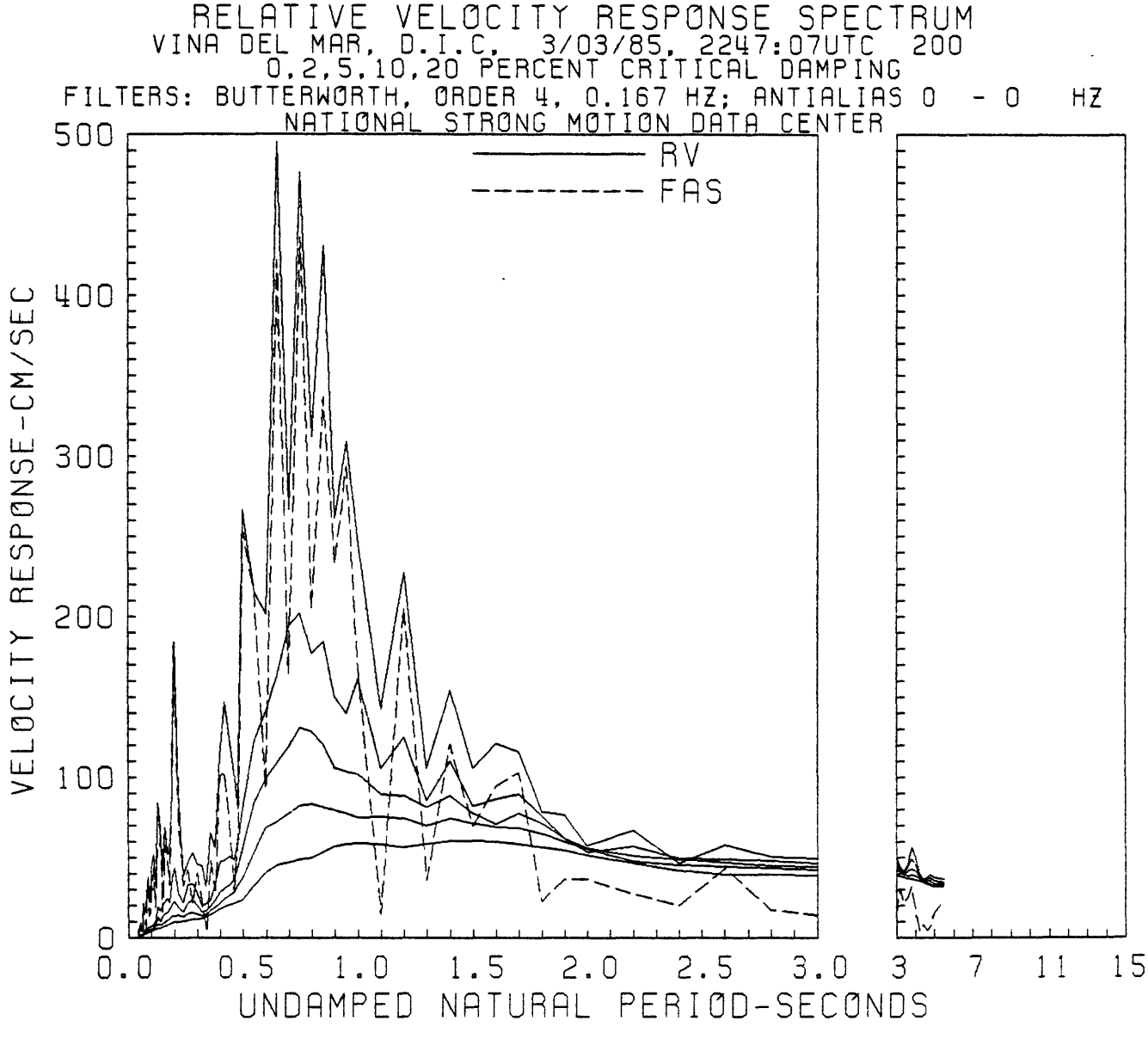

RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, D.I.C, 3/03/85, 2247:07UTC 100
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
50
100
150
200
250
300
350
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

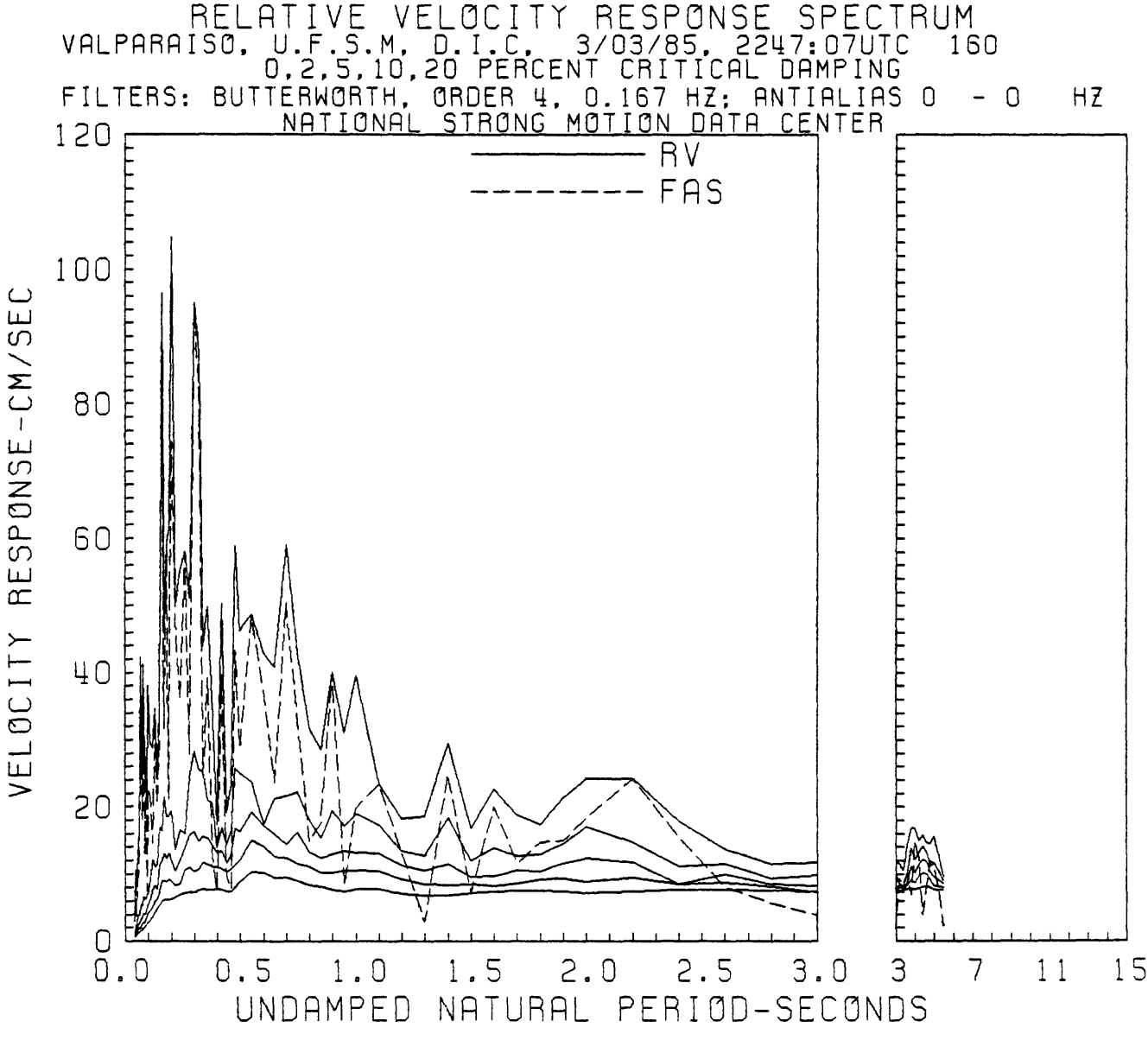

RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, D.I.C, 3/03/85, 2247:07UTC UP
0,2.5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
500
400
300
200
100
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

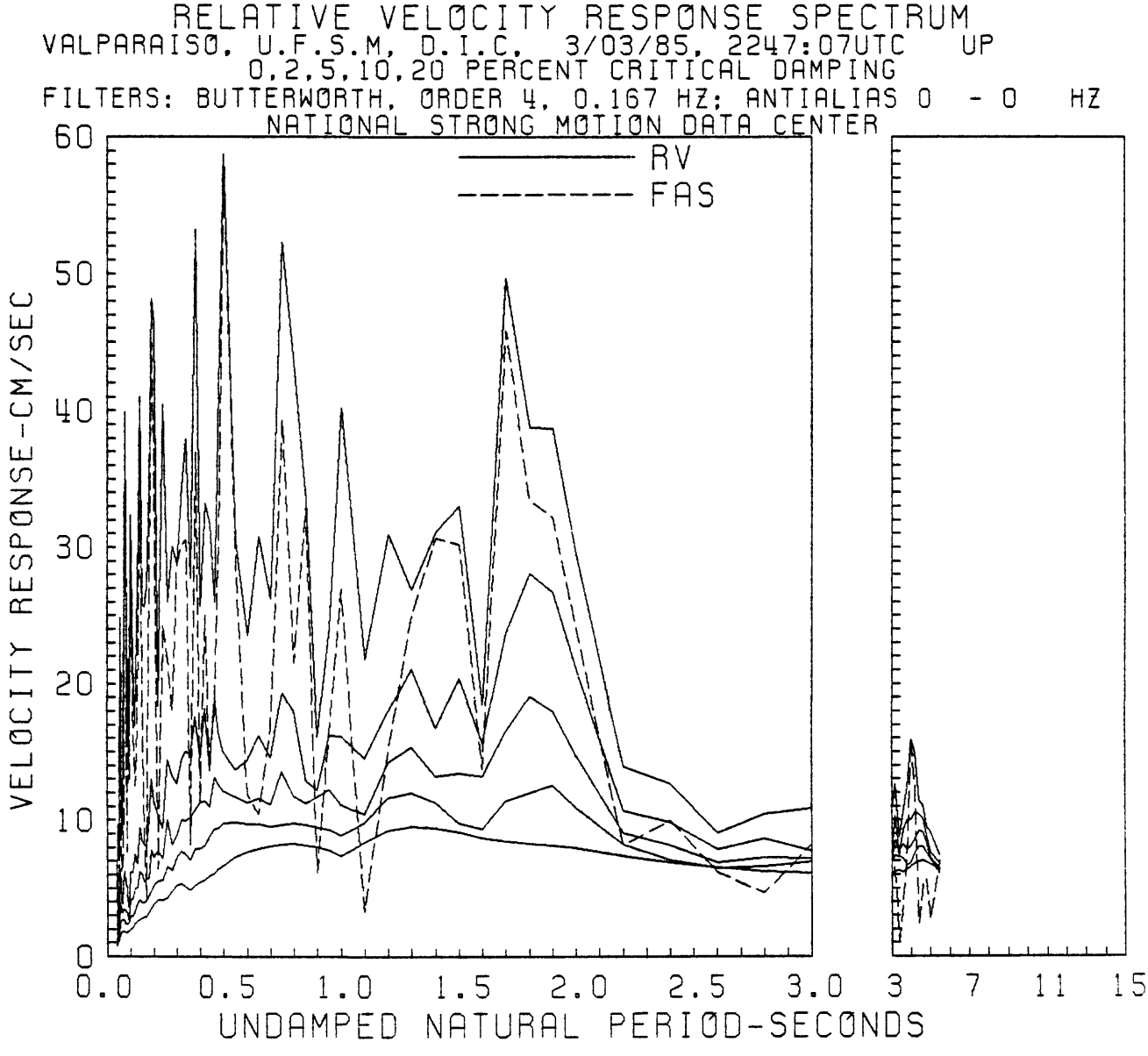

RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, D.I.C, 3/03/85, 2247:07UTC 10
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
100
200
300
400
500
600
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

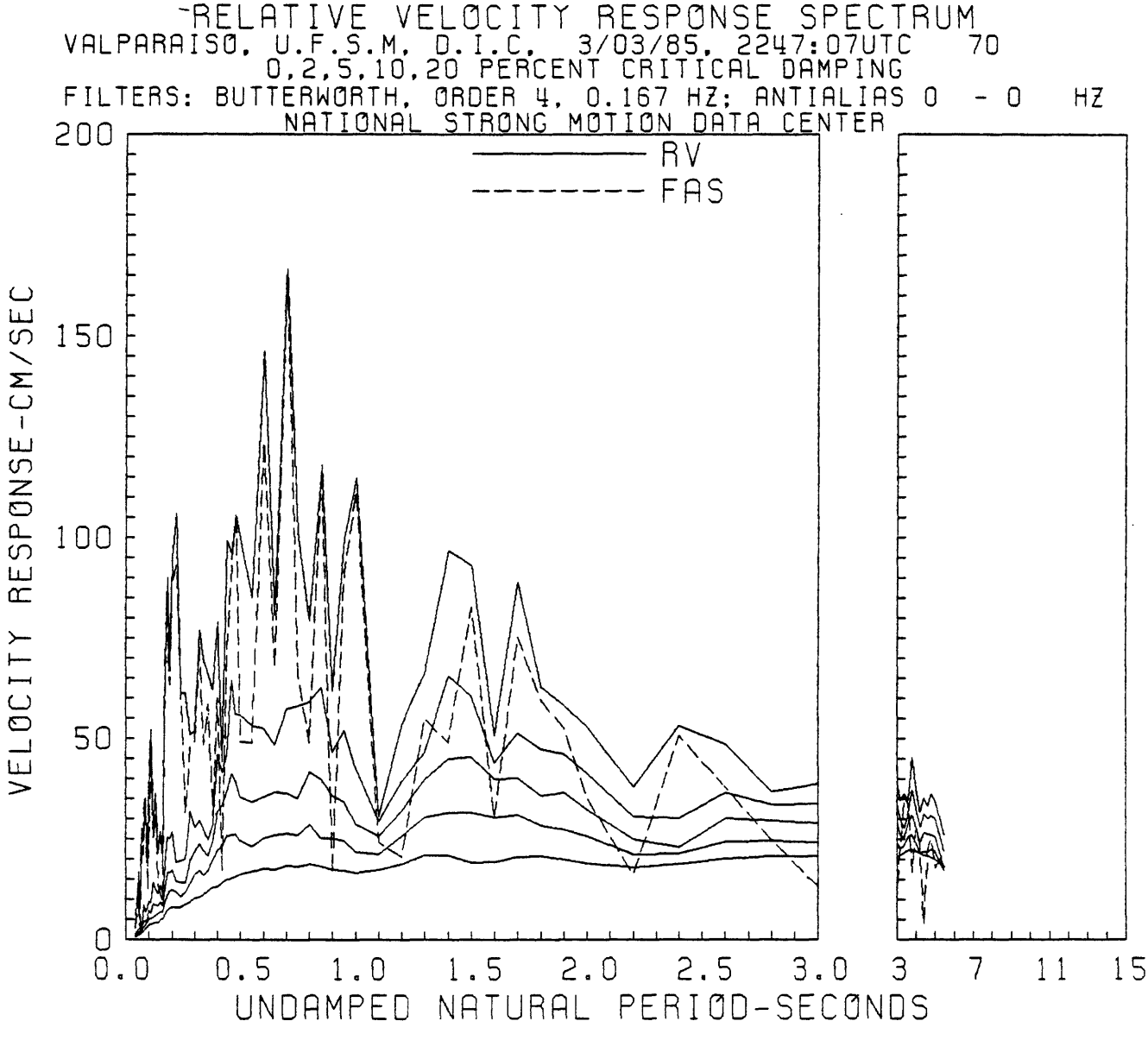

RELATIVE VELOCITY RESPONSE SPECTRUM
VINA DEL MAR, D.I.C, 3/03/85, 2247:07UTC 290
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
50
100
150
200
250
300
350
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

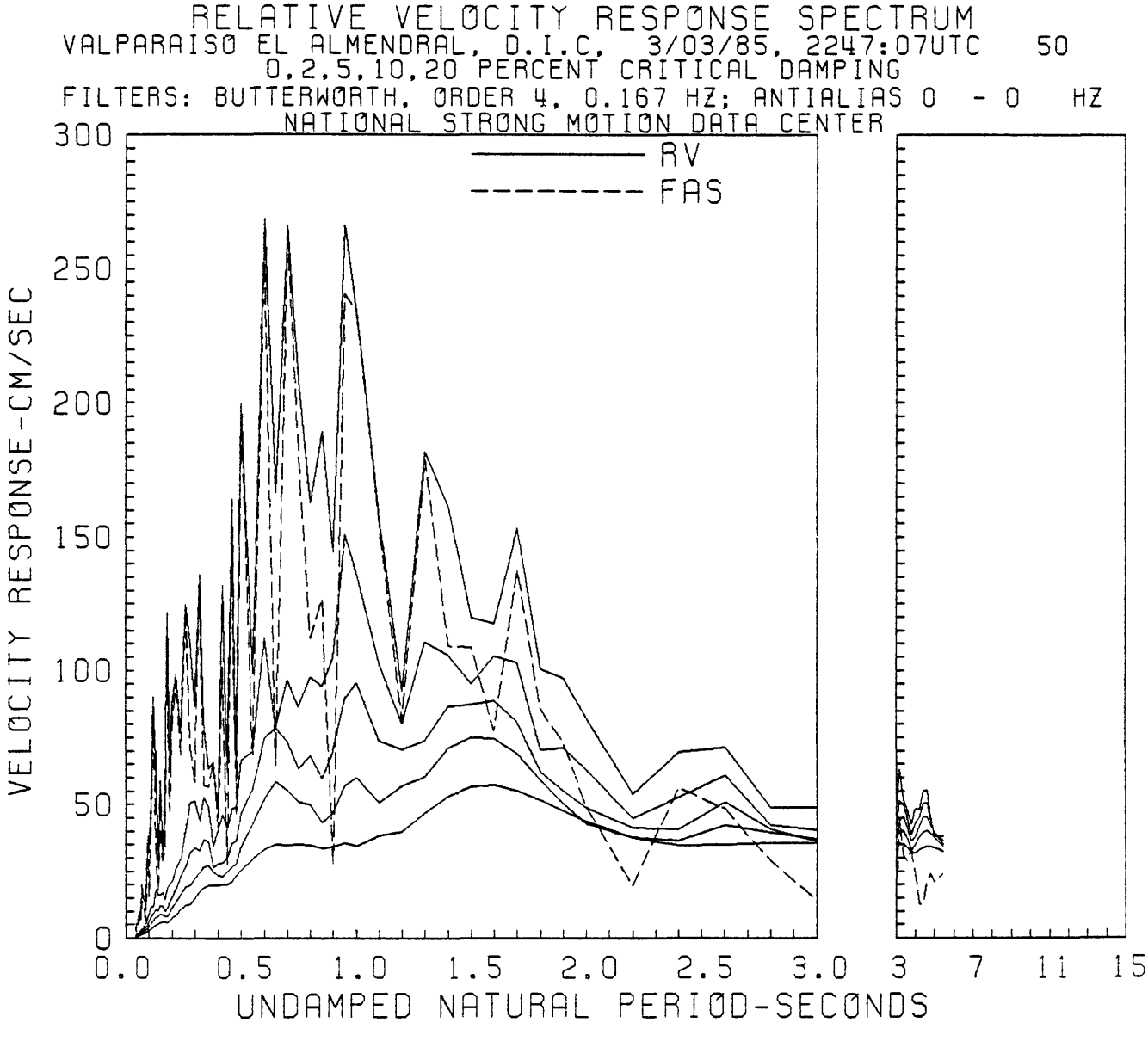

RELATIVE VELOCITY RESPONSE SPECTRUM
VINA DEL MAR, D.I.C, 3/03/85, 2247:07UTC UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
120
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

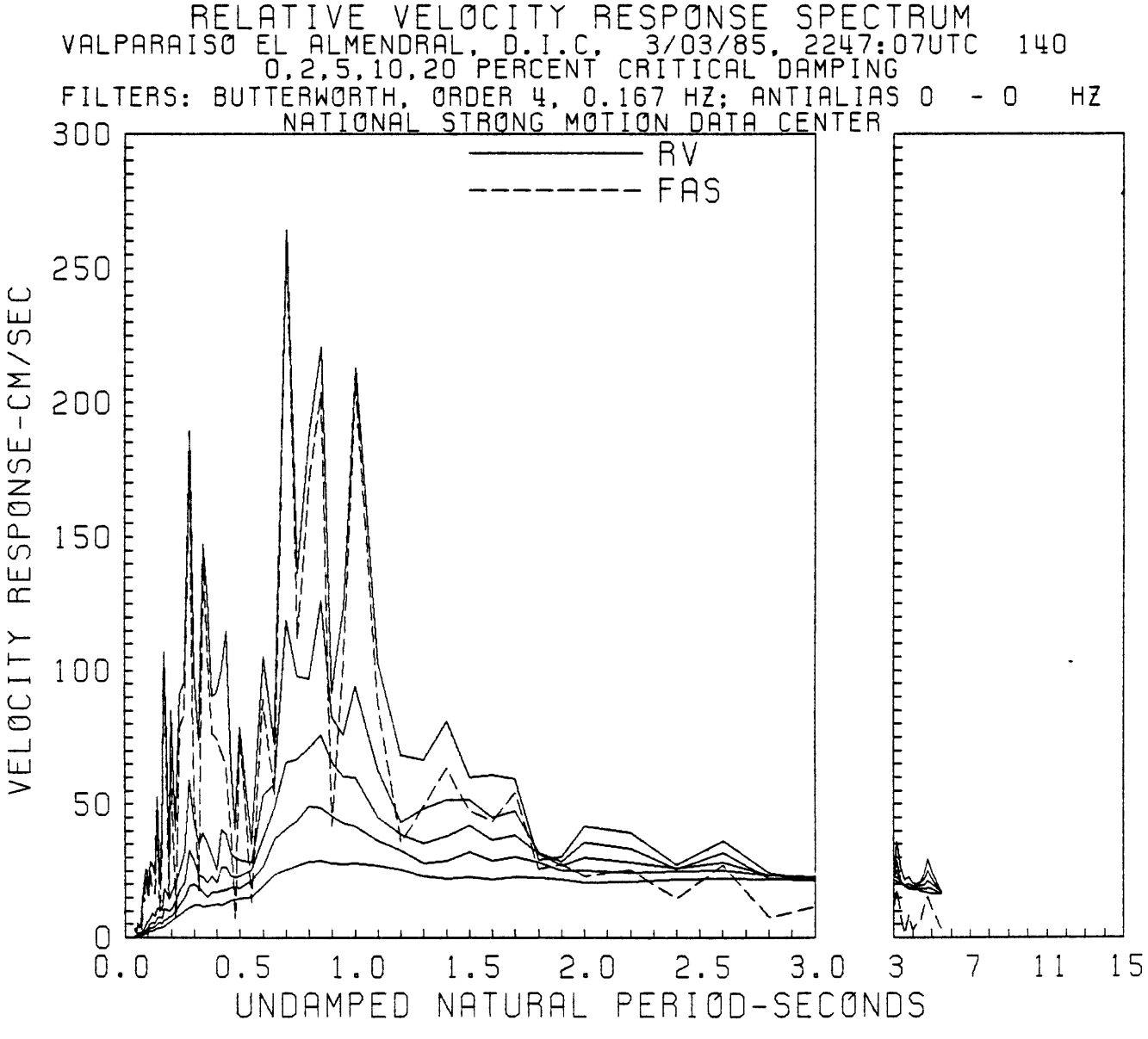

RELATIVE VELOCITY RESPONSE SPECTRUM
VINA DEL MAR, D.I.C. 3/03/85, 2247:07UTC 200
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
100
200
300
400
500
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

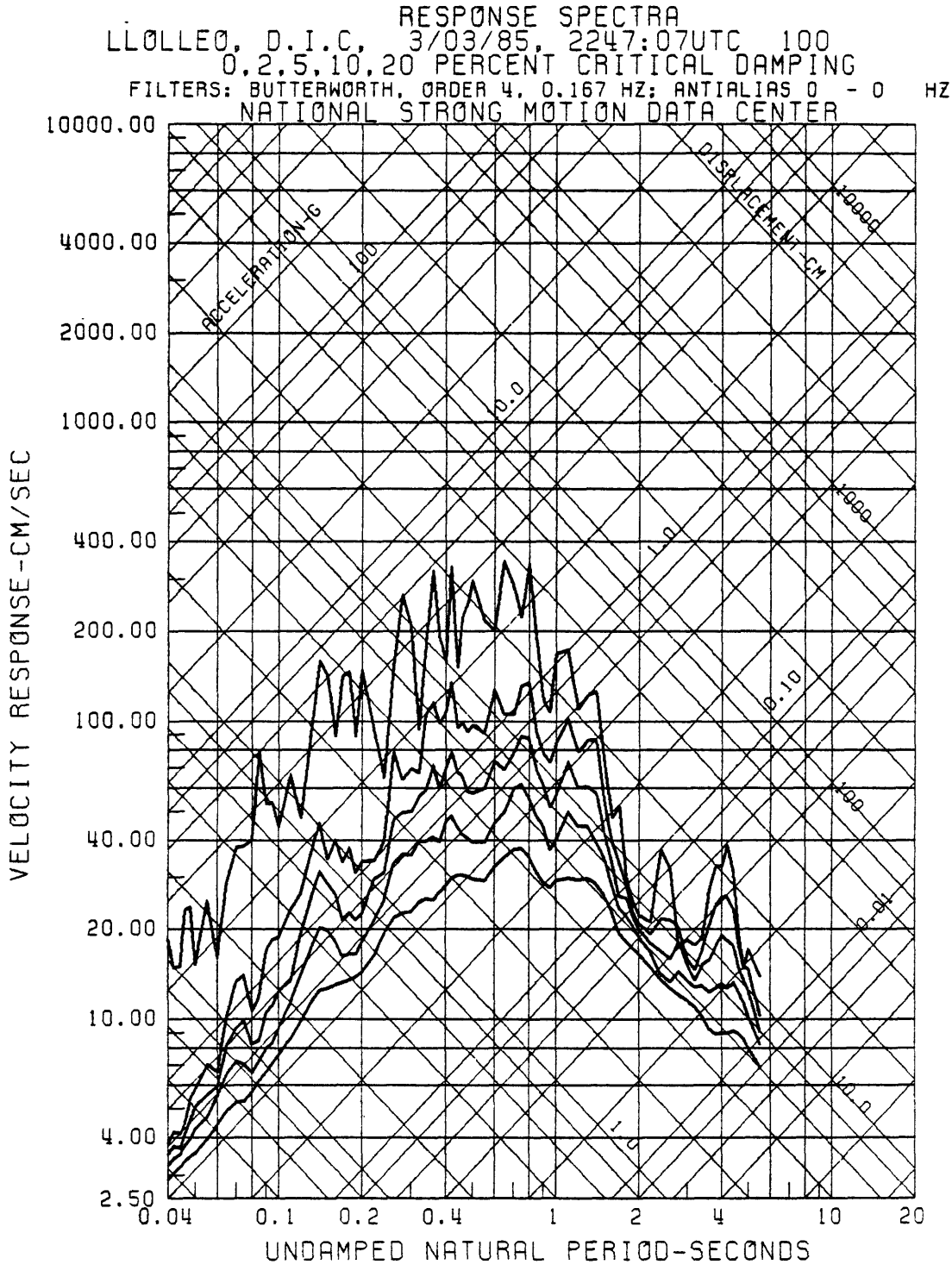

RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO, U.F.S.M, D.I.C, 3/03/85, 2247:07UTC 160
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
120
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

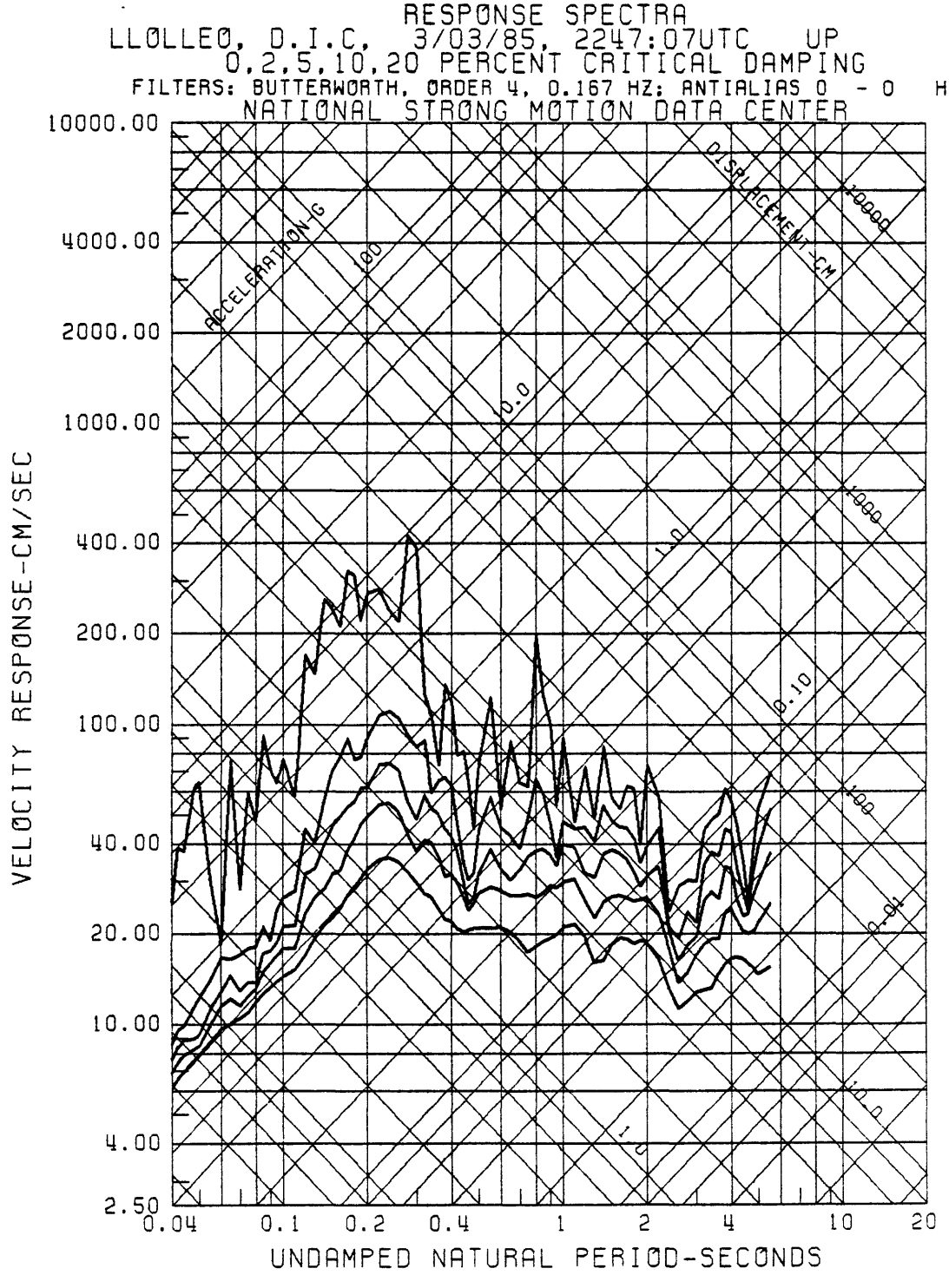

RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO, U.F.S.M, D.I.C, 3/03/85, 2247:07UTC UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
10
20
30
40
50
60
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

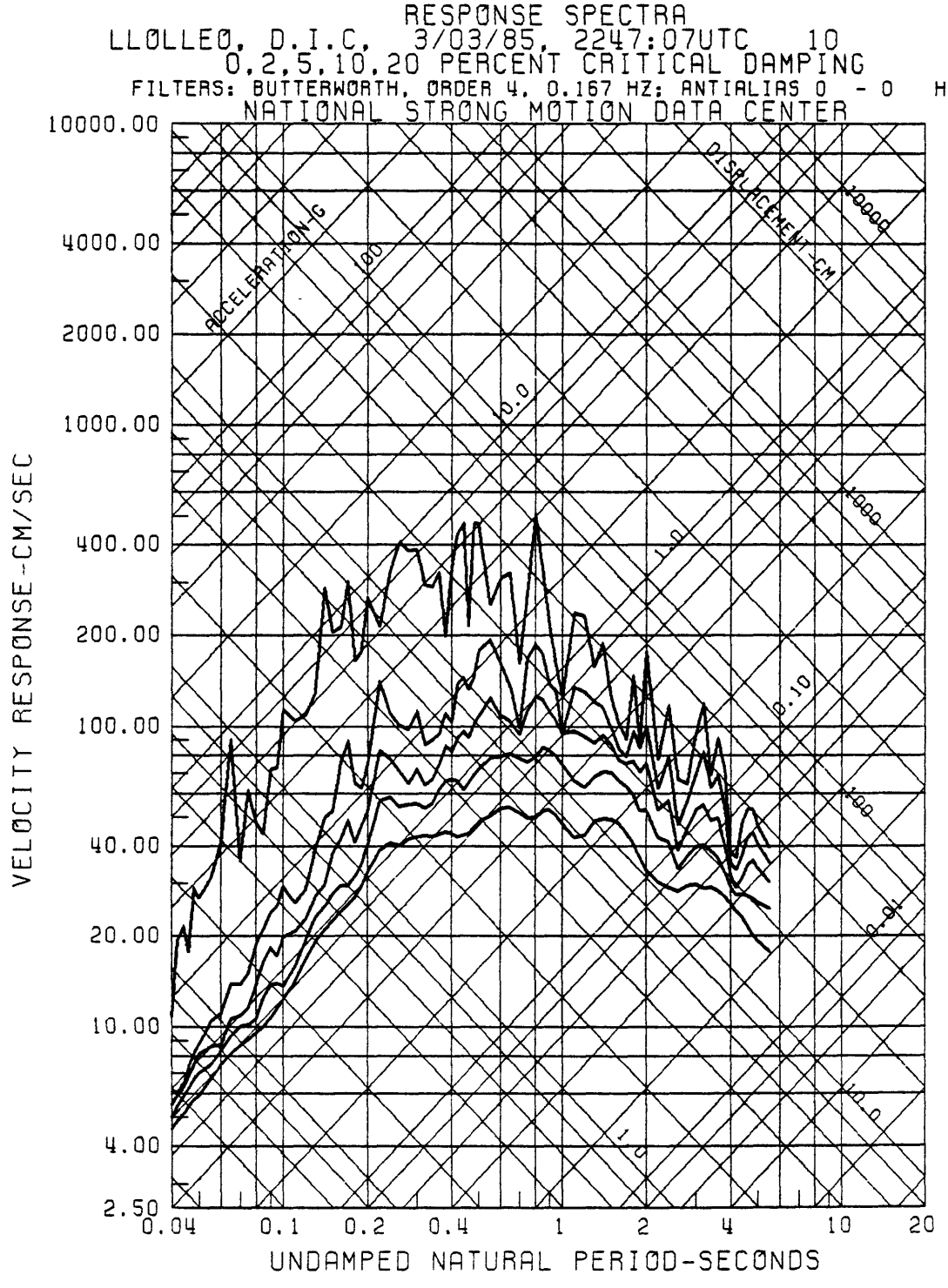

RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO, U.F.S.M, D.I.C, 3/03/85, 2247:07UTC 70
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

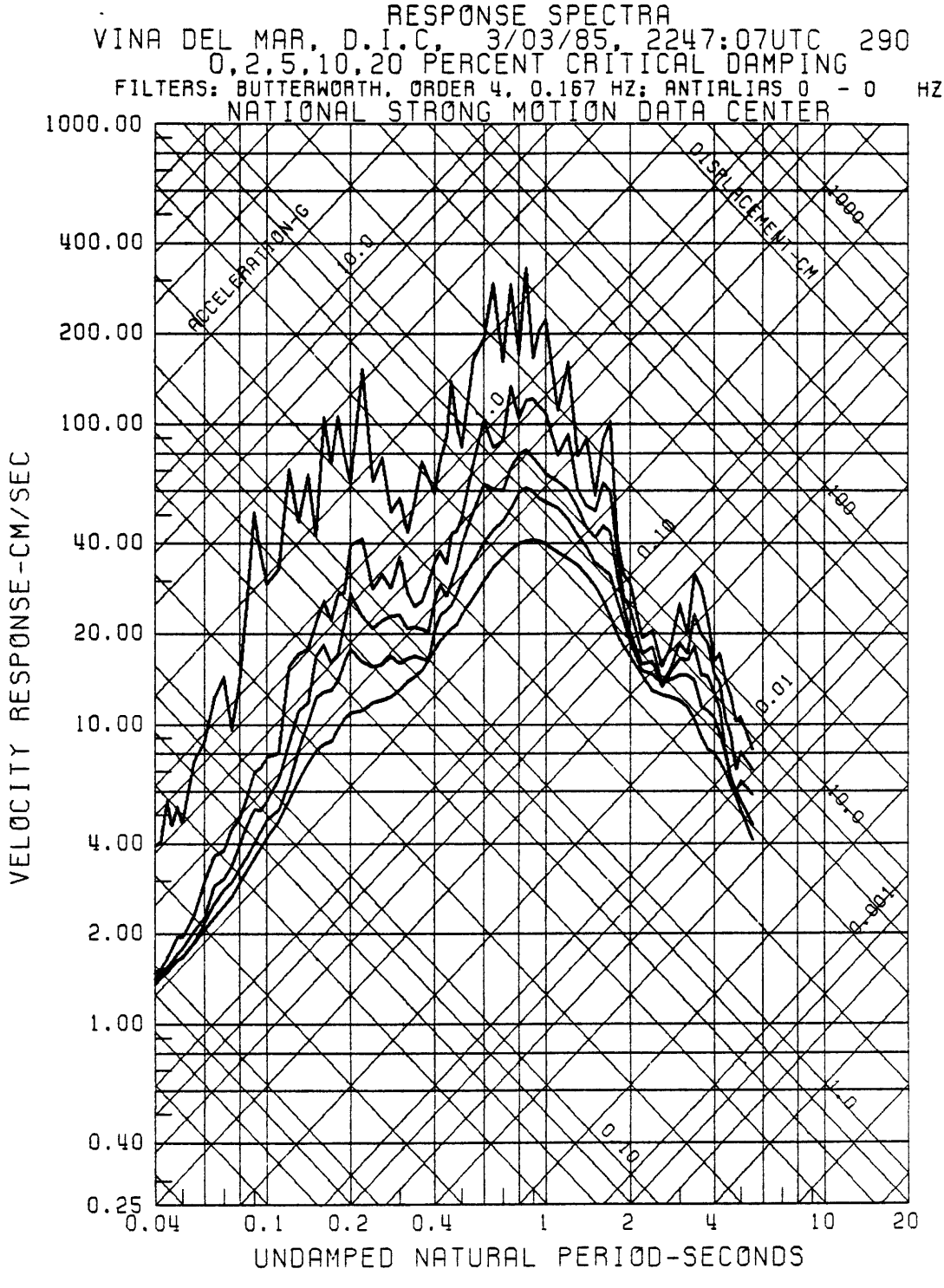

RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO EL ALMENDRAL, D.I.C, 3/03/85, 2247:07UTC 50
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
300
250
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

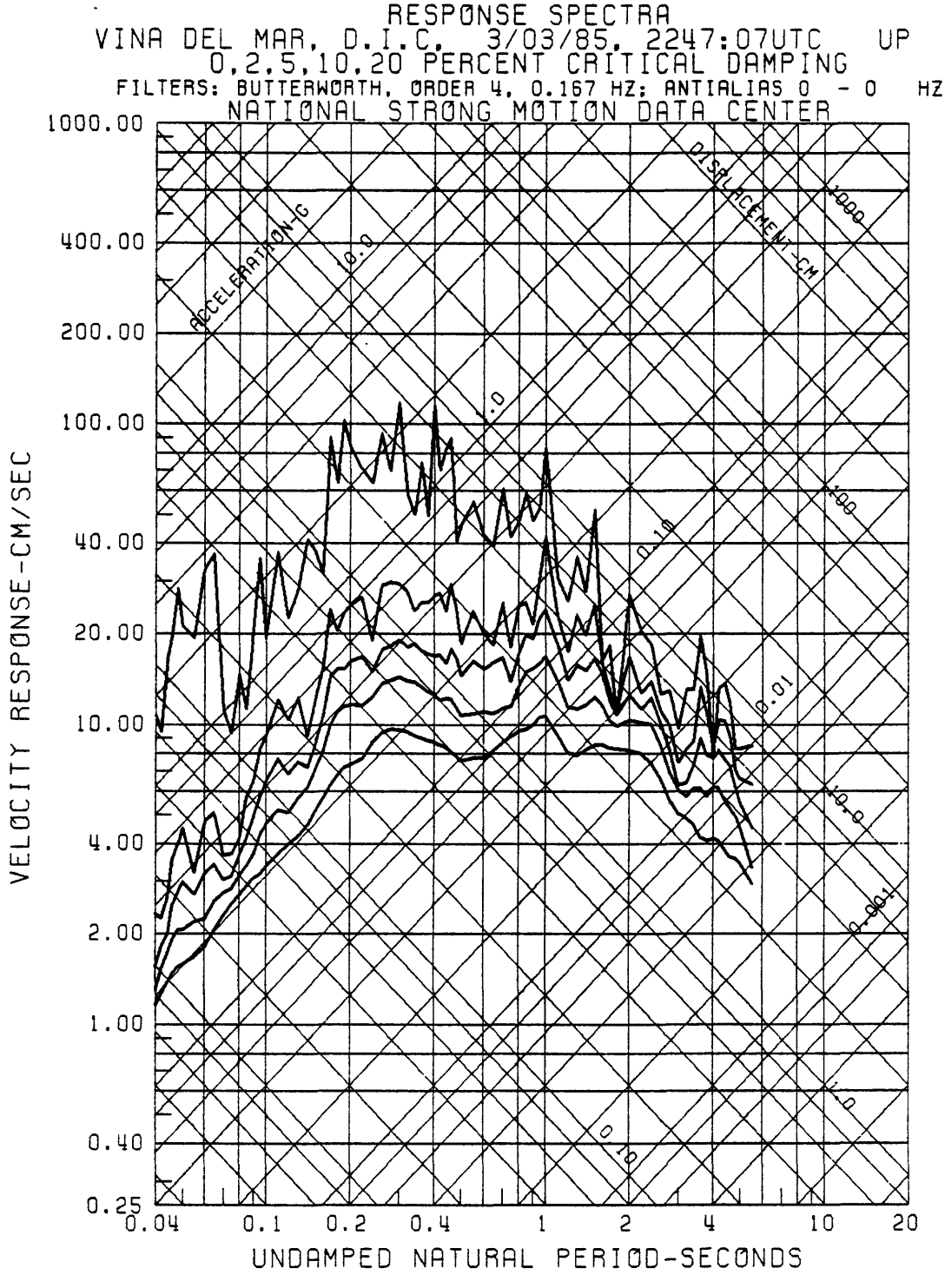

RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO EL ALMENDRAL, D.I.C, 3/03/85, 2247:07UTC 140
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
300
250
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

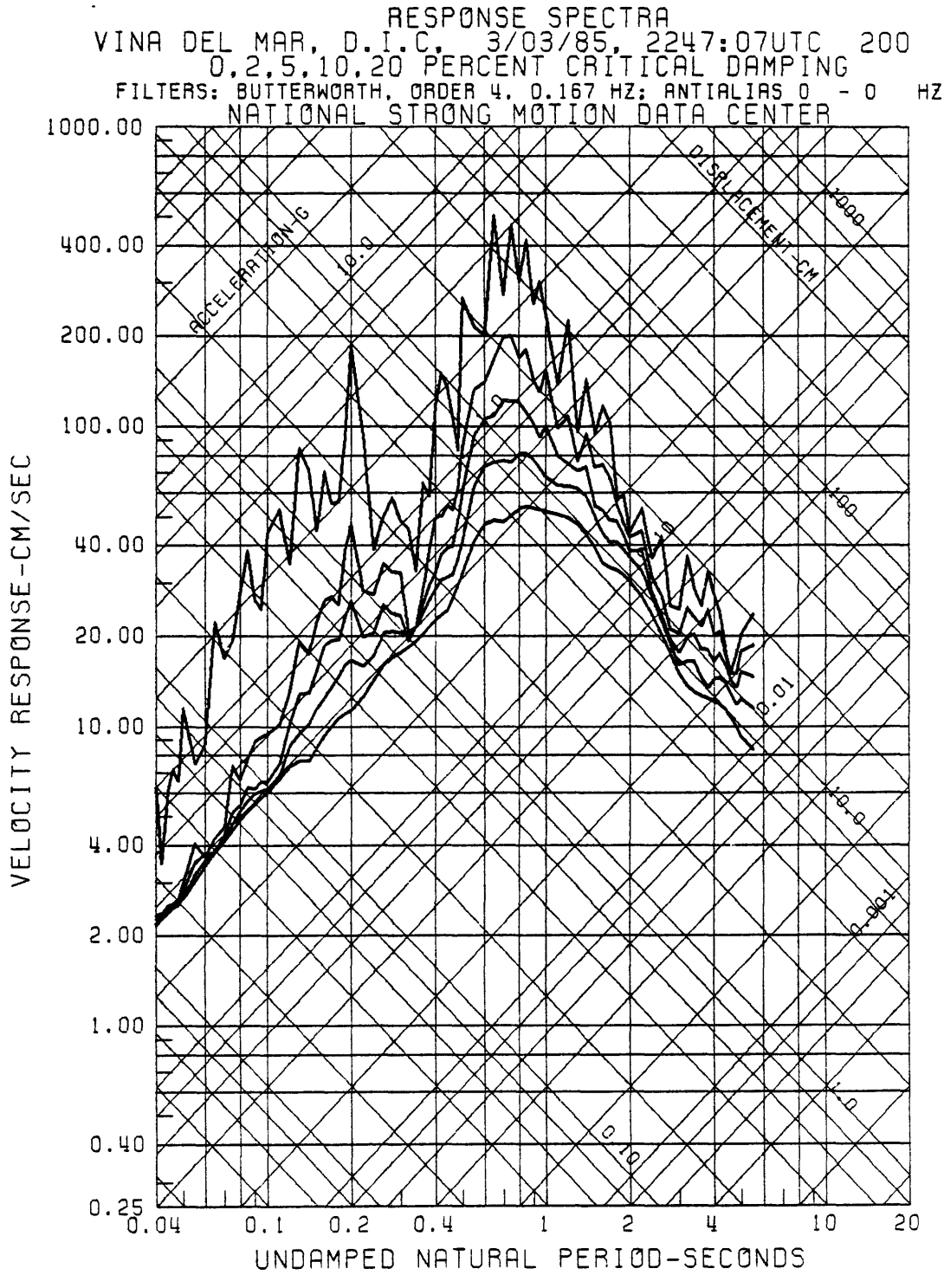

RESPONSE SPECTRA
LLOLLEO, D.I.C, 3/03/85, 2247:07UTC 100
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
10000.00
4000.00
2000.00
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.50
0.04
0.1
0.2
0.4
1
2
4
10
20

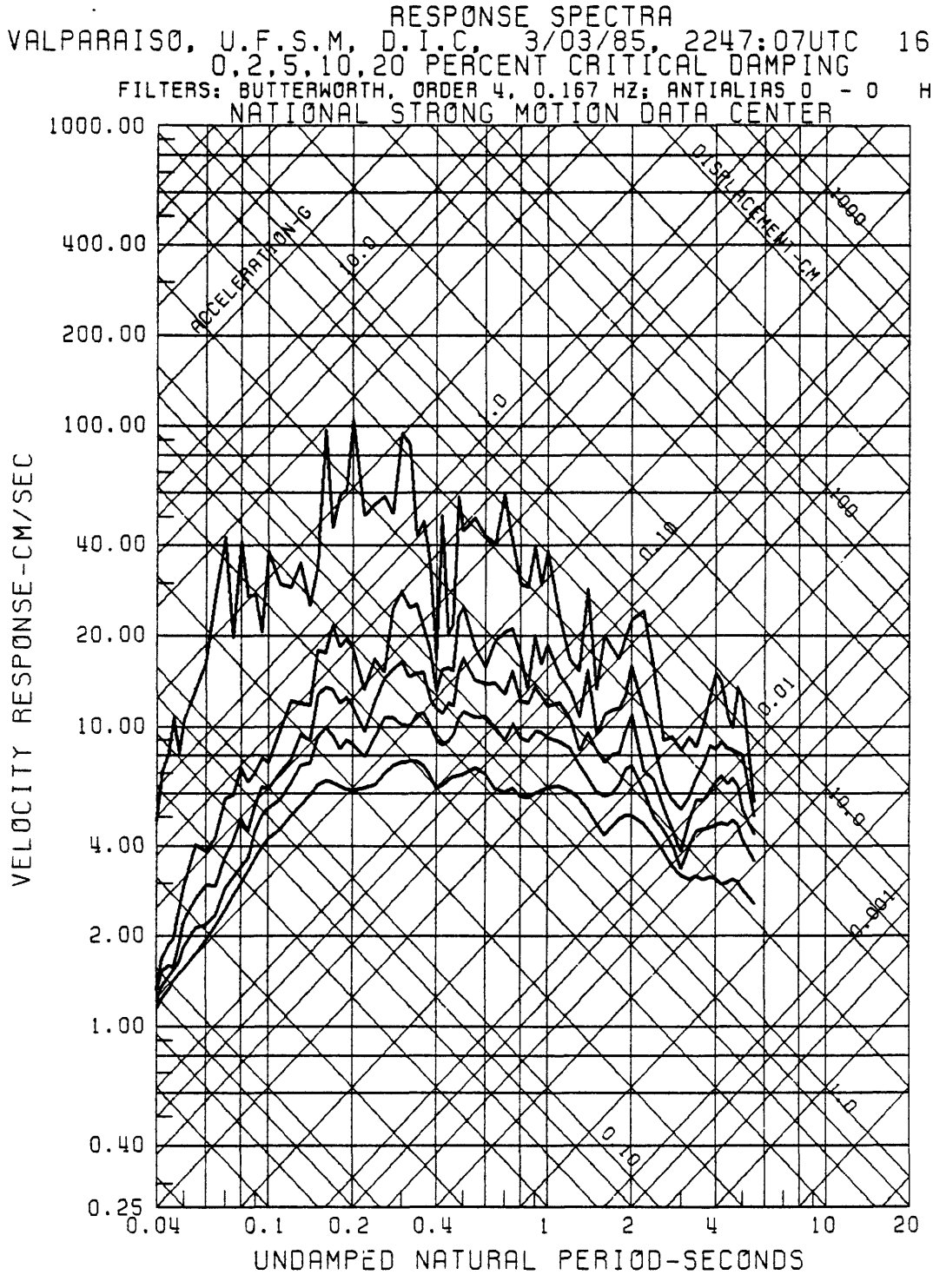

RESPONSE SPECTRA
LLOLLEO, D.I.C, 3/03/85, 2247:07UTC UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
10000.00
4000.00
2000.00
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.50
0.04
0.1
0.2
0.4
1
2
4
10
20

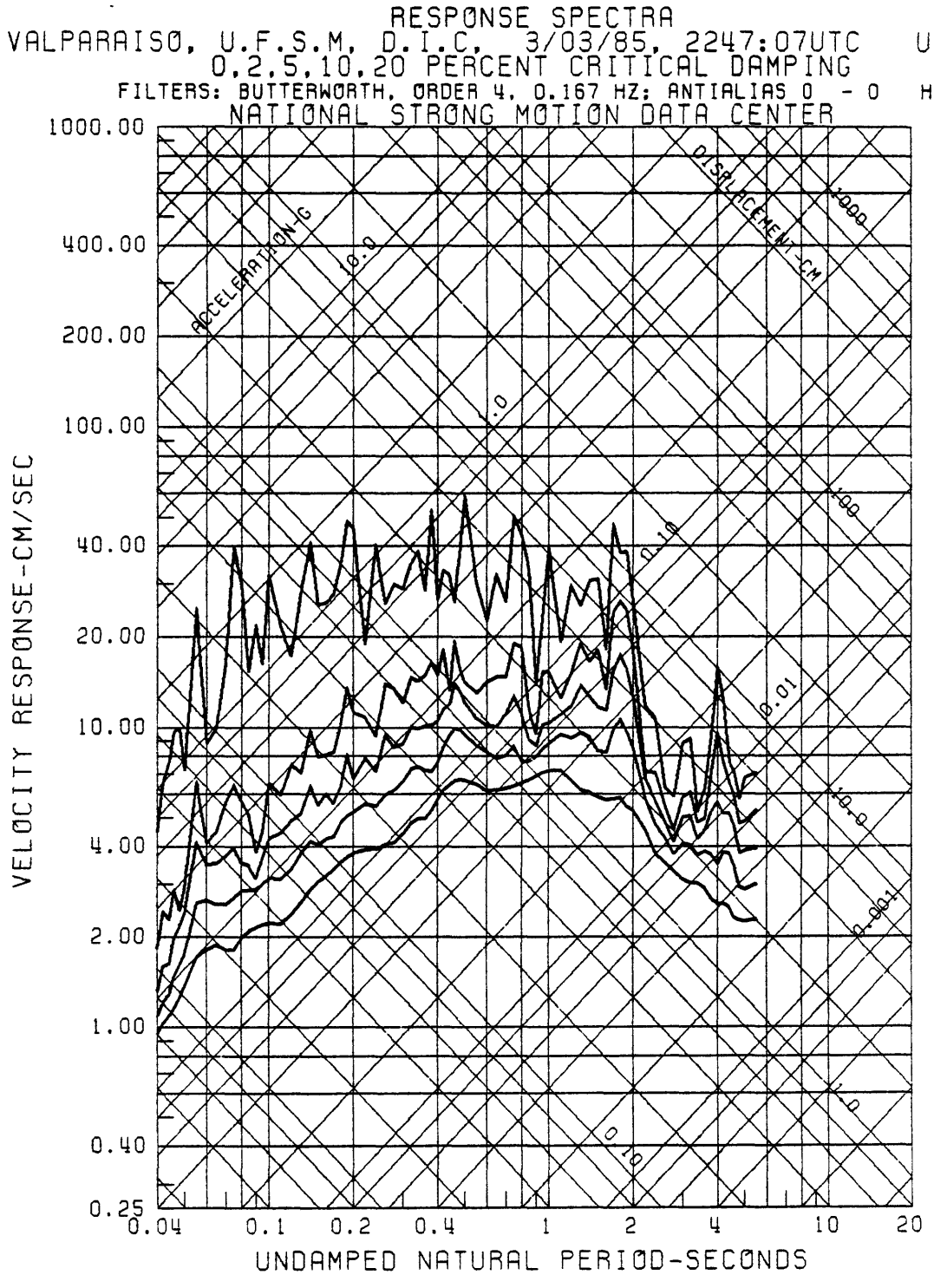

RESPONSE SPECTRA
LLOLLEO, D.I.C, 3/03/85, 2247:07UTC 10
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
10000.00
4000.00
2000.00
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.50
0.04
0.1
0.2
0.4
1
2
4
10
20

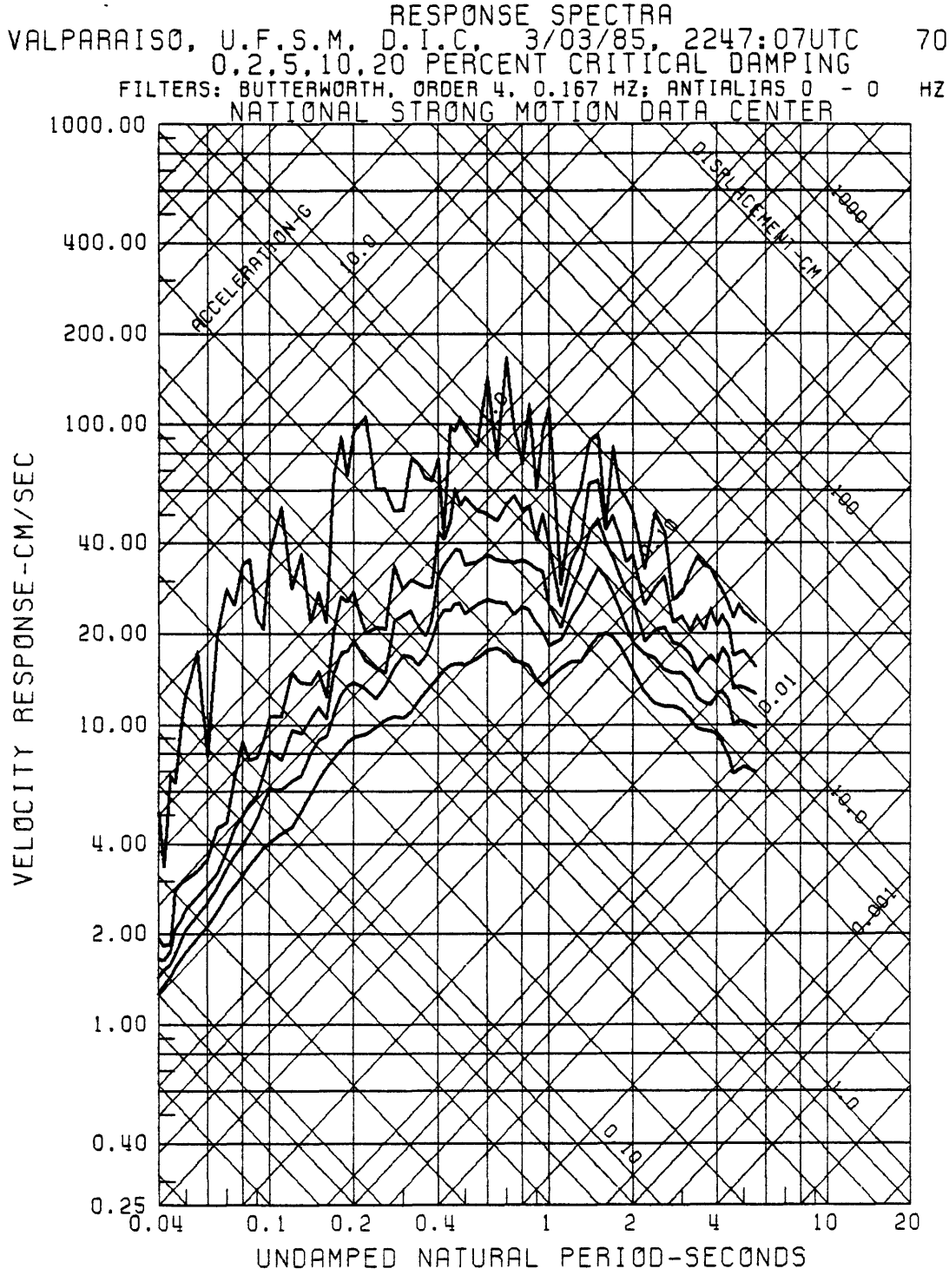

RESPONSE SPECTRA
VINA DEL MAR, D.I.C, 3/03/85, 2247:07UTC 290
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.1
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10
0.001

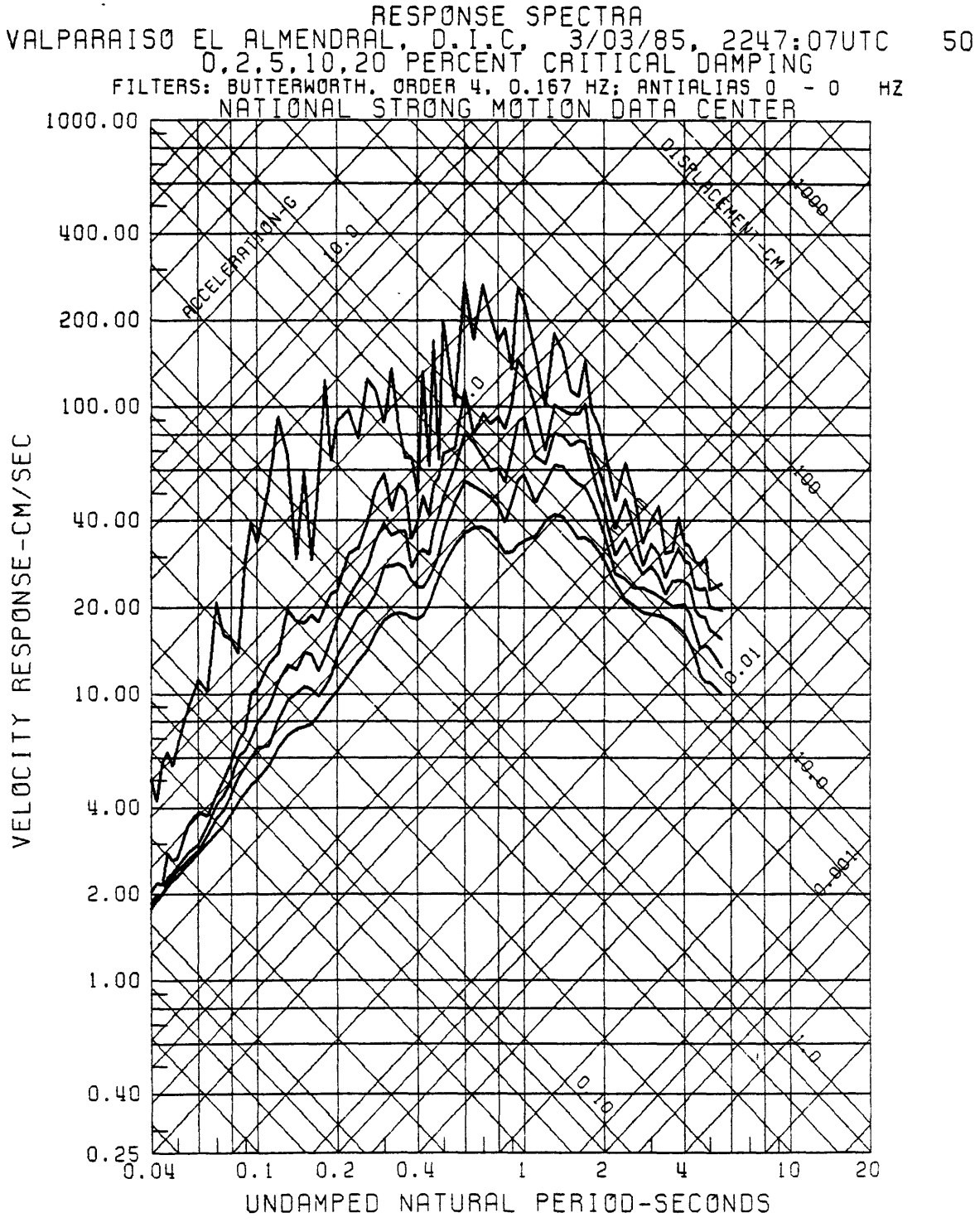

RESPONSE SPECTRA
VINA DEL MAR, D.I.C, 3/03/85, 2247:07UTC UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.10
0.01
0.001
1000
100
10.0
1.0
0.10
0.01
0.001

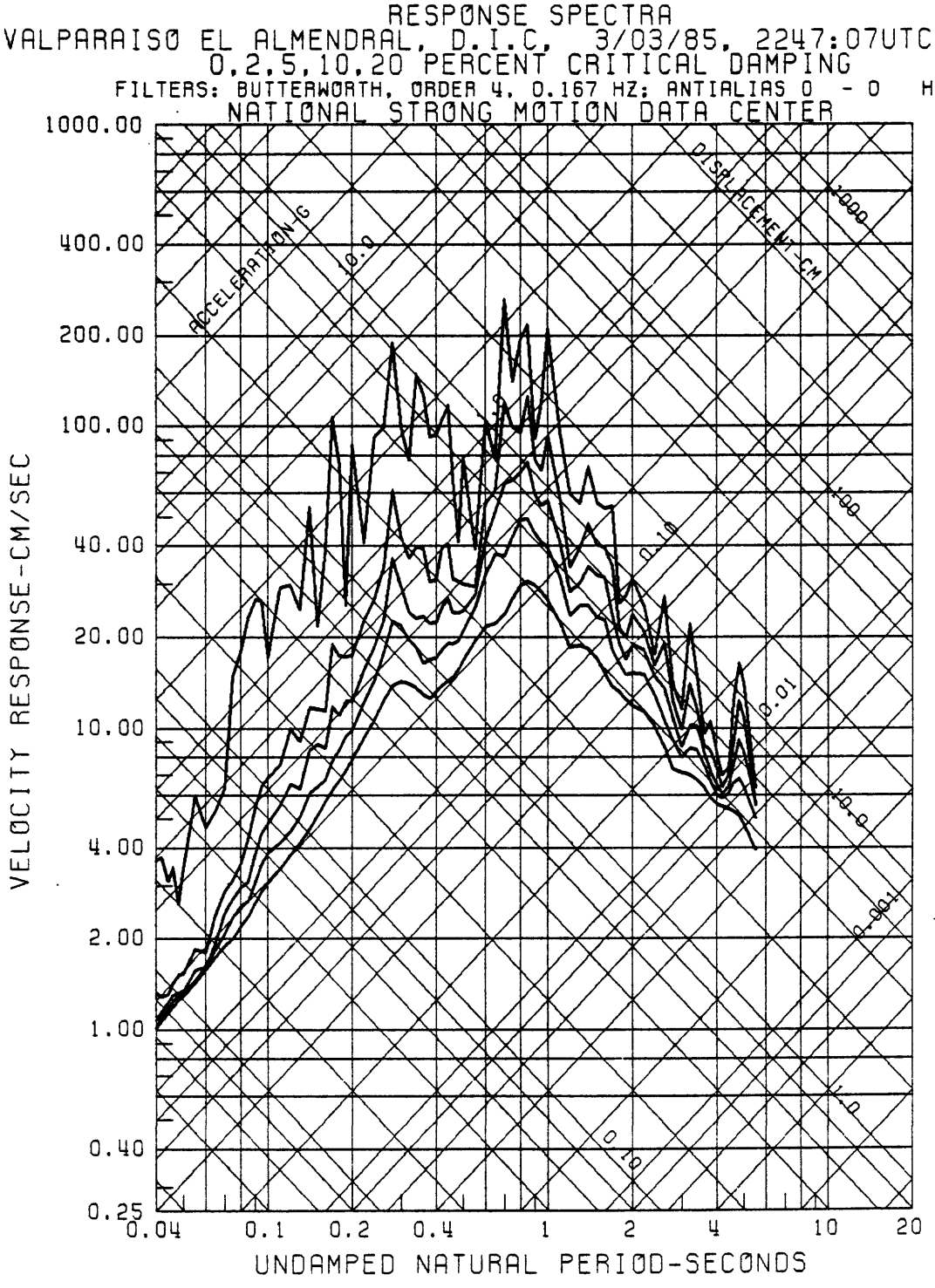

RESPONSE SPECTRA
VINA DEL MAR, D.I.C, 3/03/85, 2247:07UTC 200
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.1
0.01

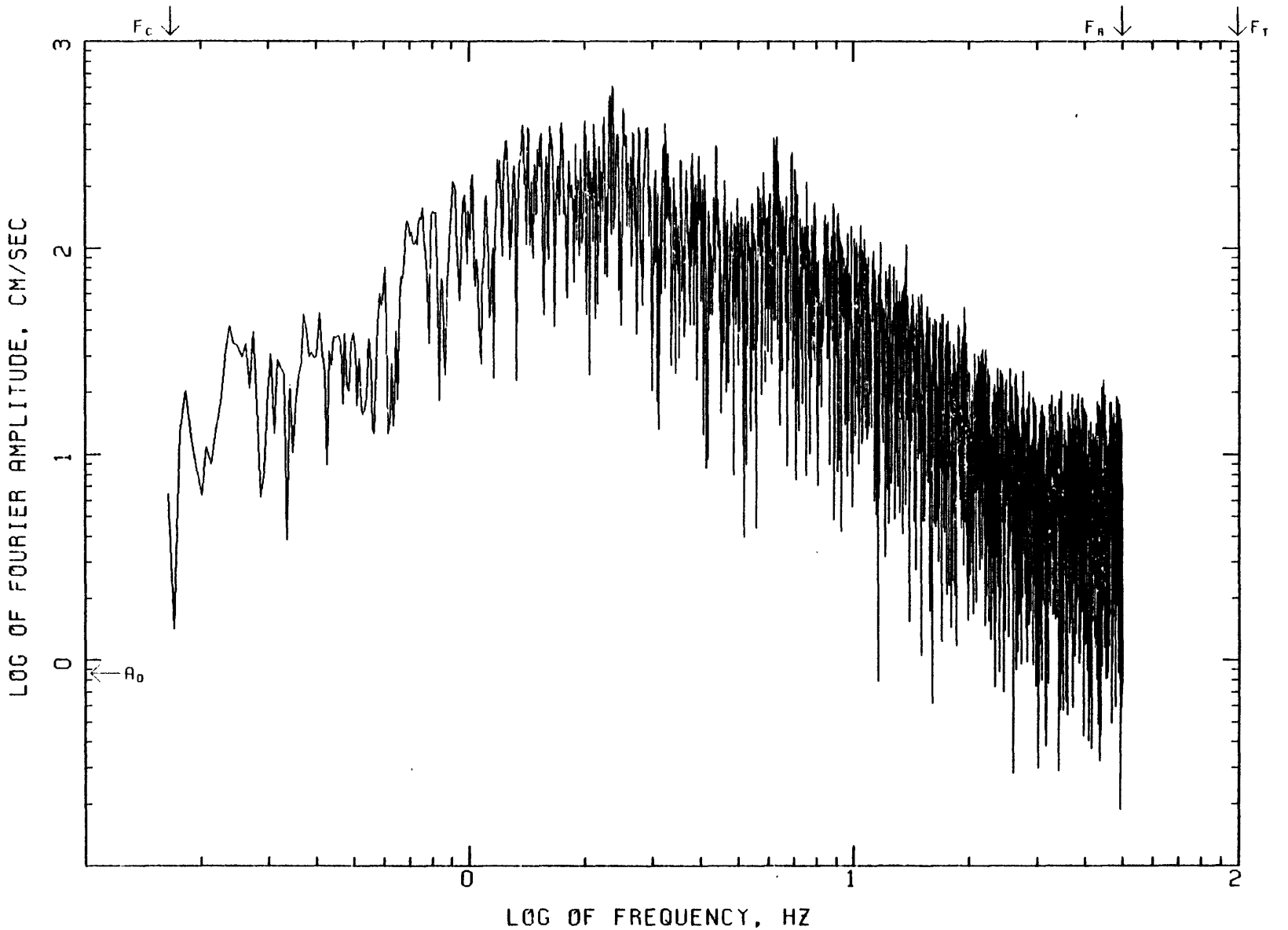

RESPONSE SPECTRA
VALPARAISO, U.F.S.M, D.I.C, 3/03/85, 2247:07UTC 160
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10
0.01

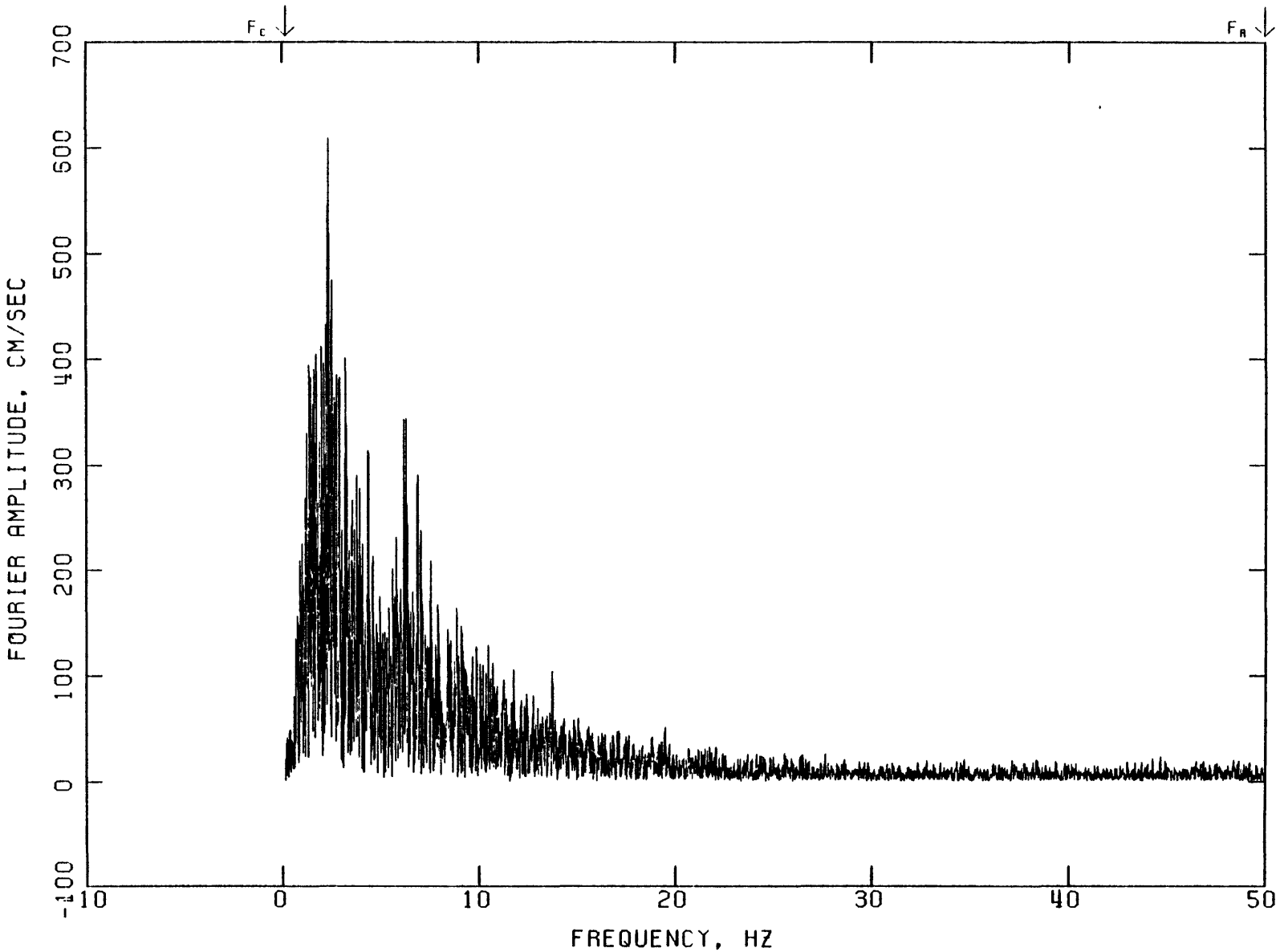

RESPONSE SPECTRA
VALPARAISO, U.F.S.M, D.I.C, 3/03/85, 2247:07UTC UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
ACCELERATION-G
DISPLACEMENT-CM
10.0
1.0
0.10
0.01
1000
100
10.0
1.0
0.10
0.01

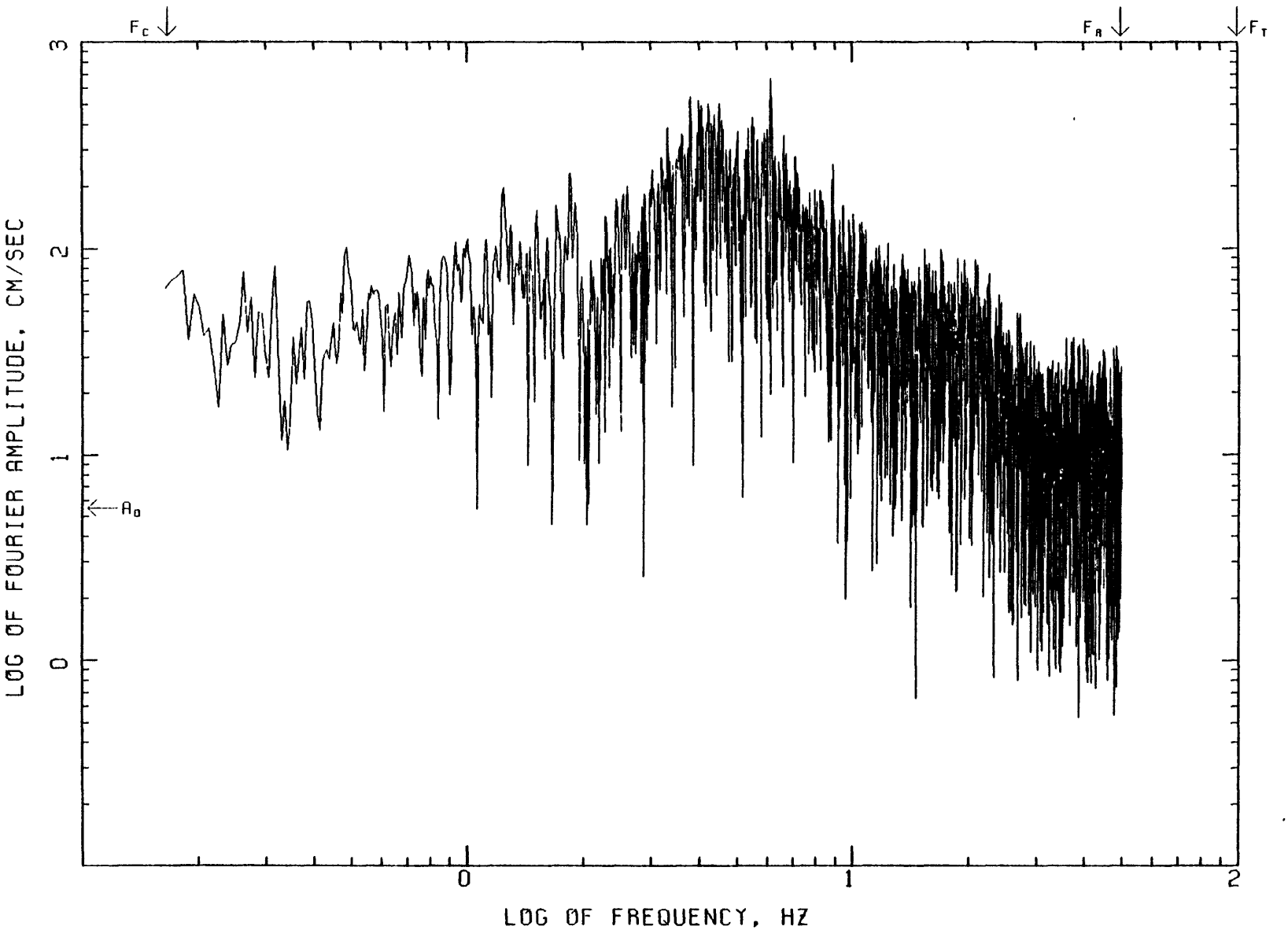

RESPONSE SPECTRA
VALPARAISO, U.F.S.M, D.I.C, 3/03/85, 2247:07UTC 70
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
ACCELERATION-G
DISPLACEMENT-CM
10.0
1.0
0.10
0.01
1000
100
10.0
1.0
0.01

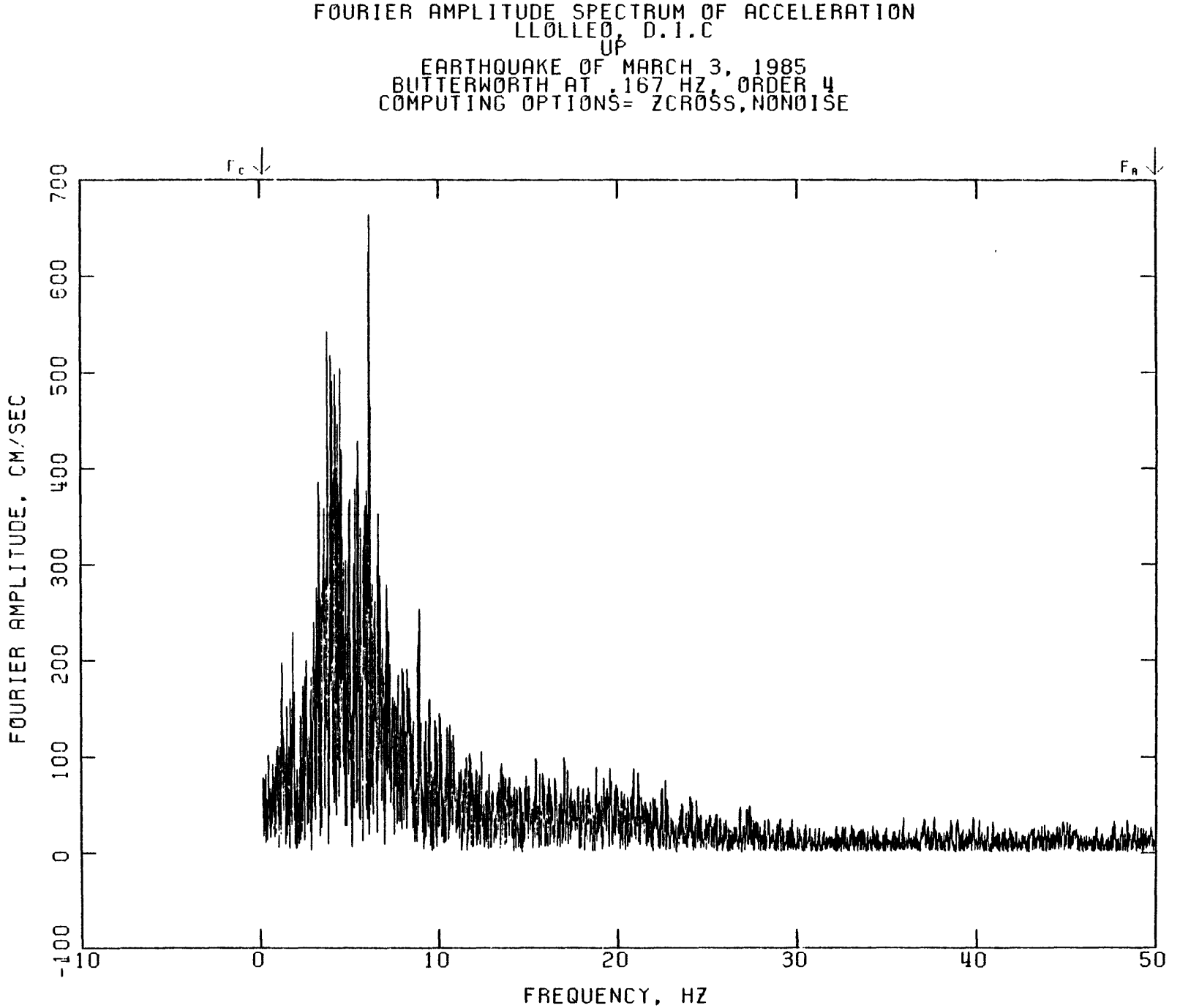

RESPONSE SPECTRA
VALPARAISO EL ALMENDRAL, D.I.C, 3/03/85, 2247:07UTC
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
50
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
VELOCITY RESPONSE-CM/SEC
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
10.0
1.0
0.10
0.01
1000
100
10.0
1.0
0.001
0

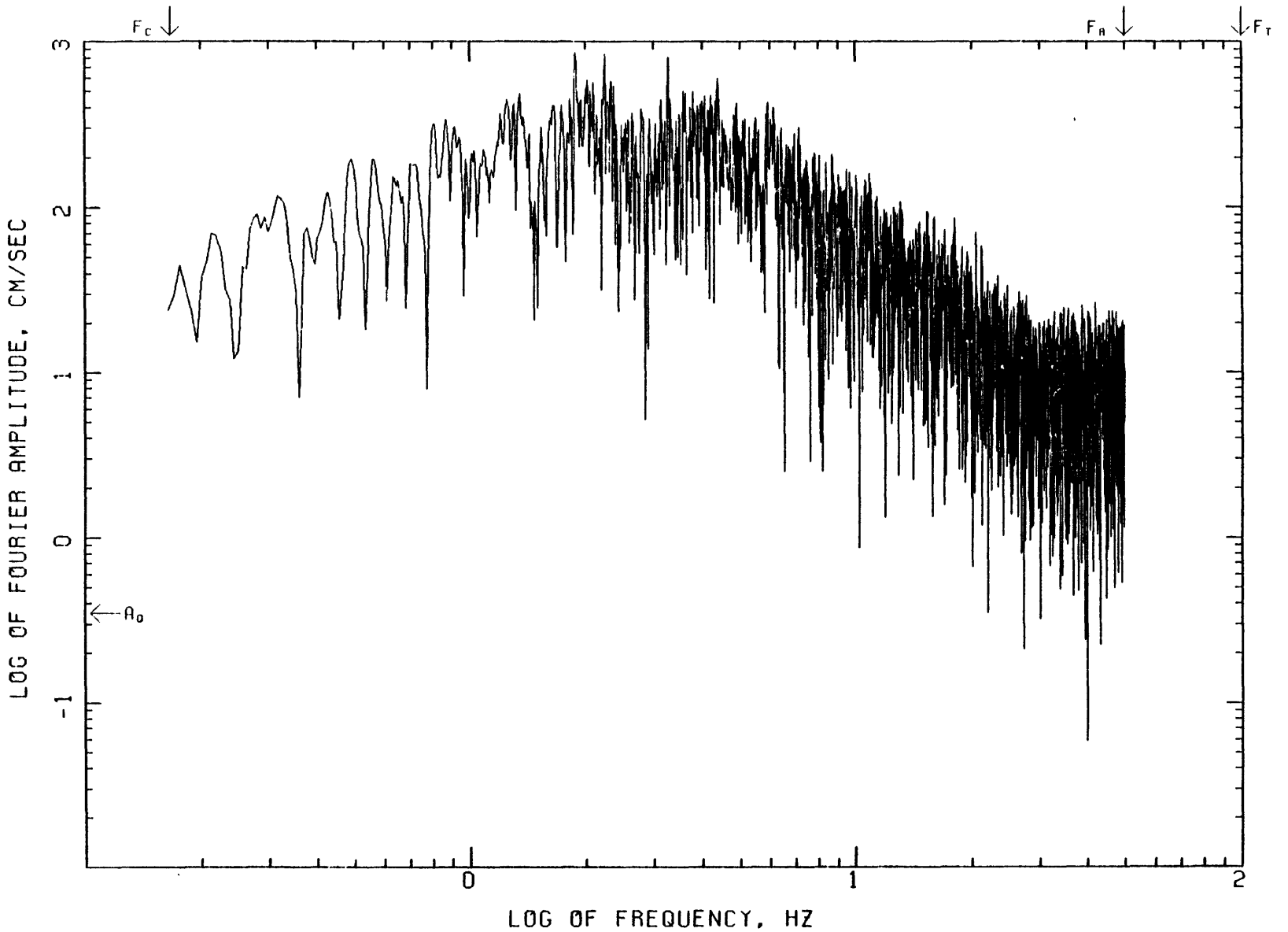

RESPONSE SPECTRA
VALPARAISO EL ALMENDRAL, D.I.C, 3/03/85, 2247:07UTC 140
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 0 - 0 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
10.0
1.0
0.1
0.01
0.001
100
10.0
1.0
0.10
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20

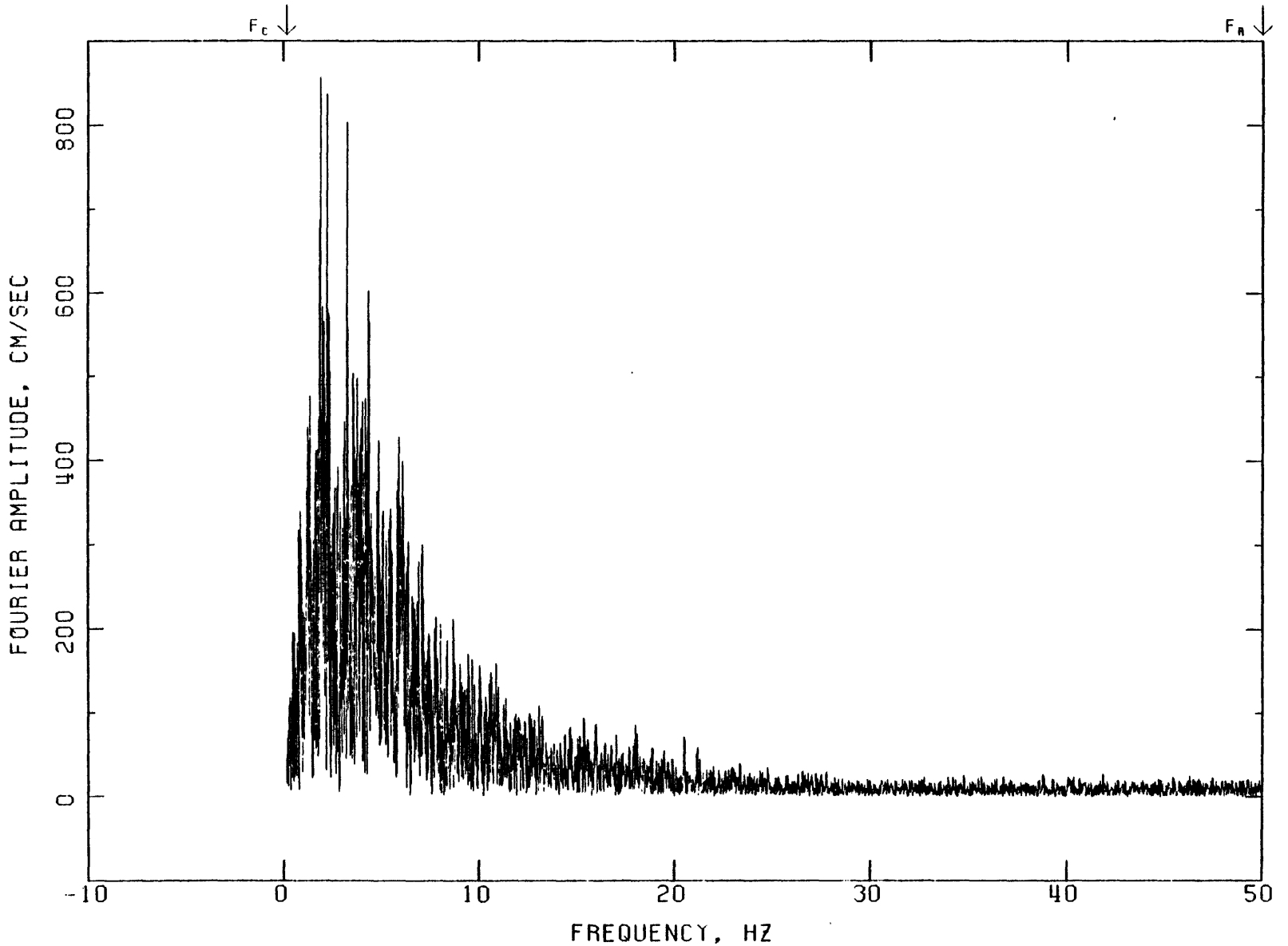

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO, D.I.C
100 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
A0
3
2
1
0
0
1
2

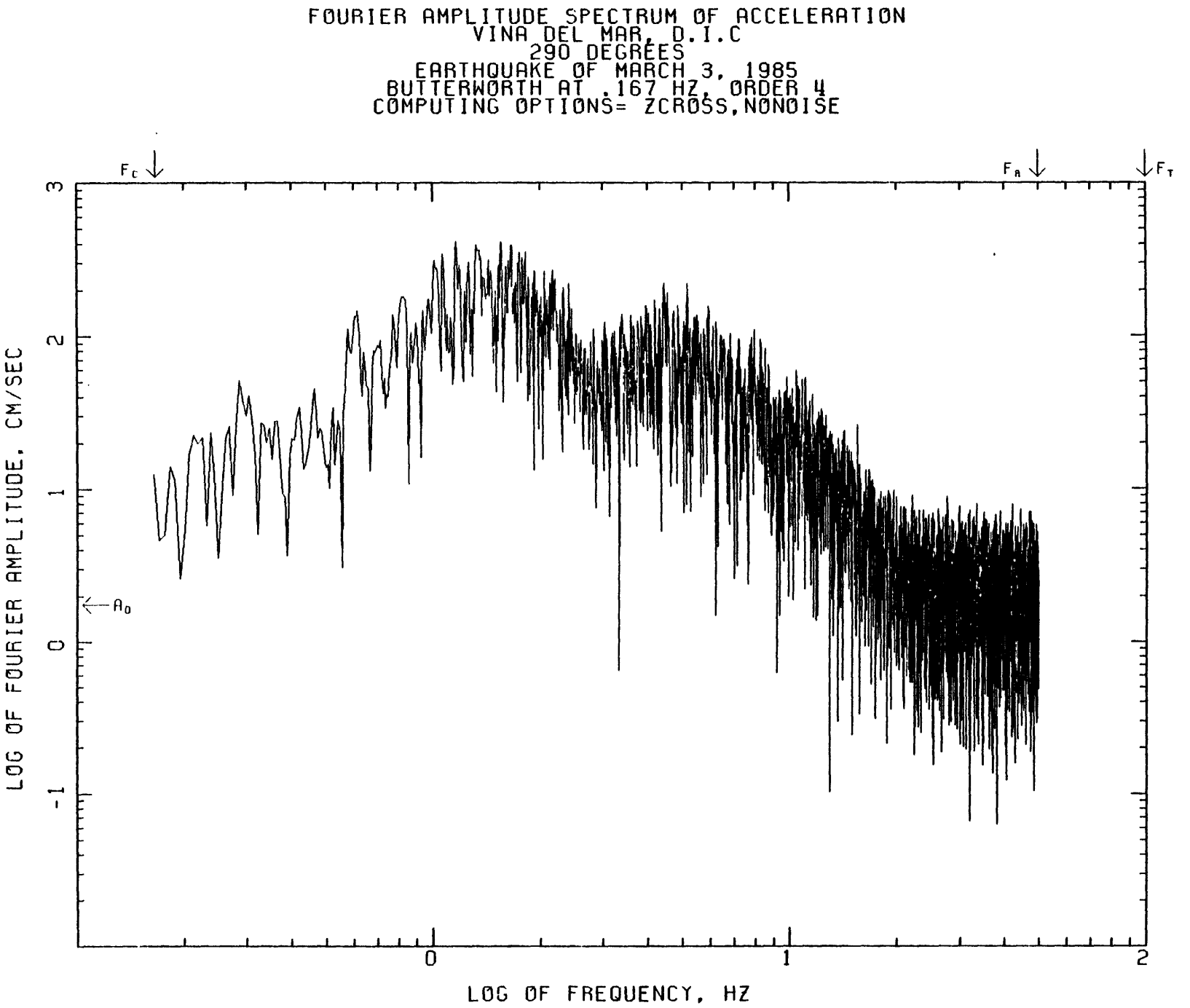

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO, D.I.C
100 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_A
FOURIER AMPLITUDE, CM/SEC
700
600
500
400
300
200
100
0
-100
-10
0
10
20
30
40
50
FREQUENCY, HZ


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO, D.I.C
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
0
1
2
3

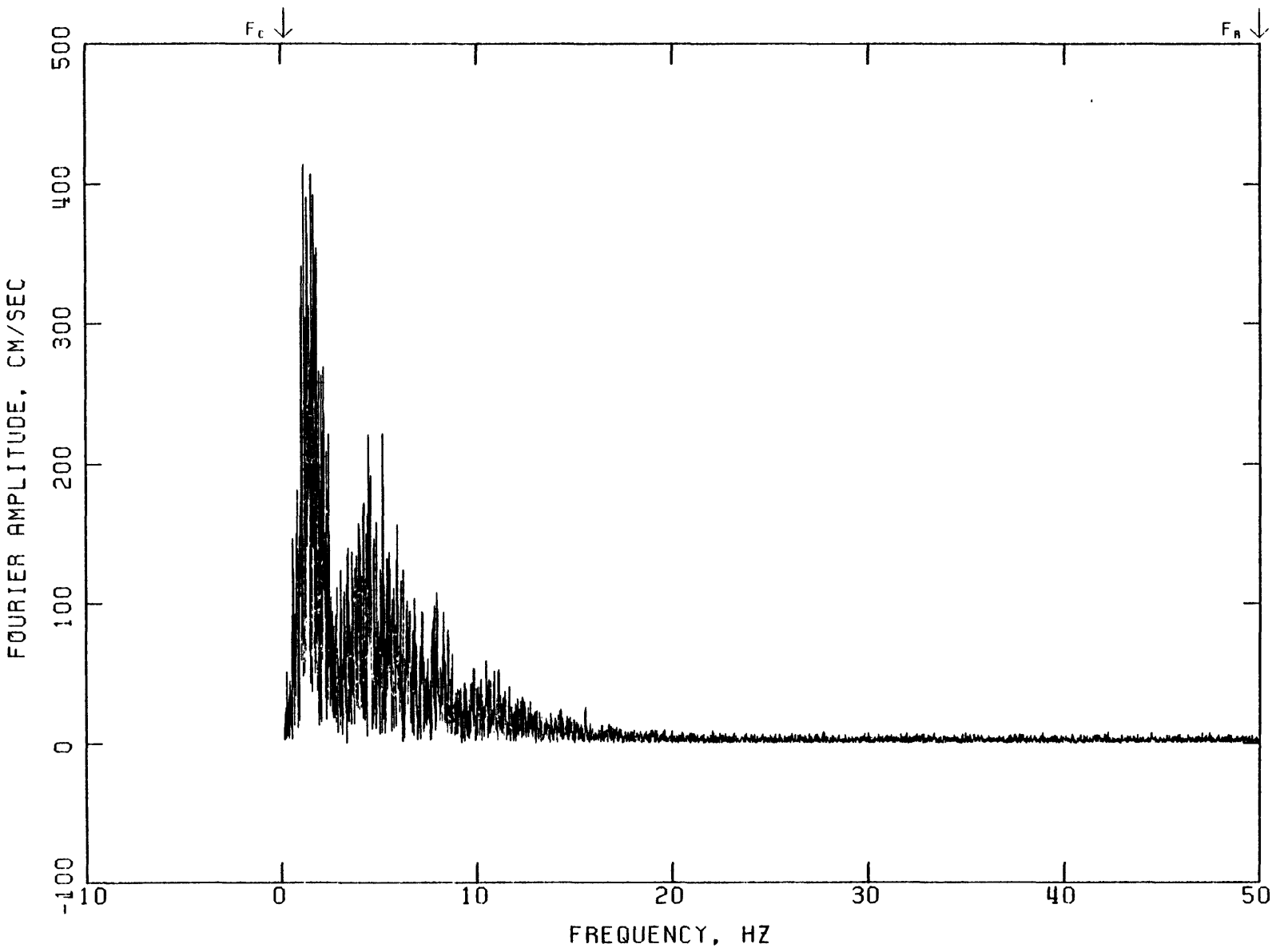

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO, D.I.C
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FOURIER AMPLITUDE, CM/SEC
700
600
500
400
300
200
100
0
-100
-10
0
10
20
30
40
50
FREQUENCY, HZ

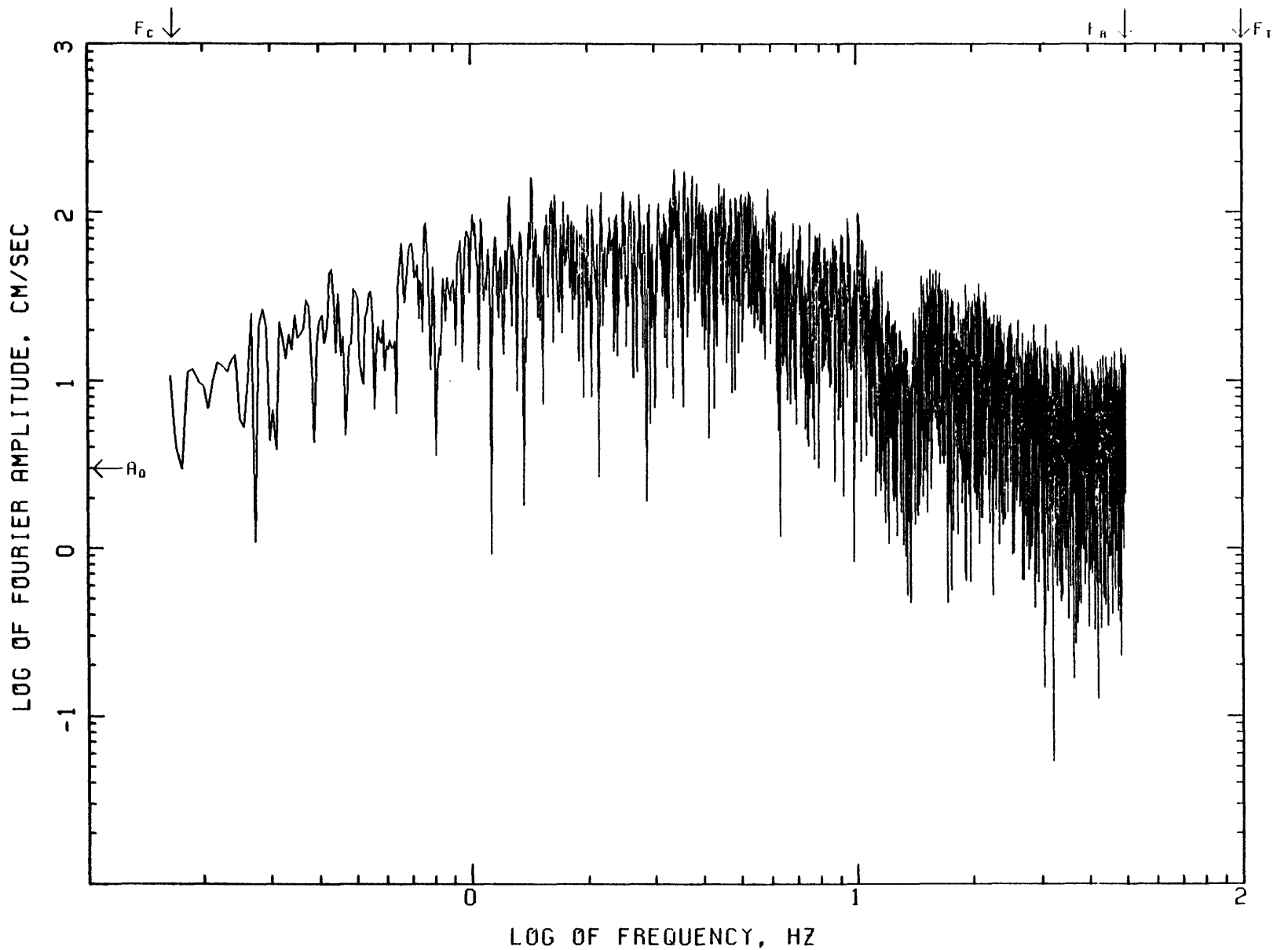

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO, D.I.C
010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

