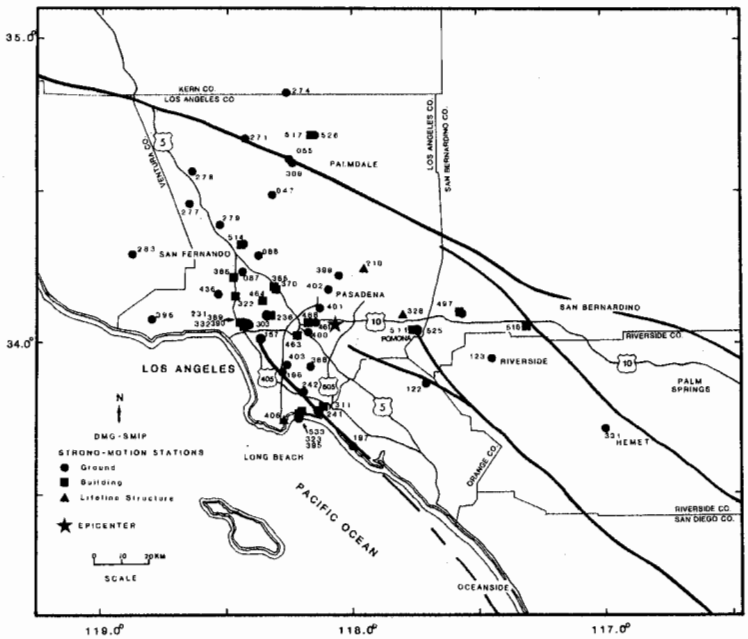
PROCESSED STRONG-MOTION DATA FROM THE WHITTIER, CALIFORNIA EARTHQUAKE OF 1 OCTOBER 1987

PART I
GROUND-RESPONSE RECORDS



CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY
OFFICE OF STRONG MOTION STUDIES
REPORT OSMS 89-03

CALIFORNIA DEPARTMENT OF CONSERVATION
Division of Mines and Geology

THE RESOURCES AGENCY
GORDON K. VAN VLECK
SECRETARY FOR RESOURCES

STATE OF CALIFORNIA
GEORGE DEUKMEJIAN
GOVERNOR

DEPARTMENT OF CONSERVATION
RANDALL M. WARD
DIRECTOR

DIVISION OF MINES AND GEOLOGY

BRIAN E. TUCKER

ACTING STATE GEOLOGIST

PROCESSED STRONG-MOTION DATA FROM THE WHITTIER, CALIFORNIA EARTHQUAKE OF 1 OCTOBER 1987

PART I

GROUND-RESPONSE RECORDS

M.J. Huang

T.Q. Cao

D.L. Parke

A.F. Shakal

Report No. OSMS 89-03

California Strong Motion Instrumentation Program

California Department of Conservation

Division of Mines and Geology

Office of Strong Motion Studies

630 Bercut Drive, Sacramento, California 95814

July 1989

CONTENTS

	Page
Introduction	1
Earthquake Characteristics	1
CSMIP Stations and Data	2
Accelerogram Digitization and Processing	2
References	18
Data Availability	20
Definition of Usable Data Bandwidth	21
Appendix A - Plots of Processed Data	22
Organization and Order of Plots	22
Stations:	
Tarzana - Cedar Hill Nursery	23
Alhambra - Fremont School	27
San Marino - Southwestern Academy	31
Los Angeles - Obregon Park	35
Altadena - Eaton Canyon Park	39
Downey - County Maint. Bldg.	43
Mt. Wilson - Caltech Seismic Station	47
Los Angeles - 116th St. School	51
Los Angeles - Hollywood Storage Bldg. FF	55
Inglewood - Union Oil Yard	59
Long Beach - Rancho Los Cerritos	63
Los Angeles - Baldwin Hills	67
Century City - LA County Club South	71
Century City - LA County Club North	75
Long Beach - Recreation Park	79
Long Beach - Harbor Admin. Bldg. FF	83
Pacoima - Kagel Canyon	87
Arleta - Nordhoff Ave Fire Station	91
Sylmar - Olive View Medical Center FF	95
Pomona - 4th & Locust FF	99

CONTENTS(continued)

Page

Stations(continued)

Featherly Park - Park Maint. Bldg. 103
Huntington Beach - Lake St. Fire Station 107
Rancho Cucamonga - Law & Justice Center FF 111
Riverside - Airport 115
Hemet - Stetson Ave Fire Station 119

Vasquez Rocks Park 123
Newhall - LA County Fire Station 127
Lancaster - Medical Office Bldg. FF 131
Leona Valley #5 - Ritter Ranch 135
Leona Valley #6 139

Malibu - Point Dume School 143
Castaic - Hasley Canyon 147
Lake Hughes #1 - Fire Station #78 151
Castaic - Old Ridge Route 155
Moorpark - Ventura Co. Fire Dept. Garage 159

Rosamond - Godde Ranch 163

List of CSMIP Reports and Data Tapes 167

INTRODUCTION

Strong-motion records were recovered from 101 stations of the California Strong Motion Instrumentation Program (CSMIP) following the Whittier earthquake of October 1, 1987 (also known as the Whittier Narrows earthquake). Sixty-three of those stations were ground-response stations. This report presents results of the digitization and processing performed on the records obtained from 36 of these stations. The remaining 27 stations typically had maximum accelerations of 5% g or less, as shown in the data report by Shakal et al. (1987), and those records were not digitized. The results for the digitization of records obtained at CSMIP structural-response stations are presented in an accompanying Part II report for buildings, and a Part III report covers for bridges and dams (Huang et al., 1989a and b).

EARTHQUAKE CHARACTERISTICS

The Whittier earthquake occurred on October 1, 1987 in the eastern Los Angeles area. Damage was moderate over a broad area and extensive in certain localized areas. Papers considering various aspects of the earthquake and associated damage appear in two issues of Earthquake Spectra (Earthquake Engineering Research Institute, 1988).

The earthquake location and magnitude are (Caltech Seismological Lab.):

Origin Time:	14:42:20 GMT, 1 October 1987 (07:42:20 PDT)
Epicenter:	34.067 N, 118.078 W
Focal Depth:	14 Km, approximate
Magnitude:	5.9 ML

CSMIP STATIONS AND DATA

The locations of the earthquake epicenter and of the 36 CSMIP ground-response stations for which data are included in this report are shown on the map in Figure 1. The locations of the 18 instrumented buildings for which data are included in the Part II report, and the three instrumented lifeline structures (one bridge and two dams) for which data are included in the Part III report are also shown. The 36 ground-response stations are within a distance range of 7 to 108 km from the epicenter. The stations are listed in order of code number (three-digit code on the map) in Table 1, and in alphabetical order in Table 2. The coordinates, site characteristics and maximum values of ground motion are given for each station in Table 3. Table 3 also lists the distance of the station from the epicenter.

For completeness, records presented in this report for the six stations which are also building reference free-field stations are also included in the Part II report for building records.

ACCELEROGRAM DIGITIZATION AND PROCESSING

The digitization results presented in this report were obtained using the CSMIP computer-driven optical scanning system. This facility is patterned after the system developed at the University of Southern California (Trifunac and Lee, 1979). In this system, a direct photographic negative copy of the film accelerogram is mounted on a rotating drum, which is scanned by a photodensitometer. The photodensitometer is mounted on a carriage moving perpendicular to the rotational direction of the drum. The resulting x-y array of optical density values is converted to raw time series through several trace-reconstruction steps. Baseline and other corrections are then

applied to this raw data to obtain the acceleration data for further processing and spectral analysis. The subsequent post-digitization processing is similar to that first developed at the California Institute of Technology (Trifunac and Lee, 1973). As discussed in greater detail below, a change of operators was made to improve the instrument correction procedure at high frequencies. In addition, the results of system noise analyses are used to guide the selection of filter corner frequencies in CSMIP processing.

The accelerograms digitized for this report are from SMA-1 accelerographs having 3 channels of data recorded on a 70 mm (2.75 in) wide film. For each accelerogram, the 70 mm film contains three acceleration traces, one or two straight-line reference traces, and two time-mark traces. For most of the accelerograms presented in this report, one of the time-mark traces contains a WWVB time code and their accelerograph trigger times are included in Table 3.

The sequence of steps in digitizing and processing a record is summarized in the following:

1. The film record, 70 mm wide and about 60 cm (60 seconds) long, is contact-copied onto a 25 cm by 25 cm high-contrast photographic negative; two sections of the record, each approximately 22 cm (22 seconds) in length, are copied onto a single negative. To facilitate subsequent reconstruction of the original record, adjacent sections are copied so that they have an overlap of approximately 2 seconds. For further details, refer to the report by Trifunac and Lee (1979).

2. The negative containing the two sections of the accelerogram is digitized into x and y coordinates by the optical scanner. The scanner sampling rate used for these records is 200 samples per centimeter in x and y. This is nominally equal to a time step of 0.005 second (200 samples/sec) and

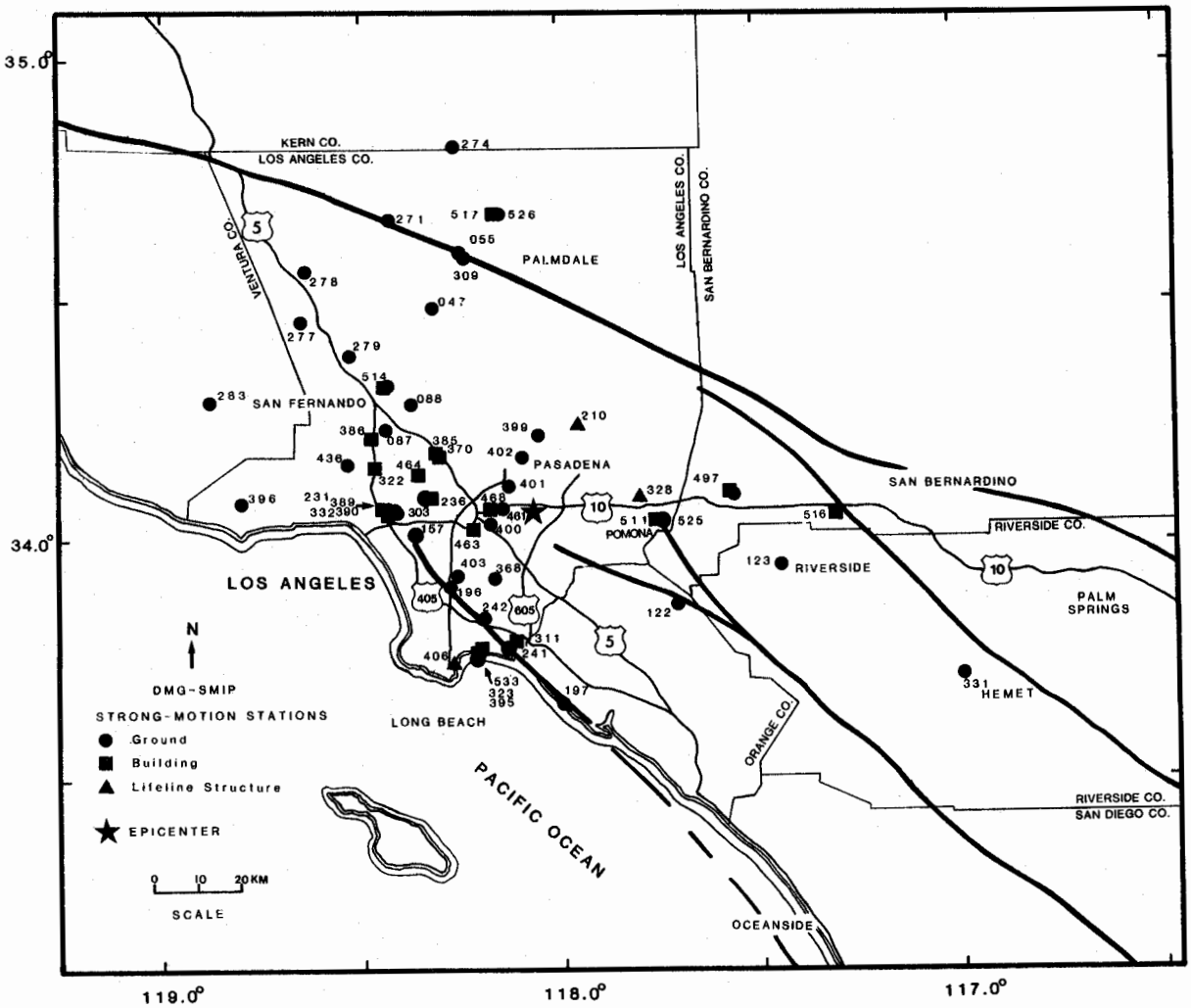


Fig. 1. Locations of the epicenter and the CSMIP strong-motion stations for which the records from the Whittier earthquake of October 1, 1987 are digitized and processed. Solid circles indicate the locations of ground-response stations for which the processed data are presented in this report. These ground-response stations are identified by 3-digit codes which are cross-referenced to station names in Table 1. The solid squares indicate the locations of buildings considered in the Part II report, and the solid triangles indicate the locations of lifeline structures considered in the Part III report.

TABLE 1 - STATION-CODE REFERENCE TABLE

Code	Station No.	Station Name	Page
047	24047	Vasquez Rocks Park	123
055	24055	Leona Valley #5 - Ritter Ranch	135
087	24087	Arleta - Nordhoff Ave Fire Station	91
088	24088	Pacoima - Kagel Canyon	87
122	13122	Featherly Park - Park Maint. Bldg.	103
123	13123	Riverside - Airport	115
157	24157	Los Angeles - Baldwin Hills	67
196	14196	Inglewood - Union Oil Yard	50
197	13197	Huntington Beach - Lake St. Fire Station	107
241	14241	Long Beach - Recreation Park	79
242	14242	Long Beach - Rancho Los Cerritos	63
271	24271	Lake Hughes #1 - Fire Station #78	151
274	24274	Rosamond - Goode Ranch	163
277	24277	Castaic - Hasley Canyon	147
278	24278	Castaic - Old Ridge Route	155
279	24279	Newhall - LA County Fire Station	127
283	24283	Moorpark - Ventura Co. Fire Dept. Garage	159
303	24303	Los Angeles - Hollywood Storage Bldg. FF	55
309	24309	Leona Valley #6	139
331	12331	Hemet - Stetson Ave Fire Station	119
368	14368	Downey - County Maint. Bldg.	43
389	24389	Century City - LA County Club North	75
390	24390	Century City - LA County Club South	71
395	14395	Long Beach - Harbor Admin. Bldg. FF	83
396	24396	Malibu - Point Dume School	143
399	24399	Mt. Wilson - Caltech Seismic Station	47
400	24400	Los Angeles - Obregon Park	35
401	24401	San Marino - Southwestern Academy	31
402	24402	Altadena - Eaton Canyon Park	39
403	14403	Los Angeles - 116th St. School	51
436	24436	Tarzana - Cedar Hill Nursery	23
461	24461	Alhambra - Fremont School	27
497	23497	Rancho Cucamonga - Law & Justice Center FF	111
514	24514	Sylmar - Olive View medical Center FF	95
525	23525	Pomona - 4th & Locust FF	99
526	24526	Lancaster - Medical Office Bldg. FF	131

TABLE 2 - ALPHABETICAL LIST OF STATIONS

Station Name	Code	Page
Alhambra - Fremont School	461	27
Altadena - Eaton Canyon Park	402	39
Arleta - Nordhoff Ave Fire Station	087	91
Castaic - Hasley Canyon	277	143
Castaic - Old Ridge Route	278	155
Century City - LA County Club South	390	71
Century City - LA County Club North	389	75
Downey - County Maint. Bldg.	368	43
Featherly Park - Park Maint. Bldg.	122	103
Hemet - Stetson Ave Fire Station	331	119
Huntington Beach - Lake St. Fire Station	197	107
Inglewood - Union Oil Yard	196	50
Lake Hughes #1 - Fire Station #78	271	151
Lancaster - Medical Office Bldg. FF	526	131
Leona Valley #5 - Ritter Ranch	055	135
Leona Valley #6	309	139
Long Beach - Harbor Admin. Bldg. FF	395	83
Long Beach - Rancho Los Cerritos	242	63
Long Beach - Recreation Park	241	79
Los Angeles - 116th St. School	403	51
Los Angeles - Baldwin Hills	157	67
Los Angeles - Hollywood Storage Bldg. FF	303	55
Los Angeles - Obregon Park	400	35
Malibu - Point Dume School	396	143
Moorpark - Ventura Co. Fire Dept. Garage	283	159
Mt. Wilson - Caltech Seismic Station	399	47
Newhall - LA County Fire Station	279	127
Pacoima - Kagel Canyon	088	87
Pomona - 4th & Locust FF	525	99
Rancho Cucamonga - Law & Justice Center FF	497	111
Riverside - Airport	123	115
Rosamond - Goode Ranch	274	163
San Marino - Southwestern Academy	401	31
Sylmar - Olive View medical Center FF	514	95
Tarzana - Cedar Hill Nursery	436	23
Vasquez Rocks Park	047	123

an acceleration increment of 0.003 g.

3. The raw x,y data from the individual sections are concatenated to form continuous acceleration traces, straight-line reference traces and timing traces.

4. Phase 1 (Volume 1) Processing. The reference traces are subtracted from the acceleration traces to remove any spurious film-movement effects. The axis of zero acceleration is determined by assuming the entire record has zero mean. The time-mark traces are used to obtain an accurate time scale. The starting times of the acceleration channels are adjusted so any time phasing error from one channel to another is less than 0.02 sec (i.e., less than one time increment in the Phase 2 (Volume 2 data). The instrument sensitivities are used to scale ordinate values to accelerations. The processed record length is 40 seconds for all the records presented in this report.

5. Phase 2 (Volume 2) Processing. The Phase 1 (Volume 1) acceleration data are interpolated to obtain exactly 200 pts/sec sampling (100 Hz Nyquist frequency). The instrumental data are corrected to true acceleration using a simple finite-difference based instrument correction operator. A high-frequency Ormsby filter with a corner frequency of 23 Hz and a roll-off termination frequency of 25 Hz is applied. The data are then decimated to 50 pts/sec (25 Hz Nyquist). As discussed in Shakal and Ragsdale (1984), this order (instrument correction prior decimation) improves the accuracy of the instrument correction procedure at high frequencies while still using the same simple operator used in the original Caltech code (Trifunac and Lee, 1973). The acceleration data are initially corrected for long-period errors by using a low-frequency Ormsby filter with a ramp from 0.05 to 0.07 Hz. Velocity and

TABLE 3 - SUMMARY OF PROCESSED GROUND-RESPONSE RECORDS FROM

Station No.	Station Name	Station Coordinates N Lat.	Station Coordinates W Long.	Site Geology	Instrument Housing *	Epicentral Dist. ** (km)
24436	Tarzana Cedar Hill Nursery	34.160	118.534	Alluvium(10m?) over siltstone	Instr. shltr. H	44
24461	Alhambra Fremont School	34.070	118.150	Alluvium	1-story bldg.	7
24401	San Marino Southwestern Academy	34.115	118.130	Alluvium	1-story bldg.	8
24400	Los Angeles Obregon Park	34.037	118.178	Alluvium	1-story bldg.	10
24402	Altadena Eaton Canyon Park	34.177	118.096	Alluvium	1-story bldg.	13
14368	Downry County Maint. Bldg.	33.924	118.167	Deep alluvium	1-story bldg.	17
24399	Mt. Wilson Caltech Seismic Station	34.224	118.057	Quartz diorite	Seismic vault	19
14403	Los Angeles 116th St. School	33.929	118.260	Terrace deposits	1-story bldg.	22
24303	Los Angeles Hollywood Storage Bldg. FF	34.090	118.339	Alluvium(130m?) over sandstone, shale	Instr. shltr. H	25
14196	Inglewood Union Oil Yard	33.905	118.279	Terrace deposits	Instr. shltr. A	25
14242	Long Beach Rancho Los Cerritos	33.840	118.194	Alluvium	Instr. shltr. H	27
24157	Los Angeles Baldwin Hills	34.009	118.361	Fill over shale, sandstone	Instr. shltr. H	27
24390	Century City LA Country Club South	34.062	118.416	Alluvium	Instr. shltr. H	32

THE WHITTIER EARTHQUAKE OF OCTOBER 1, 1987

Station No.	Trigger Time #	Component Azimuth (deg.)	Peak Accel. (g) ##	Peak Velocity (cm/sec)	Peak Displ. (cm)	Usable Data Bandwidth	Page
24436	---	90	-0.610	24.2	-1.3	0.42-23.6 Hz	23
		UP	0.257	-6.2	0.4	(0.04-2.35 sec)	
		360	-0.451	-19.2	-1.3		
24461	---	270	-0.399	17.0	-1.6	0.42-23.6 Hz	27
		UP	-0.199	-5.9	0.7	(0.04-2.35 sec)	
		180	0.294	-21.7	-2.4		
24401	22.3	360	0.194	-12.9	2.1	0.42-23.6 Hz	31
		UP	-0.137	6.6	0.7	(0.04-2.35 sec)	
		270	-0.143	-4.8	0.5		
24400	22.8	360	0.434	-21.8	-2.8	0.34-23.6 Hz	35
		UP	0.142	5.3	-0.7	(0.04-2.94 sec)	
		270	-0.451	12.9	-2.4		
24402	24.4	90	-0.164	-4.8	-0.5	0.42-23.6 Hz	39
		UP	0.175	-3.1	0.4	(0.04-2.35 sec)	
		360	0.316	-10.2	1.2		
14368	---	270	0.156	-12.9	-1.5	0.42-23.6 Hz	43
		UP	-0.164	3.0	0.3	(0.04-2.35 sec)	
		180	0.206	-28.9	-3.7		
24399	24.0	90	-0.183	4.1	0.3	0.42-23.6 Hz	47
		UP	-0.122	2.5	0.3	(0.04-2.35 sec)	
		360	-0.130	-4.2	0.4		
14403	25.4	360	-0.400	18.6	2.1	0.42-23.6 Hz	51
		UP	0.105	3.1	-0.2	(0.04-2.35 sec)	
		270	0.280	-17.5	1.7		
24303	---	90	-0.121	6.9	-0.9	0.34-23.6 Hz	55
		UP	0.080	3.1	0.5	(0.04-2.94 sec)	
		360	-0.211	9.2	-1.4		
14196	26.0	90	0.228	-16.4	-2.0	0.34-23.6 Hz	59
		UP	0.072	-2.9	-0.3	(0.04-2.94 sec)	
		360	0.263	-8.7	-0.7		
14242	26.1	90	0.241	-18.5	-2.1	0.42-23.6 Hz	63
		UP	-0.086	-2.8	0.2	(0.04-2.35 sec)	
		360	0.149	-16.5	2.4		
24157	26.2	90	0.163	6.7	1.0	0.42-23.6 Hz	67
		UP	0.112	-4.0	-0.4	(0.04-2.35 sec)	
		360	0.152	7.7	1.1		
24390	30.3	90	-0.069	4.2	-0.7	0.51-23.6 Hz	71
		UP	-0.028	-1.6	-0.2	(0.04-1.96 sec)	
		360	0.061	3.7	-0.5		

TABLE 3 - SUMMARY OF PROCESSED GROUND-RESPONSE RECORDS FROM

Station No.	Station Name	Station Coordinates N Lat.	Station Coordinates W Long.	Site Geology	Instrument Housing *	Epicentral Dist. ** (km)
24389	Century City LA Country Club North	34.063	118.418	Alluvium	Instr. shltr. H	32
14241	Long Beach Recreation Park	33.778	118.133	Terrace deposits	Instr. shltr. H	32
14395	Long Beach Harbor Admin. Bldg. FF	33.754	118.200	Alluvium	Instr. shltr. H	36
24088	Pacoima Kagel Canyon	34.288	118.375	Sandstone	1-story bldg.	38
24087	Arleta Nordhoff Ave Fire Station	34.236	118.439	Deep alluvium	1-story bldg.	39
24514	Sylmar Olive View medical Center FF	34.326	118.444		Small 1-story bldg.	45
23525	Pomona 4th and Locust FF	34.056	117.748		Instr. shltr. H	30
13122	Featherly Park Park Maint. Bldg.	33.869	117.709	Alluvium	1-story bldg.	40
13197	Huntington Beach Lake St. Fire Station	33.662	117.997	Sand over alluvium	1-story bldg.	45
23497	Rancho Cucamonga Law & Justice Center FF	34.104	117.574	Sand, alluvium (250m?) over granite	Instr. shltr. D	47
13123	Riverside Airport	33.951	117.446	Alluvium	1-story bldg.	59
12331	Hemet Stetson Ave Fire Station	33.729	116.979	Deep alluvium	1-story bldg.	108
24047	Vasquez Rocks Park	34.490	118.320	Shallow alluvium (~3m) over sandstone	Instr. shltr. A	53

Station No.	Trigger Time #	Component Azimuth (deg.)	Peak Accel. (g) ##	Peak Velocity (cm/sec)	Peak Displ. (cm)	Usable Data Bandwidth	Page
24389	27.1	90	-0.104	6.6	-0.7	0.42-23.6 Hz	75
		UP	-0.040	-1.5	0.2	(0.04-2.35 sec)	
		360	-0.074	3.9	-0.4		
14241	28.1	180	0.056	5.5	-0.9	0.42-23.6 Hz	79
		UP	-0.044	1.8	-0.2	(0.04-2.35 sec)	
		90	-0.060	3.6	-0.4		
14395	30.4	90	-0.071	-7.9	1.1	0.42-23.6 Hz	83
		UP	0.028	1.2	-0.2	(0.04-2.35 sec)	
		360	-0.053	4.6	-0.6		
24088	27.0	90	0.163	7.7	-1.0	0.42-23.6 Hz	87
		UP	0.058	2.7	0.3	(0.04-2.35 sec)	
		360	0.160	7.4	-0.6		
24087	---	270	-0.087	5.7	0.9	0.42-23.6 Hz	91
		UP	-0.085	3.4	0.4	(0.04-2.35 sec)	
		180	0.093	-4.8	-0.6		
24514	28.2	90	-0.053	-3.5	-0.5	0.42-23.6 Hz	95
		UP	0.042	1.8	-0.2	(0.04-2.35 sec)	
		360	0.058	-4.0	0.5		
23525	25.9	102	-0.057	2.3	-0.2	0.68-23.6 Hz	99
		UP	-0.058	-1.6	-0.1	(0.04-1.47 sec)	
		12	0.072	-2.4	-0.3		
13122	---	90	-0.079	-4.4	0.3	0.68-23.6 Hz	103
		UP	0.049	1.2	0.1	(0.04-1.47 sec)	
		360	0.079	3.9	0.3		
13197	---	360	-0.042	1.9	-0.3	0.51-23.6 Hz	107
		UP	-0.028	1.0	-0.1	(0.04-1.96 sec)	
		270	0.047	-1.4	-0.2		
23497	28.9	90	0.062	-1.4	-0.1	0.68-23.6 Hz	111
		UP	0.039	-0.8	0.1	(0.04-1.47 sec)	
		360	0.049	1.4	-0.2		
13123	31.3	270	-0.062	-1.3	-0.05	0.85-23.6 Hz	115
		UP	0.046	-0.7	-0.03	(0.04-1.18 sec)	
		180	0.046	1.3	0.05		
12331	39.3	360	0.037	1.3	-0.1	0.68-23.6 Hz	119
		UP	-0.028	0.8	-0.1	(0.04-1.18 sec)	
		270	0.034	1.4	0.1		
24047	29.0	90	-0.071	-1.7	-0.1	0.68-23.6 Hz	123
		UP	-0.039	-0.9	0.1	(0.04-1.47 sec)	
		360	0.062	2.2	-0.1		

TABLE 3 - SUMMARY OF PROCESSED GROUND-RESPONSE RECORDS FROM

Station No.	Station Name	Station Coordinates N Lat.	Station Coordinates W Long.	Site Geology	Instrument Housing *	Epicentral Dist. ** (km)
24279	Newhall LA County Fire Station	34.390	118.530	Alluvium	1-story bldg.	56
24526	Lancaster Medical Office Bldg. FF	34.688	118.156	Alluvium	Instr. shltr. H	70
24055	Leona Valley #5 Ritter Ranch	34.600	118.241	Alluvium	Instr. shltr. A	62
24309	Leona Valley #6	34.604	118.244		Instr. shltr. H	62
24396	Malibu Point Dume School	34.077	118.800		1-story bldg.	67
24277	Castaic Hasley Canyon	34.459	118.650	Shallow alluvium	1-story bldg.	69
24271	Lake Hughes #1 Fire Station #78	34.674	118.430	Alluvium(~300m) over granitics	1-story bldg.	75
24278	Castaic Old Ridge Route	34.564	118.642		Small 1-story bldg.	77
24283	Moorpark Ventura Co. Fire Dept. Garage	34.288	118.881	Alluvium	Small Garage	79
24274	Rosamond Goode Ranch	34.827	118.265	Alluvium	Instr. shltr. H	87

* - Instrument shelter types:
Instr. shltr A - small prefabricated metal building
Instr. shltr D - small metal box
Instr. shltr H - small fiberglass shelter
** - Distance given relative to the epicenter at 34.058N, 118.075W.

THE WHITTIER EARTHQUAKE OF OCTOBER 1, 1987 (continued)

Station No.	Trigger Time #	Component Azimuth (deg.)	Peak Accel. (g) ##	Peak Velocity (cm/sec)	Peak Displ. (cm)	Usable Data Bandwidth	Page
24279	34.6	270	-0.058	-3.7	0.4	0.51-23.6 Hz	127
		UP	-0.034	-1.1	0.1	(0.04-1.96 sec)	
		180	-0.048	2.8	0.3		
24526	33.1	100	-0.063	3.0	0.2	0.68-23.6 Hz	131
		UP	-0.028	0.8	-0.1	(0.04-1.47 sec)	
		10	-0.062	-2.9	0.2		
24055	33.1	90	0.054	-2.6	0.2	0.85-23.6 Hz	135
		UP	0.027	0.9	-0.1	(0.04-1.18 sec)	
		360	0.053	2.2	0.1		
24309	35.8	90	-0.050	1.9	-0.1	0.85-23.6 Hz	139
		UP	-0.023	0.9	0.1	(0.04-1.18 sec)	
		360	0.034	1.5	0.1		
24396	33.9	270	0.048	2.3	0.2	0.68-23.6 Hz	143
		UP	-0.029	1.5	-0.1	(0.04-1.47 sec)	
		180	-0.045	2.2	0.2		
24277	---	90	-0.037	2.1	-0.2	0.68-23.6 Hz	147
		UP	-0.022	1.3	0.2	(0.04-1.47 sec)	
		360	-0.031	-2.2	0.2		
24271	35.7	90	0.028	1.7	-0.2	0.68-23.6 Hz	151
		UP	---	---	---	(0.04-1.47 sec)	
		360	-0.038	2.5	0.2		
24278	---	90	0.070	-4.3	-0.4	0.51-23.6 Hz	155
		UP	-0.027	-1.4	0.1	(0.04-1.96 sec)	
		360	0.069	4.2	0.4		
24283	35.7	180	0.047	2.7	0.3	0.68-23.6 Hz	159
		UP	-0.019	1.1	0.1	(0.04-1.47 sec)	
		90	-0.049	3.1	0.3		
24274	37.5	90	0.053	-3.1	0.3	0.68-23.6 Hz	163
		UP	0.023	1.4	0.1	(0.04-1.47 sec)	
		360	-0.076	-3.6	0.4		

\# Accelerograph trigger time, when known, in seconds after 14:42 GMT on 1 October 1987.

Phase 1 (Volume 1) peak acceleration values.

displacement are integrated from acceleration and filtered using the same low-frequency Ormsby filter as for the acceleration. To prevent the introduction of spurious long-period energy through aliasing, an Ormsby filter rather than a running mean filter is used prior to the decimation associated with the long period filtering (Shakal, 1982; Shakal and Ragsdale, 1984).

6. Phase 3 (Volume 3) Processing. The response spectra for periods from 0.04 to 15 seconds and damping values of 0, 2, 5, 10 and 20 per cent of critical are calculated from the accelerations obtained in Step 5. The Fourier amplitude spectral values are also computed for these periods. A preliminary plot of the pseudo-velocity (PSV) response spectrum is generated for use in filter selection.

7. The Phase 2 Processing of Step 5 is repeated, but with a new low-frequency Ormsby filter to remove long-period noise in the record. The corner frequency of the filter used depends on the signal-to-noise ratio in the record and the noise level of the digitizing system. The long-period intersection of the PSV spectrum obtained in Step 6 and the CSMIP system average noise spectrum shown in Figure 2 (from Shakal and Ragsdale, 1984) indicates the long-period limit of useful information. An iterative procedure is used, with the filter corner being set at progressively shorter periods in order to remove the long period noise while preserving as much of the signal as possible. The final value of filter bandwidth used is shown on the titles of the plots and explained in Appendix B. The acceleration, velocity and displacement time histories obtained using this filter are the final Phase 2 (Volume 2) data written on a magnetic tape and presented in this report.

8. The final relative velocity response spectrum (SV), relative displacement response spectrum (SD), absolute acceleration response spectrum

(SA), and Fourier amplitude spectrum (FS) are computed using the final filter settings. The pseudo-velocity response spectra (PSV) computed from SD are plotted on tripartite logarithmic paper and presented in this report. In addition, the SA spectra are plotted versus period with a linear scale.

Note that the optimal filter bandwidth is obtained for each accelerogram; all accelerograms from a single earthquake are not restricted to have a single filter corner frequency. However, the same filter corner is used for all channels from a single accelerogram to make channel-to-channel comparisons convenient.

As discussed above, Figure 2 shows the average noise spectrum for the CSMIP digitization system. It is also useful to consider the noise characteristics in terms of actual time-domain amplitudes. Figure 3 shows typical noise amplitudes present in acceleration, in velocity, and in displacement time histories obtained for different long-period filter cutoff settings. For example, Figure 3 indicates that for a filter cutoff near 10 seconds, the expected noise level is near 0.002 g in acceleration, 1 cm/sec in velocity, and 1 cm in displacement.

ADDITIONAL STRONG-MOTION DATA

Several agencies in addition to CSMIP have strong-motion instruments in the Los Angeles area. The network of the University of Southern California recorded the October 1 Whittier earthquake at 68 stations (Trifunac, 1988). The records obtained from 52 stations by the U.S. Geological Survey (USGS) are described in the data report by Etheredge et al. (1987), and the processed data from some of these records are presented in the reports by Brady et al. (1988 and 1989). Records were also recovered from small, specialized network

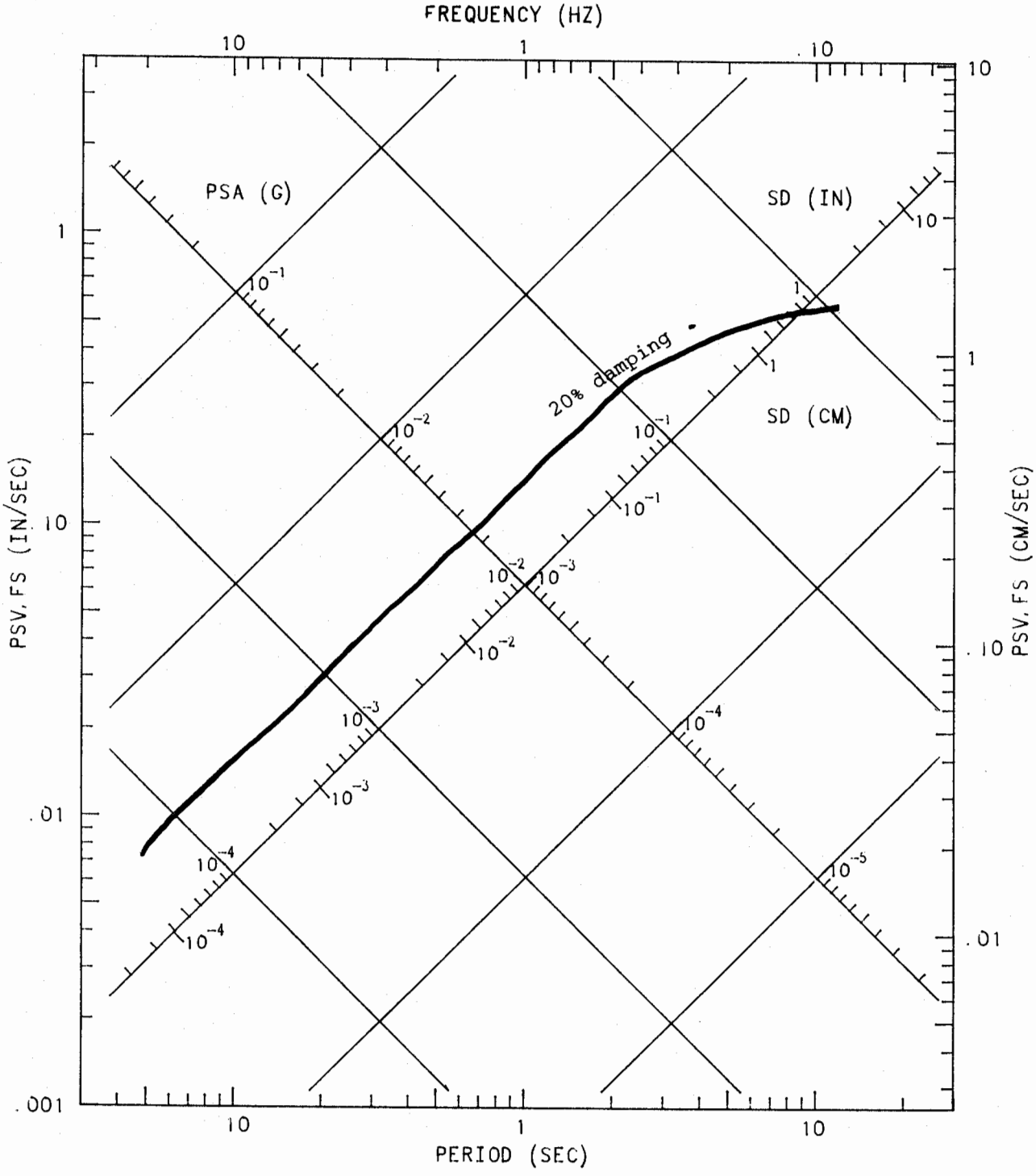


Fig. 2. Noise-level spectra (PSV, 20% damping) for the CSMIP digitization system (from Shakal and Ragsdale, 1984).

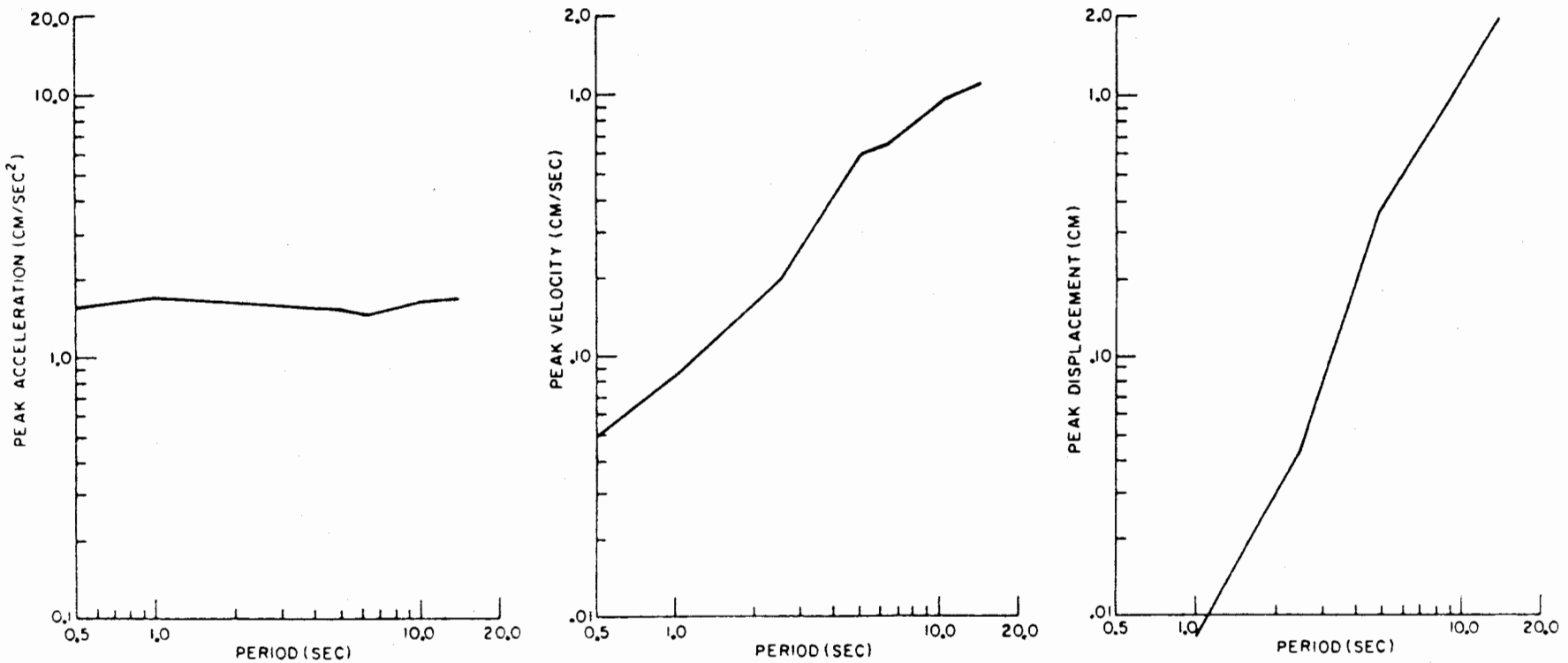


Fig. 3. Processing noise present in a typical acceleration (left), velocity (middle) and displacement (right) record processed with a long-period filter cut-off period ranging from 0.5 sec to 15 secs (from Shakal and Ragsdale, 1984).

maintained by the California Institute of Technology (Levine and others, 1988), Southern California Edison and other agencies.

The Los Angeles City code requires the owners of tall buildings to install and maintain strong-motion accelerographs. CSMIP has archived some of the records from these privately owned instruments. It is planned that a report containing copies of these records and their processed results will be prepared in the future.

REFERENCES

Brady, A.G., P.N. Mork, and L.C. Seekins, 1988, Processed strong-motion records, Whittier Narrows, California earthquake, October 1, 1987, Volume I, USGS-NSMIN stations within 15 km of the epicenter, U.S. Geological Survey, Open File Report 88-354.

Brady, A.G., P.N. Mork, and L.C. Seekins, 1989, Processed strong-motion records, Whittier Narrows, California earthquake, October 1, 1987, Volume 2, USGS-NSMIN stations between 11 and 31 km and the Santa Ana River Pipeline Bridge, U.S. Geological Survey, Open File Report 89-122.

Earthquake Engineering Research Institute, 1988, LFE, The 1987 Whittier Narrows earthquake, Earthquake Spectra, Vol. 4, Numbers 1 and 2.

Etheredge, E. and R. Porcella, 1987, Strong-motion data from the October 1, 1987 Whittier Narrows earthquake, U.S. Geological Survey, Open File Report 87-616.

Huang, M.J., T.Q. Cao, C.E. Ventura, and A.F. Shakal, 1989a, Processed strong-motion data from the Whittier, California earthquake of 1 October 1987, Part II. Building records, Calif. Div. Mines and Geology, Report No. OSMS 89-04. (in preparation)

Huang, M.J., T.Q. Cao, C.E. Ventura, and A.F. Shakal, 1989b, Processed strong-motion data from the Whittier, California earthquake of 1 October 1987, Part III. Lifelines records, Calif. Div. Mines and Geology, Report No. OSMS 89-05. (in preparation)

Levine, M.B., J.L. Beck, W.D. Iwan, P.C. Jennings and R. Relles, 1988, Accelerograms recorded at Caltech during the Whittier Narrows earthquake of October 1 and 4, 1987: A preliminary report, Report EERL 88-01, Calif. Inst. of Technology, Pasadena.

Shakal, A.F., 1982, Spectral folding in the processing of strong-motion accelerograms, (abstr.), Trans. Amer. Geophys. Union, Vol. 63, p. 1037.

Shakal, A.F. and M.J. Huang, 1985, Standard tape format for CSMIP strong-motion data tapes, Calif. Div. Mines and Geology, Report No. OSMS 85-03, 26 p.

Shakal, A.F. and J.T. Ragsdale, 1984, Acceleration, velocity and displacement noise analysis for the CSMIP accelerogram digitization system, Proc. 8th World Conference on Earthquake Engineering, Vol. 2, p. 111-118.

Shakal, A.F., M.J. Huang, C.E. Ventura, D.L. Parke, T.Q. Cao, R.W. Sherburne, and R. Blazquez, 1987, CSMIP strong-motion records from the Whittier, California earthquake of 1 October 1987, Calif. Div. Mines and Geology, Report No. OSMS 87-05, 198 p.

Trifunac, M.D. and V.W. Lee, 1973, Routine computer processing of strong-motion accelerograms, Earthquake Engineering Research Lab., Report EERL 73-03, Calif. Inst. of Technology, Pasadena.

Trifunac, M.D. and V.W. Lee, 1979, Automatic digitization and processing of strong-motion accelerograms, Part I: Automatic digitization, Report No. 79-15 I, Dept. of Civil Engineering, Univ. of Southern Calif., Los Angeles.

Trifunac, M.D., 1988, The Whittier Narrows, California earthquake of october 1, 1987 - Note on peak accelerations during the 1 and 4 October earthquakes, Earthquake Spectra, Vol. 4, No. 1, p. 101-113.

DATA AVAILABILITY

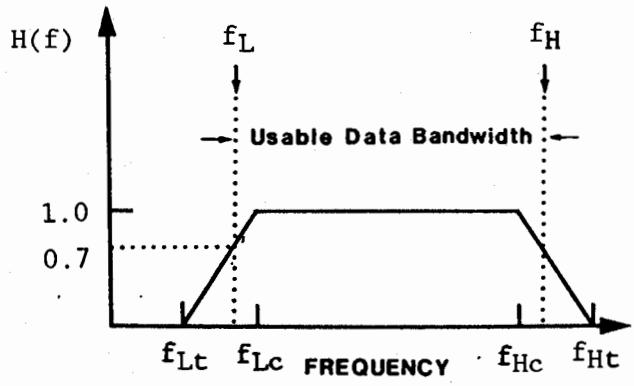
The processed data for the CSMIP ground-response records presented in this report are available on two magnetic tapes, one containing Phase 1 (Vol. 1) data (named WHITTIER87-IG) and the other Phases 2 and 3 (Vol. 2 and 3) data (WHITTIER87-G). They are written in a standard CSMIP format similar to that of the Caltech tapes, documented in Shakal and Huang (1985). These tapes are available in standard ASCII or EBCDIC blocked (unlabeled) coding. In addition, the Phase 2 and 3 data are available on floppy disks for use in personal computers. The data are available on IBM-compatible 5.25" disk of AT (1.2Mb) or XT (360Kb) type, as well as the 3.5" disks (720Kb) used by PS/2 type and laptop computers. These tapes and floppy disks can be obtained at nominal cost from this office:

Office of Strong Motion Studies
Division of Mines and Geology
California Department of Conservation
630 Bercut Drive, Sacramento, California 95814

Phone: (916) 322-3105

DEFINITION OF USABLE DATA BANDWIDTH

The usable data bandwidth for each record is indicated on the plots for the Phase 2 and Phase 3 data. The user should only use these data for analyses within this bandwidth. As described in the section on Accelerogram Digitization and Processing, the digitized data are processed and filtered using Ormsby filters. The data are first low-pass filtered by a high-frequency filter (typically with a corner frequency of 23 Hz and a roll-off termination frequency of 25 Hz), and then high-pass filtered by a low-frequency filter. The corner frequency of the low-frequency filter may be different for different records. Therefore, the Phase 2 data is the result of the digitized data being filtered by the bandpass filter H(f) with ramps as shown in the figure:



The usable data bandwidth is defined as the band between frequencies f_H and f_L where f_H and f_L are the -3 dB points on the high-frequency and low-frequency ramps, respectively. The value of H(f) is approximately equal to 0.7 for -3 dB*.

The values of f_H and f_L can be calculated from the corner frequencies (f_{Hc}, f_{Lc}) and the roll-off termination frequencies (f_{Ht}, f_{Lt}) by using the formulas $f_H = f_{Hc} + 0.3 * (f_{Ht} - f_{Hc})$ and $f_L = f_{Lc} - 0.3 * (f_{Lc} - f_{Lt})$. For example, the usable data bandwidth for data bandpass-filtered with ramps at 0.25 to 0.50 Hz and 23.0 to 25.0 Hz is 0.42 to 23.6 Hz.

* Note on dB: It is common in signal processing to plot 20 $\log_{10}[H(f)]$ versus frequency, and express the ordinate value in decibels (abbreviated dB). Accordingly, 0 dB corresponds to a value of H(f) equal to 1; 20 dB is equivalent to H(f) = 10; -20 dB corresponds to H(f) = 0.1; and -3 dB corresponds to H(f) = 0.7.

APPENDIX A

PLOTS OF PROCESSED DATA

Organization and Order of Plots

In this appendix, four plots for each record are presented in the following order:

1. Phase 1 (Vol. 1) data: uncorrected accelerations. The three channels of the acceleration for the full processed length (40 seconds) are plotted with a common scaling factor.

2. Phase 2 (Vol. 2) data: instrument and baseline-corrected acceleration, velocity and displacement. The data for the first 30 seconds are plotted with equal scaling for all three channels. The usable data bandwidth, determined during processing, is indicated on the plots.

3. Phase 3 (Vol. 3) data: response spectra. The pseudo-velocity spectra (PSV), the pseudo-acceleration spectra (PSA), and the displacement spectra (SD) are presented on a tripartite logarithmic plot for each channel. The spectra are plotted for periods within the usable data bandwidth.

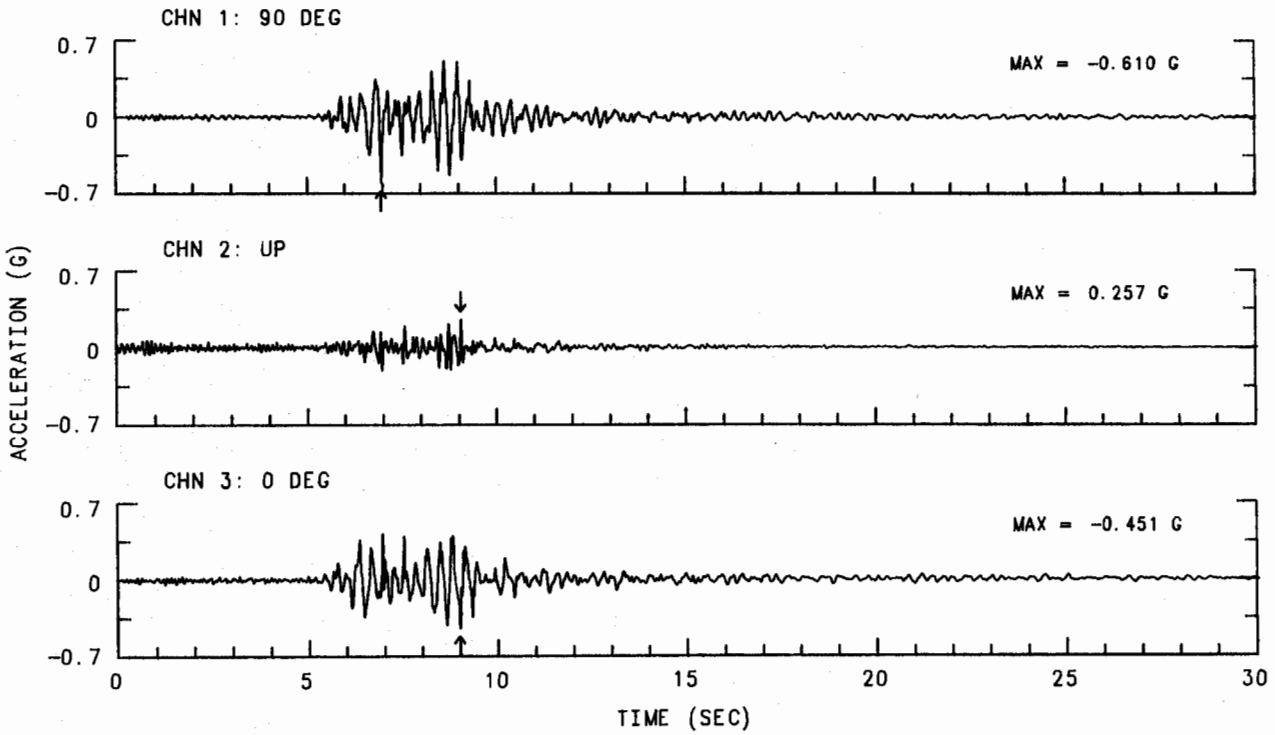
4. Phase 3 (Vol. 3) data: response spectra. The absolute acceleration spectra (SA) for 0%, 2%, 5%, 10%, and 20% dampings are plotted against period for periods from 0 to 2 seconds with linear-linear scaling.

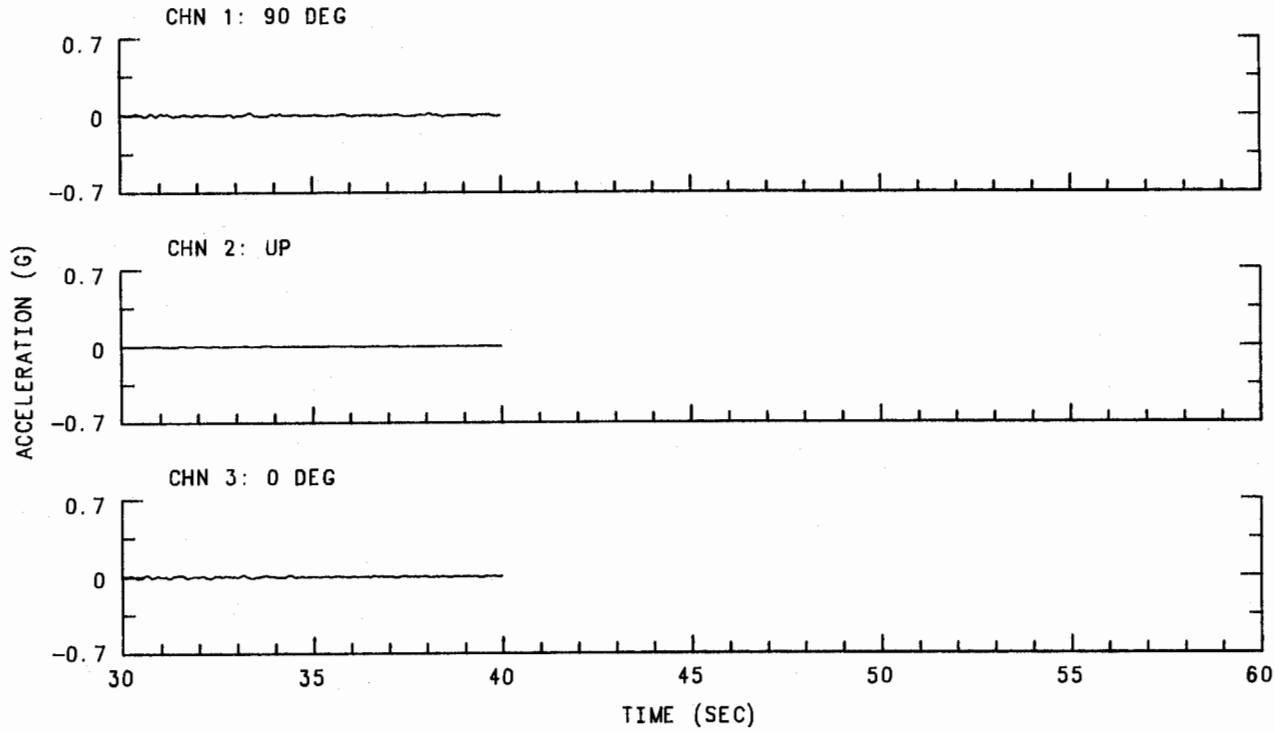
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

TARZANA - CEDAR HILL NURSERY: CSMIP S/N 436

PHASE 1 ACCELERATION

RECORD ID: 24436-S1614-87275.01.1

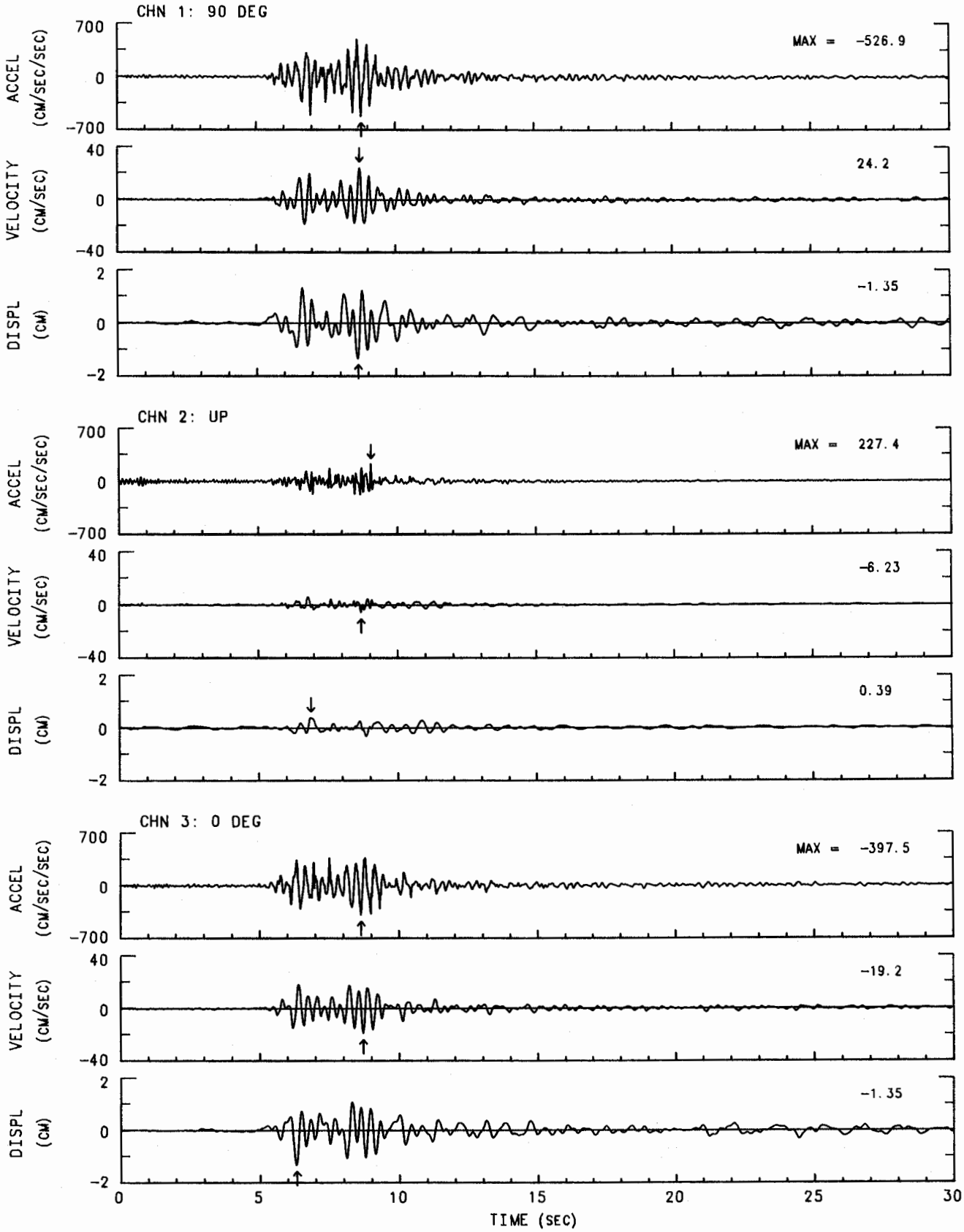




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
TARZANA - CEDAR HILL NURSERY: CSMIP S/N 436

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24436-S1614-87275.01.1



TARZANA - CEDAR HILL NURSERY: CSMIP S/N 436

WHITTIER EARTHQUAKE

OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ

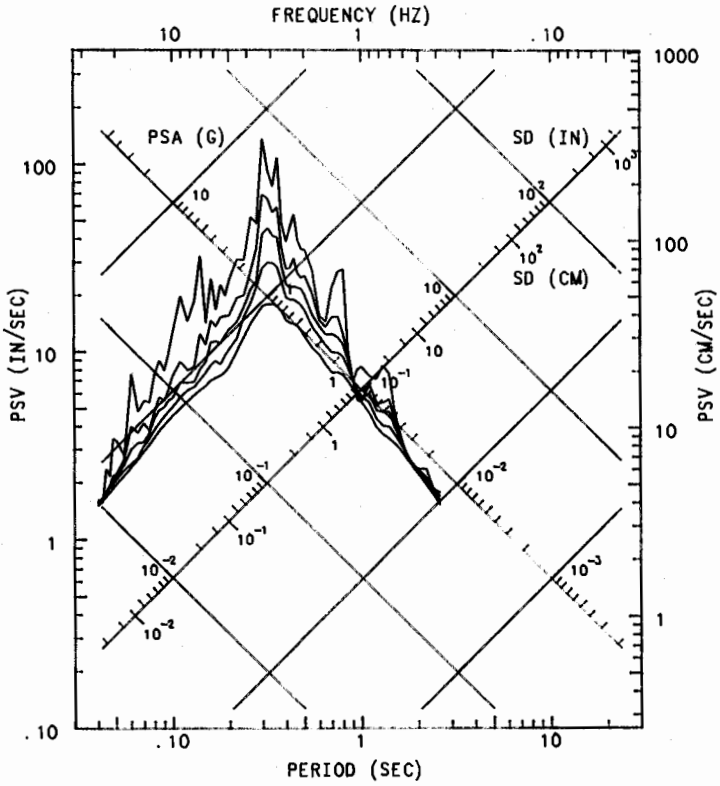
(0.04 TO 2.35 SEC)

RECORD ID: 24436-S1614-87275.01.1

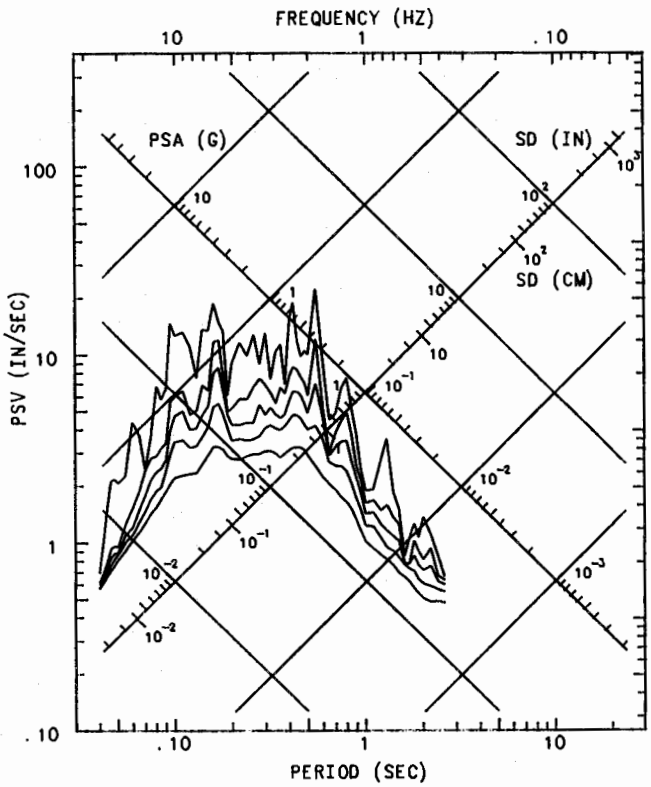
—— RESPONSE SPECTRA: PSV, PSA & SD

DAMPING VALUES: 0, 2, 5, 10, 20%

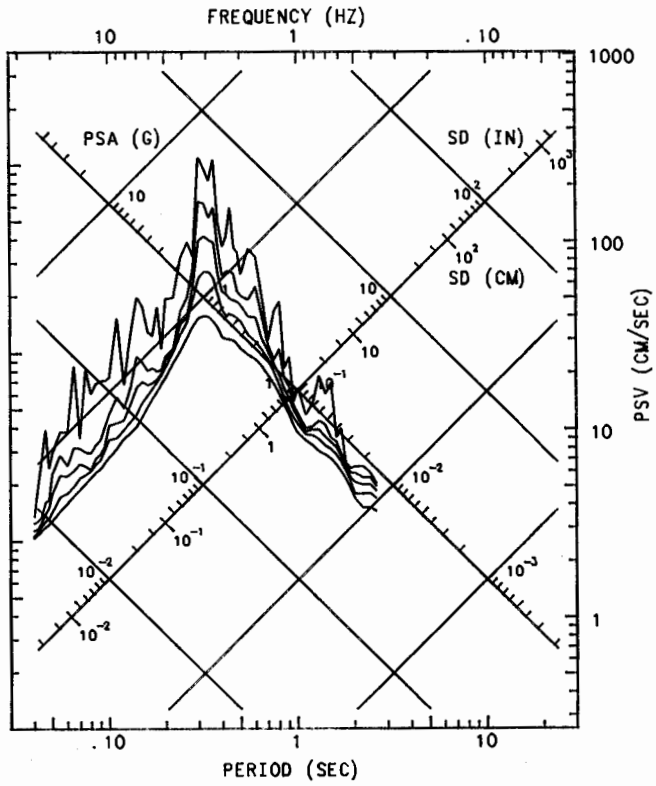
CHN 1: 90 DEG



CHN 2: UP



CHN 3: 0 DEG

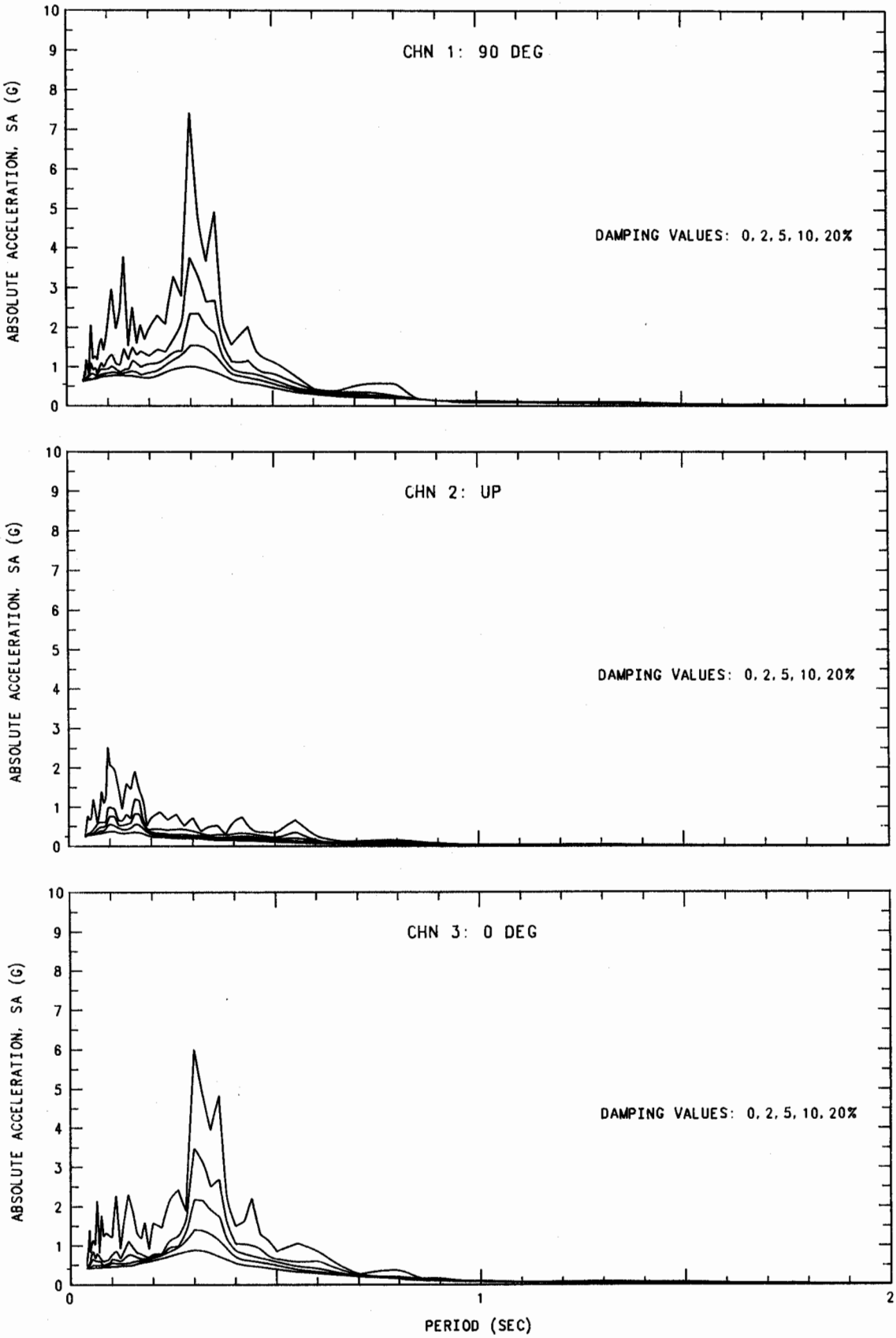


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

TARZANA - CEDAR HILL NURSERY: CSMIP S/N 436

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24436-S1614-87275.01.1

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

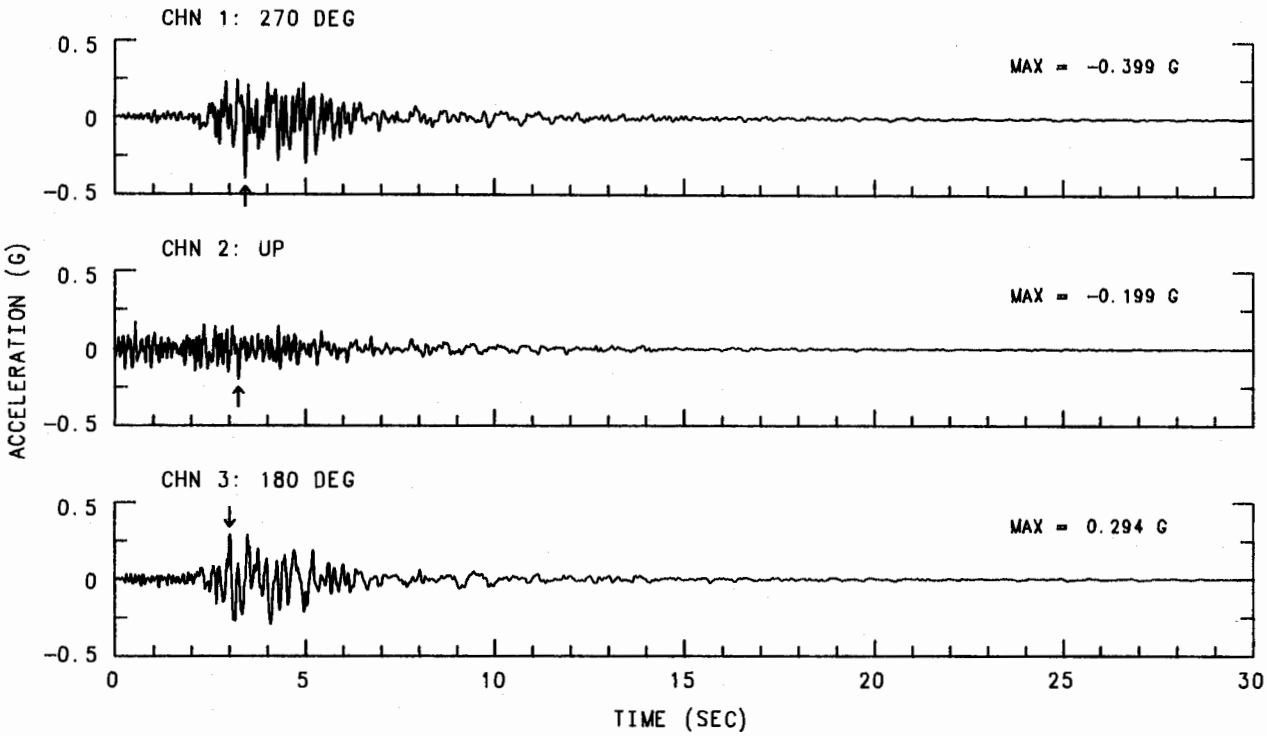


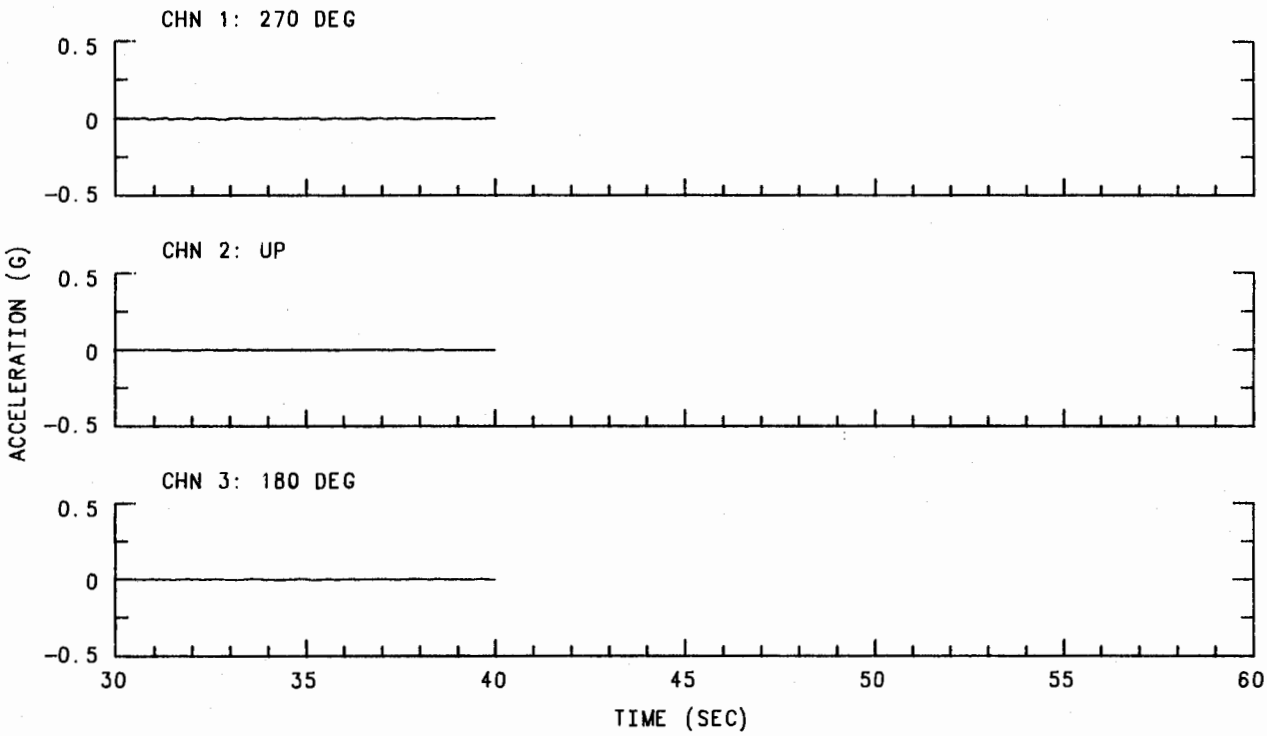
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

ALHAMBRA - FREMONT SCHOOL: CSMIP S/N 461

PHASE 1 ACCELERATION

RECORD ID: 24461-S3498-87274.01.1



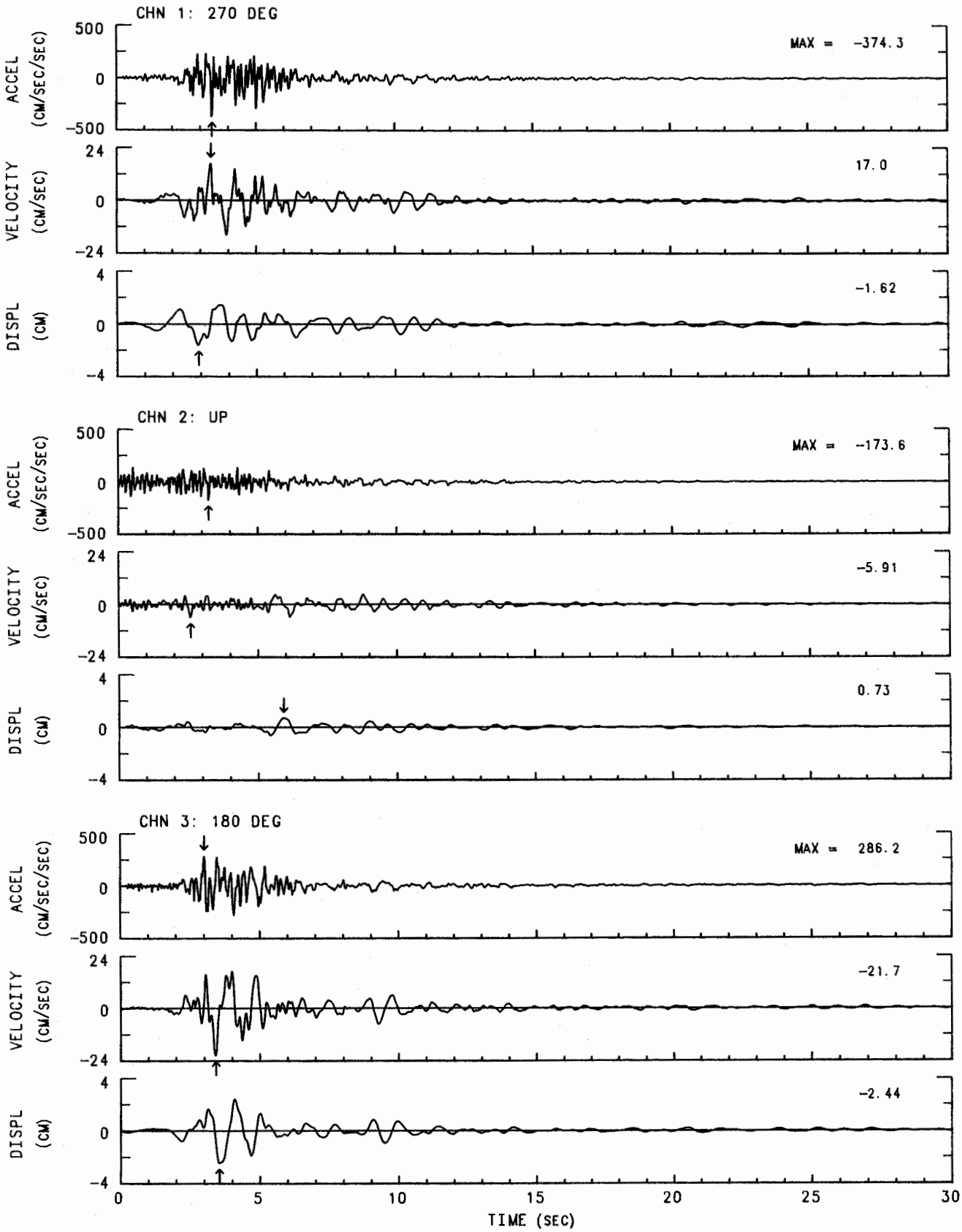


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

ALHAMBRA - FREMONT SCHOOL: CSMIP S/N 461

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24461-S3498-87274.01.1



ALHAMBRA - FREMONT SCHOOL: CSMIP S/N 461

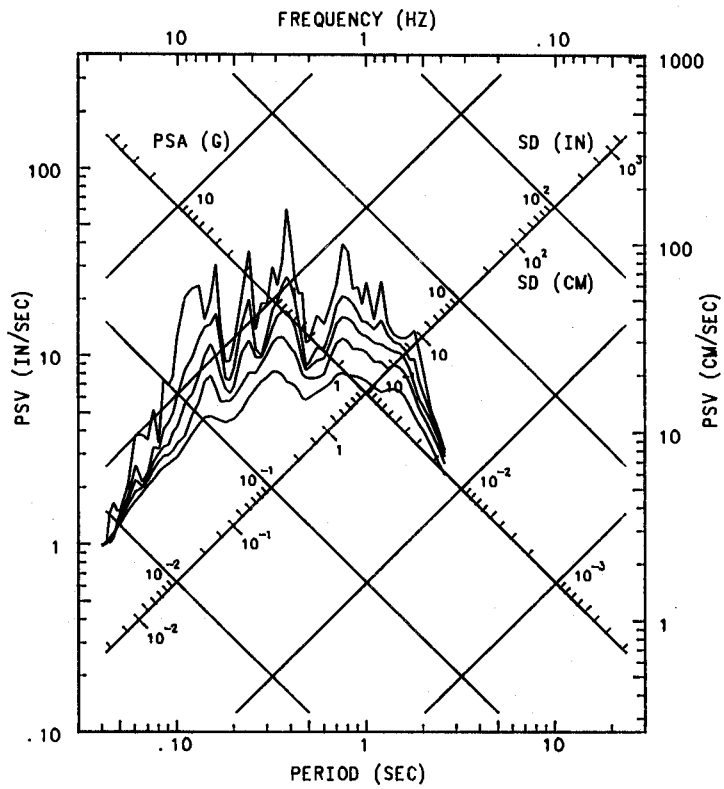
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

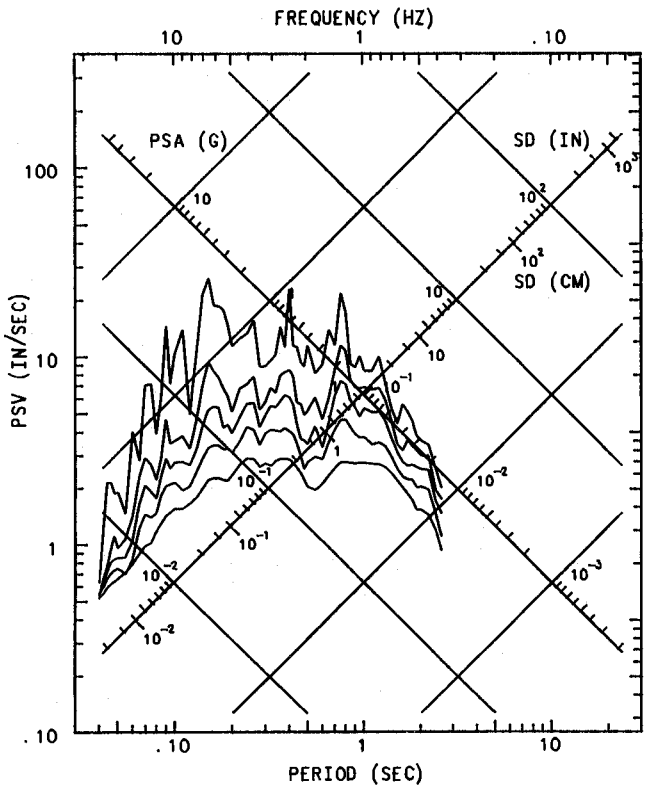
RECORD ID: 24461-S3498-87274.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

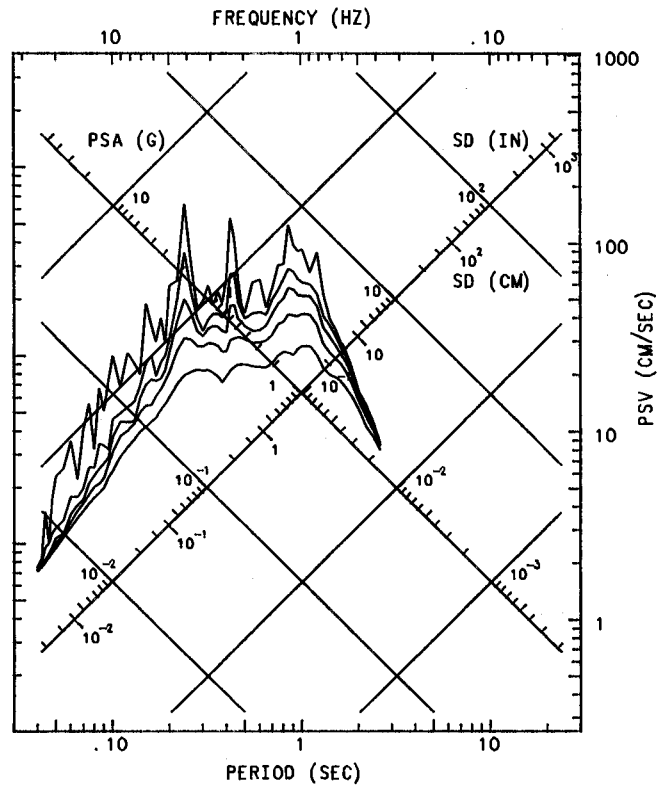
CHN 1: 270 DEG



CHN 2: UP

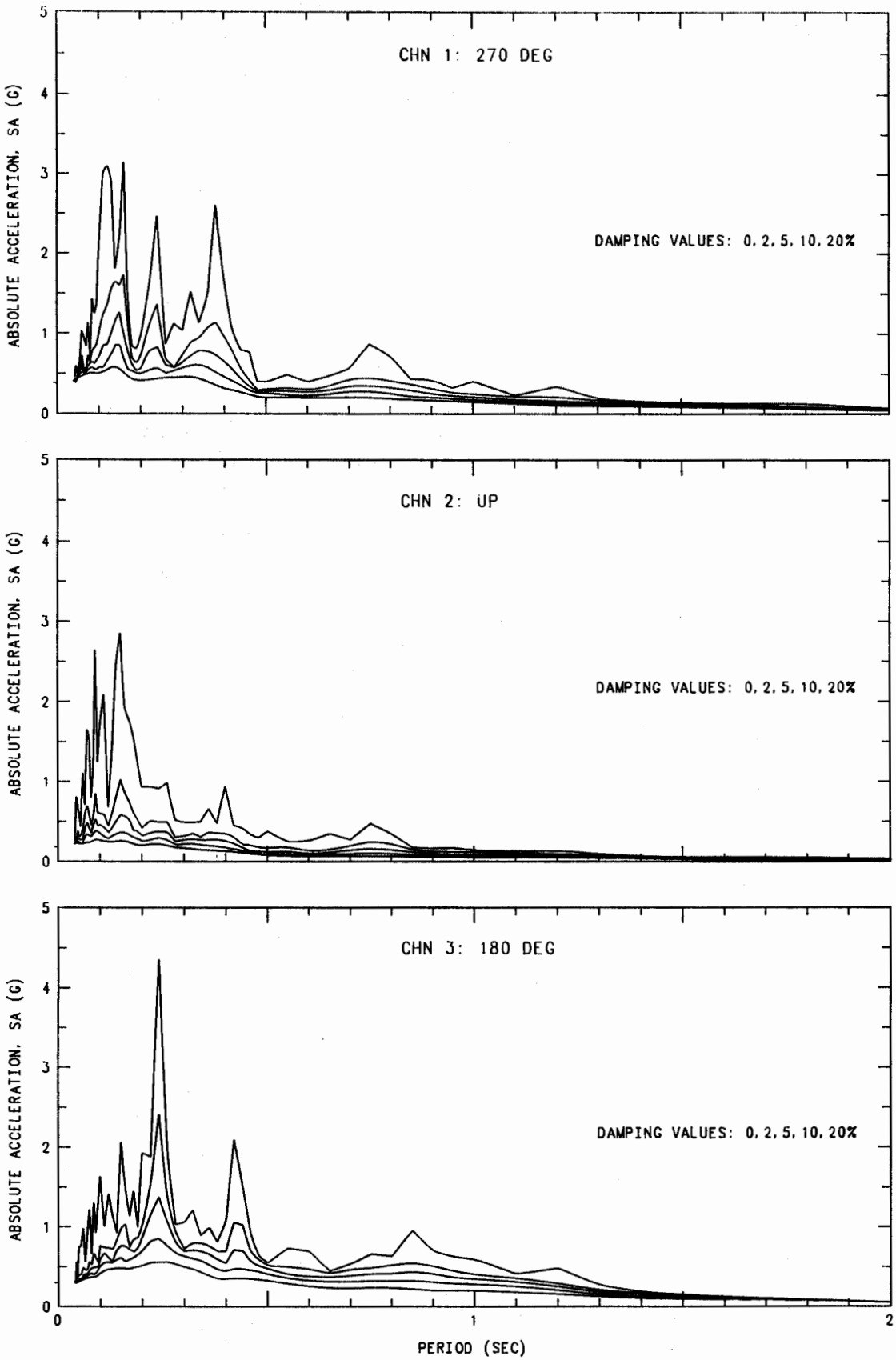


CHN 3: 180 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
ALHAMBRA - FREMONT SCHOOL: CSMIP S/N 461

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24461-S3498-87274.01.1
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

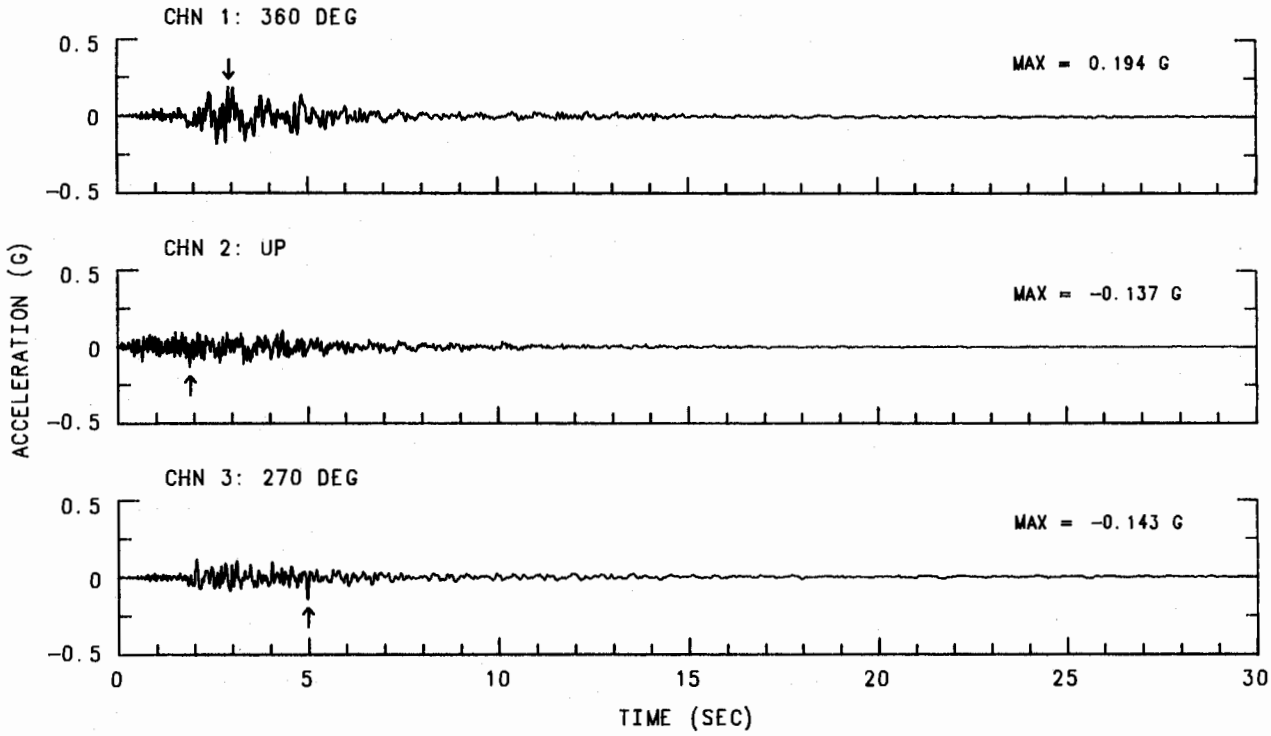


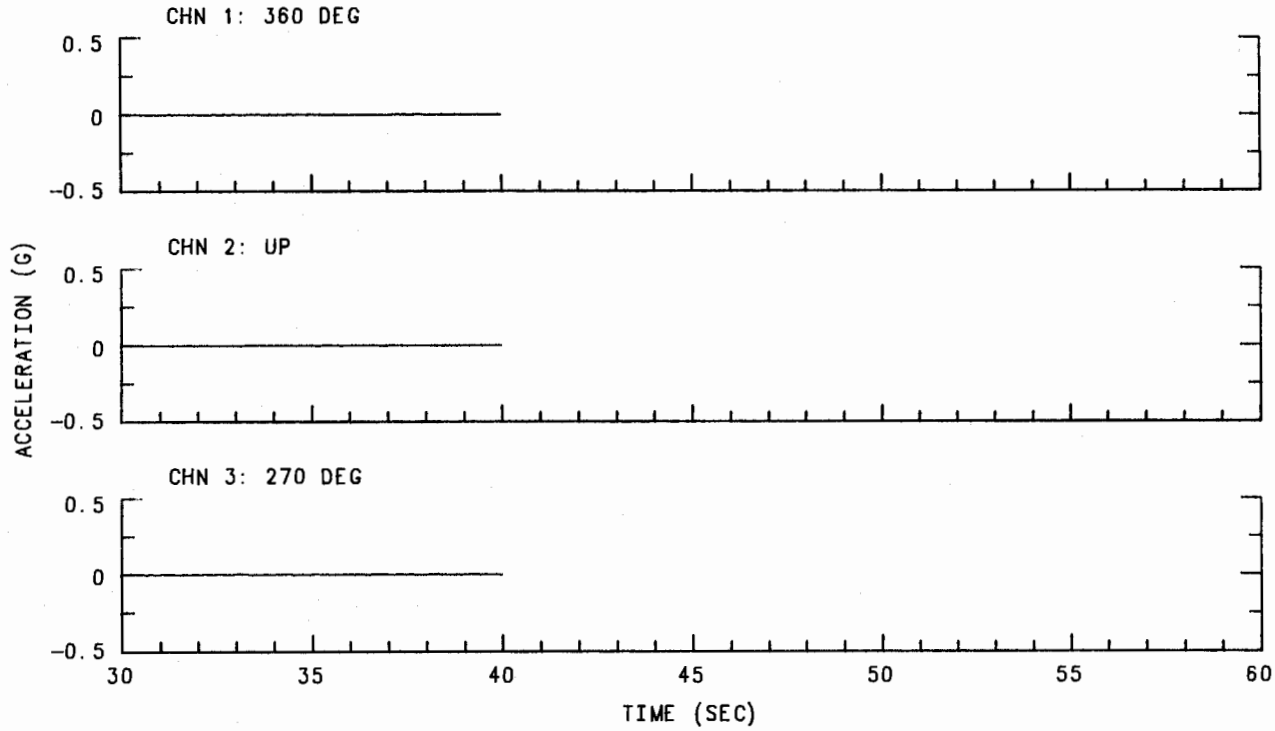
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

