CALIFORNIA INSTITUTE OF TECHNOLOGY

EARTHQUAKE ENGINEERING RESEARCH LABORATORY

ANALYSES OF
STRONG MOTION EARTHQUAKE ACCELEROGRAMS

Volume IV - Fourier Amplitude Spectra

Part G - Accelerograms IIG106 through IIG114

EERL 73-105

A Report on Research Conducted Under a Grant

from the National Science Foundation

Pasadena, California

December, 1973

ABSTRACT

This is one of a series of reports presenting Fourier amplitude spectra for earthquake ground motions and for structural response accelerations. Volume IV, Part A, Report No. EERL 72-100, included an introduction summarizing Fourier spectrum techniques in earthquake engineering as a background to the use of the data. For each earthquake accelerogram, two spectrum plots are given - a Fourier amplitude spectrum versus frequency on a linear scale and a log-spectrum, log-frequency plot. In the series, Fourier amplitude spectra will be given for all corrected accelerograms, including building response measurements. The corrected records analyzed in this report, Volume IV, Part G, appeared in Volume II, Part G, Report No. EERL 73-52. Their uncorrected versions were published in Volume I, Part G, Report No. EERL 72-20.

TABLE OF CONTENTS

PREFACE TO VOLUME IV, PART G

This report, Volume IV, Part G, Report No. EERL 73-105, is part of the Volume IV series presenting Fourier spectrum curves calculated from corrected strong-motion accelerograms including measurements in structures as well as at ground sites. We continue here with records from the San Fernando, California, earthquake of February 9, 1971. The analysis of records from this earthquake appeared first in Volume IV, Part C, Report No. EERL 73-101, and this report presents the spectra from the following locations:

1. Caltech Seismological Laboratory, Pasadena
2. Caltech Athenaeum, Pasadena
3. Caltech Millikan Library, Pasadena (2 records)
4. Caltech Jet Propulsion Laboratory, Pasadena (2 records)
5. 611 W. 6th Street, Los Angeles (2 records)
6. Palmdale Fire Station, Palmdale

The uncorrected versions of these records appeared in Volume I, Part G, Report No. EERL 72-20, and the plotted corrected accelerations, velocities and displacements were included in Volume II, Part G, Report No. EERL 73-52. These Volume II corrections included a long period cut-off of 8 seconds for the 70-mm film records in this part instead of the standard cut-off period of approximately 15 sec. The results published here reflect this altered low-frequency limit most clearly in the log-log plots where the Fourier amplitude spectrum in general commences falling off at a frequency of 0.125 cps ($\log f = -0.90$) instead of 0.07 cps ($\log f = -1.15$).

Several comments applying to the reports of the Volume IV series of Fourier spectra are included in the next section.

NOTES ON THE VOLUME IV SERIES

The following includes some general background information describing the Volume IV series.

The series of reports in Volume I present "uncorrected" digitized and plotted strong-motion earthquake accelerograph data, while the series in Volume II present corrected digitized data prepared so that the maximum information over the widest practicable frequency range would be available. The corrections include long period filtering ensuring to the greatest extent possible a uniform type of baseline adjustment and an instrument correction to account for the high frequency response characteristics of the accelerograph transducer.

The Volume III series presents earthquake response spectrum curves calculated from the corrected accelerograms of Volume II, while the Volume IV series contains Fourier spectra calculated by the Fast Fourier Transform algorithm. An extensive introduction was prepared for Volume IV, Part A, Report No. EERL 72-100, where details of the methods used can be found together with examples of applications to various problems of earthquake engineering and strong-motion seismology. That introduction should also serve as a basic summary of background information for users of the data.

Contents of the Various Parts. The specific records whose "uncorrected" digitized versions appeared in Part A of Volume I are included subsequently with their analyses in Part A of Volumes II, III, and IV. This arrangement has been maintained throughout the whole series. In Part C of Volume IV, Report No. EERL 73-101, we

began the presentation of Fourier spectra analysis for the unusually important series of accelerograms obtained during the San Fernando earthquake of February 9, 1971. These are expected to be concluded with Part S. The reports following Part S will continue with the original selection of approximately one hundred strong-motion records on which a start was made in Parts A and B.

Component Directions. A description of the component direction nomenclature for the records was given in Volume II, Part B, Report No. EERL 72-50. Consistent with this, the component direction where it appears in this report refers to the direction of the transducer pendulum motion for the trace to be deflected "up" on the record when viewed in the normal way with time increasing from left to right. The direction of true ground acceleration is opposite to this pendulum motion. The spectral calculations of Volume IV, however, are concerned with the amplitude spectrum only and the particular component sense is thus immaterial.

Assessment of Long Period Errors. A separate section in Volume II, Part G, Report No. EERL 73-52, entitled "Current Assessment of Long Period Errors" describes the results of a recent investigation of long period displacements calculated from recorded accelerations. During the course of this study it became evident that the procedures for preparation of 70-mm and, to a lesser extent, 35-mm film records from the San Fernando earthquake of February 9, 1971, introduced spurious excitations at periods close to the duration of the sectional enlargements. These effects have been removed from all of the 70- and 35-mm film records by filtering with a long period

limit of 8 seconds rather than the standard cut-off period of 16 seconds in the Volume II correction procedure. The following list of Caltech reference numbers indicates the records from the San Fernando earthquake included in Volume I, Parts C through S, that have been processed with the cut-off period of 8 seconds:

Parts G, H, I, K, N, Q, R, S: All records in these parts.

Part J: Records J142 and J145 through J150.

Part L: Records L166, L167, L168; L172 through L175.

Part M: Records M176, M177, M178; M180 through M184.

Part O: Records O198 through O201; O206, O208, O210.

Part P: Records P231 and P232.

A decision was also made at the same time to eliminate a number of very low amplitude accelerograms from further processing (Volume II and on) reflecting the expectation that the resulting displacement records will be dominated by noise. Their Caltech reference numbers are as follows:

H127; I140; J151, J152; K153 through K156, K161 through K165; O202, O203, O209, O211, O212; P224 through P230.

Description of the Figures and Tables. For each component in the following pages the Fourier amplitude spectrum is presented in two forms - a linear plot and a log-log plot. Details concerning identification are given at the top of each plot. The second line gives the name, date, and time of occurrence of the earthquake; the third line is comprised of two labels, the observation station and the component processed. The Roman numeral "IV" in the first identification

label indicates that the results pertain to the fourth stage of data processing, i.e., Volume IV of Fourier spectra of accelerogram records already corrected for baseline adjustment and instrument response. The letter following the Roman numerals indicates the part of Volume II to which the processed record belongs. The three digit number completing the first label is the Caltech Reference Number for the given earthquake record in Volume I, right-adjusted in a three-digit numerical field. The second label is a string of three numbers separated by periods; the first number gives the year in which the earthquake occurred; the second is the serial number of the record as it was received at the Caltech Earthquake Engineering Research Laboratory during that year; and the last number indicates whether it was a main event or an aftershock (sequentially numbered, the main event starting from zero). On the linear spectrum plot, the data lying above the 95 percent confidence level may be considered relevant to that degree. The spectra have been plotted up to a frequency of 25 cyc/sec on linear and logarithmic scales, corresponding to the capabilities of the instrumentation and data processing methods used.

Frequency Transfer Functions. This report presents many spectra of accelerograms recorded simultaneously at different locations in the same structure, for example, the basement, mid-height, and roof levels of a tall building. At present it is planned to calculate frequency transfer functions involving smoothing and calculating the ratio of two such spectra in supplementary reports.

Acknowledgments. The cooperative efforts of many people are essential in the preparation of a series of reports of this kind and we have been fortunate in the quality of staff that has carried out the various details with special care and attention. We should like to express our appreciation to Mr. Vincent Lee for his assistance with many details of computer programming, to Miss Barbara Turner and Miss Sharon Vedrode for the care taken over typing and editing, to the staff of the Willis H. Booth Computing Center for their continued help with all aspects of the computing process, and to the staff of the Caltech Graphic Arts Facilities for very efficient work on publication details. The whole project has been made possible by the continued support of the National Science Foundation, supplemented in an important way by contributions from the Earthquake Research Affiliates Program of the California Institute of Technology.

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California Institute of Technology

INDEX OF EARTHQUAKE RECORDS IN VOLUME IV, PART G

EARTHQUAKE DATA

The San Fernando, California, Earthquake of February 9, 1971, 0600 PST; epicenter, 34°24.0′N, 118°23.7′W; maximum intensity, XI; revised magnitude (M_L) 6.4; depth, 13.0 km.