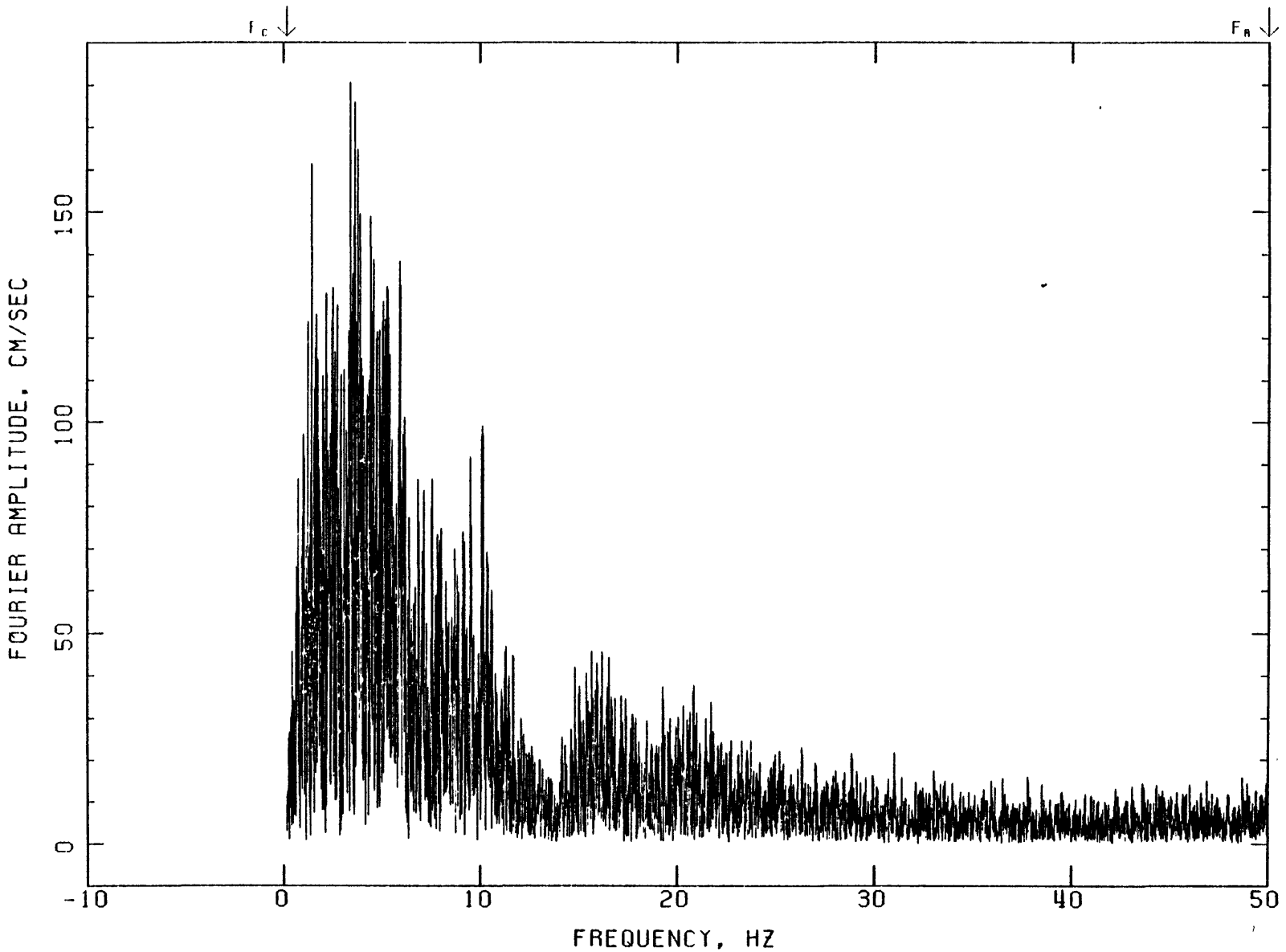

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO, D.I.C
010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FN
FOURIER AMPLITUDE, CM/SEC
0
200
400
600
800
-10
0
10
20
30
40
50
FREQUENCY, HZ

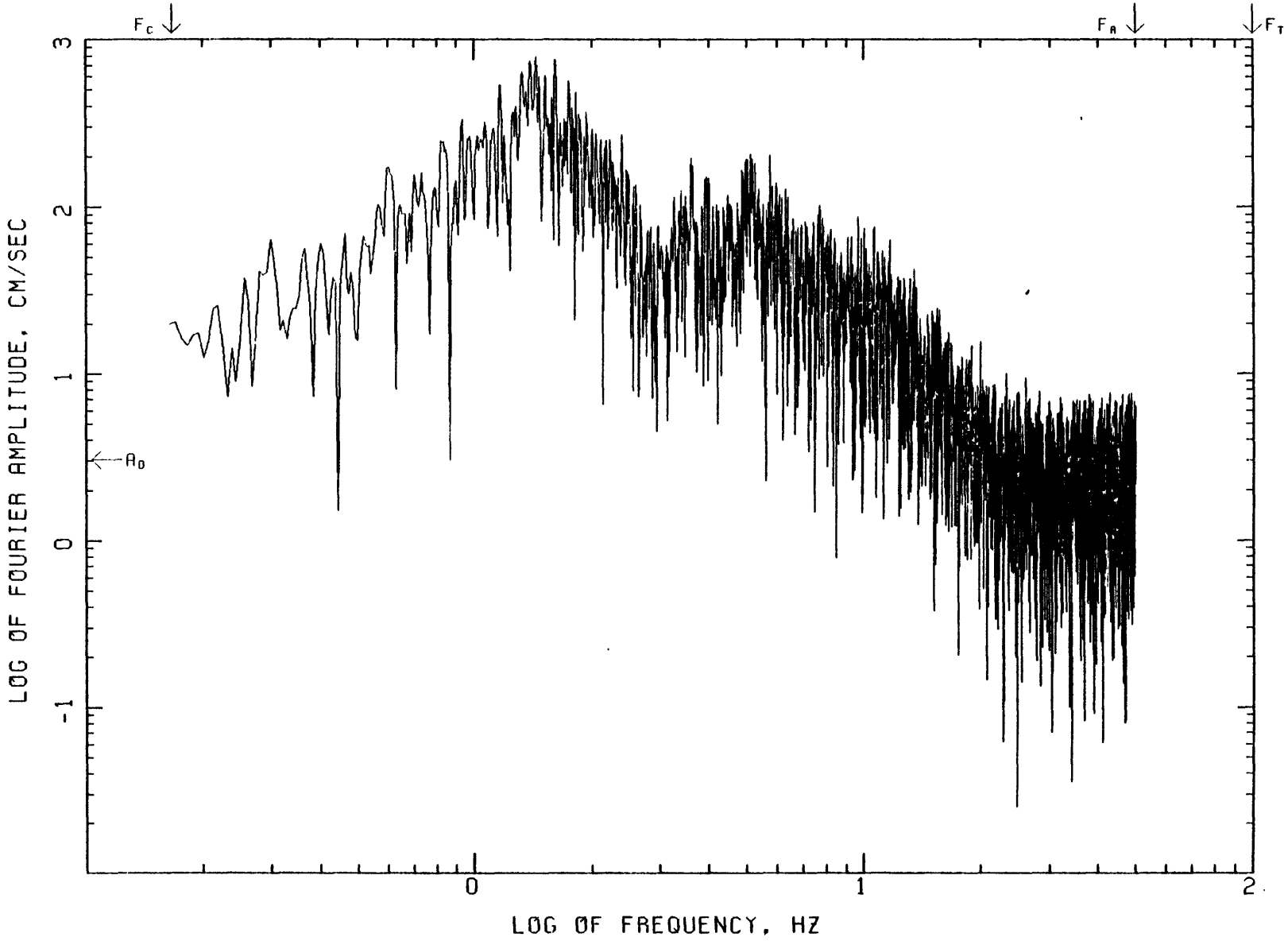

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR, D.I.C
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_A
F_T
A_0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

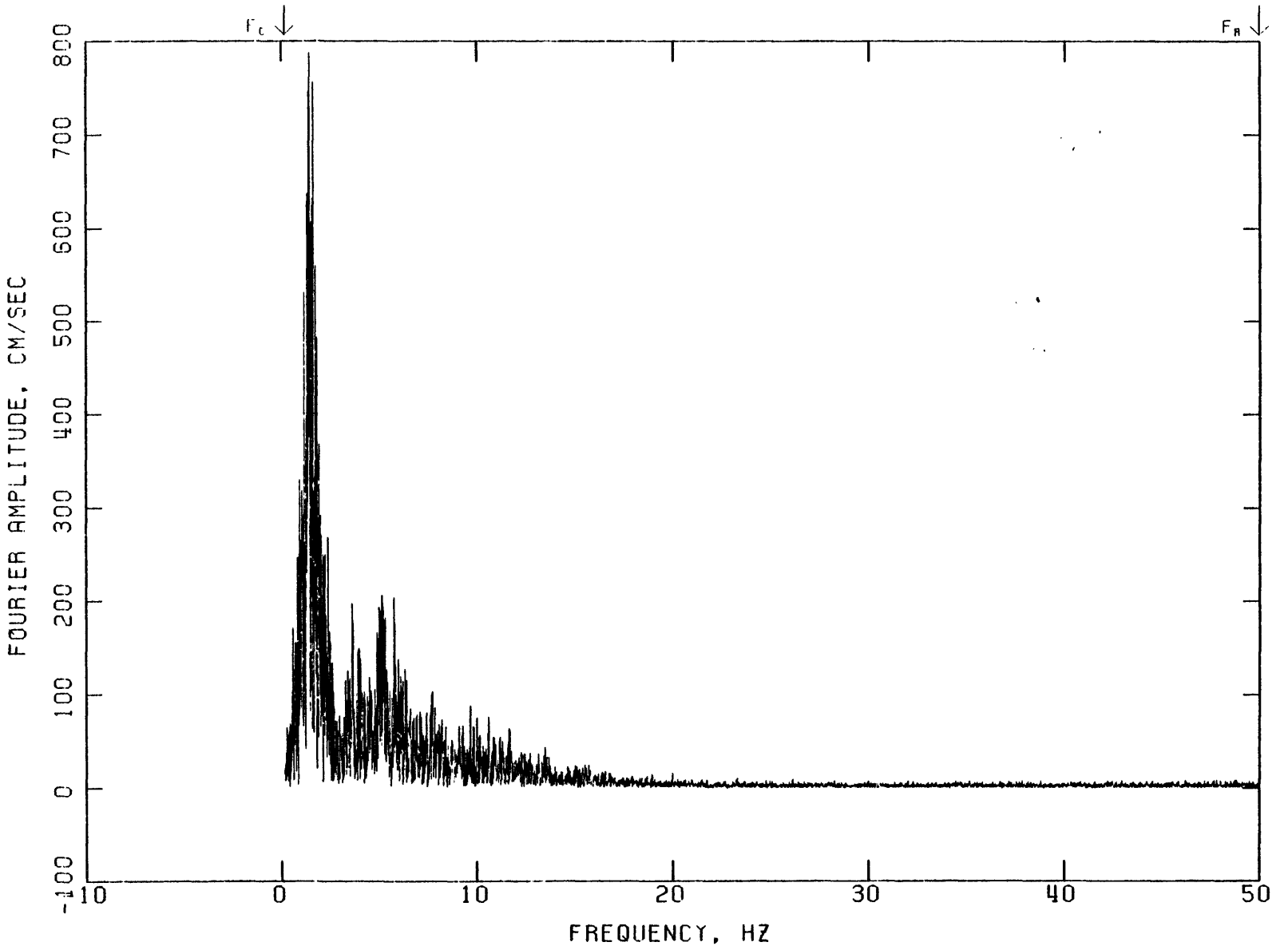
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR, D.I.C
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

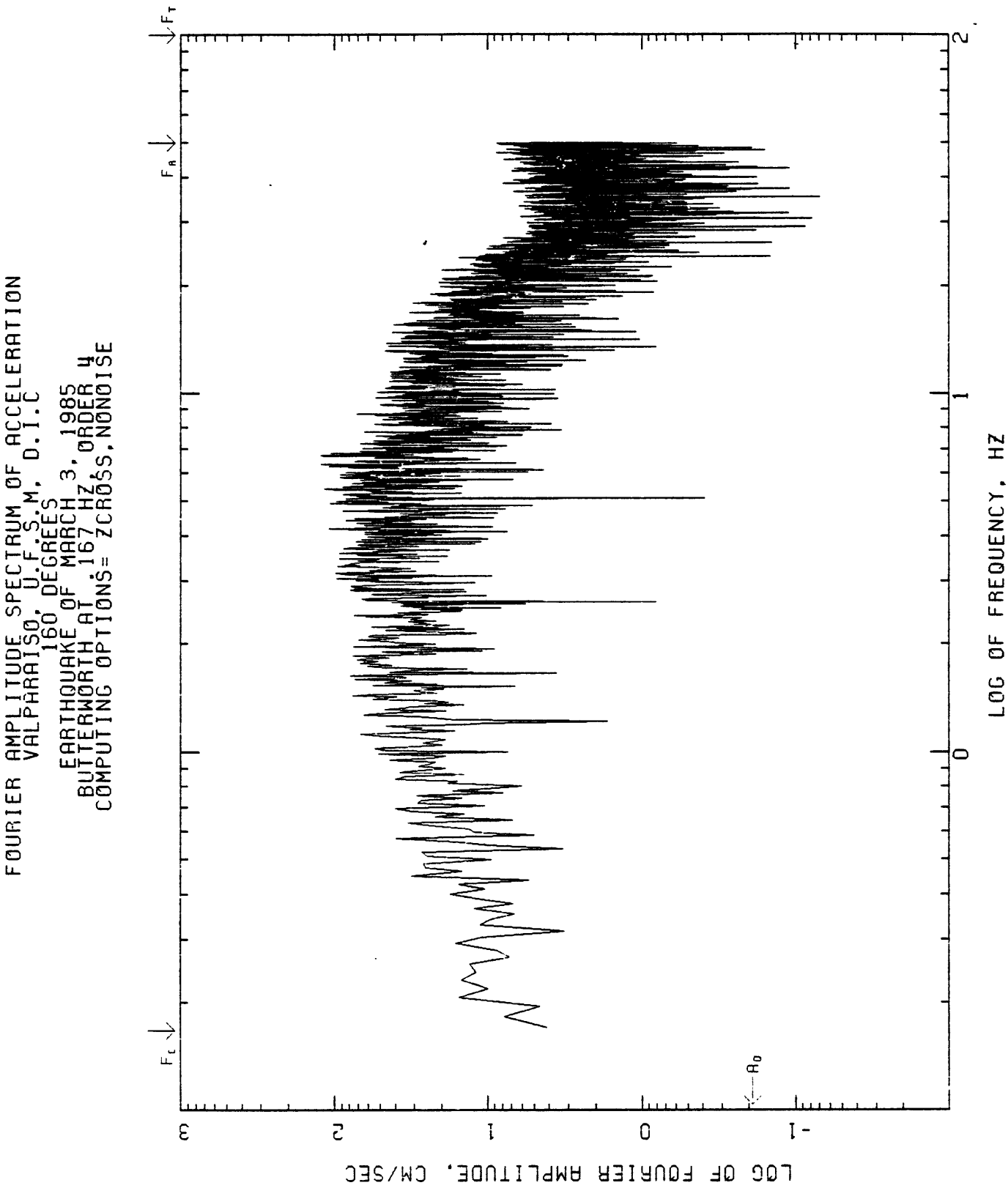



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR, D.I.C
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

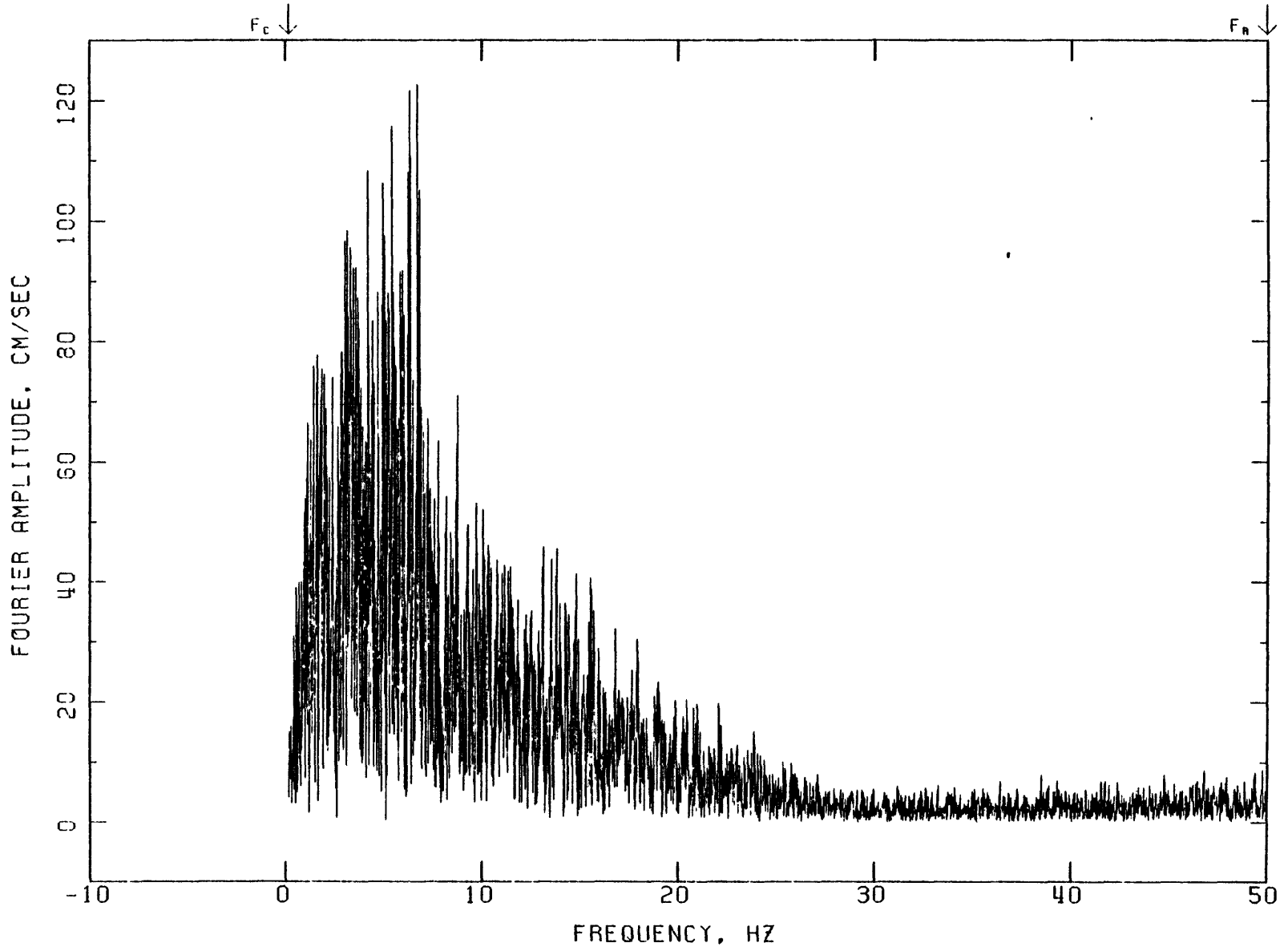

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR, D.I.C
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_A
FOURIER AMPLITUDE, CM/SEC
0
50
100
150
-10
0
10
20
30
40
50
FREQUENCY, HZ


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR, D.I.C
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
AO
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

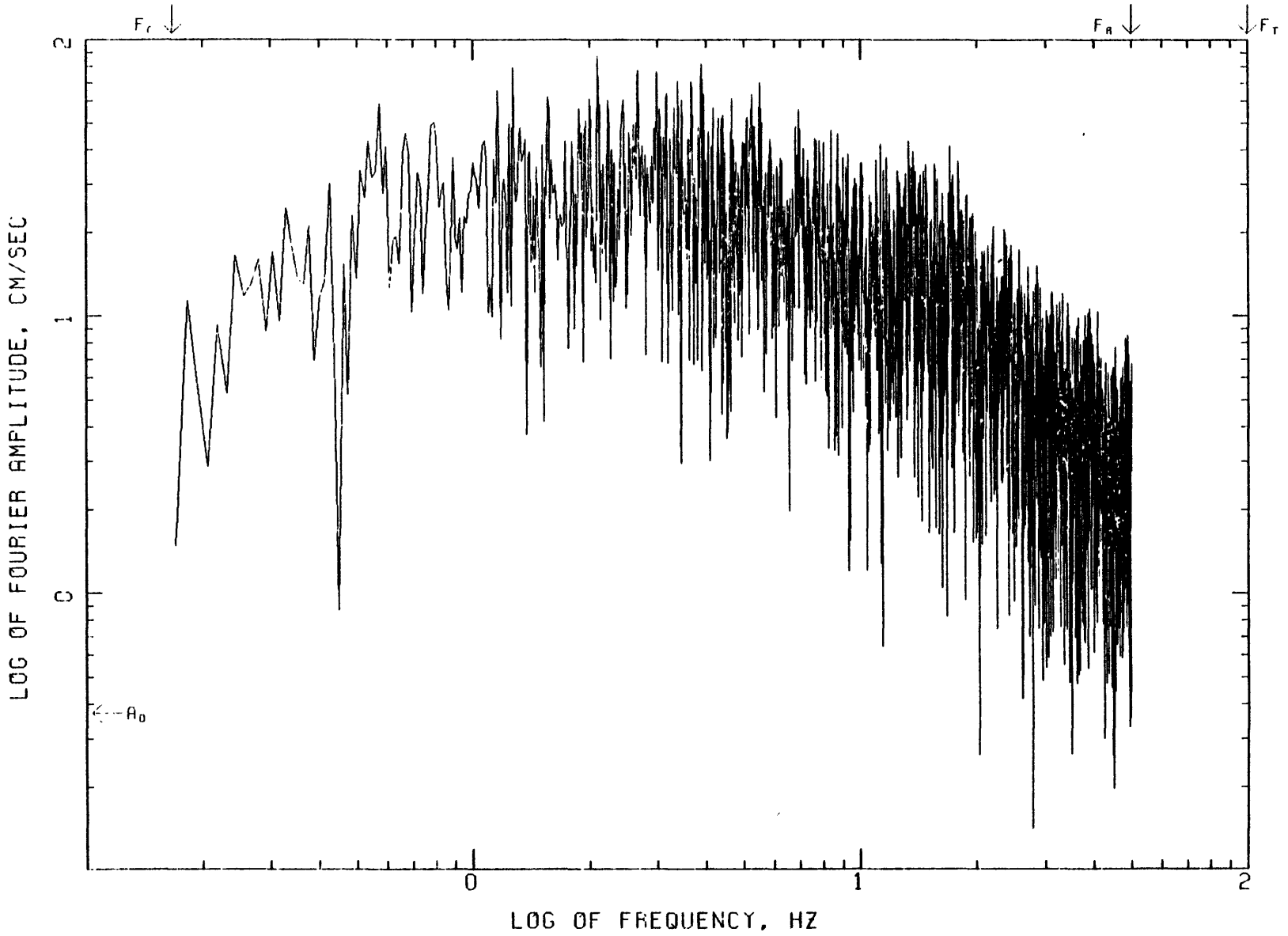

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR, D.I.C
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_L
F_H
FOURIER AMPLITUDE, CM/SEC
-100
0
100
200
300
400
500
600
700
800
-10
0
10
20
30
40
50
FREQUENCY, HZ


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.F.S.M, D.I.C
160, DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
F_T
F_A
F_C
A_O
3
2
1
0
-1
2
1
0

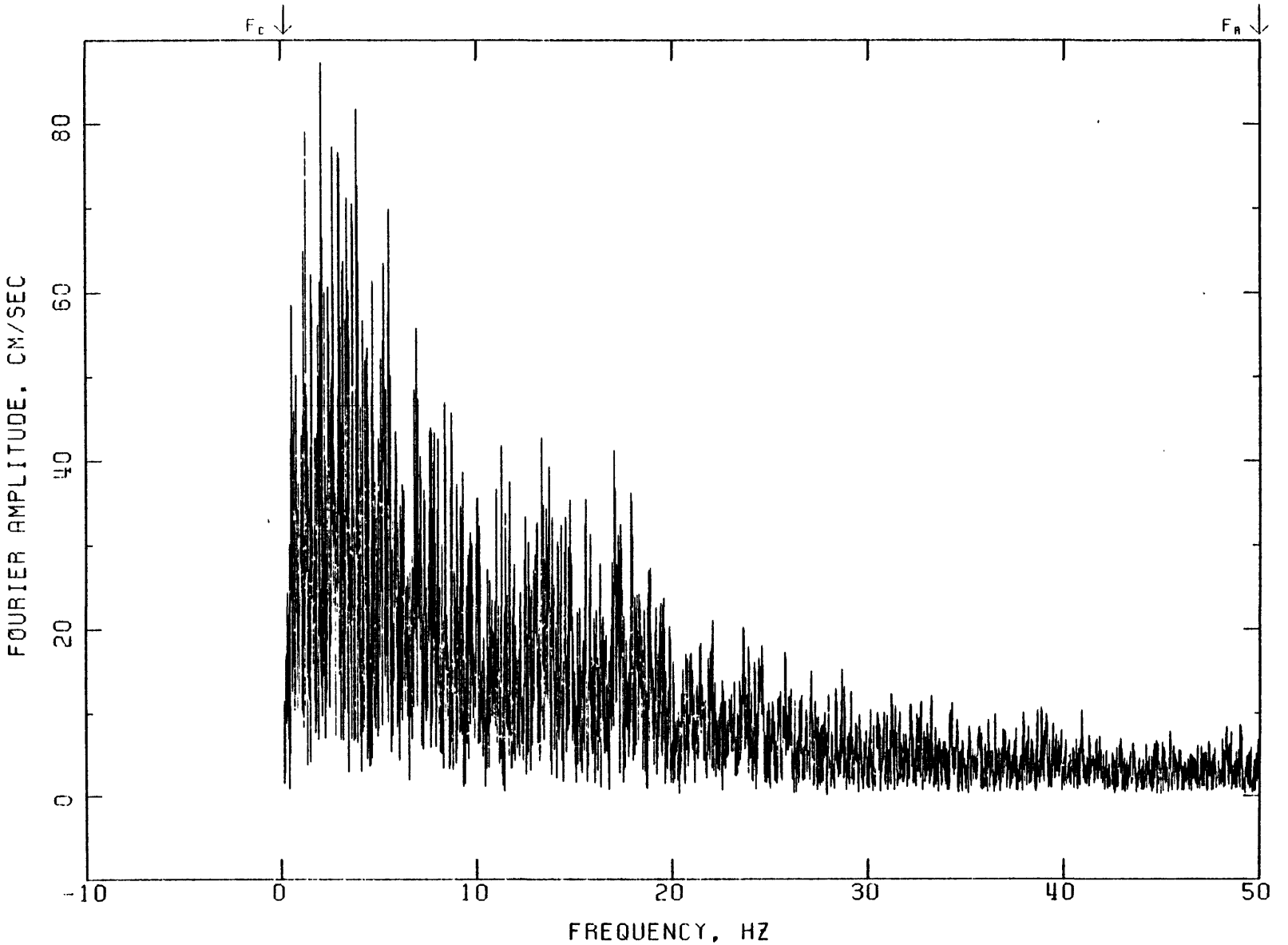
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.F.S.M, D.I.C
160 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

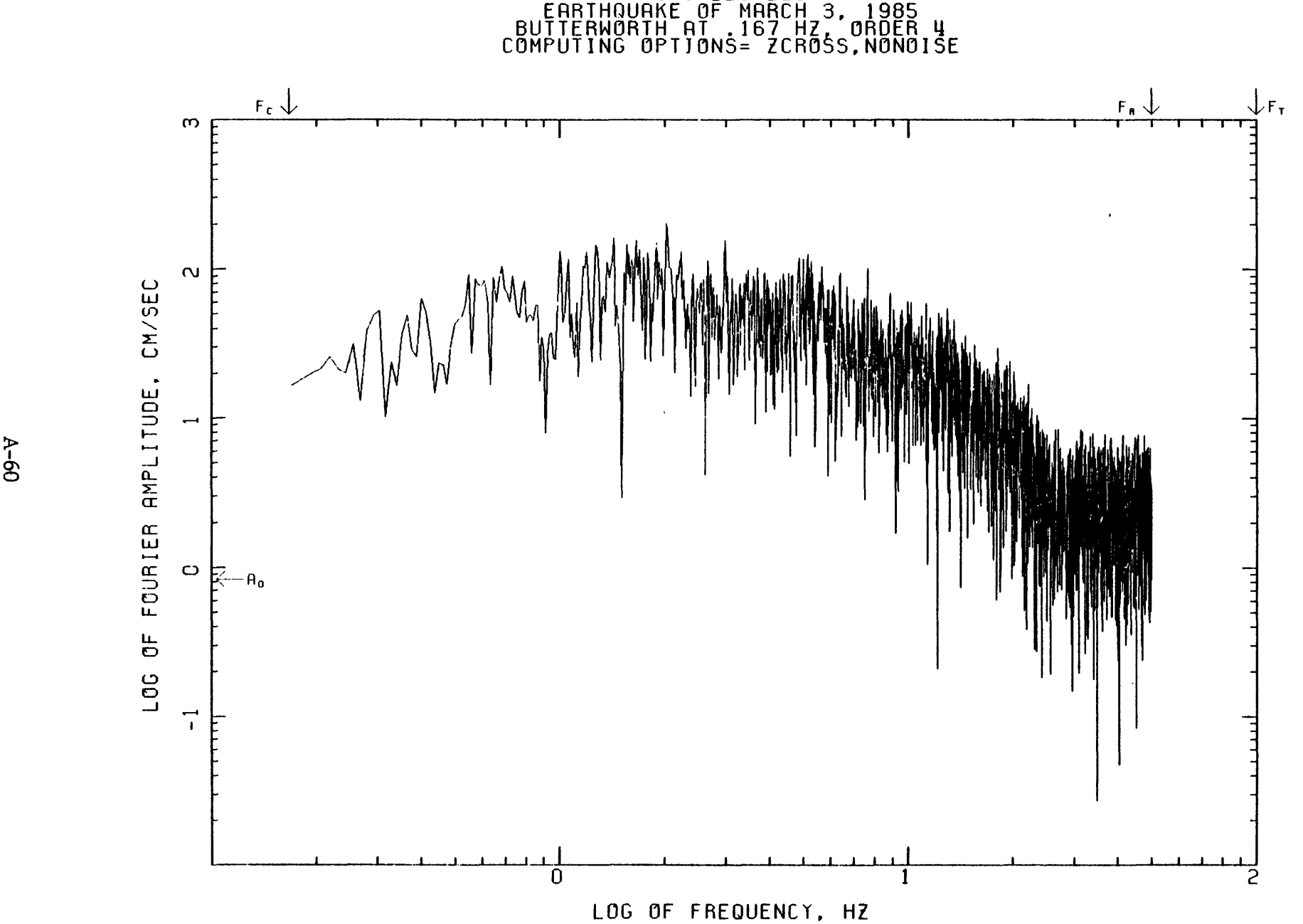


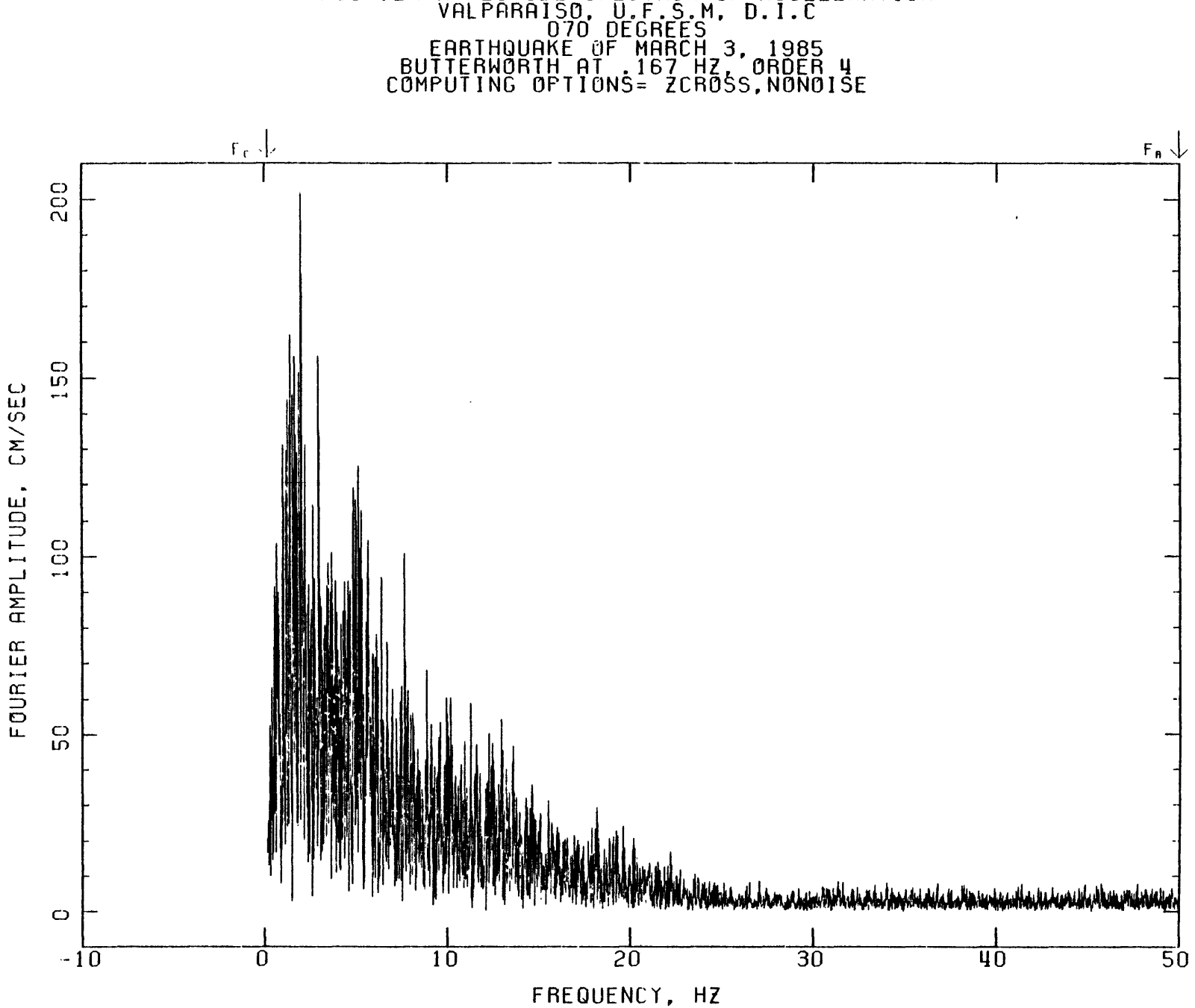
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.F.S.M, D.I.C
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

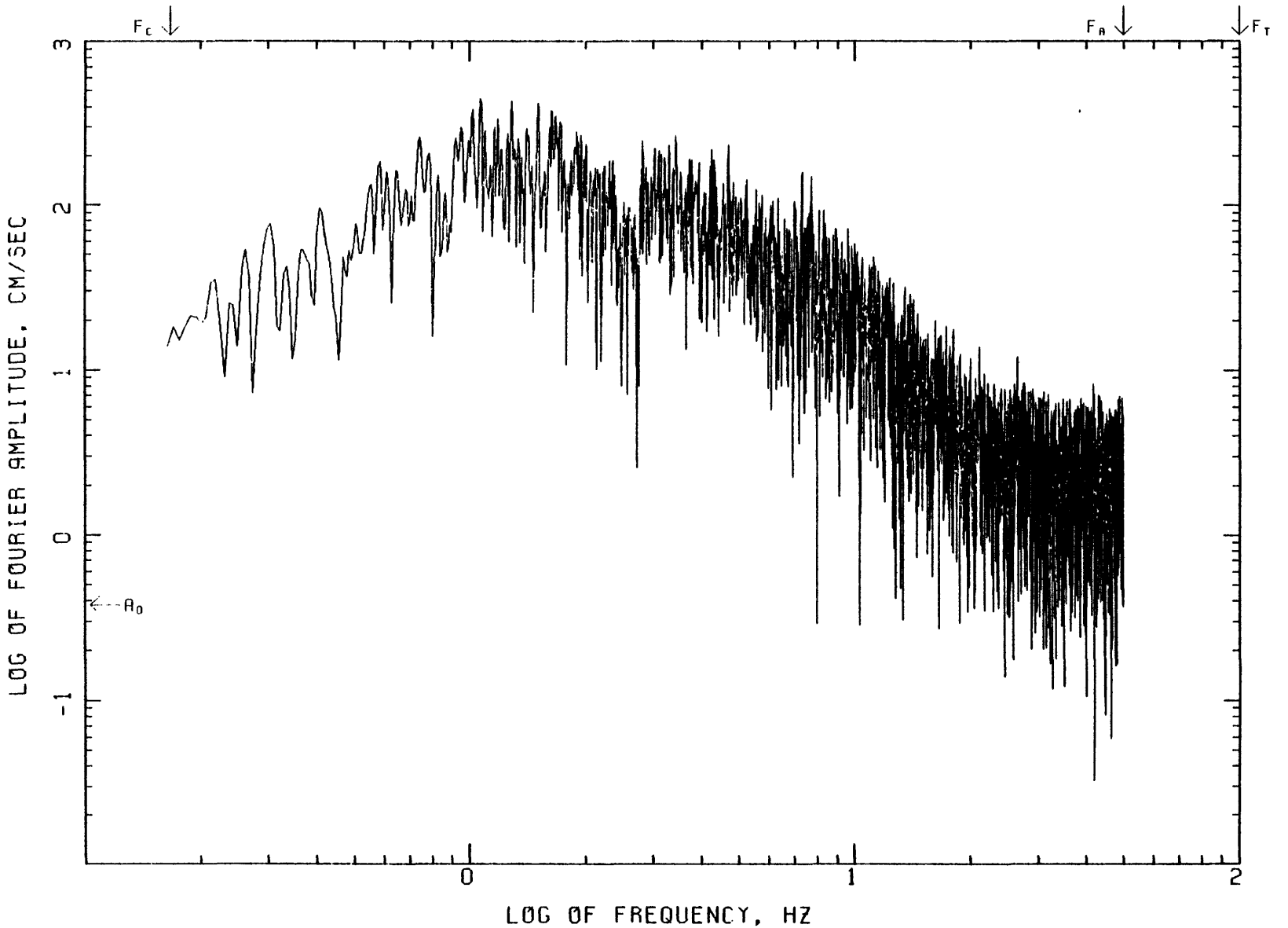


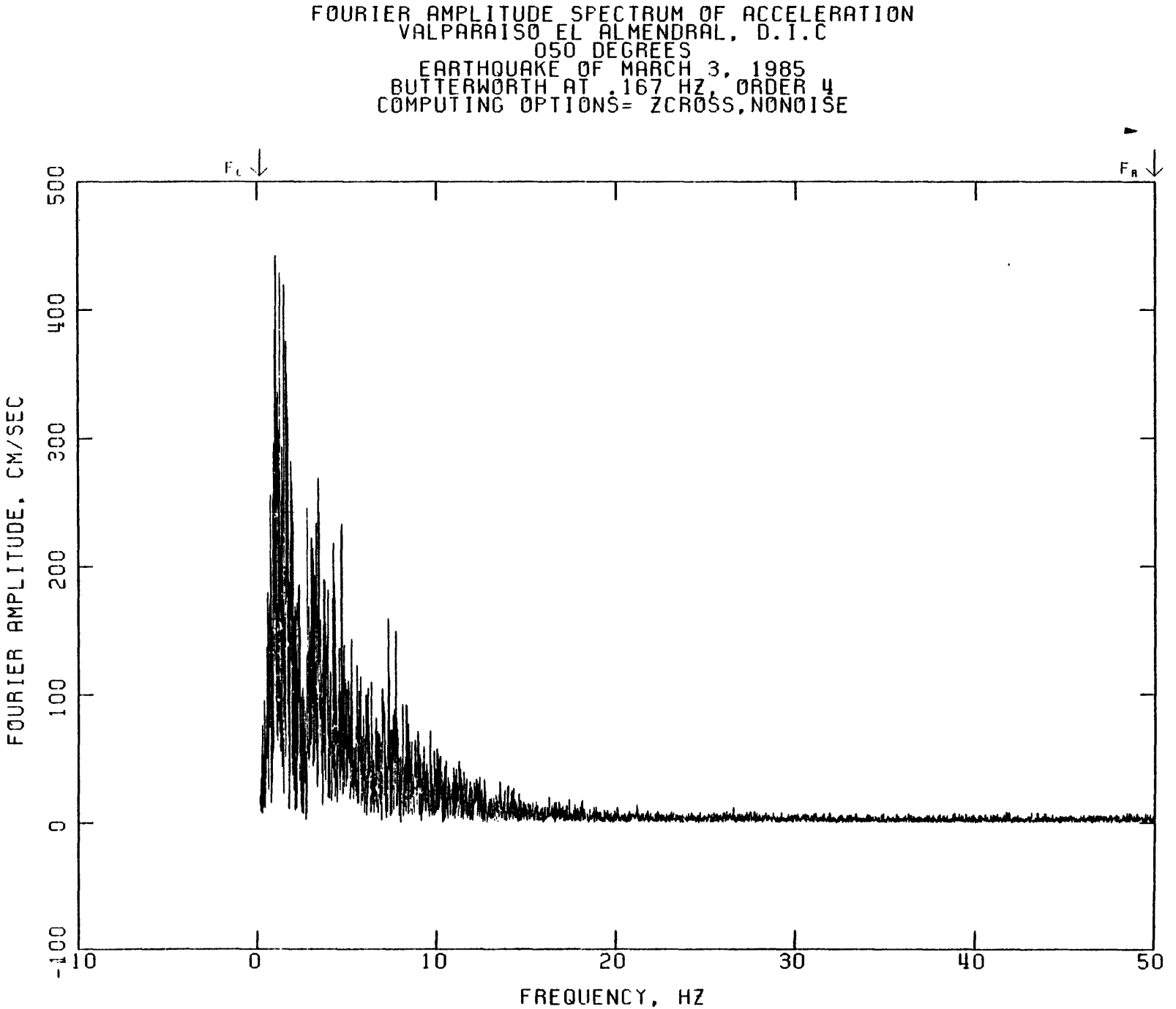
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.F.S.M, D.I.C
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

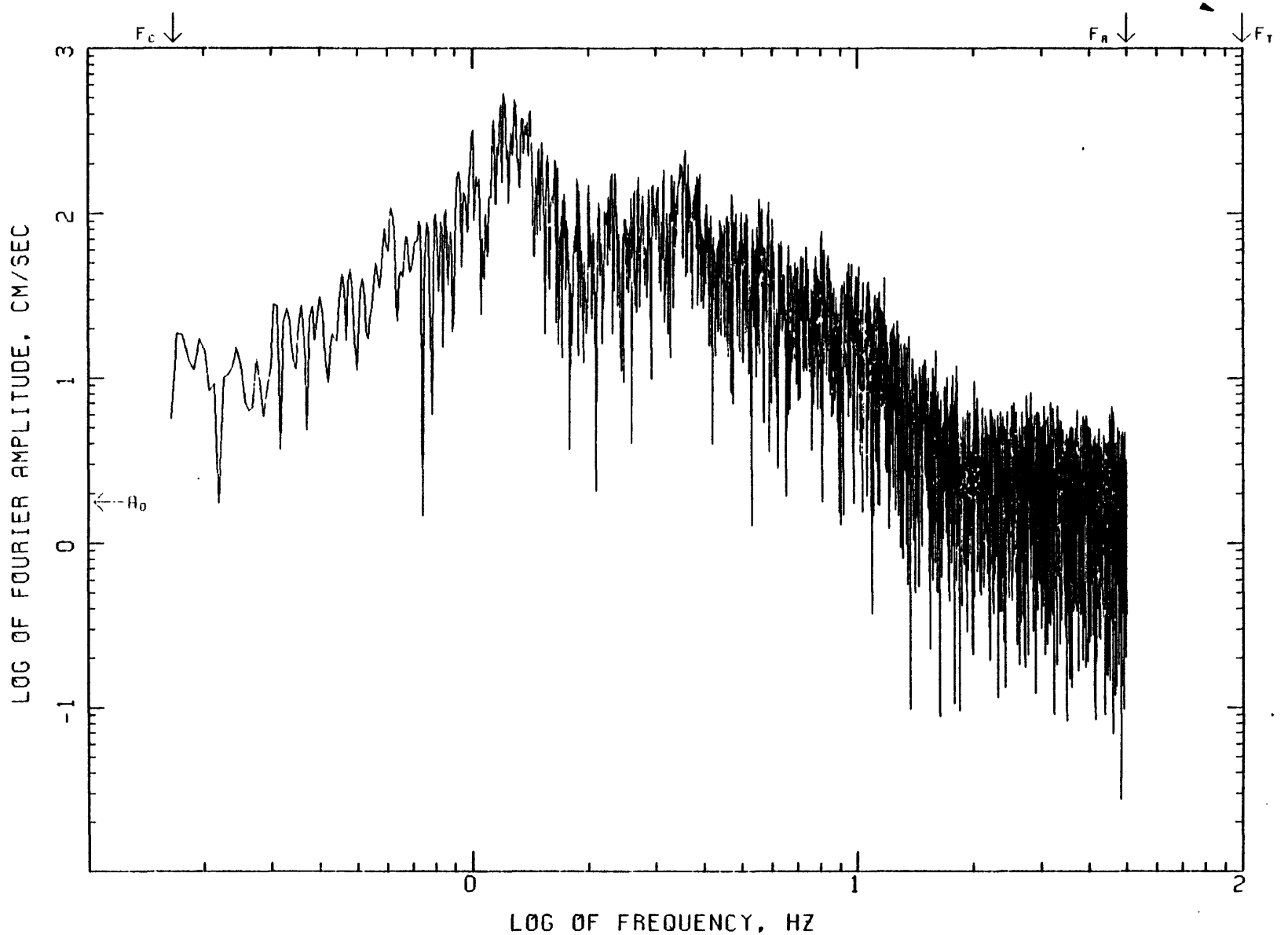


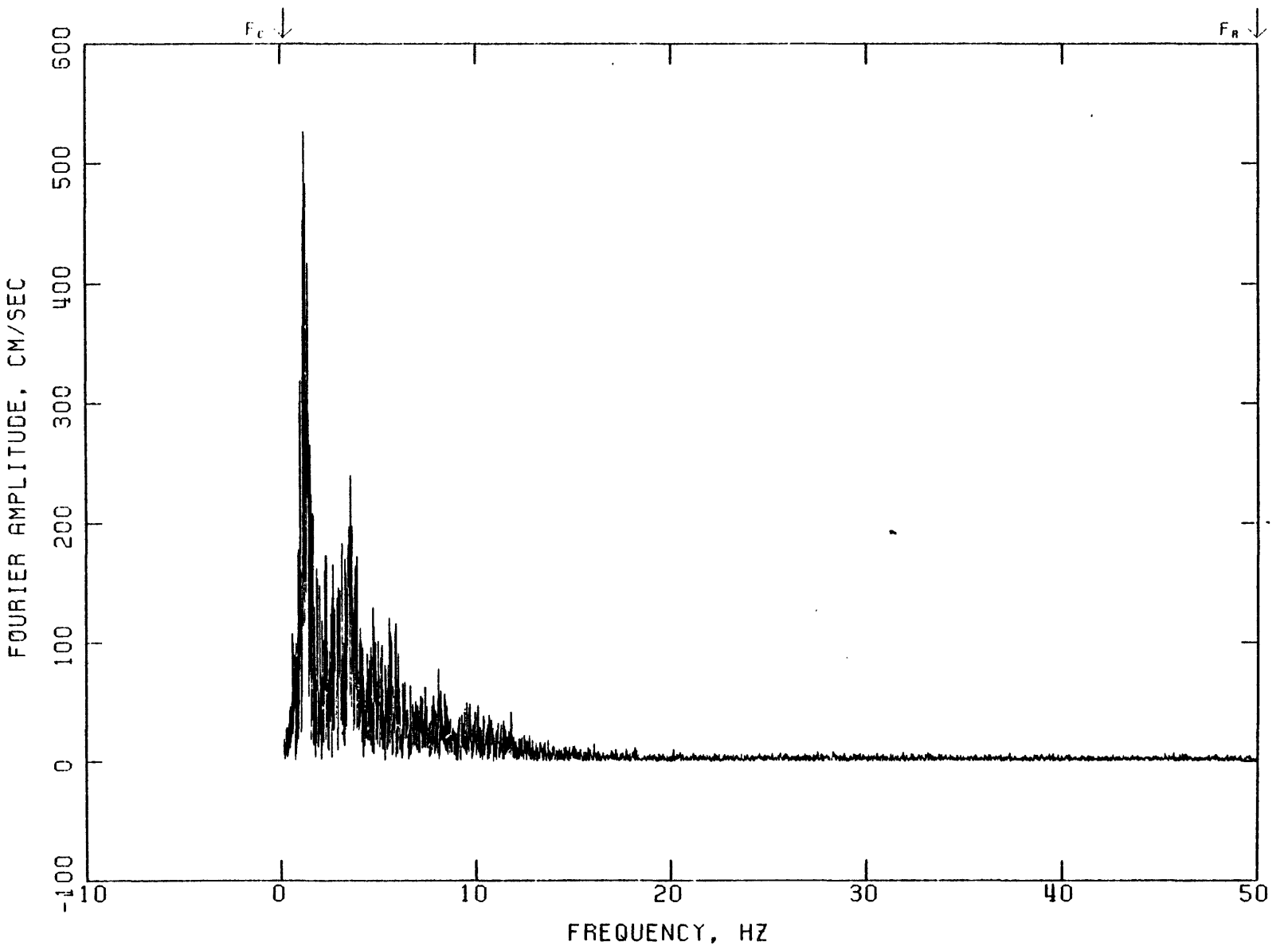

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.F.S.M, D.I.C
070 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.F.S.M, D.I.C
070 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_A
FOURIER AMPLITUDE, CM/SEC
0
50
100
150
200
-10
0
10
20
30
40
50
FREQUENCY, HZ

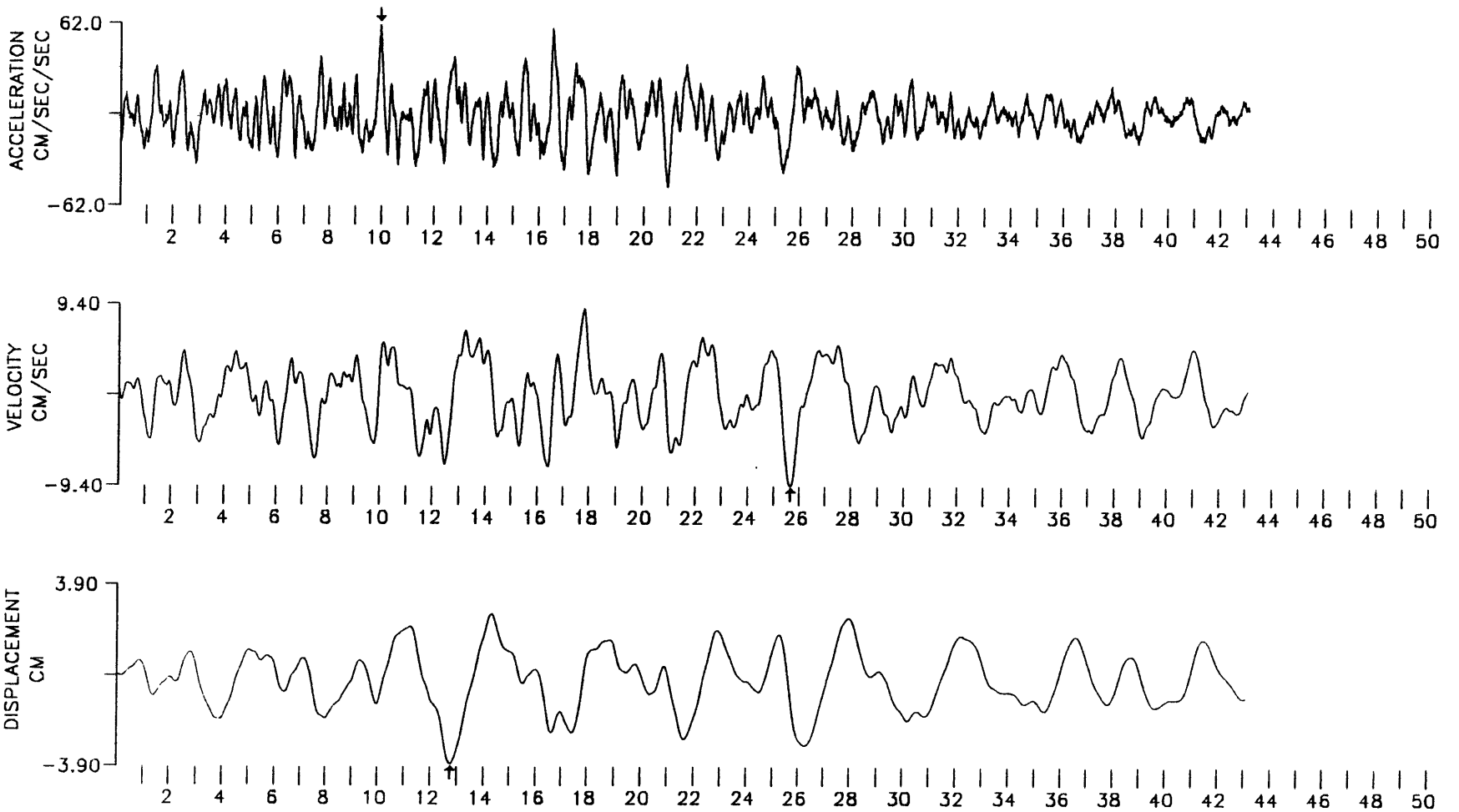

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO EL ALMENDRAL, D.I.C
050 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO EL ALMENDRAL, D.I.C
050 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_L
F_R
FOURIER AMPLITUDE, CM/SEC
500
400
300
200
100
0
-100
-10
0
10
20
30
40
50
FREQUENCY, HZ

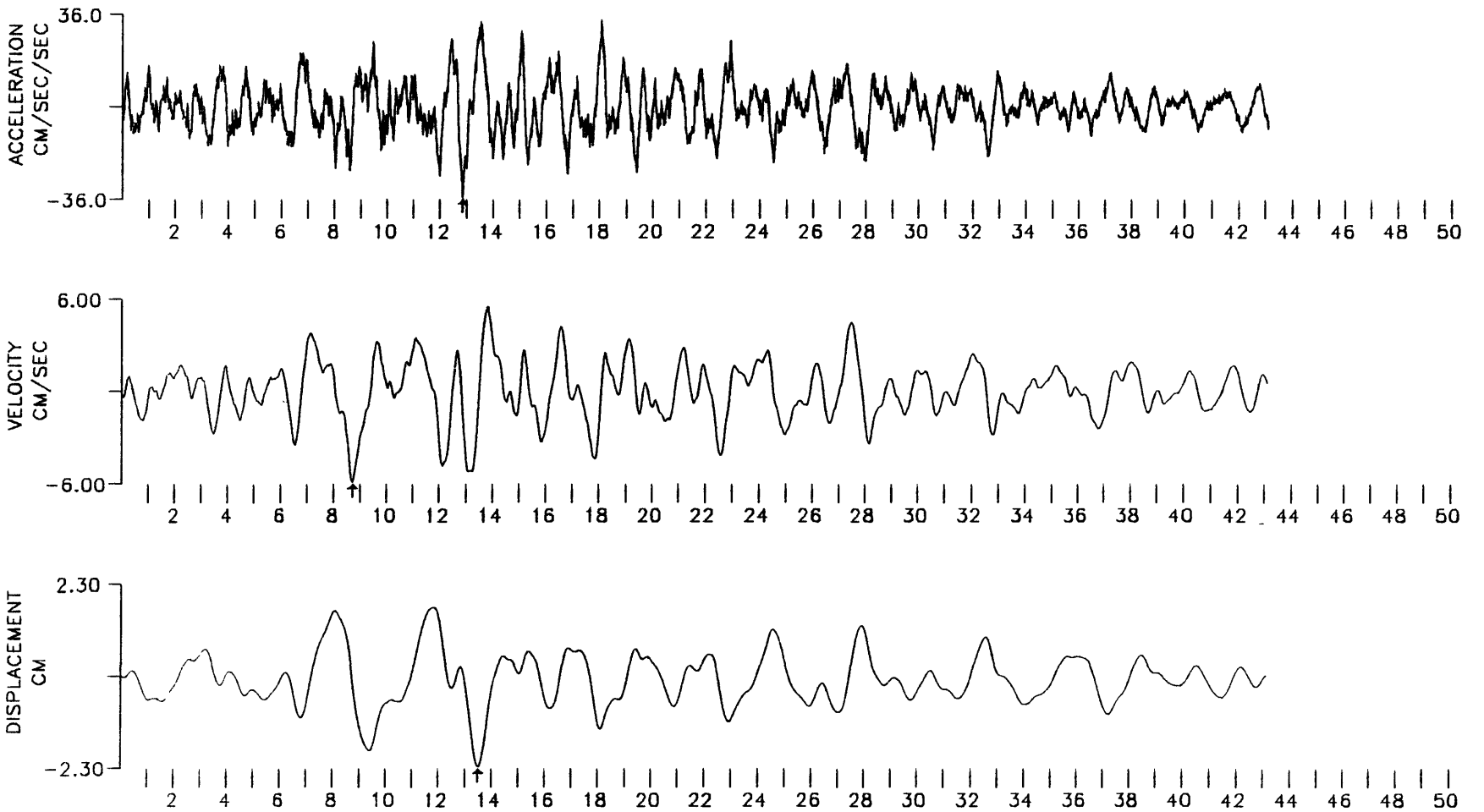

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO EL ALMENDRAL, D.I.C
140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO EL ALMENDRAL, D.I.C
140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_R
FOURIER AMPLITUDE, CM/SEC
600
500
400
300
200
100
0
-100
-10
0
10
20
30
40
50
FREQUENCY, HZ

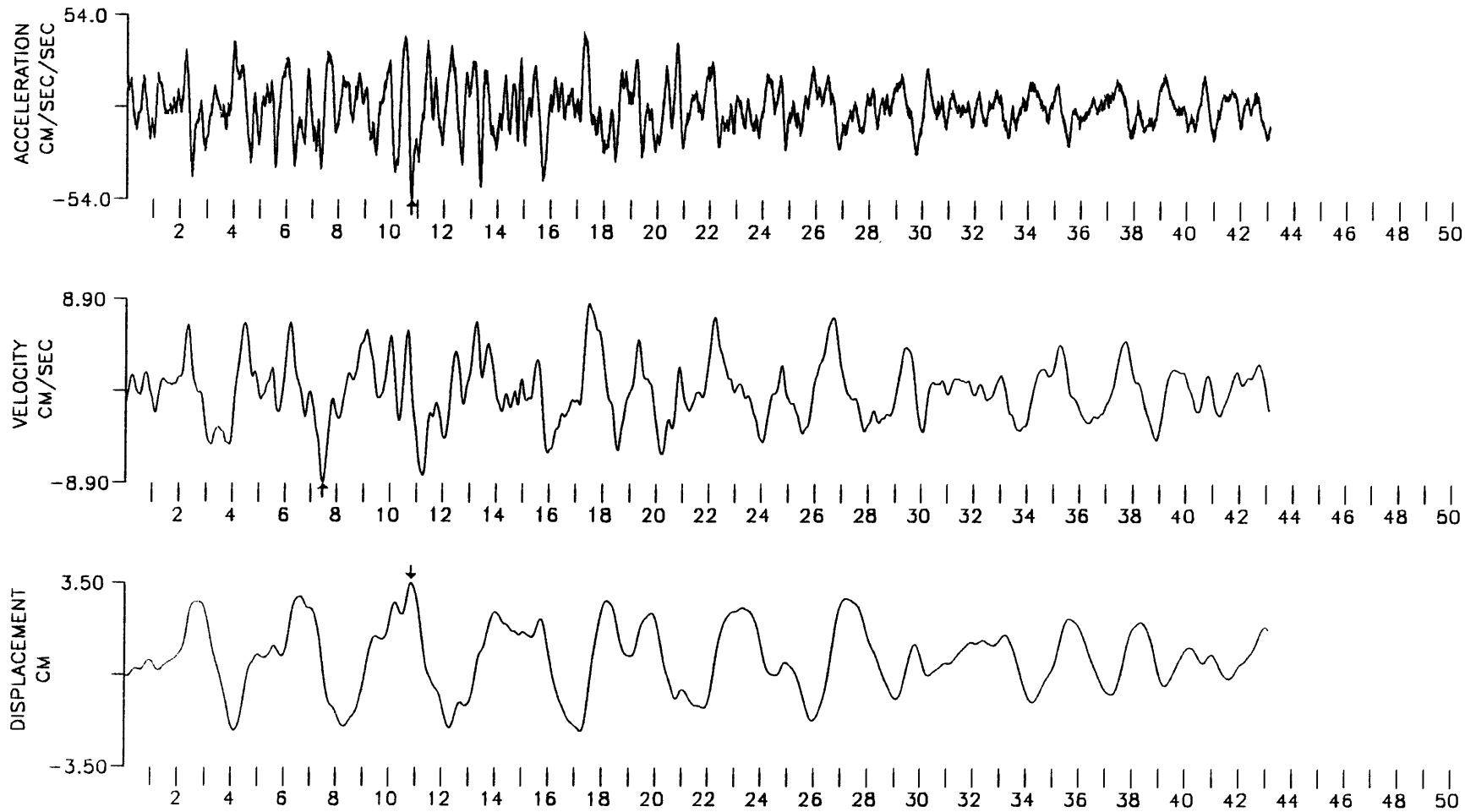
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
CHILLAN INSTITUTE
080 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=61.01 CM/SEC/SEC, VELOCITY=-9.35 CM/SEC, DISPL=-3.80 CM



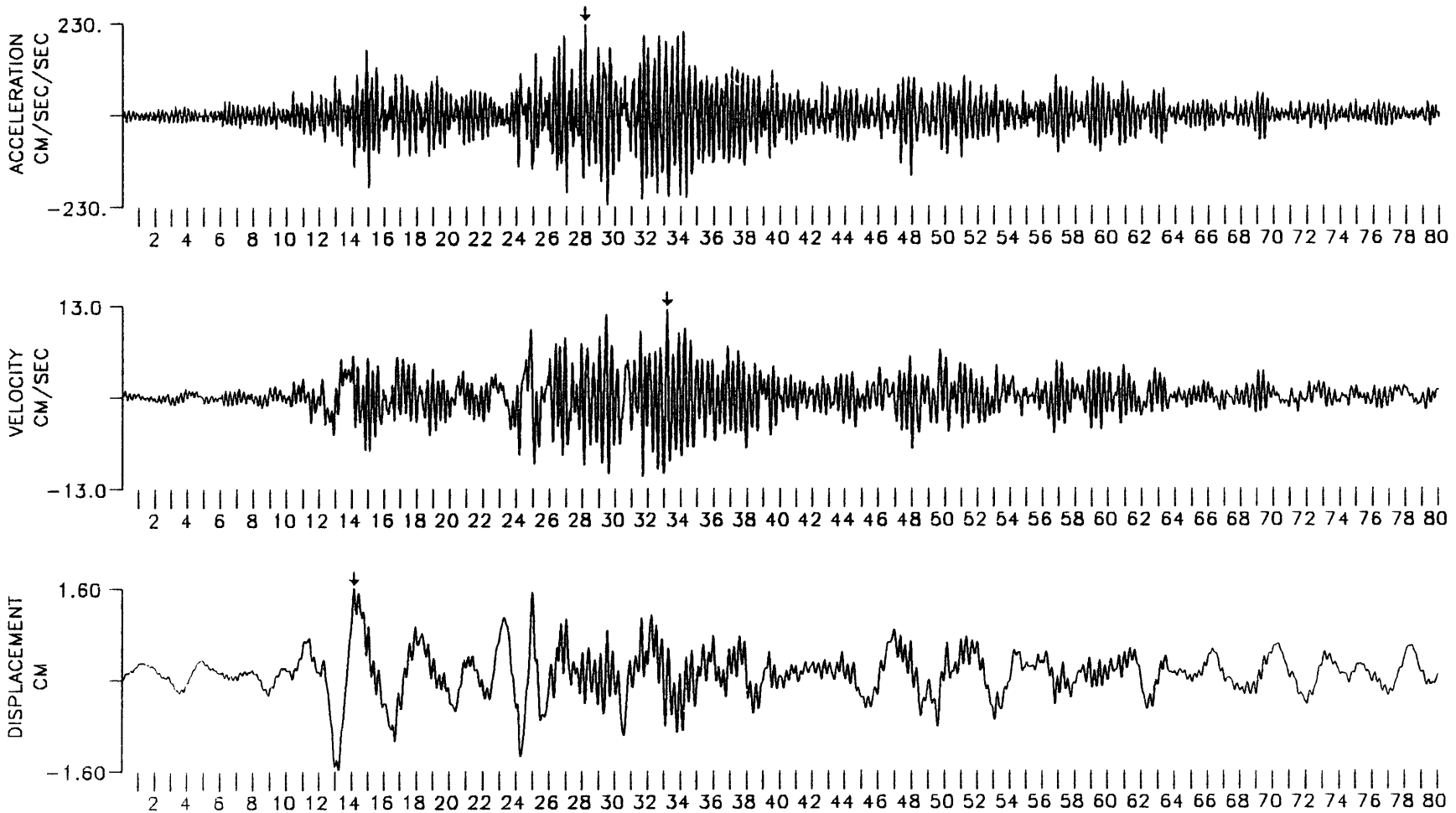
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
CHILLAN INSTITUTE
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=-35.08 CM/SEC/SEC, VELOCITY=-5.91 CM/SEC, DISPL=-2.26 CM



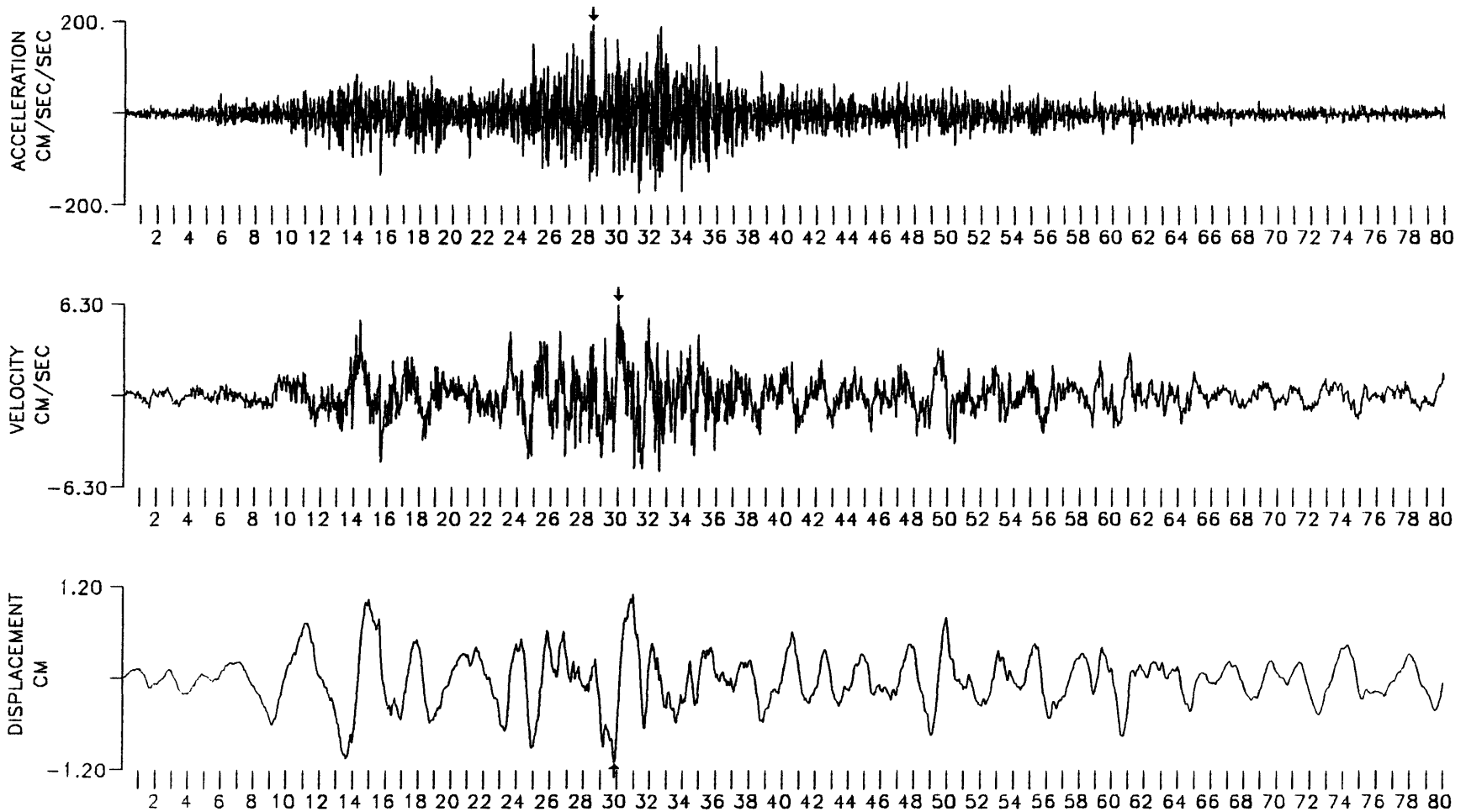
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
CHILLAN INSTITUTE
350 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=-53.81 CM/SEC/SEC, VELOCITY=-8.81 CM/SEC, DISPL=3.49 CM



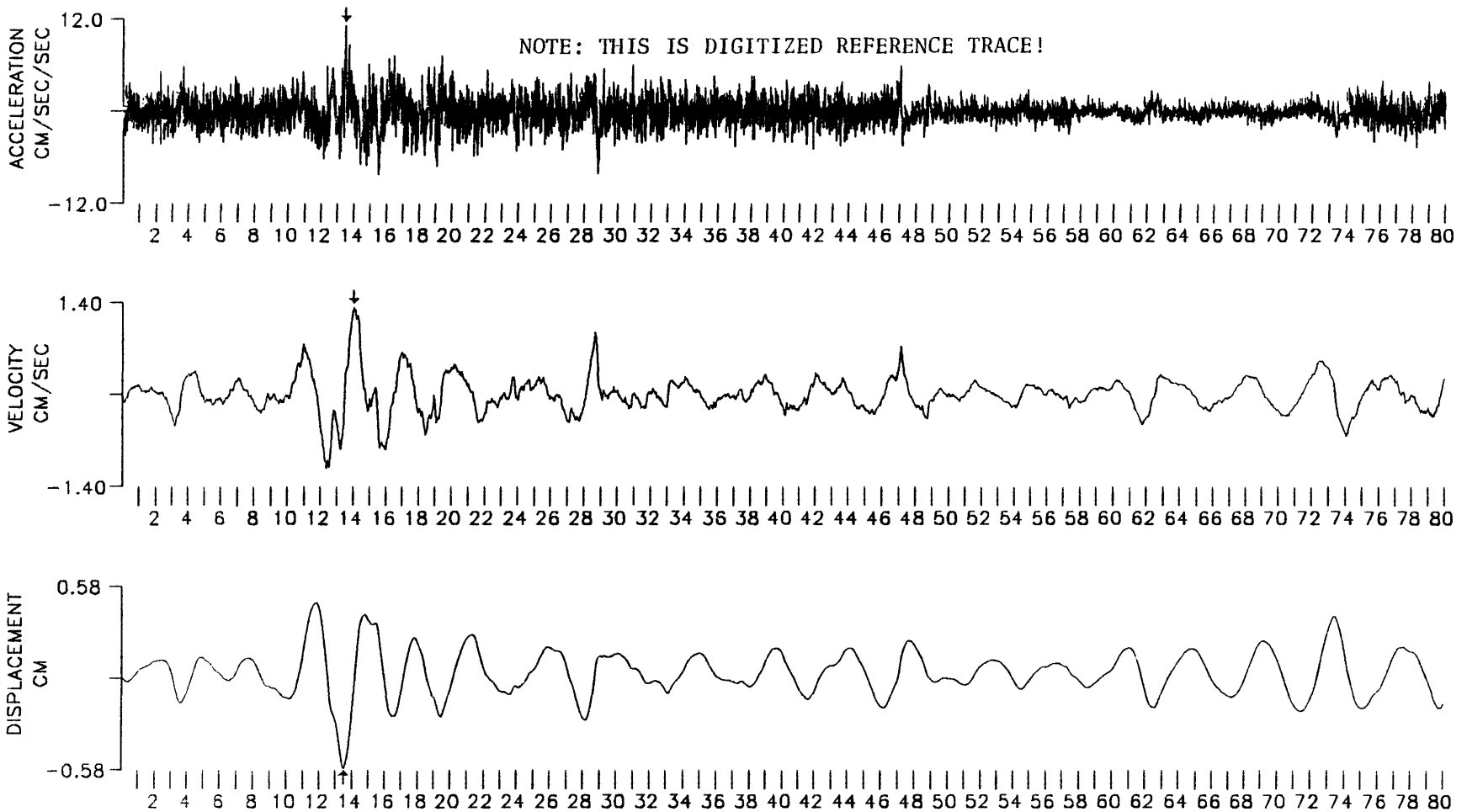
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
PAPUDO
140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=226.43 CM/SEC/SEC, VELOCITY=12.41 CM/SEC, DISPL=1.59 CM



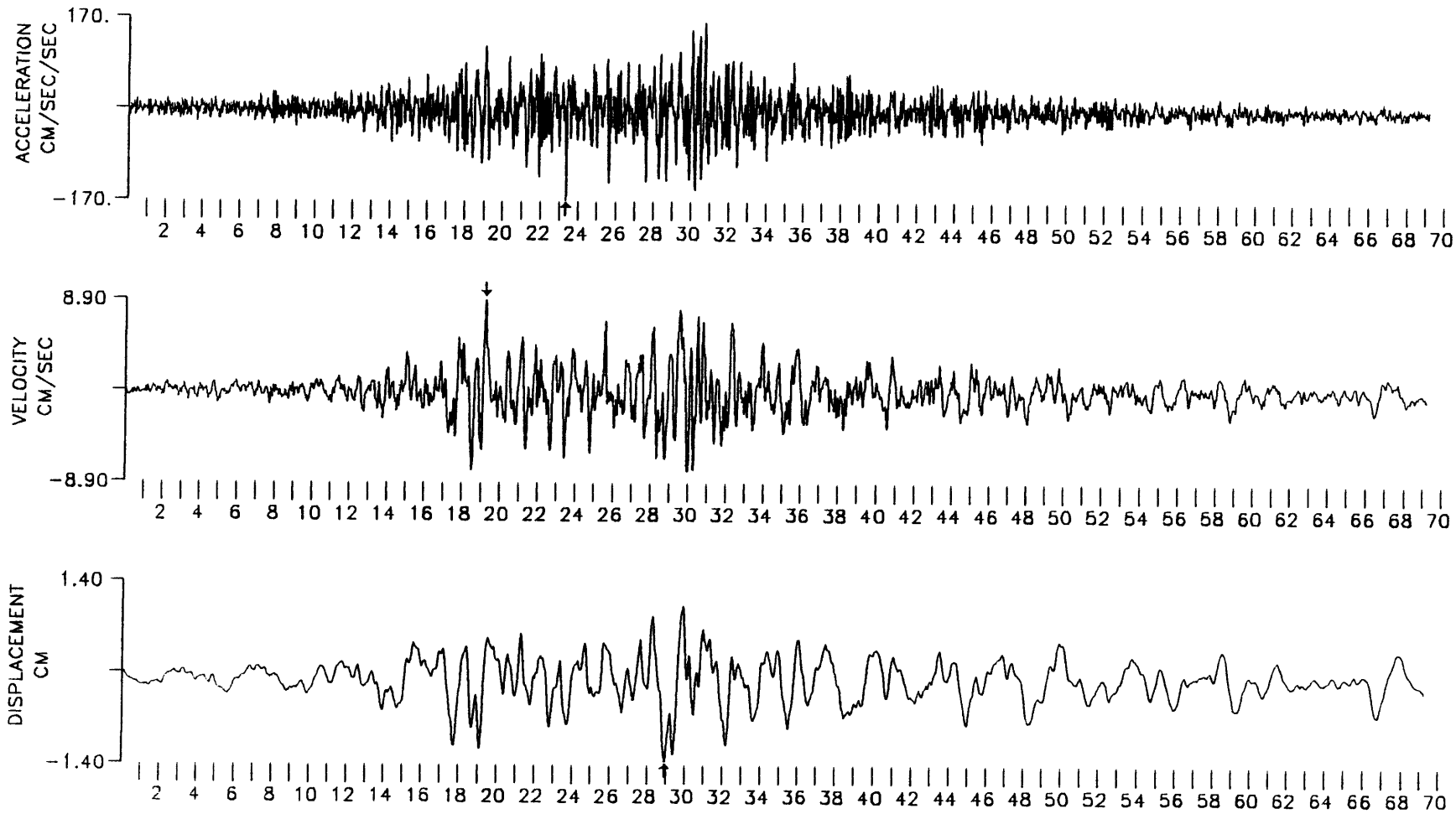
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
PAPUDO
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=193.09 CM/SEC/SEC, VELOCITY=6.26 CM/SEC, DISPL=-1.10 CM



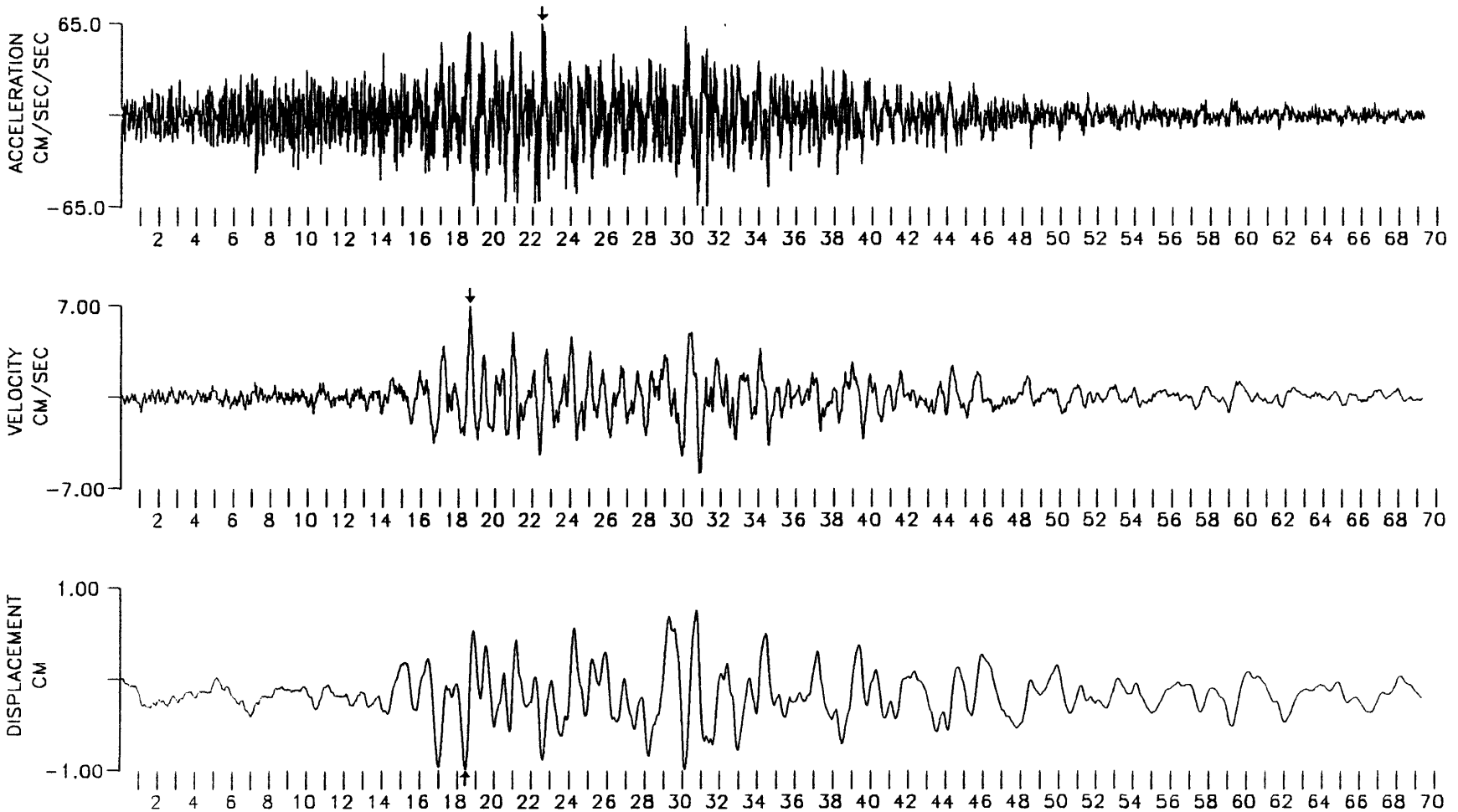
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
PAPUDO
050 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=11.16 CM/SEC/SEC, VELOCITY=1.32 CM/SEC, DISPL=-0.57 CM

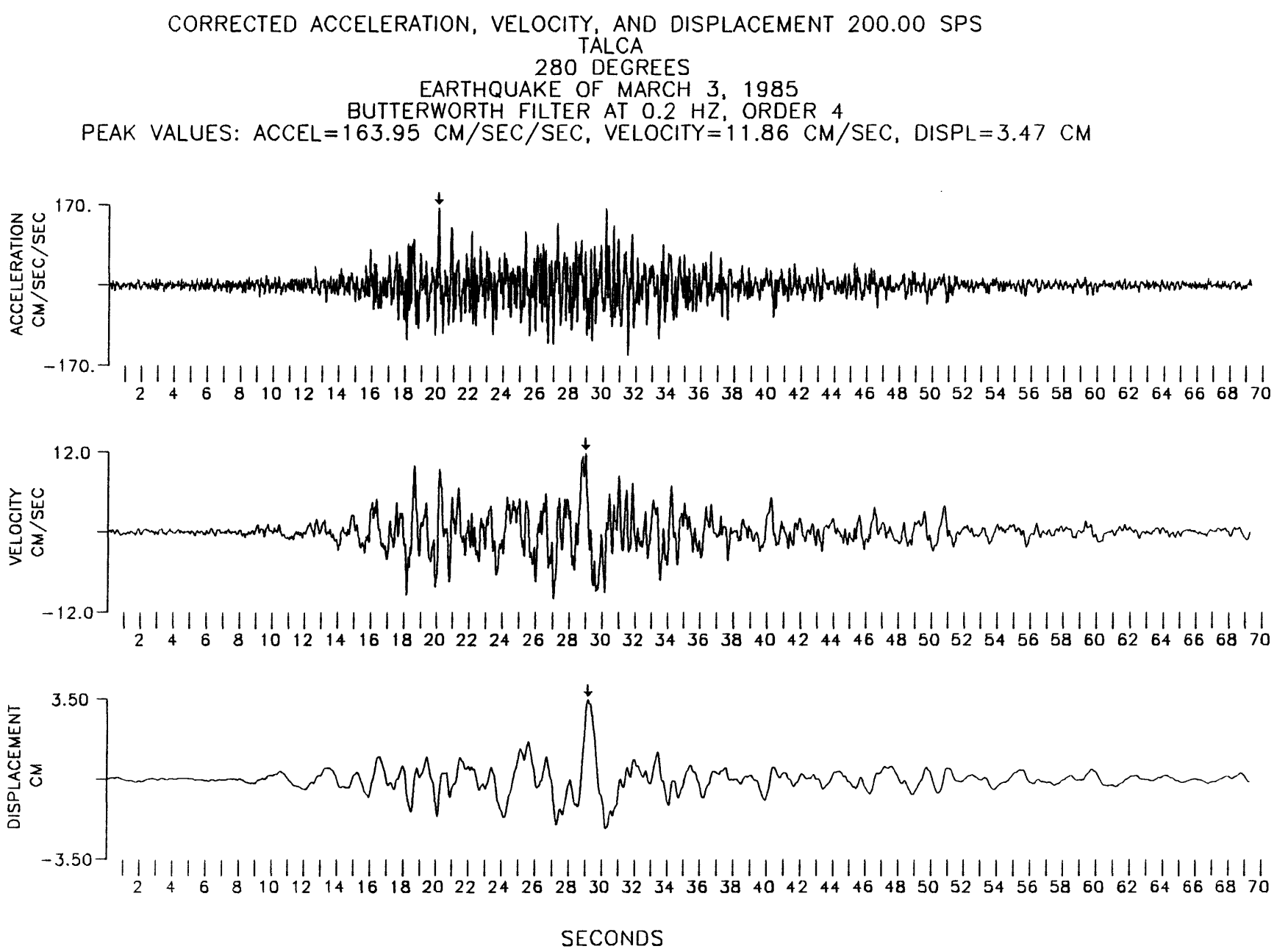


CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
TALCA
010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=-167.90 CM/SEC/SEC, VELOCITY=8.89 CM/SEC, DISPL=-1.36 CM

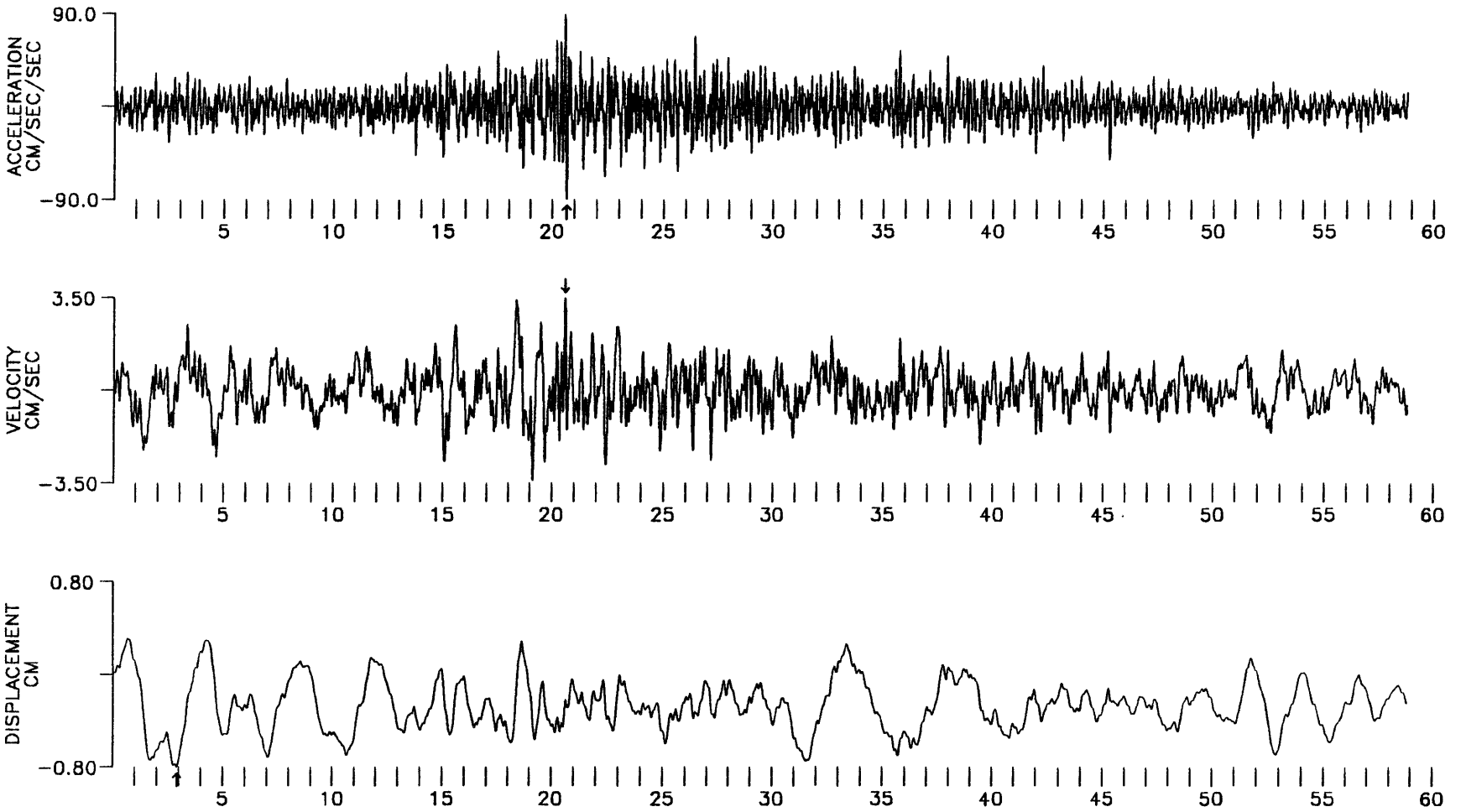


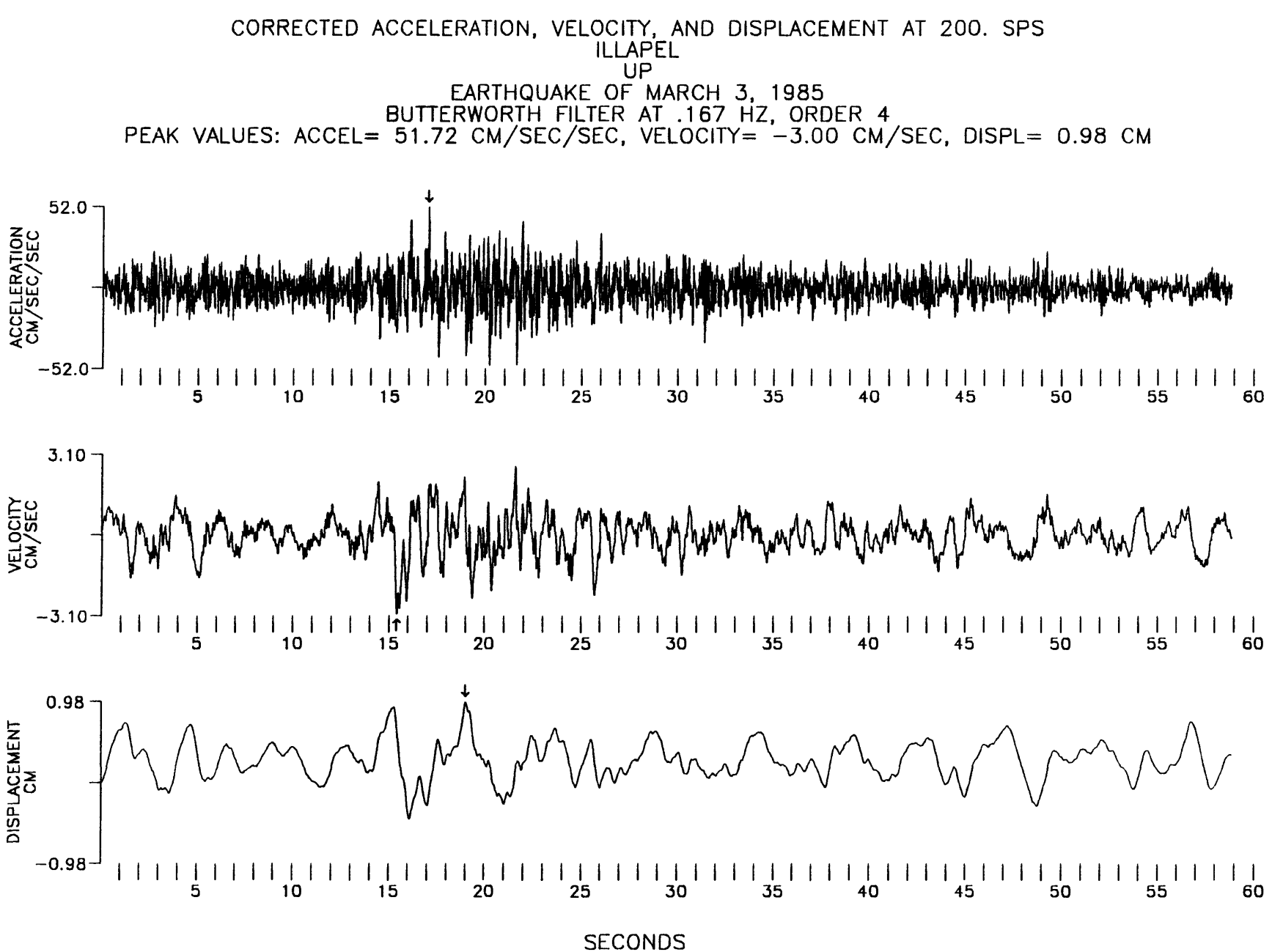
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
TALCA
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=64.77 CM/SEC/SEC, VELOCITY=6.95 CM/SEC, DISPL=-1.00 CM



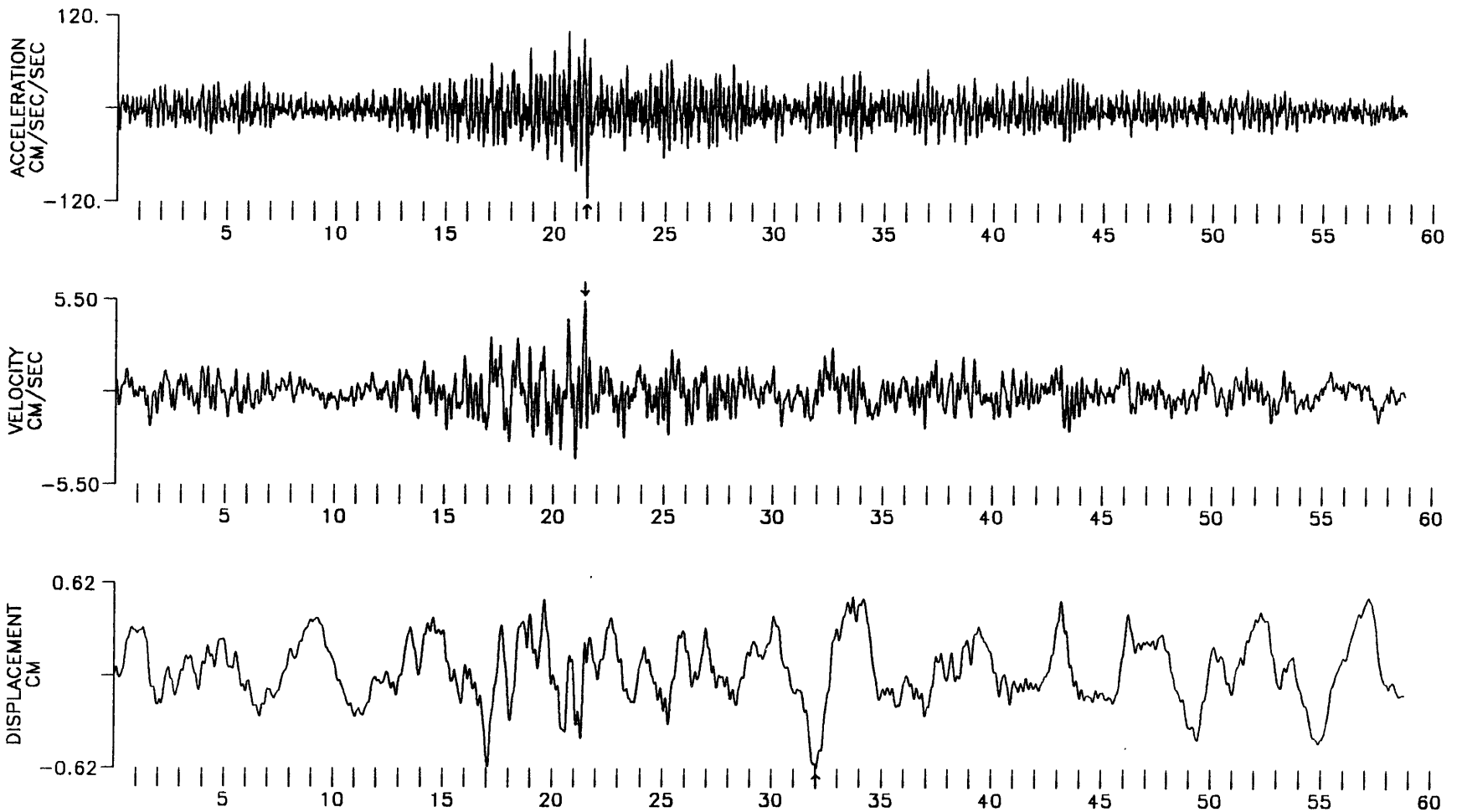

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
TALCA
280 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=163.95 CM/SEC/SEC, VELOCITY=11.86 CM/SEC, DISPL=3.47 CM
ACCELERATION CM/SEC/SEC
170.
-170.
VELOCITY CM/SEC
12.0
-12.0
DISPLACEMENT CM
3.50
-3.50
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 52 54 56 58 60 62 64 66 68 70
SECONDS

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
ILLAPEL
70 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= −89.60 CM/SEC/SEC, VELOCITY= 3.47 CM/SEC, DISPL= −0.80 CM

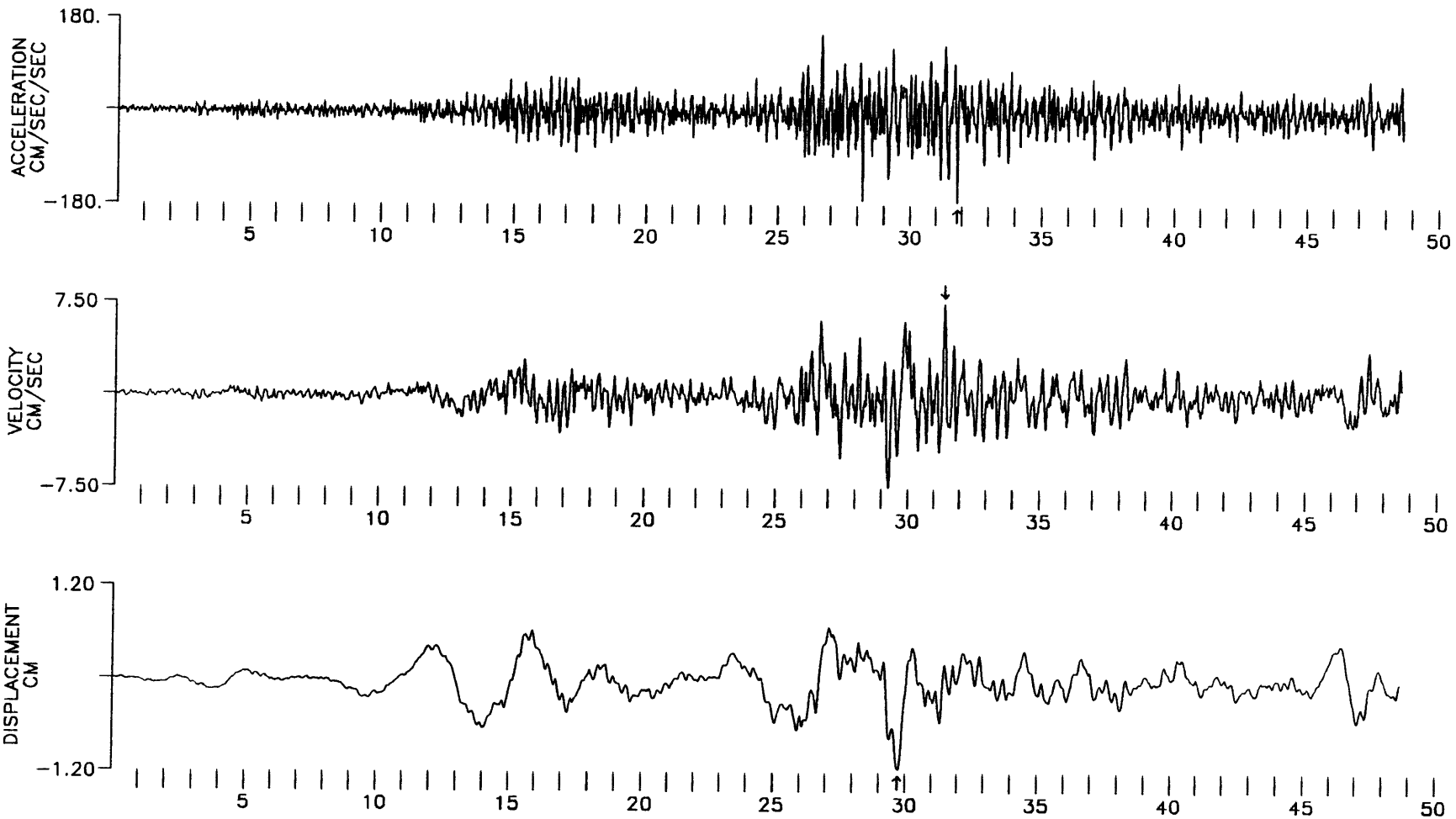



CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
ILLAPEL
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= 51.72 CM/SEC/SEC, VELOCITY= -3.00 CM/SEC, DISPL= 0.98 CM
ACCELERATION CM/SEC/SEC
52.0
-52.0
VELOCITY CM/SEC
3.10
-3.10
DISPLACEMENT CM
0.98
-0.98
5
10
15
20
25
30
35
40
45
50
55
60
SECONDS