SAN MARINO - SOUTHWESTERN ACADEMY: CSMIP S/N 401

PHASE 1 ACCELERATION

RECORD ID: 24401-S0760-87274.01.1



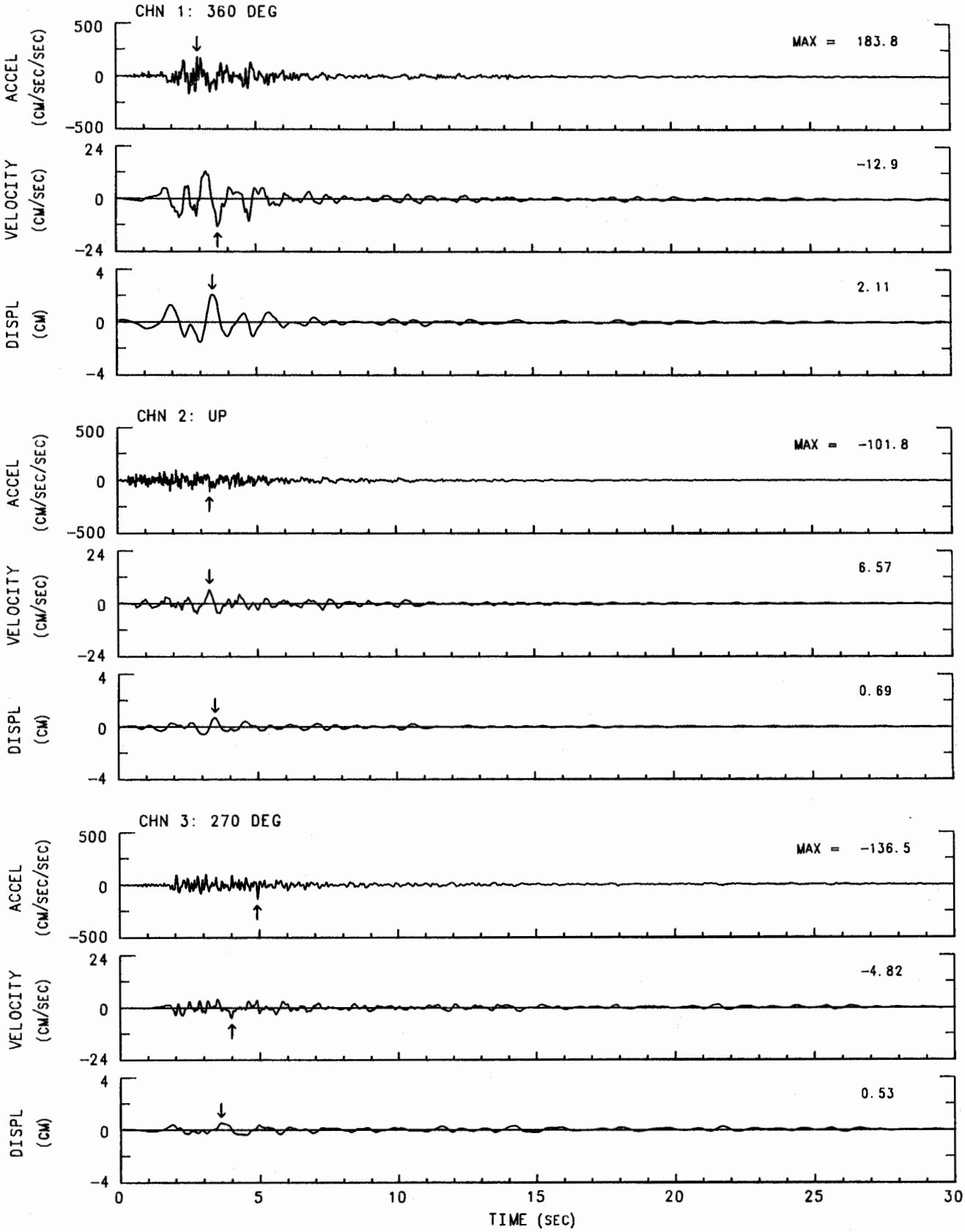


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

SAN MARINO - SOUTHWESTERN ACADEMY: CSMIP S/N 401

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24401-S0760-87274.01.1



SAN MARINO - SOUTHWESTERN ACADEMY: CSMIP S/N 401

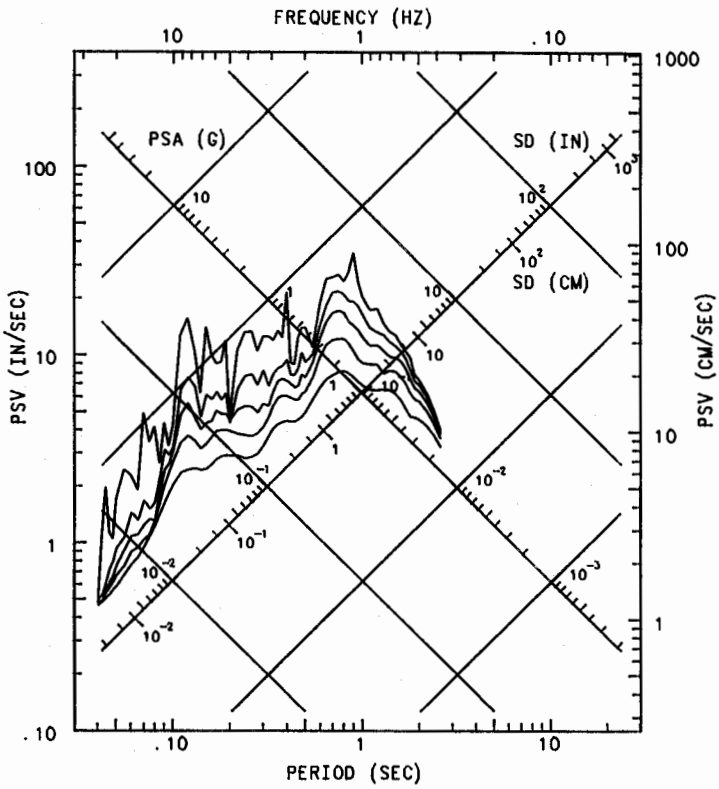
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

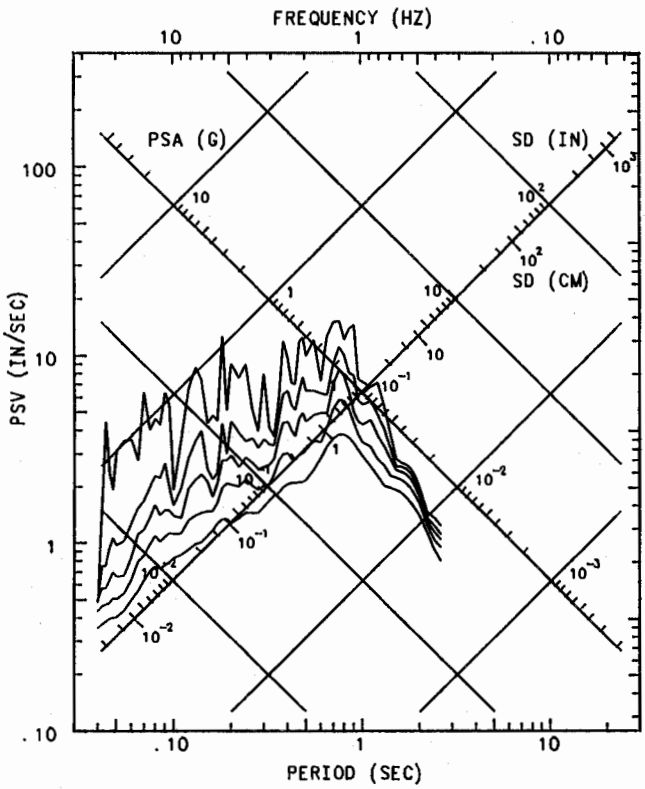
RECORD ID: 24401-S0760-87274.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

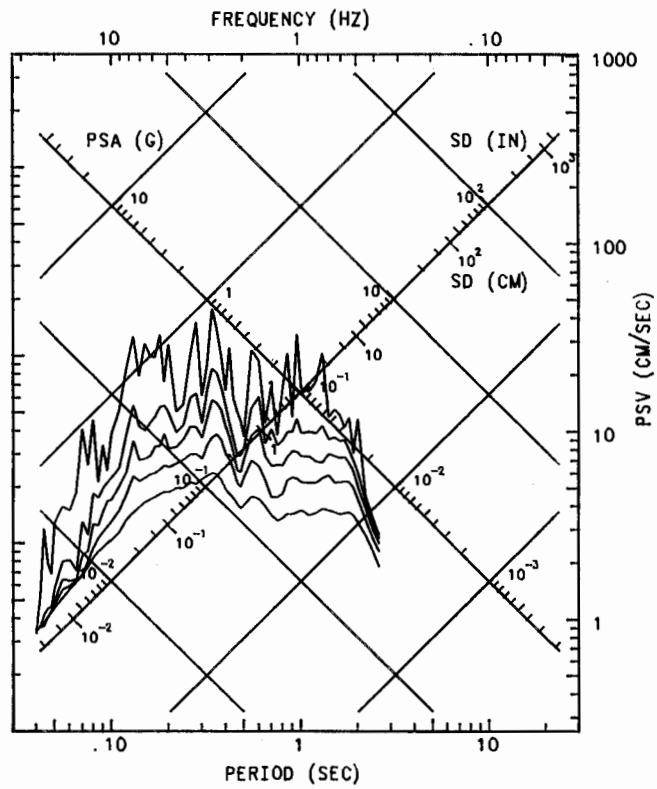
CHN 1: 360 DEG



CHN 2: UP

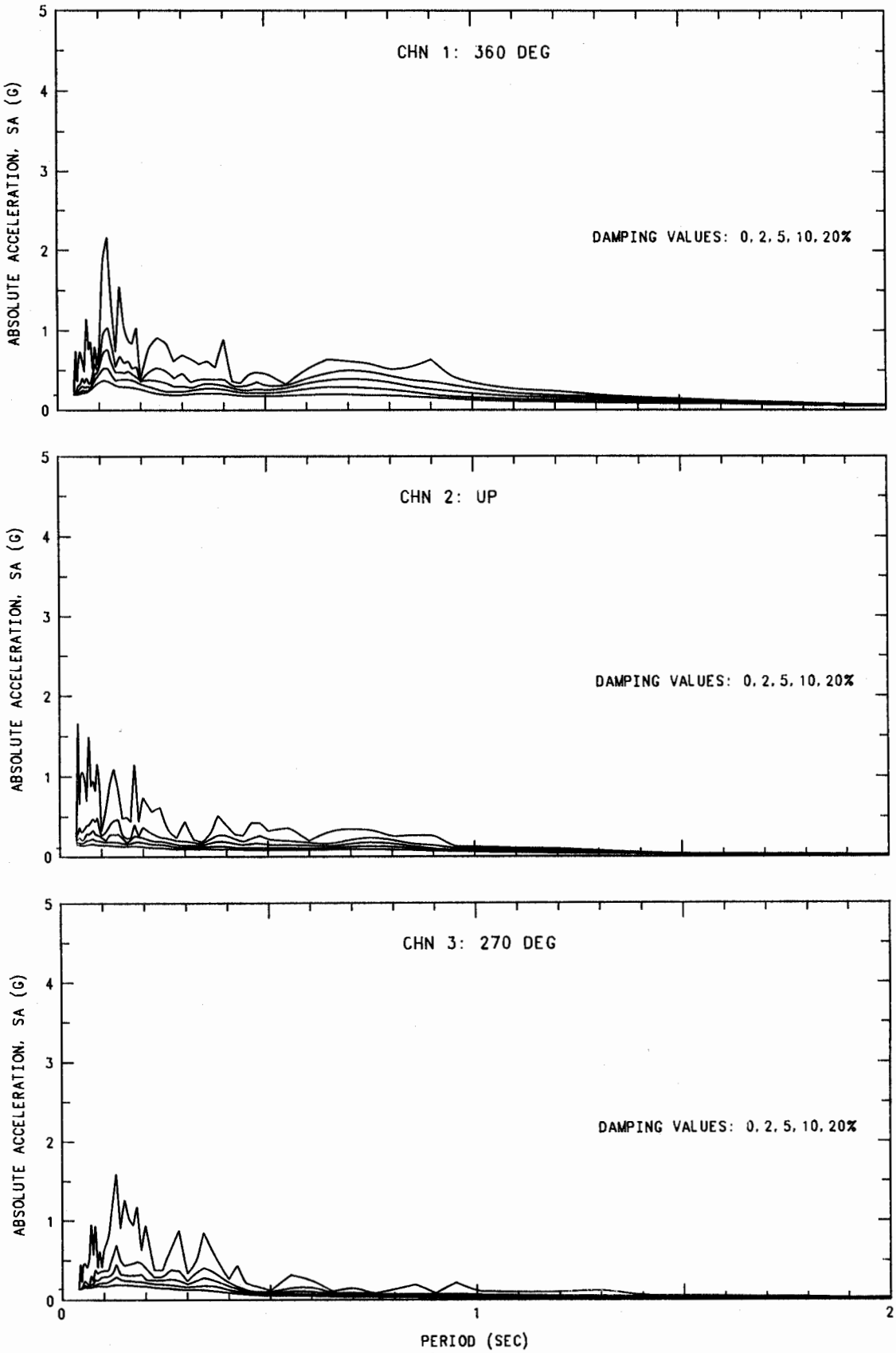


CHN 3: 270 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
SAN MARINO - SOUTHWESTERN ACADEMY: CSMIP S/N 401

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24401-S0760-87274.01.1
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

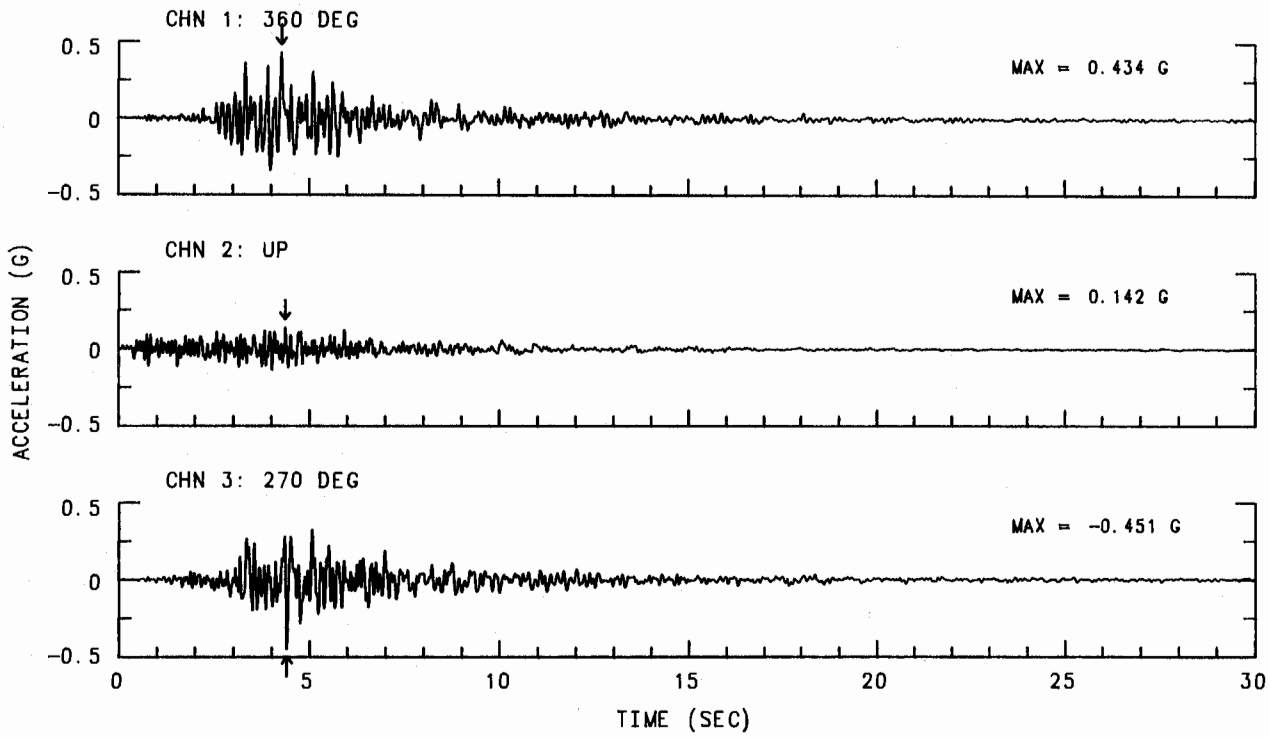


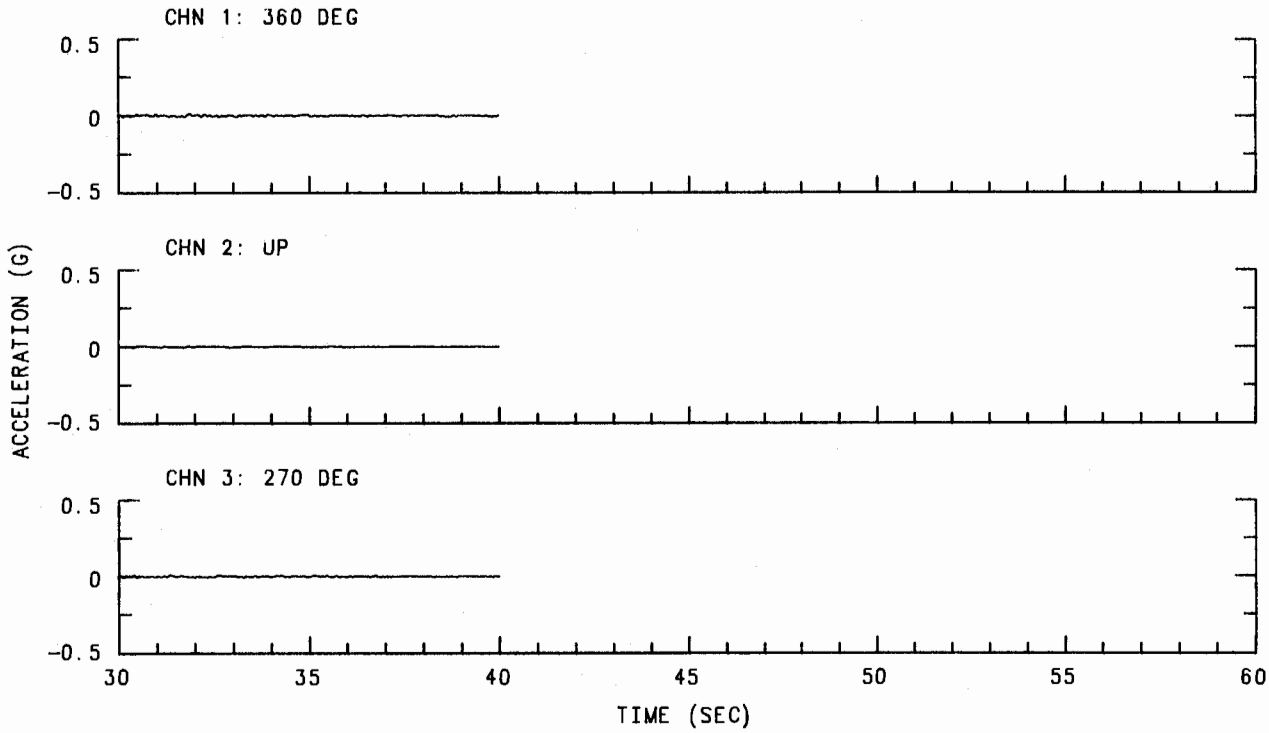
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LOS ANGELES - OBREGON PARK: CSMIP S/N 400

PHASE 1 ACCELERATION

RECORD ID: 24400-S1606-87274.01.1



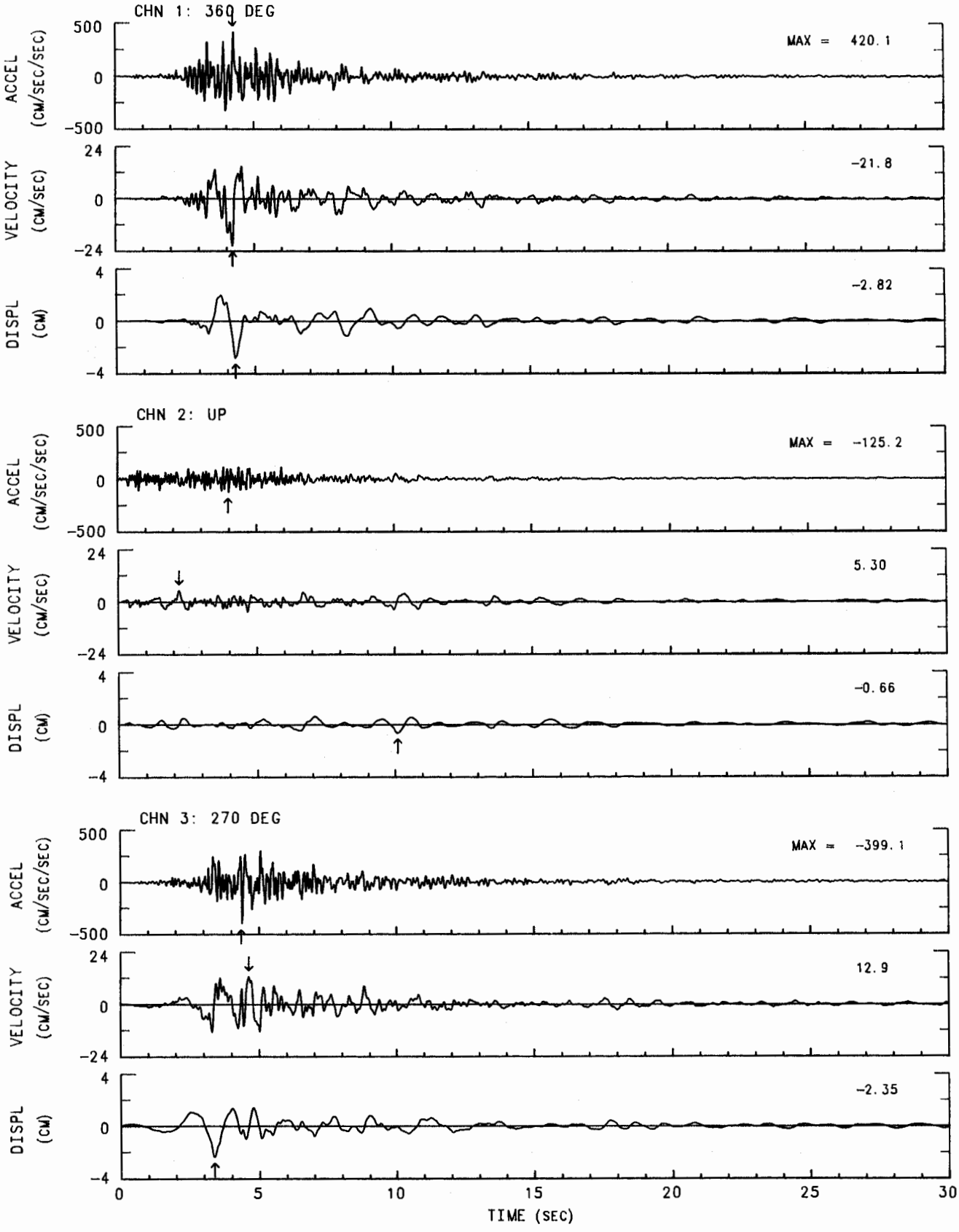


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LOS ANGELES - OBREGON PARK: CSMIP S/N 400

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ (0.04 TO 2.94 SEC) RECORD ID: 24400-S1606-87274.01.1



LOS ANGELES - OBREGON PARK: CSMIP S/N 400

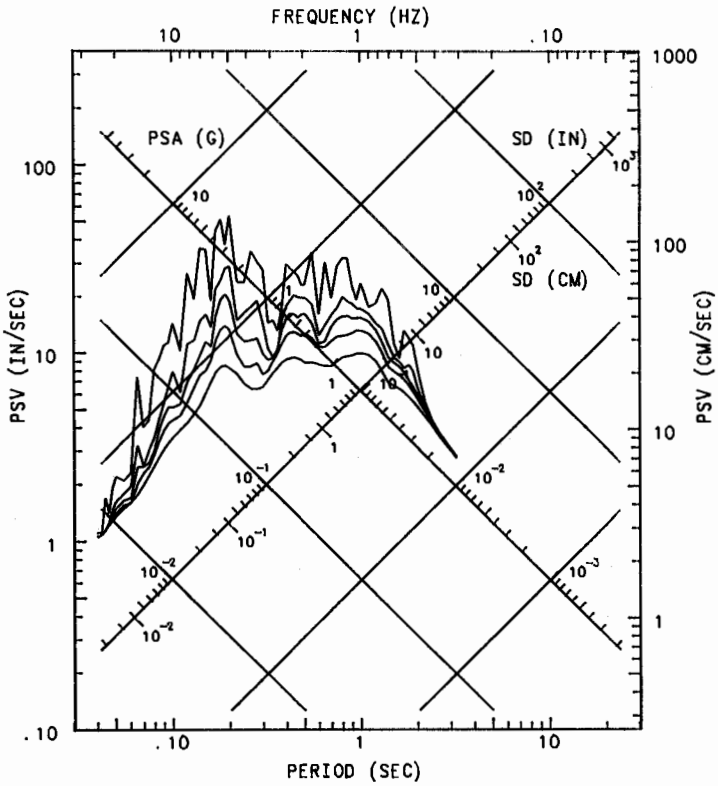
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ
(0.04 TO 2.94 SEC)

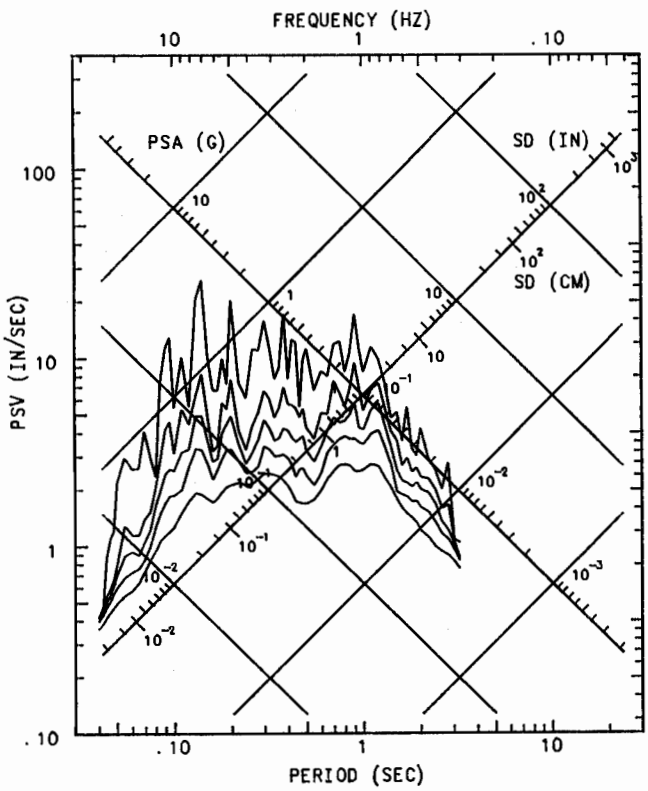
RECORD ID: 24400-S1606-87274.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

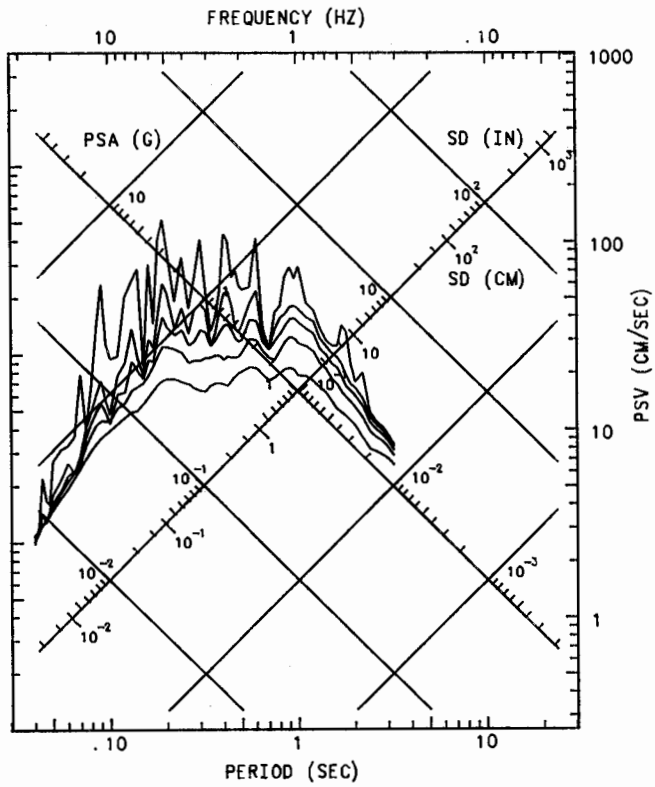
CHN 1: 360 DEG



CHN 2: UP

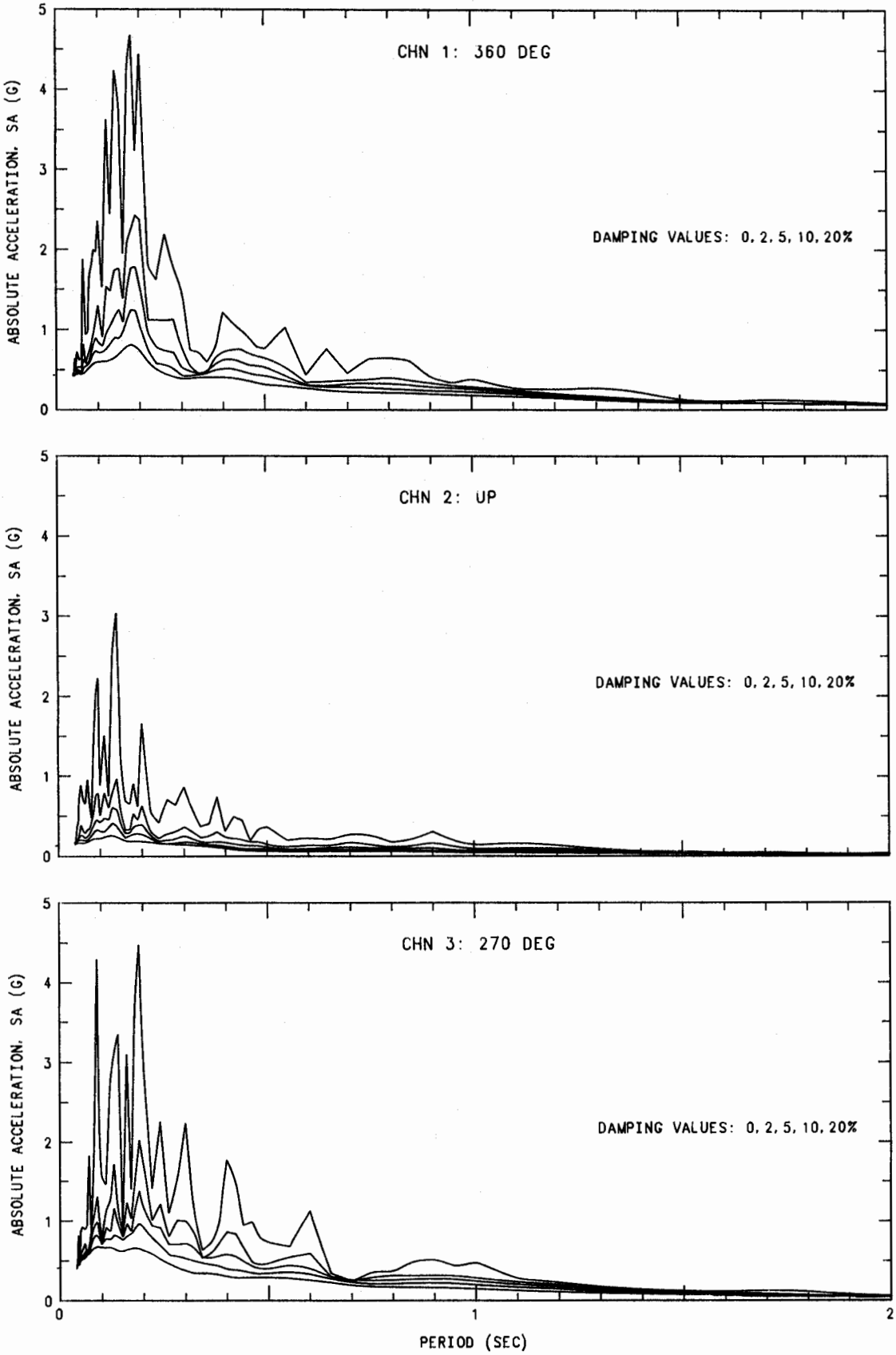


CHN 3: 270 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LOS ANGELES - OBREGON PARK: CSMIP S/N 400

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24400-S1606-87274.01.1
USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ (0.04 TO 2.94 SEC)

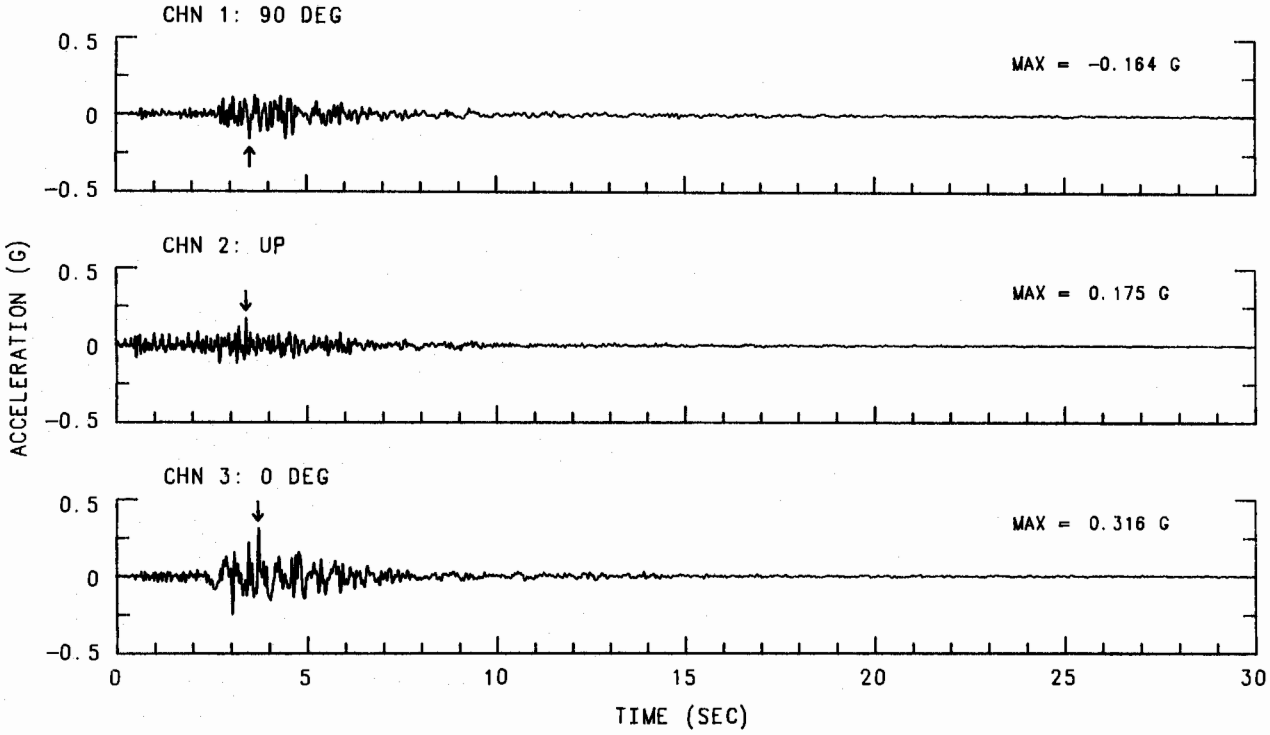


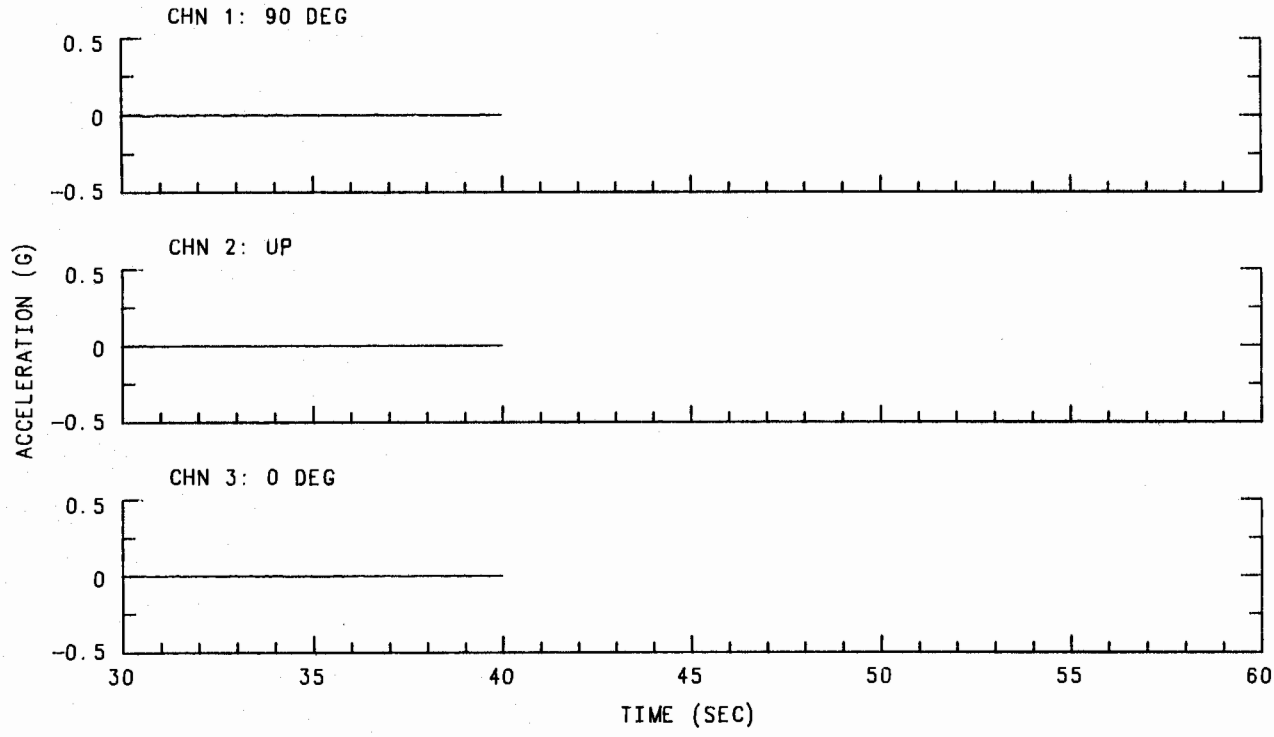
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

ALTADENA - EATON CANYON PARK: CSMIP S/N 402

PHASE 1 ACCELERATION

RECORD ID: 24402-S0758-87276.01.1



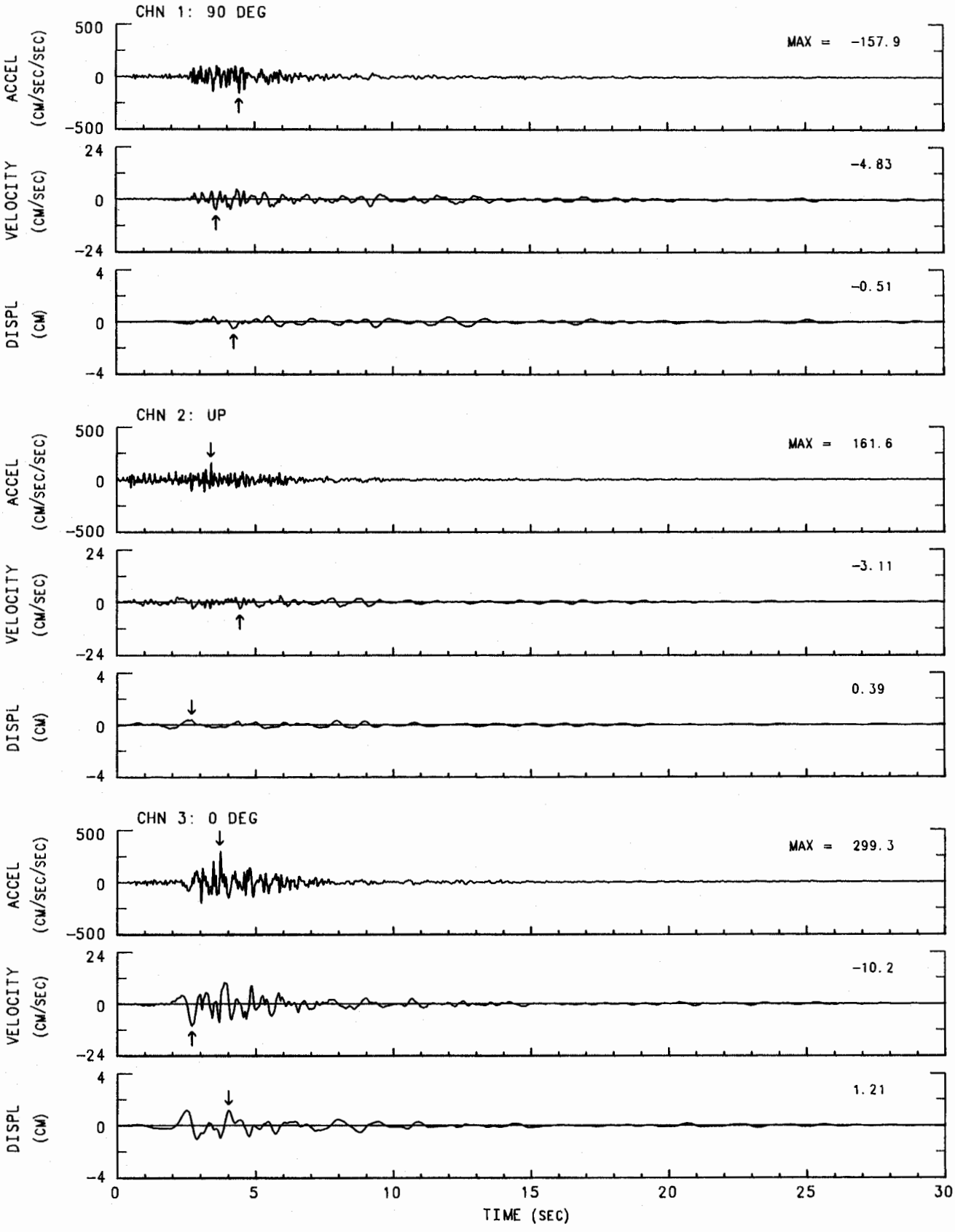


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

ALTADENA - EATON CANYON PARK: CSMIP S/N 402

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24402-S0758-87276.01.1



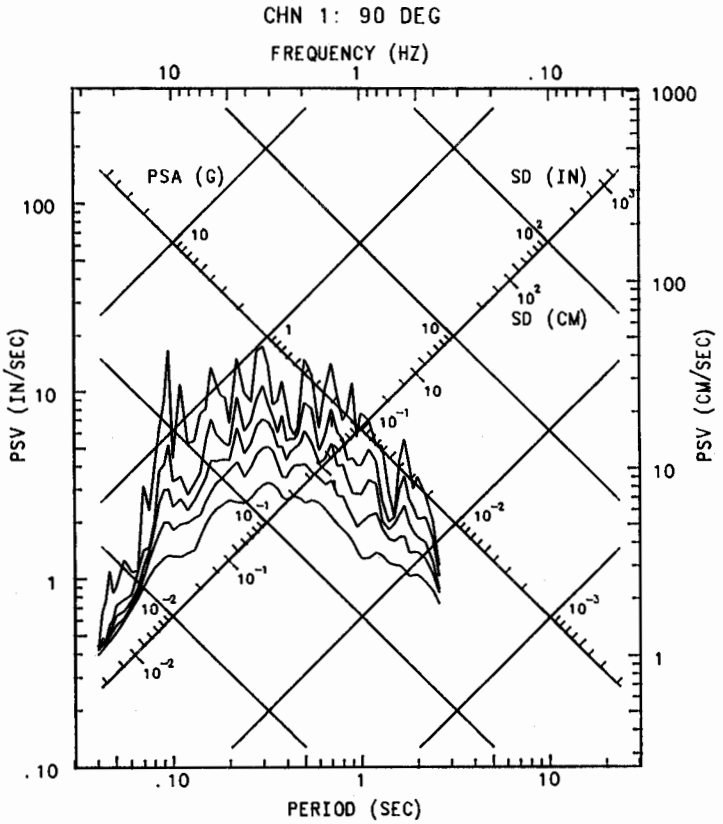
ALTADENA - EATON CANYON PARK: CSMIP S/N 402

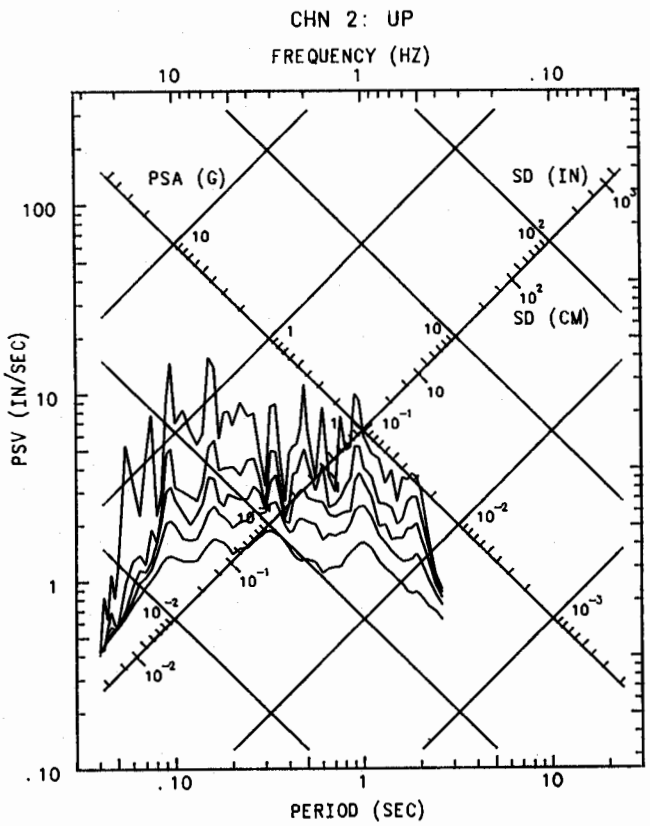
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

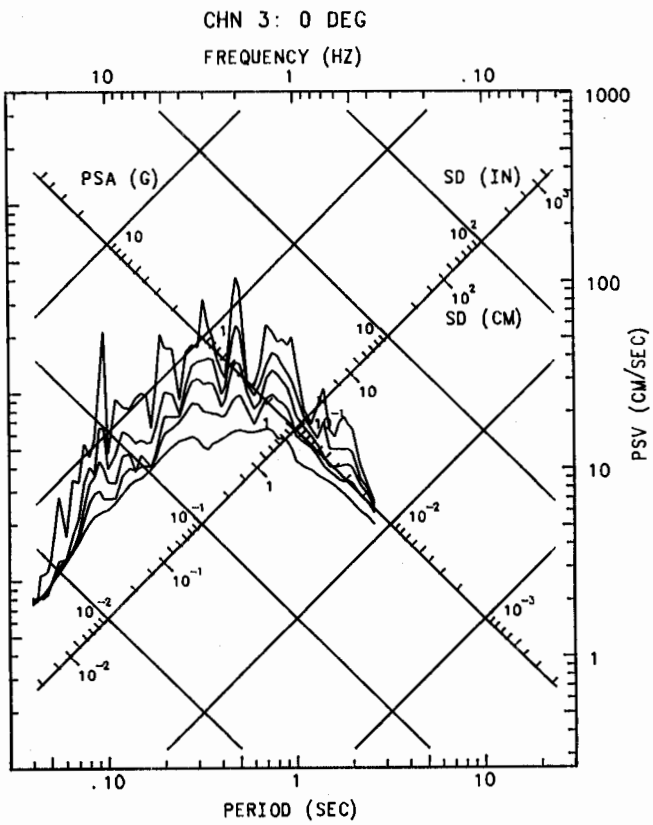
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

RECORD ID: 24402-S0758-87276.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

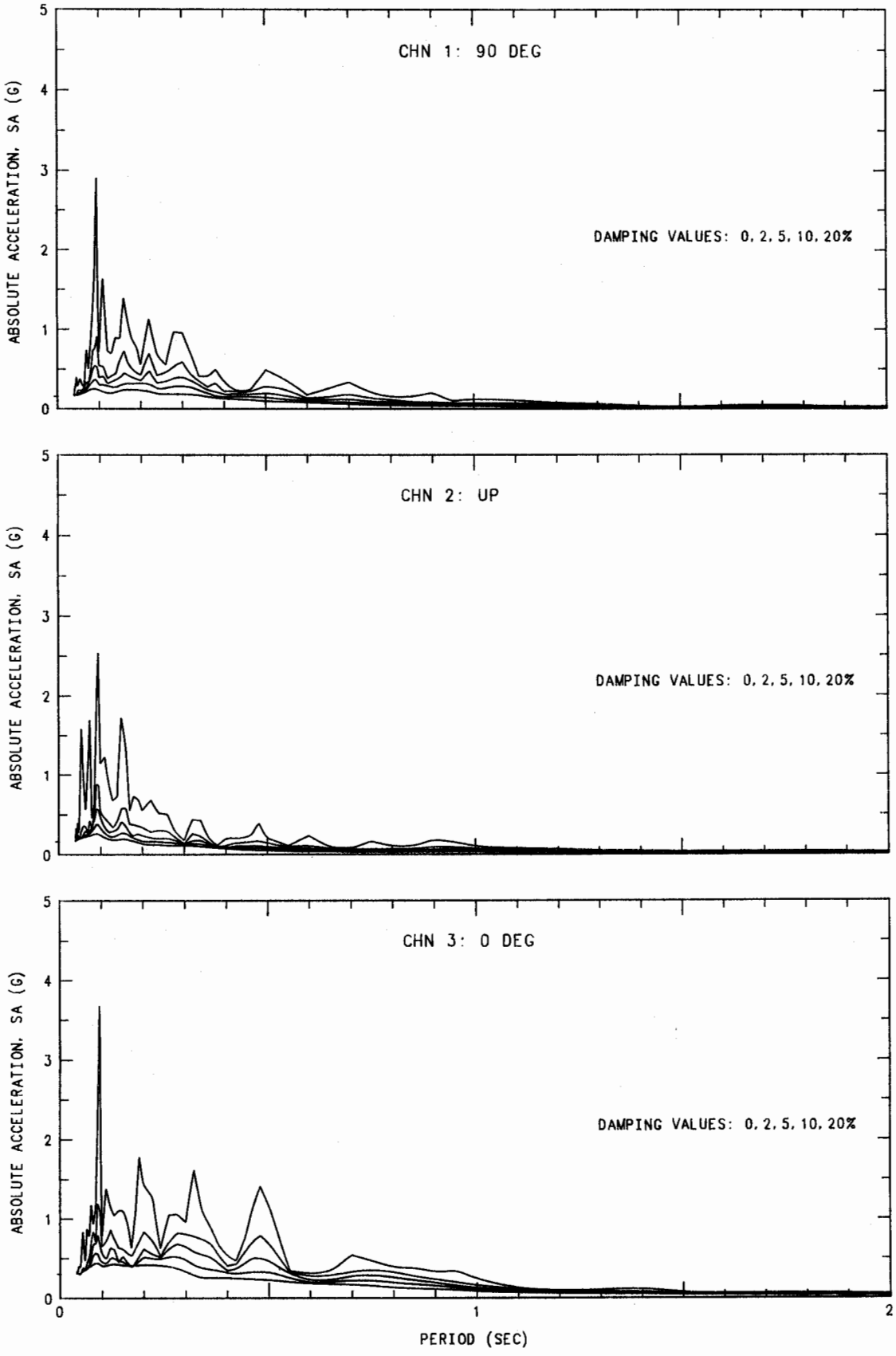






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
ALTADENA - EATON CANYON PARK: CSMIP S/N 402

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24402-S0758-87276.01.1
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

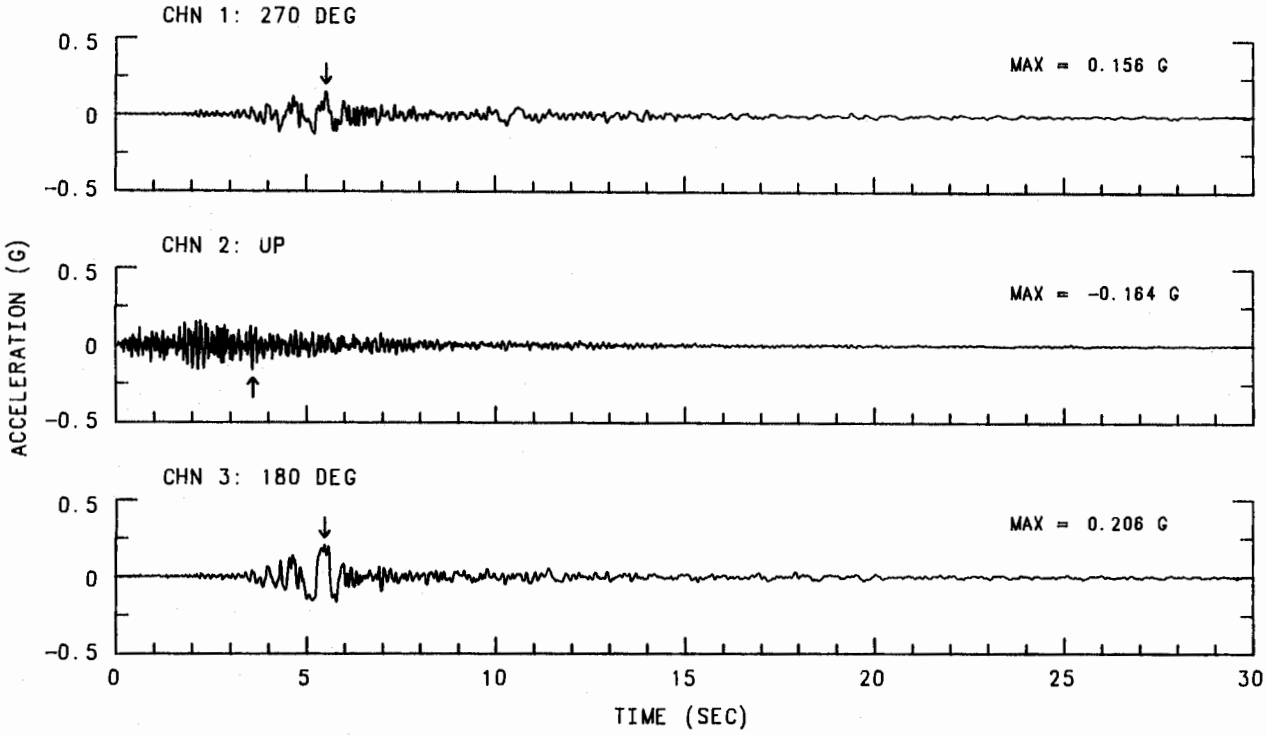


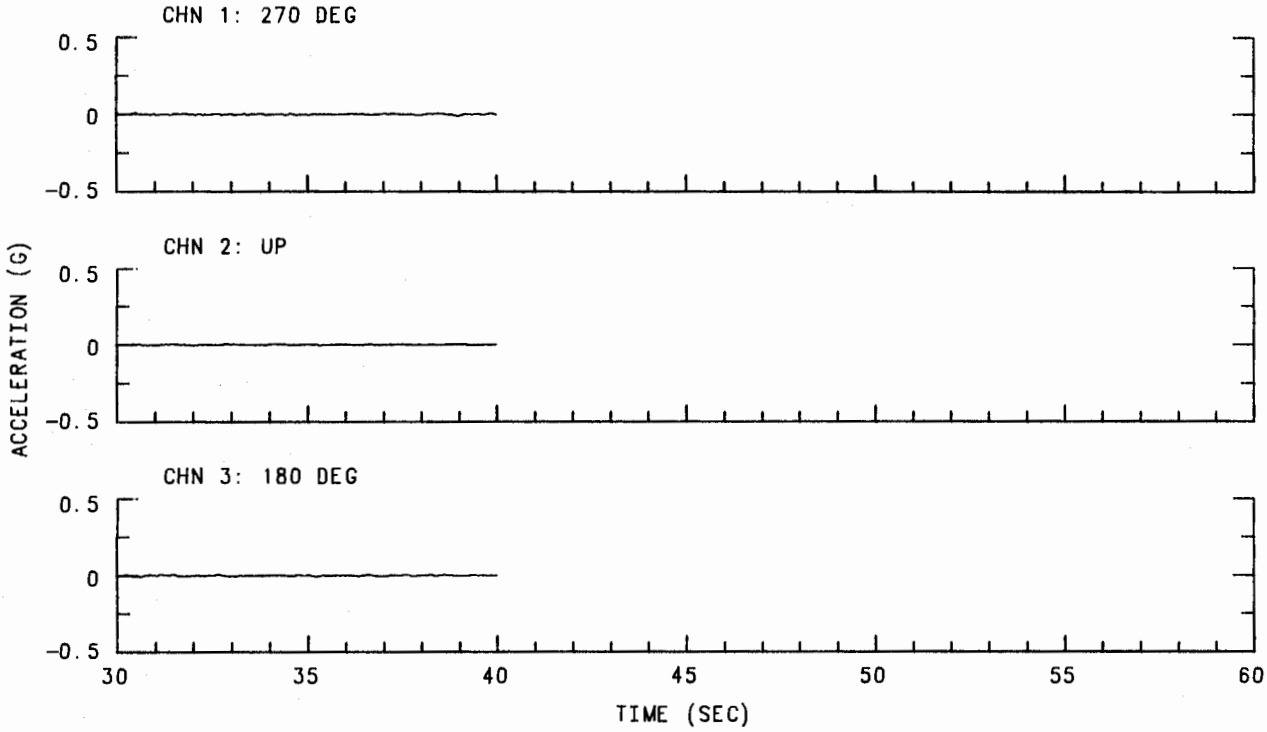
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

DOWNEY - COUNTY MAINT. BLDG. CSMIP S/N 368

PHASE 1 ACCELERATION

RECORD ID: 14368-S1607-87275.01.1

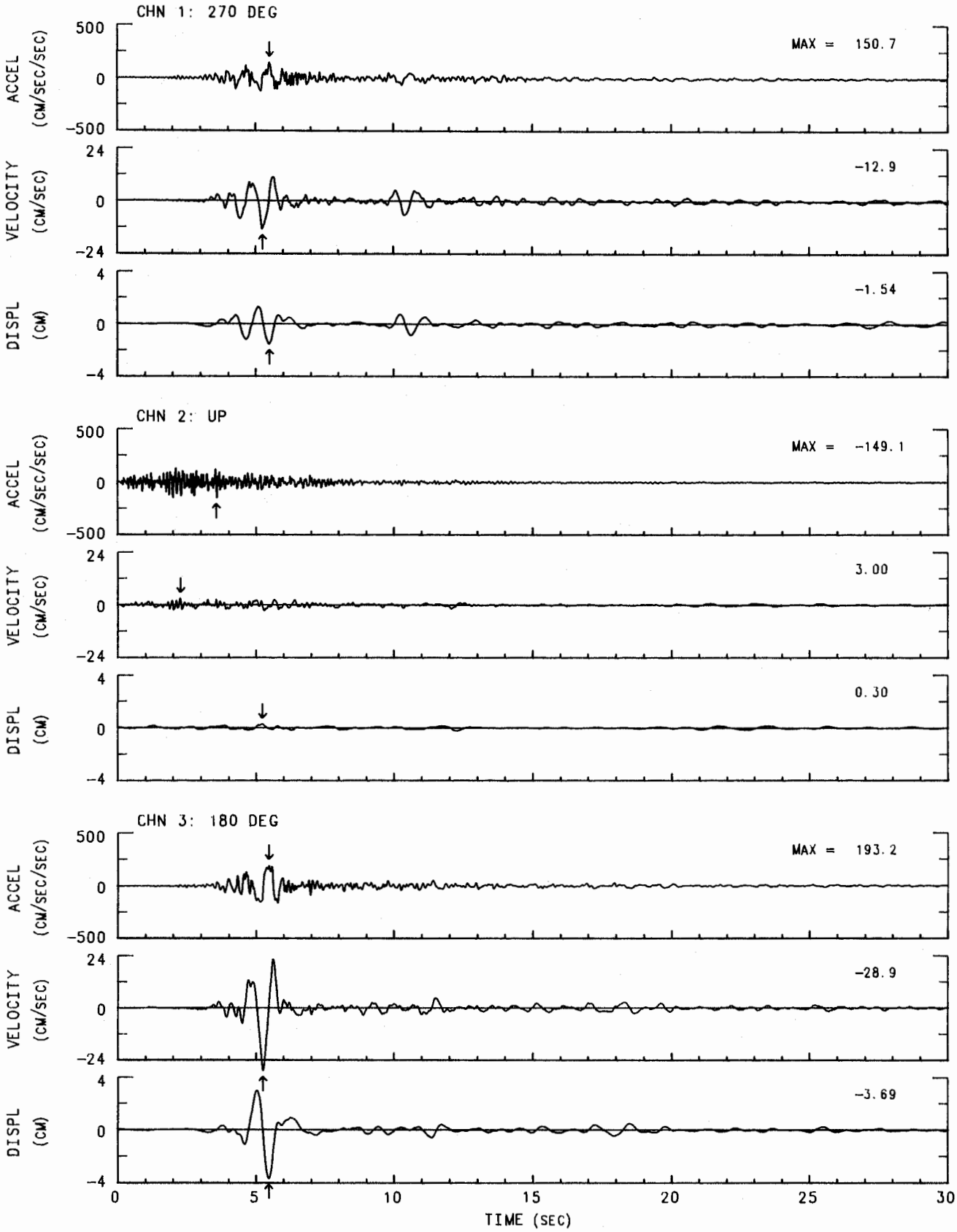




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
DOWNEY - COUNTY MAINT. BLDG.: CSMIP S/N 368

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 14368-S1607-87275.01.1



DOWNEY - COUNTY MAINT. BLDG. : CSMIP S/N 368

WHITTIER EARTHQUAKE

OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ

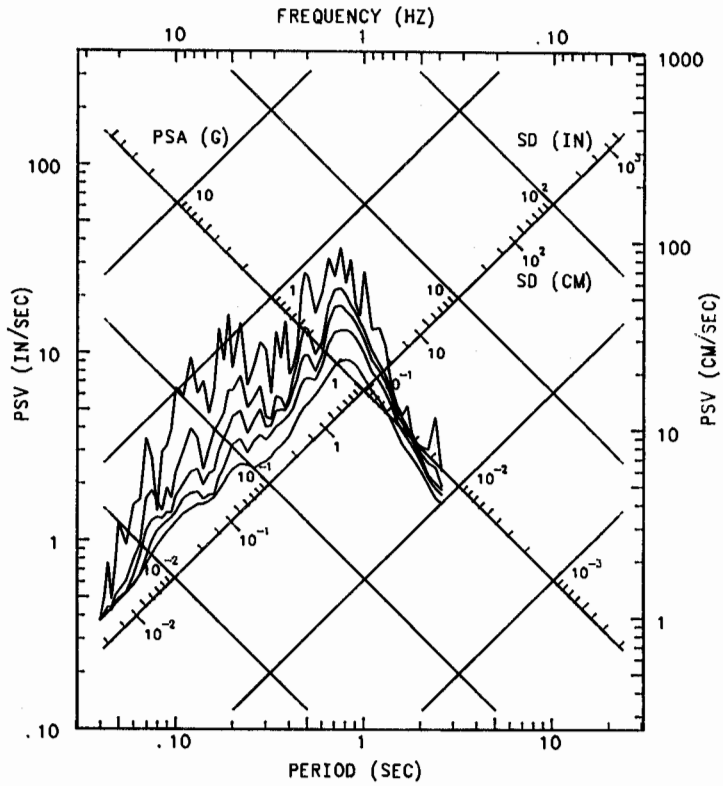
(0.04 TO 2.35 SEC)

RECORD ID: 14368-S1607-87275.01.1

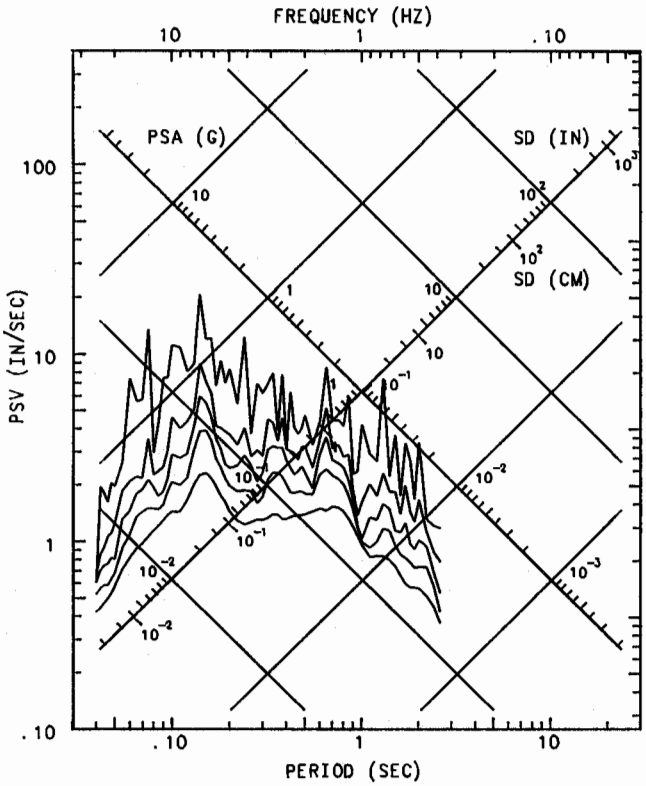
RESPONSE SPECTRA: PSV, PSA & SD

DAMPING VALUES: 0, 2, 5, 10, 20%

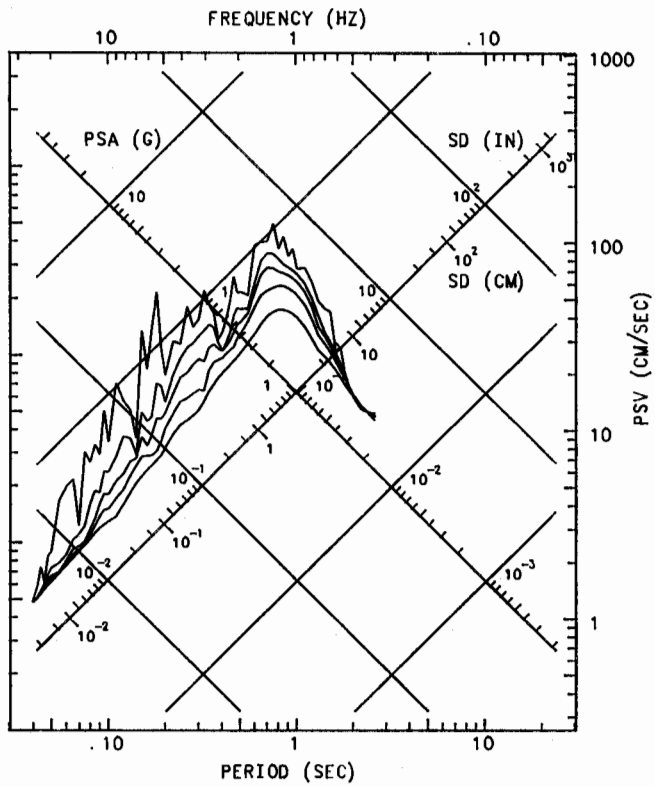
CHN 1: 270 DEG



CHN 2: UP

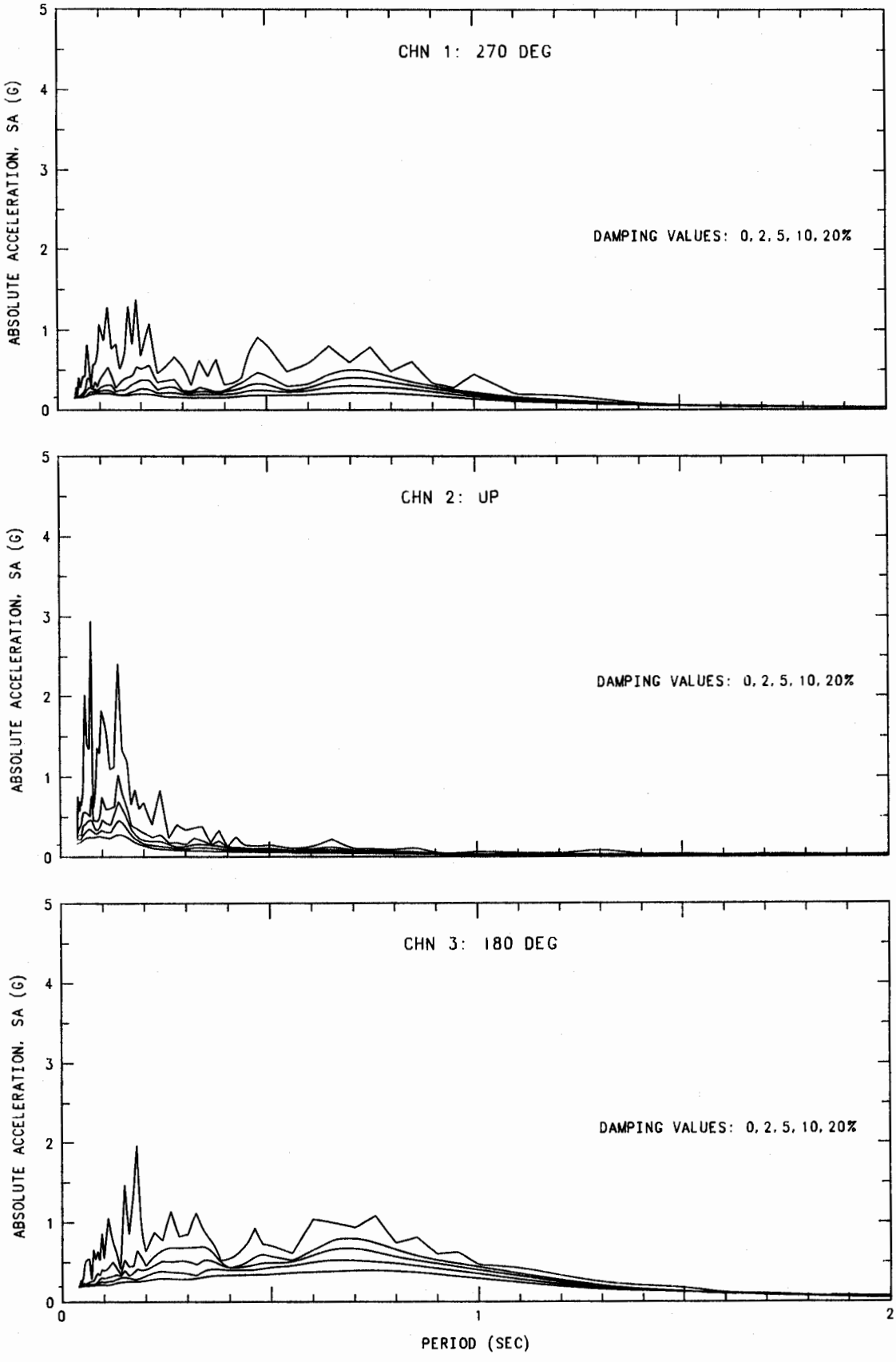


CHN 3: 180 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
DOWNEY - COUNTY MAINT. BLDG. CSMIP S/N 368

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 14368-S1607-87275.01.1
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

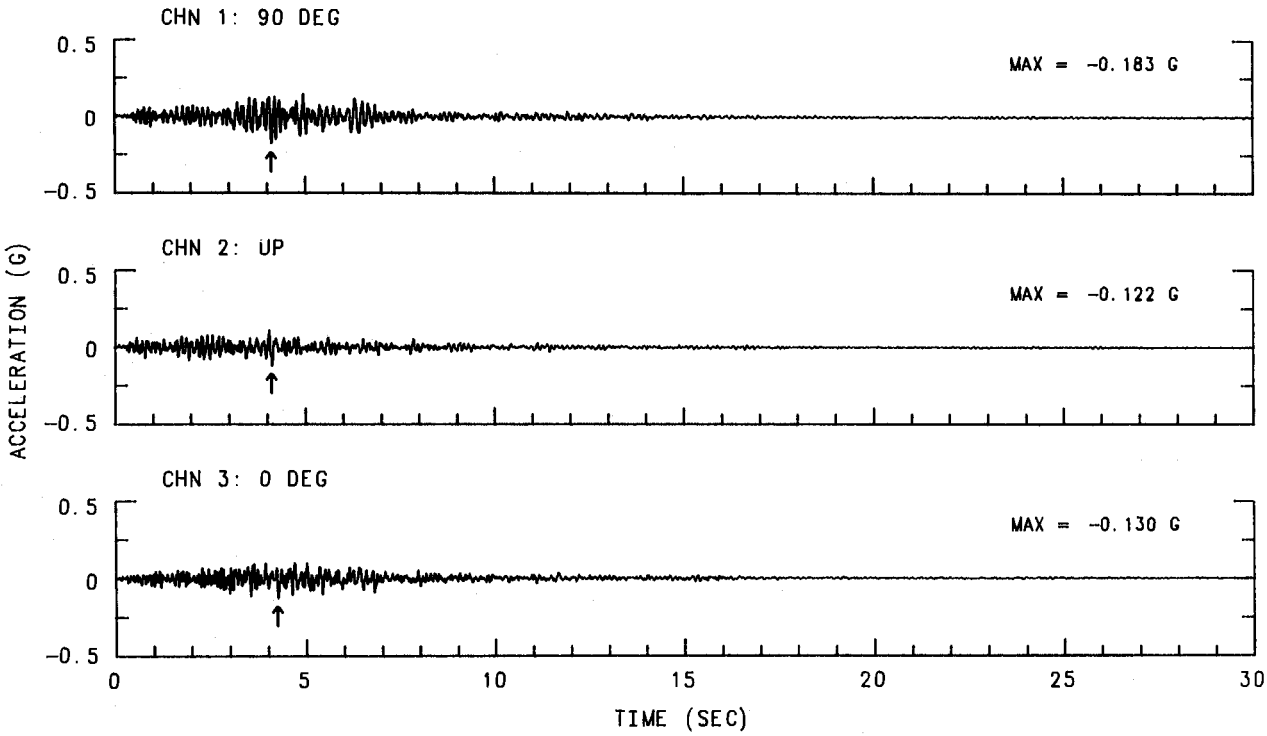


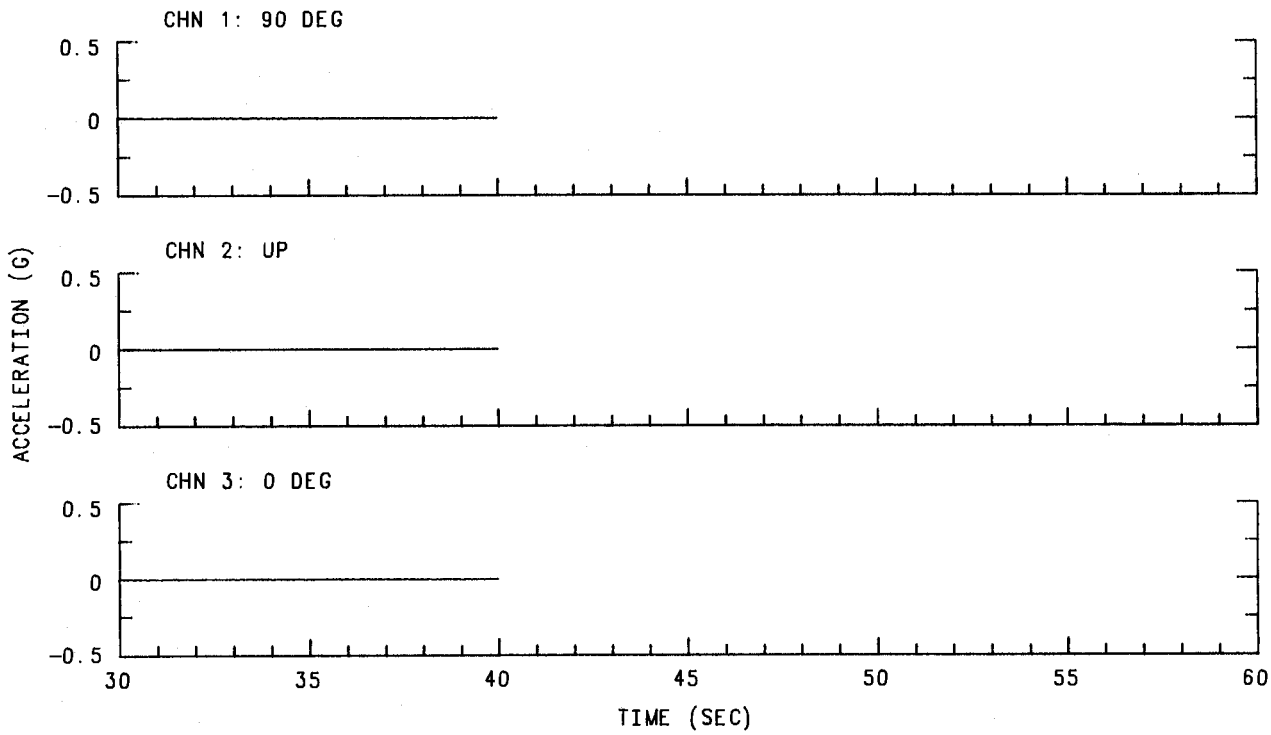
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

MT. WILSON - CALTECH SEISMIC STATION: CSMIP S/N 399

PHASE 1 ACCELERATION

RECORD ID: 24399-S0416-87278.01.1

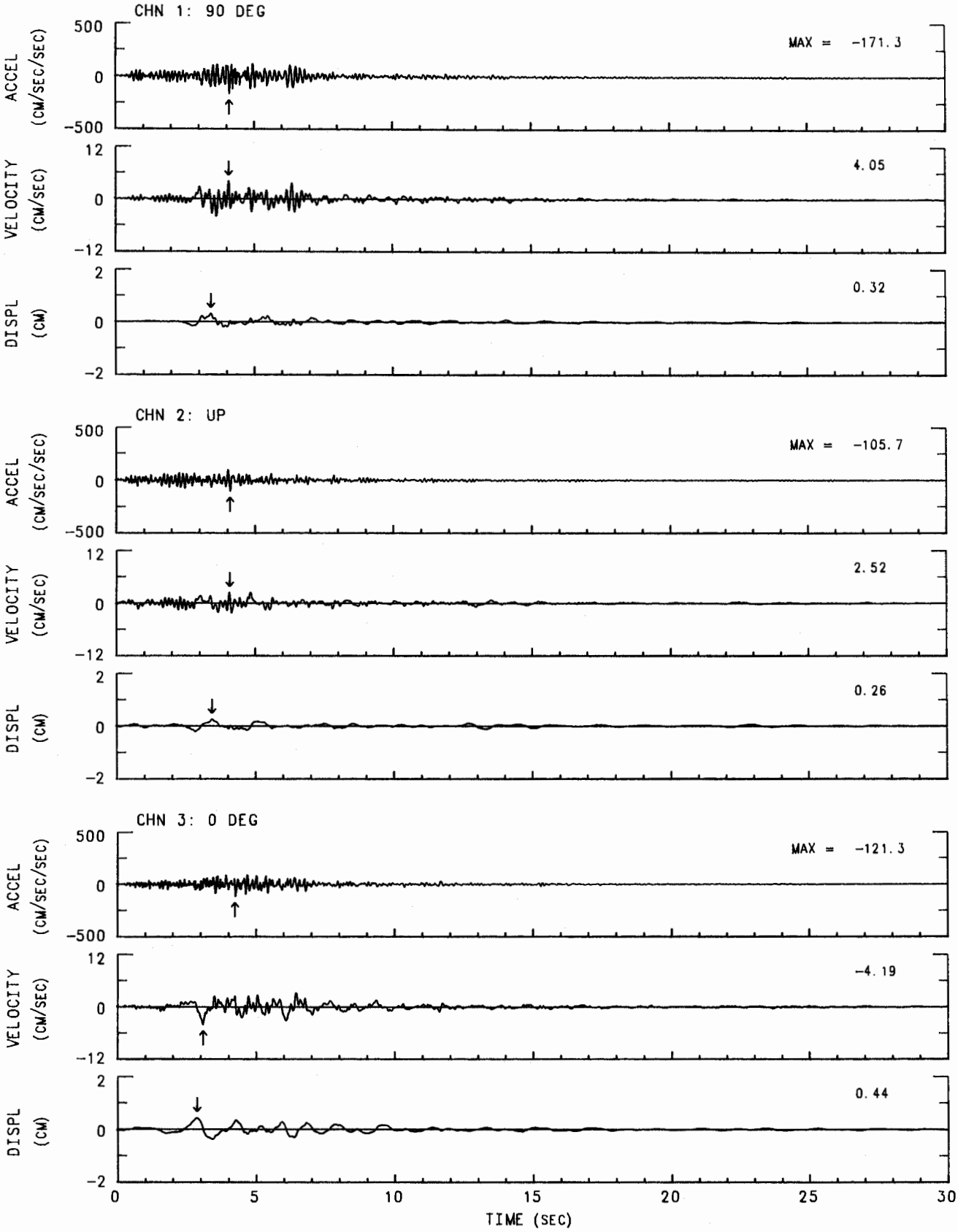




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
MT. WILSON - CALTECH SEISMIC STATION: CSMIP S/N 399

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24399-S0416-87278.01.1



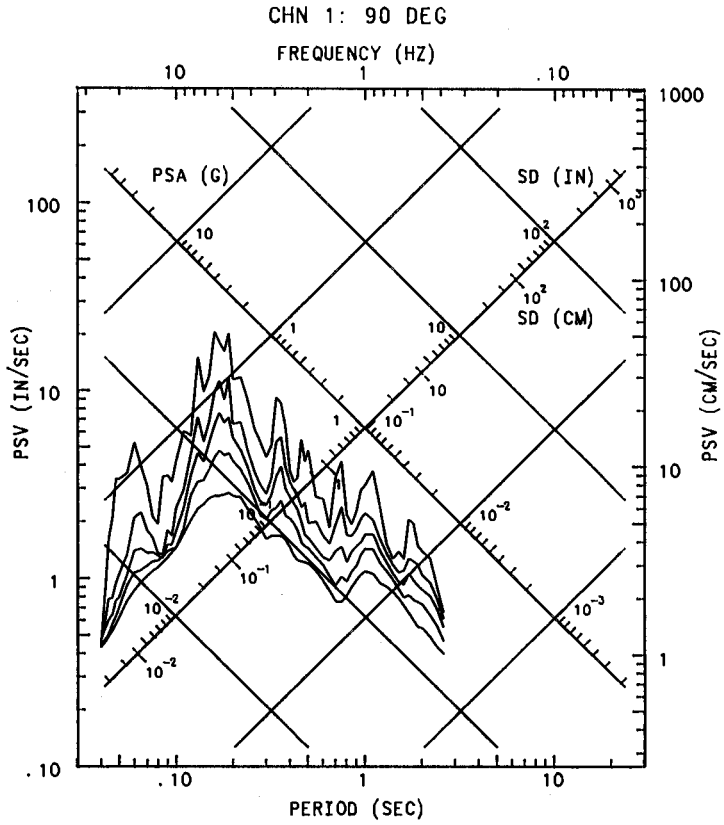
MT. WILSON - CALTECH SEISMIC STATION: CSMIP S/N 399

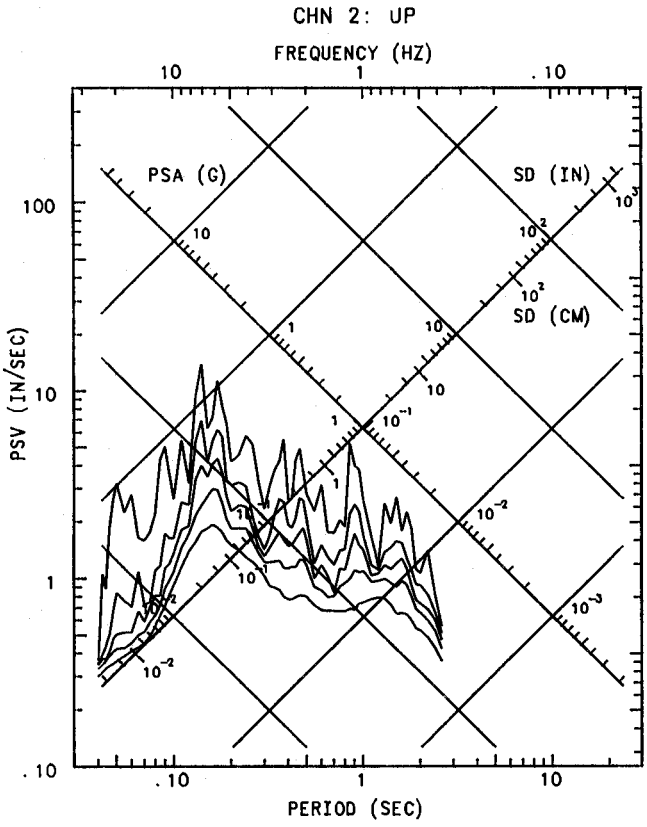
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

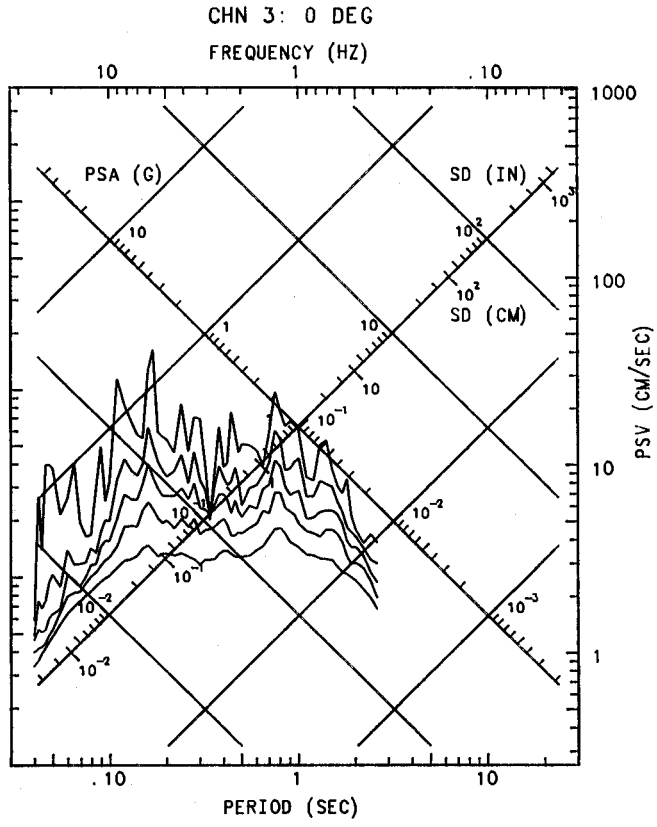
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

RECORD ID: 24399-S0416-87278.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

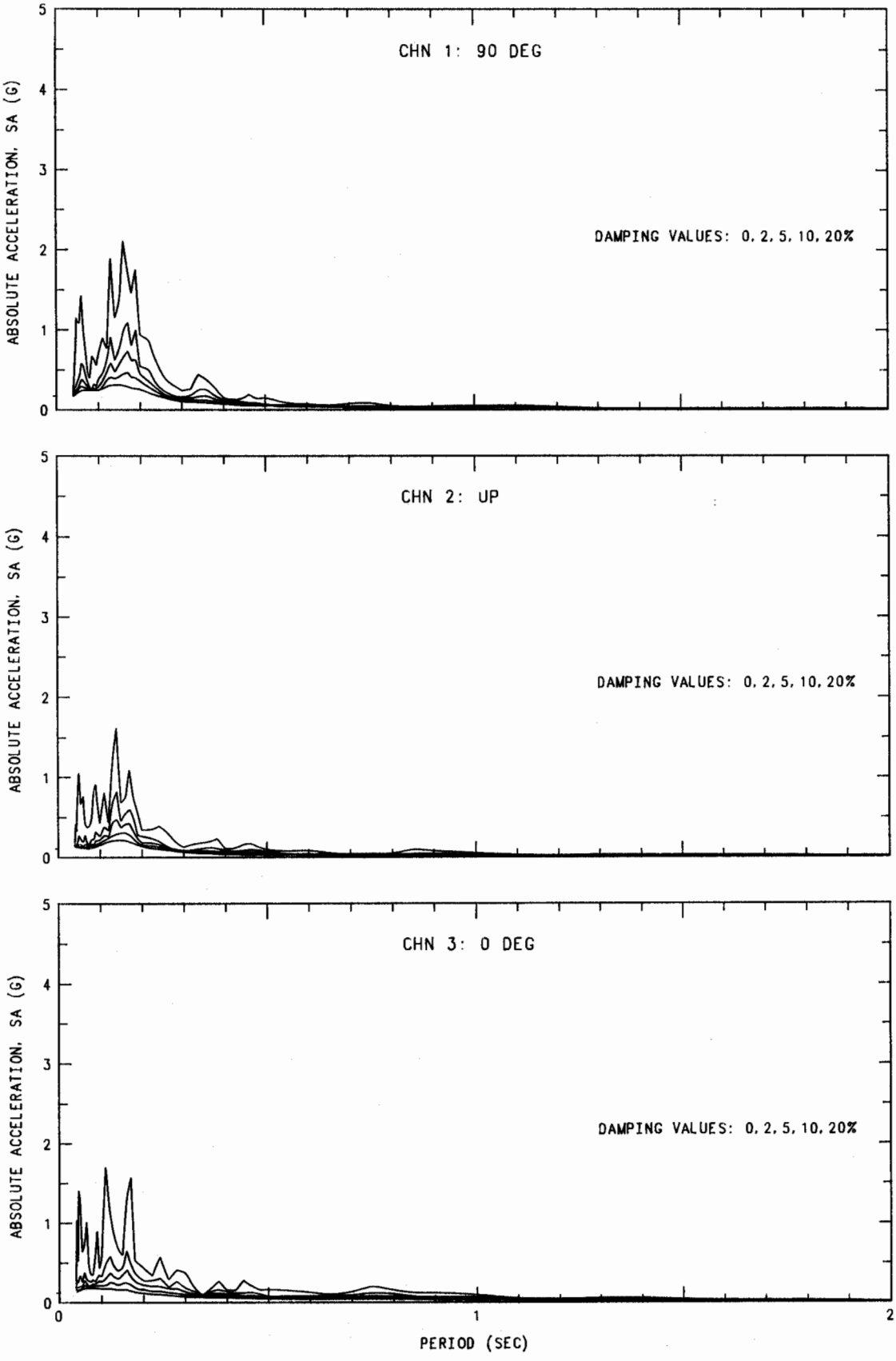






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
MT. WILSON - CALTECH SEISMIC STATION: CSMIP S/N 399

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24399-S0416-87278.01.1
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

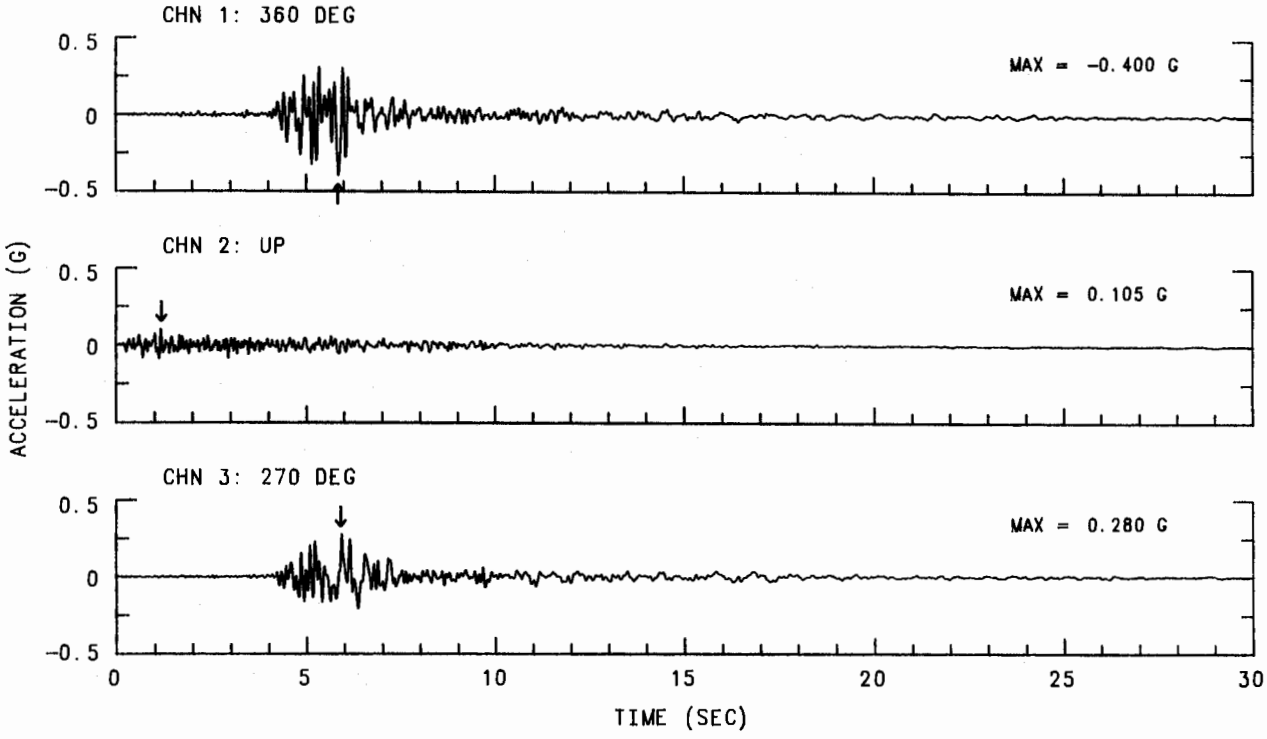


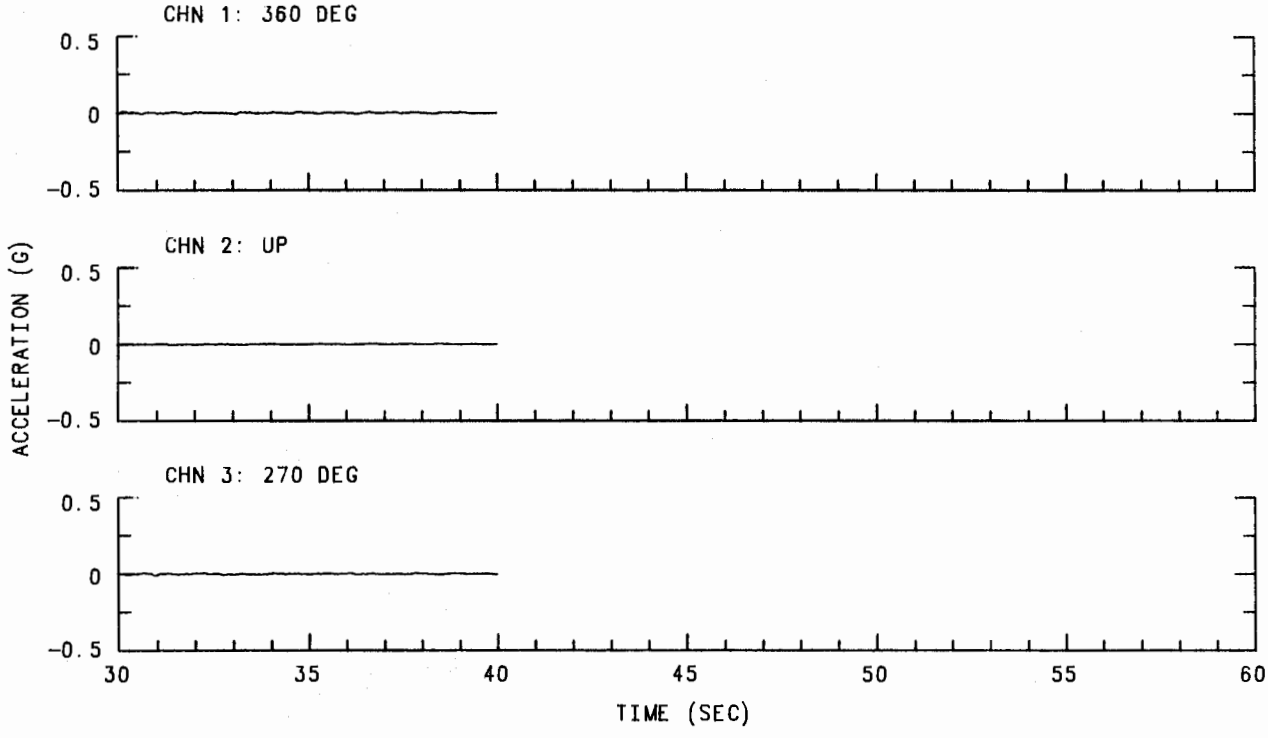
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LOS ANGELES - 116TH ST. SCHOOL: CSMIP S/N 403