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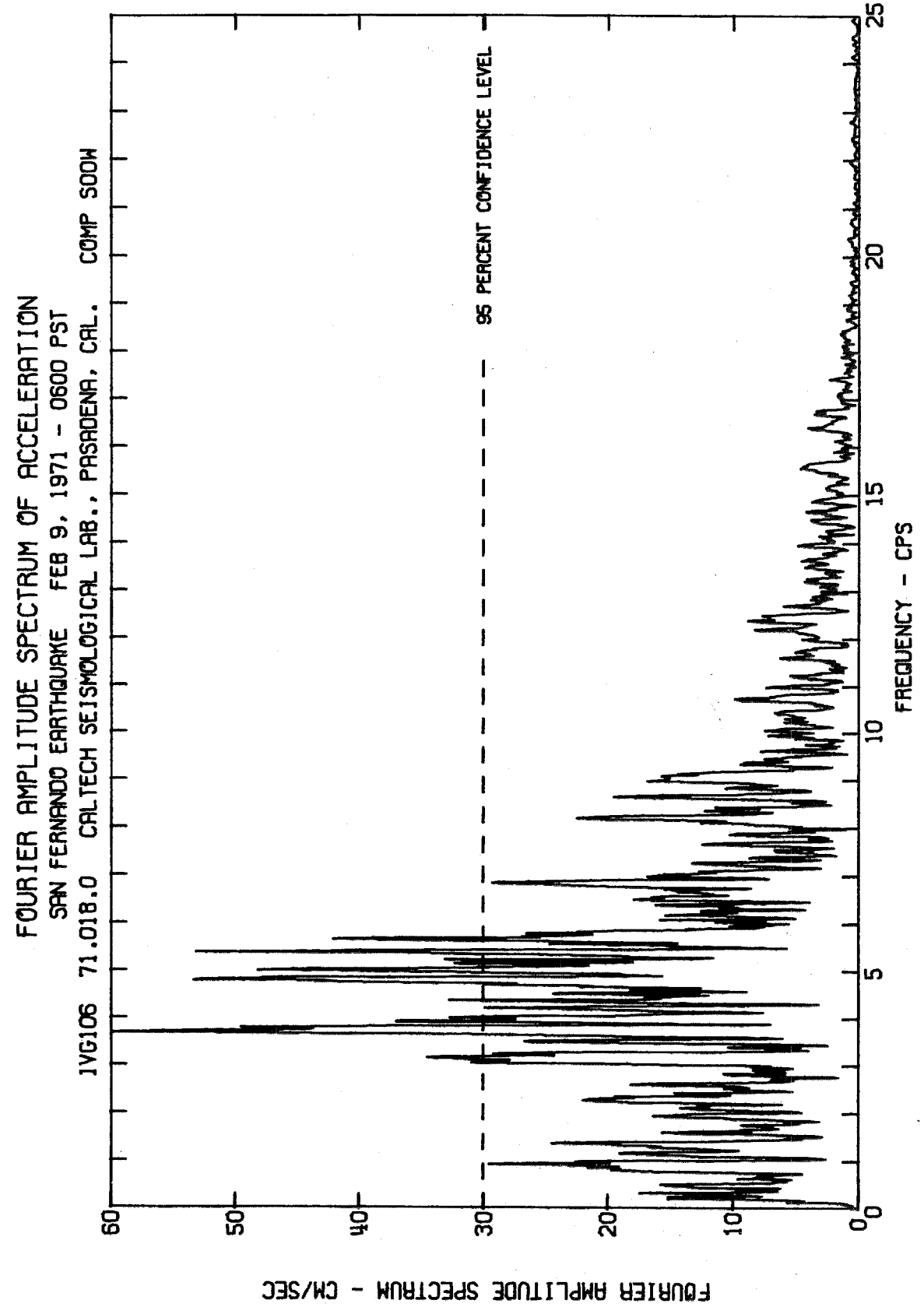
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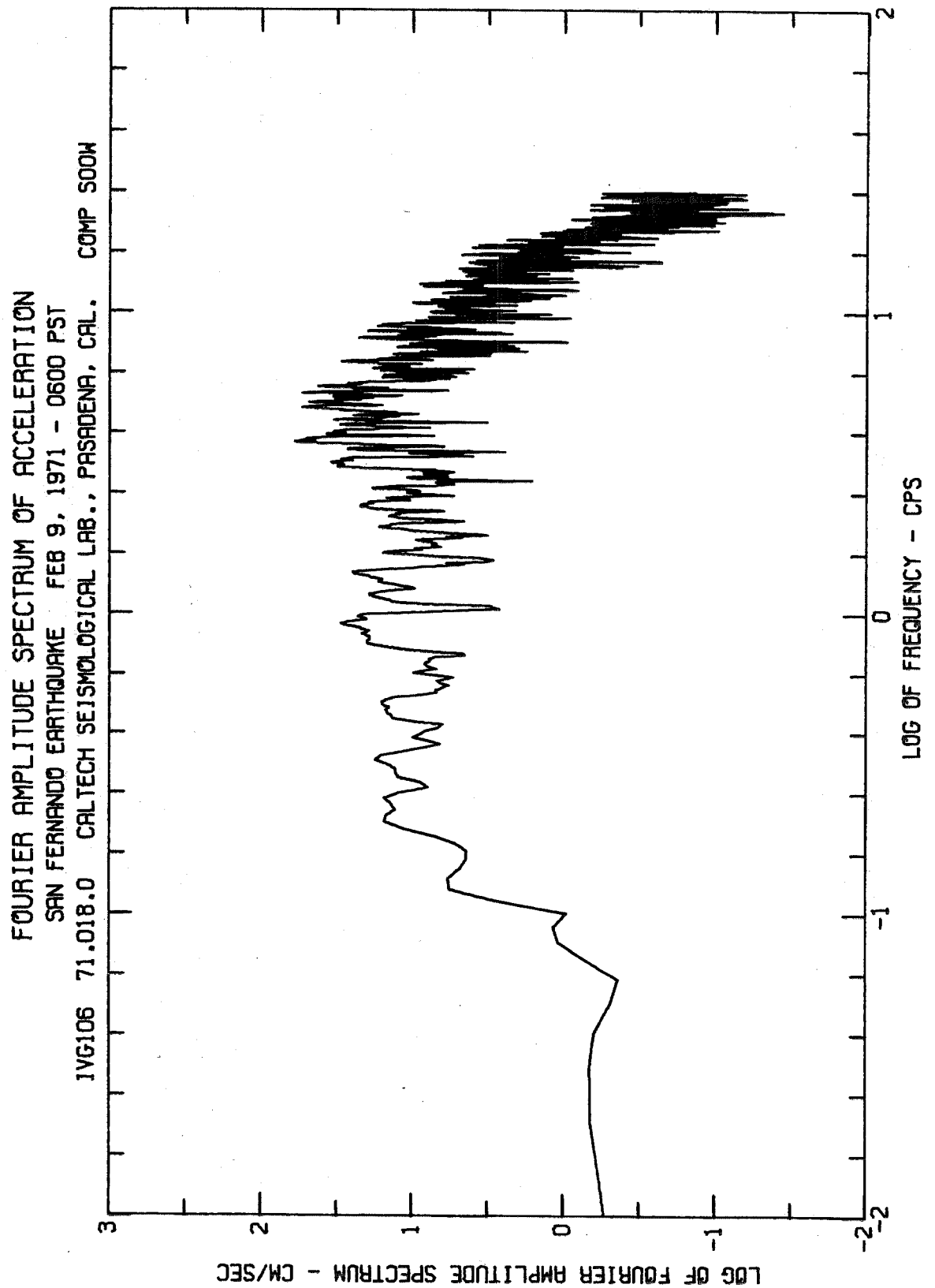
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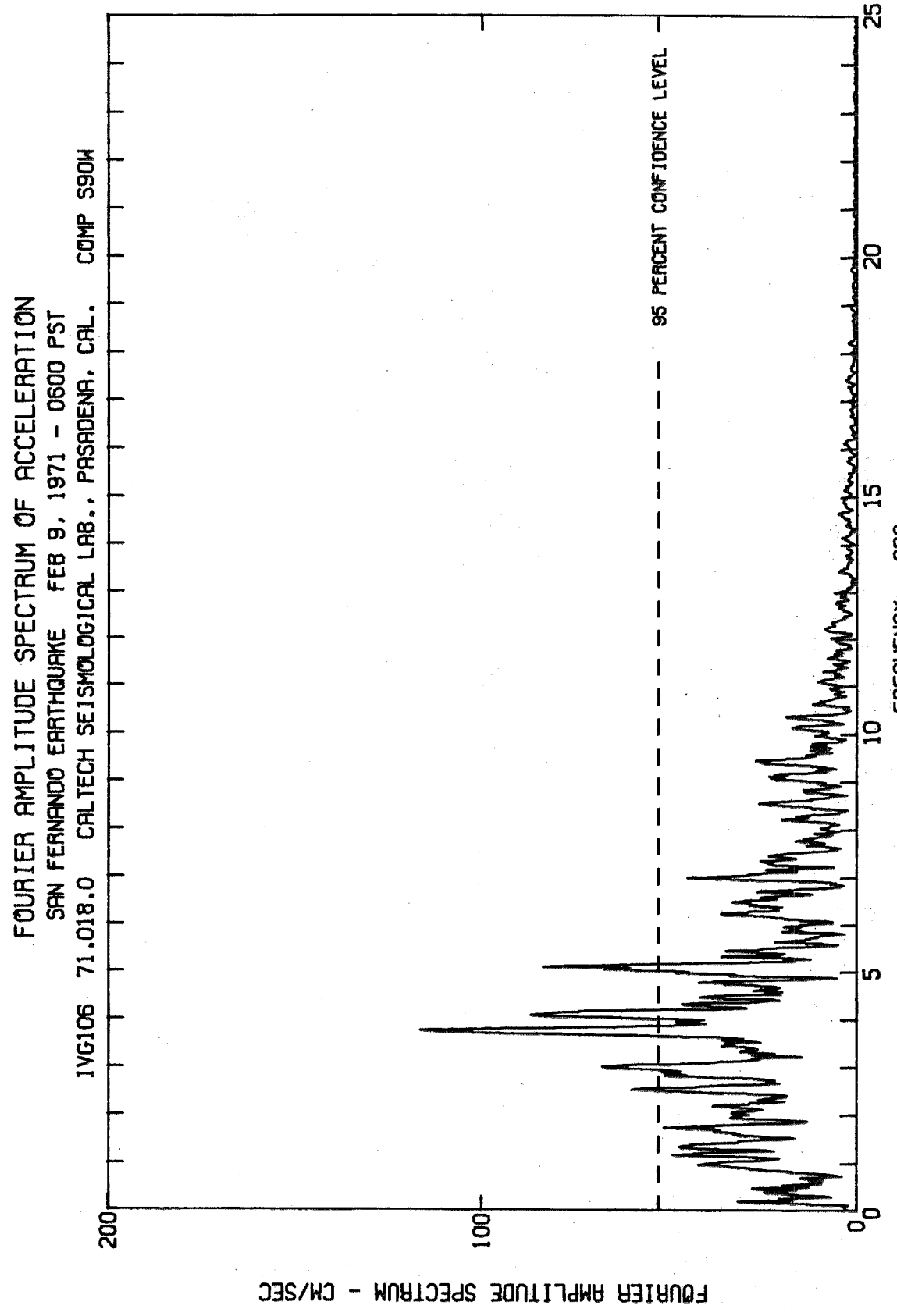
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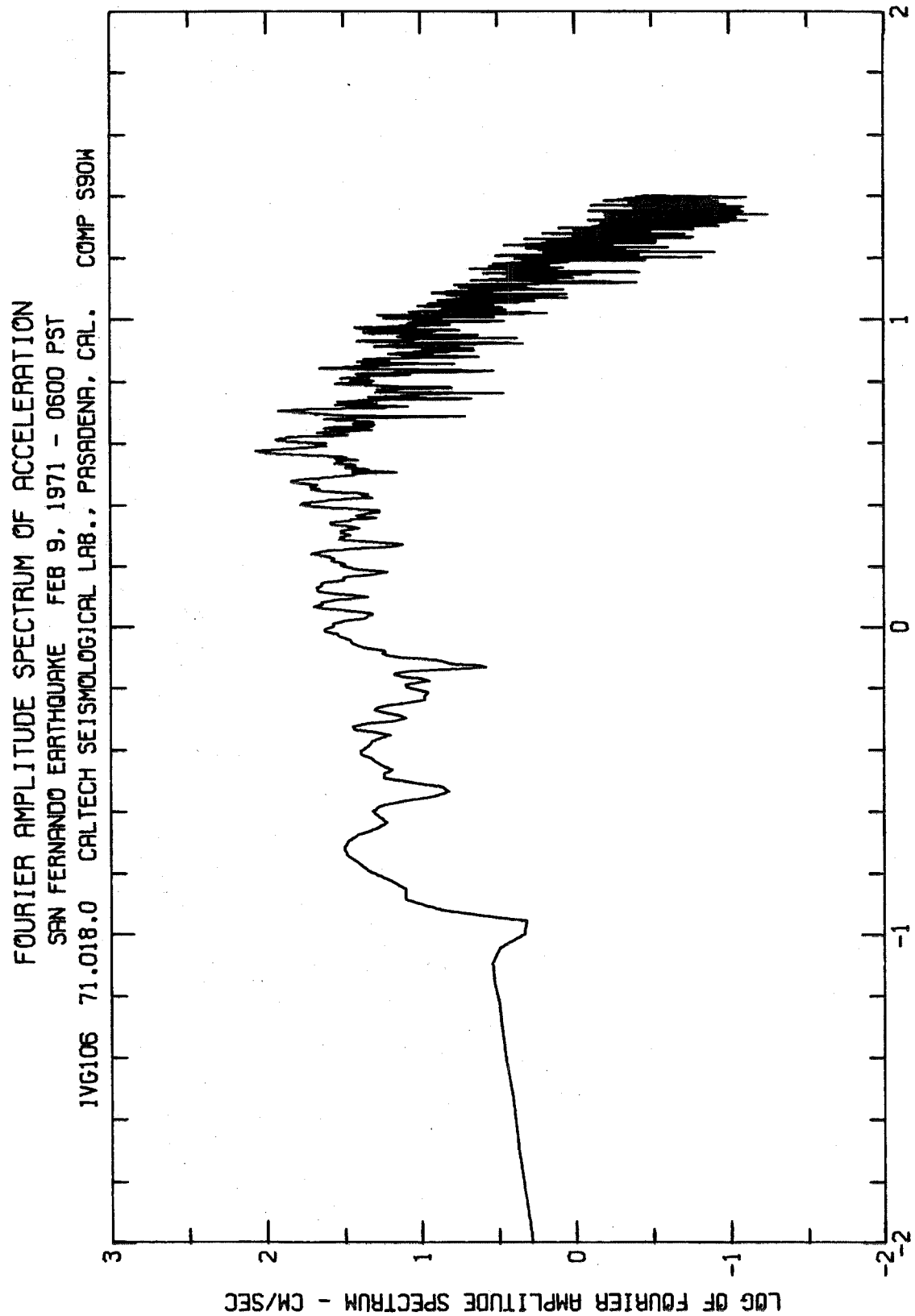
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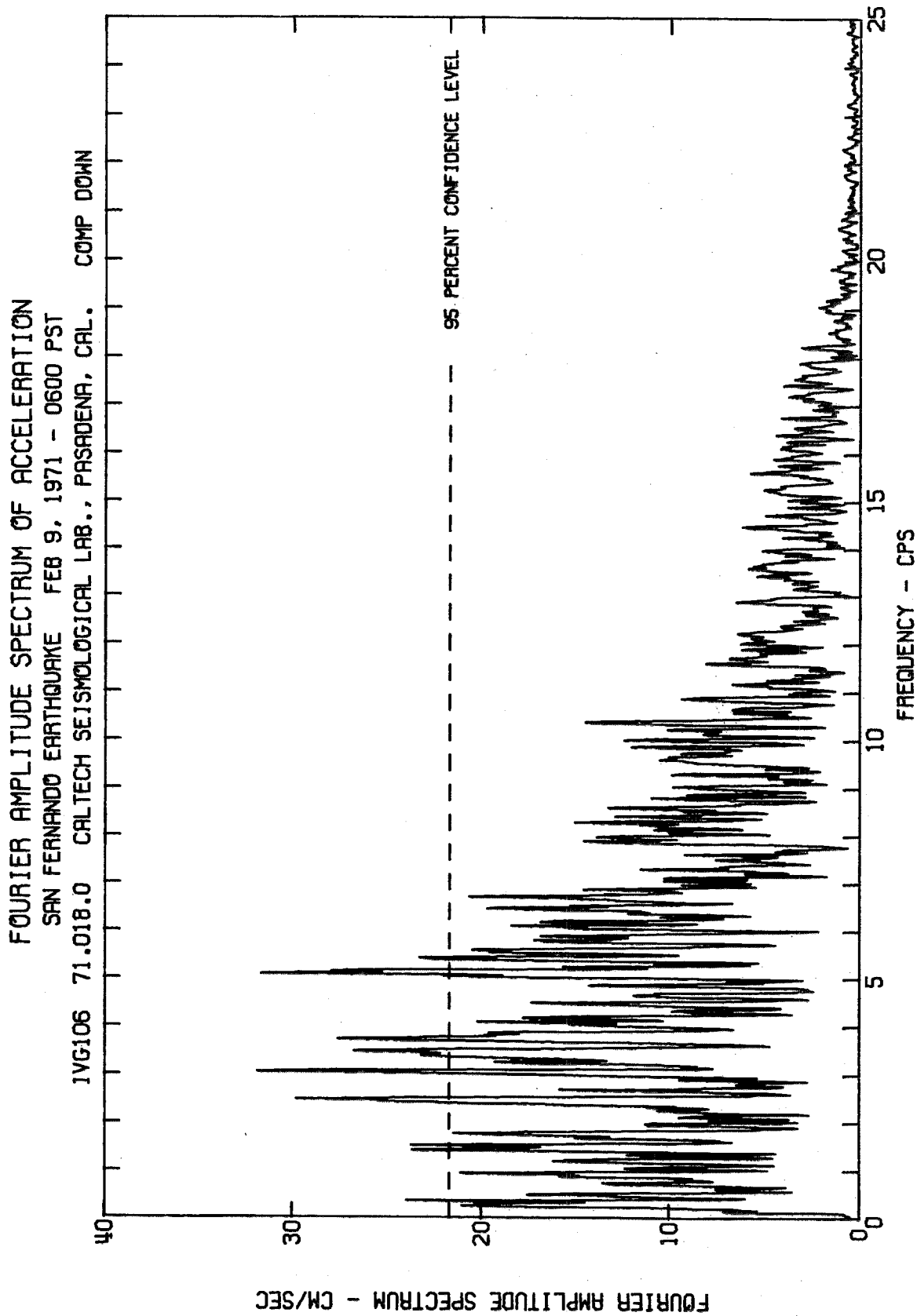
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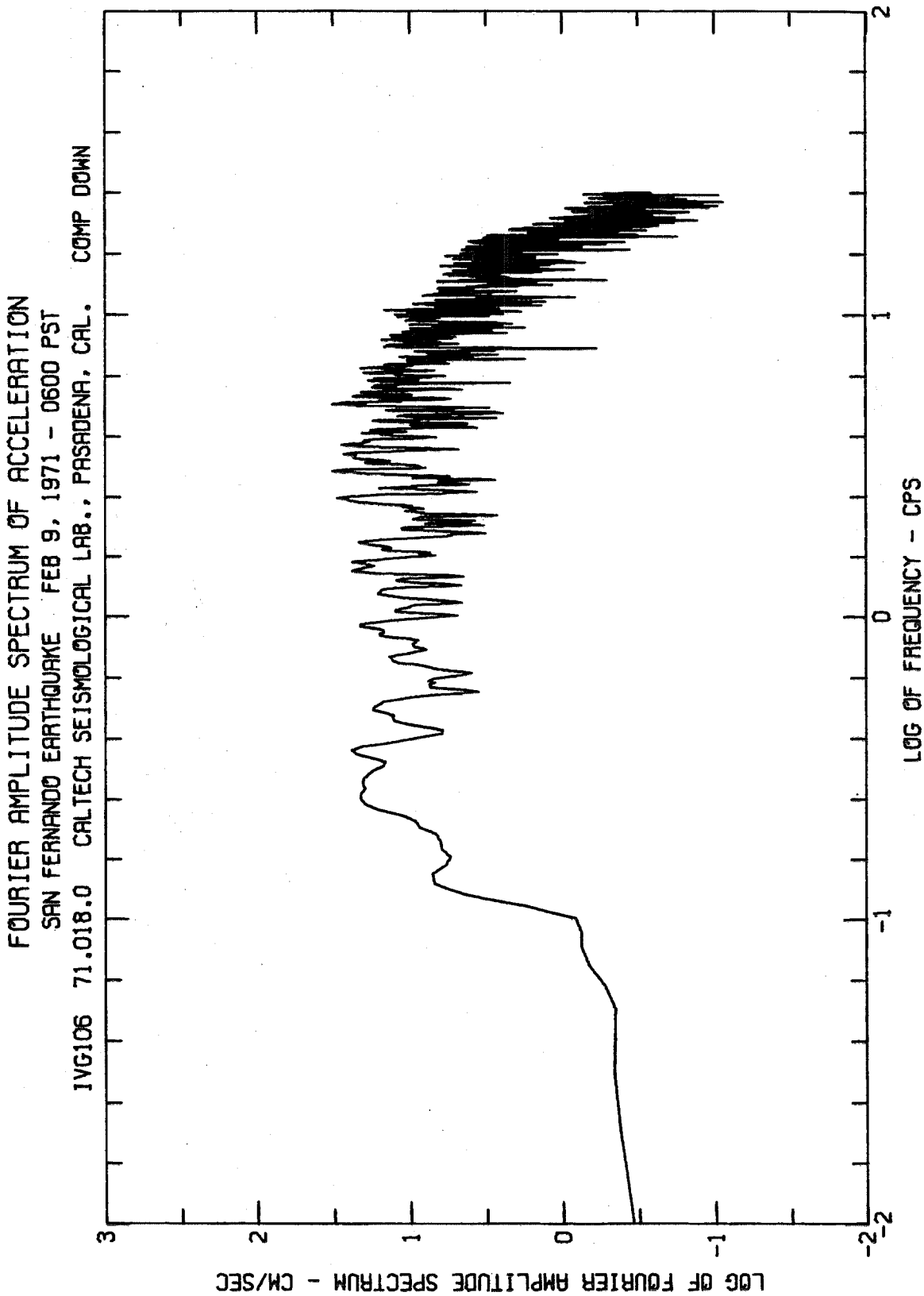
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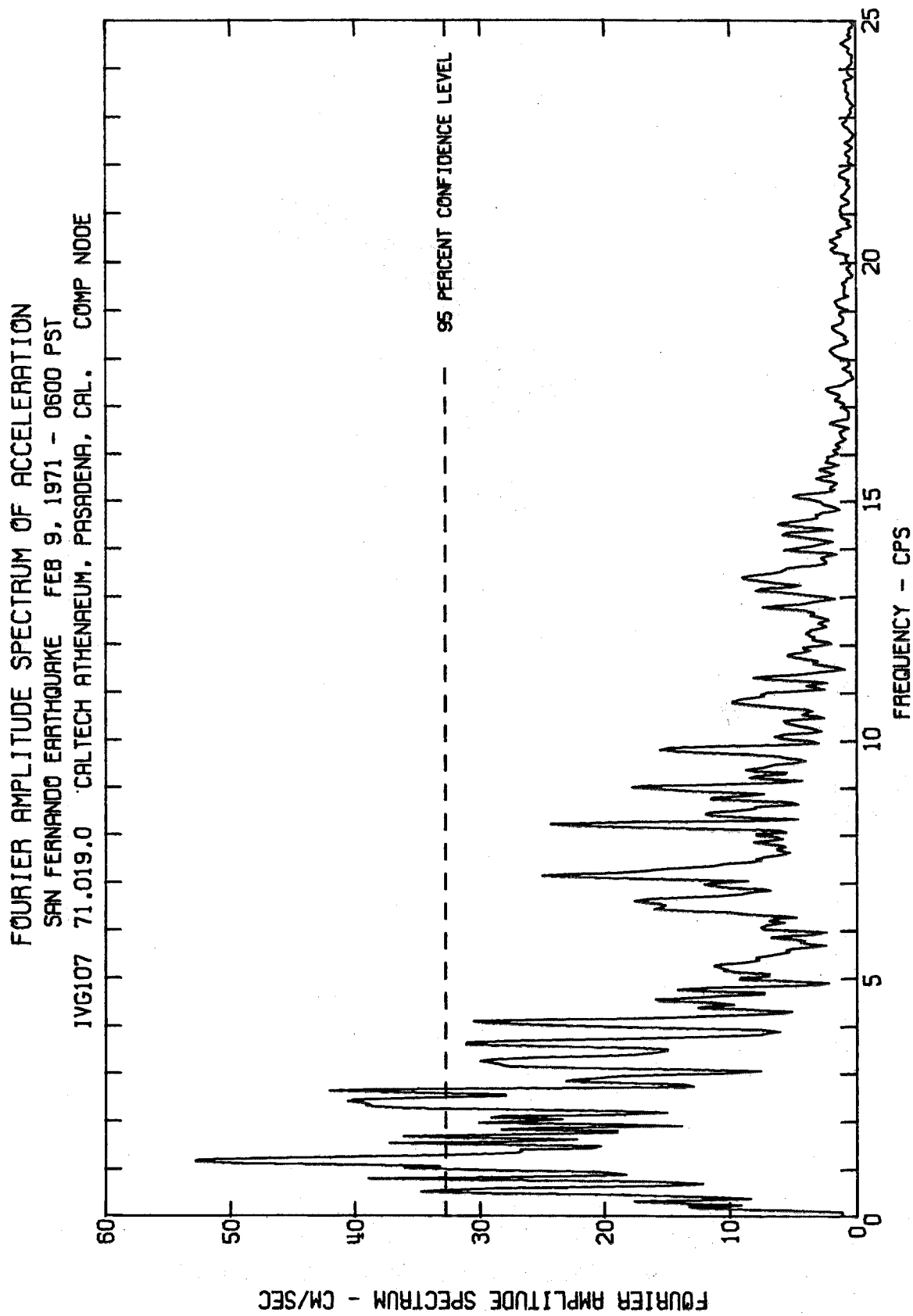
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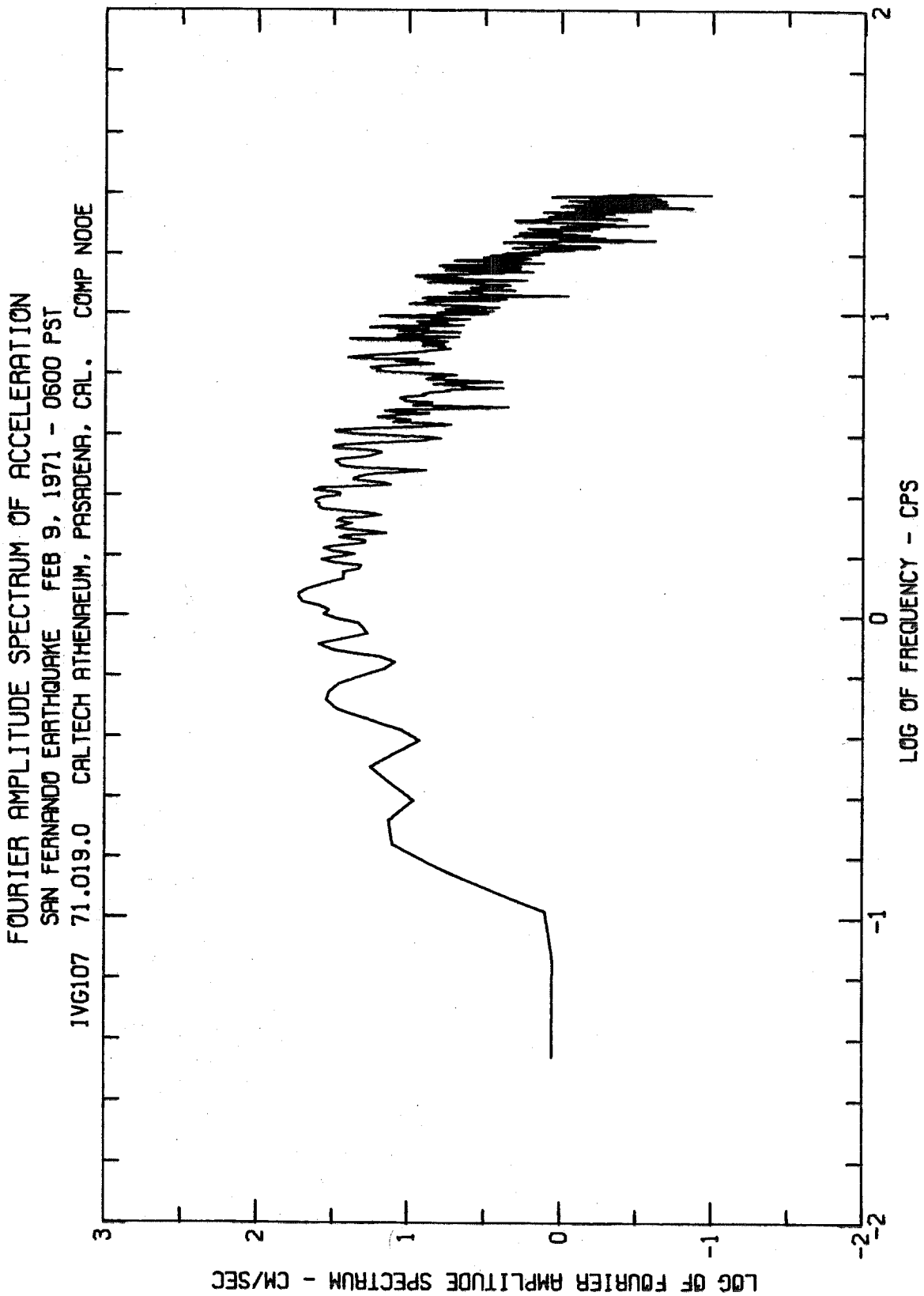
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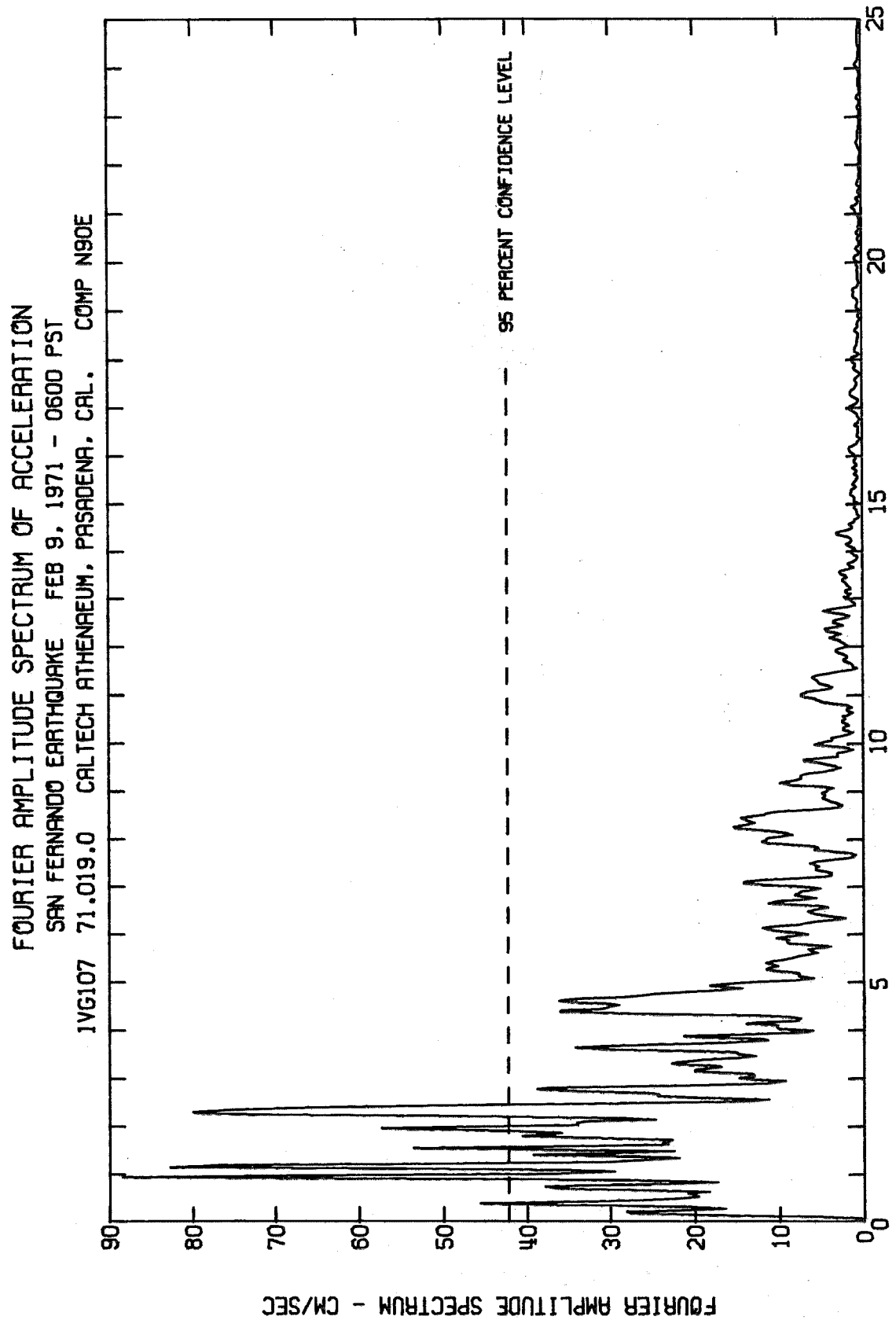
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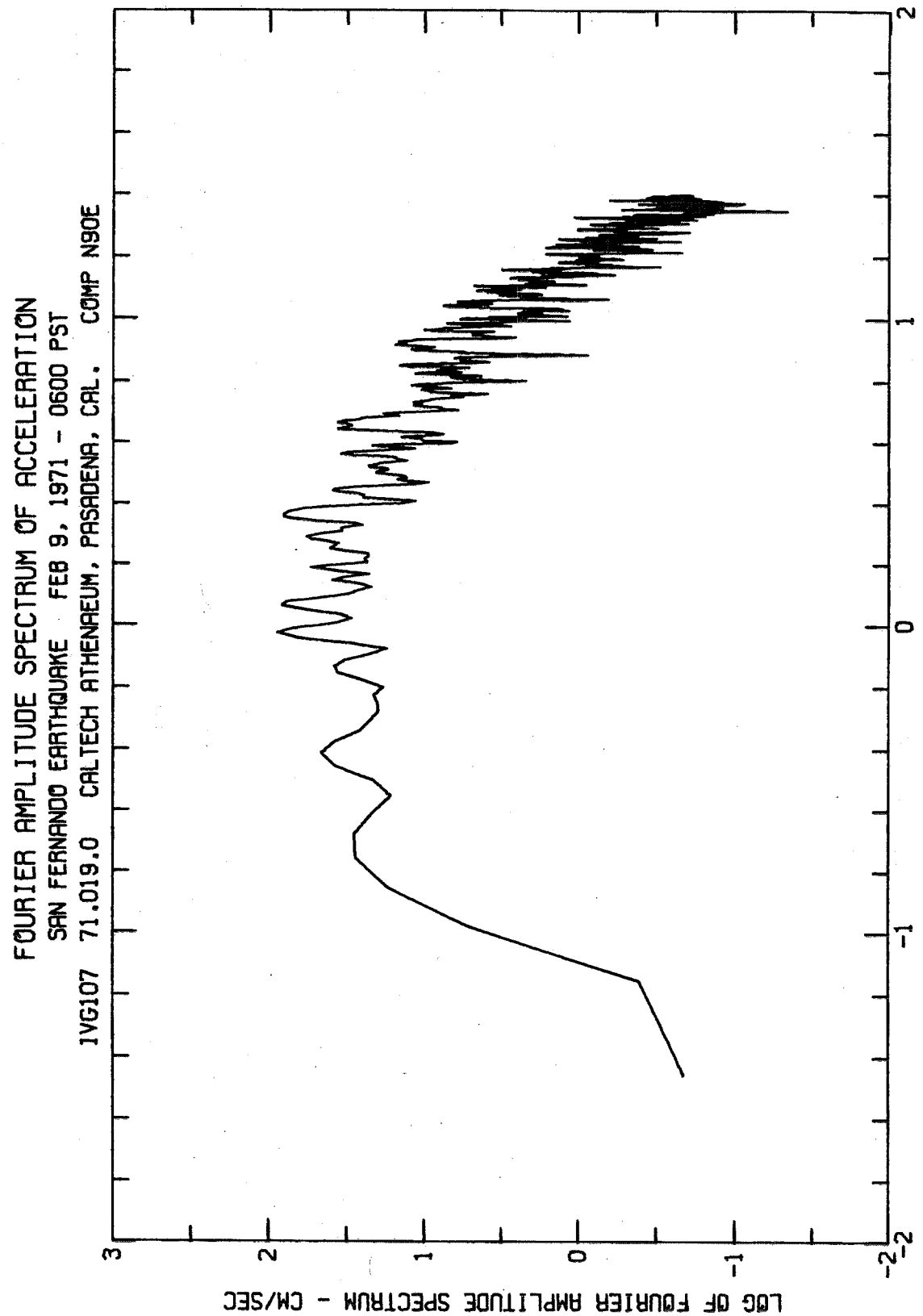
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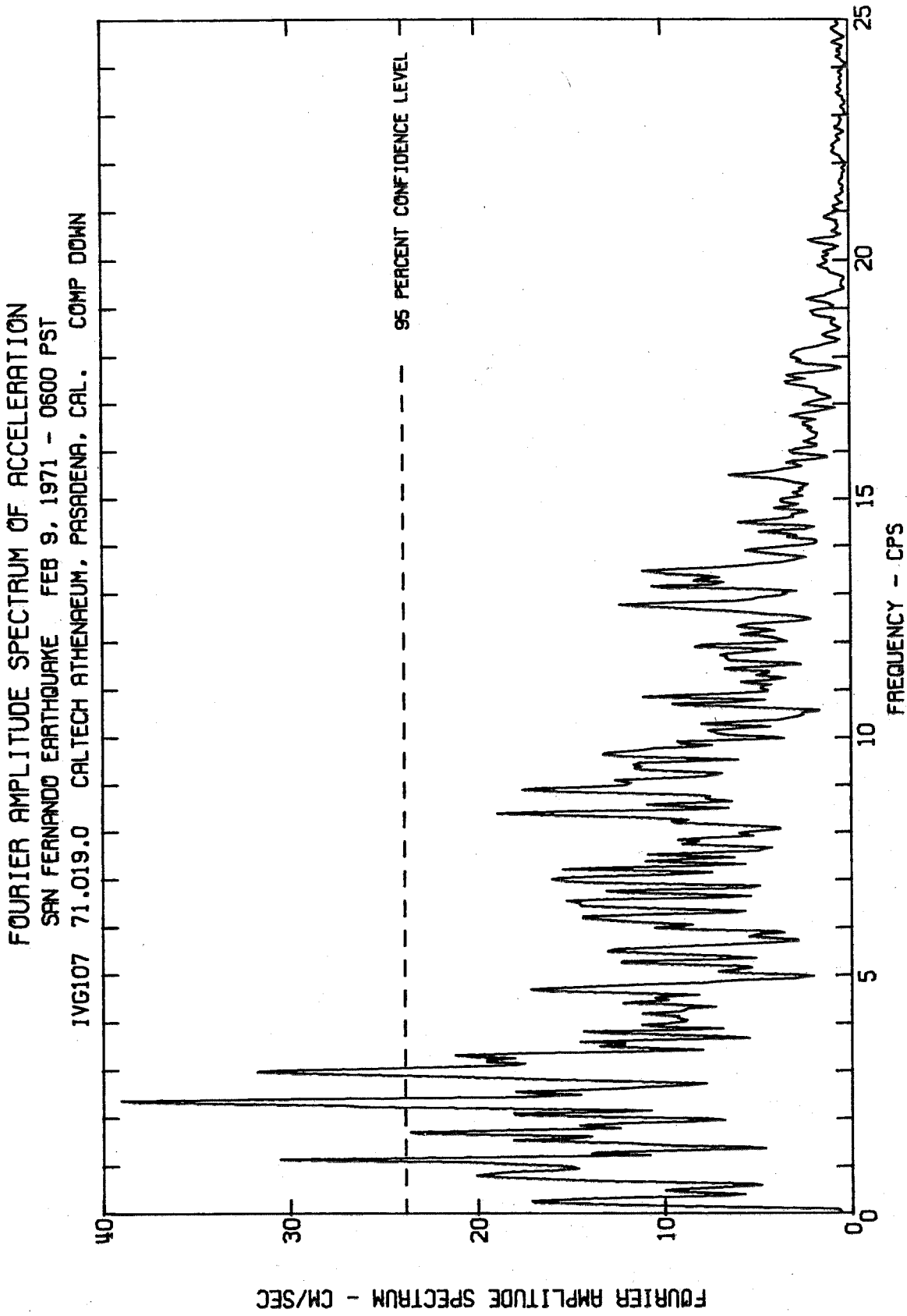
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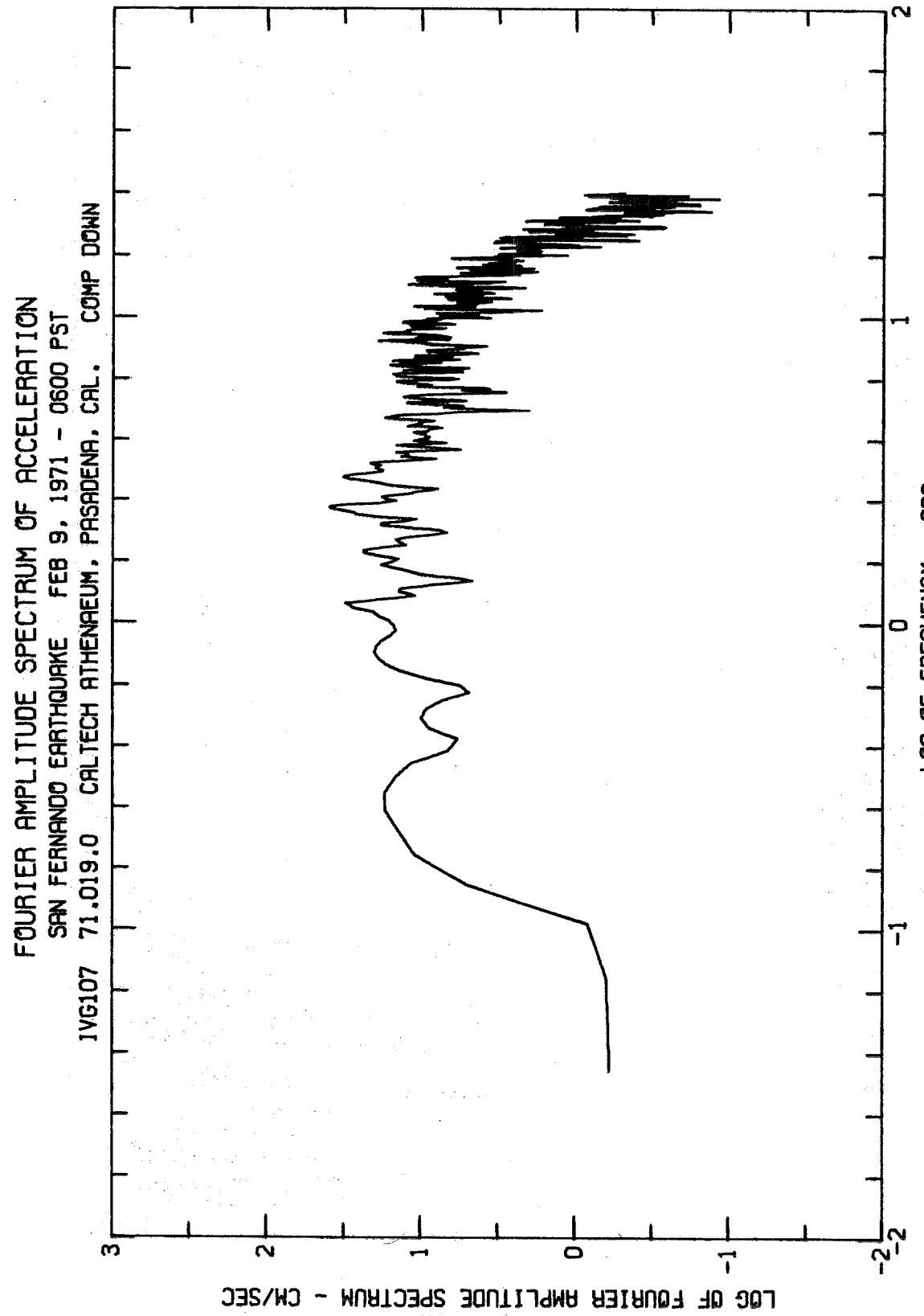
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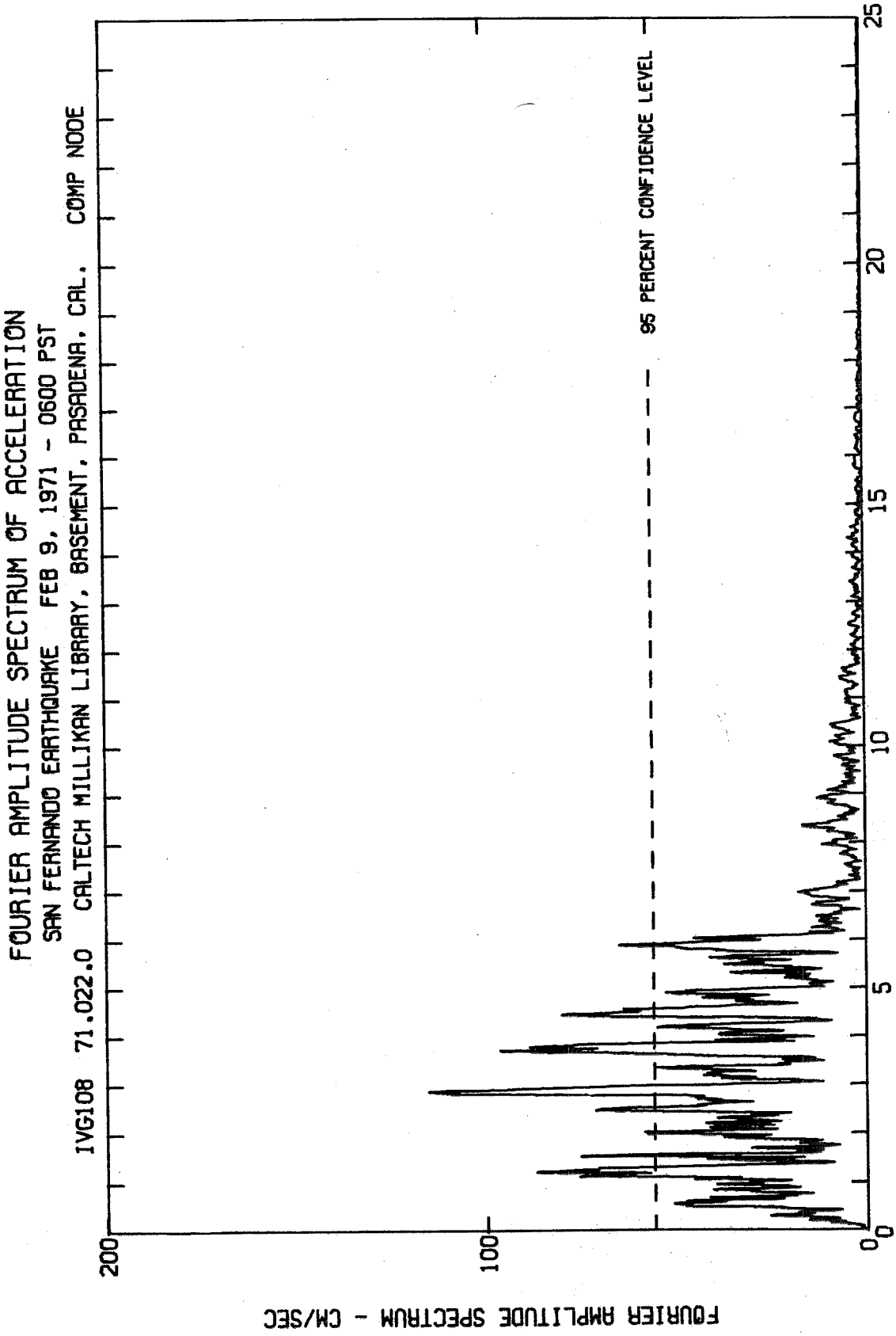
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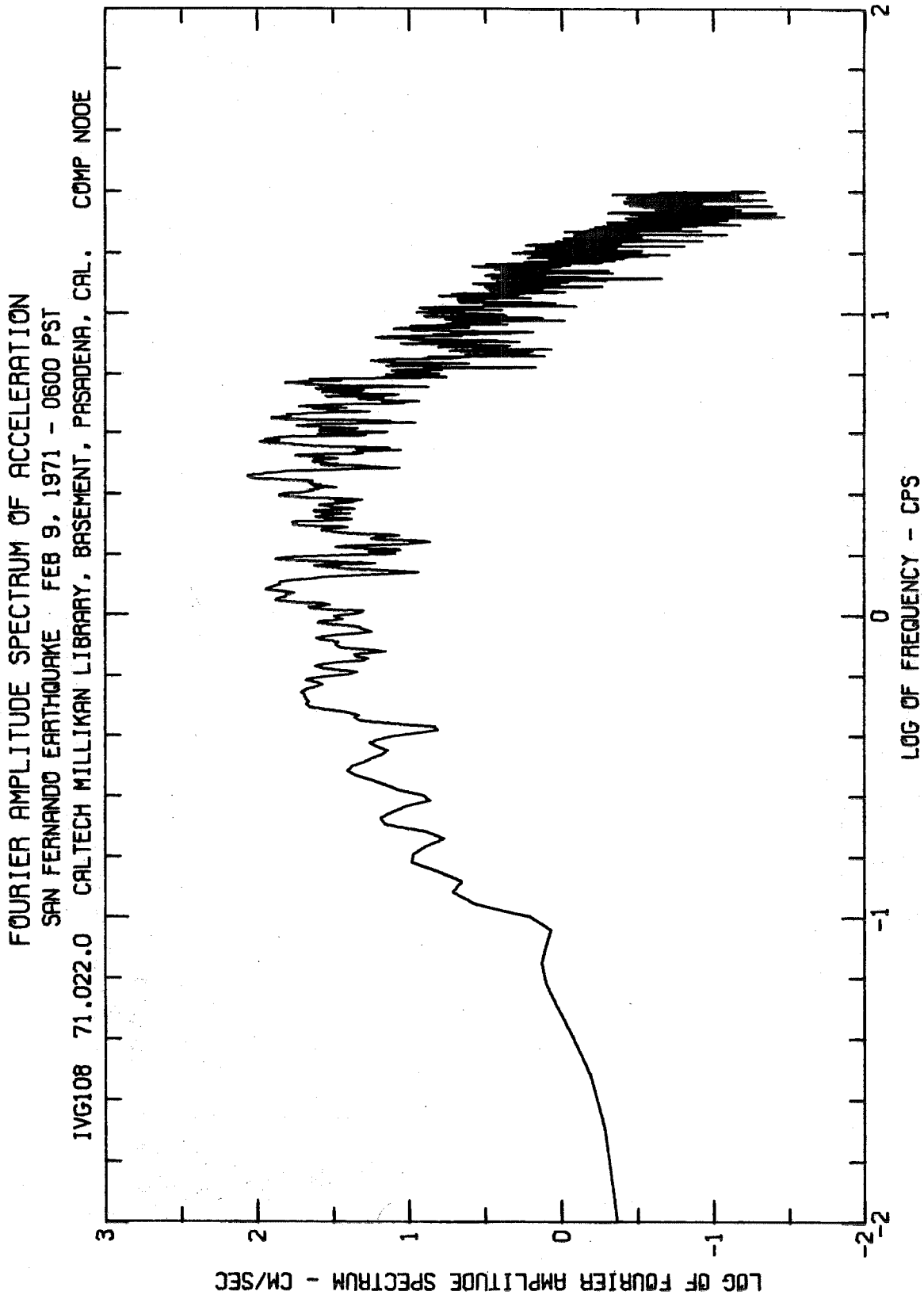
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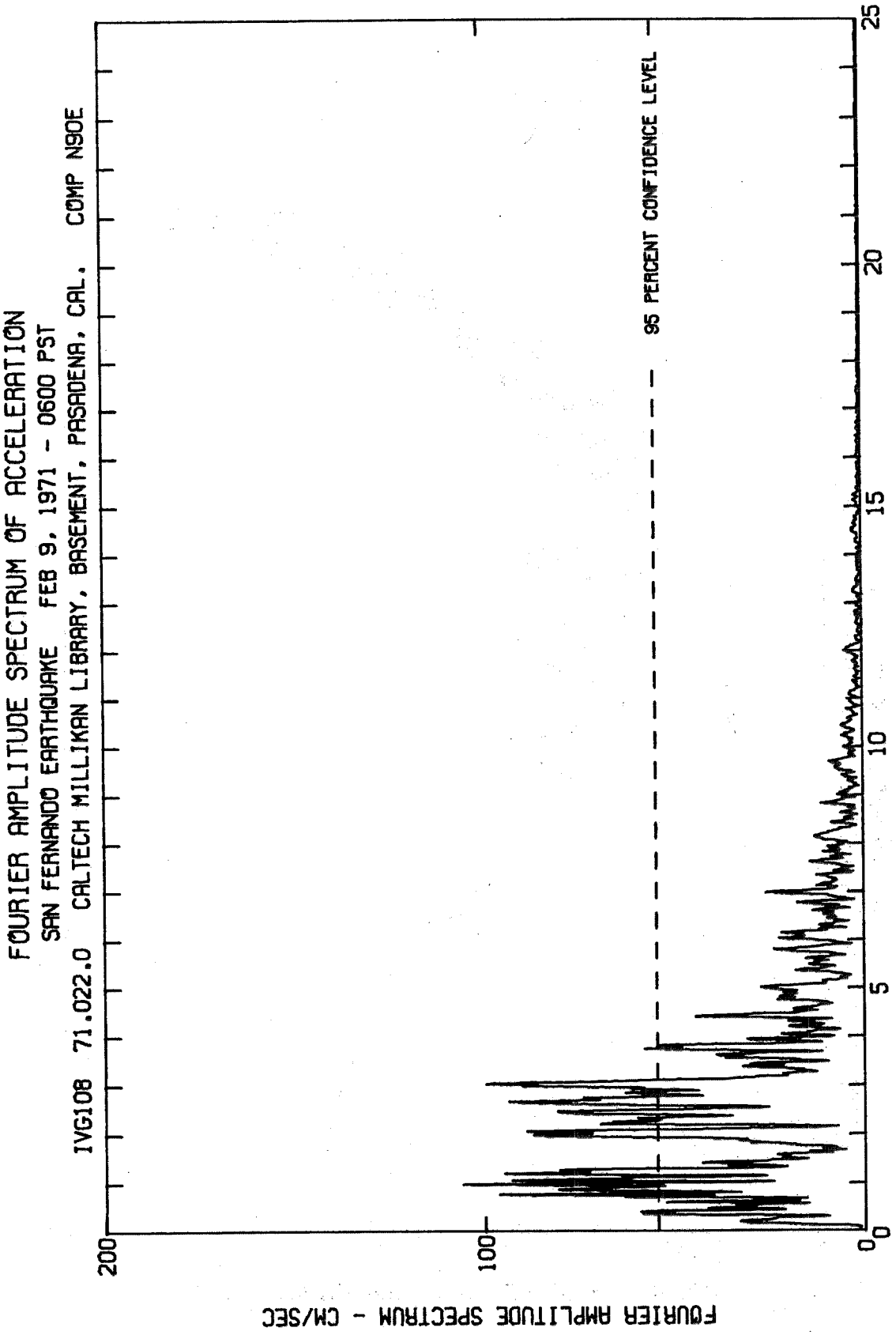
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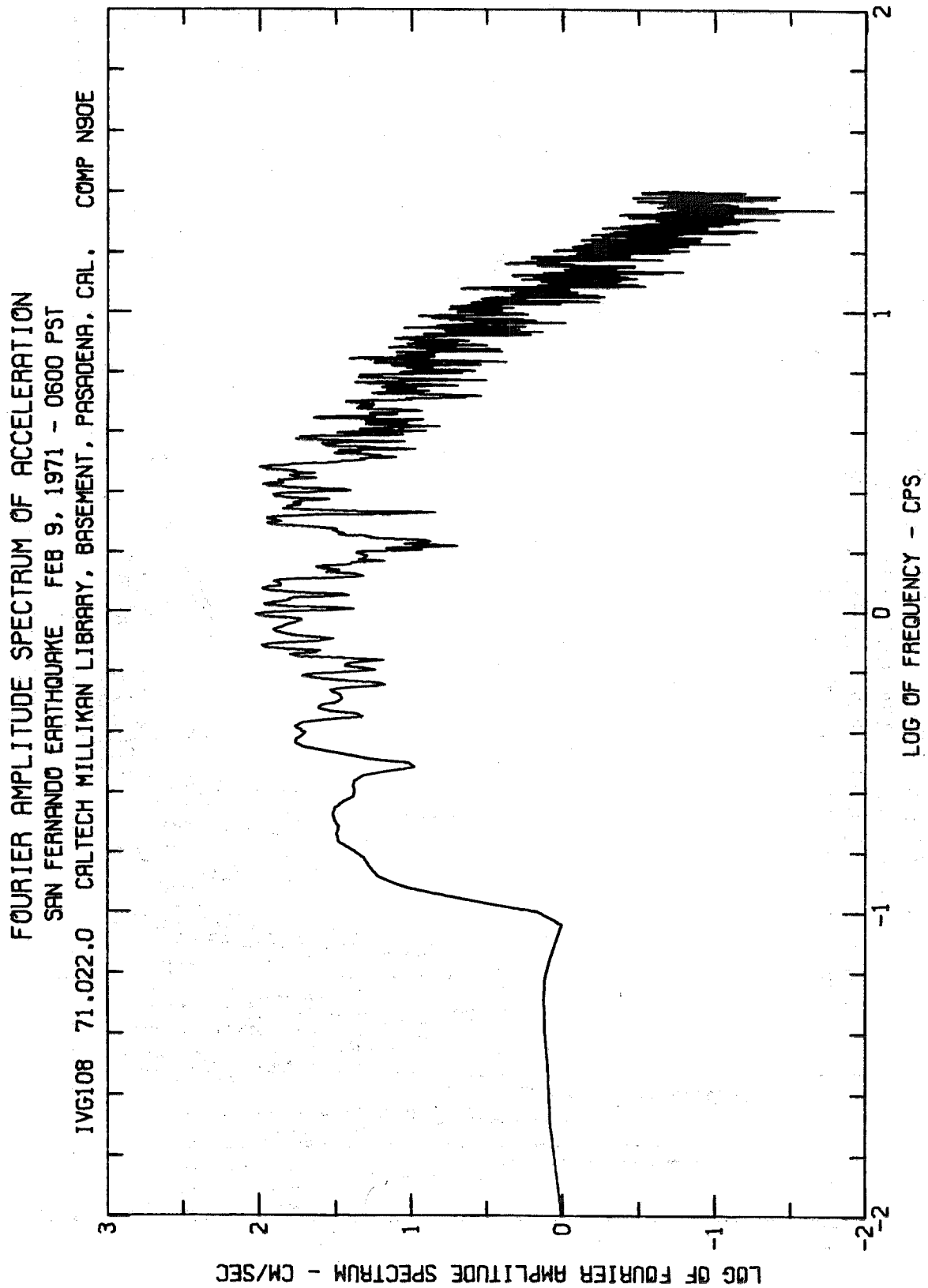
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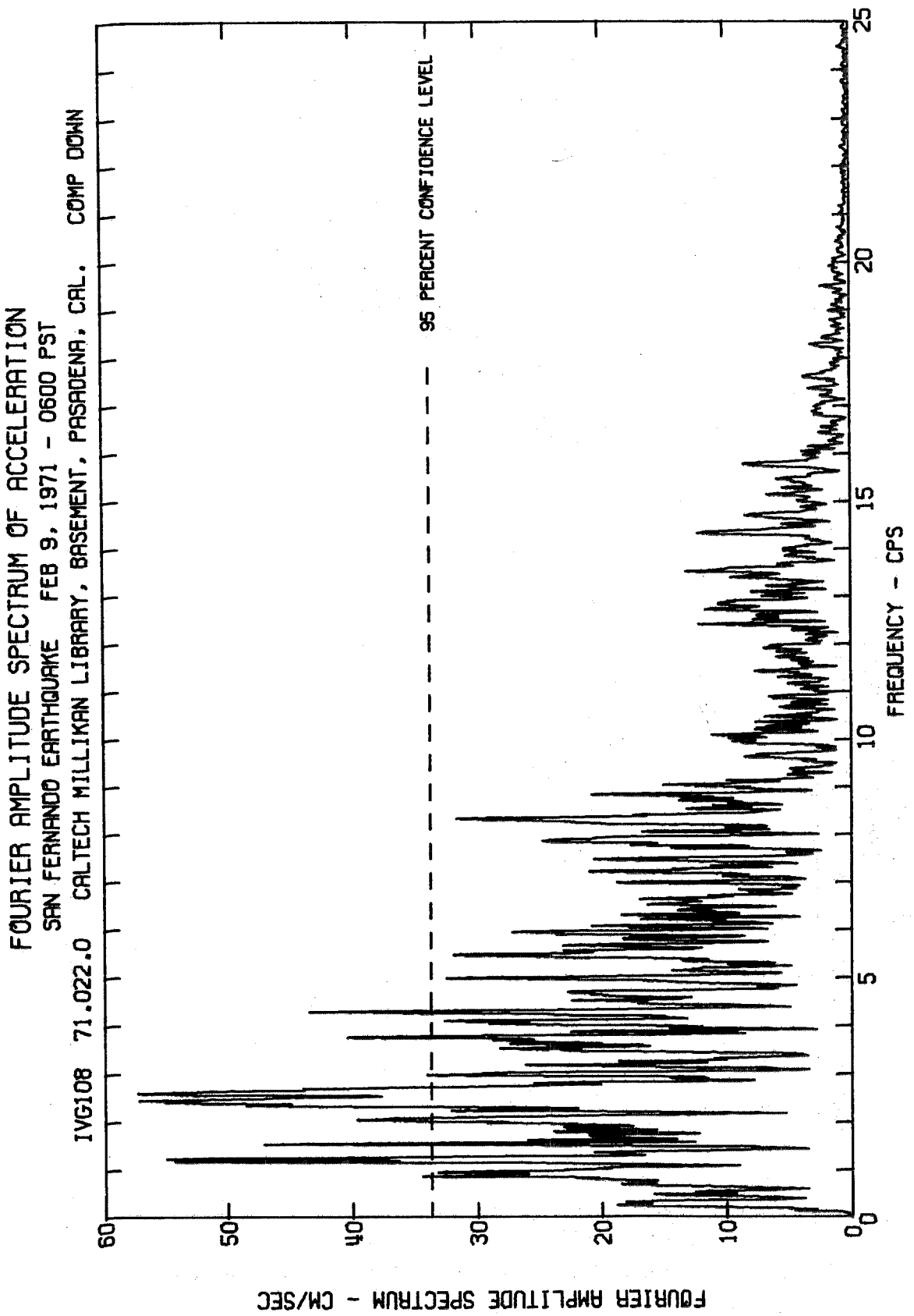
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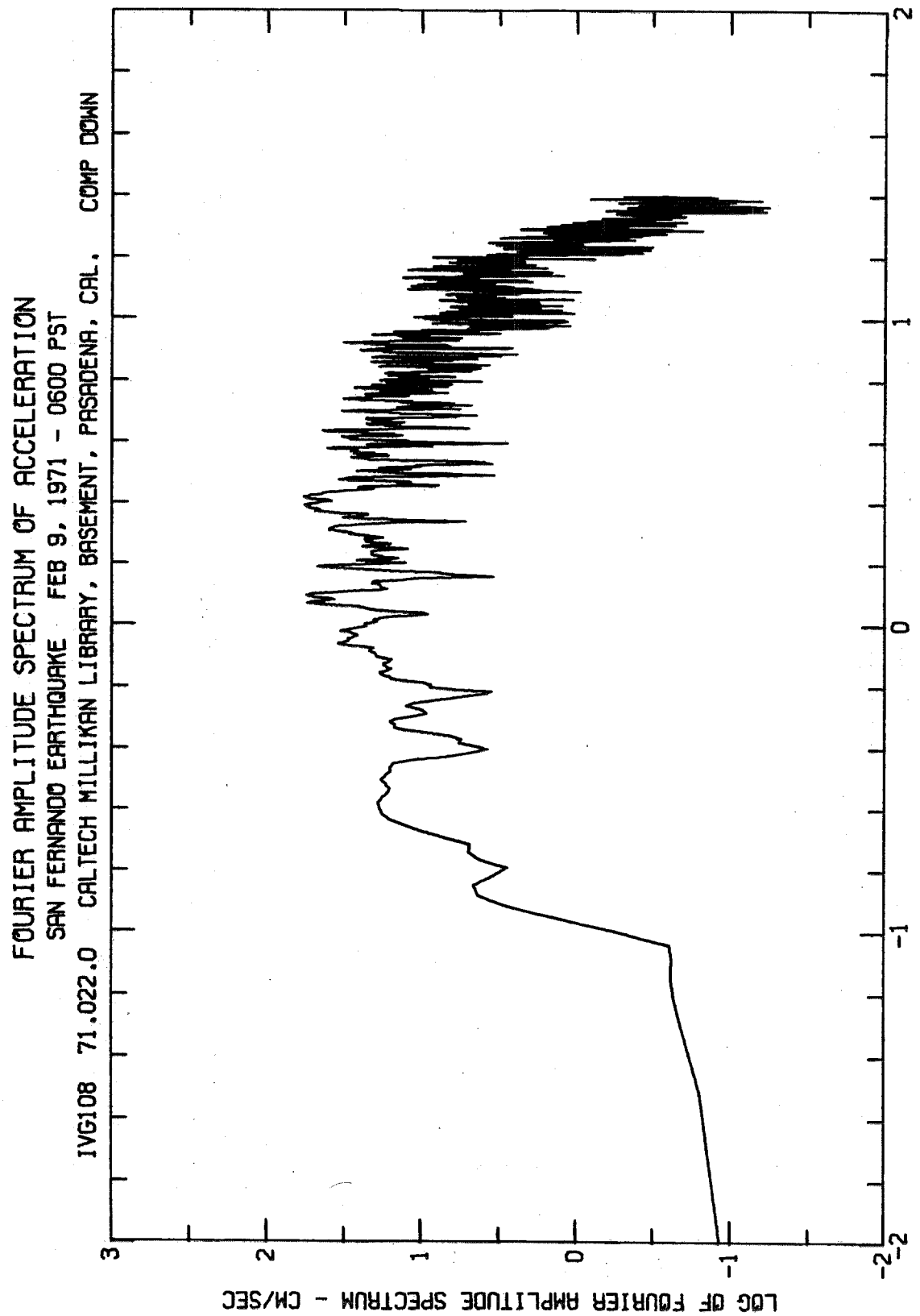
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG108 71.022.0 CALTECH MILLIKAN LIBRARY, BASEMENT, PASADENA, CAL. COMP DOWN
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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-1
-2
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-1
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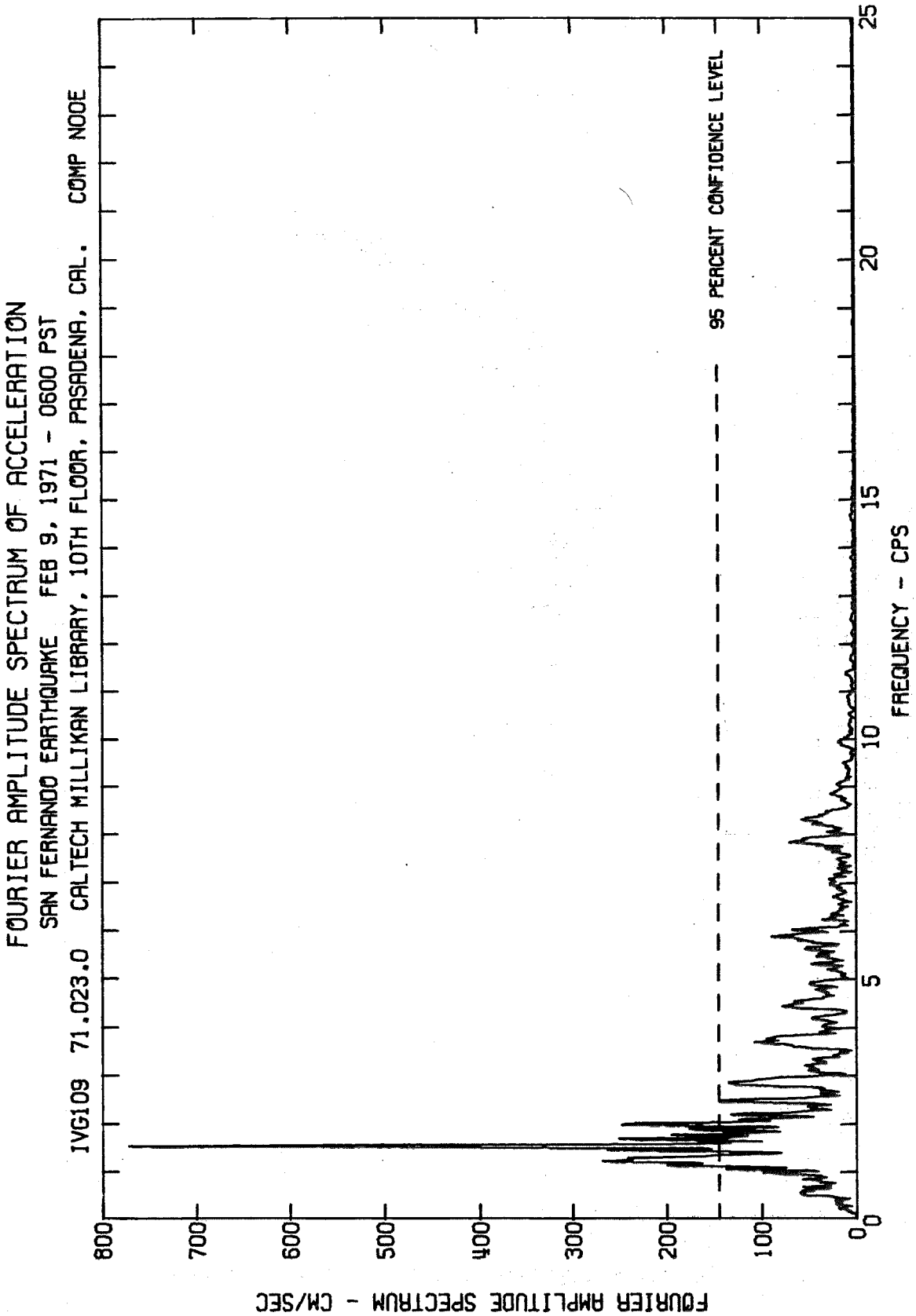
1