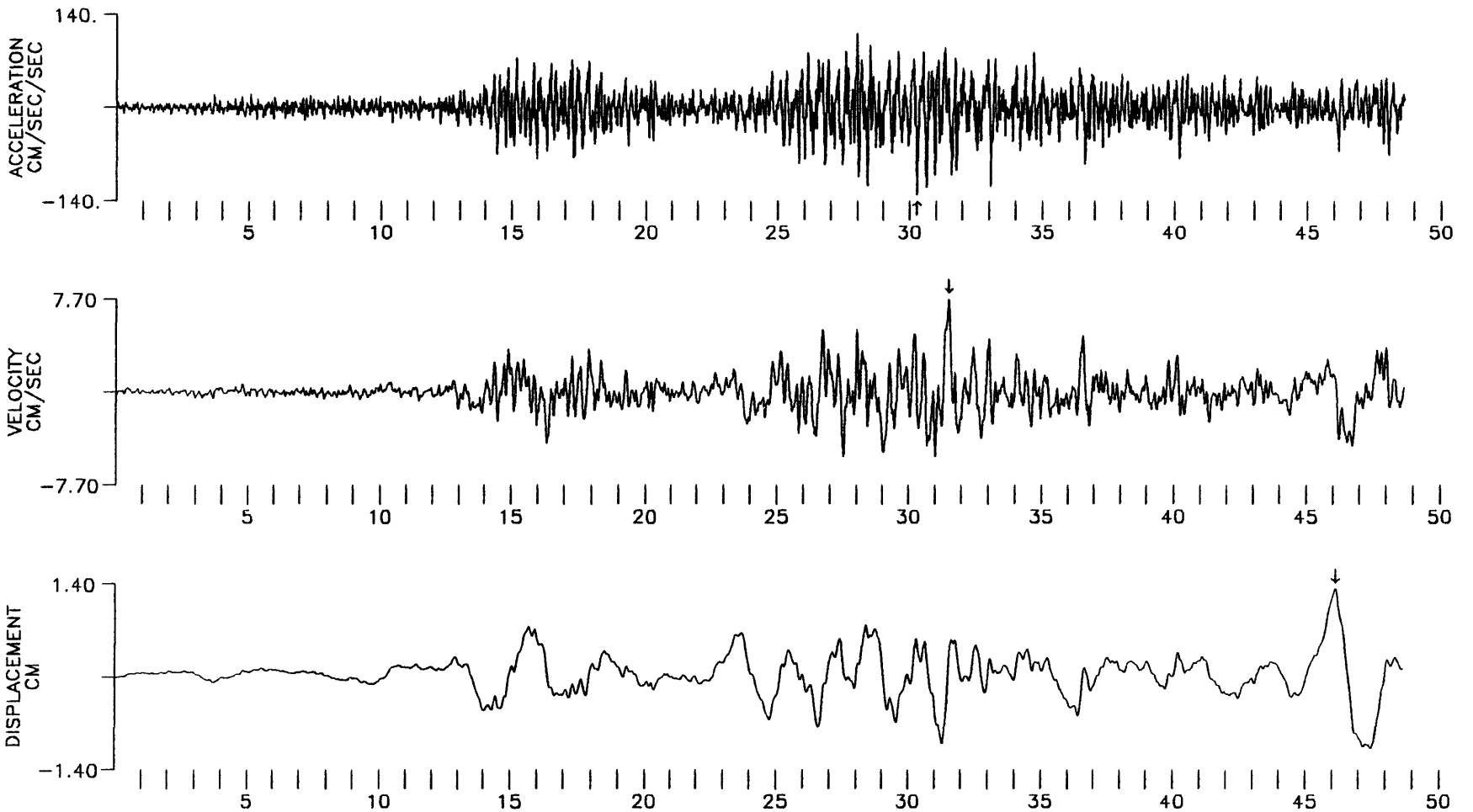
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
ILLAPEL
340 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= −115.06 CM/SEC/SEC, VELOCITY= 5.42 CM/SEC, DISPL= −0.62 CM



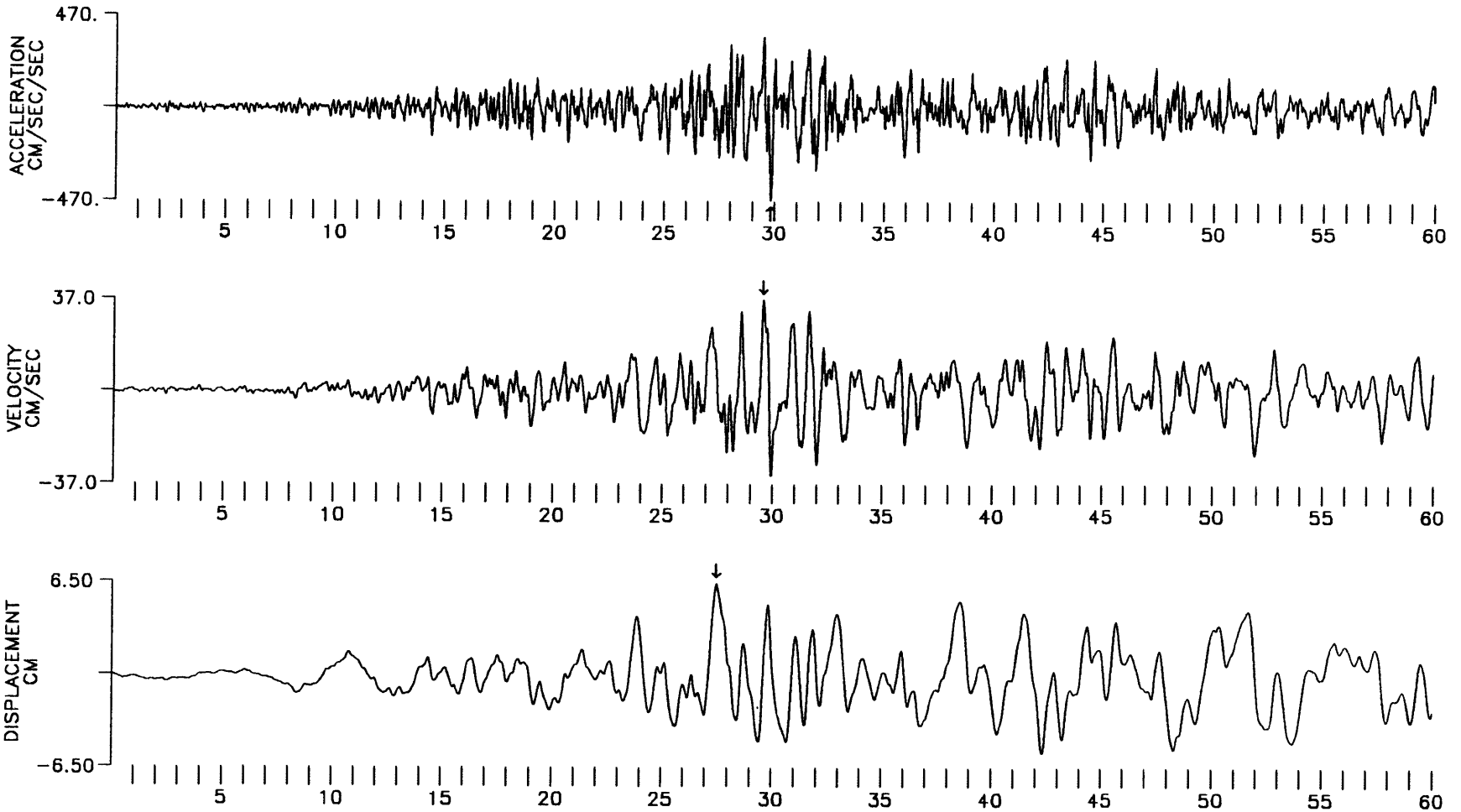
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
LALIGUA
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= −173.64 CM/SEC/SEC, VELOCITY= 7.47 CM/SEC, DISPL= −1.15 CM



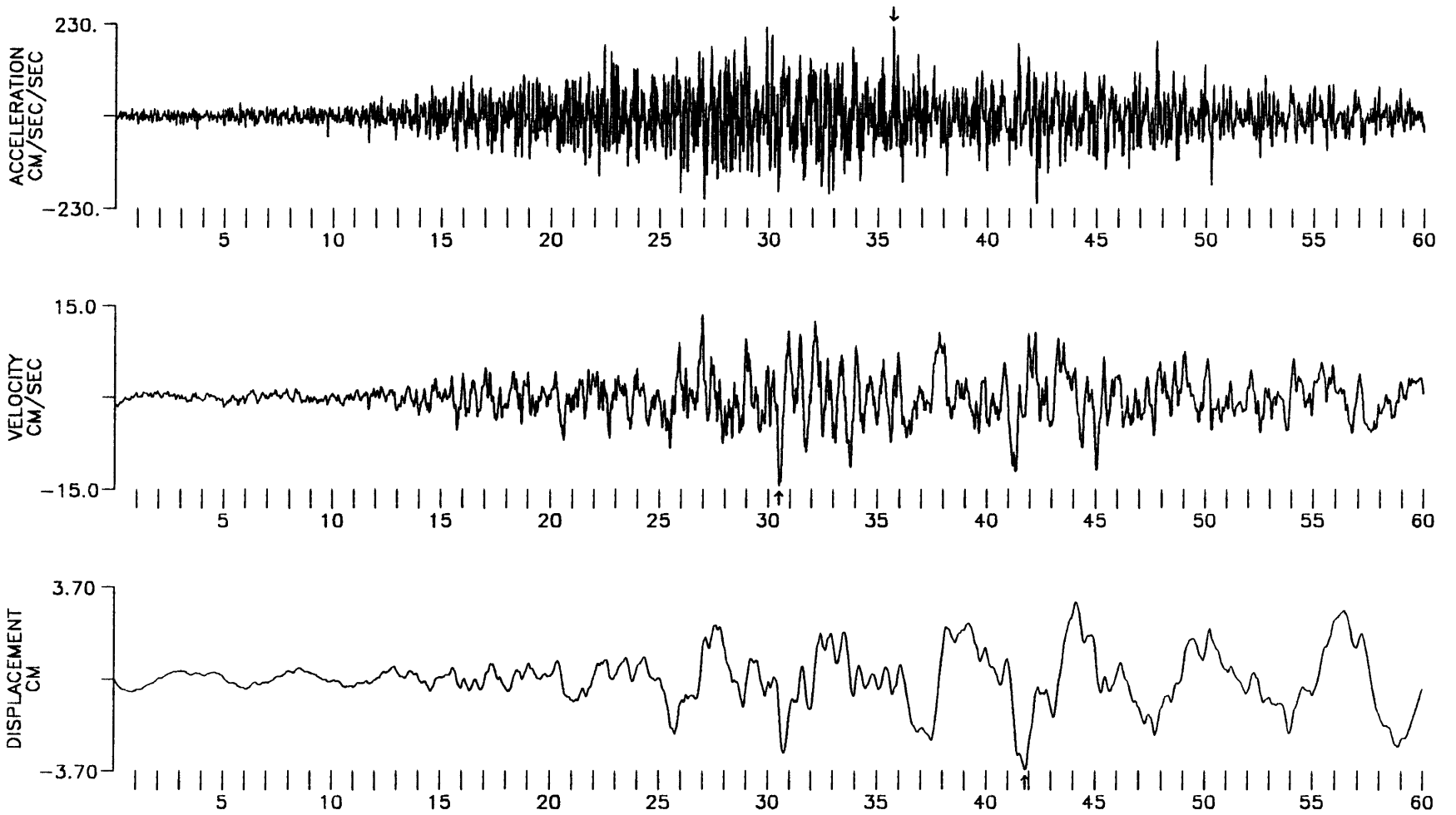
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
LALIGUA
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= −130.71 CM/SEC/SEC, VELOCITY= 7.69 CM/SEC, DISPL= 1.33 CM



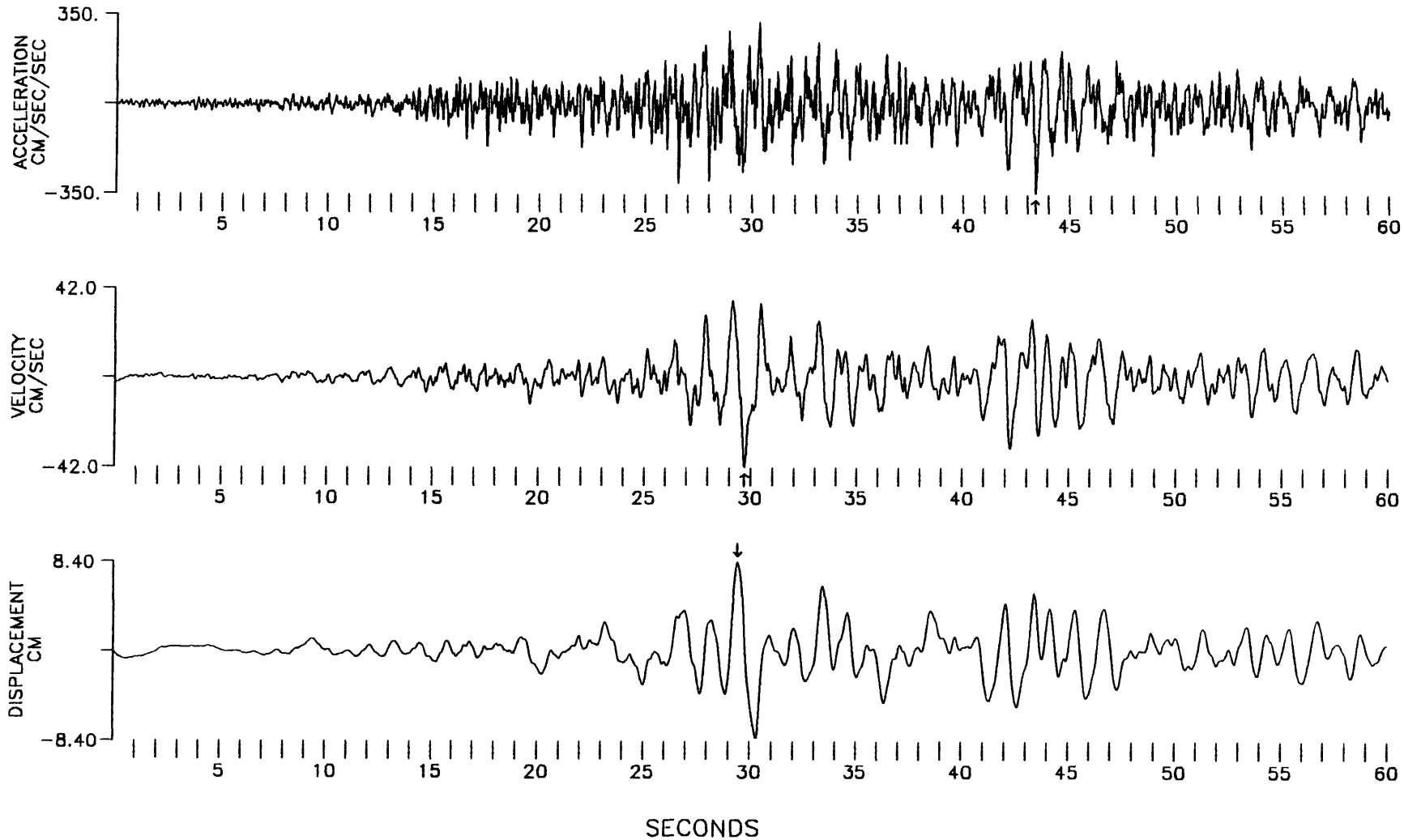
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
LLAYLLAY
280 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
PEAK VALUES: ACCEL= -465.30 CM/SEC/SEC, VELOCITY= 36.66 CM/SEC, DISPL= 6.40 CM



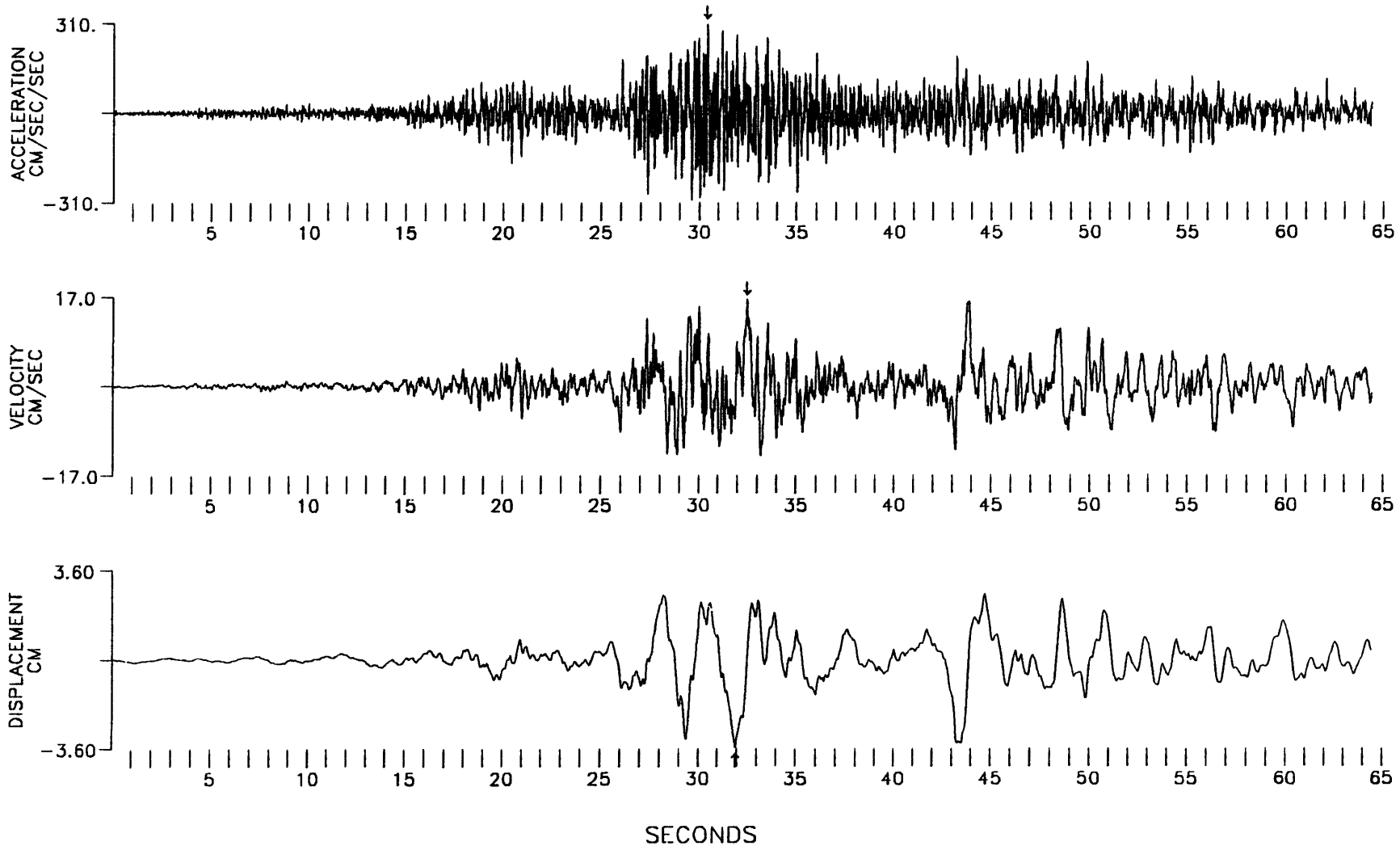
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
LLAYLLAY
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
PEAK VALUES: ACCEL= 222.84 CM/SEC/SEC, VELOCITY= −14.35 CM/SEC, DISPL= −3.65 CM



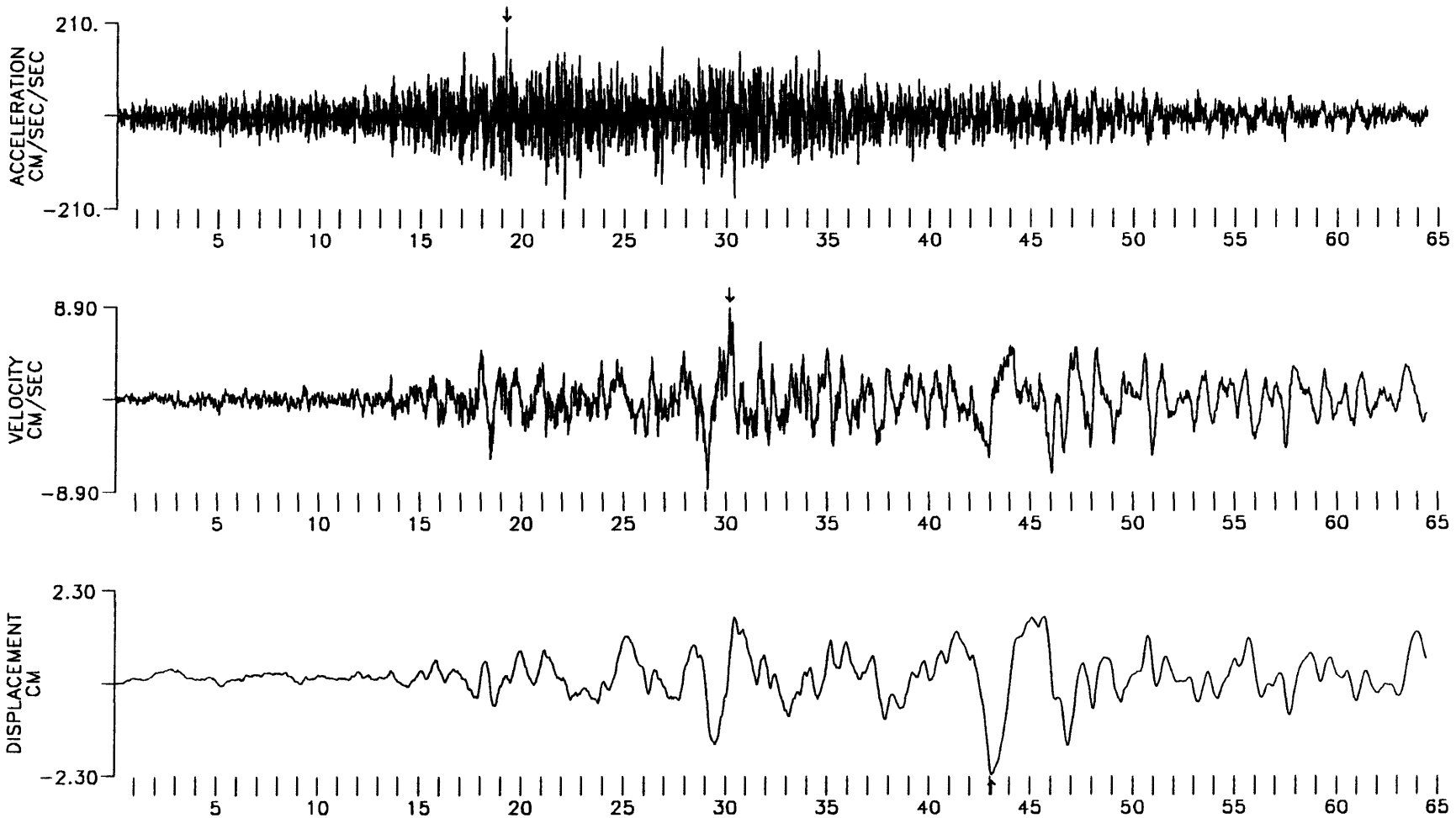
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
LLAYLLAY
190 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
PEAK VALUES: ACCEL= -345.47 CM/SEC/SEC, VELOCITY= -41.79 CM/SEC, DISPL= 8.40 CM



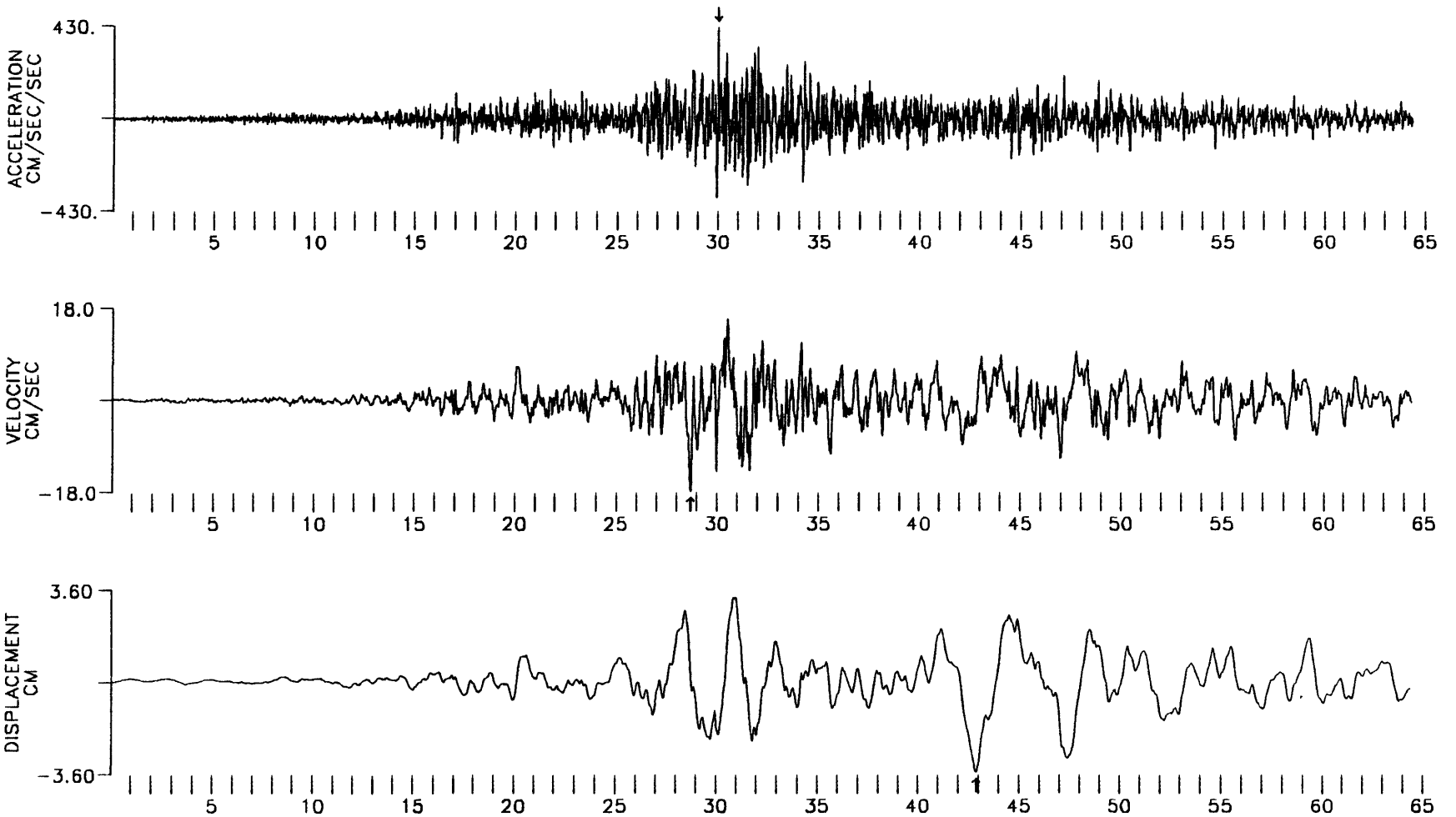
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
SAN FELIPE
170 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= 303.47 CM/SEC/SEC, VELOCITY= 16.17 CM/SEC, DISPL= -3.58 CM



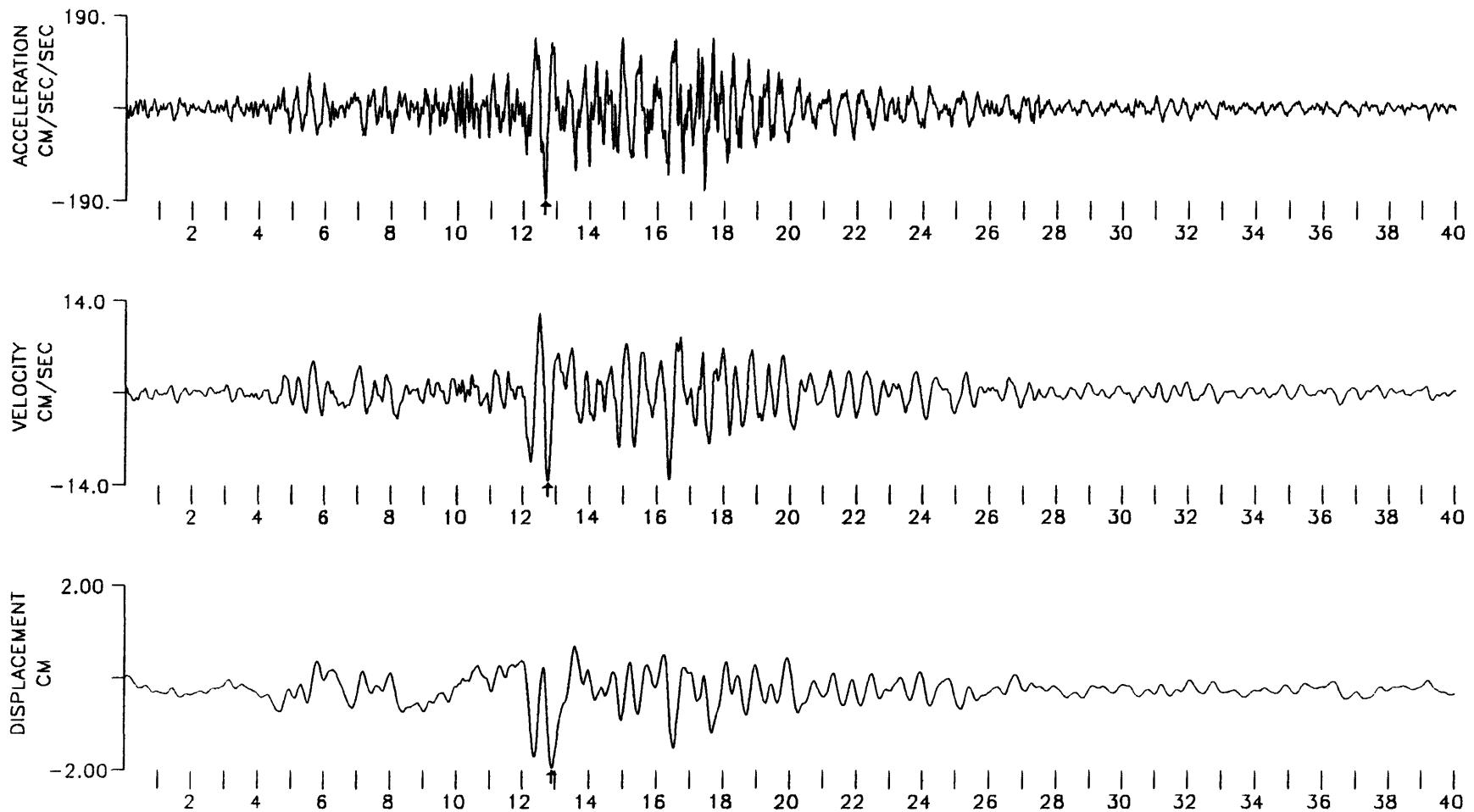
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
SAN FELIPE
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= 200.58 CM/SEC/SEC, VELOCITY= 8.83 CM/SEC, DISPL= -2.28 CM



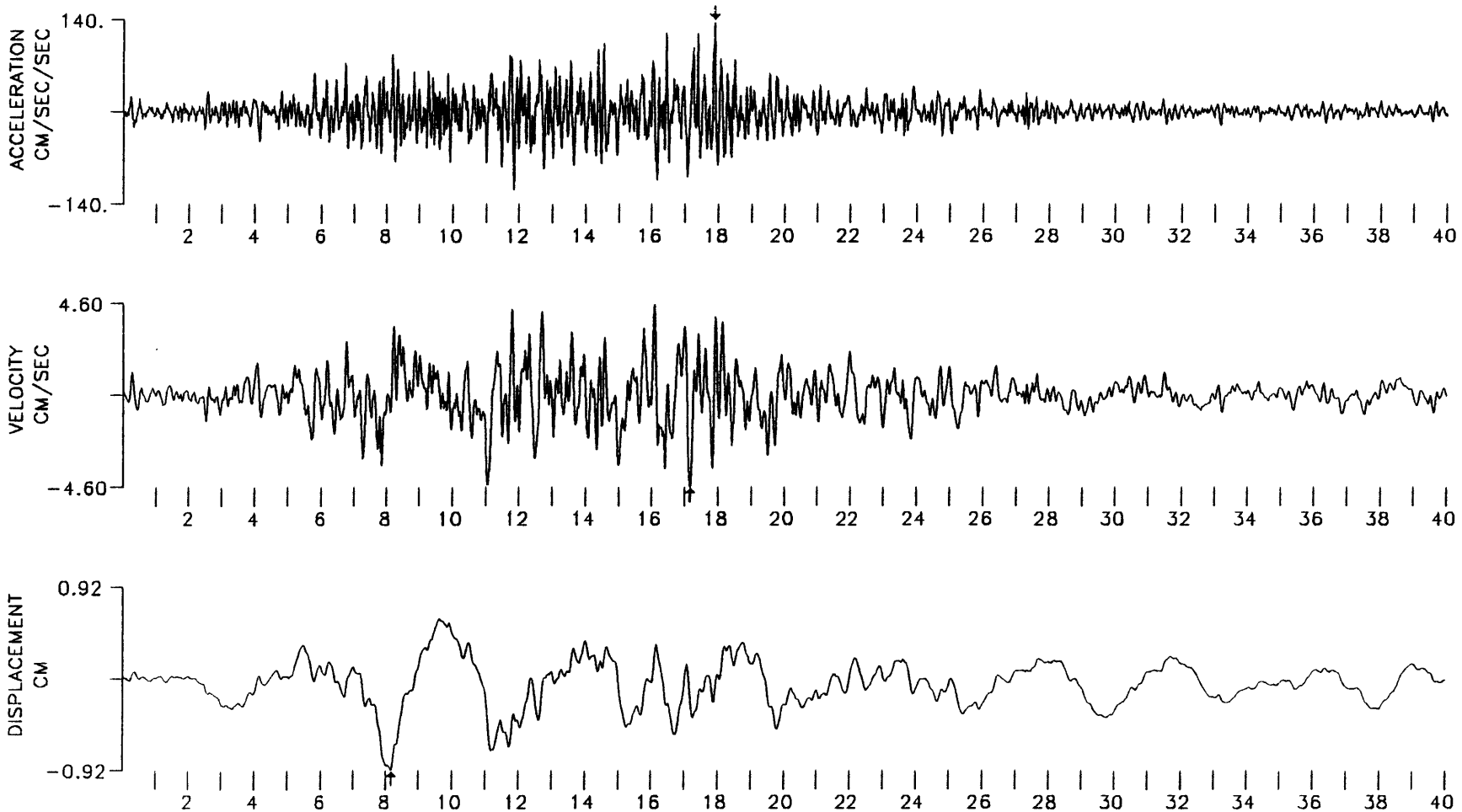
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT AT 200. SPS
SAN FELIPE
80 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
PEAK VALUES: ACCEL= 425.12 CM/SEC/SEC, VELOCITY= -17.77 CM/SEC, DISPL= -3.50 CM



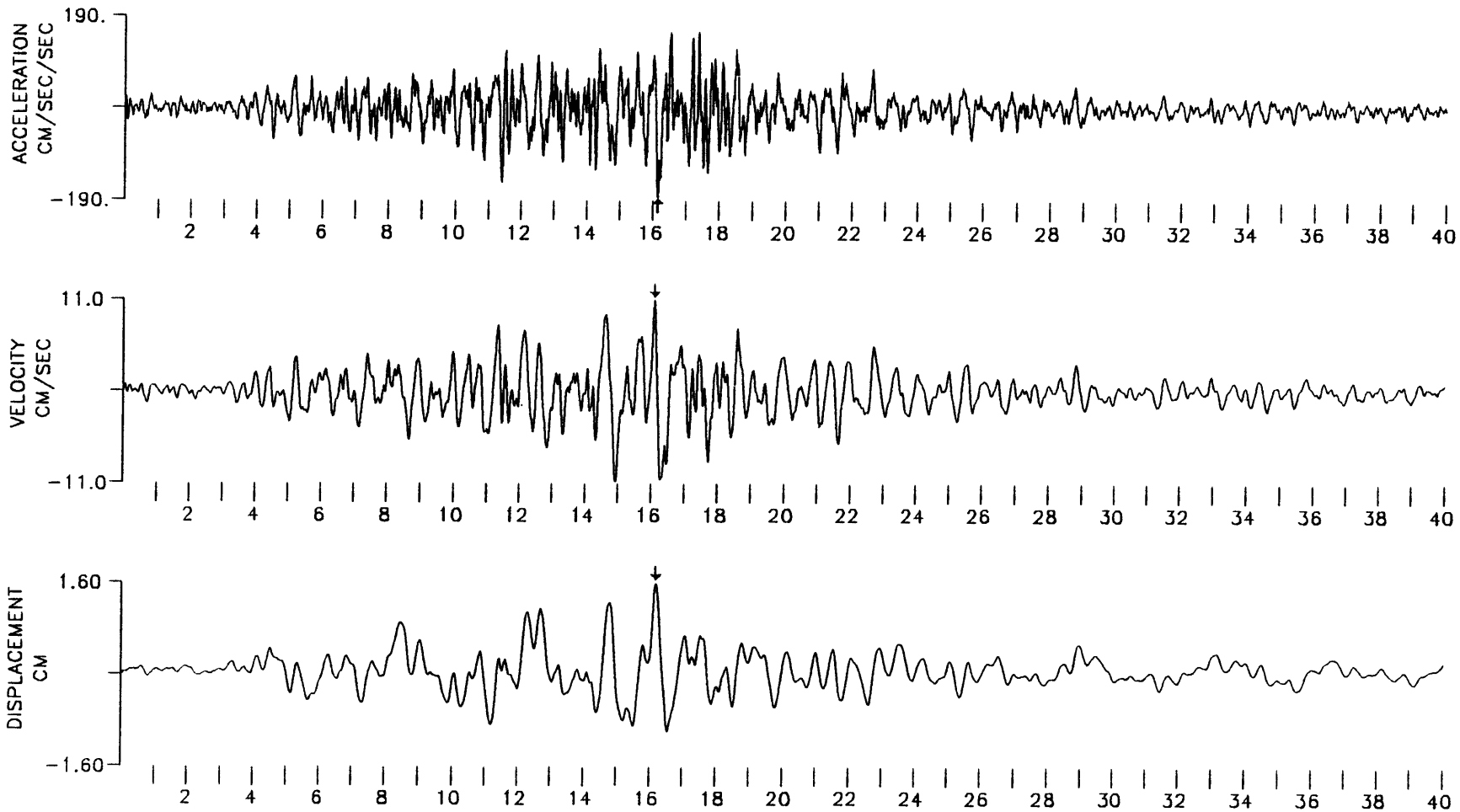
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
LLOLLEO
100 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=-186.90 CM/SEC/SEC, VELOCITY=-13.39 CM/SEC, DISPL=-1.96 CM

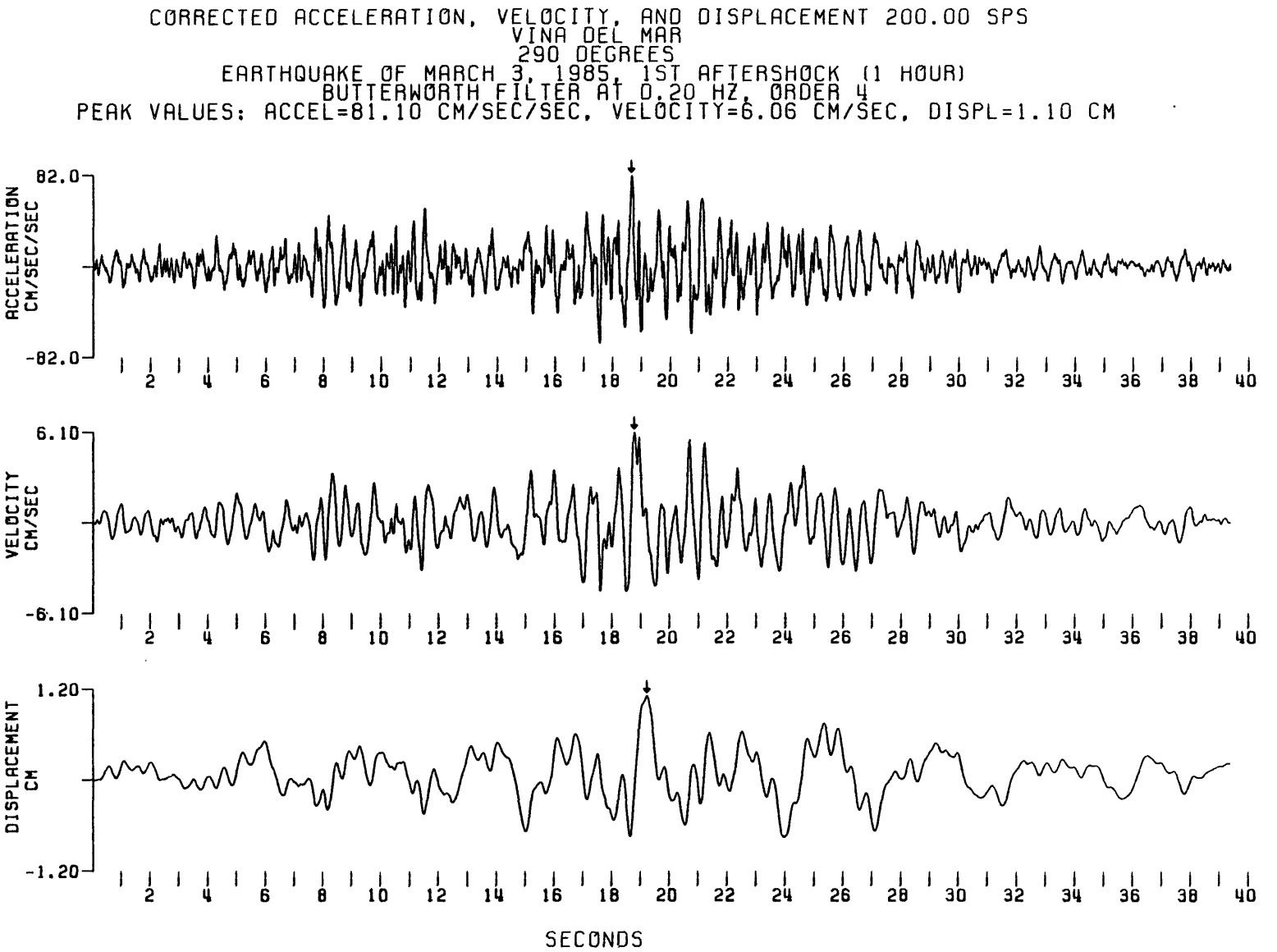


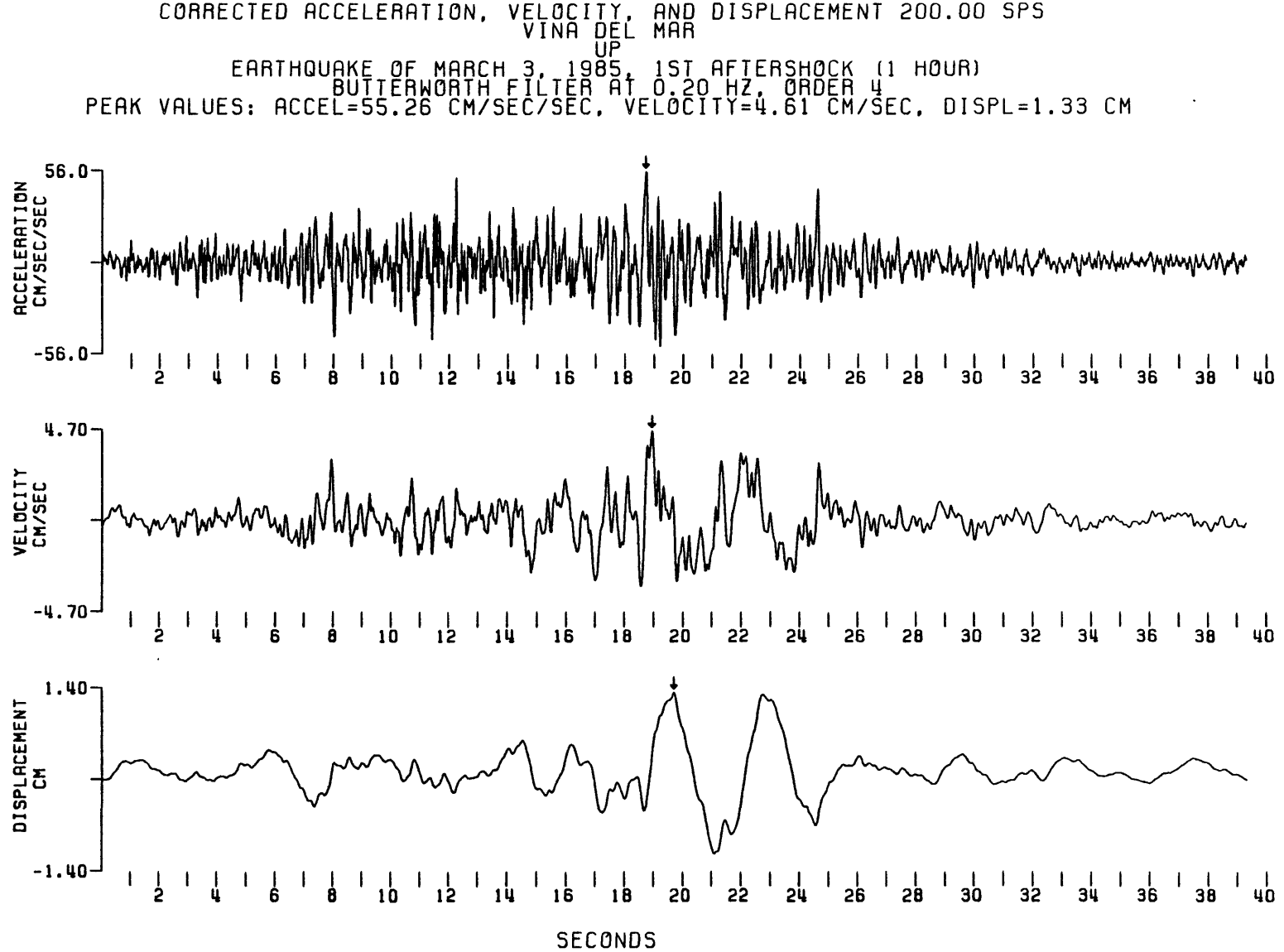
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
LLOLLEO
UP
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=134.04 CM/SEC/SEC, VELOCITY=-4.58 CM/SEC, DISPL=-0.92 CM

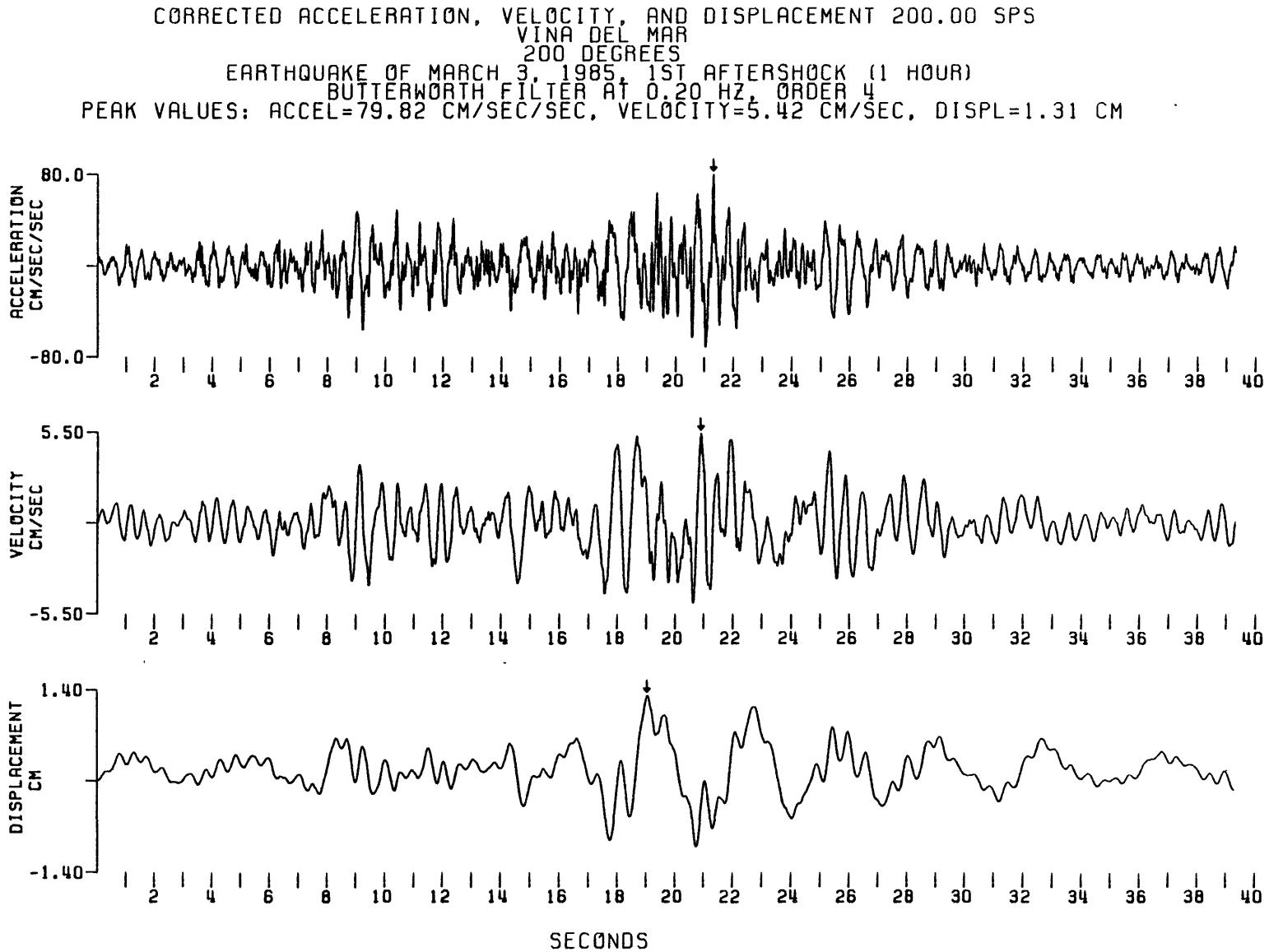


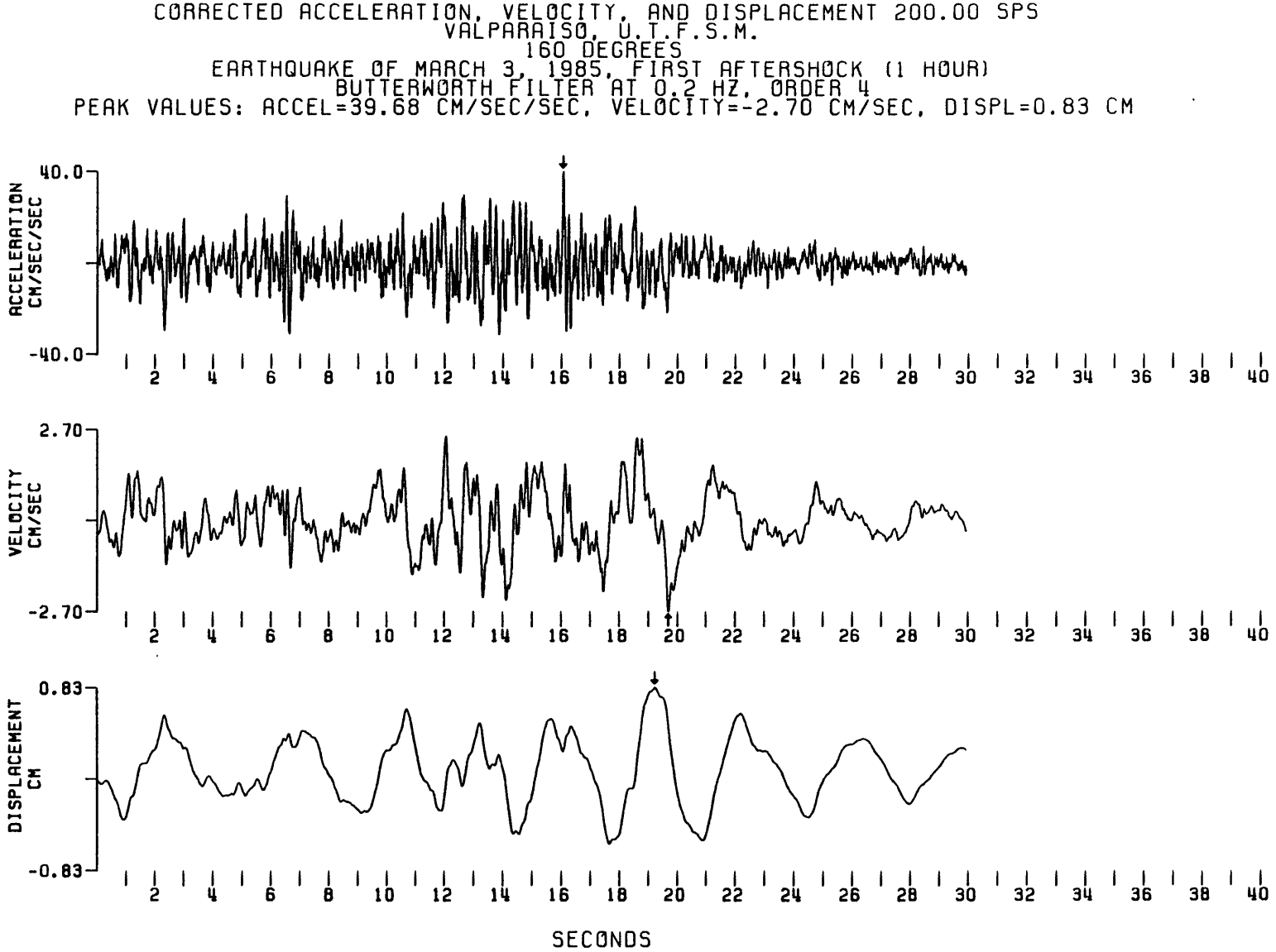
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
LLOLLEO
10 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=−182.38 CM/SEC/SEC, VELOCITY=10.88 CM/SEC, DISPL=1.59 CM



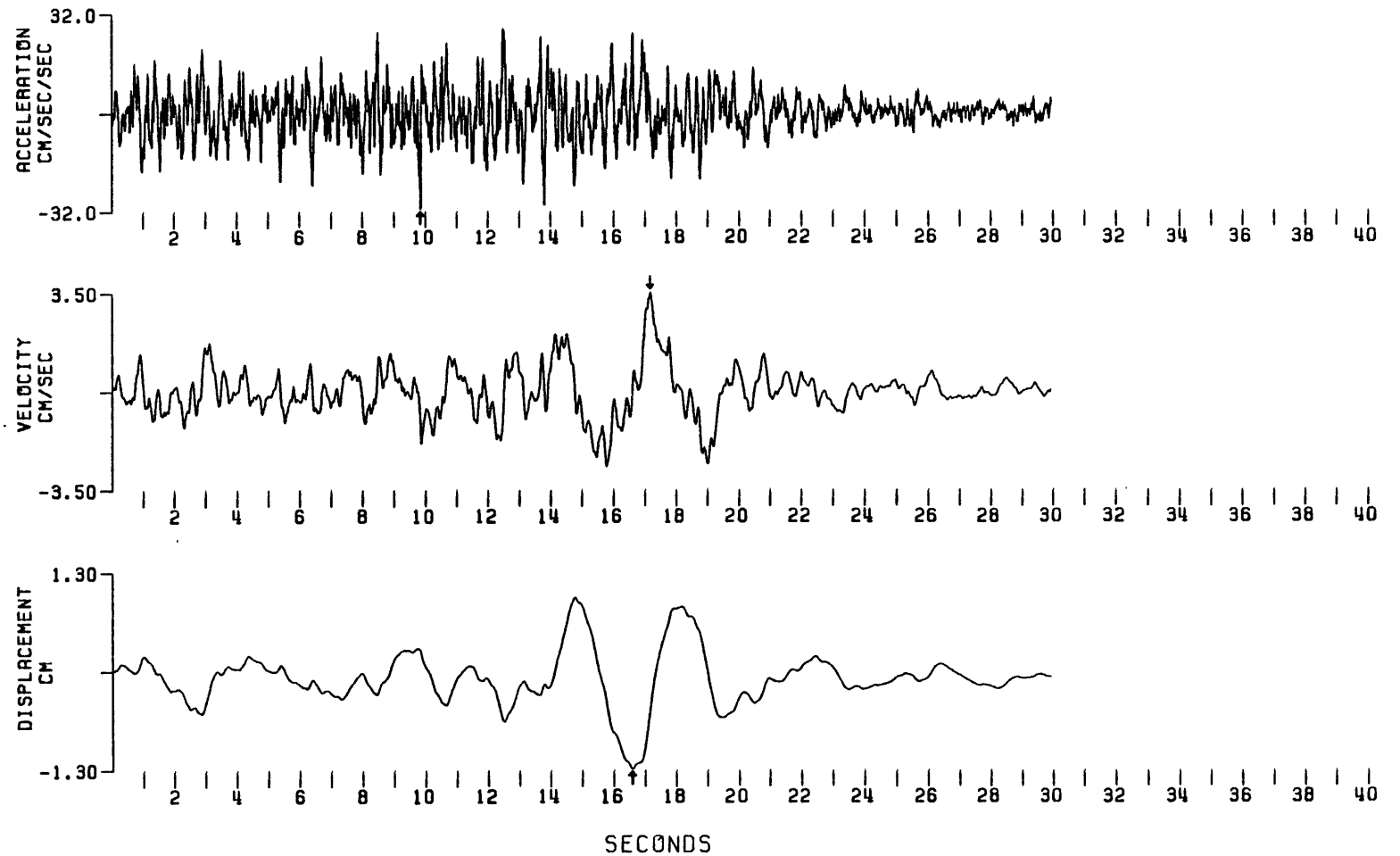

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
VINA DEL MAR
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=81.10 CM/SEC/SEC, VELOCITY=6.06 CM/SEC, DISPL=1.10 CM
ACCELERATION CM/SEC/SEC
82.0
-82.0
VELOCITY CM/SEC
6.10
-6.10
DISPLACEMENT CM
1.20
-1.20
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS

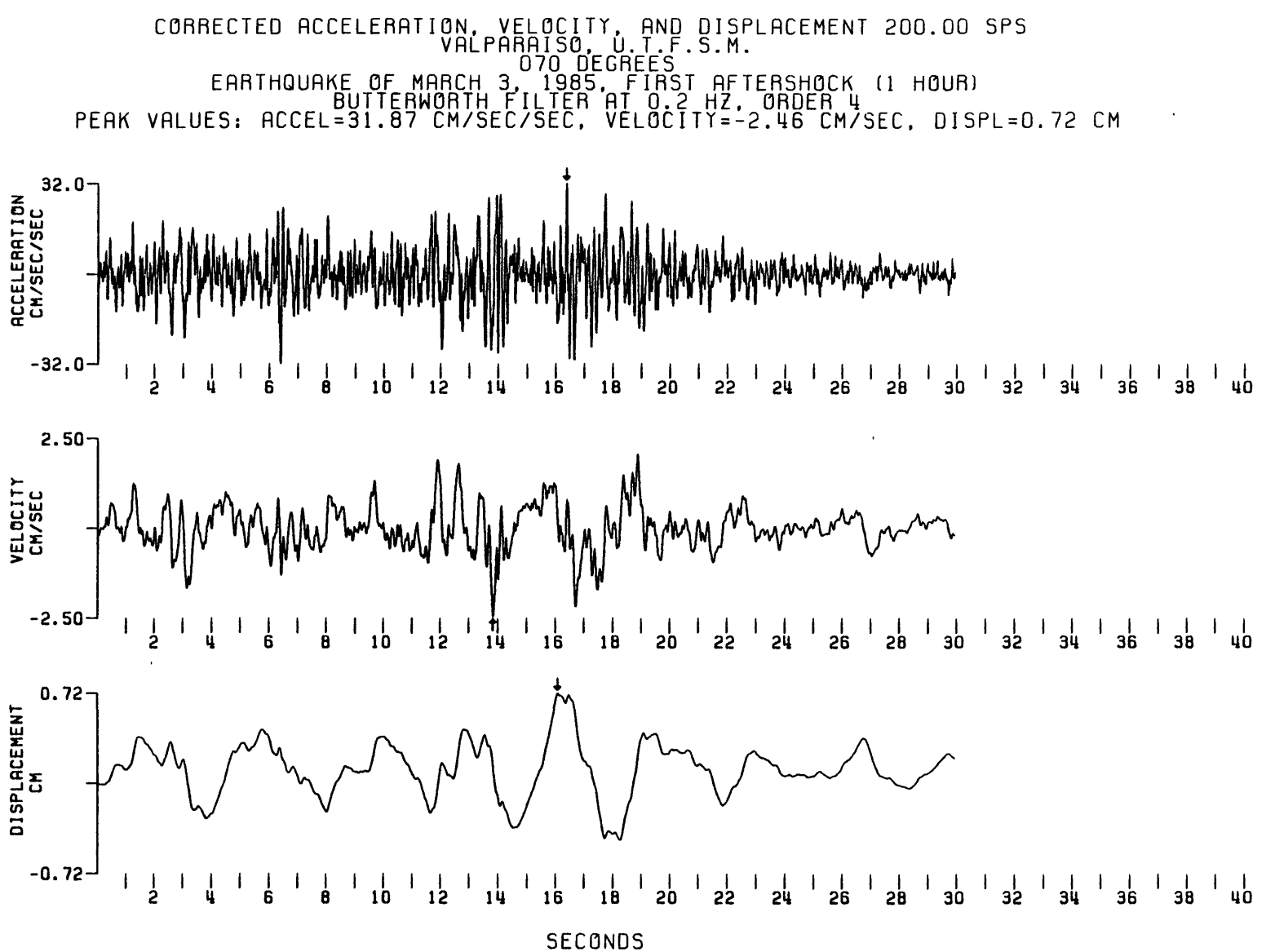

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
VINA DEL MAR
UP
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=55.26 CM/SEC/SEC, VELOCITY=4.61 CM/SEC, DISPL=1.33 CM
ACCELERATION CM/SEC/SEC
56.0
-56.0
VELOCITY CM/SEC
4.70
-4.70
DISPLACEMENT CM
1.40
-1.40
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS

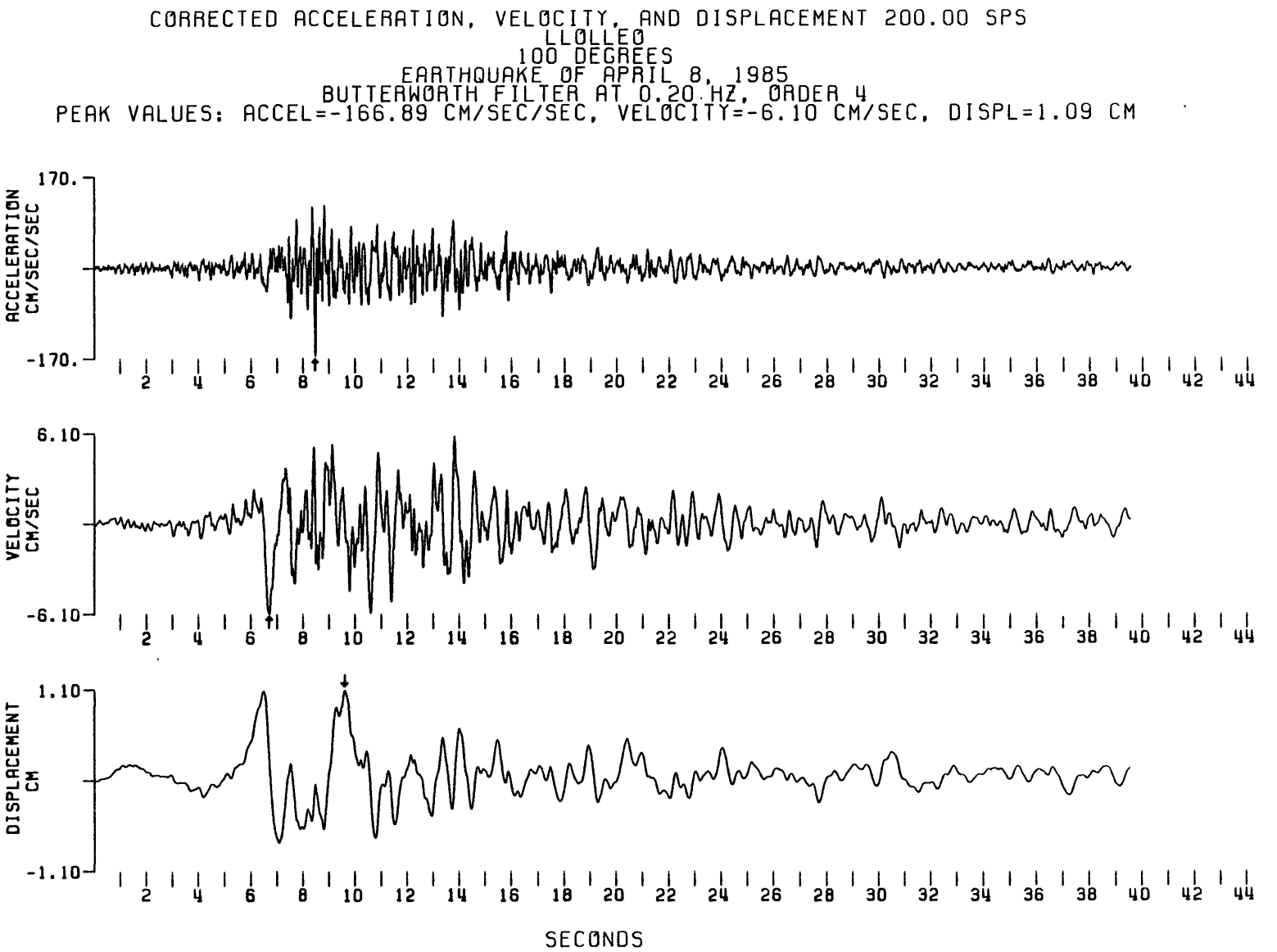

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
VINA DEL MAR
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=79.82 CM/SEC/SEC, VELOCITY=5.42 CM/SEC, DISPL=1.31 CM
ACCELERATION CM/SEC/SEC
80.0
-80.0
VELOCITY CM/SEC
5.50
-5.50
DISPLACEMENT CM
1.40
-1.40
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS

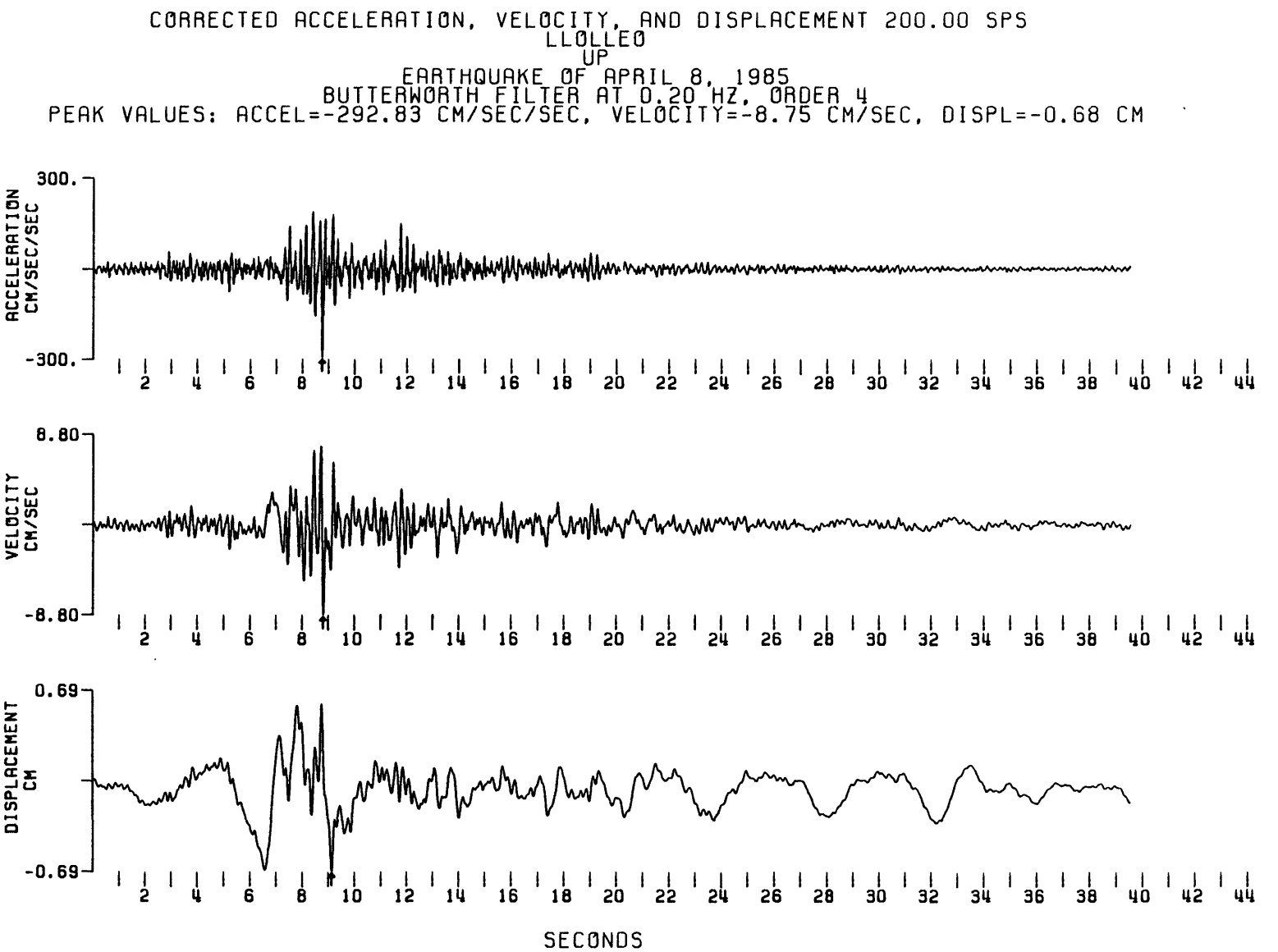

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
VALPARAISO, U.T.F.S.M.
160 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=39.68 CM/SEC/SEC, VELOCITY=-2.70 CM/SEC, DISPL=0.83 CM
ACCELERATION CM/SEC/SEC
40.0
-40.0
VELOCITY CM/SEC
2.70
-2.70
DISPLACEMENT CM
0.83
-0.83
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS

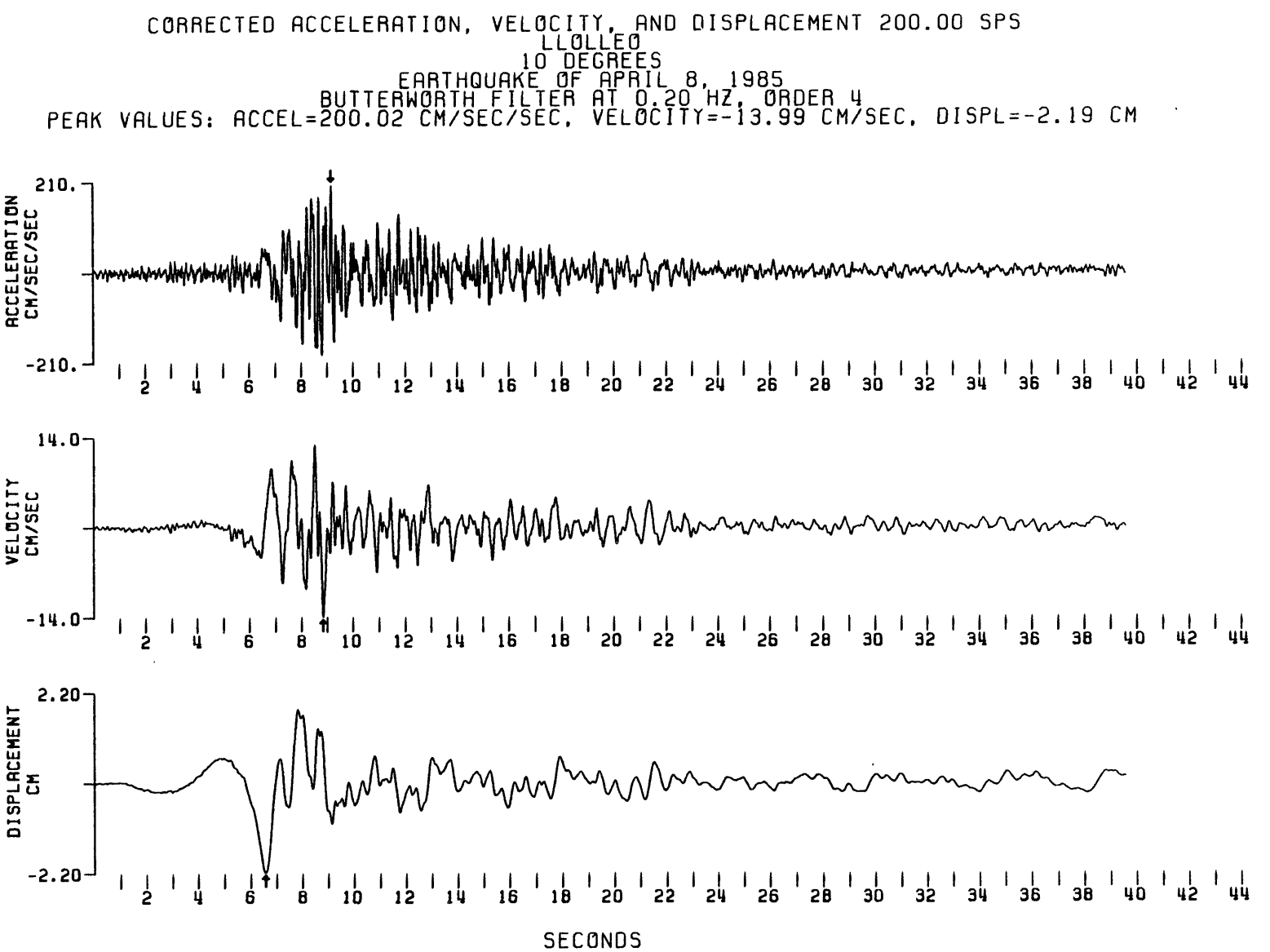
CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
VALPARAISO, U.T.F.S.M.
UP
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=-31.33 CM/SEC/SEC, VELOCITY=3.49 CM/SEC, DISPL=-1.29 CM



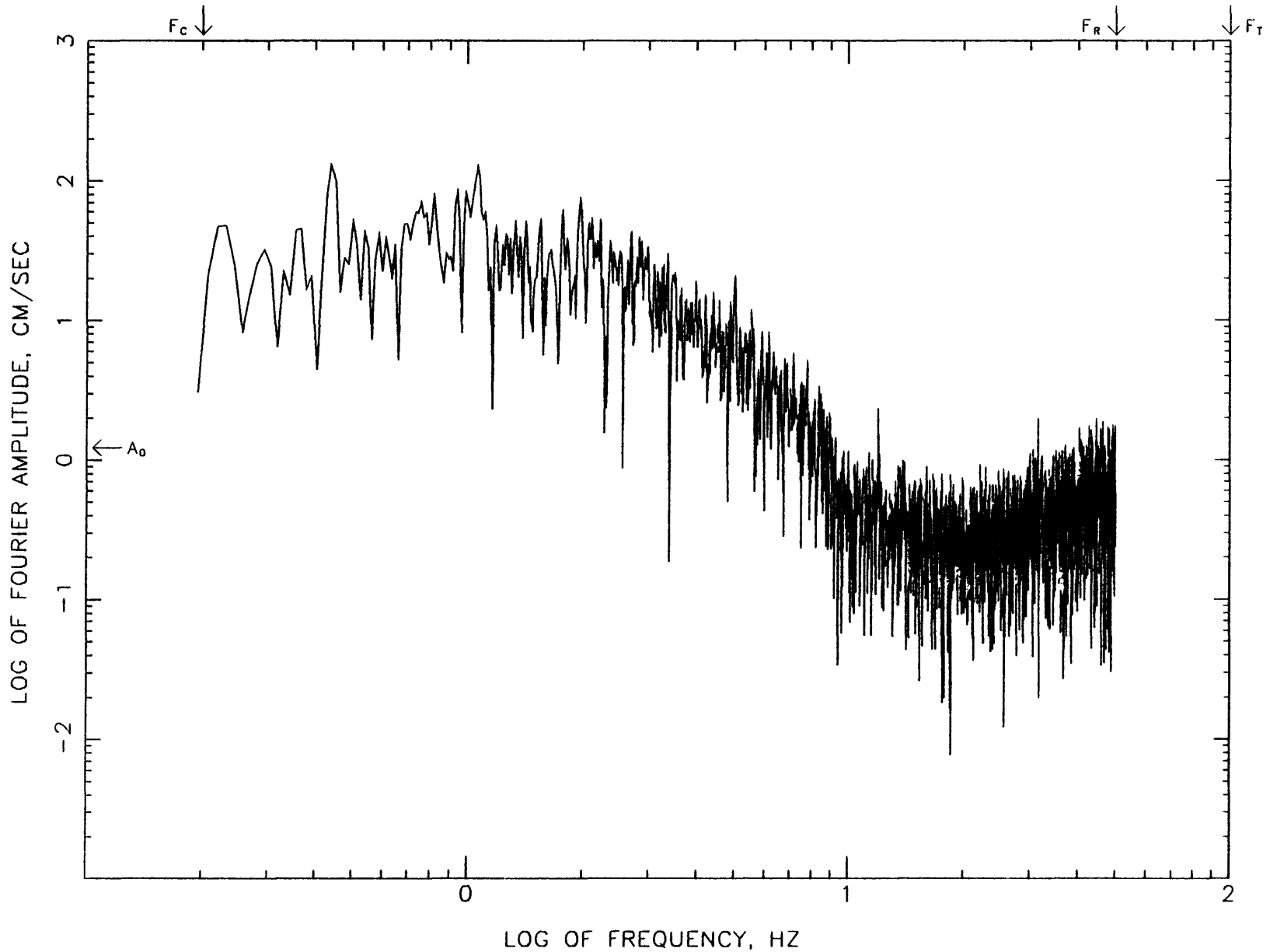

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
VALPARAISO, U.T.F.S.M.
070 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
PEAK VALUES: ACCEL=31.87 CM/SEC/SEC, VELOCITY=-2.46 CM/SEC, DISPL=0.72 CM
ACCELERATION CM/SEC/SEC
32.0
-32.0
VELOCITY CM/SEC
2.50
-2.50
DISPLACEMENT CM
0.72
-0.72
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS


CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
LLOLLEO
100 DEGREES
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=-166.89 CM/SEC/SEC, VELOCITY=-6.10 CM/SEC, DISPL=1.09 CM
ACCELERATION CM/SEC/SEC
170.
-170.
VELOCITY CM/SEC
6.10
-6.10
DISPLACEMENT CM
1.10
-1.10
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44
SECONDS

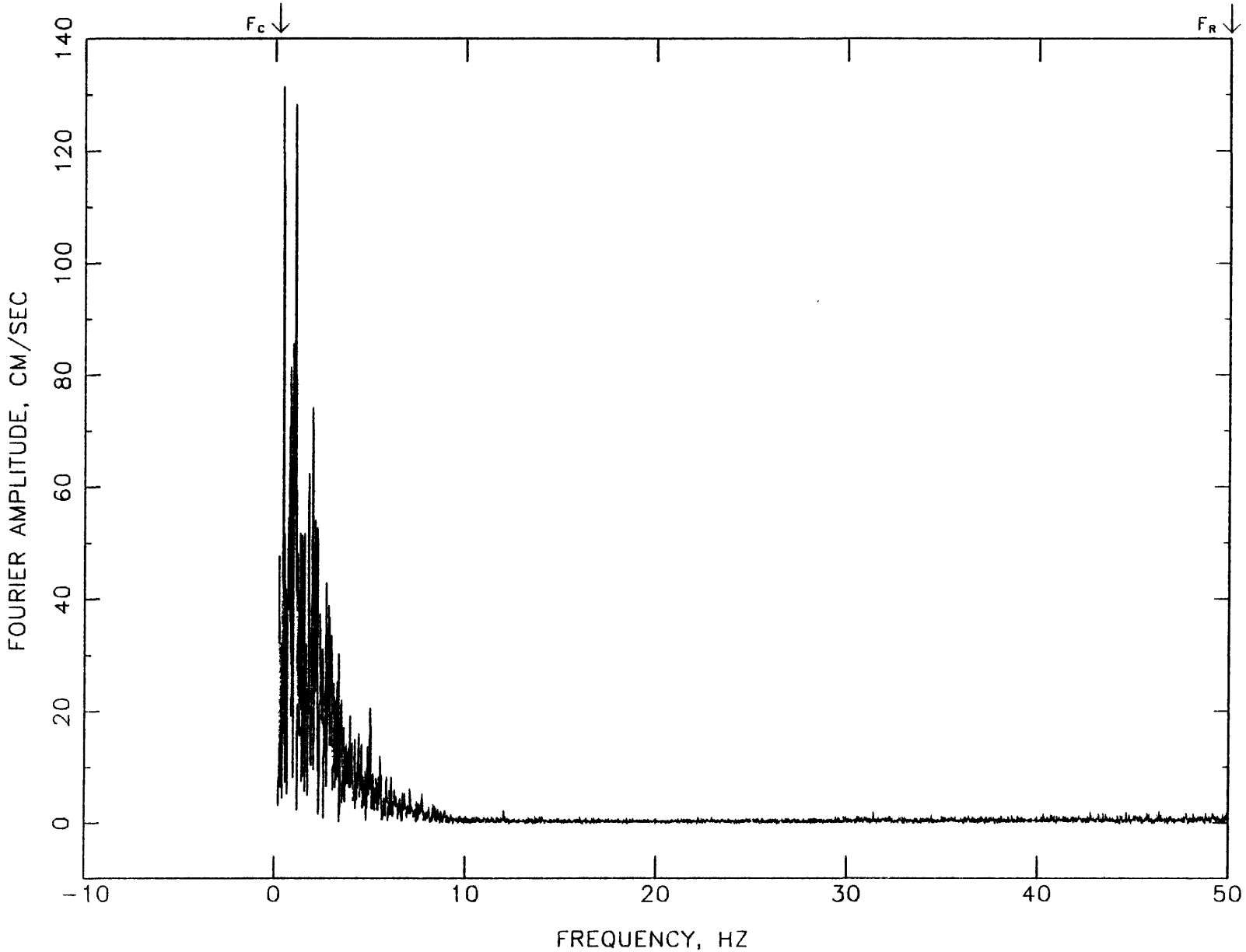

CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
LLOLLEO
UP
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=-292.83 CM/SEC/SEC, VELOCITY=-8.75 CM/SEC, DISPL=-0.68 CM
ACCELERATION CM/SEC/SEC
300.
-300.
VELOCITY CM/SEC
8.80
-8.80
DISPLACEMENT CM
0.69
-0.69
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44
SECONDS


CORRECTED ACCELERATION, VELOCITY, AND DISPLACEMENT 200.00 SPS
LLOLLEO
10 DEGREES
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
PEAK VALUES: ACCEL=200.02 CM/SEC/SEC, VELOCITY=-13.99 CM/SEC, DISPL=-2.19 CM
ACCELERATION CM/SEC/SEC
210.
-210.
VELOCITY CM/SEC
14.0
-14.0
DISPLACEMENT CM
2.20
-2.20
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44
SECONDS

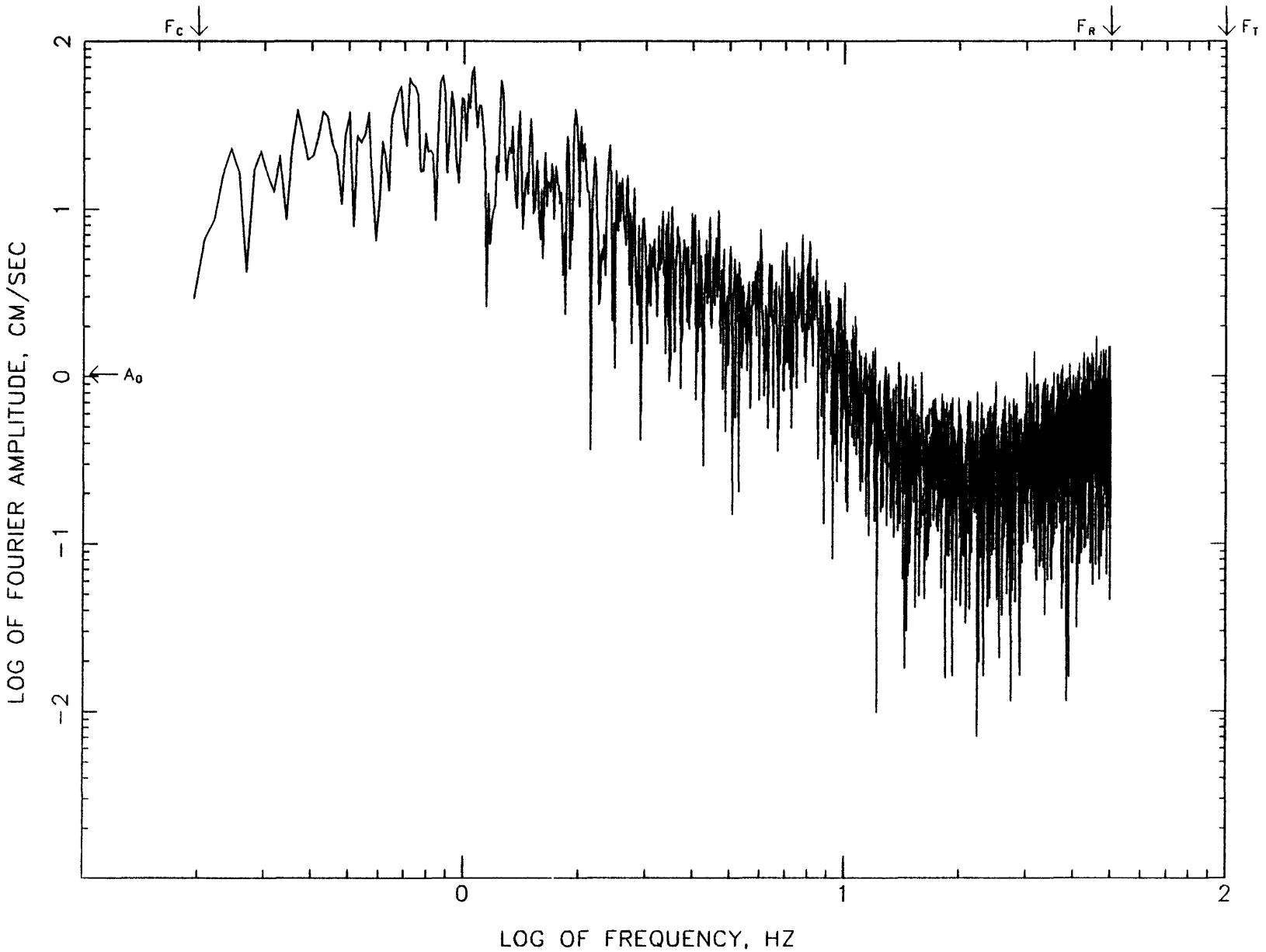
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
CHILLAN INSTITUTE
080 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



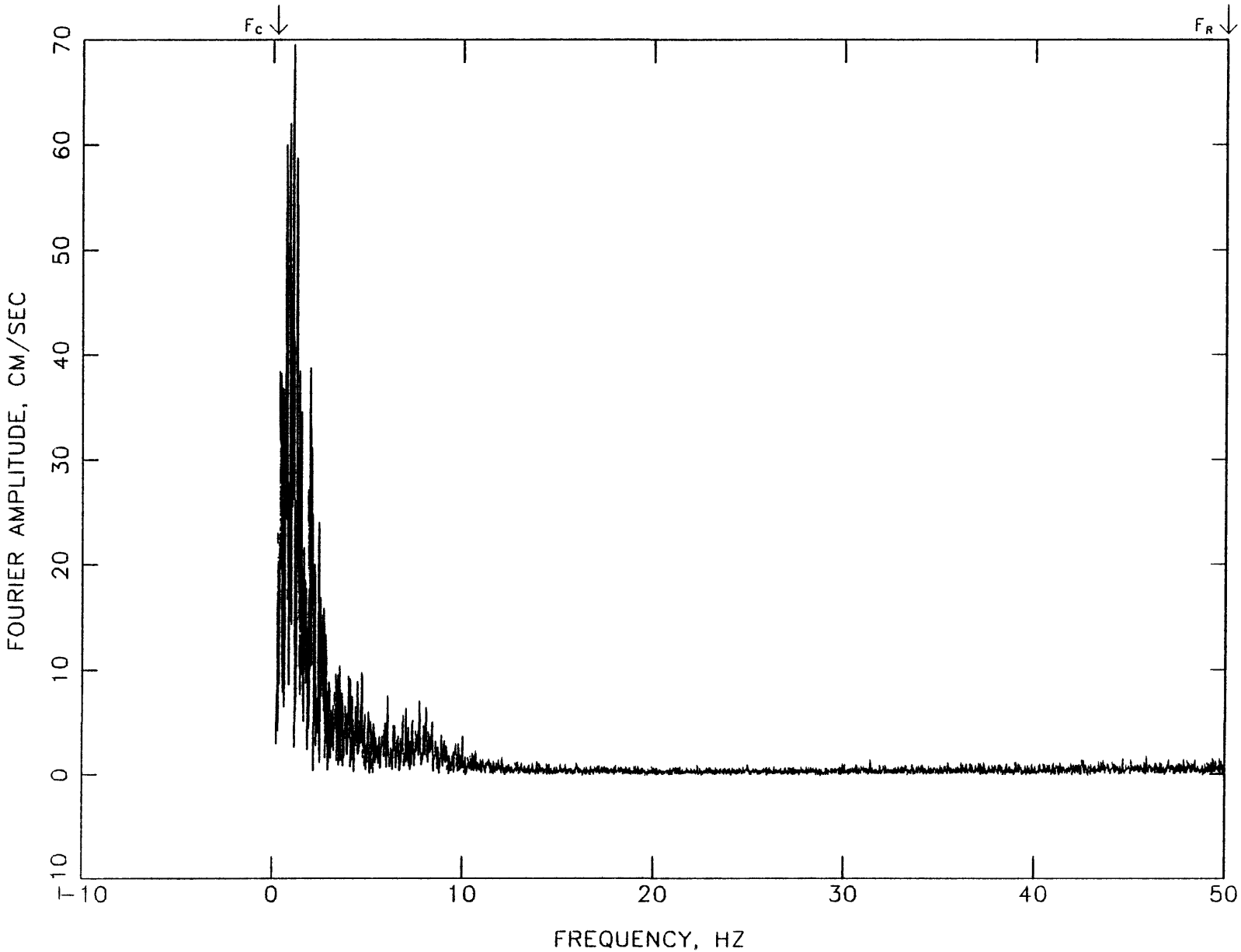
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
CHILLAN INSTITUTE
080 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



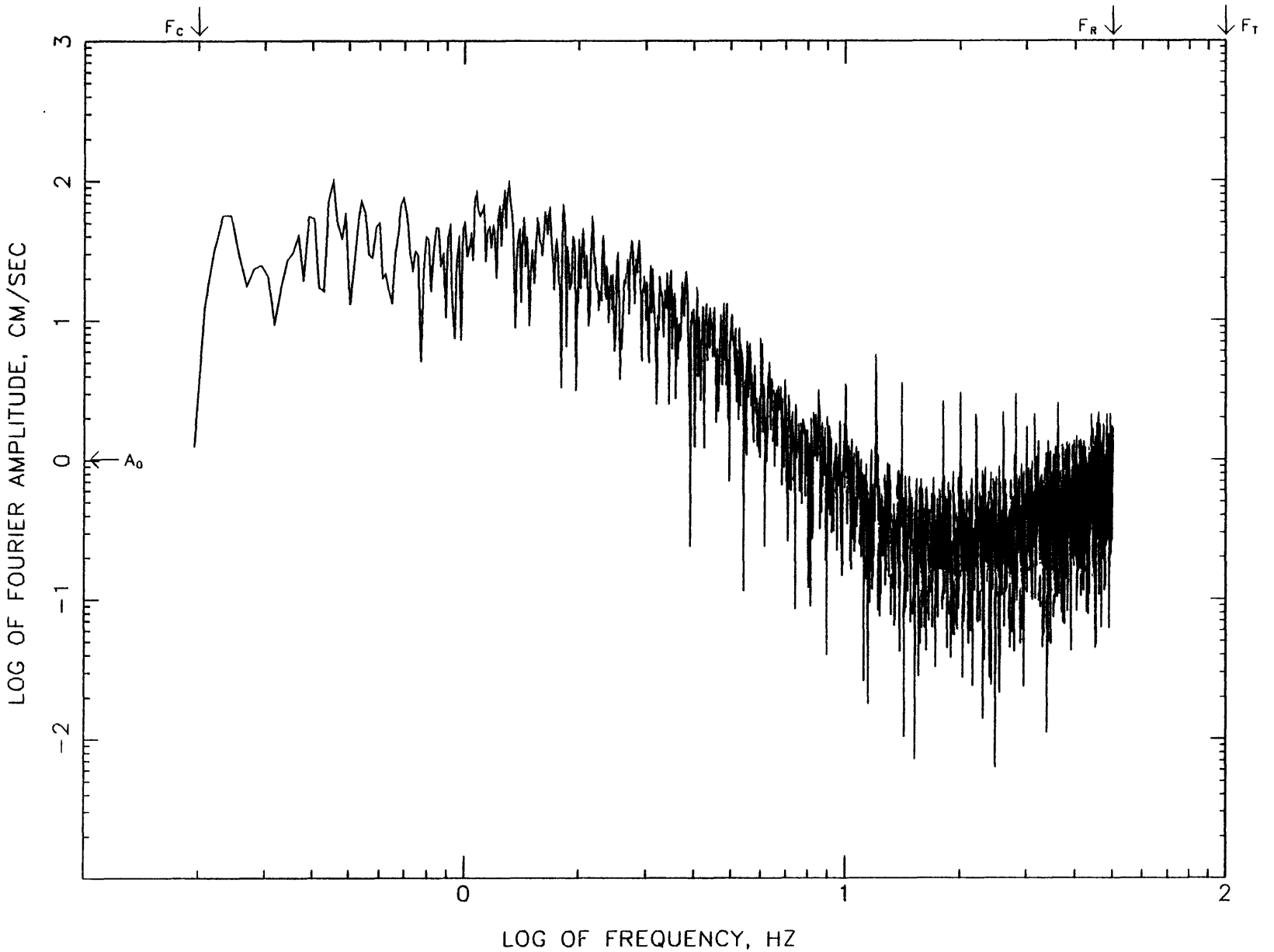
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
CHILLAN INSTITUTE
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



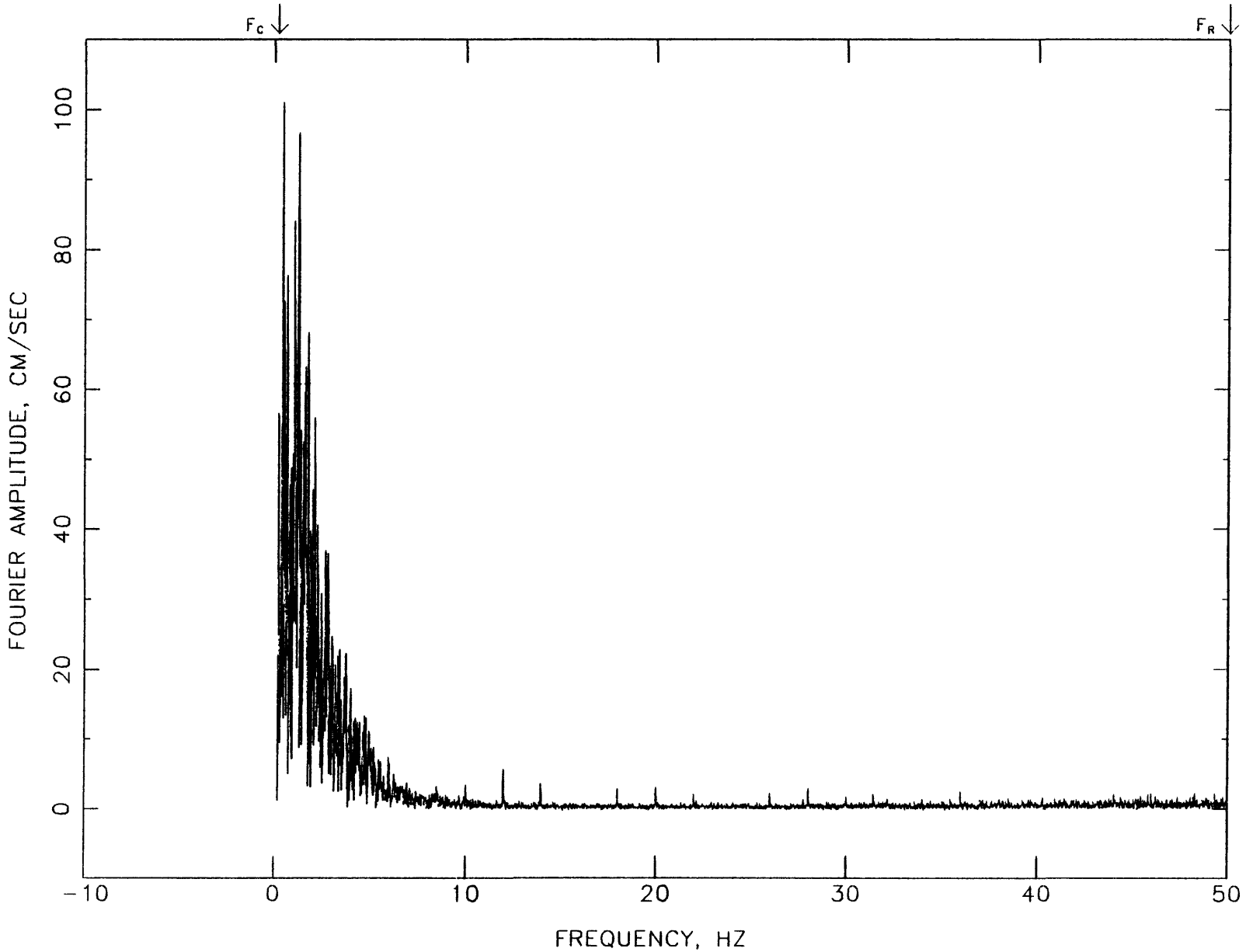
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
CHILLAN INSTITUTE
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



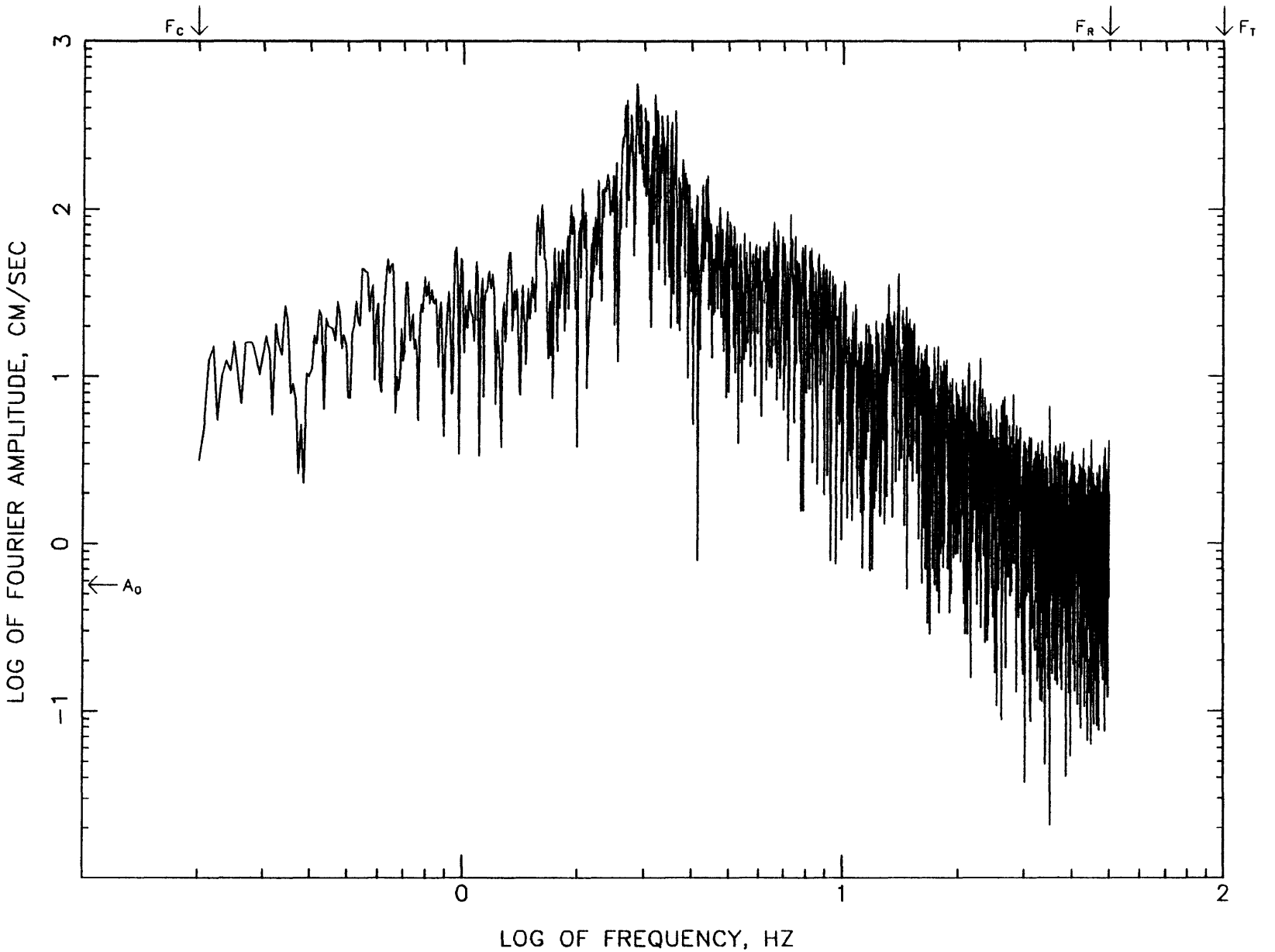
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
CHILLAN INSTITUTE
350 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