PHASE 1 ACCELERATION

RECORD ID: 14403-S3492-87275.01.1

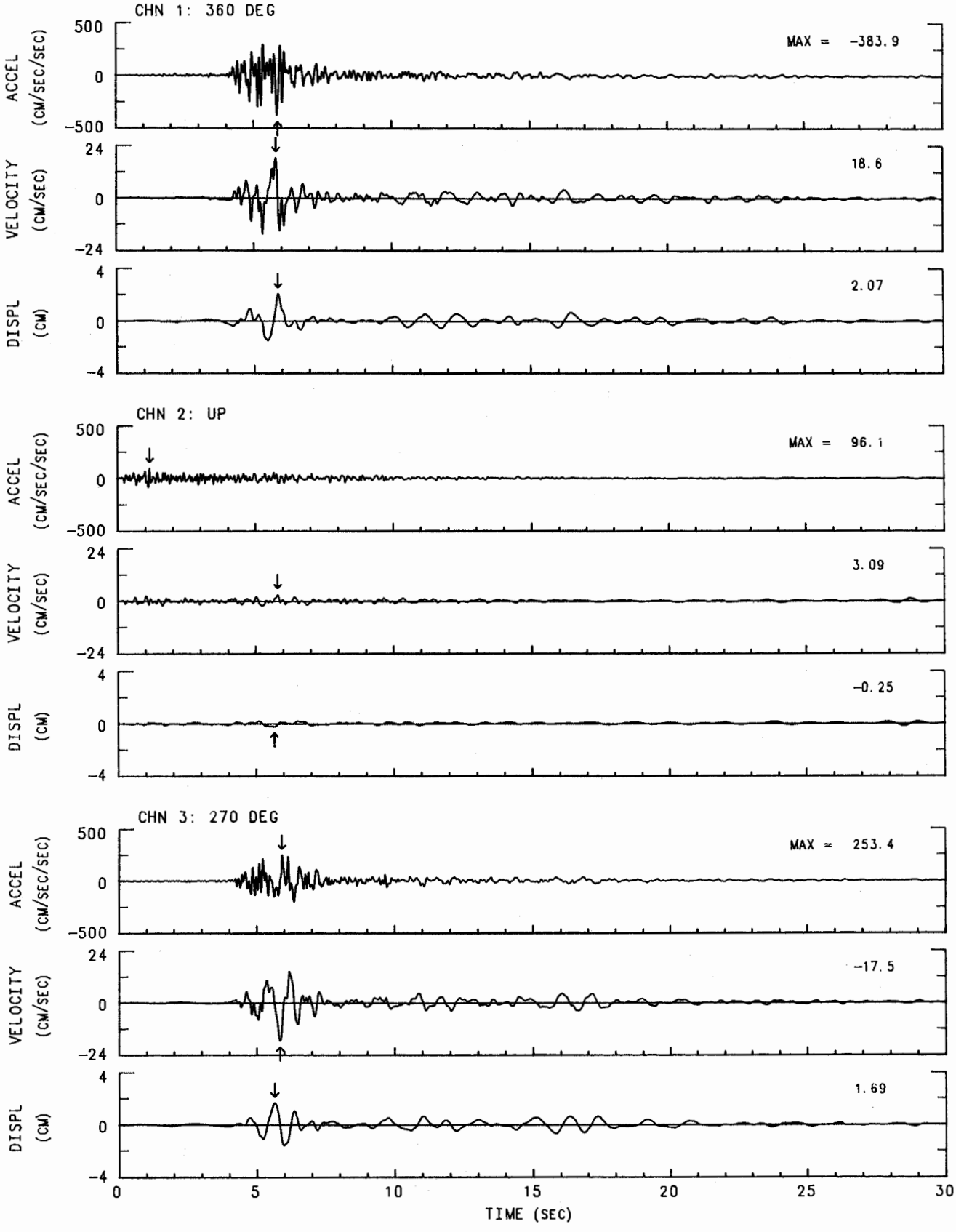




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LOS ANGELES - 116TH ST. SCHOOL: CSMIP S/N 403

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 14403-S3492-87275.01.1



LOS ANGELES - 116TH ST. SCHOOL: CSMIP S/N 403

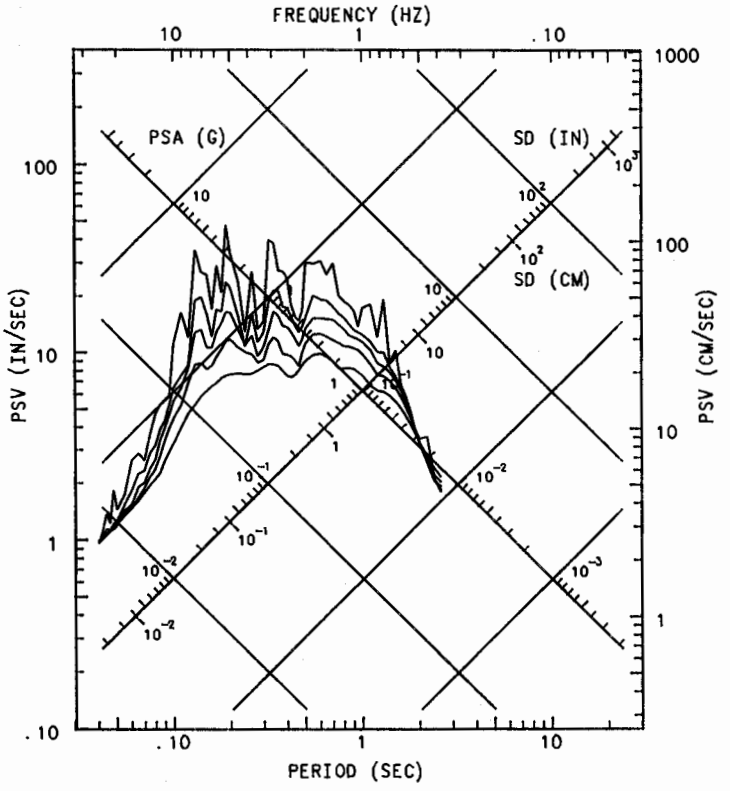
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

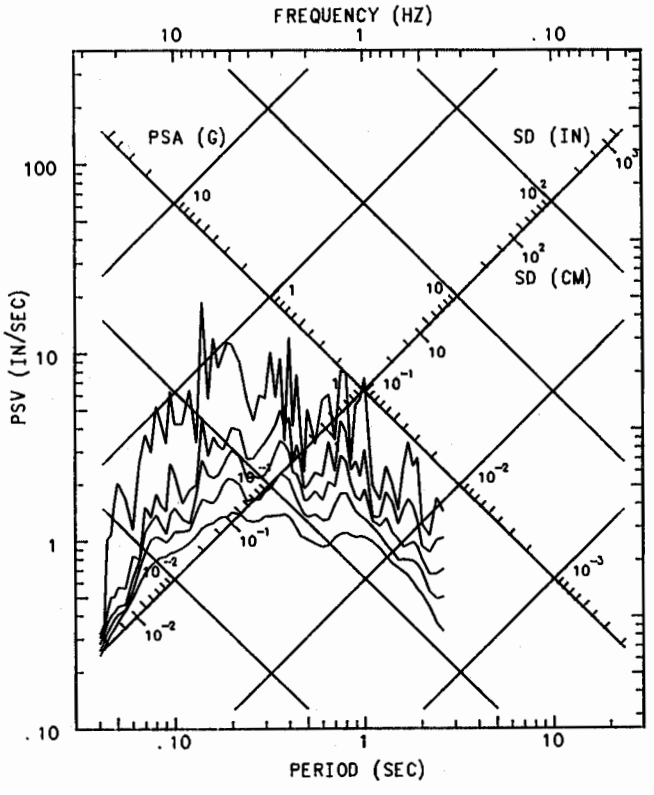
RECORD ID: 14403-S3492-87275.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

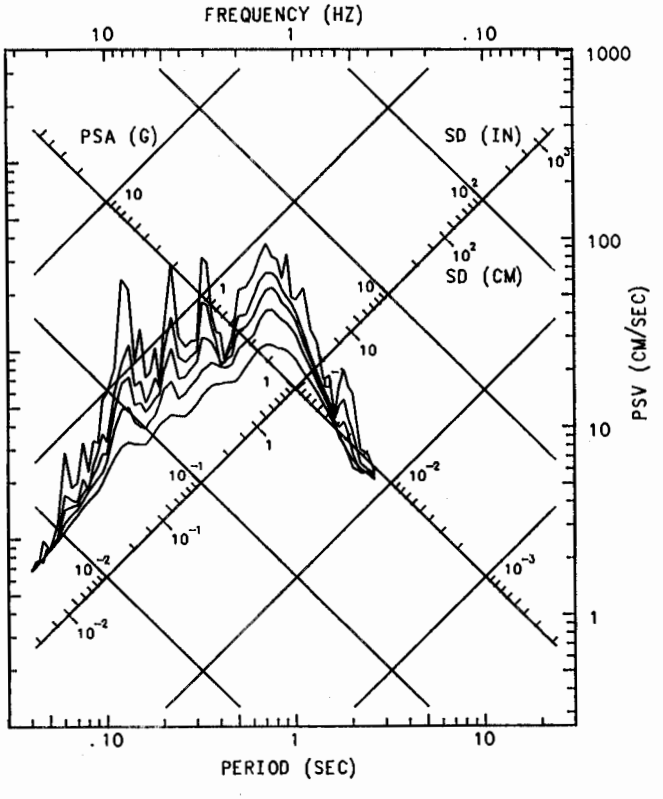
CHN 1: 360 DEG



CHN 2: UP

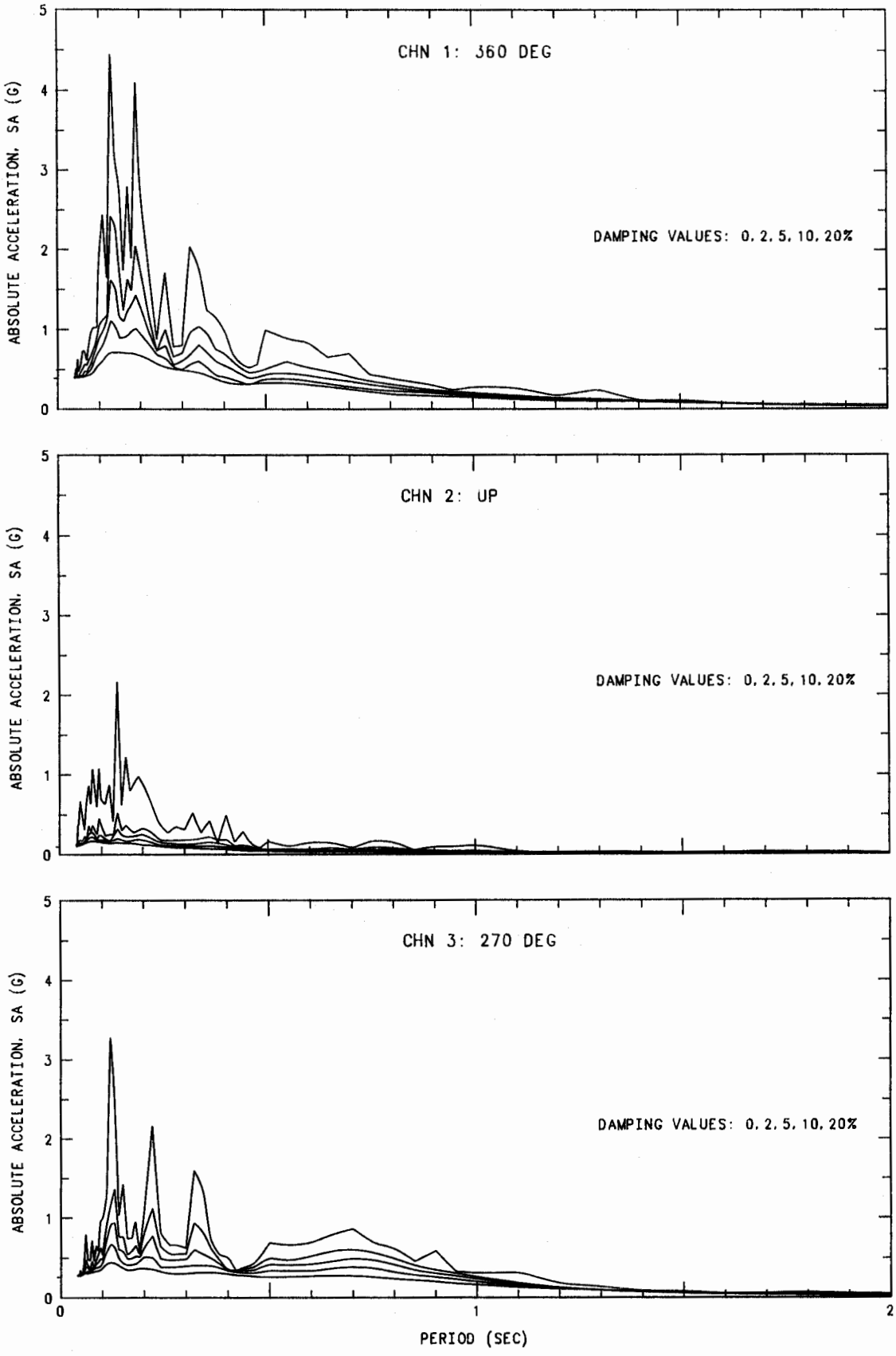


CHN 3: 270 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LOS ANGELES - 116TH ST. SCHOOL: CSMIP S/N 403

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 14403-S3492-87275.01.1
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

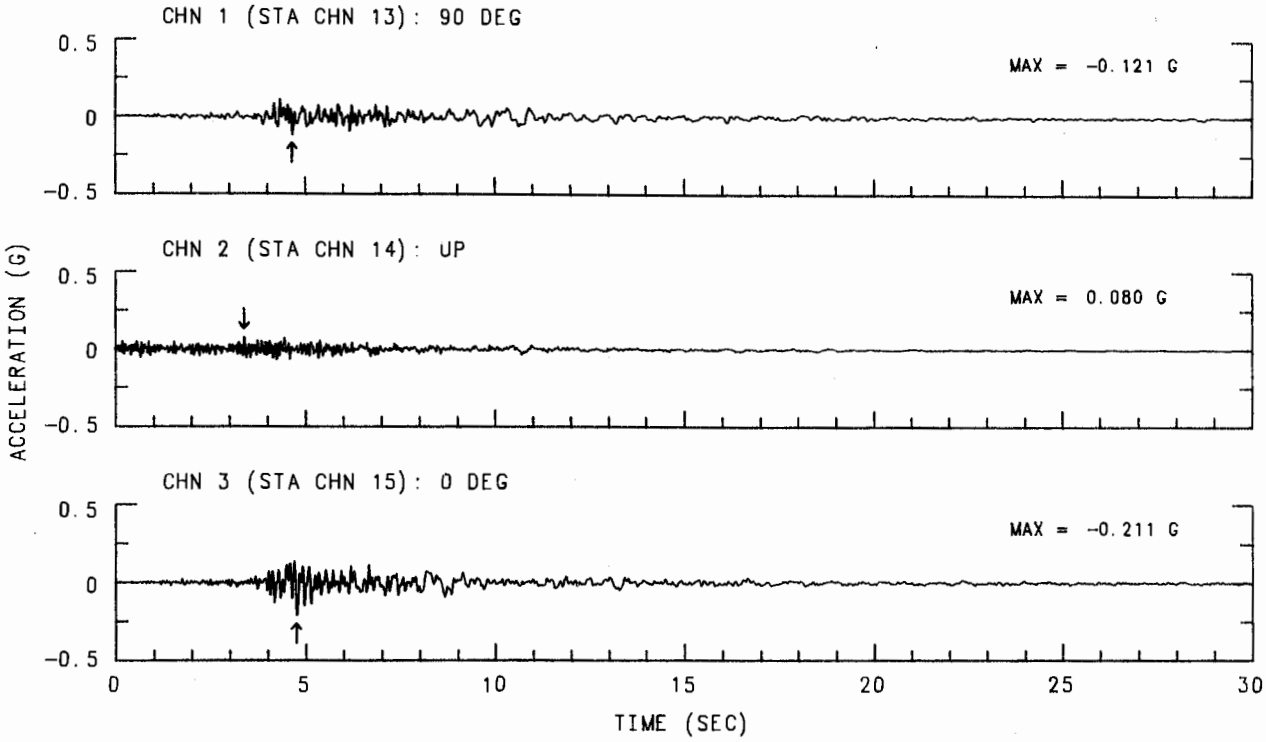


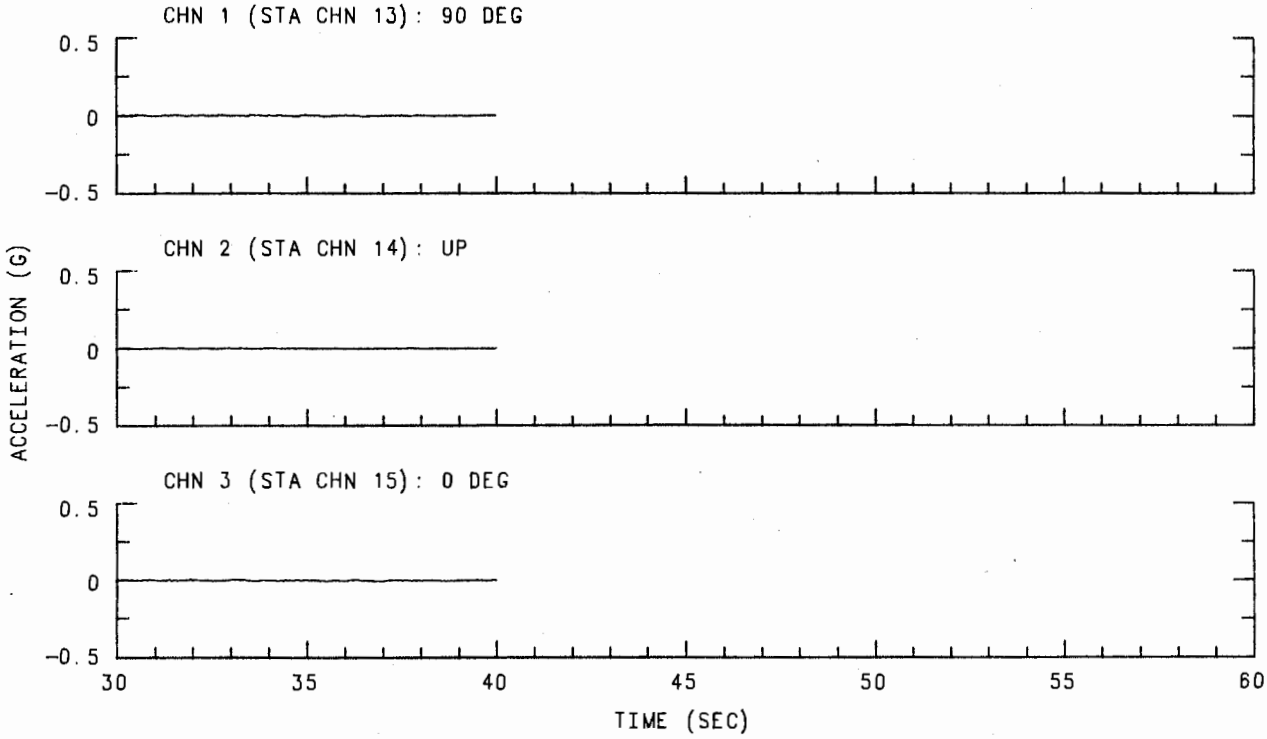
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LOS ANGELES - HOLLYWOOD STORAGE BLDG. FF: CSMIP S/N 303

PHASE 1 ACCELERATION

RECORD ID: 24303-S2774-87275.01.1

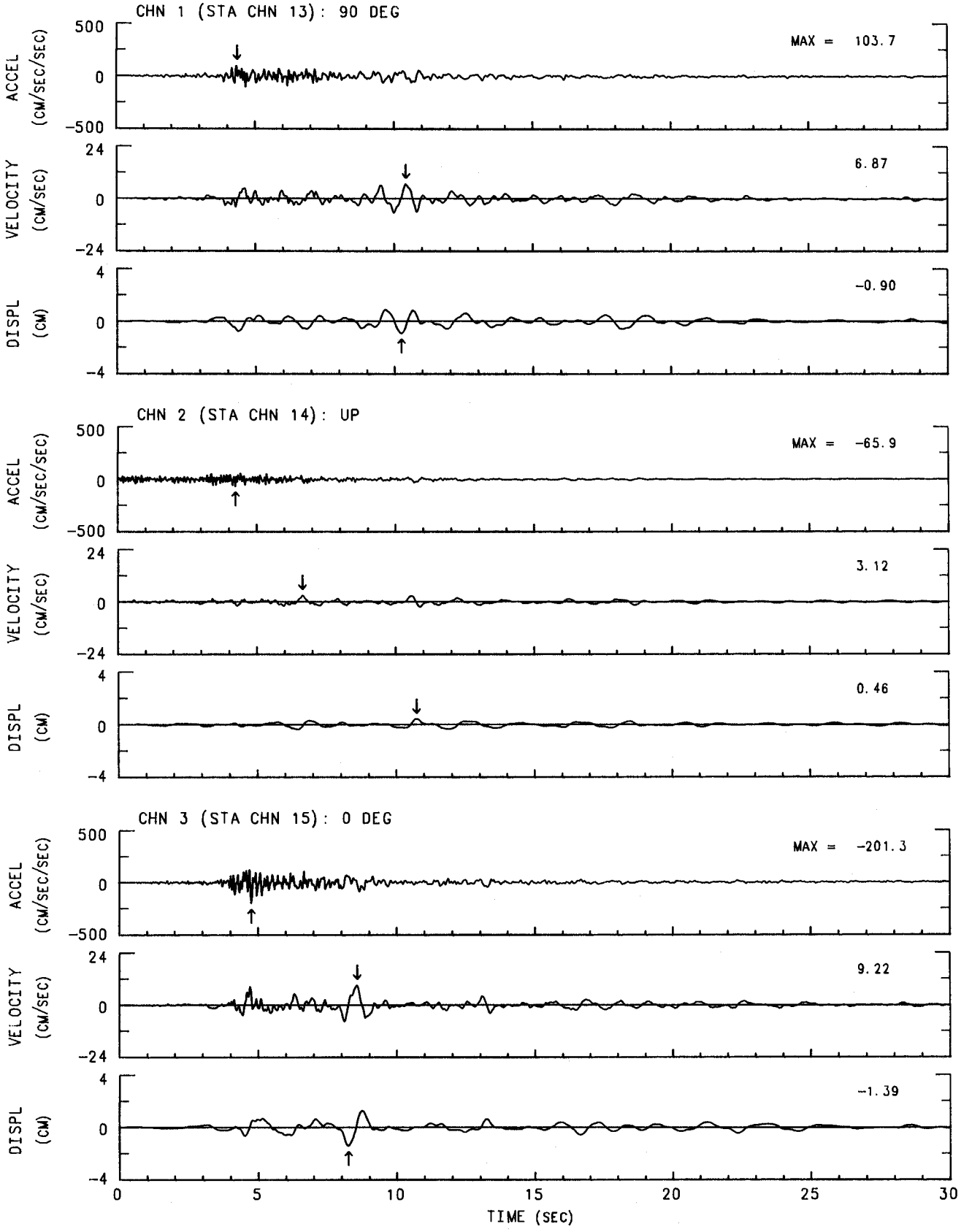




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LOS ANGELES - HOLLYWOOD STORAGE BLDG. FF: CSMIP S/N 303

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ (0.04 TO 2.94 SEC) RECORD ID: 24303-S2774-87275.01.1



LOS ANGELES - HOLLYWOOD STORAGE BLDG. FF: CSMIP S/N 303

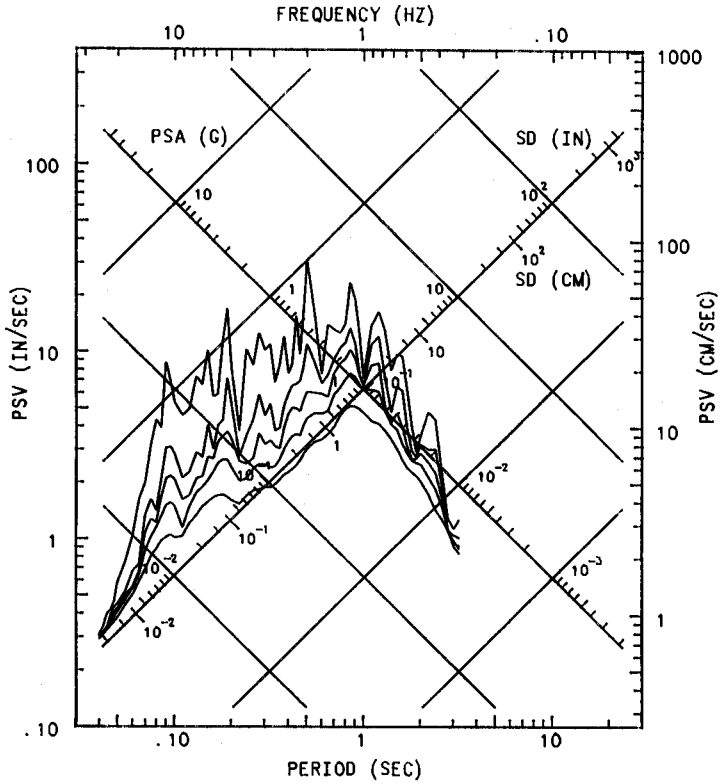
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ
(0.04 TO 2.94 SEC)

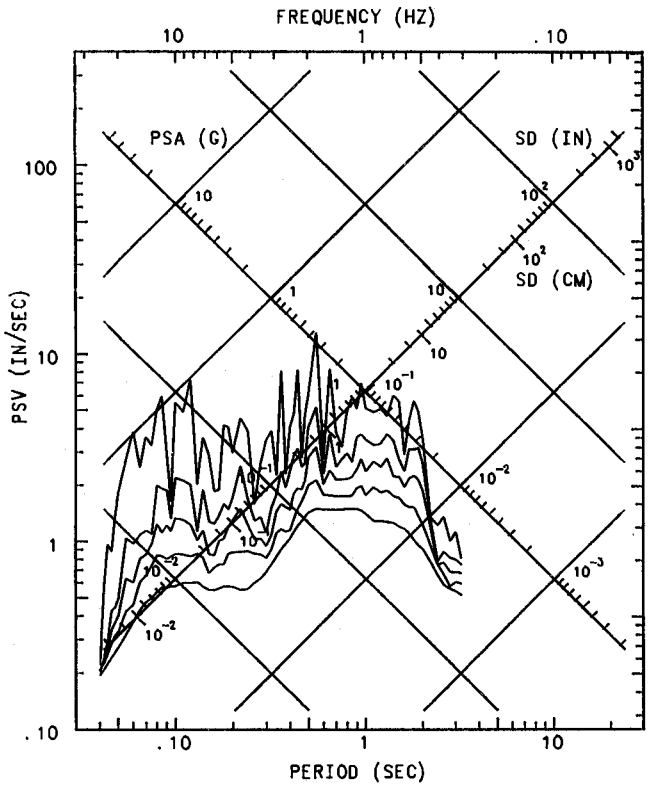
RECORD ID: 24303-S2774-87275.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

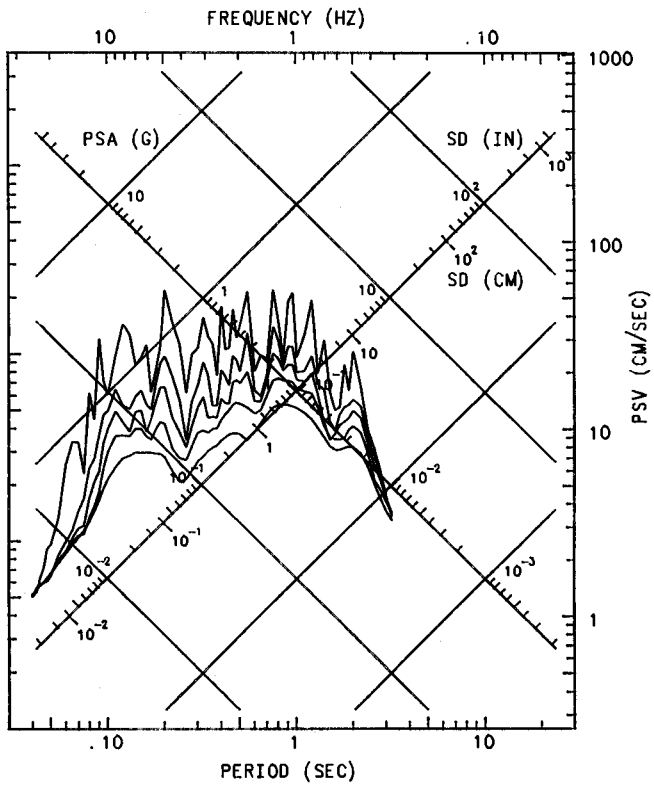
CHN 1 (STA CHN 13): 90 DEG



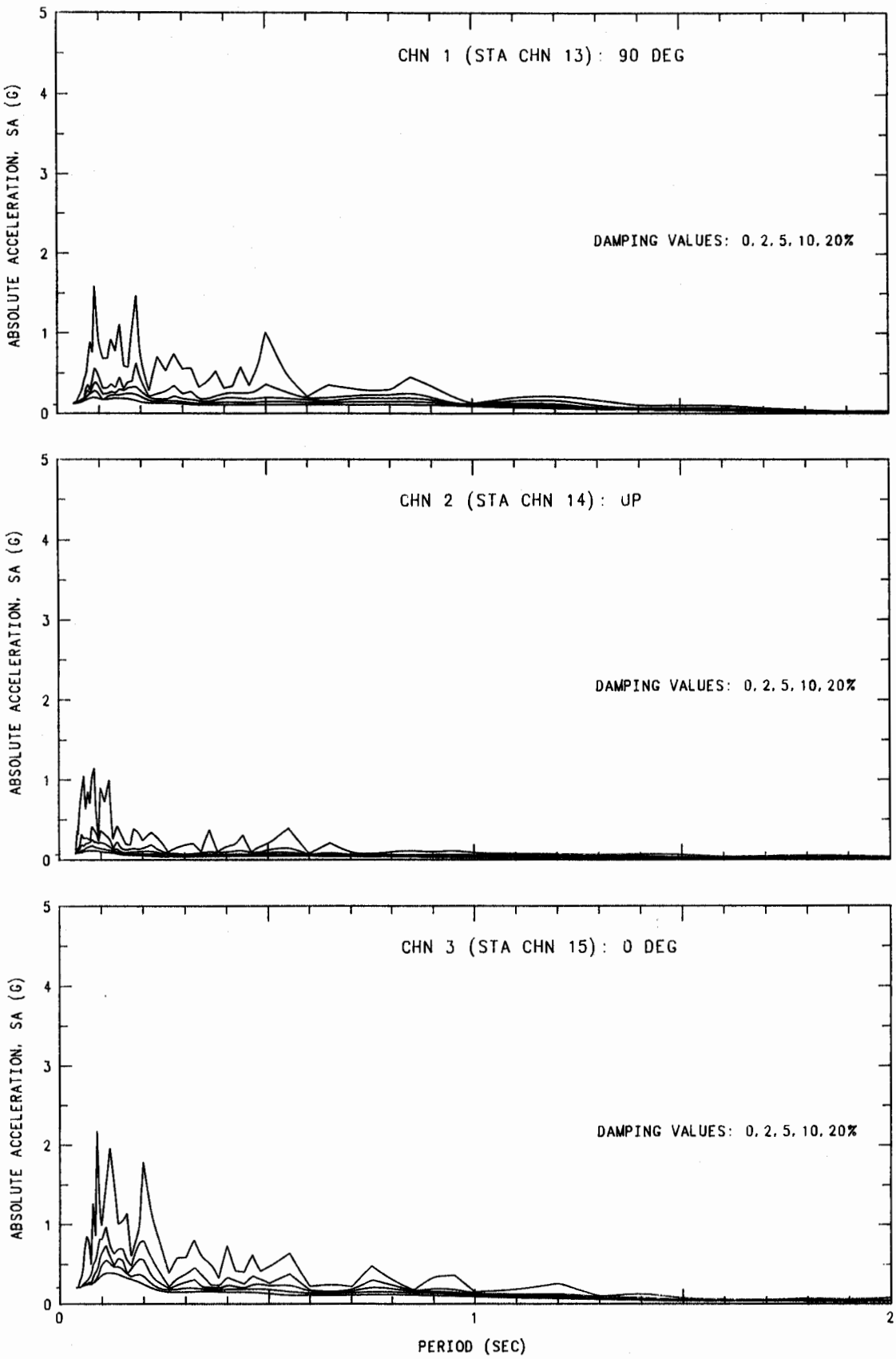
CHN 2 (STA CHN 14): UP



CHN 3 (STA CHN 15): 0 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LOS ANGELES - HOLLYWOOD STORAGE BLDG. FF: CSMIP S/N 303
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24303-S2774-87275.01.1
USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ (0.04 TO 2.94 SEC)

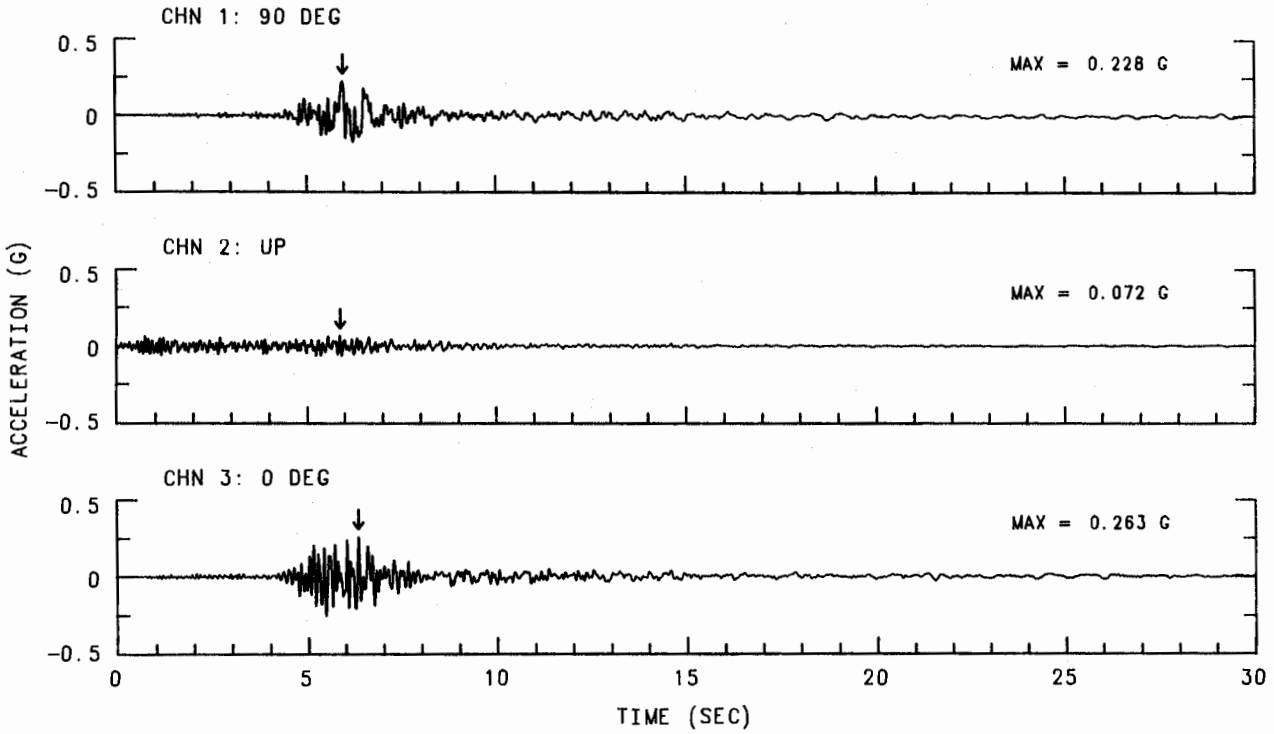


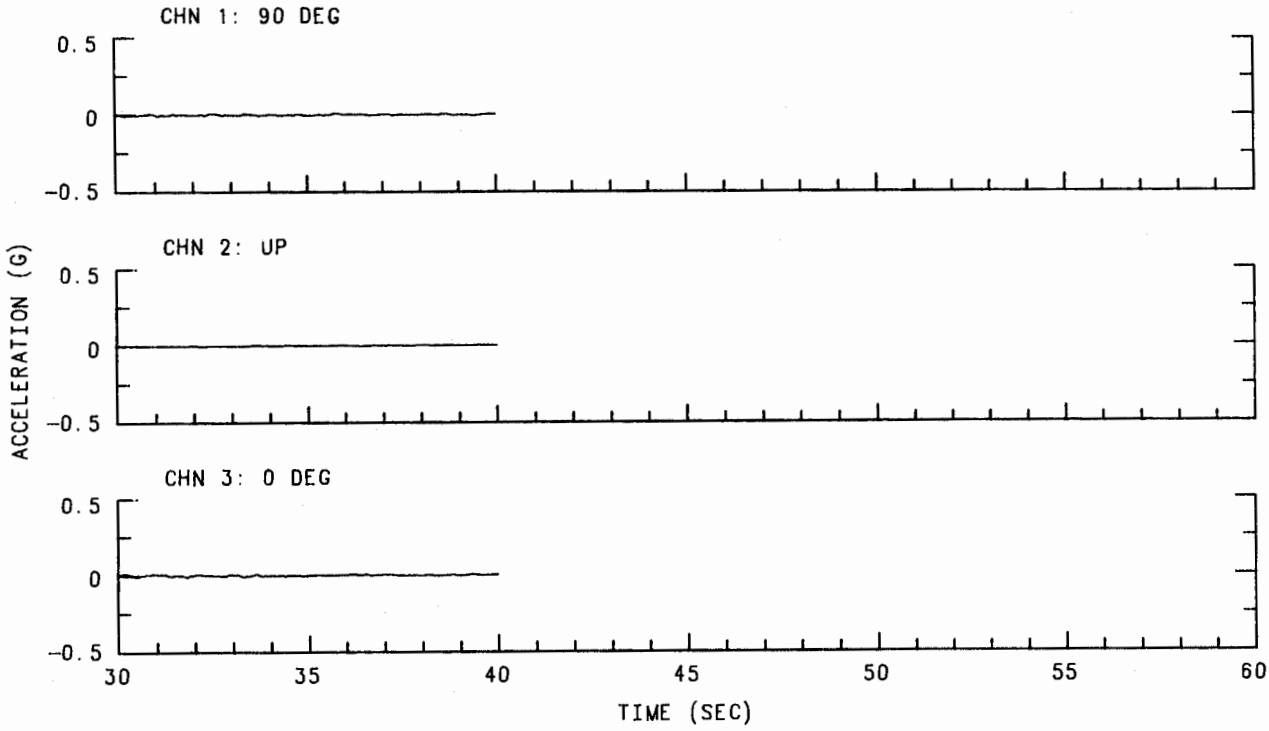
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

INGLEWOOD - UNION OIL YARD: CSMIP S/N 196

PHASE 1 ACCELERATION

RECORD ID: 14196-S1874-87274.01.1

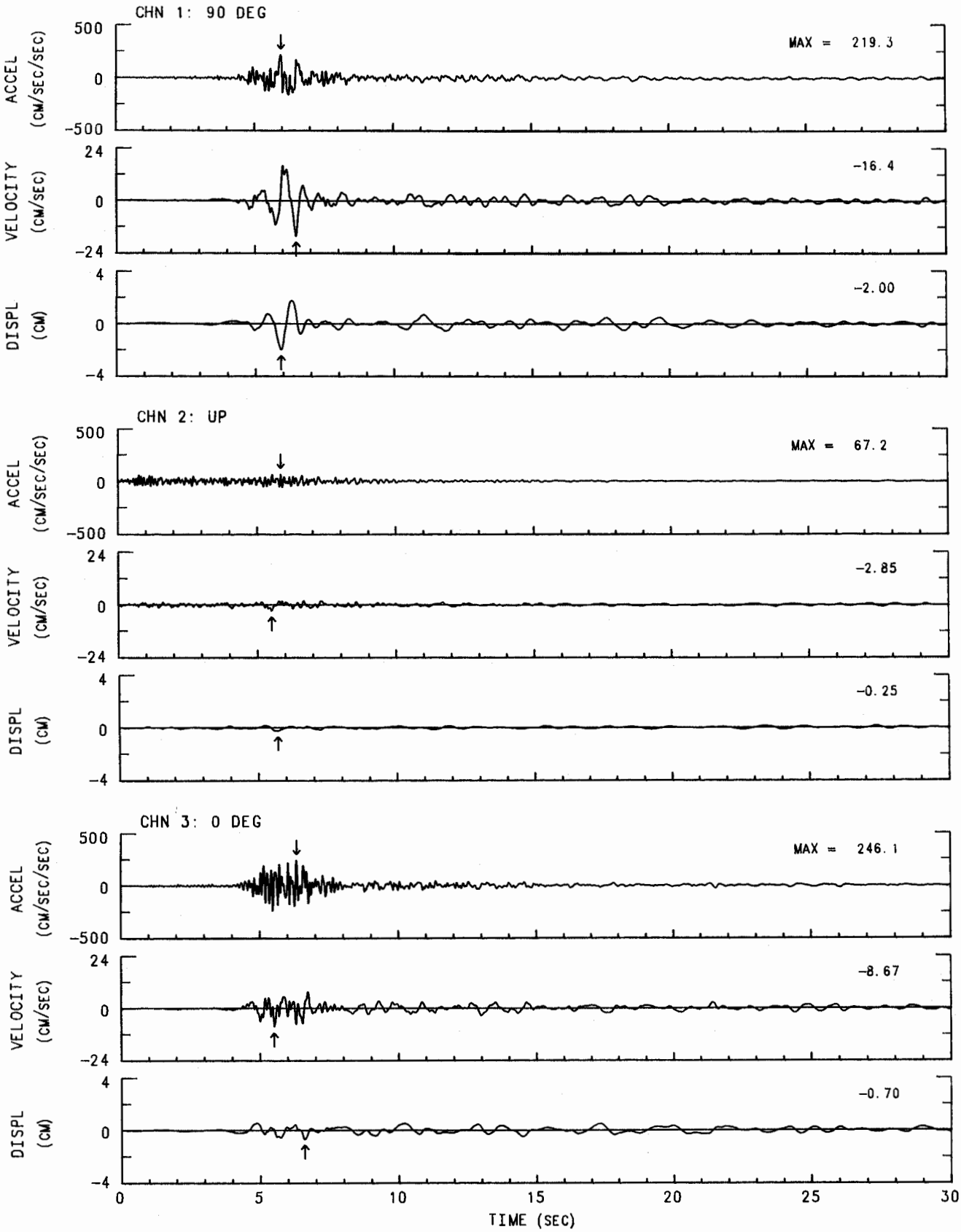




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
INGLEWOOD - UNION OIL YARD: CSMIP S/N 196

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ (0.04 TO 2.94 SEC) RECORD ID: 14196-S1874-87274.01.1



INGLEWOOD - UNION OIL YARD: CSMIP S/N 196

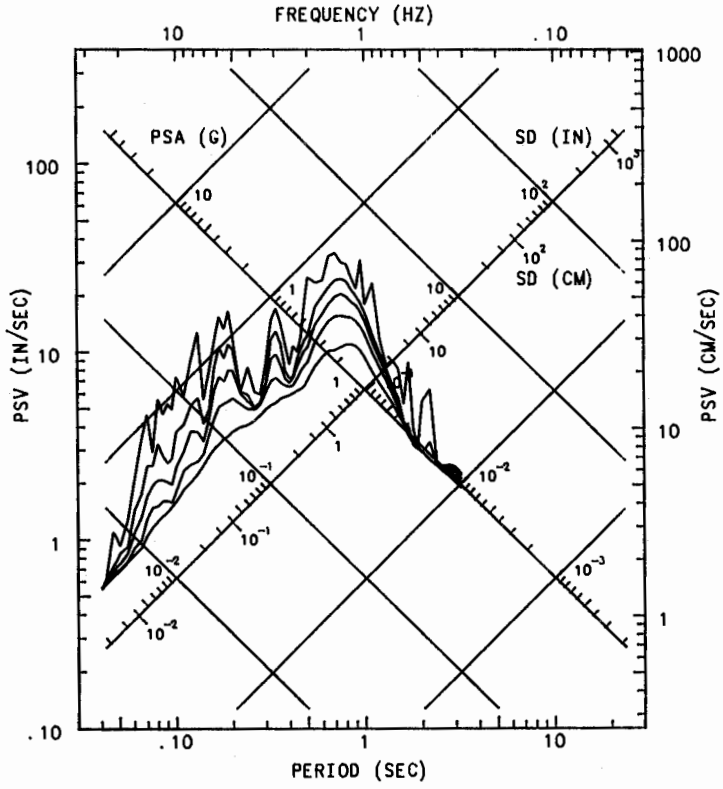
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ
(0.04 TO 2.94 SEC)

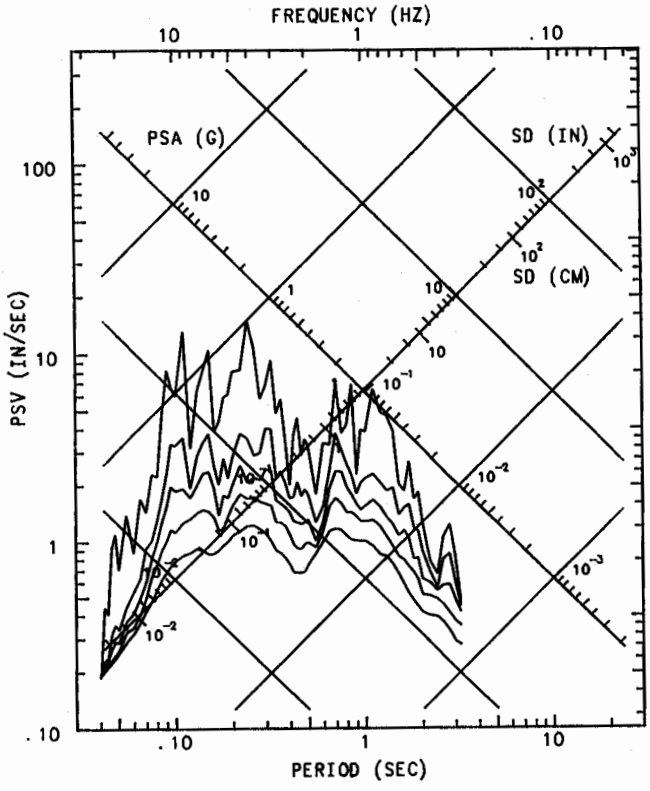
RECORD ID: 14196-S1874-87274.01.1

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

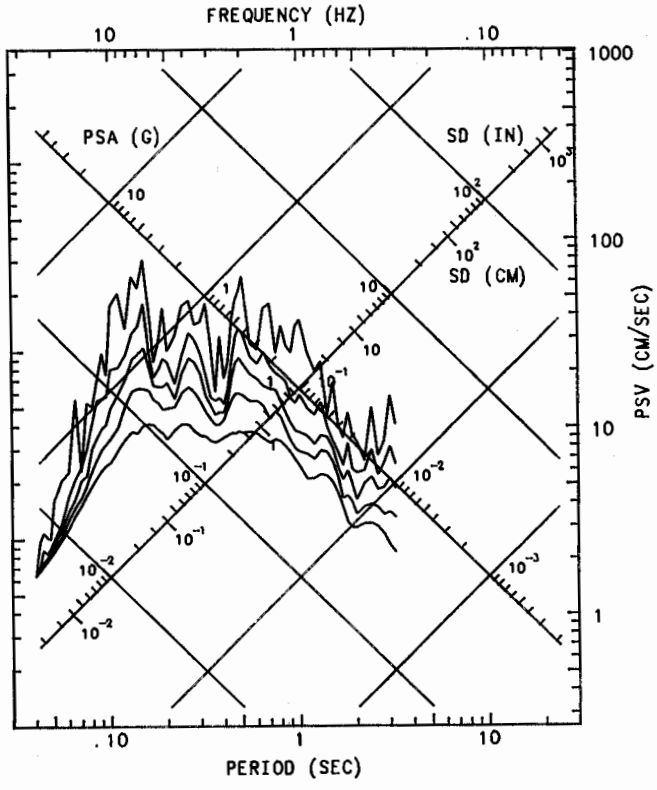
CHN 1: 90 DEG



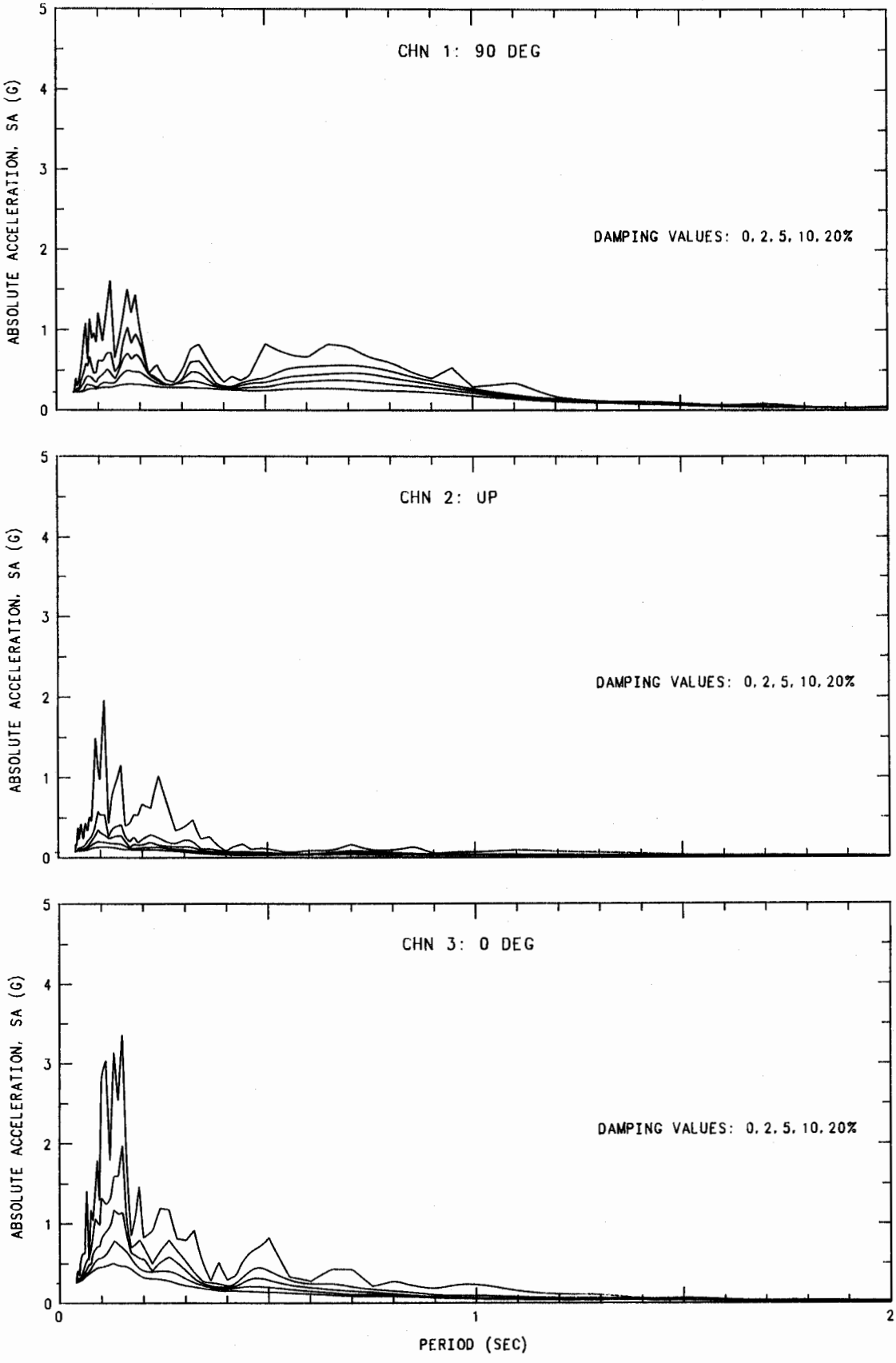
CHN 2: UP



CHN 3: 0 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
INGLEWOOD - UNION OIL YARD: CSMIP S/N 196
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 14196-S1874-87274.01.1
USABLE DATA BANDWIDTH: 0.34 TO 23.6 HZ (0.04 TO 2.94 SEC)

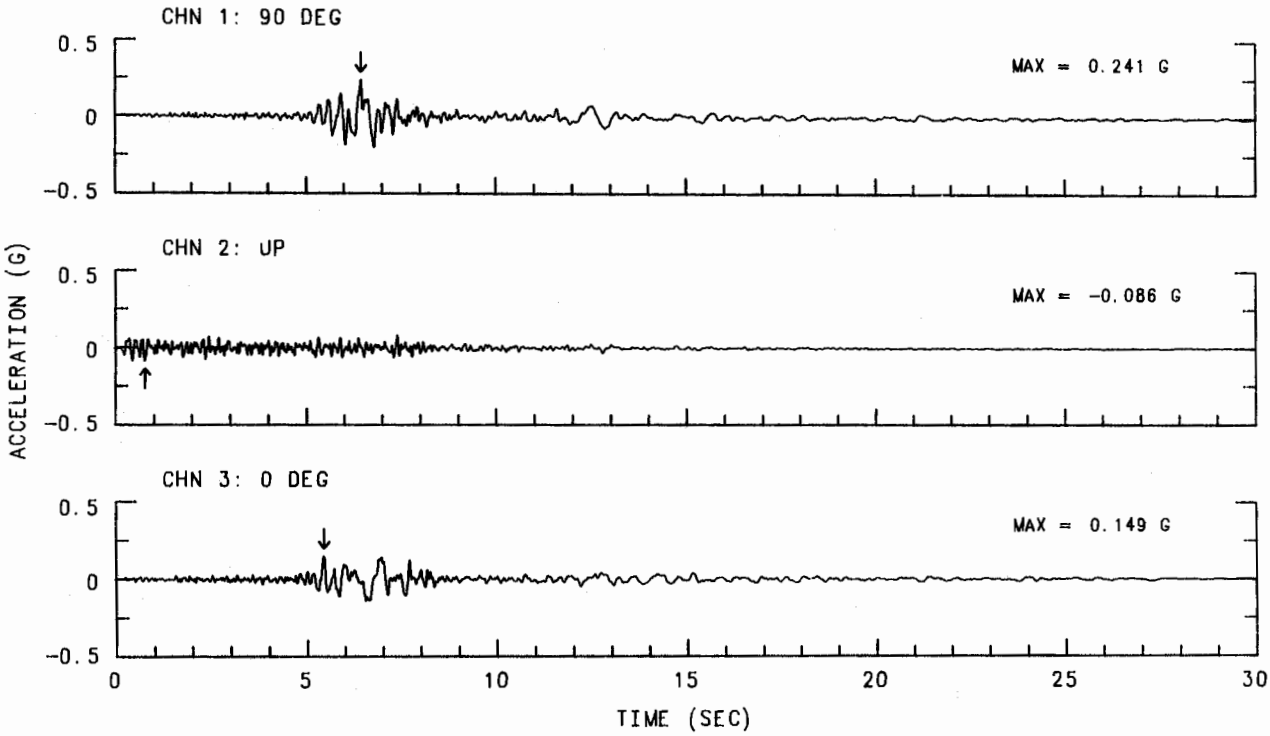


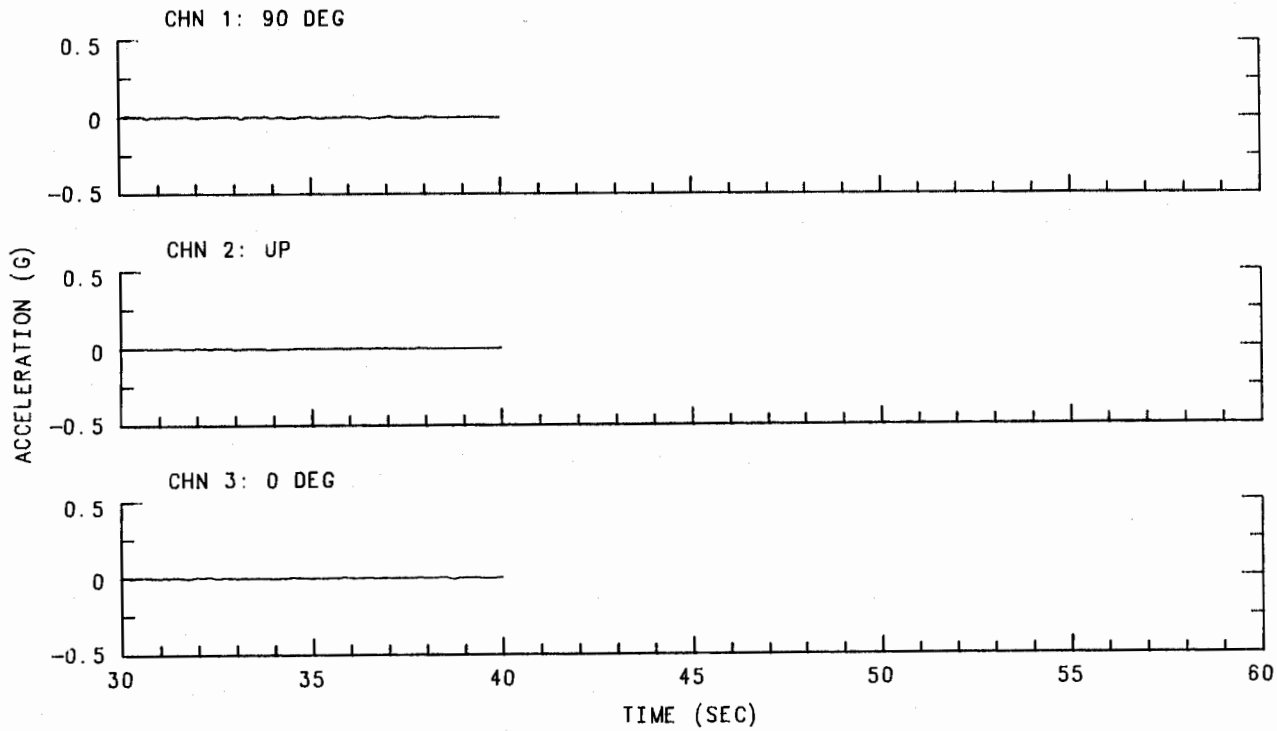
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LONG BEACH - RANCHO LOS CERRITOS: CSMIP S/N 242

PHASE 1 ACCELERATION

RECORD ID: 14242-S2491-87276.01.1



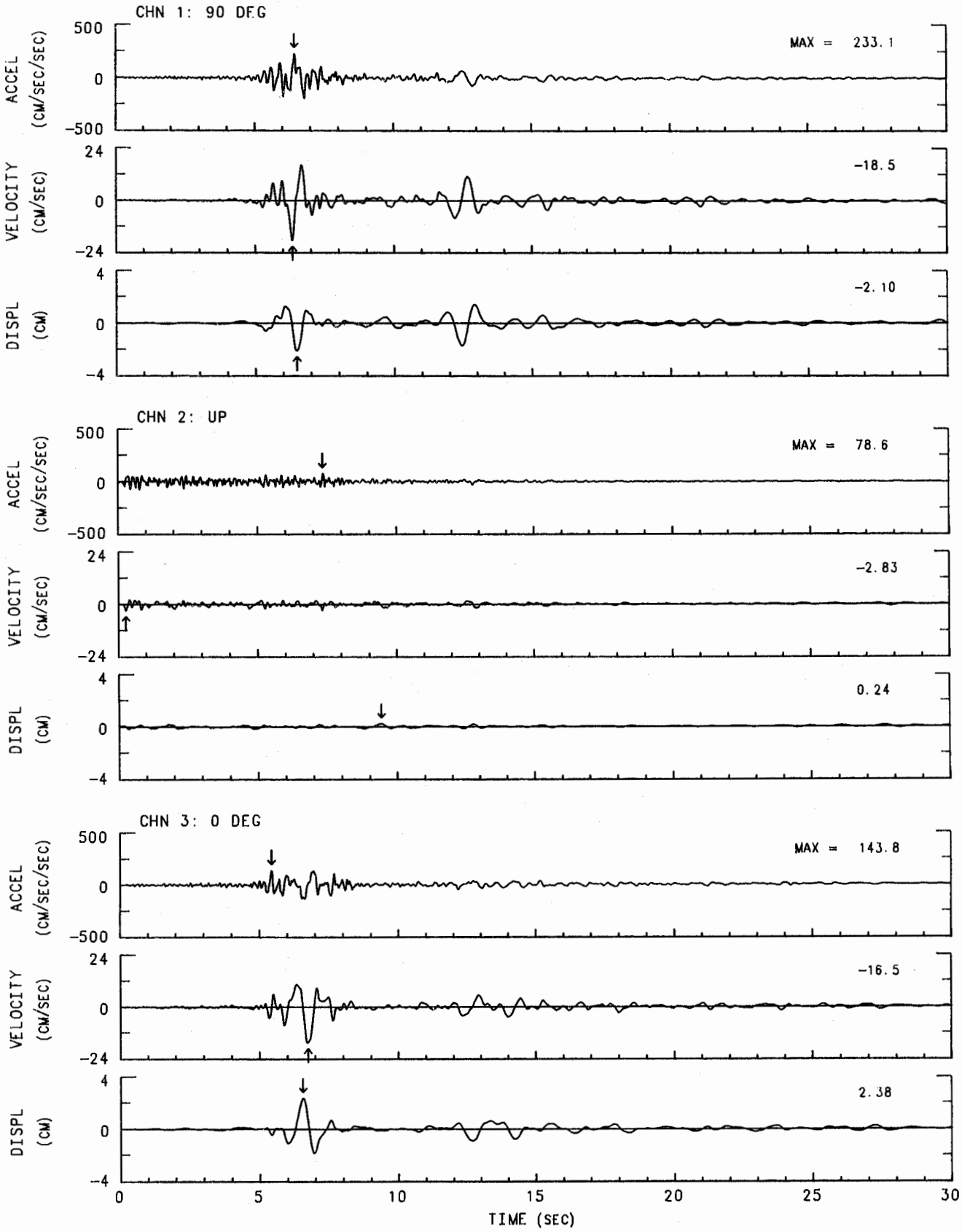


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LONG BEACH - RANCHO LOS CERRITOS: CSMIP S/N 242

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 14242-S2491-87276.01.1



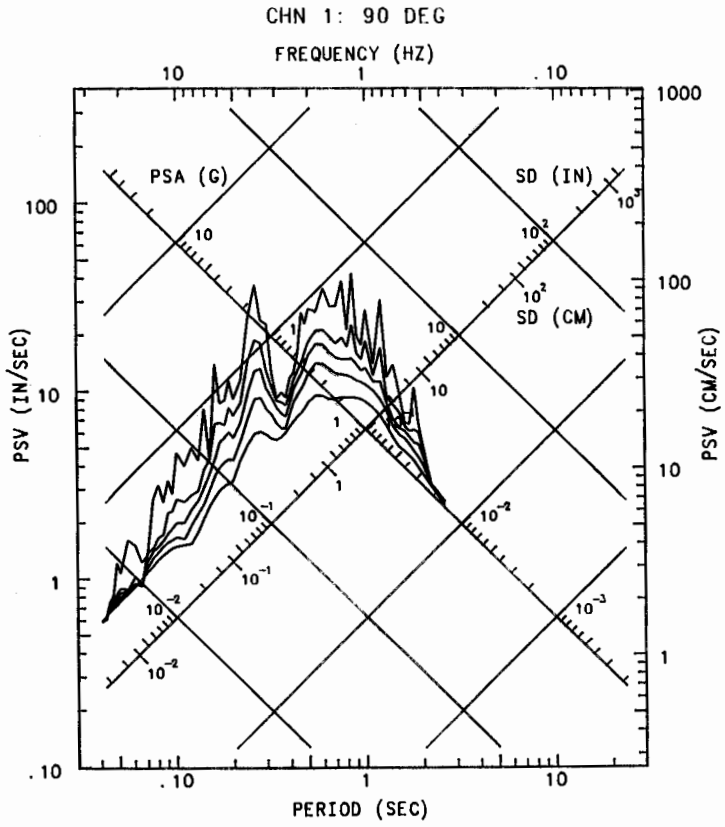
LONG BEACH - RANCHO LOS CERRITOS: CSMIP S/N 242

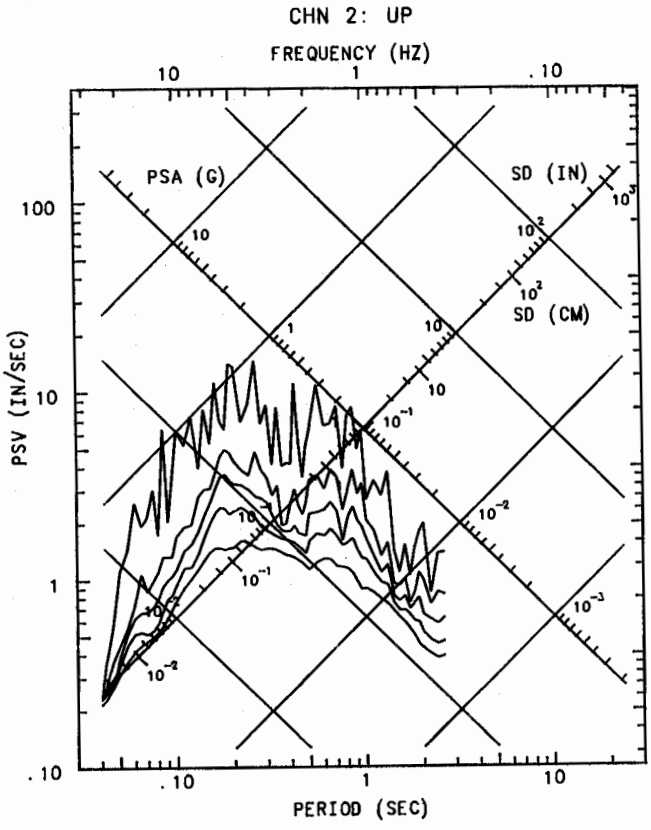
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

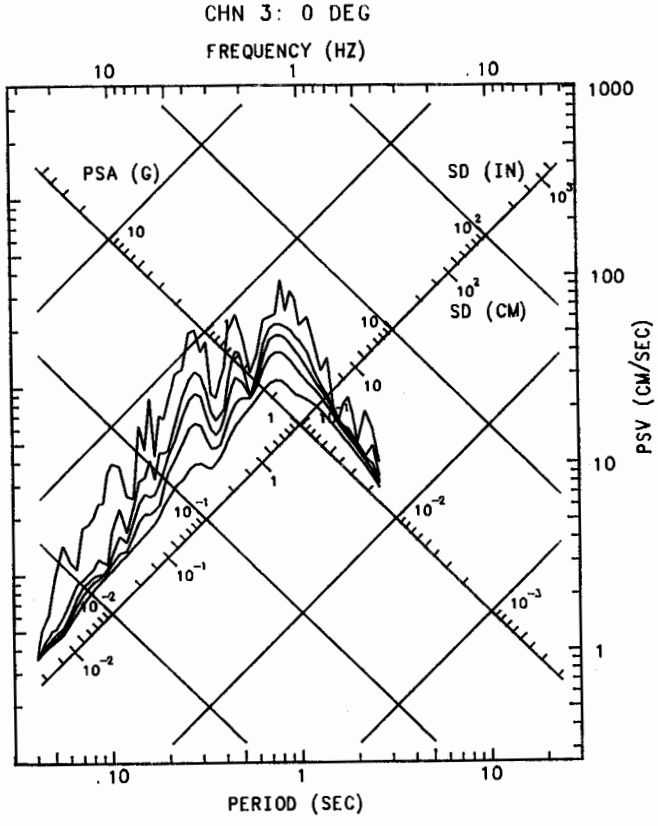
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

RECORD ID: 14242-S2491-87276.01.1

RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

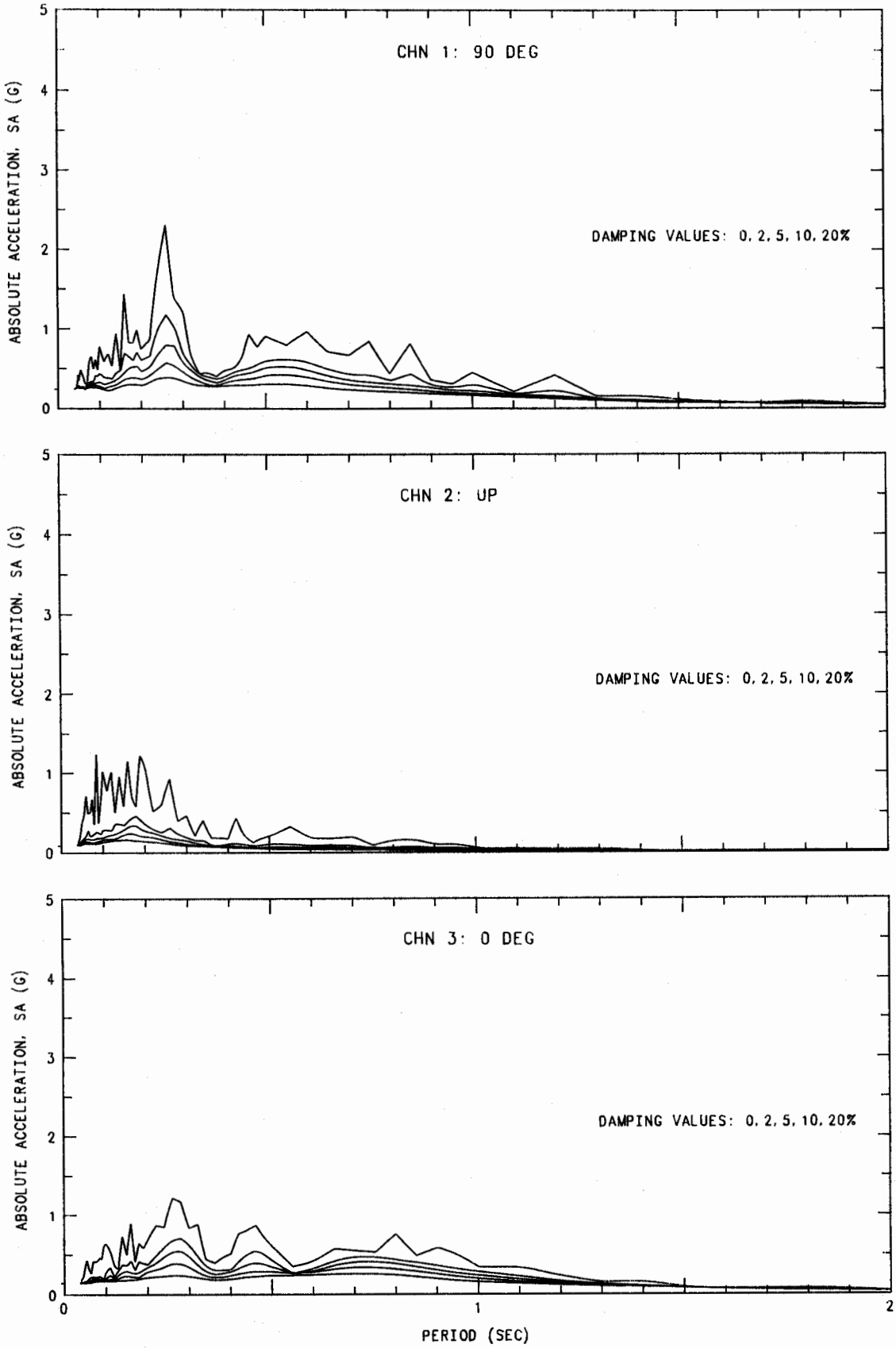






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LONG BEACH - RANCHO LOS CERRITOS: CSMIP S/N 242

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 14242-S2491-87276.01.1
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

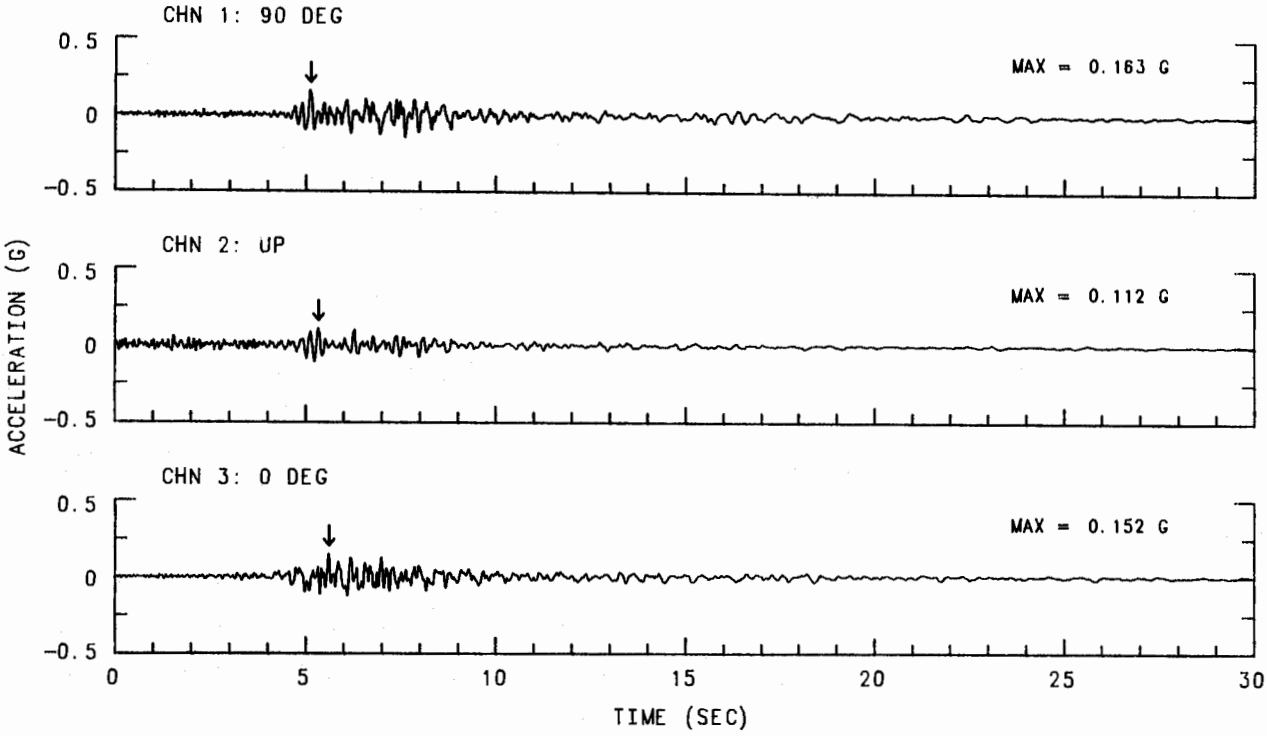


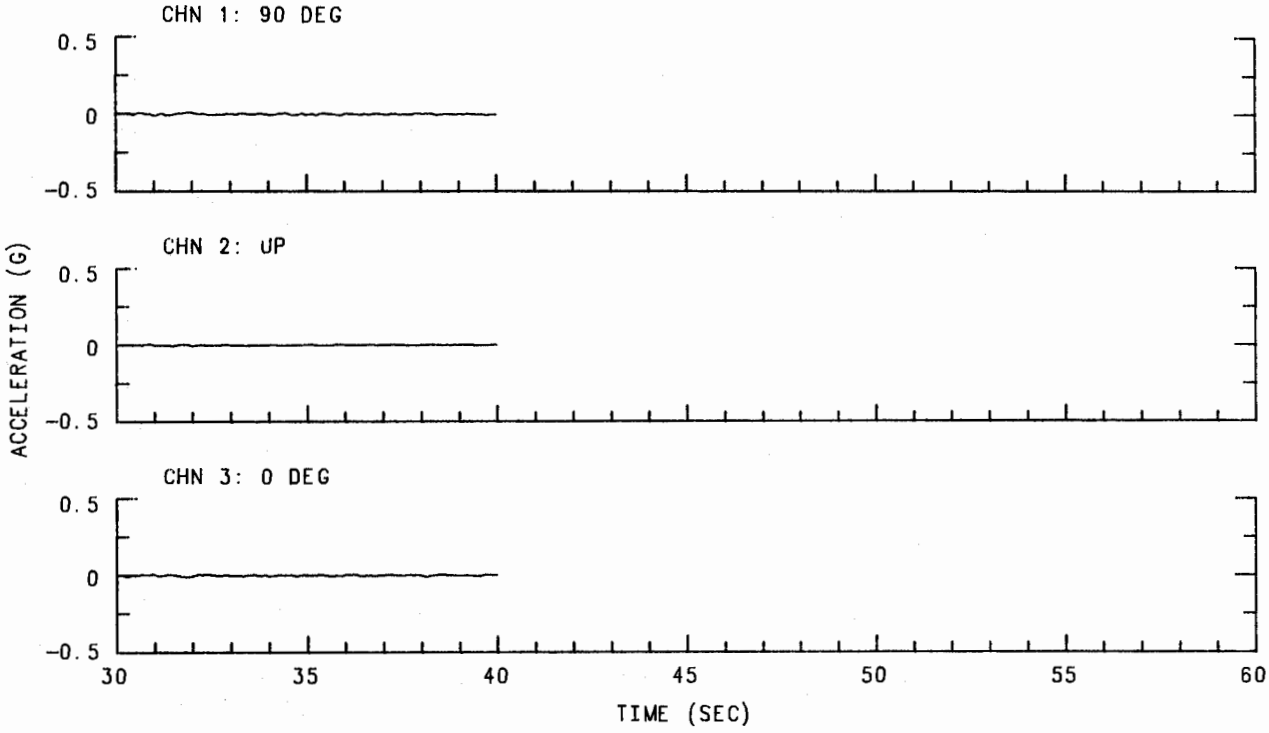
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LOS ANGELES - BALDWIN HILLS: CSMIP S/N 157

PHASE 1 ACCELERATION

RECORD ID: 24157-S1687-87276.01



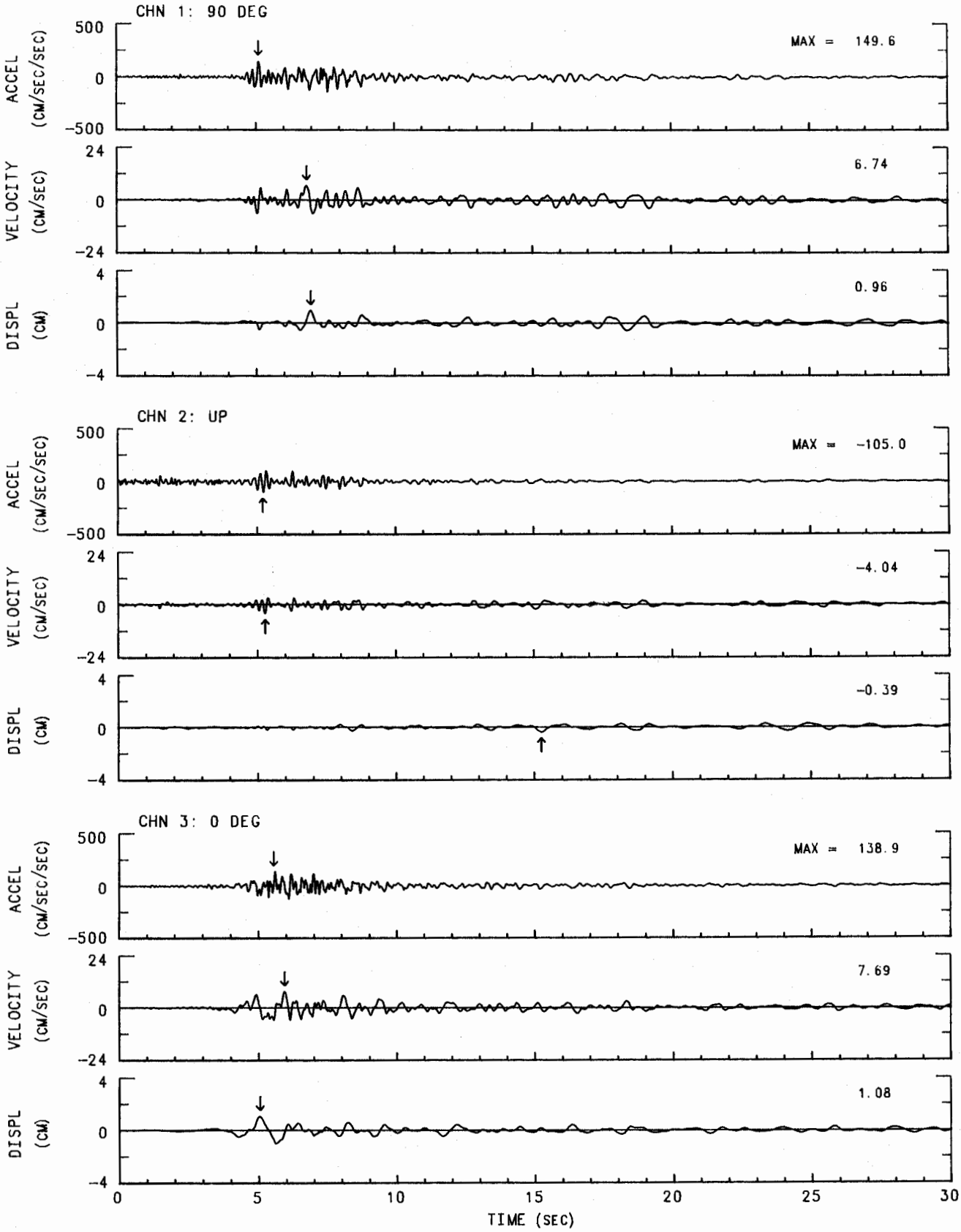


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LOS ANGELES - BALDWIN HILLS: CSMIP S/N 157

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24157-S1687-87276.01



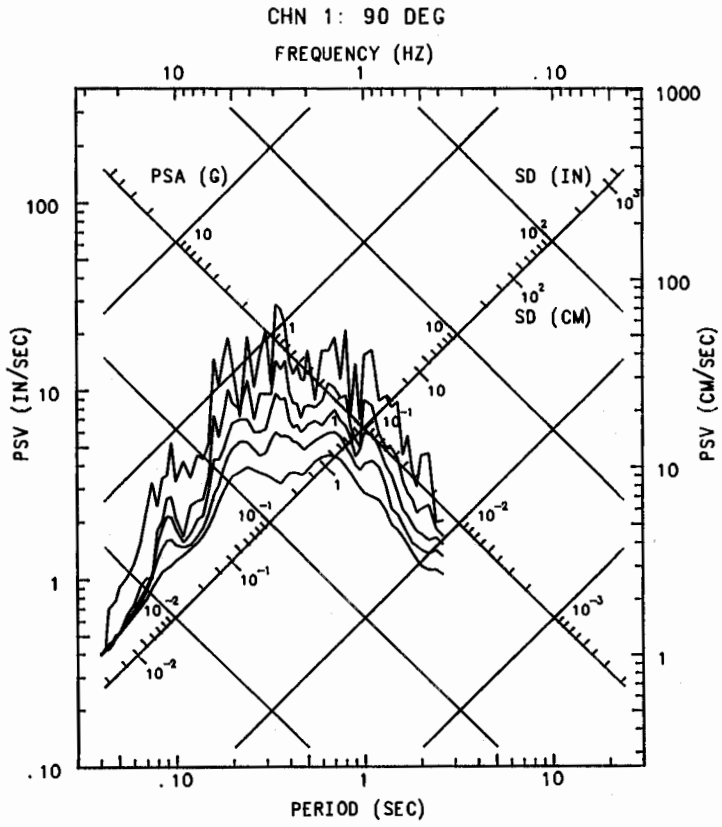
LOS ANGELES - BALDWIN HILLS: CSMIP S/N 157

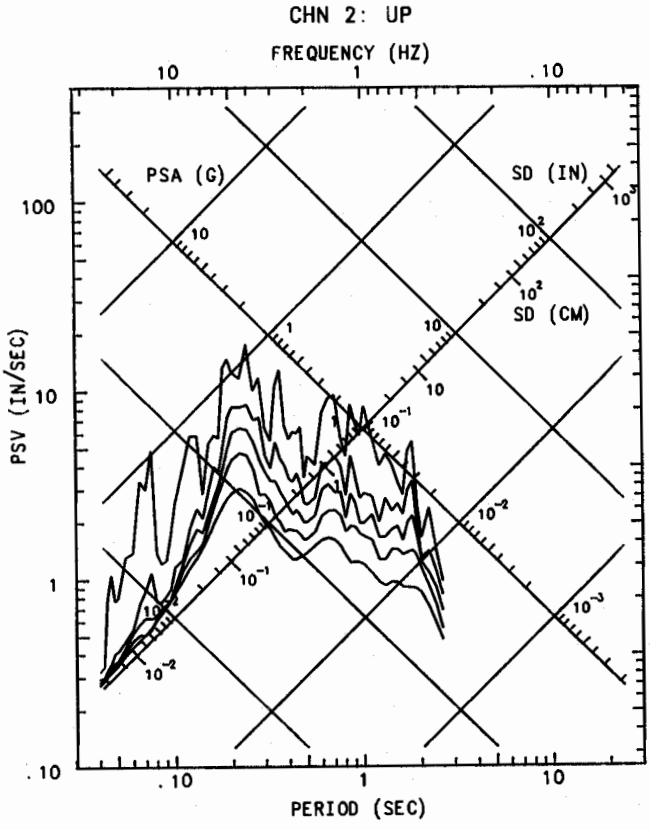
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

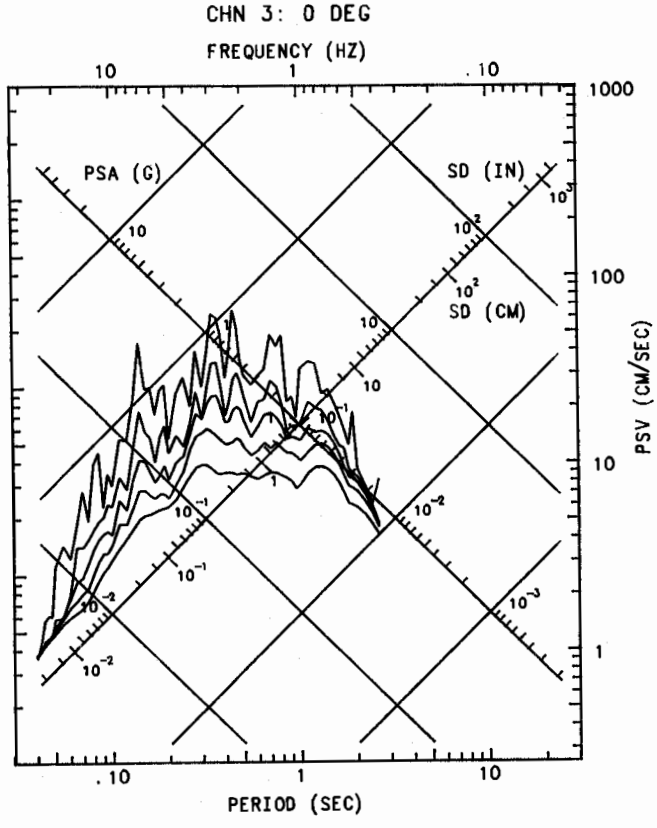
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

RECORD ID: 24157-S1687-87276.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

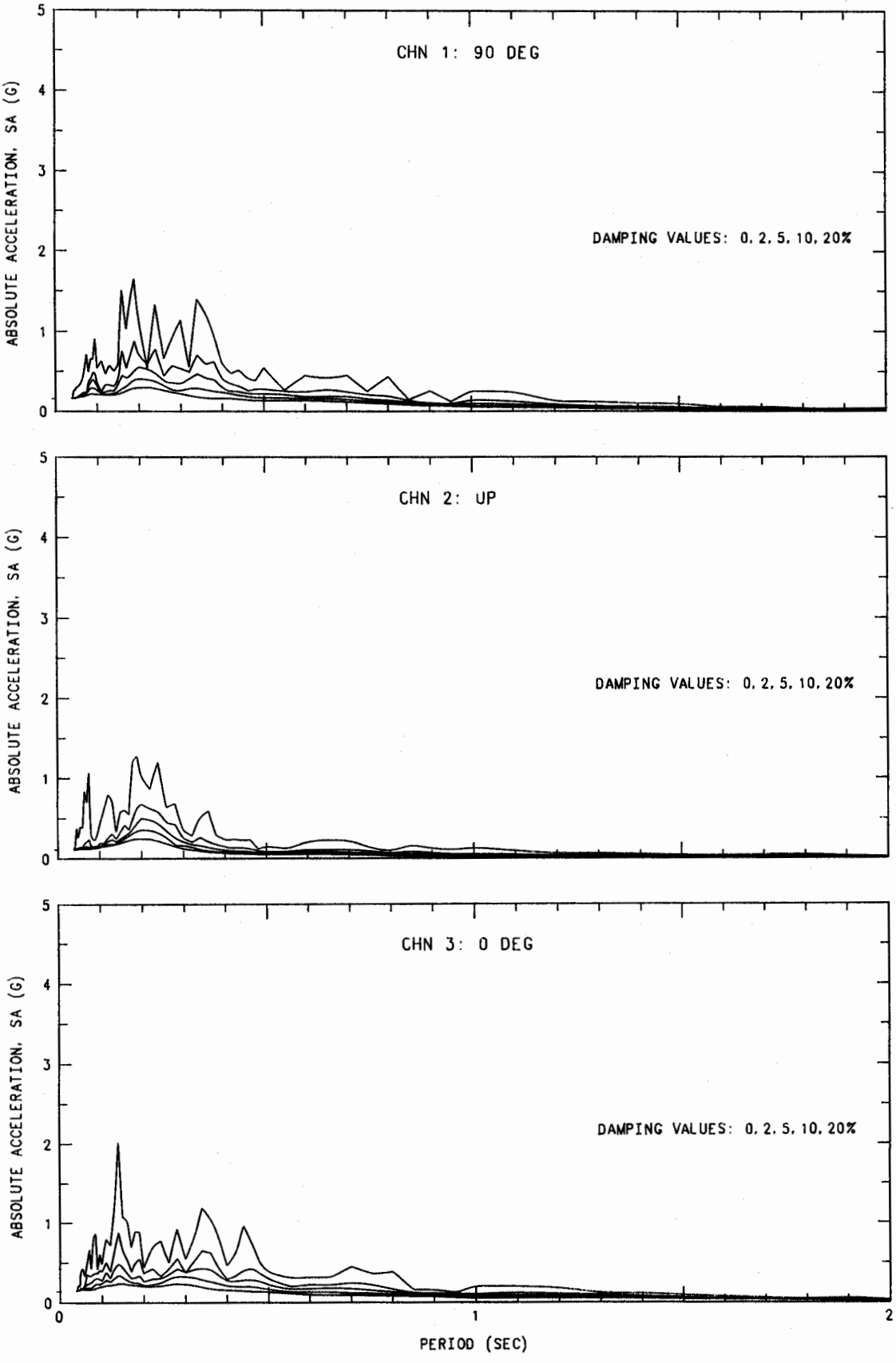






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LOS ANGELES - BALDWIN HILLS: CSMIP S/N 157

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24157-S1687-87276.01
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

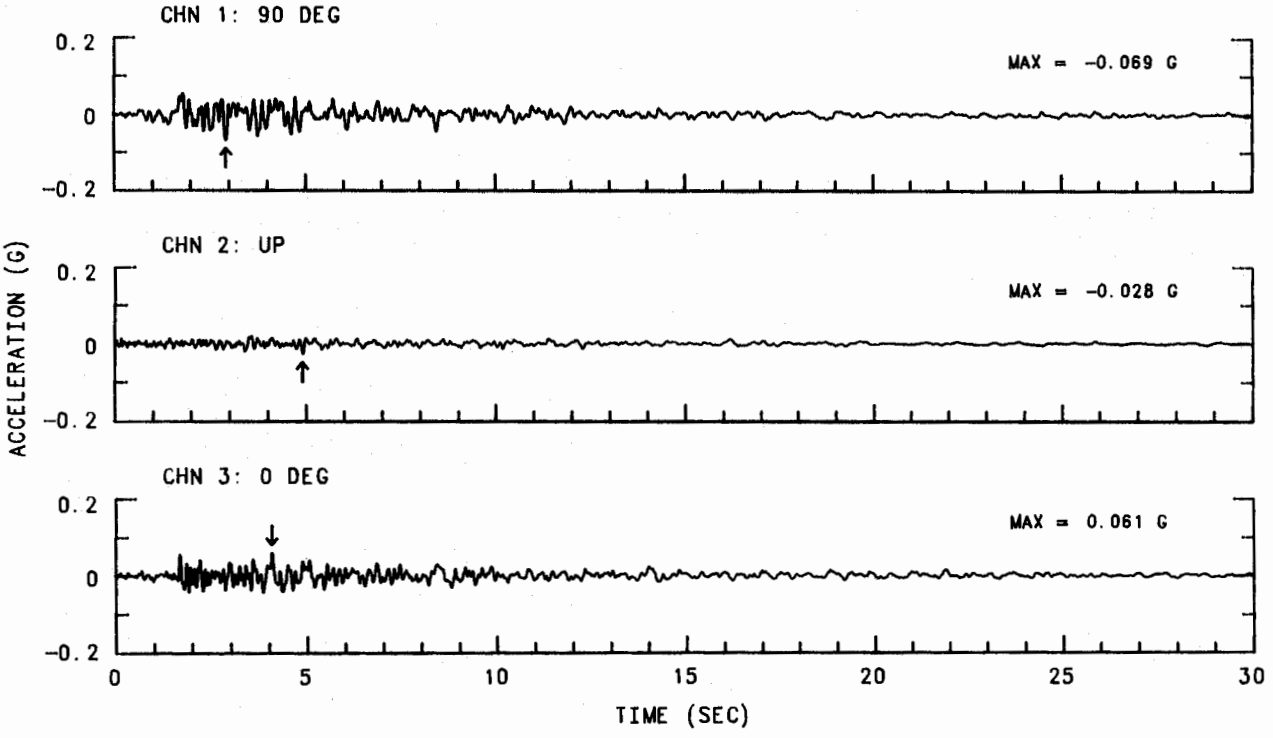


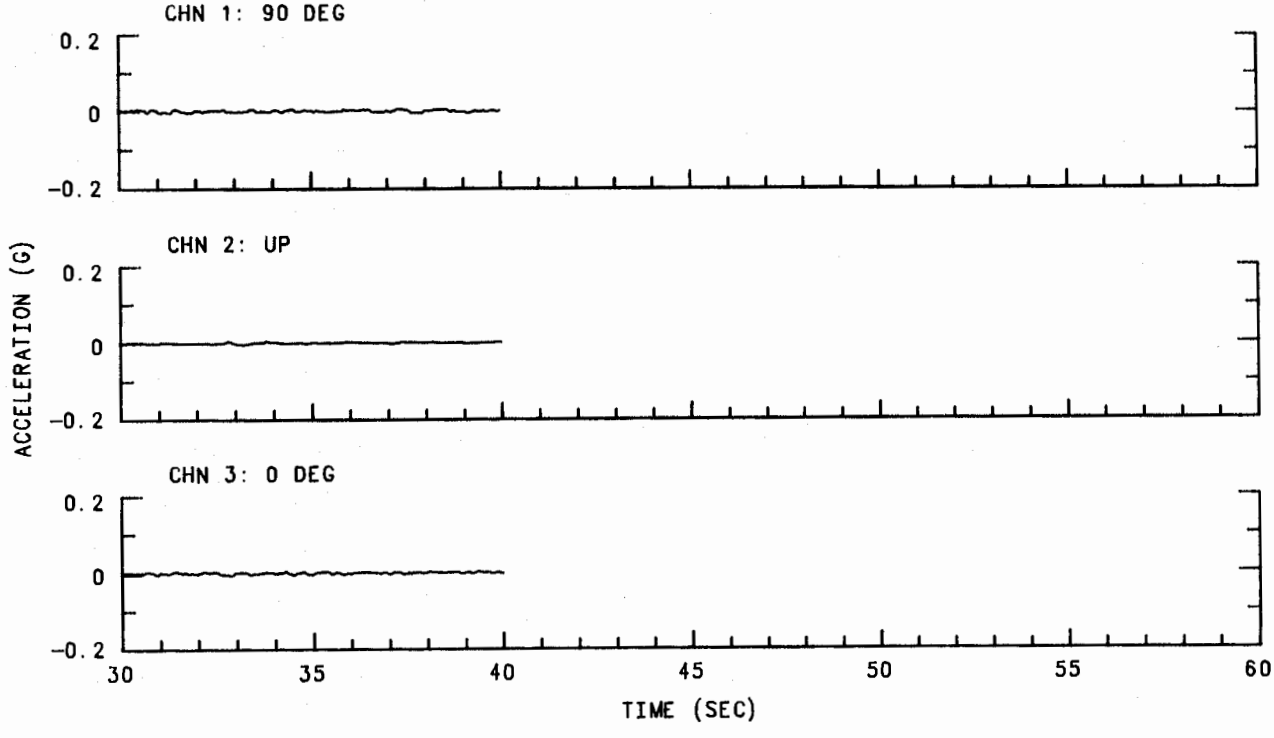
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CENTURY CITY - LA COUNTRY CLUB SOUTH: CSMIP S/N 390

