PROCESSED CSMIP STRONG-MOTION RECORDS FROM THE LANDERS, CALIFORNIA EARTHQUAKE OF JUNE 28 1992: RELEASE NO. 3

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Report No. OSMS 93-01

California Strong Motion Instrumentation Program

California Department of Conservation

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February 11, 1993

INTRODUCTION

Strong-motion records were recovered from 144 stations of the California Strong Motion Instrumentation Program (CSMIP) following the Landers earthquake of June 28, 1992. The records from these 144 stations are presented in the CSMIP data report on the earthquake (Shakal and others, 1992).

Digitization and processing of the records recovered by CSMIP started after the data report was completed and is continuing. The preliminary results of digitizing and processing for the first release of 6 records were announced on October 9, 1992 and were included in the first release report (CSMIP, 1992). The second release of 8 stations, including 6 ground-response and 2 instrumented buildings, were announced on December 4, 1992 and were included in the second release report (Darragh, and others 1992). The third release of 10 ground-response stations has been completed and the results are presented in this report.

The processing results from 5 ground-response stations are final. These stations are:

- Featherly Park
- Pomona - 4th & Locust
- Puerta La Cruz
- Riverside Airport
- Tarzana - Cedar Hills Nursery

This release also includes preliminary processing results for the records from 5 additional ground-response stations including:

- Boron
- Downey - County Maintenance Building
- Fort Irwin
- Los Angeles - 116th Street School
- Los Angeles - Obregon Park

A preliminary release of the processed data for these 5 records is being made because of their unprecedented long-period content, probably due to the large magnitude of the earthquake. The bandwidth of the data extends beyond the traditional broadest bandwidth used by CSMIP, which dates back to the Caltech Bluebook processing. This bandwidth is 0.05-0.07 to 23-25 Hz, or 0.04 to 15 seconds period. The data appear to have reliable signal beyond 15 seconds period, but we need to extend the noise analysis of the CSMIP digitization system to increase knowledge about the noise in this period range. In the meantime, this preliminary release of the processed data within the traditional 0.04 to 15 sec bandwidth is being made so that users will not be delayed from analyzing the data. We expect the final release to differ inconsequentially in acceleration and response spectra; differences will be small in velocity, but could be important in long-period displacement.

Information on the earthquake and recording stations are given in Shakal and others (1992). Details on accelerogram digitizing and processing will be presented in the forthcoming final CSMIP processed data report.

PLOTS OF PROCESSED DATA

For each ground-response station there is a group of plots which is identified by a set number at the upper corner of each page as follows:

Set No.	Station Name
1	Boron
2	Downey - County Maintenance Building
3	Featherly Park
4	Fort Irwin
5	Los Angeles - 116th Street School
6	Los Angeles - Obregon Park
7	Pomona - 4th & Locust
8	Puerta La Cruz
9	Riverside Airport
10	Tarzana - Cedar Hills Nursery

The order of the plots for each station is as follows:

1. Phase 1 (Vol. 1) data: uncorrected accelerations. Acceleration for the first 22 seconds is plotted with a common scaling factor for all channels; three channels are plotted on one page. This plot is followed by a second plot of the full processed length (80 seconds) with each channel individually scaled.

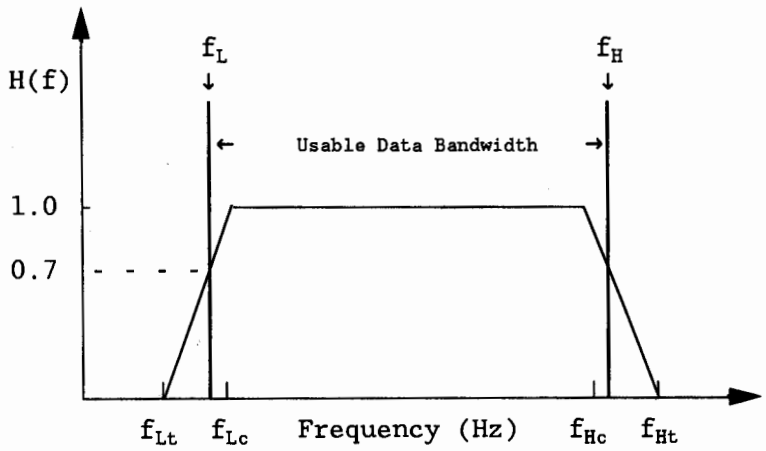
2. Phase 2 (Vol. 2) data: instrument and baseline-corrected acceleration, velocity and displacement. The data for the full processed length are plotted with equal scaling for all channels. The filter frequencies used in the processing are indicated on the plots (see Usable Data Bandwidth).

3. Phase 3 (Vol. 3) data: response spectra. The pseudo-velocity spectra (PSV), the pseudo-acceleration spectra (PSA), the displacement spectra (SD) and the Fourier amplitude spectra (FS) are presented on a tripartite logarithmic plot for each channel for 0%, 2%, 5%, 10%, and 20% dampings. 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 with linear-linear scaling.