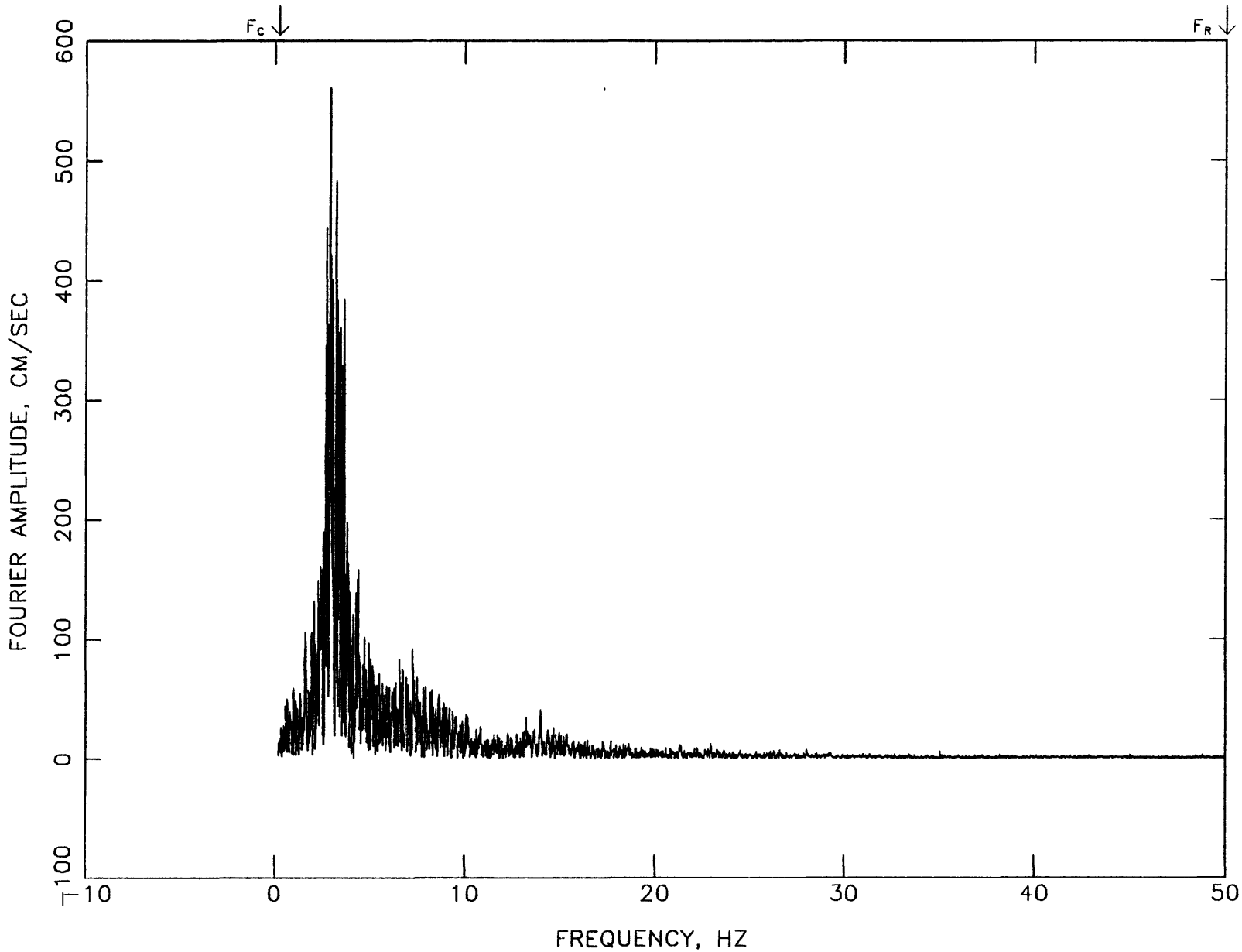
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
CHILLAN INSTITUTE
350 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



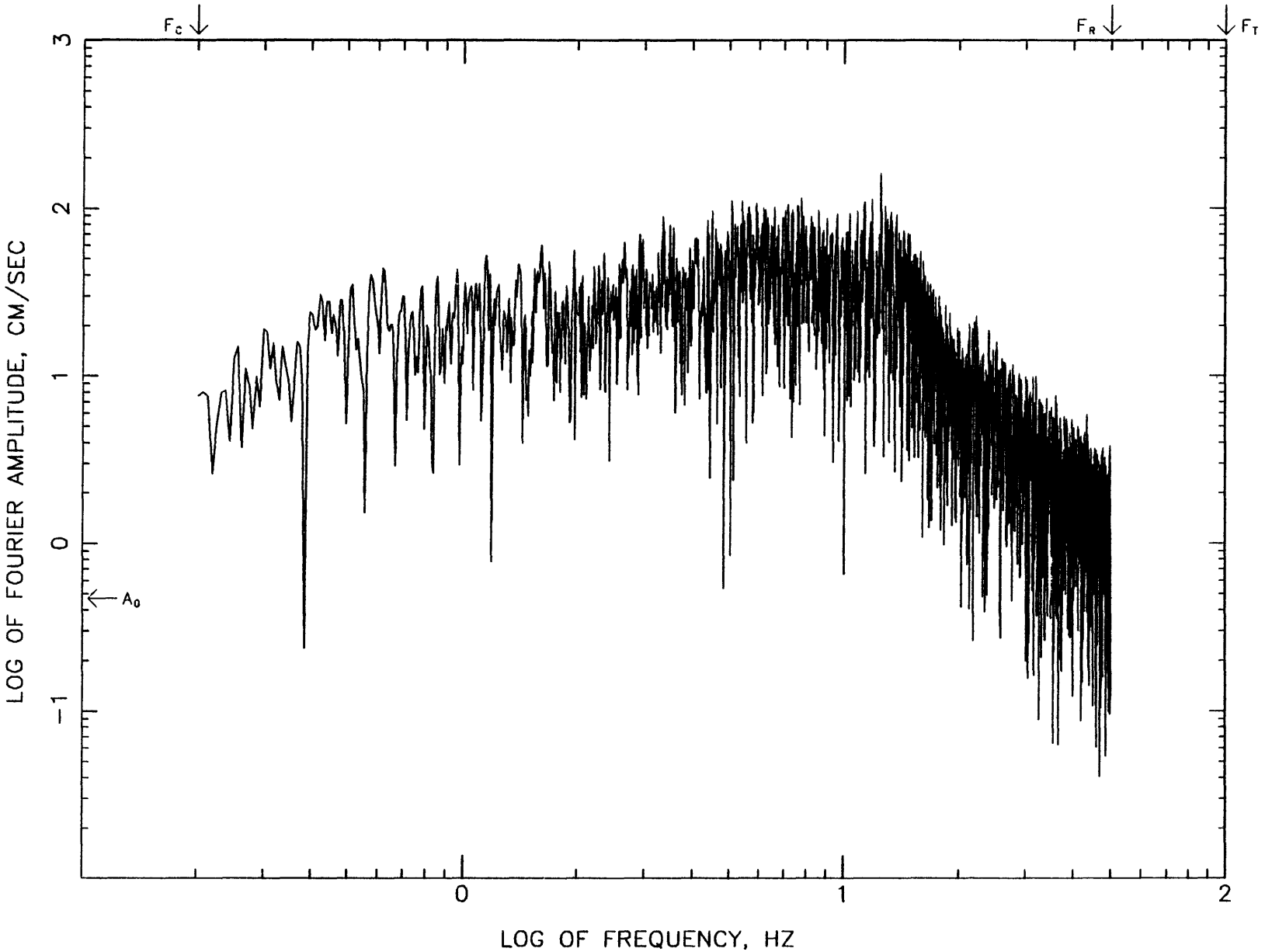
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
PAPUDO
140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



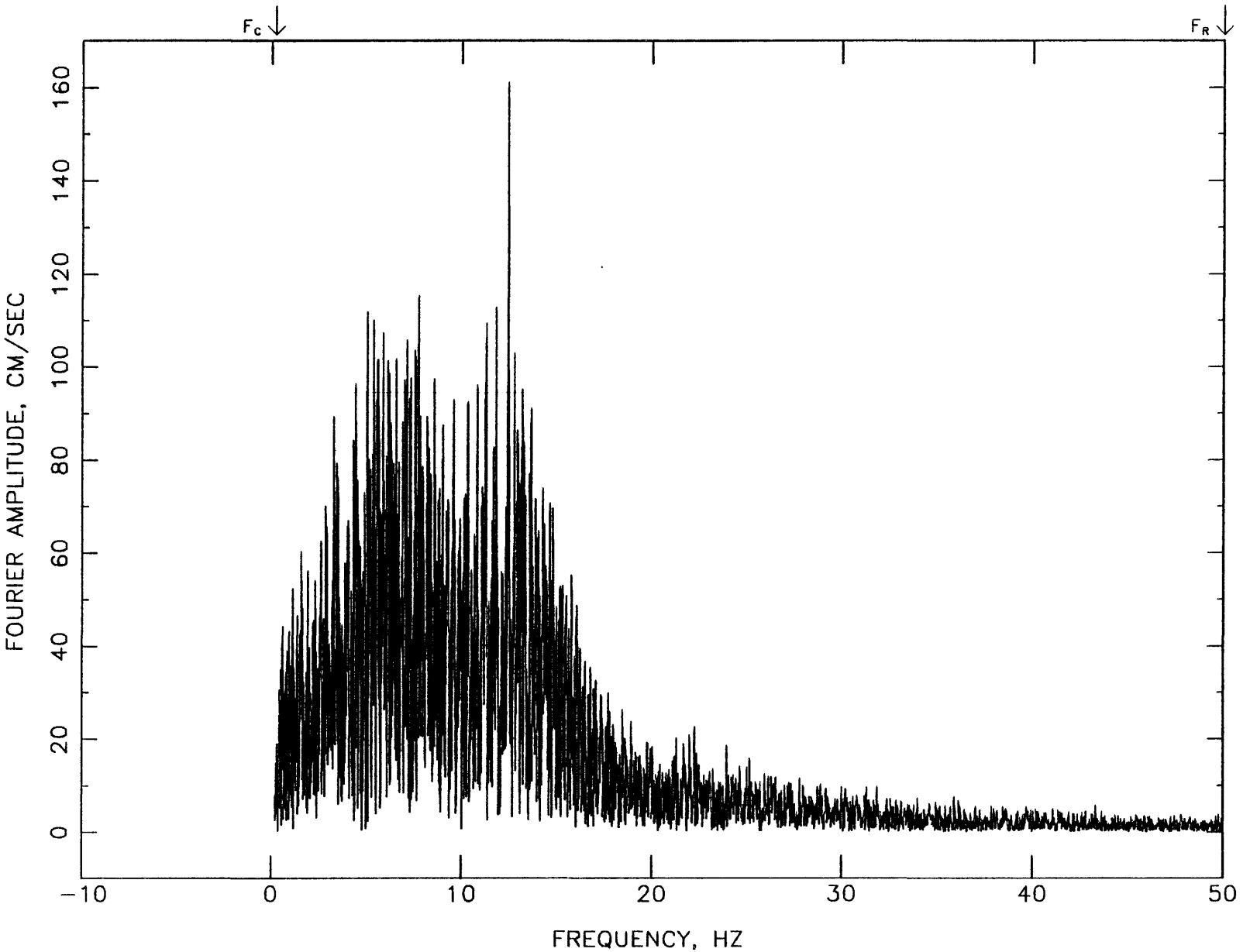
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
PAPUDO
140 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

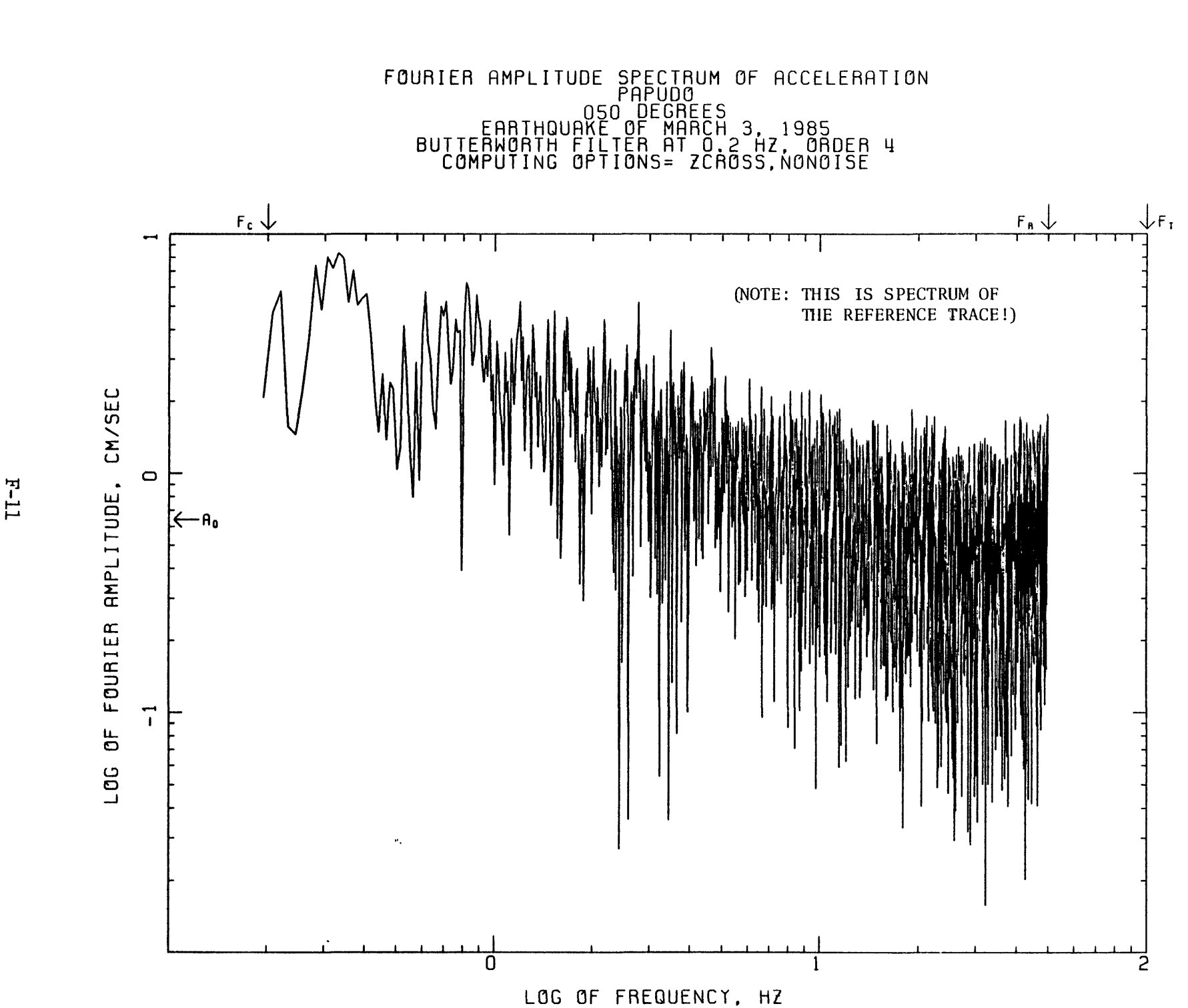


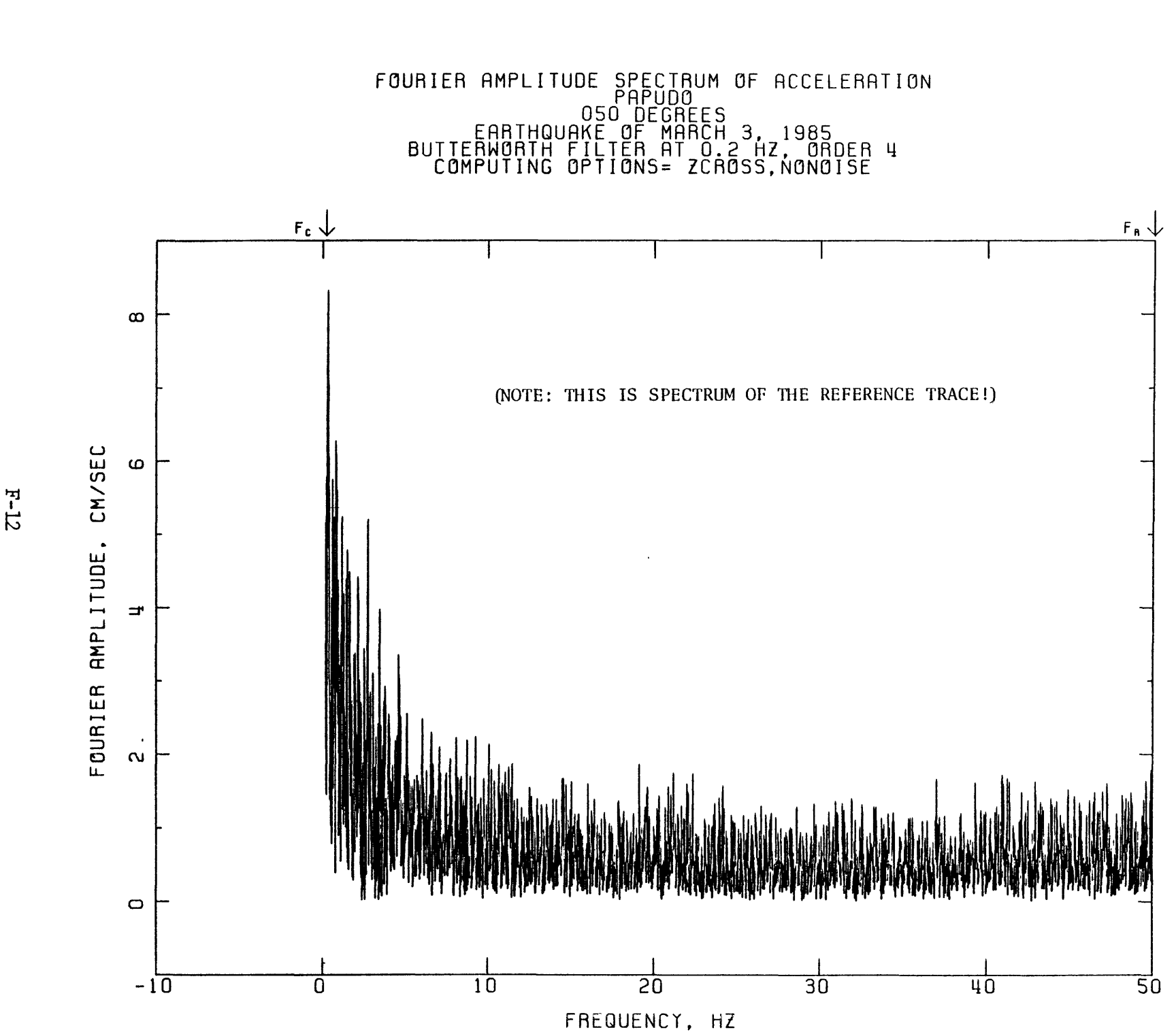
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
PAPUDO
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

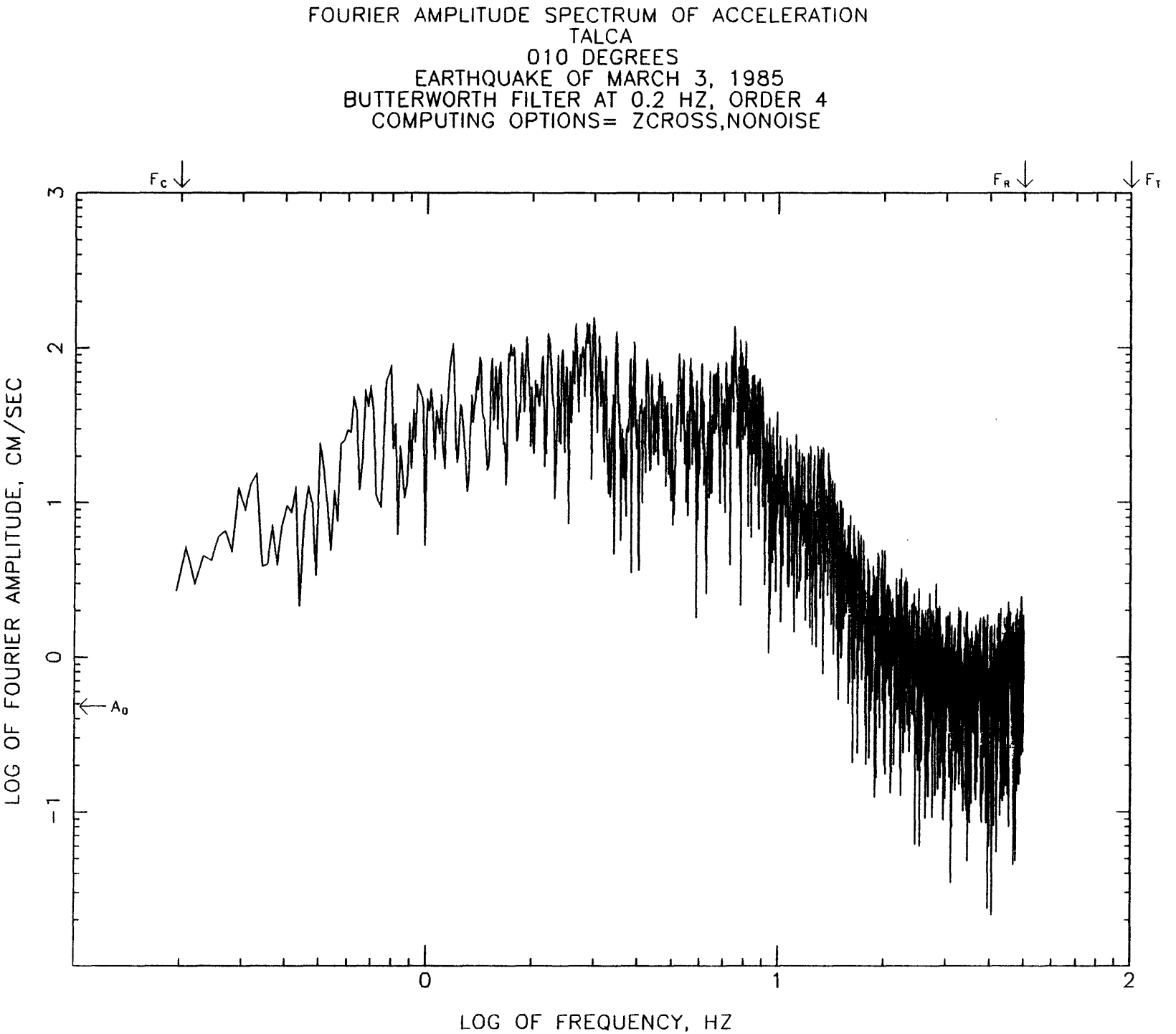


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
PAPUDO
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

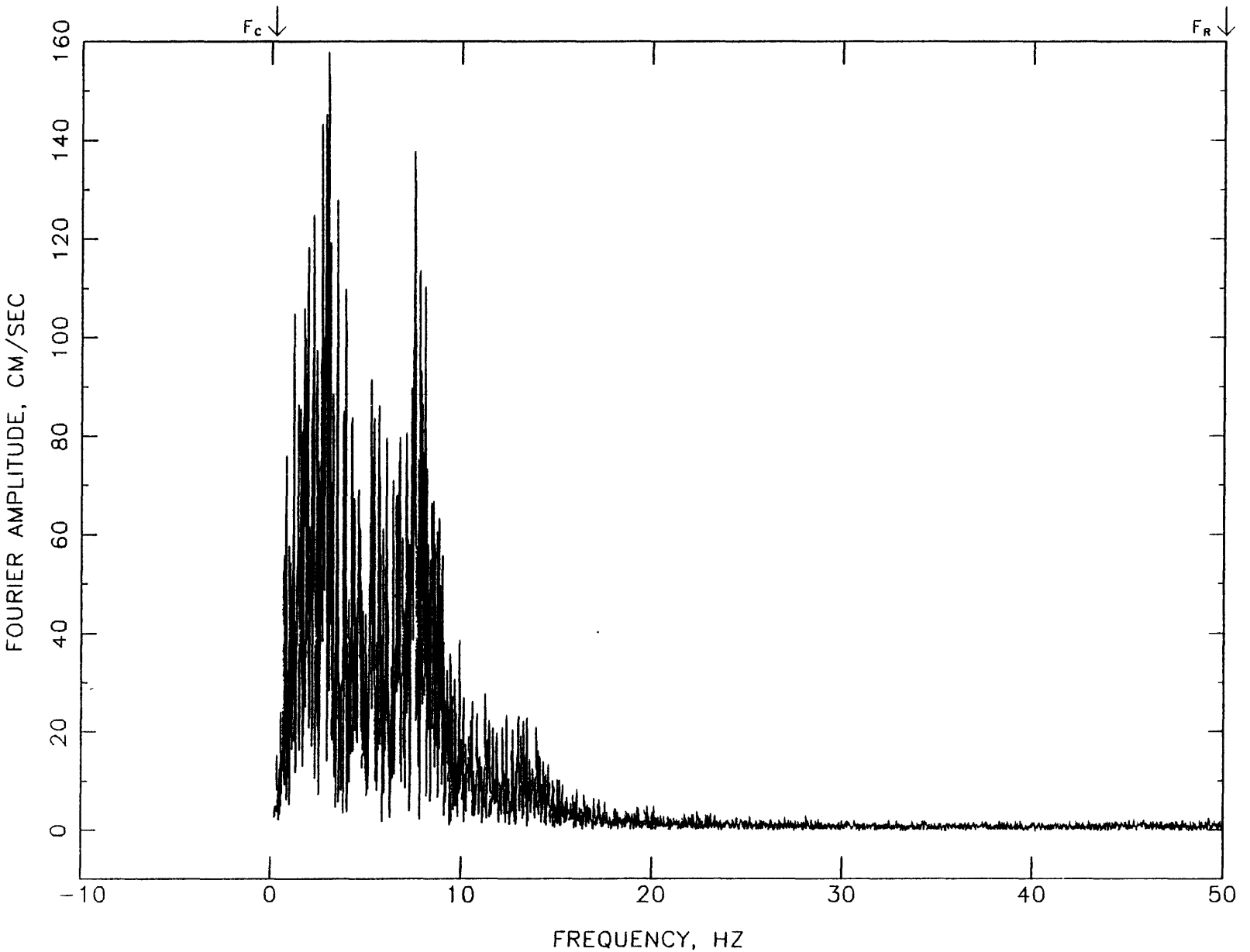



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
PAPUD0
050 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_R
F_T
(NOTE: THIS IS SPECTRUM OF
THE REFERENCE TRACE!)
A_0
LOG OF FOURIER AMPLITUDE, CM/SEC
1
0
-1
0
1
2
LOG OF FREQUENCY, HZ

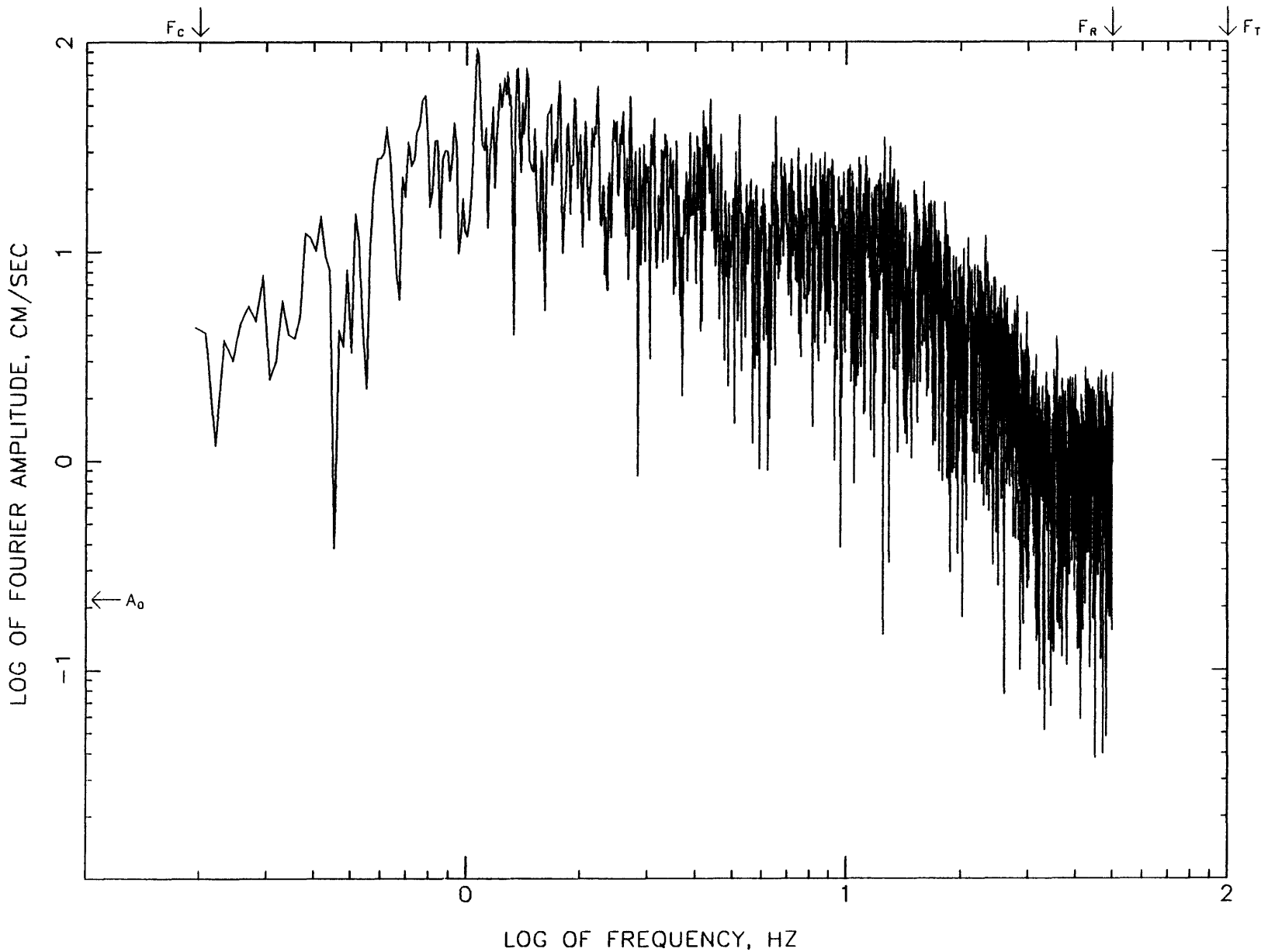

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
PAPUDO
050 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
(NOTE: THIS IS SPECTRUM OF THE REFERENCE TRACE!)
FOURIER AMPLITUDE, CM/SEC
0
2.
4
6
8
-10
0
10
20
30
40
50
FREQUENCY, HZ

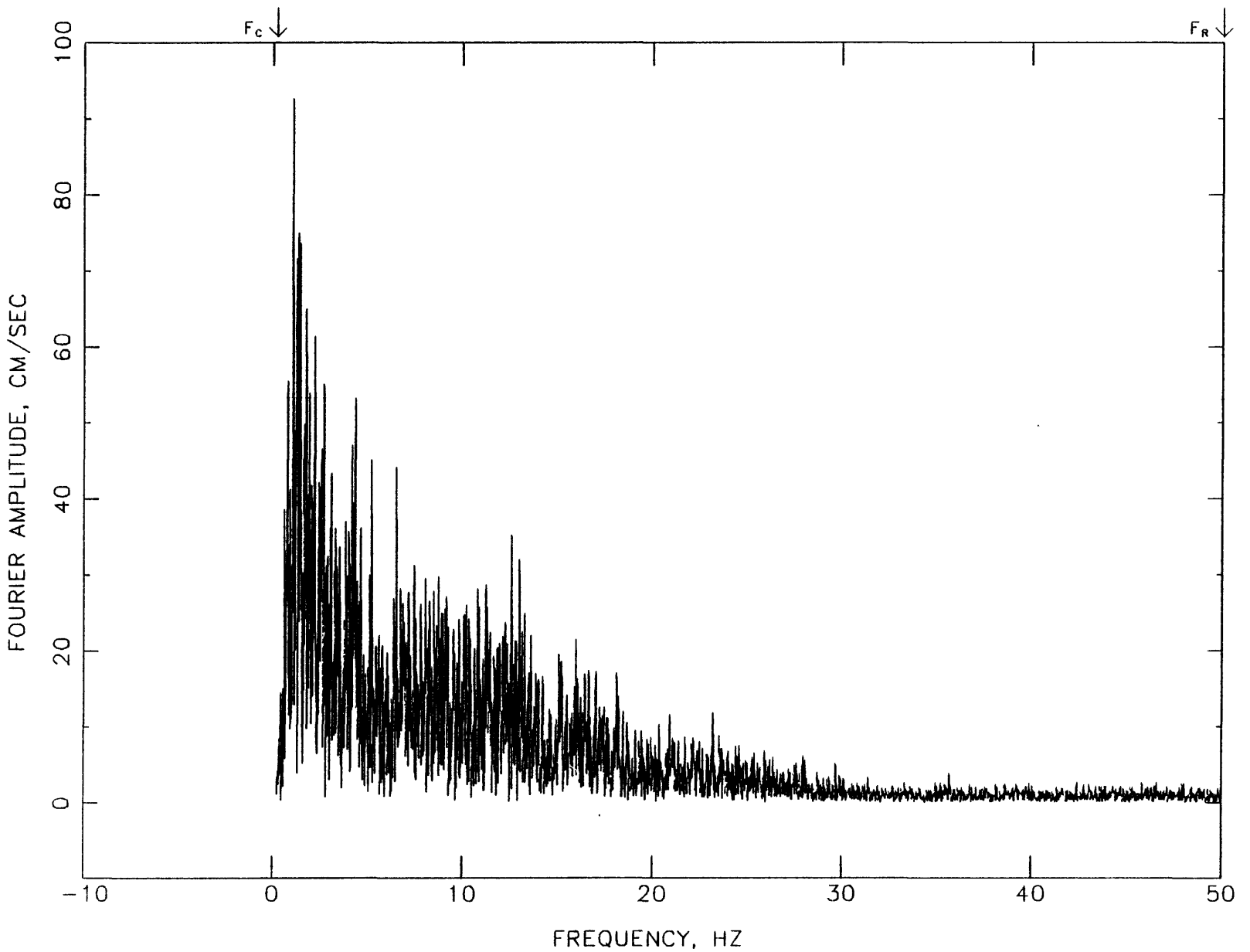

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
TALCA
010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

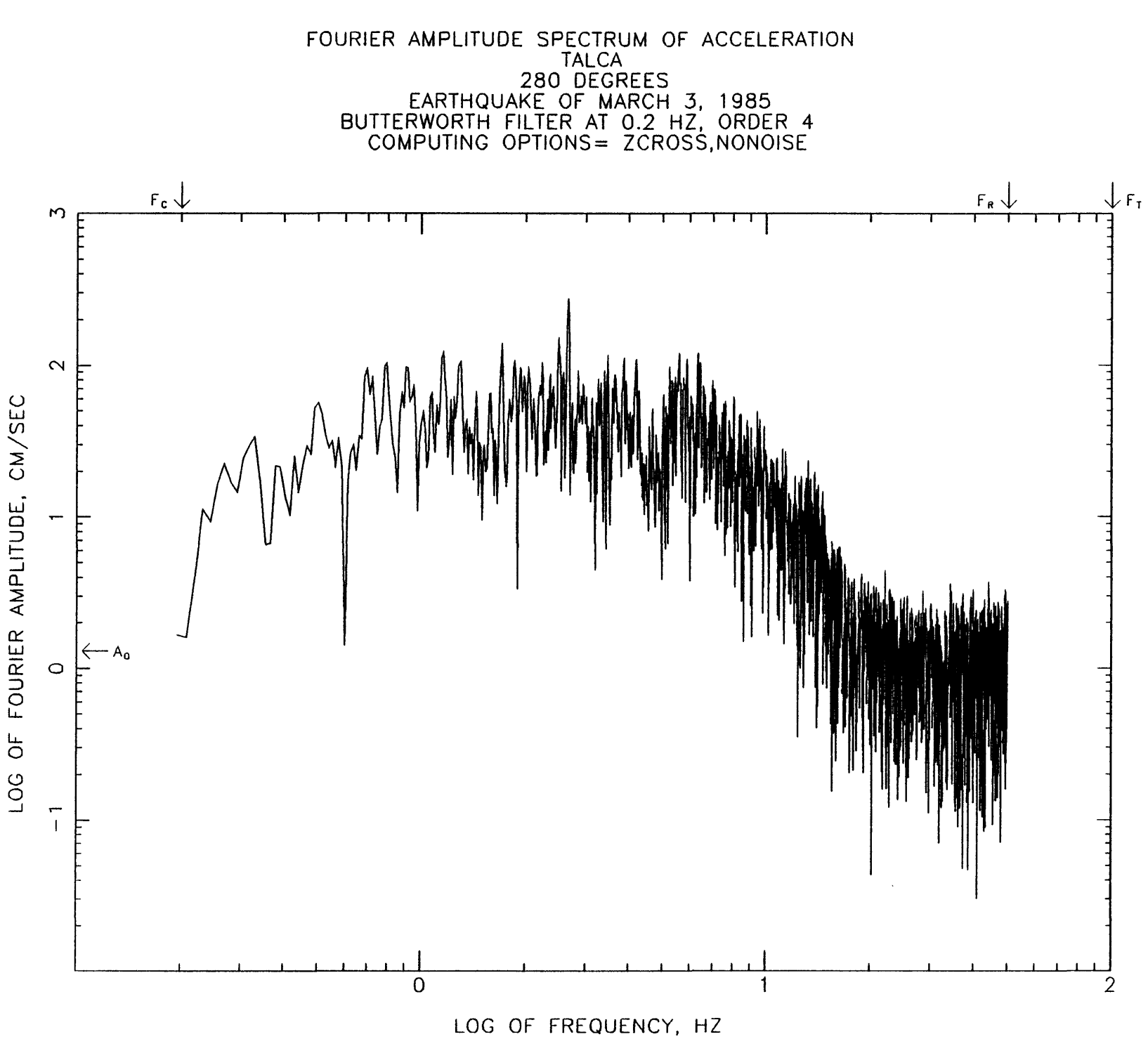
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
TALCA
010 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



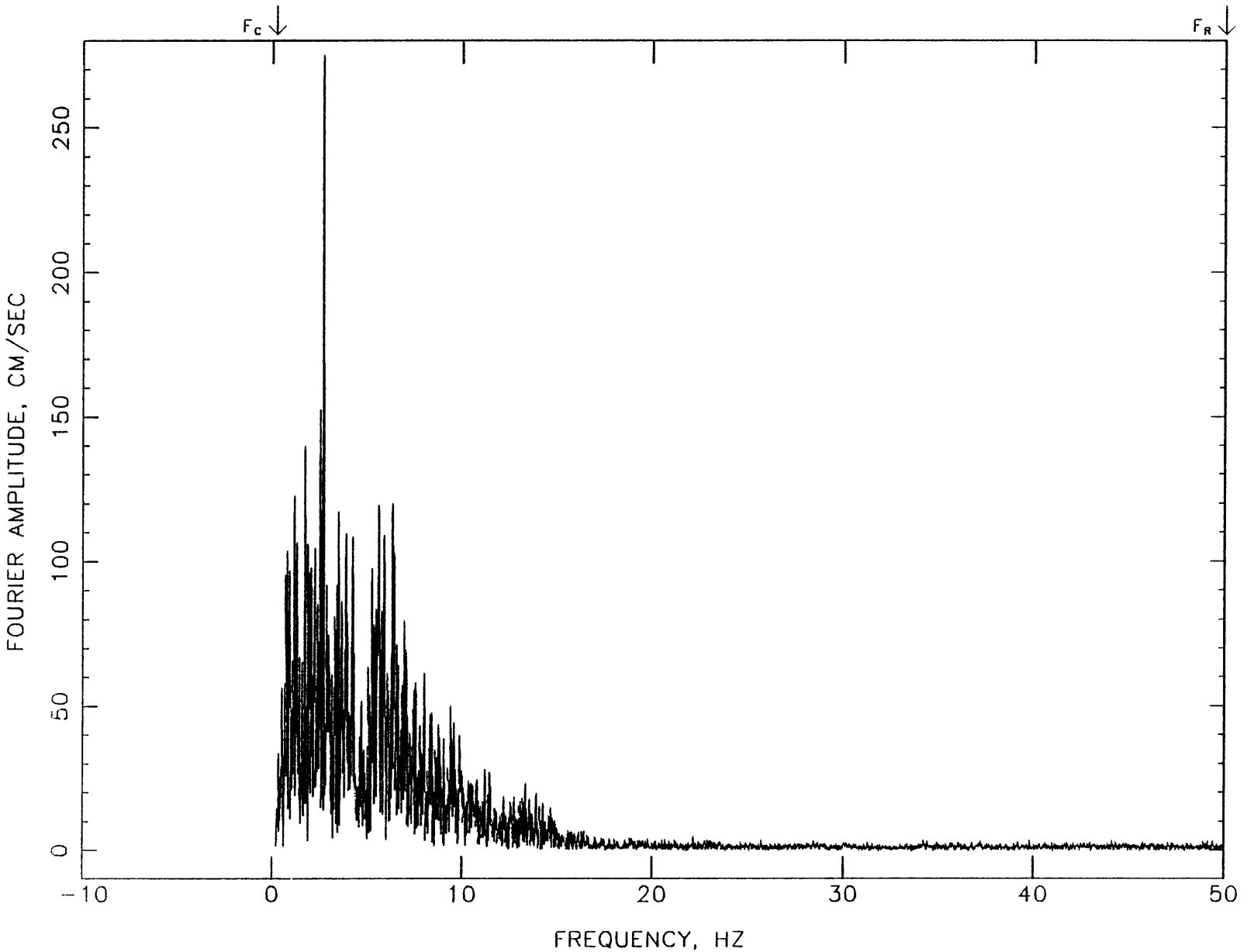
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
TALCA
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



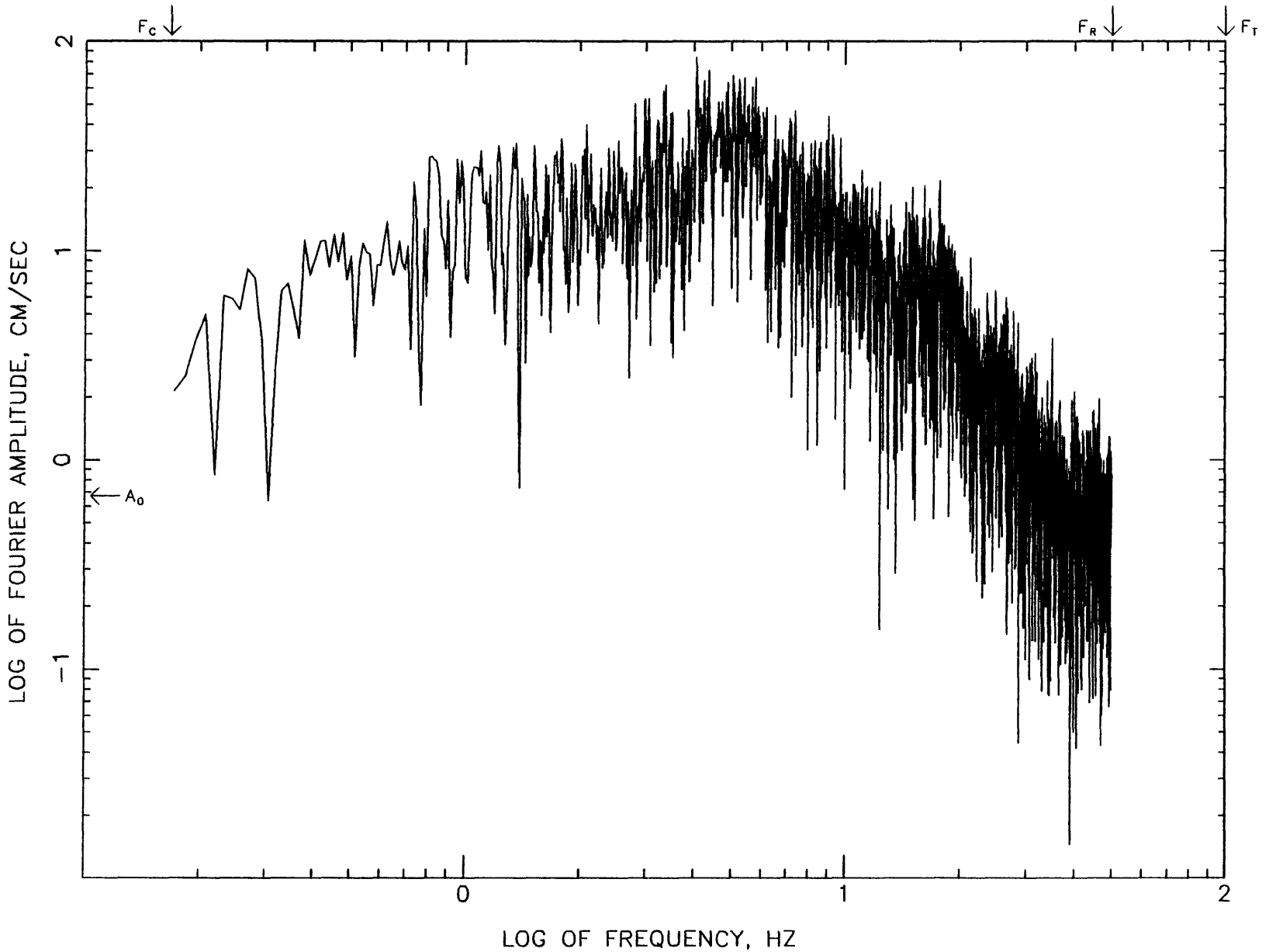

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
TALCA
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_R
FOURIER AMPLITUDE, CM/SEC
0
20
40
60
80
100
−10
0
10
20
30
40
50
FREQUENCY, HZ


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
TALCA
280 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_R
F_T
A_0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

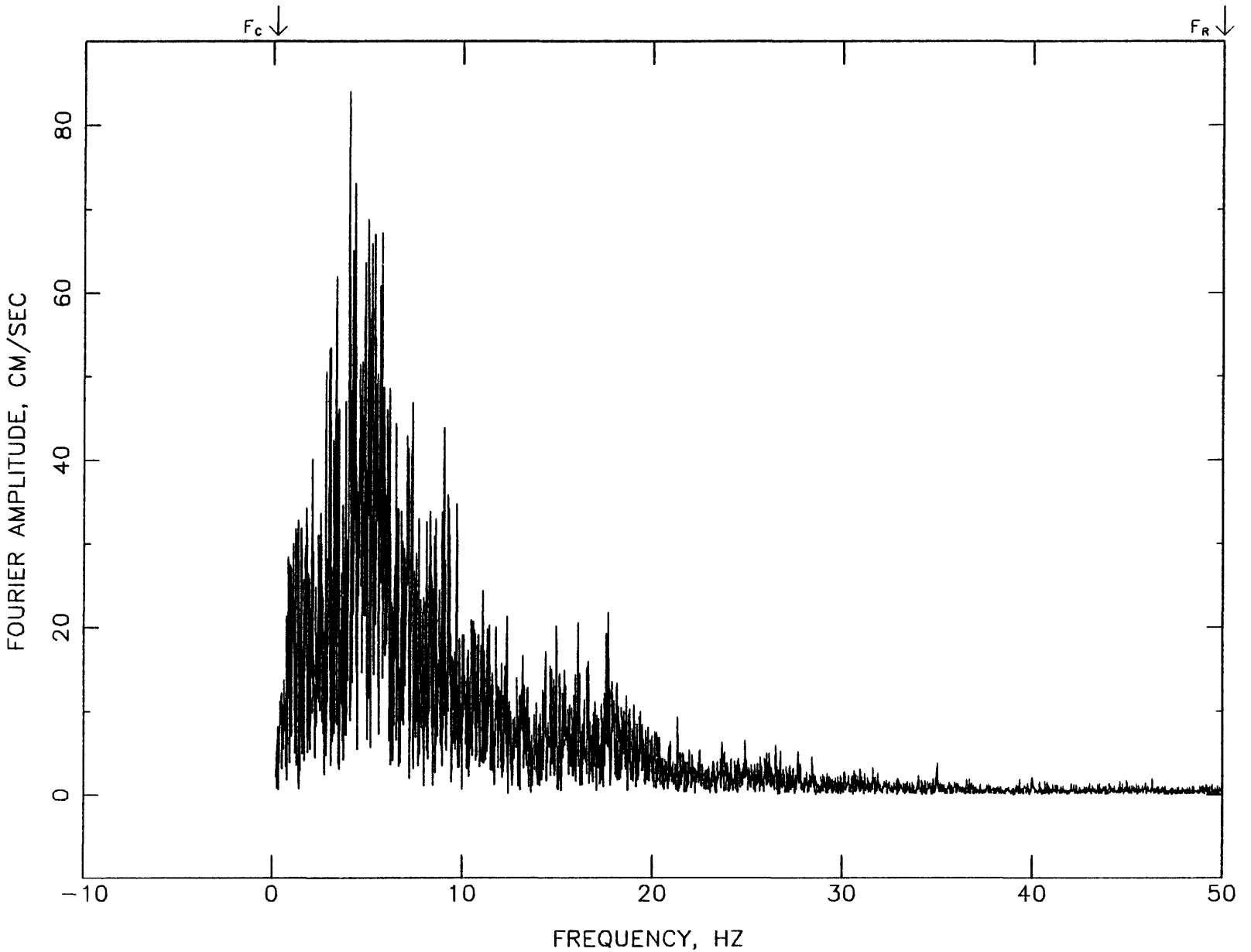
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
TALCA
280 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



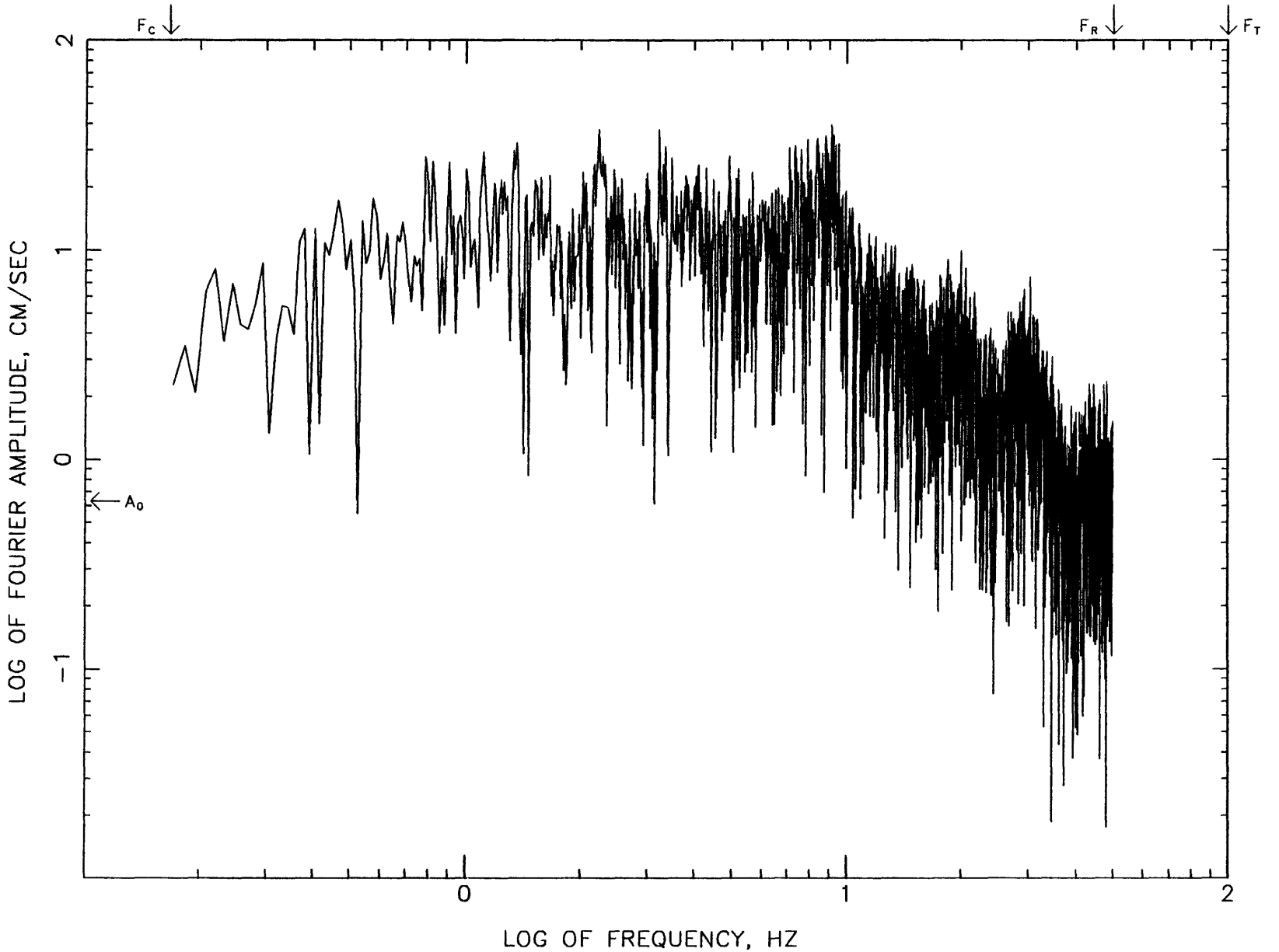
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
ILLAPEL
70 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

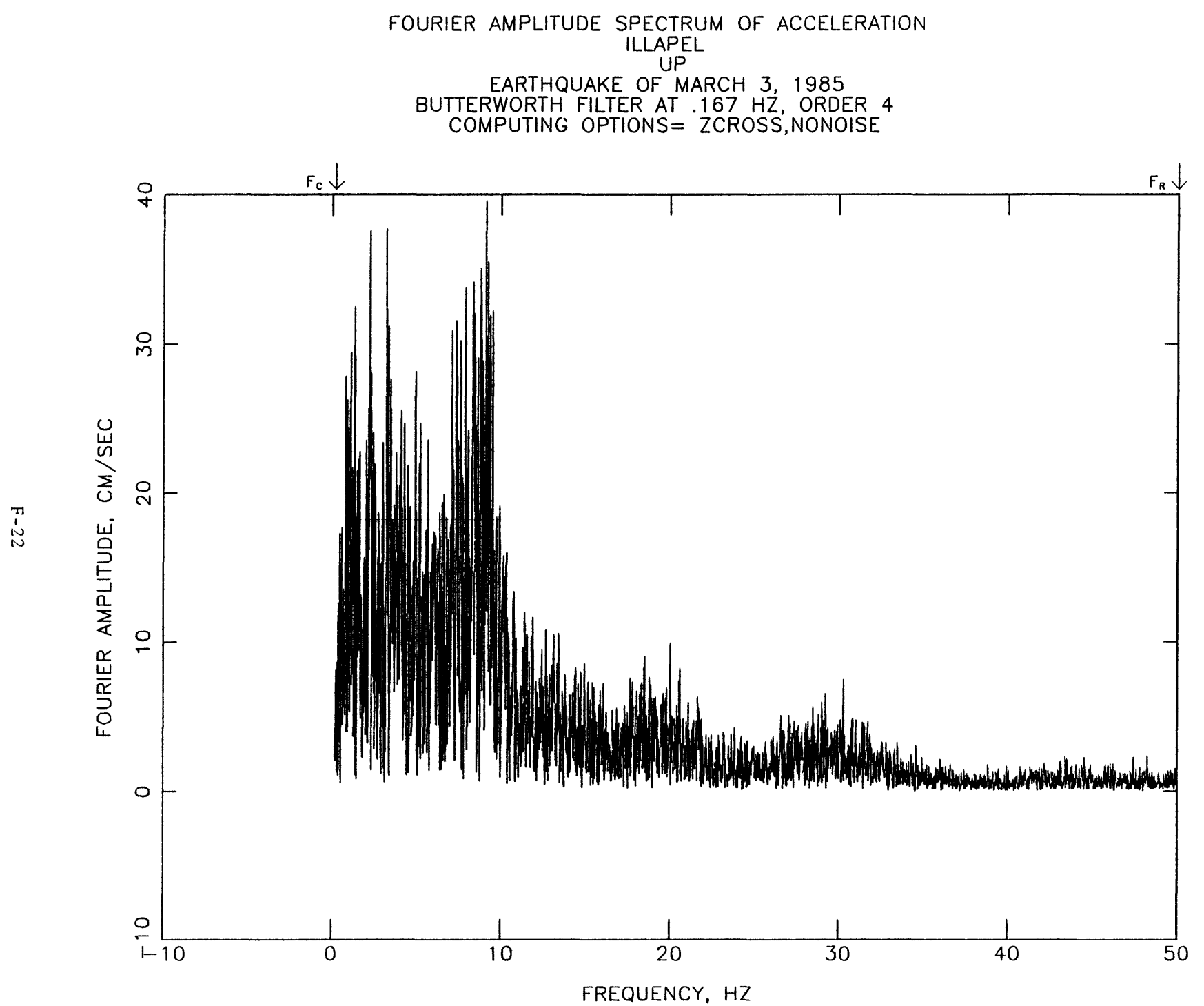


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
ILLAPEL
70 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

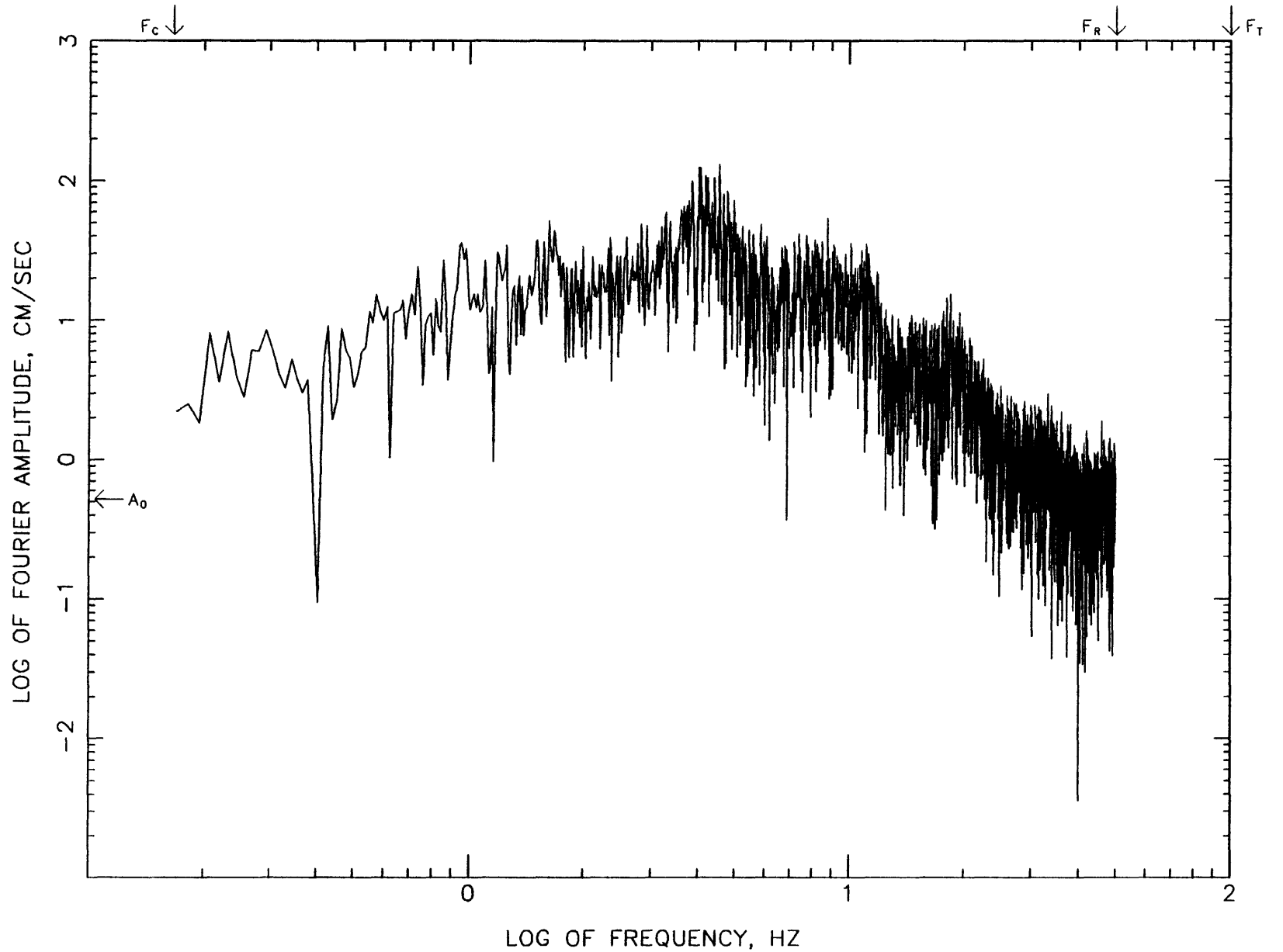


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
ILLAPEL
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

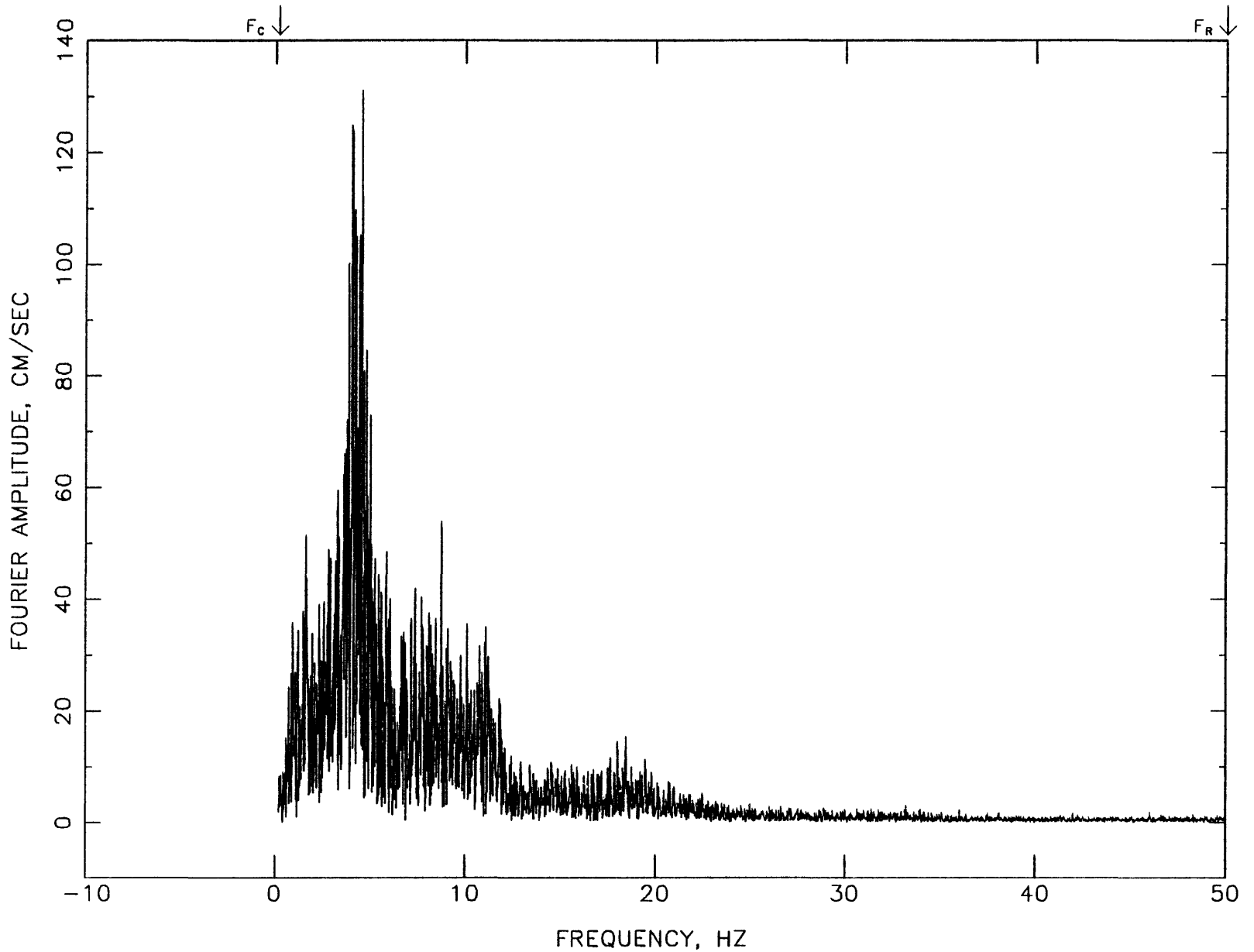



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
ILLAPEL
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FOURIER AMPLITUDE, CM/SEC
40
30
20
10
0
-10
-10
0
10
20
30
40
50
FREQUENCY, HZ

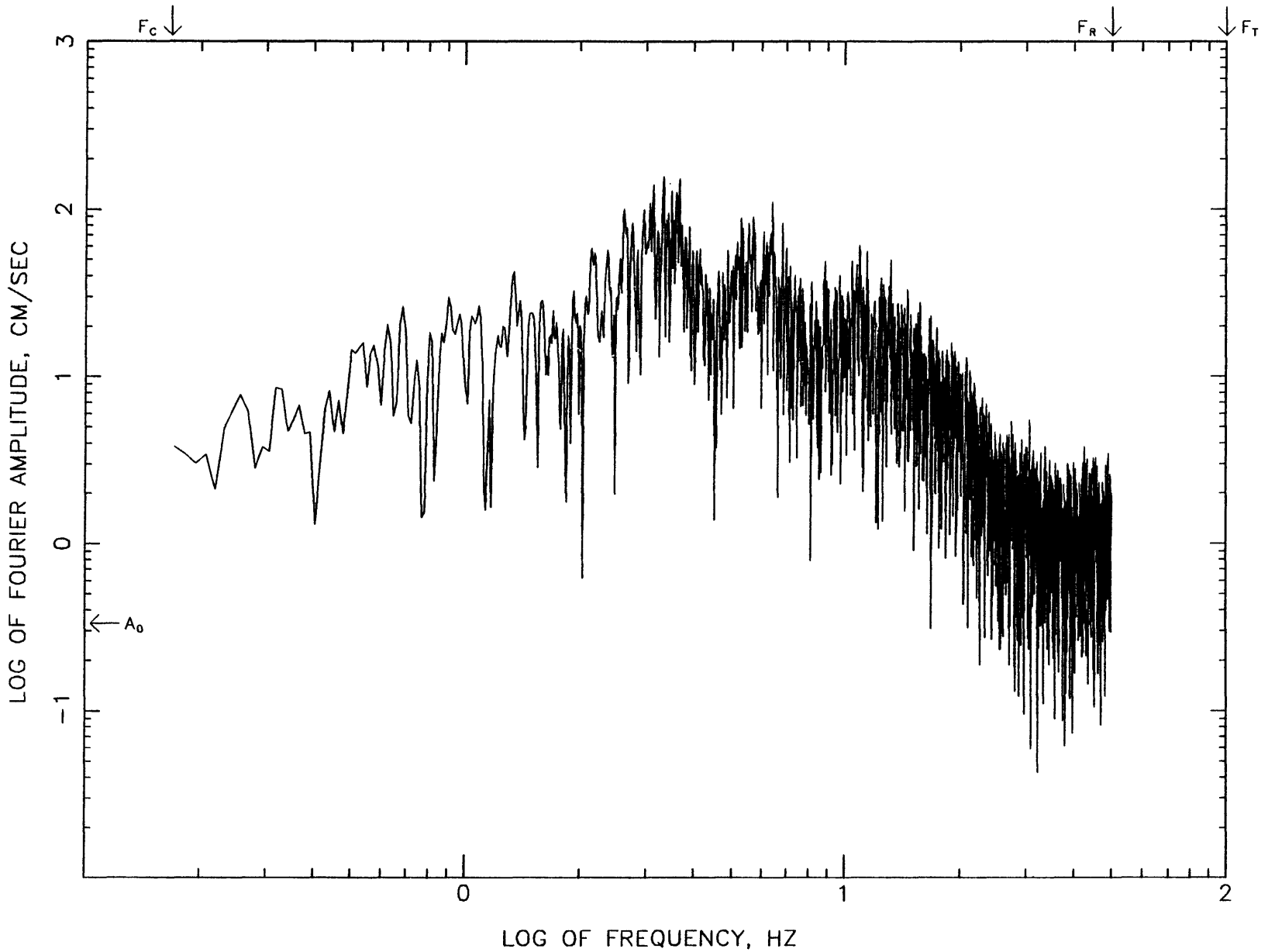
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
ILLAPEL
340 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



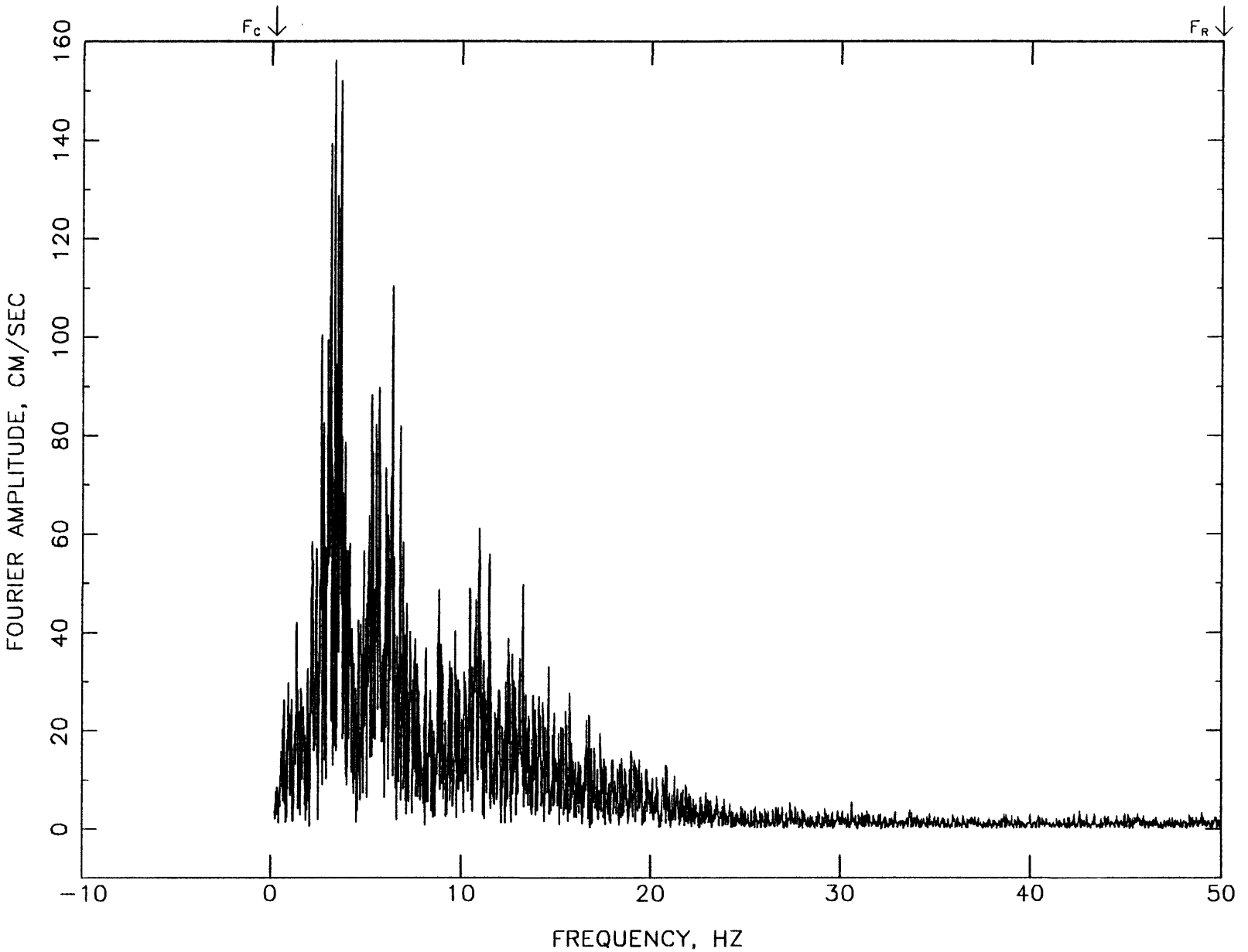
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
ILLAPEL
340 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



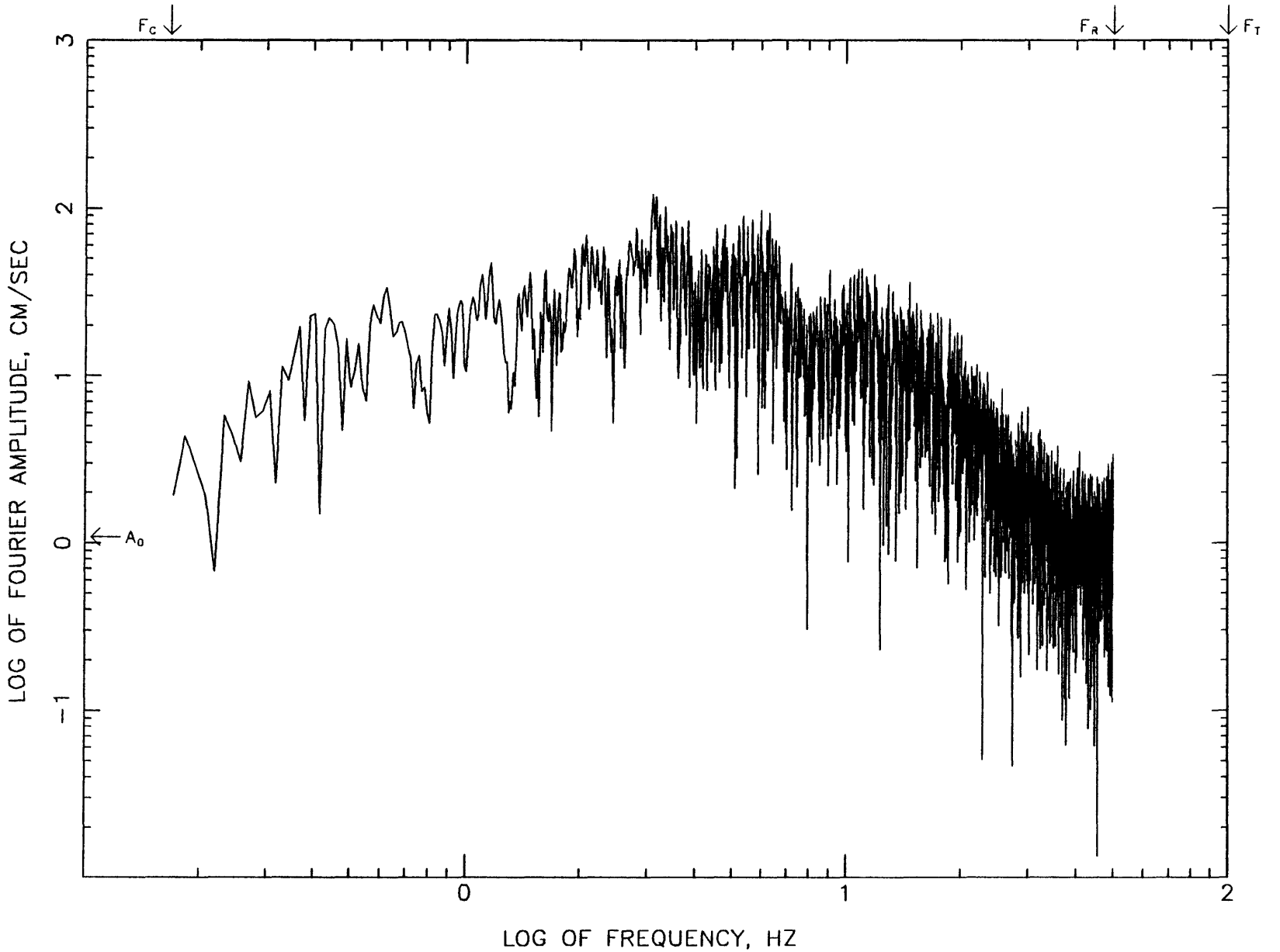
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LALIGUA
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



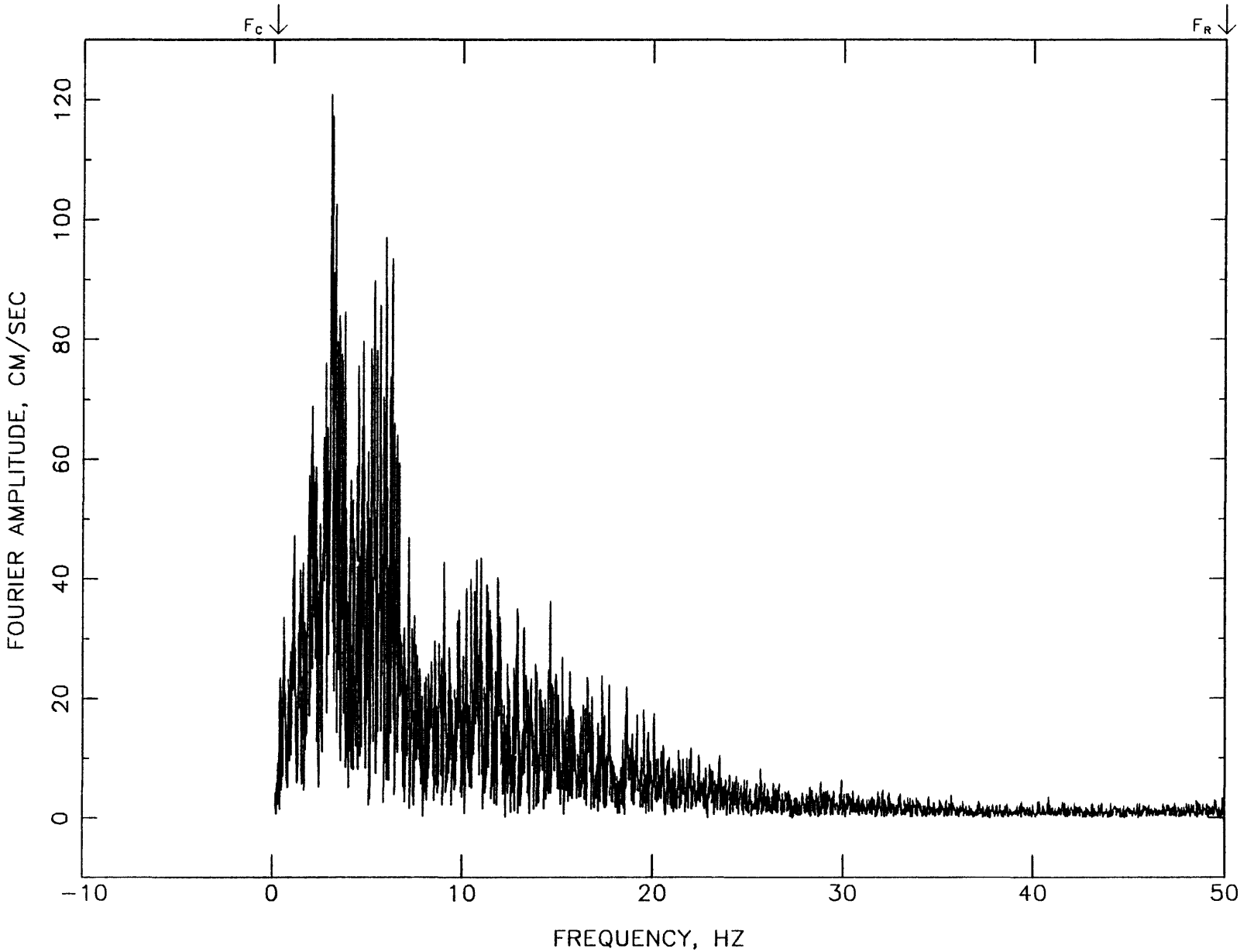
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LALIGUA
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



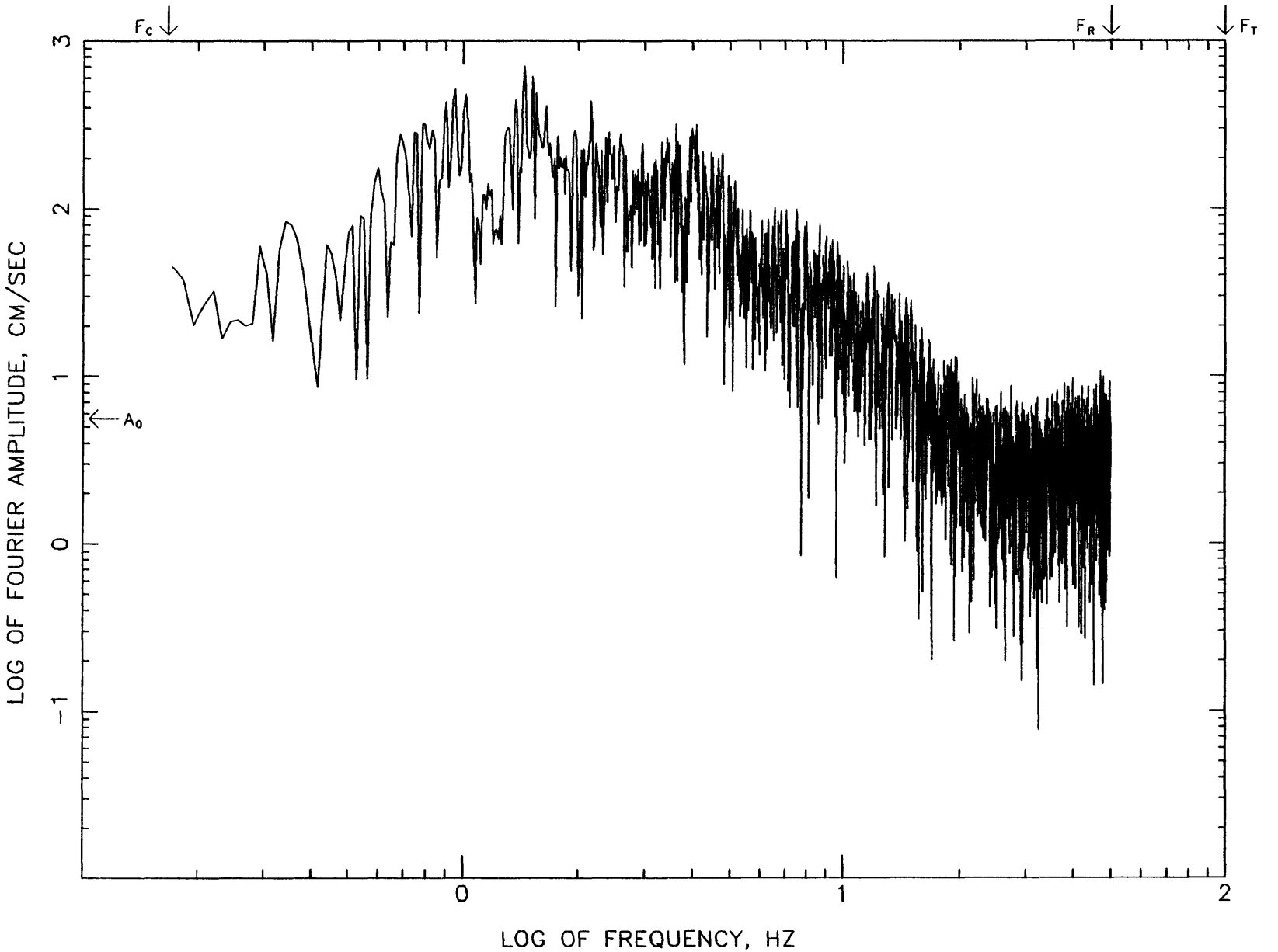
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LALIGUA
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



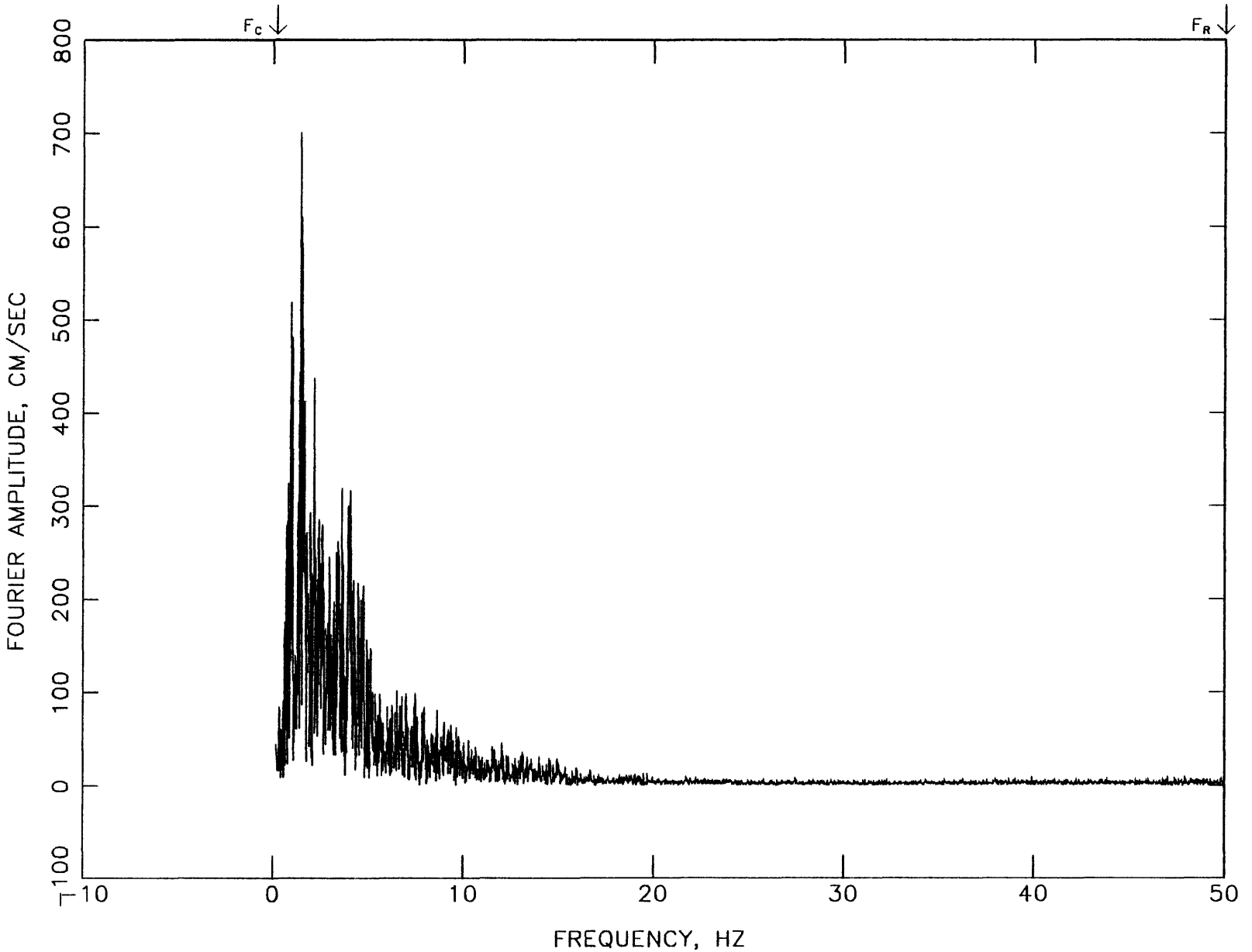
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LALIGUA
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

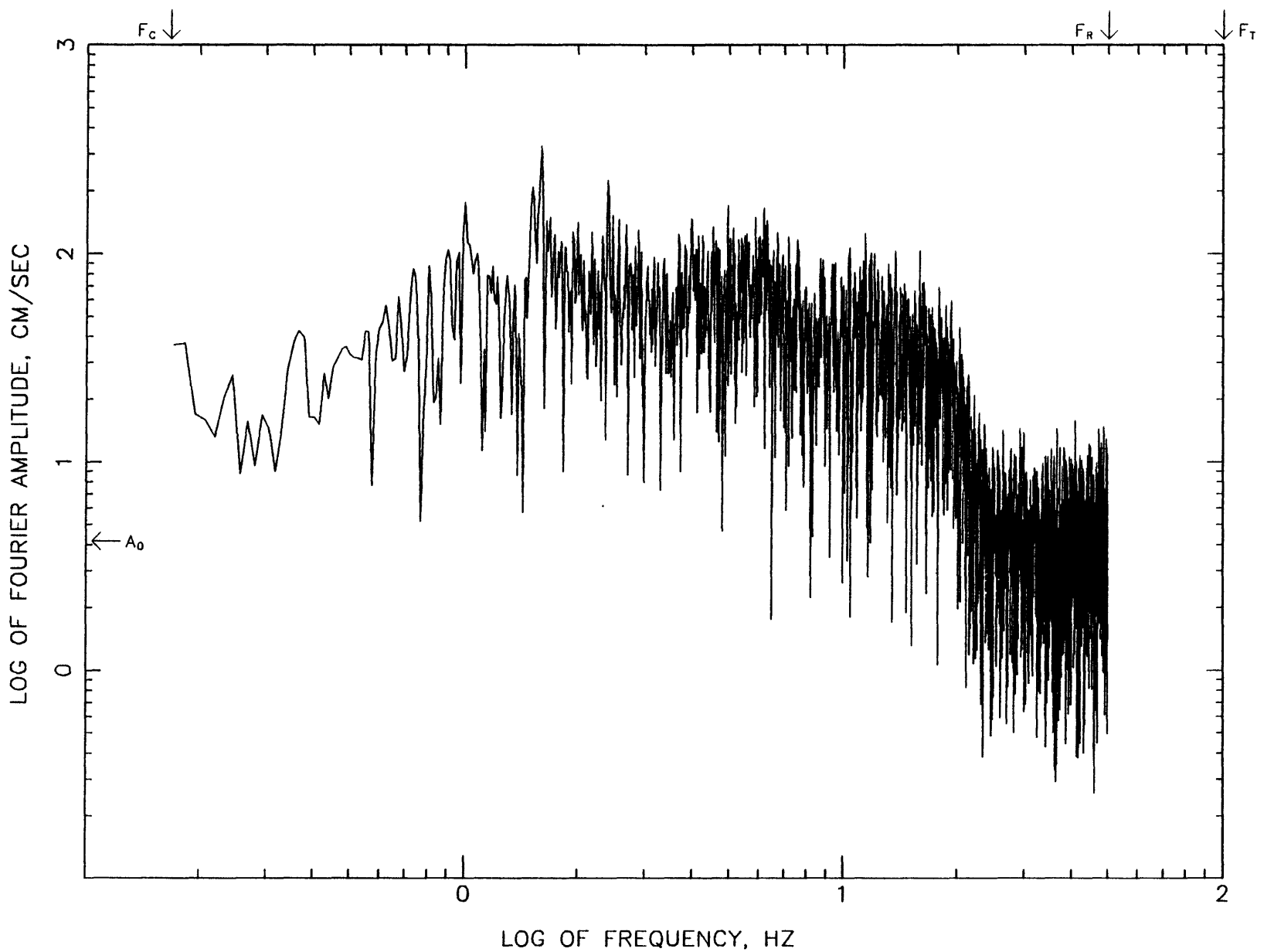


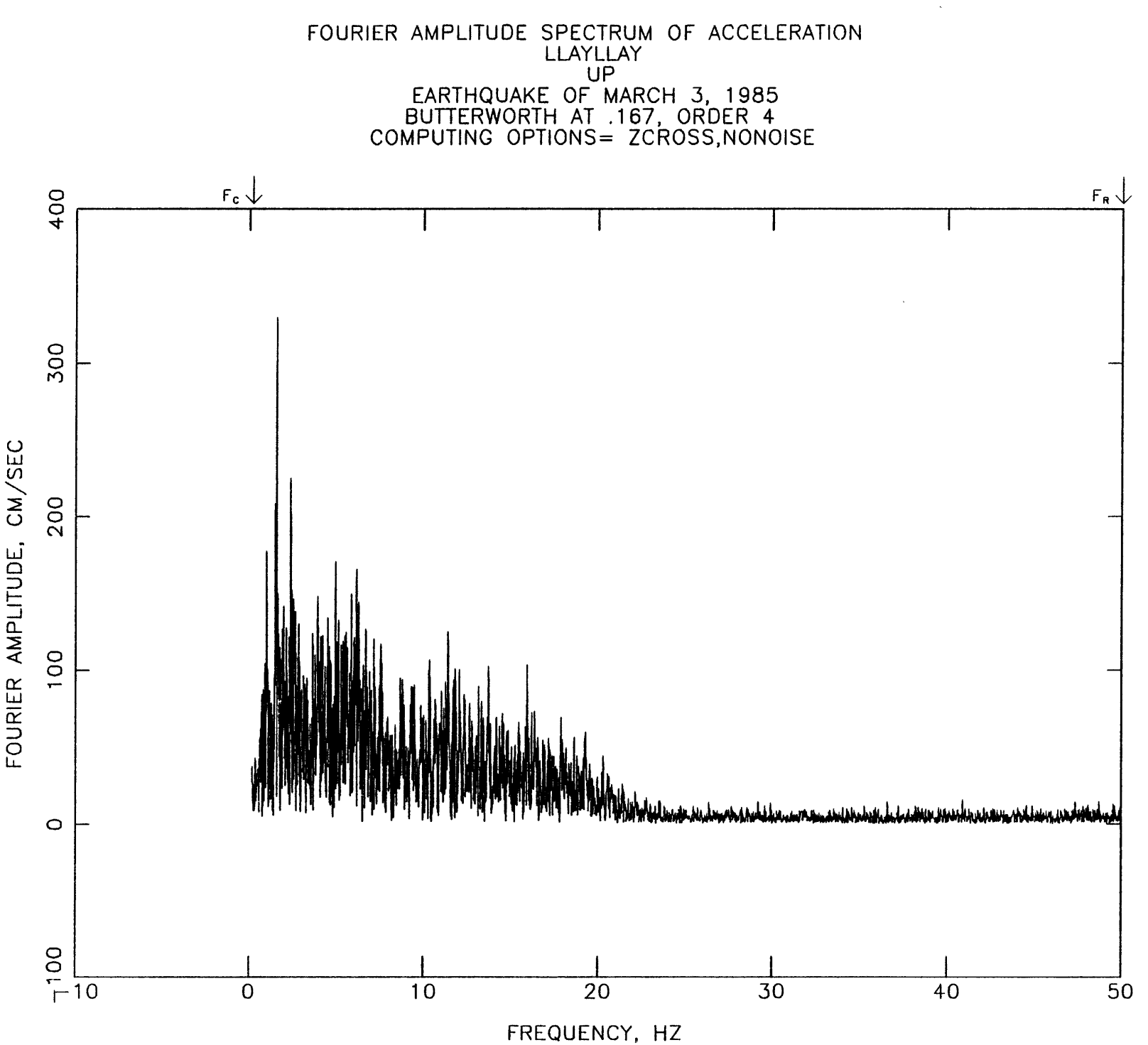
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLAYLLAY
280 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

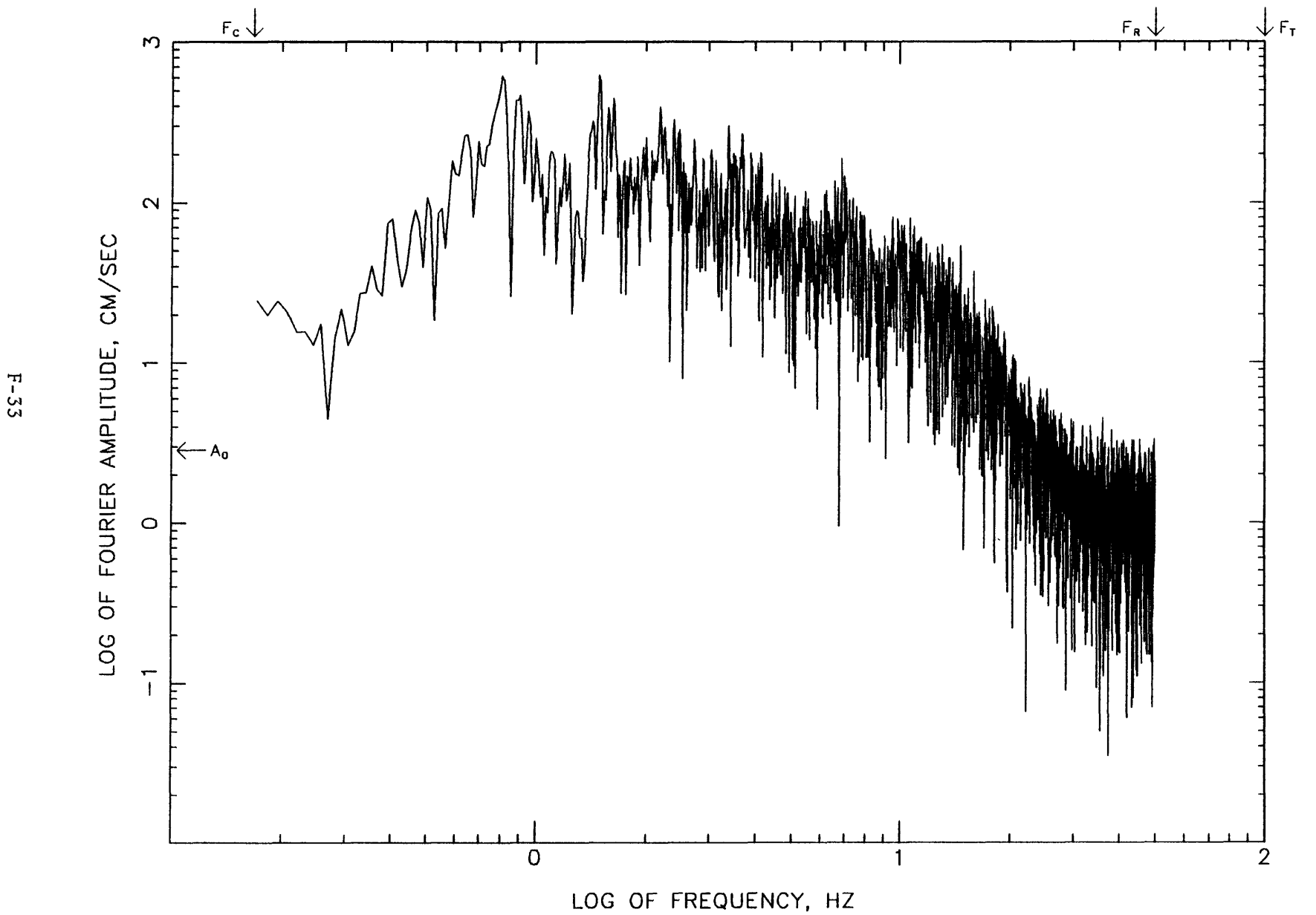


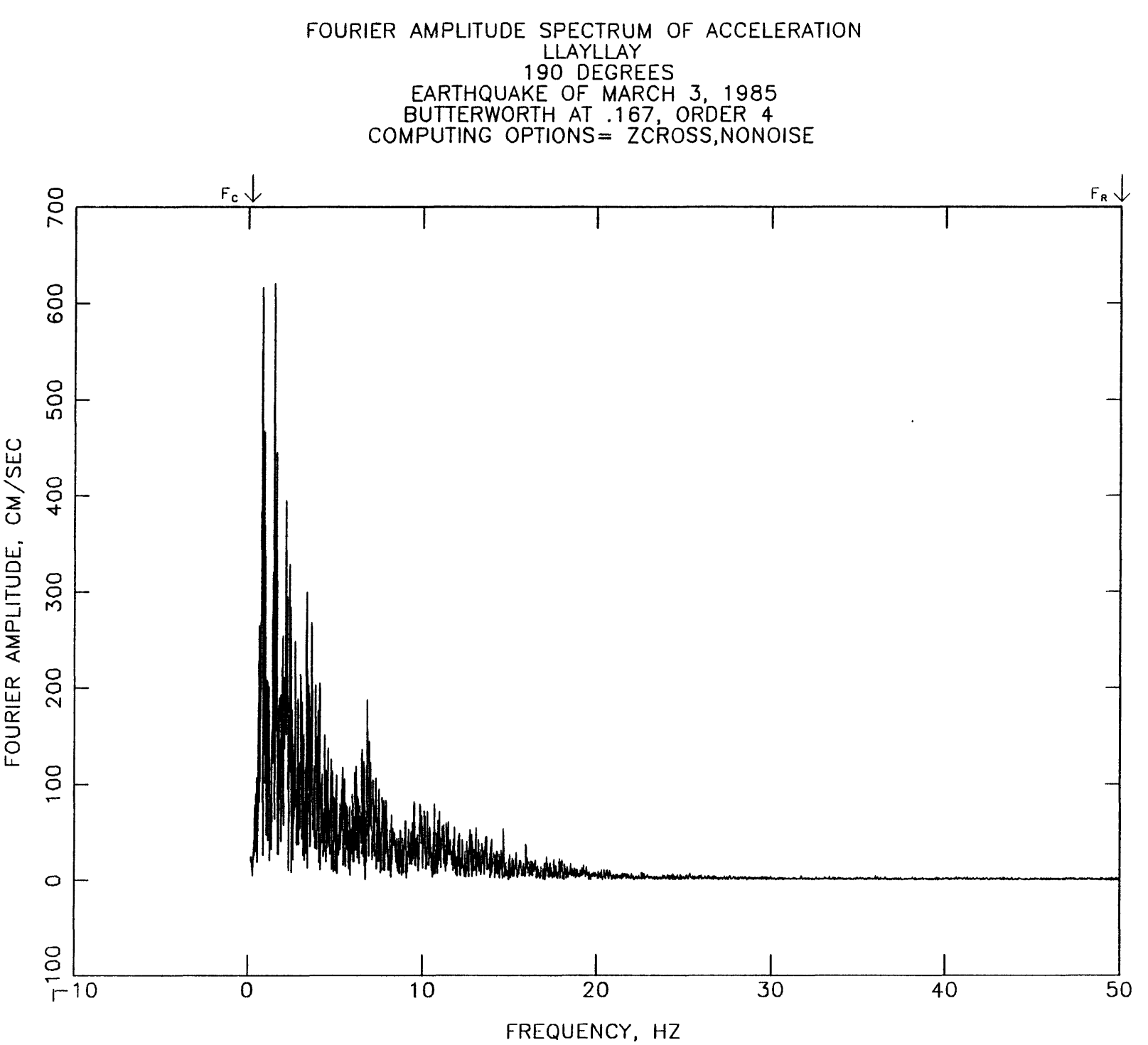
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLAYLLAY
280 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