PHASE 1 ACCELERATION

RECORD ID: 24390-S2772-87276.01



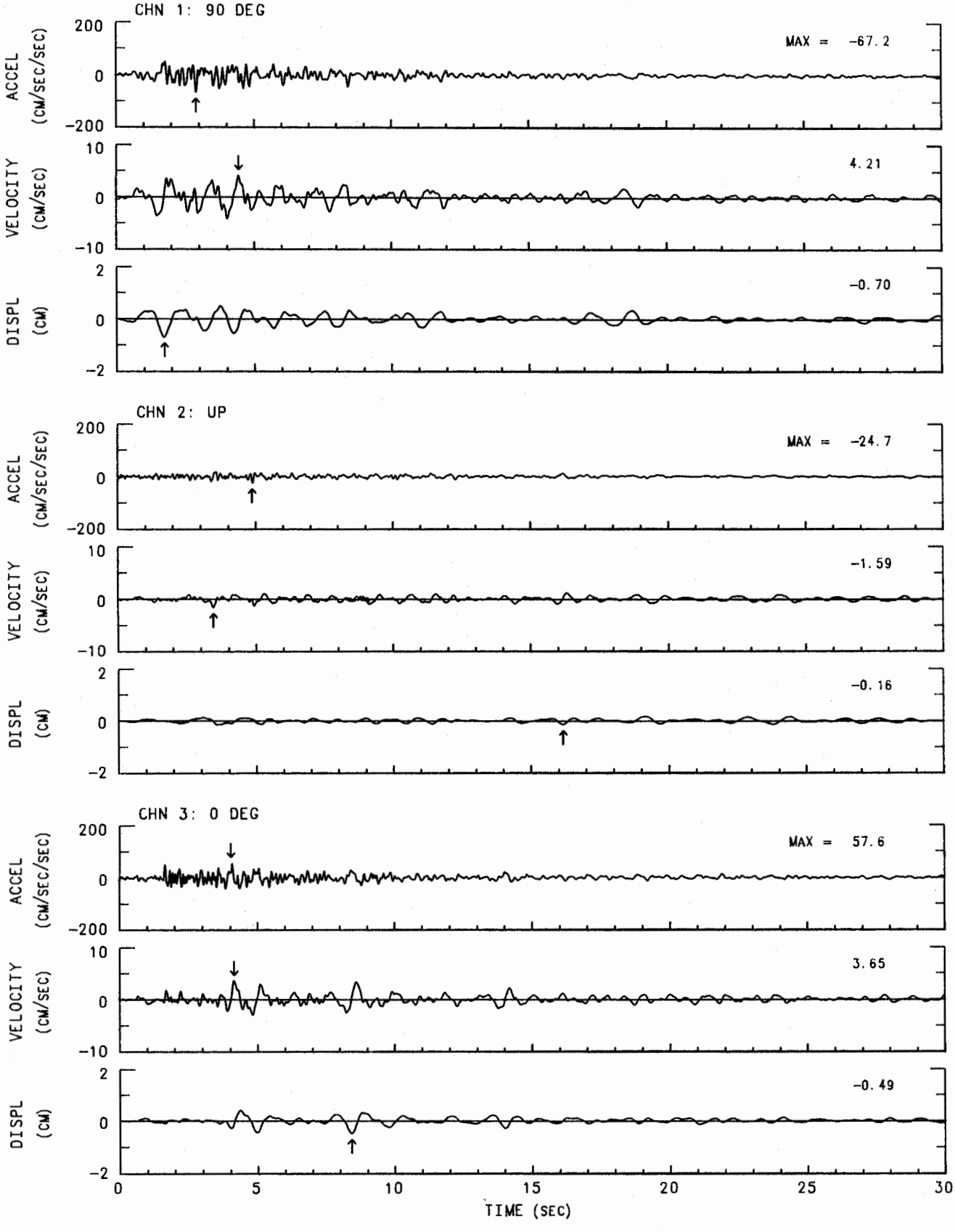


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CENTURY CITY - LA COUNTRY CLUB SOUTH: CSMIP S/N 390

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC) RECORD ID: 24390-S2772-87276.01



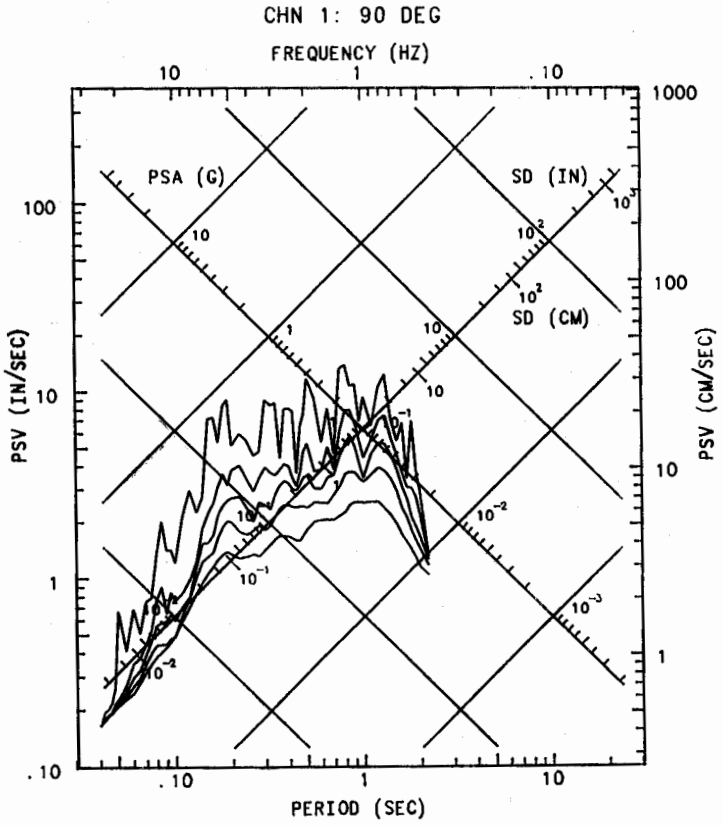
CENTURY CITY - LA COUNTRY CLUB SOUTH: CSMIP S/N 390

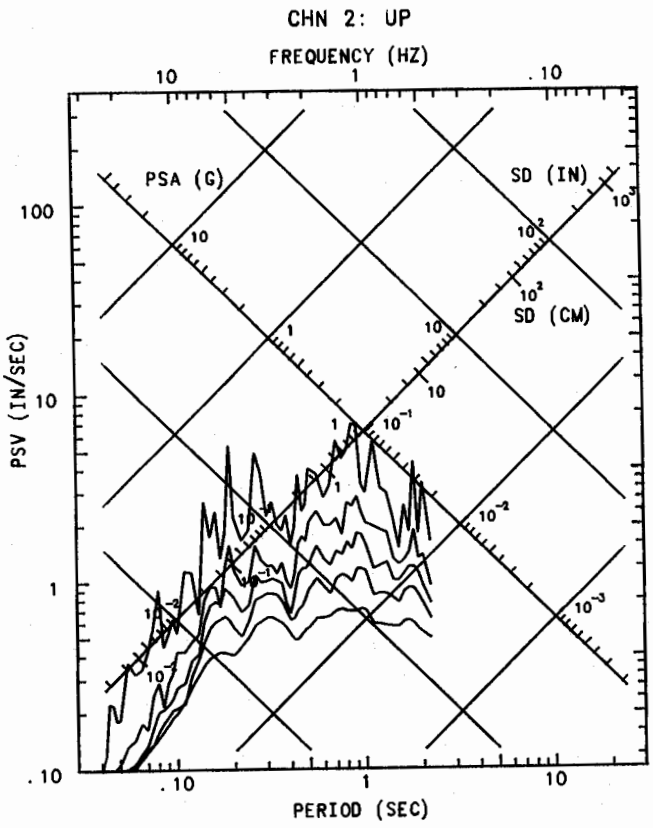
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

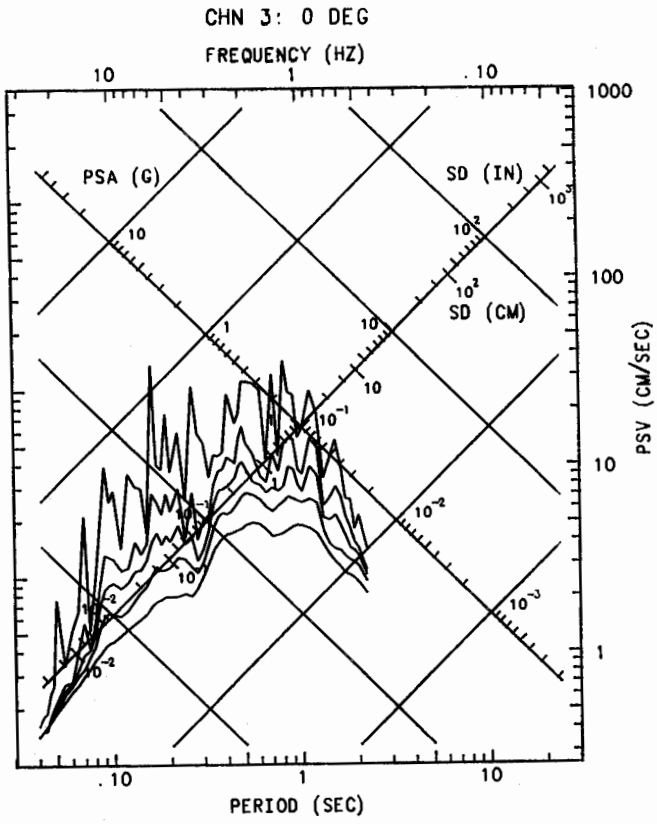
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ
(0.04 TO 1.96 SEC)

RECORD ID: 24390-S2772-87276.01

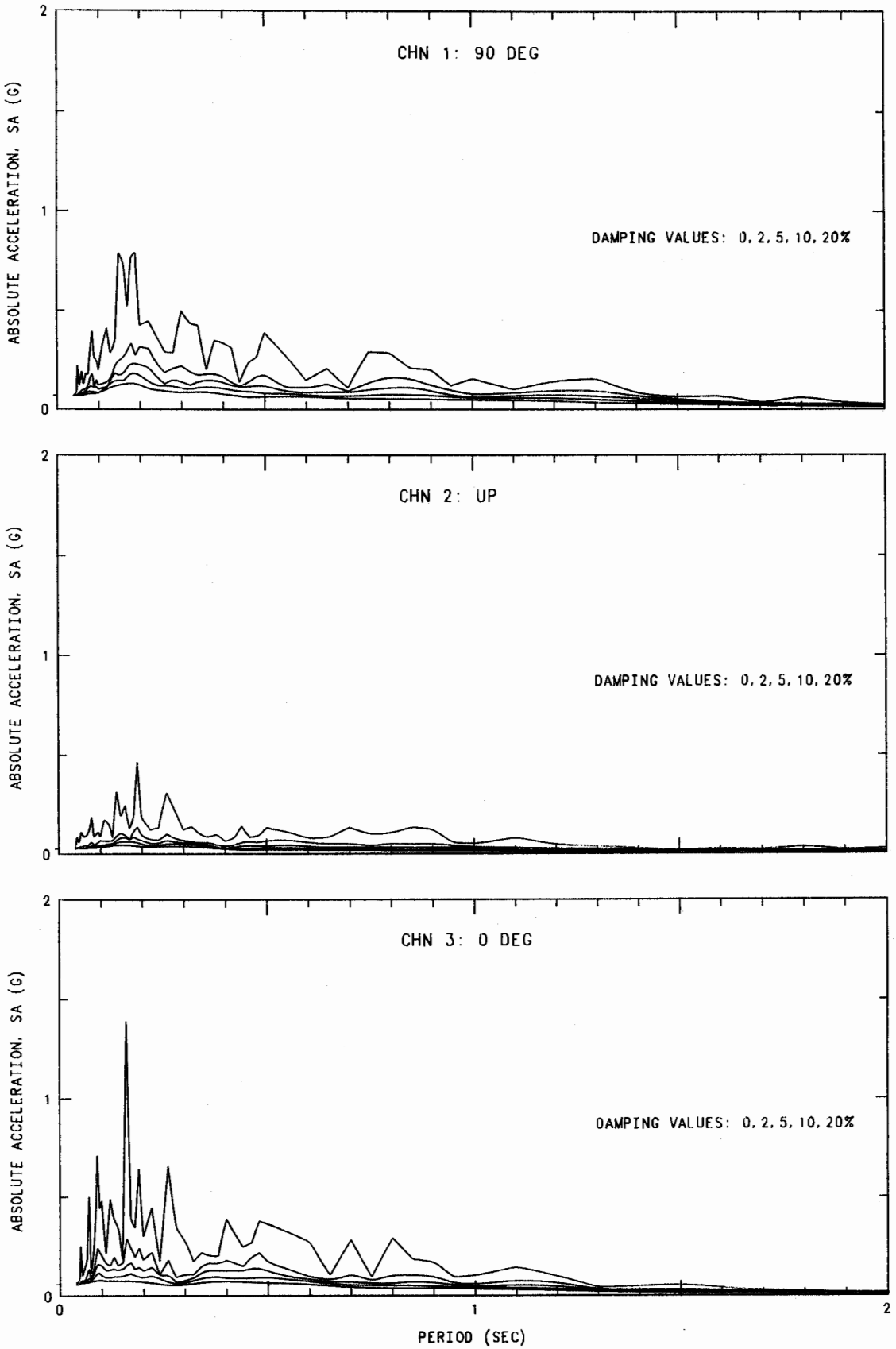
—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%







WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
CENTURY CITY - LA COUNTRY CLUB SOUTH: CSMIP S/N 390
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24390-S2772-87276.01
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC)

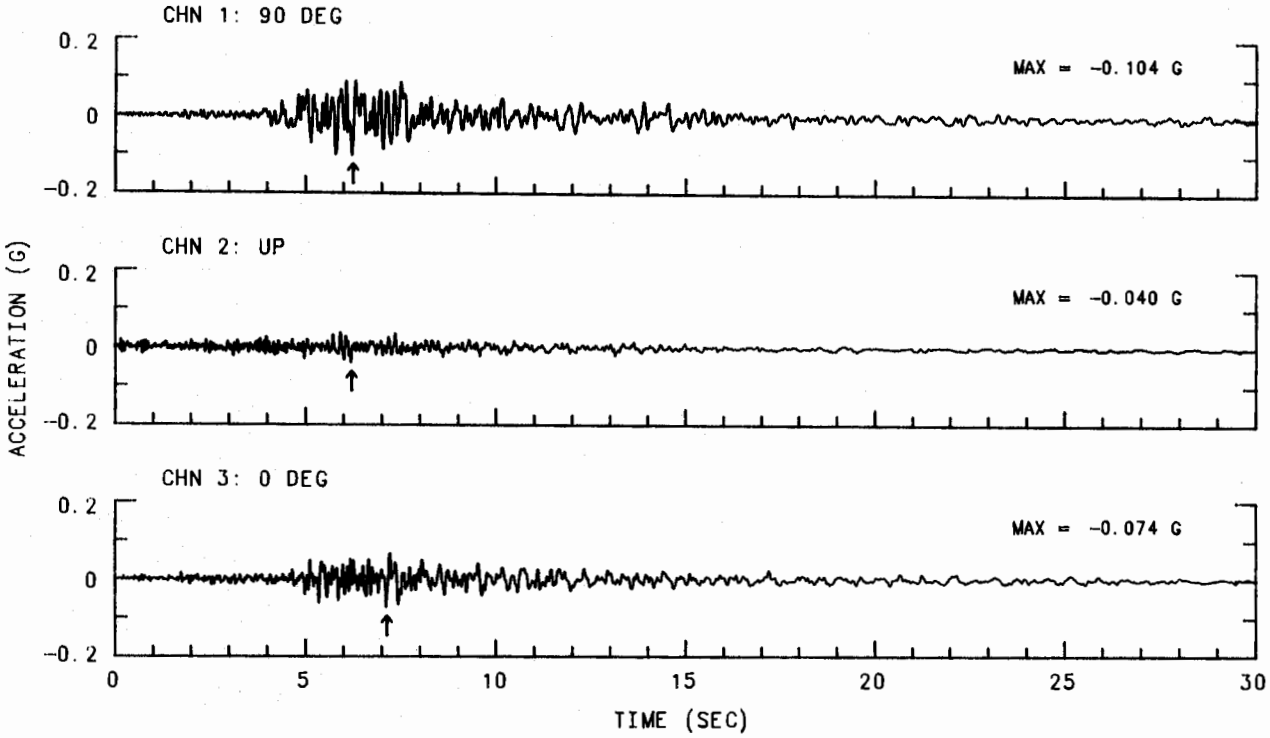


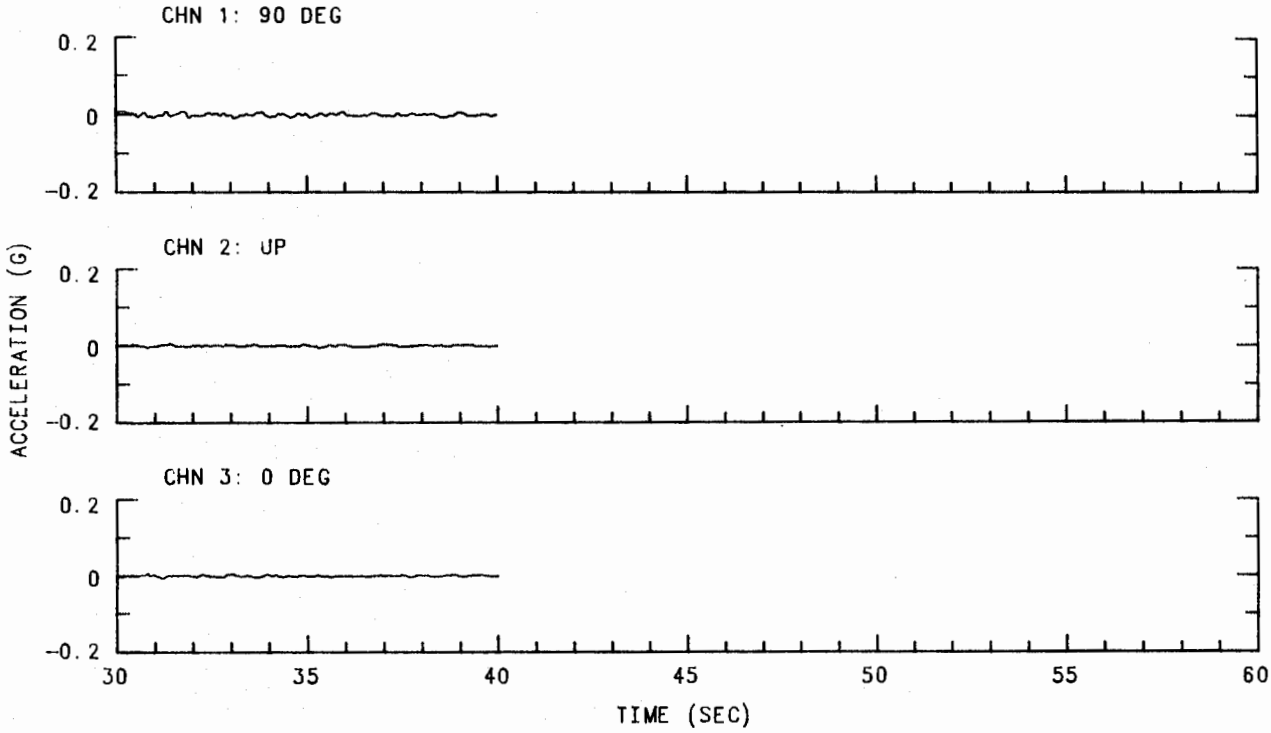
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CENTURY CITY - LA COUNTRY CLUB NORTH: CSMIP S/N 389

PHASE 1 ACCELERATION

RECORD ID: 24389-S2775-87276.01



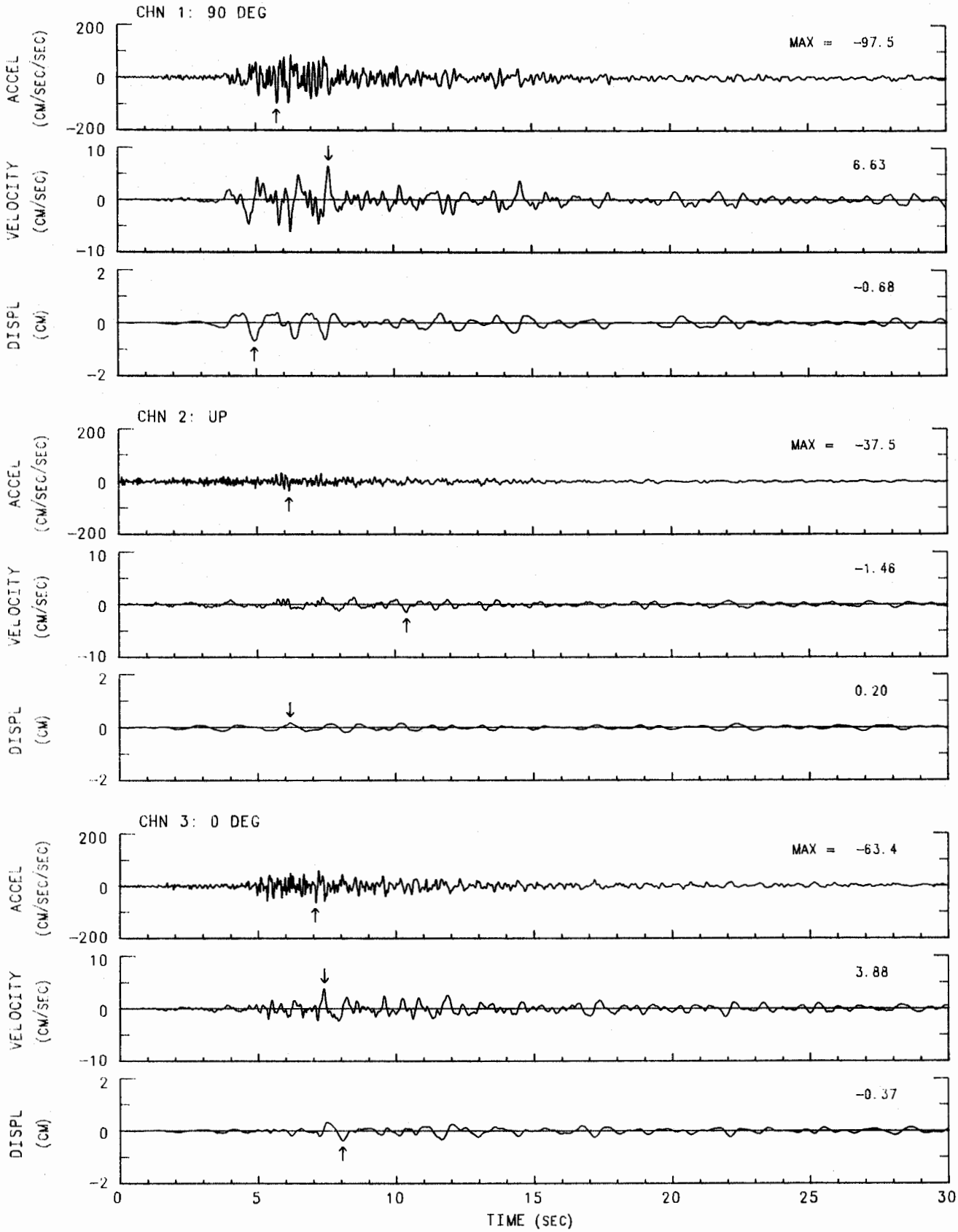


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CENTURY CITY - LA COUNTRY CLUB NORTH: CSMIP S/N 389

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC) RECORD ID: 24389-S2775-B7276.01



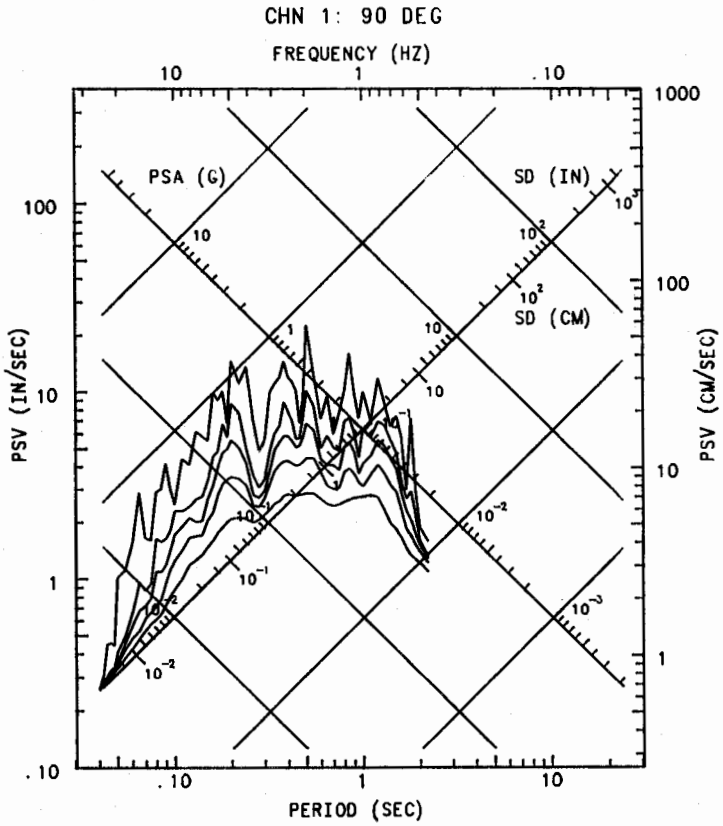
CENTURY CITY - LA COUNTRY CLUB NORTH: CSMIP S/N 389

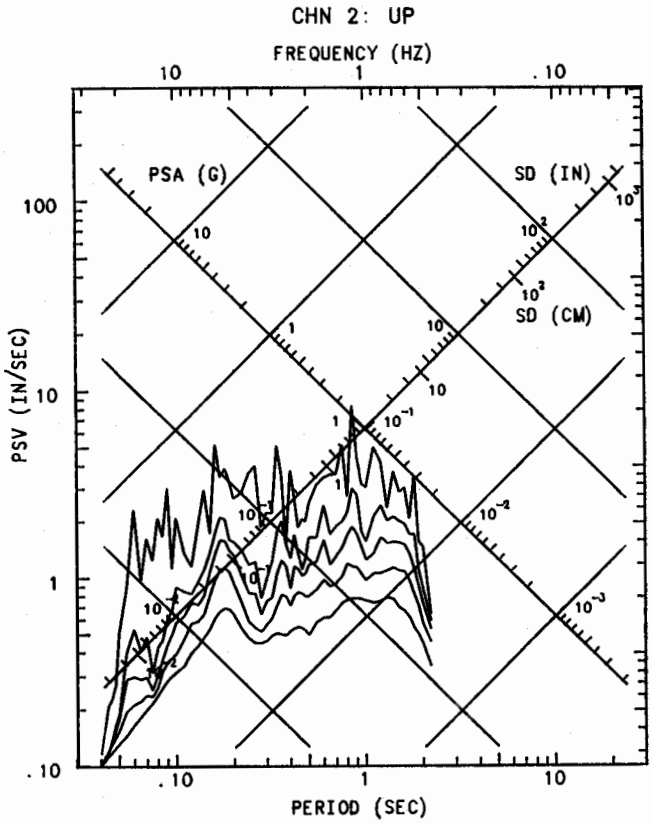
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

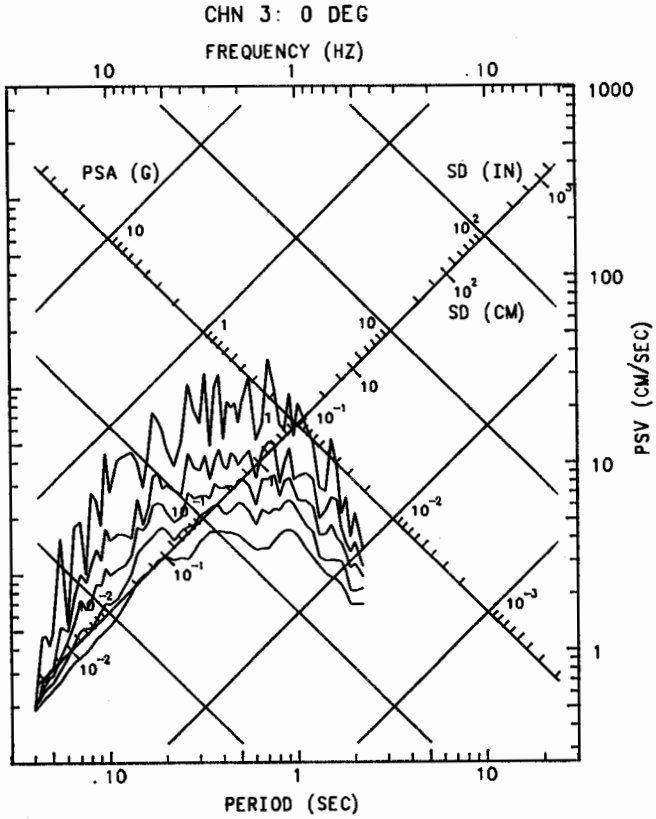
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ
(0.04 TO 1.96 SEC)

RECORD ID: 24389-S2775-87276.01

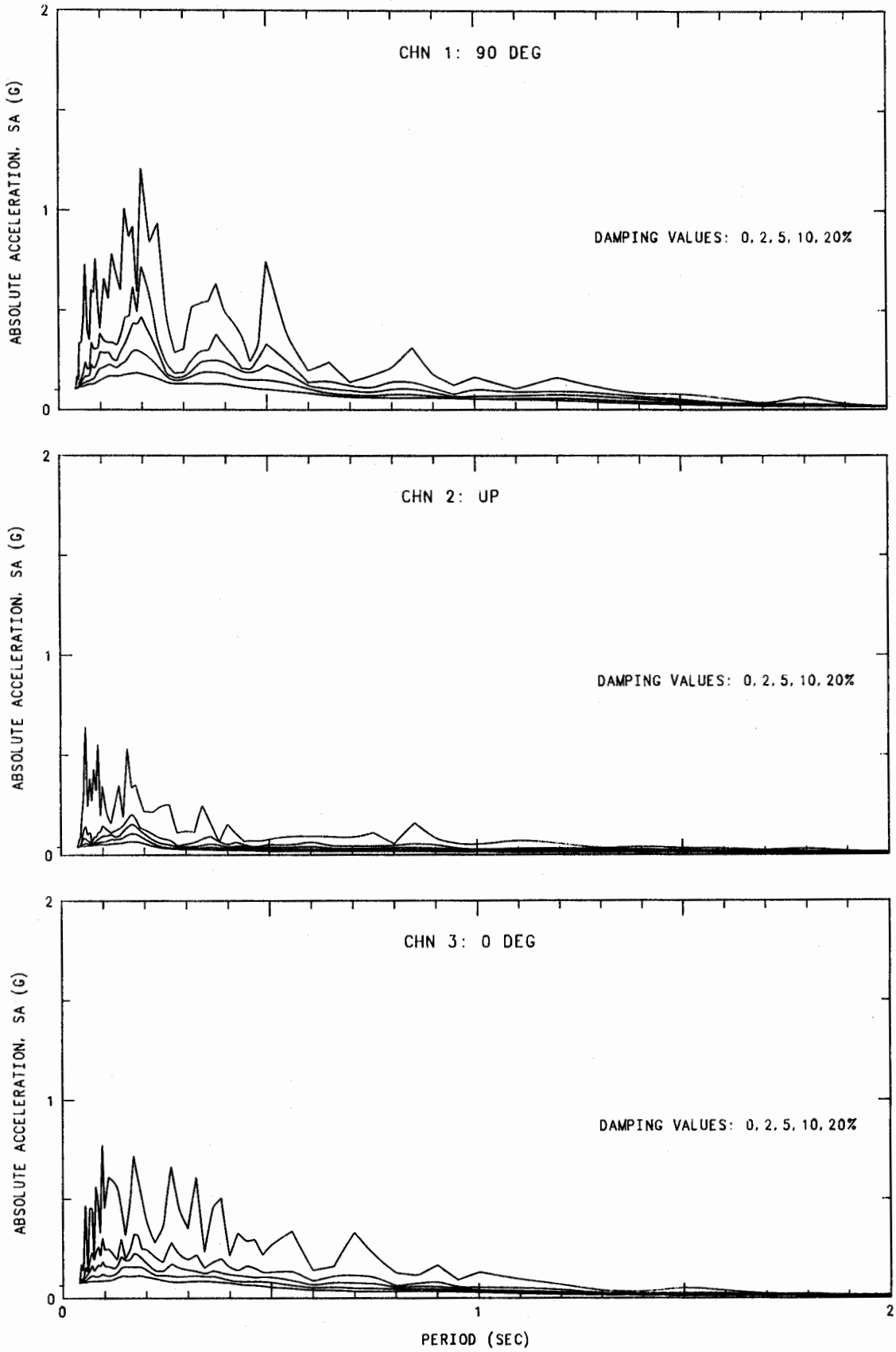
—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%







WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
CENTURY CITY - LA COUNTRY CLUB NORTH: CSMIP S/N 389
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24389-S2775-87276.01
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC)

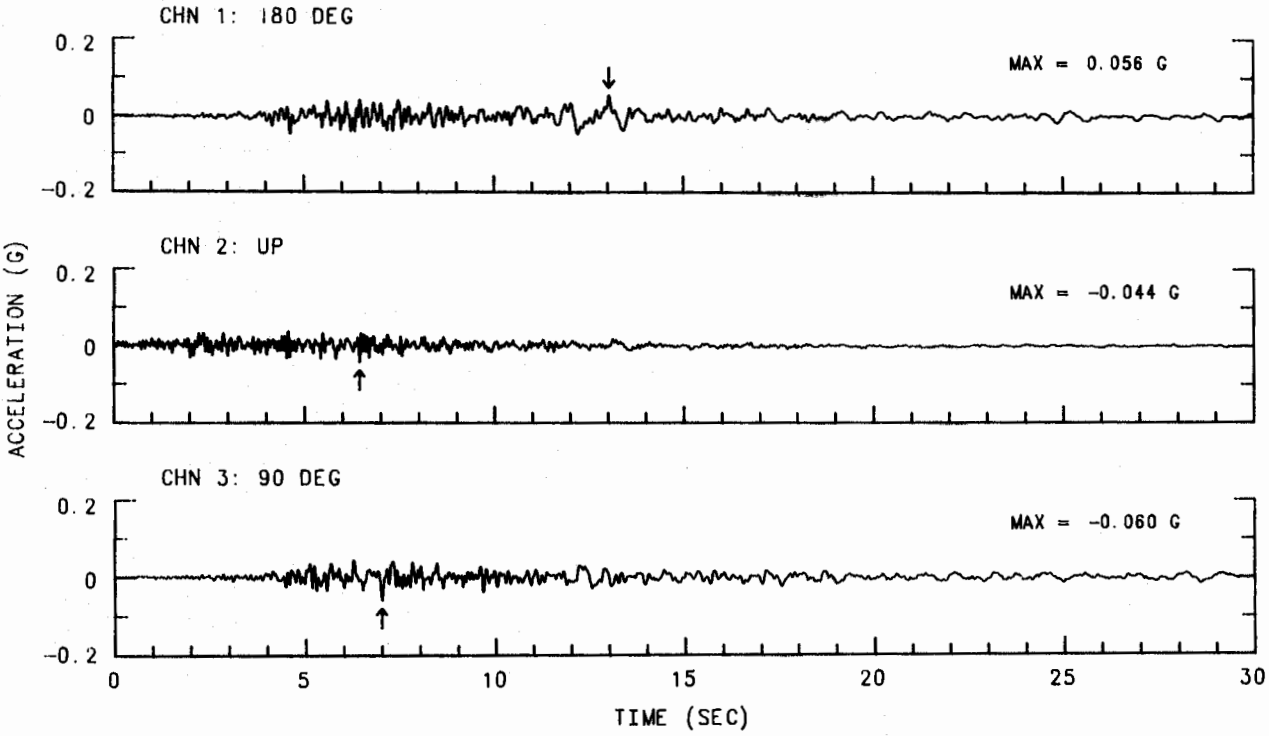


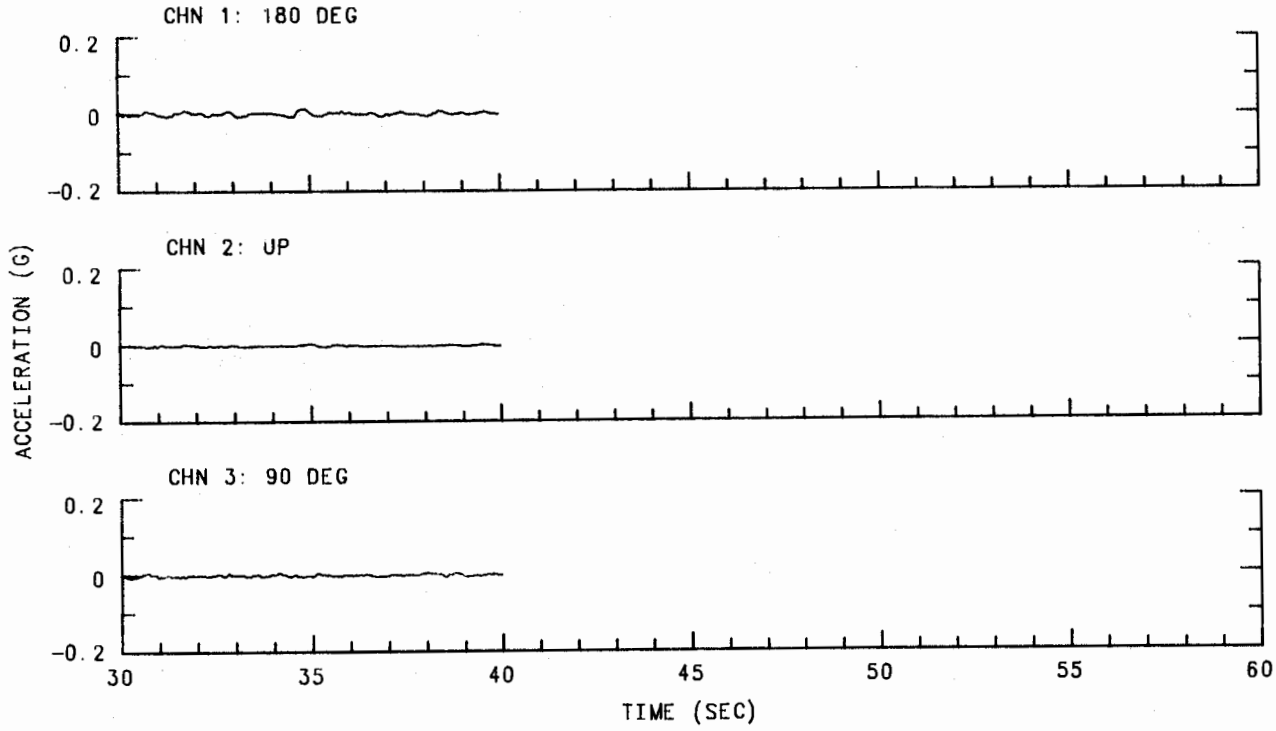
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LONG BEACH - RECREATION PARK: CSMIP S/N 241

PHASE 1 ACCELERATION

RECORD ID: 14241-S2613-87275.01

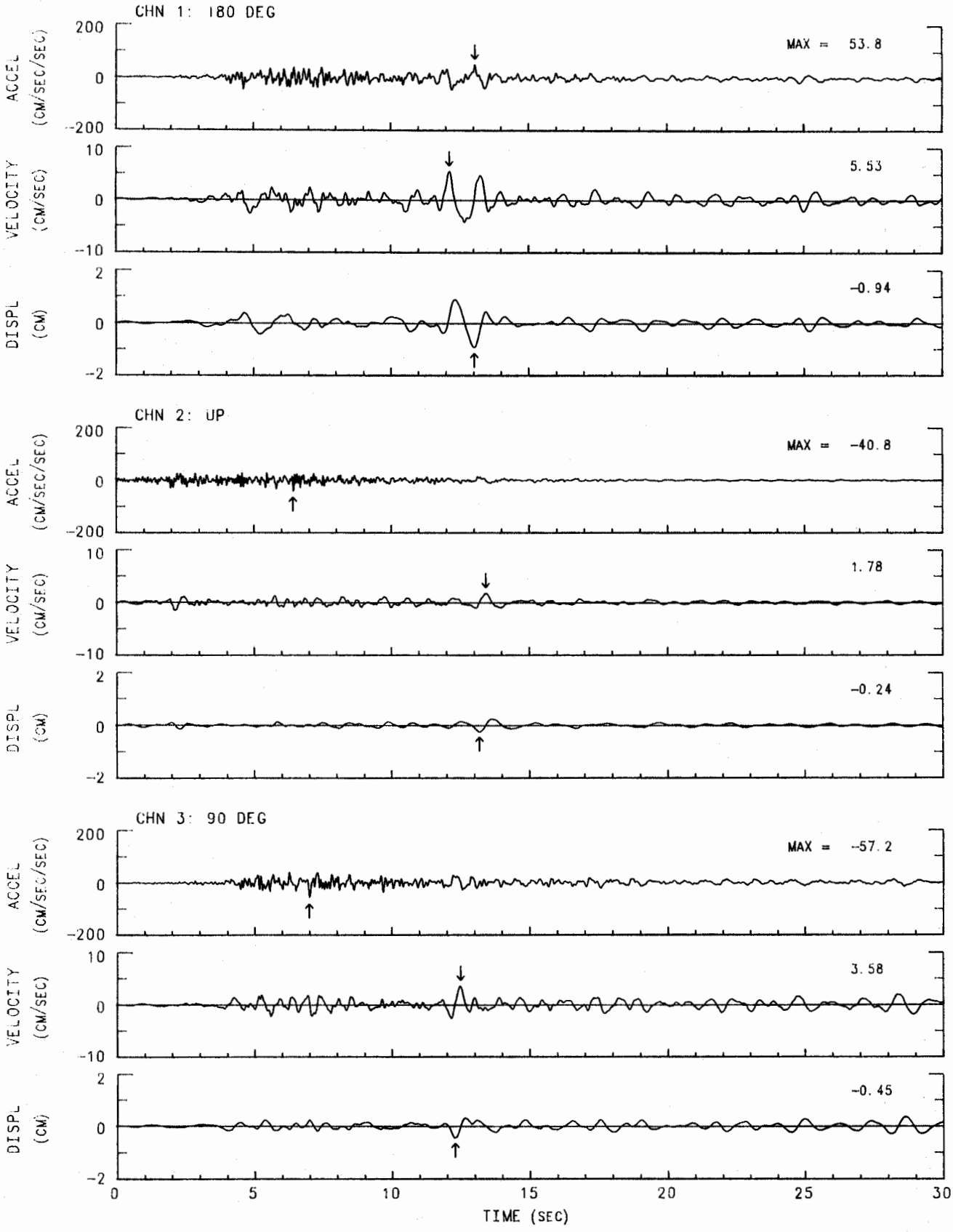




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LONG BEACH - RECREATION PARK: CSMIP S/N 241

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 14241-S2613-87275.01



LONG BEACH - RECREATION PARK: CSMIP S/N 241

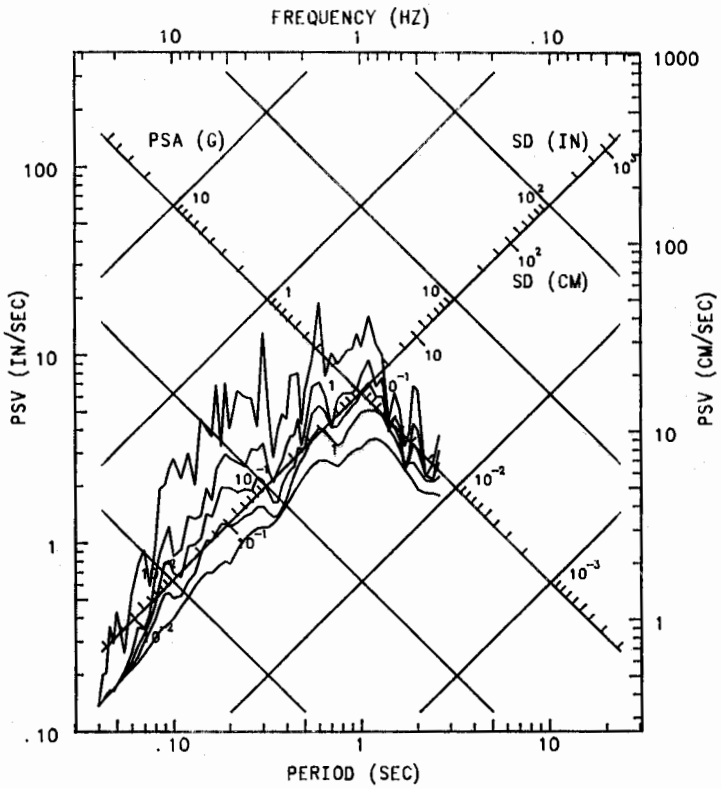
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

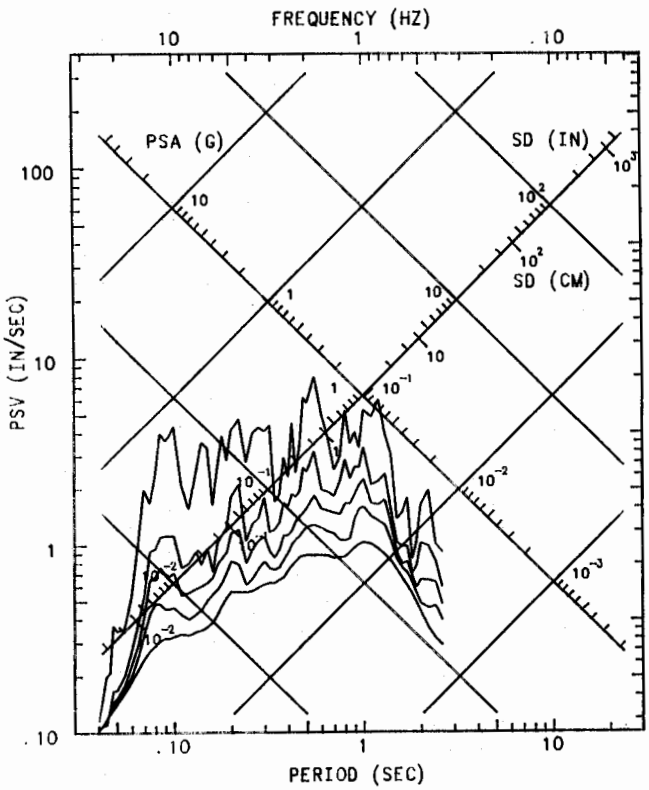
RECORD ID: 14241-S2613-87275.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

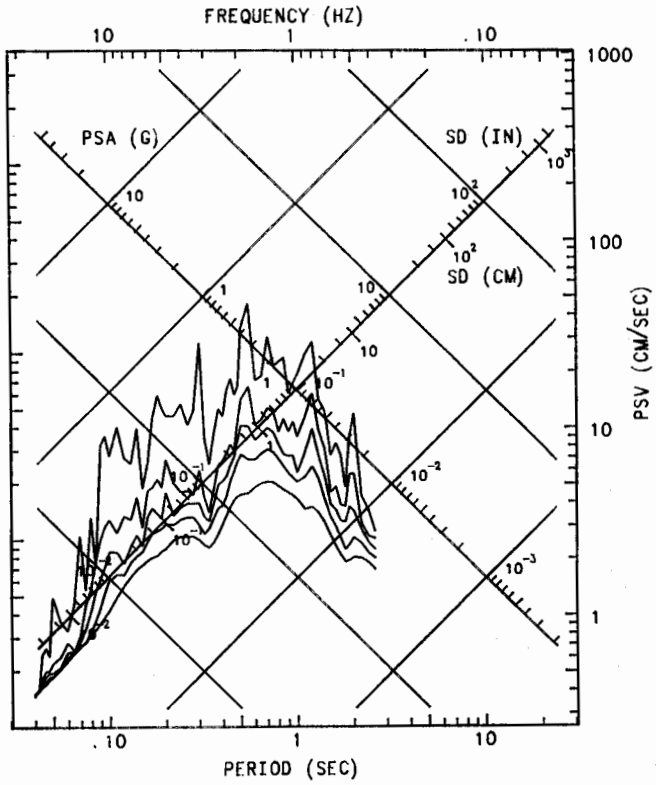
CHN 1: 180 DEG



CHN 2: UP

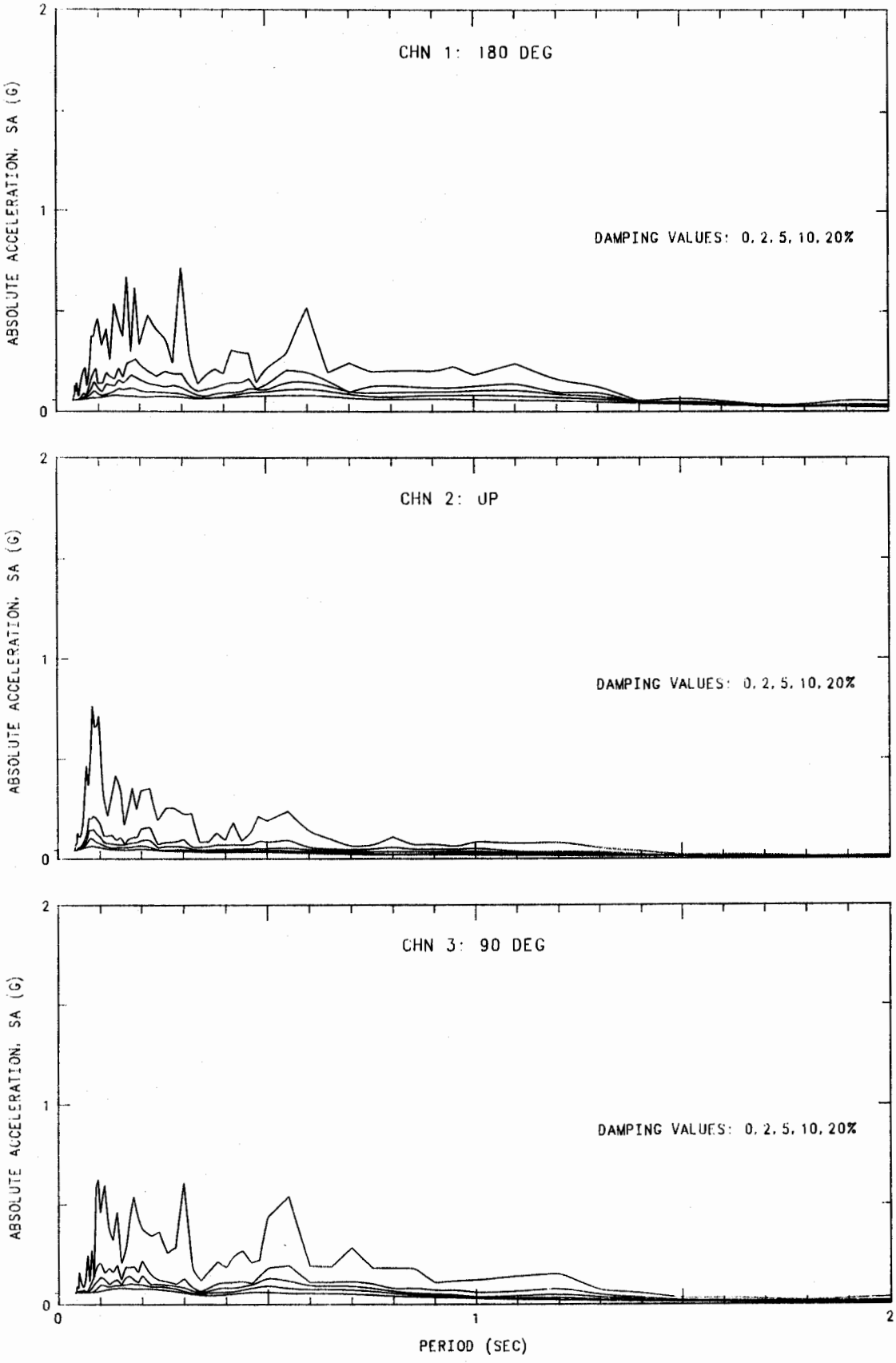


CHN 3: 90 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LONG BEACH - RECREATION PARK: CSMIP S/N 241

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 14241-S2613-87275.01
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

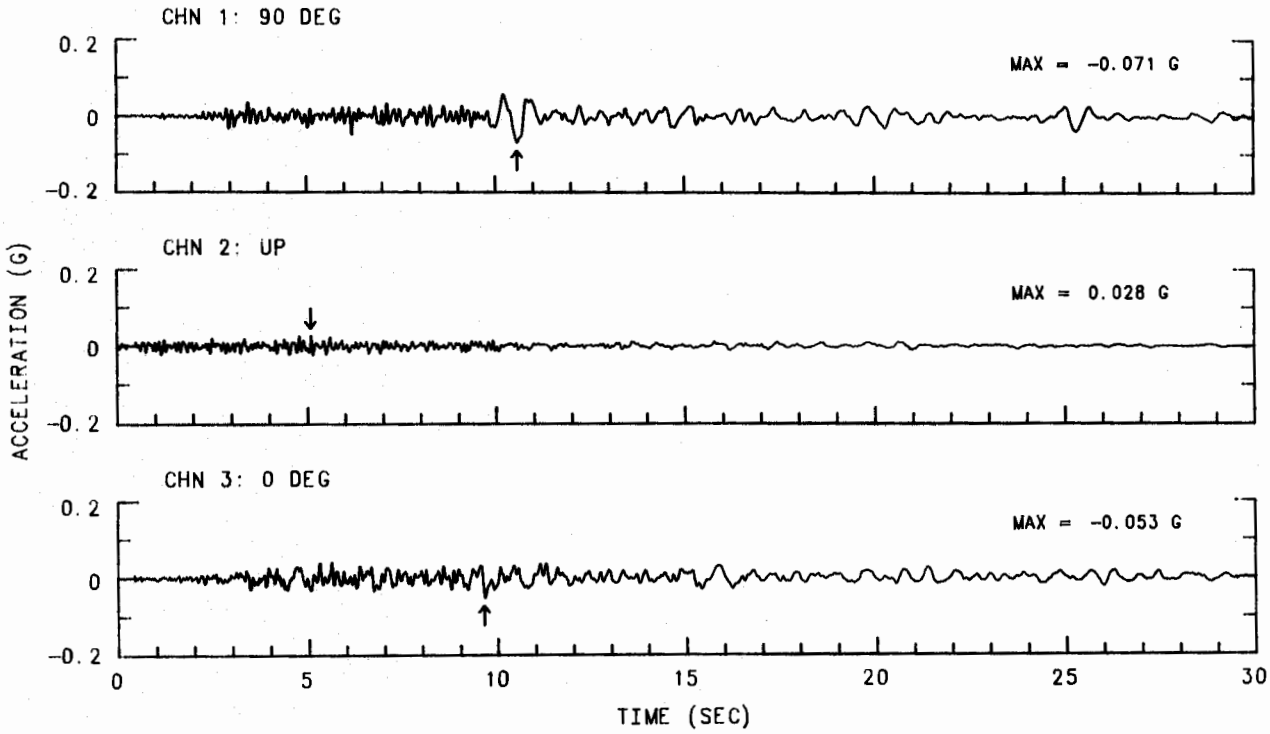


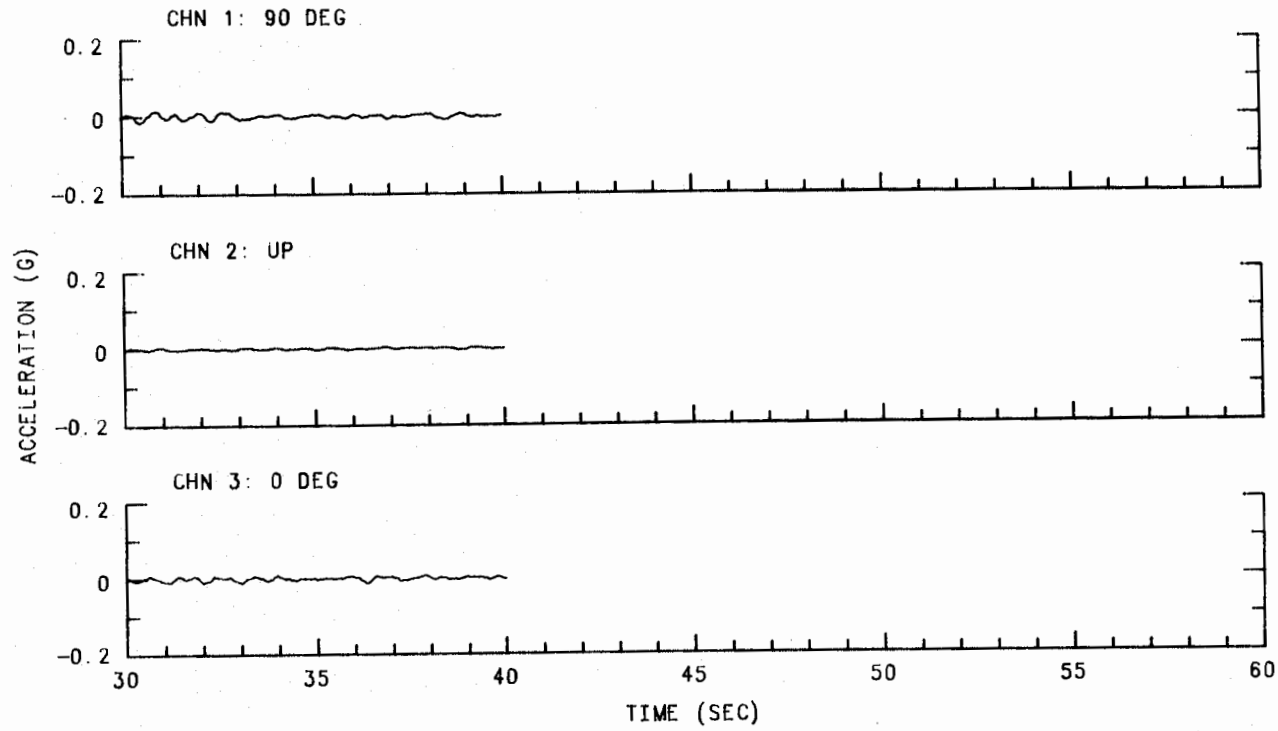
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LONG BEACH - HARBOR ADMIN. BLDG. FF: CSMIP S/N 395

PHASE 1 ACCELERATION

RECORD ID: 14395-S4377-87275.01



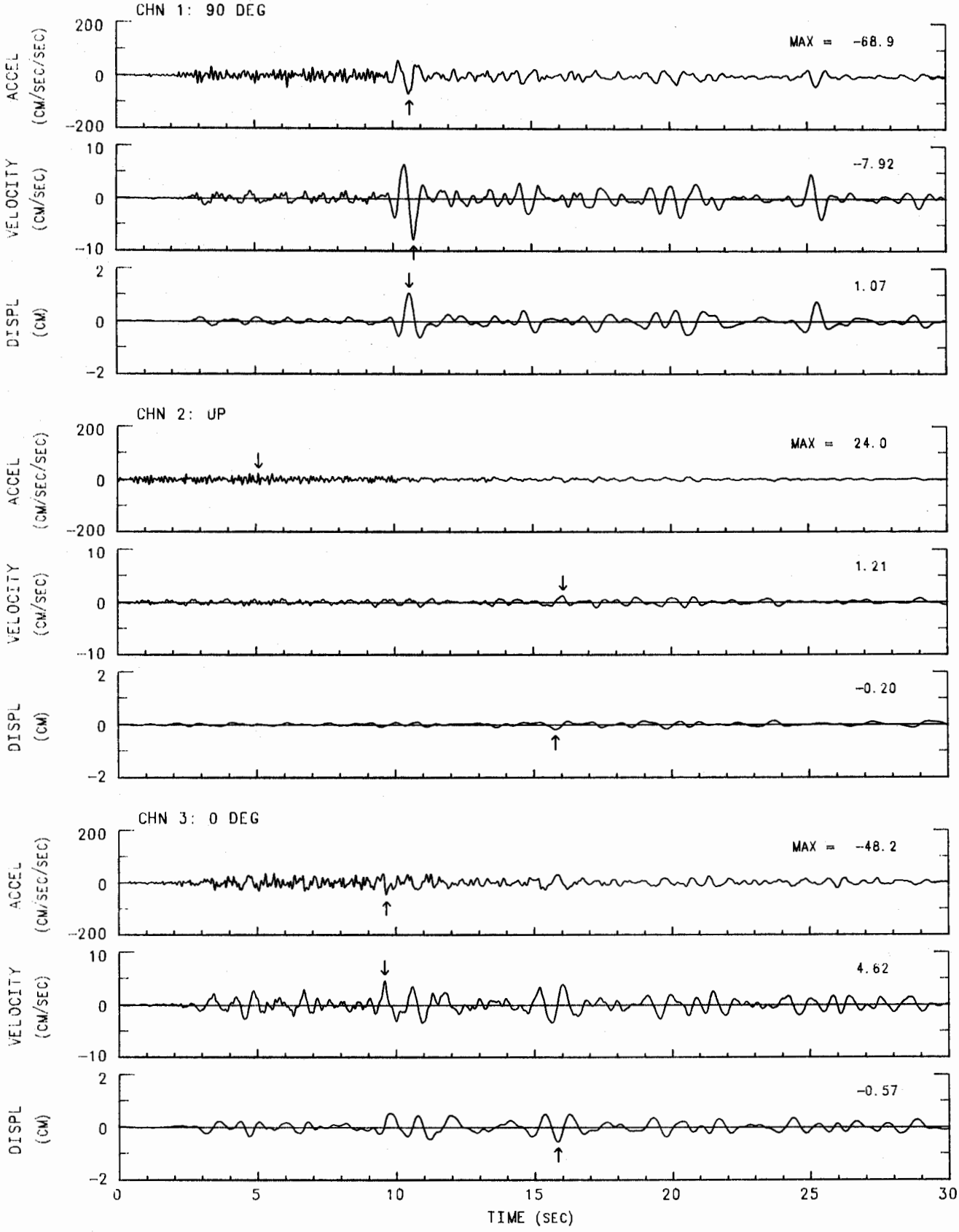


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LONG BEACH - HARBOR ADMIN. BLDG. FF: CSMIP S/N 395

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 14395-S4377-87275.01



LONG BEACH - HARBOR ADMIN. BLDG. FF: CSMIP S/N 395

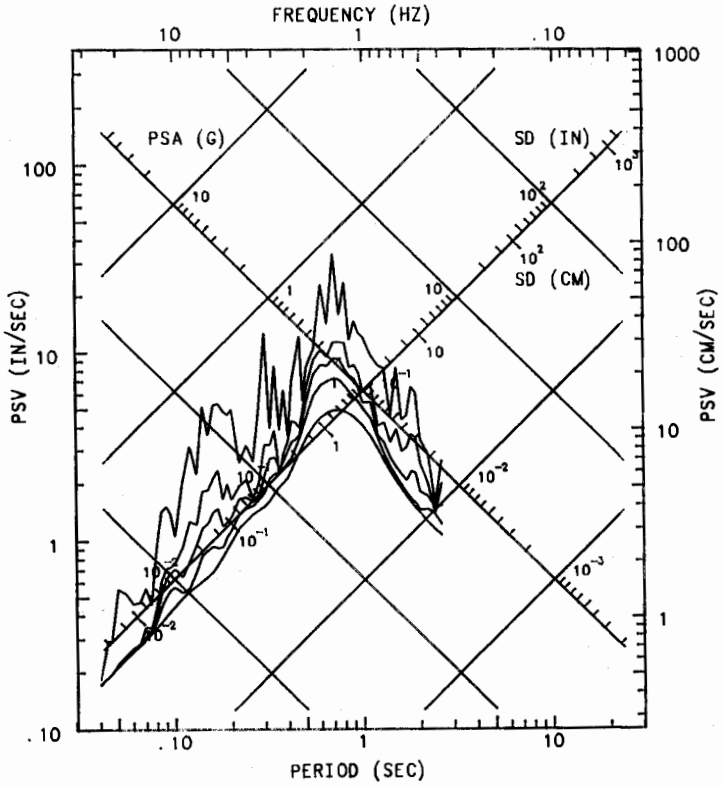
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

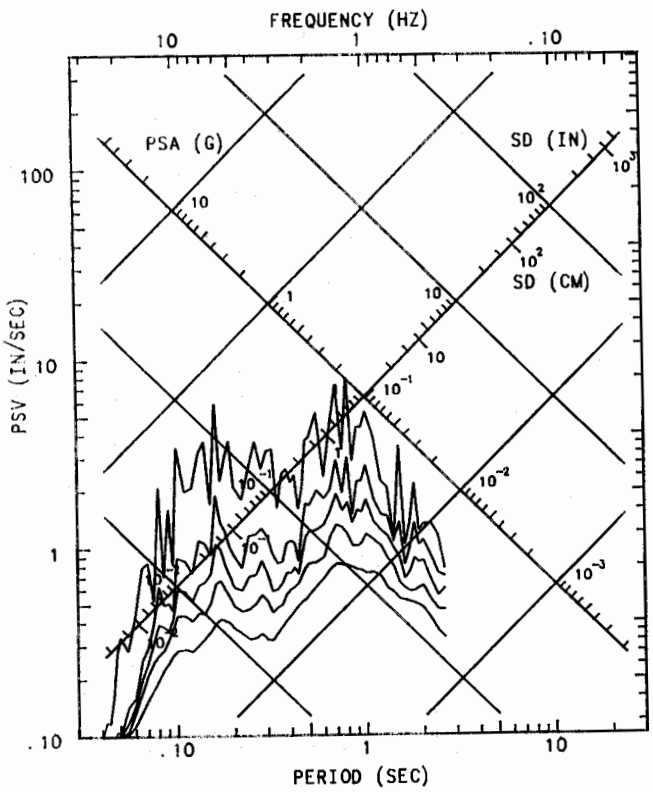
RECORD ID: 14395-S4377-87275.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

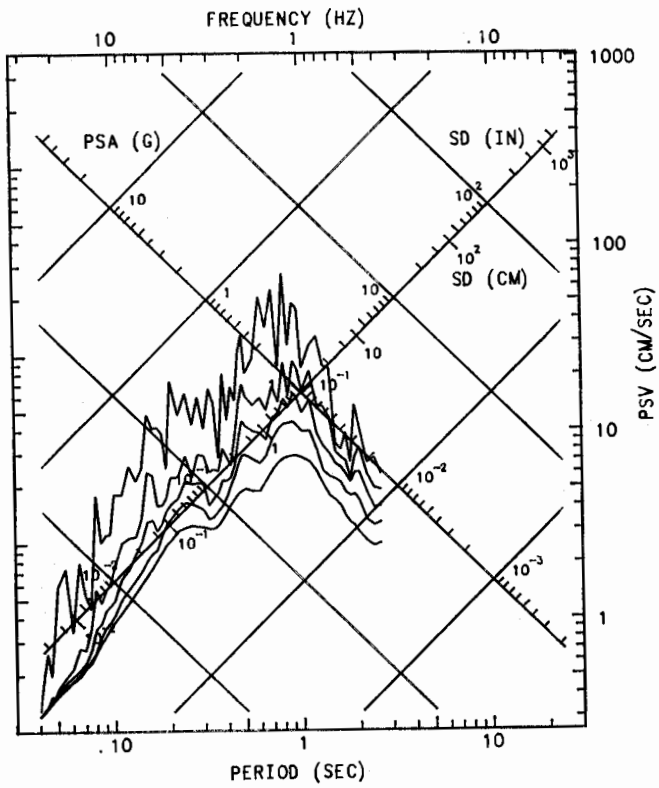
CHN 1: 90 DEG



CHN 2: UP

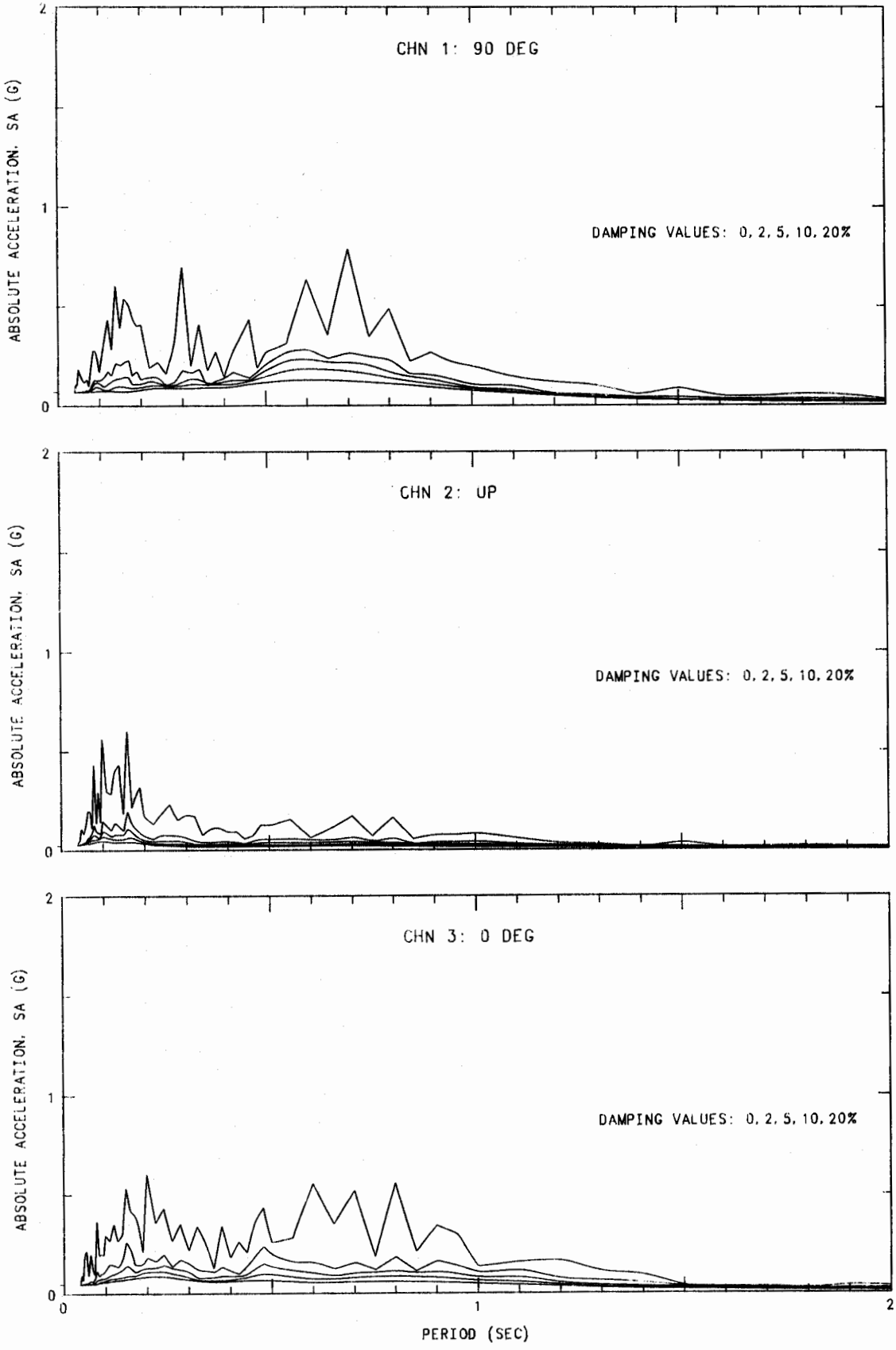


CHN 3: 0 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LONG BEACH - HARBOR ADMIN. BLDG. FF: CSMIP S/N 395

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 14395-S4377-87275.01
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

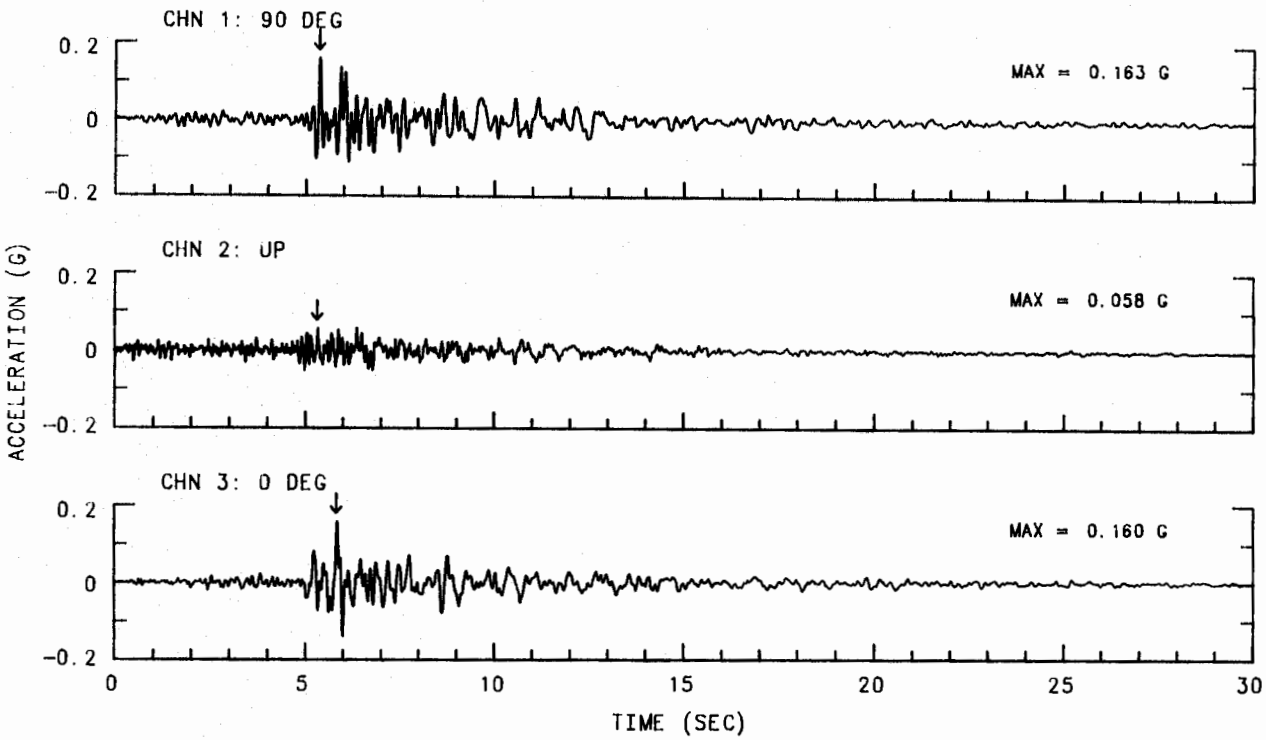


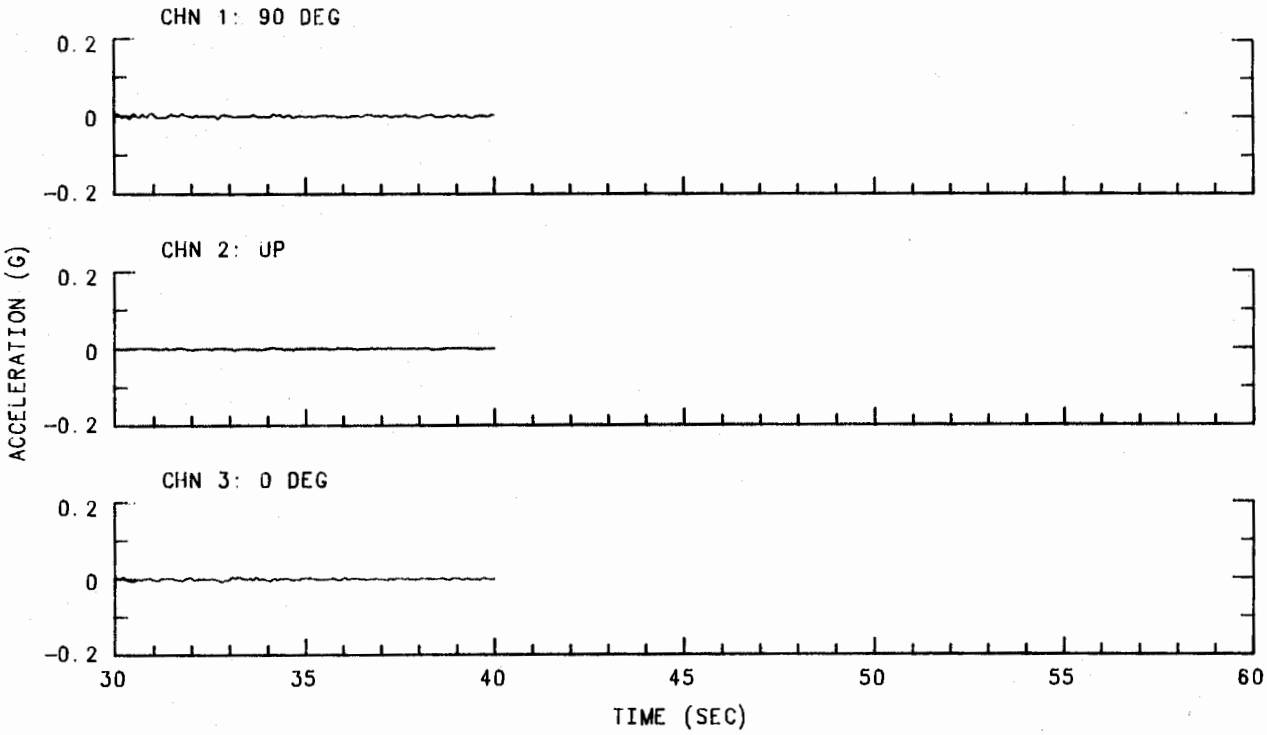
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

PACOIMA - KAGEL CANYON: CSMIP S/N 088

PHASE 1 ACCELERATION

RECORD ID: 24088-S1618-87276.01



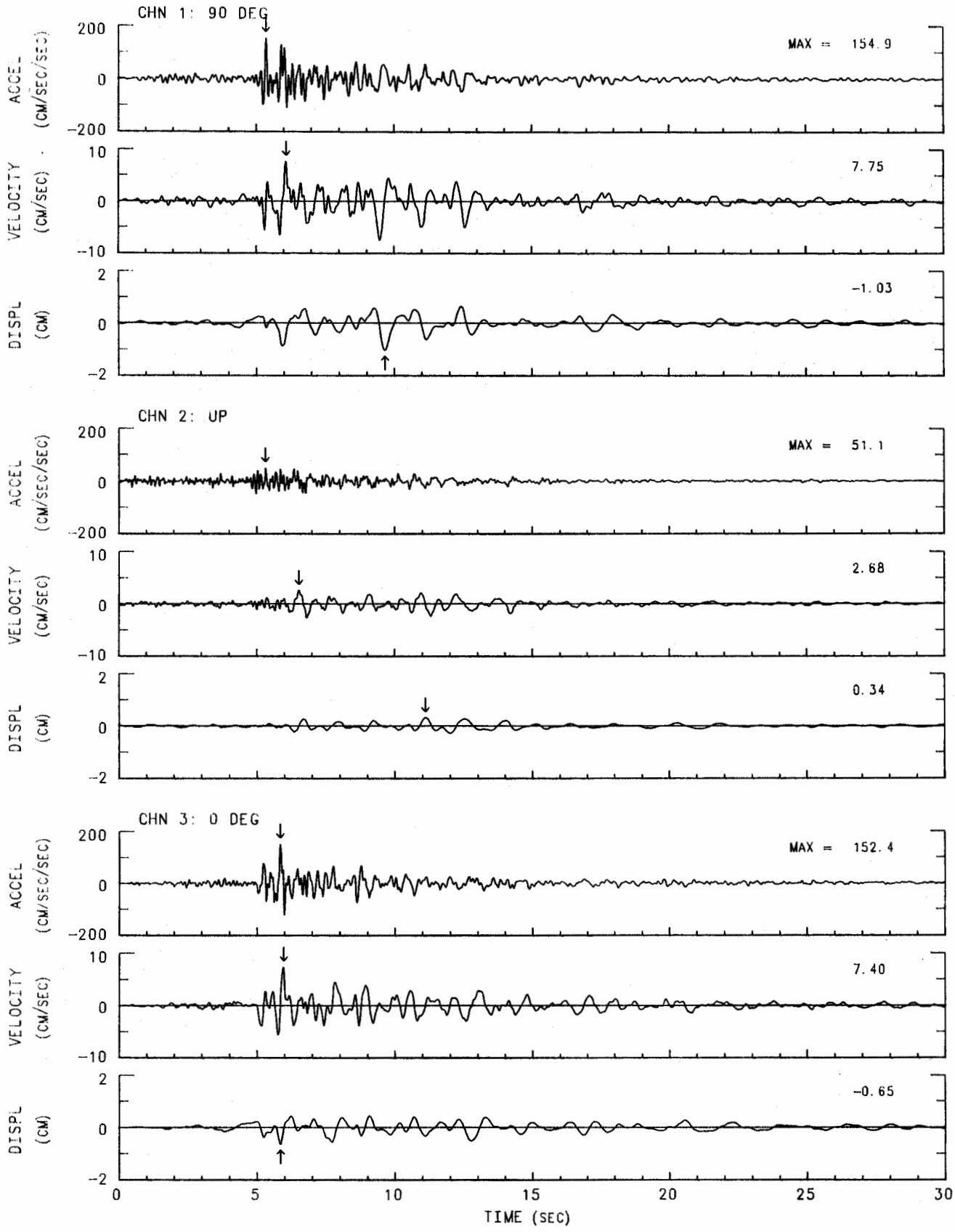


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

PACOIMA - KAGEL CANYON: CSMIP S/N 088

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24088-S1618-87276.01



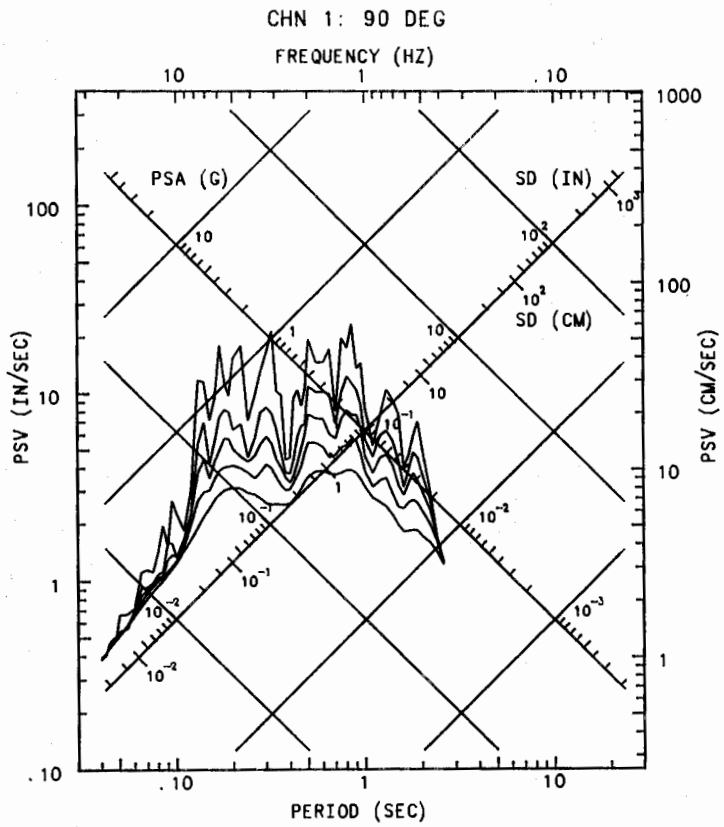
PACOIMA – KAGEL CANYON: CSMIP S/N 088

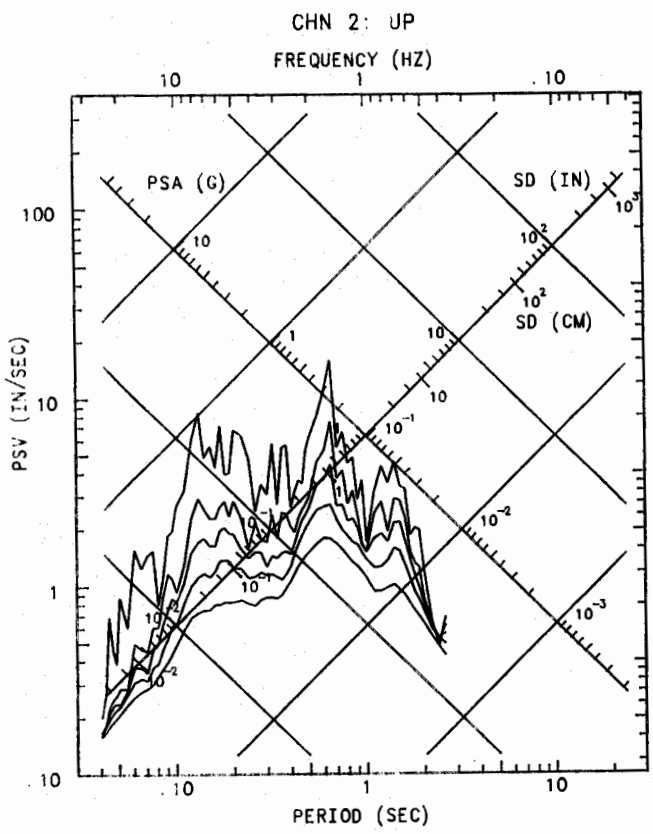
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

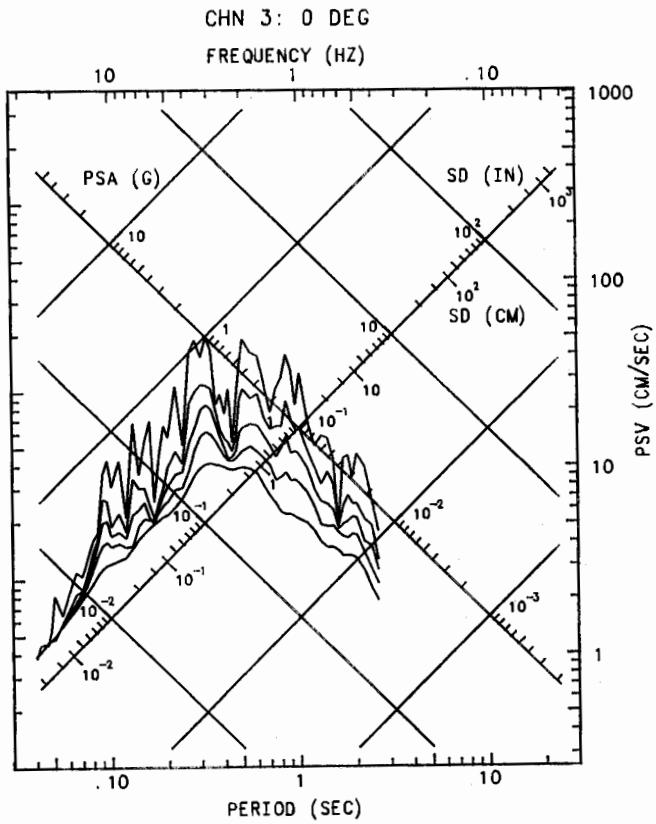
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

RECORD ID: 24088-S1618-87276.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%





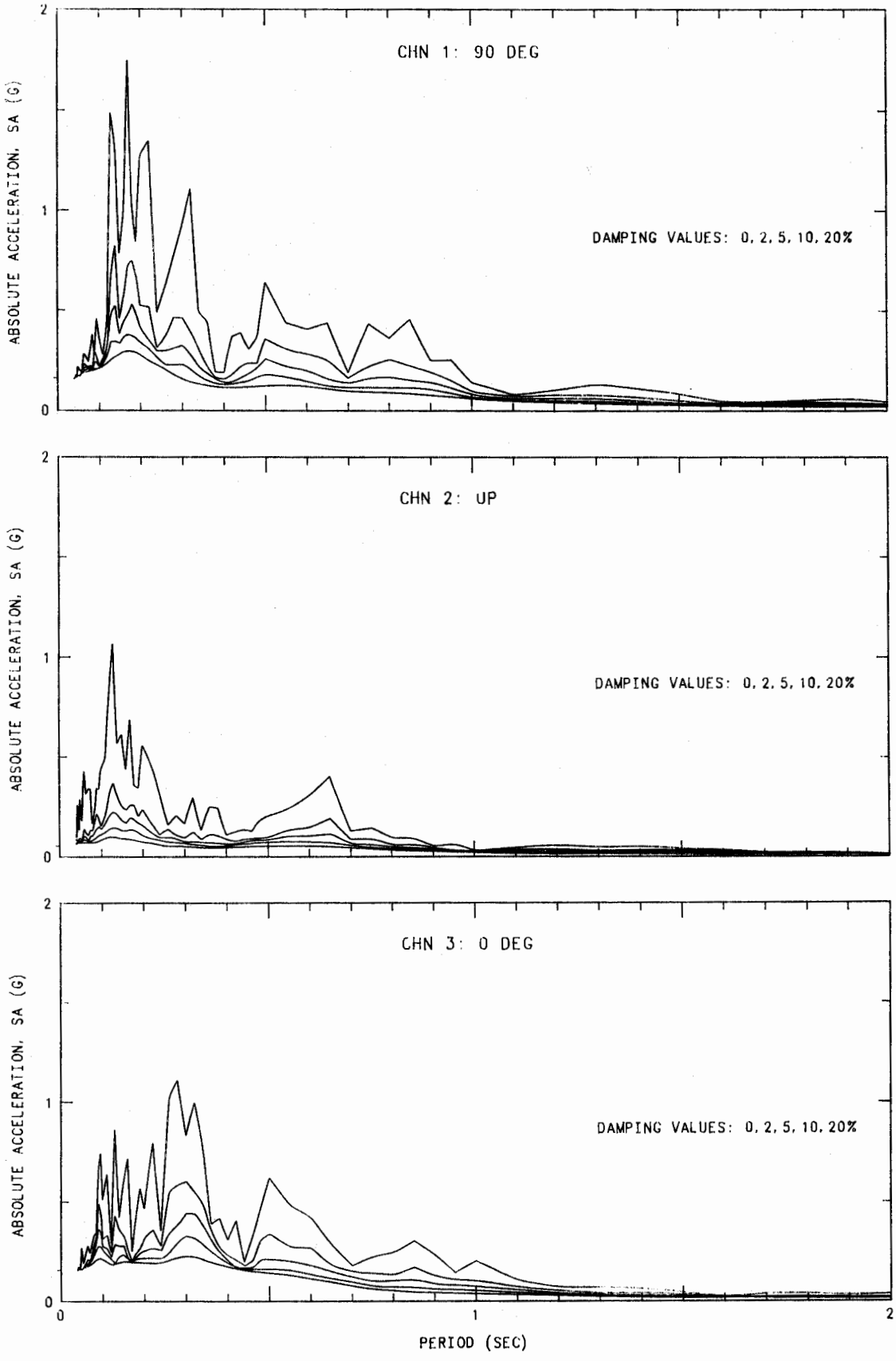


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

PACOIMA - KAGEL CANYON: CSMIP S/N 088

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24088-S1618-87276.01

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

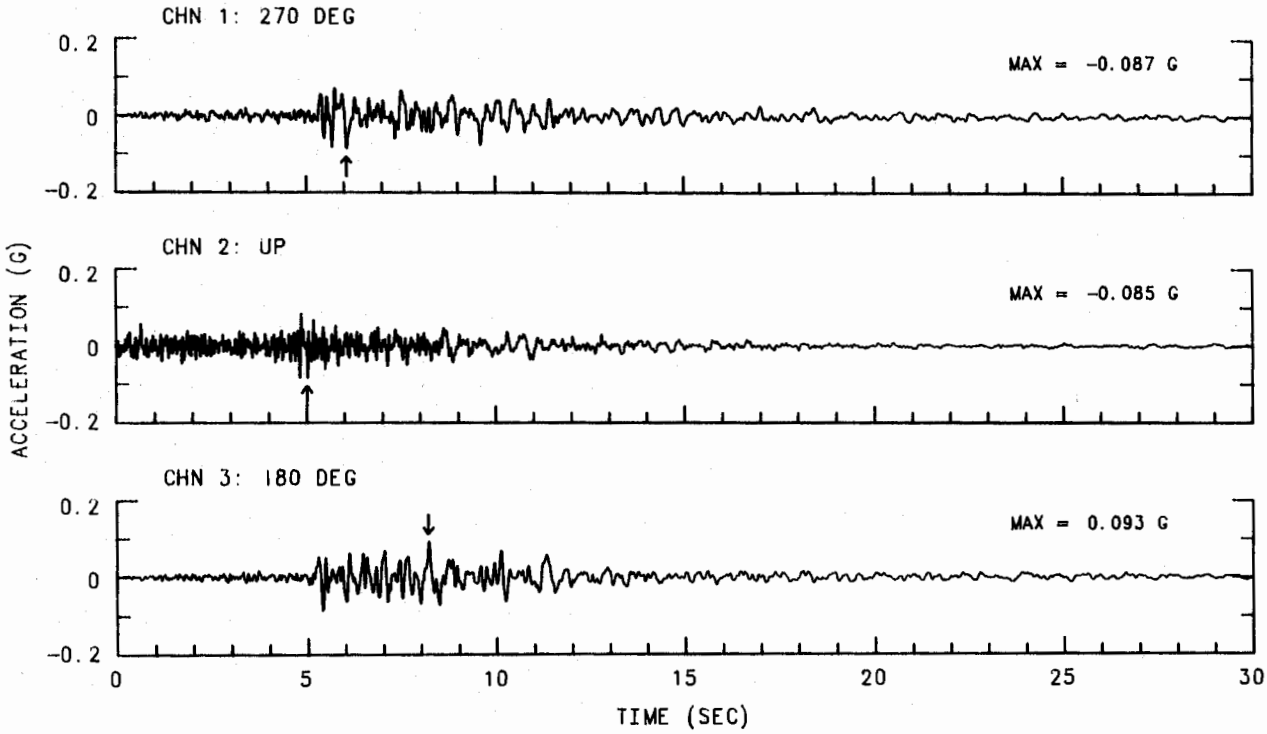


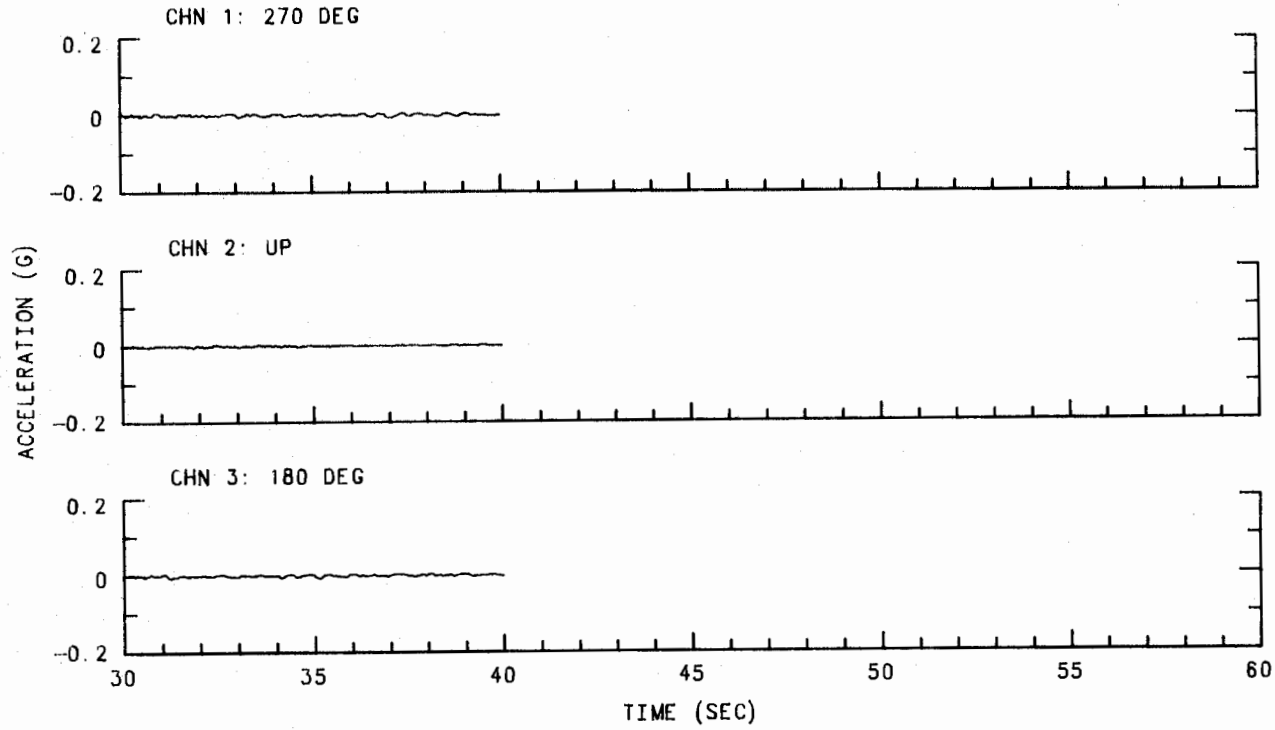
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