2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IVG109 71.023.0 CALTECH MILLIKAN LIBRARY, 10TH FLOOR, PASADENA, CAL. COMP NOOE
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
0
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300
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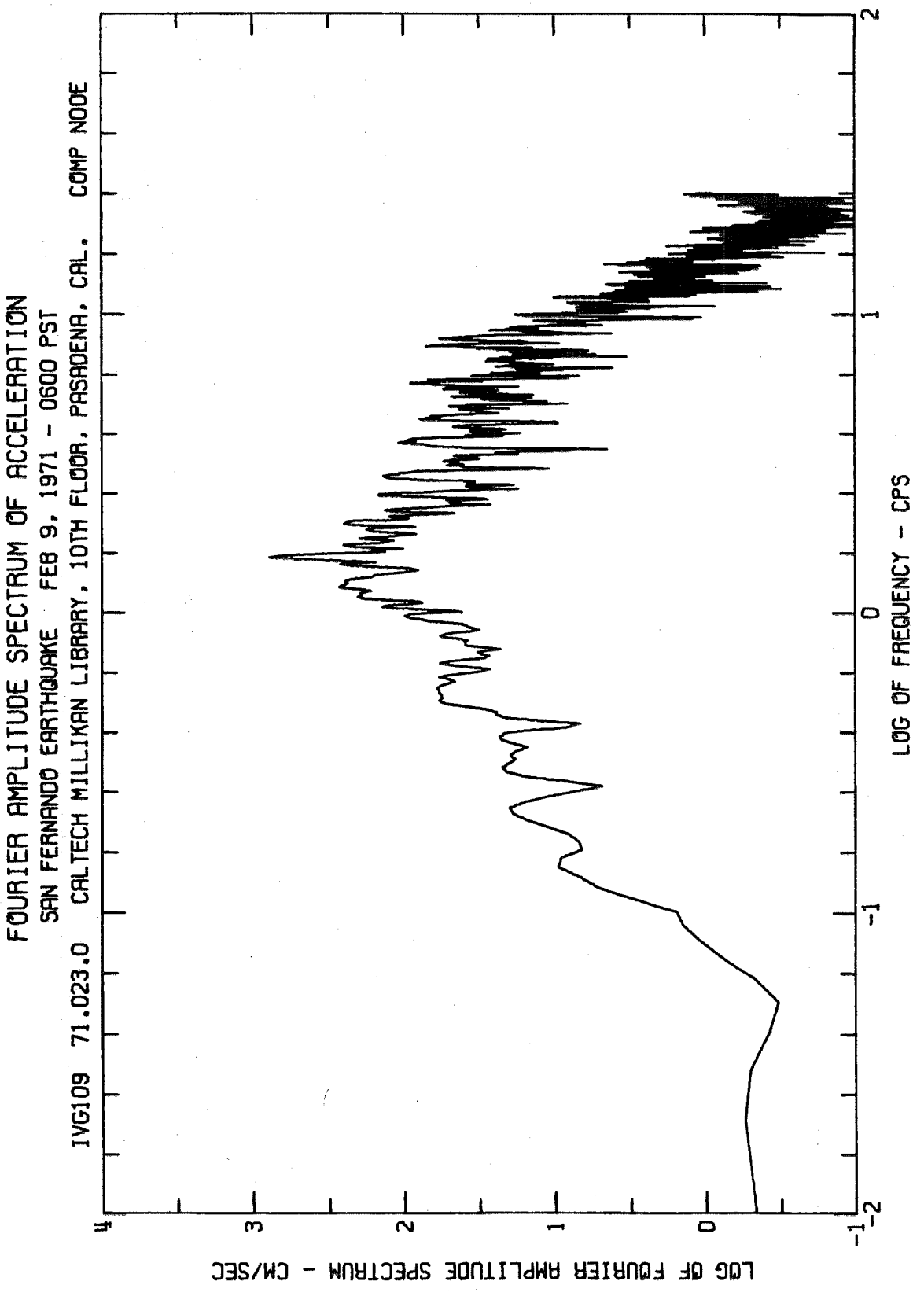
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SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
1VG109 71.023.0 CALTECH MILLIKAN LIBRARY, 10TH FLOOR, PASADENA, CAL. COMP NODE
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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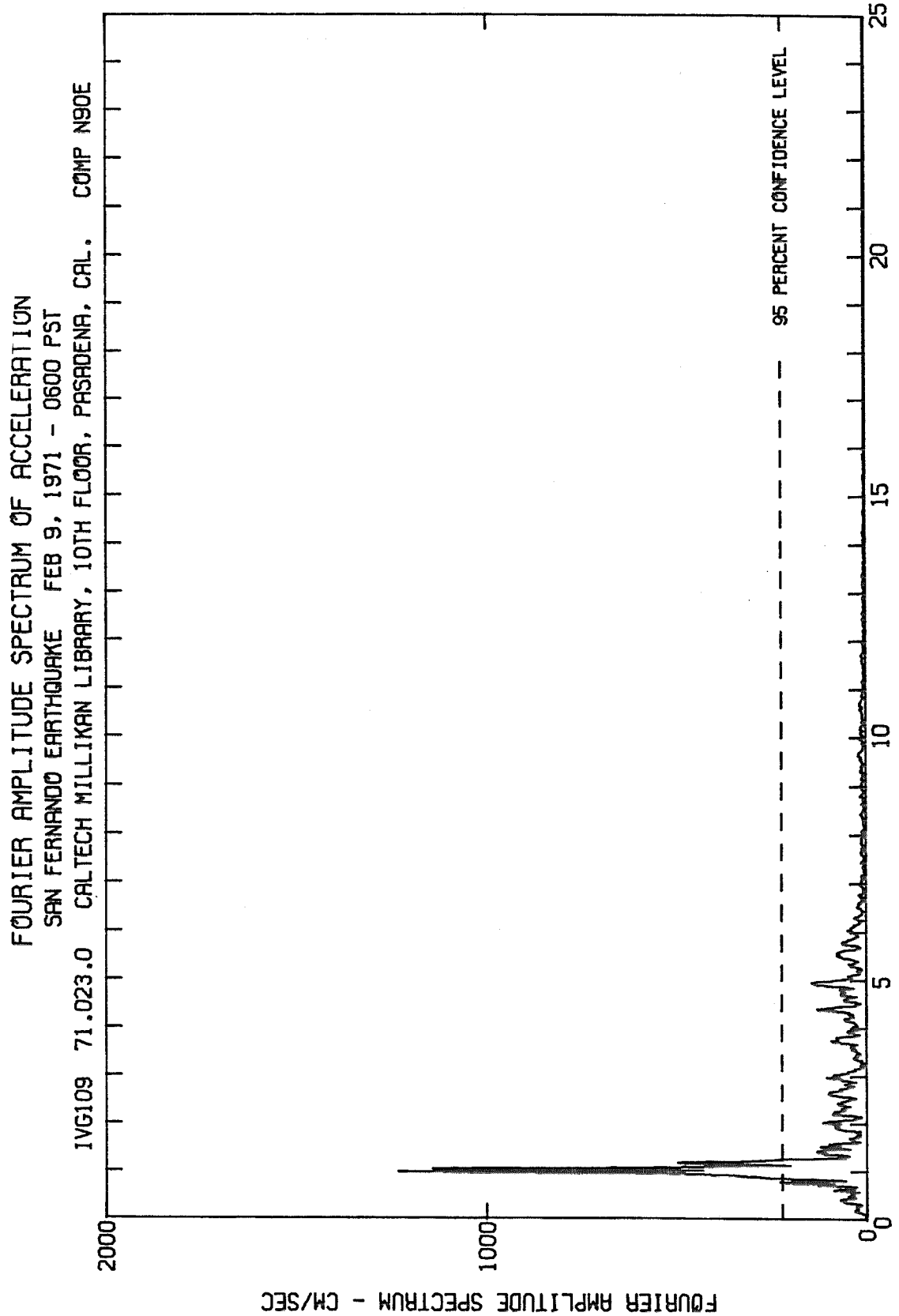
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SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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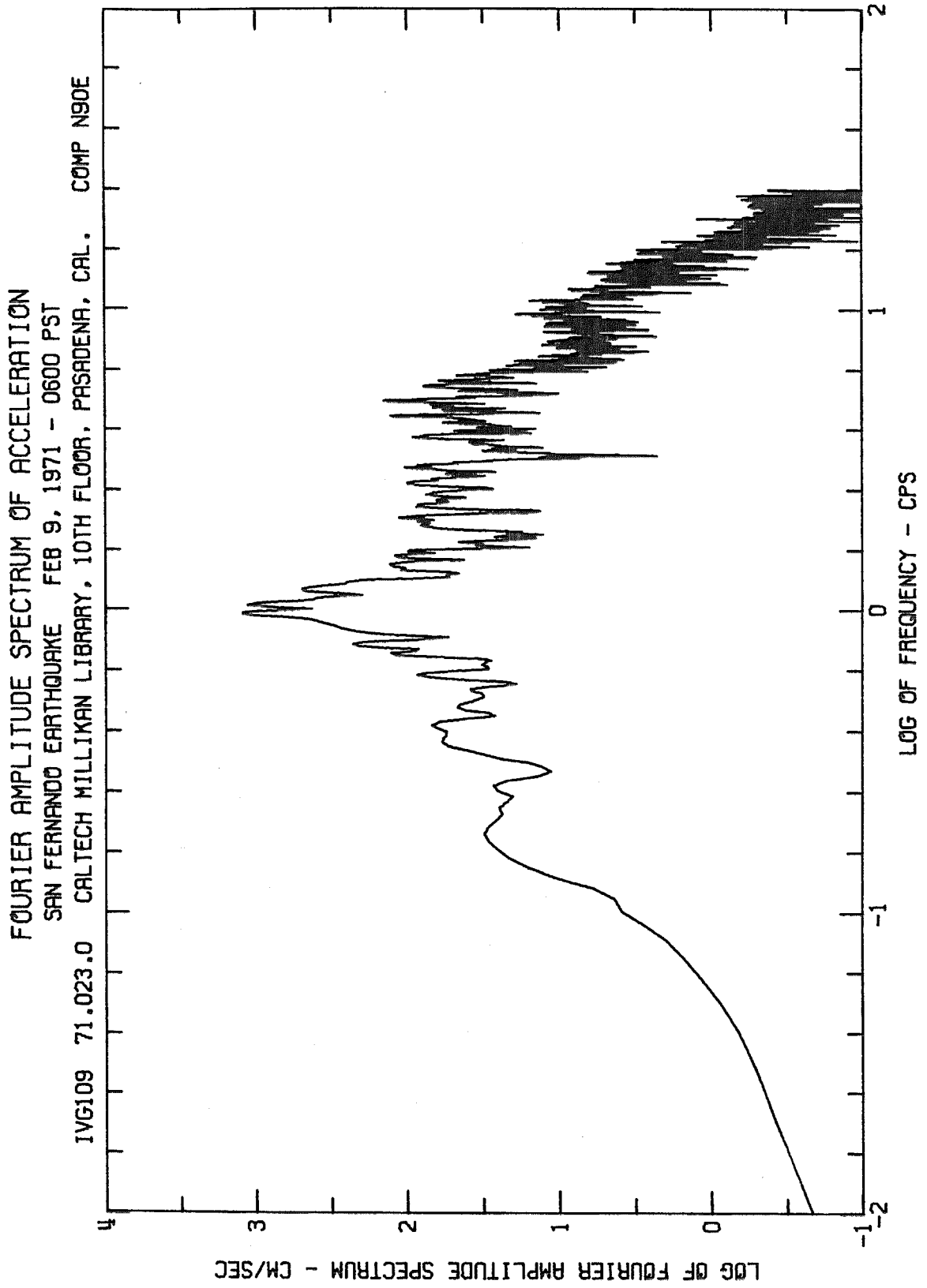
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LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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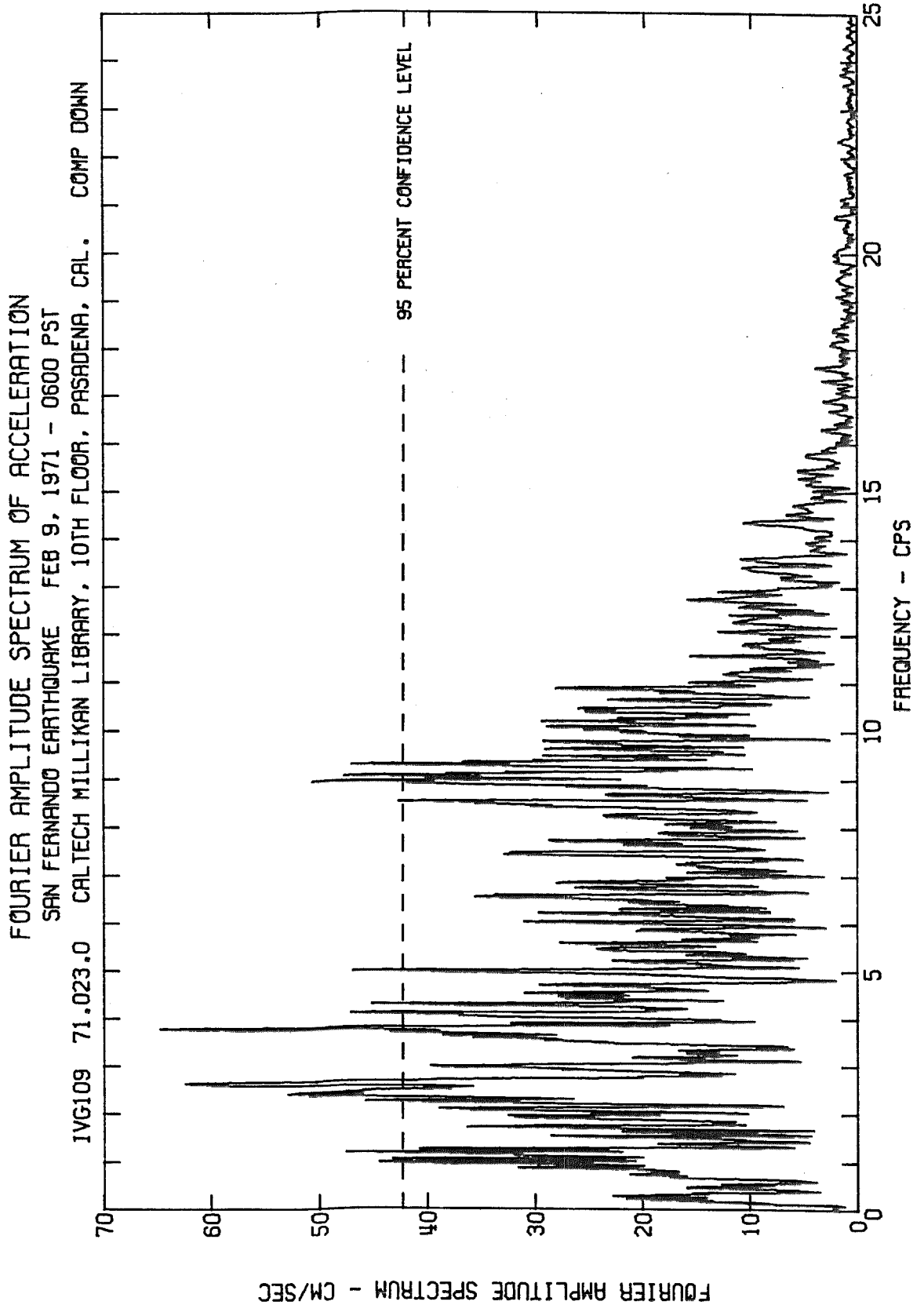
-1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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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20
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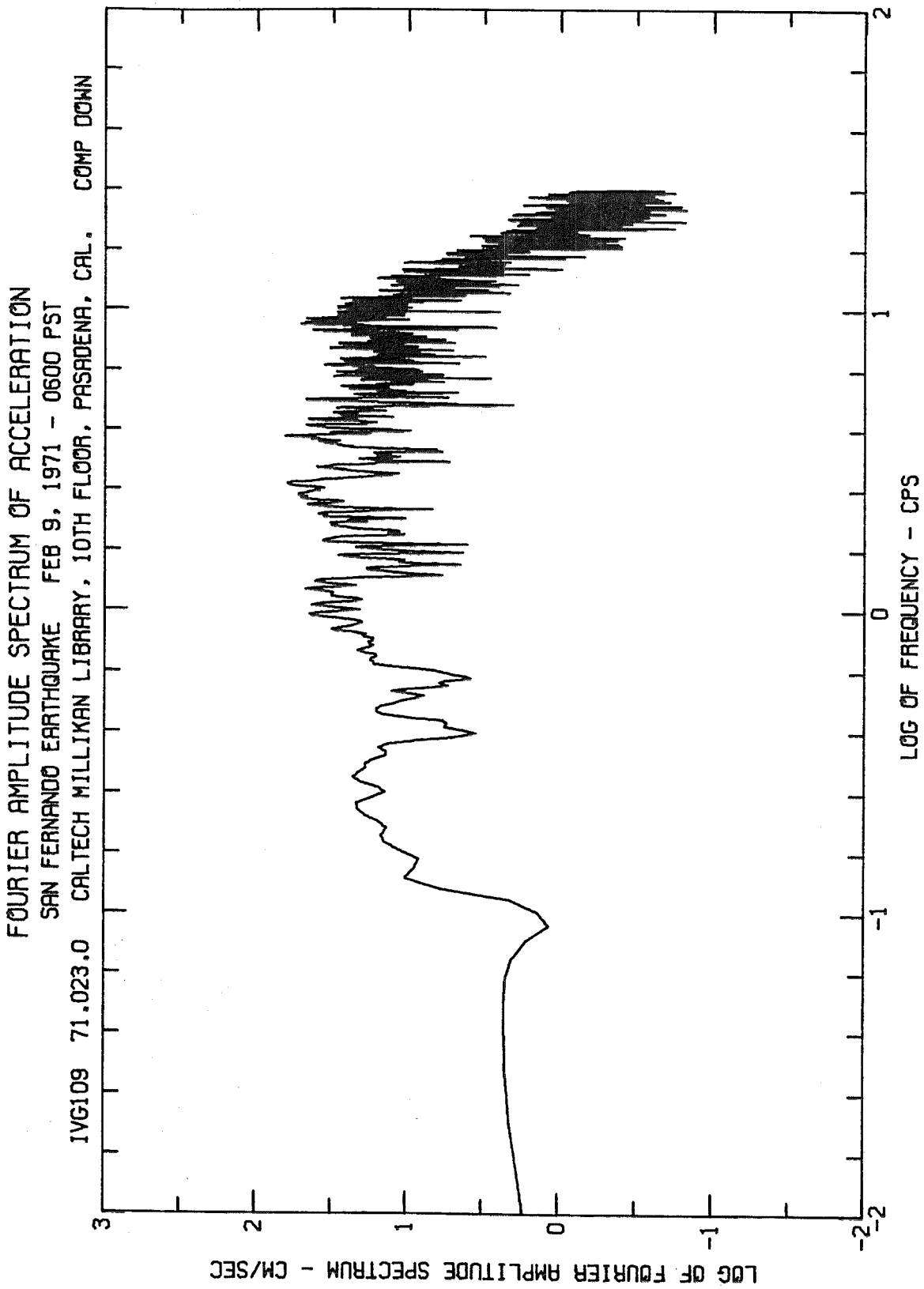
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LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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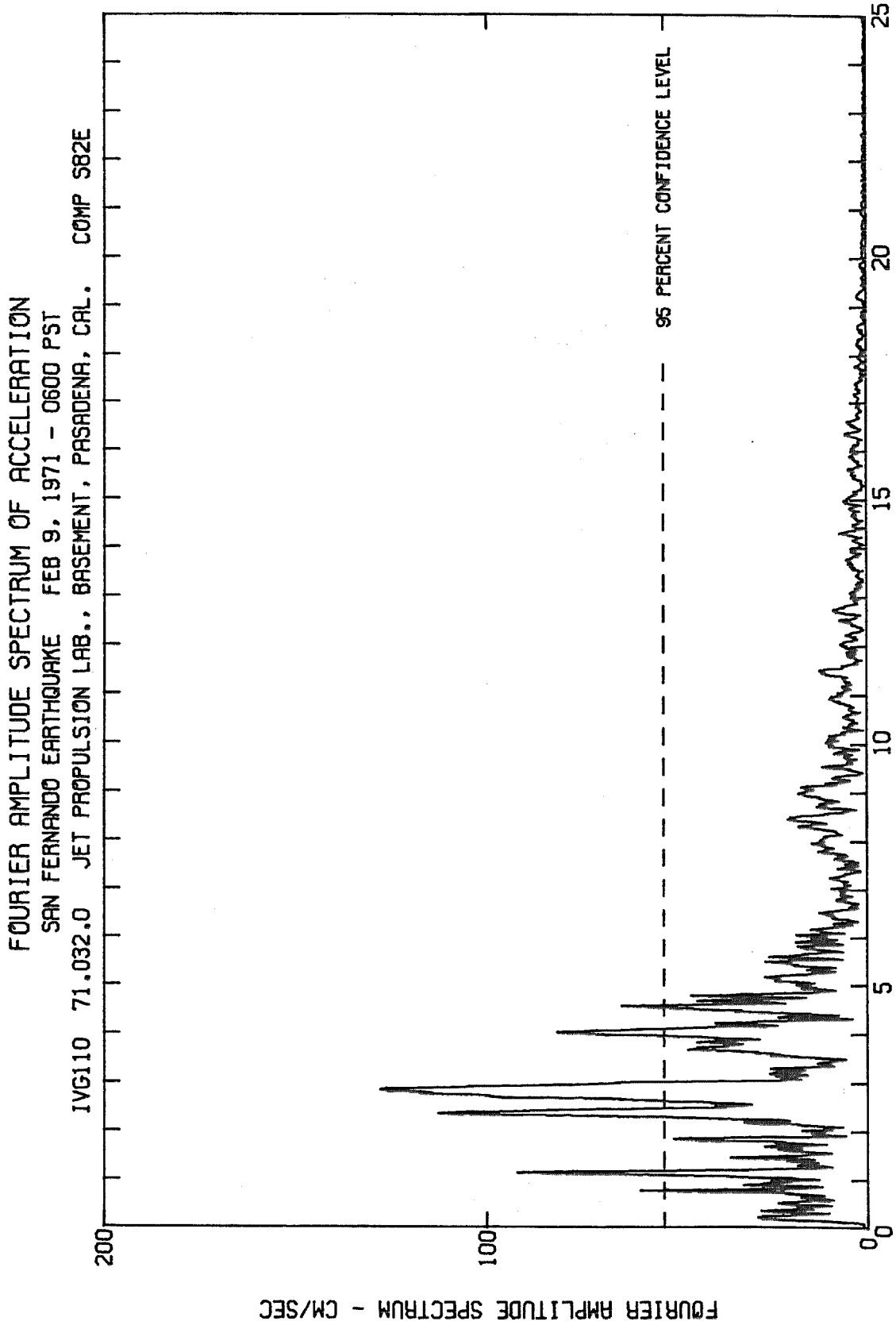
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG110 71.032.0 JET PROPULSION LAB., BASEMENT, PASADENA, CAL. COMP S82E
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
0
100
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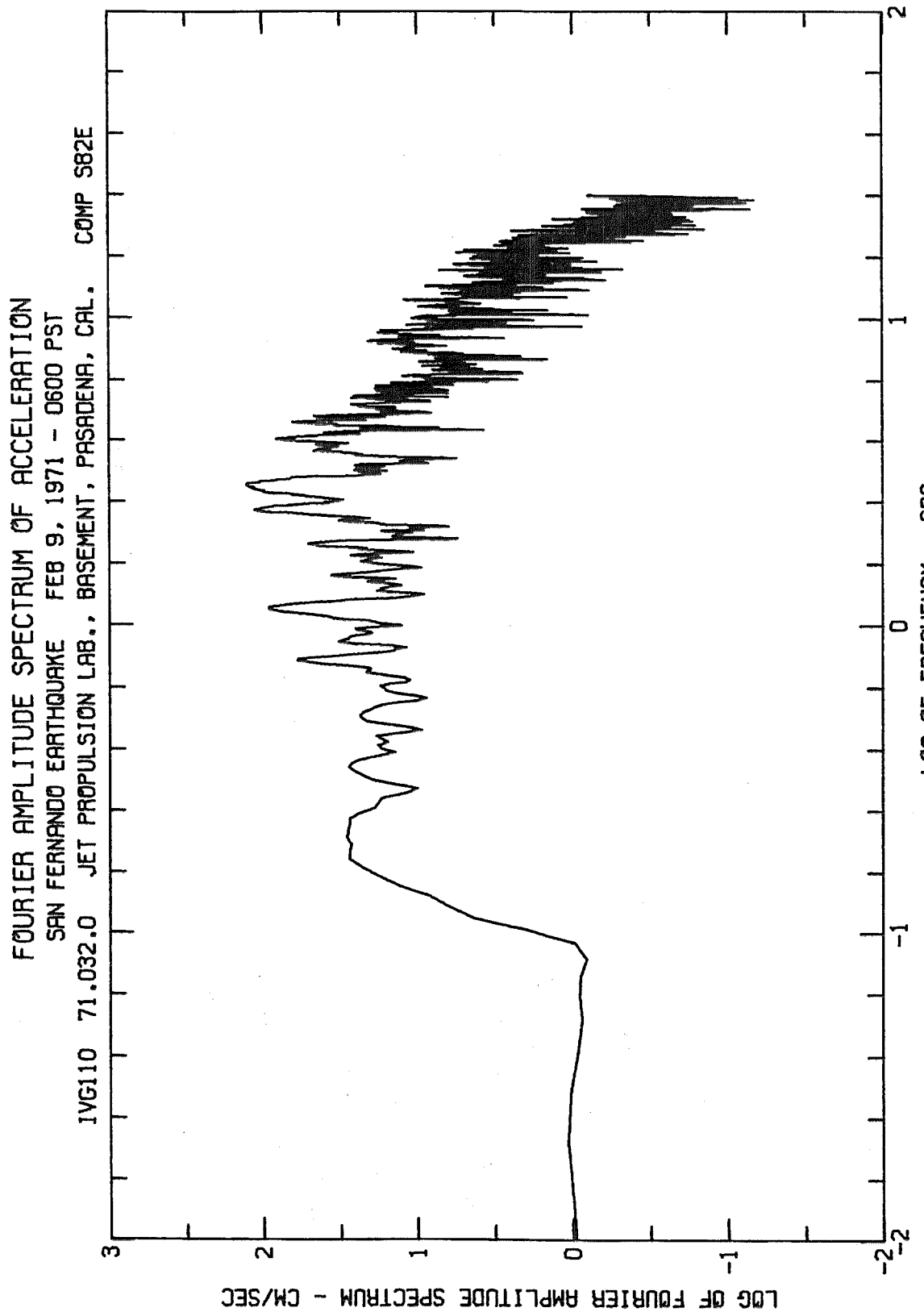
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
1VG110 71.032.0 JET PROPULSION LAB., BASEMENT, PASADENA, CAL. COMP S82E
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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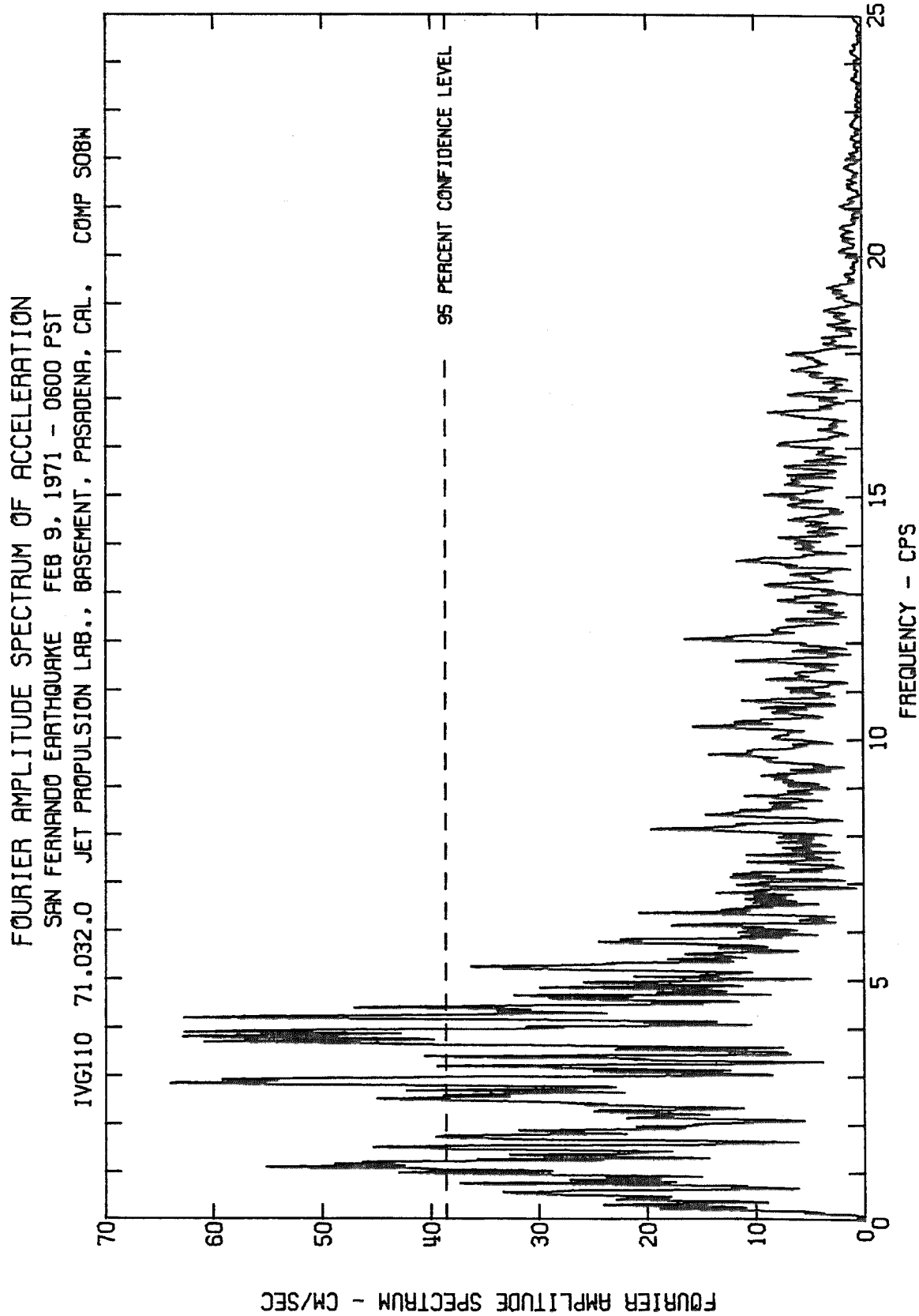
1