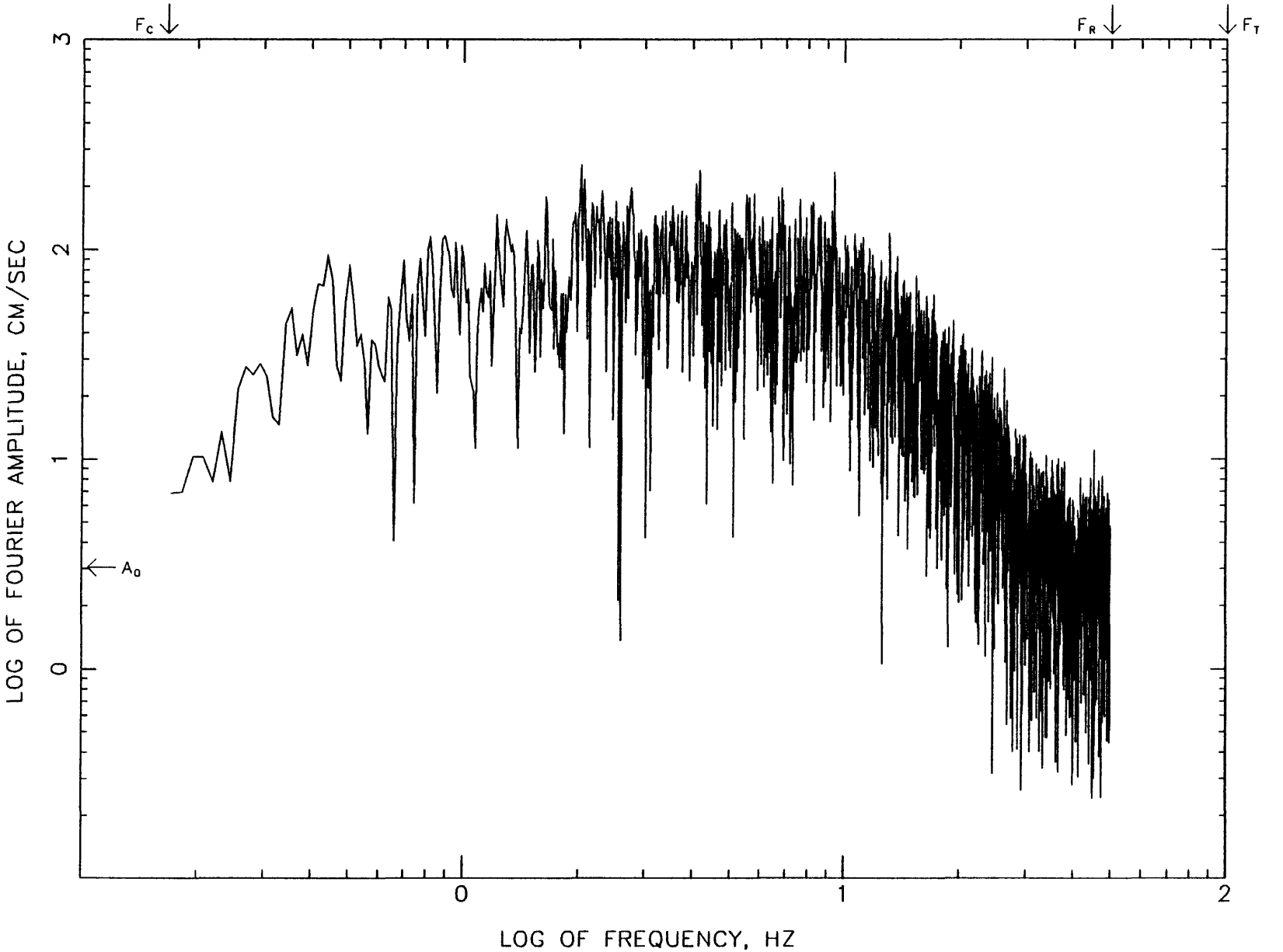

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLAYLLAY
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
0
1
2
3


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLAYLLAY
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_c
F_R
400
300
200
100
0
100
FOURIER AMPLITUDE, CM/SEC
10
0
10
20
30
40
50
FREQUENCY, HZ

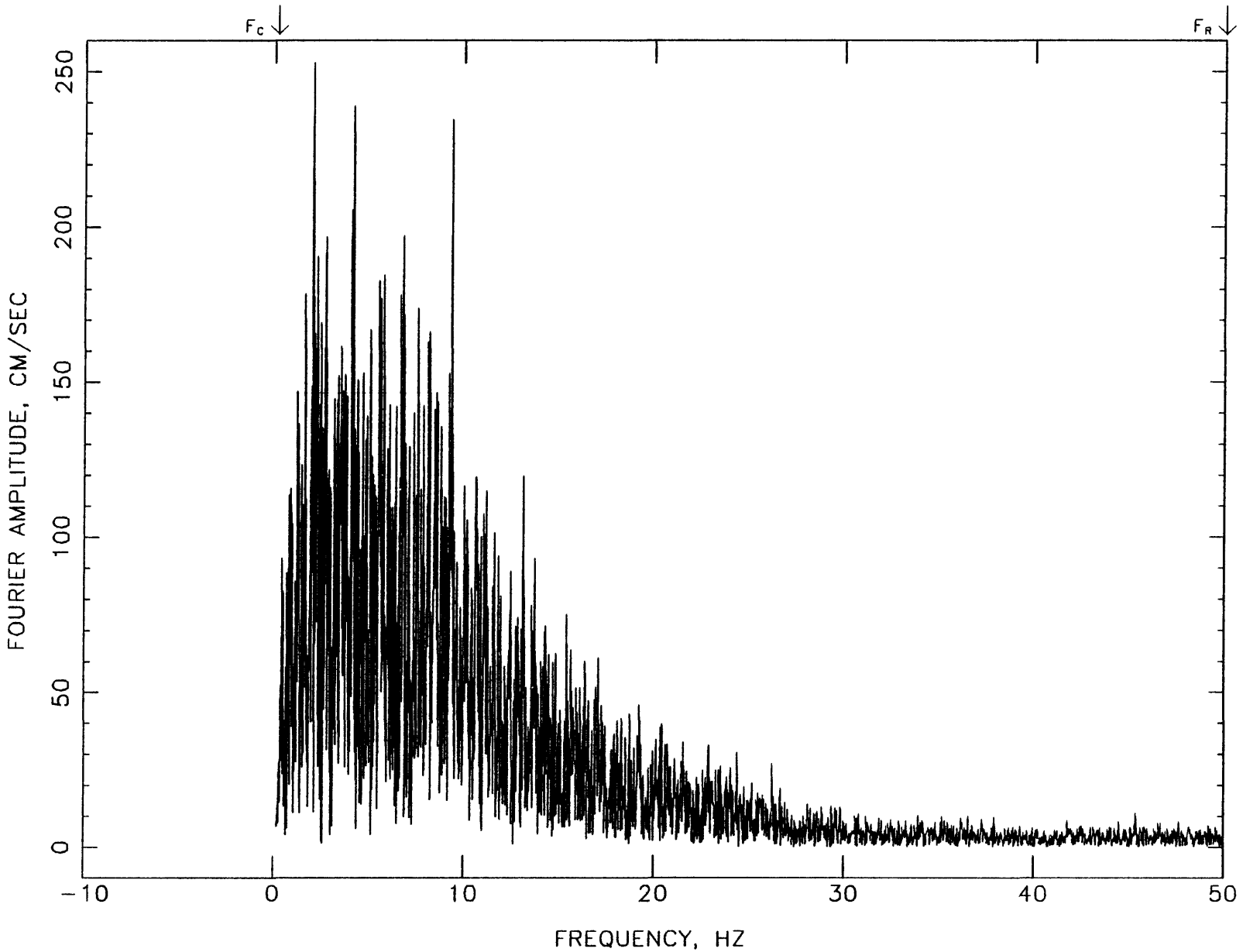

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLAYLLAY
190 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLAYLLAY
190 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH AT .167, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FOURIER AMPLITUDE, CM/SEC
700
600
500
400
300
200
100
0
100
10
0
10
20
30
40
50
FREQUENCY, HZ

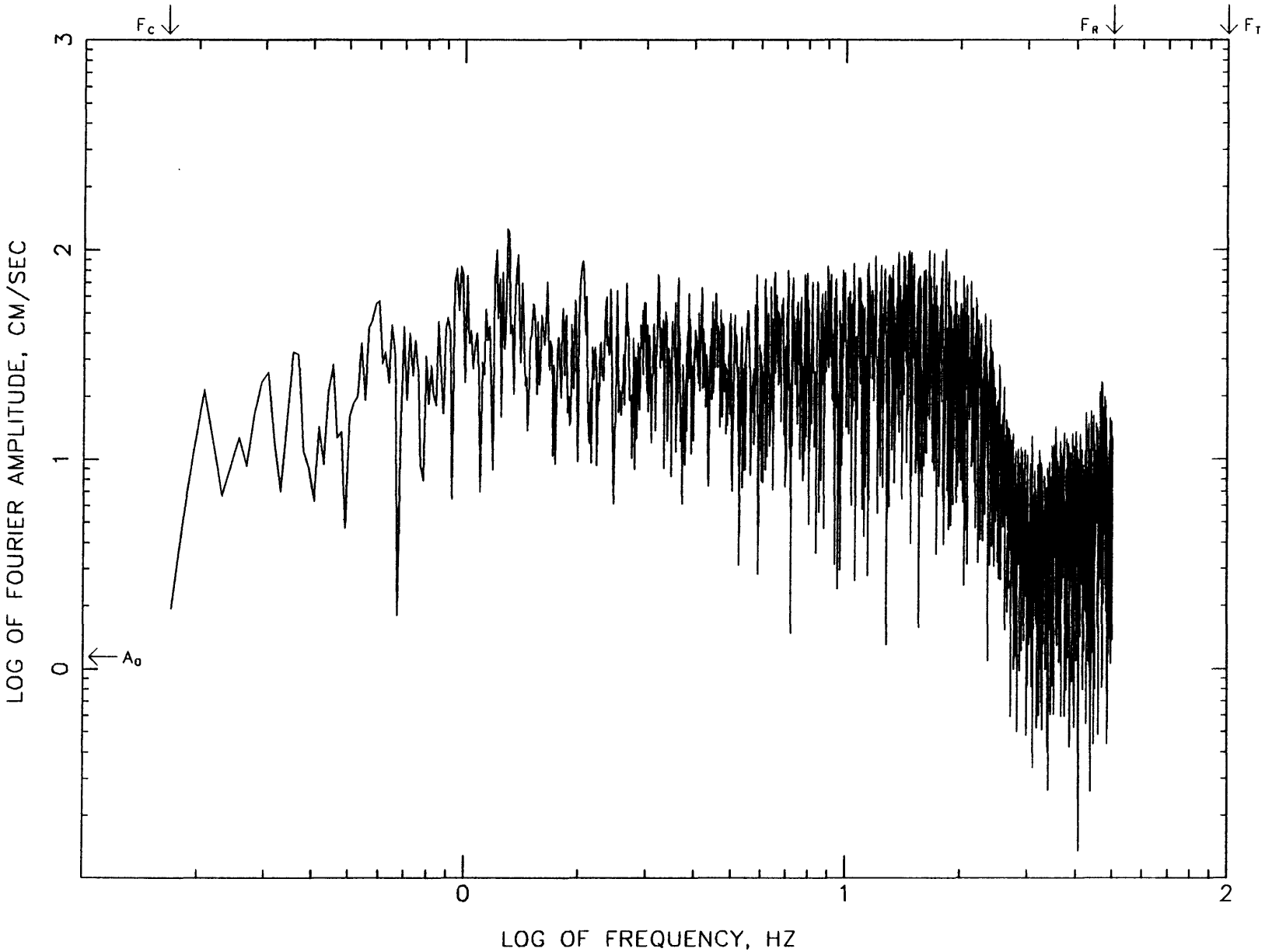
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FELIPE
170 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



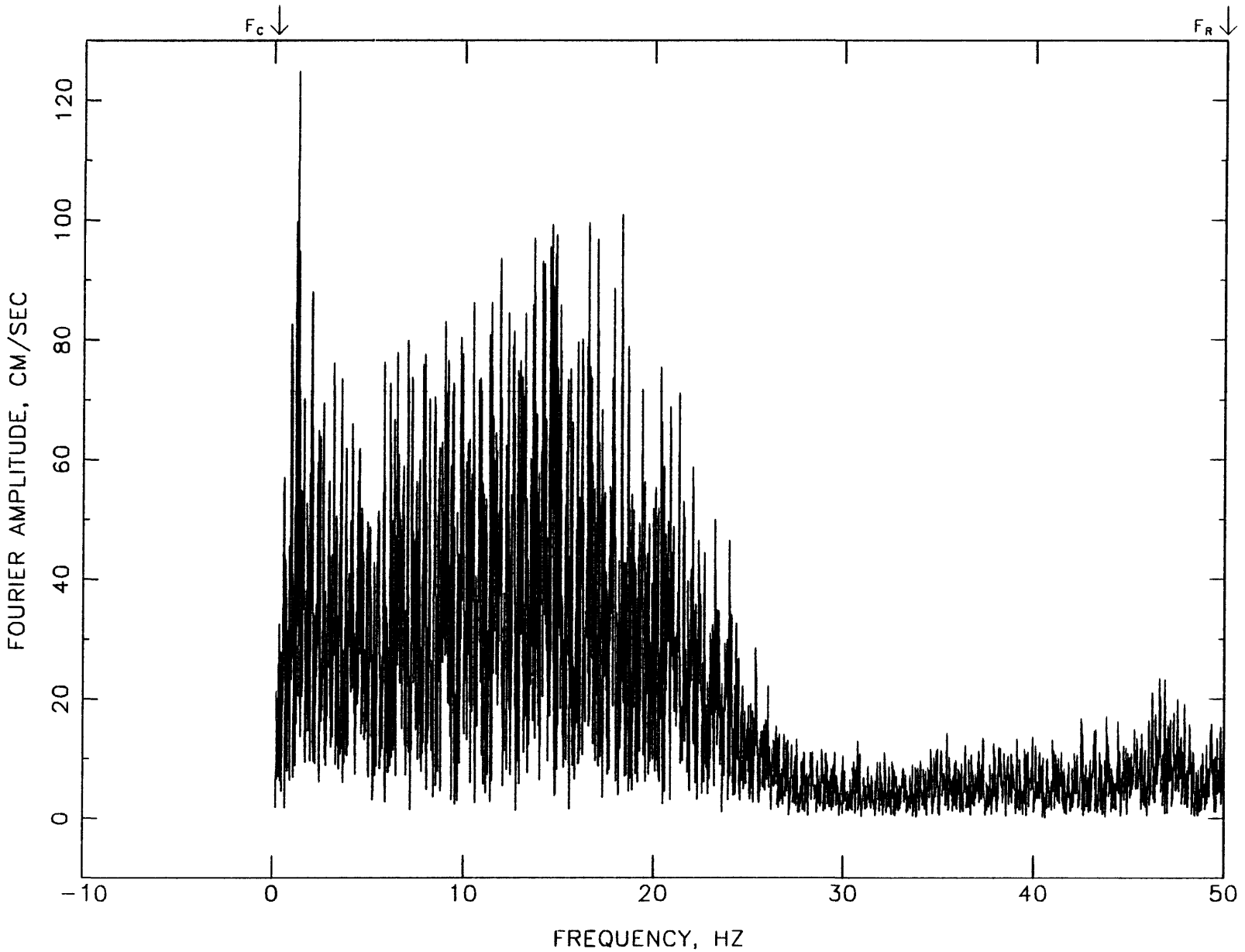
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FELIPE
170 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



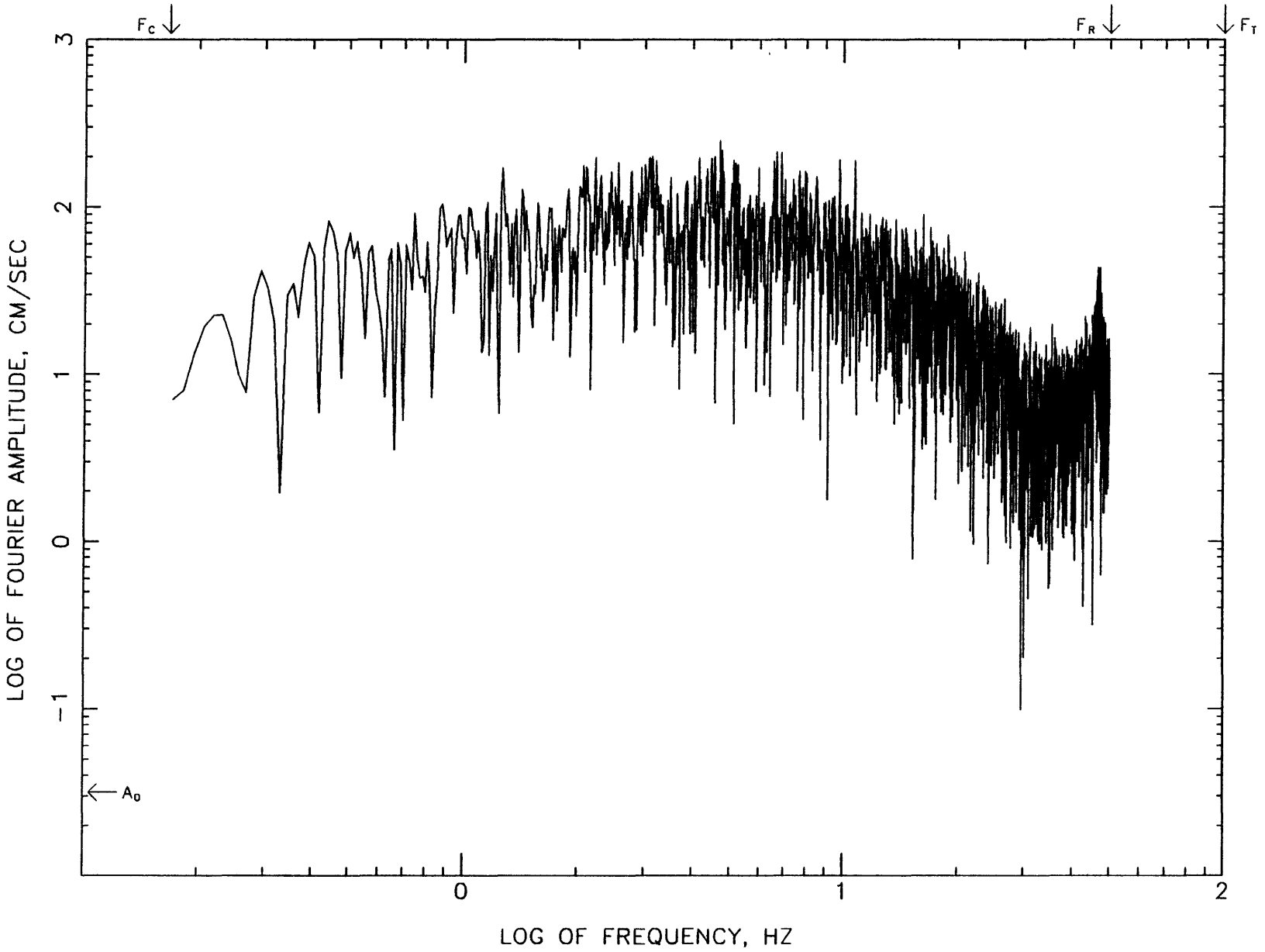
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FELIPE
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



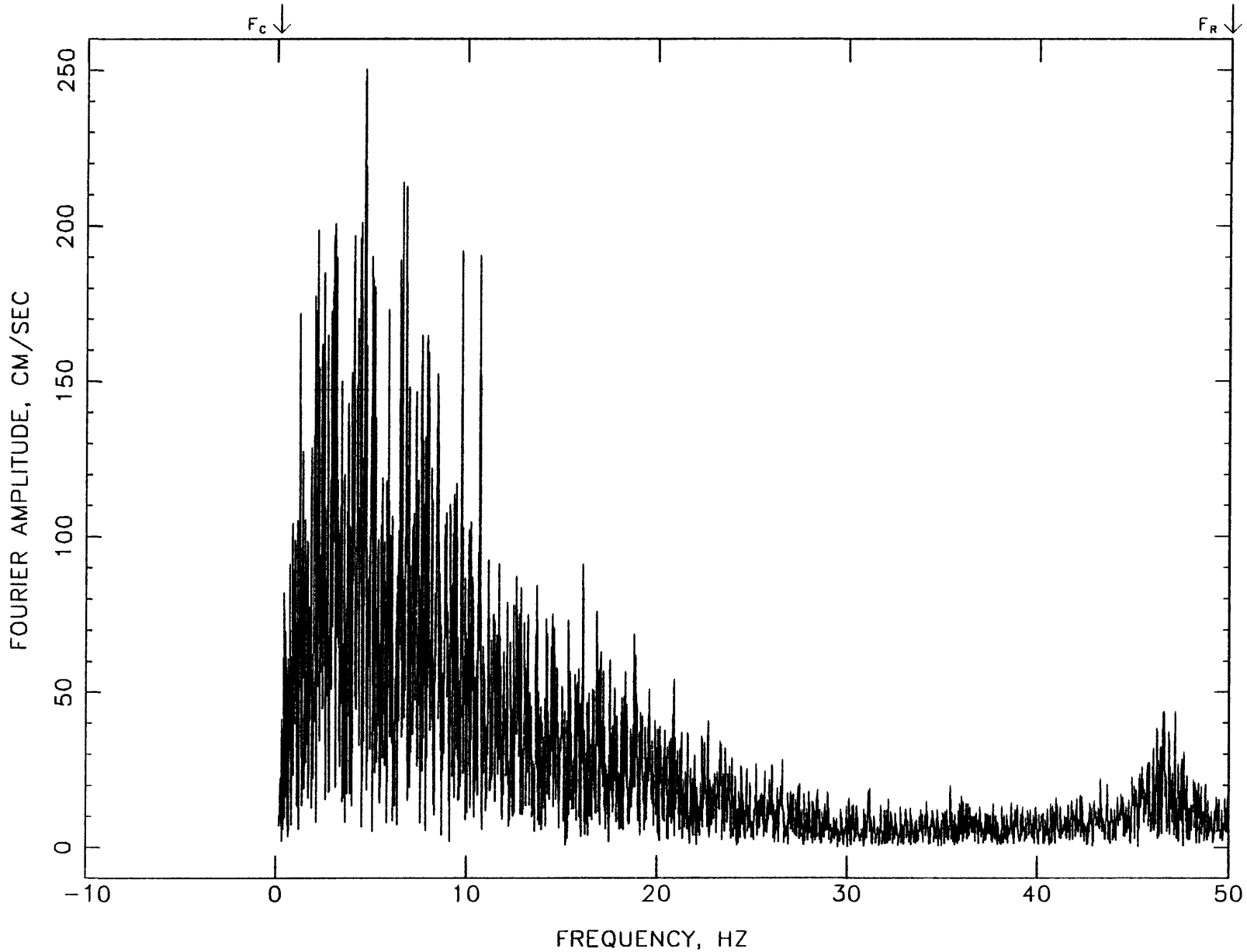
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FELIPE
UP
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

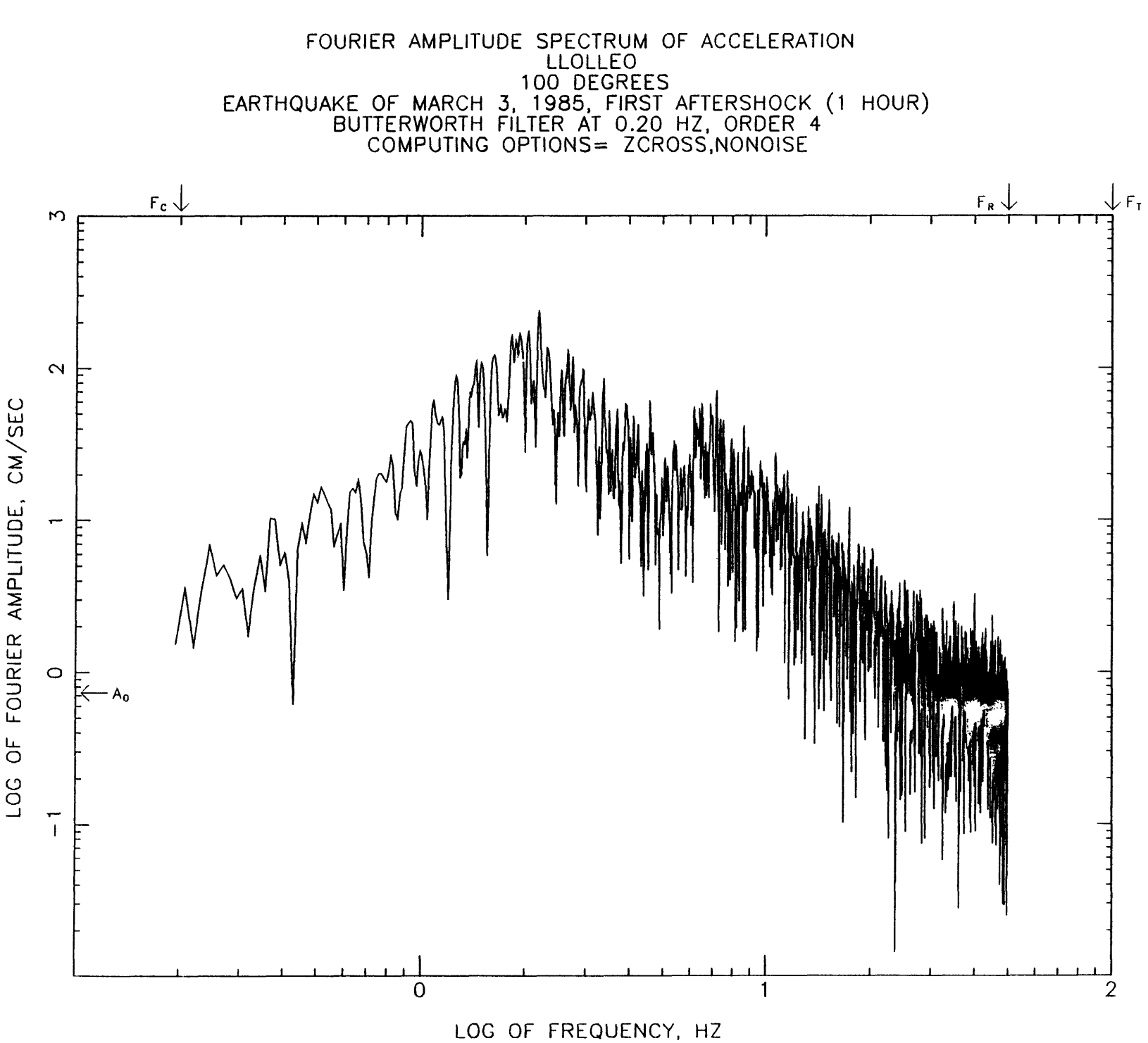


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FELIPE
80 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

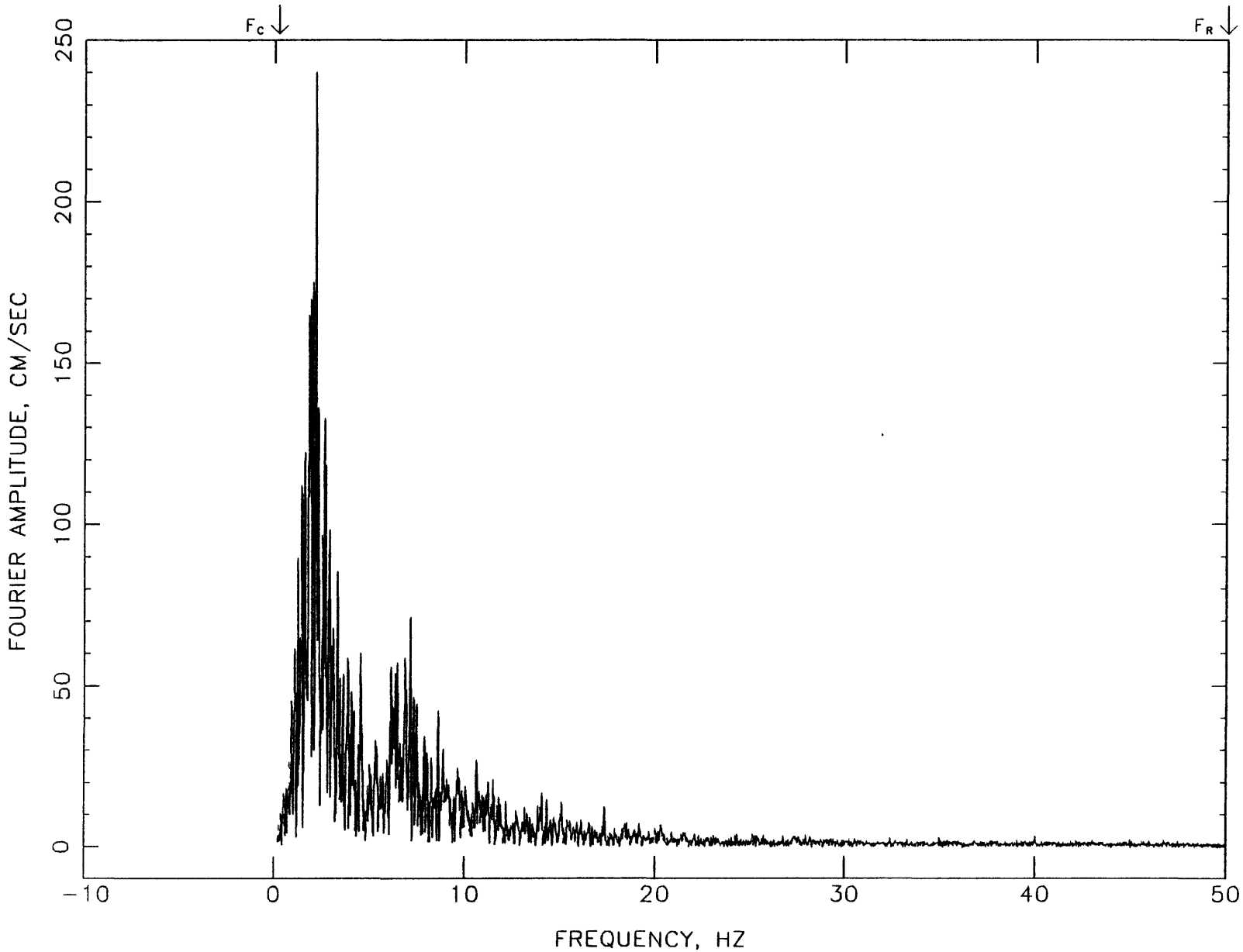


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FELIPE
80 DEGREES
EARTHQUAKE OF MARCH 3, 1985
BUTTERWORTH FILTER AT .167 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

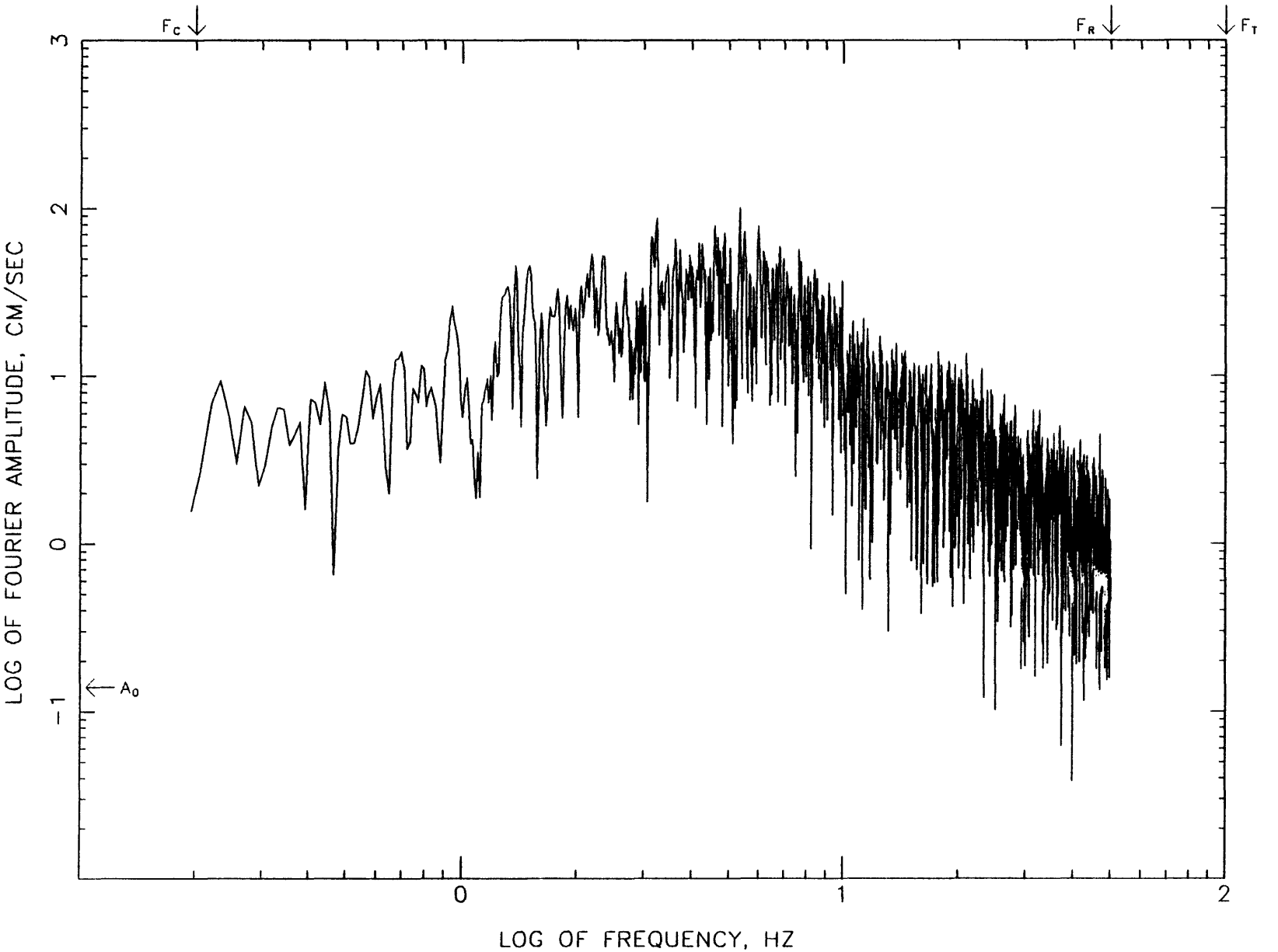



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
100 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

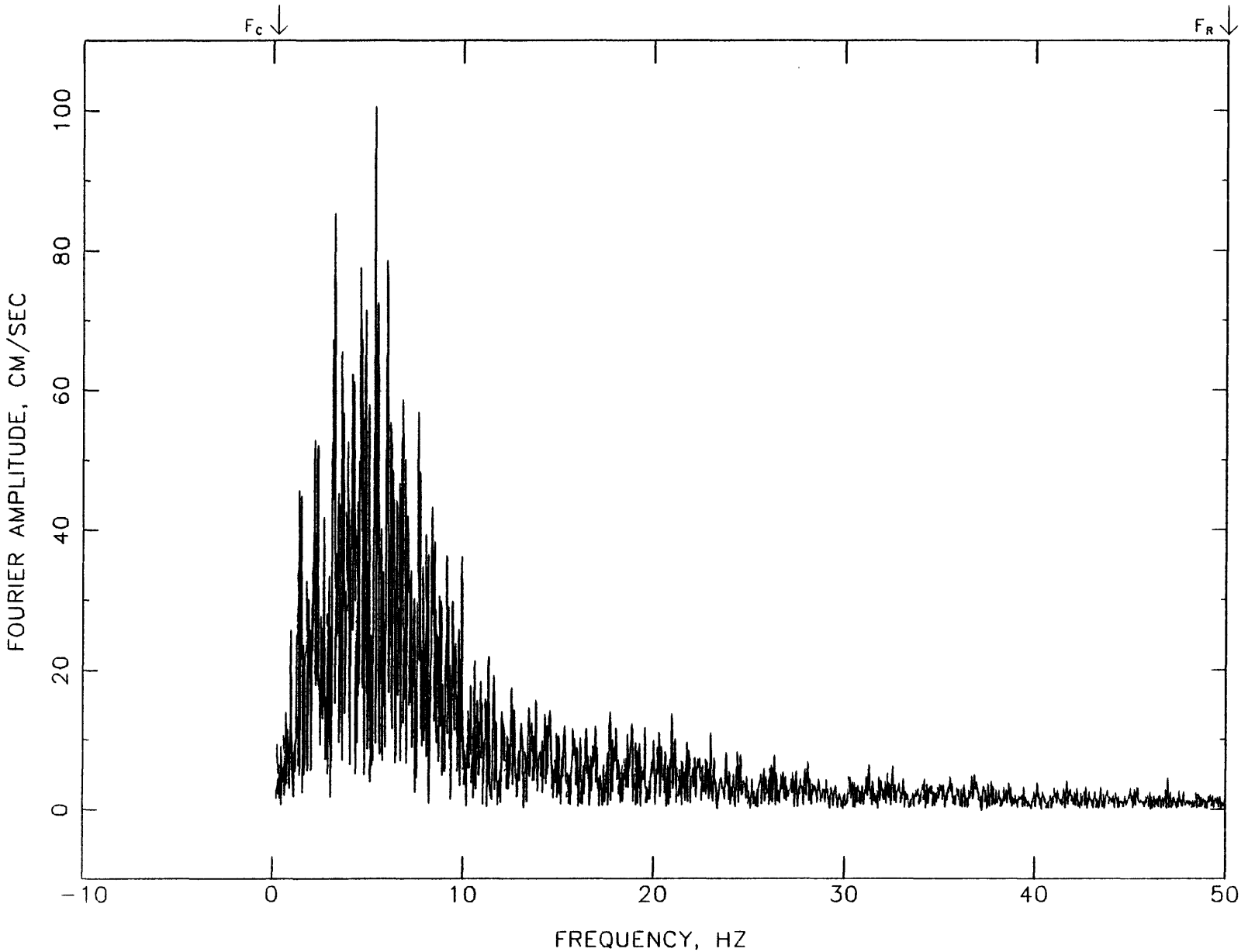
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
100 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



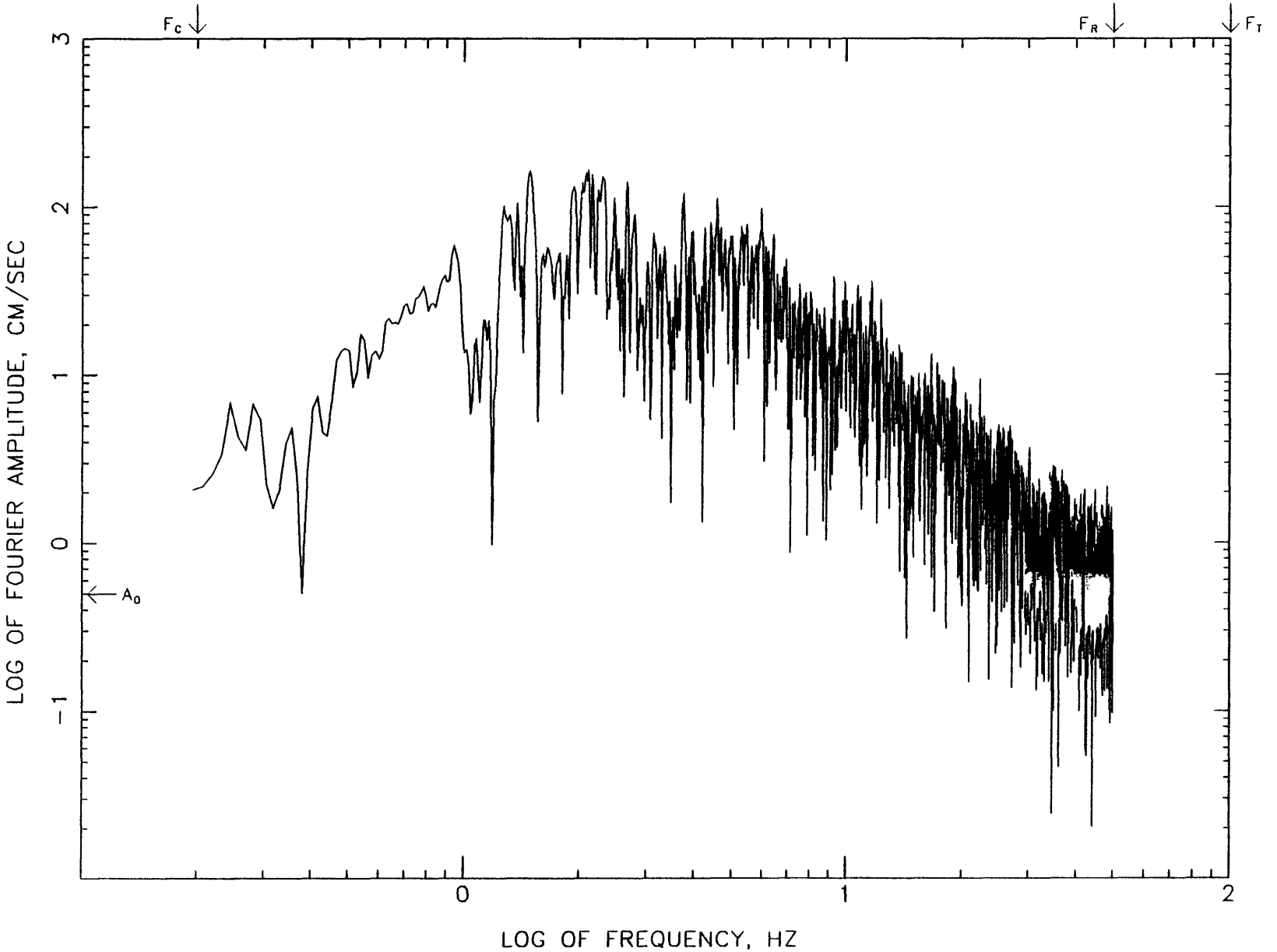
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
UP
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



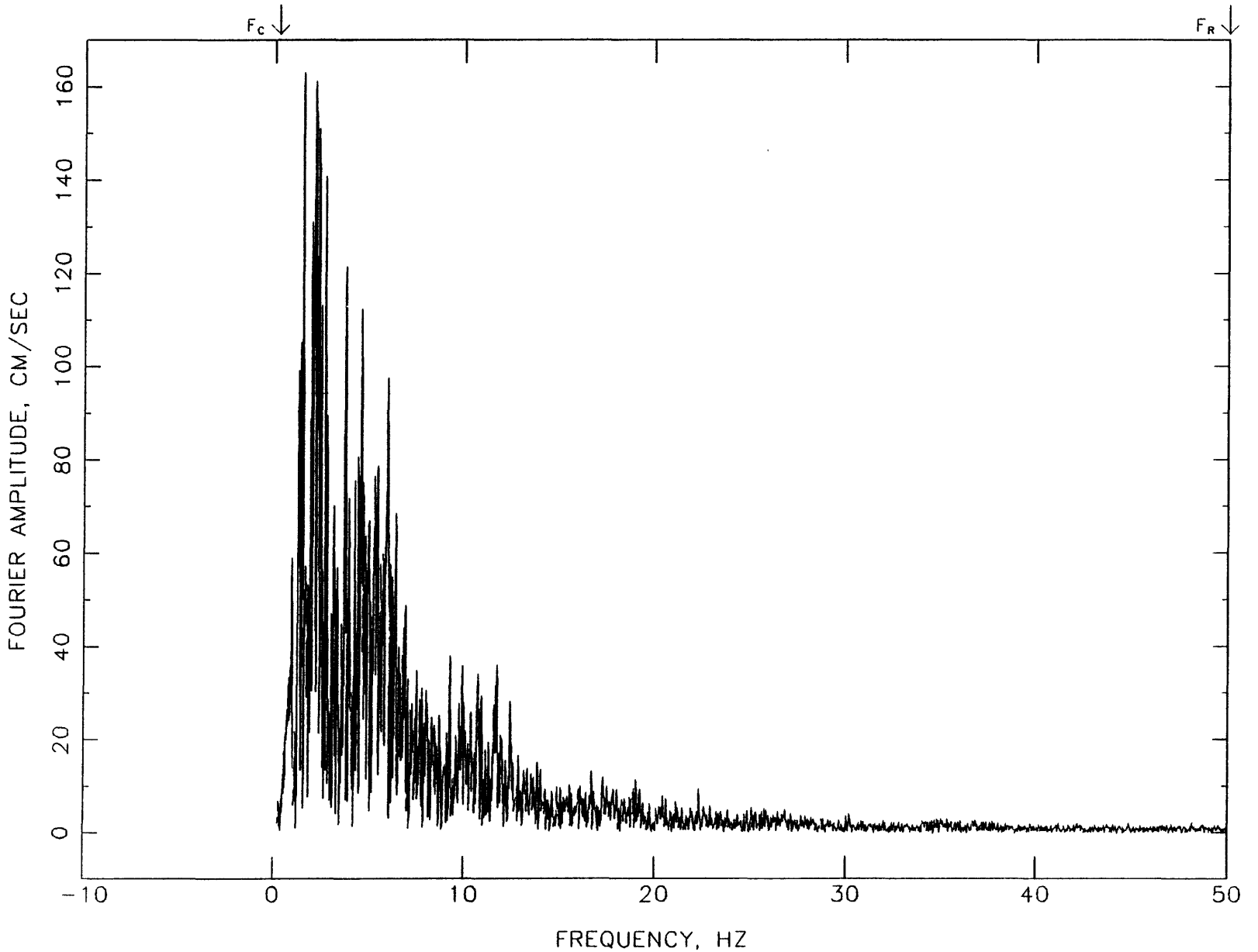
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
UP
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



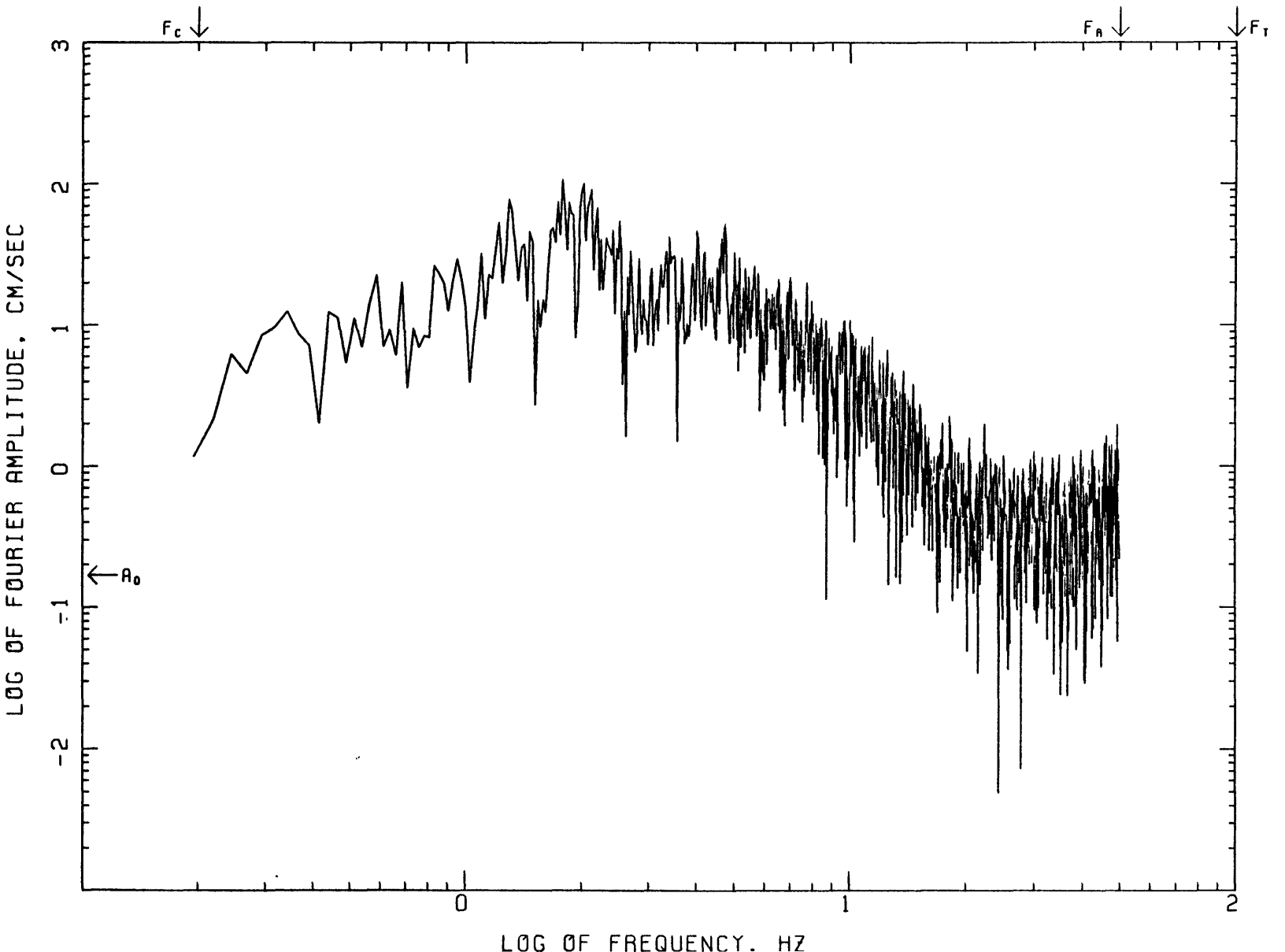
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
10 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

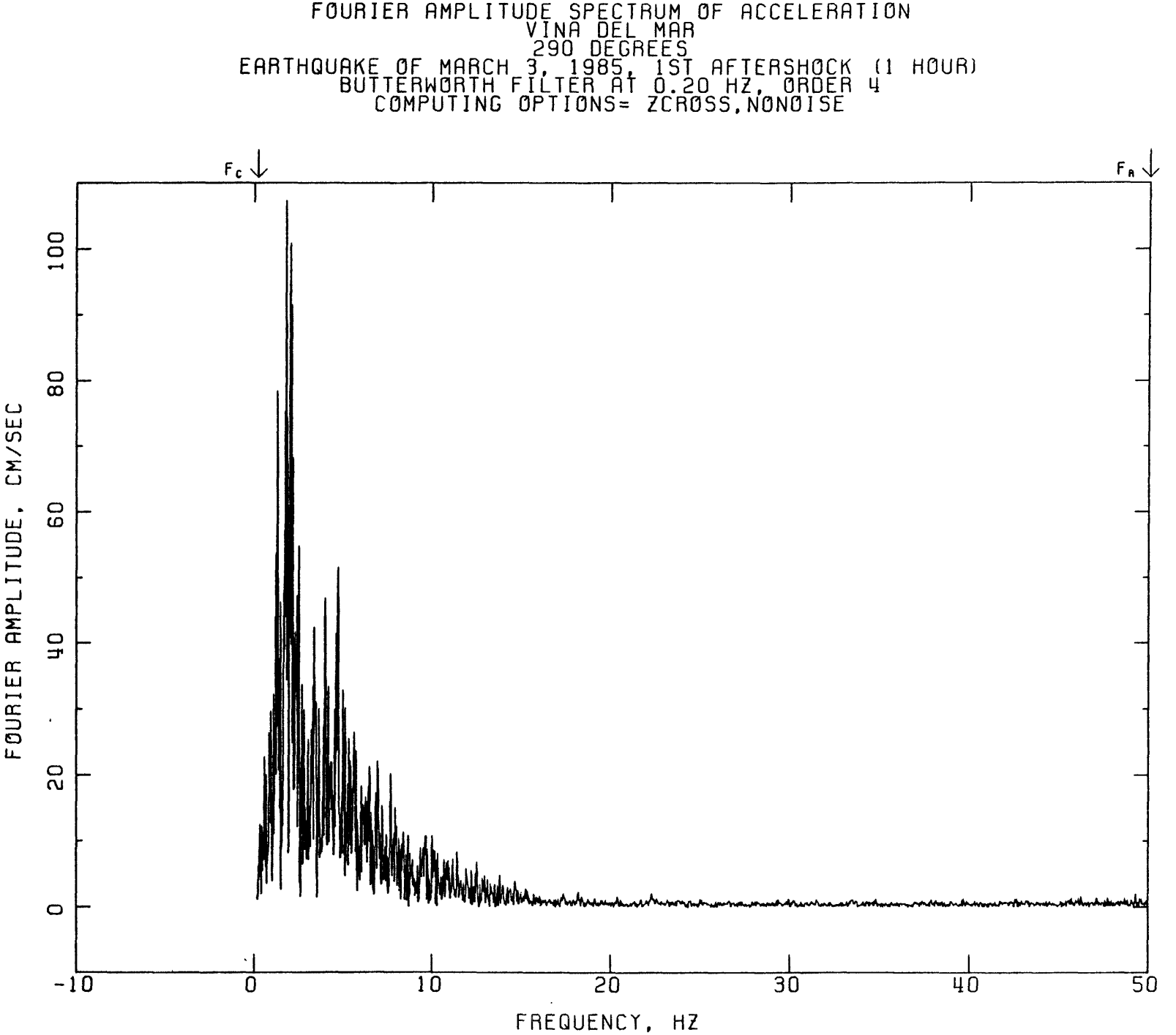


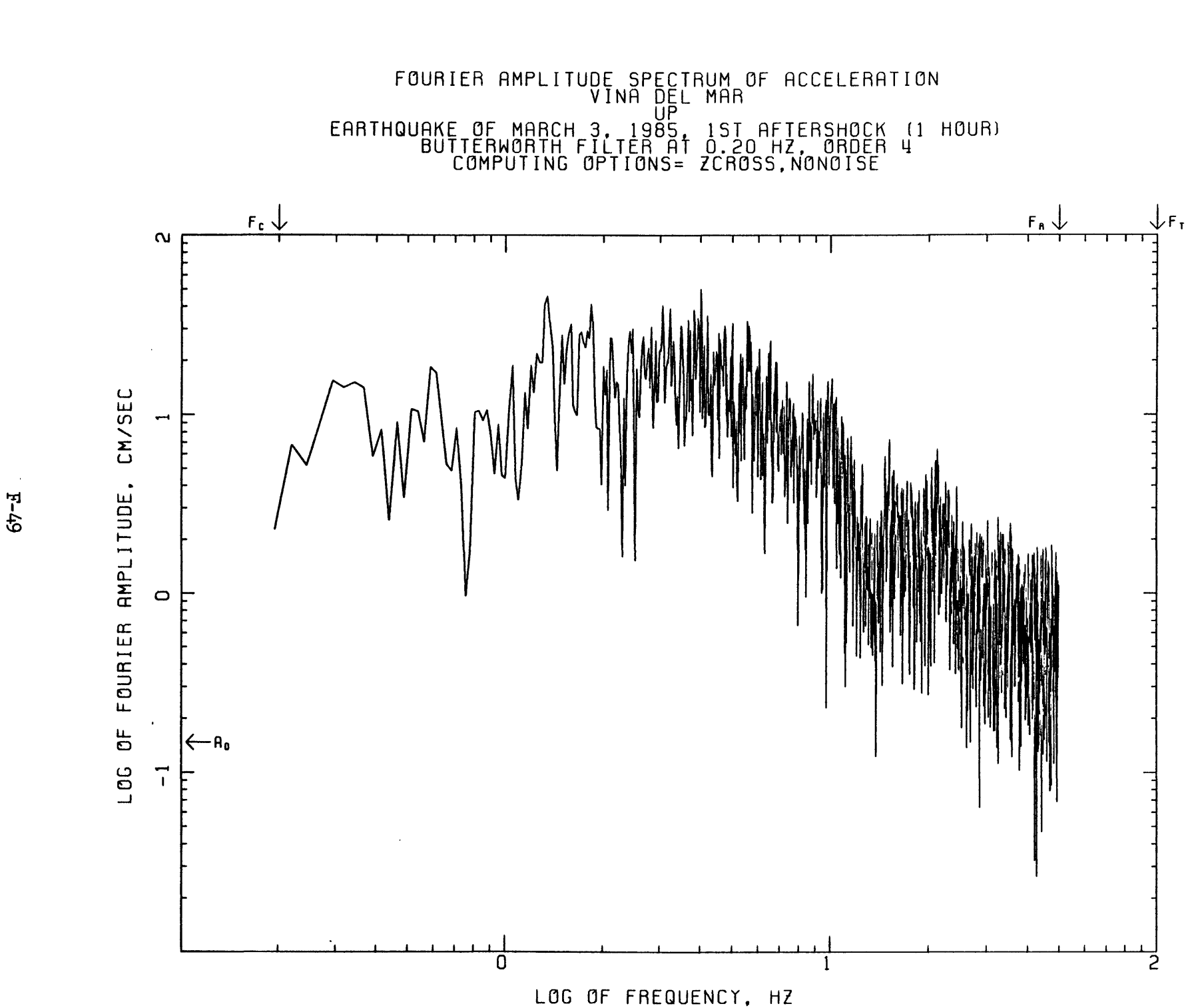
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
10 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

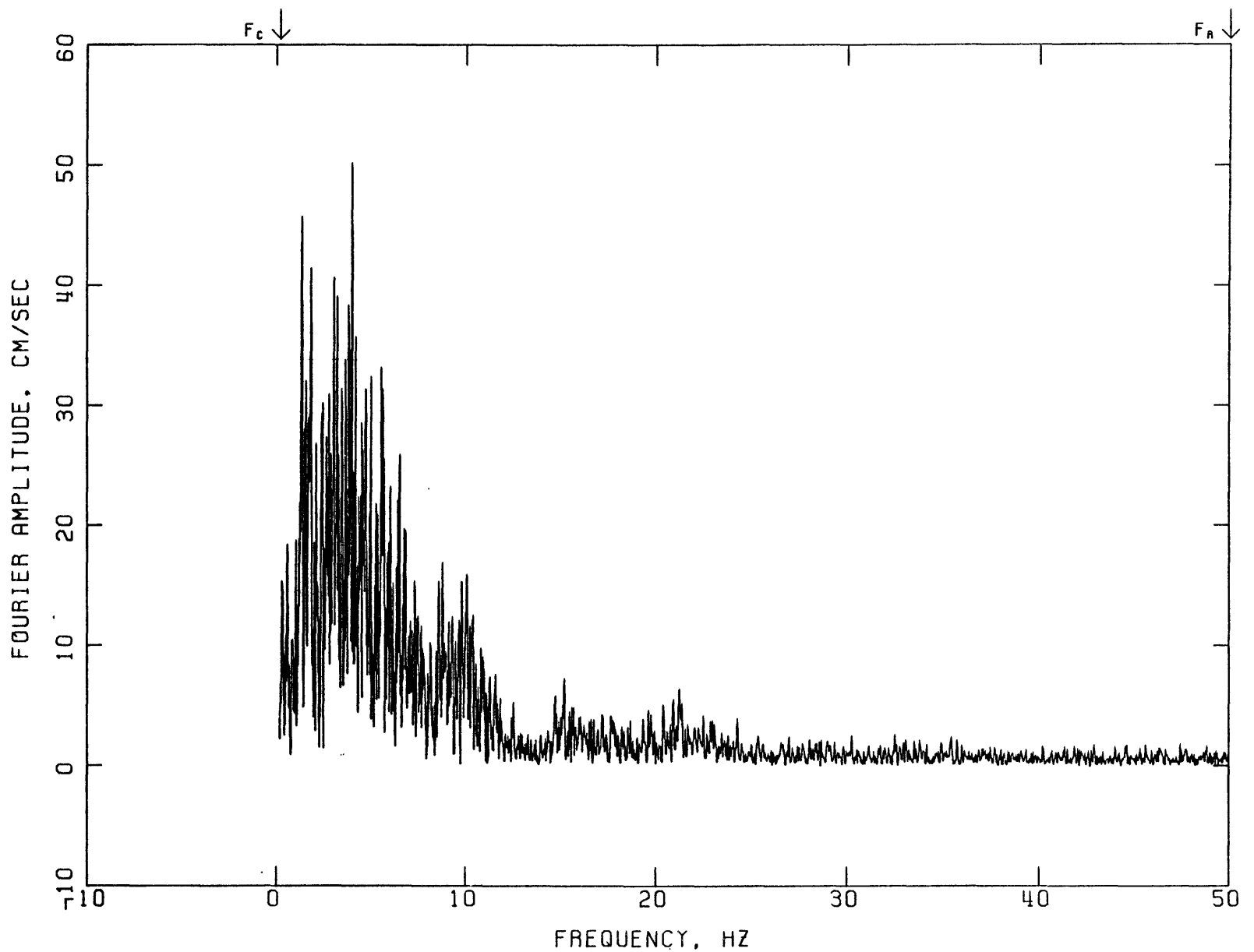


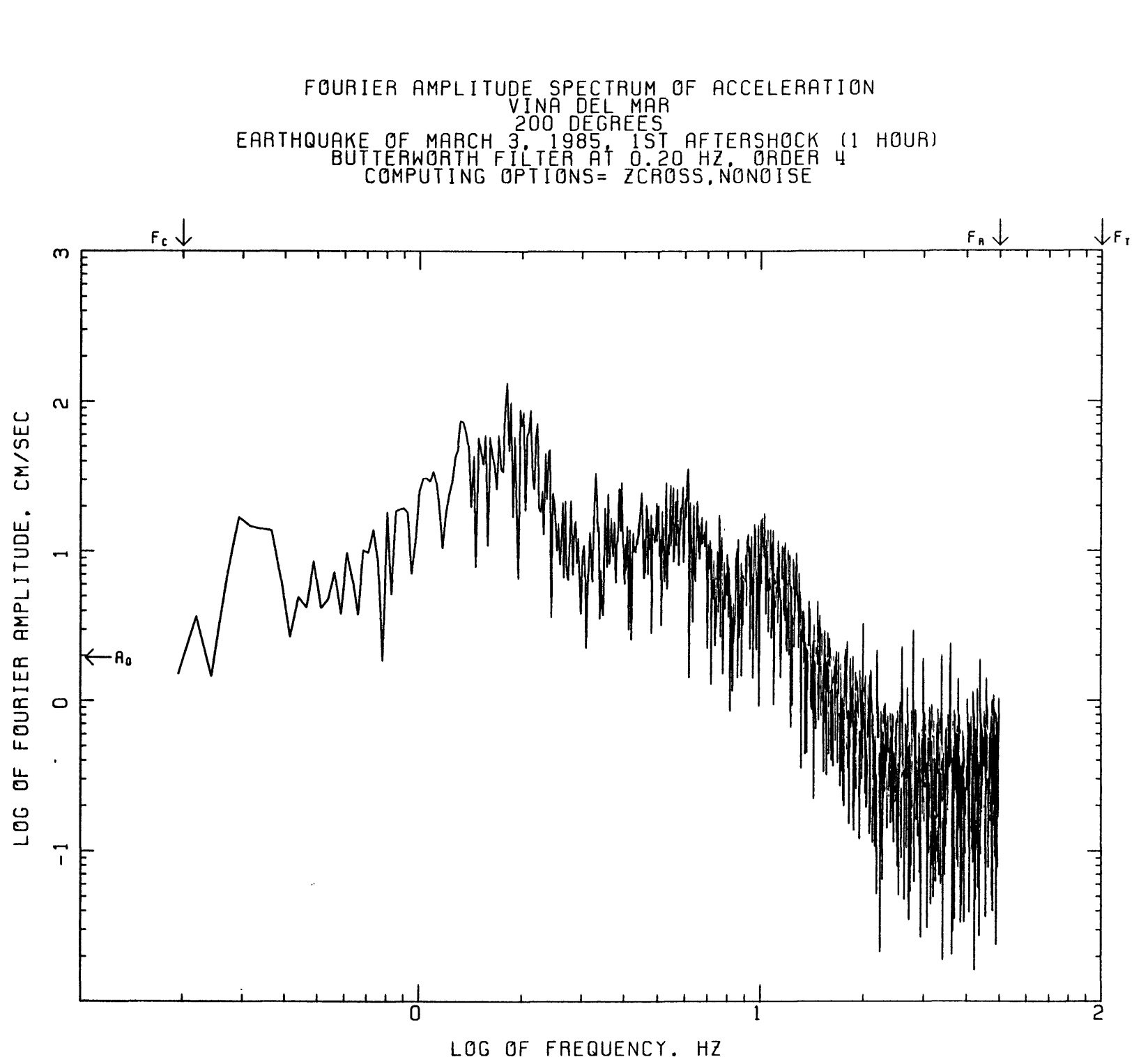
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE



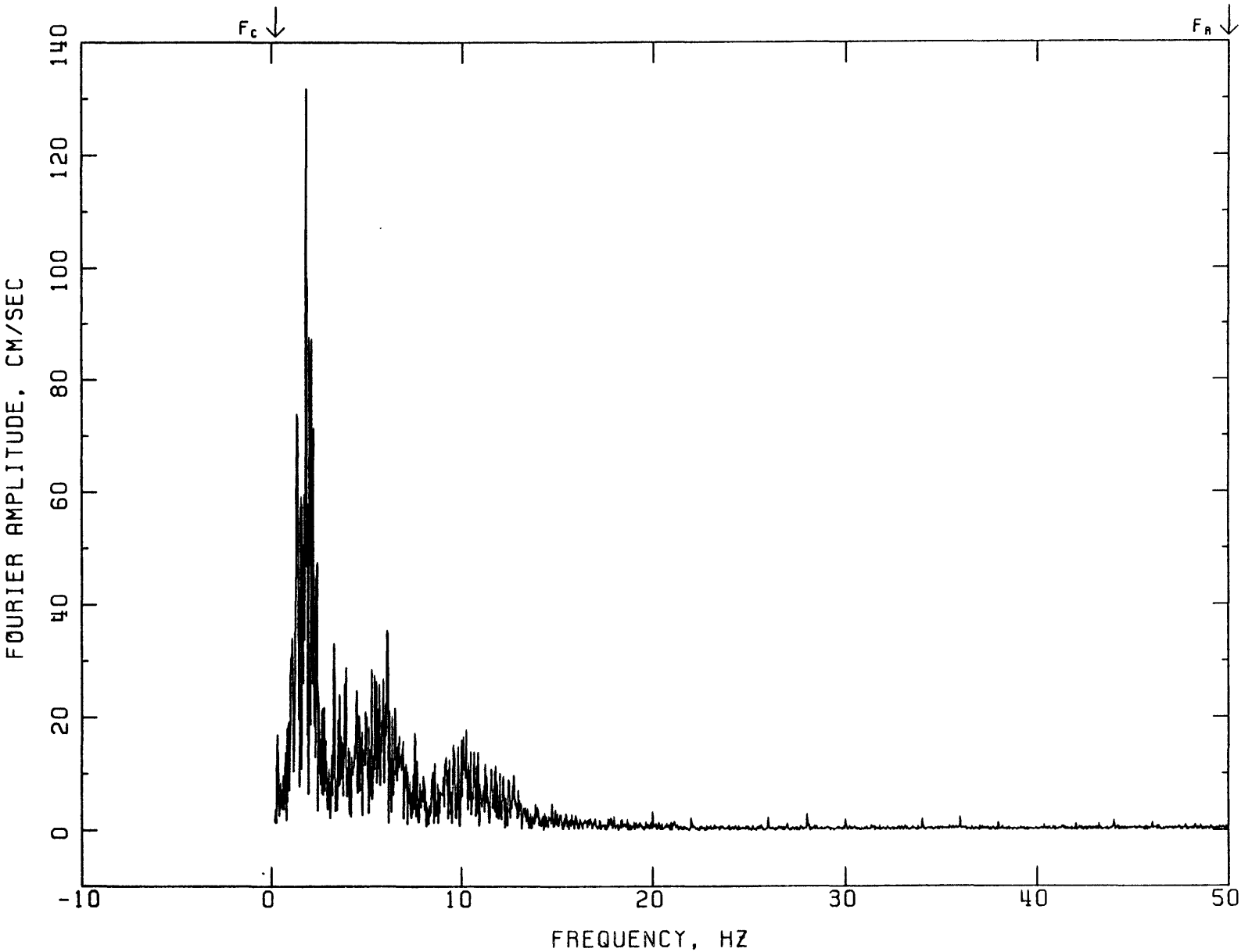

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR
290 DEGREES
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FOURIER AMPLITUDE, CM/SEC
0
20
40
60
80
100
-10
0
10
20
30
40
50
FREQUENCY, HZ

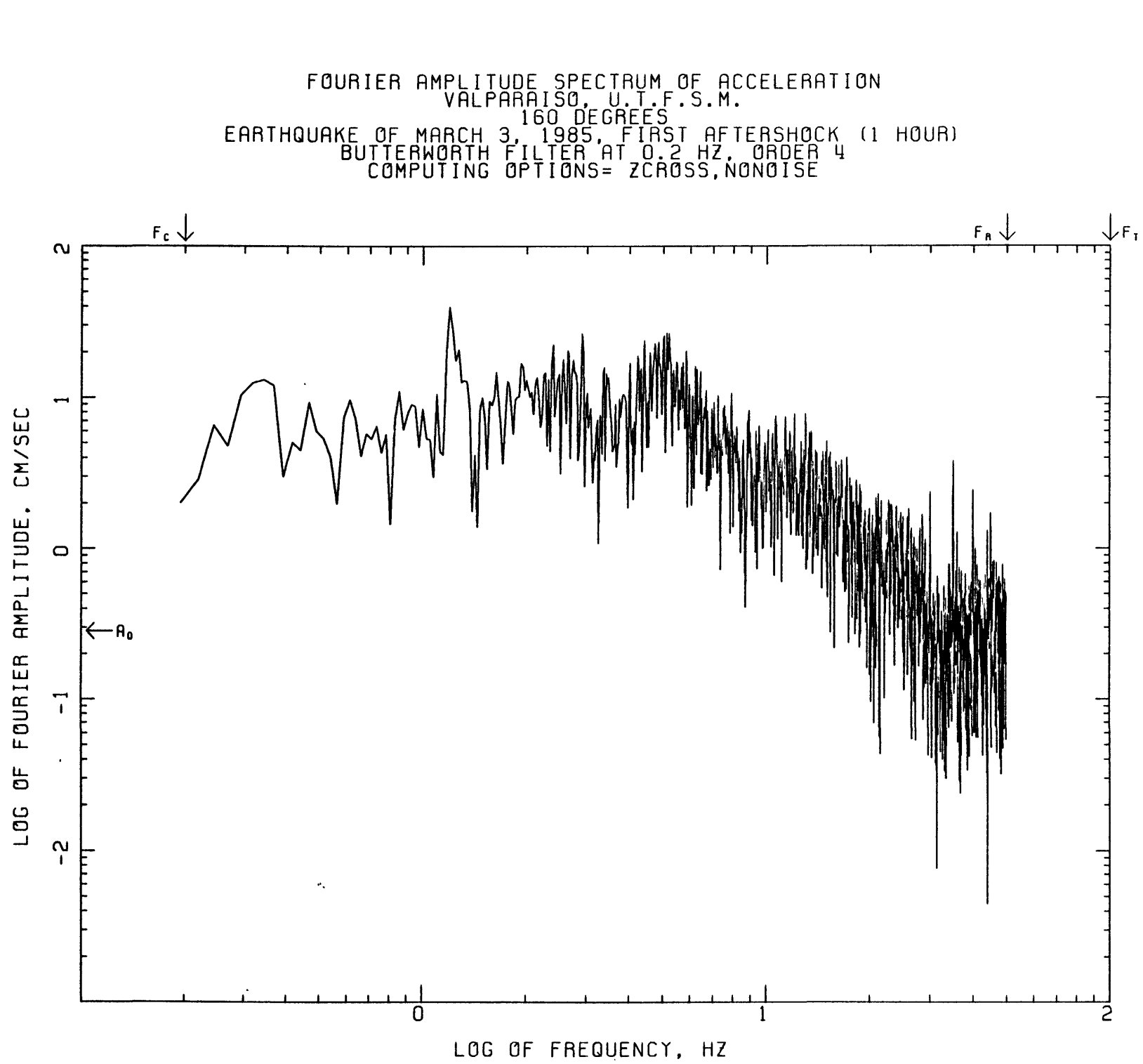

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR
UP
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_A
F_T
A_0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
2
1
0
-1
0
1
2

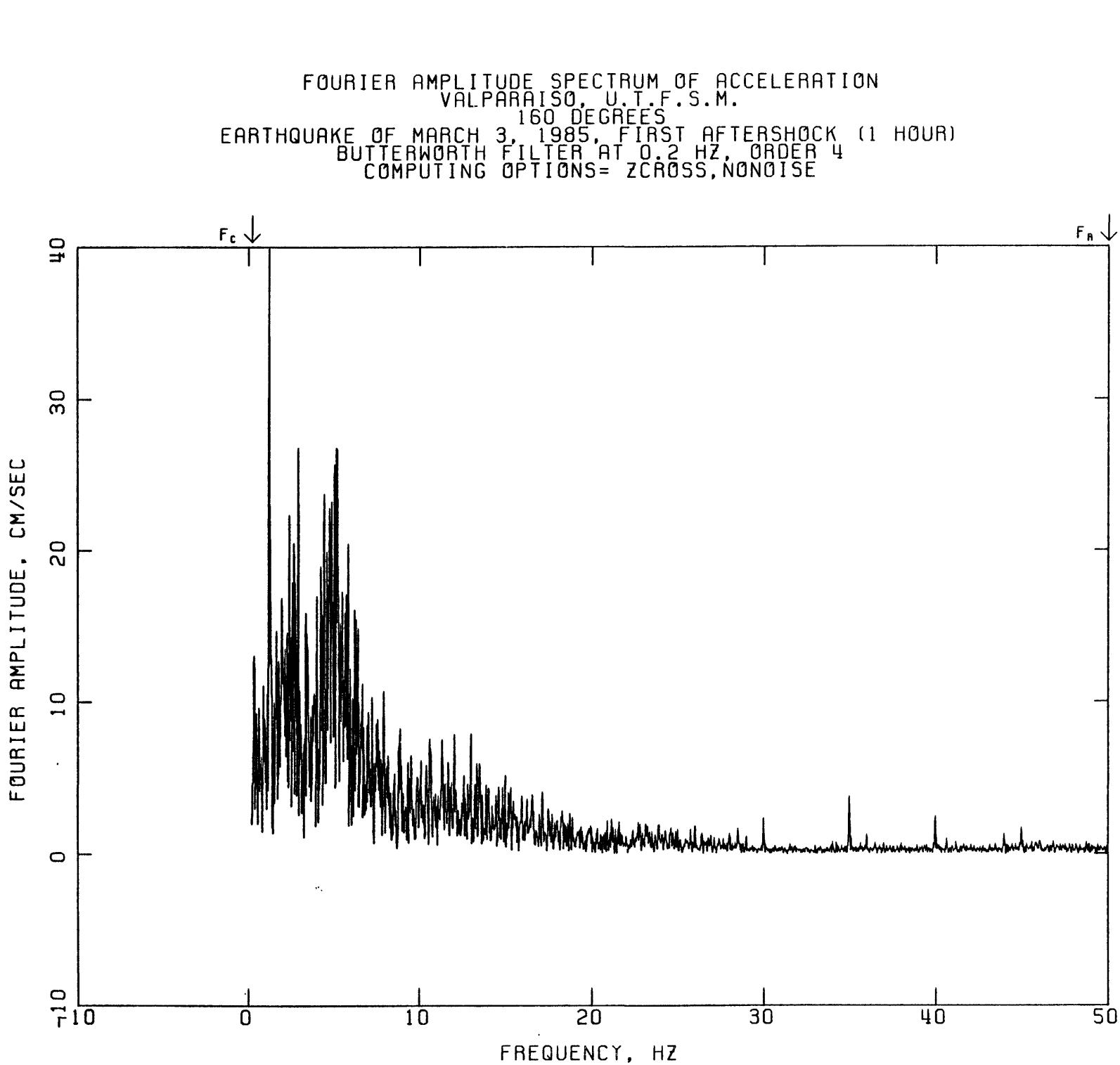

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR
UP
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FOURIER AMPLITUDE, CM/SEC
60
50
40
30
20
10
0
-10
-10
0
10
20
30
40
50
FREQUENCY, HZ

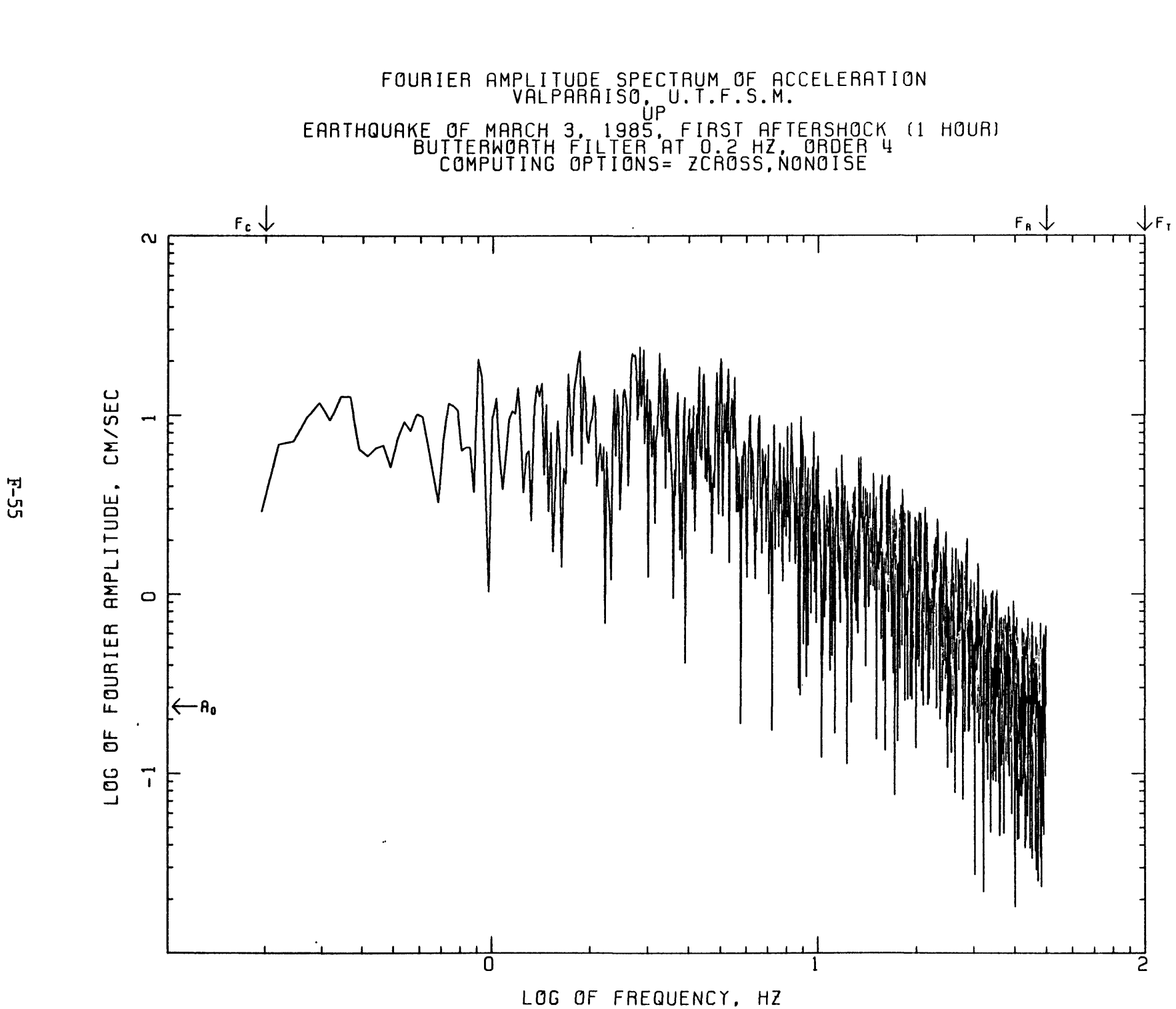

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VINA DEL MAR
200 DEGREES
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

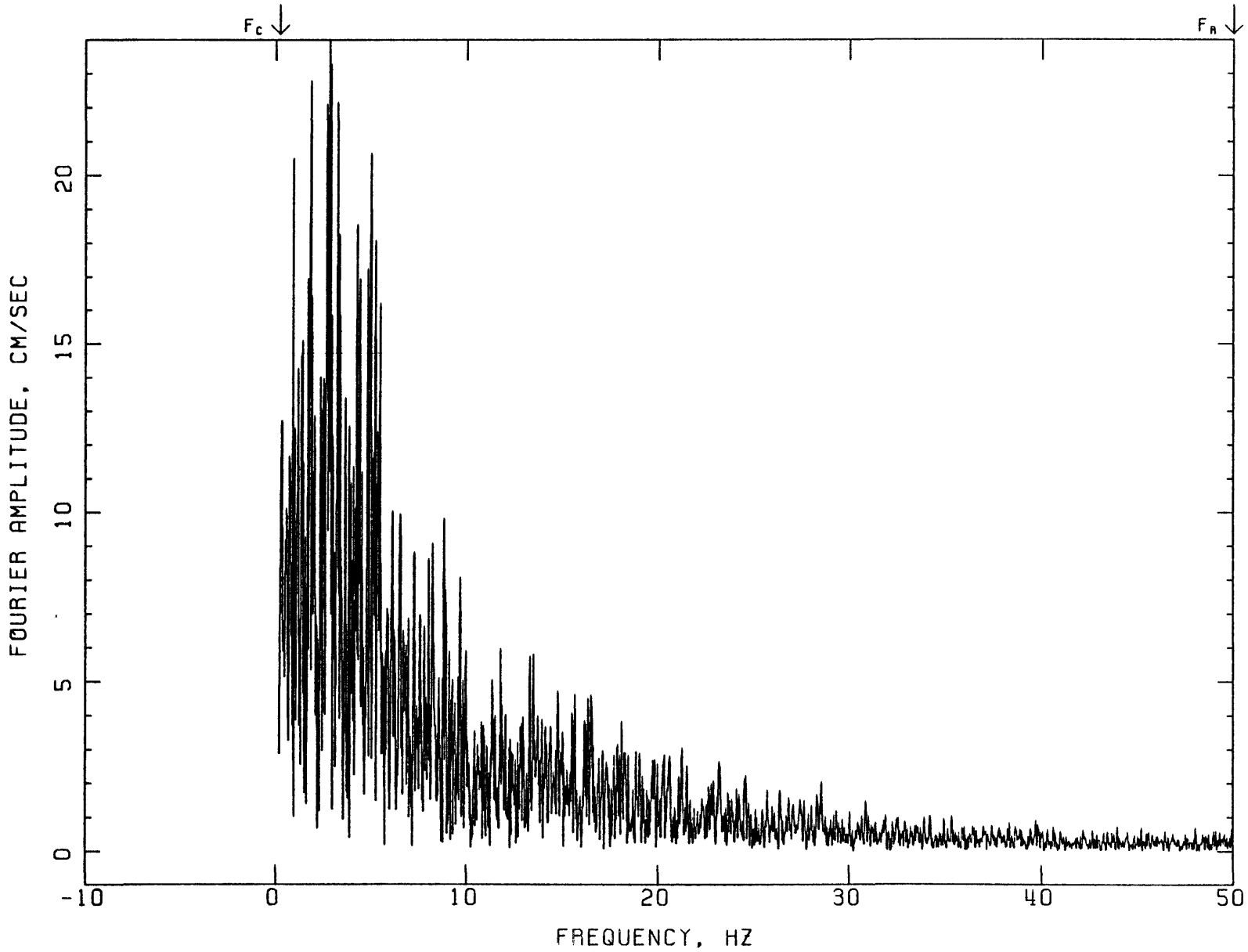


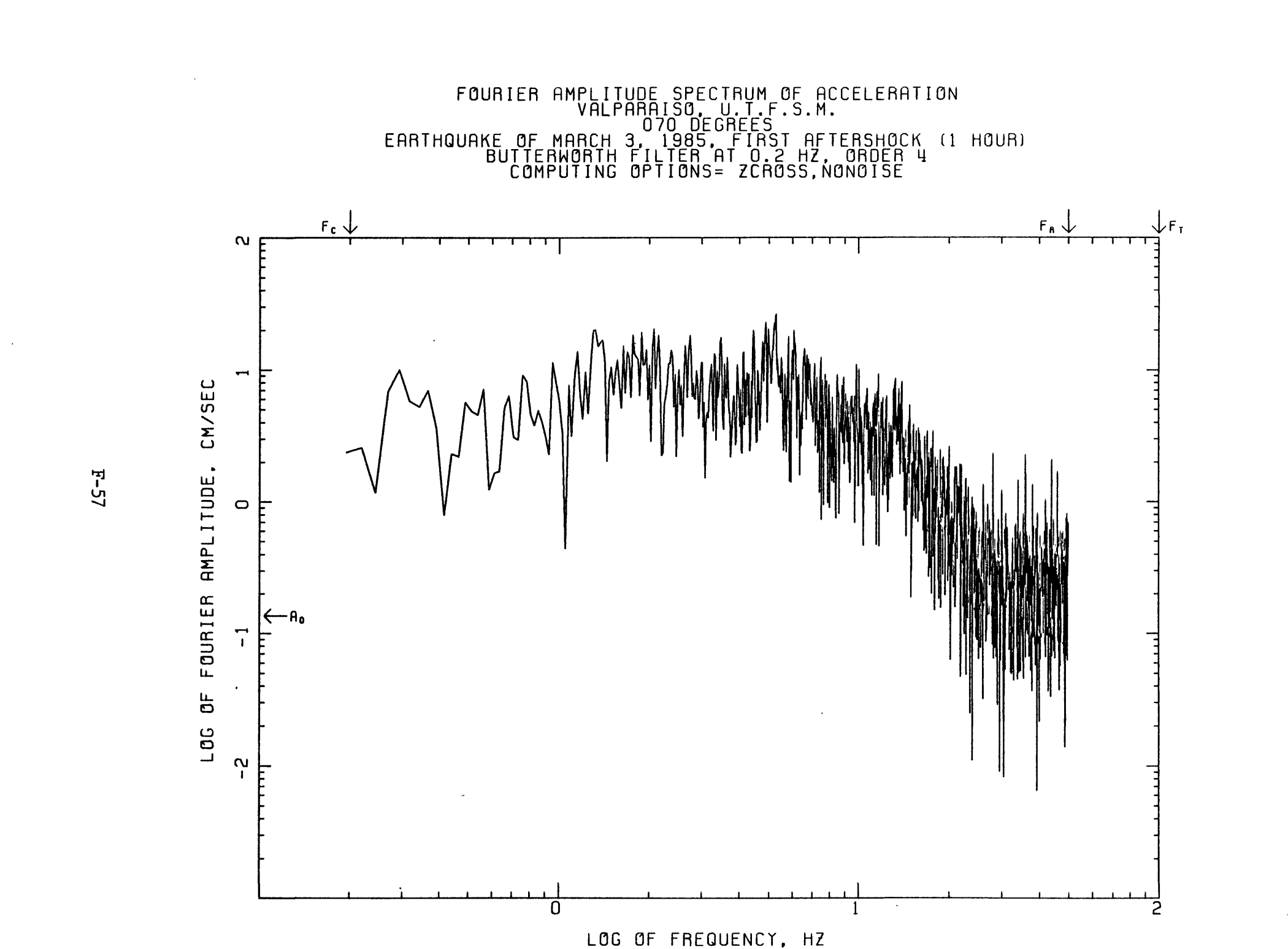

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.T.F.S.M.
160 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
2
1
0
-1
-2
0
1
2

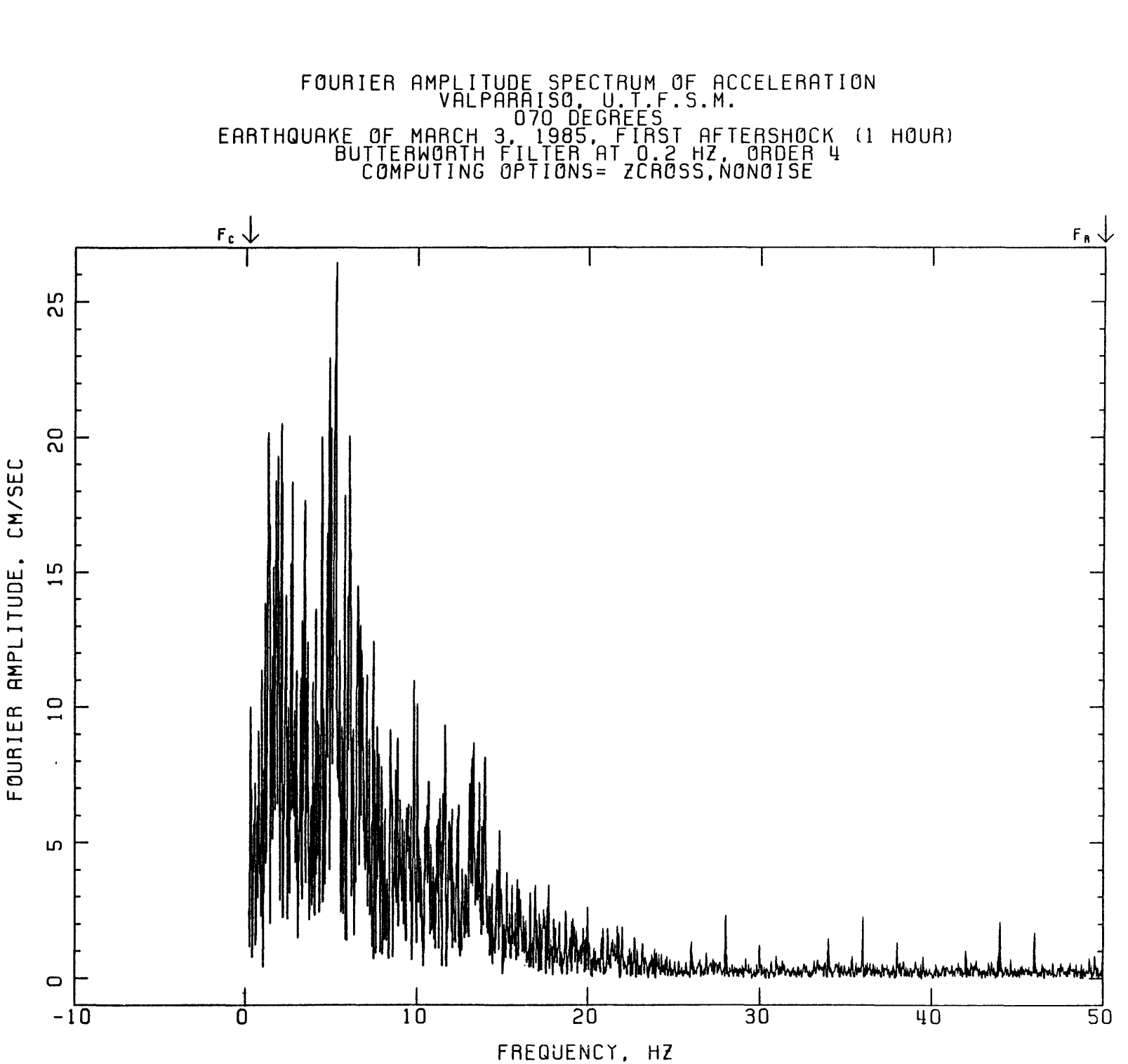

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.T.F.S.M.
160 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FOURIER AMPLITUDE, CM/SEC
40
30
20
10
0
-10
-10
0
10
20
30
40
50
FREQUENCY, HZ

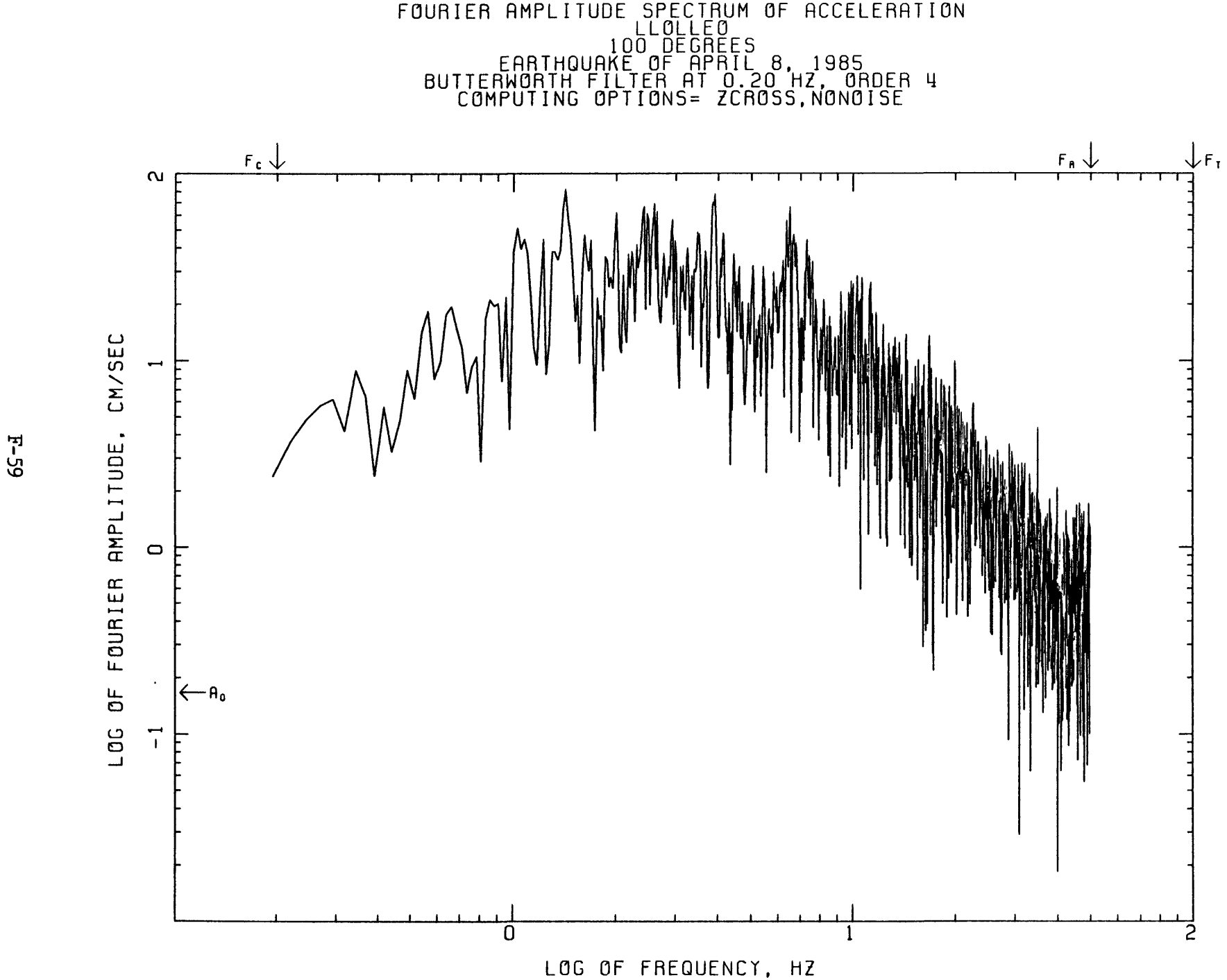

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.T.F.S.M.
UP
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_R
F_T
A_0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
2
1
0
-1
0
1
2

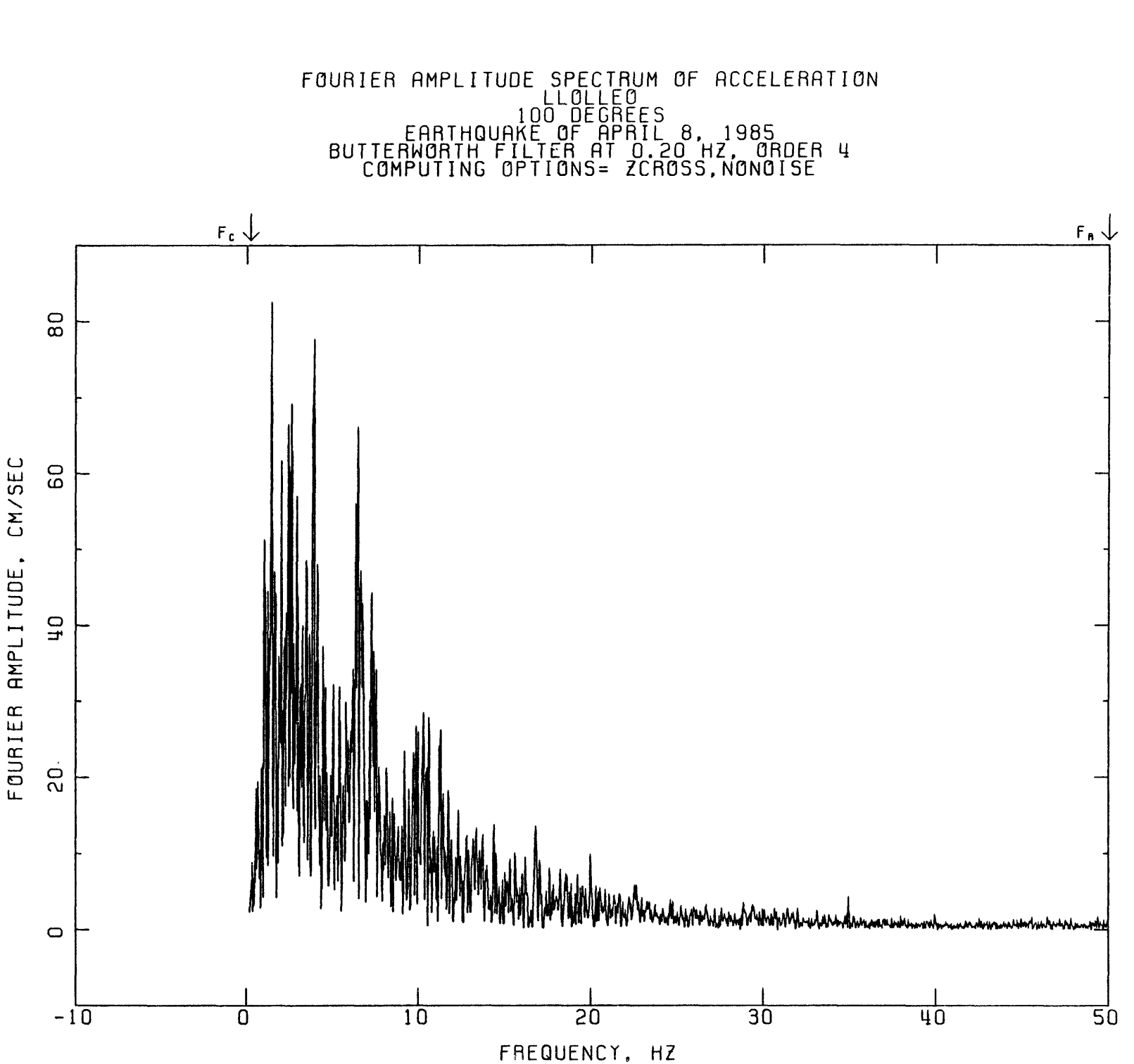
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.T.F.S.M.
UP
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

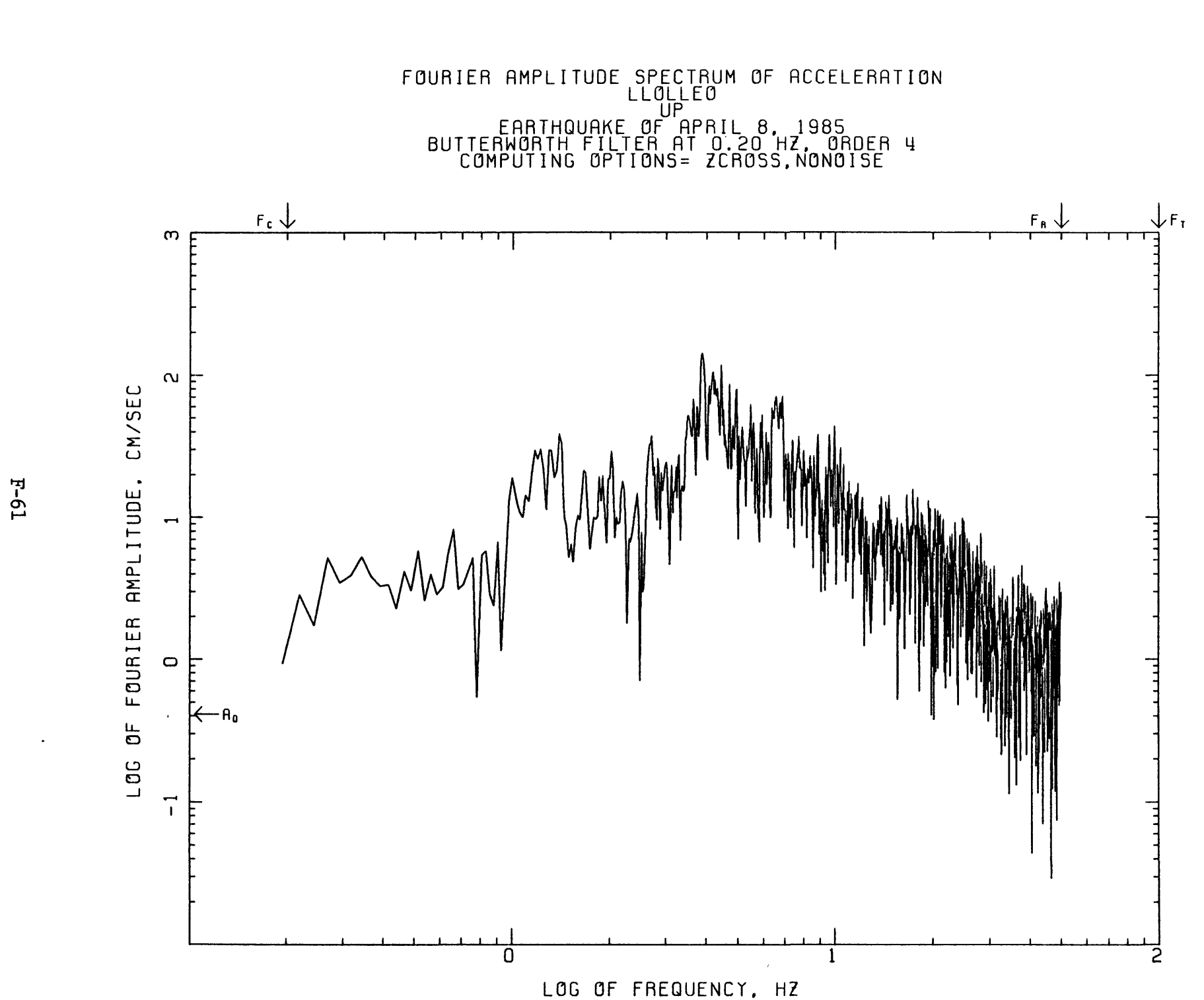



FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.T.F.S.M.
070 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_A
F_T
A_0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
2
1
0
-1
-2
0
1
2