ARLETA - NORDHOFF AVE FIRE STATION: CSMIP S/N 087

PHASE 1 ACCELERATION

RECORD ID: 24087-S1594-87274.01

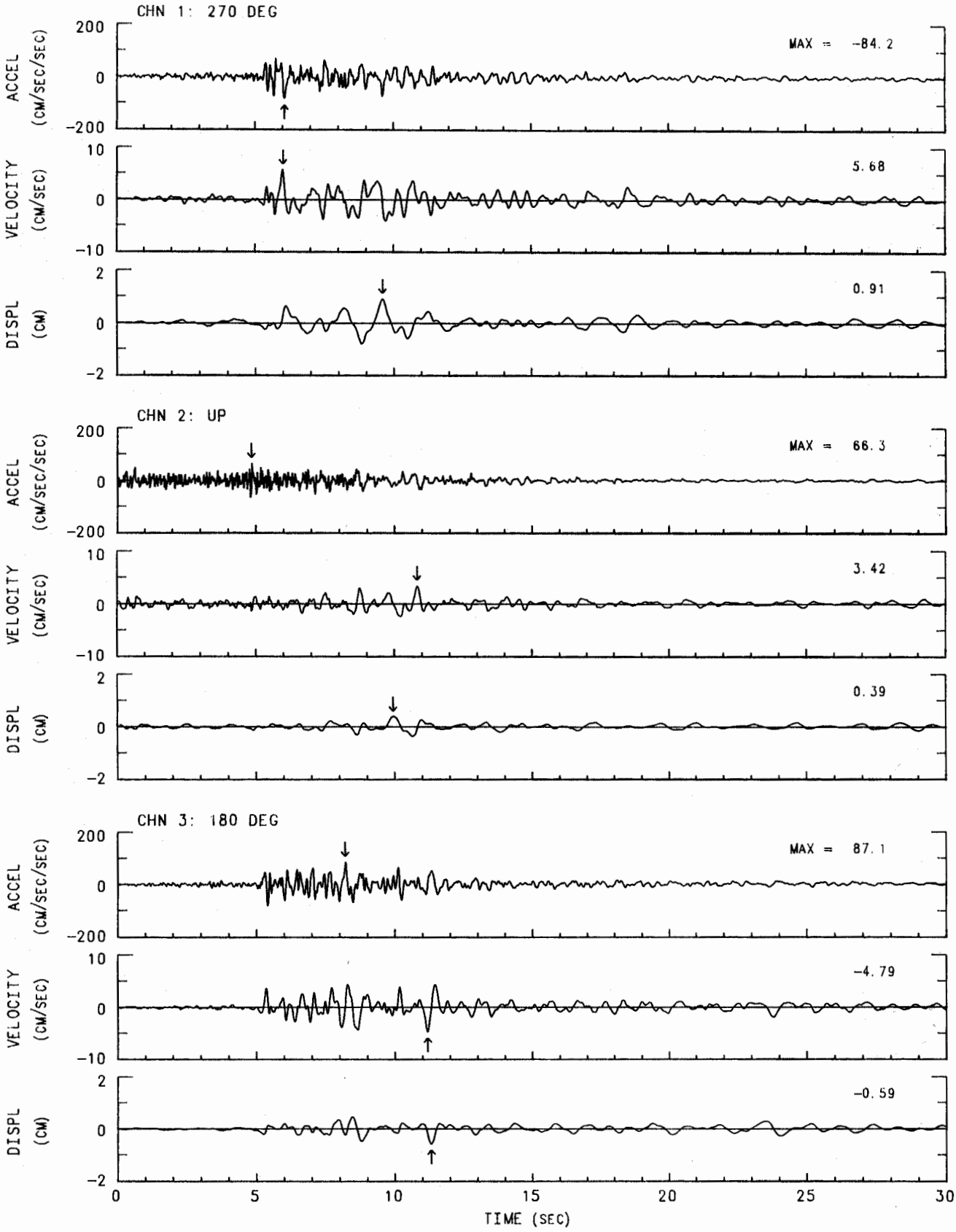




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
ARLETA - NORDHOFF AVE FIRE STATION: CSMIP S/N 087

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24087-S1594-87274.01



ARLETA - NORDHOFF AVE FIRE STATION: CSMIP S/N 087

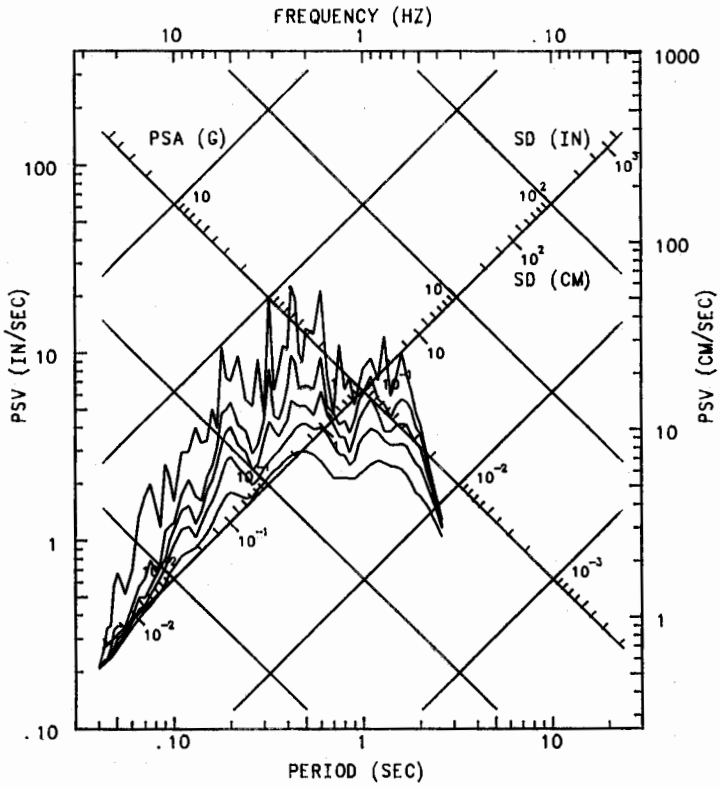
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

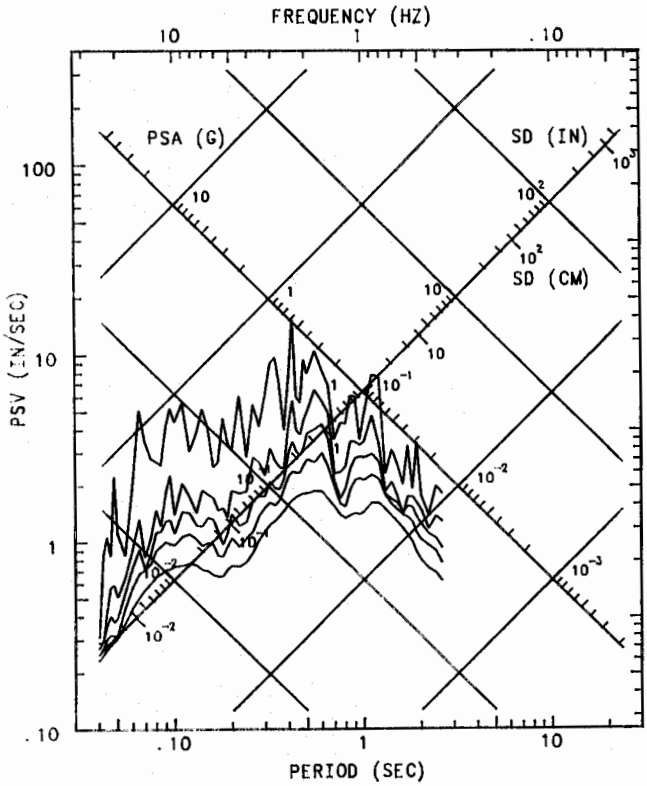
RECORD ID: 24087-S1594-87274.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

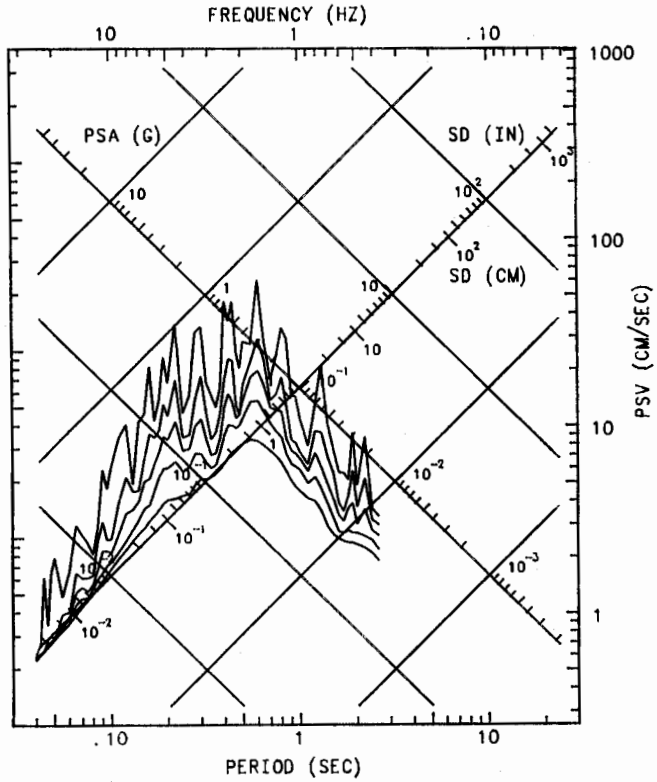
CHN 1: 270 DEG



CHN 2: UP

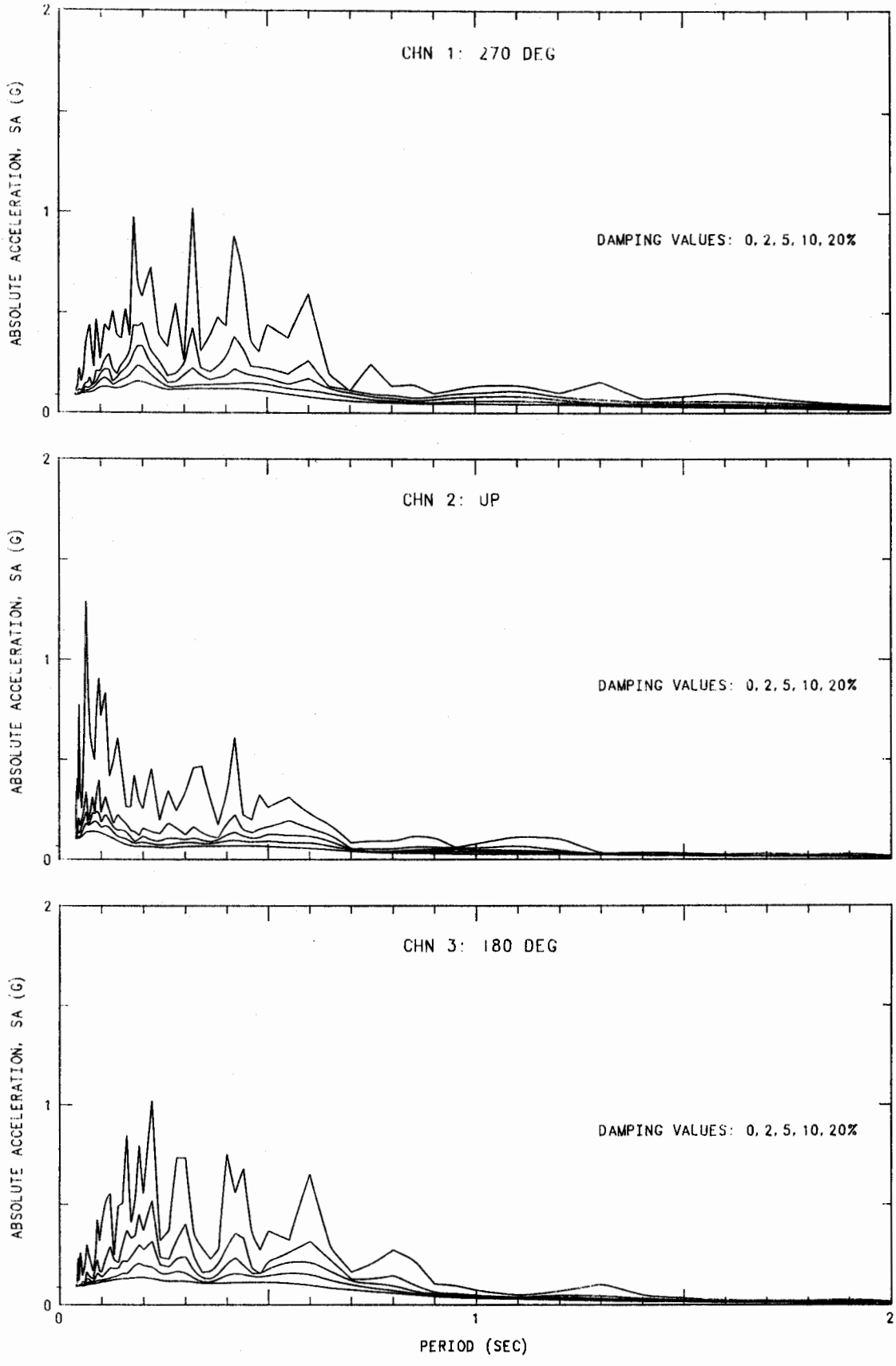


CHN 3: 180 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
ARLETA - NORDHOFF AVE FIRE STATION: CSMIP S/N 087

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24087-S1594-87274.01
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

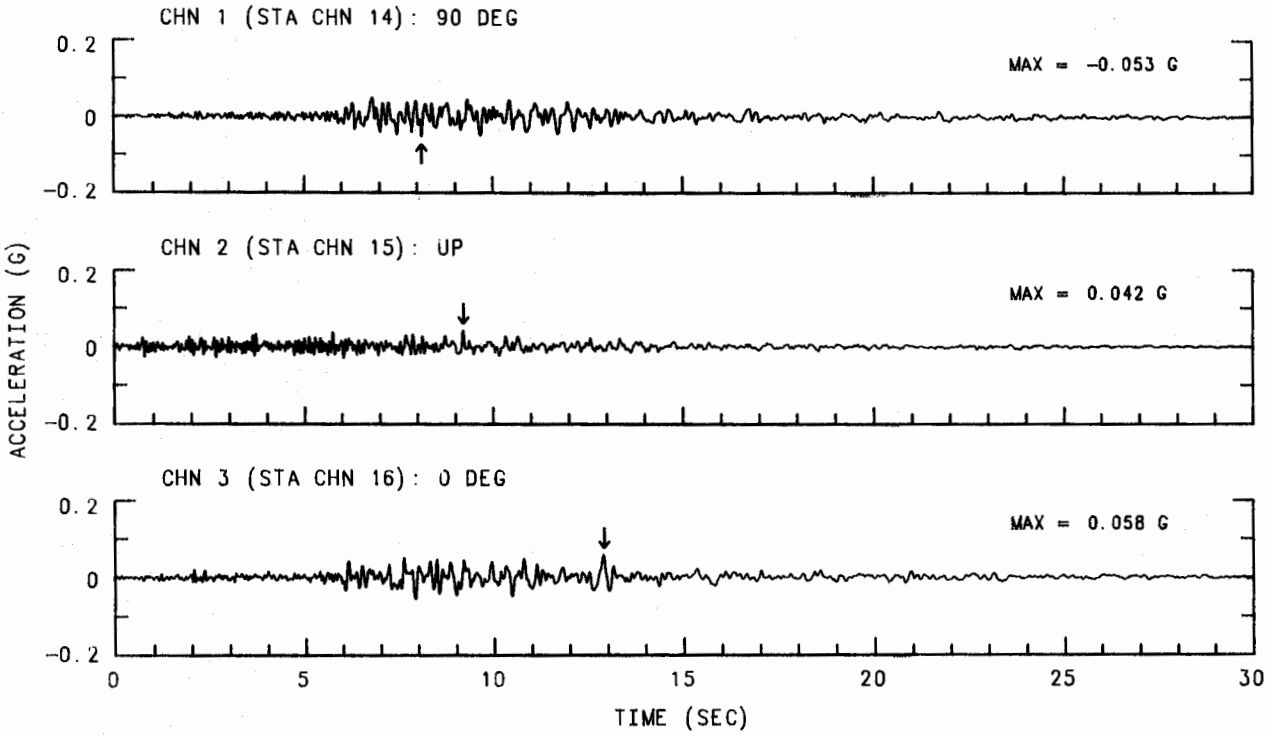


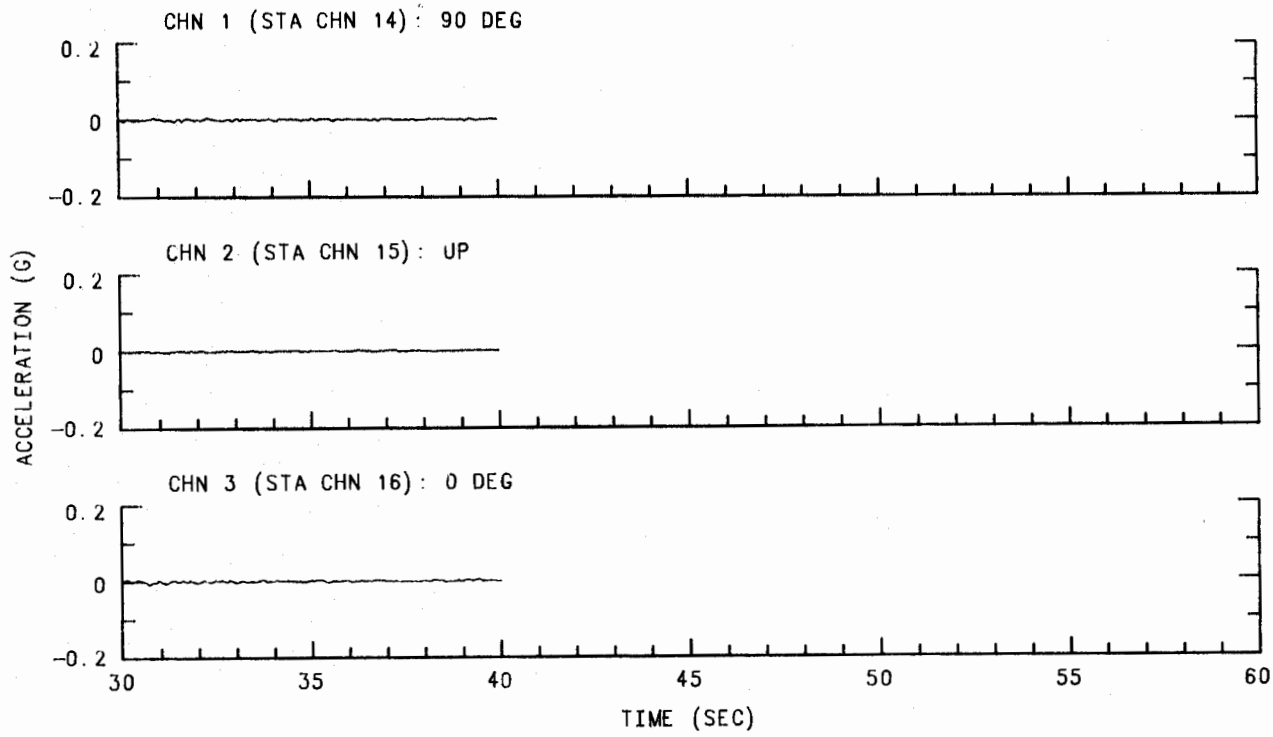
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

SYLMAR - OLIVE VIEW MEDICAL CENTER FF: CSMIP S/N 514

PHASE 1 ACCELERATION

RECORD ID: 24514-S5254-87278.01



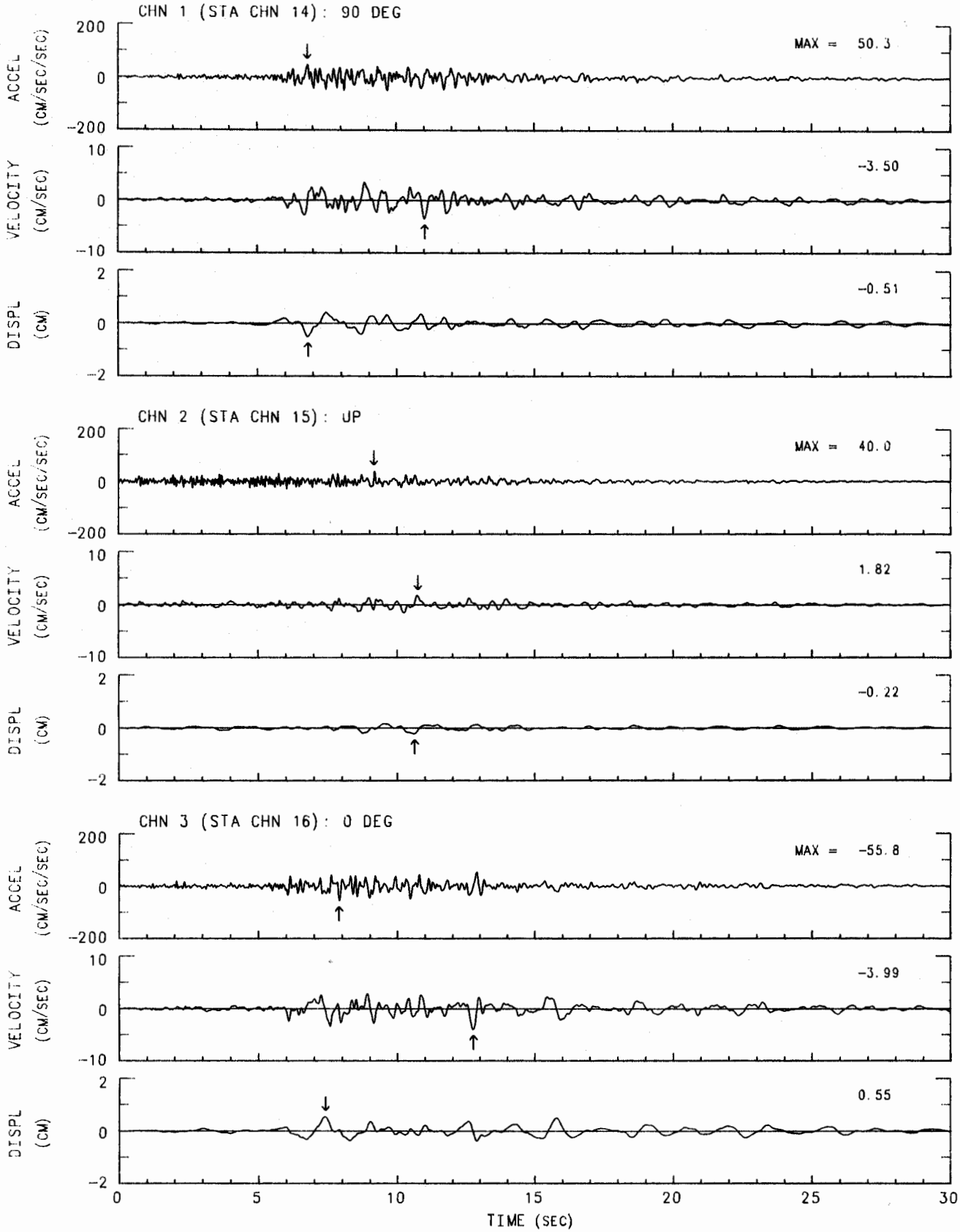


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

SYLMAR – OLIVE VIEW MEDICAL CENTER FF: CSMIP S/N 514

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC) RECORD ID: 24514-S5254-87278.01



SYLMAR - OLIVE VIEW MEDICAL CENTER FF: CSMIP S/N 514

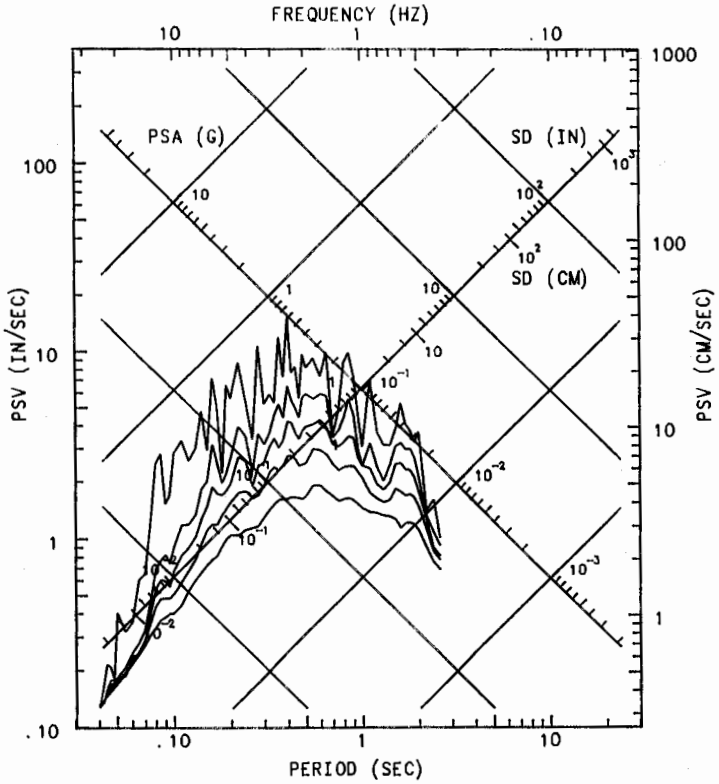
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ
(0.04 TO 2.35 SEC)

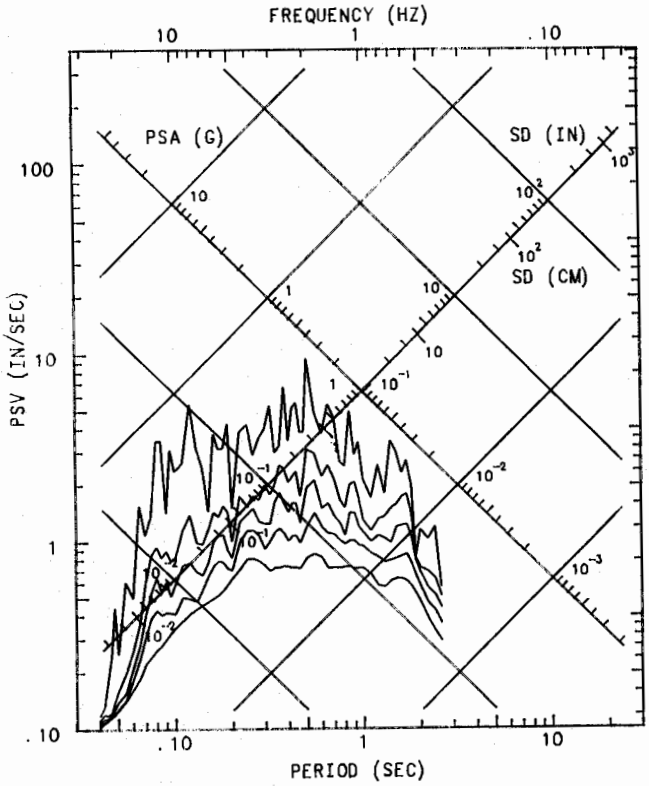
RECORD ID: 24514-S5254-87278.01

RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

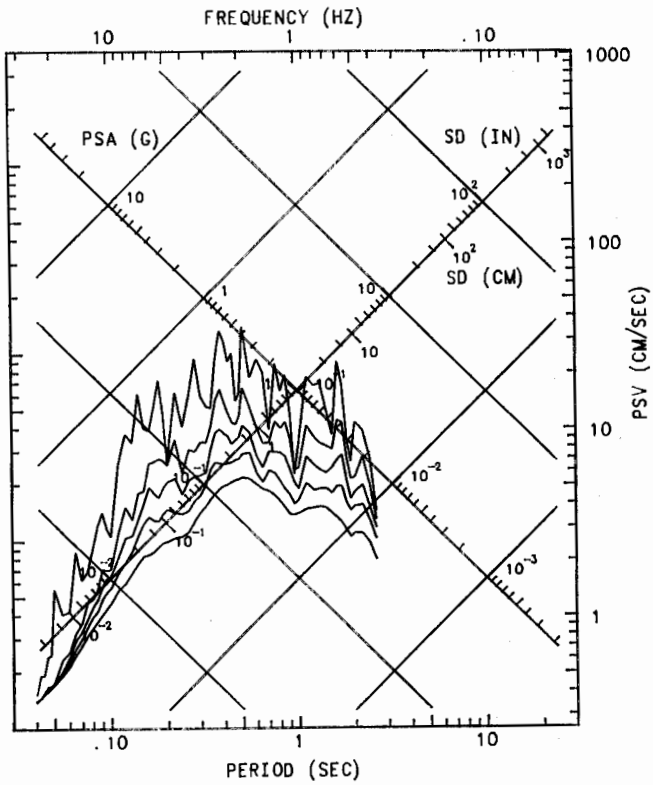
CHN 1 (STA CHN 14): 90 DEG



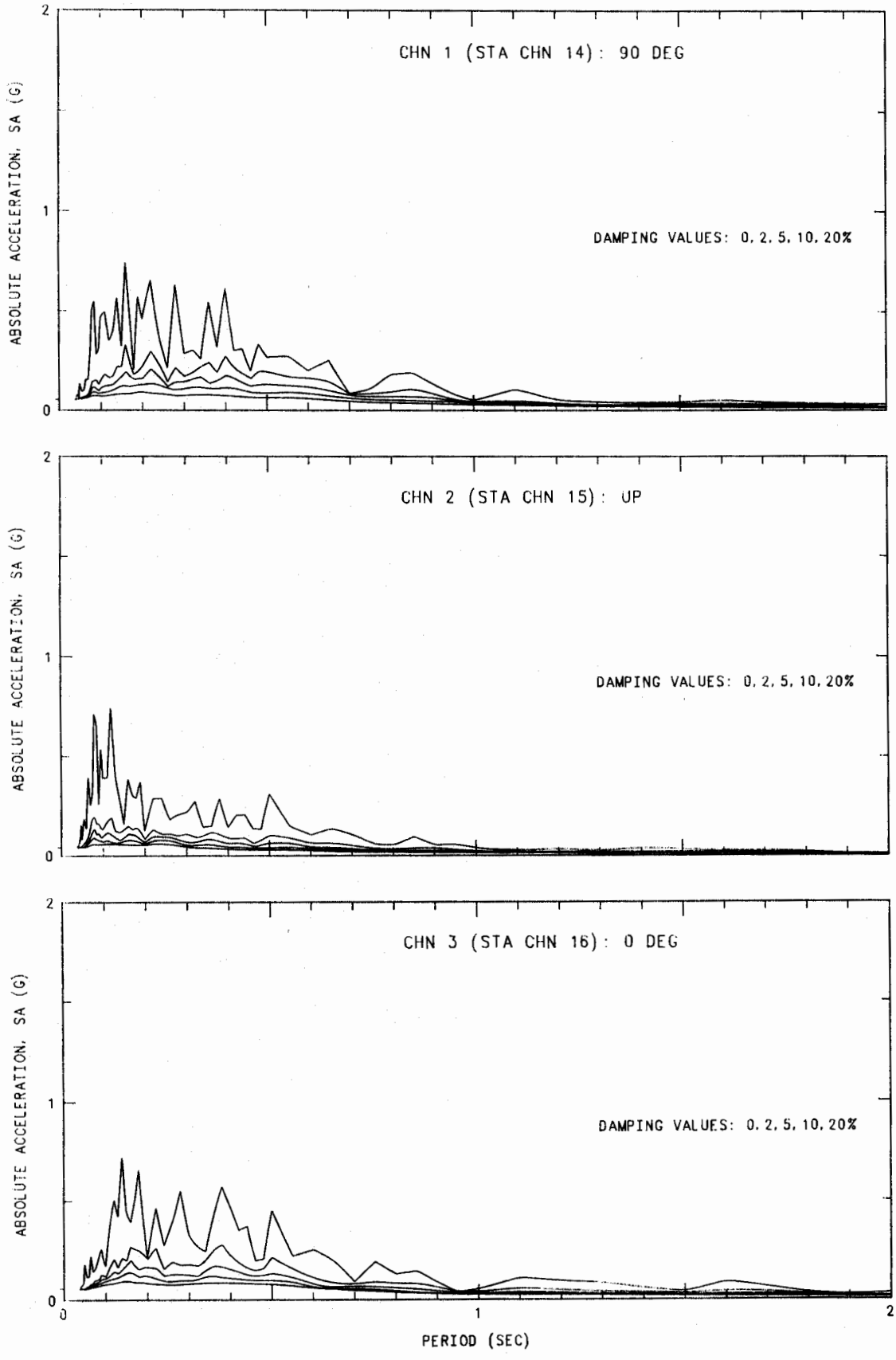
CHN 2 (STA CHN 15): UP



CHN 3 (STA CHN 16): 0 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
SYLMAR - OLIVE VIEW MEDICAL CENTER FF CSMIP S/N 514
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24514-S5254-87278.01
USABLE DATA BANDWIDTH: 0.42 TO 23.6 HZ (0.04 TO 2.35 SEC)

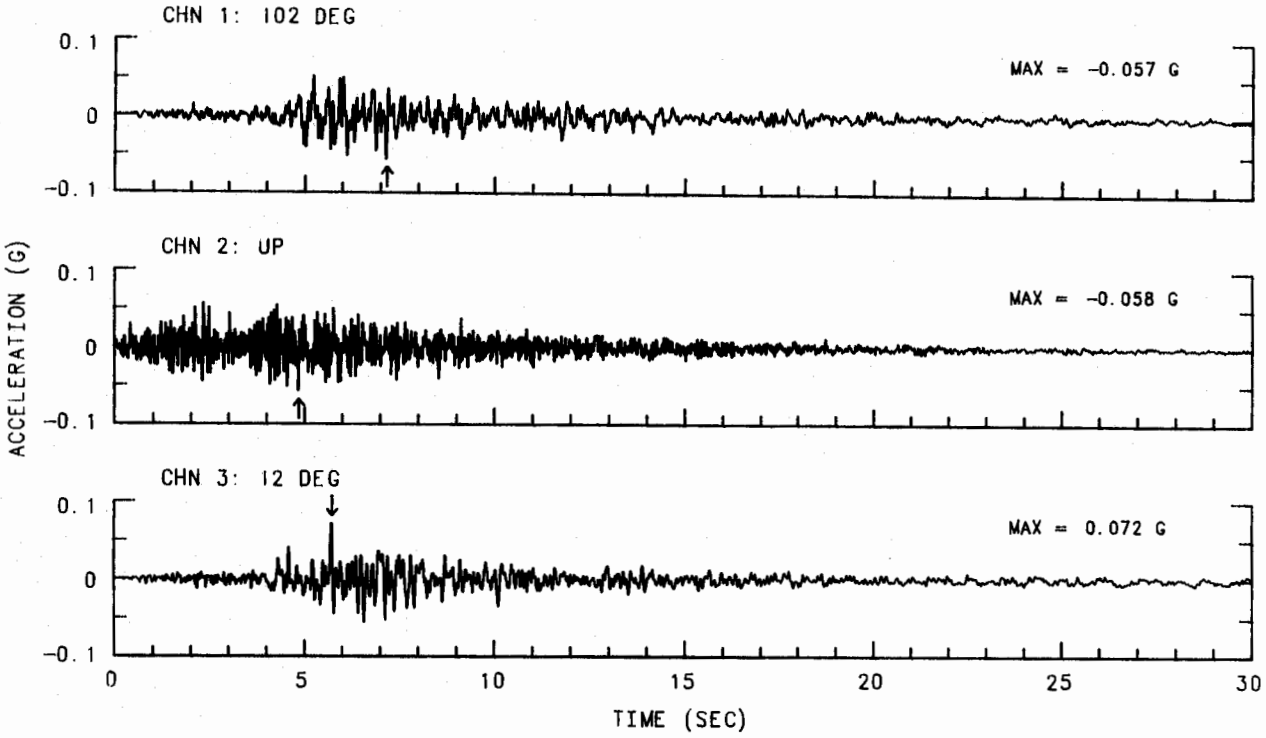


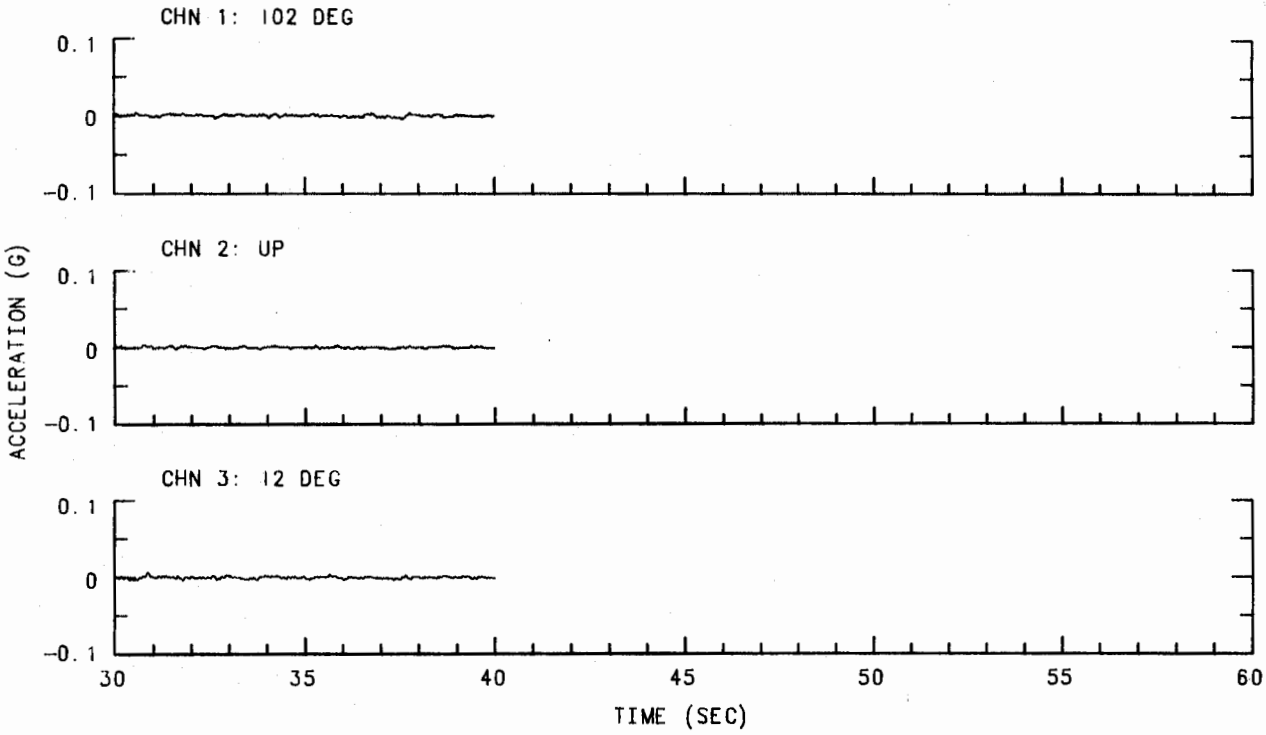
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

POMONA - 4TH & LOCUST FF: CSMIP S/N 525

PHASE 1 ACCELERATION

RECORD ID: 23525-S2785-87274.01

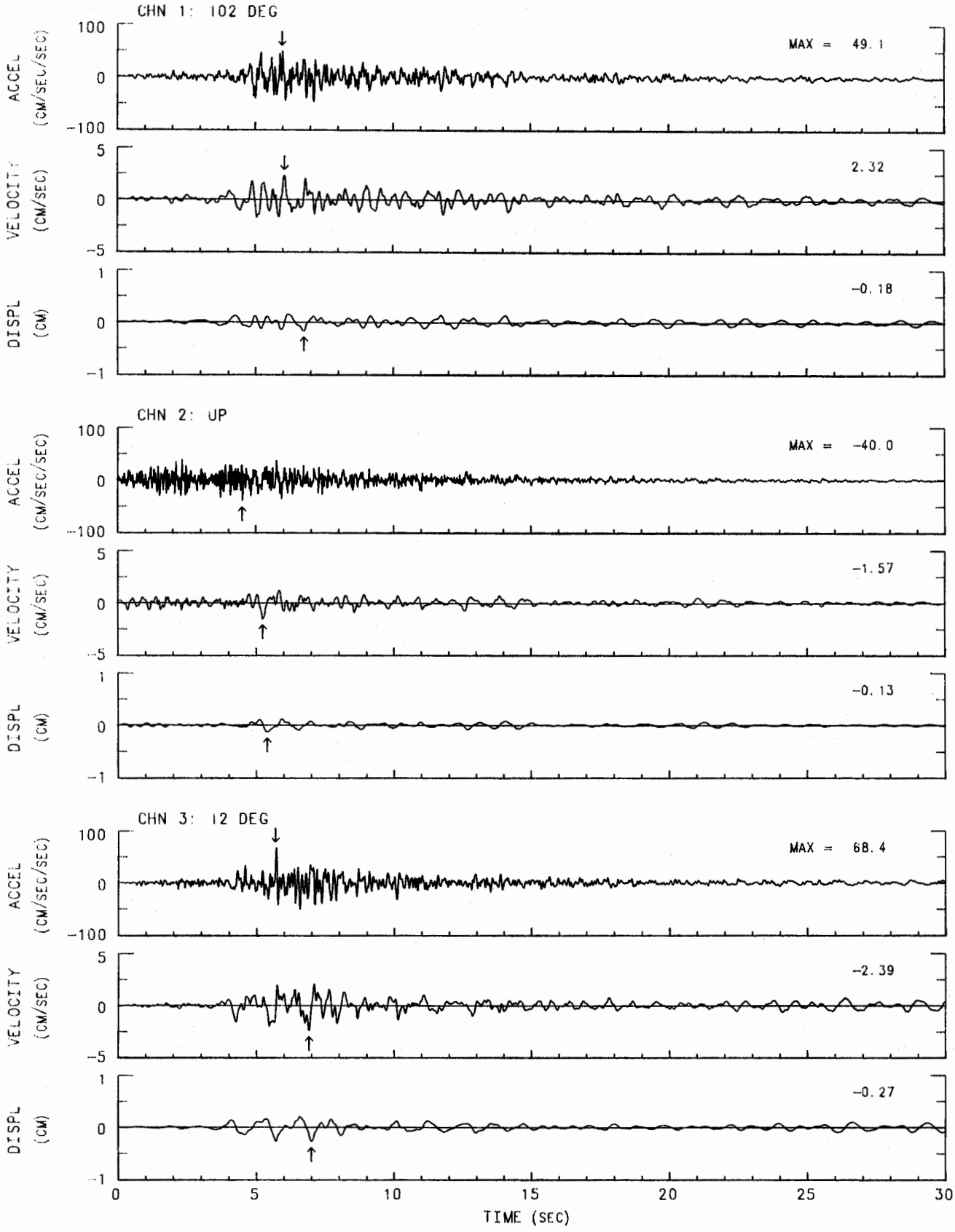




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
POMONA - 4TH & LOCUST FF: CSMIP S/N 525

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 23525-S2785-87274.01



POMONA – 4TH & LOCUST FF: CSMIP S/N 525

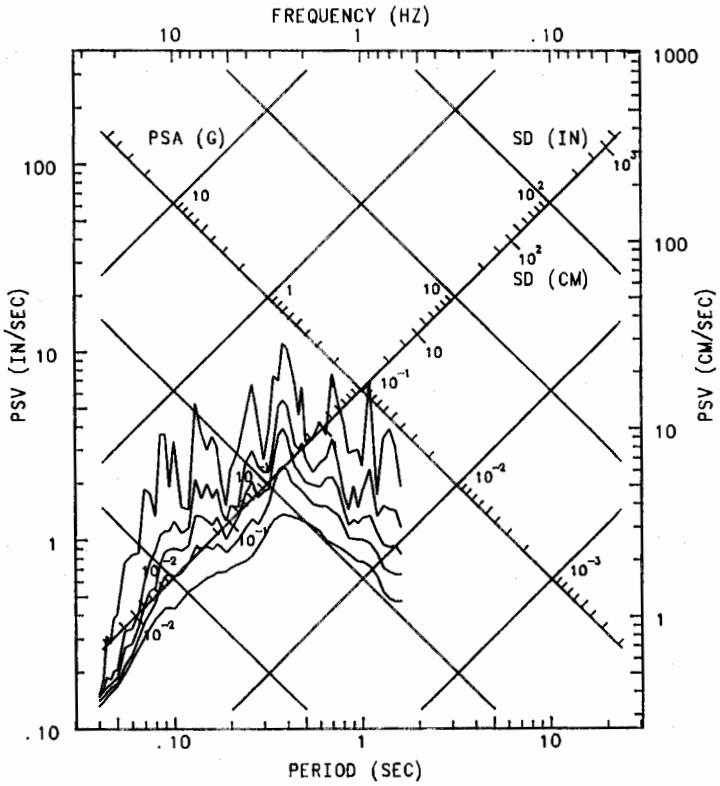
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ
(0.04 TO 1.47 SEC)

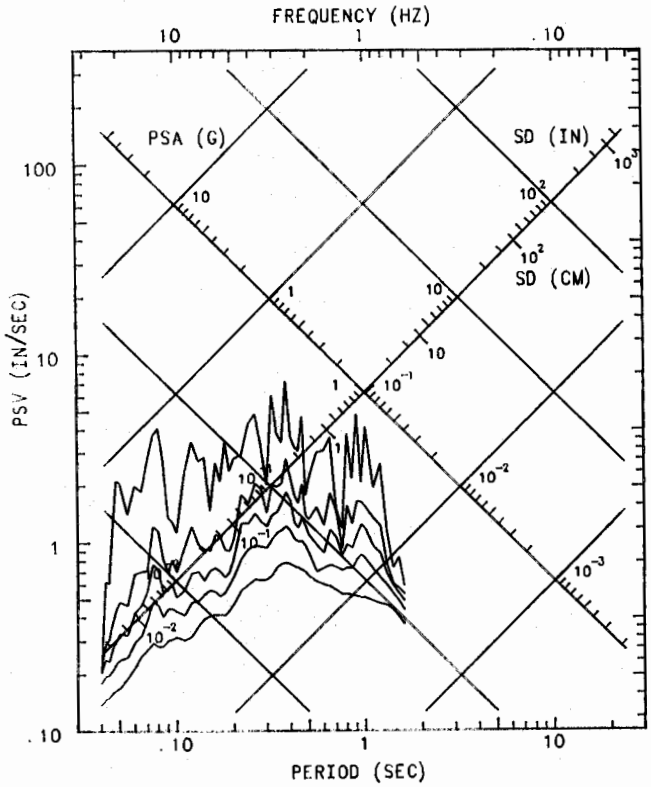
RECORD ID: 23525-S2785-87274.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

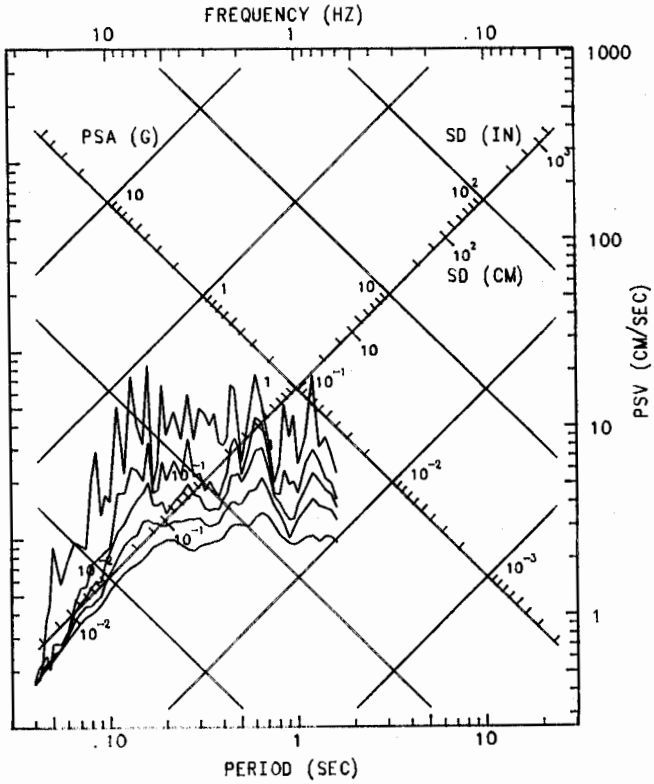
CHN 1: 102 DEG



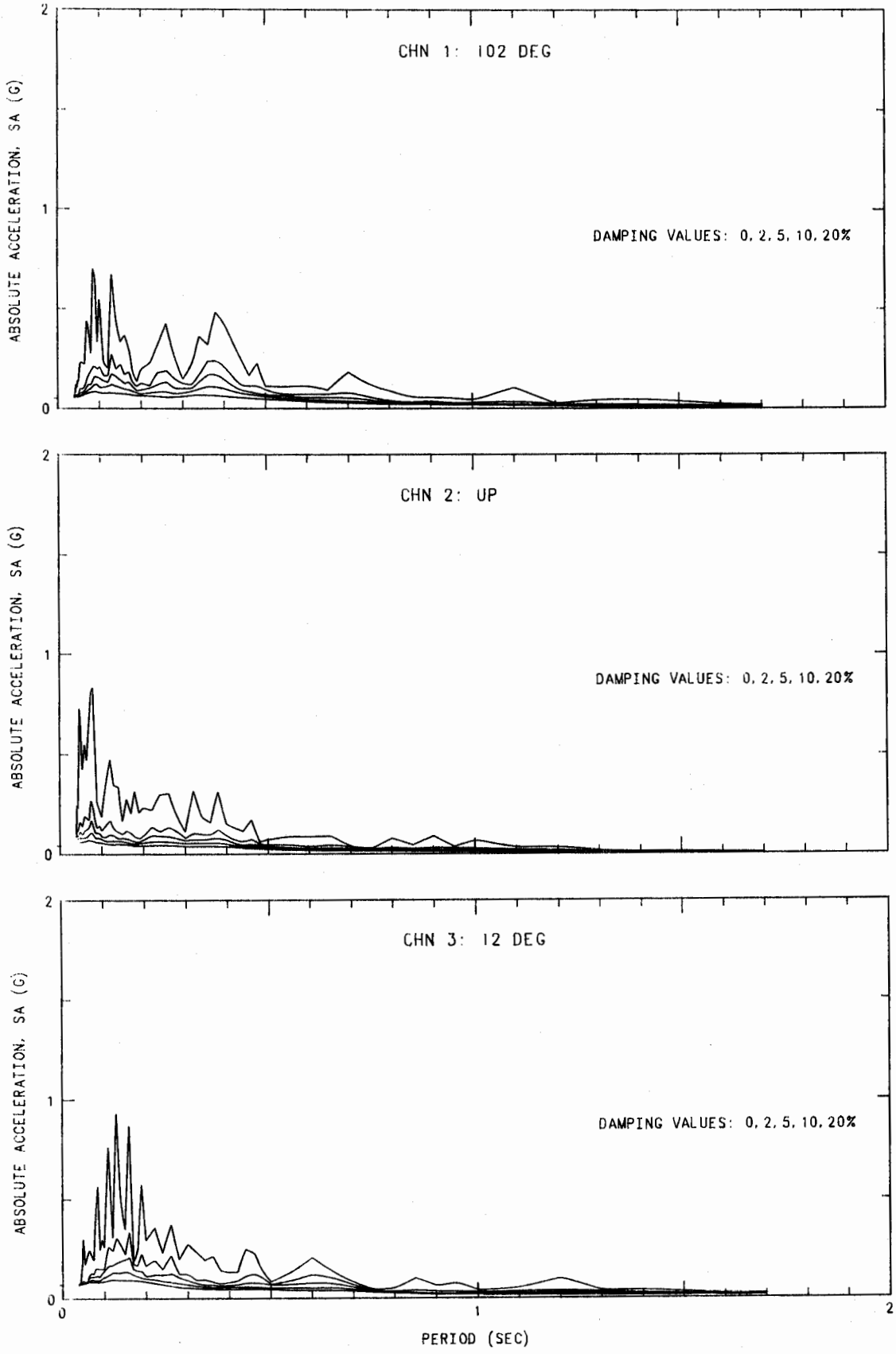
CHN 2: UP



CHN 3: 12 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
POMONA - 4TH & LOCUST FF: CSMIP S/N 525
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 23525-S2785-87274.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

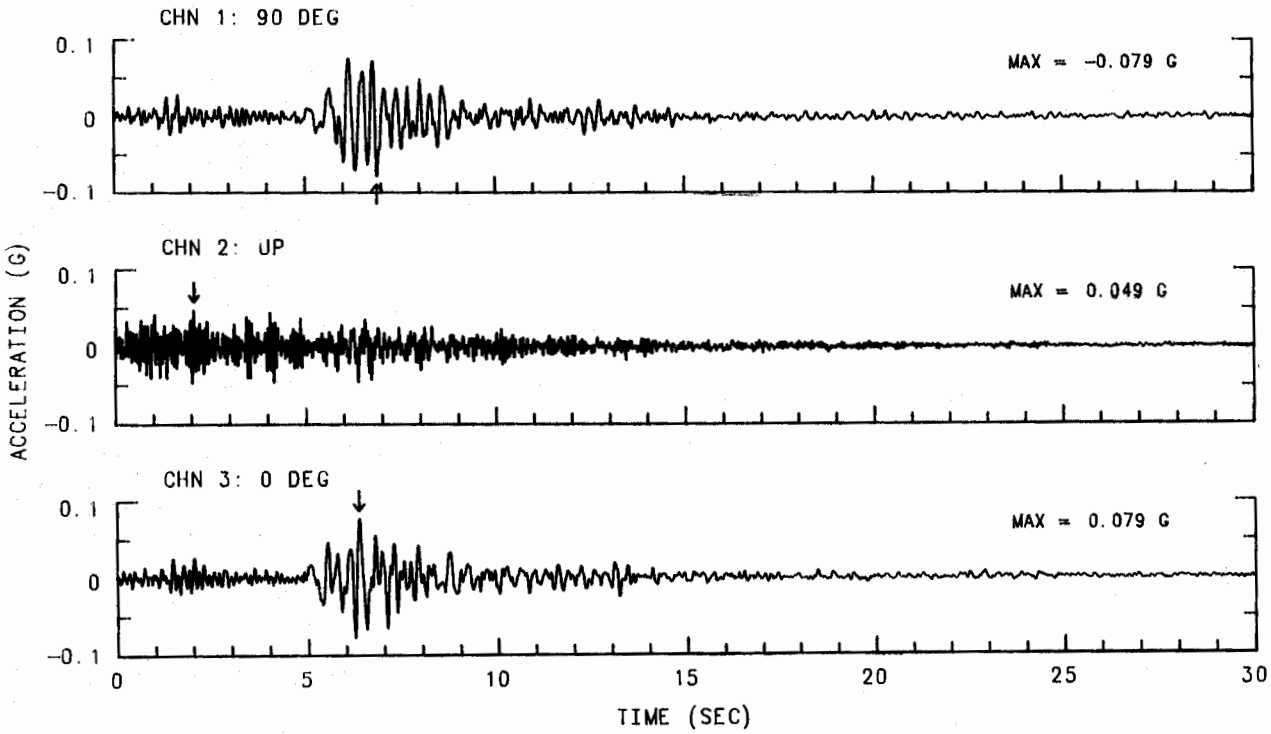


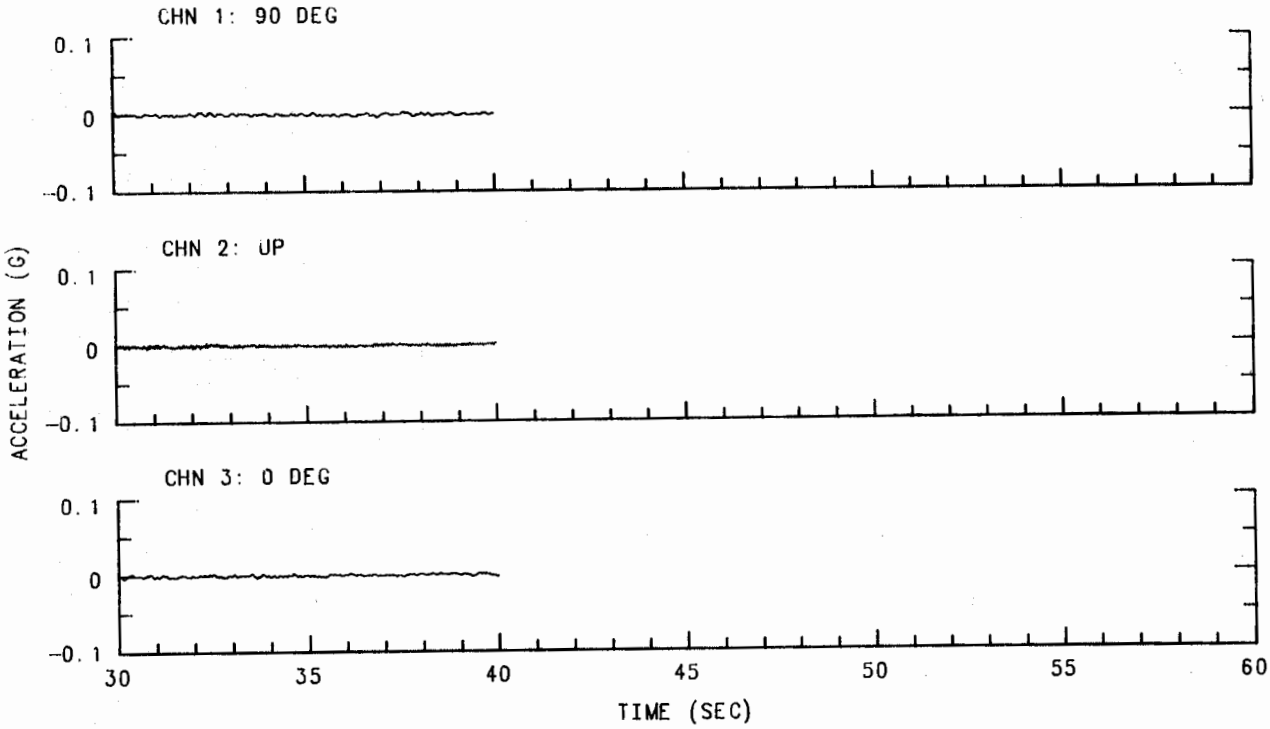
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

FEATHERLY PARK - PARK MAINT. BLDG. CSMIP S/N 122

PHASE 1 ACCELERATION

RECORD ID: 13122-S1596-87276.01

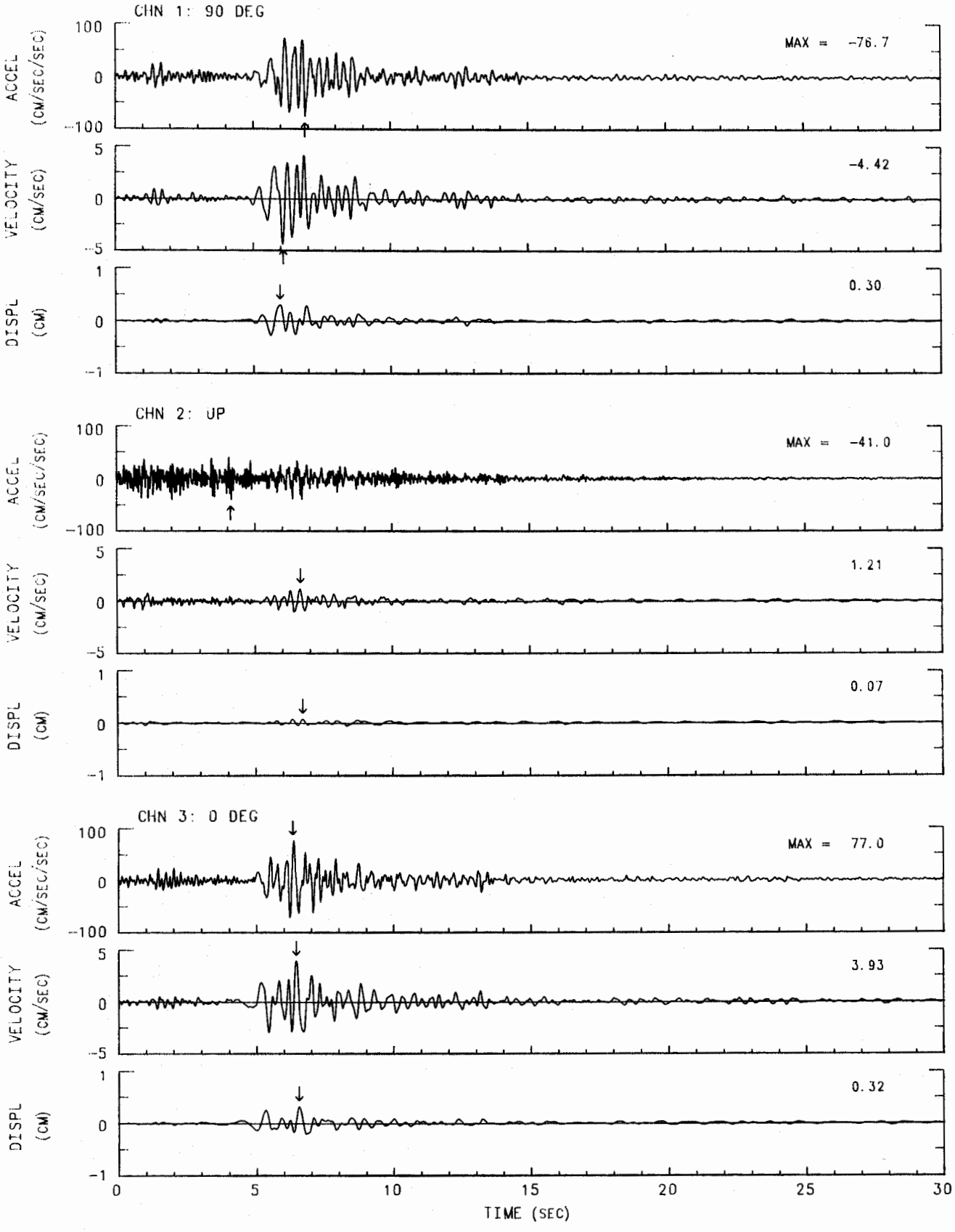




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
FEATHERLY PARK - PARK MAINT. BLDG. CSMIP S/N 122

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: I3122-S1596-87276.01



FEATHERLY PARK -- PARK MAINT. BLDG. CSMIP S/N 122

WHITTIER EARTHQUAKE

OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ

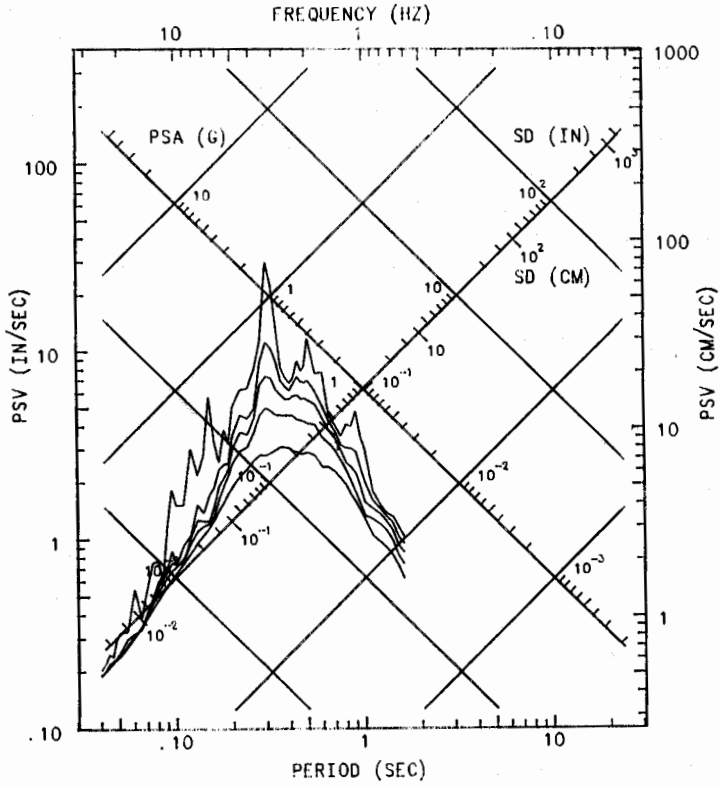
(0.04 TO 1.47 SEC)

RECORD ID: 13122-S1596-87276.01

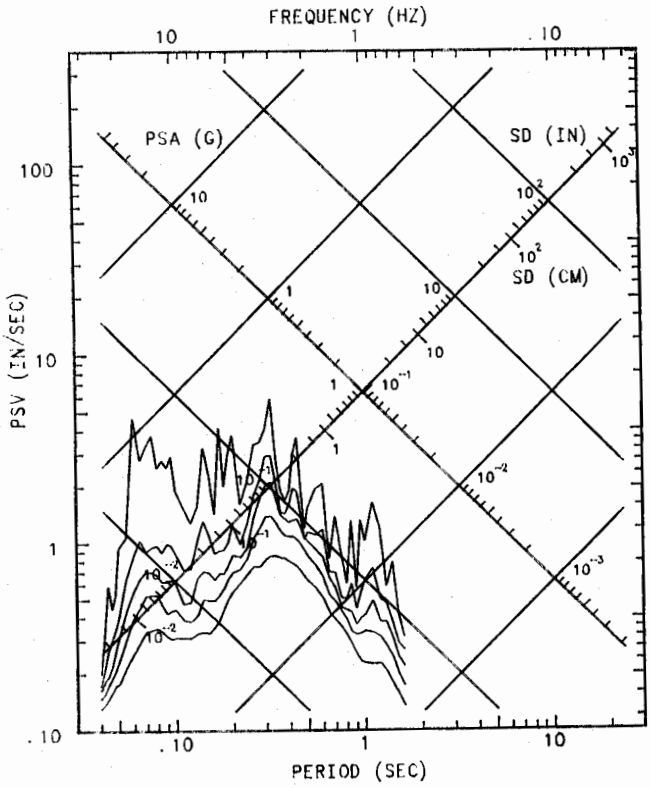
RESPONSE SPECTRA: PSV, PSA & SD

DAMPING VALUES: 0, 2, 5, 10, 20%

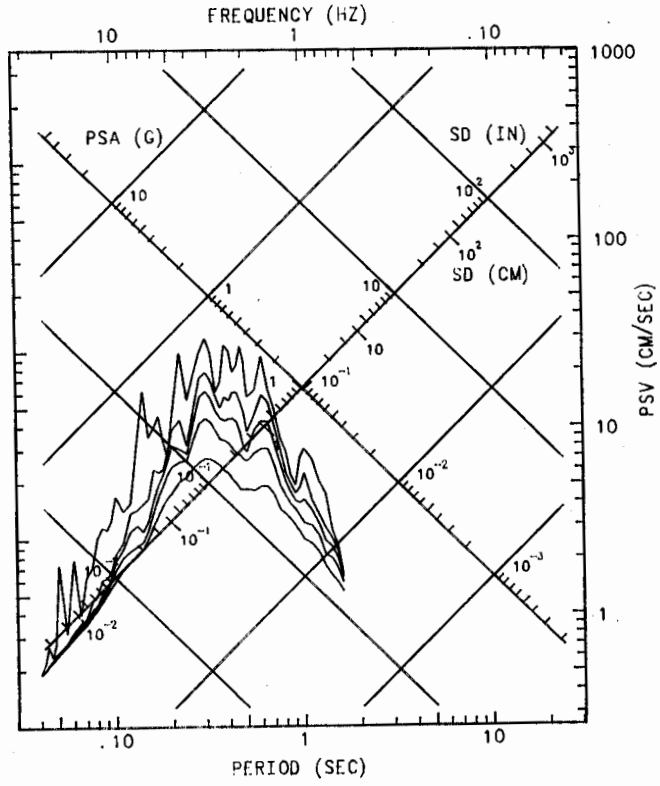
CHN 1: 90 DEG



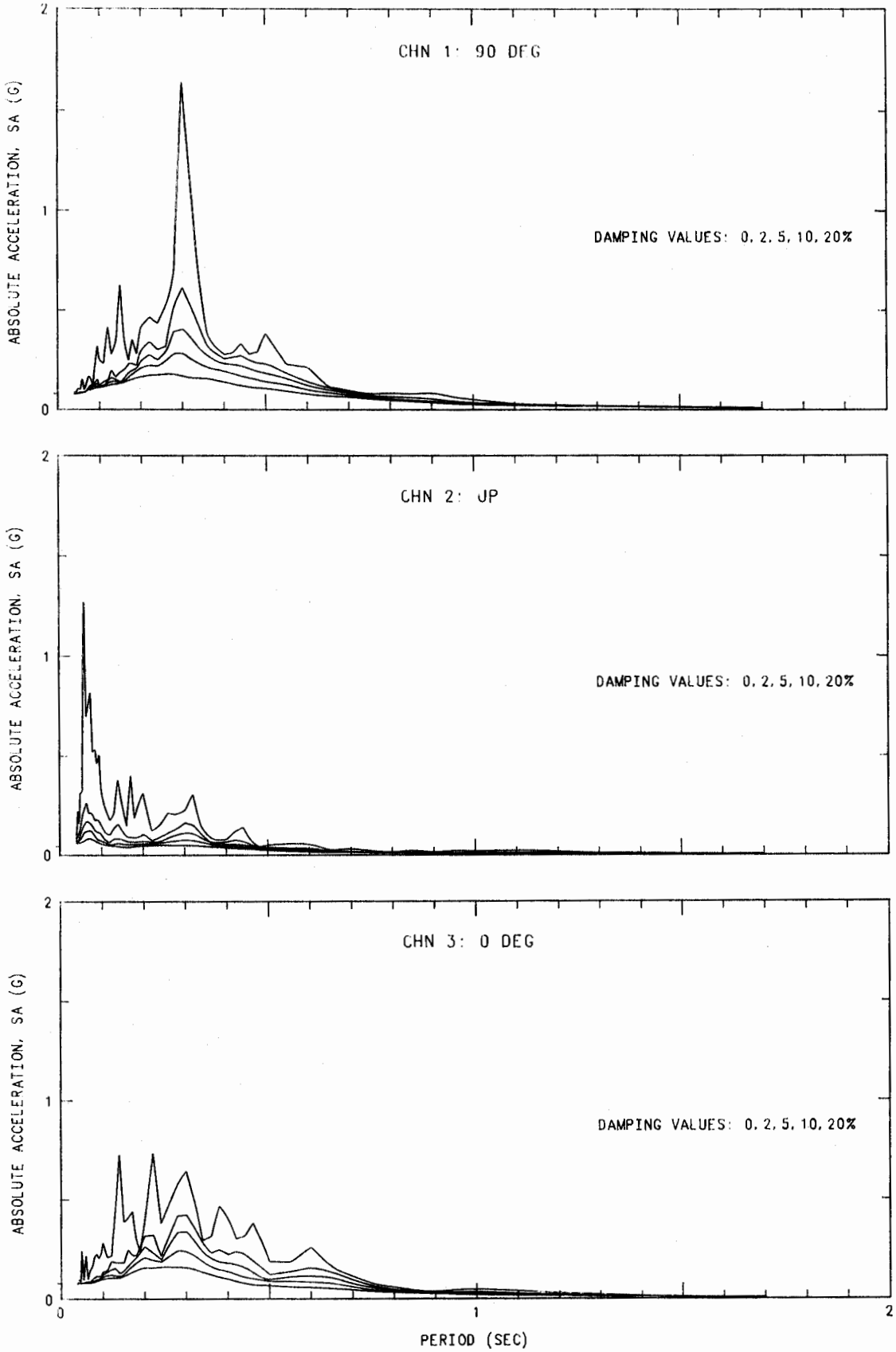
CHN 2: UP



CHN 3: 0 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
FEATHERLY PARK - PARK MAINT. BLDG. CSMIP S/N 122
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 13122-S1596-87276.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

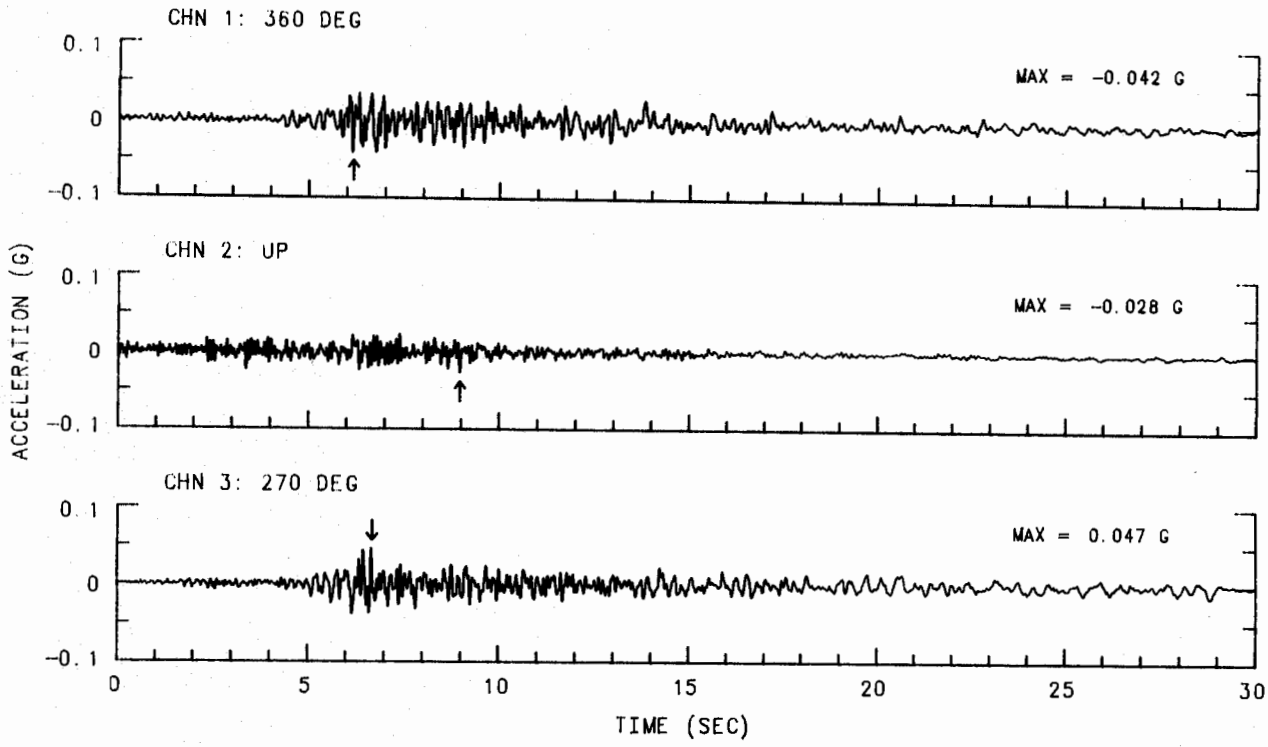


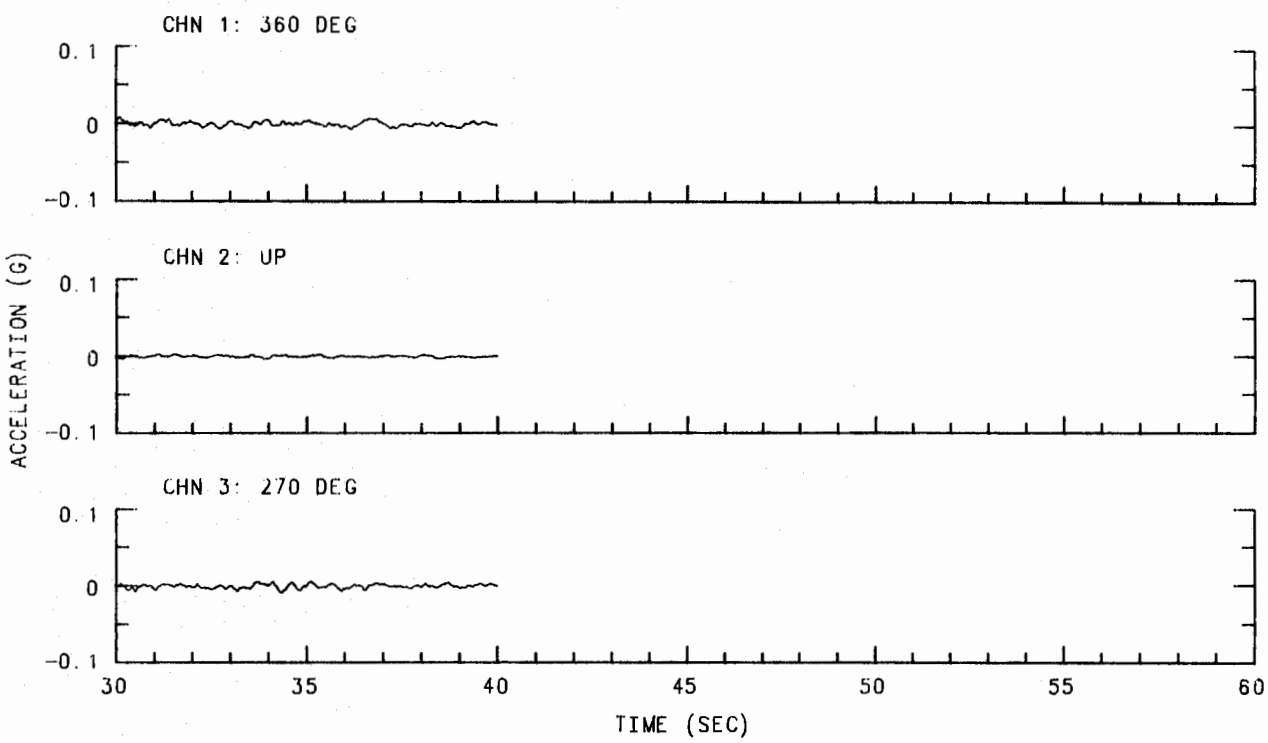
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

HUNTINGTON BEACH - LAKE ST. FIRE STATION: CSMIP S/N 197

PHASE 1 ACCELERATION

RECORD ID: 13197-S0759-87276.01



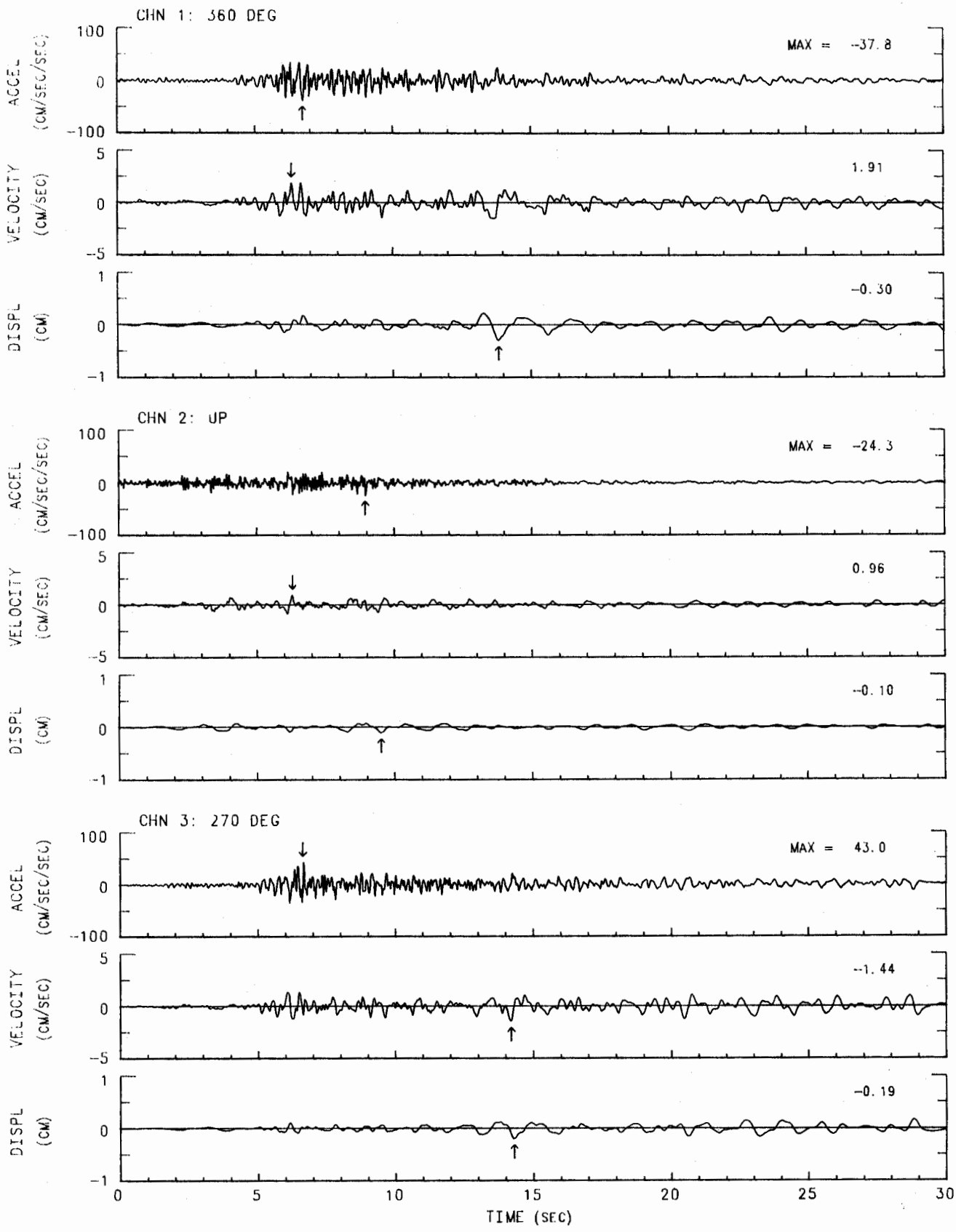


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

HUNTINGTON BEACH - LAKE ST. FIRE STATION: CSMIP S/N 197

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC) RECORD ID: 13197-S0759-87276.01



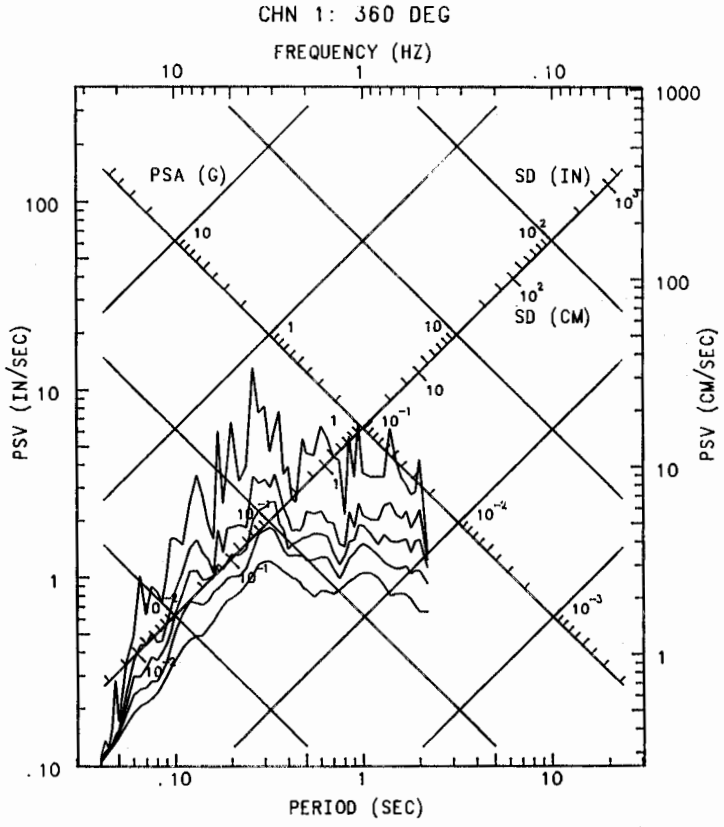
HUNTINGTON BEACH - LAKE ST. FIRE STATION: CSMIP S/N 197

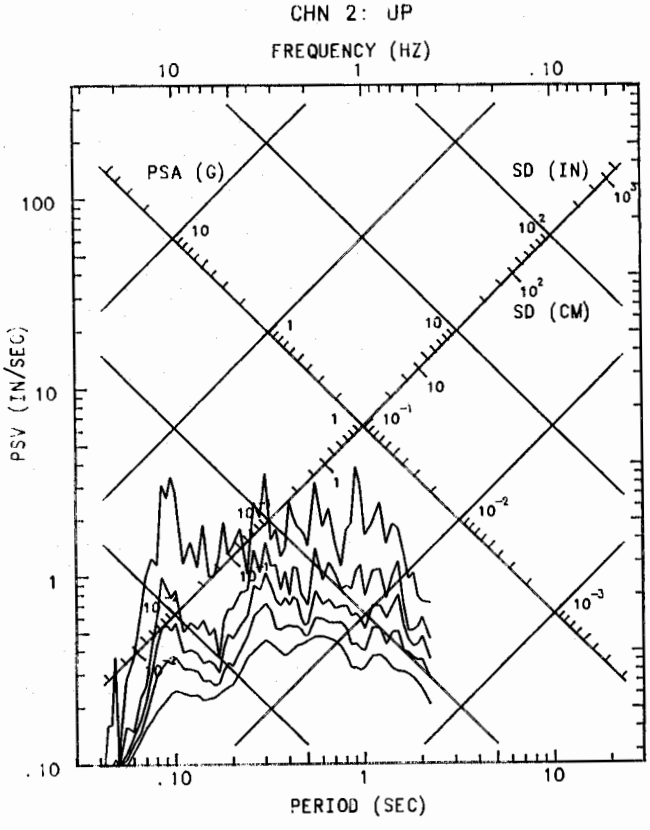
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

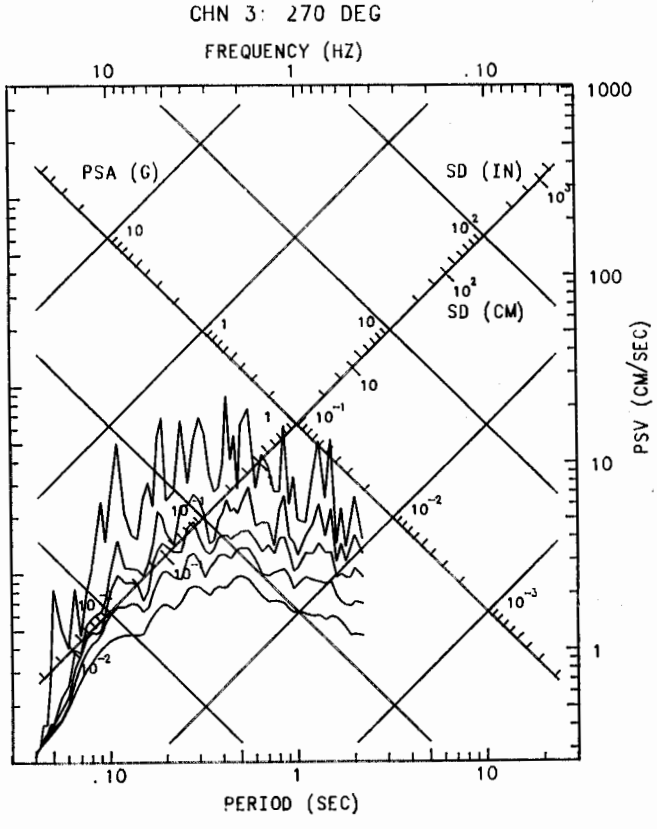
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ
(0.04 TO 1.96 SEC)

RECORD ID: 13197-S0759-87276.01

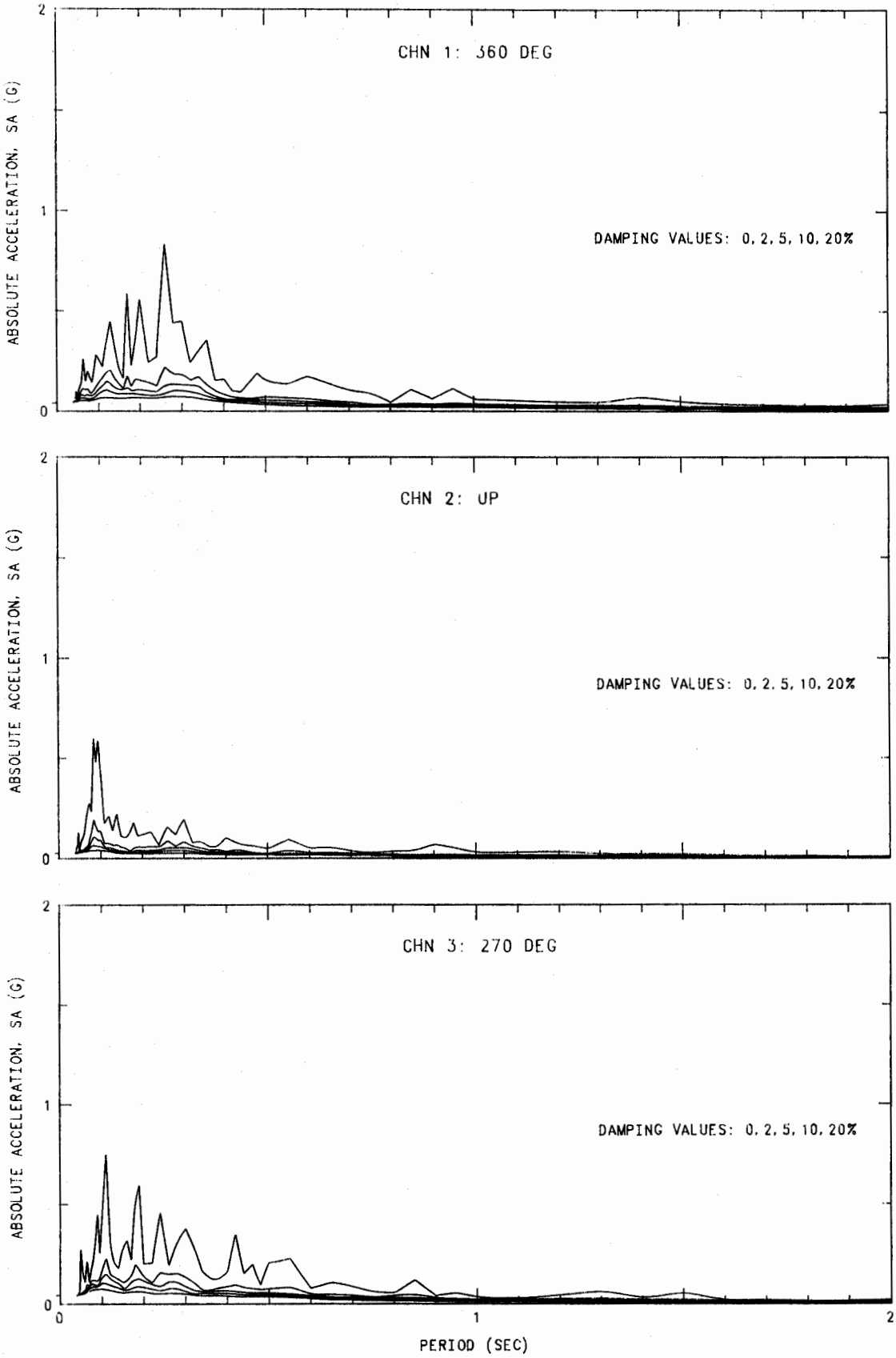
—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%







WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
HUNTINGTON BEACH - LAKE ST. FIRE STATION: CSMIP S/N 197
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 13197-S0759-87276.01
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC)