2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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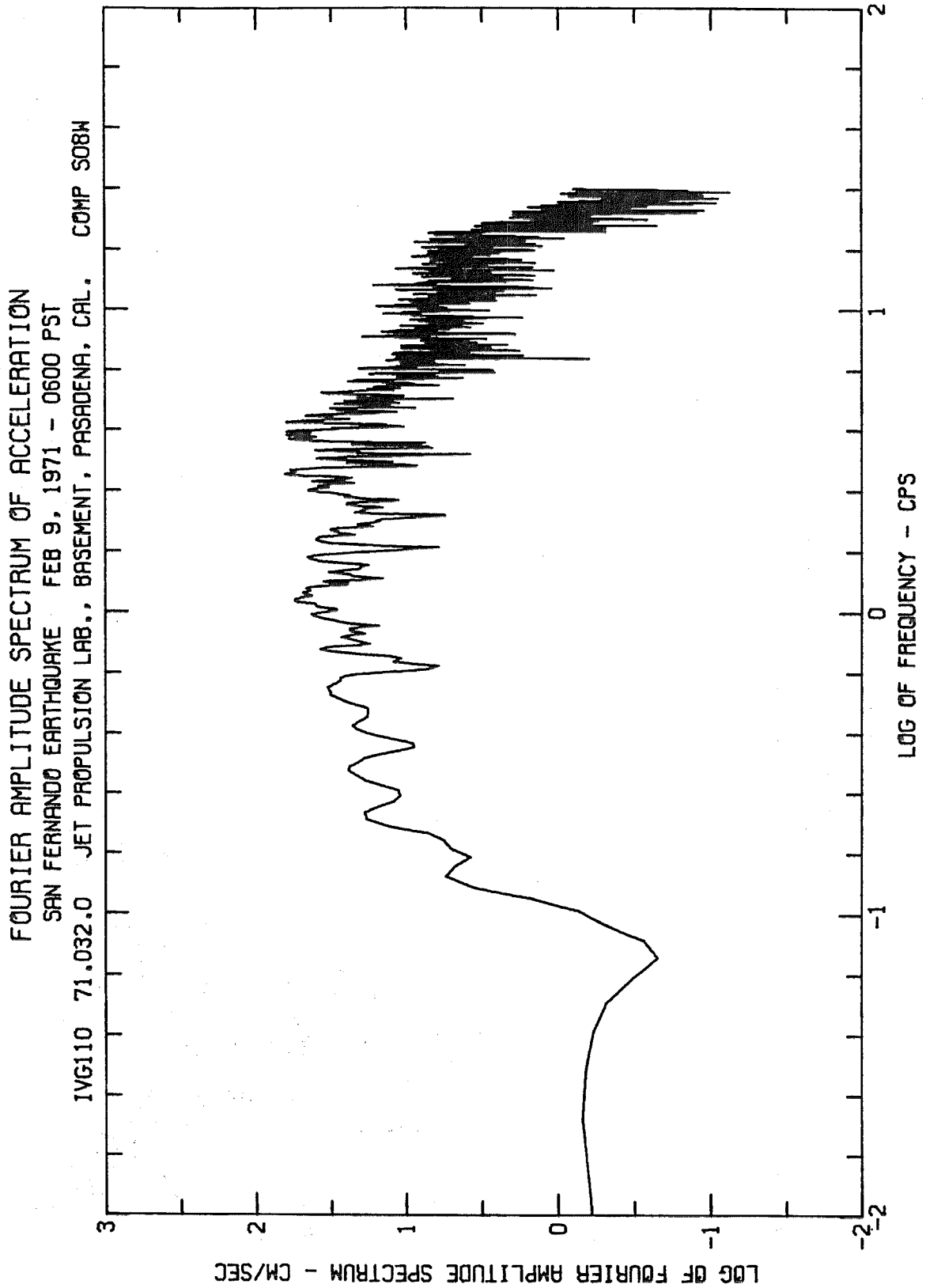
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG110 71.032.0 JET PROPULSION LAB., BASEMENT, PASADENA, CAL. COMP S08W
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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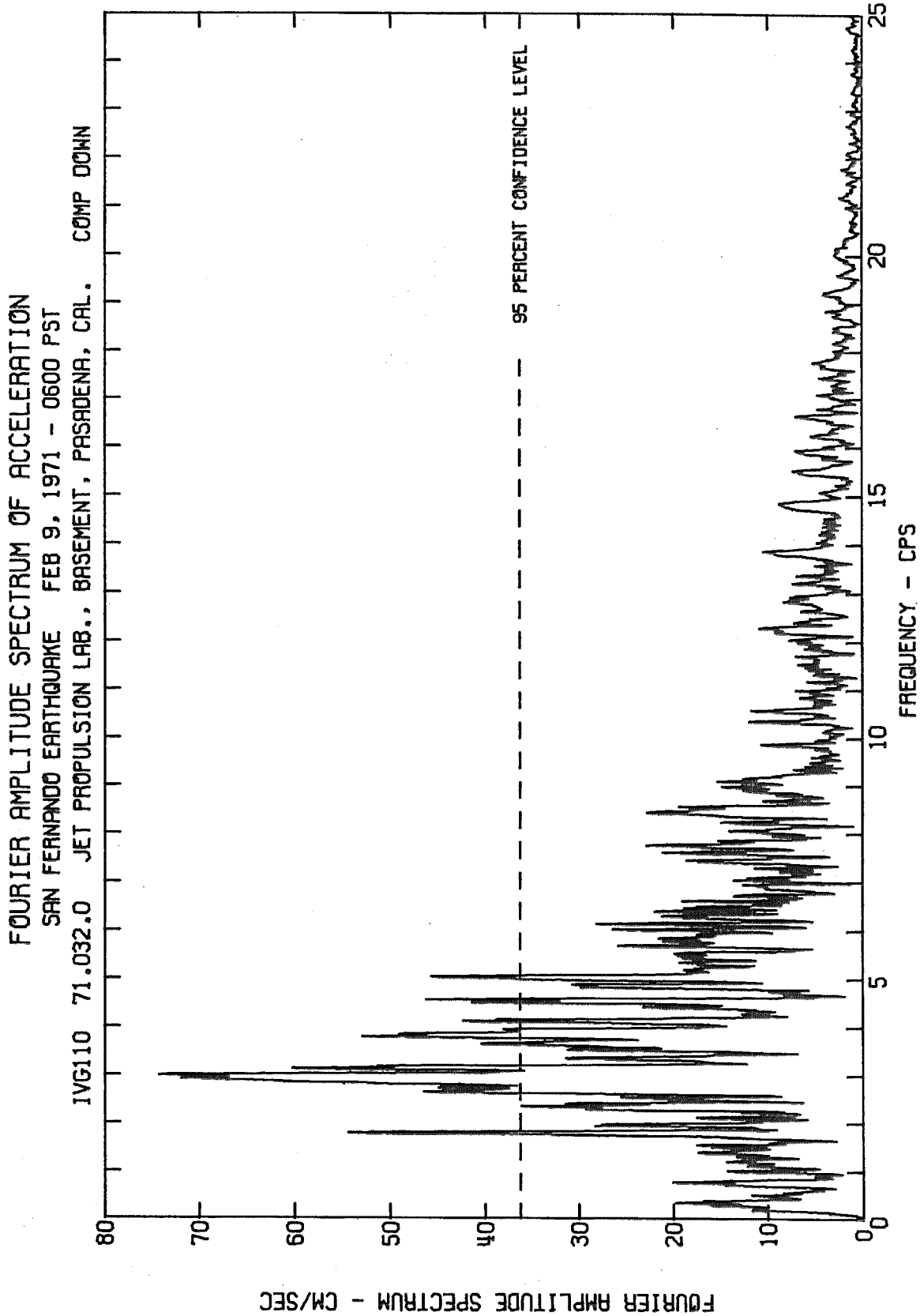
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
1VG110 71.032.0 JET PROPULSION LAB., BASEMENT, PASADENA, CAL. COMP DOWN
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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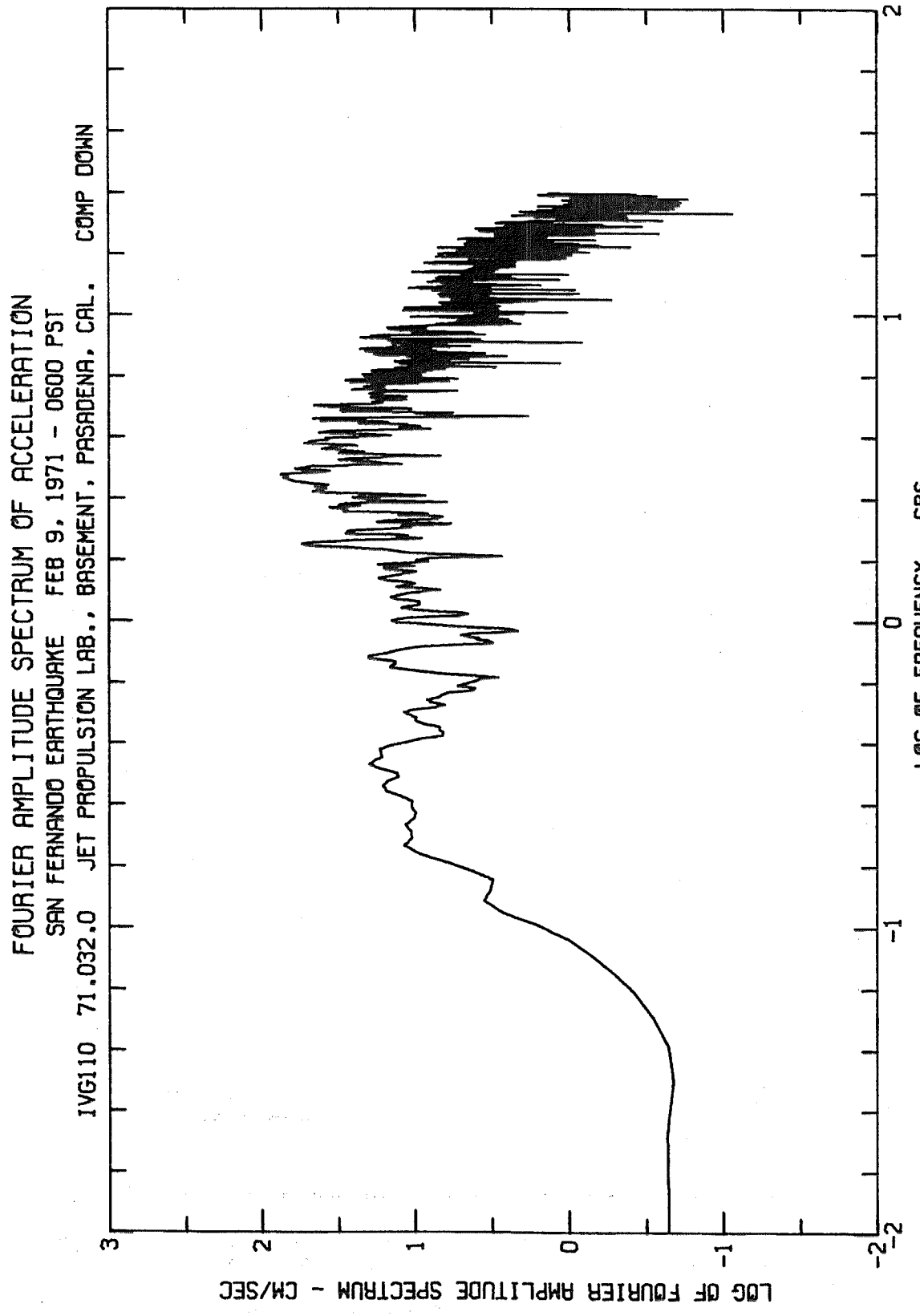
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG110 71.032.0 JET PROPULSION LAB., BASEMENT, PASADENA, CAL. COMP DOWN
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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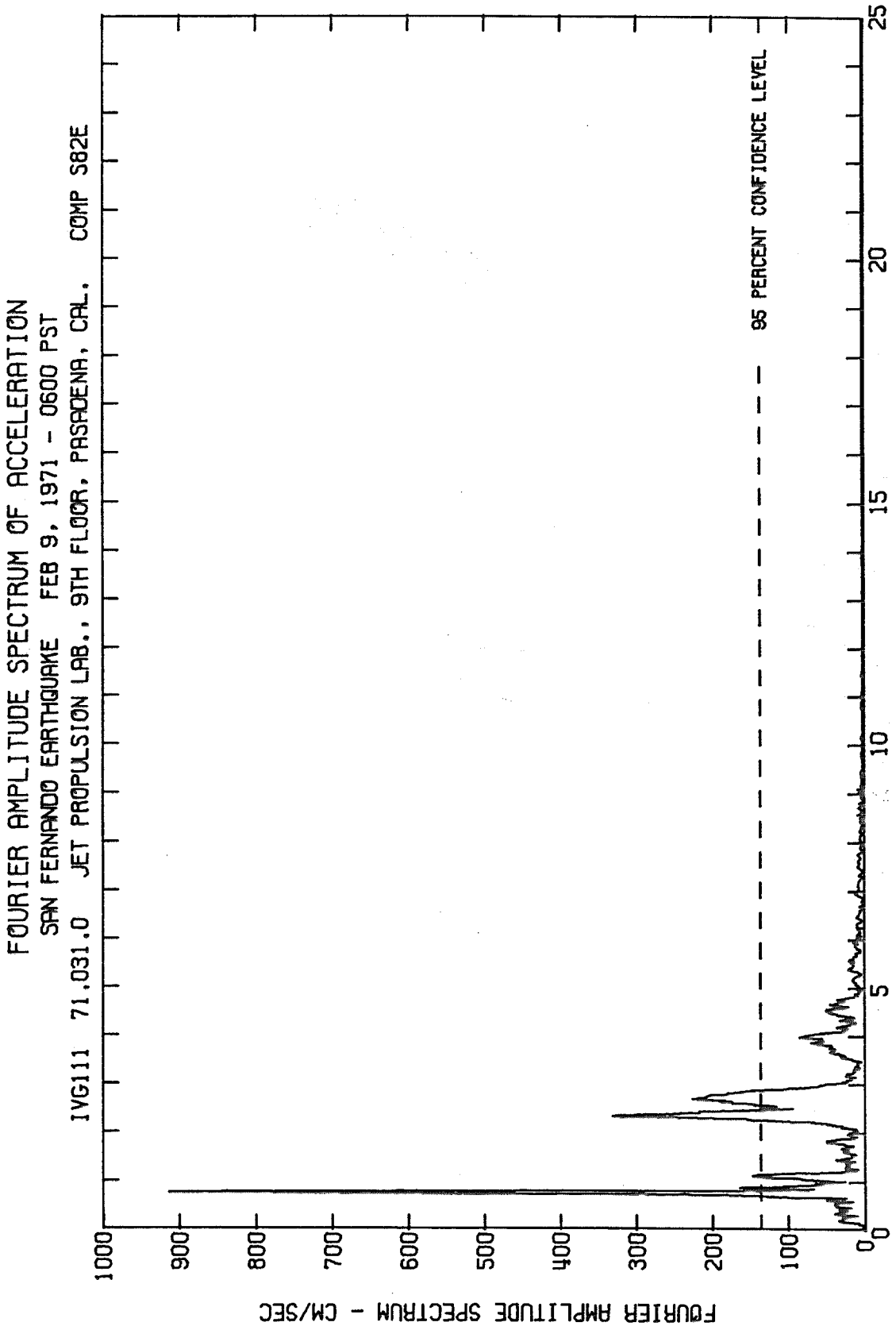
2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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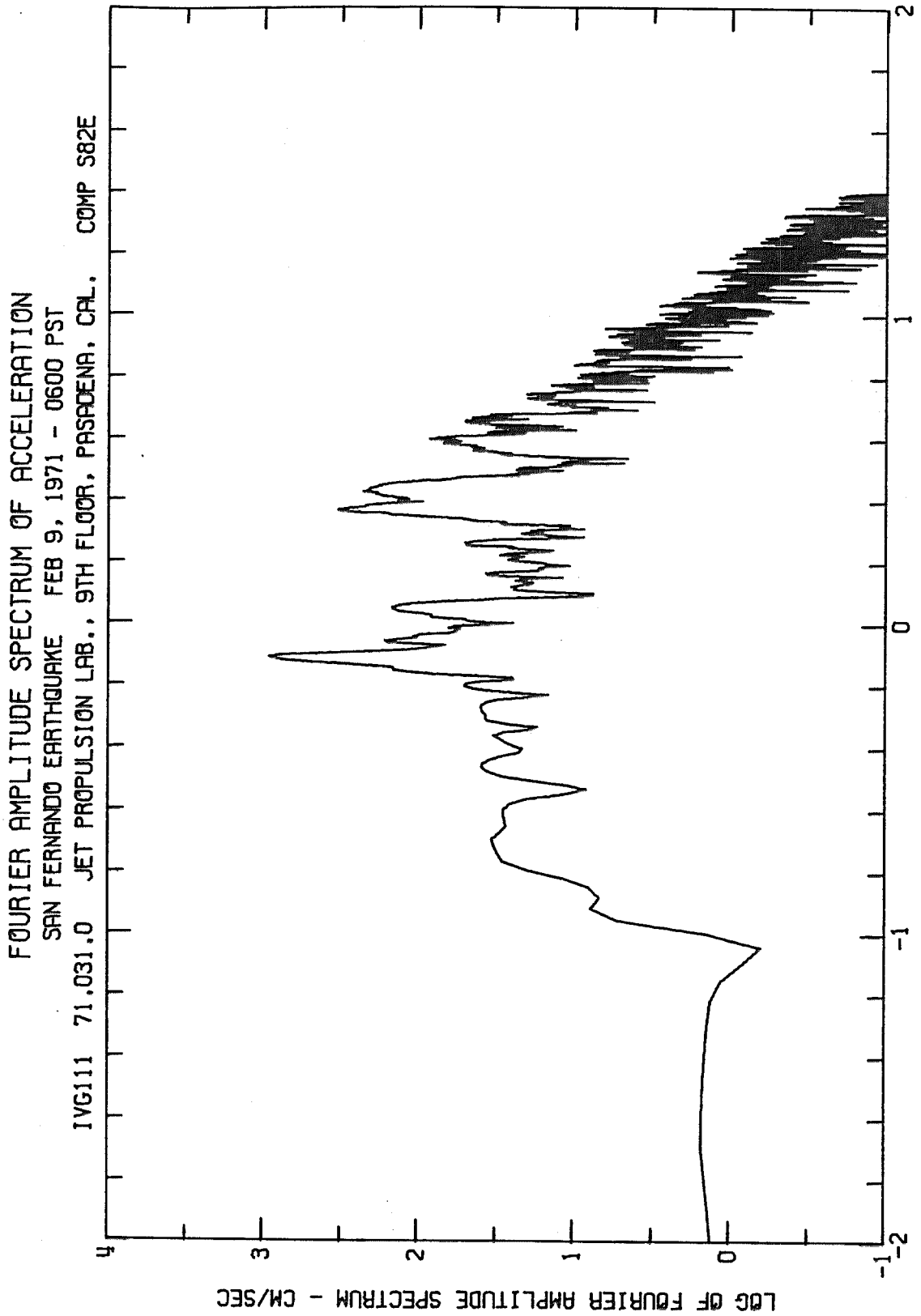
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG111 71.031.0 JET PROPULSION LAB., 9TH FLOOR, PASADENA, CAL. COMP S82E
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
4
3
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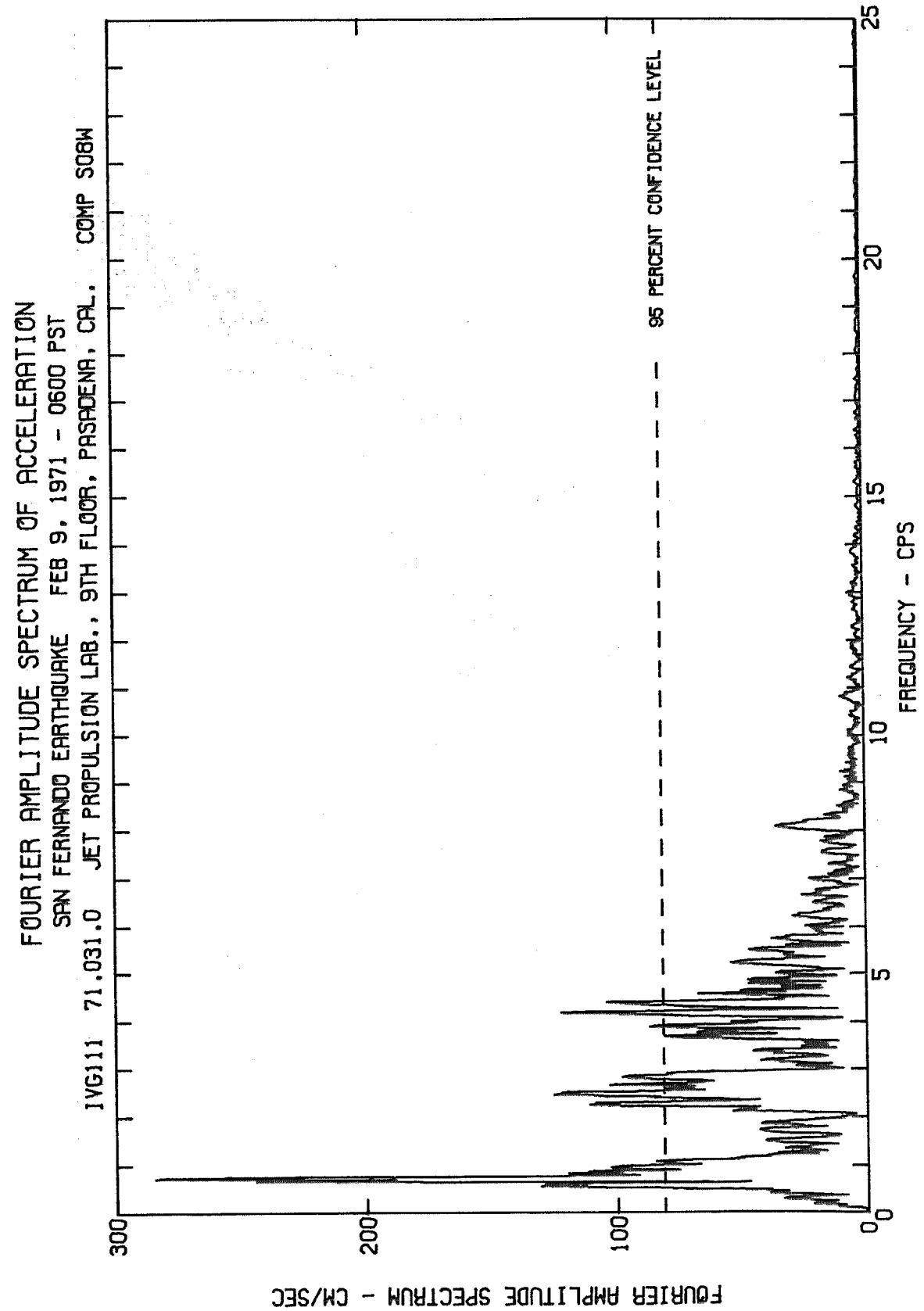
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG111 71.031.0 JET PROPULSION LAB., 9TH FLOOR, PASADENA, CAL. COMP S08W
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
0
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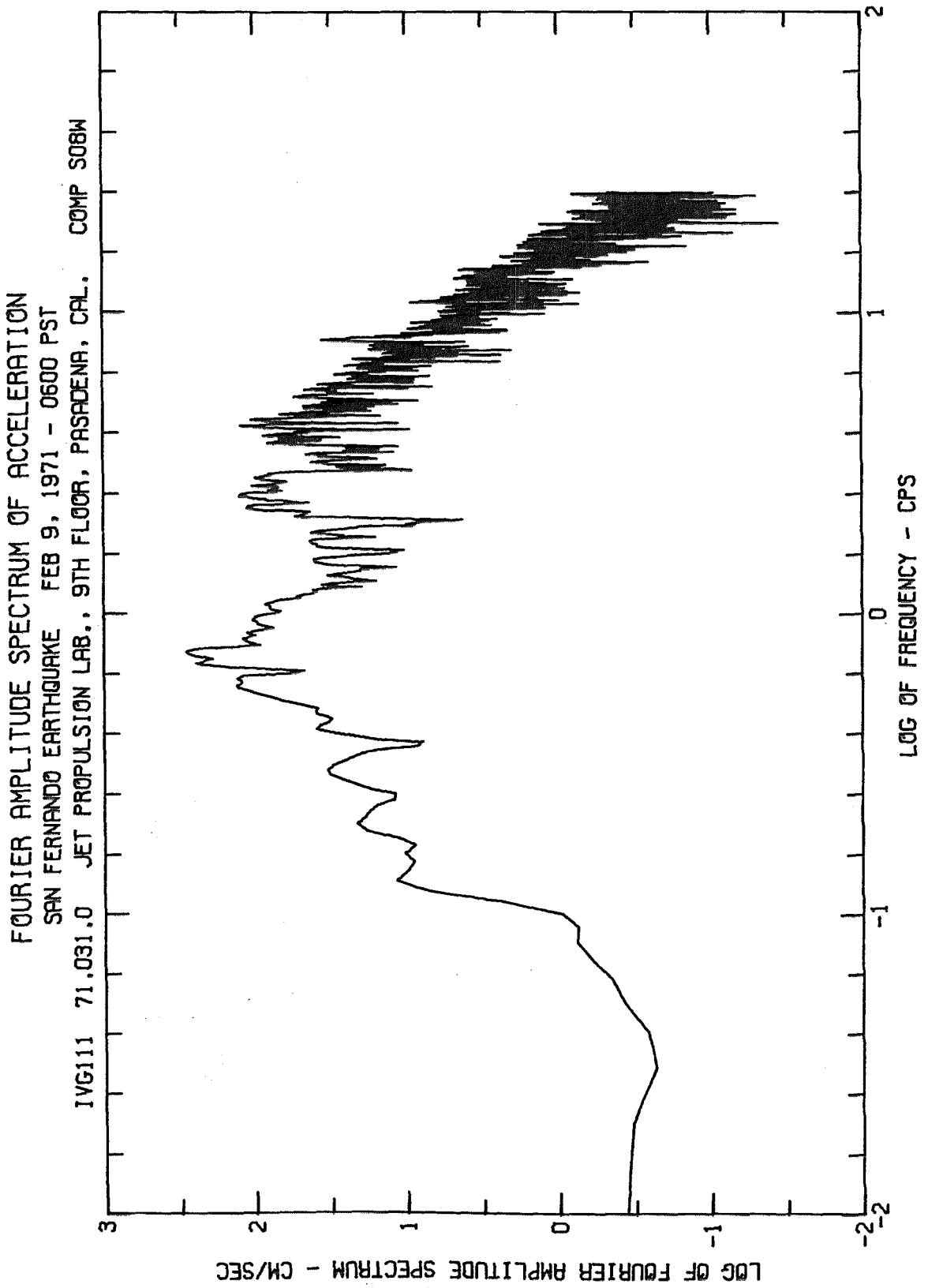
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG111 71.031.0 JET PROPULSION LAB., 9TH FLOOR, PASADENA, CAL. COMP S08W
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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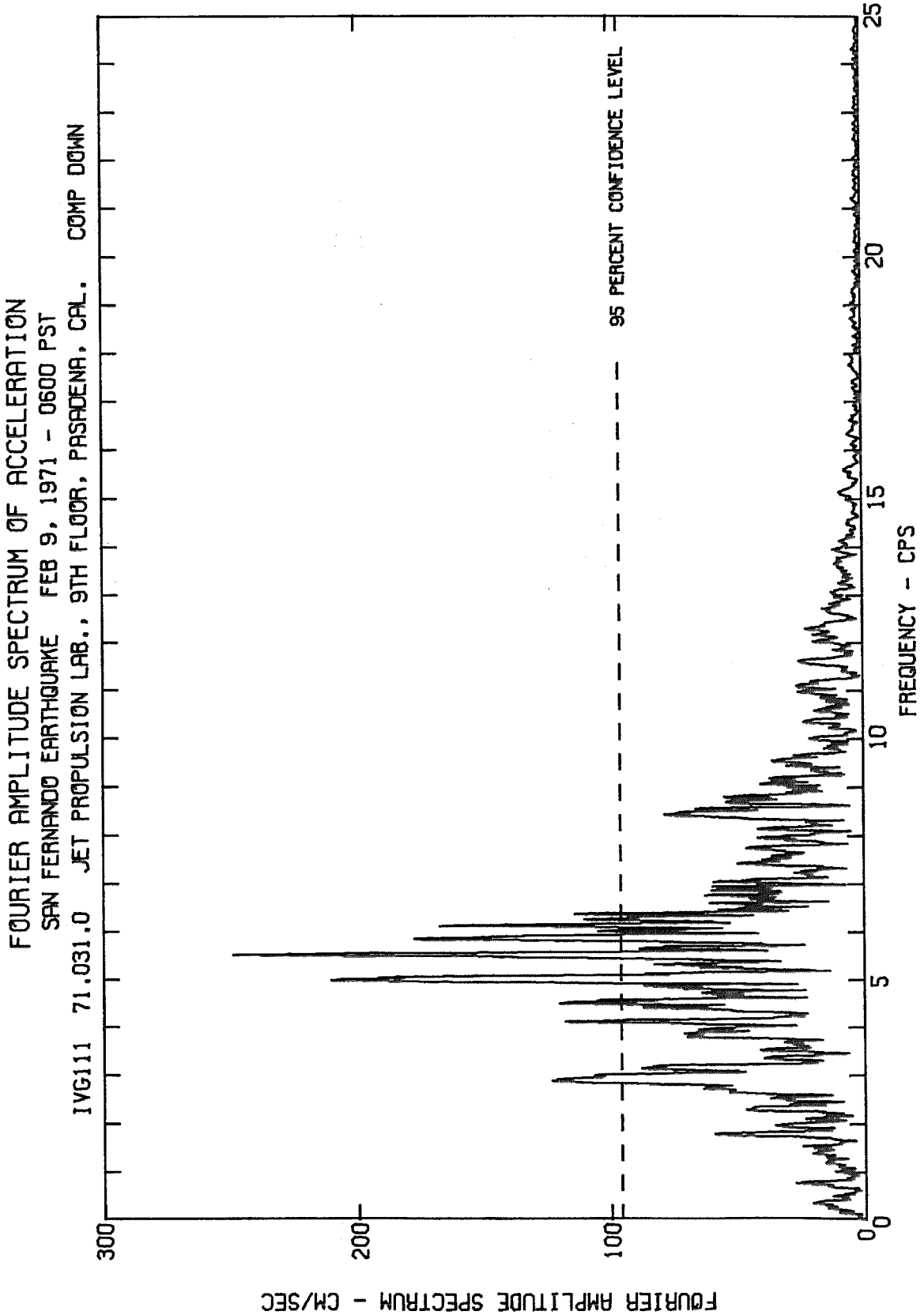
-2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
0
100
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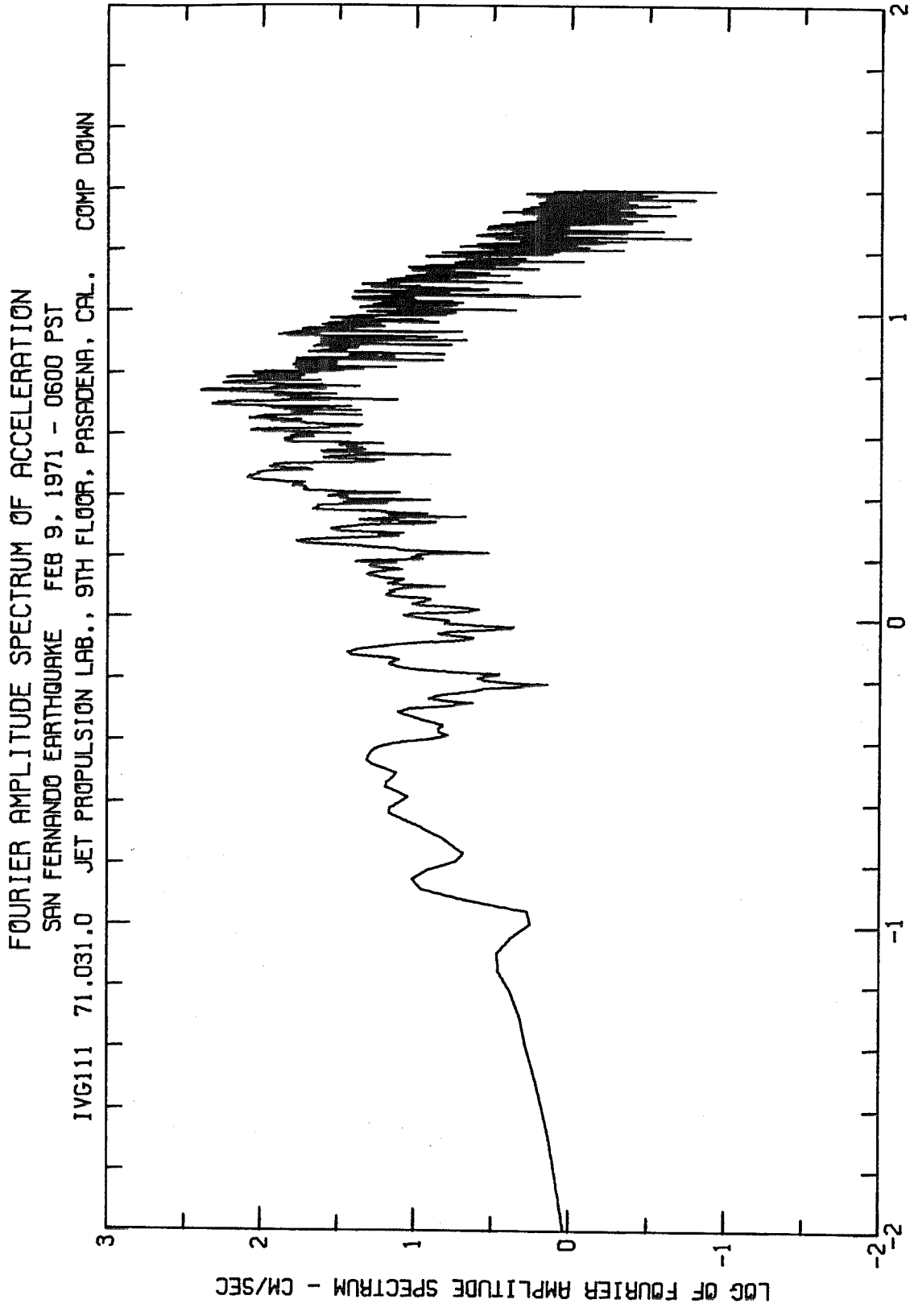
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