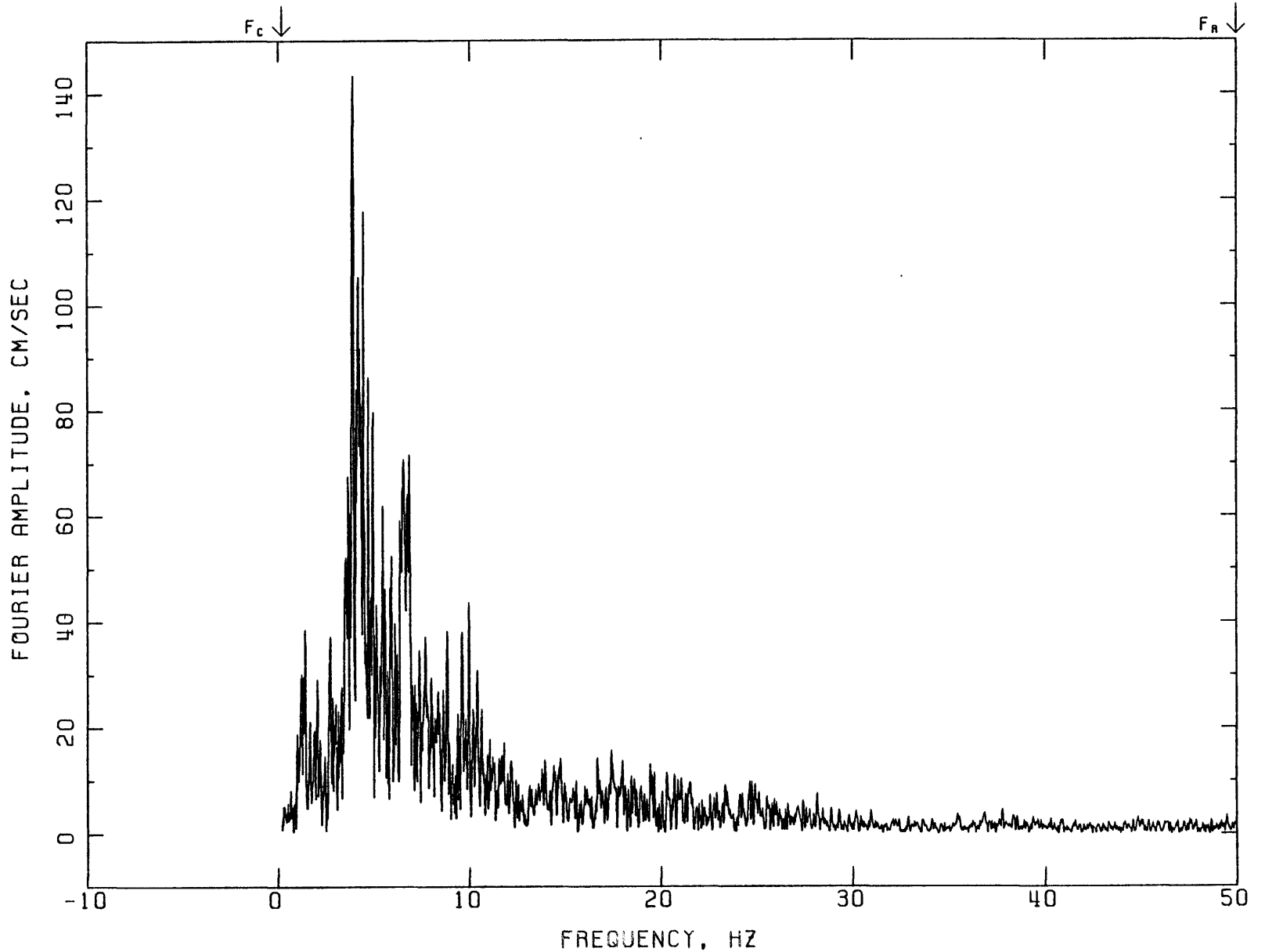

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
VALPARAISO, U.T.F.S.M.
070 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
BUTTERWORTH FILTER AT 0.2 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FR
FOURIER AMPLITUDE, CM/SEC
0
5
10
15
20
25
-10
0
10
20
30
40
50
FREQUENCY, HZ

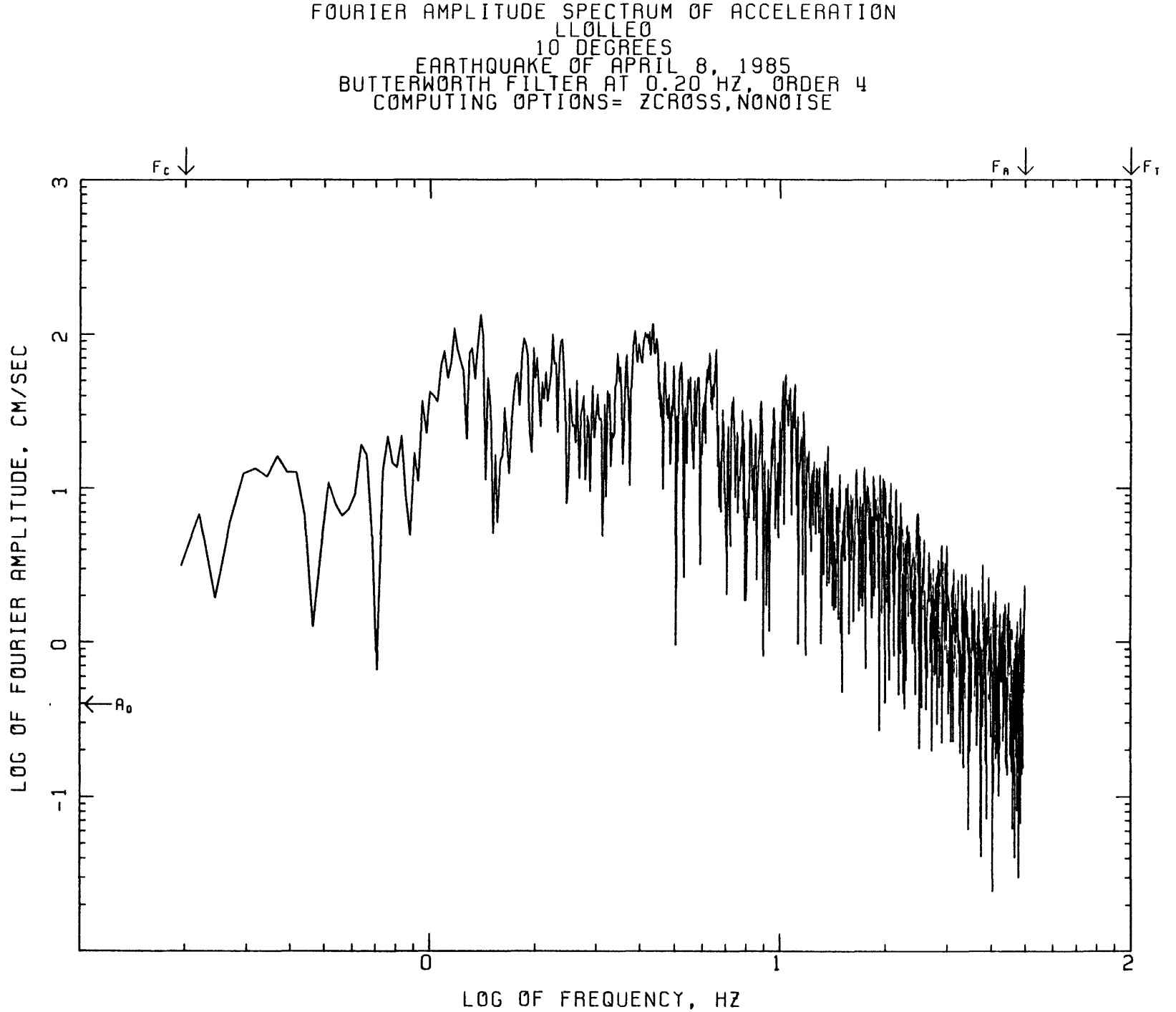

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
100 DEGREES
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
2
1
0
-1
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
0
1
2
LOG OF FREQUENCY, HZ

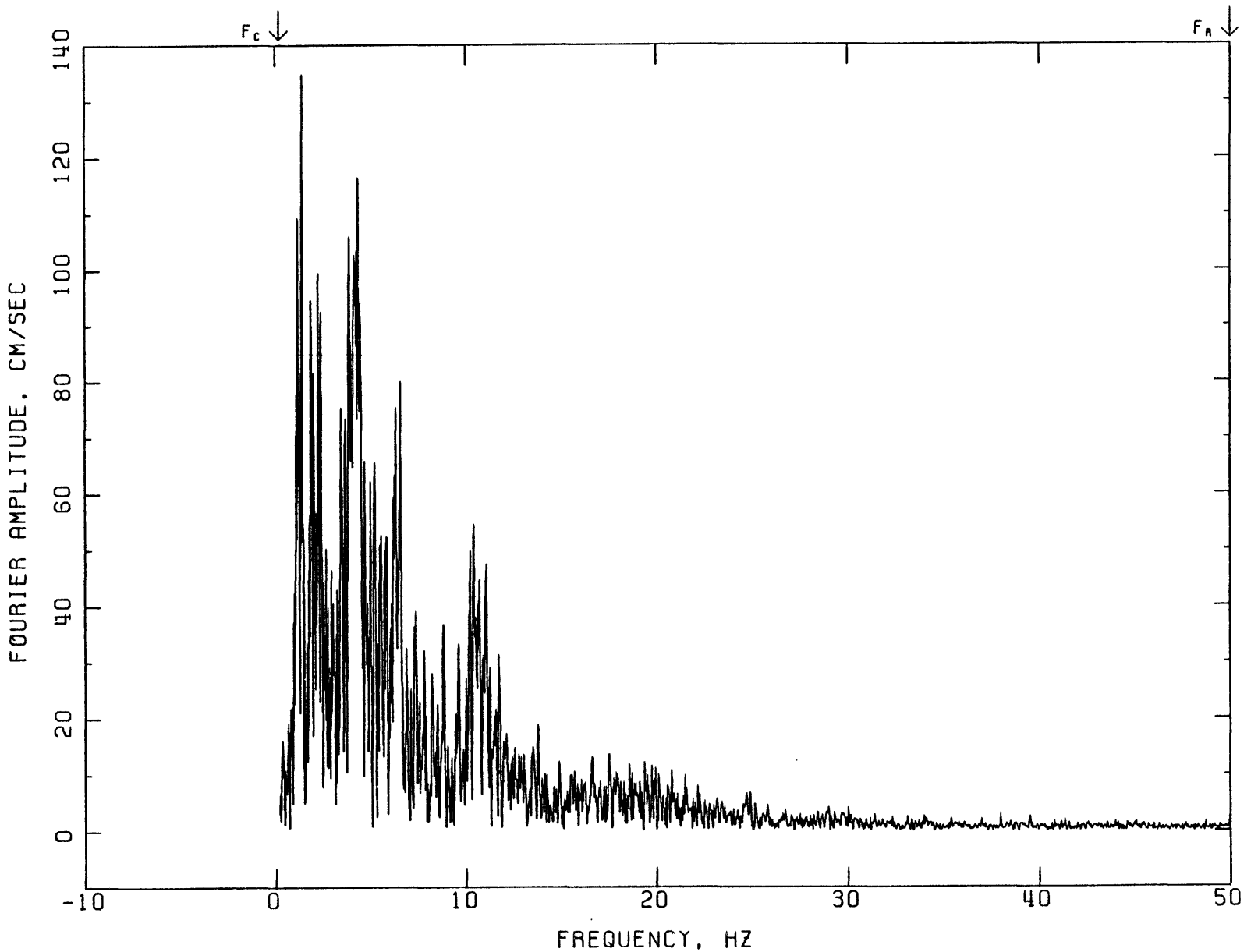

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
100 DEGREES
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FN
FOURIER AMPLITUDE, CM/SEC
0
20
40
60
80
-10
0
10
20
30
40
50
FREQUENCY, HZ

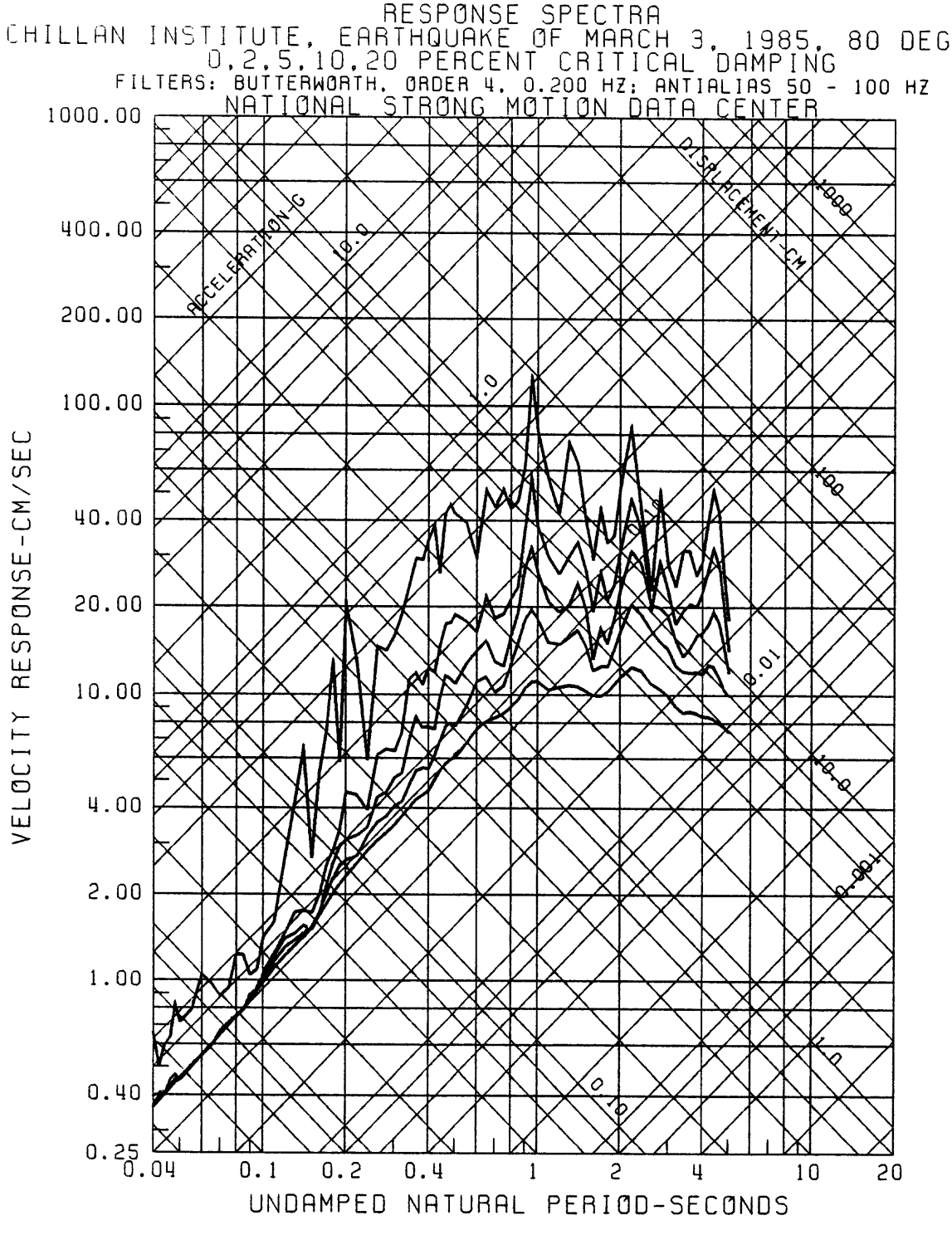

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
UP
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
F_C
F_R
F_T
A_0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

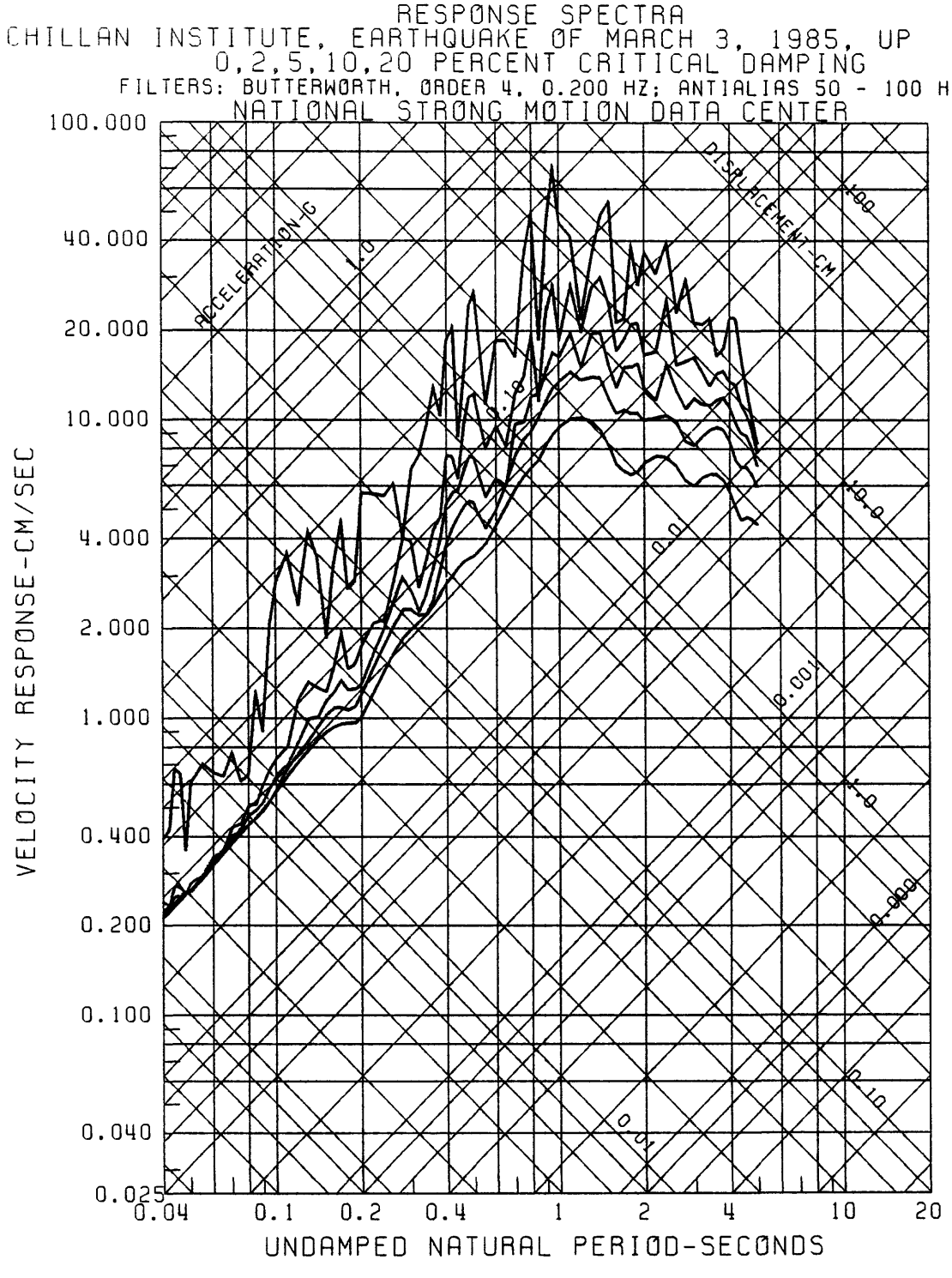
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
UP
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE

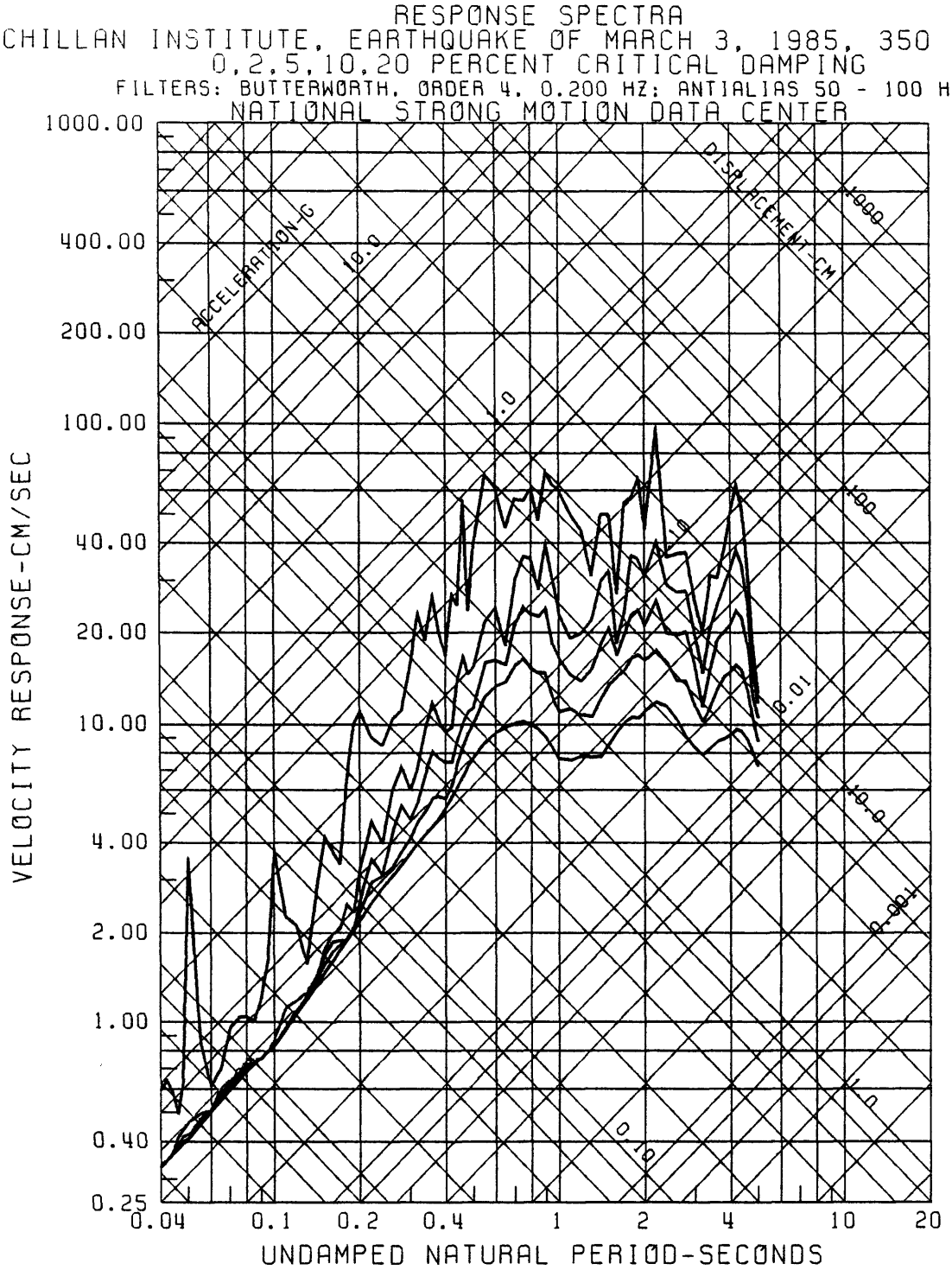


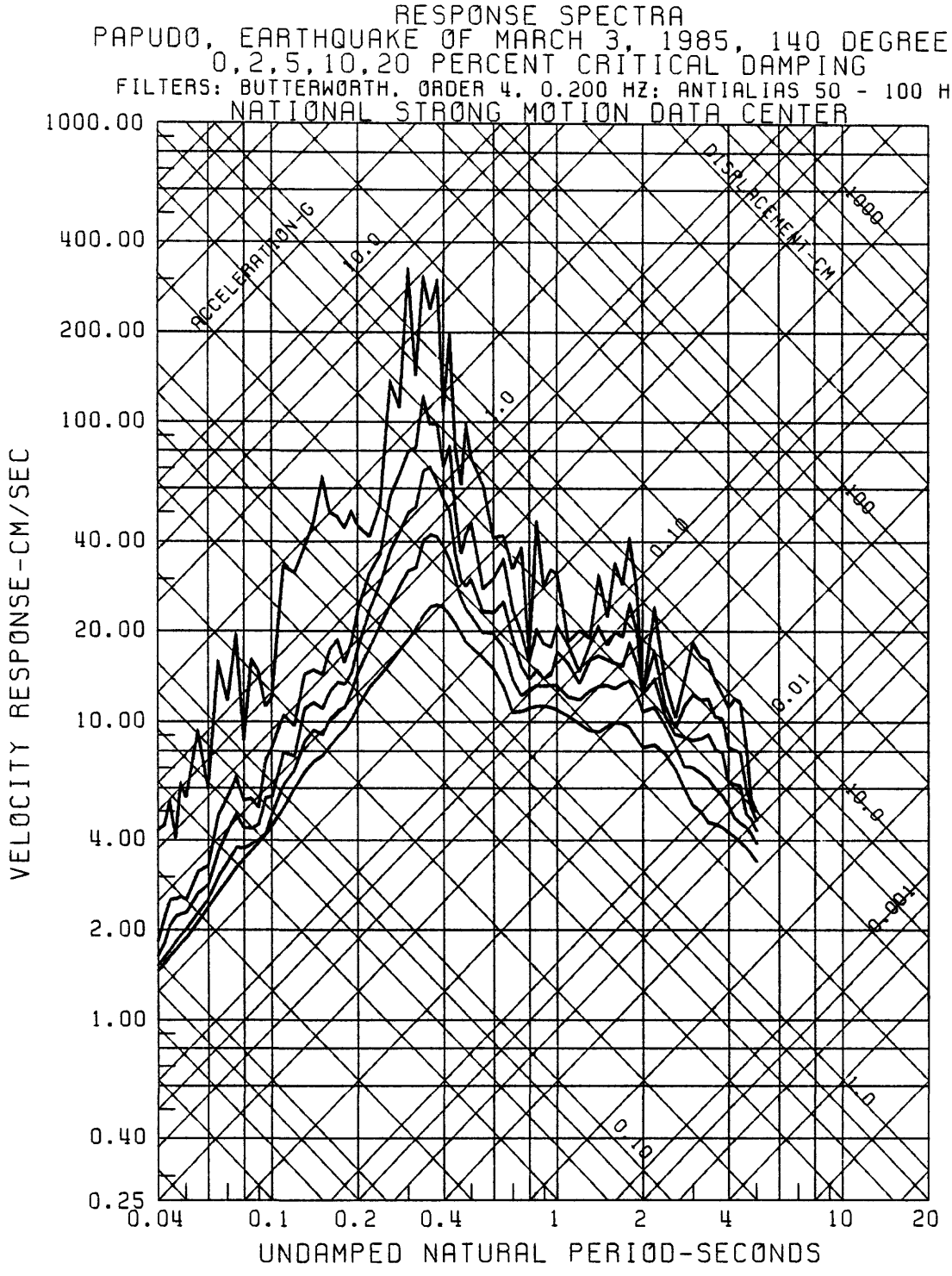

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
10 DEGREES
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FA
FT
A0
LOG OF FOURIER AMPLITUDE, CM/SEC
LOG OF FREQUENCY, HZ
3
2
1
0
-1
0
1
2

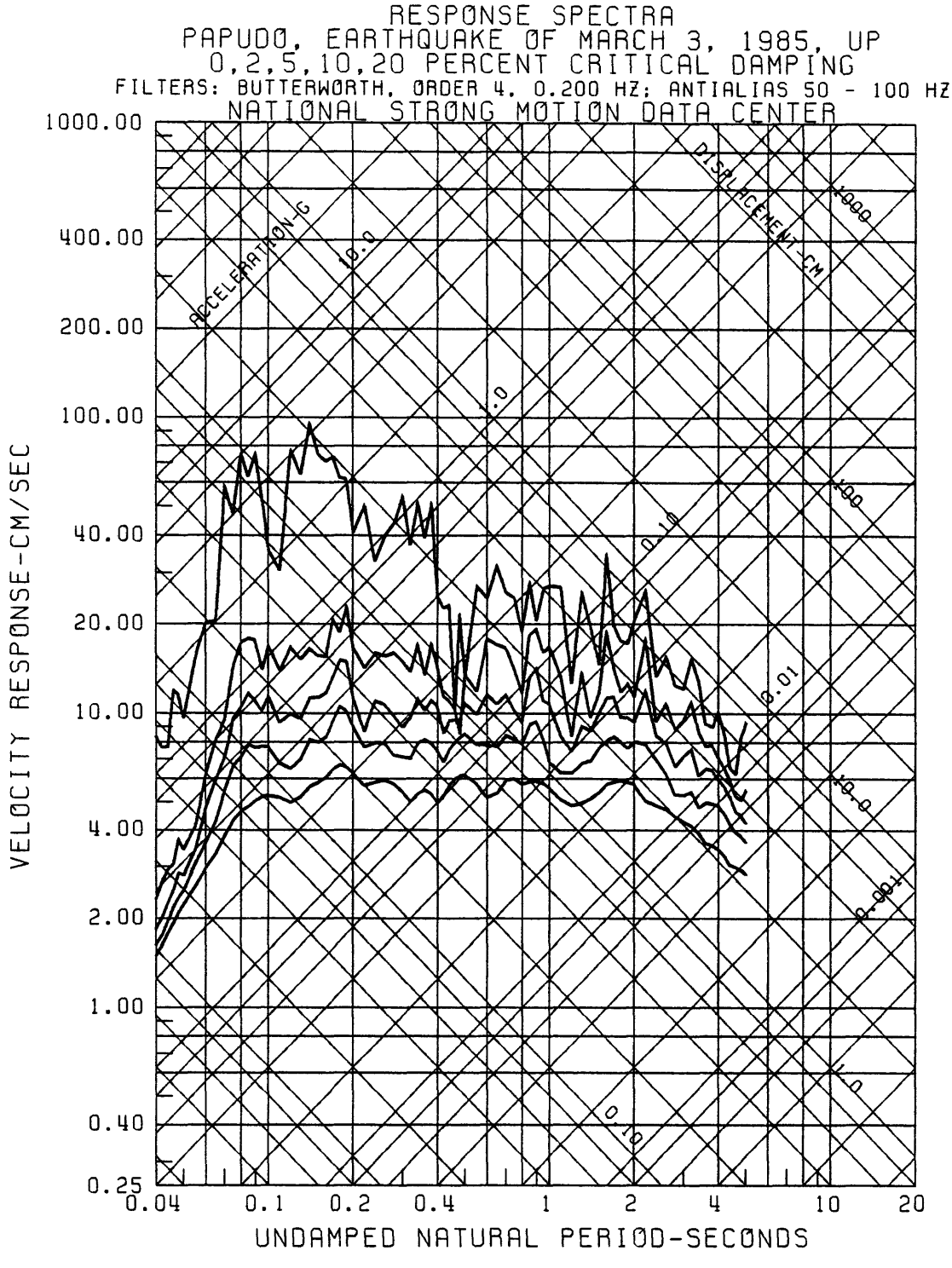

FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
LLOLLEO
10 DEGREES
EARTHQUAKE OF APRIL 8, 1985
BUTTERWORTH FILTER AT 0.20 HZ, ORDER 4
COMPUTING OPTIONS= ZCROSS,NONOISE
Fc
FN
FOURIER AMPLITUDE, CM/SEC
0
20
40
60
80
100
120
140
-10
0
10
20
30
40
50
FREQUENCY, HZ


RESPONSE SPECTRA
CHILLAN INSTITUTE, EARTHQUAKE OF MARCH 3, 1985, 80 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.10
0.01
0.001
1000
100
10.0
1.0
0.01
0.001

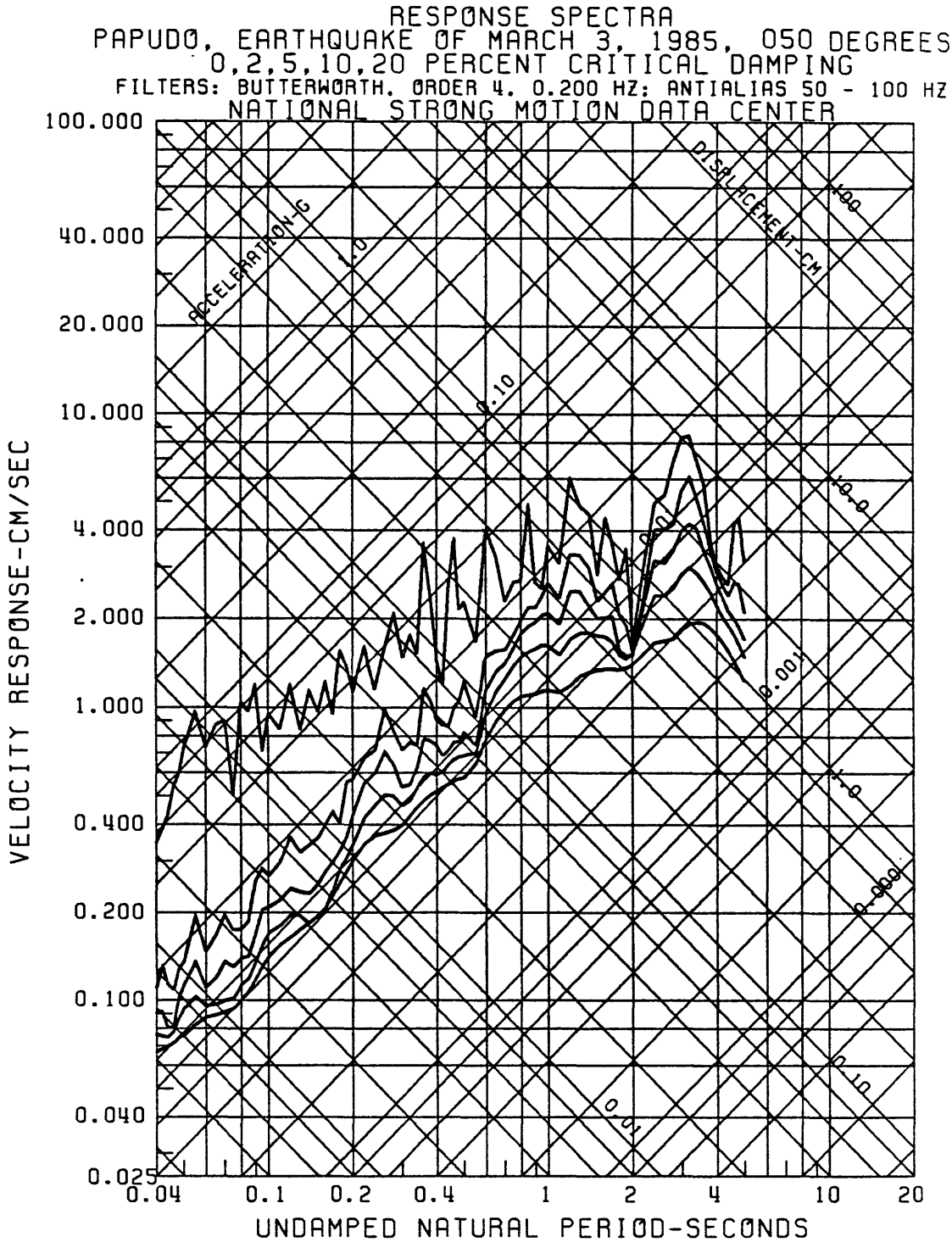

RESPONSE SPECTRA
CHILLAN INSTITUTE, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
100.000
40.000
20.000
10.000
4.000
2.000
1.000
0.400
0.200
0.100
0.040
0.025
0.04
0.1
0.2
0.4
1
2
4
10
20

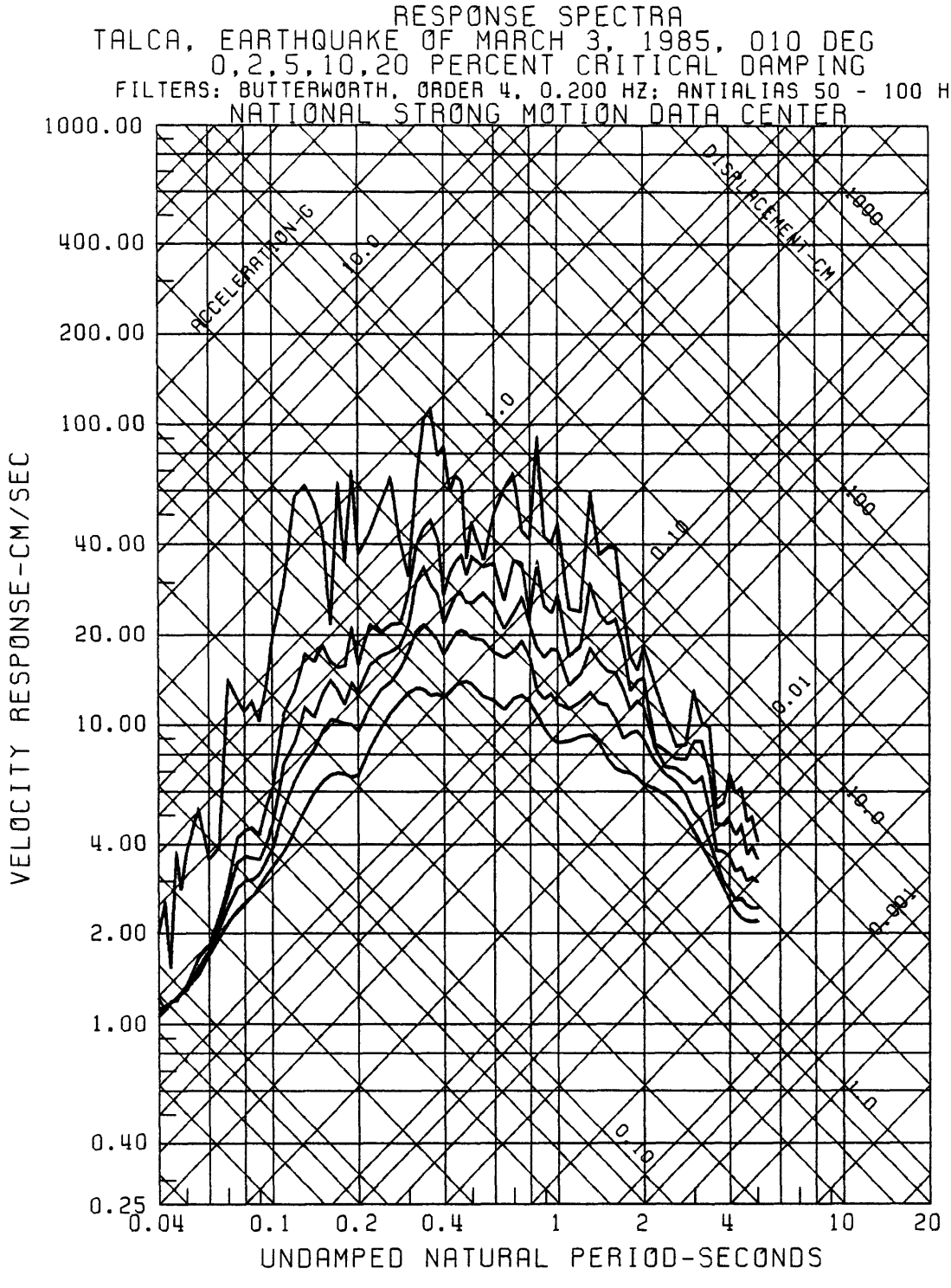

RESPONSE SPECTRA
CHILLAN INSTITUTE, EARTHQUAKE OF MARCH 3, 1985, 350 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
10.0
1.0
0.1
0.01
0.10
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20

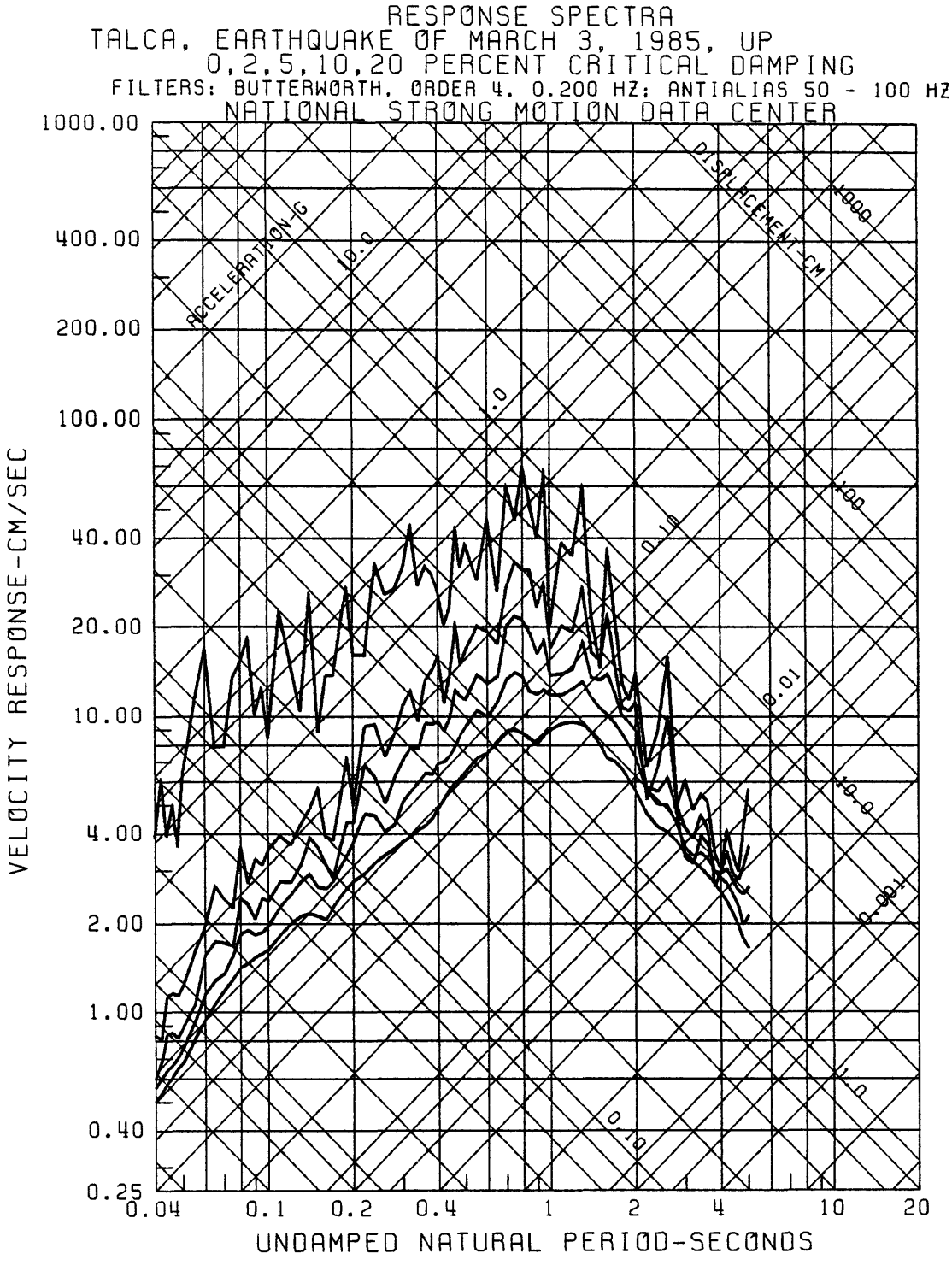

RESPONSE SPECTRA
PAPUDO, EARTHQUAKE OF MARCH 3, 1985, 140 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10

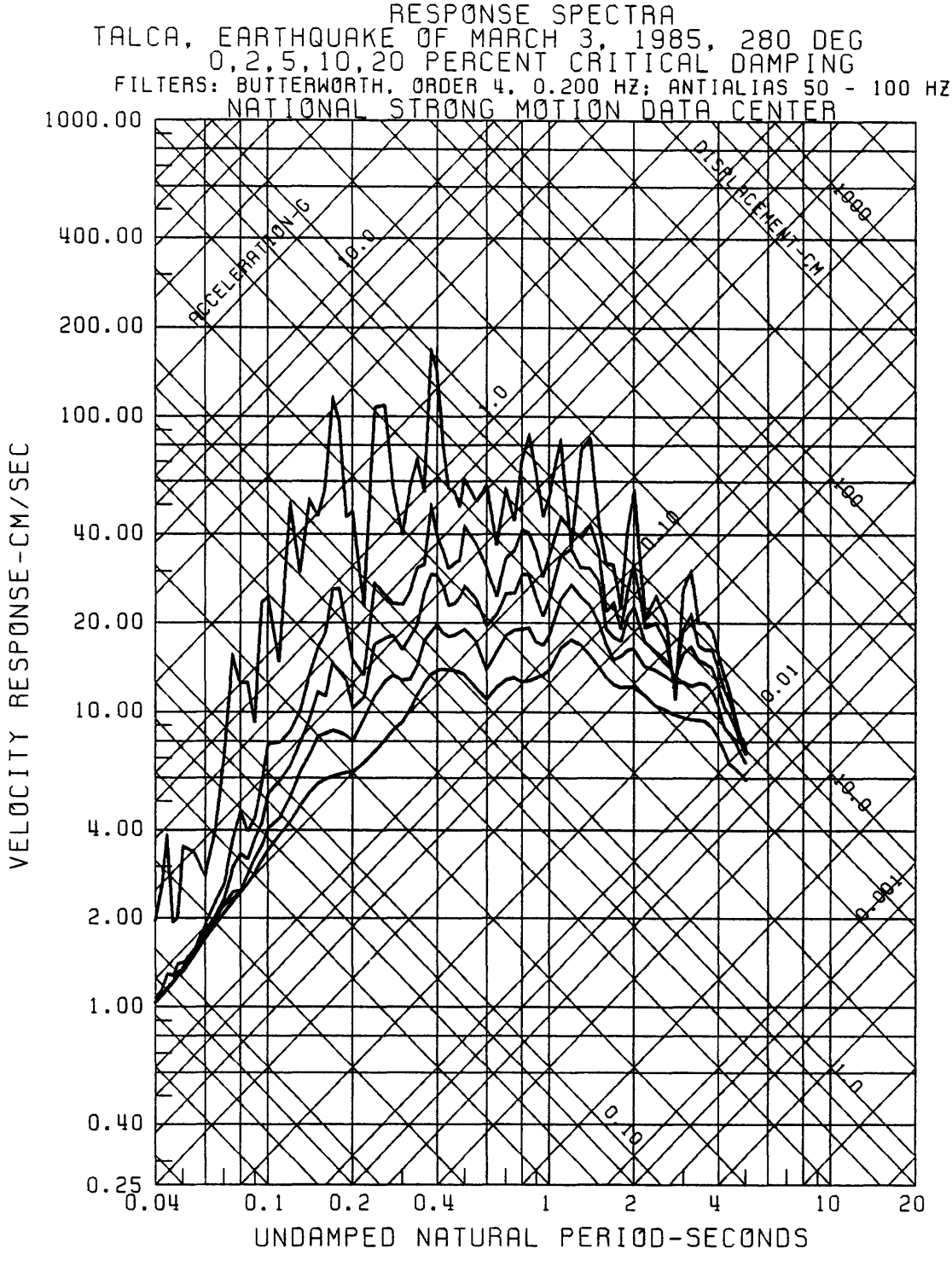

RESPONSE SPECTRA
PAPUDO, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
0.001
1.0
0.10

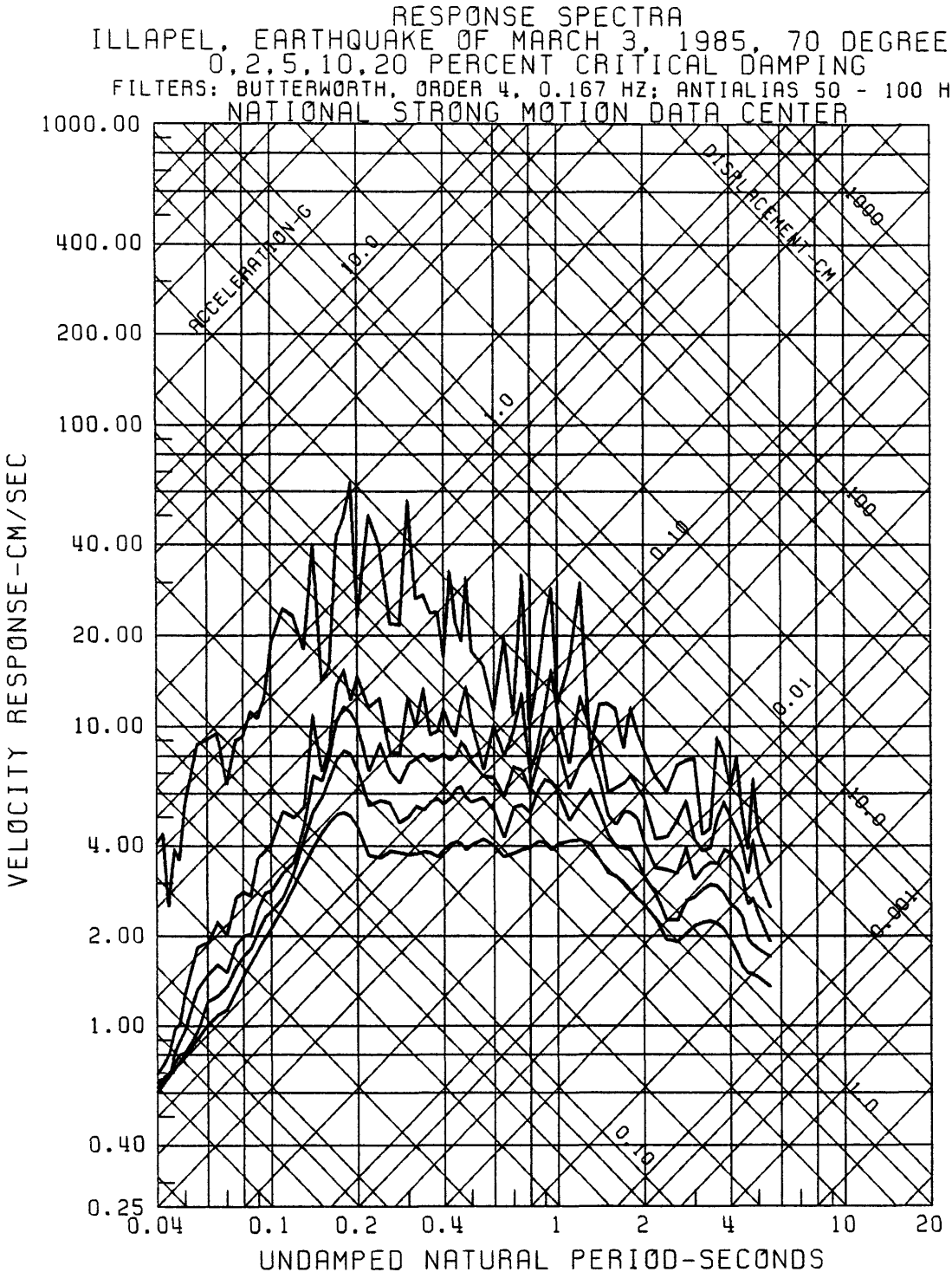
(NOTE: THIS IS SPECTRA OF REFERENCE TRACE!)

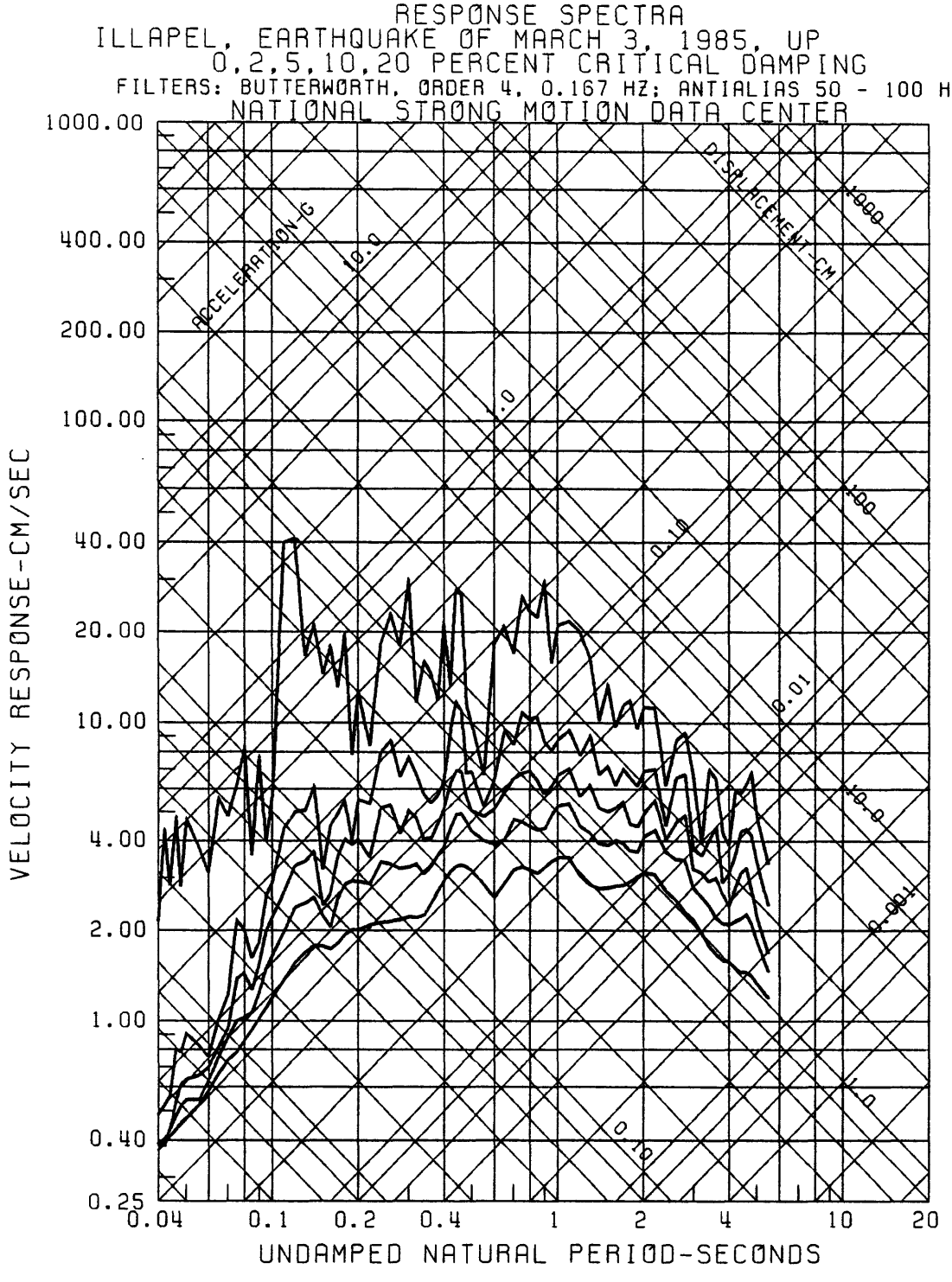


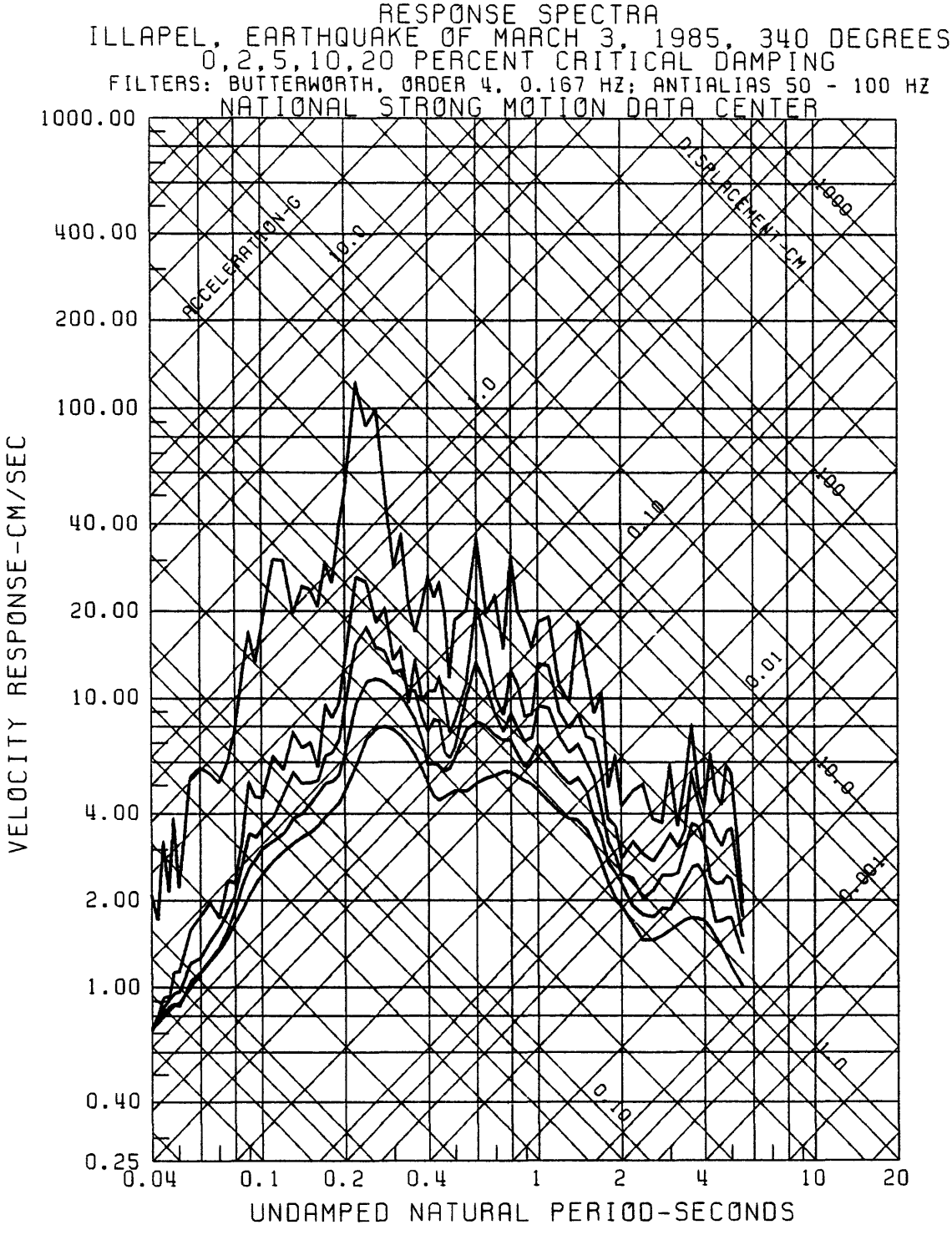

RESPONSE SPECTRA
TALCA, EARTHQUAKE OF MARCH 3, 1985, 010 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
400
100
10.0
4.00
1.0
0.10

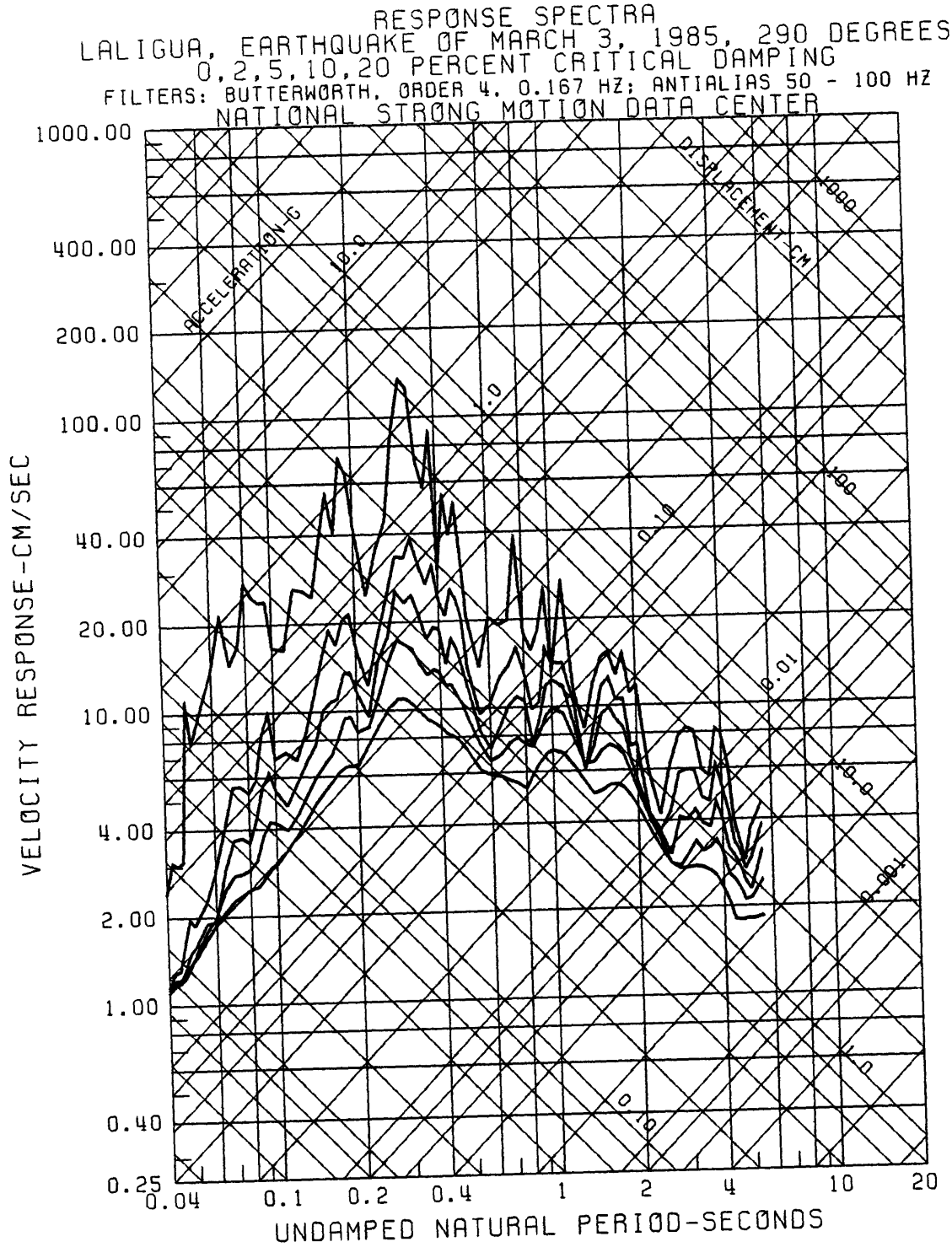

RESPONSE SPECTRA
TALCA, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.10
0.01
0.001
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10

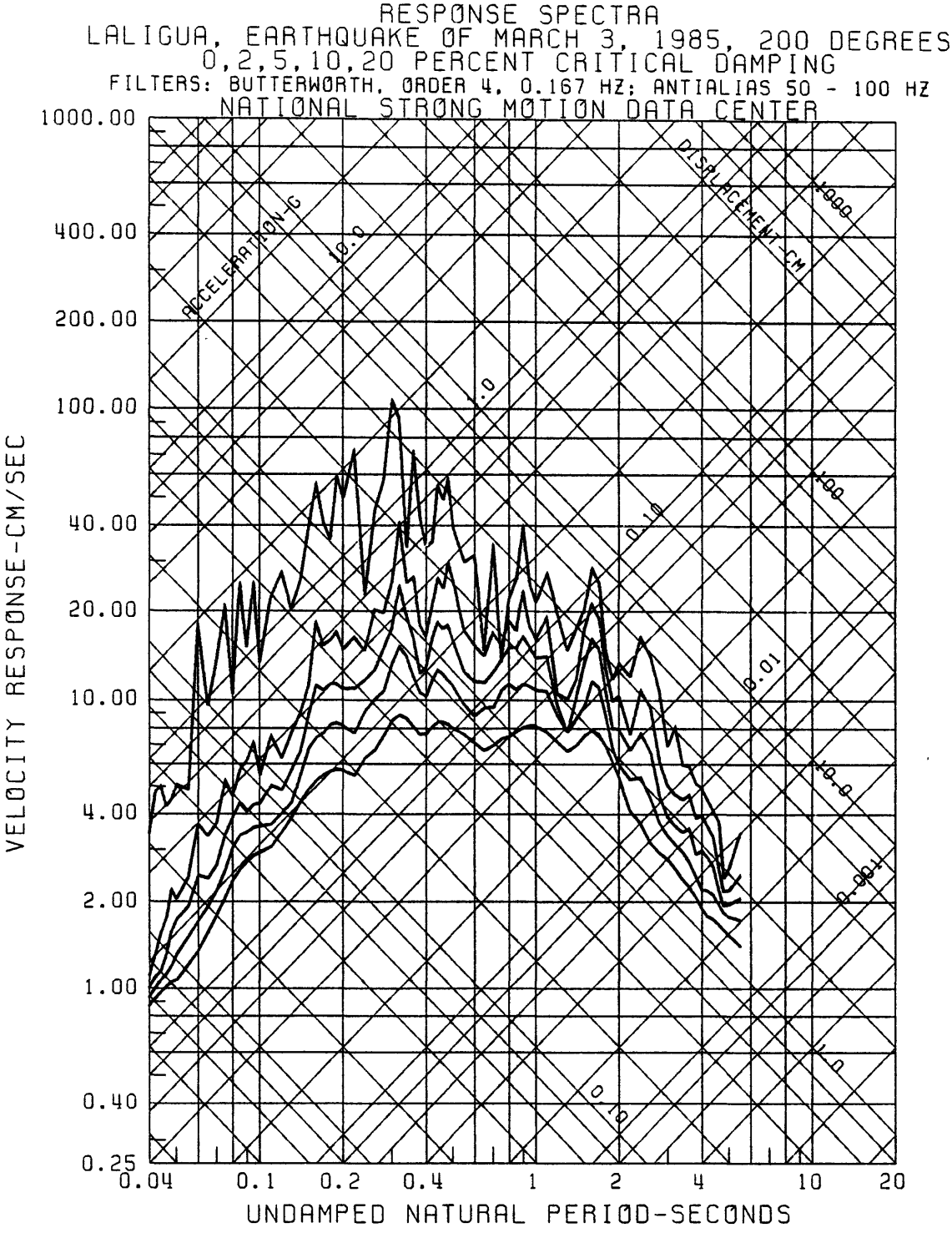

RESPONSE SPECTRA
TALCA, EARTHQUAKE OF MARCH 3, 1985, 280 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.1
0.01
DISPLACEMENT-CM
1000
100
10.0
0.01
1.0
0.10

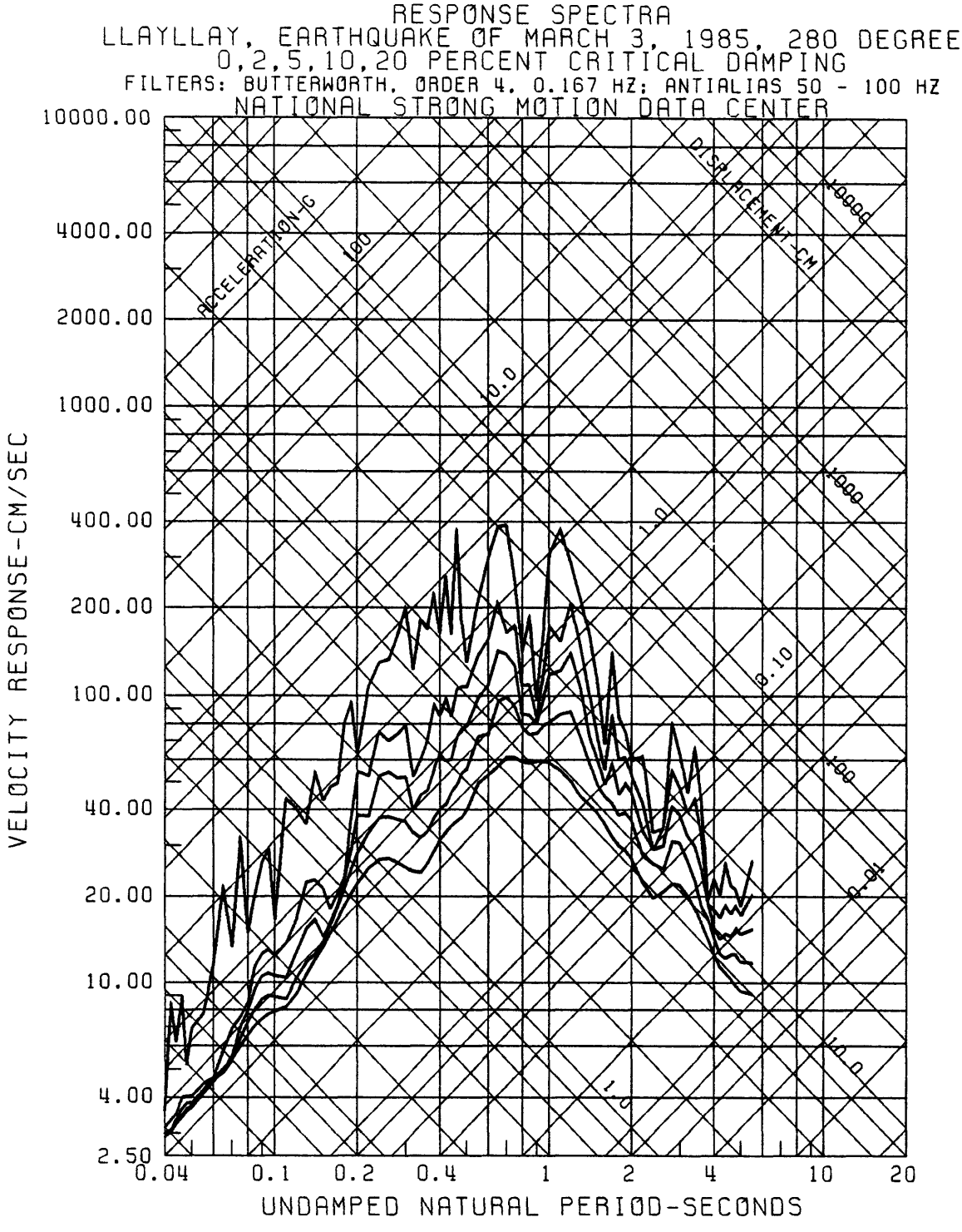

RESPONSE SPECTRA
ILLAPEL, EARTHQUAKE OF MARCH 3, 1985, 70 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.10
0.01
0.001
1000
100
10.0
1.0
0.10

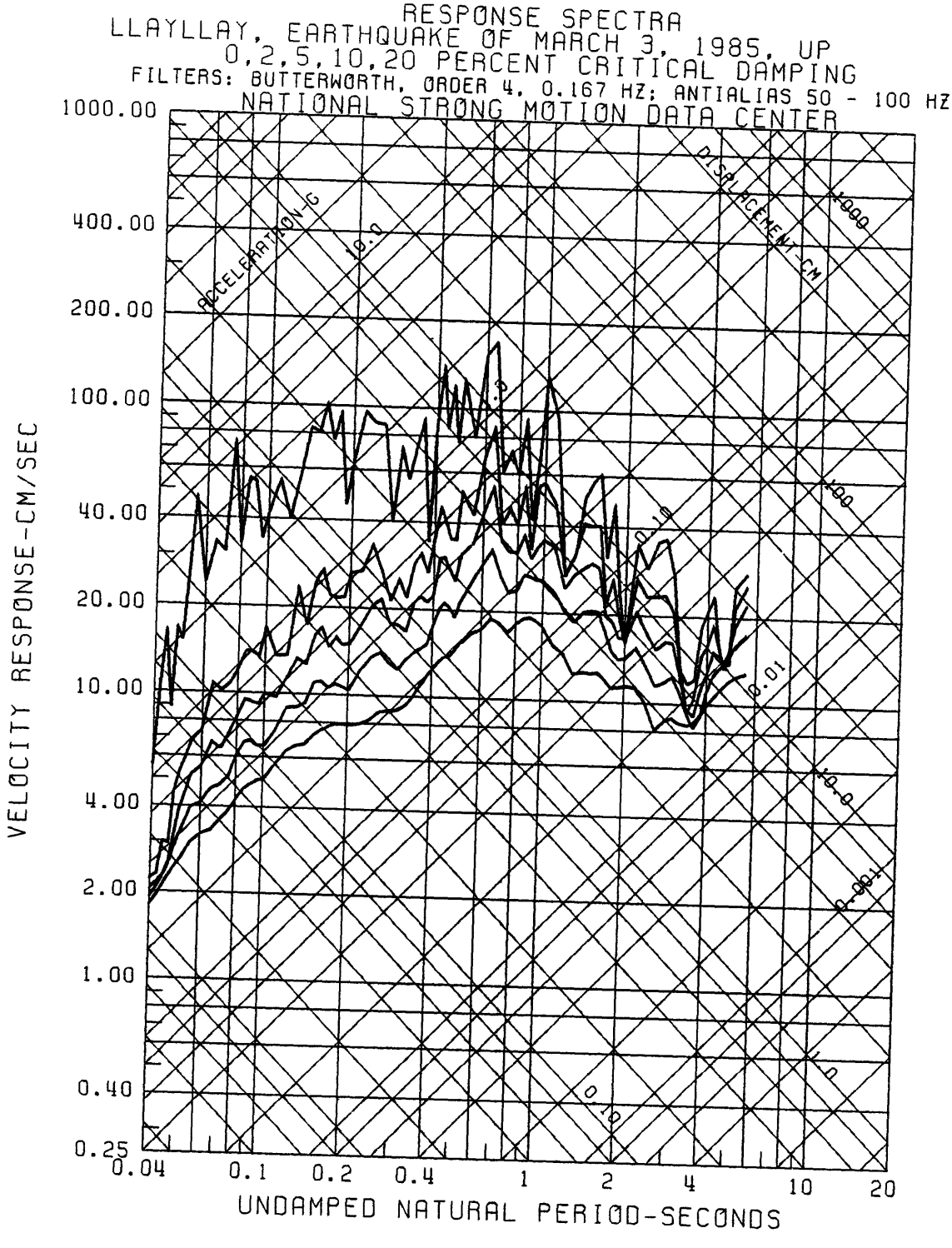

RESPONSE SPECTRA
ILLAPEL, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.1
0.01
0.001
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10

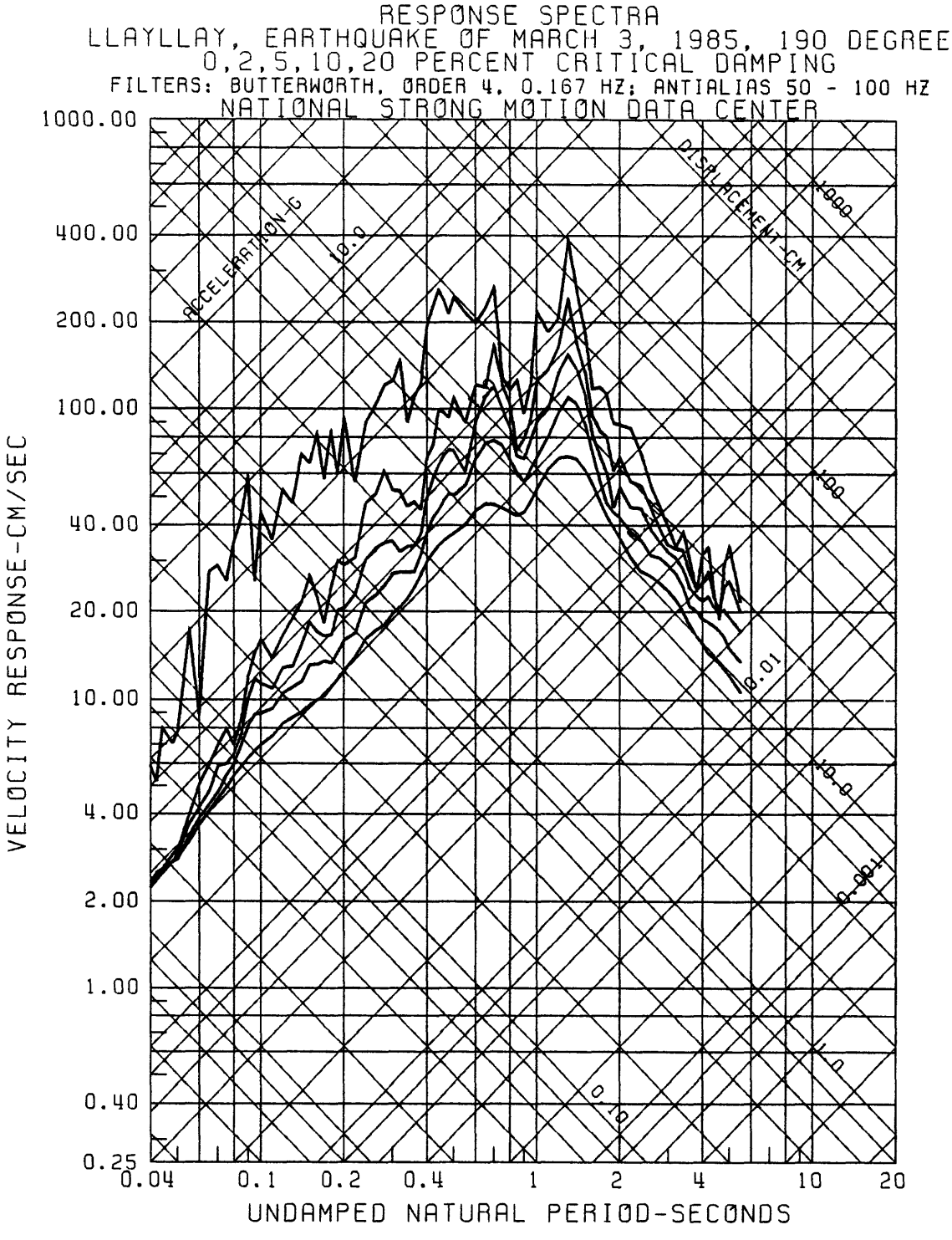

RESPONSE SPECTRA
ILLAPEL, EARTHQUAKE OF MARCH 3, 1985, 340 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

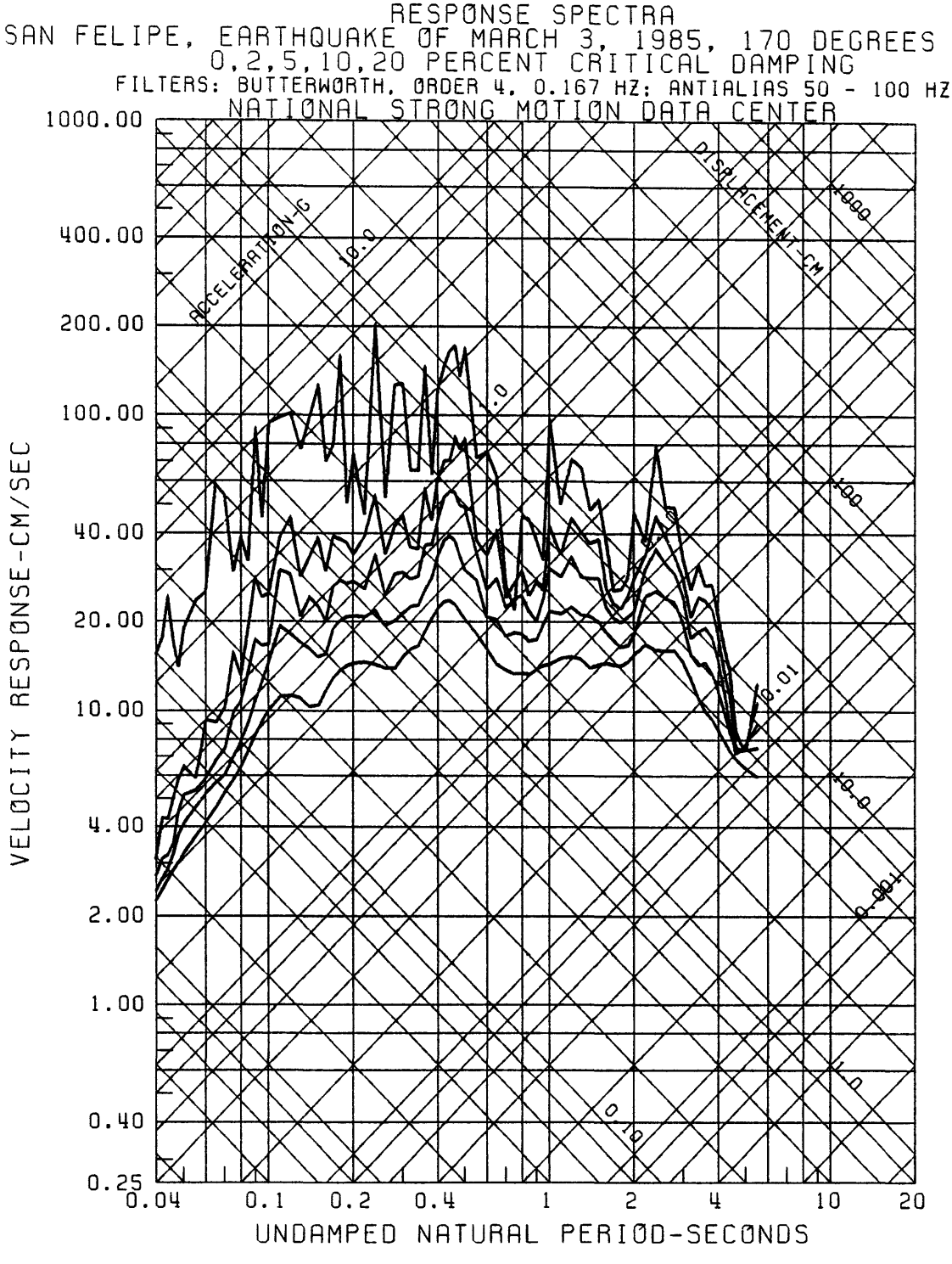

RESPONSE SPECTRA
LALIGUA, EARTHQUAKE OF MARCH 3, 1985, 290 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

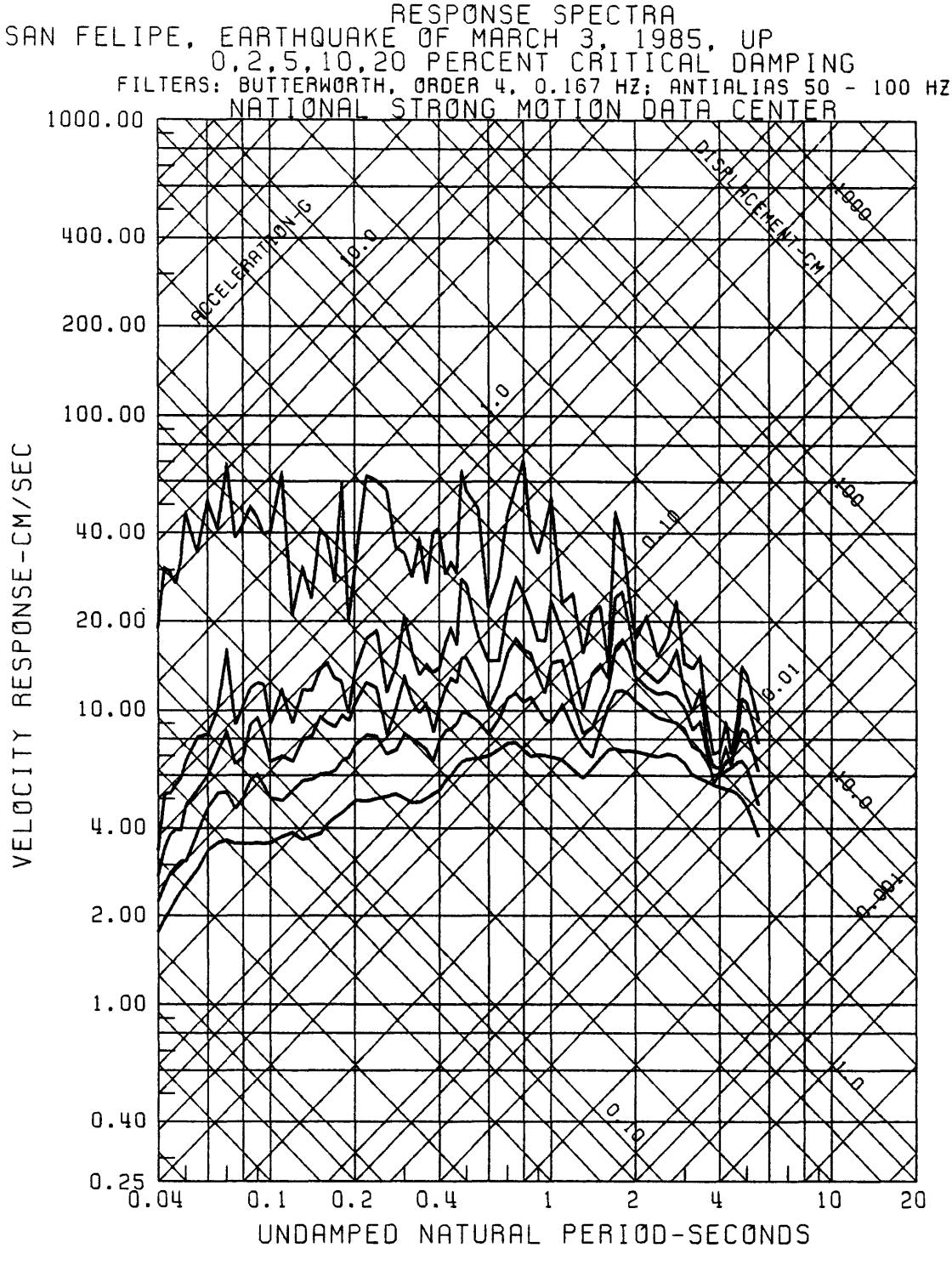

RESPONSE SPECTRA
LALIGUA, EARTHQUAKE OF MARCH 3, 1985, 200 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS


RESPONSE SPECTRA
LLAYLLAY, EARTHQUAKE OF MARCH 3, 1985, 280 DEGREE
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
10000.00
4000.00
2000.00
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.50
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
100
10.0
1.0
0.10
.100
.0100
DISPLACEMENT-CM
10000
1000
100
10.0
1.0

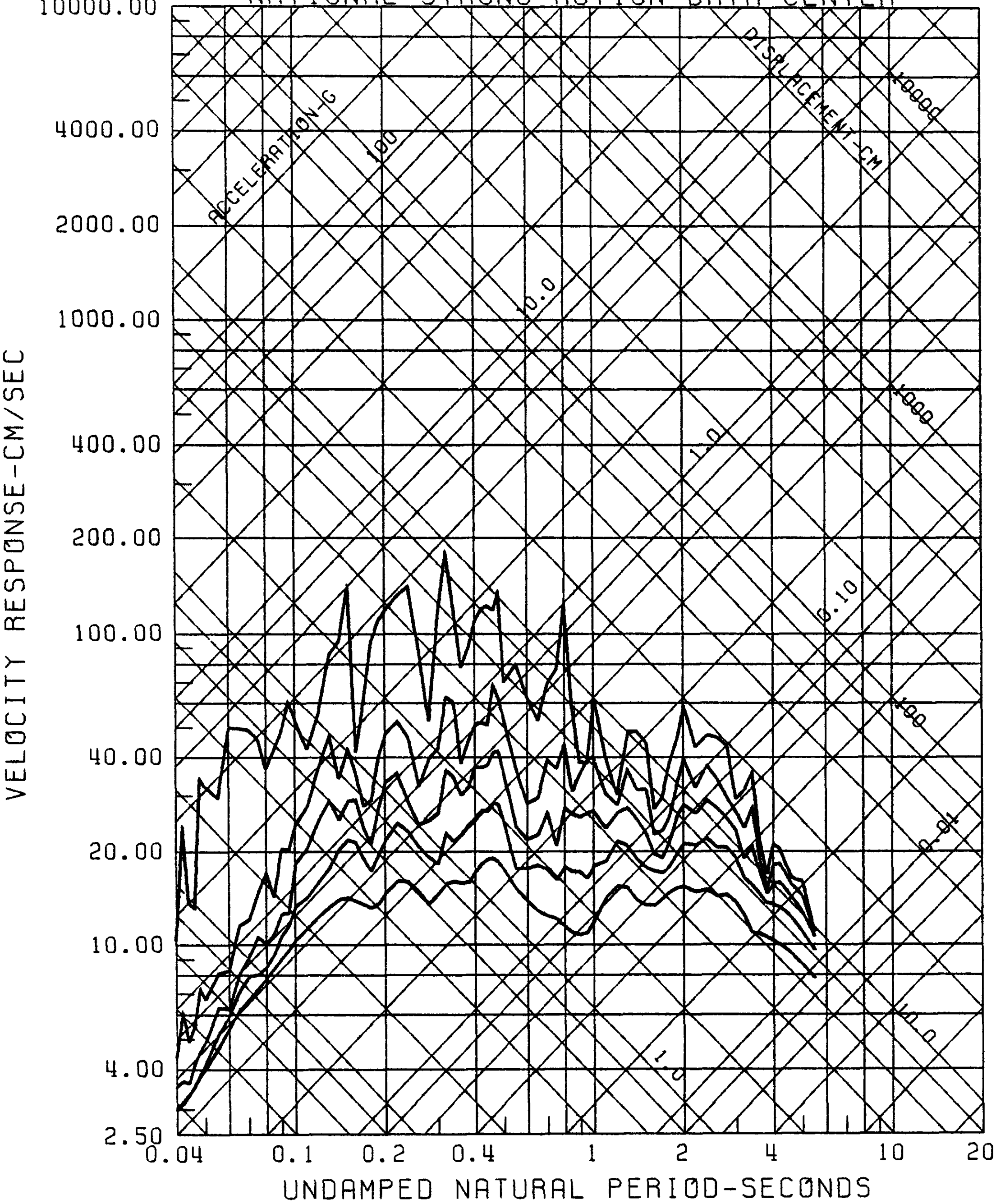

RESPONSE SPECTRA
LLAYLLAY, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.1
0.01
1000
100
10.0
1.0
0.1

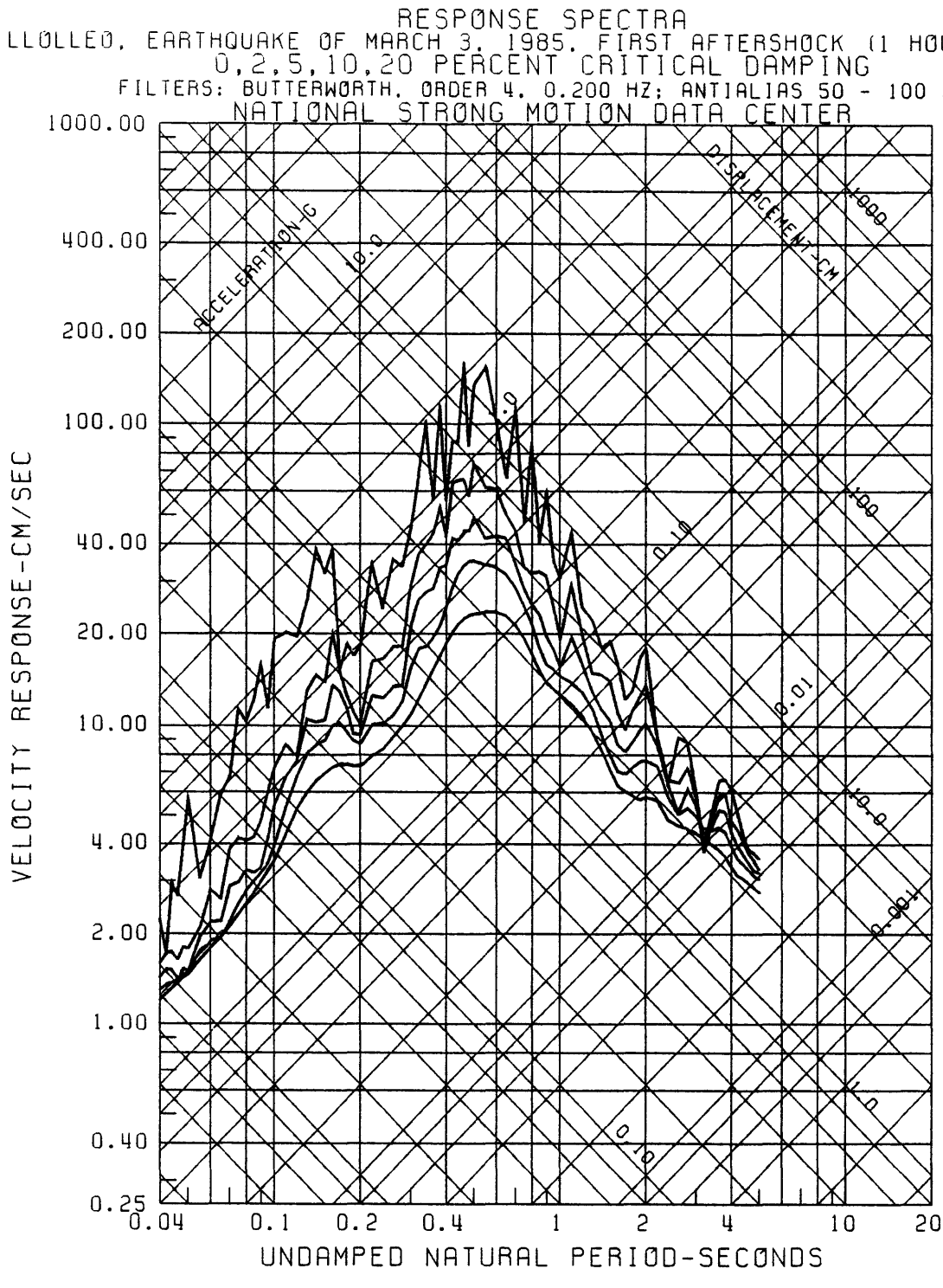

RESPONSE SPECTRA
LLAYLLAY, EARTHQUAKE OF MARCH 3, 1985, 190 DEGREE
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.00
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
0.01
1.0

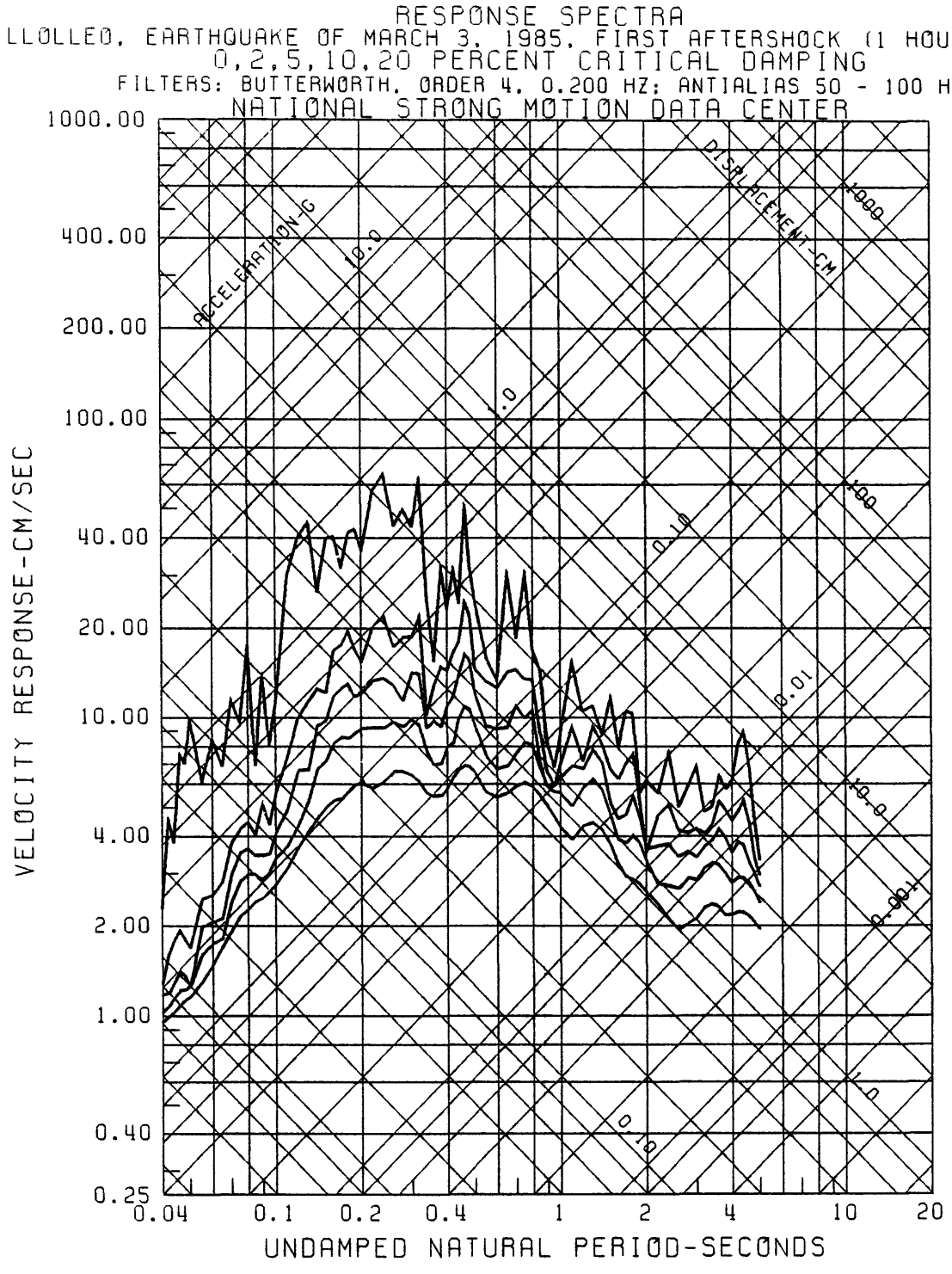

RESPONSE SPECTRA
SAN FELIPE, EARTHQUAKE OF MARCH 3, 1985, 170 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.01
0.001

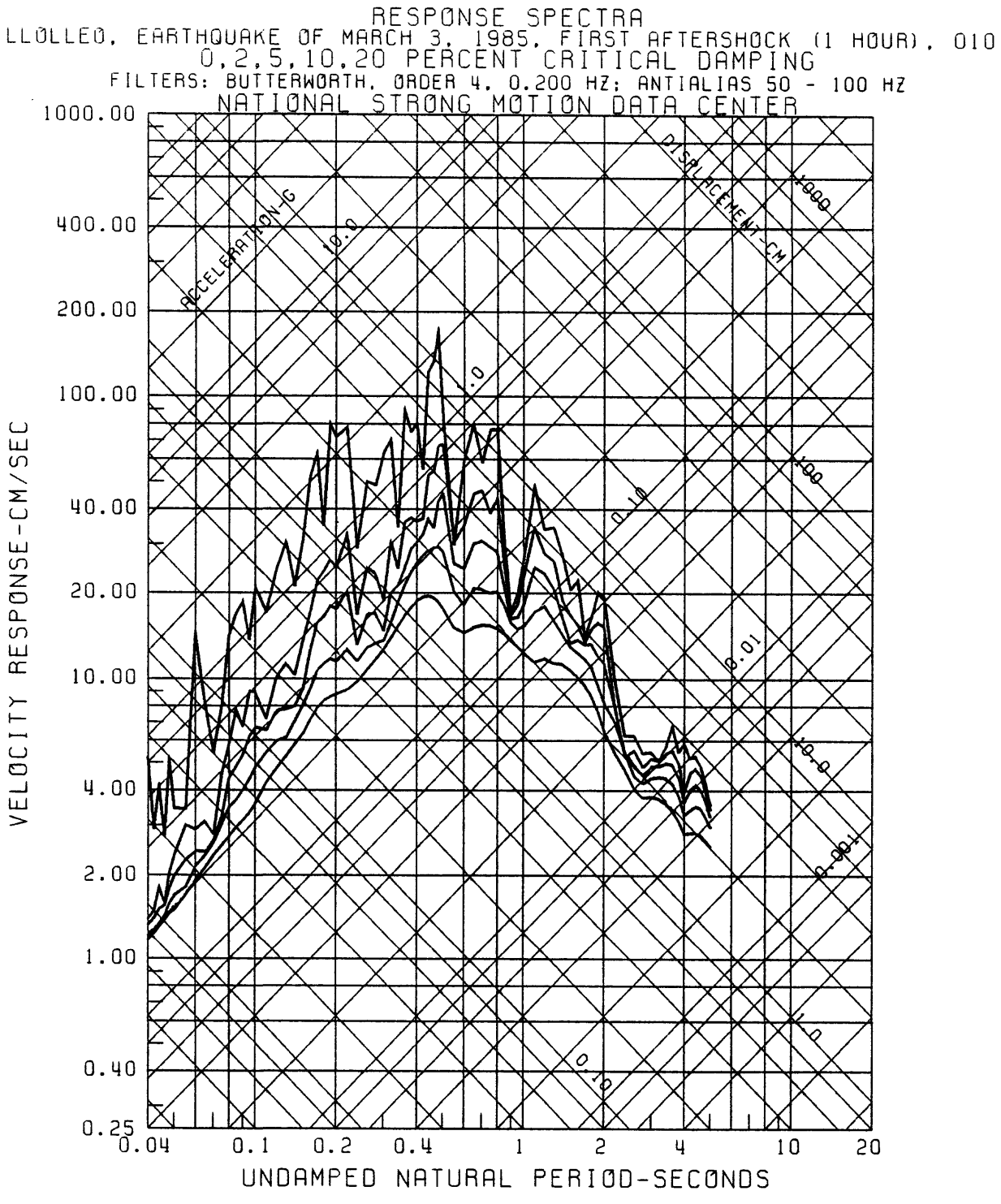

RESPONSE SPECTRA
SAN FELIPE, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.10
0.01
1000
100
10.0
1.0
0.01