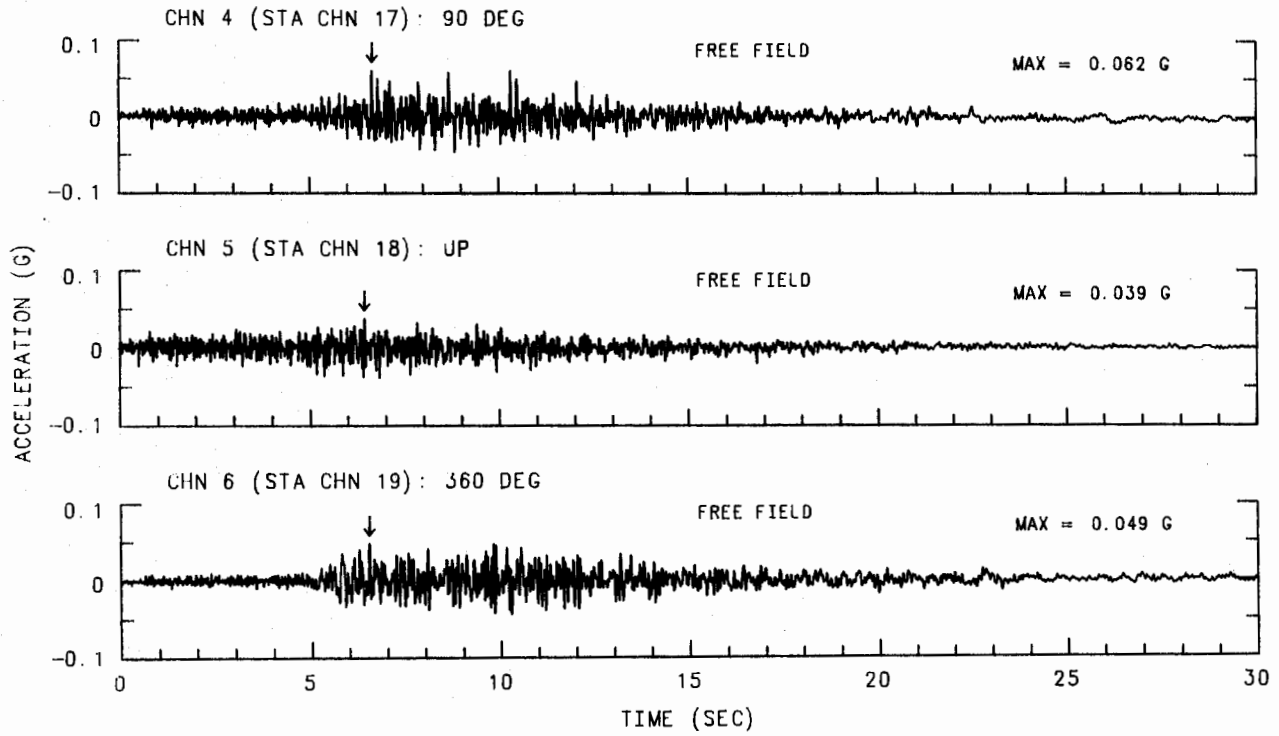


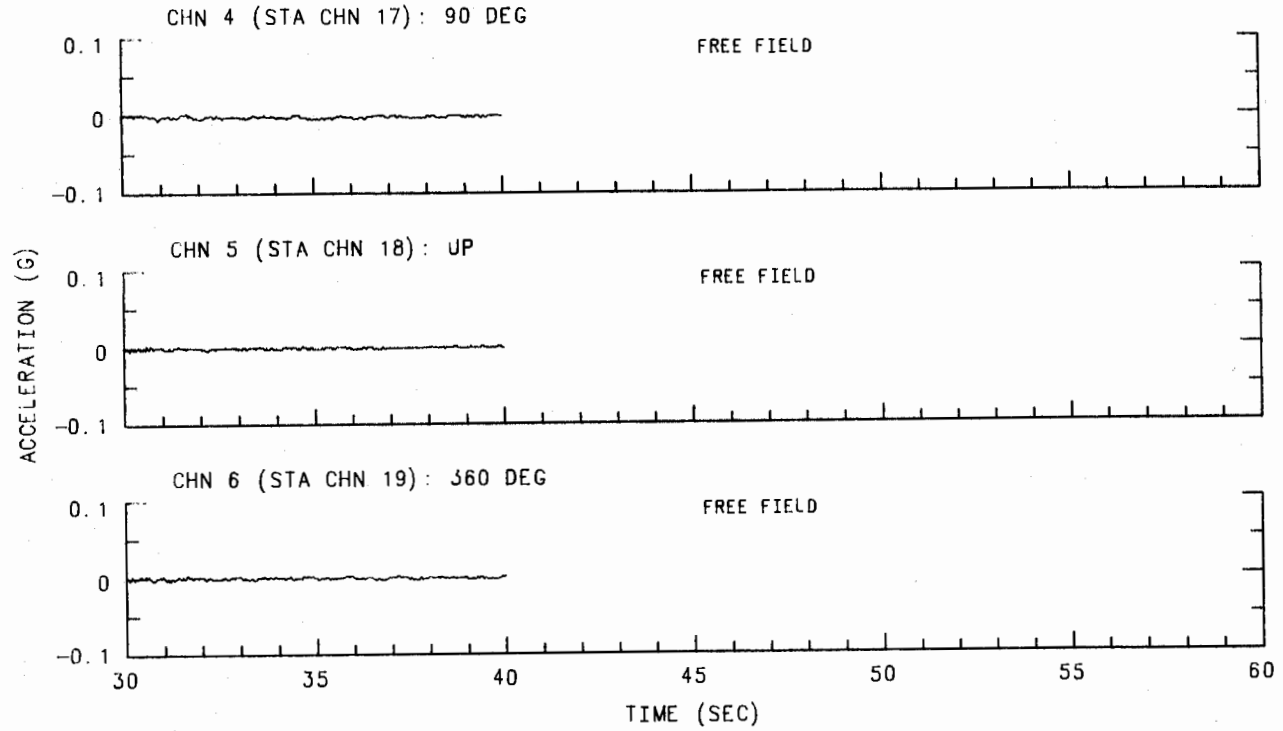
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

RANCHO CUCAMONGA - LAW & JUSTICE CENTER: CSMIP S/N 497

PHASE 1 ACCELERATION

RECORD ID: 23497-C0118-87274.01



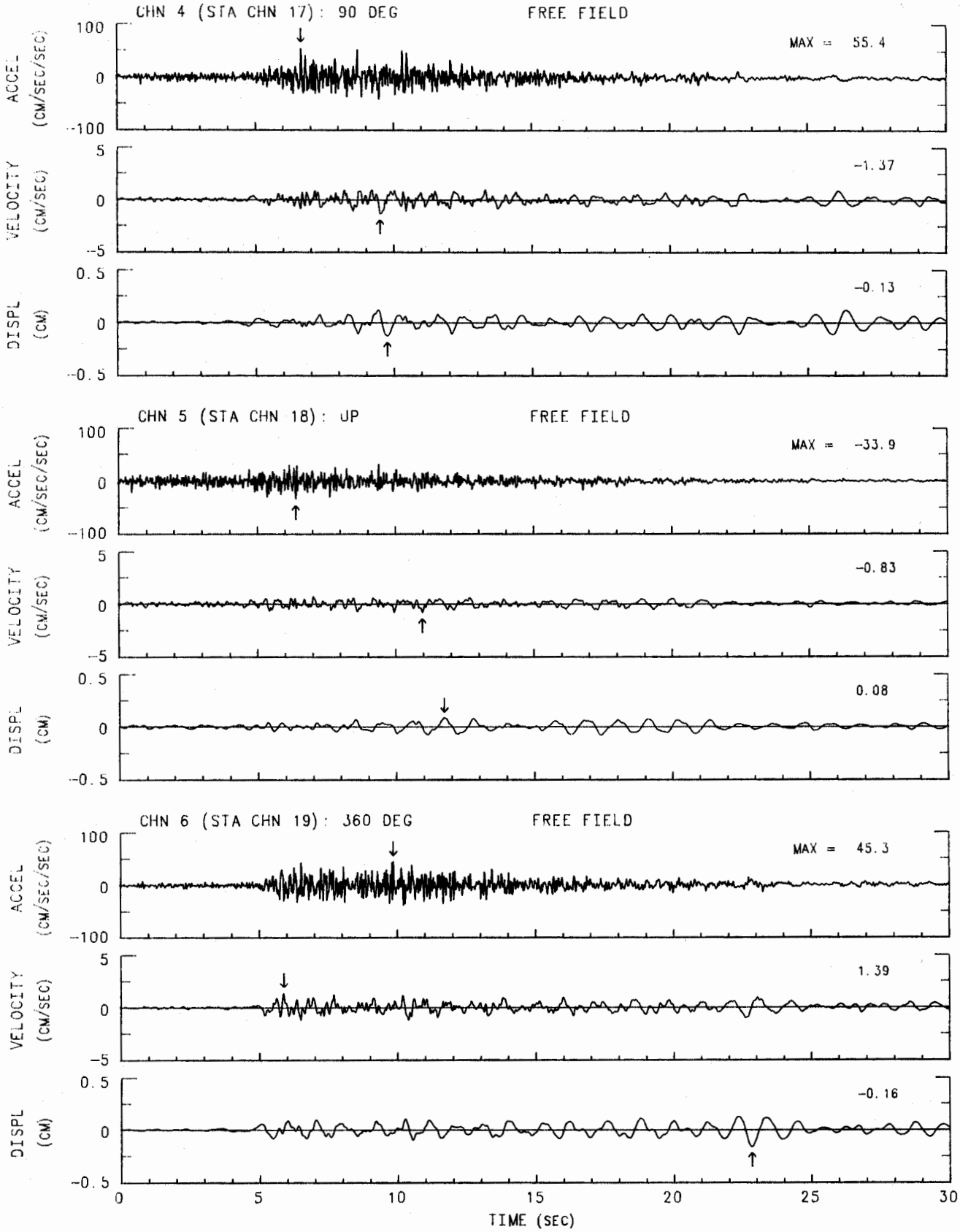


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

RANCHO CUCAMONGA - LAW & JUSTICE CENTER: CSMIP S/N 497

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 23497-C0118-87274.01



RANCHO CUCAMONGA - LAW & JUSTICE CENTER: CSMIP S/N 497

WHITTIER EARTHQUAKE

OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ

(0.04 TO 1.47 SEC)

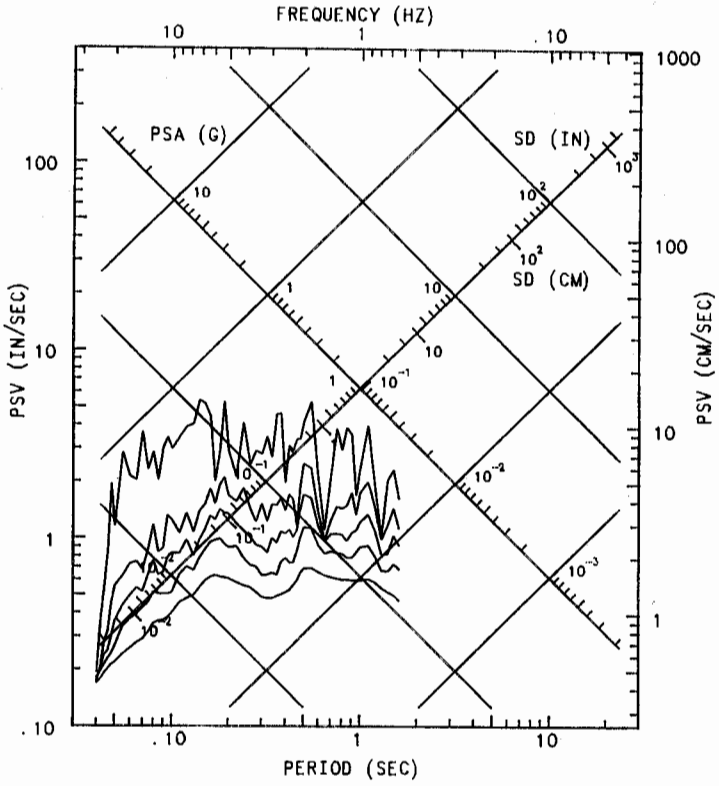
RECORD ID: 23497-C0118-87274.01

—— RESPONSE SPECTRA: PSV, PSA & SD

DAMPING VALUES: 0, 2, 5, 10, 20%

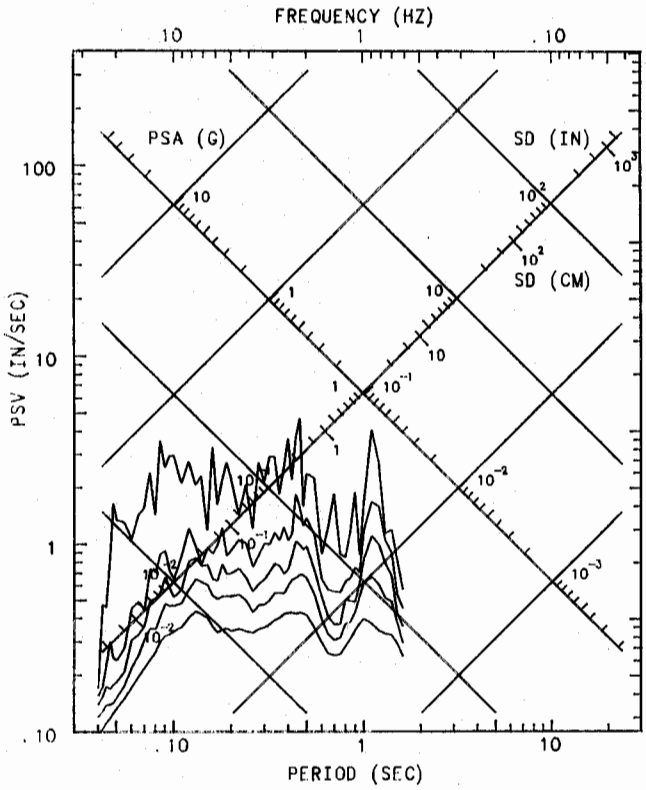
CHN 4 (STA CHN 17): 90 DEG

FREE FIELD



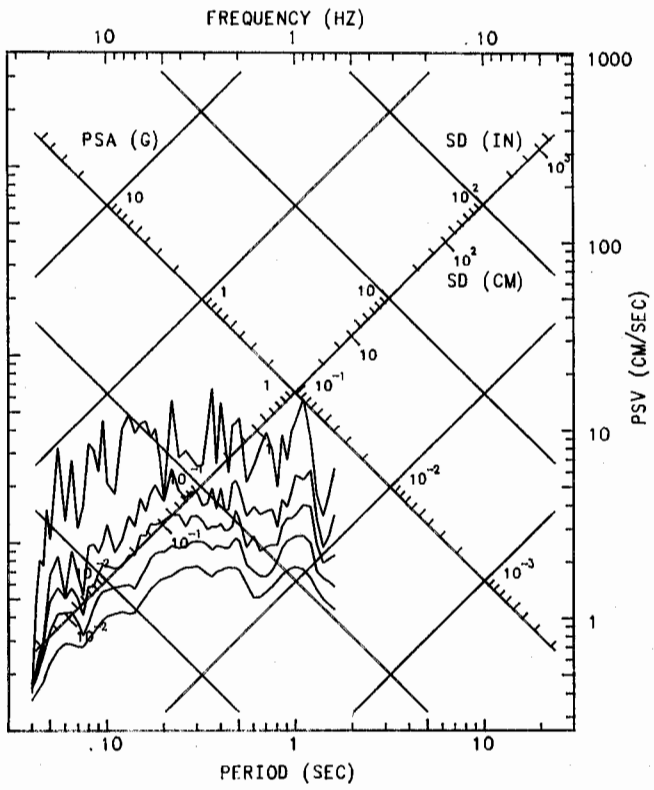
CHN 5 (STA CHN 18): UP

FREE FIELD



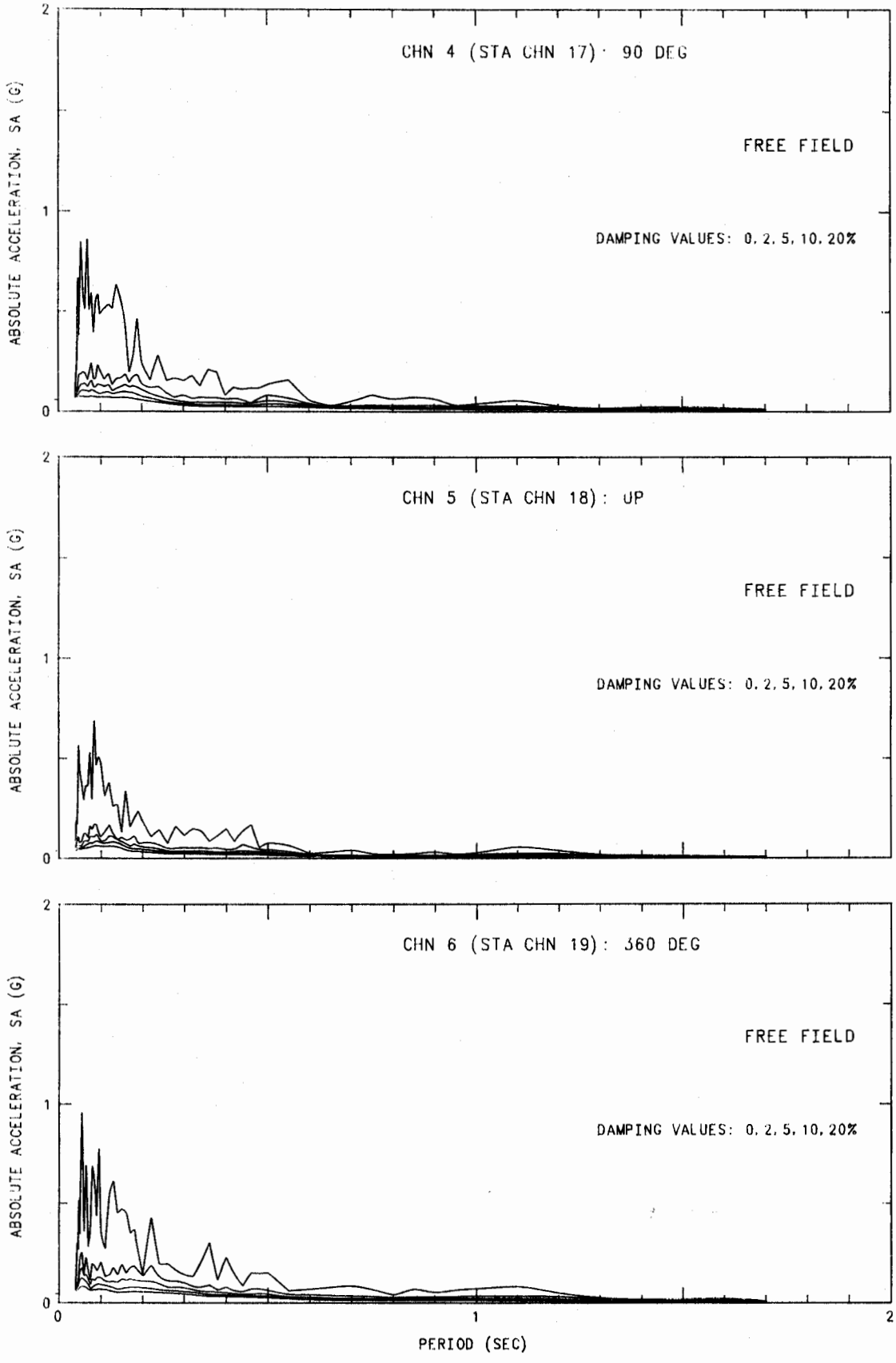
CHN 6 (STA CHN 19): 360 DEG

FREE FIELD



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
RANCHO CUCAMONGA - LAW & JUSTICE CENTER: CSMIP S/N 497

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 23497-C0118-87274.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

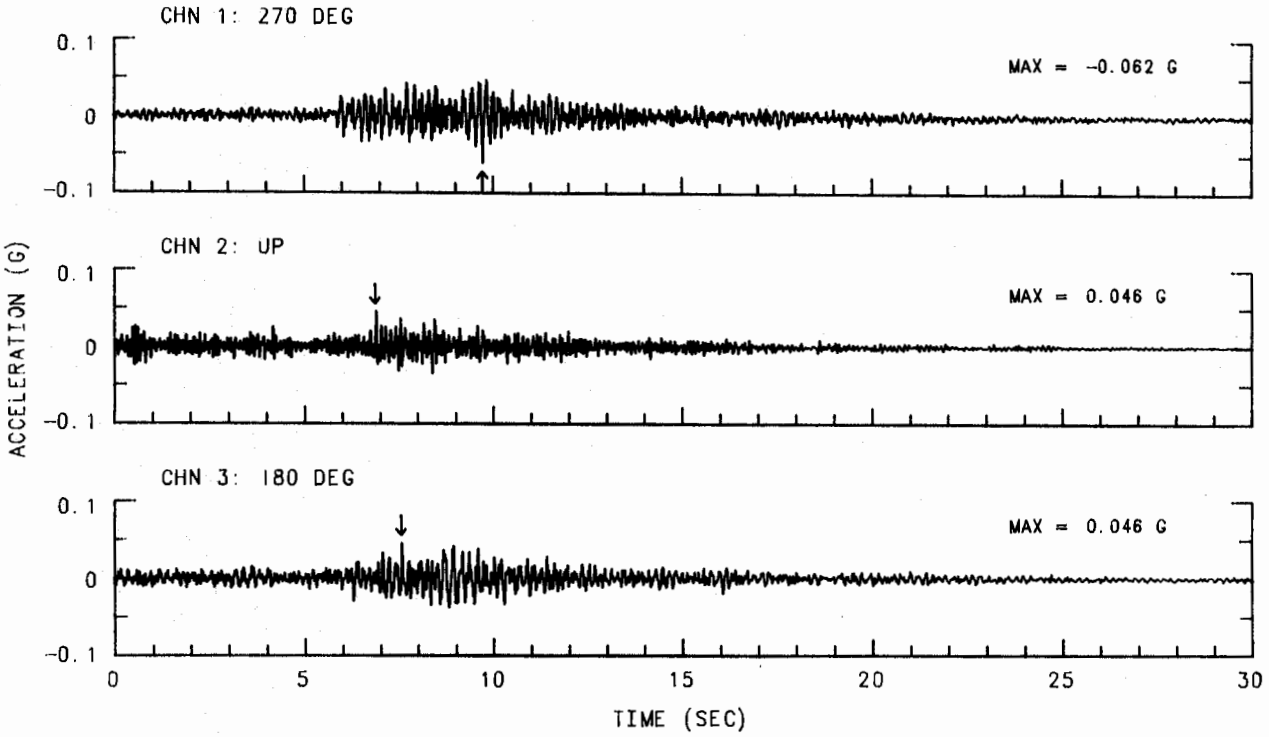


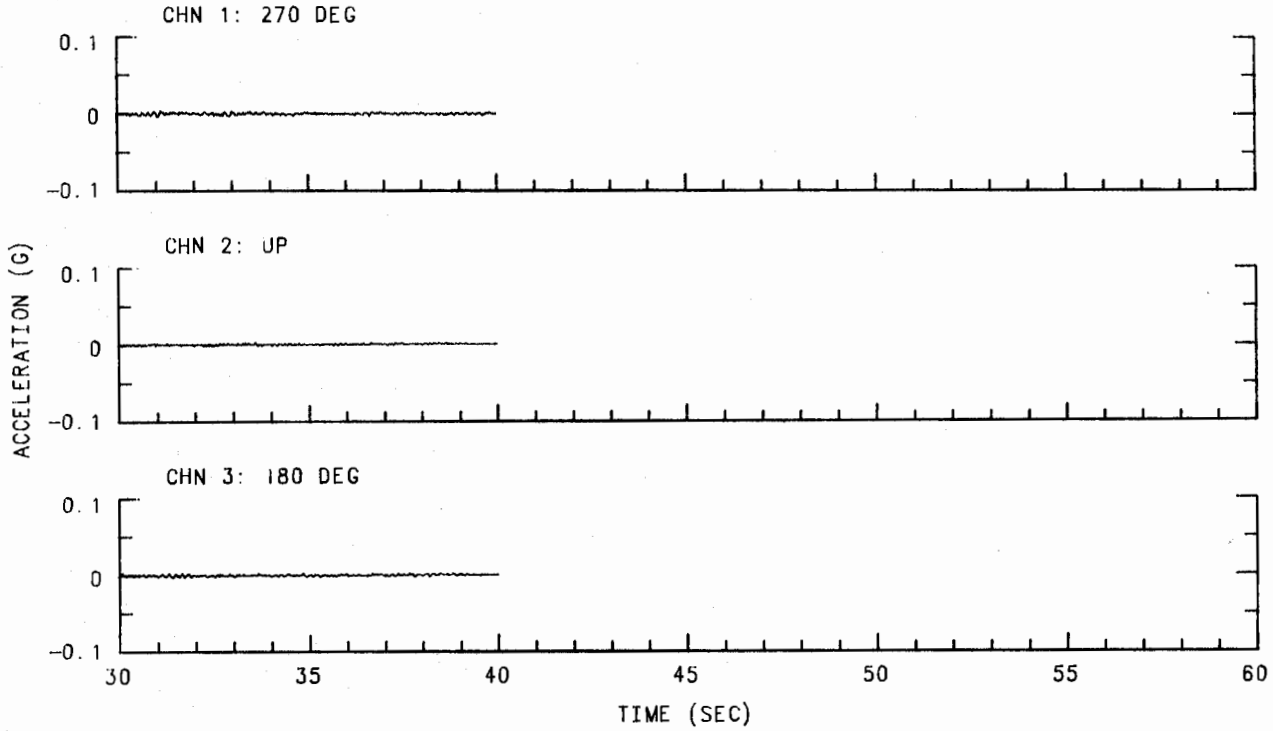
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

RIVERSIDE - AIRPORT: CSMIP S/N 123

PHASE 1 ACCELERATION

RECORD ID: 13123-S1593-87278.01



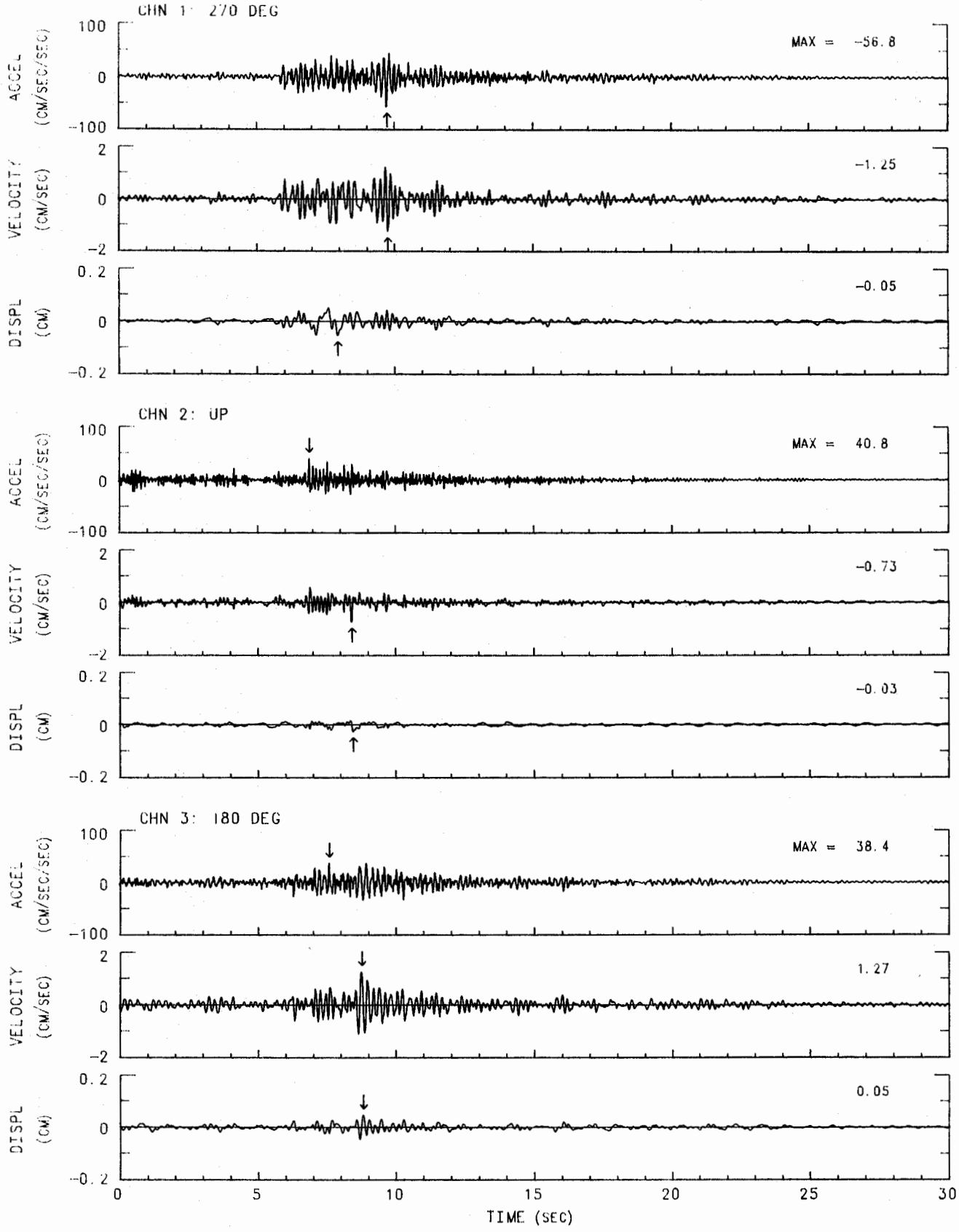


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

RIVERSIDE - AIRPORT: CSMIP S/N 123

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ (0.04 TO 1.18 SEC) RECORD ID: 13123-S1593-87278.01



RIVERSIDE - AIRPORT: CSMIP S/N 123

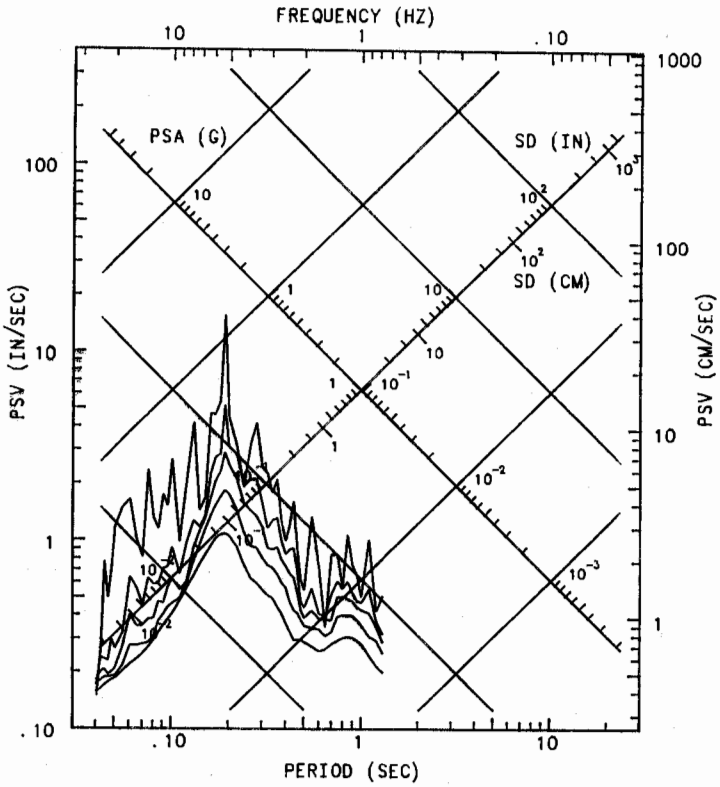
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ
(0.04 TO 1.18 SEC)

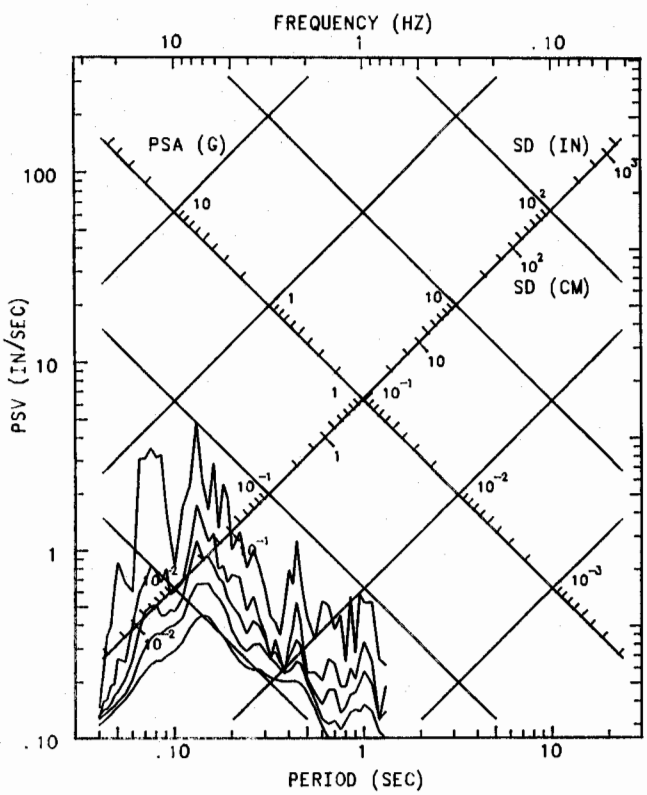
RECORD ID: 13123-S1593-87278.01

RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

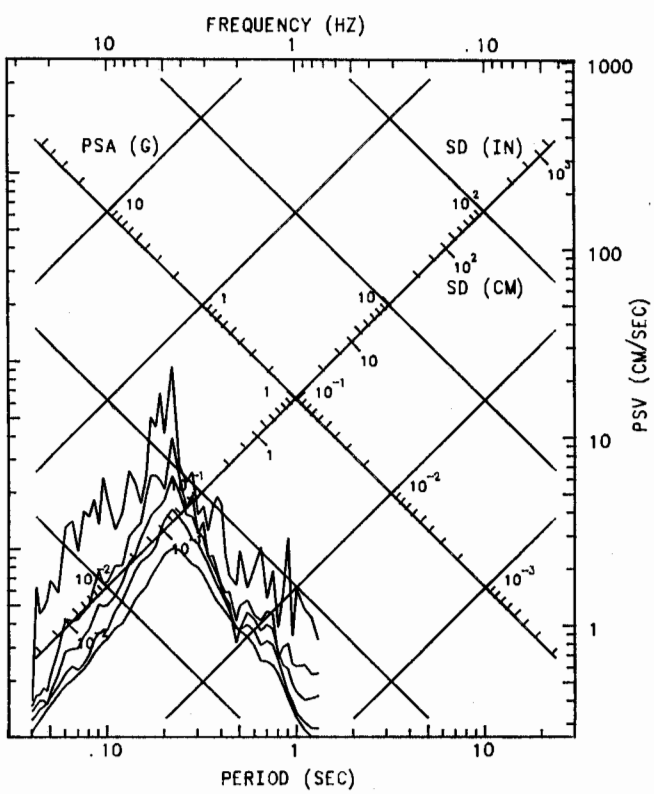
CHN 1: 270 DEG



CHN 2: UP

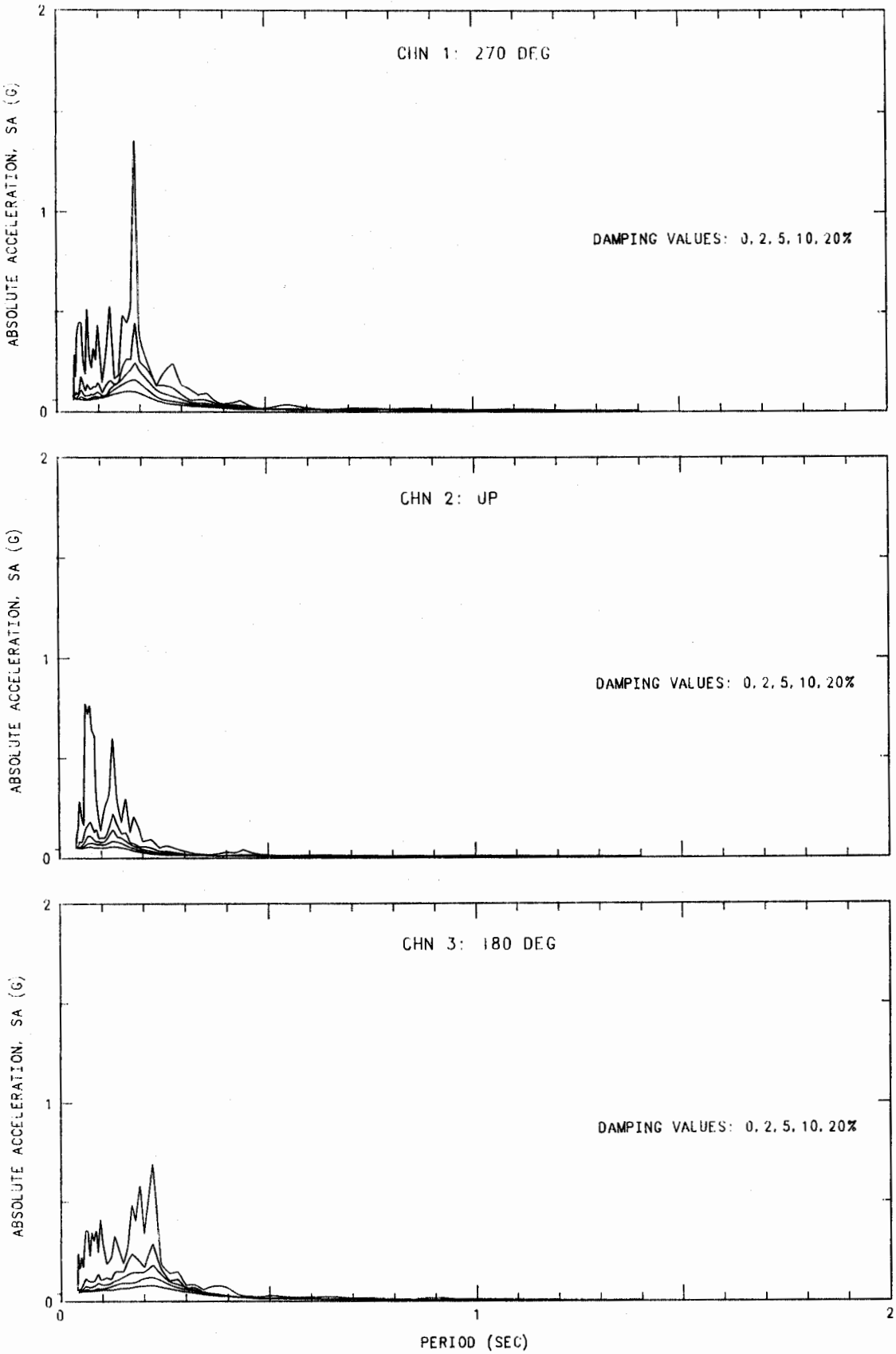


CHN 3: 180 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
RIVERSIDE - AIRPORT: CSMIP S/N 123

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 13123-S1593-87278.01
USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ (0.04 TO 1.18 SEC)

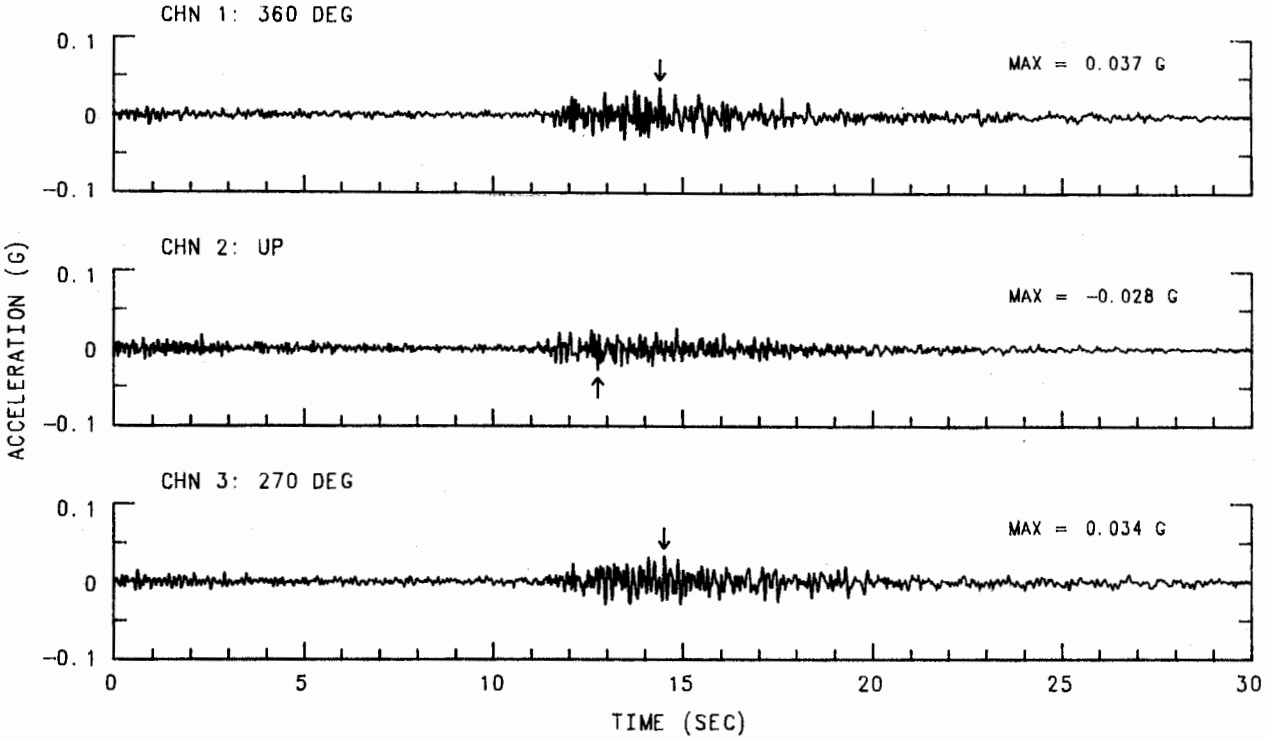


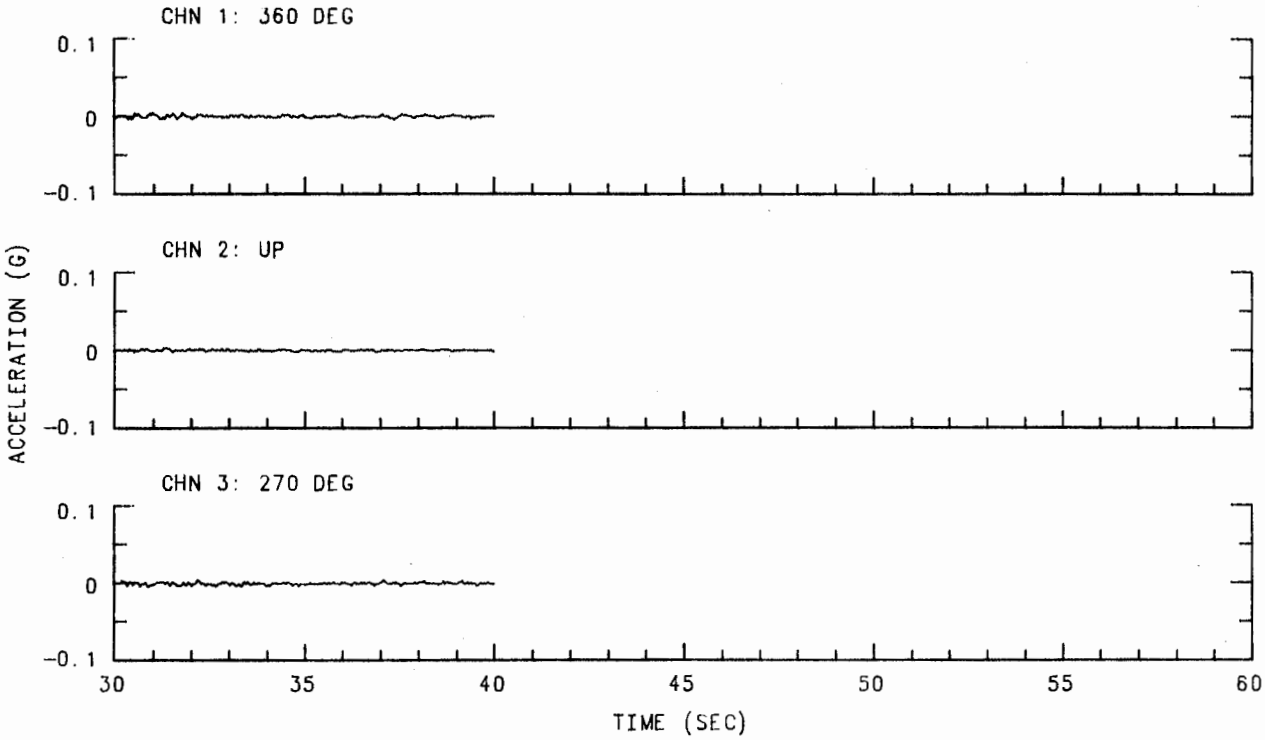
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

HEMET - STETSON AVE FIRE STATION: CSMIP S/N 331

PHASE 1 ACCELERATION

RECORD ID: 12331-S2572-87279.01



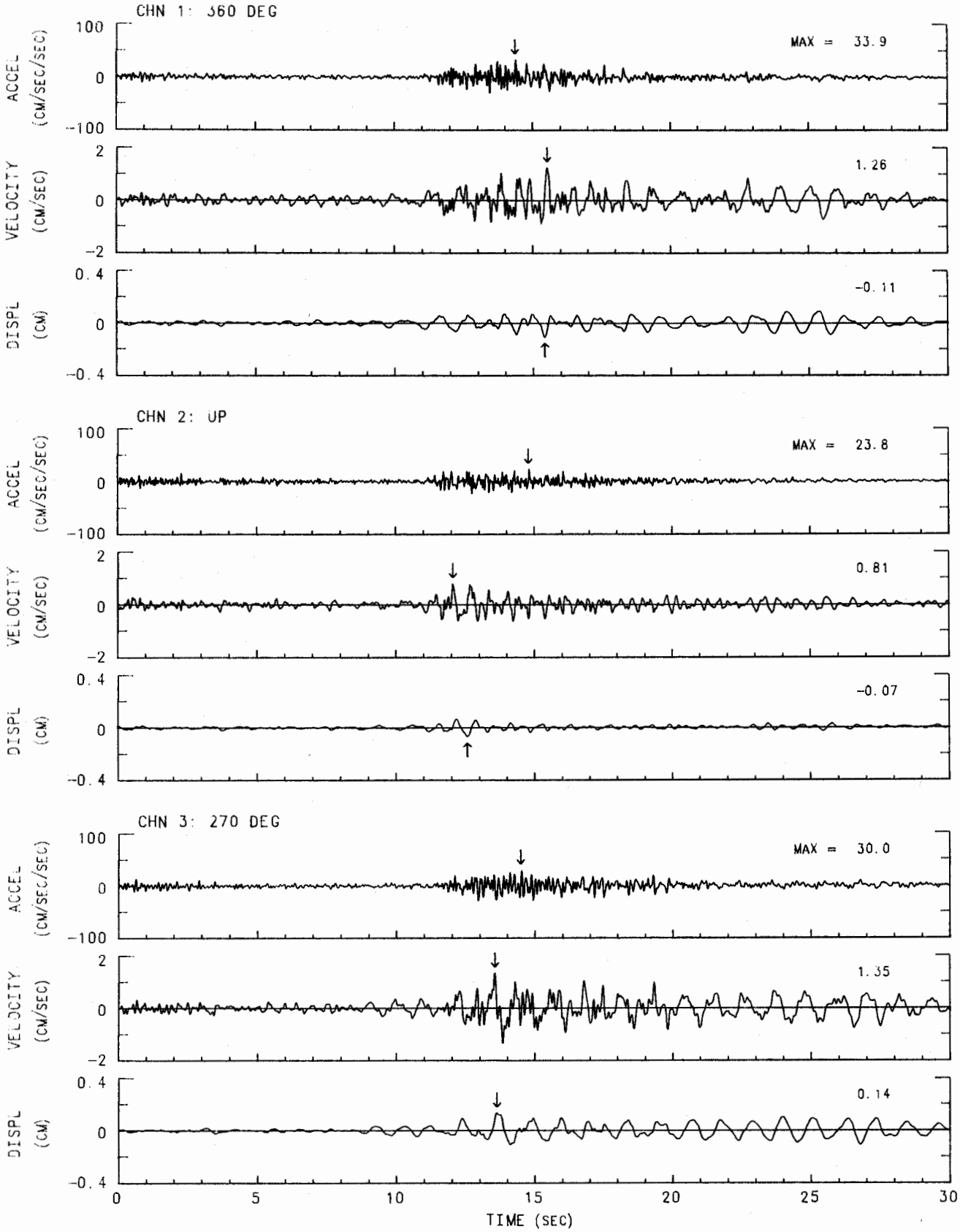


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

HEMET - STETSON AVE FIRE STATION: CSMIP S/N 331

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 12331-S2572-87279.01



HEMET - STETSON AVE FIRE STATION: CSMIP S/N 331

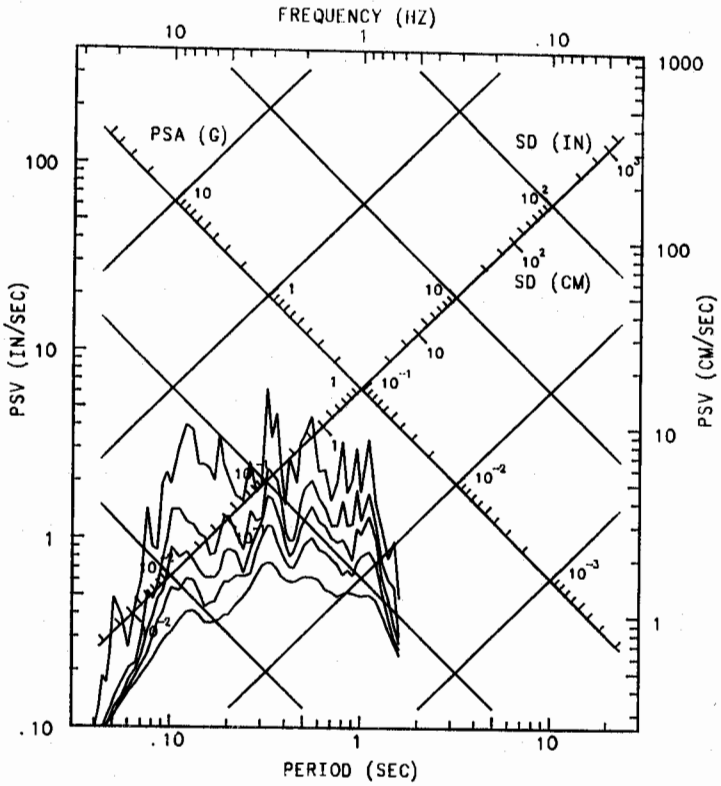
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ
(0.04 TO 1.47 SEC)

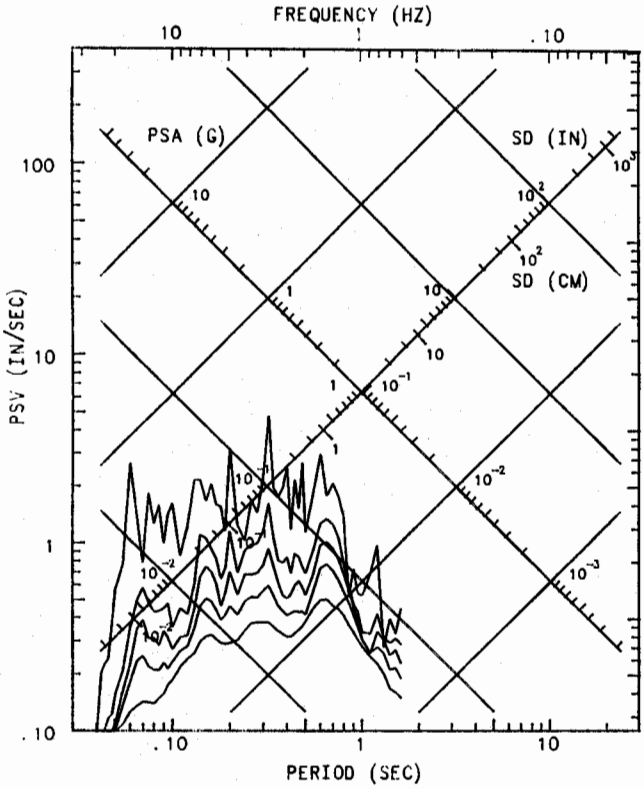
RECORD ID: 12331-S2572-87279.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

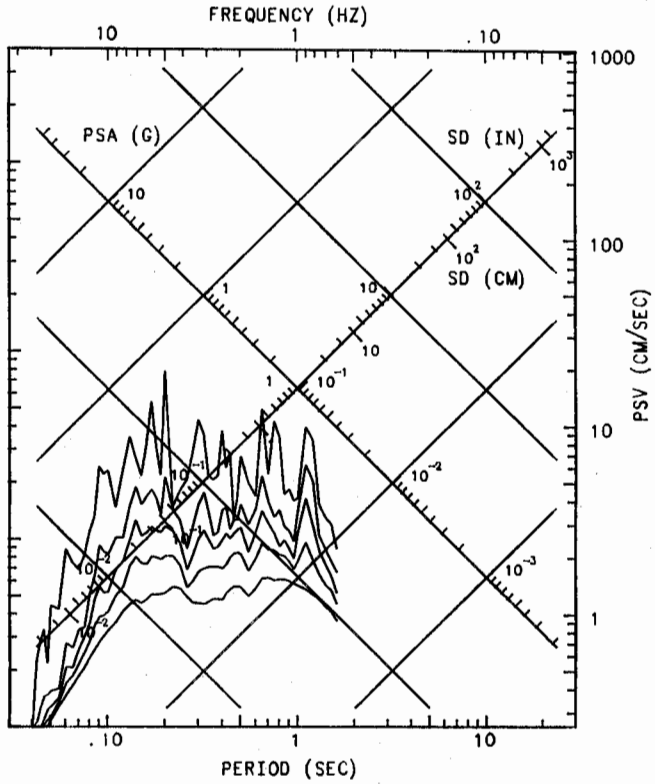
CHN 1: 360 DEG



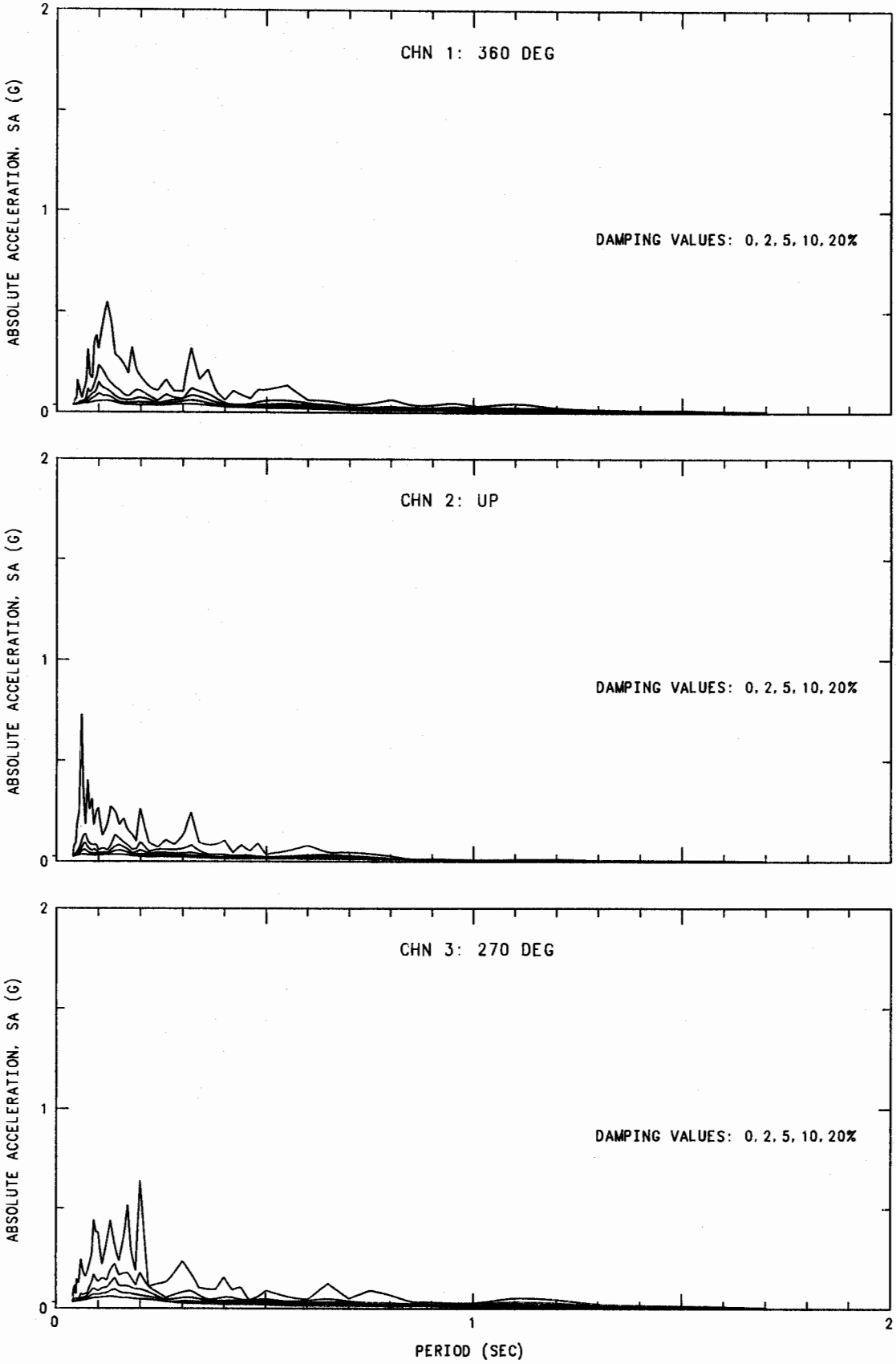
CHN 2: UP



CHN 3: 270 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
HEMET - STETSON AVE FIRE STATION: CSMIP S/N 331
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 12331-S2572-87279.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

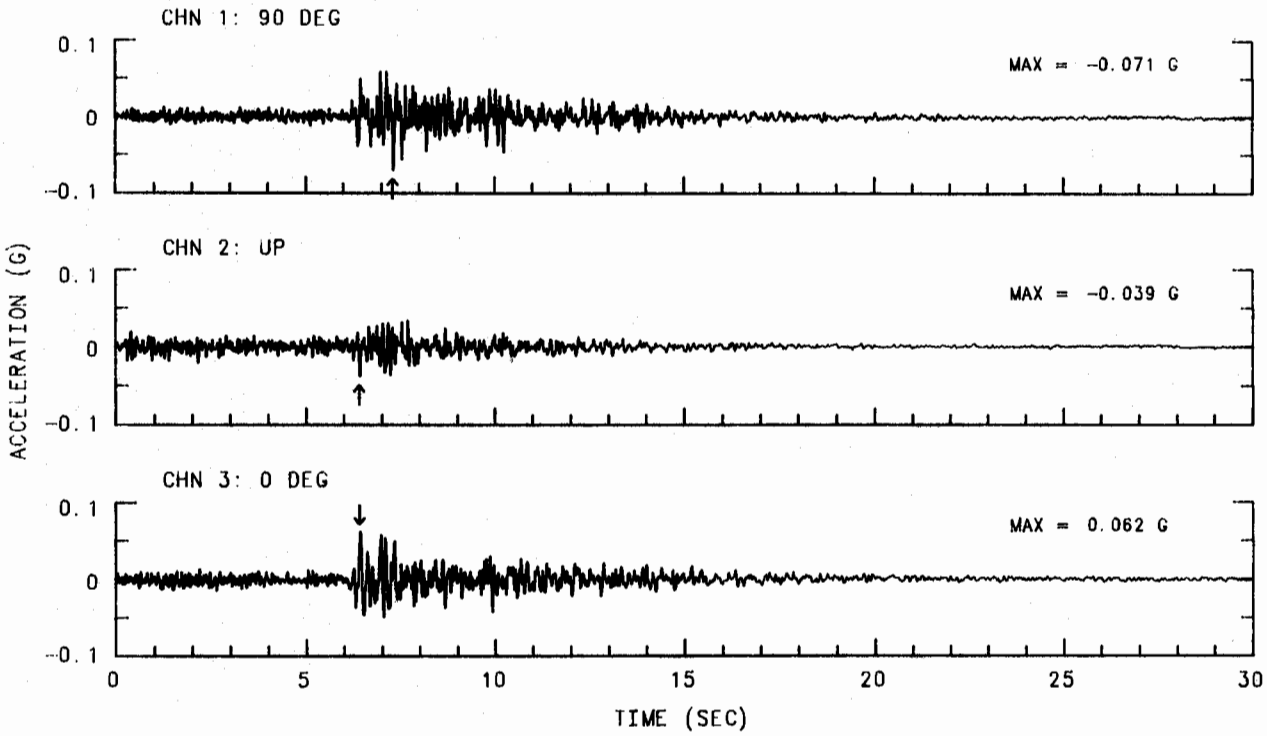


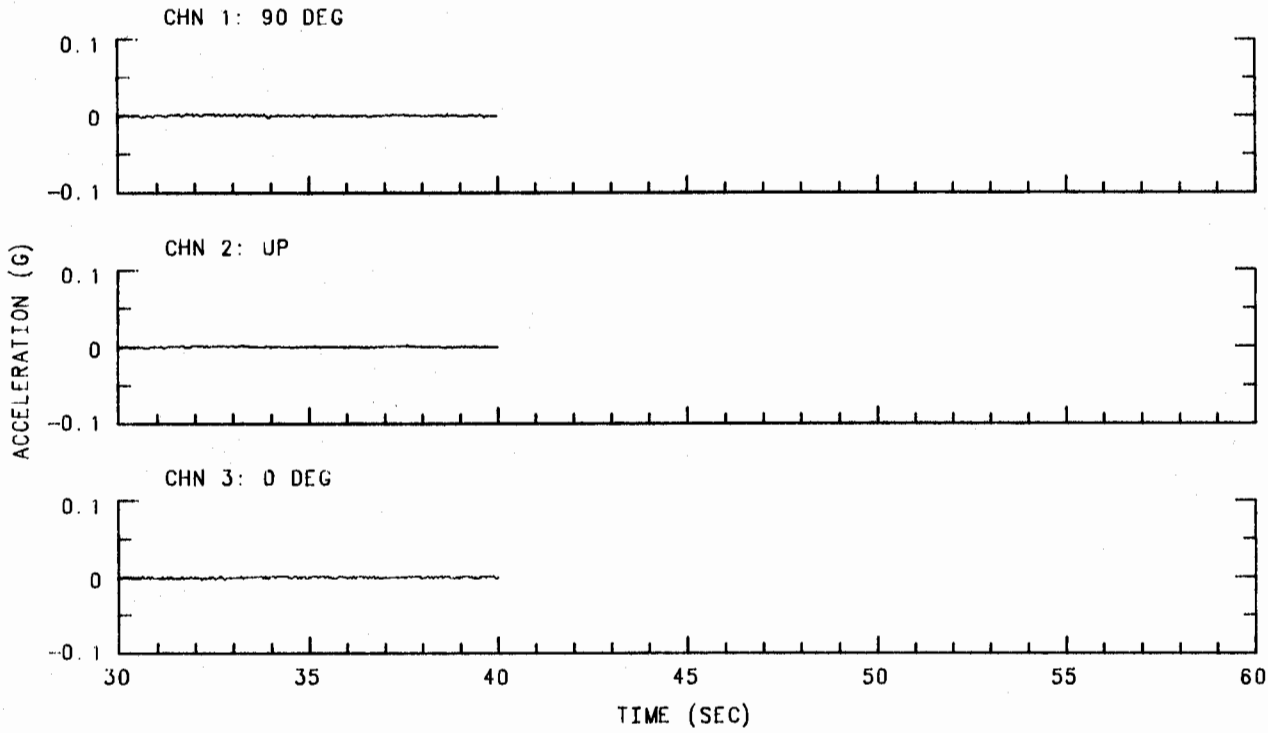
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

VASQUEZ ROCKS PARK: CSMIP S/N 047

PHASE 1 ACCELERATION

RECORD ID: 24047-S1820-87280.01.1

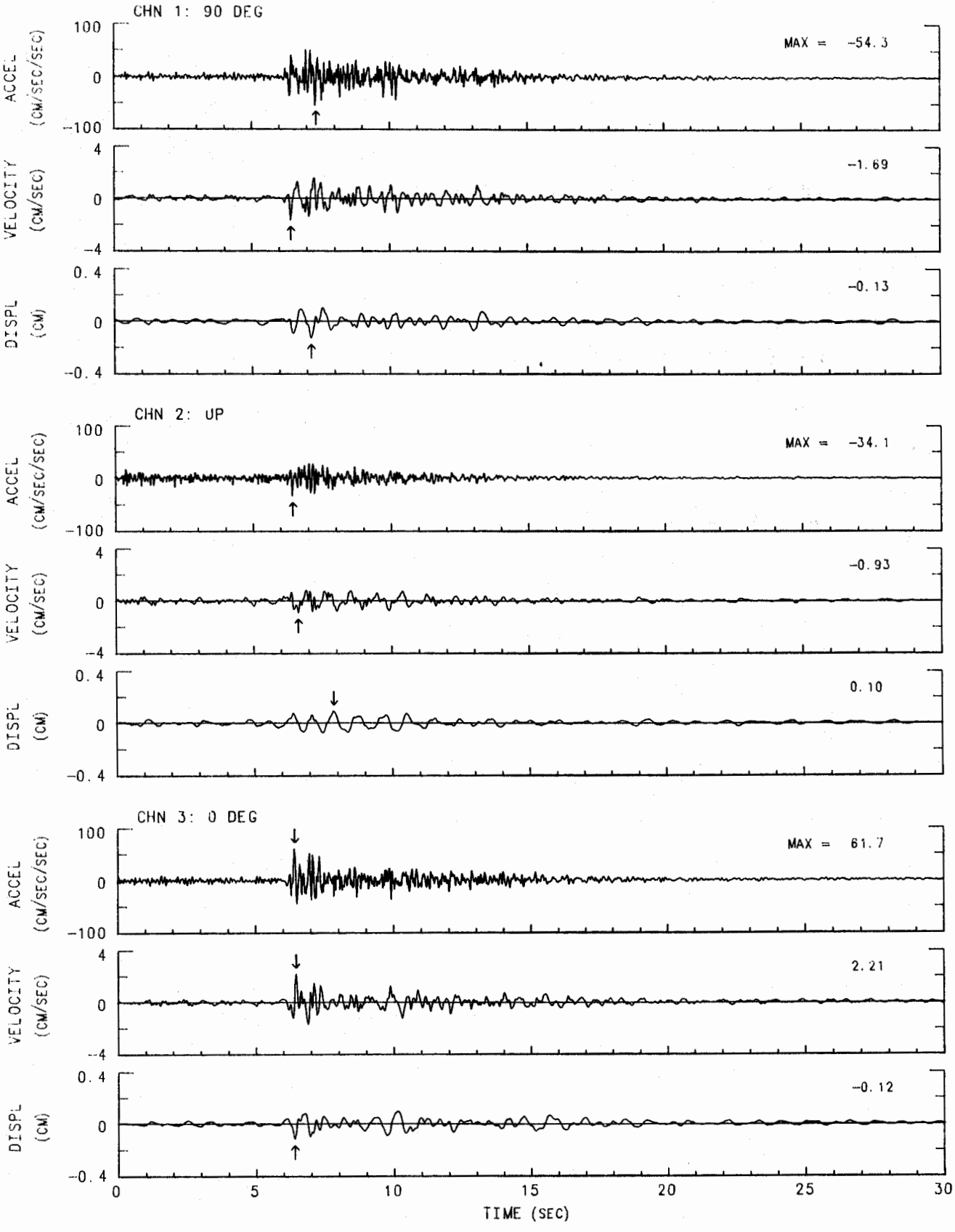




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
VASQUEZ ROCKS PARK: CSMIP S/N 047

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 24047-S1820-87280.01.1



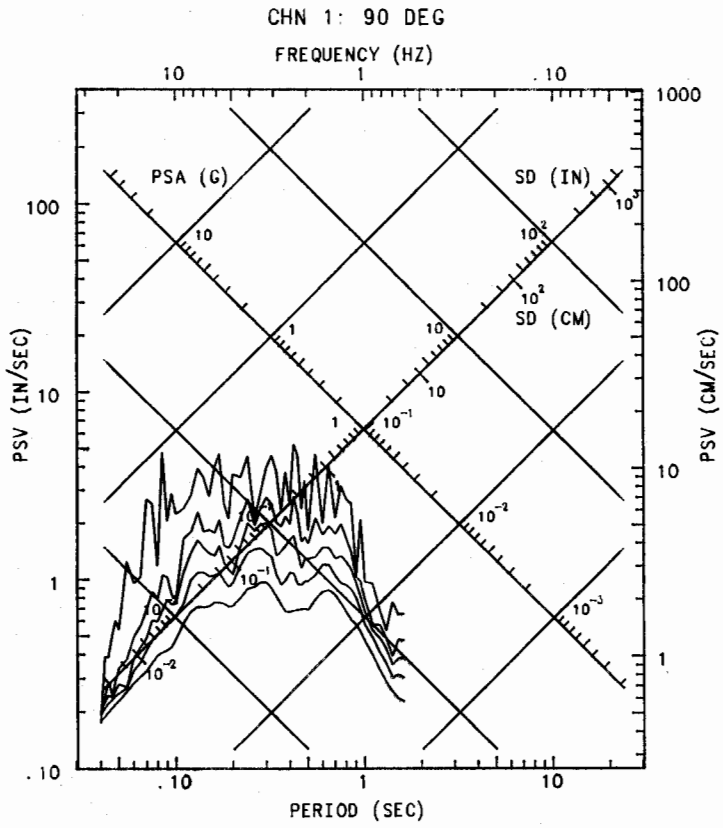
VASQUEZ ROCKS PARK: CSMIP S/N 047

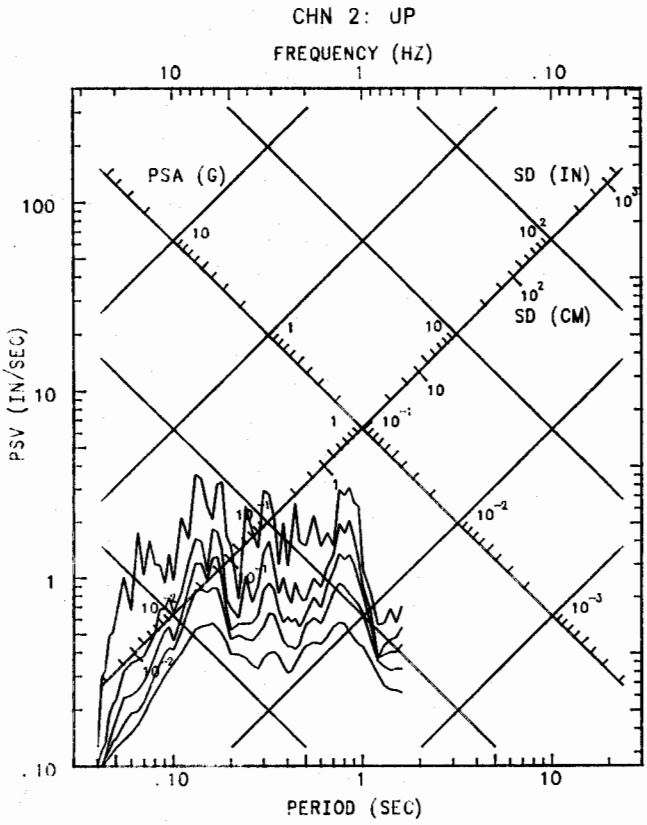
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

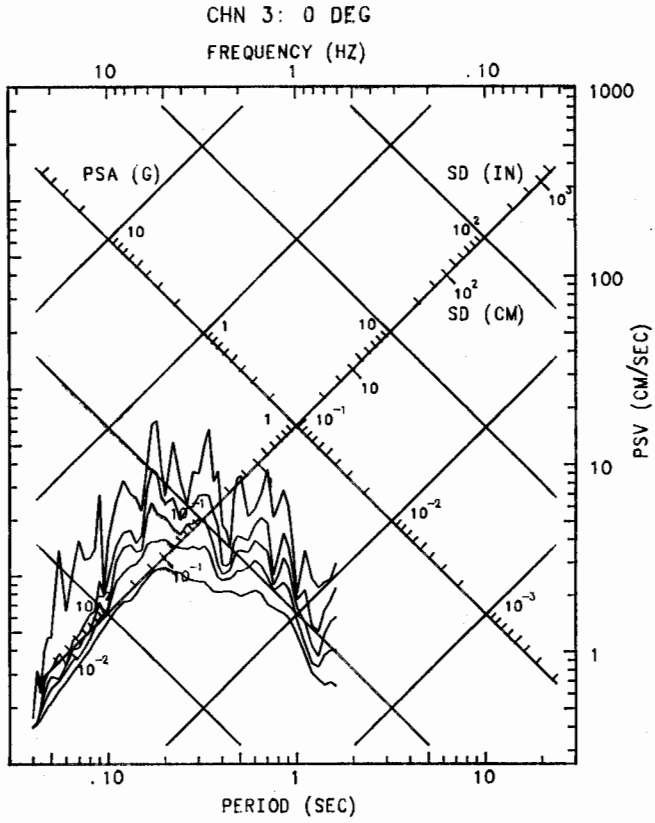
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ
(0.04 TO 1.47 SEC)

RECORD ID: 24047-S1820-87280.01.1

RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

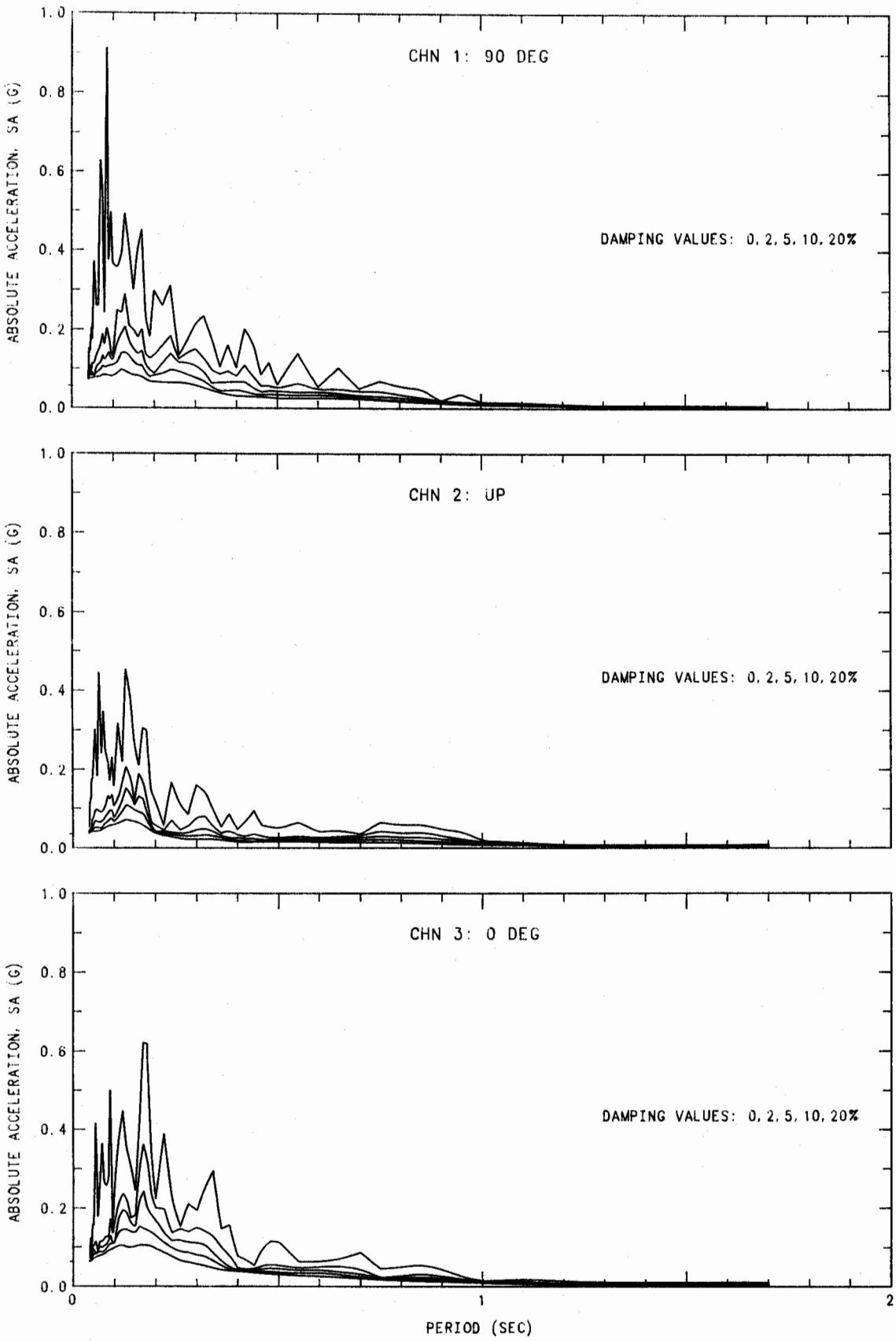






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
VASQUEZ ROCKS PARK: CSMIP S/N 047

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24047-S1820-87280.01.1
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

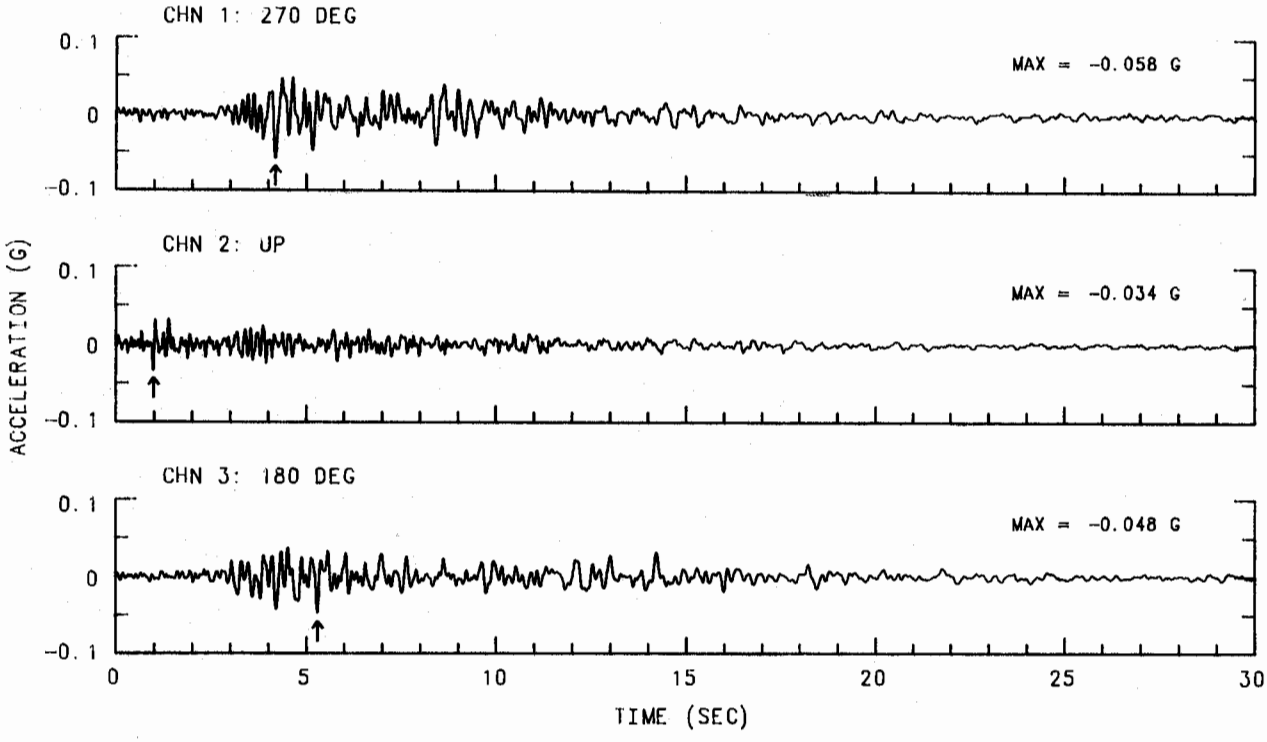


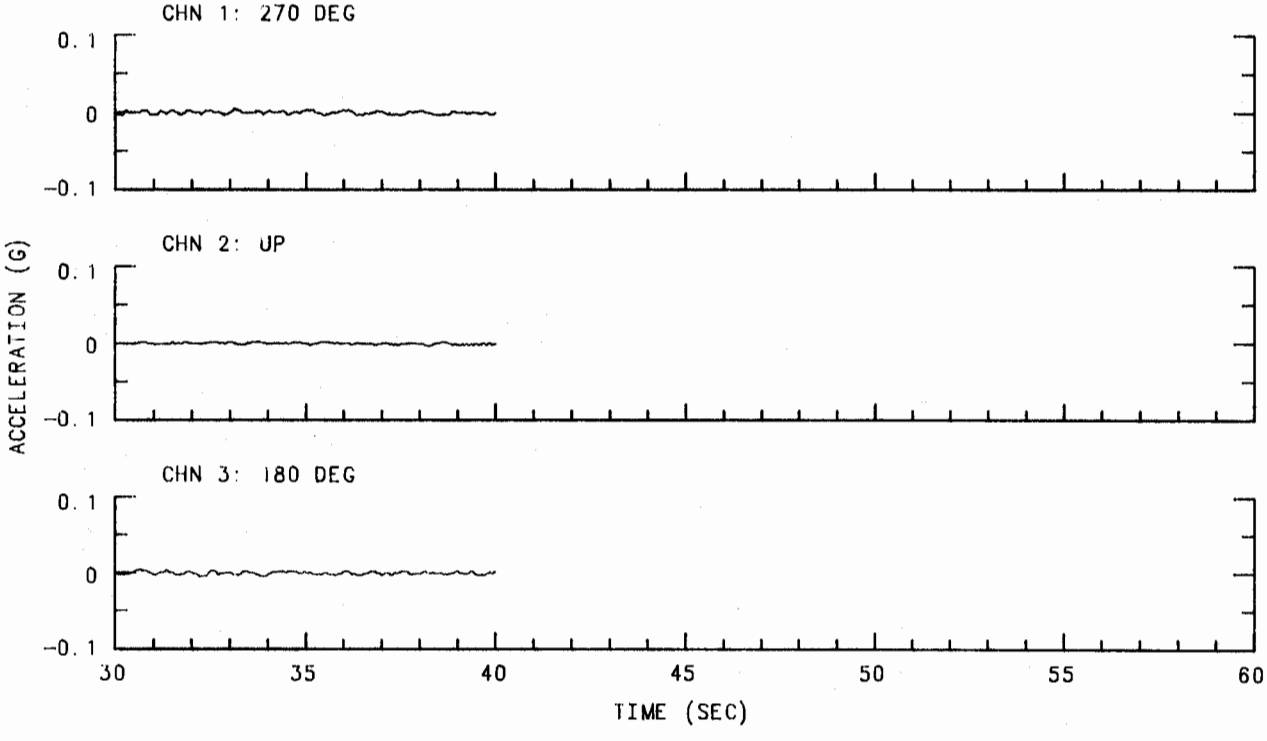
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

NEWHALL -- LA COUNTY FIRE STATION: CSMIP S/N 279

PHASE 1 ACCELERATION

RECORD ID: 24279-S2499-87279.01

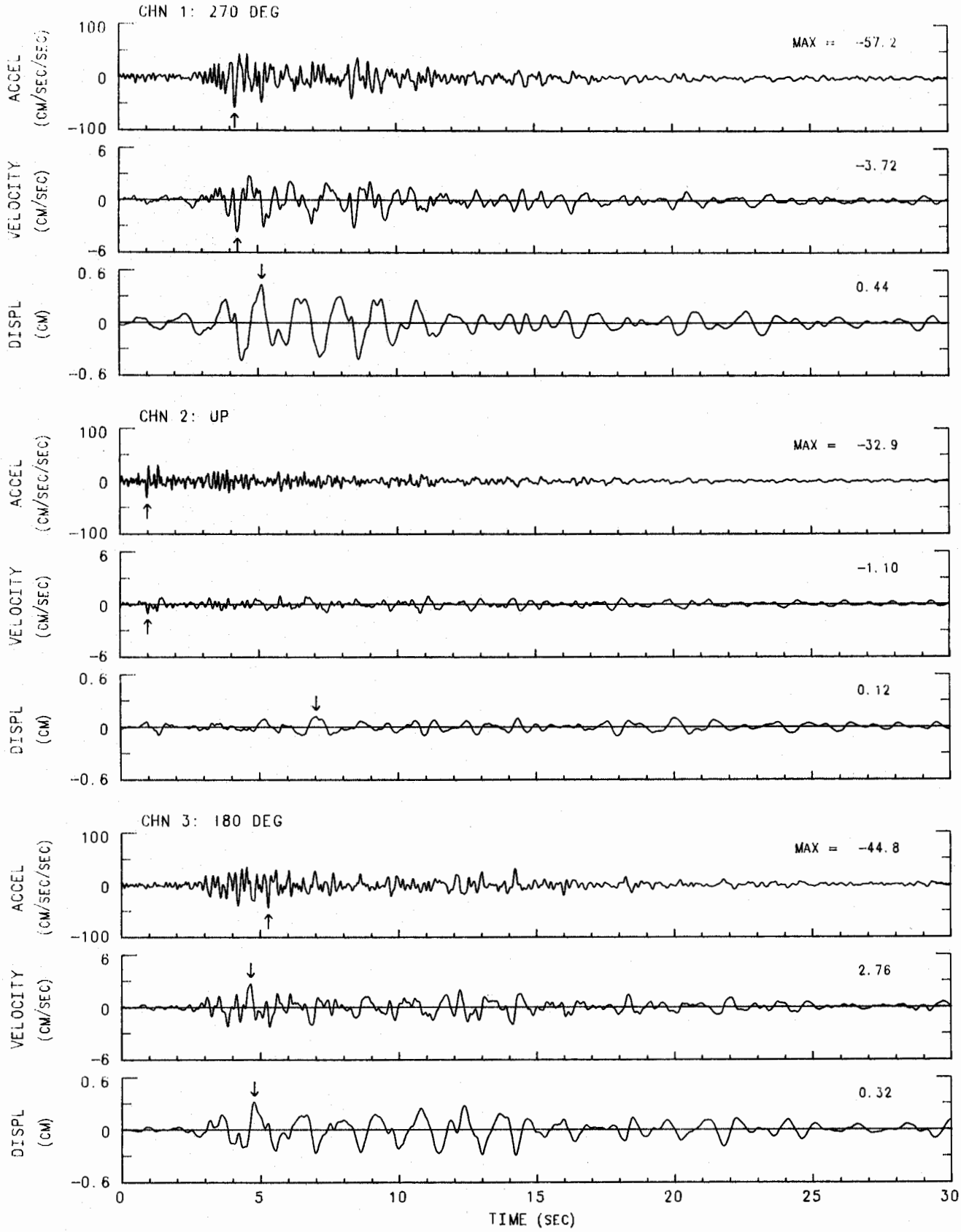




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
NEWHALL - LA COUNTY FIRE STATION: CSMIP S/N 279

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC) RECORD ID: 24279-S2499-87279.01



NEWHALL - LA COUNTY FIRE STATION: CSMIP S/N 279

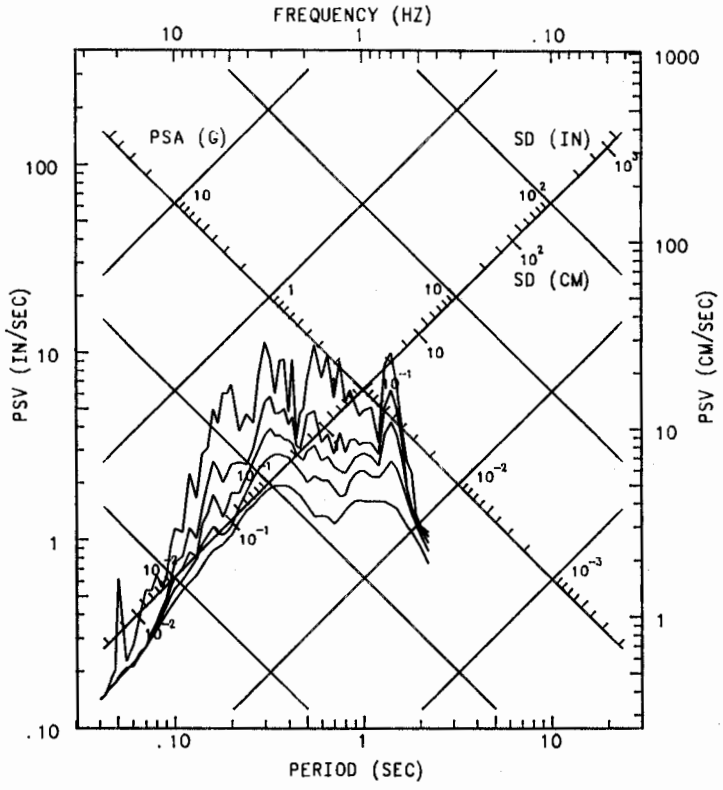
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ
(0.04 TO 1.96 SEC)

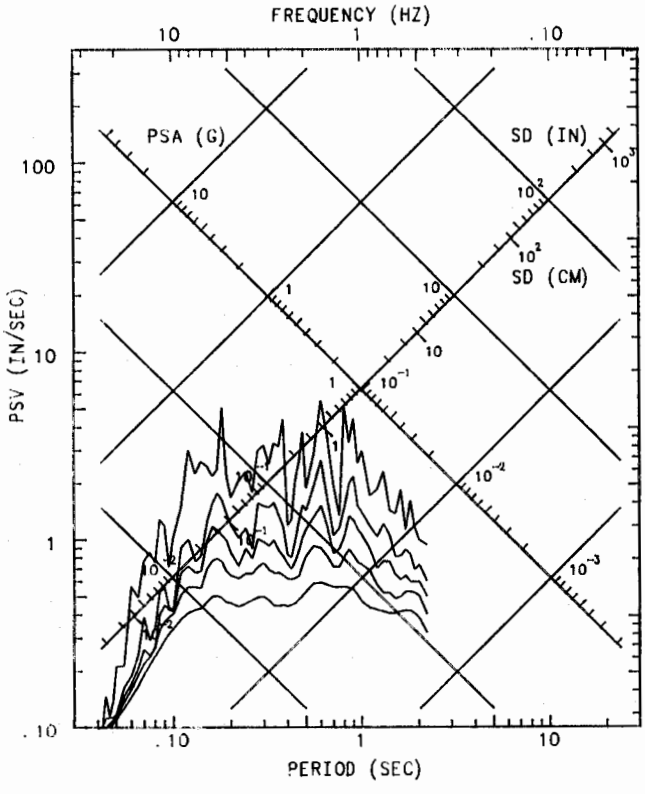
RECORD ID: 24279-S2499-87279.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

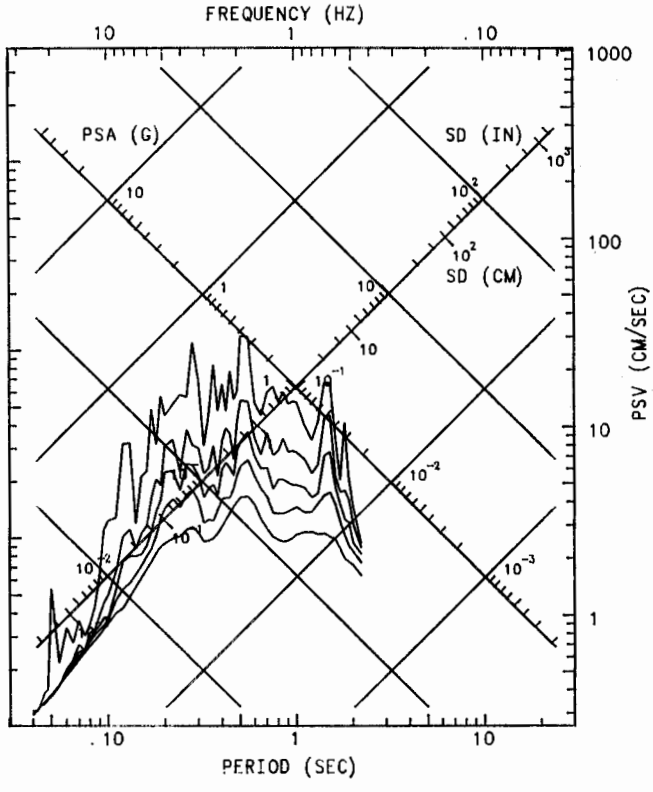
CHN 1: 270 DEG



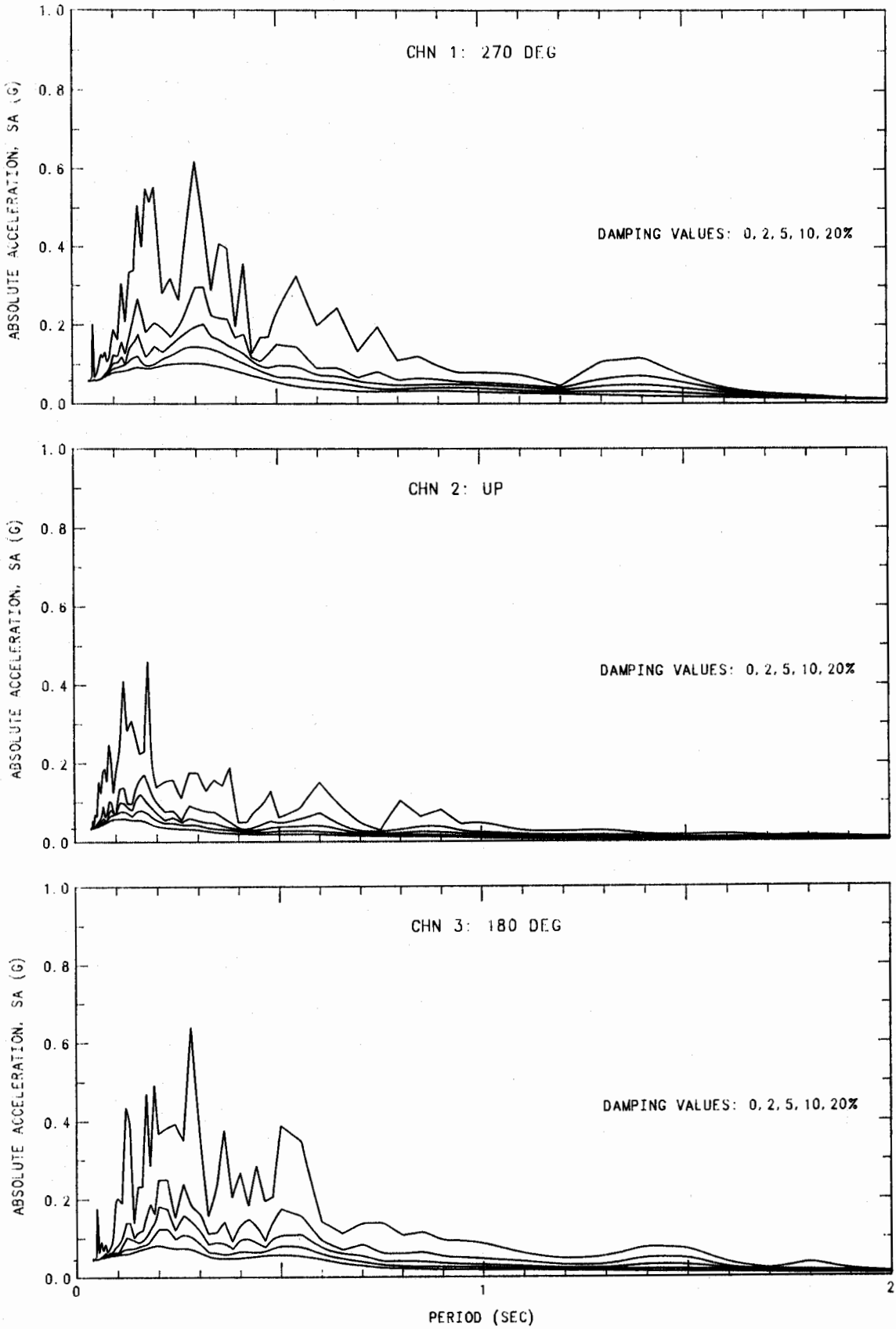
CHN 2: UP



CHN 3: 180 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
NEWHALL - LA COUNTY FIRE STATION: CSMIP S/N 279
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24279-S2499-87279.01
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC)