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IVG111 71.031.0 JET PROPULSION LAB., 9TH FLOOR, PASADENA, CAL. COMP DOWN
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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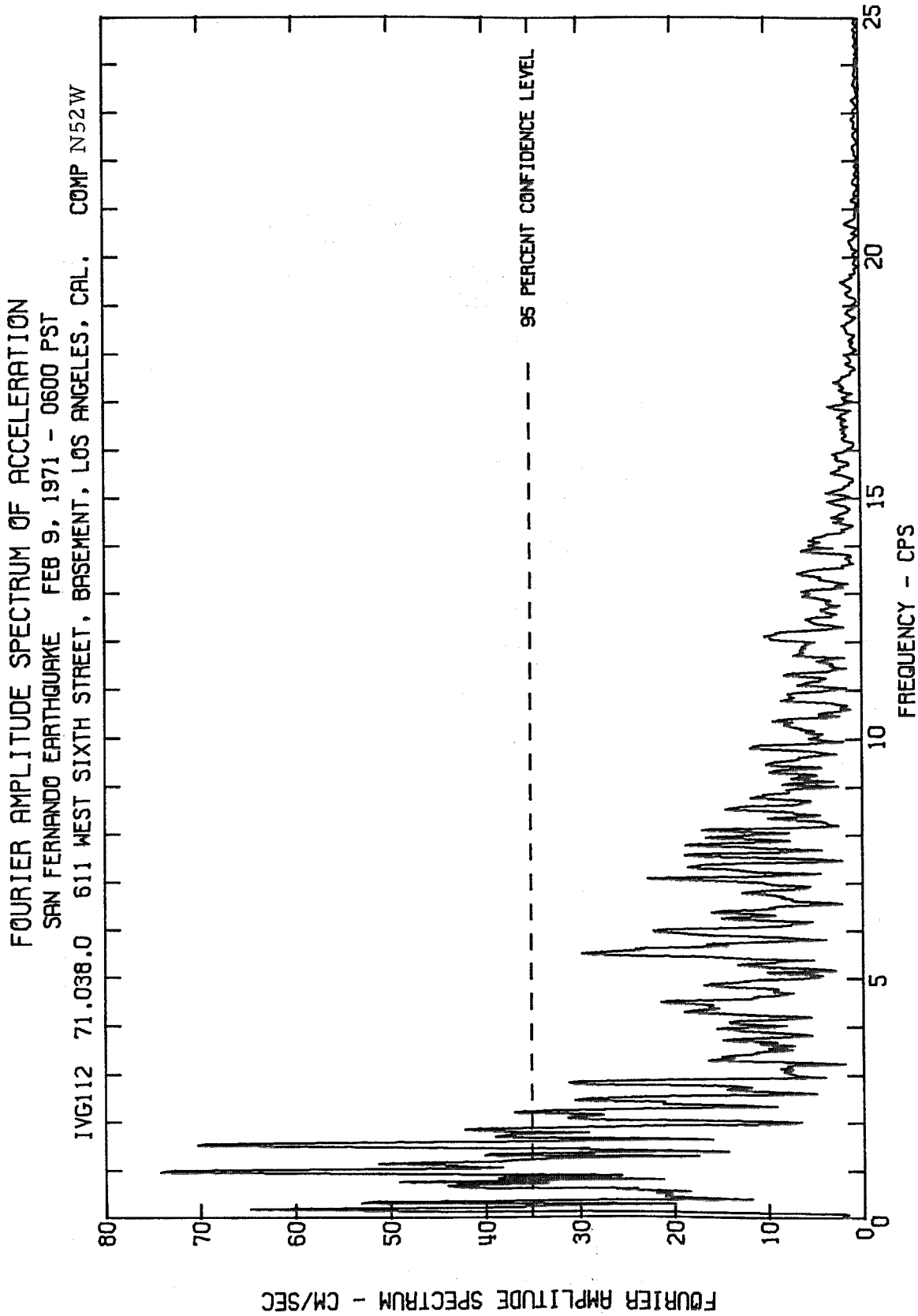
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG112 71.038.0 611 WEST SIXTH STREET, BASEMENT, LOS ANGELES, CAL. COMP N52W
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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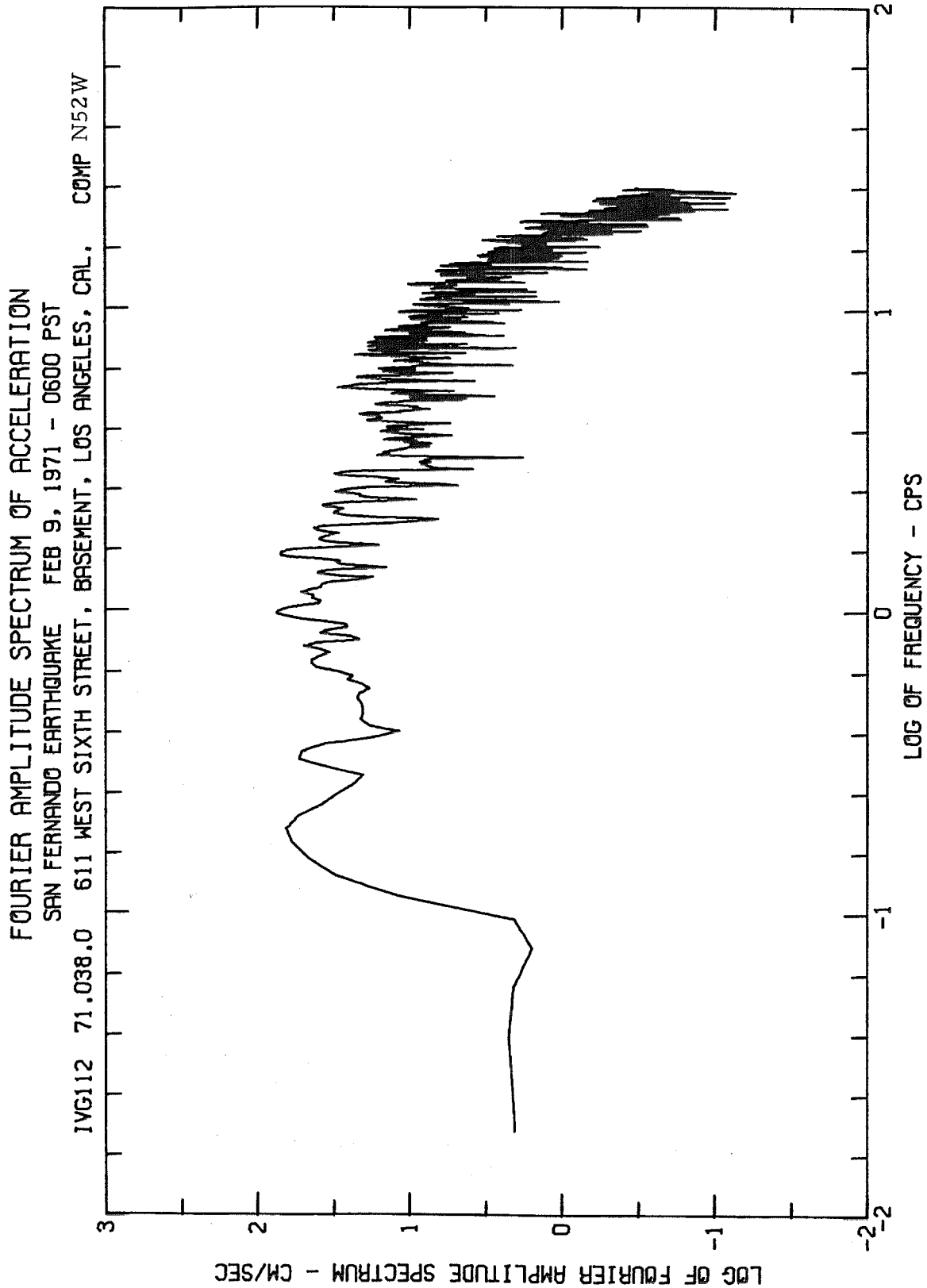
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LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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1
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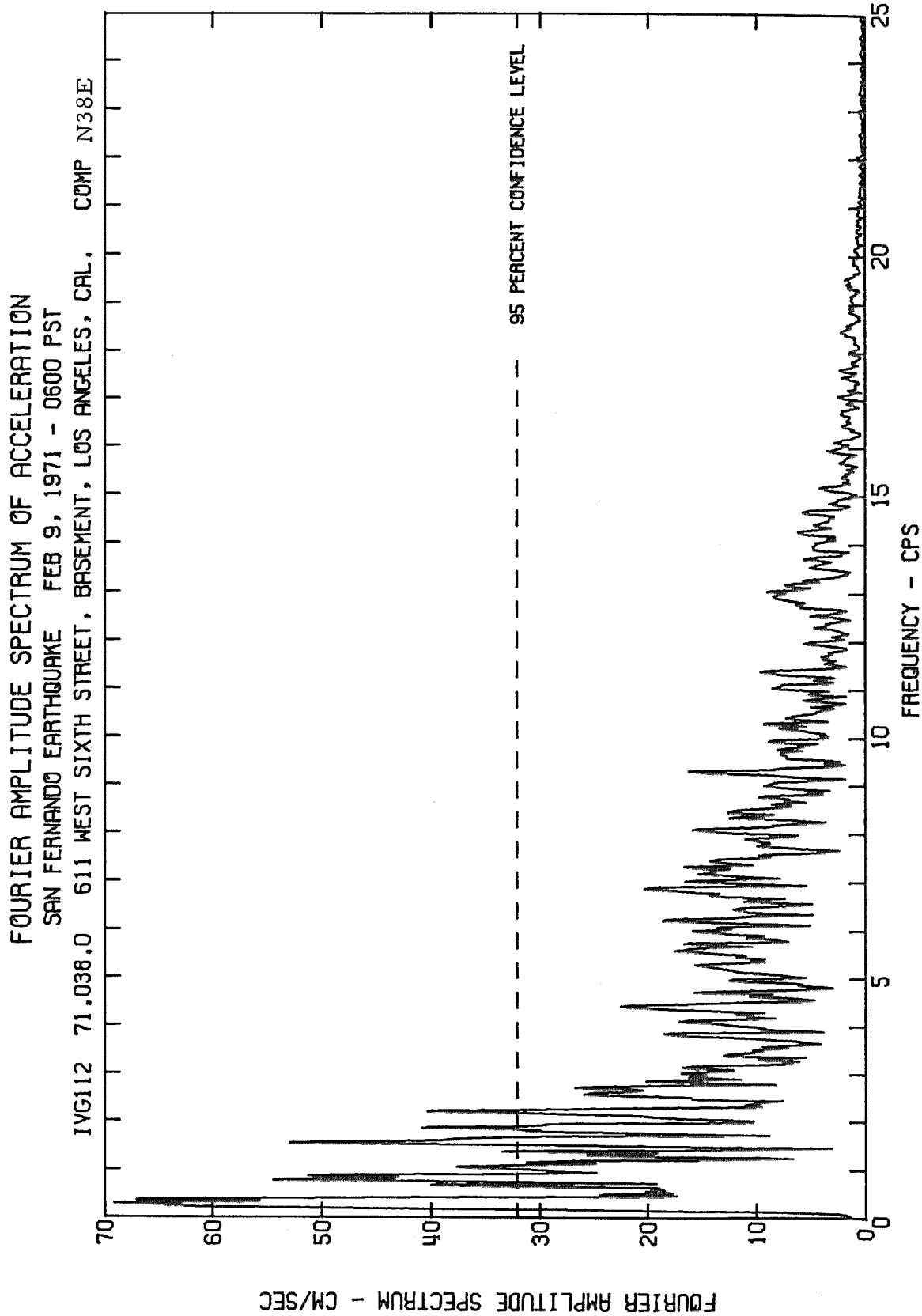
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG112 71.038.0 611 WEST SIXTH STREET, BASEMENT, LOS ANGELES, CAL. COMP N38E
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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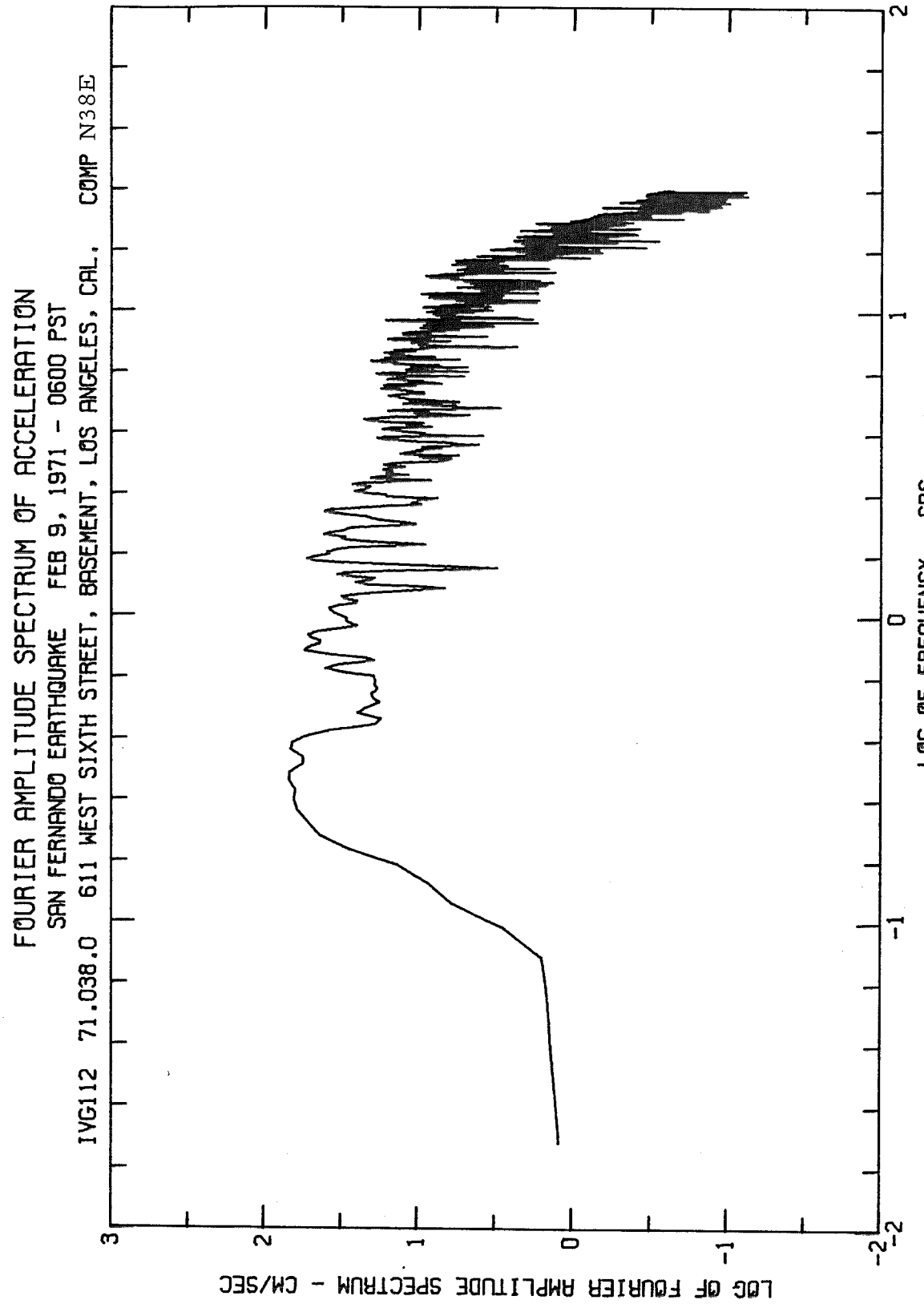
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LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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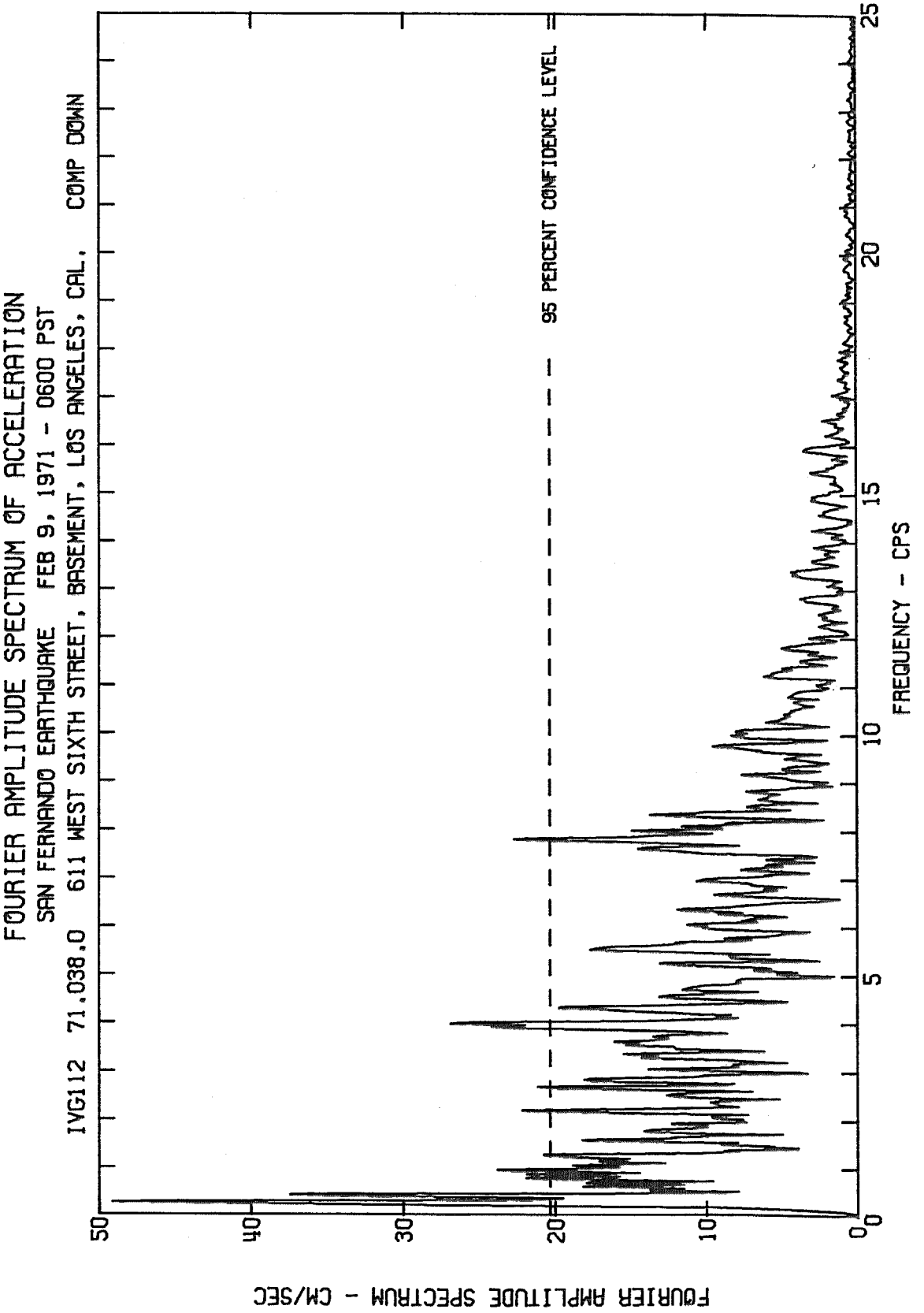
1
2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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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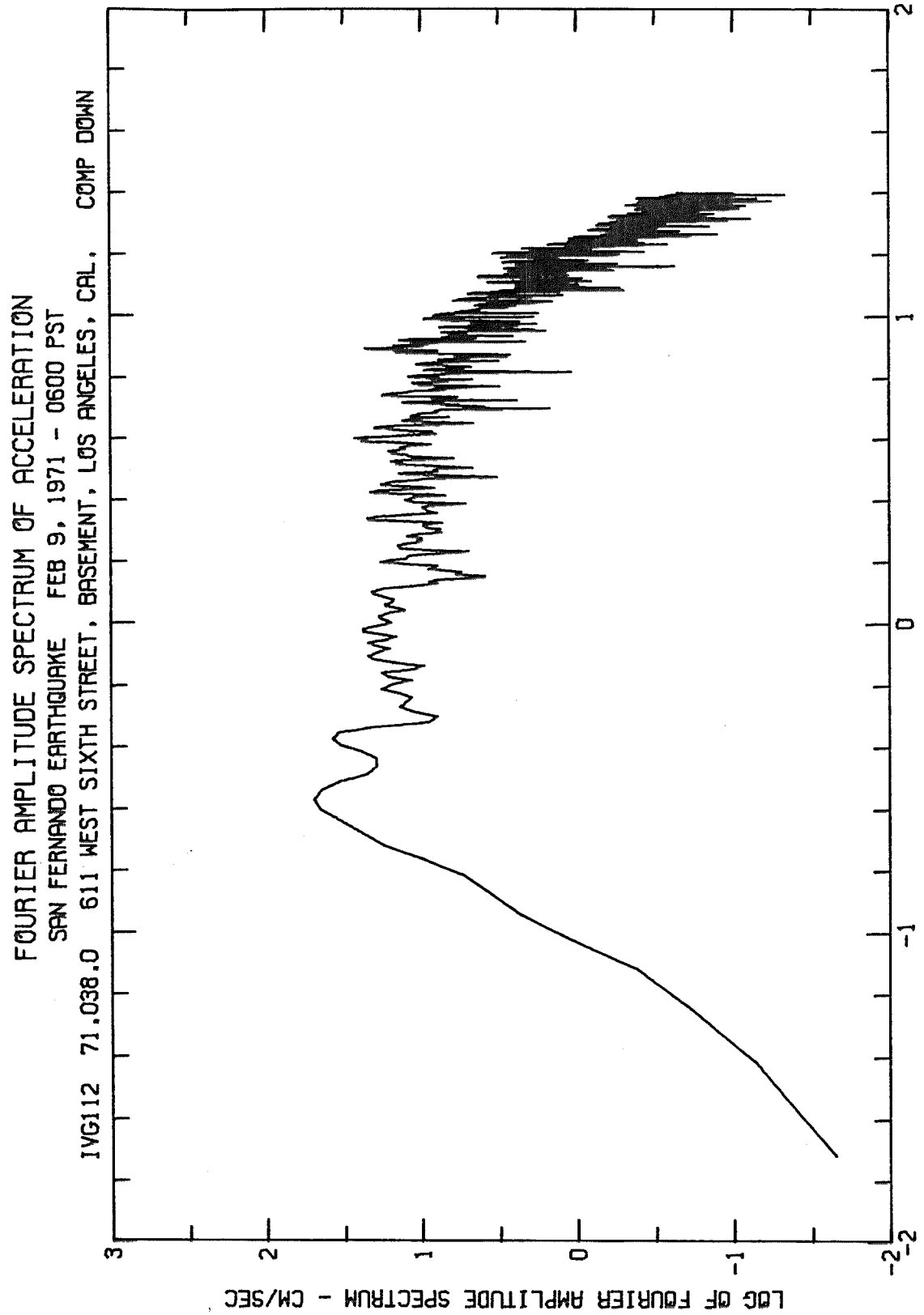
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LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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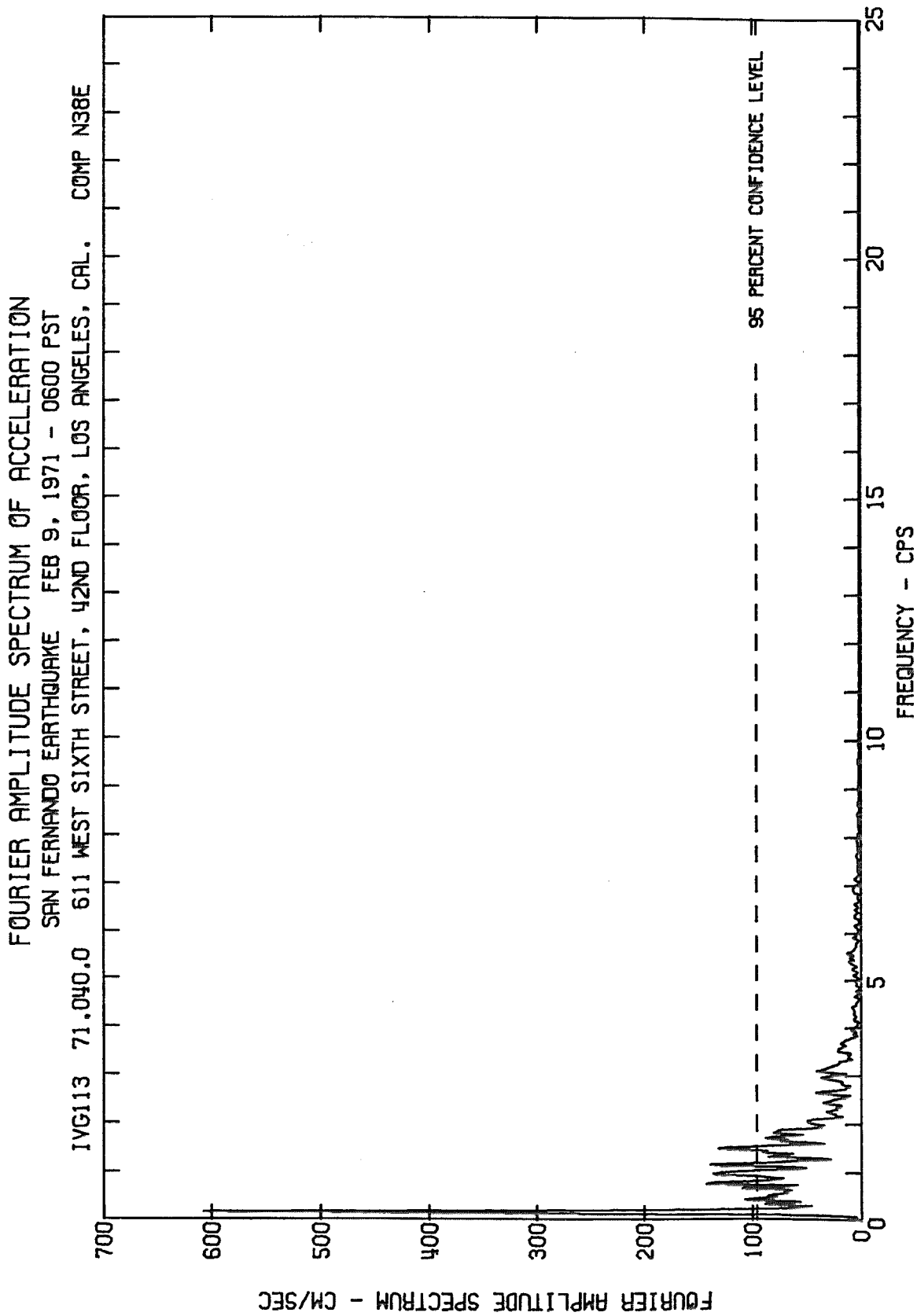
FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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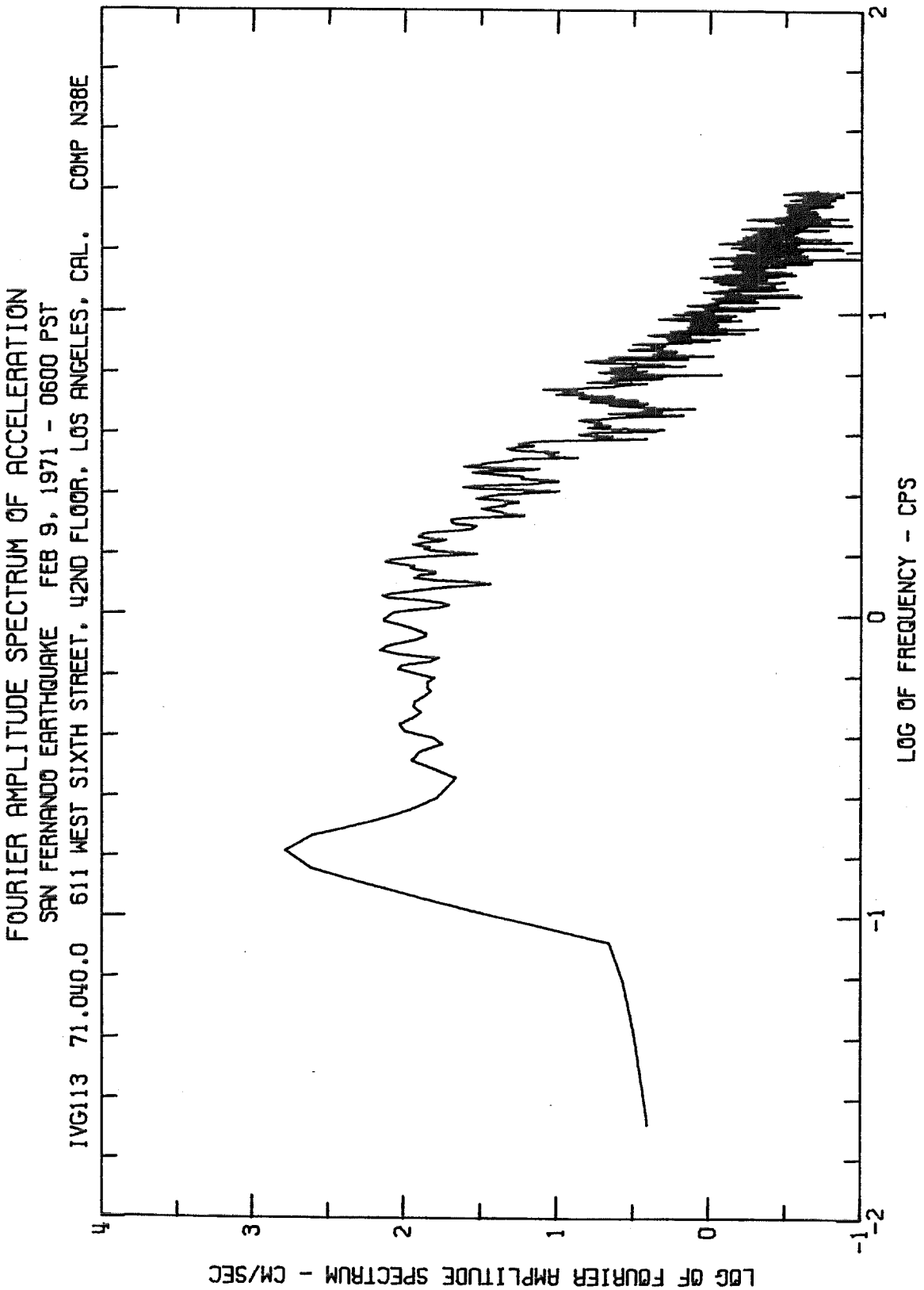
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IVG113 71.040.0 611 WEST SIXTH STREET, 42ND FLOOR, LOS ANGELES, CAL. COMP N38E
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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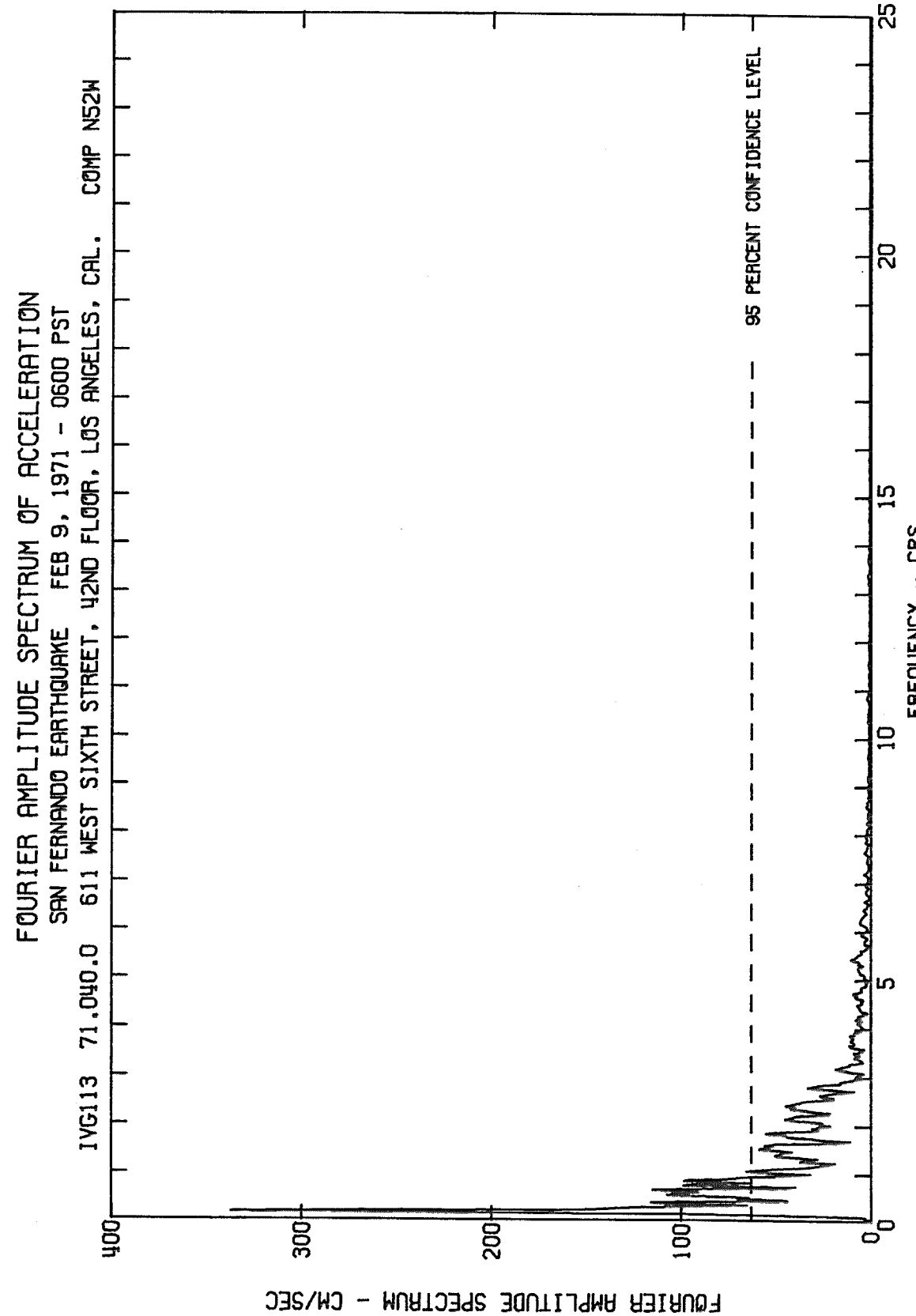
-1