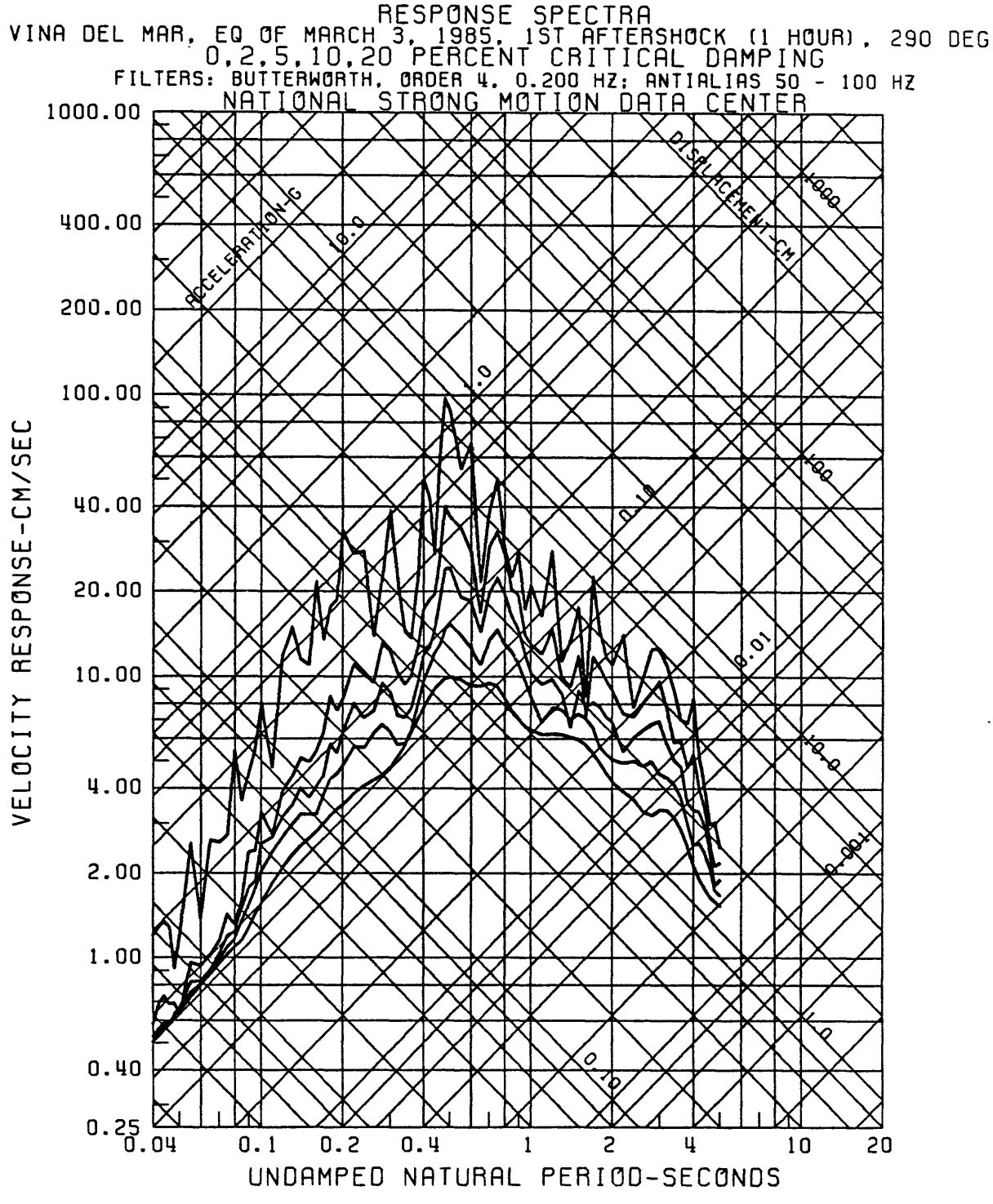
RESPONSE SPECTRA
SAN FELIPE, EARTHQUAKE OF MARCH 3, 1985, 80 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER

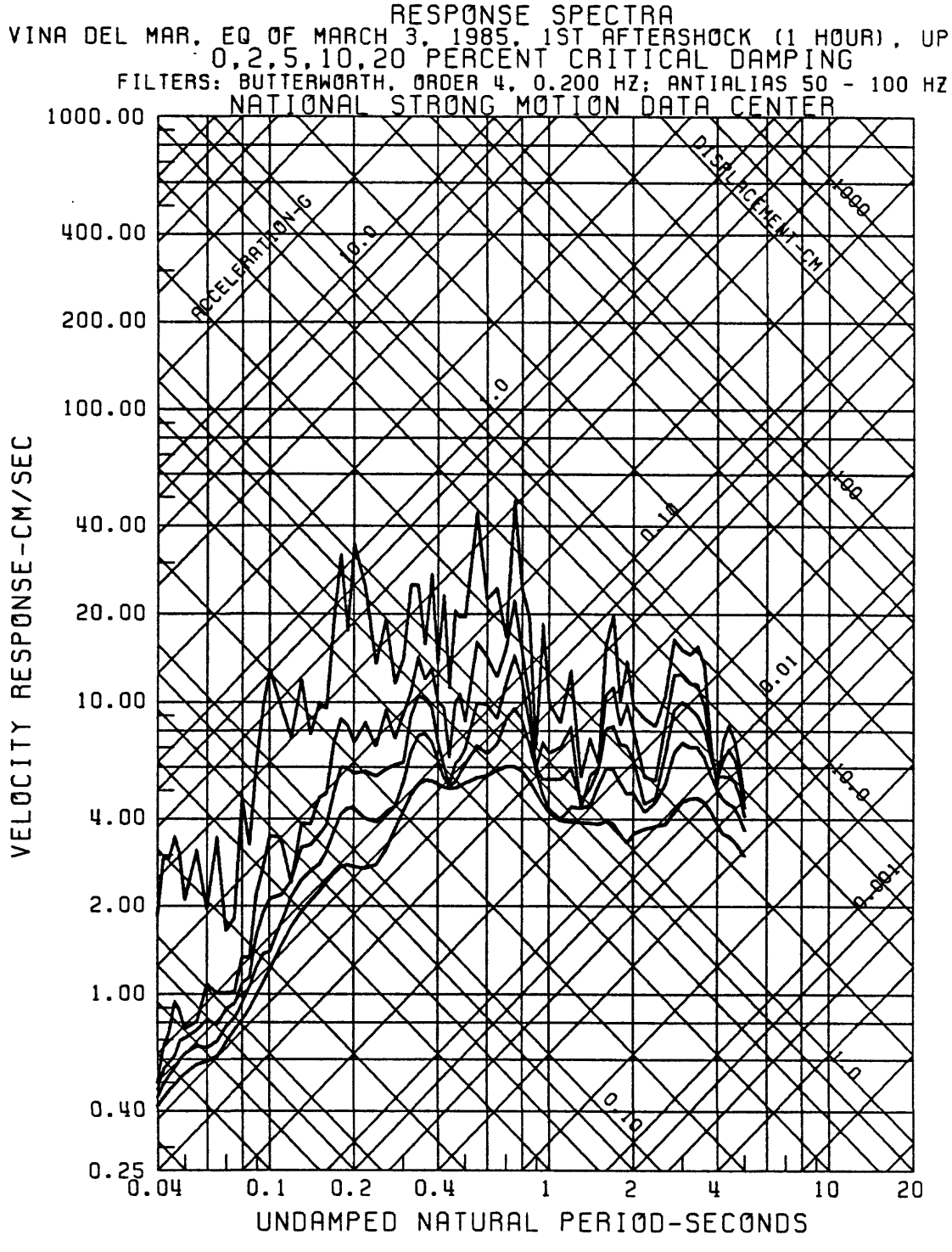


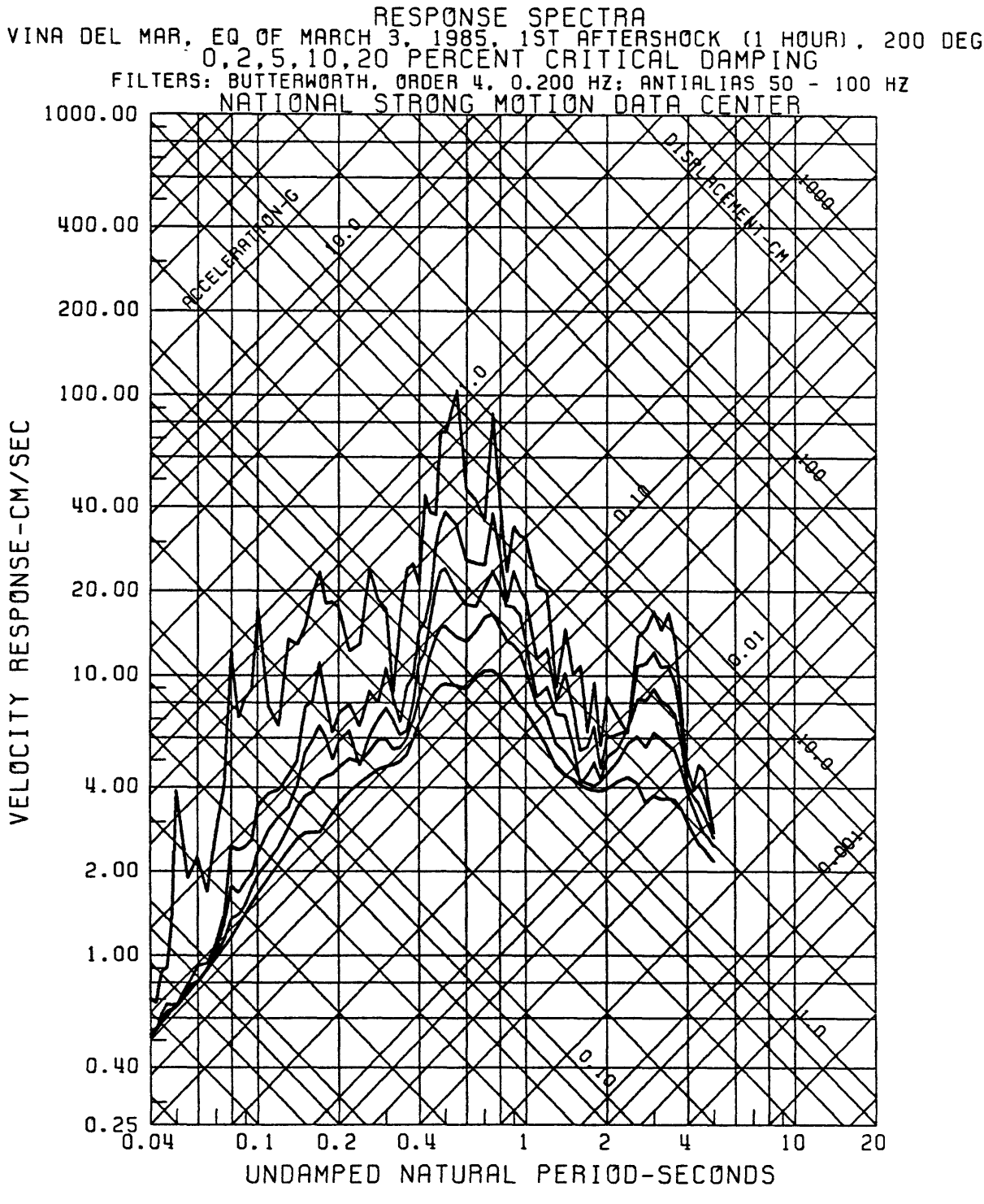

RESPONSE SPECTRA
LLOLLEO, EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR), 100
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10
0.01

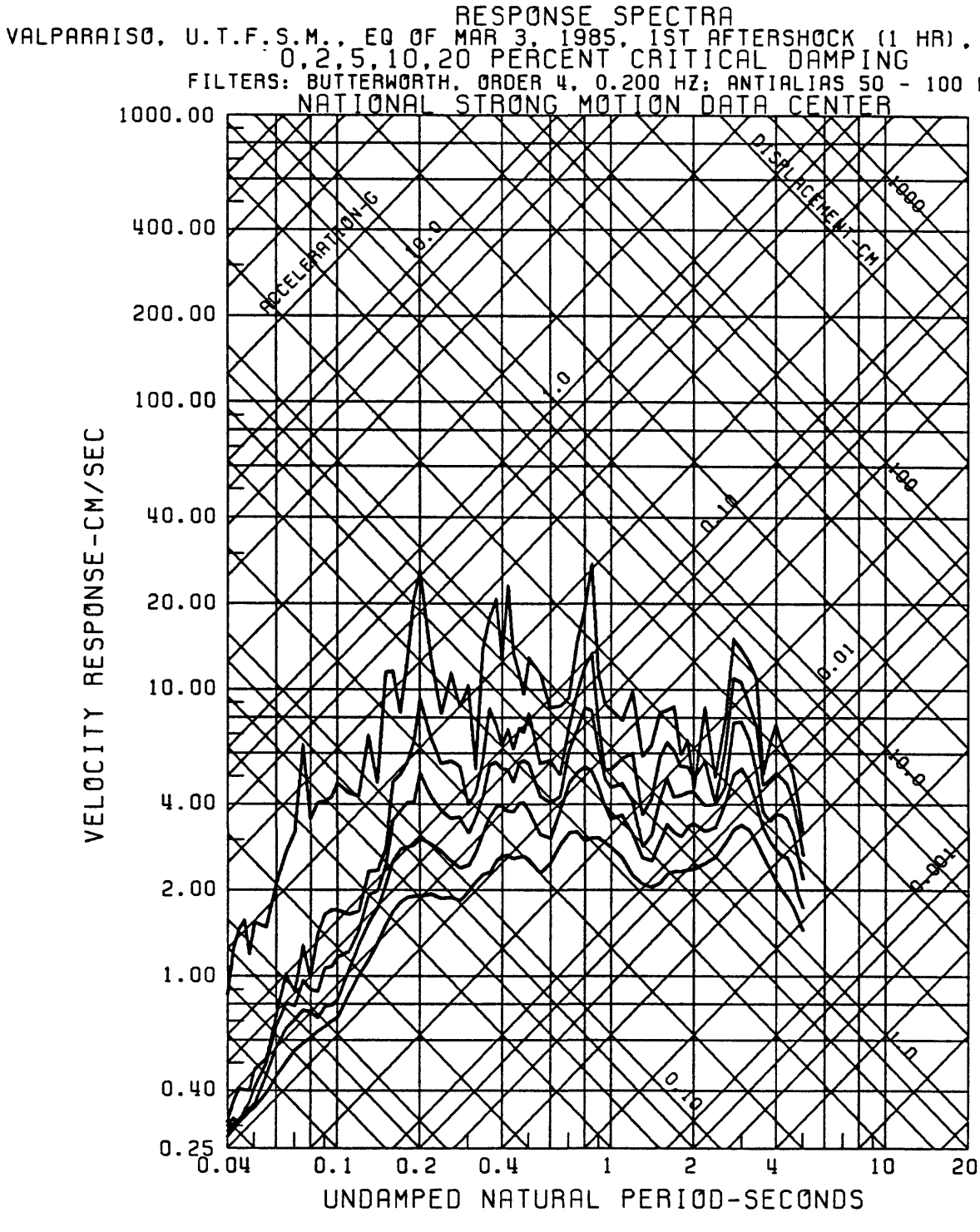

RESPONSE SPECTRA
LLOLLEO, EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR), UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
ACCELERATION-G
10.0
1.0
0.1
0.01
0.10
DISPLACEMENT-CM
1000
100
10.0
1.0
0.001

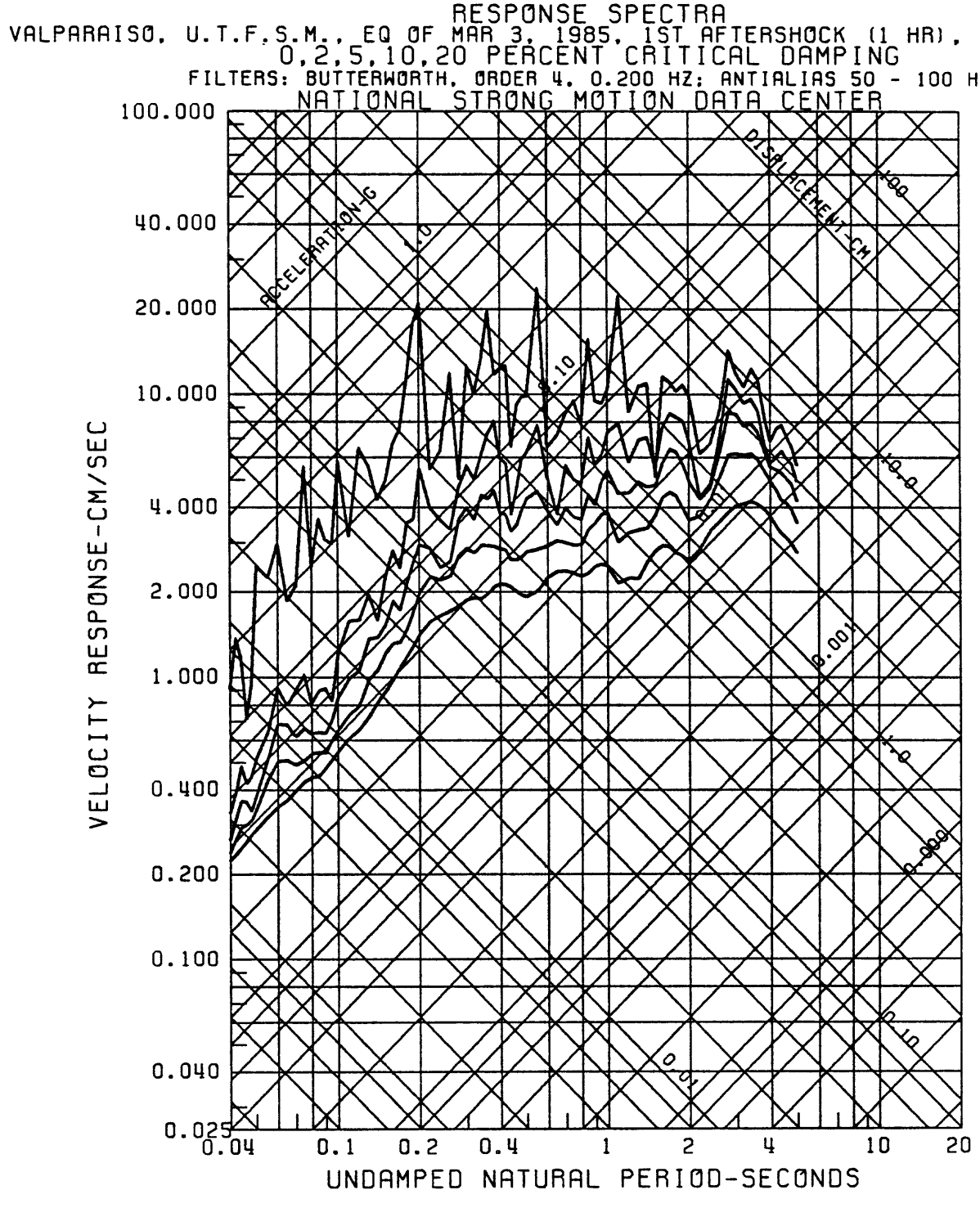

RESPONSE SPECTRA
LLOLLEO, EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR), 010
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.10
0.01
1000
100
10.0
1.0
0.10
0.01

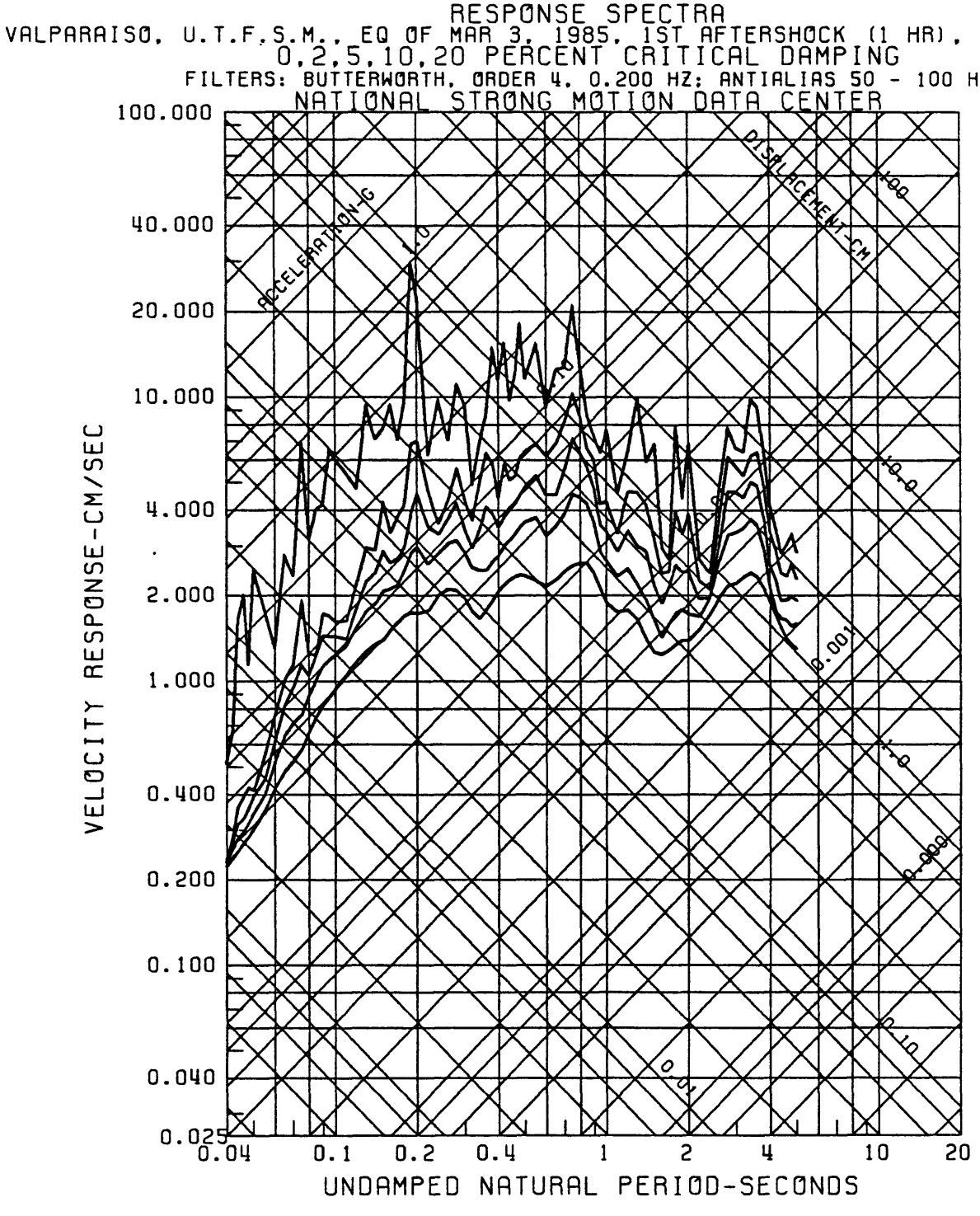

RESPONSE SPECTRA
VINA DEL MAR, EQ OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR), 290 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
ACCELERATION-G
10.0
1.0
0.1
0.01
0.001
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10

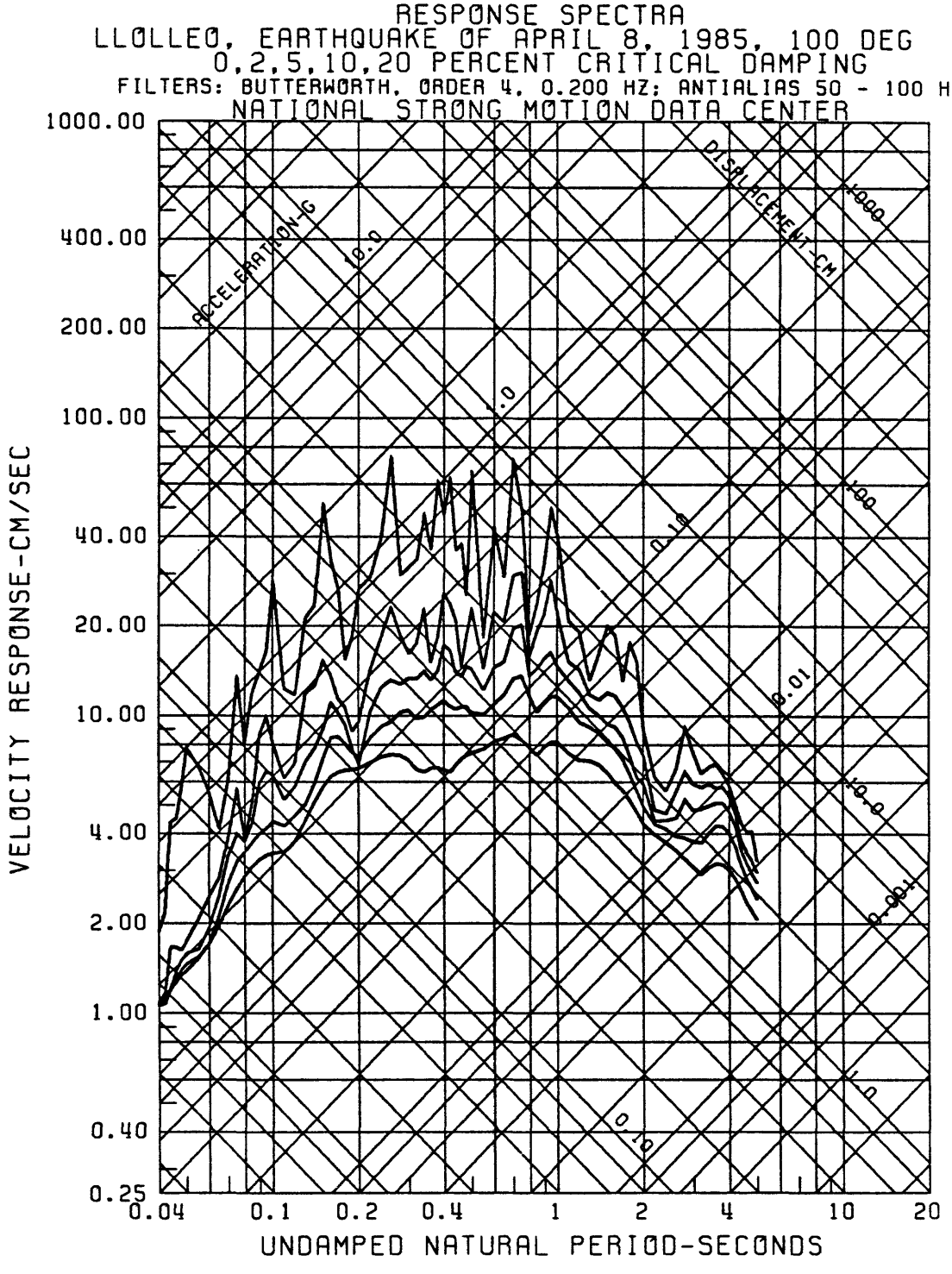

RESPONSE SPECTRA
VINA DEL MAR, EQ OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR), UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.10
0.01
1000
100
10.0
1.0
0.01
0.10

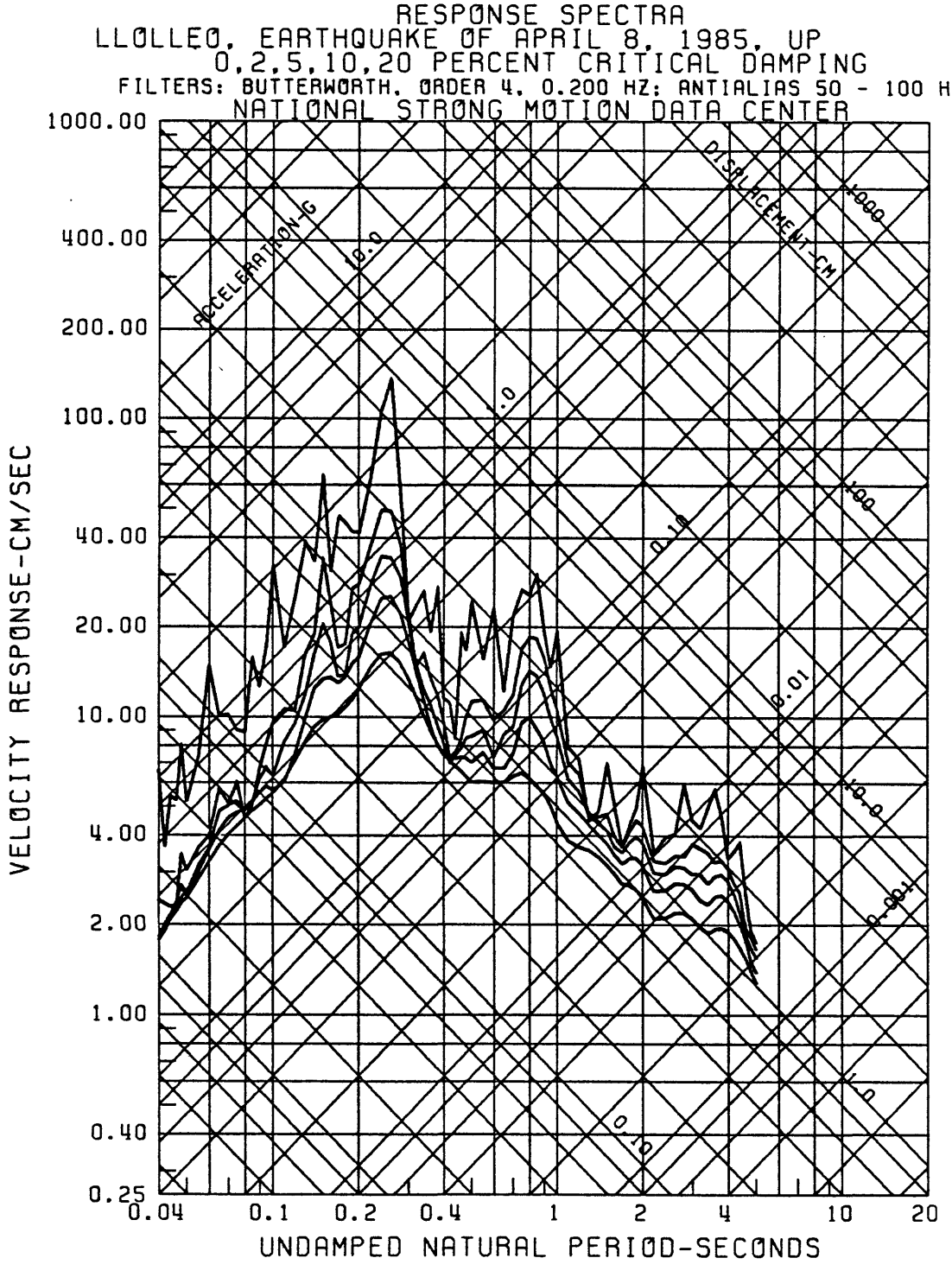

RESPONSE SPECTRA
VINA DEL MAR, EQ OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR), 200 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
10.0
1.0
0.10
0.01
0.001
1000
100
10.0
1.0
0.10
0.01
0.001

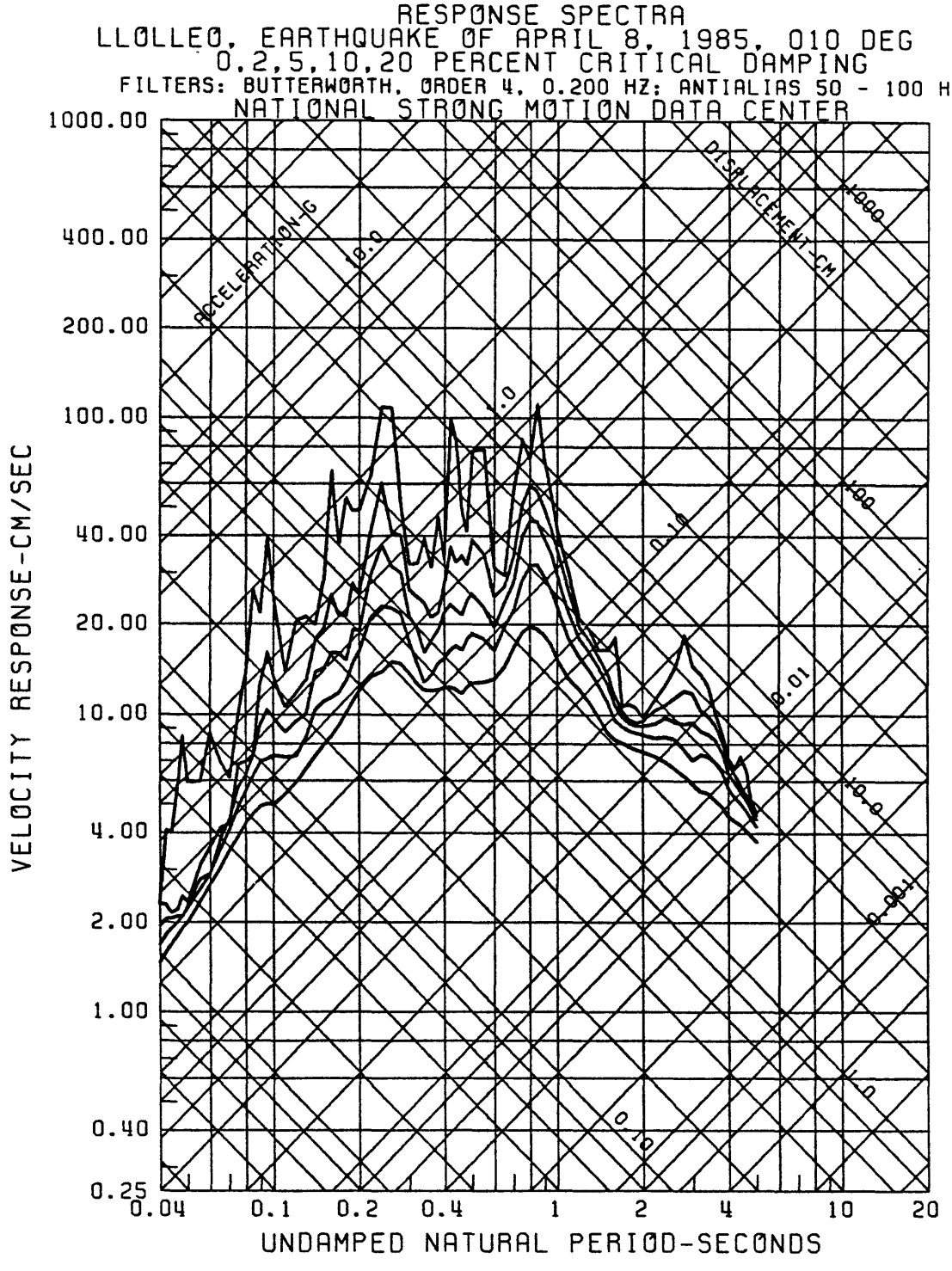

RESPONSE SPECTRA
VALPARAISO, U.T.F.S.M., EQ OF MAR 3, 1985, 1ST AFTERSHOCK (1 HR), 160 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
ACCELERATION-G
10.0
1.0
0.1
0.01
0.001
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
VELOCITY RESPONSE-CM/SEC
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS

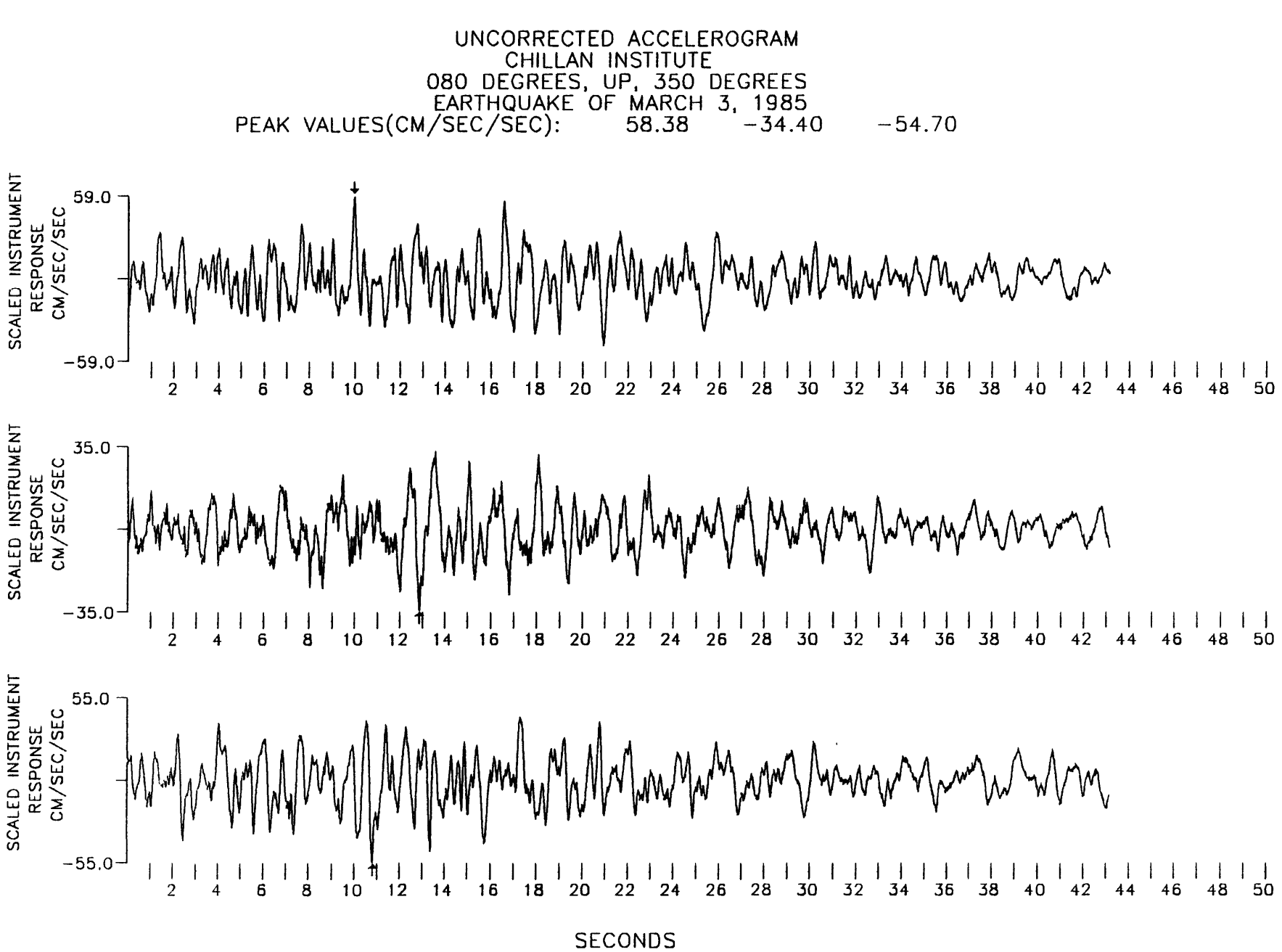

RESPONSE SPECTRA
VALPARAISO, U.T.F.S.M., EQ OF MAR 3, 1985, 1ST AFTERSHOCK (1 HR), UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
100.000
40.000
20.000
10.000
4.000
2.000
1.000
0.400
0.200
0.100
0.040
0.025
0.04
0.1
0.2
0.4
1
2
4
10
20
1.0
0.10
0.01
0.001
100
10.0
1.0
0.100
0.010


RESPONSE SPECTRA
VALPARAISO, U.T.F.S.M., EQ OF MAR 3, 1985, 1ST AFTERSHOCK (1 HR), 070 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
100.000
40.000
20.000
10.000
4.000
2.000
1.000
0.400
0.200
0.100
0.040
0.025
0.04
0.1
0.2
0.4
1
2
4
10
20

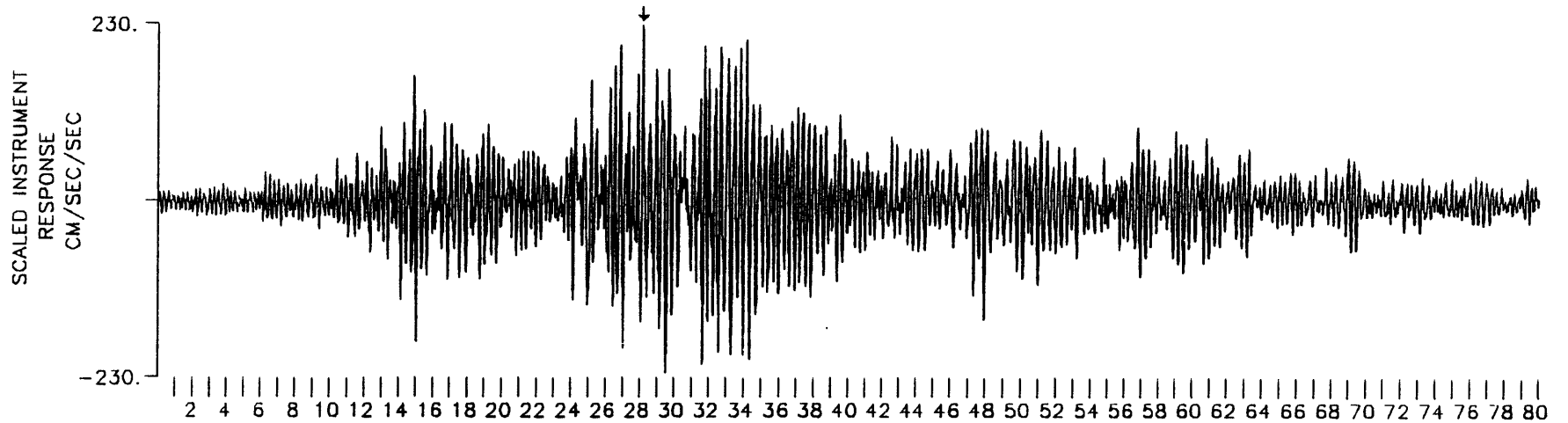

RESPONSE SPECTRA
LLOLLEO, EARTHQUAKE OF APRIL 8, 1985, 100 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.1
0.01
0.001
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10

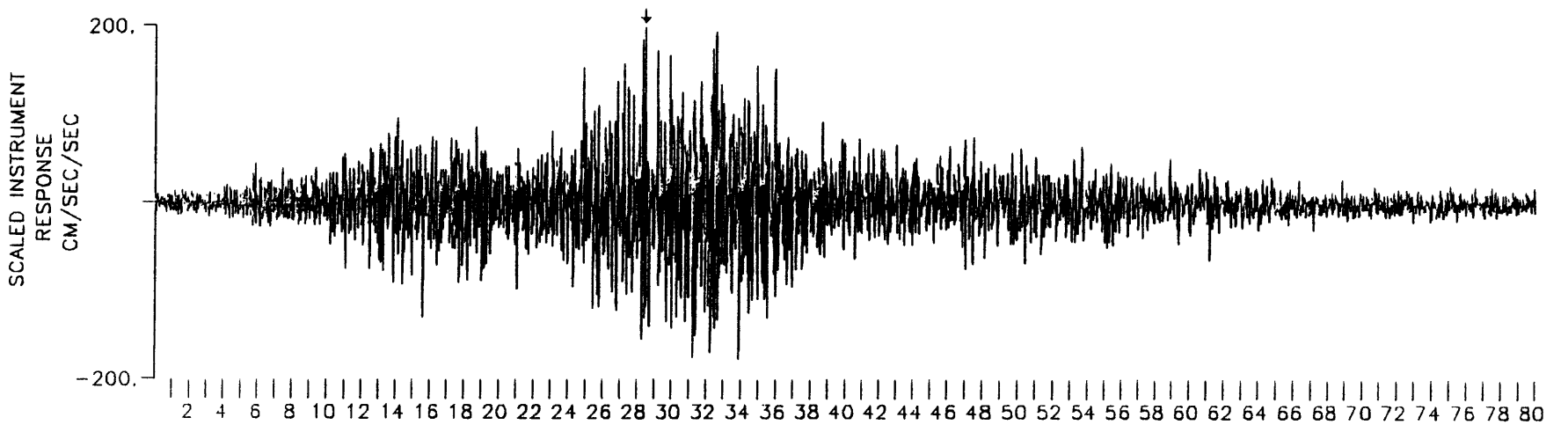

RESPONSE SPECTRA
LLOLLEO, EARTHQUAKE OF APRIL 8, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
DISPLACEMENT-CM
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20


RESPONSE SPECTRA
LLOLLEO, EARTHQUAKE OF APRIL 8, 1985, 010 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
VELOCITY RESPONSE-CM/SEC
1000.00
400.00
200.00
100.00
40.00
20.00
10.00
4.00
2.00
1.00
0.40
0.25
0.04
0.1
0.2
0.4
1
2
4
10
20
UNDAMPED NATURAL PERIOD-SECONDS
ACCELERATION-G
10.0
1.0
0.10
0.01
DISPLACEMENT-CM
1000
100
10.0
1.0
0.10

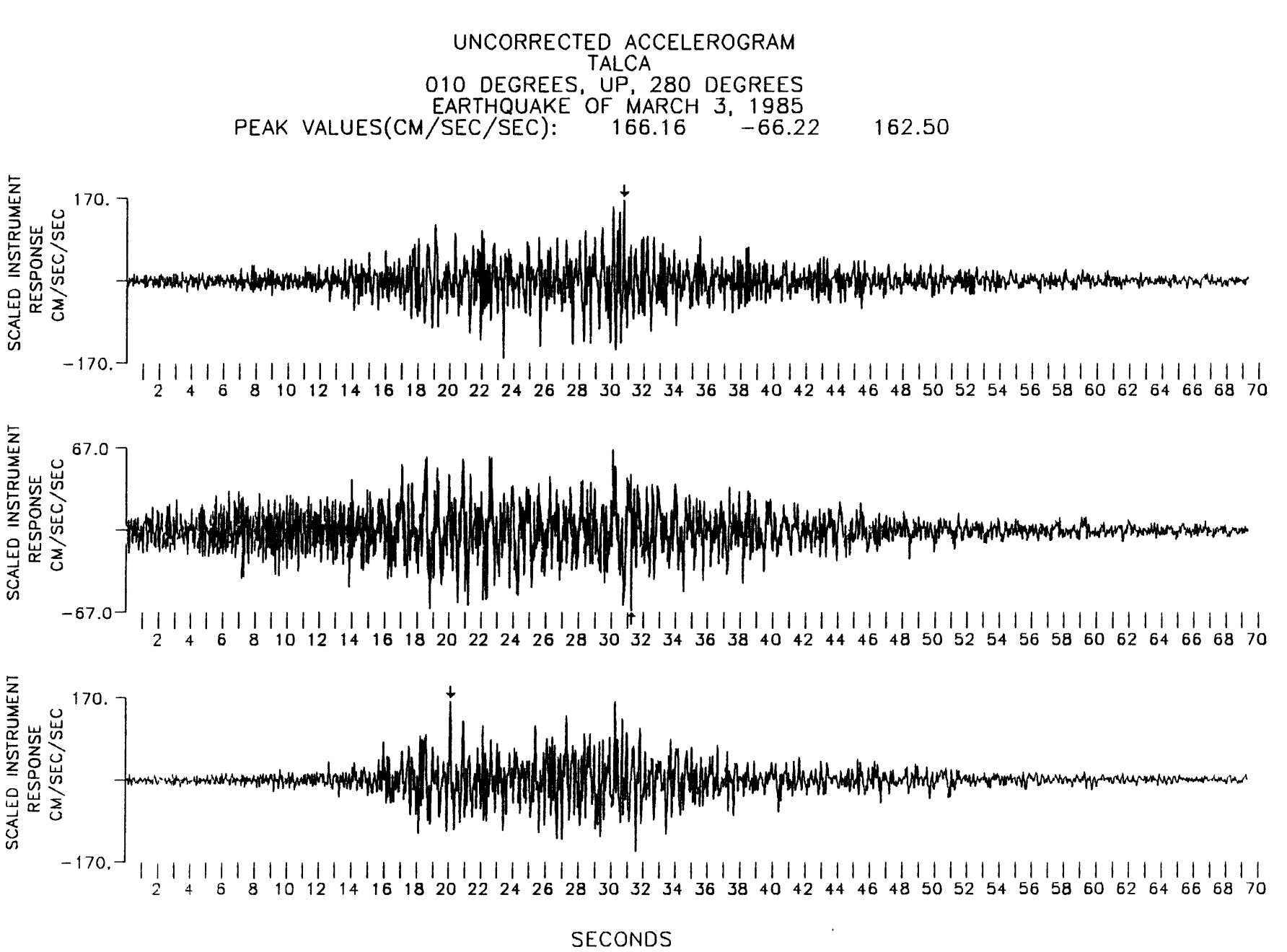

UNCORRECTED ACCELEROGRAM
CHILLAN INSTITUTE
080 DEGREES, UP, 350 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 58.38 -34.40 -54.70
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
59.0
-59.0
35.0
-35.0
55.0
-55.0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
SECONDS

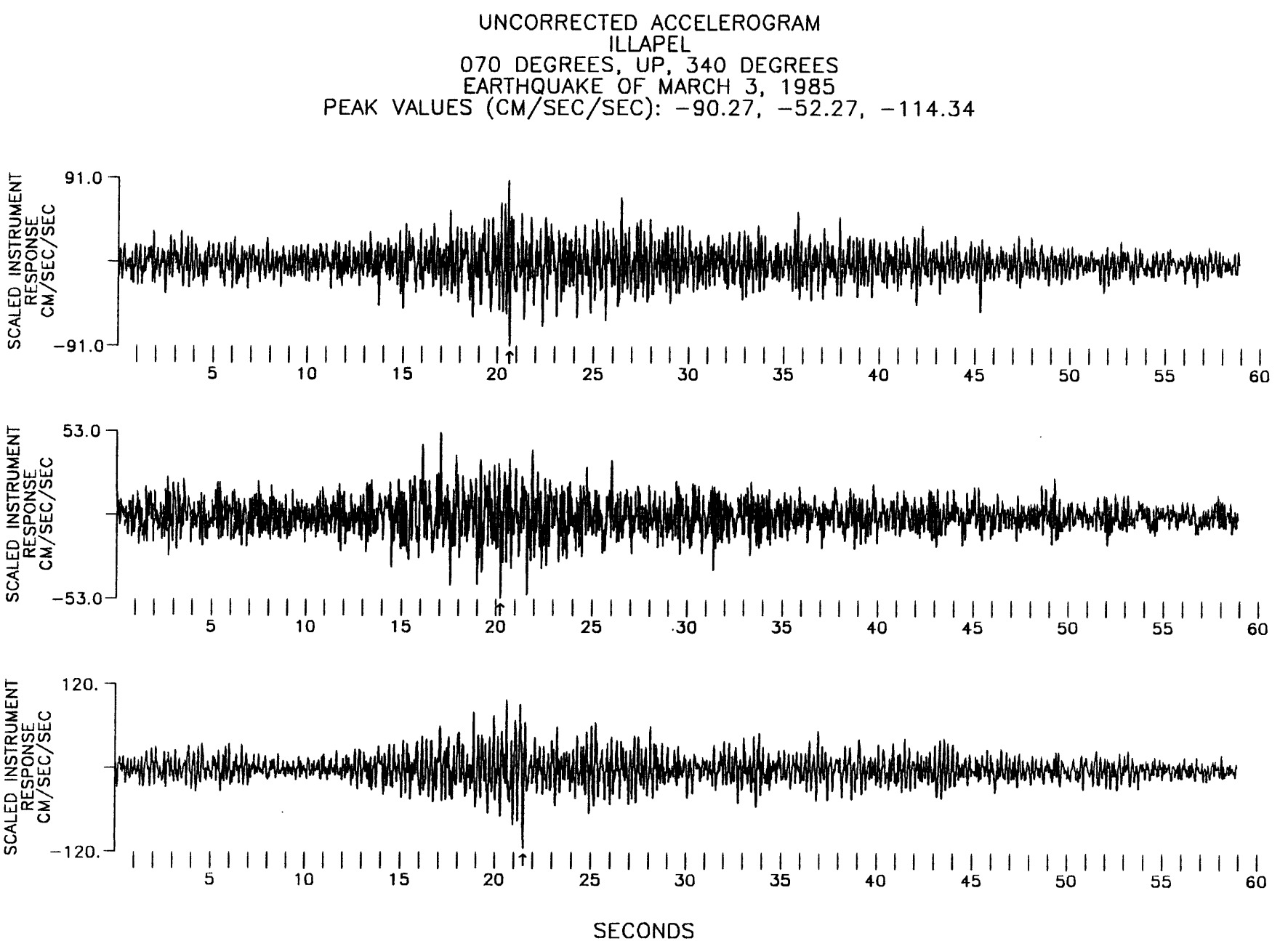
UNCORRECTED ACCELEROGRAM
PAPUDO
140 DEGREES, UP
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 228.28 198.09



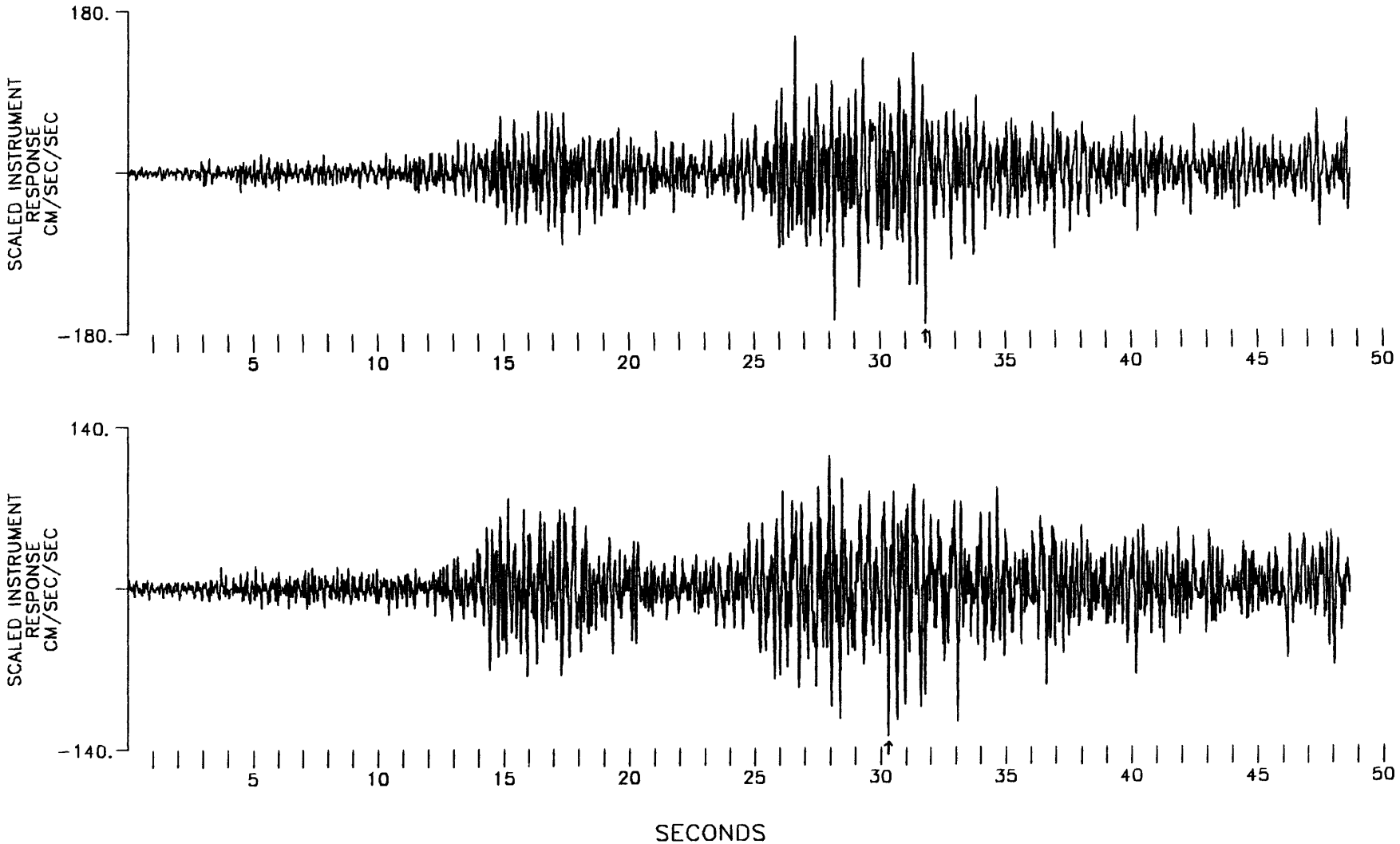


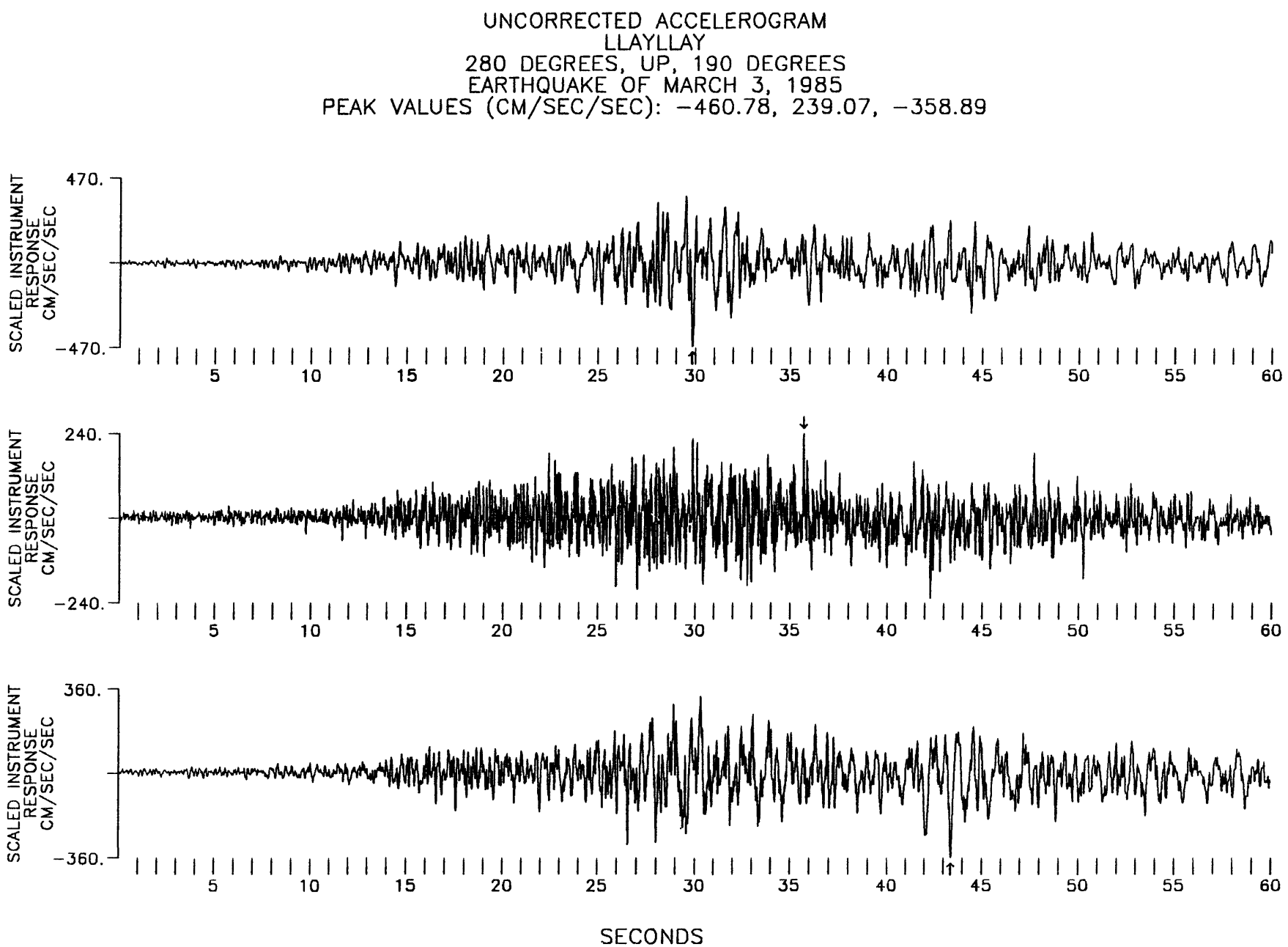
SECONDS


UNCORRECTED ACCELEROGRAM
TALCA
010 DEGREES, UP, 280 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES(CM/SEC/SEC): 166.16 -66.22 162.50
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
170.
-170.
67.0
-67.0
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 52 54 56 58 60 62 64 66 68 70
SECONDS

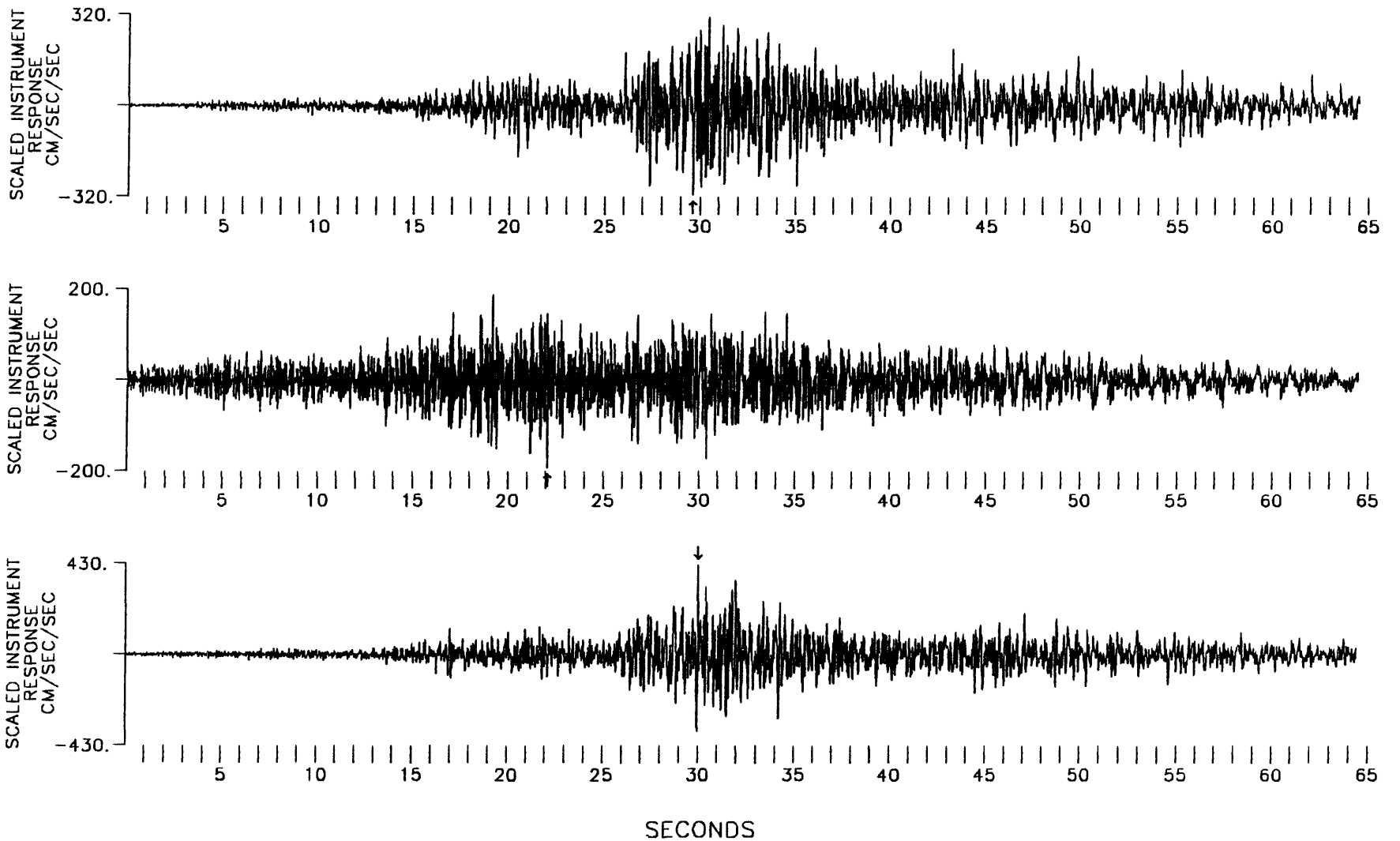

UNCORRECTED ACCELEROGRAM
ILLAPEL
070 DEGREES, UP, 340 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): −90.27, −52.27, −114.34
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
91.0
−91.0
53.0
−53.0
120.
−120.
5
10
15
20
25
30
35
40
45
50
55
60
SECONDS

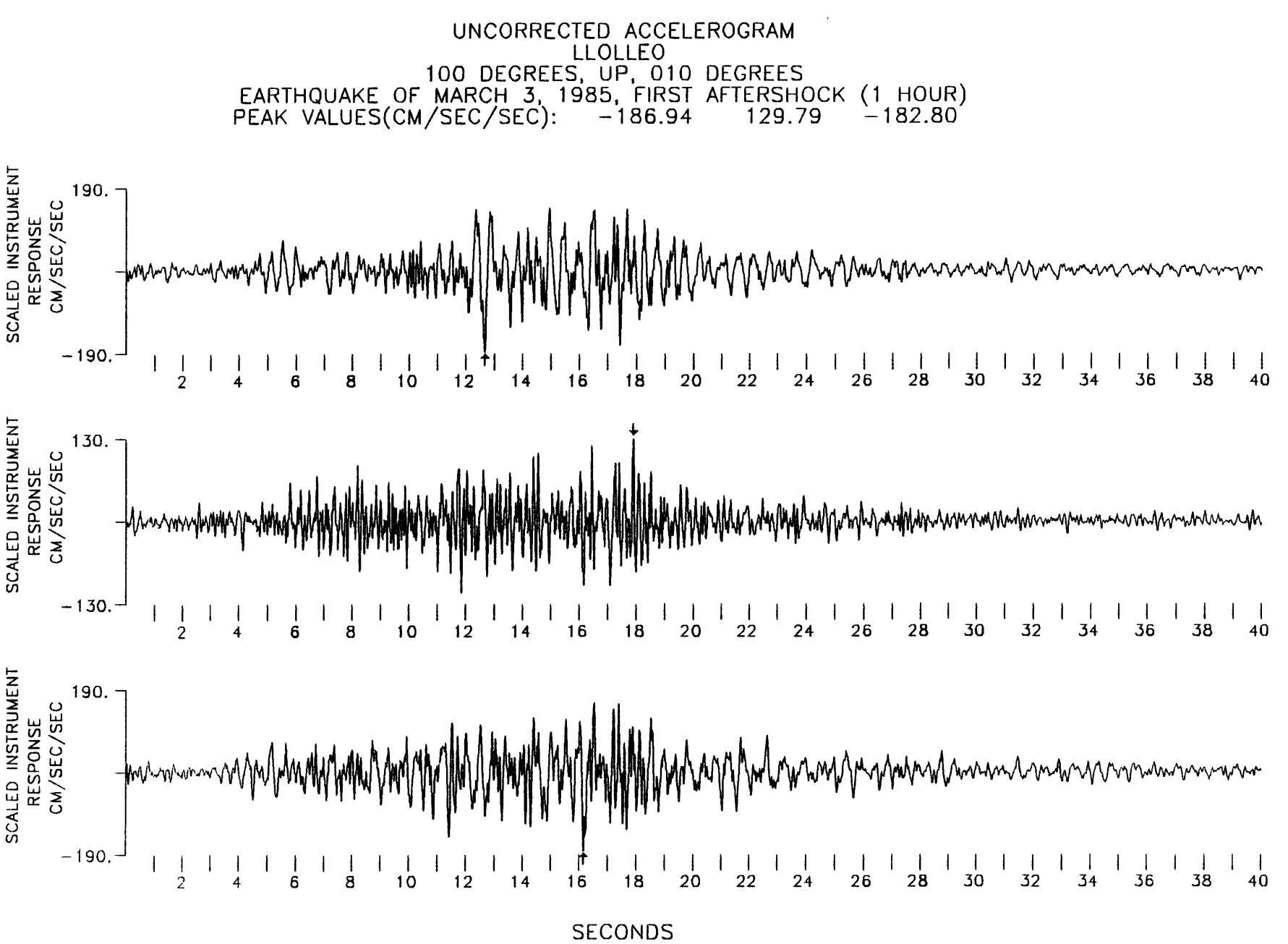
UNCORRECTED ACCELEROGRAM
LALIGUA
290 DEGREES, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): -172.32, -130.36

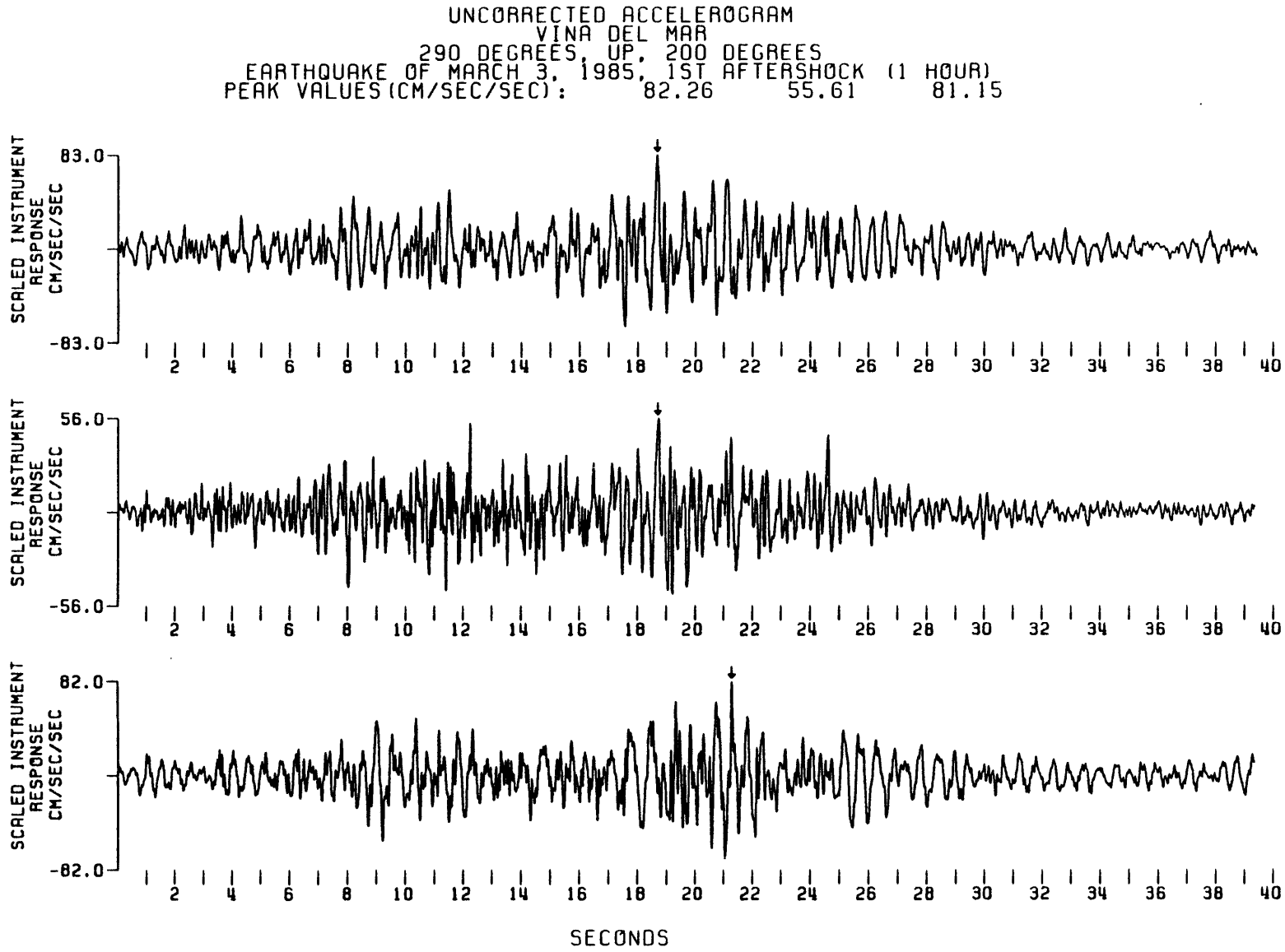


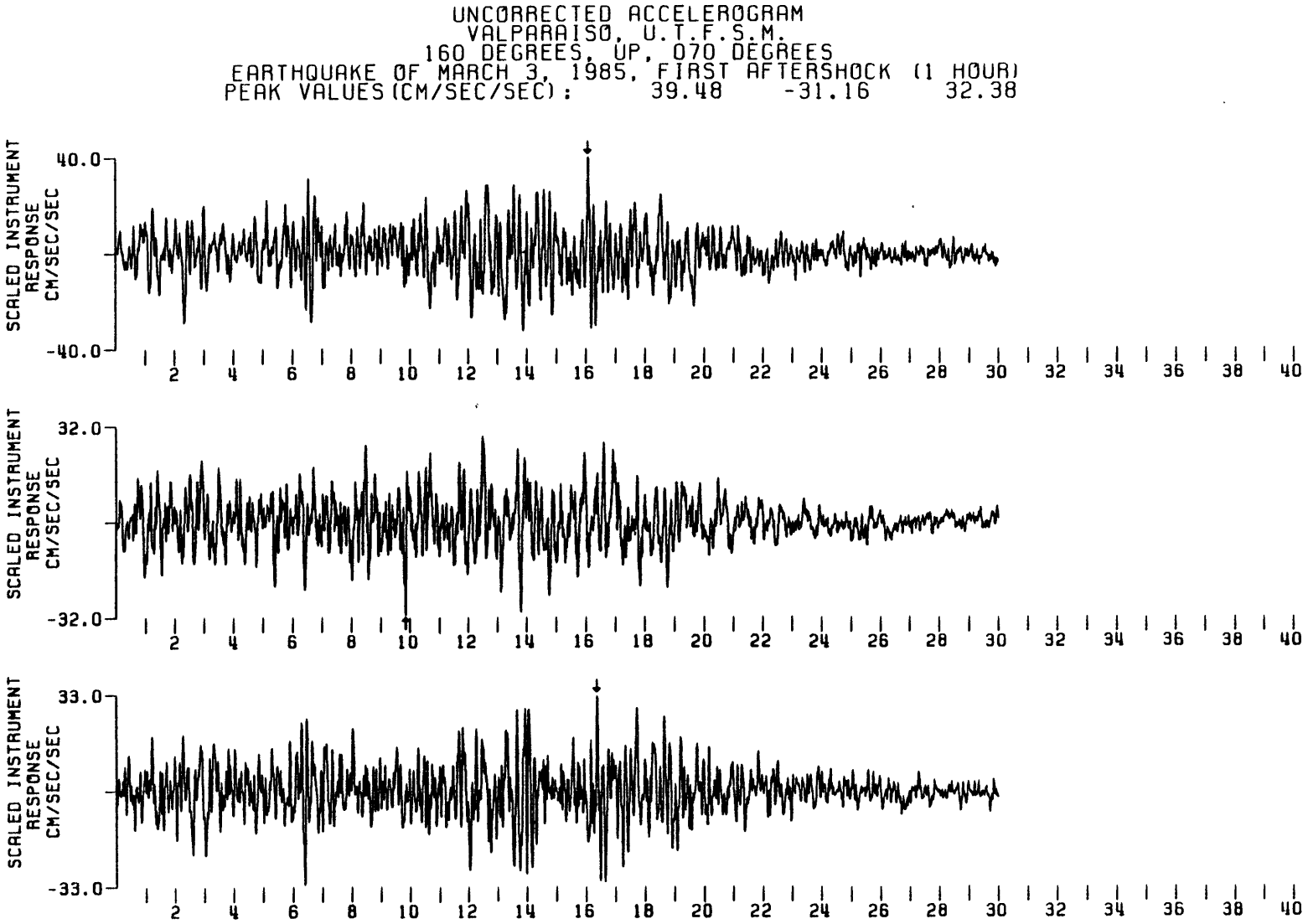

UNCORRECTED ACCELEROGRAM
LLAYLLAY
280 DEGREES, UP, 190 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): −460.78, 239.07, −358.89
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
470.
−470.
240.
−240.
360.
−360.
5
10
15
20
25
30
35
40
45
50
55
60
SECONDS

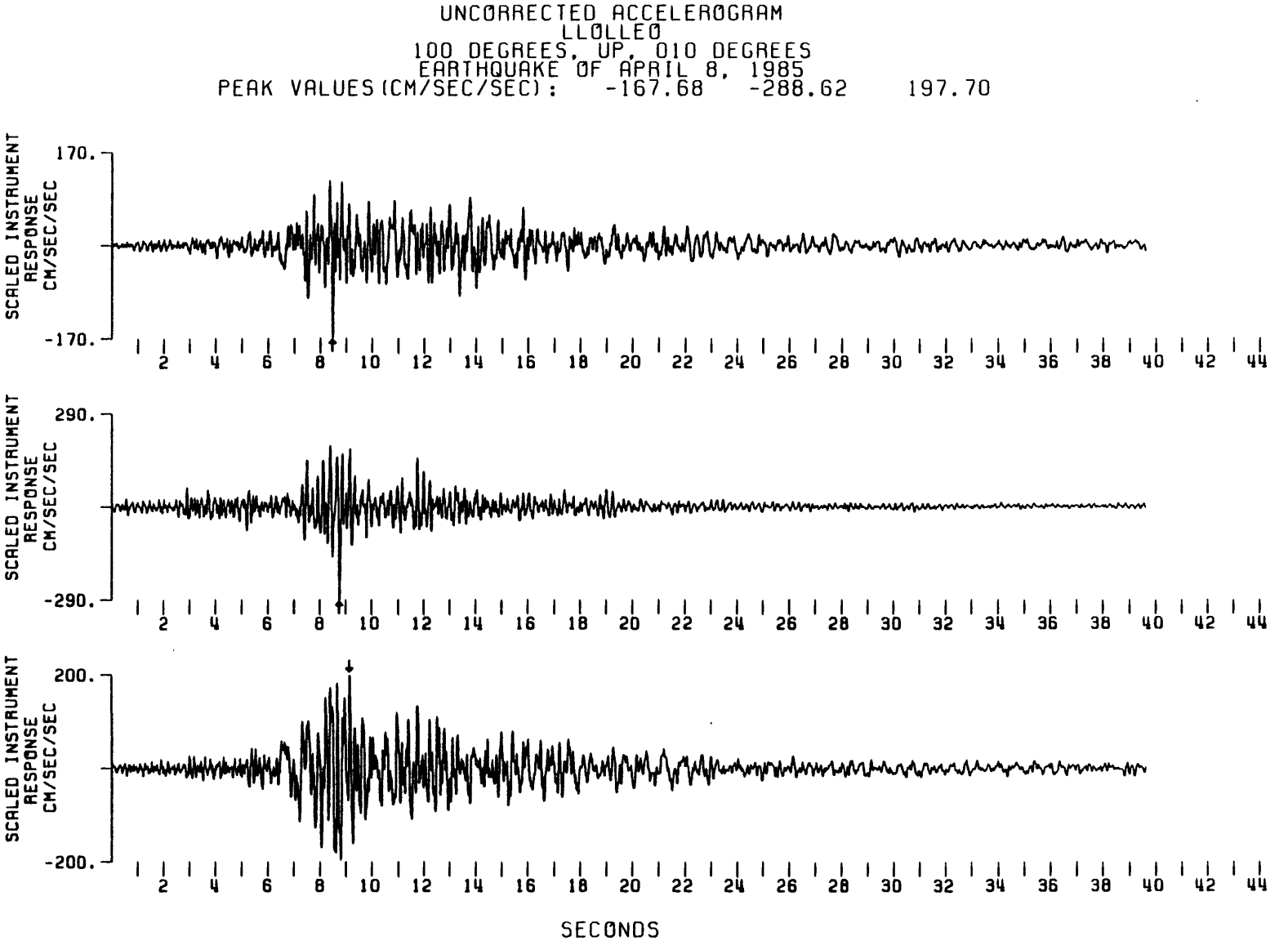
UNCORRECTED ACCELEROGRAM
SAN FELIPE
170 DEGREES, UP, 80 DEGREES
EARTHQUAKE OF MARCH 3, 1985
PEAK VALUES (CM/SEC/SEC): -314.08, -193.91, 422.06

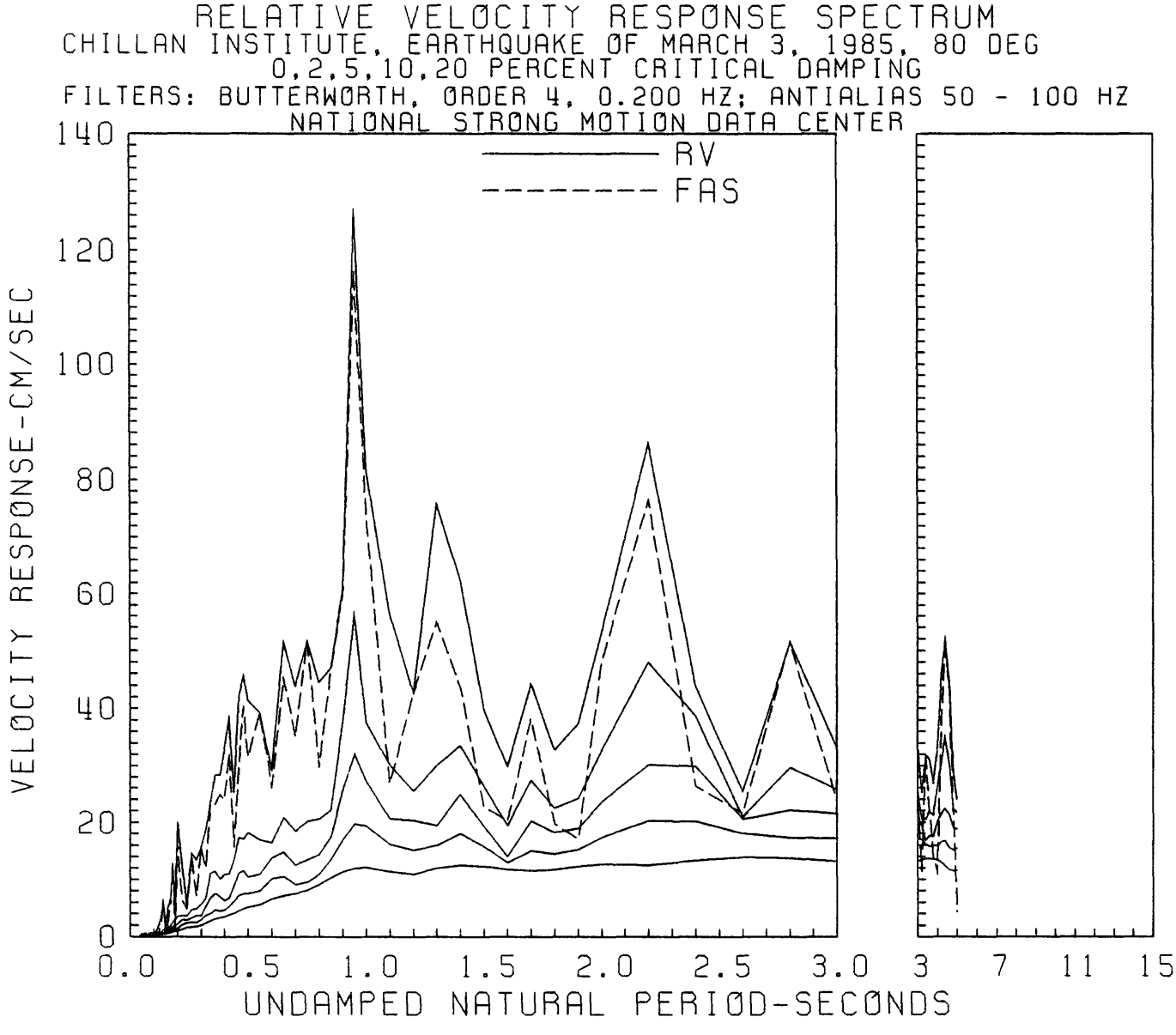


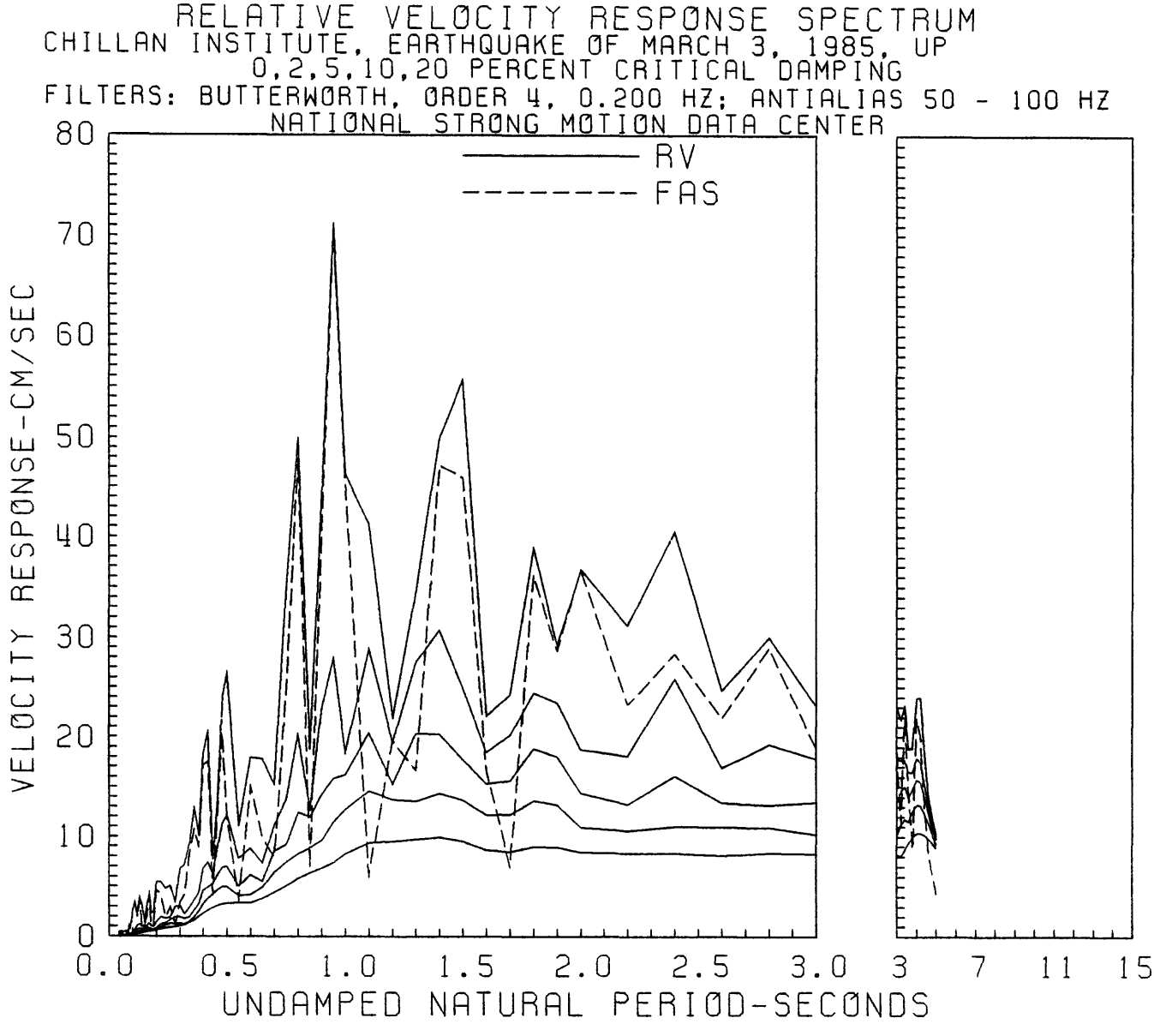

UNCORRECTED ACCELEROGRAM
LLOLLEO
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
PEAK VALUES(CM/SEC/SEC): -186.94 129.79 -182.80
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
190.
-190.
130.
-130.
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS

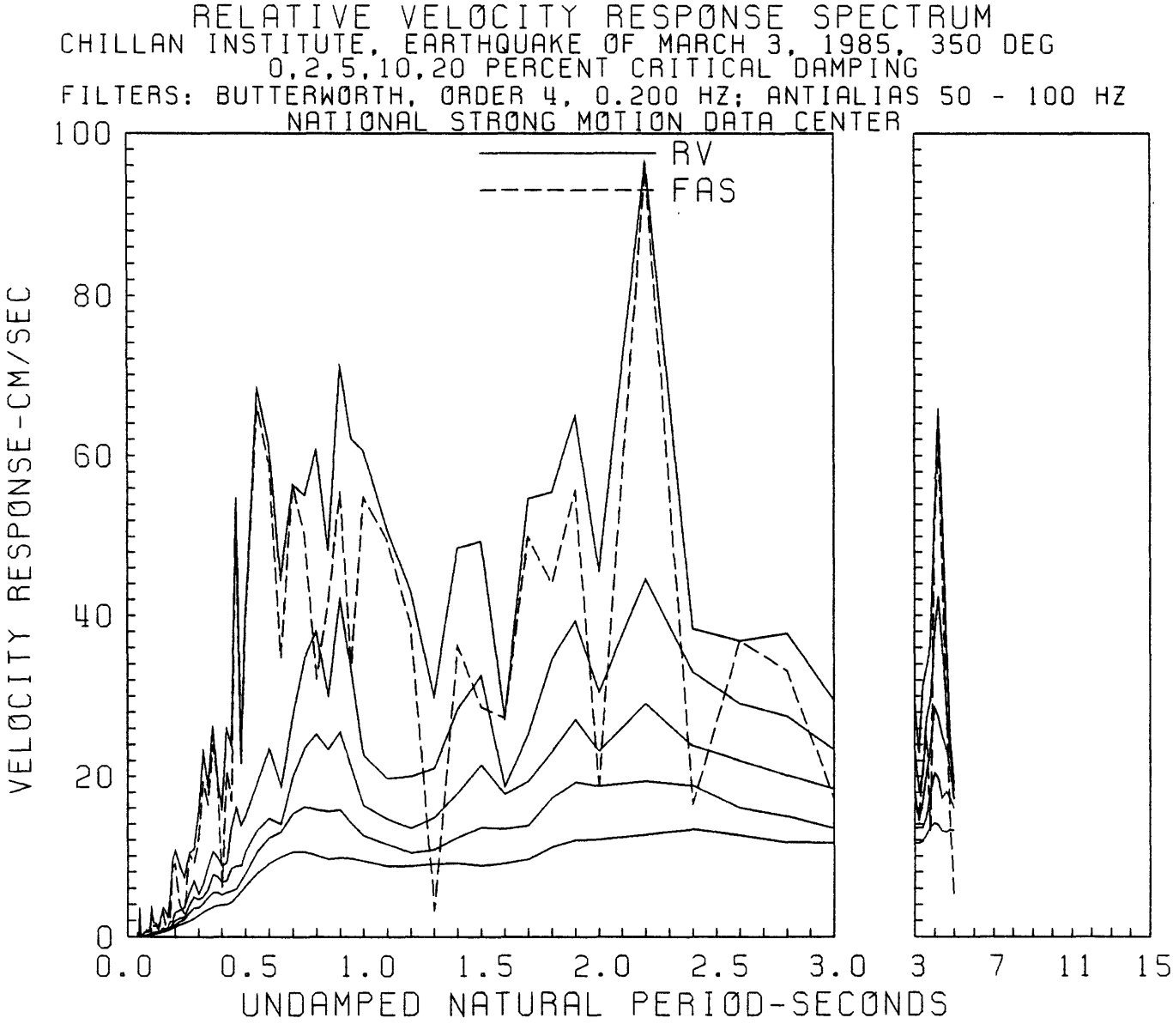

UNCORRECTED ACCELEROGRAM
VINA DEL MAR
290 DEGREES, UP, 200 DEGREES
EARTHQUAKE OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR)
PEAK VALUES(CM/SEC/SEC): 82.26 55.61 81.15
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
83.0
-83.0
56.0
-56.0
82.0
-82.0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS

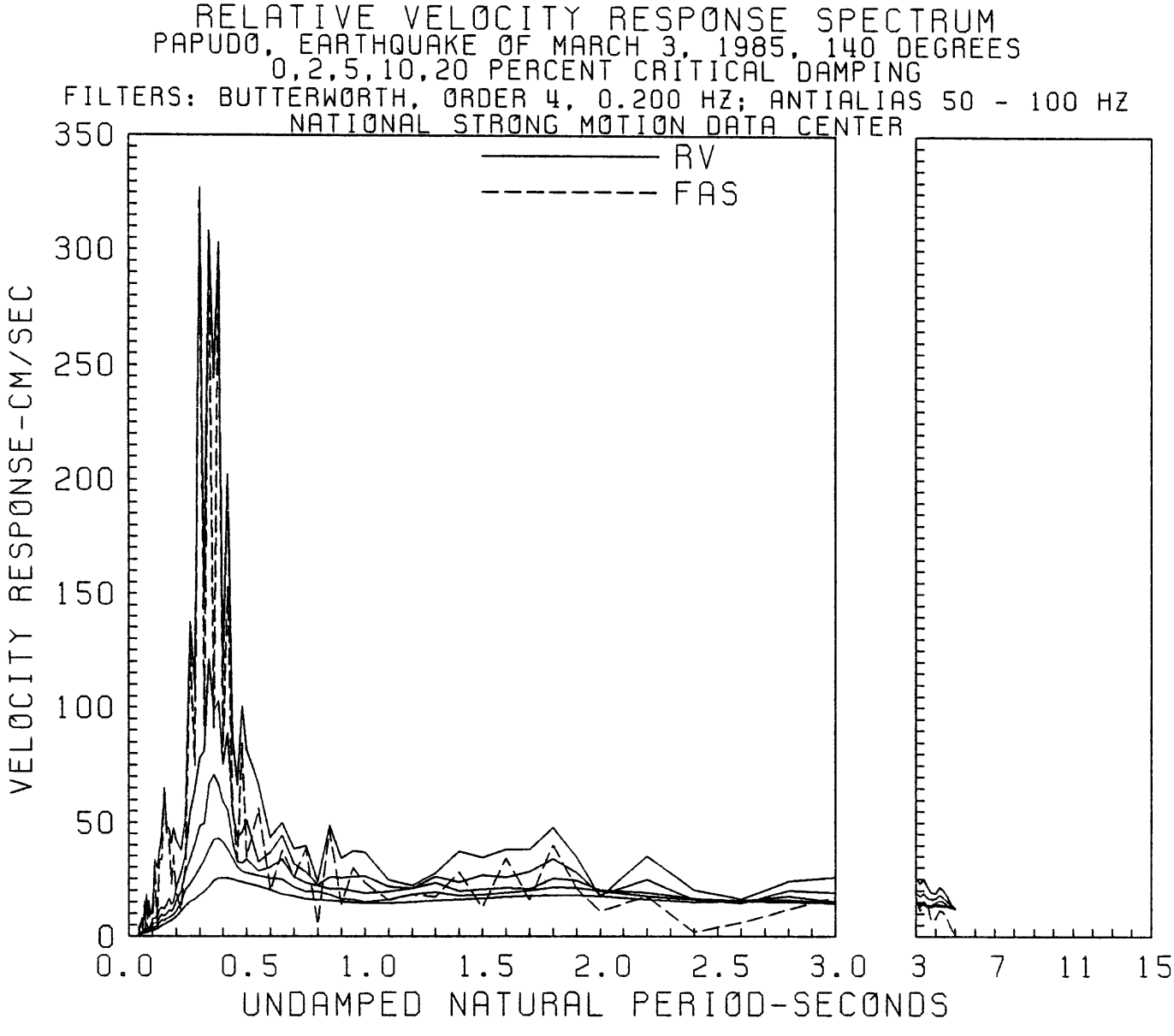

UNCORRECTED ACCELEROGRAM
VALPARAISO, U.T.F.S.M.
160 DEGREES, UP, 070 DEGREES
EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR)
PEAK VALUES (CM/SEC/SEC): 39.48 -31.16 32.38
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
40.0
-40.0
32.0
-32.0
33.0
-33.0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SECONDS

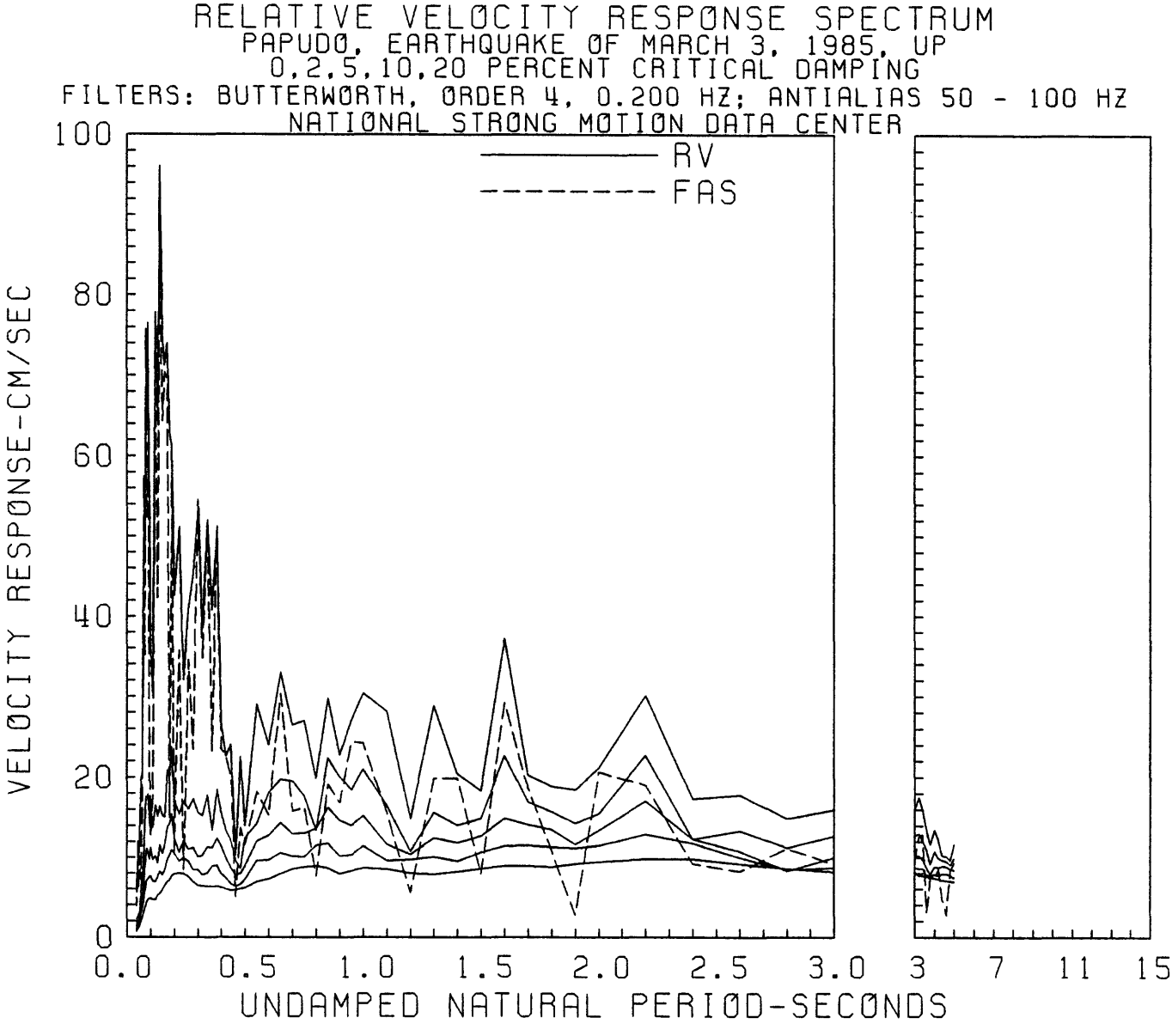

UNCORRECTED ACCELEROGRAM
LLOLLEO
100 DEGREES, UP, 010 DEGREES
EARTHQUAKE OF APRIL 8, 1985
PEAK VALUES(CM/SEC/SEC): -167.68 -288.62 197.70
SCALED INSTRUMENT RESPONSE CM/SEC/SEC
170.
-170.
290.
-290.
200.
-200.
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44
SECONDS


RELATIVE VELOCITY RESPONSE SPECTRUM
CHILLAN INSTITUTE, EARTHQUAKE OF MARCH 3, 1985, 80 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
120
140
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

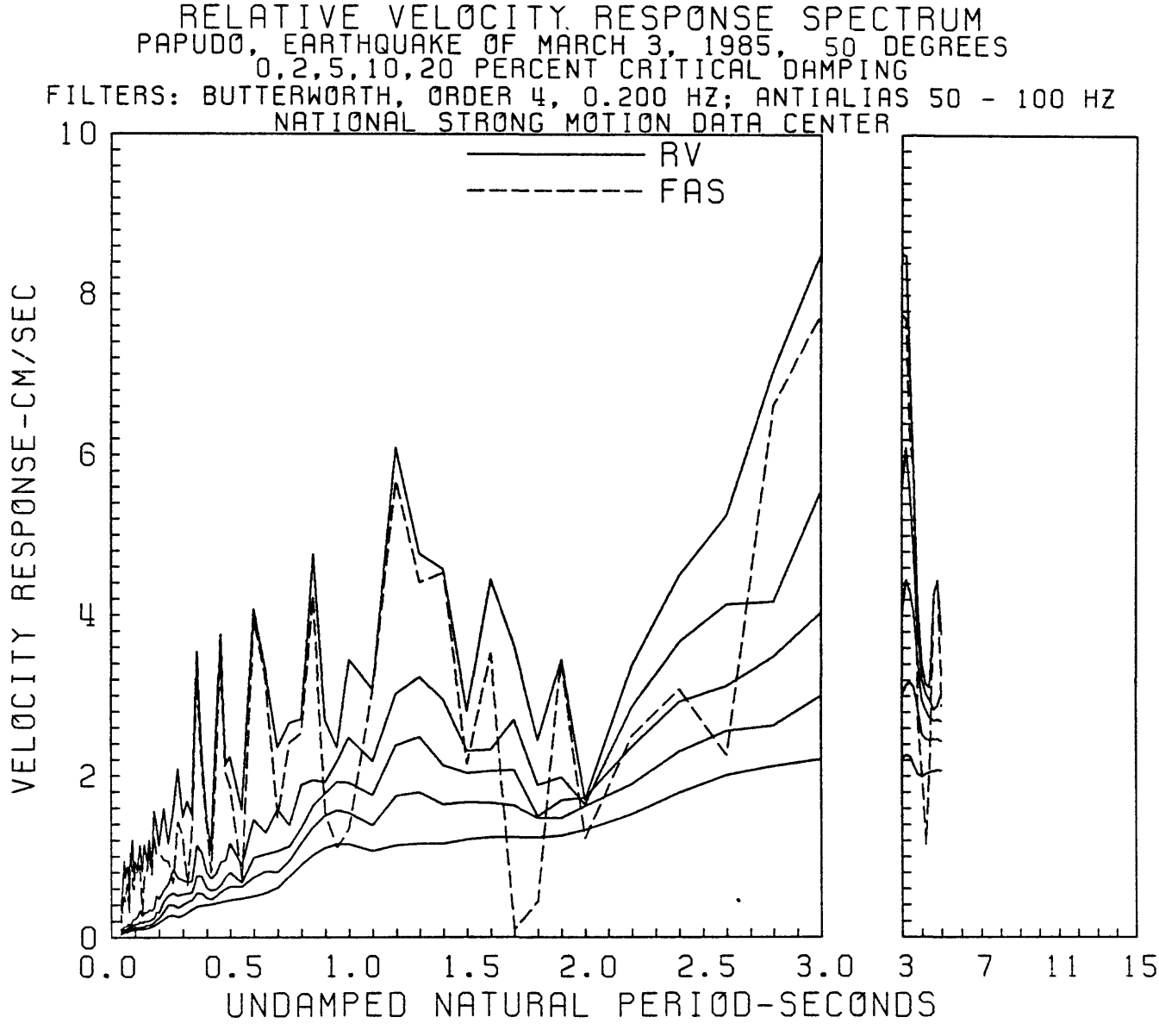

RELATIVE VELOCITY RESPONSE SPECTRUM
CHILLAN INSTITUTE, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
70
80
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