DEFINITION OF USABLE DATA BANDWIDTH

The filter bands for each record are indicated on the plots for the Phase 2 and Phase 3 data. The digitized data are processed and filtered using Ormsby filters. The data are first low-pass filtered using a high-frequency filter with a corner frequency of 23 Hz and a roll-off termination frequency of 25 Hz. Then the data are high-pass filtered using a low-frequency filter with a corner frequency of 0.07 Hz and a roll-off termination of 0.05 Hz. 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 (see Notes). The user should only use these data for analyses within this bandwidth.

Notes:

1) 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}) used in the processing 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 the preliminary processing, the usable data bandwidth for data bandpass-filtered with ramps at 0.05 to 0.07 Hz and 23.0 to 25.0 Hz is 0.064 Hz to 23.6 Hz (0.04 to 15 seconds period).

2) 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, and -20 dB corresponds to H(f) = 0.1. Thus, at the -3 dB frequency point, the amplitude of the transfer function, H(f) is reduced to 0.7, while the power transmitted by the filter, $H^2(f)$, is reduced to 0.5.

REFERENCES

CSMIP Staff (1992). Preliminary processed strong-motion data for the Landers earthquake of 28 June 1992, Calif. Div. Mines and Geology, Office of Strong Motion Studies, Report No. OSMS 92-11, 60 p.

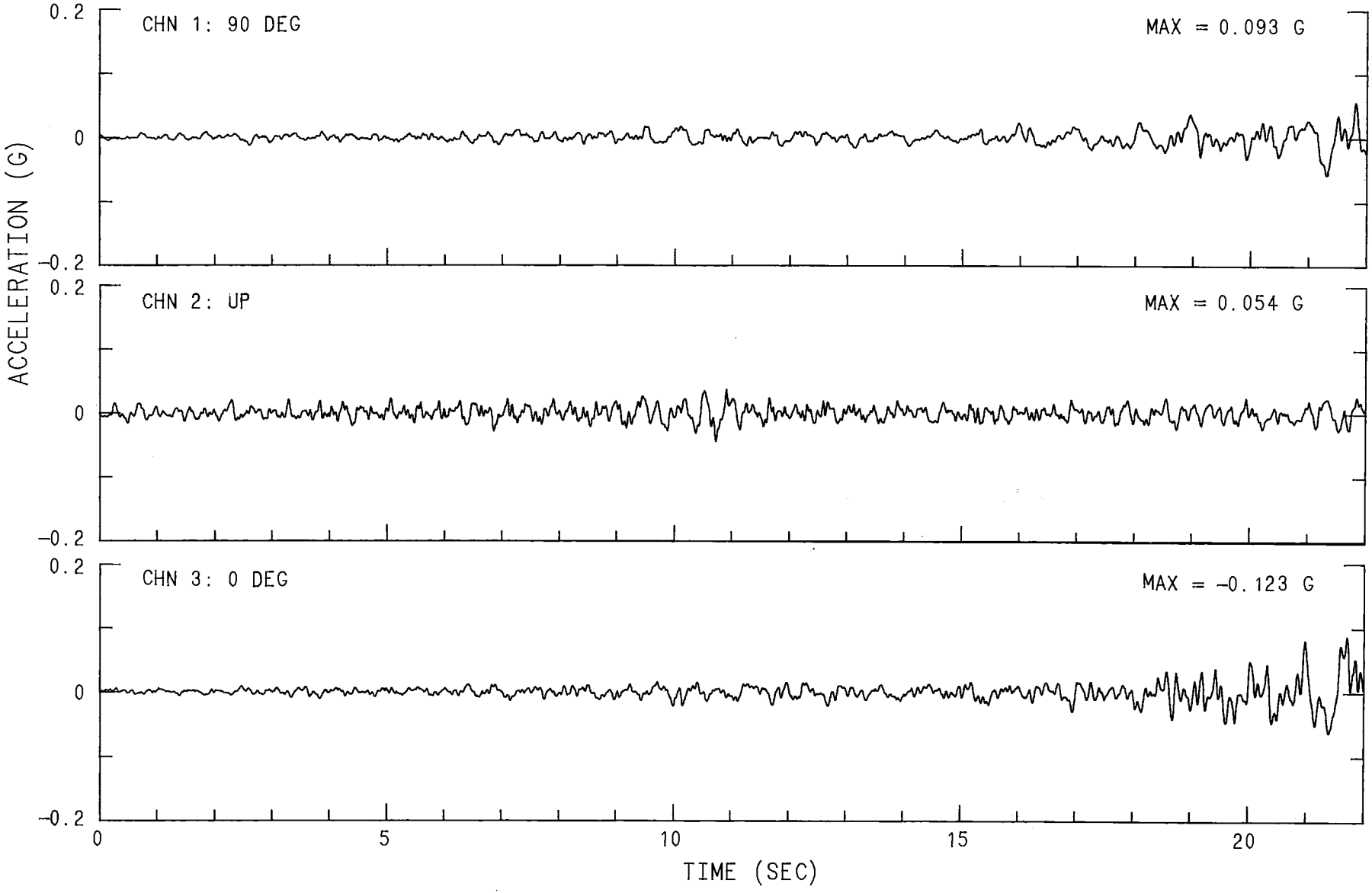
Darragh, R., T. Cao, C. Cramer, F. Su, M. Huang and A. Shakal (1992). Processed strong-motion records from the Landers earthquake of 28 June 1992: Release No. 2, Calif. Div. Mines and Geology, Office of Strong Motion Studies, Report No. OSMS 92-13, 156 p.