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG113 71.040.0 611 WEST SIXTH STREET, 42ND FLOOR, LOS ANGELES, CAL. COMP N52W
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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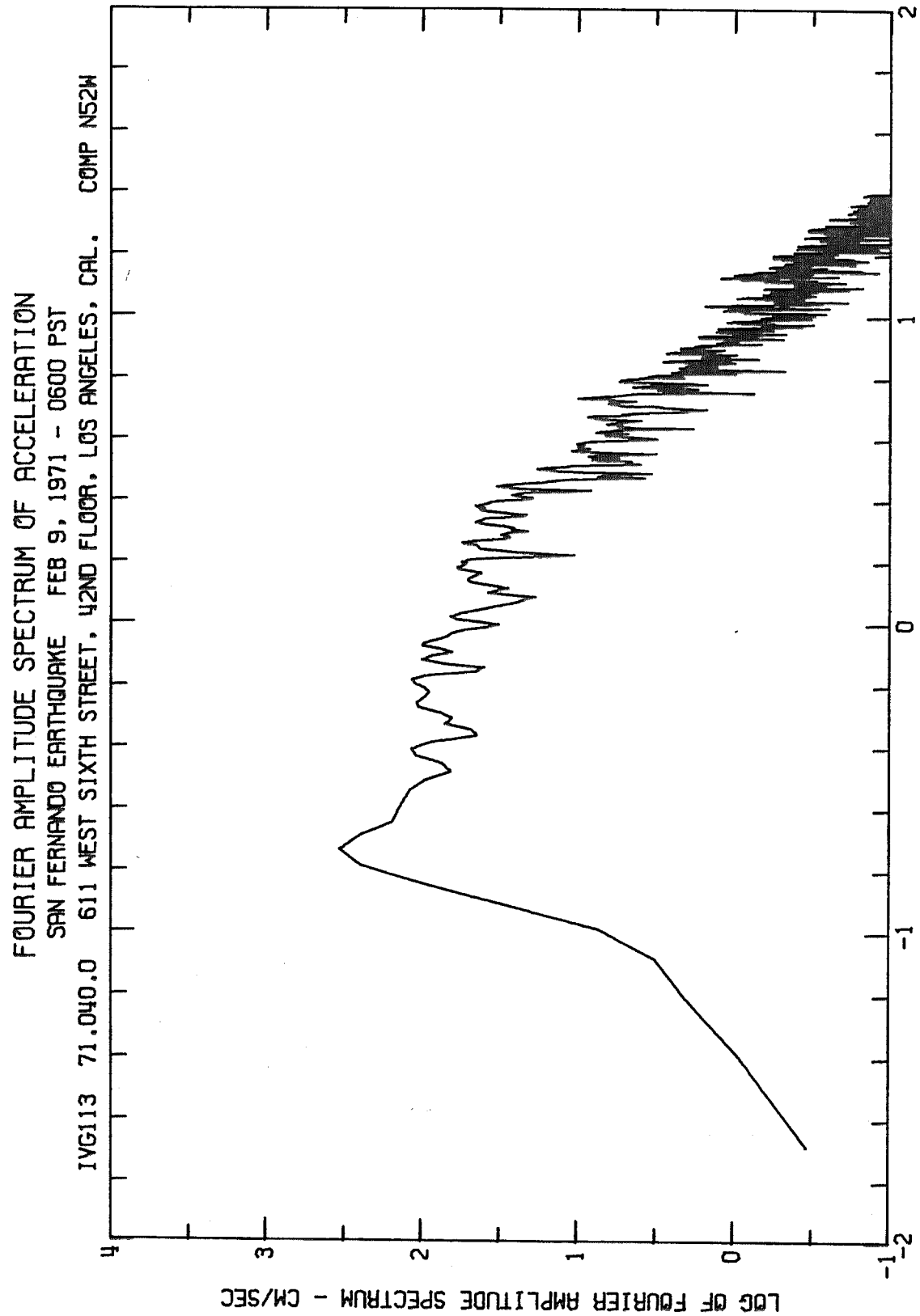
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LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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-1
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2
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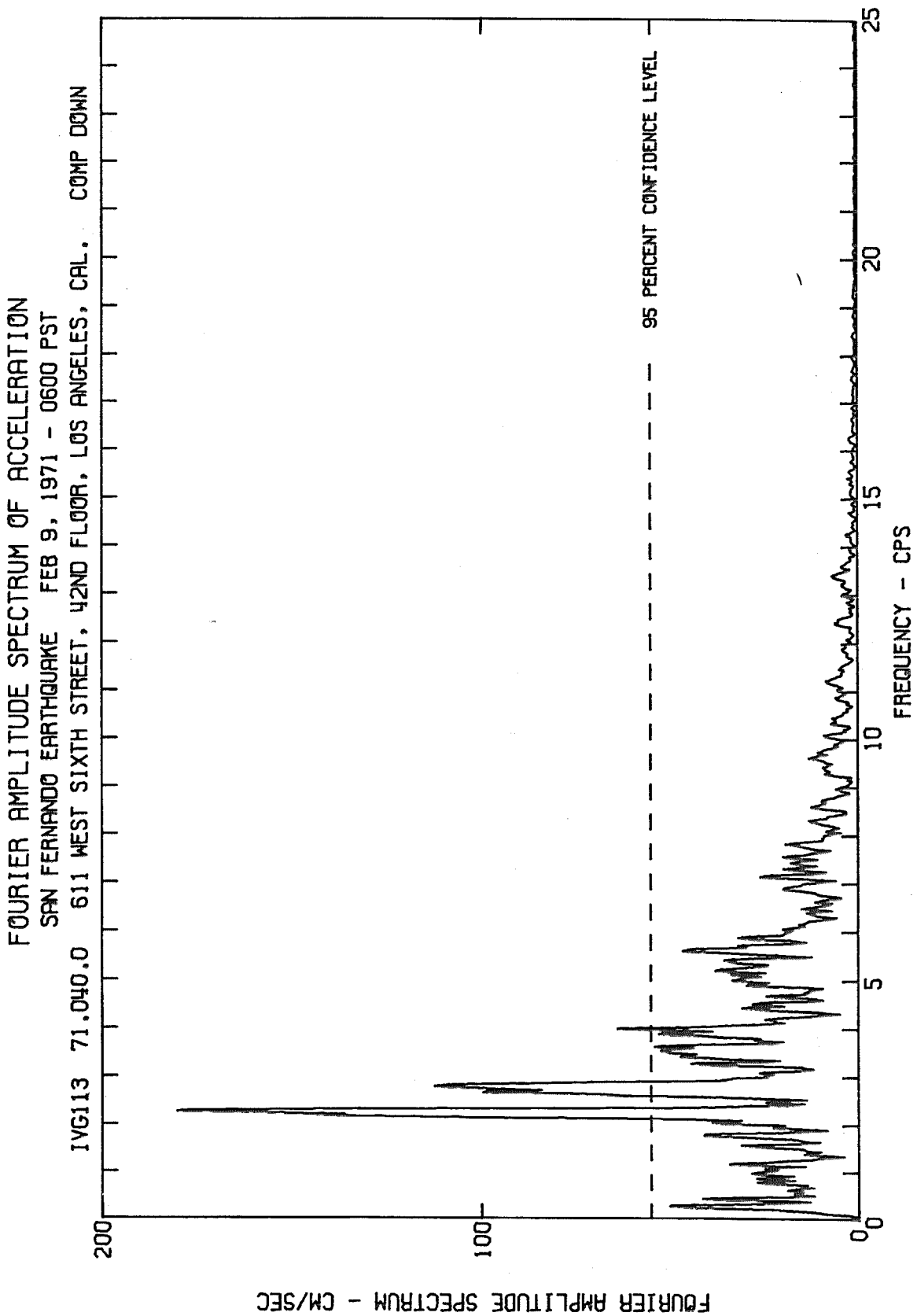
0
-1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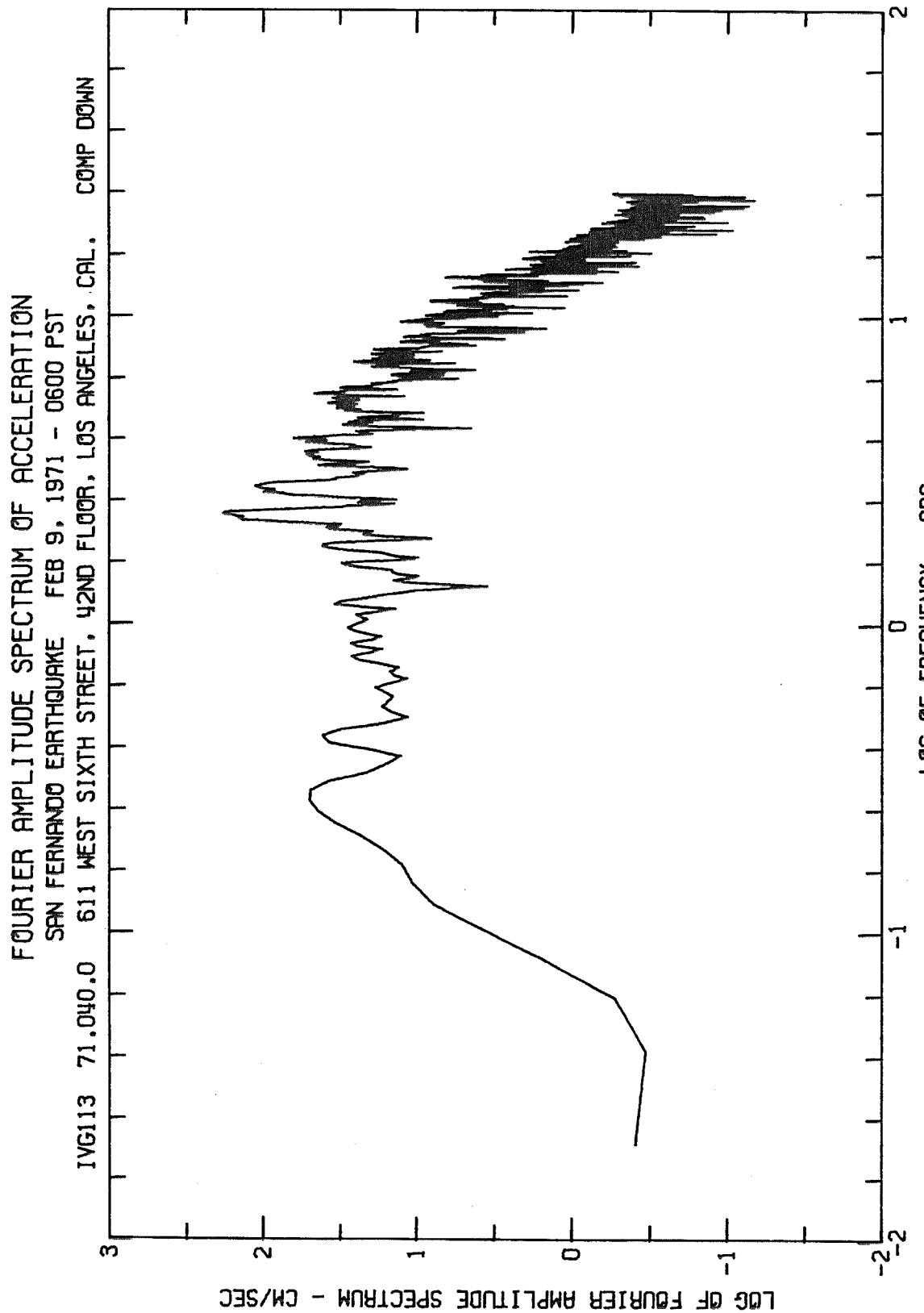
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG113 71.040.0 611 WEST SIXTH STREET, 42ND FLOOR, LOS ANGELES, CAL. COMP DOWN
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
0
100
200
0
5
10
15
20
25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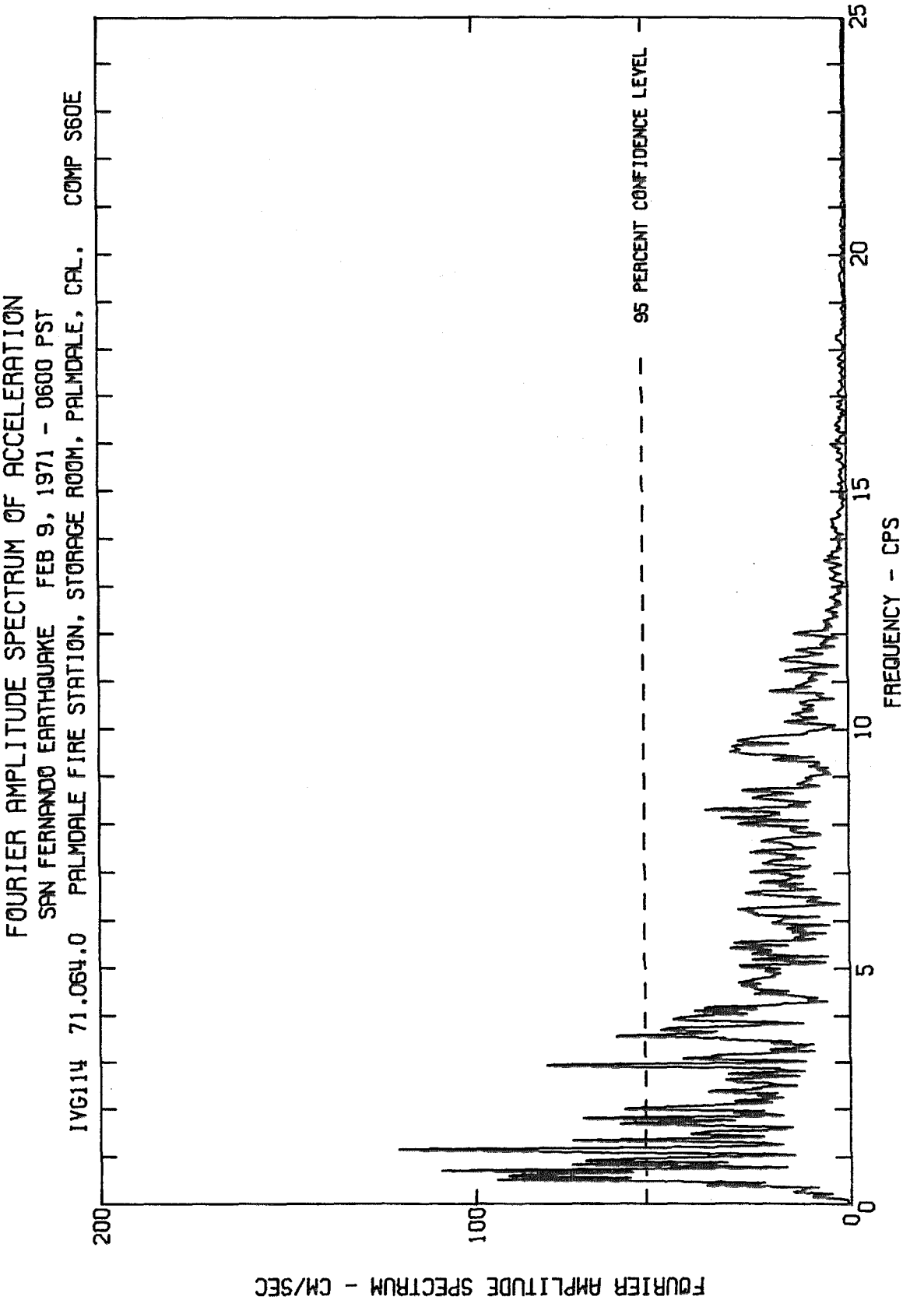
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
3
2
1
0
-1
-2
-2
-1
0
1
2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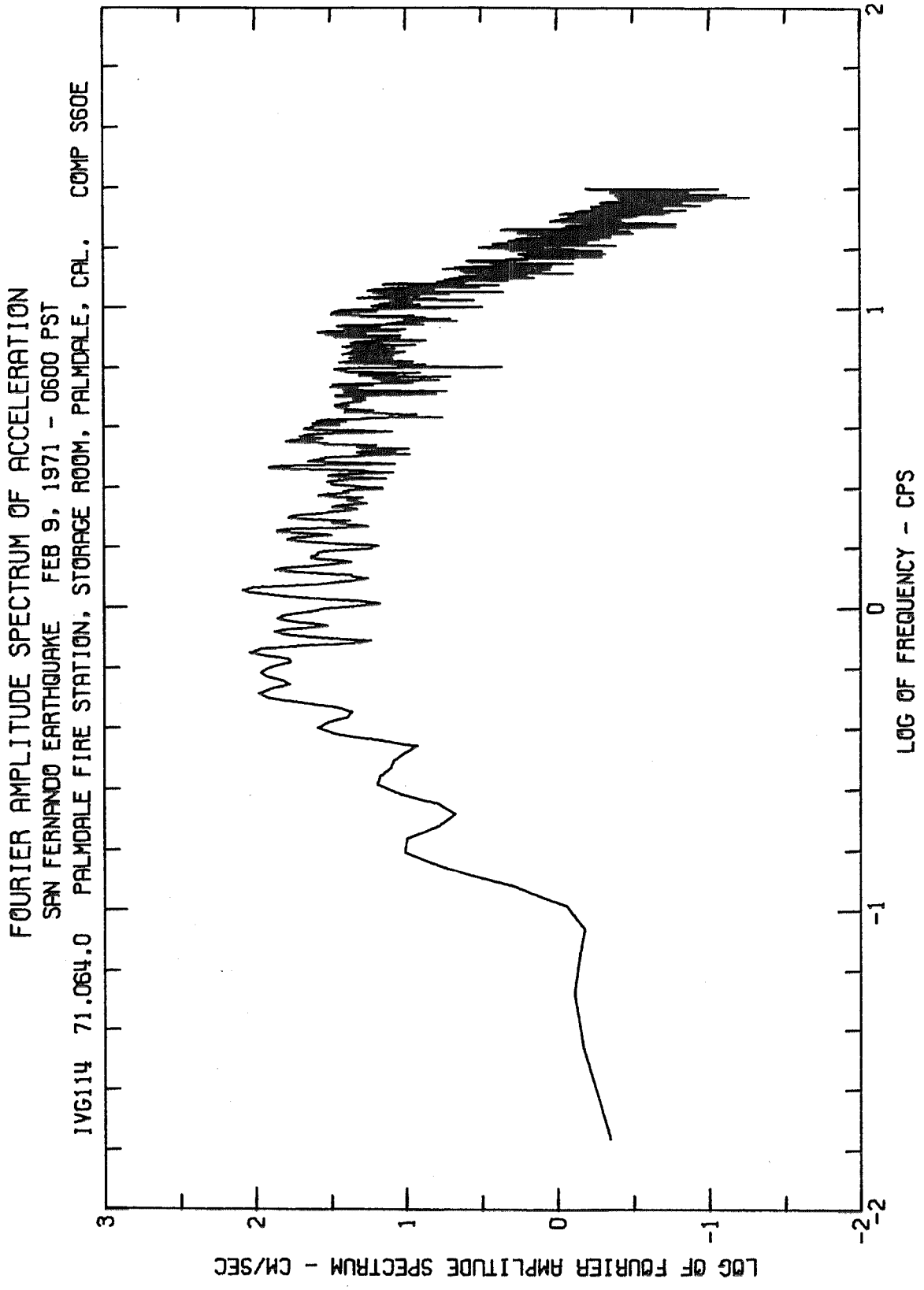
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
0
100
200
0
5
10
15
20
25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LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
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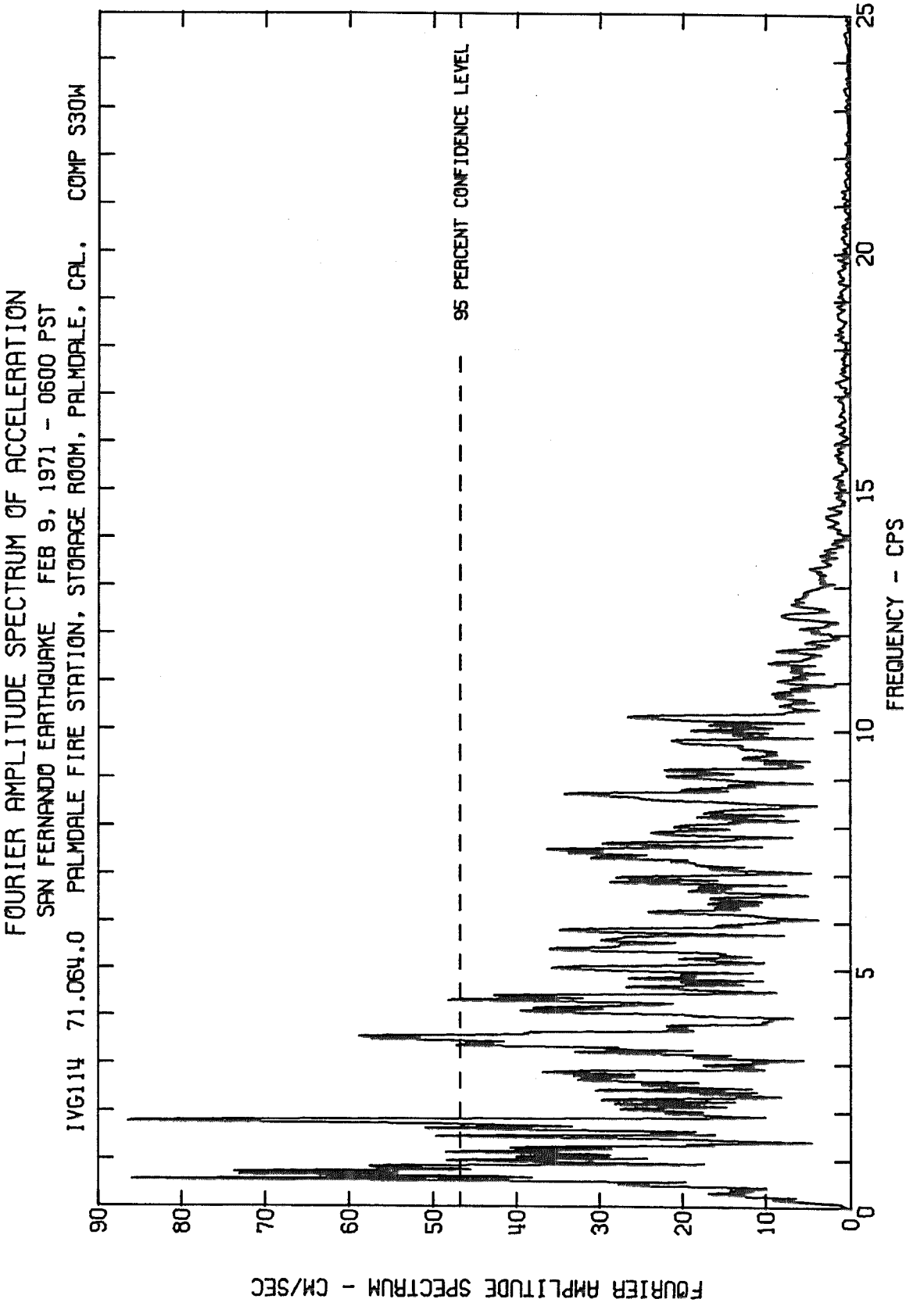
2
1
0
-1
-2
2
1
0
-1
-2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95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
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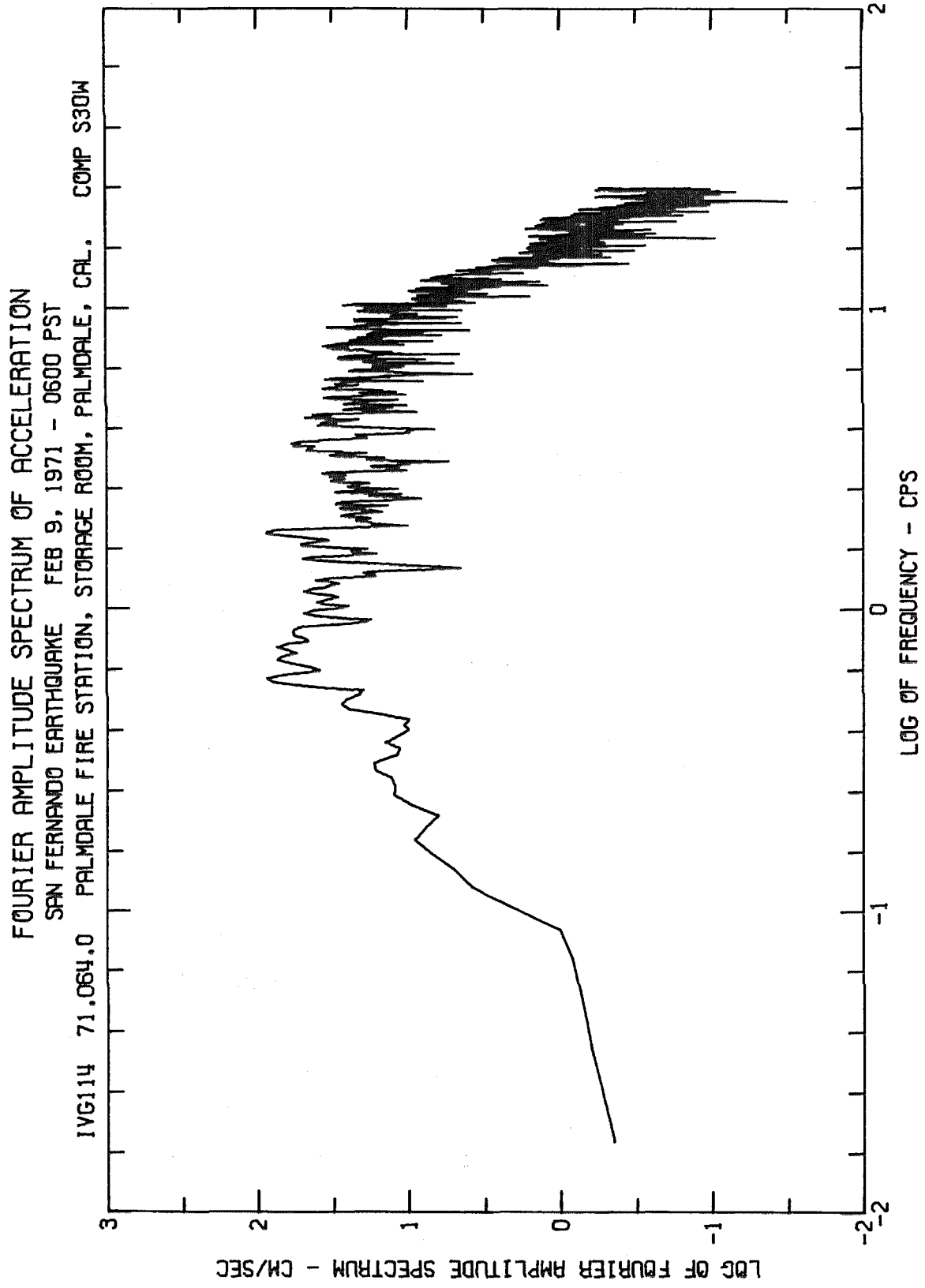
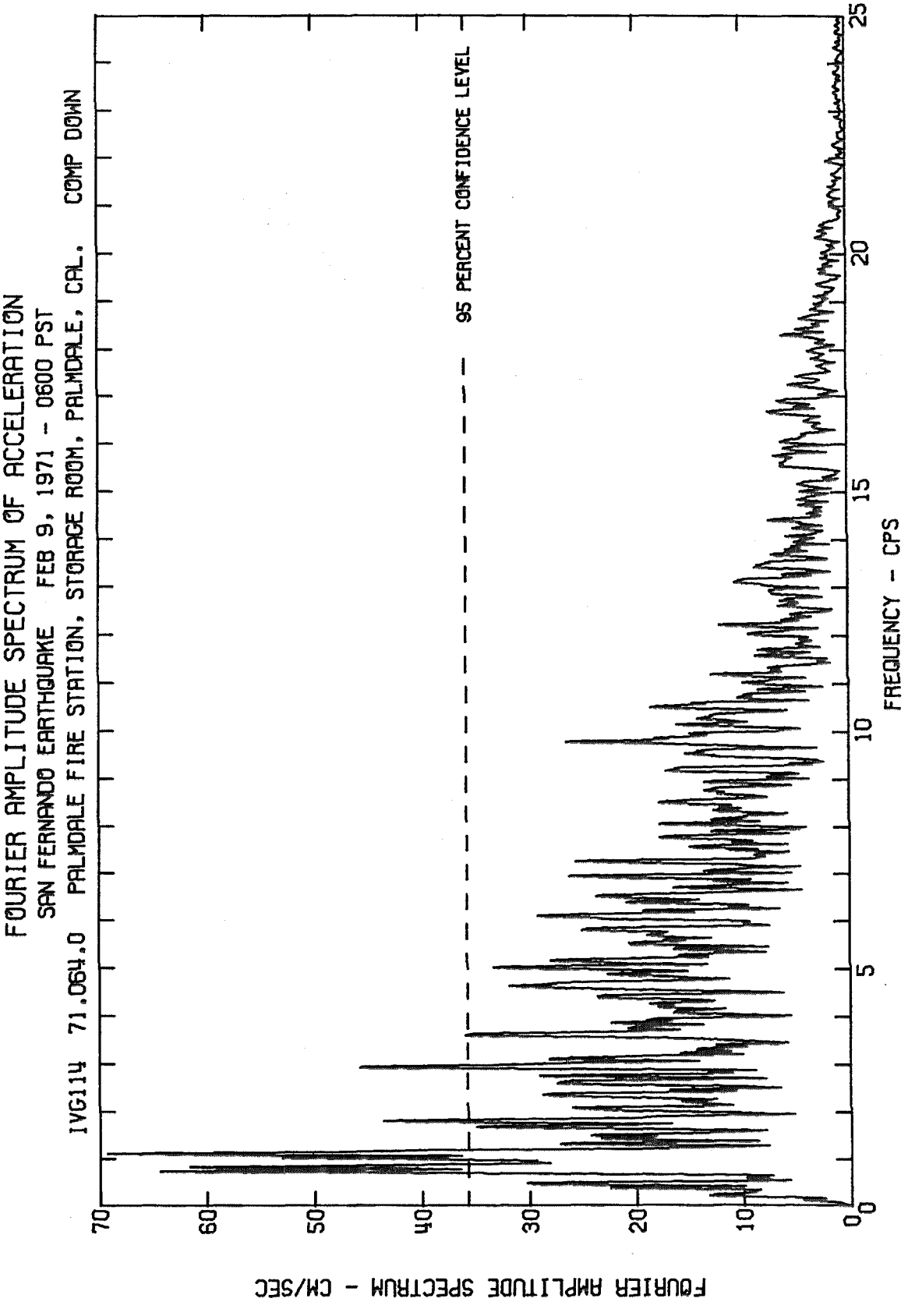
10
20
30
40
50
60
70
80
90
0
5
10
15
20
25