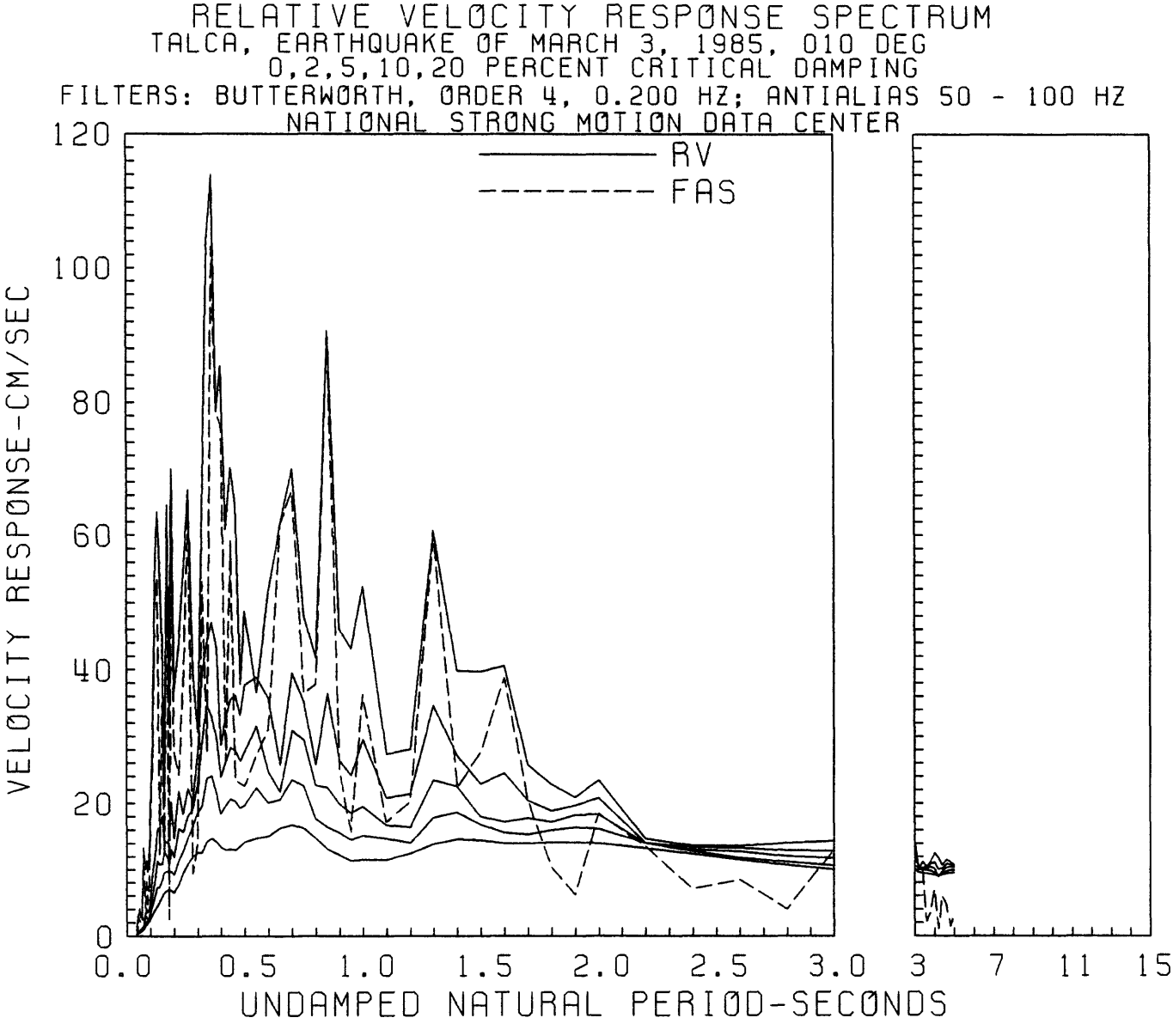

RELATIVE VELOCITY RESPONSE SPECTRUM
CHILLAN INSTITUTE, EARTHQUAKE OF MARCH 3, 1985, 350 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

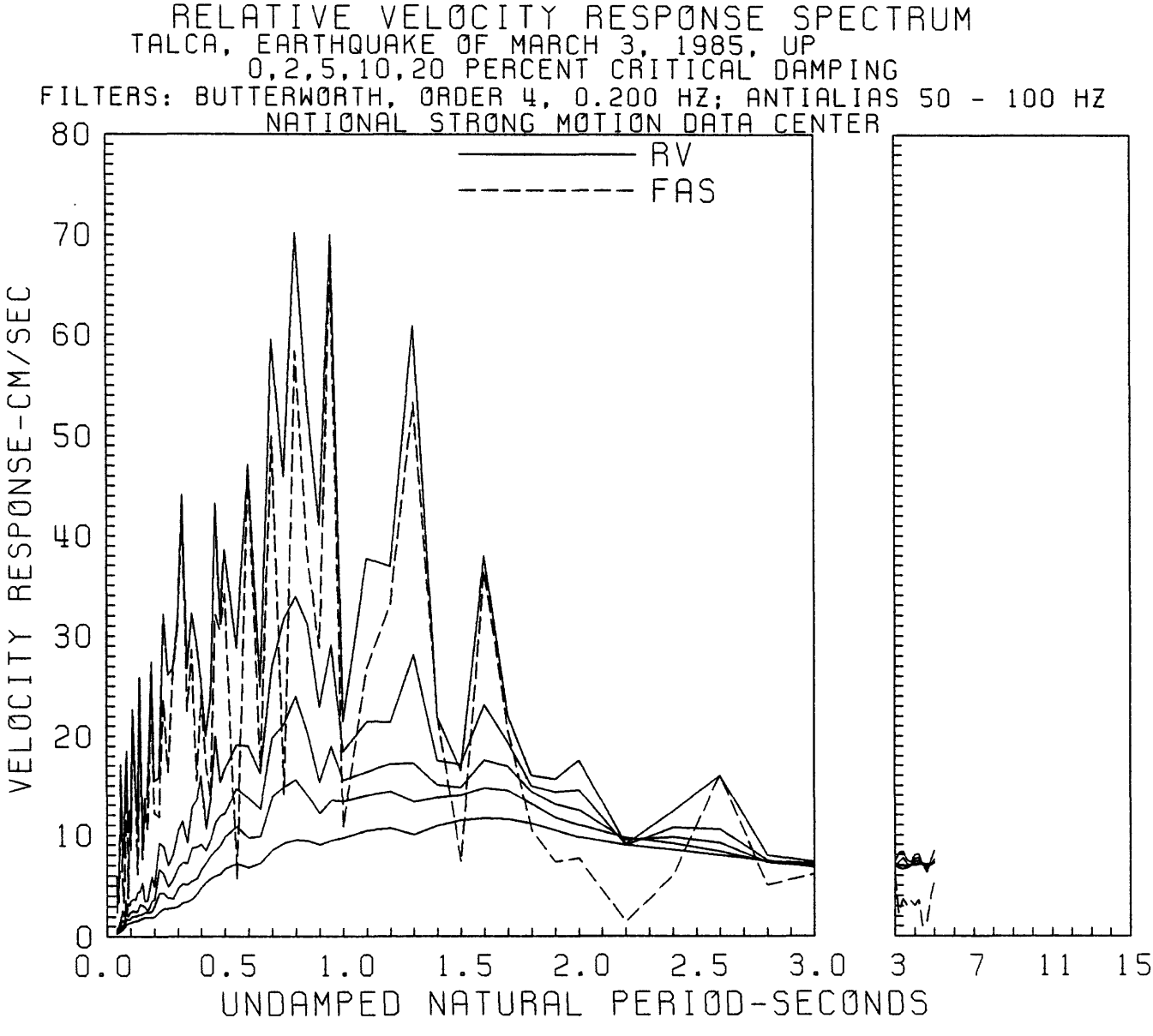

RELATIVE VELOCITY RESPONSE SPECTRUM
PAPUDO, EARTHQUAKE OF MARCH 3, 1985, 140 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
50
100
150
200
250
300
350
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

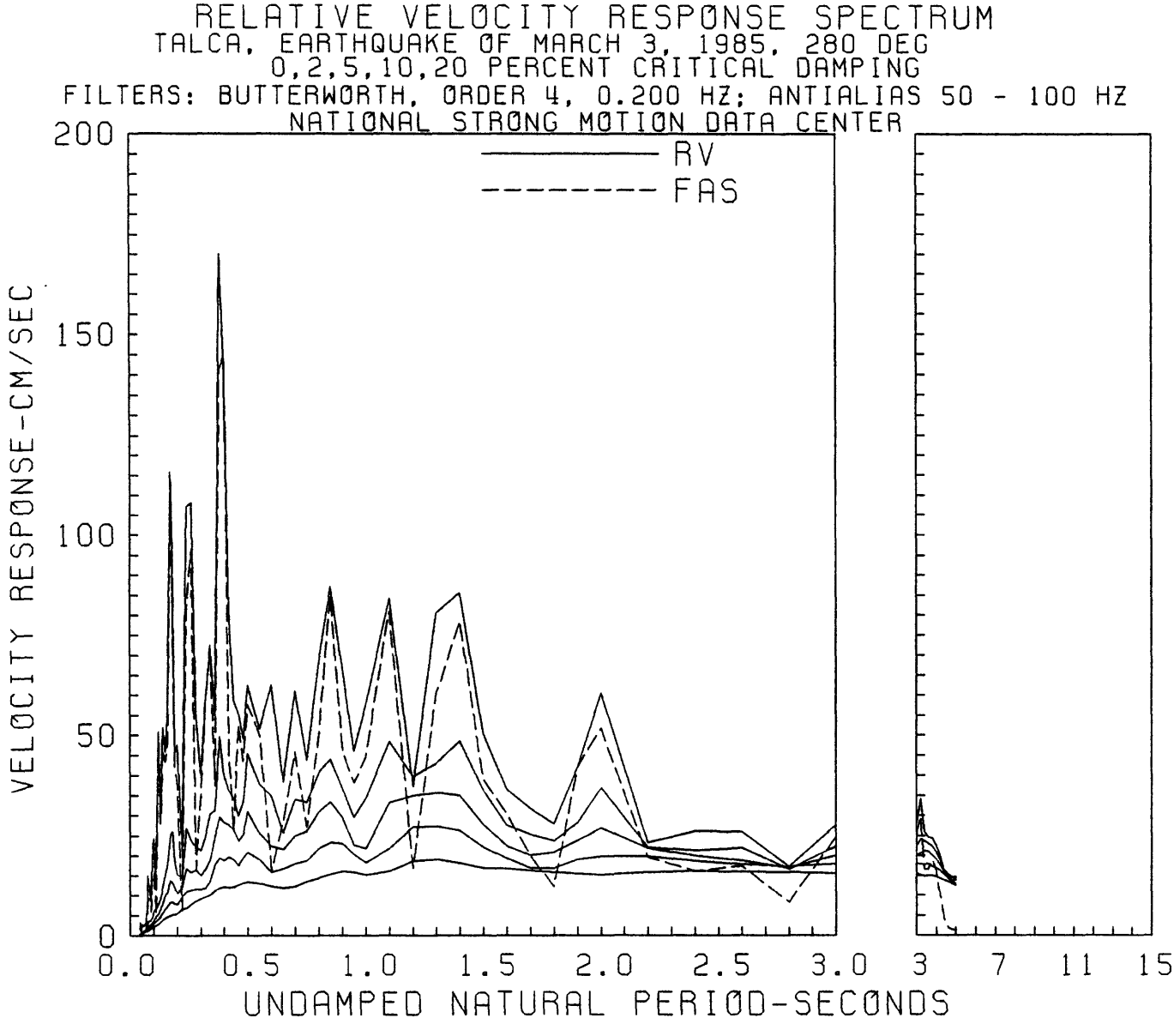

RELATIVE VELOCITY RESPONSE SPECTRUM
PAPUDO, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

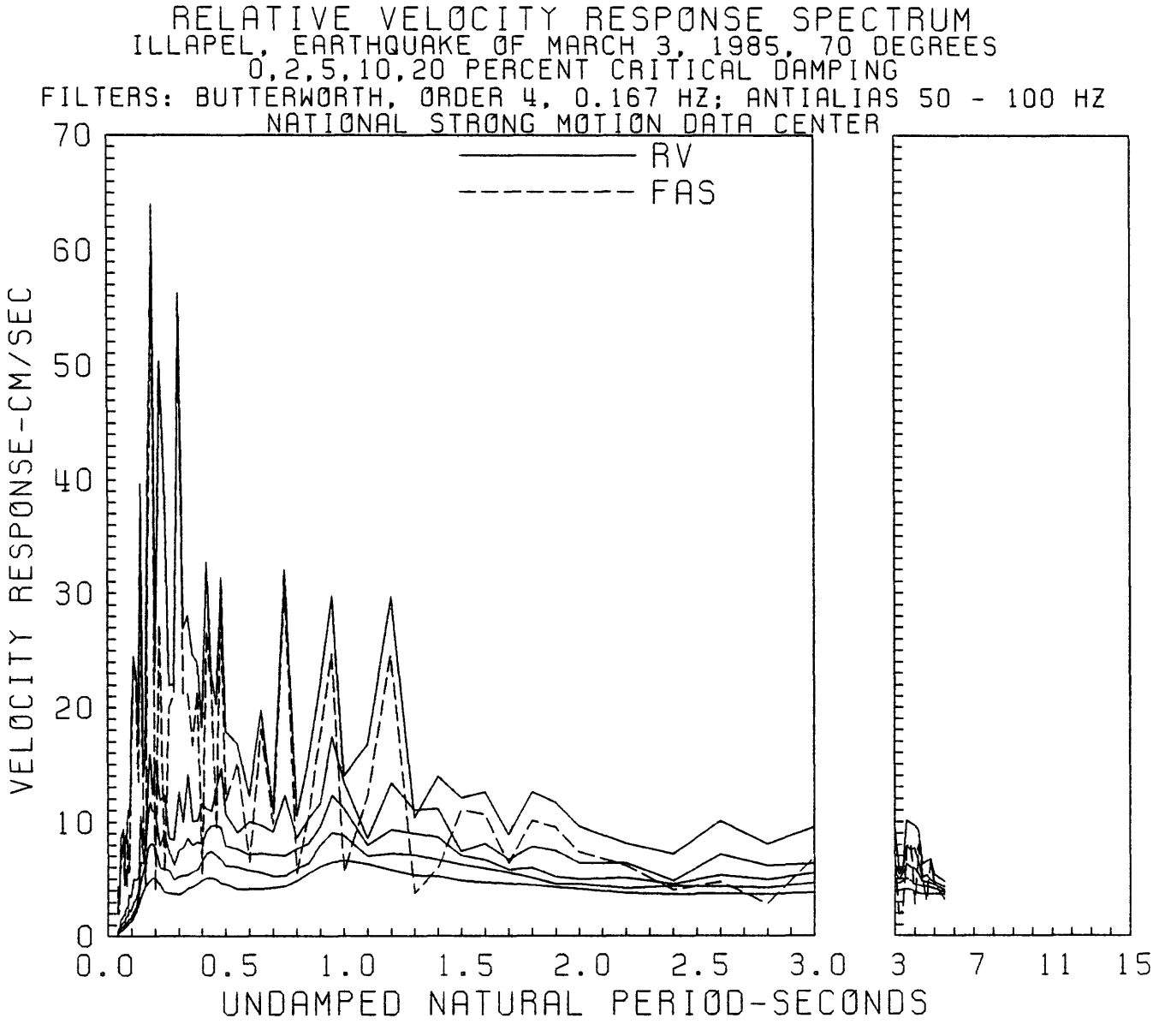
(NOTE: THIS IS SPECTRA OF REFERENCE TRACE!)

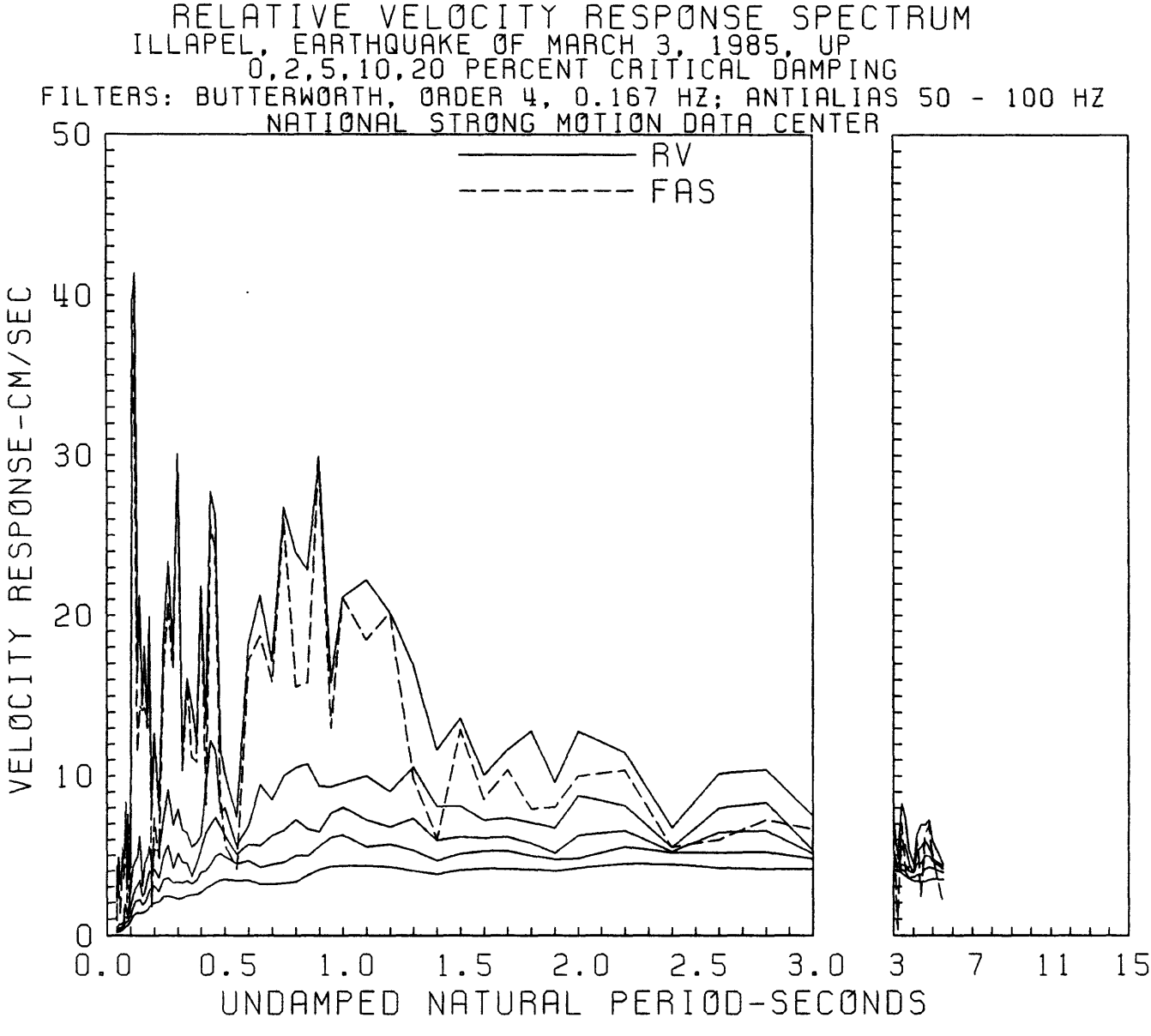


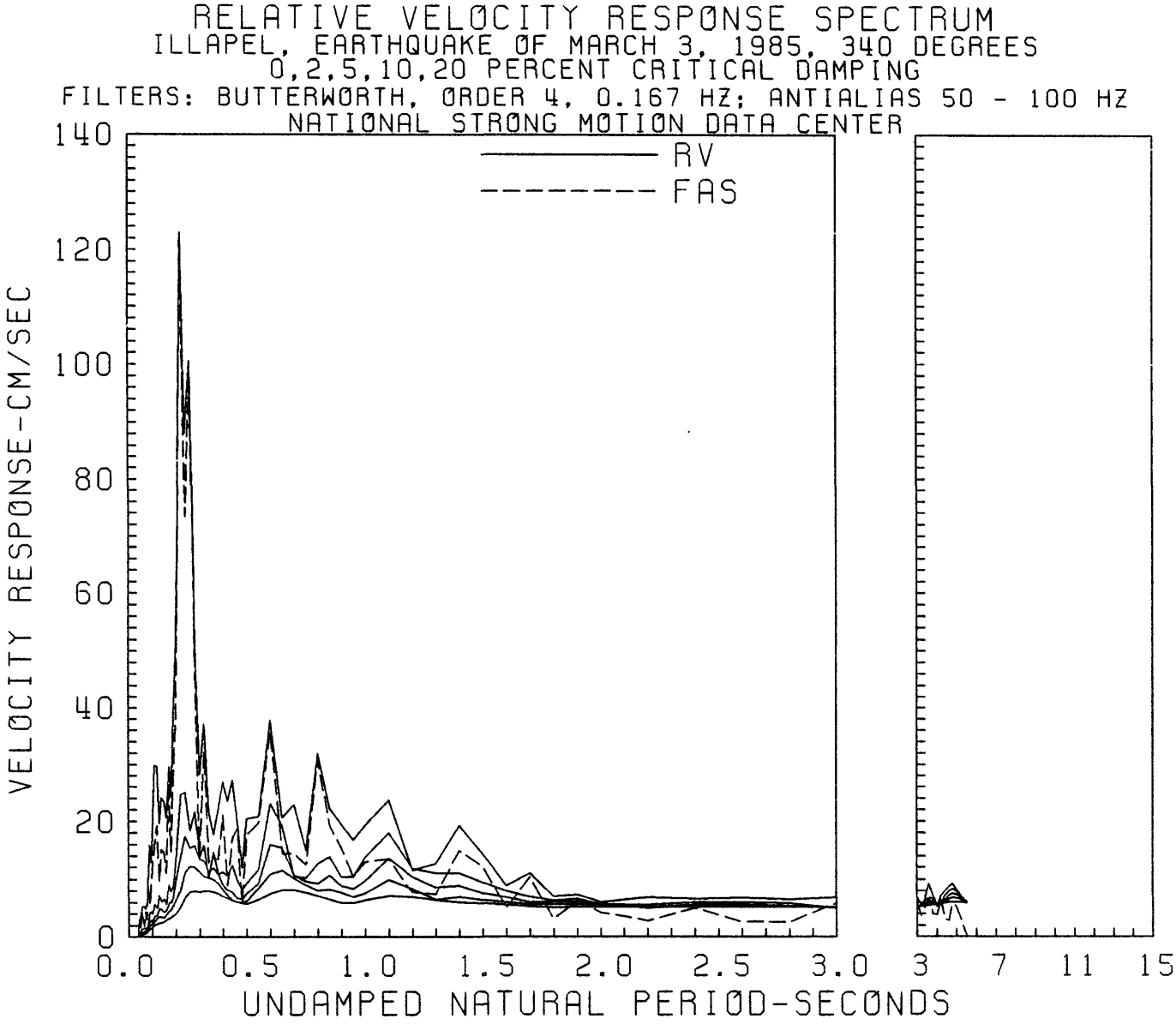

RELATIVE VELOCITY RESPONSE SPECTRUM
TALCA, EARTHQUAKE OF MARCH 3, 1985, 010 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
120
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

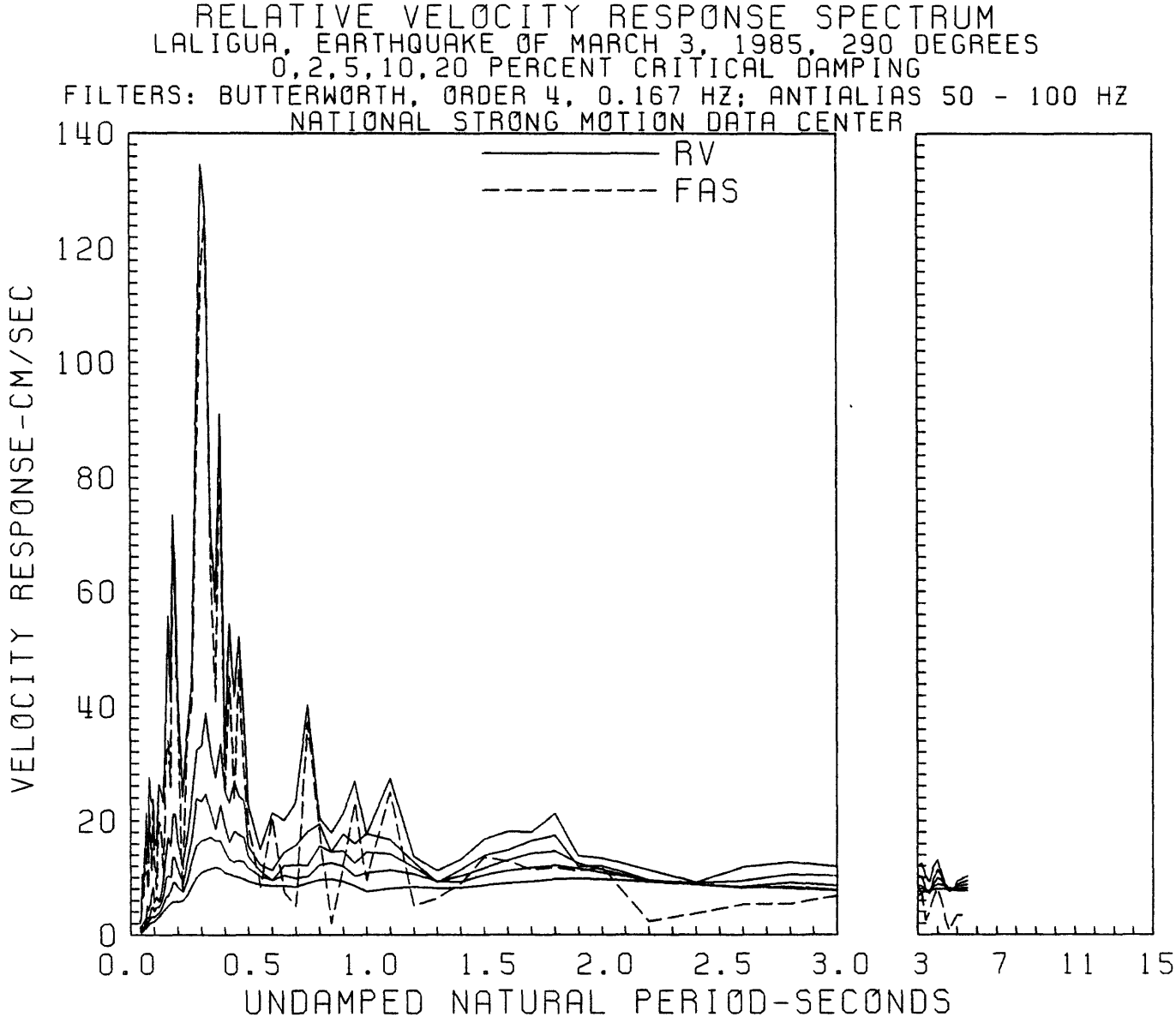

RELATIVE VELOCITY RESPONSE SPECTRUM
TALCA, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
70
80
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

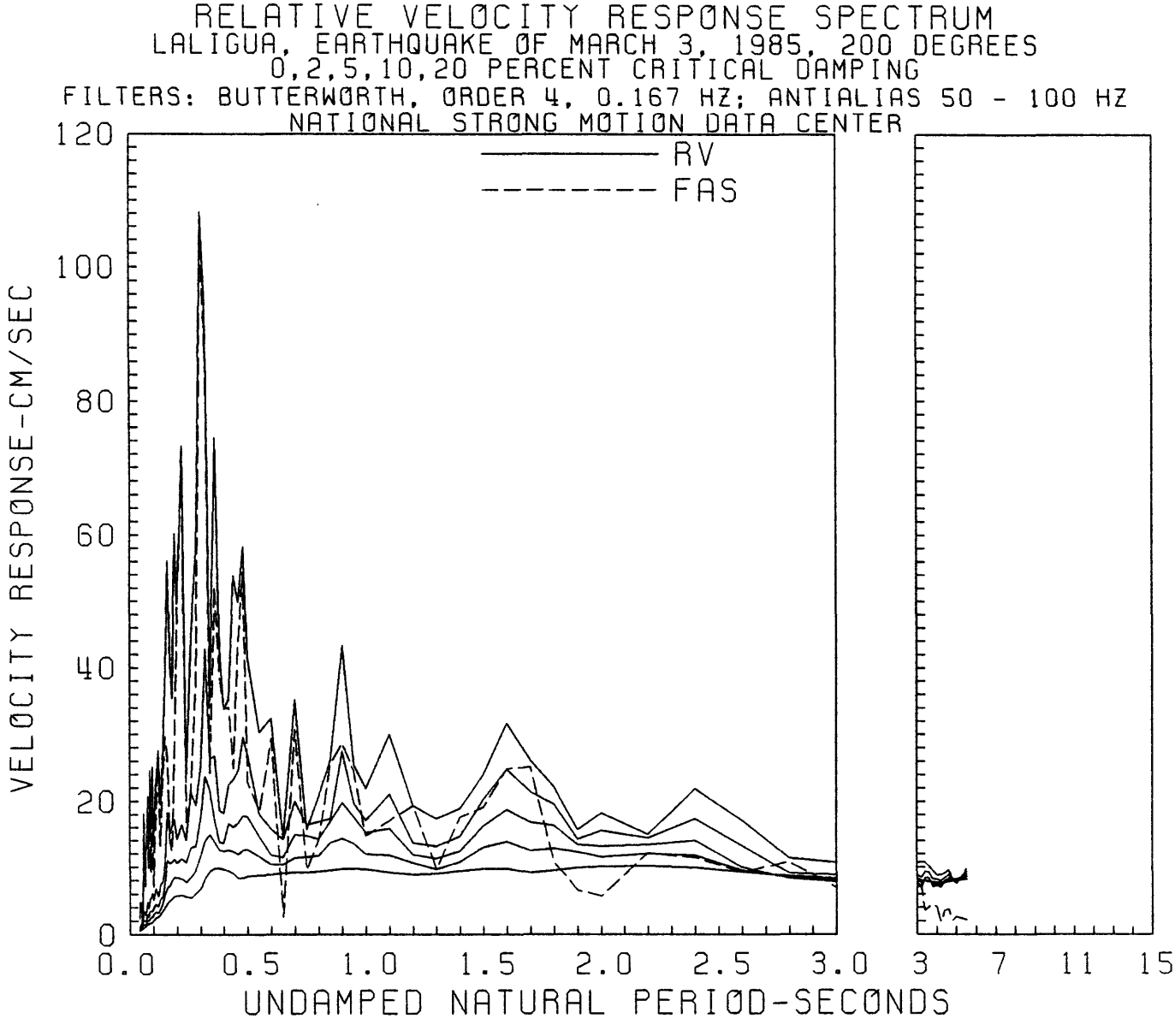

RELATIVE VELOCITY RESPONSE SPECTRUM
TALCA, EARTHQUAKE OF MARCH 3, 1985, 280 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

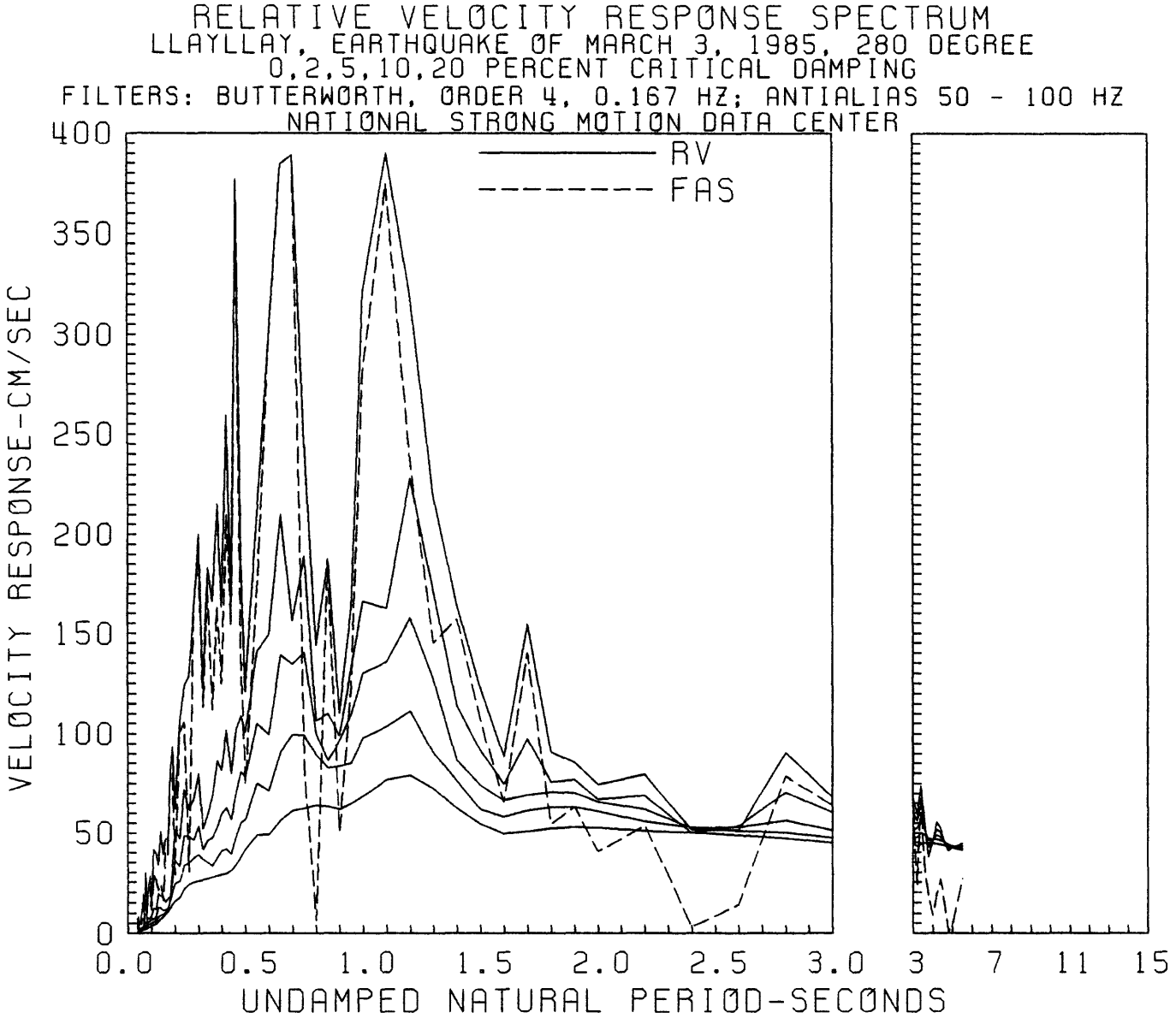

RELATIVE VELOCITY RESPONSE SPECTRUM
ILLAPEL, EARTHQUAKE OF MARCH 3, 1985, 70 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
70
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

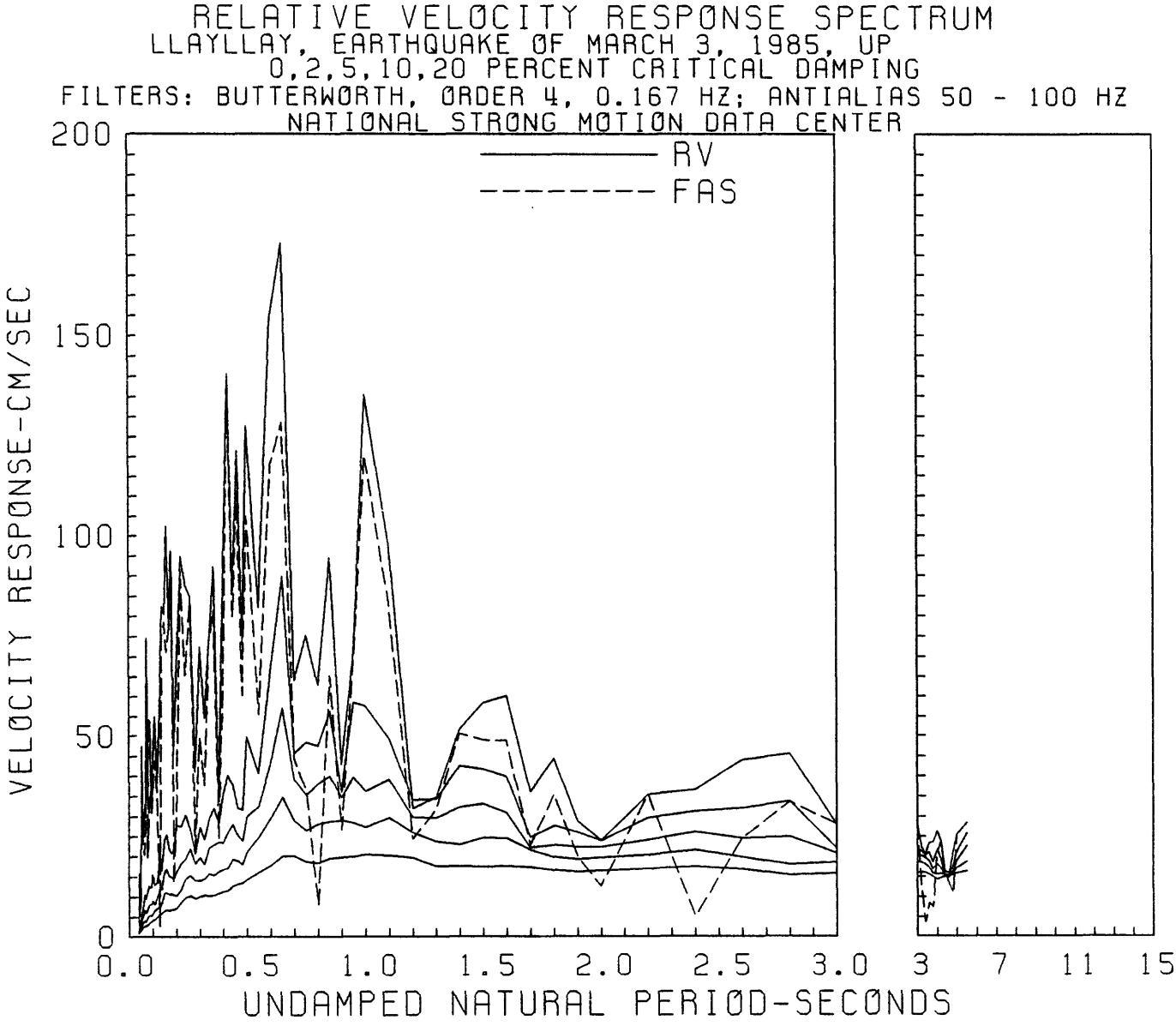

RELATIVE VELOCITY RESPONSE SPECTRUM
ILLAPEL, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
10
20
30
40
50
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

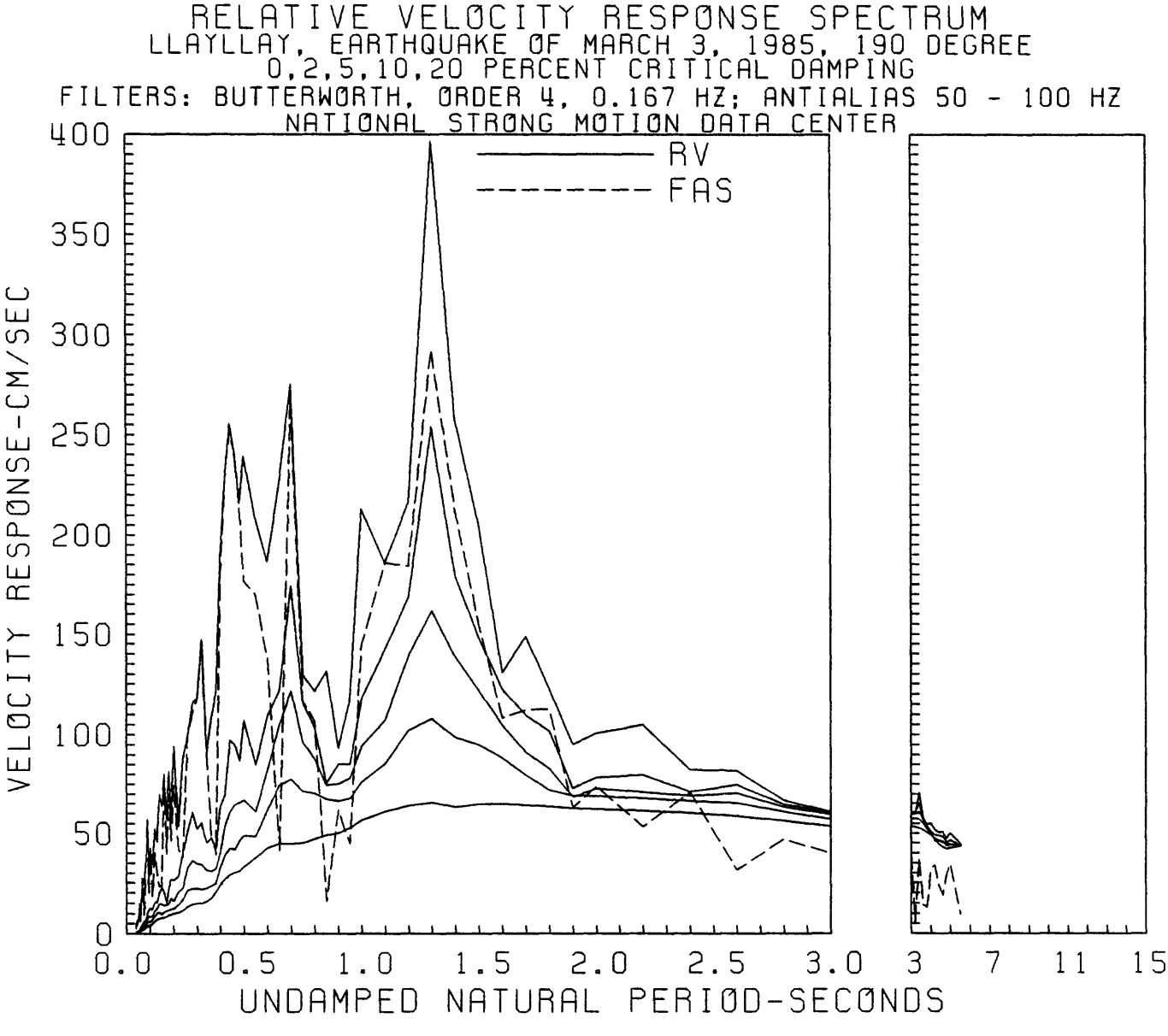

RELATIVE VELOCITY RESPONSE SPECTRUM
ILLAPEL, EARTHQUAKE OF MARCH 3, 1985, 340 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
120
140
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

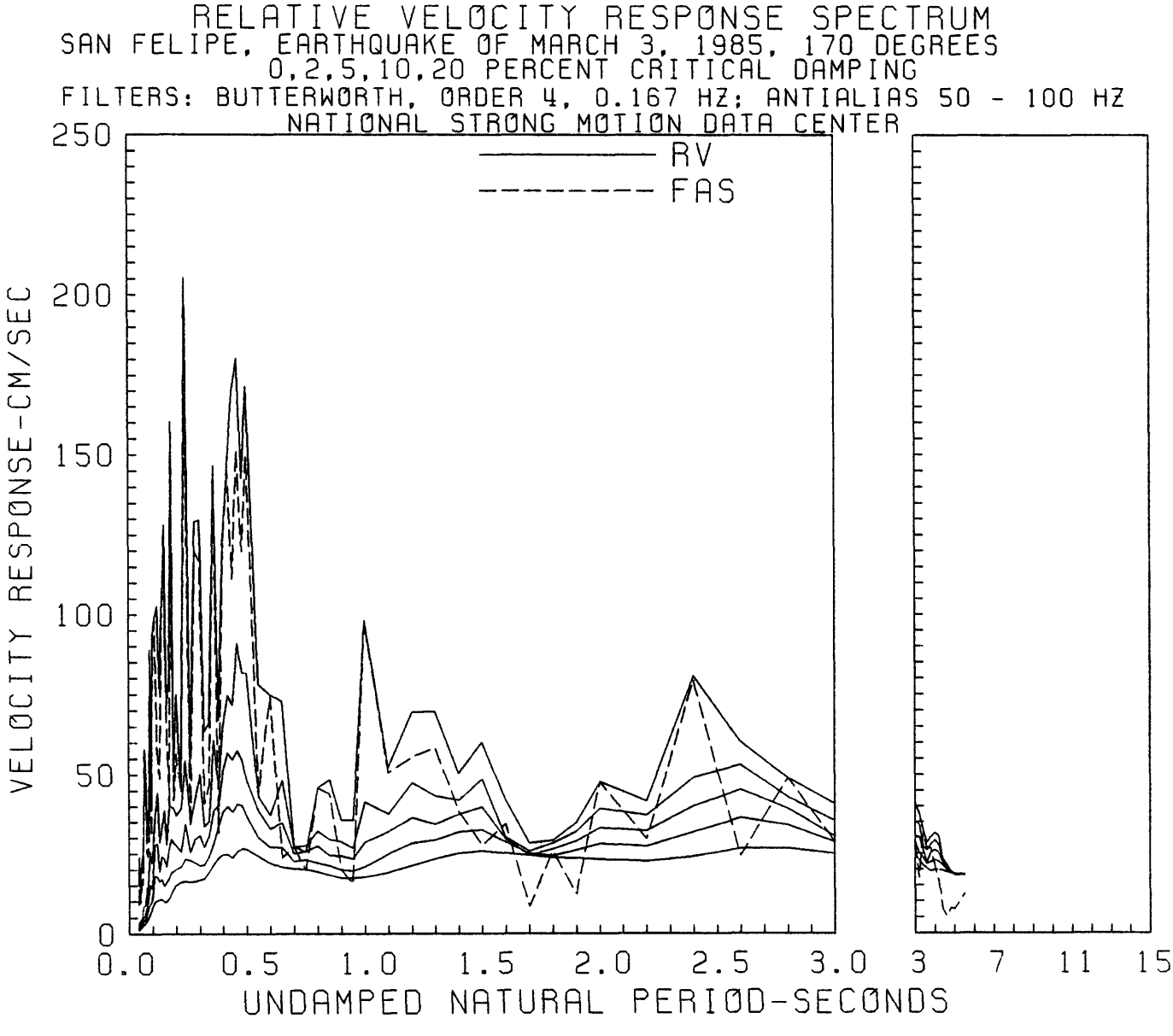

RELATIVE VELOCITY RESPONSE SPECTRUM
LALIGUA, EARTHQUAKE OF MARCH 3, 1985, 290 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
120
140
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

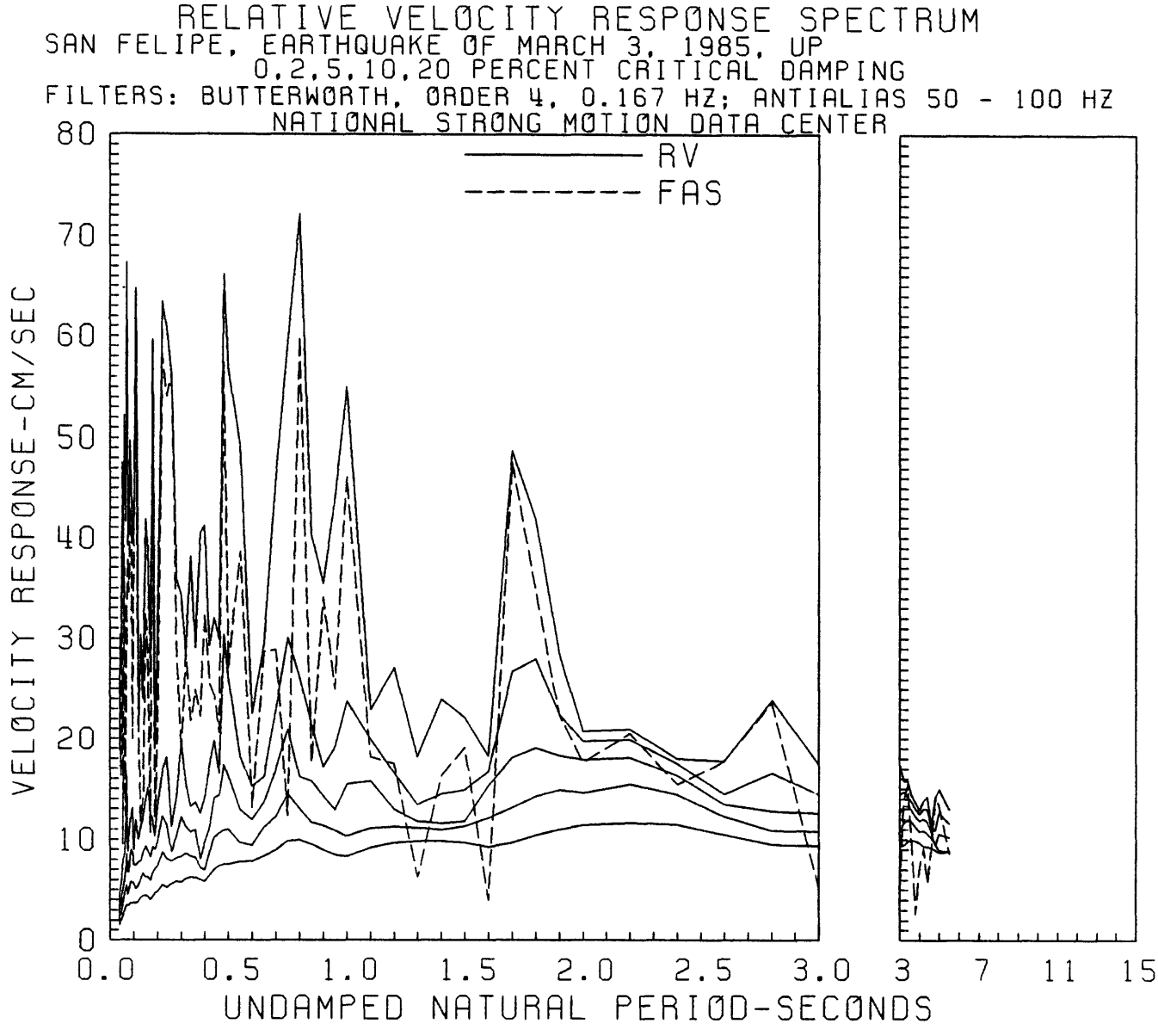

RELATIVE VELOCITY RESPONSE SPECTRUM
LALIGUA, EARTHQUAKE OF MARCH 3, 1985, 200 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
120
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

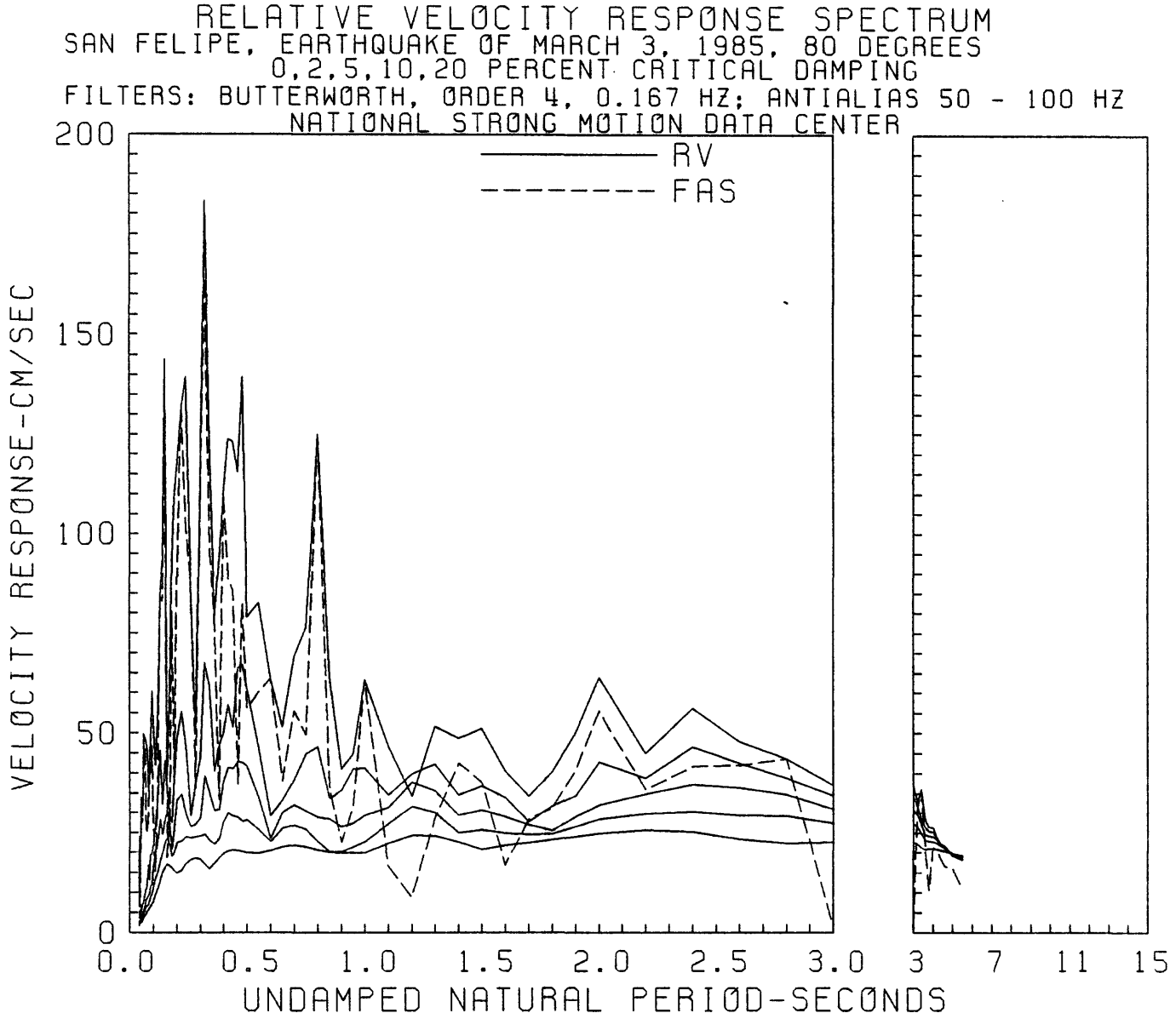

RELATIVE VELOCITY RESPONSE SPECTRUM
LLAYLLAY, EARTHQUAKE OF MARCH 3, 1985, 280 DEGREE
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
400
350
300
250
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

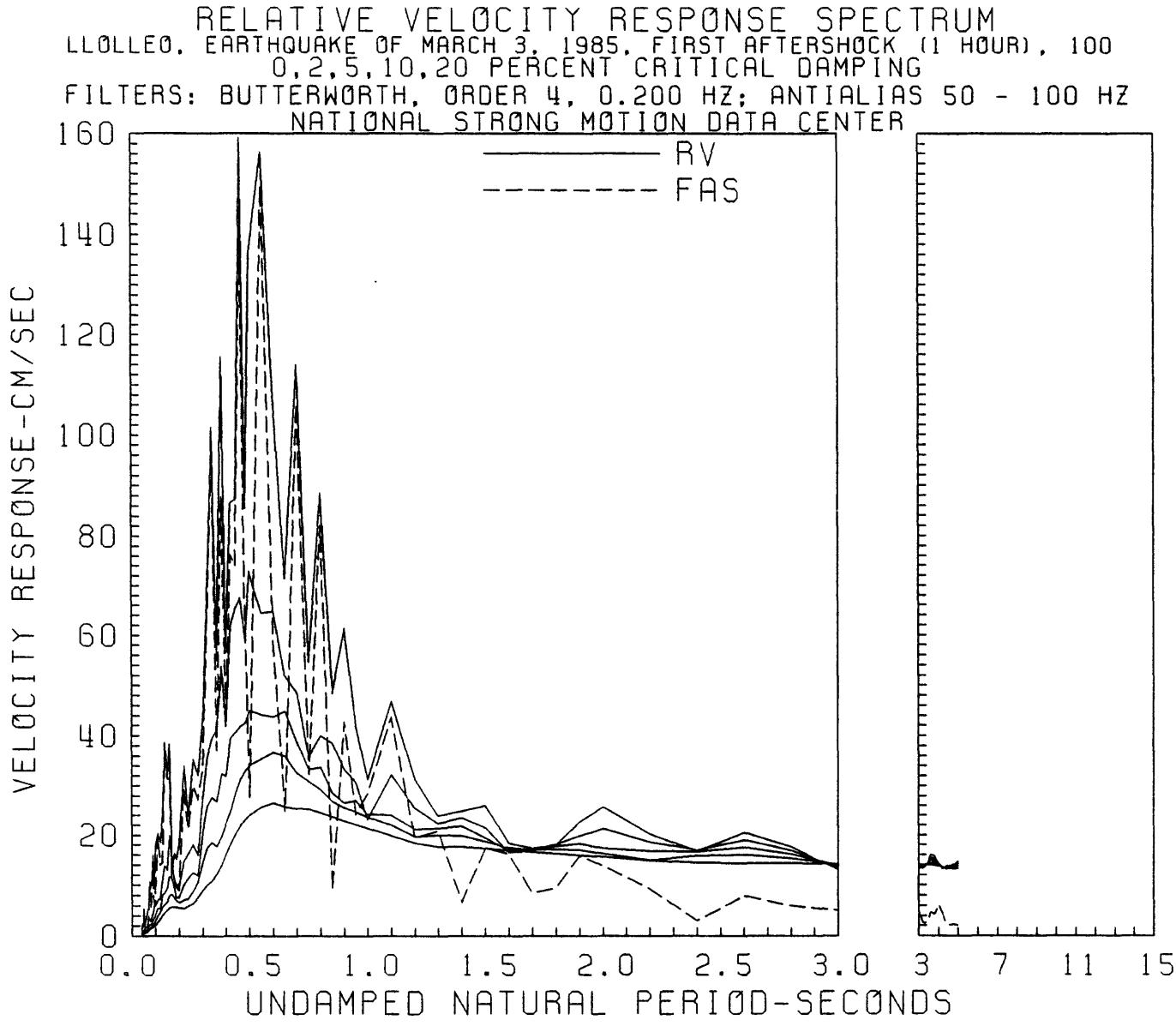

RELATIVE VELOCITY RESPONSE SPECTRUM
LLAYLLAY, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

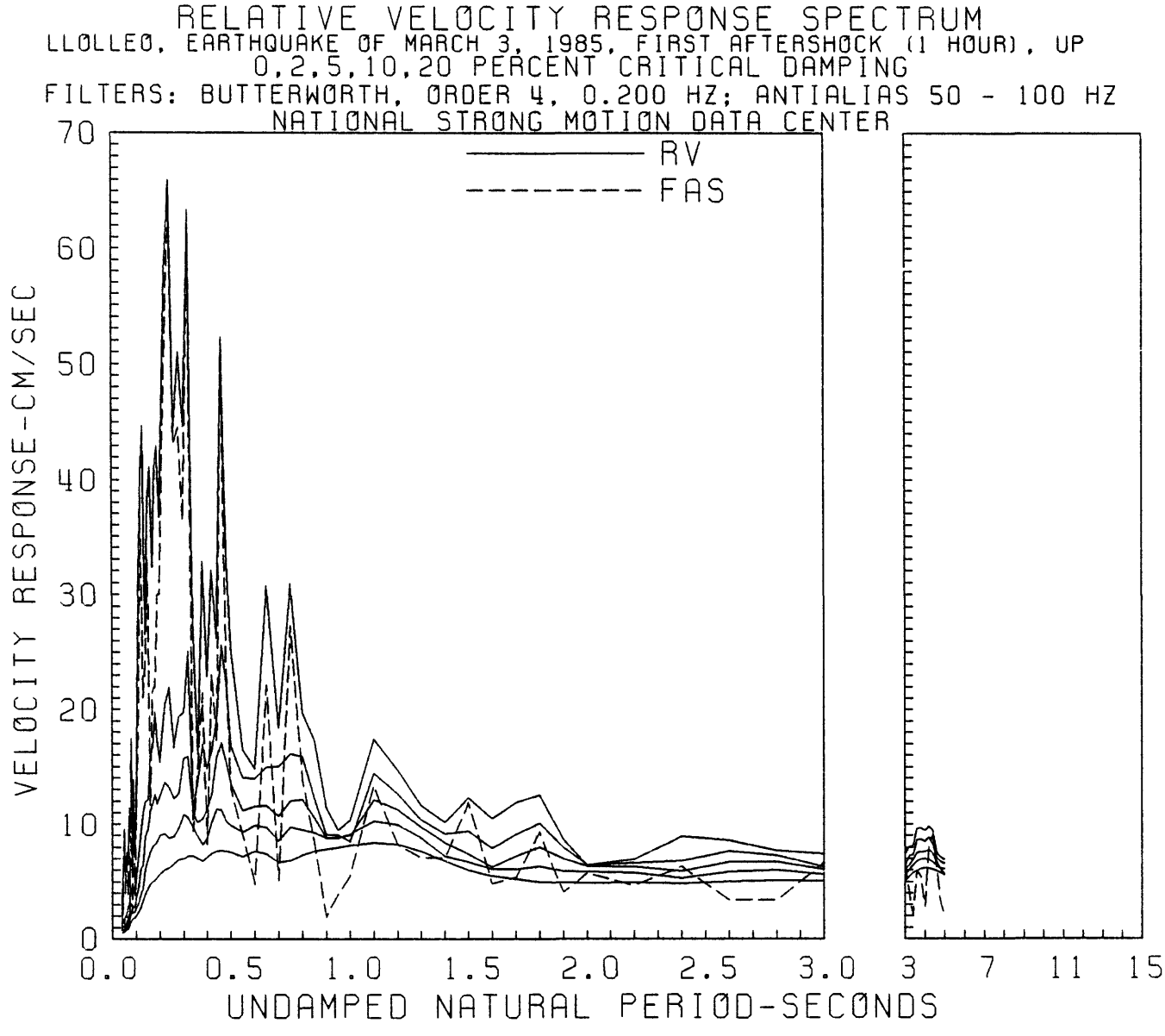

RELATIVE VELOCITY RESPONSE SPECTRUM
LLAYLLAY, EARTHQUAKE OF MARCH 3, 1985, 190 DEGREE
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
50
100
150
200
250
300
350
400
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

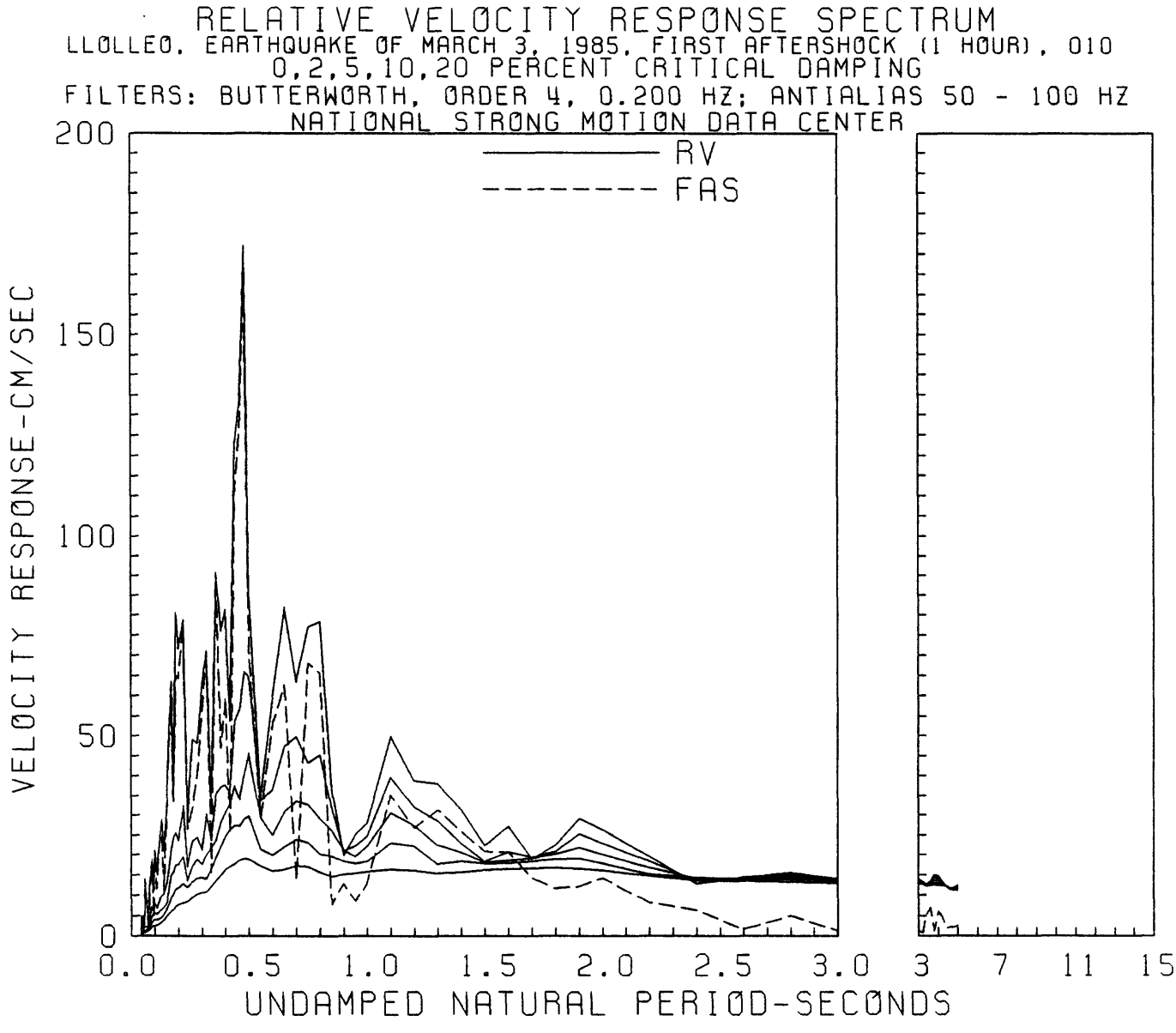

RELATIVE VELOCITY RESPONSE SPECTRUM
SAN FELIPE, EARTHQUAKE OF MARCH 3, 1985, 170 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
250
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

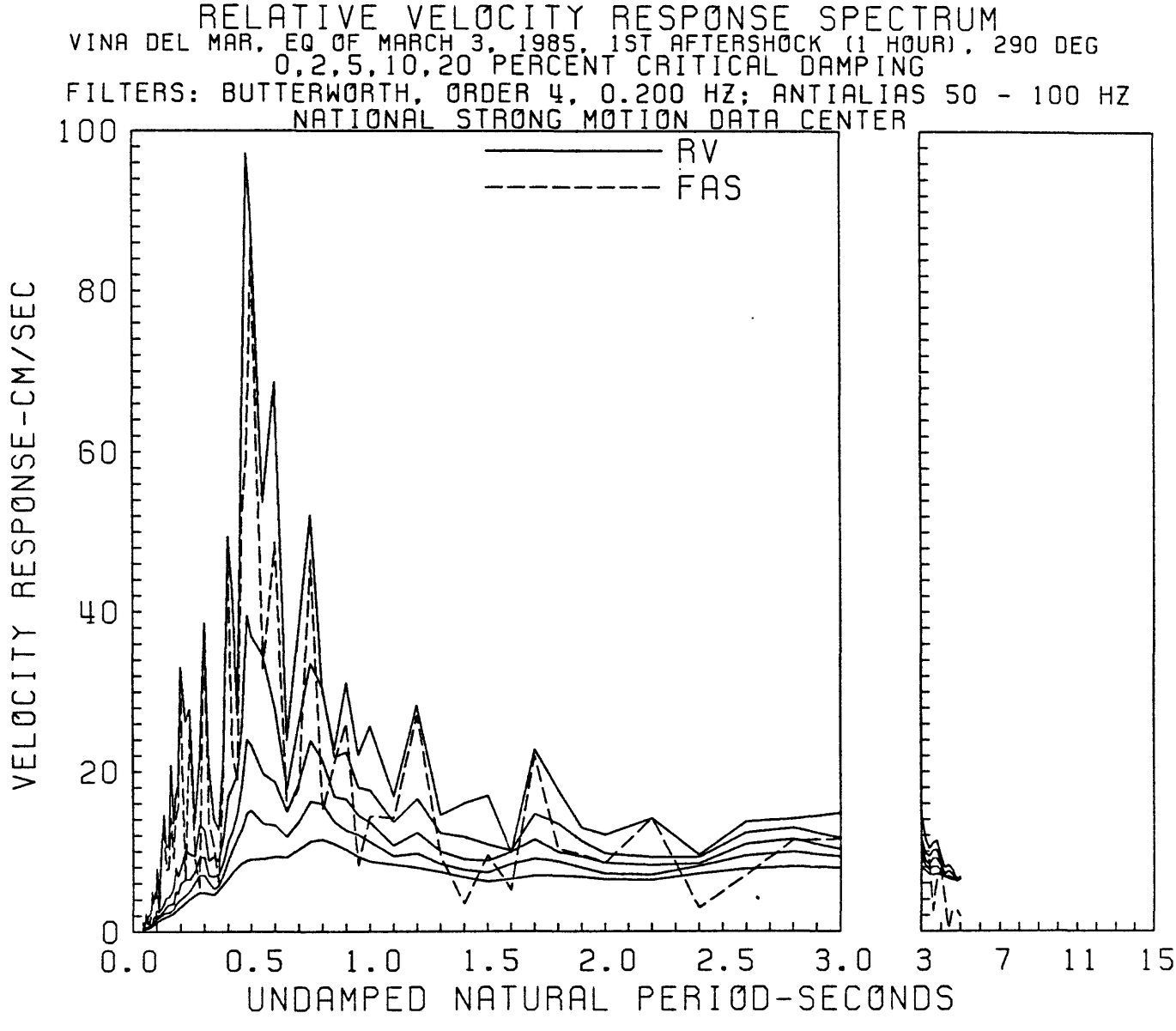

RELATIVE VELOCITY RESPONSE SPECTRUM
SAN FELIPE, EARTHQUAKE OF MARCH 3, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
70
80
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

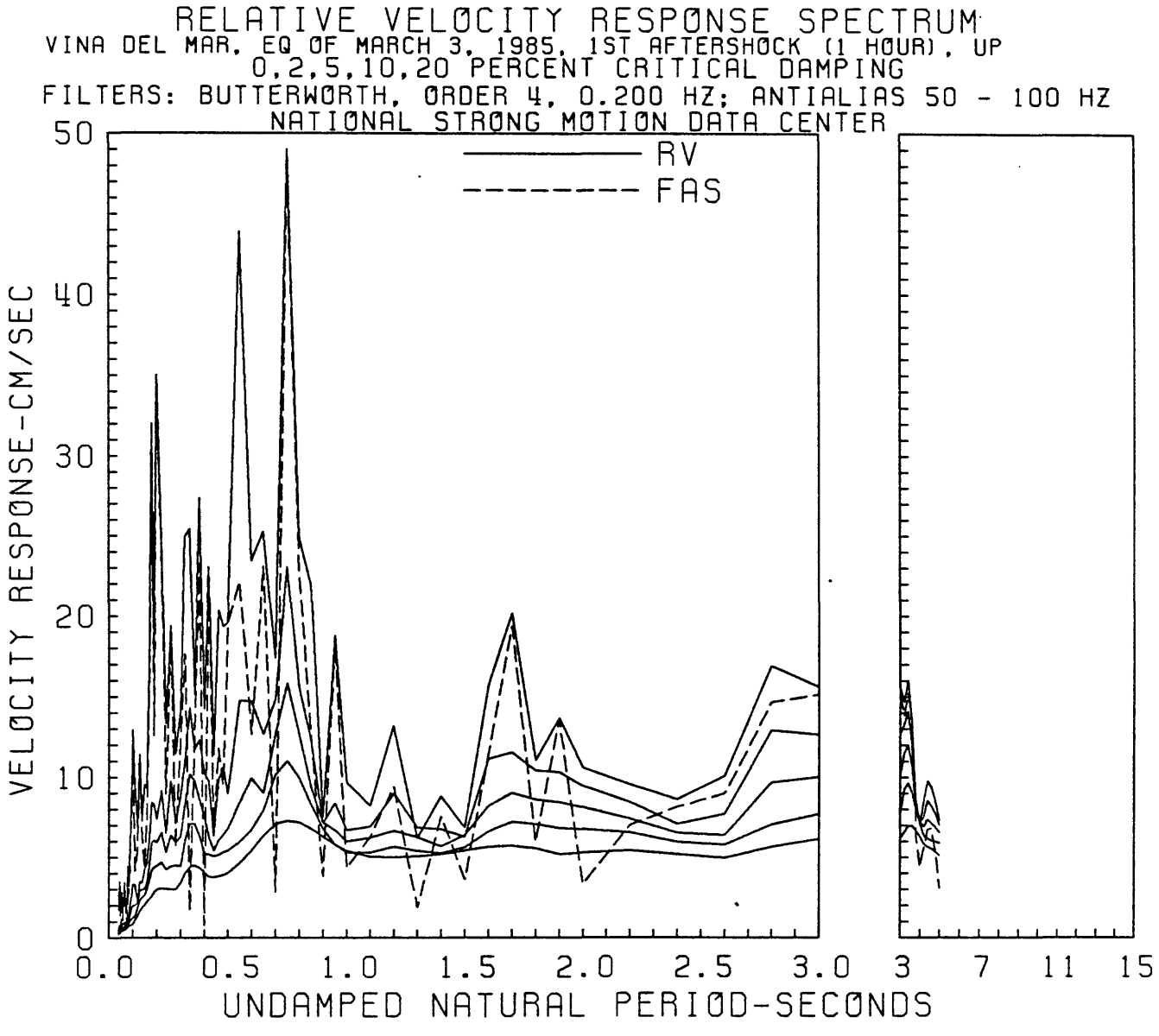

RELATIVE VELOCITY RESPONSE SPECTRUM
SAN FELIPE, EARTHQUAKE OF MARCH 3, 1985, 80 DEGREES
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.167 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

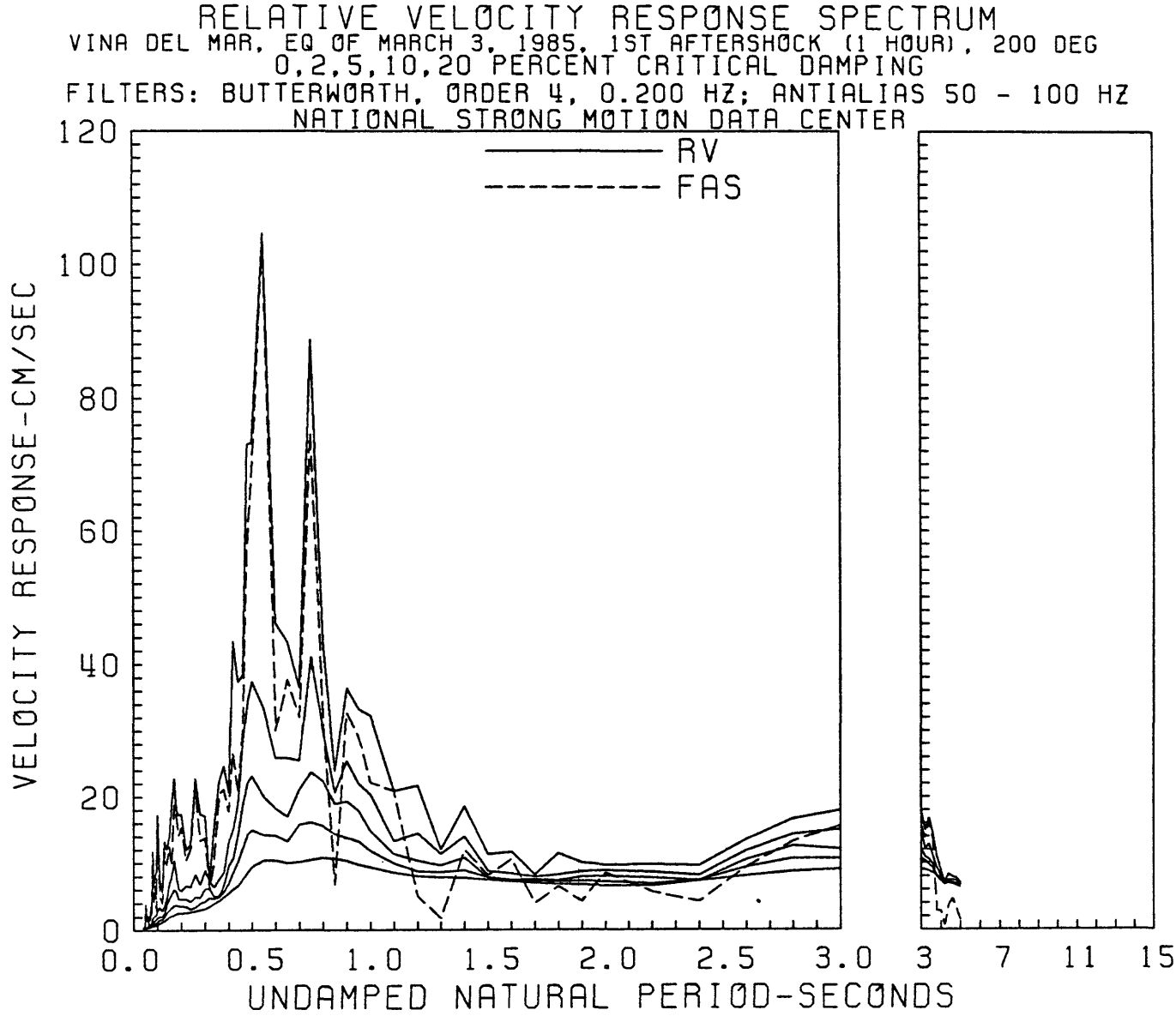

RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR), 100
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
20
40
60
80
100
120
140
160
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

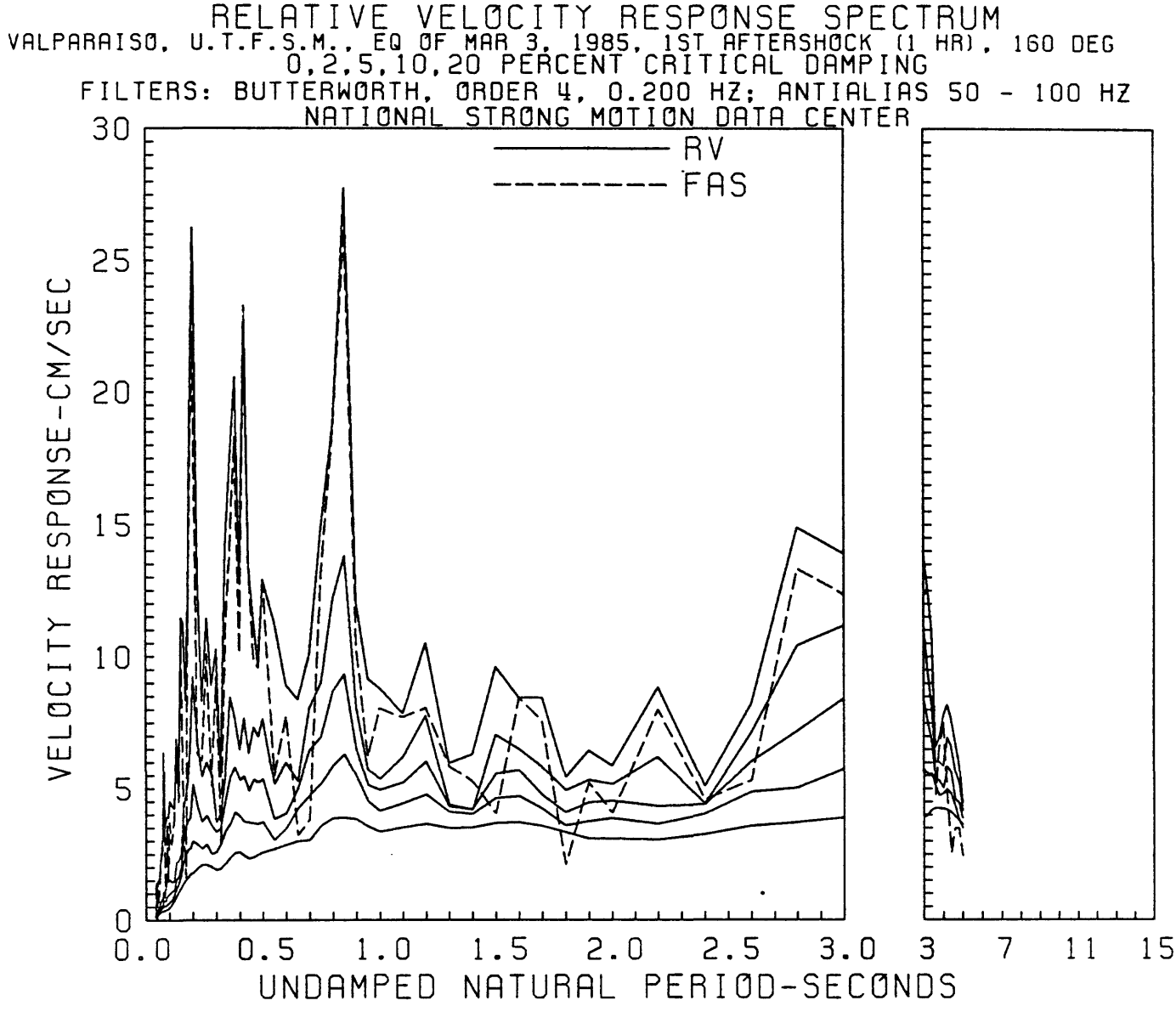

RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR), UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
10
20
30
40
50
60
70
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

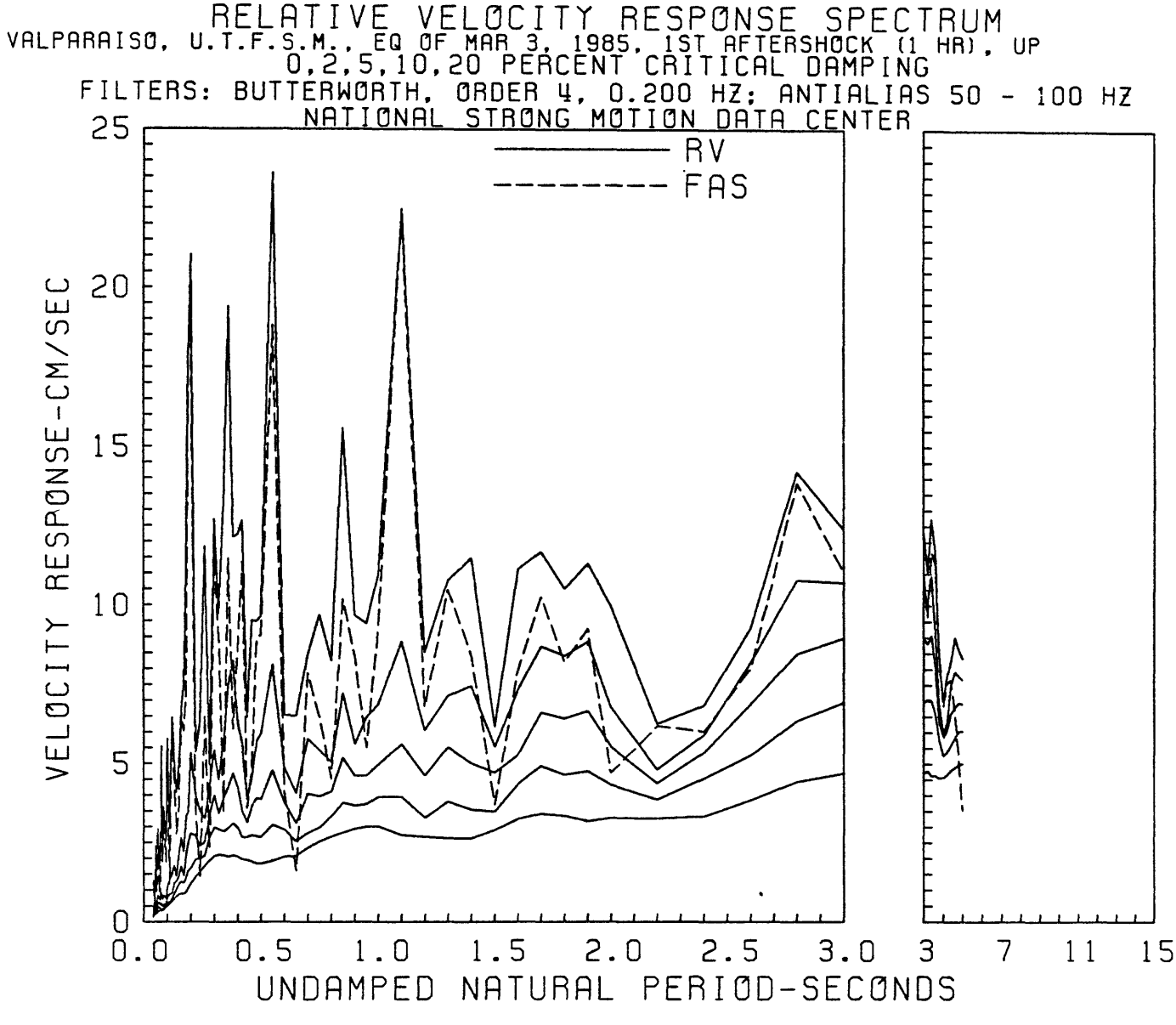

RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, EARTHQUAKE OF MARCH 3, 1985, FIRST AFTERSHOCK (1 HOUR), 010
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
200
150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

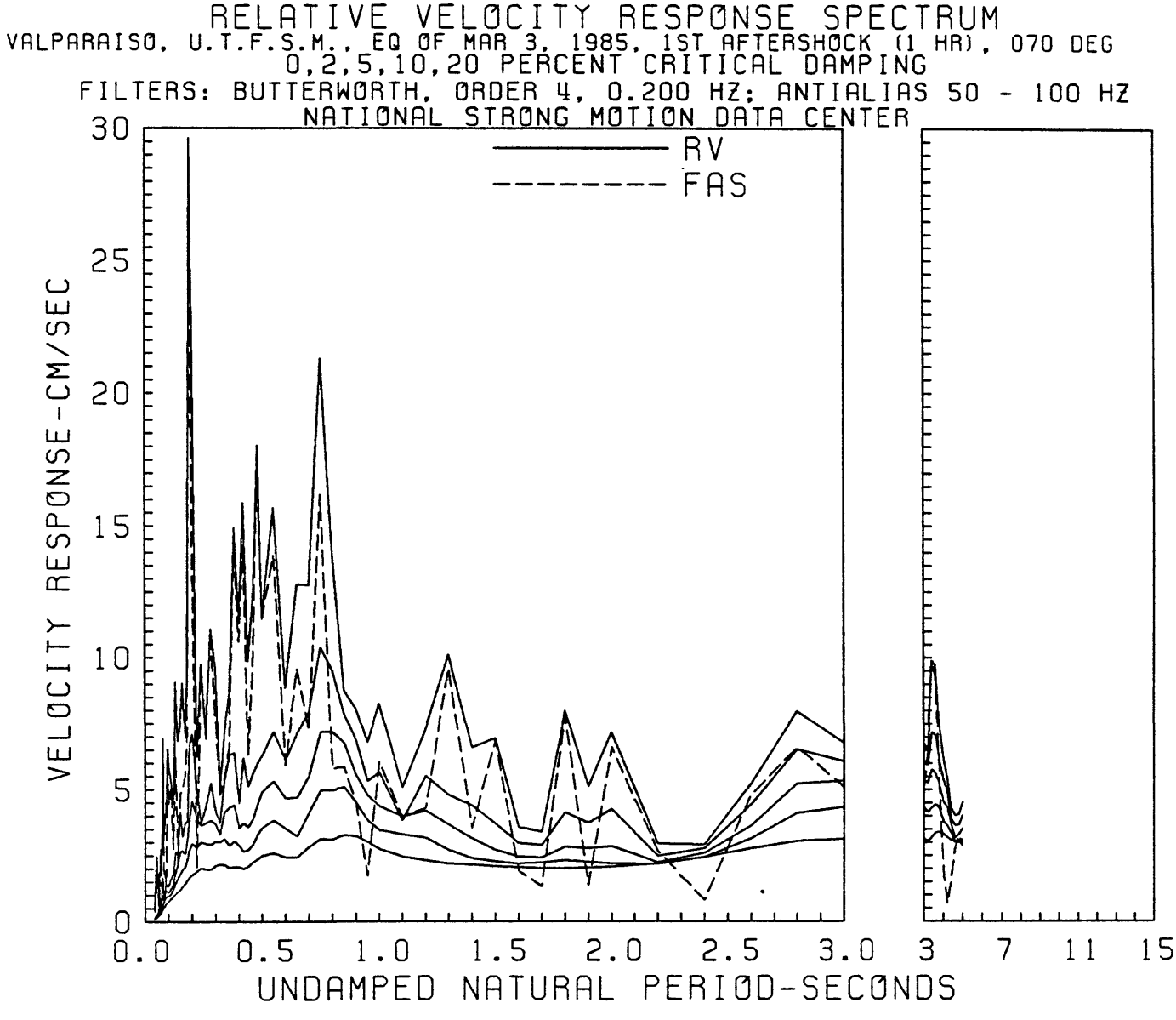

RELATIVE VELOCITY RESPONSE SPECTRUM
VINA DEL MAR, EQ OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR), 290 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
100
80
60
40
20
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

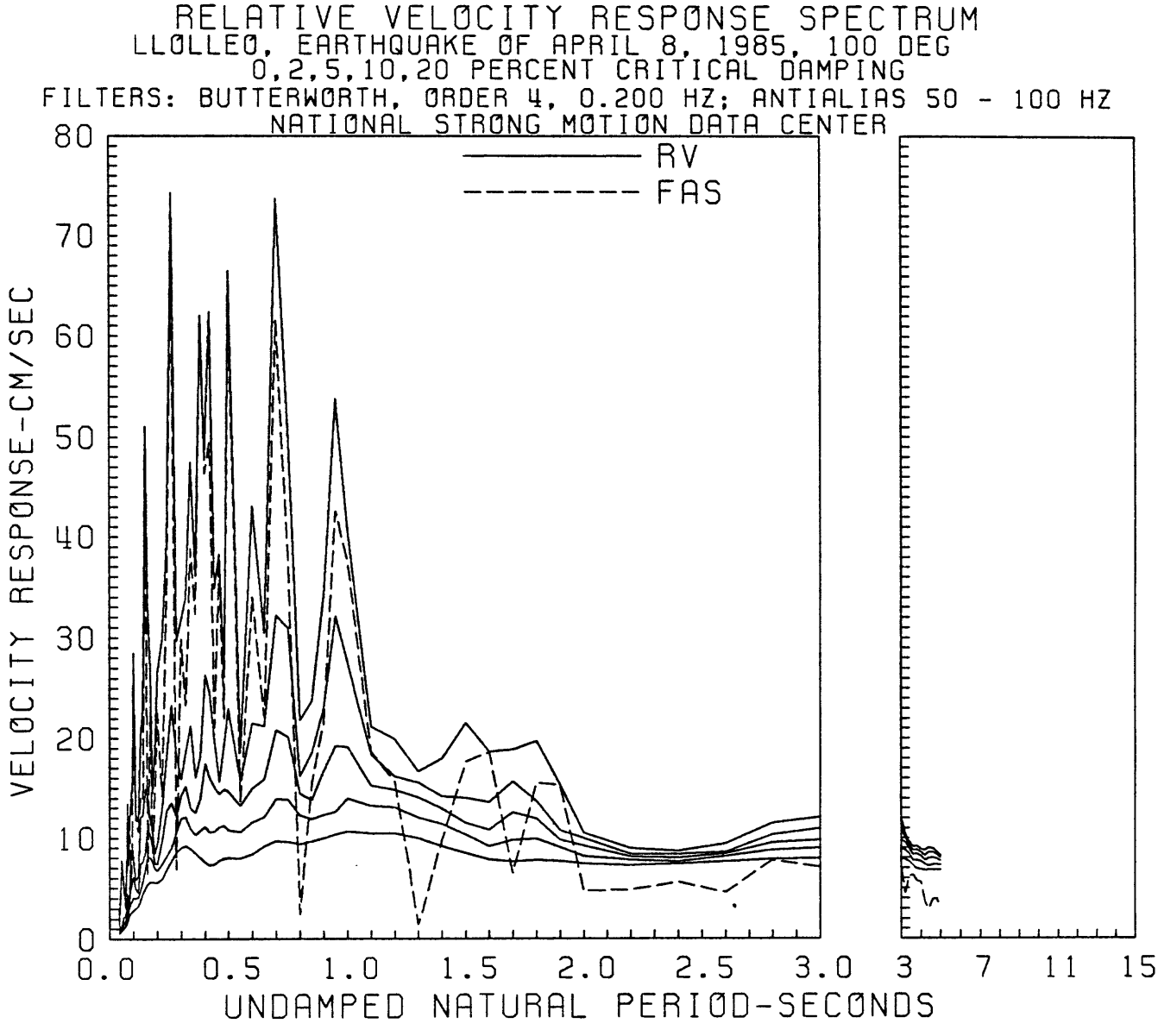

RELATIVE VELOCITY RESPONSE SPECTRUM
VINA DEL MAR, EQ OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR), UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS

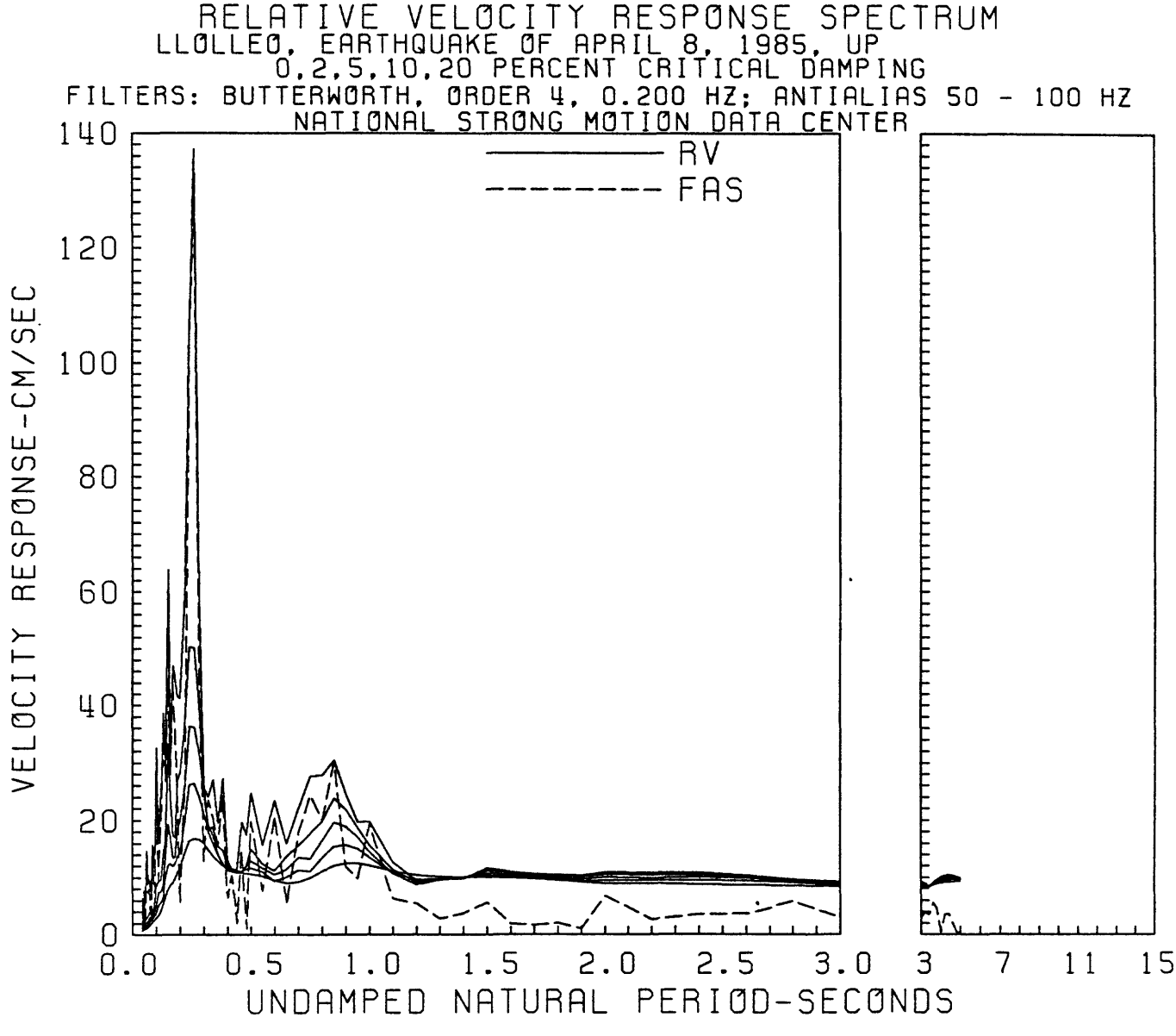

RELATIVE VELOCITY RESPONSE SPECTRUM
VINA DEL MAR, EQ OF MARCH 3, 1985, 1ST AFTERSHOCK (1 HOUR), 200 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
120
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15

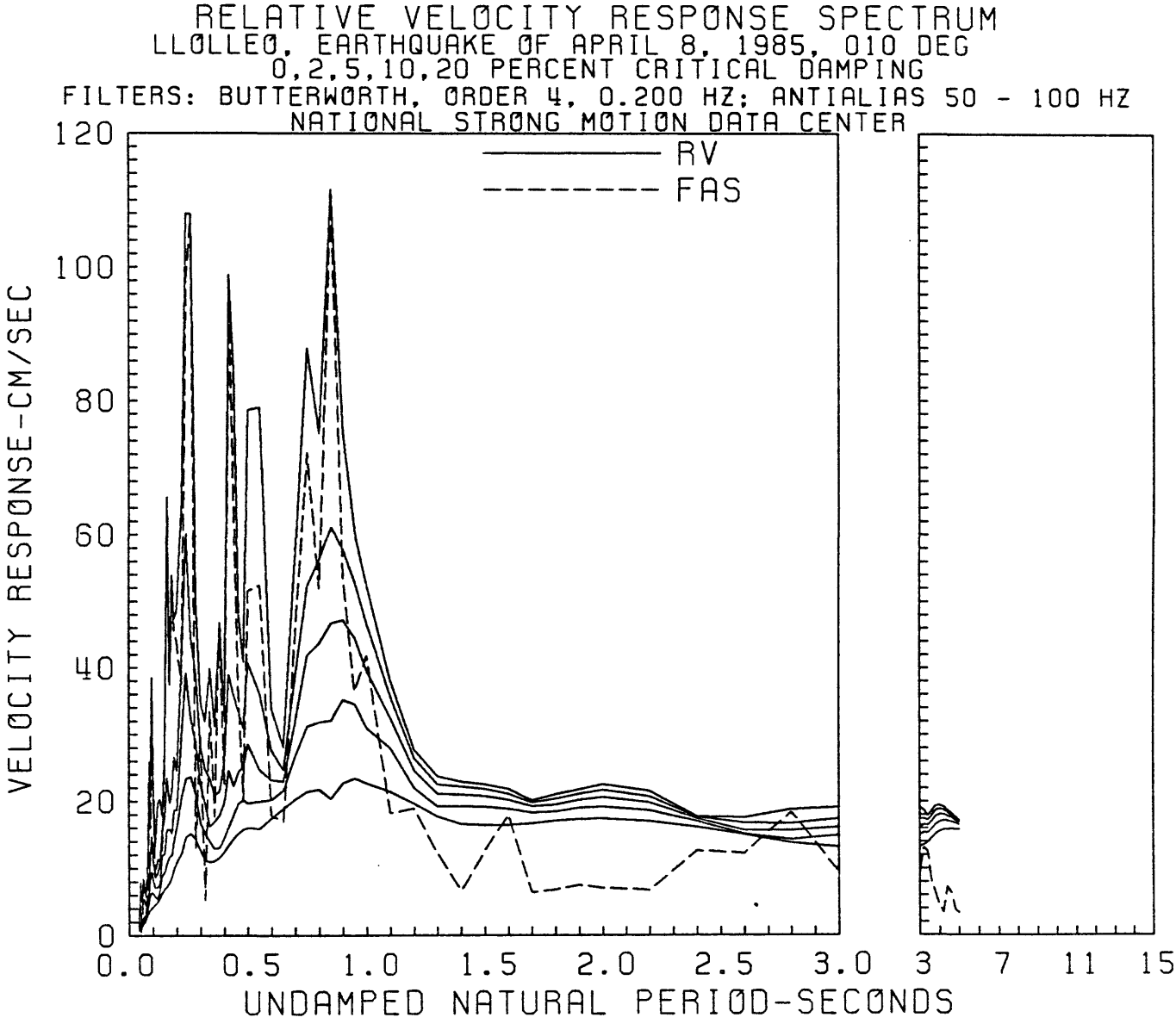

RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO, U.T.F.S.M., EQ OF MAR 3, 1985, 1ST AFTERSHOCK (1 HR), 160 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
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


RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO, U.T.F.S.M., EQ OF MAR 3, 1985, 1ST AFTERSHOCK (1 HR), UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-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 PERIOD-SECONDS


RELATIVE VELOCITY RESPONSE SPECTRUM
VALPARAISO, U.T.F.S.M., EQ OF MAR 3, 1985, 1ST AFTERSHOCK (1 HR), 070 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
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


RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, EARTHQUAKE OF APRIL 8, 1985, 100 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
10
20
30
40
50
60
70
80
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS


RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, EARTHQUAKE OF APRIL 8, 1985, UP
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
0
20
40
60
80
100
120
140
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15
UNDAMPED NATURAL PERIOD-SECONDS


RELATIVE VELOCITY RESPONSE SPECTRUM
LLOLLEO, EARTHQUAKE OF APRIL 8, 1985, 010 DEG
0,2,5,10,20 PERCENT CRITICAL DAMPING
FILTERS: BUTTERWORTH, ORDER 4, 0.200 HZ; ANTIALIAS 50 - 100 HZ
NATIONAL STRONG MOTION DATA CENTER
RV
FAS
VELOCITY RESPONSE-CM/SEC
UNDAMPED NATURAL PERIOD-SECONDS
0
20
40
60
80
100
120
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3
7
11
15