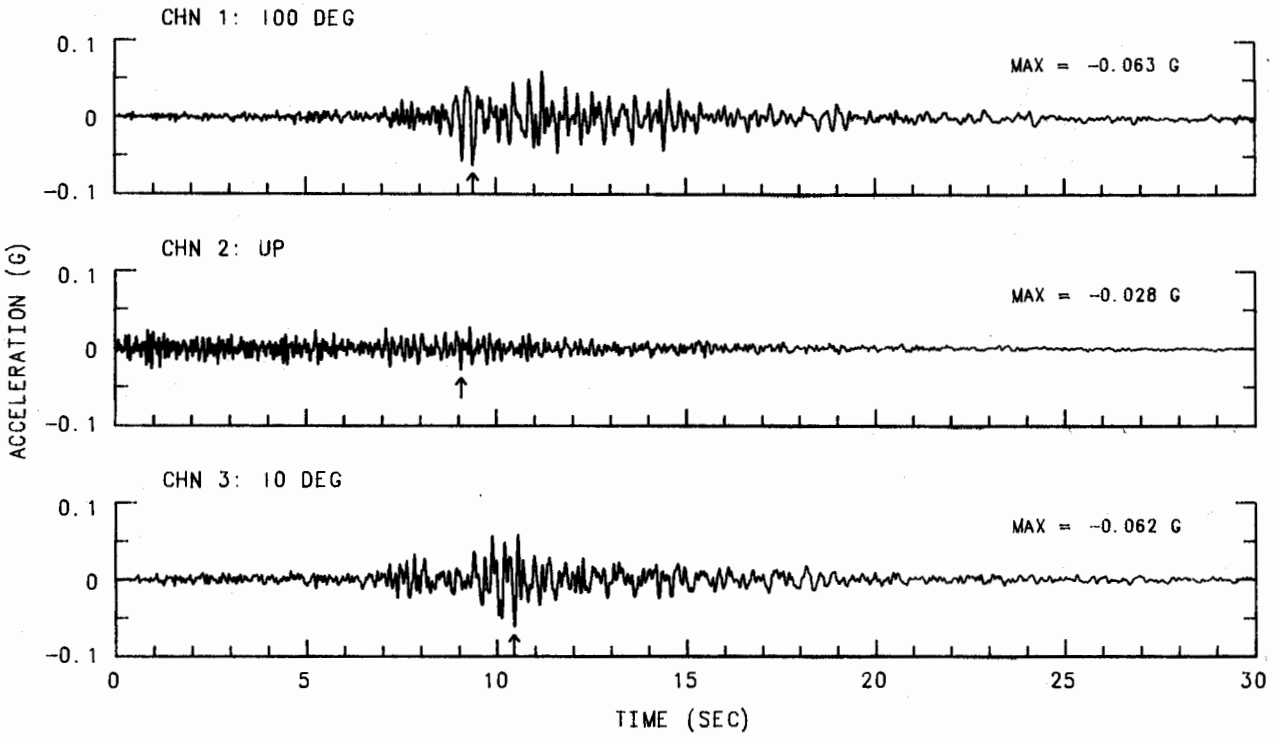


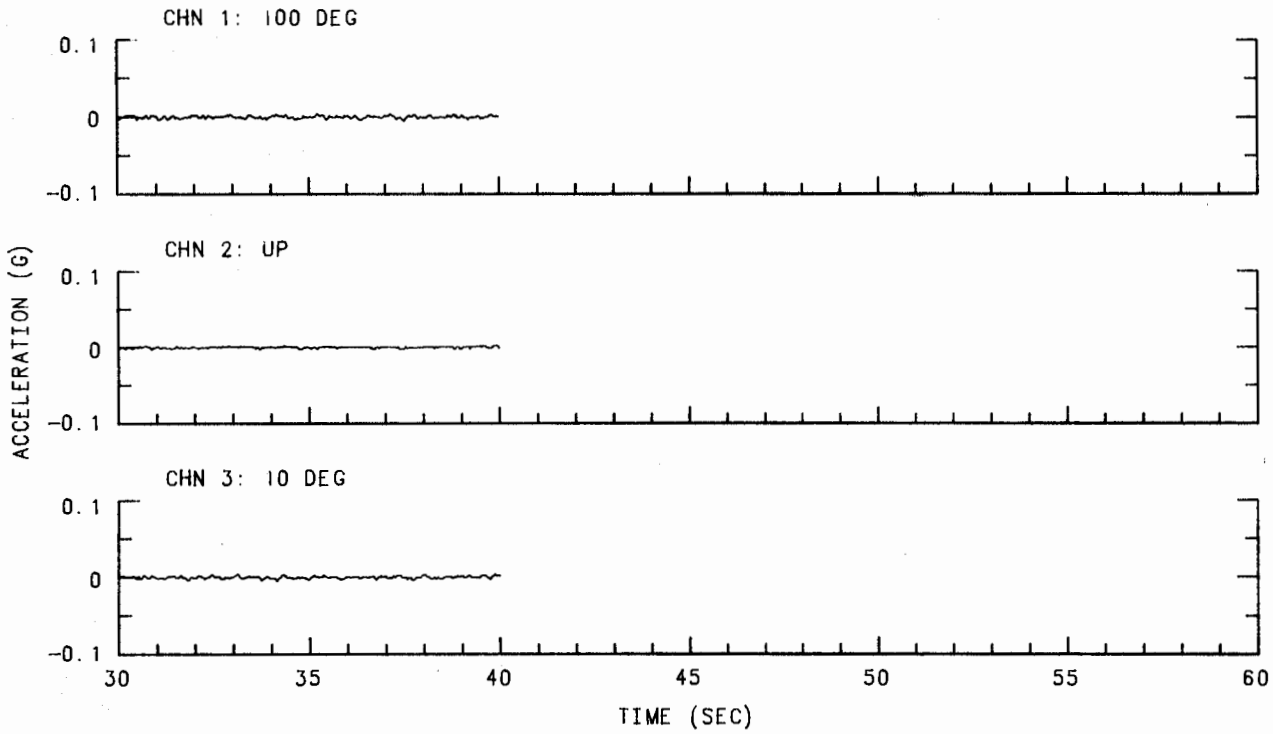
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LANCASTER - MEDICAL OFFICE BLDG. FF: CSMIP S/N 526

PHASE 1 ACCELERATION

RECORD ID: 24526-S1866-87280.14

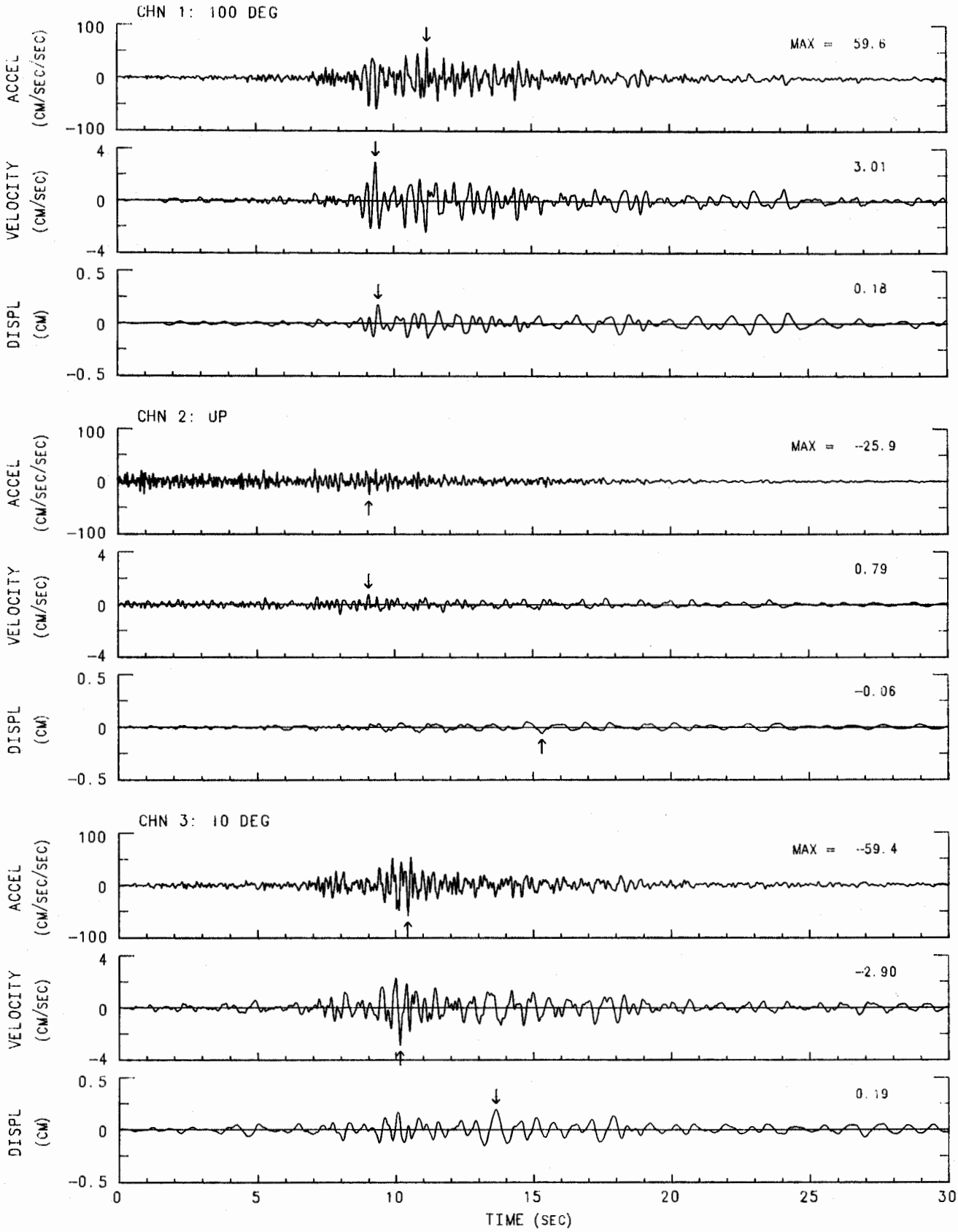




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LANCASTER - MEDICAL OFFICE BLDG. FF: CSMIP S/N 526

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 24526-S1866-87280.14



LANCASTER - MEDICAL OFFICE BLDG. FF: CSMIP S/N 526

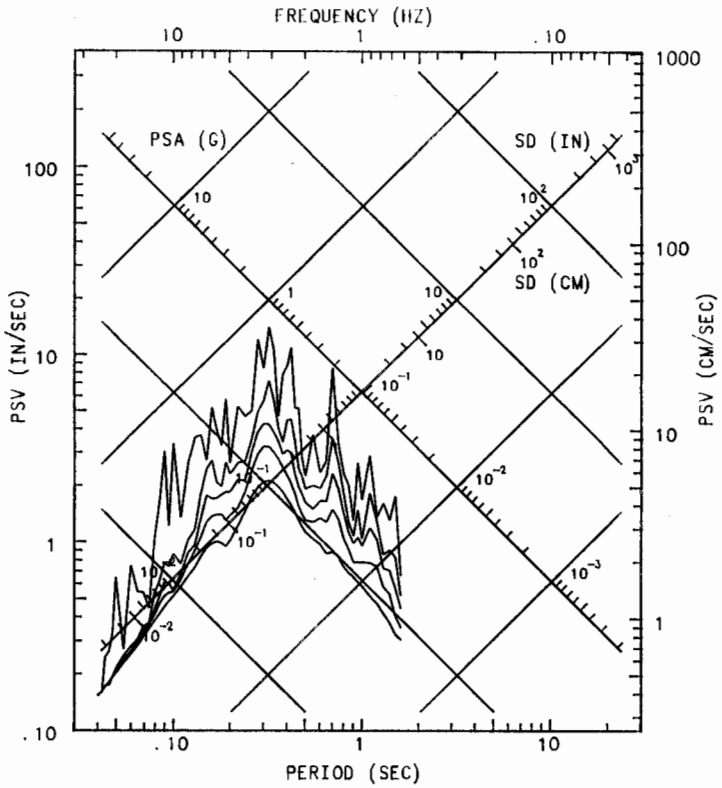
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ
(0.04 TO 1.47 SEC)

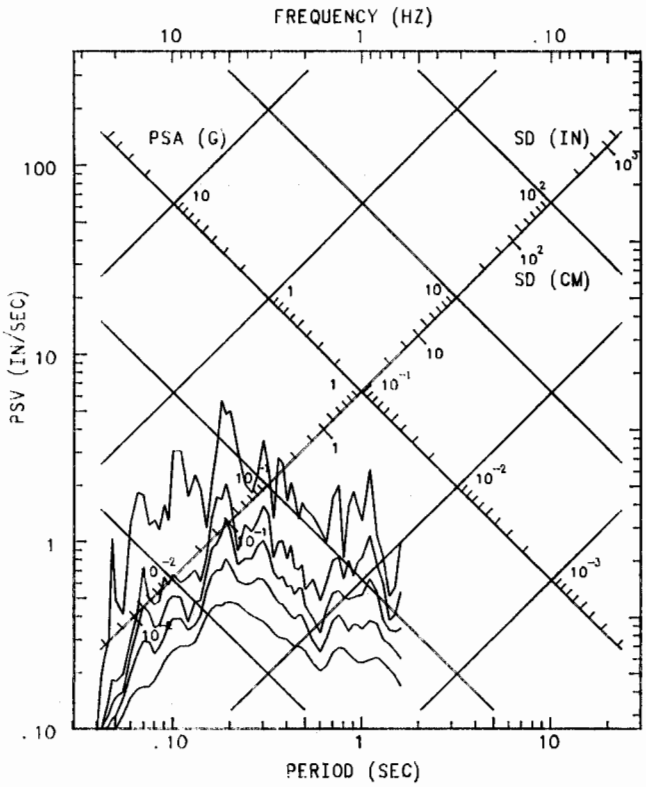
RECORD ID: 24526-S1866-87280.14

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

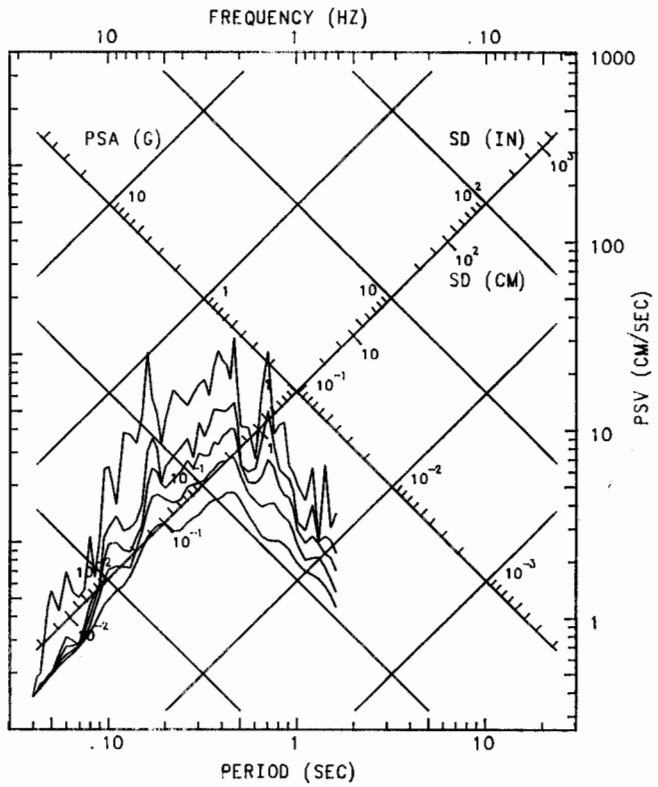
CHN 1: 100 DEG



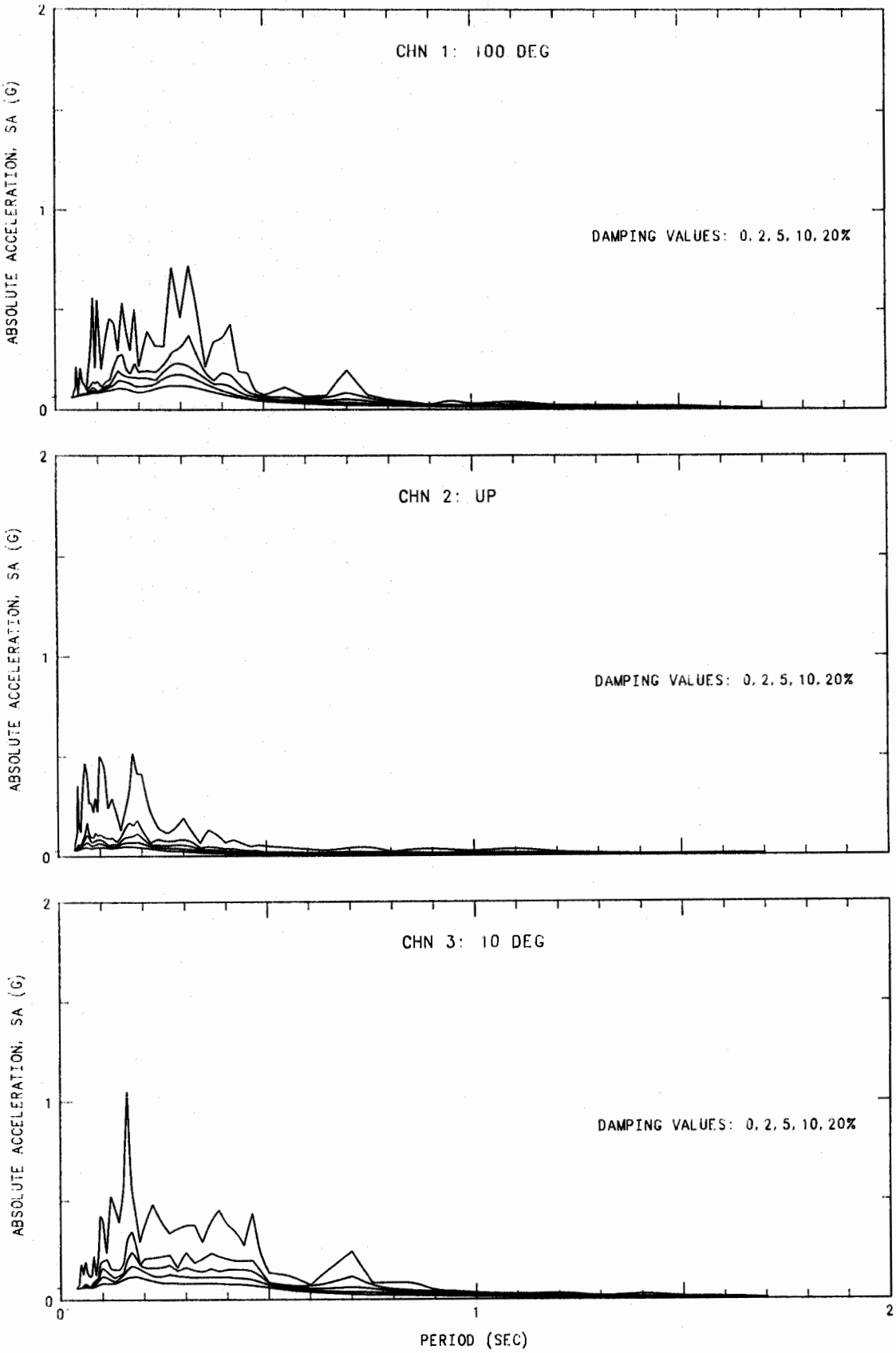
CHN 2: UP



CHN 3: 10 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LANCASTER - MEDICAL OFFICE BLDG. FF: CSMIP S/N 526
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24526-S1866-87280.14
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

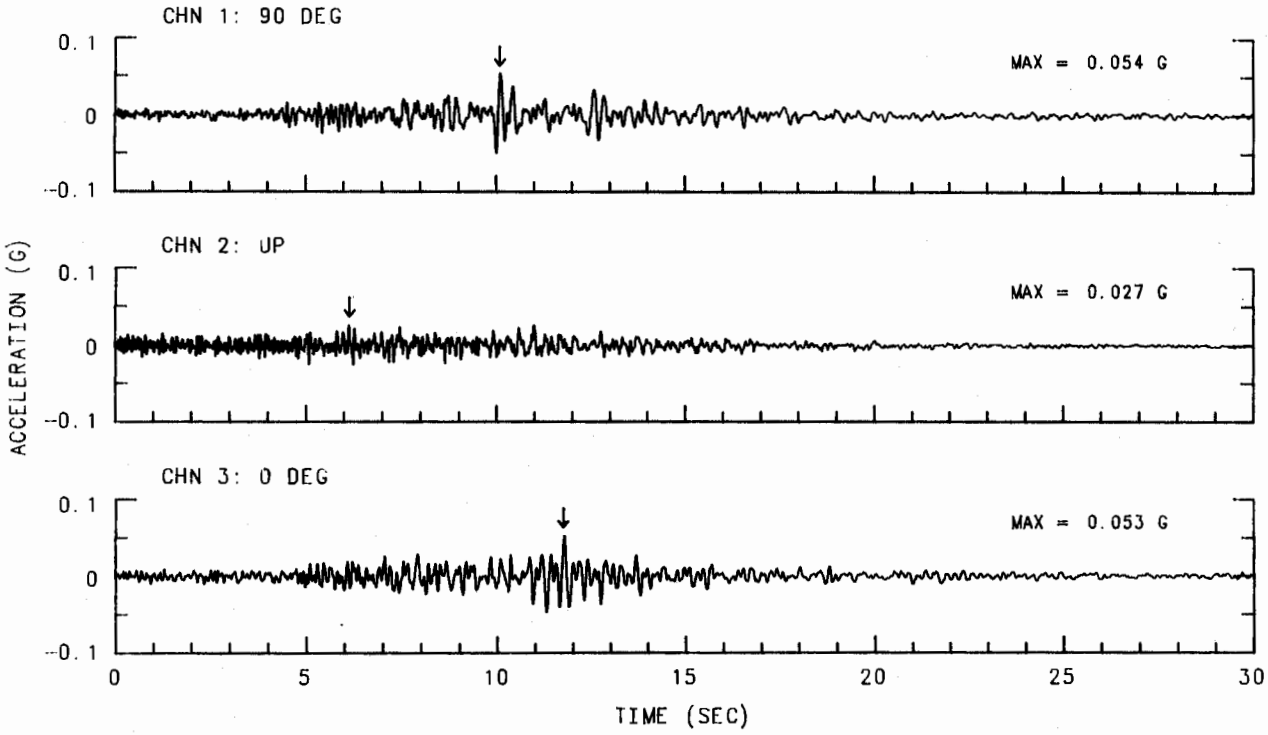


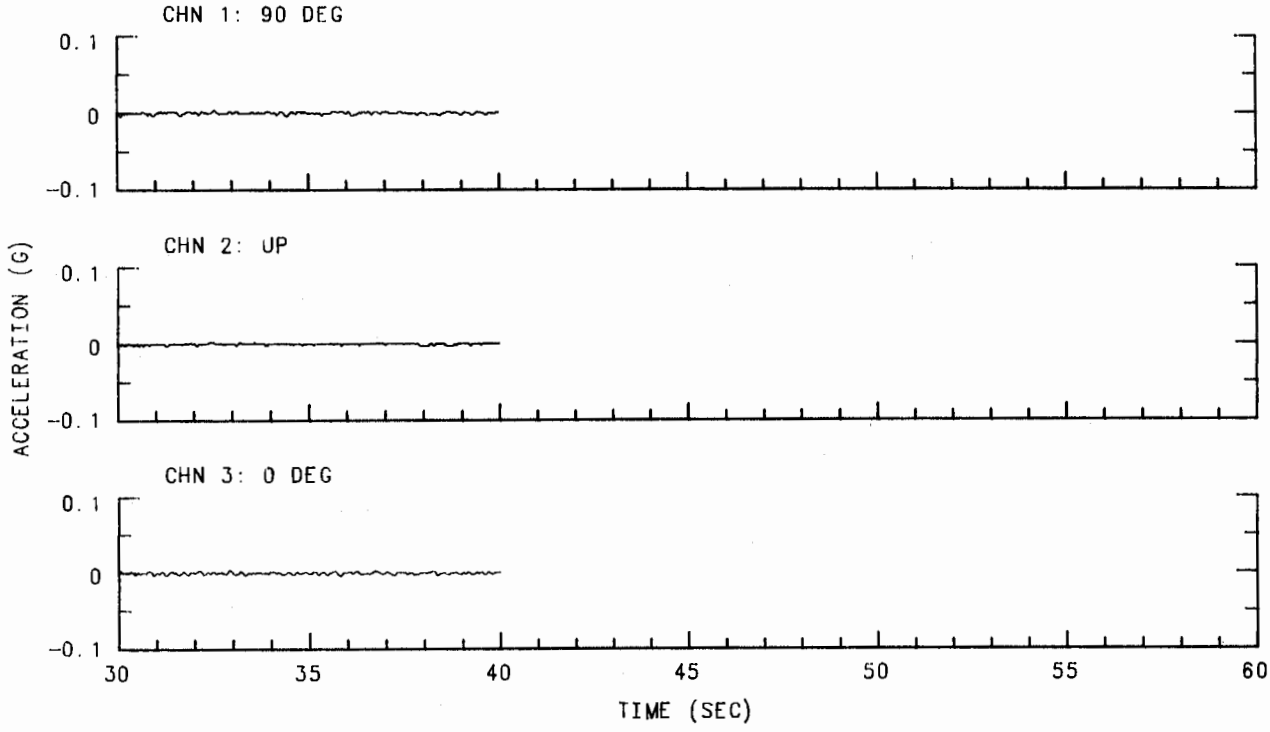
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LEONA VALLEY #5 - RITTER RANCH: CSMIP S/N 055

PHASE 1 ACCELERATION

RECORD ID: 24055-S1853-87280.01

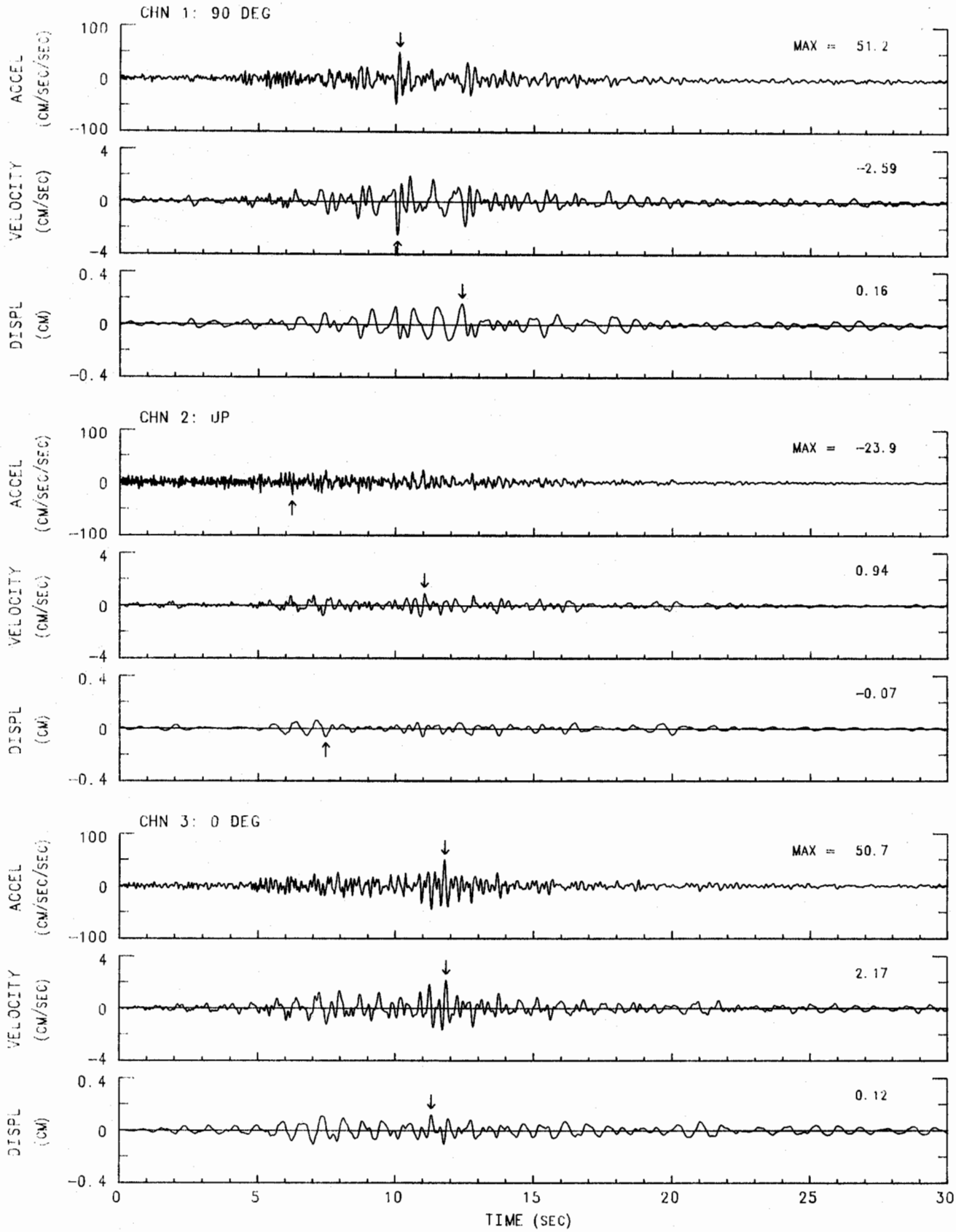




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LEONA VALLEY #5 - RITTER RANCH: CSMIP S/N 055

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ (0.04 TO 1.18 SEC) RECORD ID: 24055-S1853-87280.01



LEONA VALLEY #5 - RITTER RANCH: CSMIP S/N 055

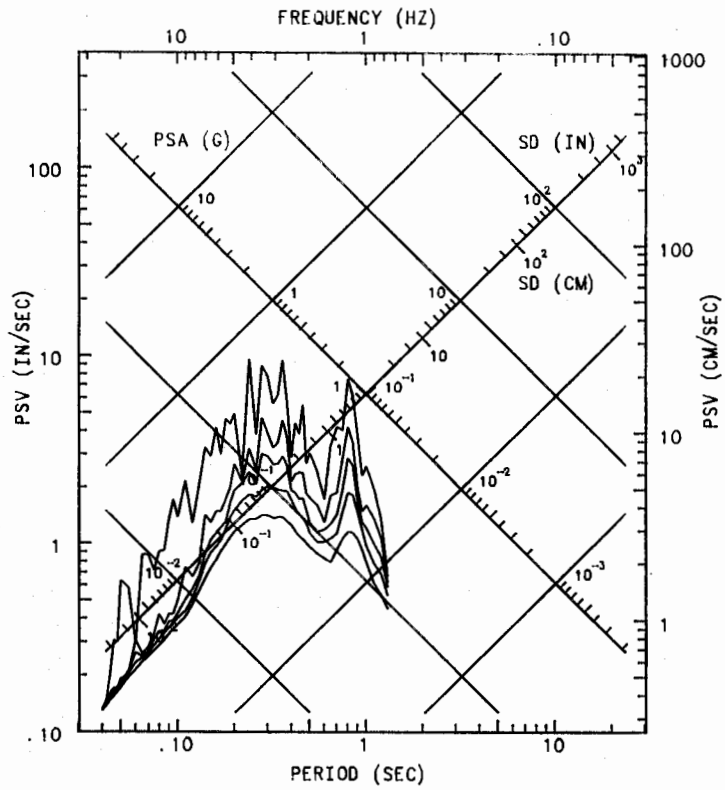
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ
(0.04 TO 1.18 SEC)

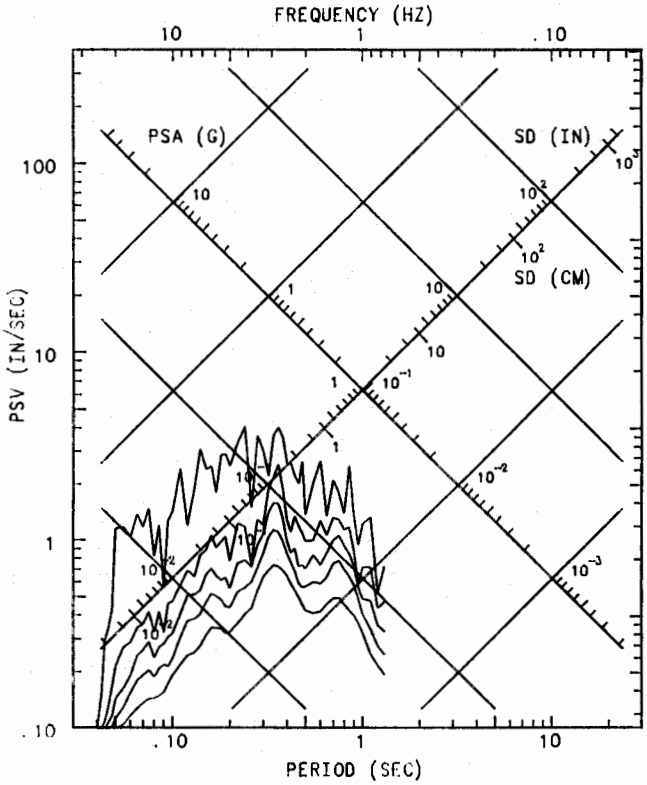
RECORD ID: 24055-S1853-87280.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

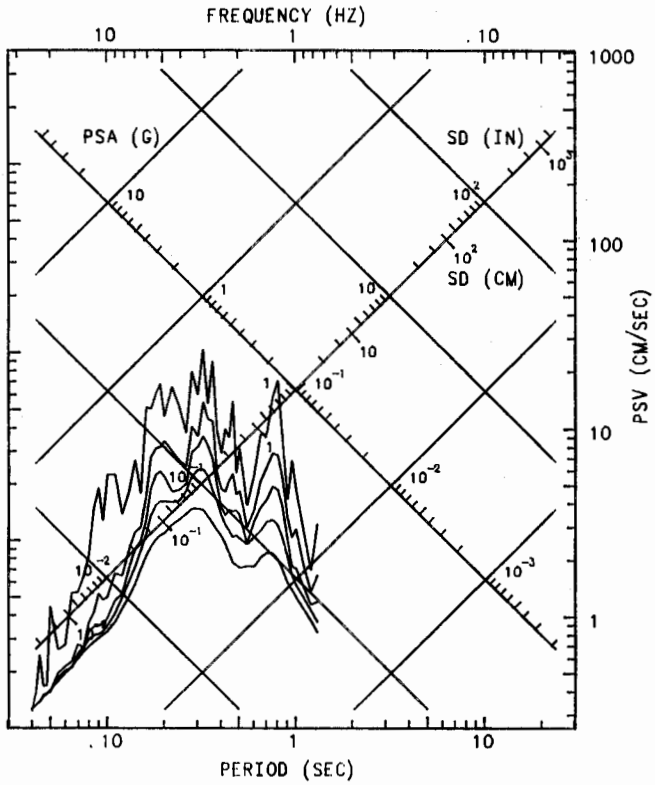
CHN 1: 90 DEG



CHN 2: UP

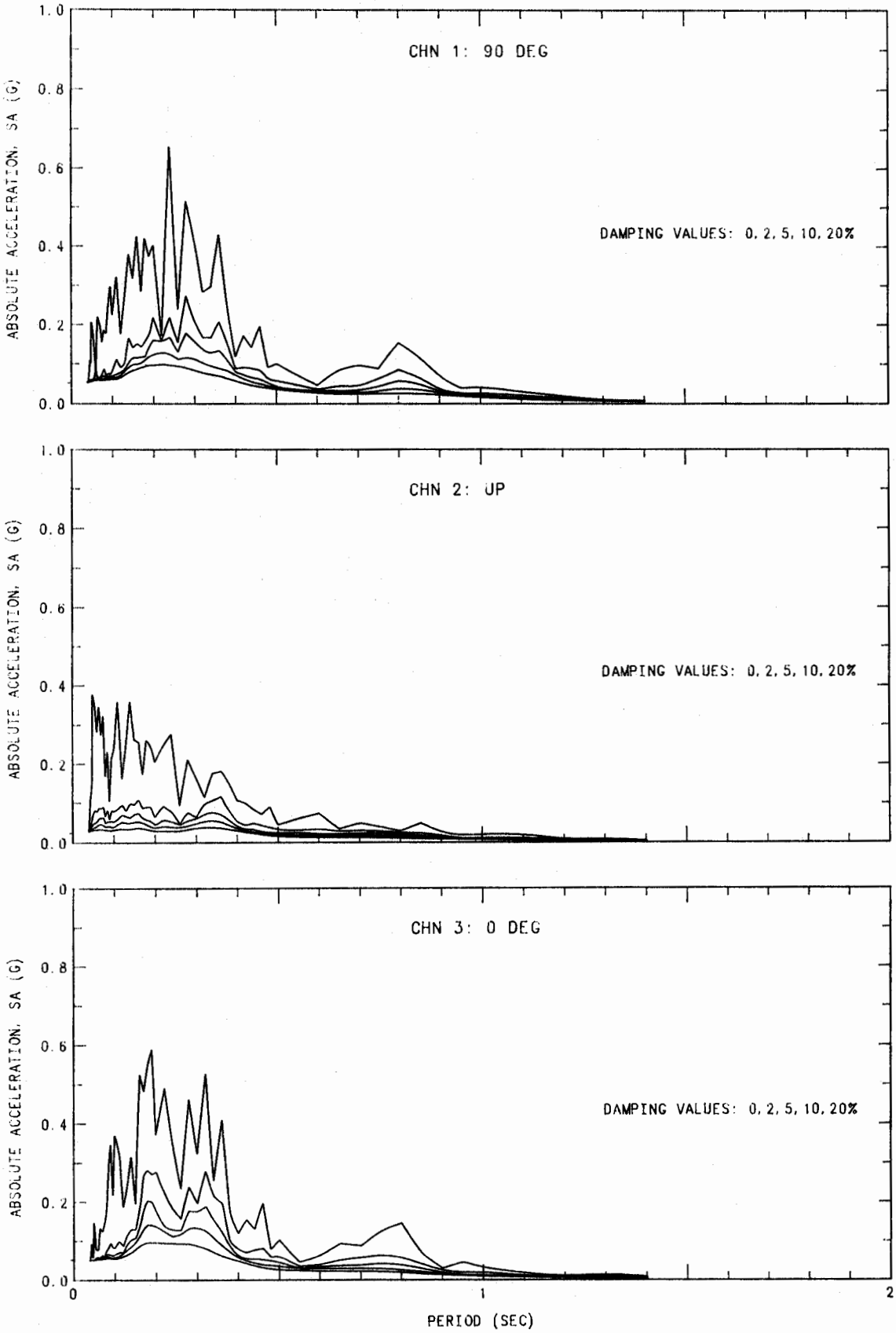


CHN 3: 0 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LEONA VALLEY #5 - RITTER RANCH: CSMIP S/N 055

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24055-S1853-87280.01
USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ (0.04 TO 1.18 SEC)

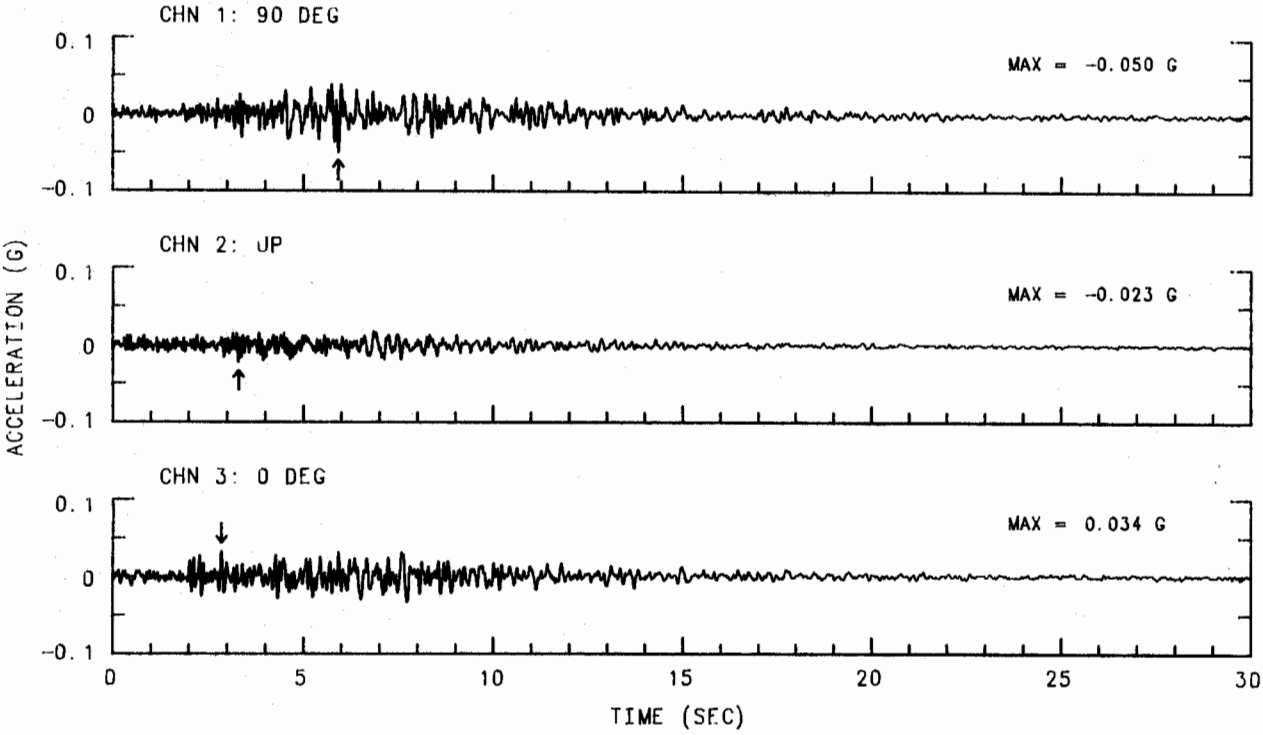


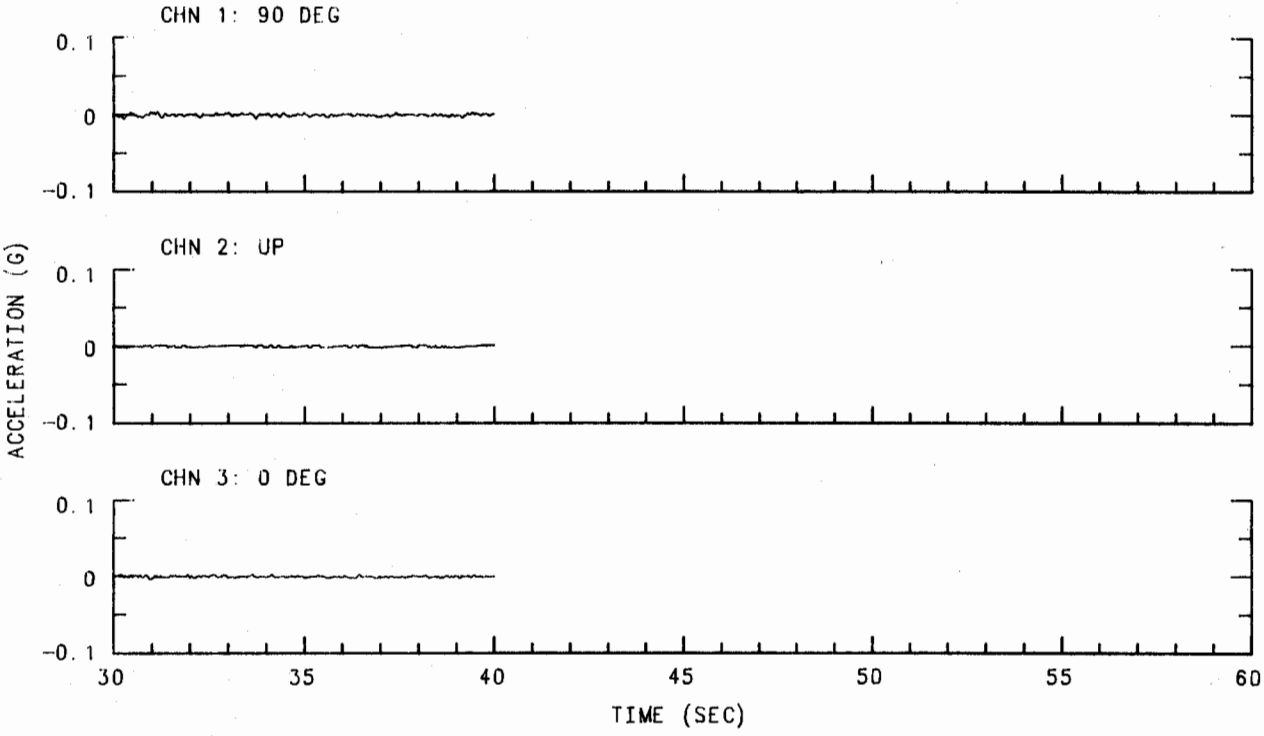
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LEONA VALLEY #6: CSMIP S/N 309

PHASE 1 ACCELERATION

RECORD ID: 24309-S2559-87280.01

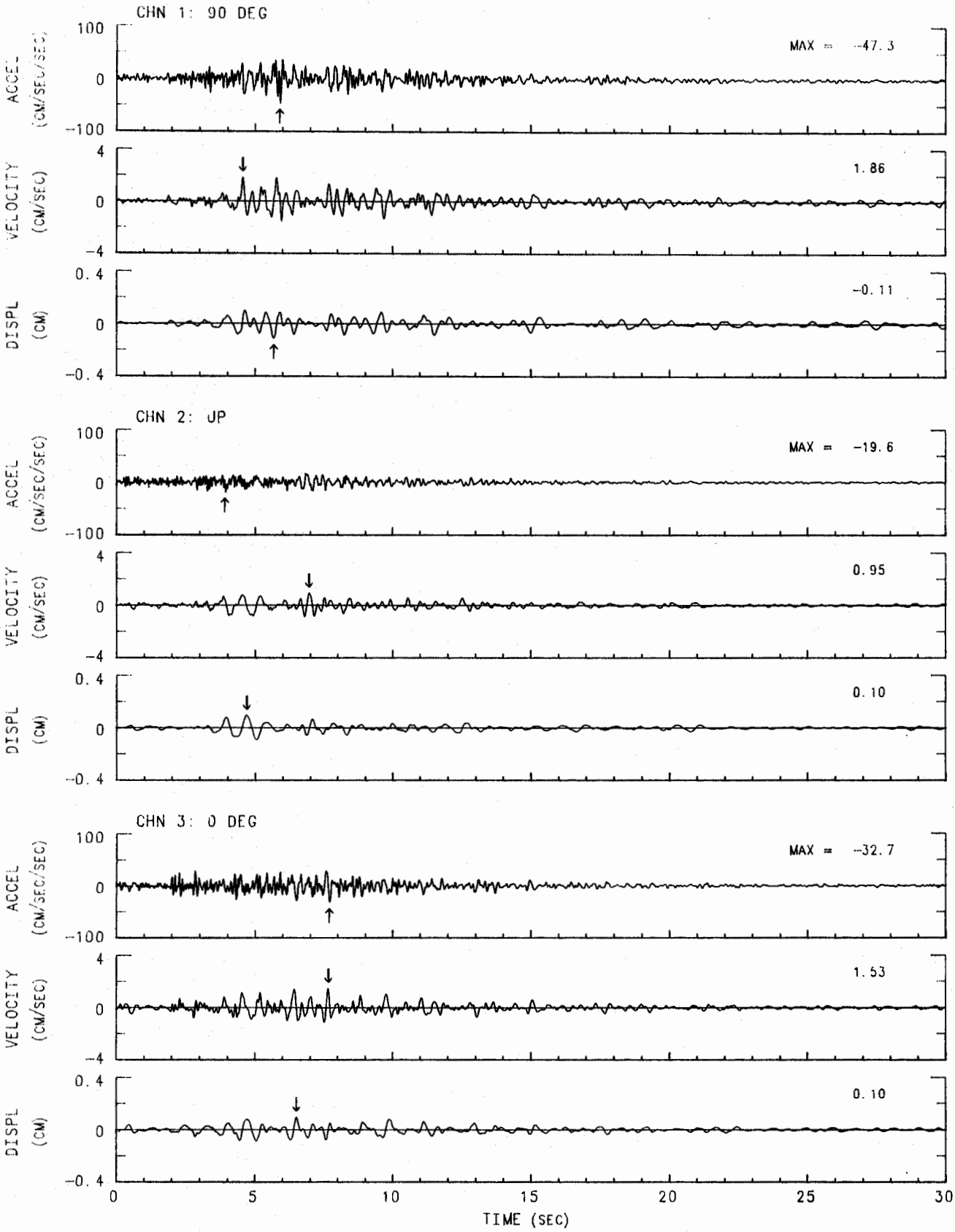




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LEONA VALLEY #6: CSMIP S/N 309

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ (0.04 TO 1.18 SEC) RECORD ID: 24309-S2559-87280.01



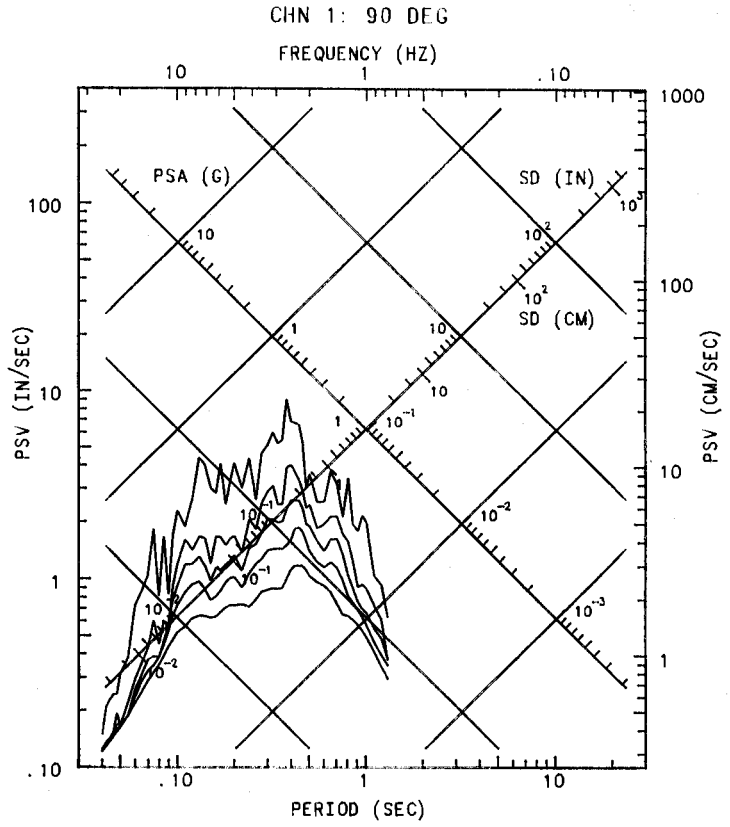
LEONA VALLEY #6: CSMIP S/N 309

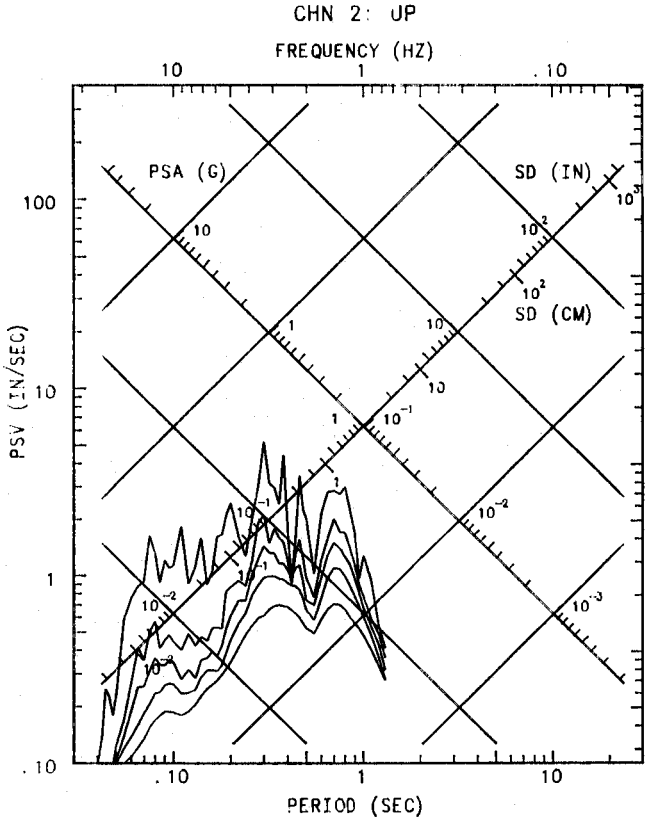
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

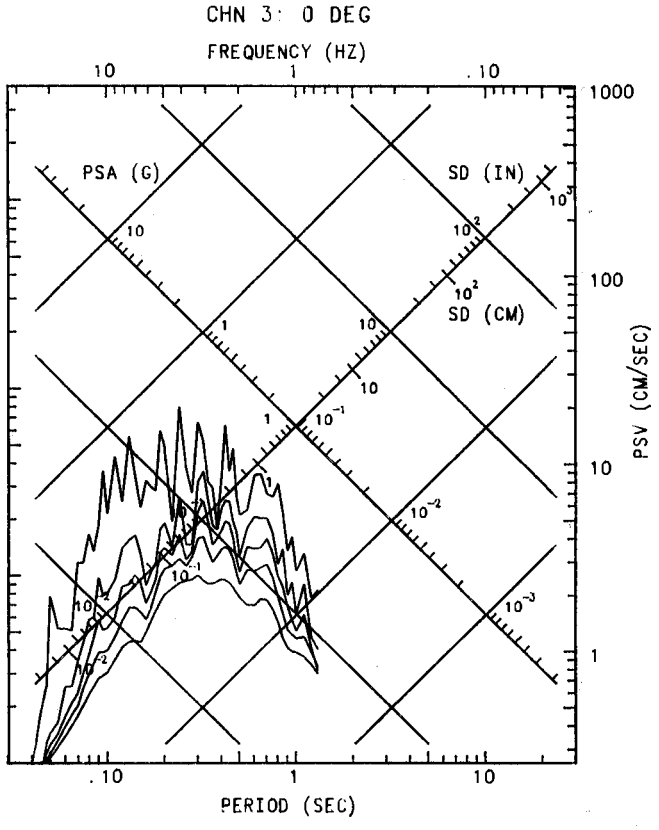
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ
(0.04 TO 1.18 SEC)

RECORD ID: 24309-S2559-87280.01

RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

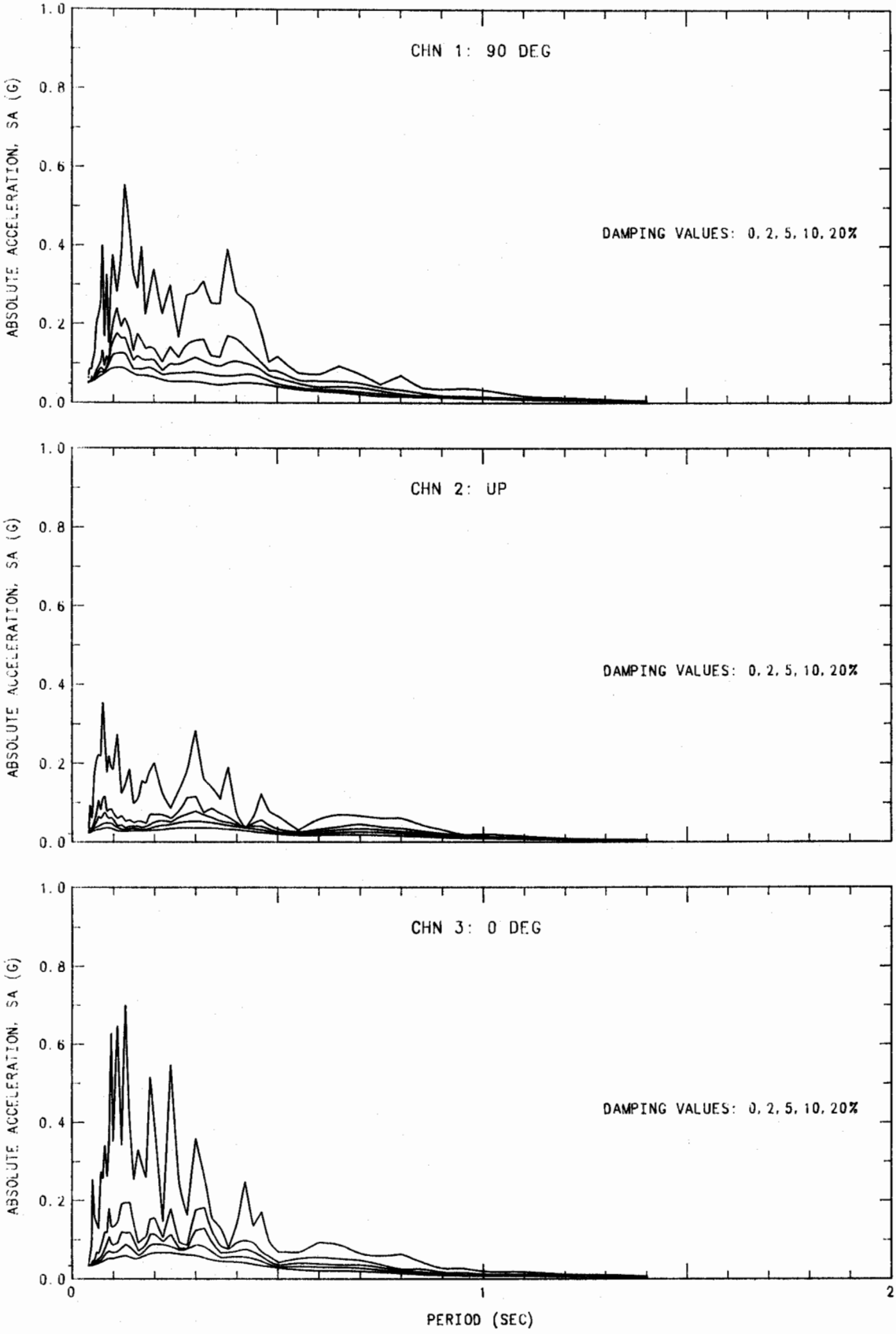






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LEONA VALLEY #6: CSMIP S/N 309

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24309-S2559-87280.01
USABLE DATA BANDWIDTH: 0.85 TO 23.6 HZ (0.04 TO 1.18 SEC)

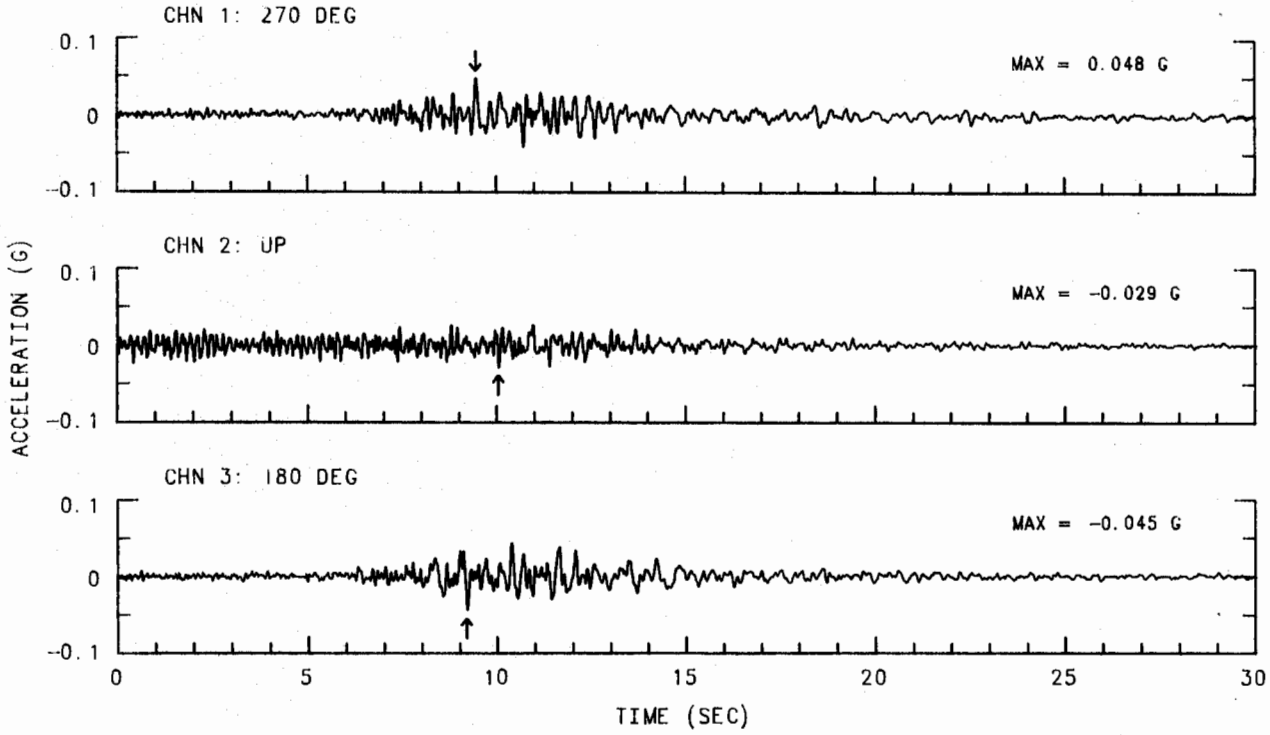


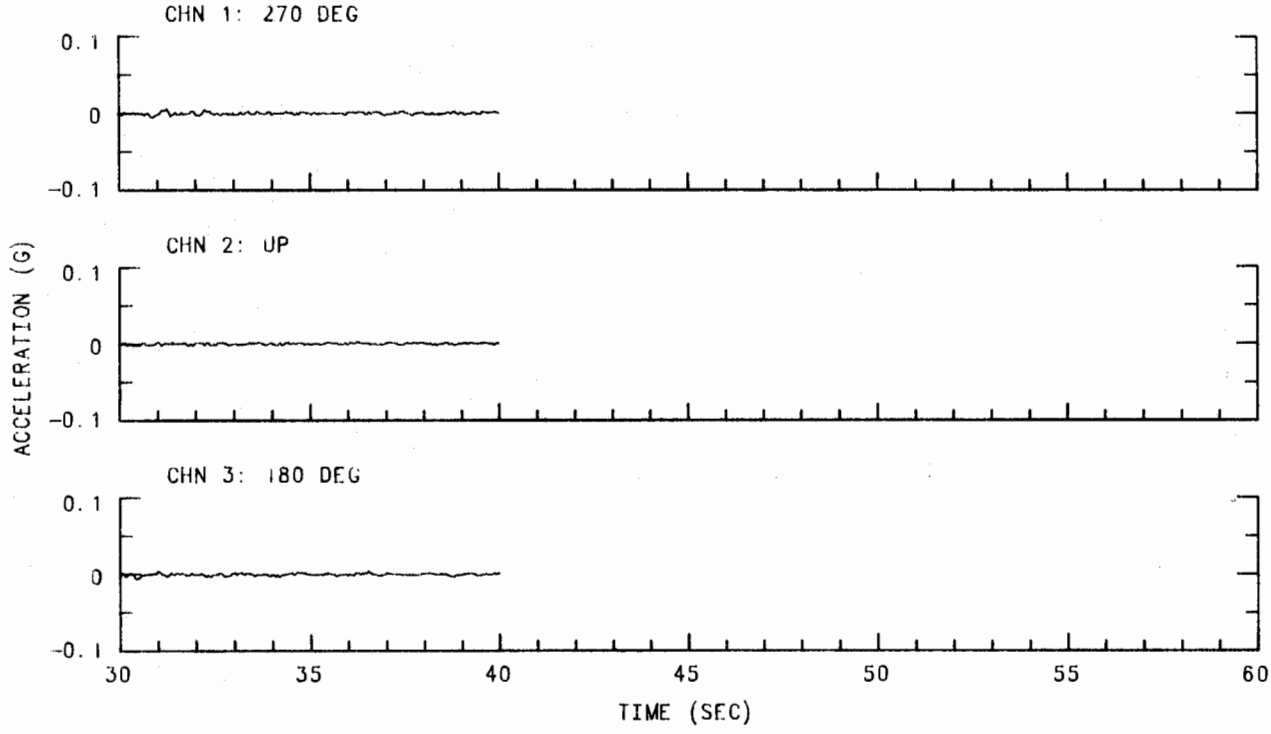
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

MALIBU - POINT DUME SCHOOL: CSMIP S/N 396

PHASE 1 ACCELERATION

RECORD ID: 24396-S2779-87279.01



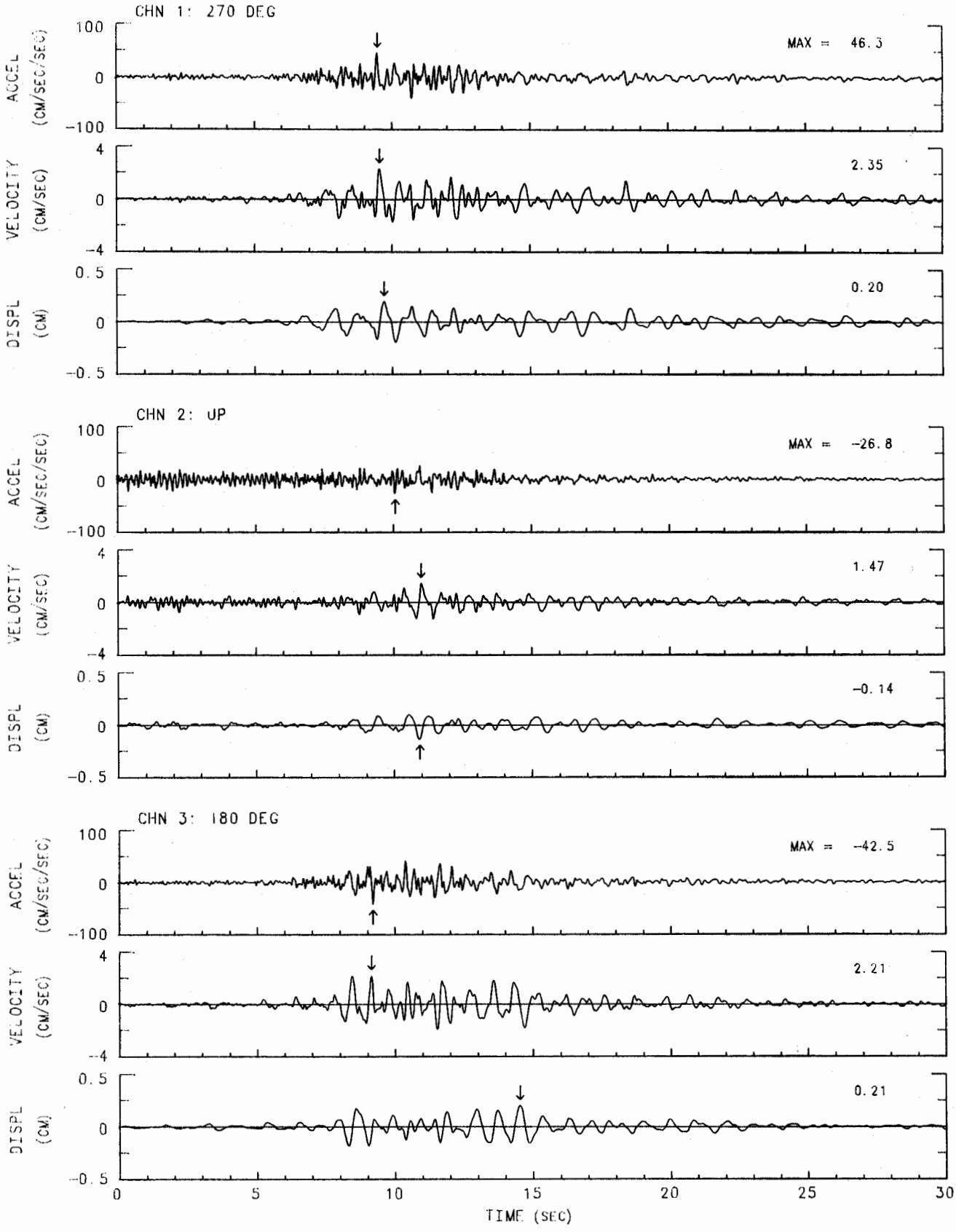


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

MALIBU - POINT DUME SCHOOL: CSMIP S/N 396

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 24396-S2779-87279.01



MALIBU - POINT DUME SCHOOL: CSMIP S/N 396

WHITTIER EARTHQUAKE

OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA

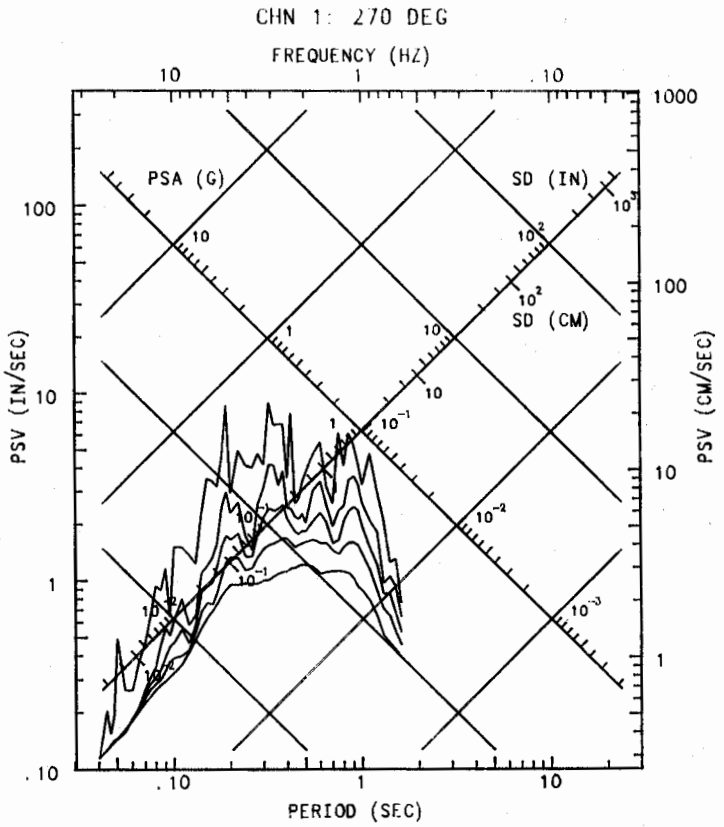
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ

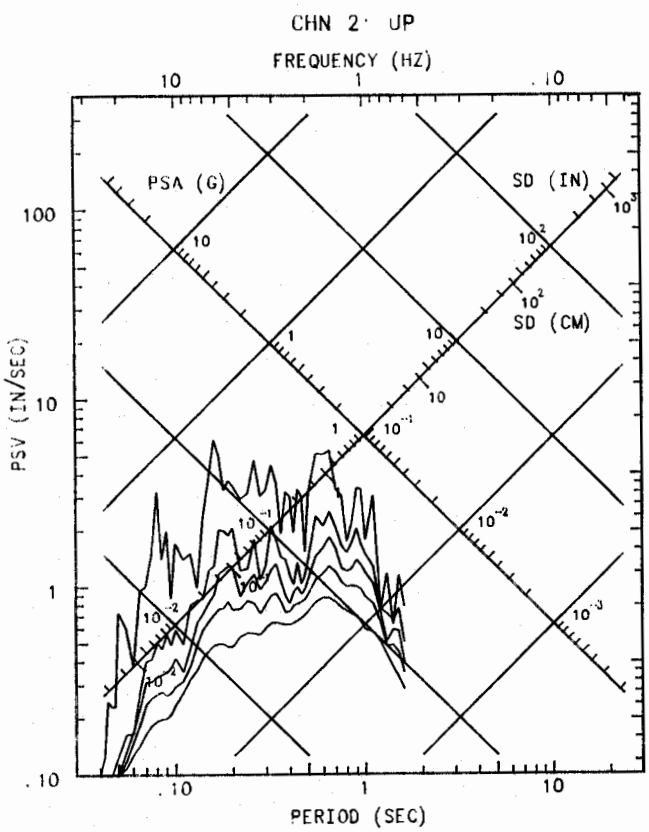
(0.04 TO 1.47 SEC)

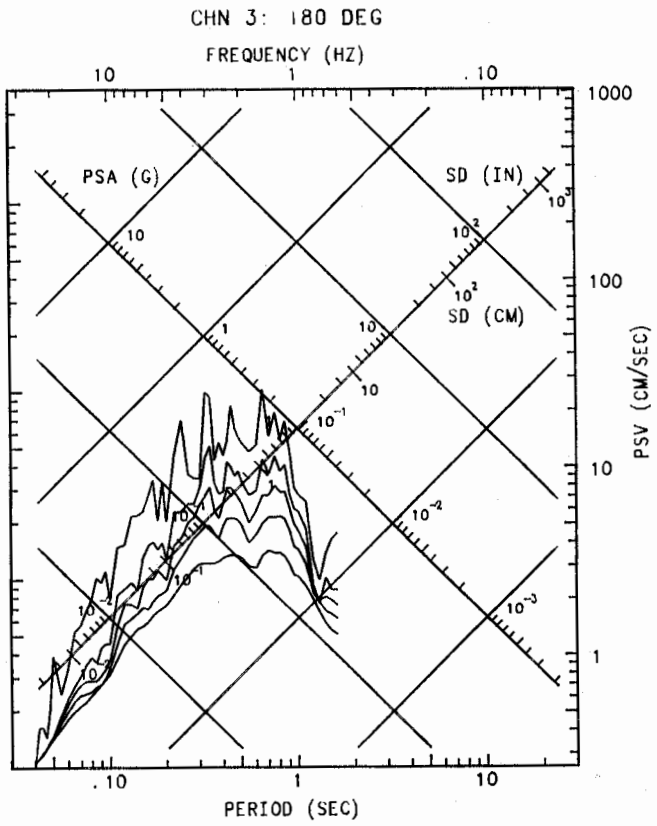
RECORD ID: 24396-S2779-87279.01

—— RESPONSE SPECTRA: PSV, PSA & SD

DAMPING VALUES: 0, 2, 5, 10, 20%

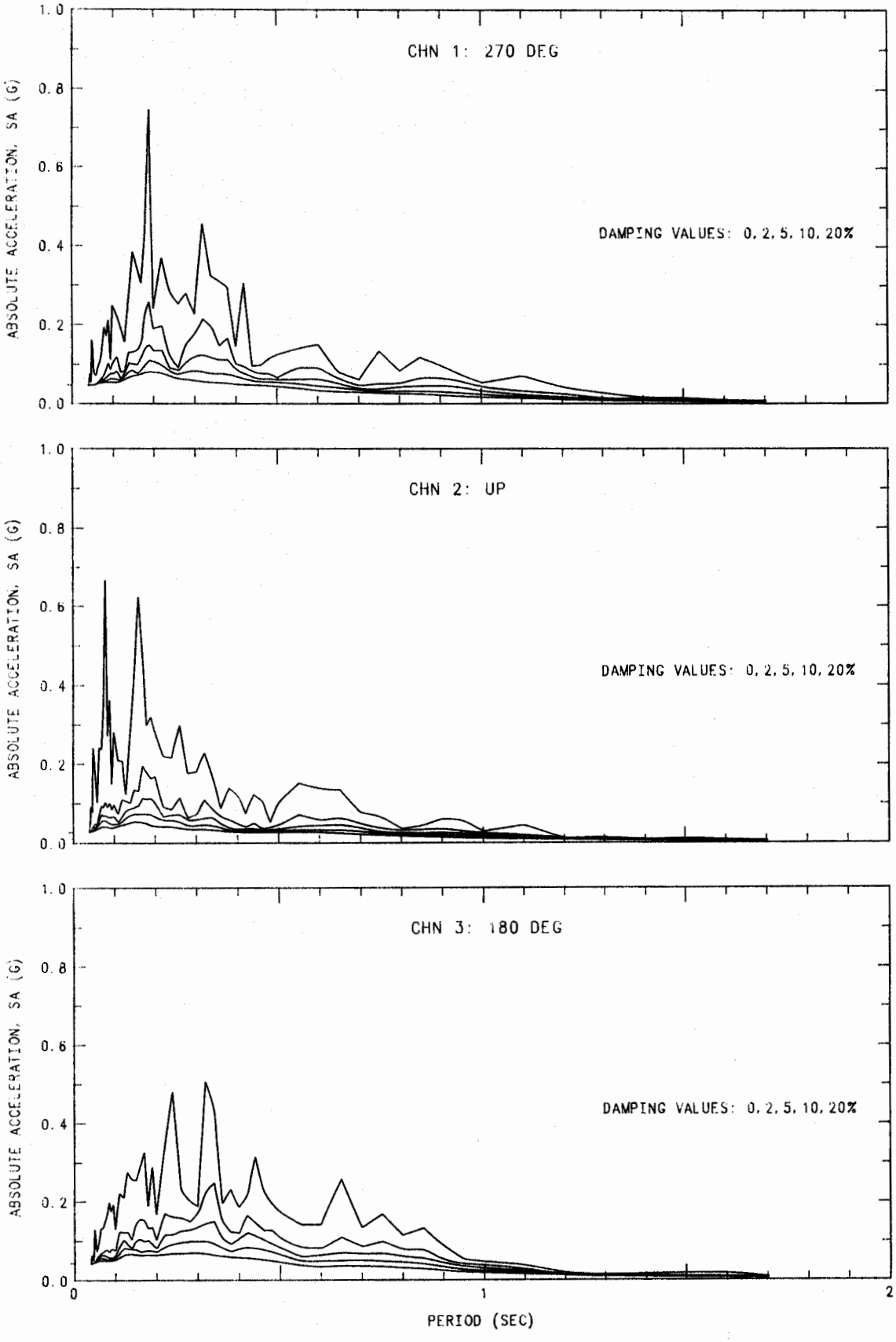






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
MALIBU - POINT DUME SCHOOL: CSMIP S/N 396

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24396-S2779-87279.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

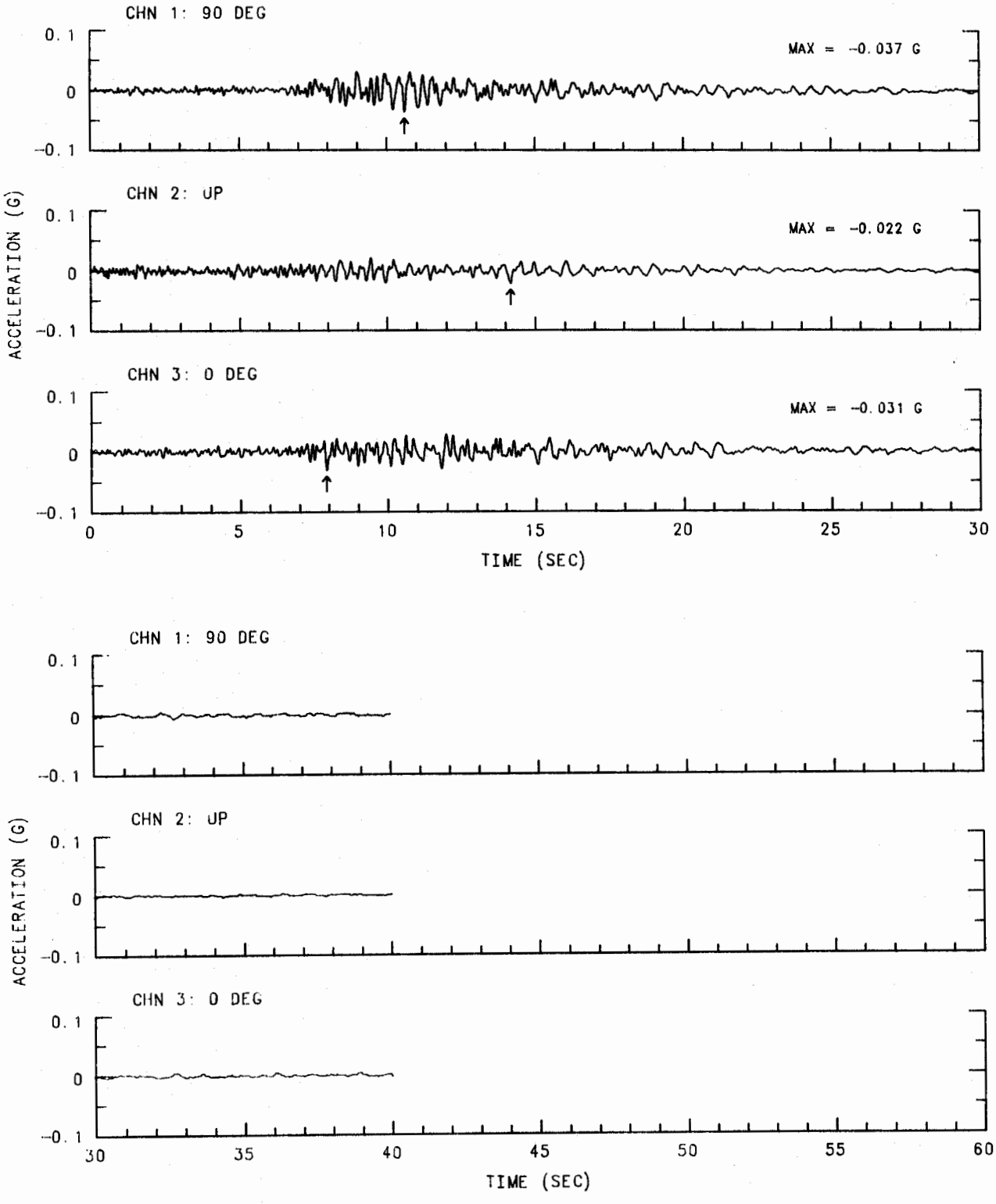


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CASTAIC - HASLEY CANYON: CSMIP S/N 277

PHASE 1 ACCELERATION

RECORD ID: 24277-S2507-87280.01

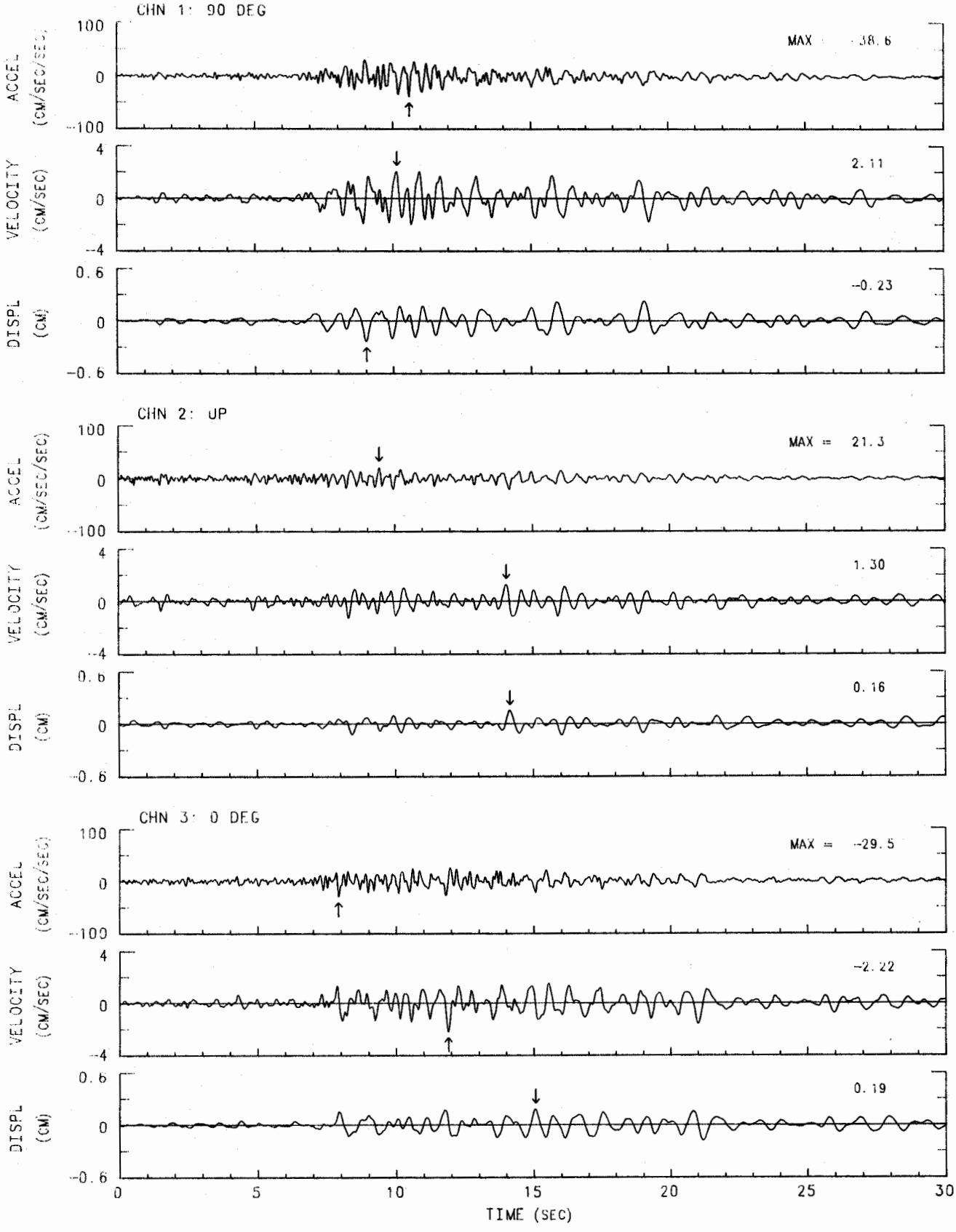


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CASTAIC - HASLEY CANYON: CSMIP S/N 277

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 24277-S2507-87280.01



CASTAIC - HASLEY CANYON: CSMIP S/N 277

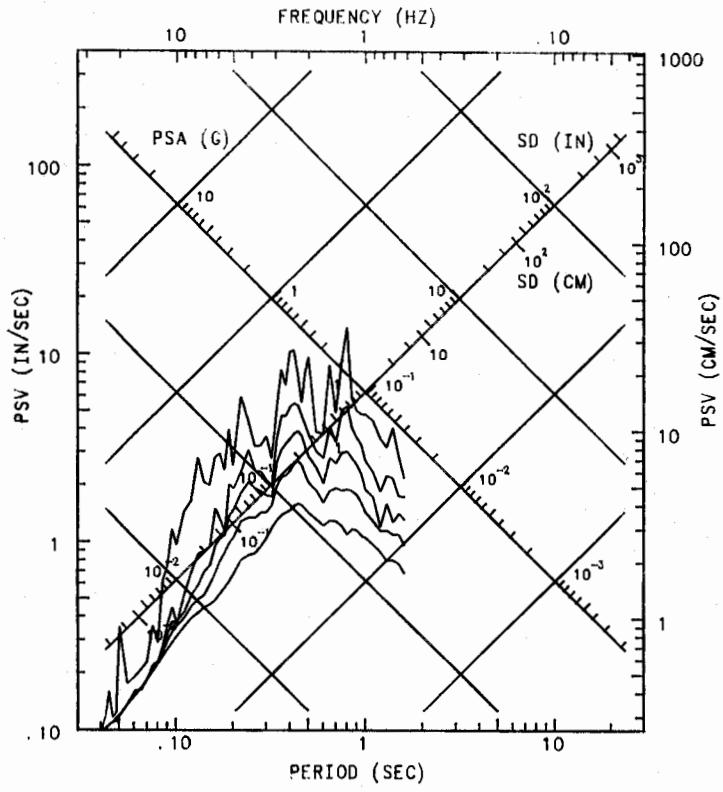
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ
(0.04 TO 1.47 SEC)

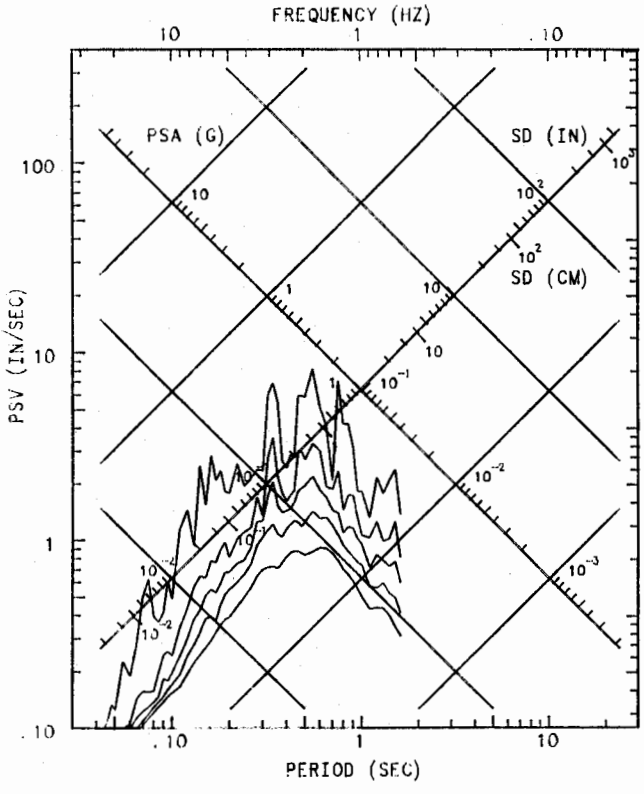
RECORD ID: 24277-S2507-87280.01

RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

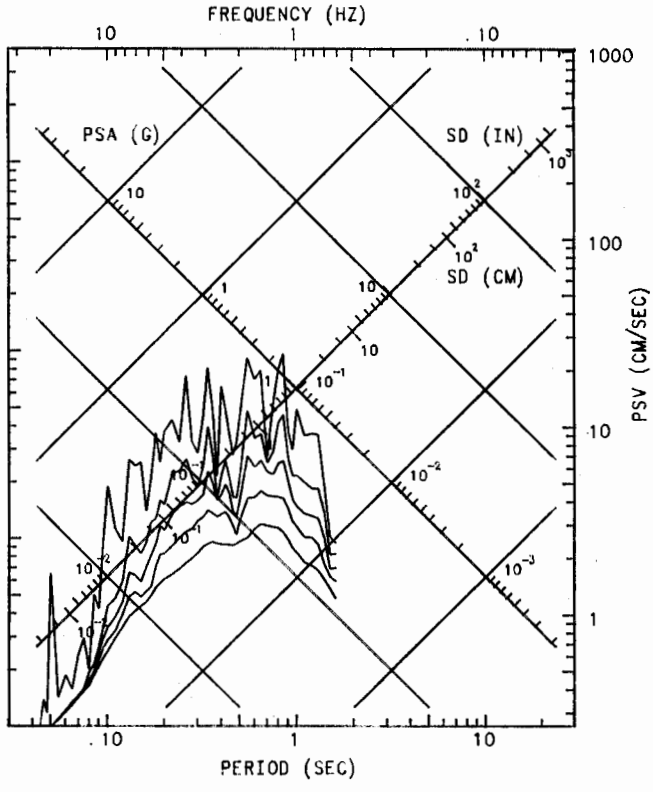
CHN 1: 90 DEG



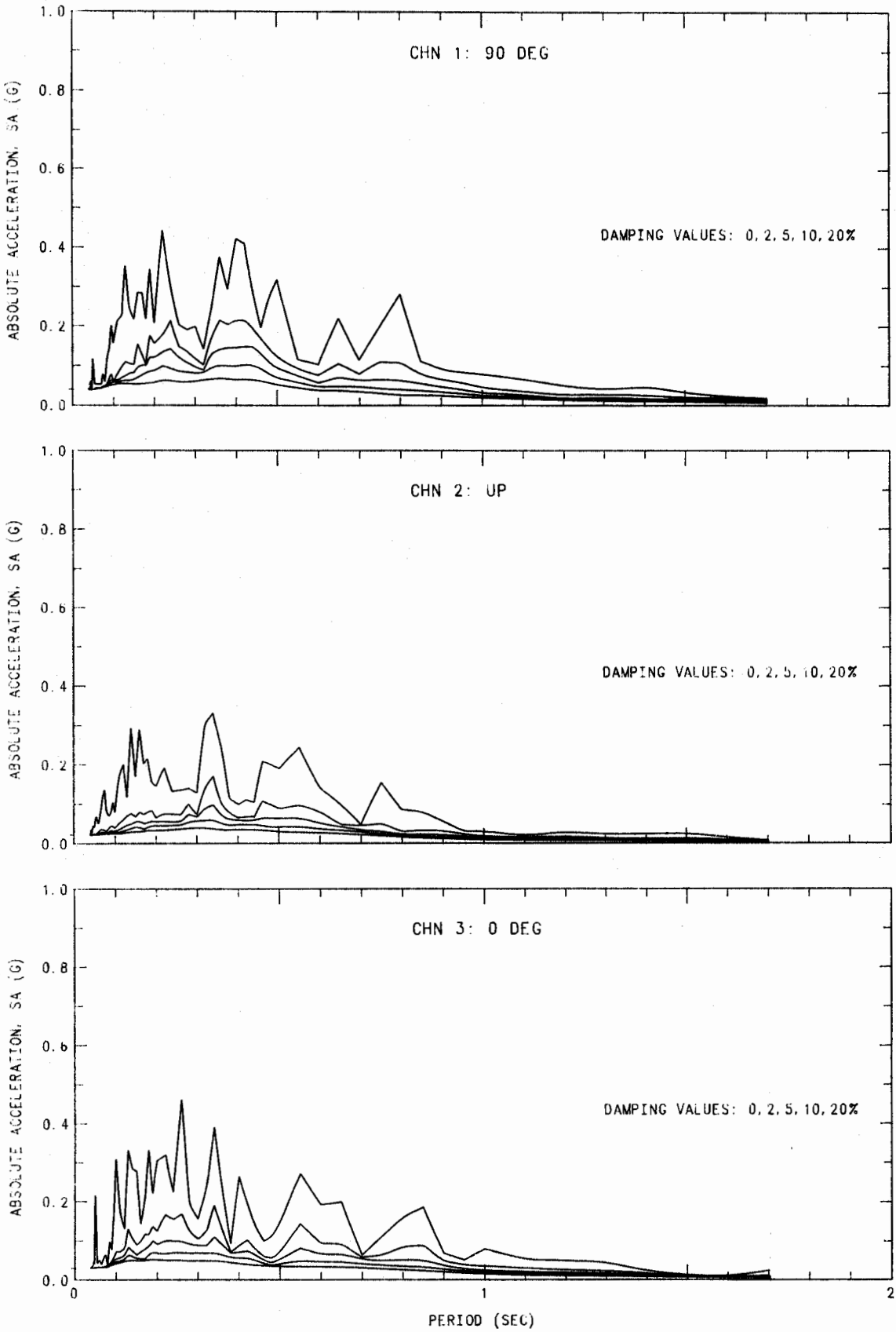
CHN 2: UP



CHN 3: 0 DEG



WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
CASTAIC - HASLEY CANYON: CSMIP S/N 277
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24277-S2507-87280.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