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG114 71.064.0 PALMDALE FIRE STATION, STORAGE ROOM, PALMDALE, CAL. COMP S30W
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
3
2
1
0
-1
-2
-2
-1
0
1
2


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
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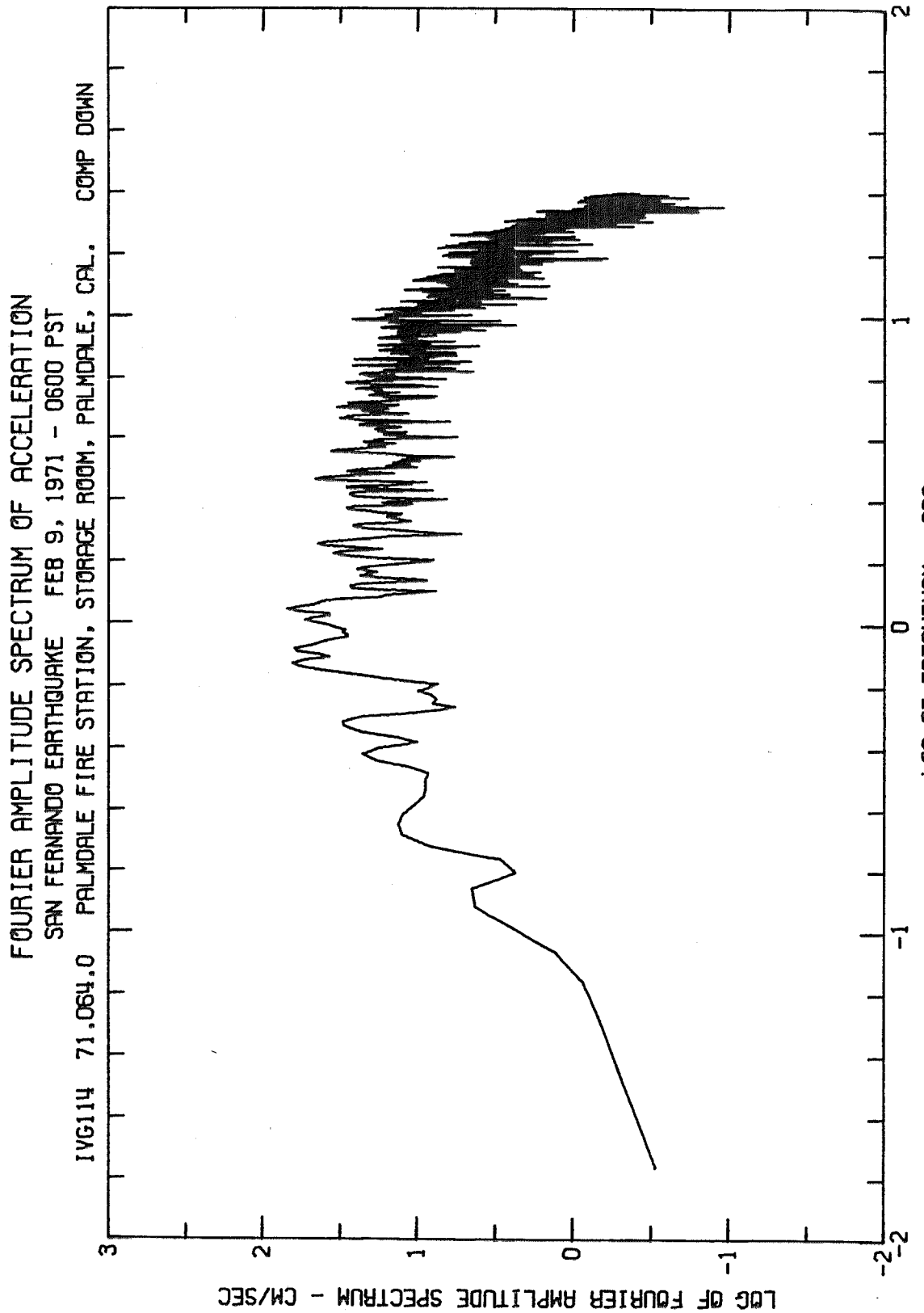
IVG114 71.064.0 PALMDALE FIRE STATION, STORAGE ROOM, PALMDALE, CAL. COMP DOWN
95 PERCENT CONFIDENCE LEVEL
FOURIER AMPLITUDE SPECTRUM - CM/SEC
FREQUENCY - CPS
0
10
20
30
40
50
60
70
0
5
10
15
20
25


FOURIER AMPLITUDE SPECTRUM OF ACCELERATION
SAN FERNANDO EARTHQUAKE FEB 9, 1971 - 0600 PST
IVG114 71.064.0 PALMDALE FIRE STATION, STORAGE ROOM, PALMDALE, CAL. COMP DOWN
LOG OF FOURIER AMPLITUDE SPECTRUM - CM/SEC
LOG OF FREQUENCY - CPS
3
2
1
0
-1
-2
2
1
0
-1
-2

California Institute of Technology

Earthquake Engineering Research Laboratory

The following reports of the Earthquake Engineering Research Laboratory from 1970 on can be obtained from the National Technical Information Service, Springfield, Virginia 22151:

EERL 70-20	Strong-Motion Earthquake Accelerograms - Digitized and Plotted Data	(Vol. I, Part A)	PB-187 847
EERL 70-21	" "	(Vol. I, Part B)	PB-196 823
EERL 71-20	" "	(Vol. I, Part C)	PB-204 364
EERL 71-21	" "	(Vol. I, Part D)	PB-208 529
EERL 71-22	" "	(Vol. I, Part E)	PB-209 749
EERL 71-23	" "	(Vol. I, Part F)	PB-210 619
EERL 72-20	" "	(Vol. I, Part G)	PB-211 357
EERL 72-21	" "	(Vol. I, Part H)	PB-211 781
EERL 72-22	" "	(Vol. I, Part I)	PB-213 422
EERL 72-23	" "	(Vol. I, Part J)	PB-213 423
EERL 72-24	" "	(Vol. I, Part K)	PB-213 424
EERL 72-25	" "	(Vol. I, Part L)	PB-215 639
EERL 72-26	" "	(Vol. I, Part M)	PB-220 554
EERL 72-27	" "	(Vol. I, Part N)	PB-223 023
EERL 73-20	" "	(Vol. I, Part O)	PB-222 417
EERL 71-50	Strong-Motion Earthquake Accelerograms - Digitized and Plotted Data: Corrected Accelerograms and Integrated Ground Velocity and Displacement Curves	(Vol. II, Part A)	PB-208 283
EERL 72-50	" "	(Vol. II, Part B)	PB-220 161
EERL 72-51	" "	(Vol. II, Part C)	PB-220 162
EERL 72-52	" "	(Vol. II, Part D)	PB-220 836
EERL 73-50	" "	(Vol. II, Part E)	PB-223 024
EERL 73-51	" "	(Vol. II, Part F)	PB-224 977/9AS

EERL 72-80	Analyses of Strong Motion Earthquake Accelerograms - Response Spectra (Vol. III, Part A)	PB-212 602
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EERL 73-81	" " (Vol. III, Part C)	PB-223 025
EERL 72-100	Analyses of Strong Motion Earthquake Accelerograms - Fourier Amplitude Spectra (Vol. IV, Part A)	PB-212 603
EERL 73-100	" " (Vol. IV, Part B)	PB-220 837
EERL 73-101	" " (Vol. IV, Part C)	PB-222 514
EERL 73-102	" " (Vol. IV, Part D)	PB-223 969/AS
Joint Report:	Strong-Motion Instrumental Data on the San Fernando Earthquake of February 9, 1971	PB-204 198
EERL 71-01	P. C. Jennings, et al, Forced Vibration of a 22-Story Steel Frame Building	PB-205 161
EERL 71-02	P. C. Jennings, ed., Engineering Features of the San Fernando Earthquake	PB-202 550
EERL 71-03	Randolph A. Adu, Response and Failure of Structures under Stationary Random Excitation	PB-205 304
EERL 71-04	Jacobo Bielak, Earthquake Response of Building-Foundation Systems	PB-205 305
EERL 71-05	M. D. Trifunac, F. E. Udwadia, A. G. Brady, High Frequency Errors and Instrument Corrections of Strong-Motion Accelerograms	PB-205 369
EERL 71-06	Knut Sverre Skattum, Dynamic Analysis of Coupled Shear Walls and Sandwich Beams	PB-205 267
EERL 71-07	John Brent Hoerner, Modal Coupling and Earthquake Response of Tall Buildings	PB-207 635
EERL 72-01	P. C. Jennings and J. Bielak, Dynamics of Building-Soil Interaction	PB-209 666
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DRC 72-01	Albert W. Whitney, On Insurance Settlements Incident to the 1906 San Francisco Fire	PB-213 256

EERL 72-04	J. H. Wood, Analysis of the Earthquake Response of a Nine-Story Steel Frame Building during the San Fernando Earthquake	PB-215 823
EERL 73-01	F. E. Udwadia and M. D. Trifunac, The Fourier Transform, Response Spectra and their Relationship through the Statistics of Oscillator Response	PB-220 458
EERL 73-02	Research Papers Submitted to Fifth World Conference on Earthquake Engineering, Rome, Italy, 25-29 June 1973	PB-220 431
DRC 73-02	Earthquakes and Insurance, Published Papers on the Earthquake Research Affiliates Conference of 2-3 April 1973	PB-223 033