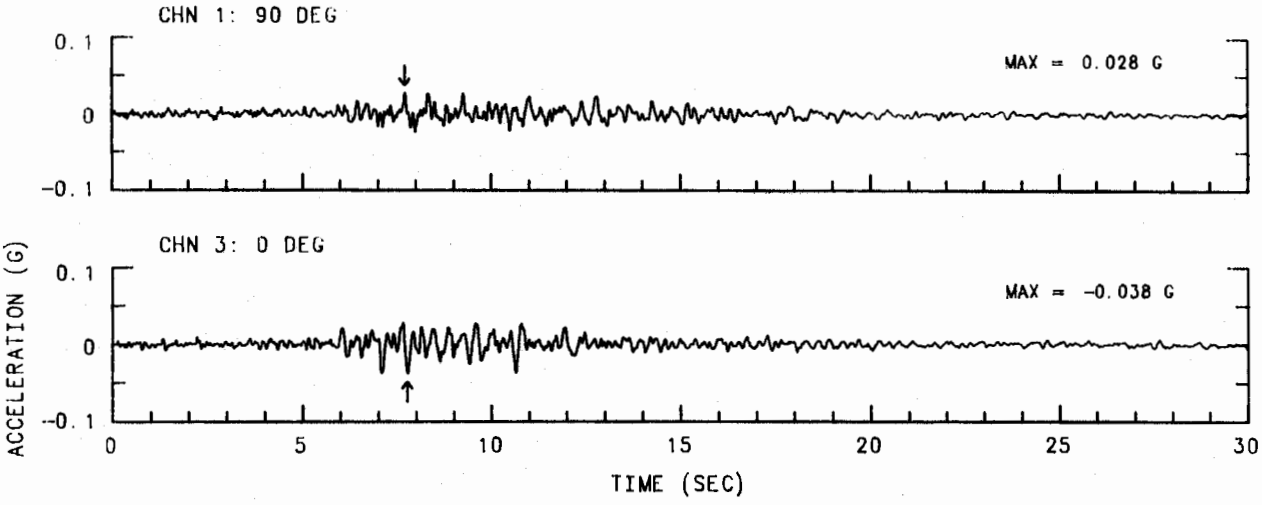


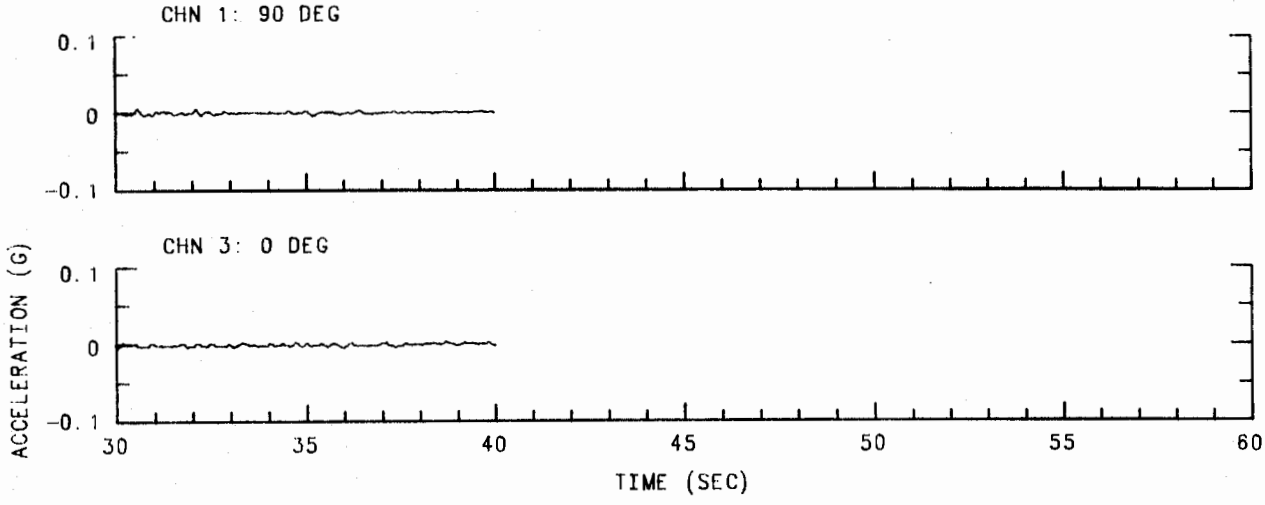
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

LAKE HUGHES #1 - FIRE STATION #78: CSMIP S/N 271

PHASE 1 ACCELERATION

RECORD ID: 24271-S2511-87280.01

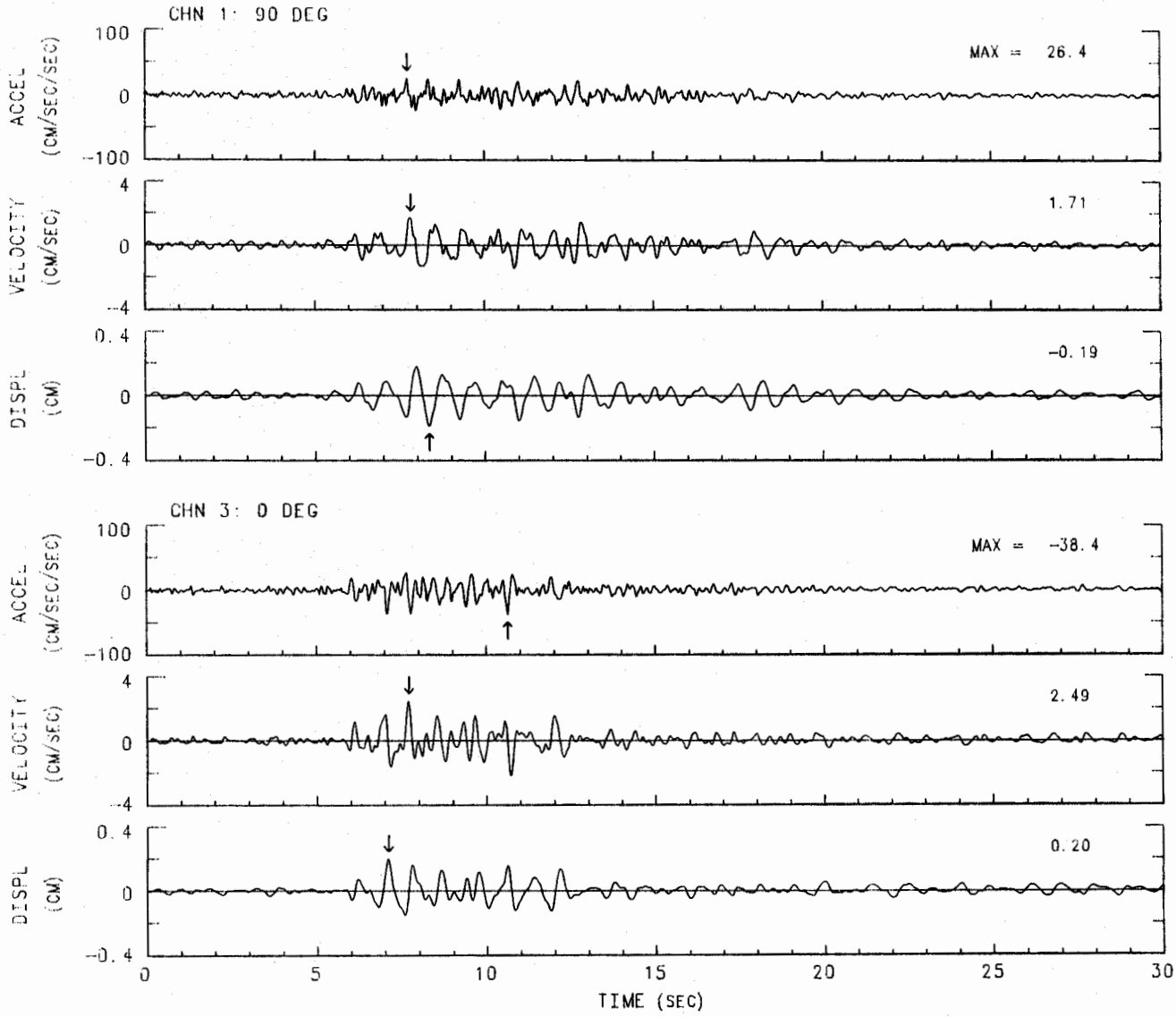




WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LAKE HUGHES #1 - FIRE STATION #78: CSMIP S/N 271

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 24271-S2511-87280.01



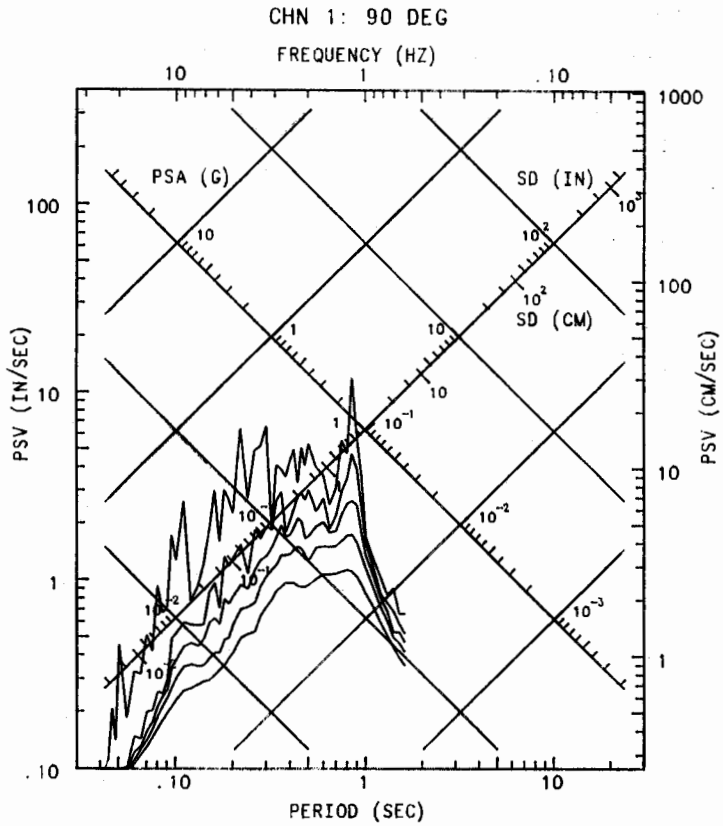
LAKE HUGHES #1 - FIRE STATION #78: CSMIP S/N 271

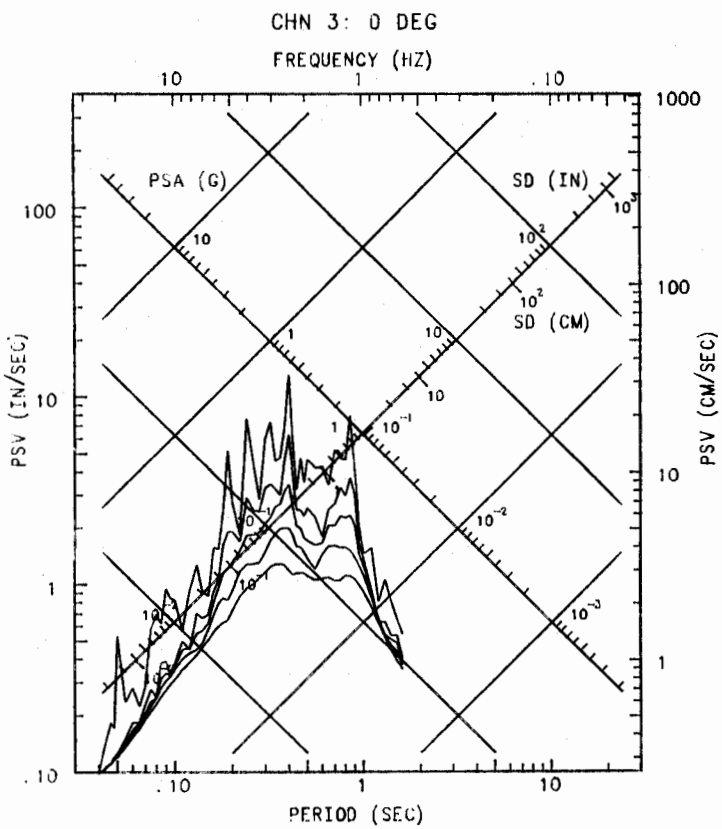
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ
(0.04 TO 1.47 SEC)

RECORD ID: 24271-S2511-87280.01

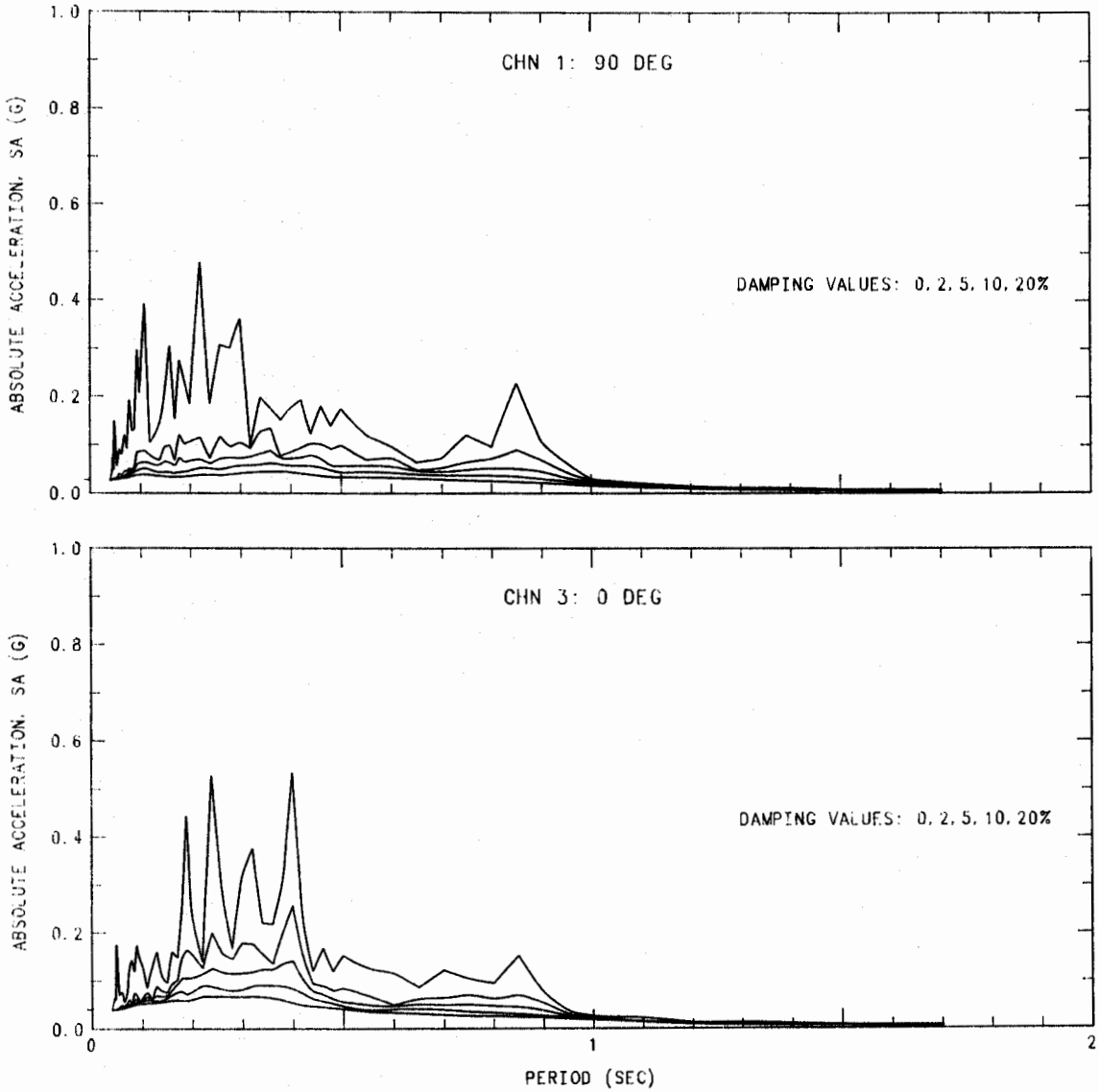
—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%





WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
LAKE HUGHES #1 -- FIRE STATION #78: CSMIP S/N 271

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24271-S2511-87280.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

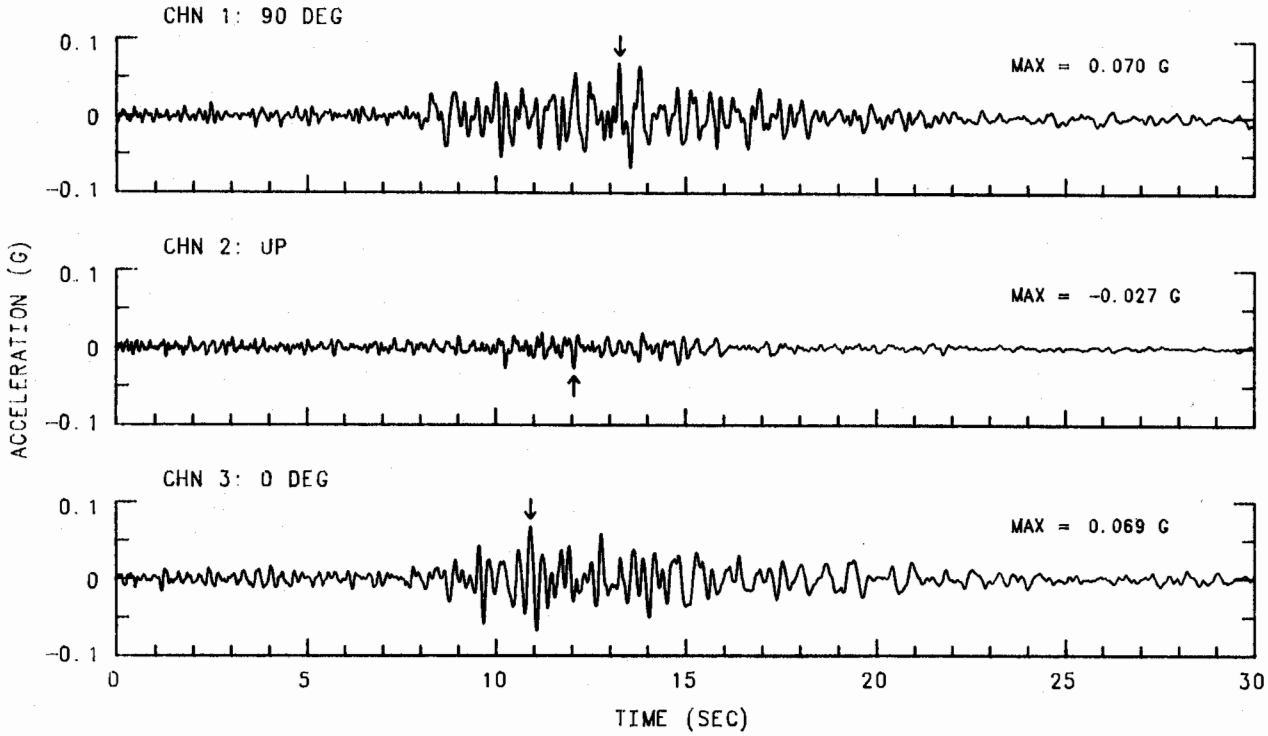


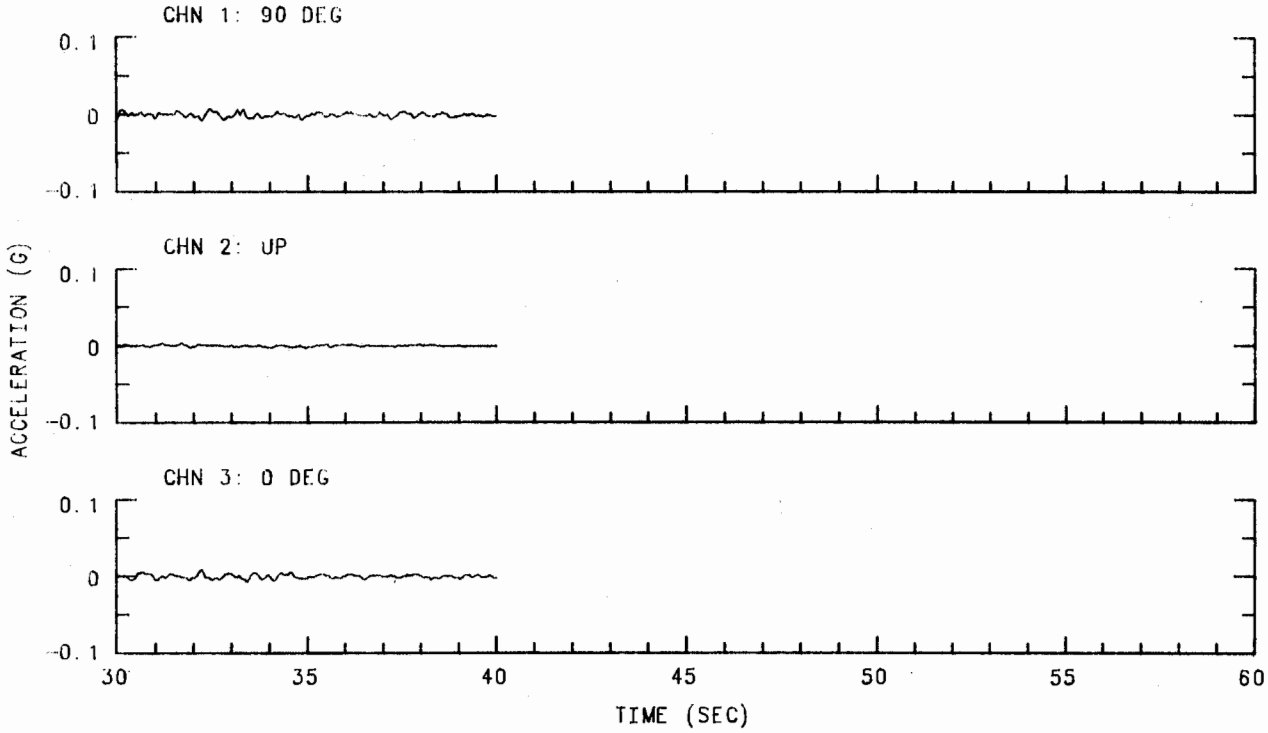
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CASTAIC - OLD RIDGE ROUTE: CSMIP S/N 278

PHASE 1 ACCELERATION

RECORD ID: 24278-S1572-87280.01



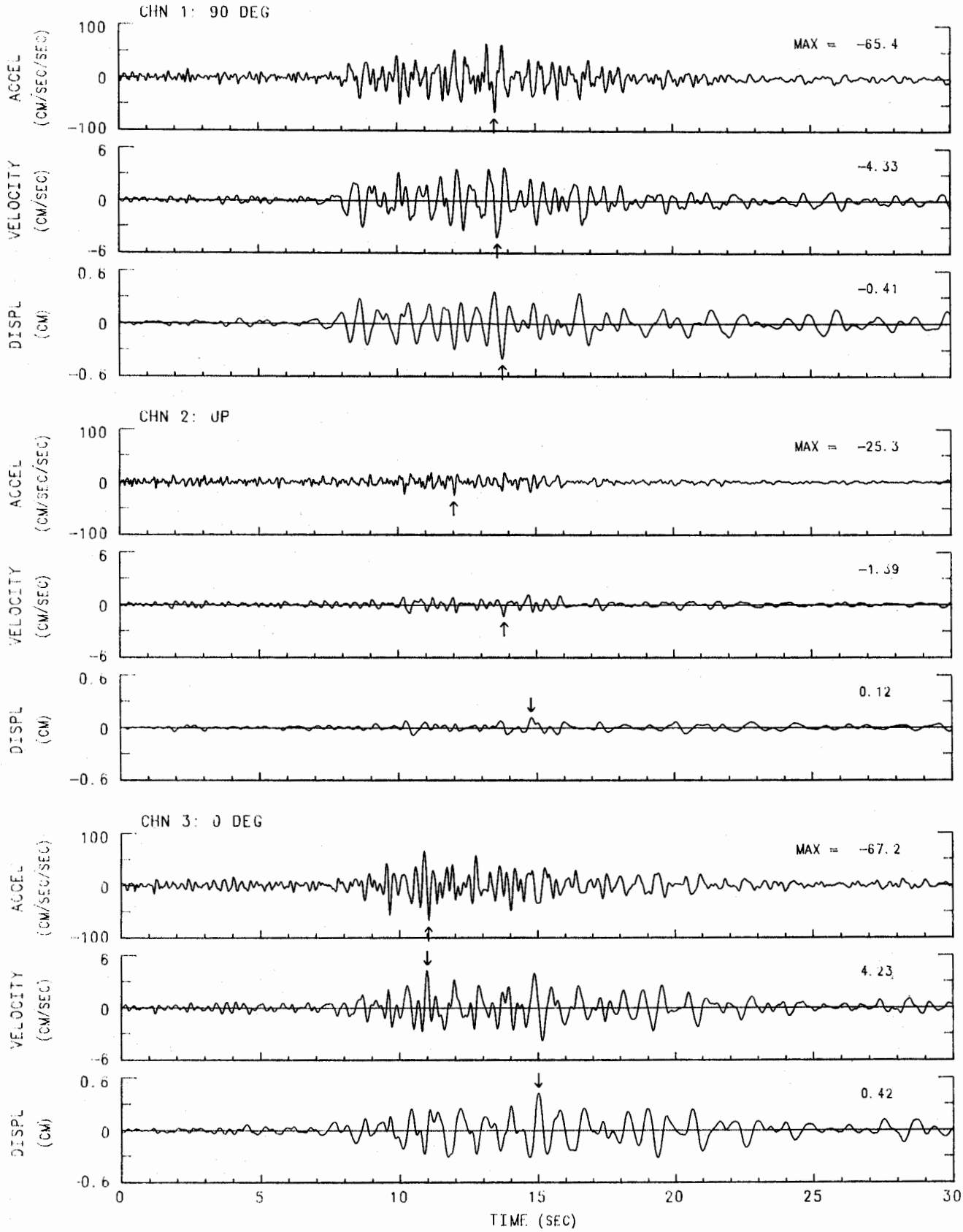


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

CASTAIC - OLD RIDGE ROUTE: CSMIP S/N 278

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC) RECORD ID: 24278-S1572-87280.01



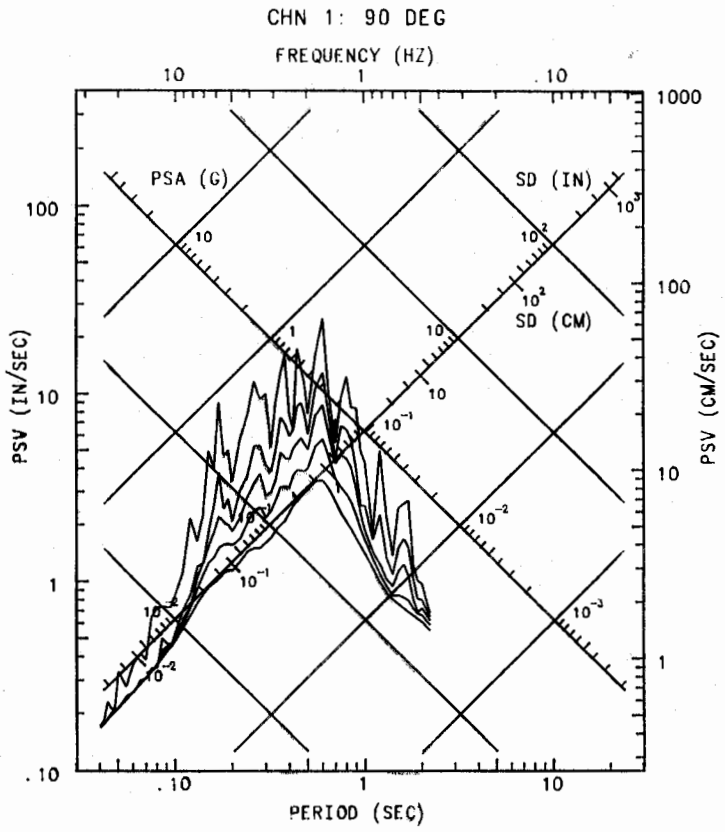
CASTAIC – OLD RIDGE ROUTE: CSMIP S/N 278

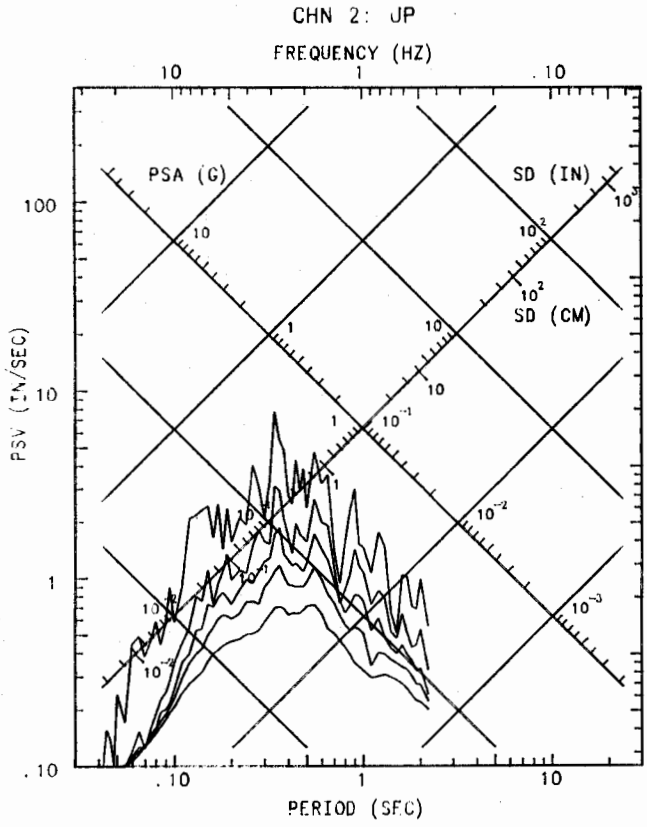
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

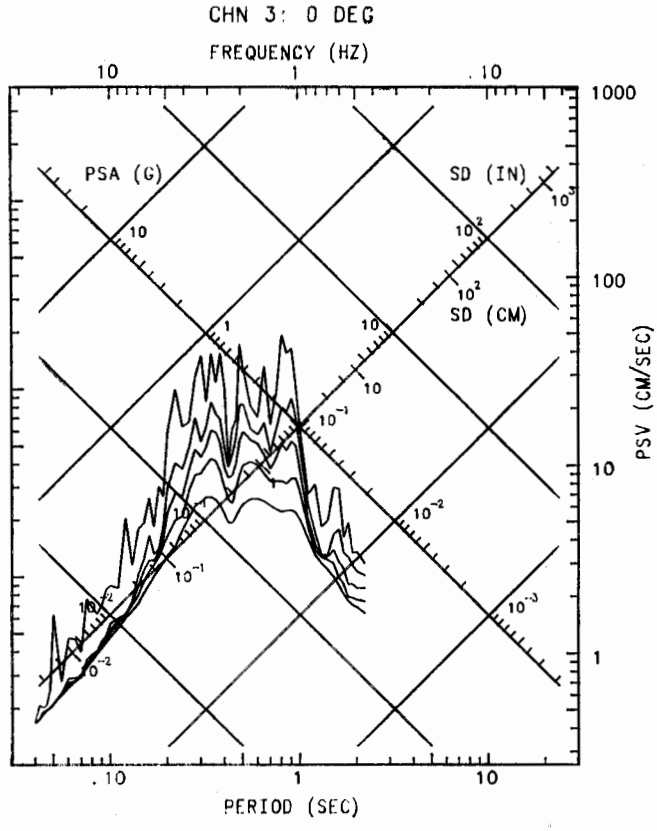
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ
(0.04 TO 1.96 SEC)

RECORD ID: 24278-S1572-87280.01

—— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

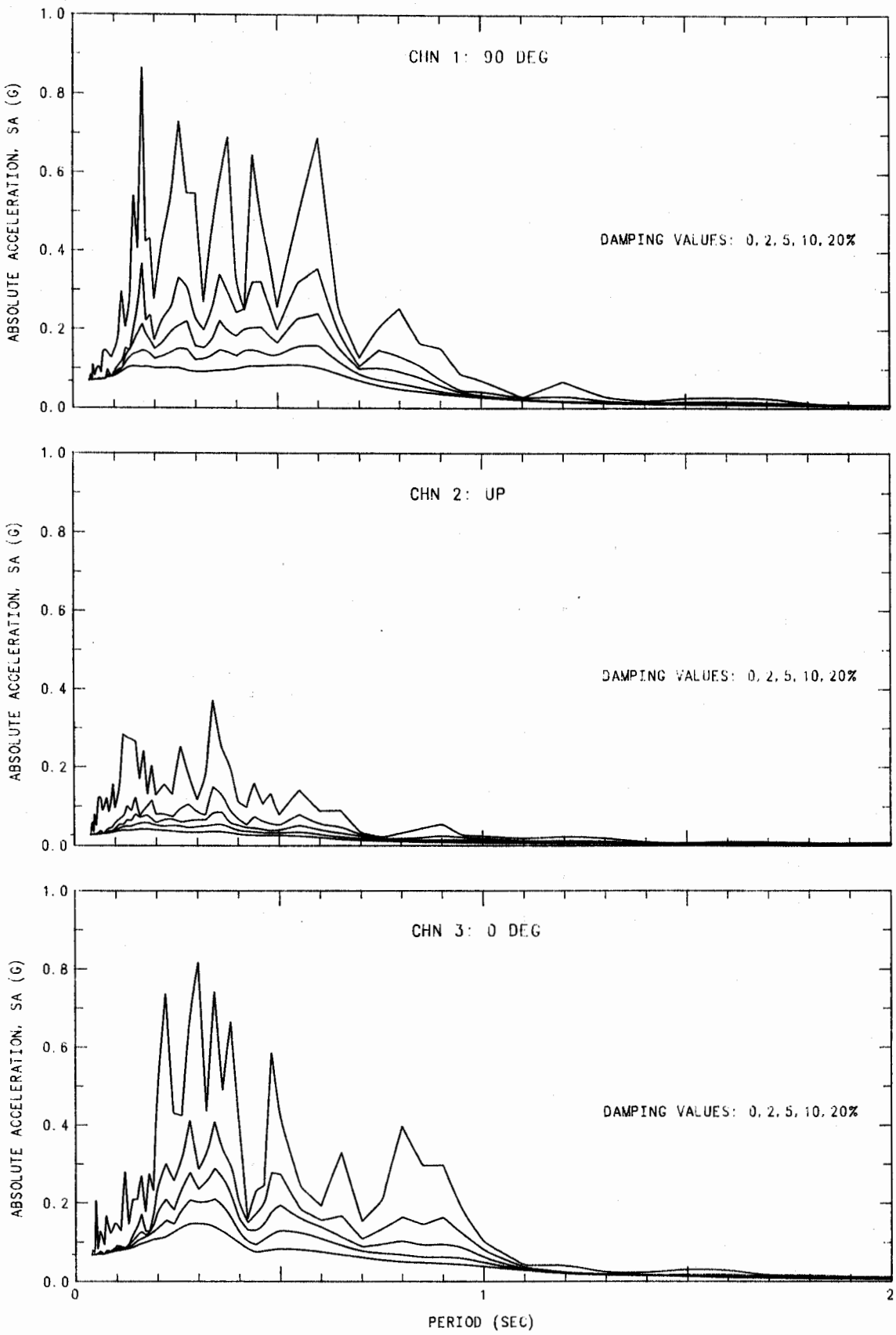






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
CASTAIC - OLD RIDGE ROUTE: CSMIP S/N 278

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24278-S1572-87280.01
USABLE DATA BANDWIDTH: 0.51 TO 23.6 HZ (0.04 TO 1.96 SEC)

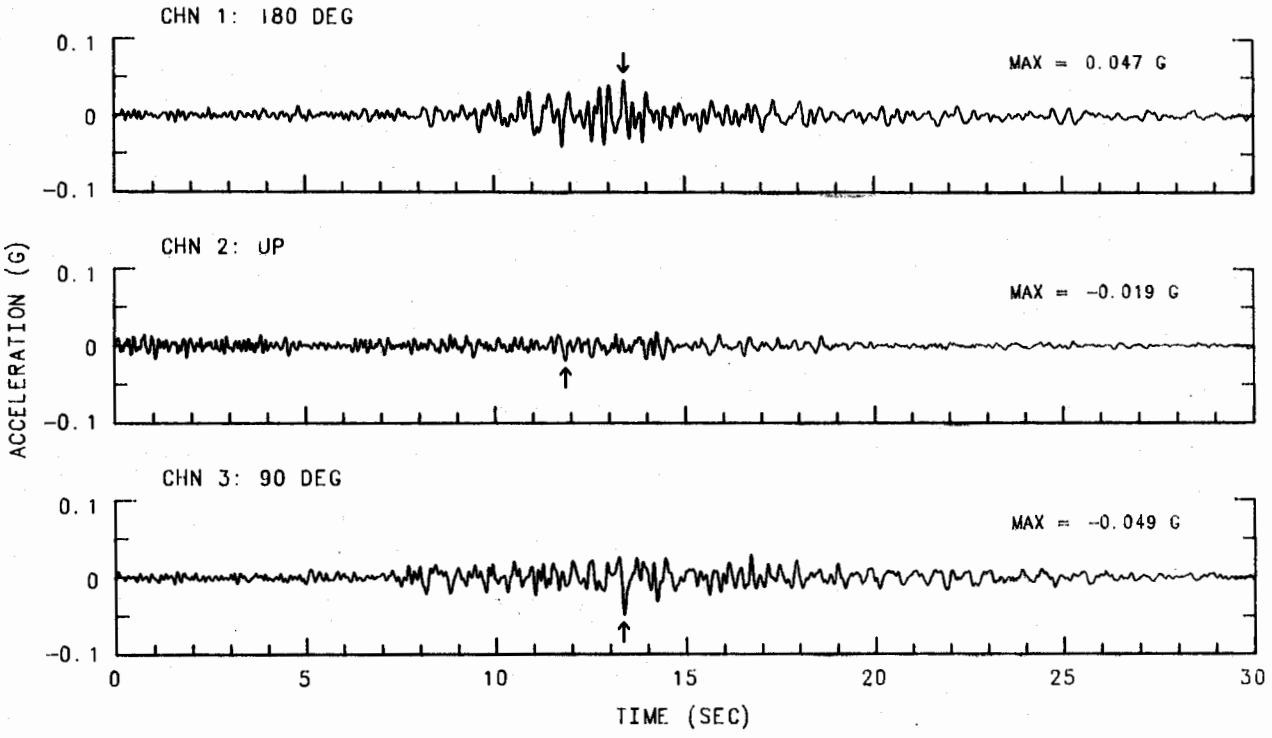


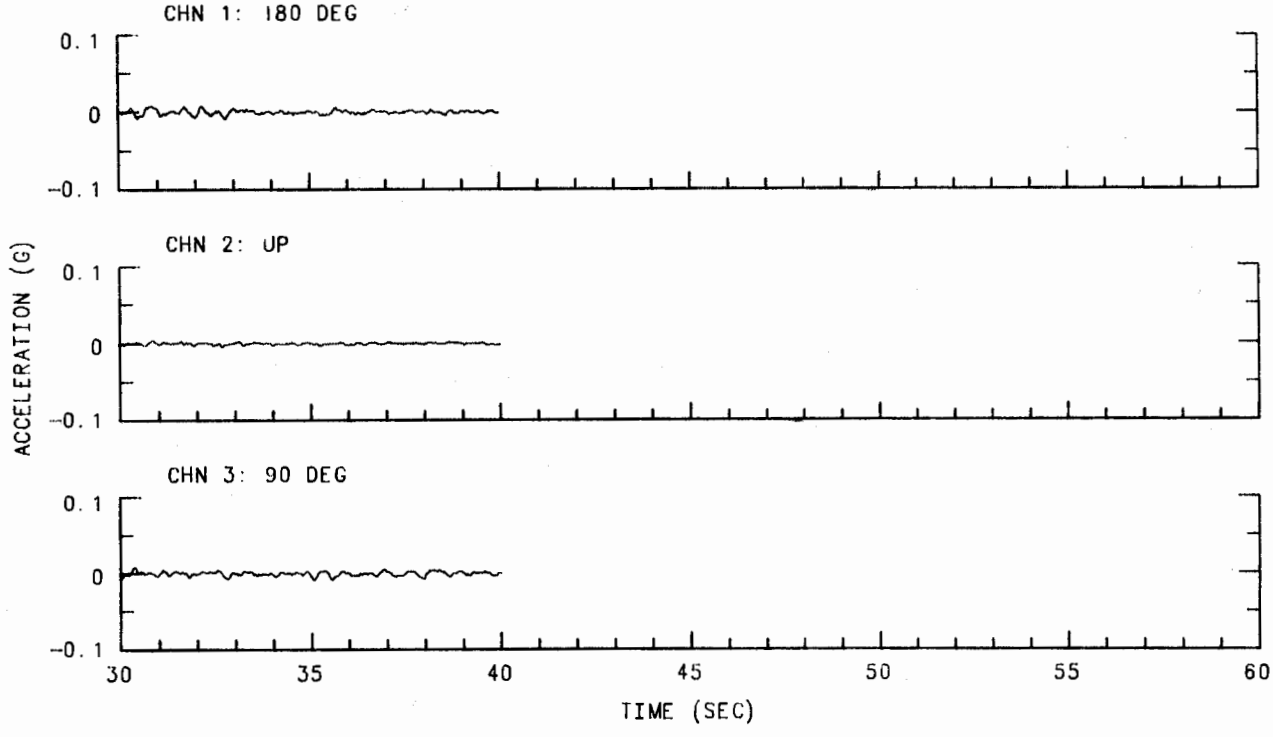
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

MOORPARK - VENTURA CO. FIRE DEPT. GARAGE: CSMIP S/N 283

PHASE 1 ACCELERATION

RECORD ID: 24283-S2509-87279.01



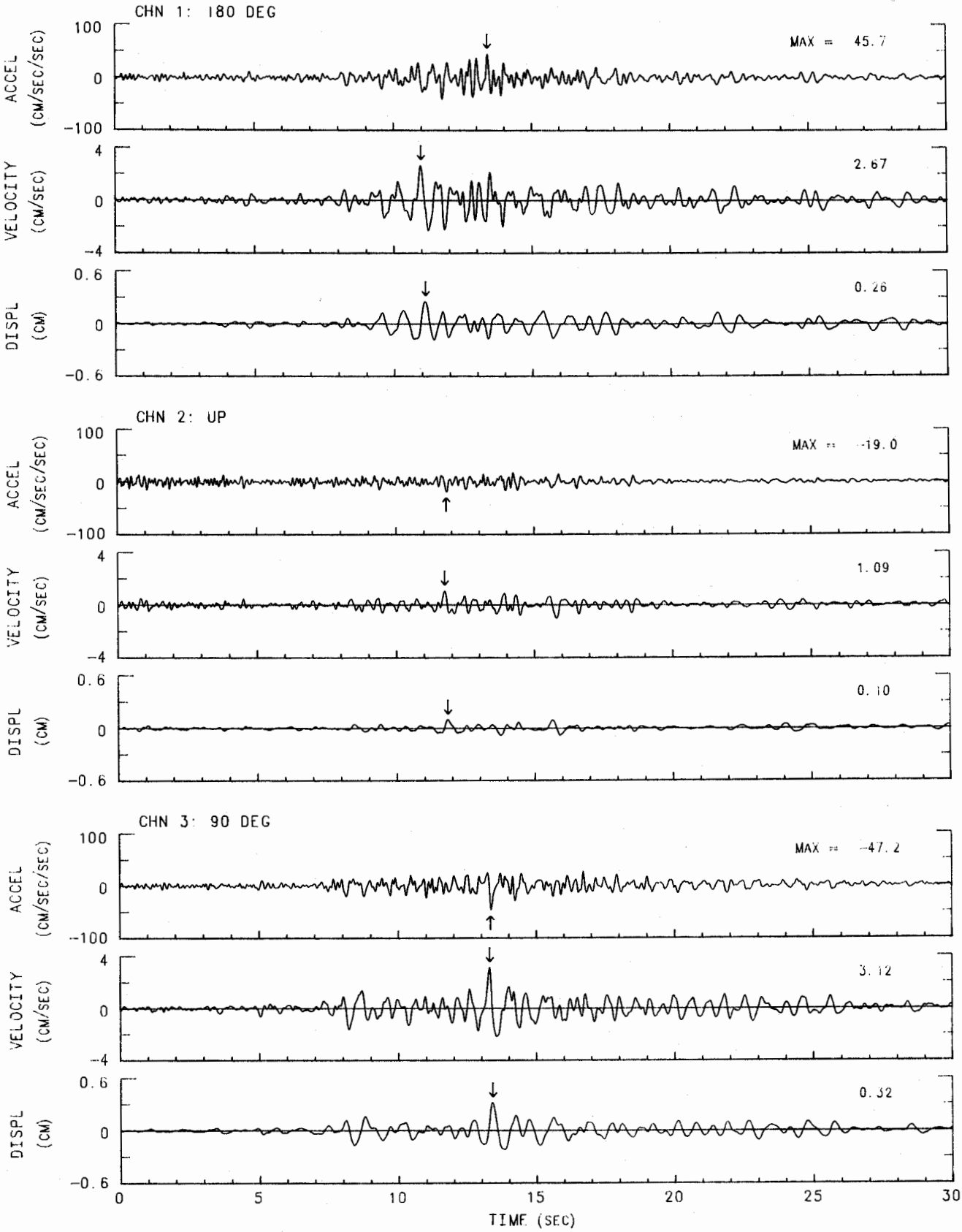


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

MOORPARK - VENTURA CO. FIRE DEPT. GARAGE: CSMIP S/N 283

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 24283-S2509-87279.01



MOORPARK - VENTURA CO. FIRE DEPT. GARAGE: CSMIP S/N 283

WHITTIER EARTHQUAKE

OCTOBER 1, 1987 07:42 PDT

PHASE 3 DATA: RESPONSE SPECTRA

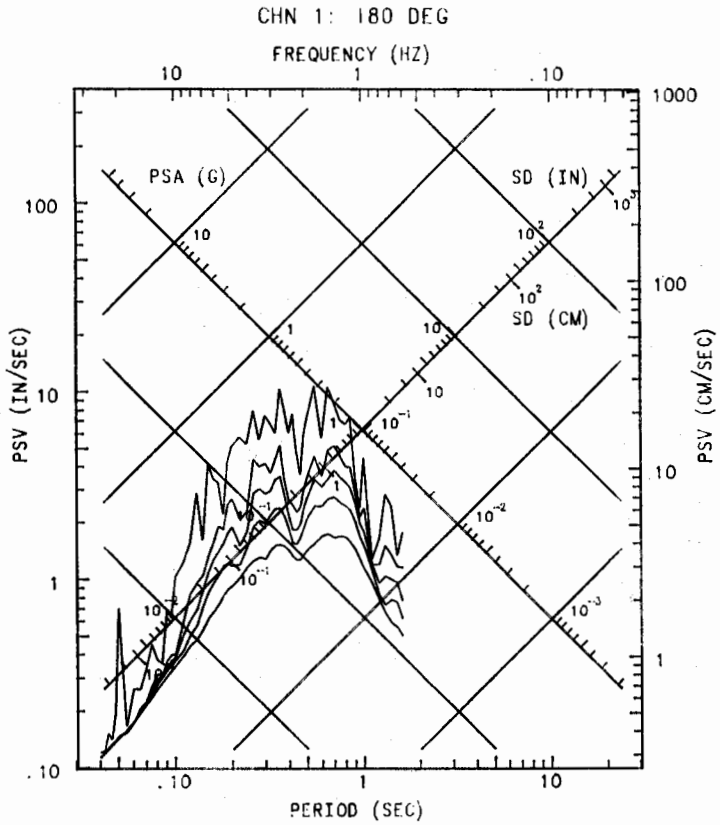
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ

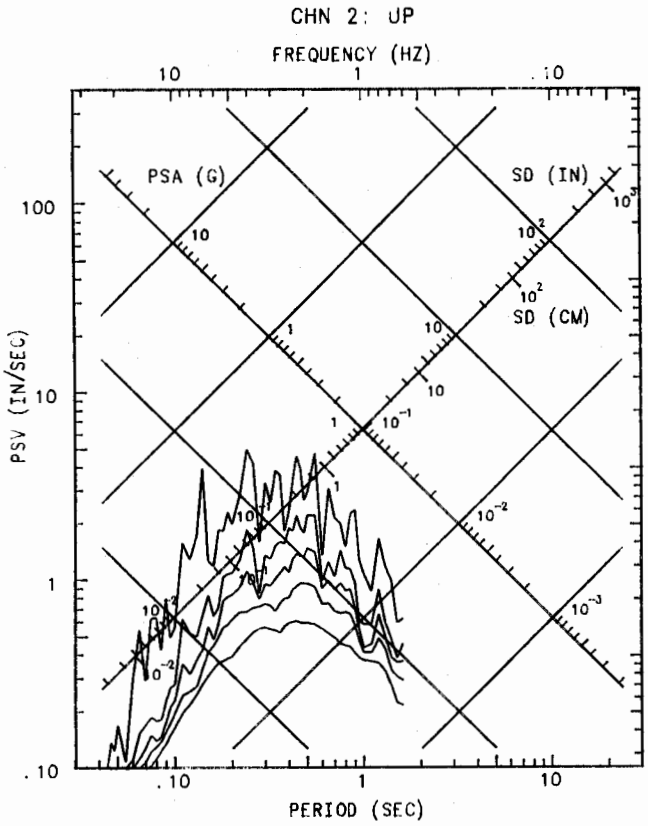
(0.04 TO 1.47 SEC)

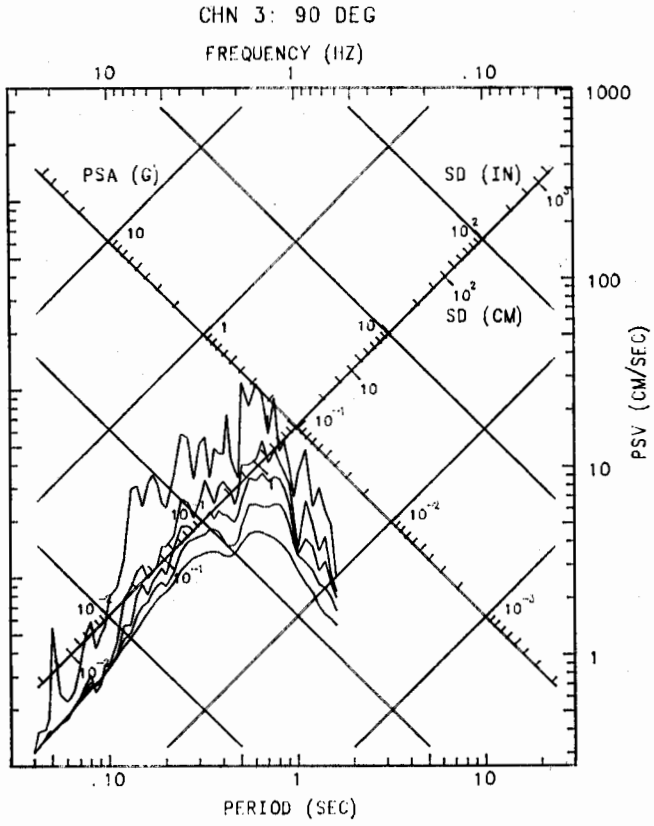
RECORD ID: 24283-S2509-87279.01

—— RESPONSE SPECTRA: PSV, PSA & SD

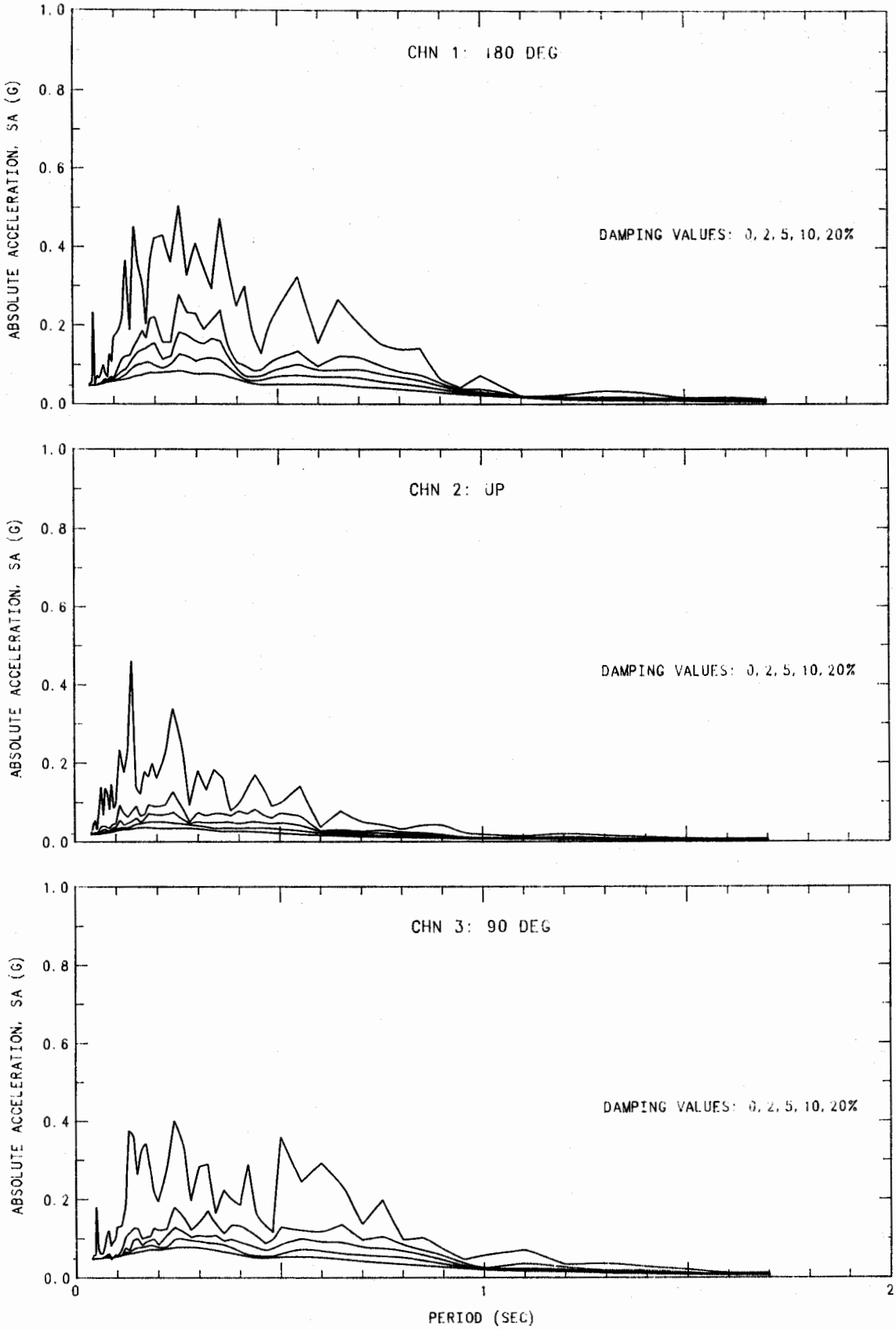
DAMPING VALUES: 0, 2, 5, 10, 20%







WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
MOORPARK - VENTURA CO. FIRE DEPT. GARAGE: CSMIP S/N 283
PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24283-S2509-87279.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)

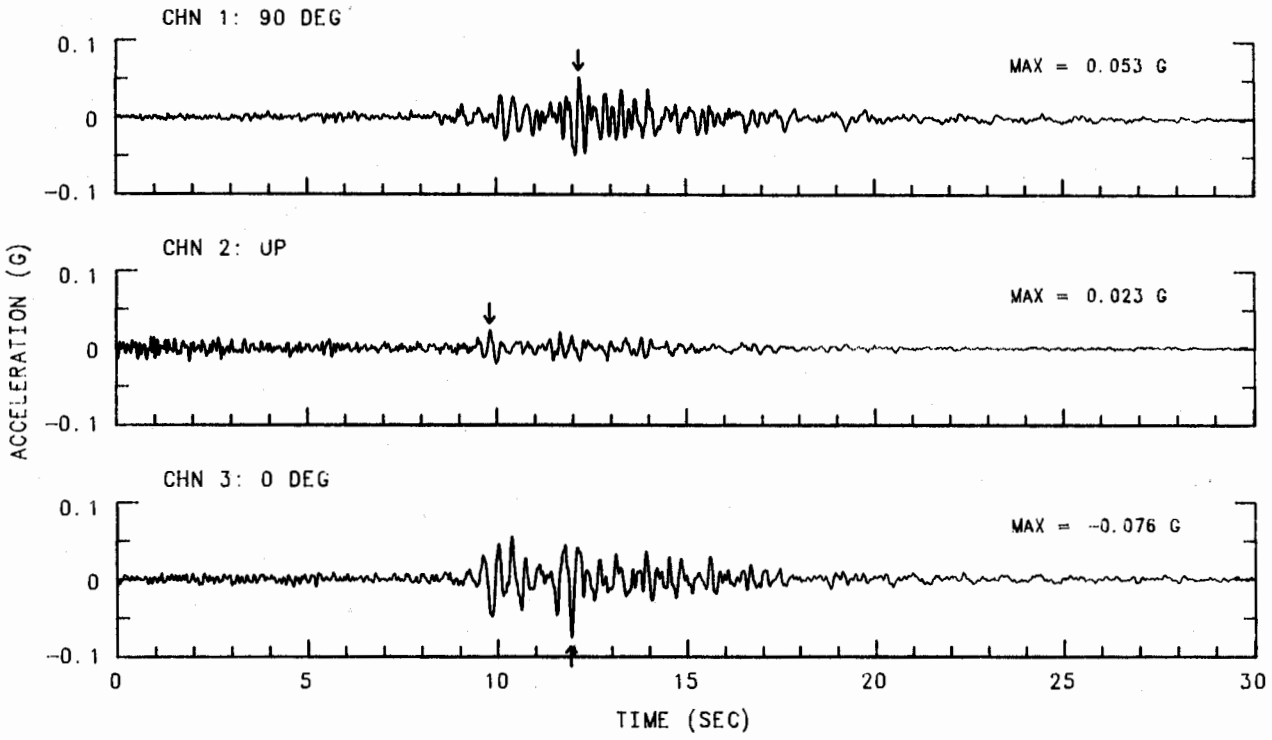


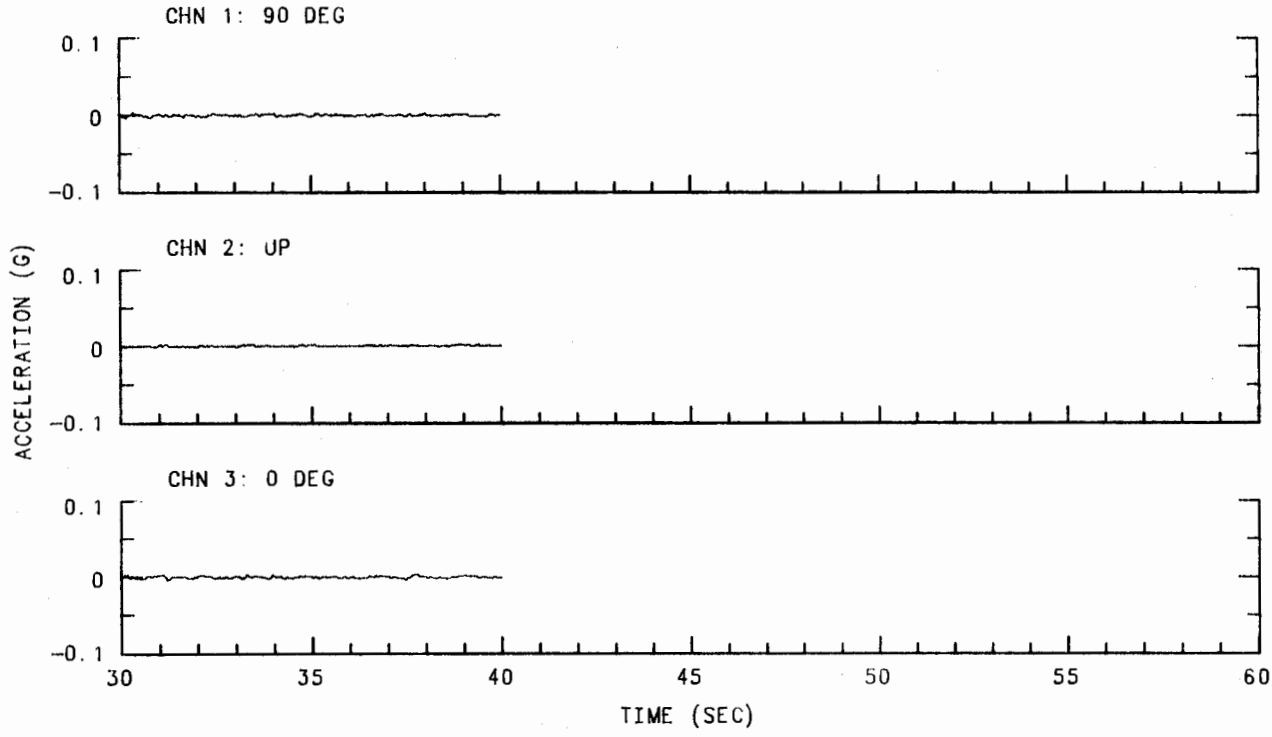
WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

ROSAMOND - GODDE RANCH: CSMIP S/N 274

PHASE 1 ACCELERATION

RECORD ID: 24274-S2518-87280.01



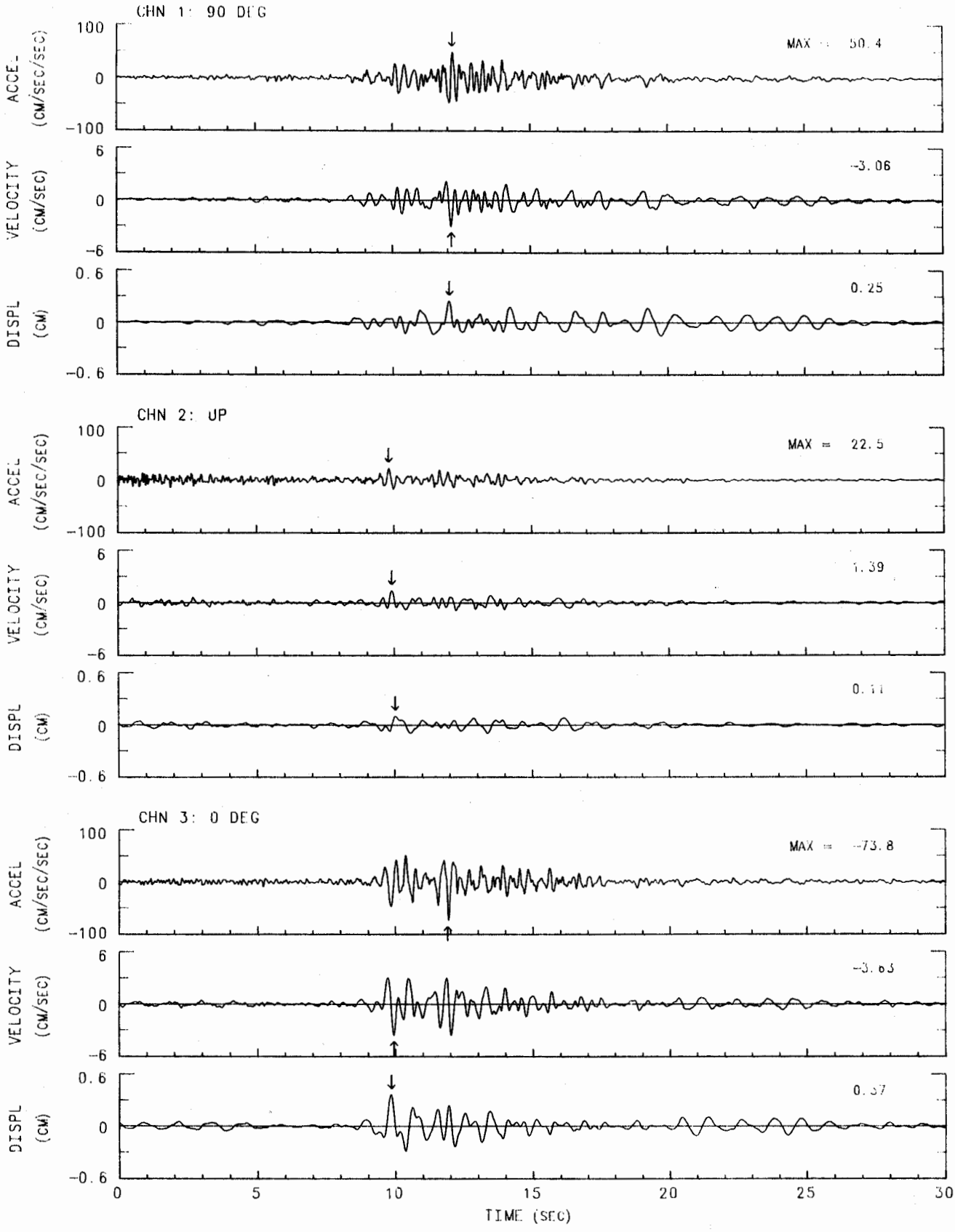


WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT

ROSAMOND - GODDE RANCH: CSMIP S/N 274

PHASE 2 FILTERED DATA: ACCELERATION, VELOCITY AND DISPLACEMENT

USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC) RECORD ID: 24274-52518-87280.01



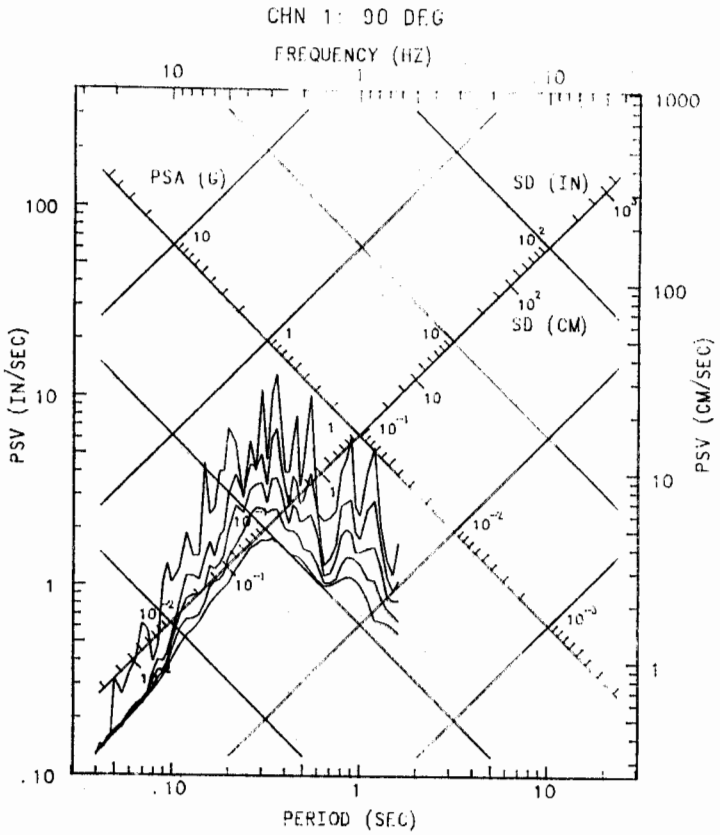
ROSAMOND - GODDE RANCH: CSMIP S/N 274

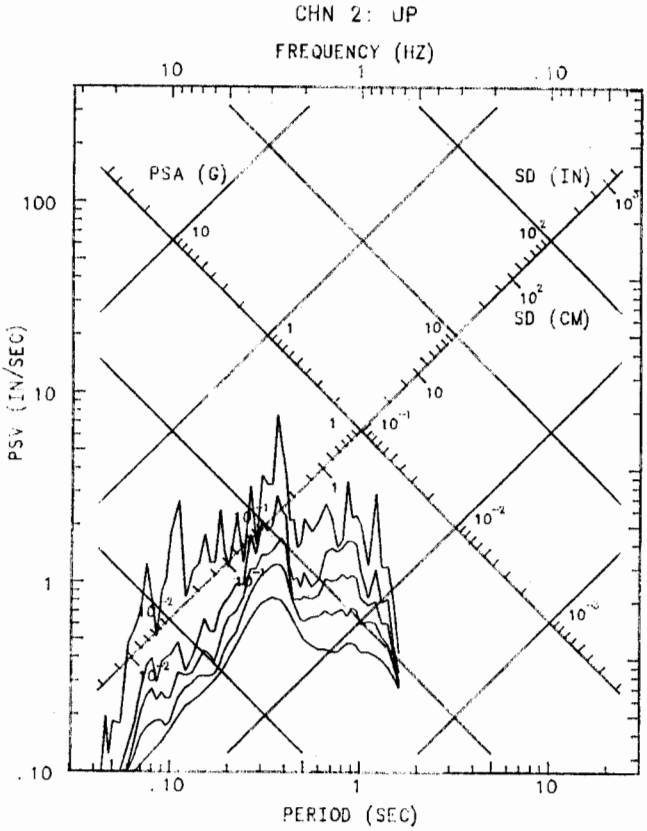
WHITTIER EARTHQUAKE
OCTOBER 1, 1987 07:42 PDT

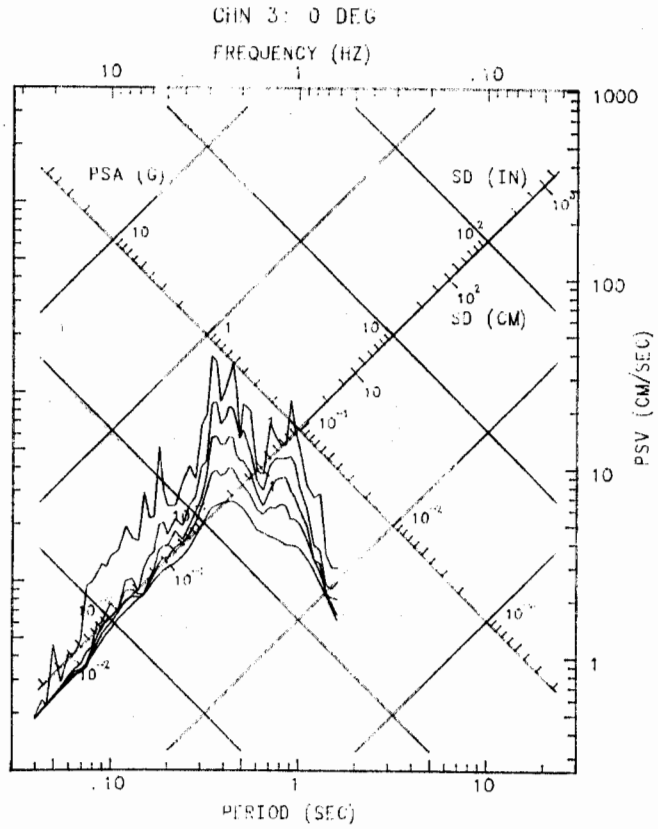
PHASE 3 DATA: RESPONSE SPECTRA
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ
(0.04 TO 1.47 SEC)

RECORD ID: 24274-S2518-87280.01

——— RESPONSE SPECTRA: PSV, PSA & SD
DAMPING VALUES: 0, 2, 5, 10, 20%

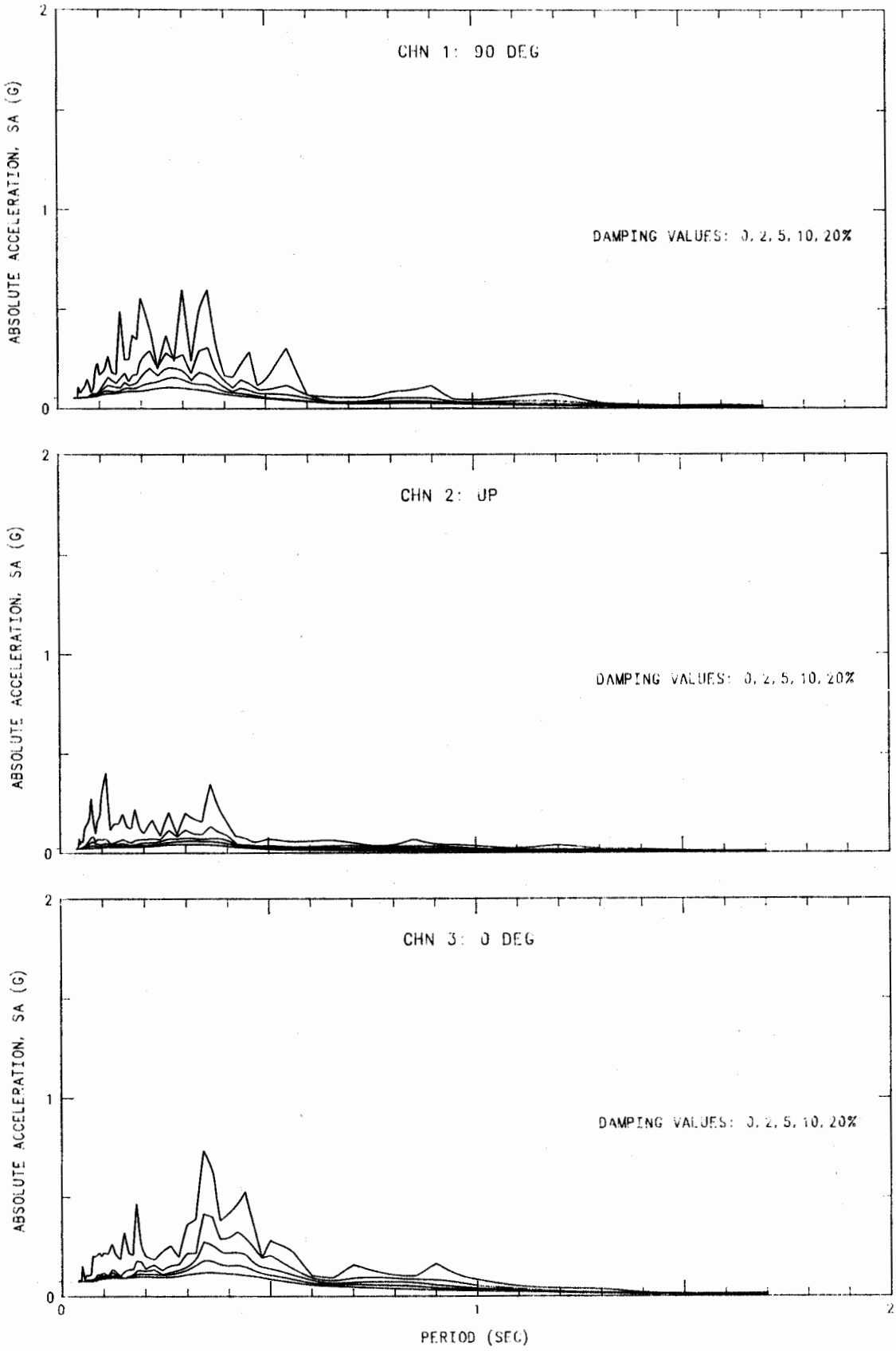






WHITTIER EARTHQUAKE OCTOBER 1, 1987 07:42 PDT
ROSAMOND - GODDE RANCH: CSMIP S/N 274

PHASE 3 DATA: RESPONSE SPECTRA RECORD ID: 24274-S2518-87280.01
USABLE DATA BANDWIDTH: 0.68 TO 23.6 HZ (0.04 TO 1.47 SEC)



LIST OF CSMIP REPORTS AND DATA TAPES

California Department of Conservation
Division of Mines and Geology
Office of Strong Motion Studies
California Strong Motion Instrumentation Program (CSMIP)

AVAILABLE REPORTS:

Title	Number
I. Earthquake Data Reports:	
CSMIP Strong-Motion Records from the Superstition Hills, Imperial County, California Earthquakes of 23 and 24 November 1987	OSMS 87-06
CSMIP Strong-Motion Records from the Whittier, California Earthquake of 1 October 1987	OSMS 87-05
CSMIP Strong-Motion Records from the Chalfant Valley, California Earthquakes of July and August 1986	OSMS 86-06
CSMIP Strong-Motion Records from the Palm Springs, California Earthquake of 8 July 1986	OSMS 86-05
Selected Accelerograms from the Redlands, California Earthquake of October 2, 1985	OSMS 85-02
CSMIP Strong-Motion Records from the Bishop, California Earthquake of 23 November 1984	OSMS 84-12
CDMG Strong-Motion Records from the Morgan Hill, California Earthquake of 24 April 1984	OSMS 84-7
Preliminary Summary of CDMG Strong-Motion Records from the 2 May 1983 Coalinga, California Earthquake	OSMS 83-5.2
Strong-Motion Records from the Mammoth Lakes, California Earthquake of 6 January 1983	OSMS 83-1.1
Strong-Motion Records Recovered from the Mammoth Lakes, California Earthquake of 30 September 1981	OSMS 81-10.1
Strong-Motion Records Recovered from the Westmorland, California Earthquake of 25 April 1981	OSMS 81-5.1
Strong-Motion Records Recovered from the Trindad-Offshore, California Earthquake of 8 November 1980	OSMS 80-11.1
Strong-Motion Records from the Livermore Earthquakes of 24 and 26 January 1980	PR 28
Strong-Motion Records from the Mammoth Lakes Earthquakes of May 1980	PR 27
Compilation of Strong-Motion Records and Preliminary Data from the Imperial Valley Earthquake of 15 October 1979	PR 26

Title	Number
Compilation of Strong-Motion Records from the Coyote Lake Earthquake of 6 August 1979	PR 25
Compilation of Strong-Motion Records Recovered from the Bishop, California Earthquake of 4 October 1978	OSMS 78-7.1
Compilation of Strong-Motion Records Recovered from the Santa Barbara Earthquake of 13 August 1978	PR 22
Catalog of Strong Motion Accelerograph Records Recovered by Office of Strong Motion Studies before January 1, 1982	SR 154
Catalog of Strong Motion Accelerograph Records Recovered by Office of Strong Motion Studies During 1982	SR 154A
II. Processed Data Reports:	
The Cerro Prieto, Baja California Earthquake of February 6, 1987 and Processed Strong-Motion Data	OSMS 87-04
Processed Strong Motion Data from the Palm Springs Earthquake of 8 July 1986; Part I Ground-Response Records	OSMS 87-01
Processed Strong Motion Data from the San Salvador Earthquake of October 10, 1986	OSMS 86-07
Processed Data from the Strong-Motion Record Obtained at a Base-Isolated Building in Rancho Cucamonga, California during the Redlands Earthquake of 2 October 1985	OSMS 86-01
Processed Data from Strong-Motion Records of the Morgan Hill Earthquake of 24 April 1984: Part I Ground-Response Records	OSMS 85-04
Processed Data from Strong-Motion Records of the Morgan Hill Earthquake of 24 April 1984: Part II Structural-Response Records	OSMS 85-05
Processed Data from the Strong-Motion Records of the Imperial Valley Earthquake of 15 October 1979.	SP 65
Processed Data from the San Juan Bautista 101/156 Separation Bridge and the San Juan Bautista Freefield Records from the Coyote Lake Earthquake 6 August 1979	SP 64
Processed Data from the Gilroy Array and Coyote Creek Records, Coyote Lake, California, Earthquake 6 August 1979	PR 24
Processed Data from the Strong-Motion Records of the Santa Barbara Earthquake of 13 August 1978. (in three volumes)	SR 144
III. Other Reports:	
Standard Tape Format of CSMIP Strong-Motion Data Tapes	OSMS 85-03

AVAILABLE STRONG-MOTION DATA TAPES:

Tape Name	Description
SANTBARB78	Santa Barbara earthquake of 13 August 1978.
IMPERIAL79	Imperial Valley earthquake of 15 October 1979 (County Services Bldg. and other CSMIP stations).
COYOTE79A	Coyote Lake earthquake of 6 August 1979, Gilroy Array stations.
COYOTE79B	Coyote Lake earthquake of 6 August 1979, San Juan Bautista overpass and nearest free-field station.
COYOTE79C	Coyote Lake earthquake of 6 August 1979, Halls Valley station.
MAMMOTH80A	Mammoth Lakes earthquakes of 25 May 1980 at 09:34 and 09:49 PDT.
MAMMOTH80B	Mammoth Lakes earthquakes of 25 May 1980 at 12:45 and 13:36 PDT.
MAMMOTH80C	Mammoth Lakes earthquakes of 26 May 1980 at 11:58 PDT and 27 May 1980 at 07:51 PDT.
WESTMOR81	Westmorland earthquake of 26 April 1981.
COALINGA83	Coalinga earthquake of 2 May 1983, 16:43 PDT; Vol. 2 and 3 data for 47 records.
COALINGA83-IA	Coalinga earthquake of 2 May 1983, Vol. 1 data for first 22 records.
COALINGA83-IB	Coalinga earthquake of 2 May 1983, Vol. 1 data for remaining 25 records.
COALINGA83AS	Vol. 2 and 3 data for eight aftershocks of the Coalinga 2 May 1983 earthquake. The aftershocks occurred between 8 May and 11 September 1983, and were of magnitude (ML) 4.3 - 6.0.
COALINGA83AS-I	Vol. 1 data for the Coalinga aftershock records included on the tape COALINGA83AS.
RIODEL8083	Processed data from the Highway 101 Overpass at Rio Dell for the earthquakes of: 8 Nov 1980 (6.9ML Trinidad-Offshore); 16 Dec 1982 (4.4ML Rio Dell) and 24 Aug 1983 (5.5ML Cape Mendicino Offshore).
MAMMOTH83	Mammoth Lakes earthquakes of 7 Jan 1983 at 01:38 and 03:24 GMT.
MORGANHILL84-IG	Morgan Hill earthquake of 24 April 1984; Vol. 1 data from 19 ground-response stations.
MORGANHILL84-G	Morgan Hill earthquake of 24 April 1984; Vol. 2 and 3 data from 19 ground-response stations.
MORGANHILL84-IS	Morgan Hill earthquake of 24 April 1984; Vol. 1 data from 7 buildings and one bridge.
MORGANHILL84-S	Morgan Hill earthquake of 24 April 1984; Vol. 2 and 3 data from 7 buildings and one bridge.

Tape Name	Description
REDLANDS85	Redlands earthquake of 2 October 1985; data from the Law & Justice Building at Rancho Cucamonga.
HOLLISTER86	Hollister earthquake of 26 January 1986.
MTLEWIS86	Mt. Lewis earthquake of 31 March 1986.
SANSALVADOR86	San Salvador earthquake of October 10, 1986.
PALMSPRINGS86-IG	Palm Springs earthquake of 8 July 1986; Vol. 1 data from 18 ground-response stations.
PALMSPRINGS86-G	Palm Springs earthquake of 8 July 1986; Vol. 2 and 3 data from 18 ground-response stations.
CERROPRIETO87	Cerro Preito, Baja California earthquake of February 6, 1987
WHITTIER87-IG	Whittier earthquake of 1 October 1987; Vol. 1 data from 36 ground-response stations.
WHITTIER87-G	Whittier earthquake of 1 October 1987; Vol. 2 and 3 data from 36 ground-response stations.
WHITTIER87-IB1	Whittier earthquake of 1 October 1987; Vol. 1 data from first 10 of the 18 buildings.
WHITTIER87-IB2	Whittier earthquake of 1 October 1987; Vol. 1 data from last 8 of the 18 buildings.
WHITTIER87-IIB	Whittier earthquake of 1 October 1987; Vol. 2 data from all 18 buildings.
WHITTIER87-IIIB	Whittier earthquake of 1 October 1987; Vol. 3 data from all 18 buildings.
WHITTIER87-L	Whittier earthquake of 1 October 1987; Vol. 1, 2 and 3 data from 3 lifeline structures (1 bridge and 2 dams).

Footnotes:

Each tape contains Vol. 1, 2 and 3 data unless otherwise specified.

Vol. 1 data - uncorrected accelerations,
Vol. 2 data - instrument and baseline-corrected acceleration, velocity, and displacement.
Vol. 3 data - Response and Fourier amplitude spectra.

The magnetic tapes are provided at cost. Included with each tape is a copy of either the processed data report (if available) or the plots of the data.

The Vol. 2 and 3 data are also available on floppy disks for use in personal computers. Requests for the reports, data tapes, data disks and/or for additional information should be addressed to:

Office of Strong Motion Studies
California Division of Mines and Geology
630 Bercut Drive
Sacramento, CA 95814

Phone: (916) 322-3105

PROCESSED ACCELEROGRAMS ON CSMIP DATA TAPES:

Tape: SANTBARB78

Santa Barbara Earthquake of 13 Aug 1978, 15:54 PDT, ML=5.1(CIT)

UCSB Goleta Free Field
Santa Barbara - Freitas Building
Santa Barbara - UCSB North Hall
Ventura - Holiday Inn

Tape: IMPERIAL79

Imperial Valley Earthquake of 15 Oct 1979, 16:17 PDT, ML=6.6(CIT)

Niland
Westmorland
Westmorland, aftershock record
El Centro - Imperial County Services Building and Free Field
El Centro - Highway 8/Meloland Road Overpass

Tape: COYOTE79A

Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BRK)

Gilroy #1, #2, #3, #4, #6
Coyote Lake Dam (San Martin)

Tape: COYOTE79B

Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BRK)

San Juan Bautista - Fire Station
San Juan Bautista - Highway 101/156 Overpass

Tape: COYOTE79C

Coyote Lake Earthquake of 6 Aug 1979, 10:05 PDT, ML=5.9(BRK)

Halls Valley

Tape: MAMMOTH80A

Mammoth Lakes Earthquake of 25 May 1980, 09:34 PDT, ML=6.1(BRK),6.4(CIT)

Convict Creek
Mammoth Lakes - High School Gym
Long Valley Dam

Aftershock at 25 May 1980, 09:36 PDT, ML=unknown

Mammoth Lakes - High School Gym, 10 channels

Mammoth Lakes Earthquake of 25 May 1980, 09:49 PDT, ML=6.0(BRK),5.8(CIT)

Convict Creek
Mammoth Lakes - High School Gym
Long Valley Dam - Upper Left Abutment

Tape: MAMMOTH80B

Mammoth Lakes Earthquake of 25 May 1980, 12:45 PDT, ML=6.1(BRK),6.5(CIT)

Convict Creek	Long Valley Dam

Mammoth Lakes Earthquake of 25 May 1980, 13:36 PDT, ML=5.7(BRK),5.5(CIT)

Convict Creek	Long Valley Dam

Aftershock approx 58 seconds after 25 May 1980, 13:36 Event, ML=unknown

Convict Creek

Tape: MAMMOTH80C

Mammoth Lakes Earthquake of 26 May 1980, 11:58 PDT, ML=5.7(BRK),4.9(CIT)

Convict Creek	Long Valley Dam

Mammoth Lakes Earthquake of 27 May 1980, 07:51 PDT, ML=6.2(BRK),6.3(CIT)

Convict Creek	Long Valley Dam
Bishop - Paradise Lodge	Benton

Tape: WESTMOR81

Westmorland Earthquake of 26 Apr 1981, 05:09 PDT, ML=5.7(CIT),6.3(BRK)

Westmorland	Niland

Tape: RIODEL8083

Records obtained at Rio Dell - Highway 101/Painter Street Overpass from the following three earthquakes:

Trinidad Offshore Earthquake of 8 Nov 1980, 02:27 PST, ML=6.9(BRK)

Rio Dell Earthquake of 15 Dec 1982, 22:53 PST, ML=4.4(BRK)

Cape Mendocino Offshore Earthquake of 24 Aug 1983, 06:36 PDT, ML=5.5(BRK)

Tape: MAMMOTH83

Records obtained at Convick Creek from the following two earthquakes:

Mammoth Lakes Earthquake of 6 Jan 1983, 17:38 PST, ML=5.2(BRK)

Mammoth Lakes Earthquake of 6 Jan 1983, 19:24 PST, ML=5.4(BRK)

Tapes: COALINGA83, COLINGA83-IA, COLINGA83-IB *

Coalinga Earthquake of 2 May 1983, 16:42 PDT, ML=6.5(BRK)

Cantua Creek School
Slack Canyon
Parkfield - Vineyard Canyon 1E, 2E, 1W, 2W, 3W, 4W, 5W, 6W
Parkfield - Gold Hill 2E, 3E, 1W, 2W, 3W, 4W, 5W, 6W
Parkfield - Stone Corral 1E, 2E, 3E, 4E
Parkfield - Cholame 1E, 2E, 3E, 2WA, 3W, 4W, 4AW, 5W, 6W, 8W, 12W
Parkfield - Fault Zone 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16

* Vol. 1 data are on tapes COALINGA83-IA and COLALINGA83-IB; Vol. 2 and 3 data are on tape on tape COALINGA83.

Tapes: COALINGA83AS, COLINGA83AS-I **

Records from 8 aftershocks of the Coalinga Earthquake of 2 May 1983

Event #2: 8 May 1983, 19:49 PDT, ML=5.1(BRK)

Coalinga - Sulphur Baths
Coalinga - CHP
Anticline Ridge - Palmer Ave.
Oil Fields - Skunk Hollow
Harris Ranch

Event #3: 10 June 1983, 20:10 PDT, ML=5.1(BRK)
Event #4: 9 July 1983, 00:41 PDT, ML=5.3(BRK)
Event #5: 21 July 1983, 19:40 PDT, ML=6.0(BRK)
Event #6: 21 July 1983, 20:43 PDT, ML=5.0(BRK)
Event #7: 25 July 1983, 15:31 PDT, ML=5.1(BRK)
Event #8: 9 Sept 1983, 02:16 PDT, ML=5.3(BRK)
Event #9: 11 Sept 1983, 04:48 PDT, ML=4.3(BRK)

For each of events #3 through #9:

Coalinga - Sulphur Baths
Coalinga - CHP

** Vol. 1 data are on tape COALINGA83AS-I; Vol. 2 and 3 data are on tape COALINGA83AS.

Tapes: MORGANHILL84-G, MORGANHILL84-IG ***

Morgan Hill Earthquake of 24 Apr 1984, 13:15 PST, ML=6.2(BRK)
Ground-response records

Halls Valley
Coyote Lake Dam (San Martin)
Gilroy #1, #2, #3, #4, #6, #7
Gilroy - Gavilan College
Corralitos
Capitolas
Santa Cruz
San Juan Bautista - Fire Station
Los Banos
Agnews - State Hospital
Redwood City - APEEL #1
San Francisco - International Airport
Fremont - Mission San Jose
Hayward - APEEL #1E

Tapes: MORGANHILL84-S, MORGANHILL84-IS ***

Morgan Hill Earthquake of 24 Apr 1984, 13:15 PST, ML=6.2(BRK)
Structural-response records

San Jose-Town Park Towers	San Jose-Great Western Savings Bldg.
San Jose-Santa Clara Co. Bldg.	Saratoga - West Valley College Gym
Watsonville - Telephone Bldg.	Hollister - Glorietta Warehouse

South San Francisco - Kaiser Medical Center
San Juan Bautista - Highway 101/156 Overpass

*** Vol. 1 data are on tapes MORGANHILL84-IG and MORGANHILL84-IS; Vol. 2 and 3 data are on tapes MORGANHILL84-G and MORGANHILL84-S.

Tape: REDLANDS85

Redlands Earthquake of 2 Oct 1985, 16:44 PDT, ML=4.8(CIT)

Rancho Cucamonga - Law & Justice Building (base-isolated) and FF

Tape: HOLLISTER86

Hollister Earthquake of 26 January 1986, 11:21 PST, ML=5.5(BRK)

SAGO South - Tunnel	SAGO South - Surface

Hollister - Glorietta Warehouse

Tape: MTLEWIS86

Mt. Lewis Earthquake of 31 March 1986, 03:56 PST, ML=5.8(BRK)

Halls Valley	San Jose - Santa Clara County Bldg.
San Jose - Town Park Towers	San Jose-Great Western Savings Bldg.

Tape: SANSALVADOR86

San Salvador Earthquake of 10 October 1986, 17:49 GMT, MS=5.4(CIG)

Natl Geographical Inst. (IGN)	Geotech. Investigation Center (CIG)
Inst. Urban Construction (IVU)	Hotel Sheraton (HSH)

Hotel Camino Real (HCR) - Basement, 2nd Floor, Roof
Centro Americana University (UCA)

Tapes: PALMSPRINGS86-G, PALMSPRINGS86-IG ****

Palm Springs Earthquake of 8 July 1986, 02:20 PDT, ML=5.6(CIT)
Ground-response records

Desert Hot Springs	Palm Springs - Airport
Silent Valley - Poppet Flat	San Jacinto - Soboba
San Jacinto - Valley Cemetery	Hemet - Stetson Ave Fire Station
Winchester - Page Bros. Ranch	Winchester - Hidden Valley Farms
Winchester - Bergman Ranch	Murrieta Hot Springs - Collins Ranch
Landers - Fire Station	Joshua Tree - Fire Station
Indio - Coachella Canal	Temecula - CDF Fire Station
Puerta La Cruz	Riverside - Airport
Hesperia	Rancho Cucamonga-Law & Justice Center FF

**** Vol. 1 data are on tape PALMSPRINGS86-IG; Vol. 2 and 3 data are on tape PALMSPRINGS86-G.

Tape: CERROPRIETO87

Cerro Prieto, Baja California earthquake of 6 February 1987, 19:45 PST, ML=5.4 (CICESE)

Cerro Prieto

Tape: WHITTIER87-IG, -G #

Whittier Earthquake of 1 October 1987, 07:42 PDT, ML=5.9 (CIT)
Ground-response records

Tarzana - Cedar Hill Nursery	Alhambra - Fremont School
San Marino - Southwestern Academy	Los Angeles - Obregon Park
Altadena - Eaton Canyon Park	Downey - County Maint. Bldg.
Mt. Wilson - Caltech Seismic Station	Los Angeles - 116th St. School
Los Angeles-Hollywood Storage Bldg. FF	Inglewood - Union Oil Yard
Long Beach - Rancho Los Cerritos	Los Angeles - Baldwin Hills
Century City - LA Country Club South	Century City - LA Country Club North
Long Beach - Recreation Park	Long Beach - Harbor Admin. Bldg. FF
Pacoima - Kagel Canyon	Arleta - Nordhoff Ave Fire Station
Sylmar - Olive View Medical Center FF	Pomona - 4th & Locust FF
Featherly Park - Park Maint. Bldg.	Huntington Beach - Lake St. Fire Station
Rancho Cucamonga-Law & Justice Cntr FF	Riverside - Airport
Hemet - Stetson Ave Fire Station	Vasquez Rocks Park
Newhall - LA County Fire Station	Lancaster - Medical Office Bldg. FF
Leona Valley #5 - Ritter Ranch	Leona Valley #6
Malibu - Point Dume School	Castaic - Hasley Canyon
Lake Hughes #1 - Fire Station #78	Castaic - Old Ridge Route
Moorpark-Ventura Co. Fire Dept. Garage	Rosamond - Godde Ranch

Vol. 1 data are on tape WHITTIER87-IG; Vol. 2 and 3 data are on Tape WHITTIER87-G.

Tape: WHITTIER87-IB1, -IB2, -IIB, IIIB ##

Whittier Earthquake of 1 October 1987, 07:42 PDT, ML=5.9 (CIT)
Building records

Los Angeles-CSULA Admin. Building	Los Angeles - Sears Warehouse
Los Angeles-Hollywood Storage Bldg. & FF	
Burbank-California Fed. Savings Bldg.	Burbank - Pacific Manor
N. Hollywood - Sheraton Universal Hotel	
Long Beach - CSULB Eng. Bldg. 1	Los Angeles-Century City Bullock's
Los Angeles-UCLA Math-Science Bldg.	Long Beach - City Hall
Long Beach - Harbor Admin. Bldg. & FF	
Sherman Oaks - Union Bank Bldg.	Van Nuys - Holiday Inn
Sylmar - Olive View Medical Center & FF	
Pomona - First Federal Savings Bldg. & FF	
Rancho Cucamonga - Law & Justice Center & FF	
San Bernardino - Sunwest Office Bldg.	Lancaster-Medical Office Bldg. & FF

Vol. 1 data are on tapes WHITTIER87-IB1 and -IB2; Vol. 2 are on WHITTIER87-IIB; Vol. 3 data are on Tape WHITTIER87-IIIB.

Tape: WHITTIER87-L

Whittier Earthquake of 1 October 1987, 07:42 PDT, ML=5.9 (CIT)
Lifeline structure records

Los Angeles - Vincent Thomas Bridge	
Puddingstone Dam	Cogswell Dam