Shakal, A., M. Huang, T. Cao, R. Sherburne, R. Sydnor, P. Fung, P. Malhotra, C. Cramer, F. Su, R. Darragh and J. Wampole (1992). CSMIP strong-motion records from the Landers, California earthquake of 28 June 1992, Calif. Div. Mines and Geology, Office of Strong Motion Studies, Report No. OSMS 92-09, 330 p.

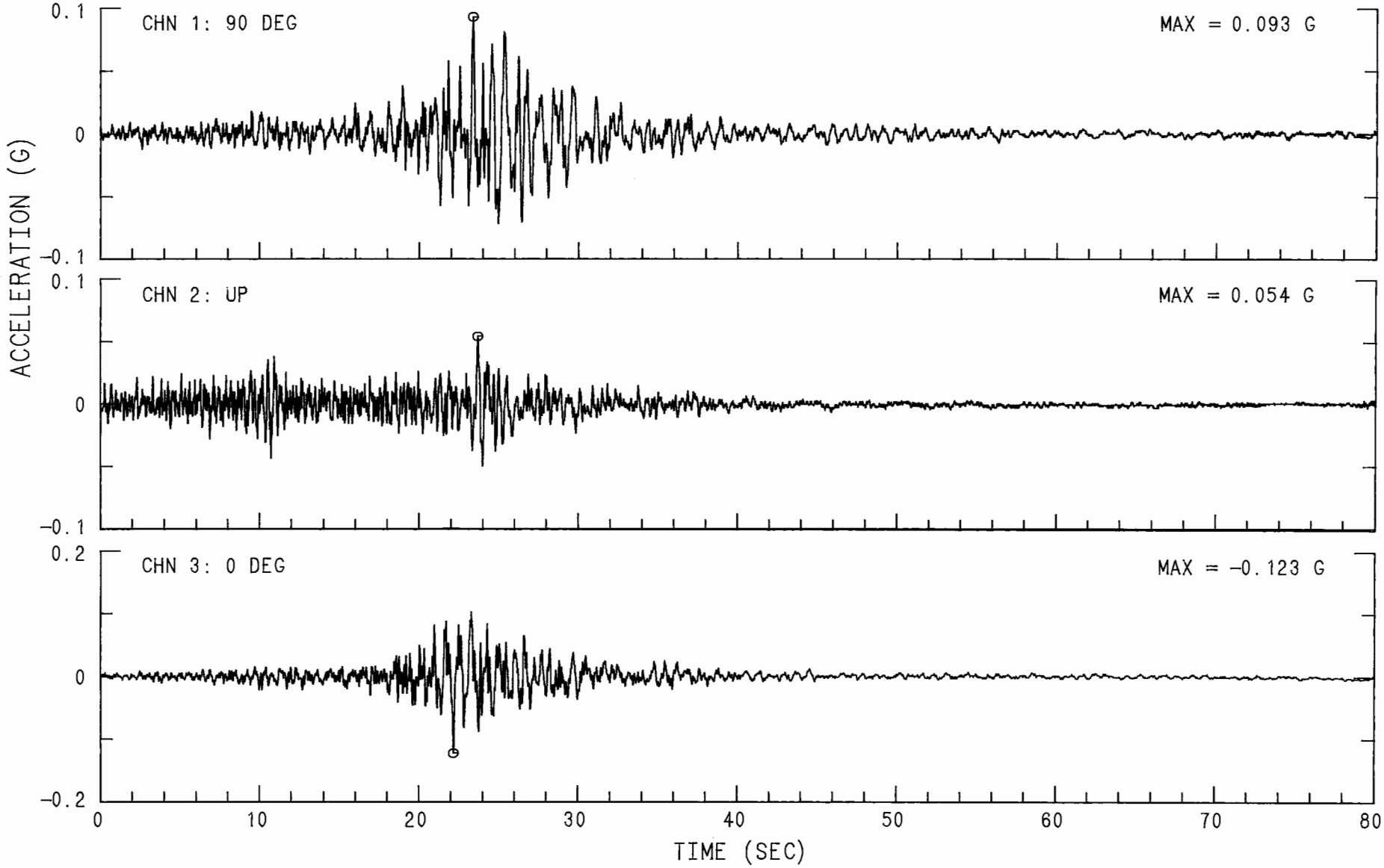
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT

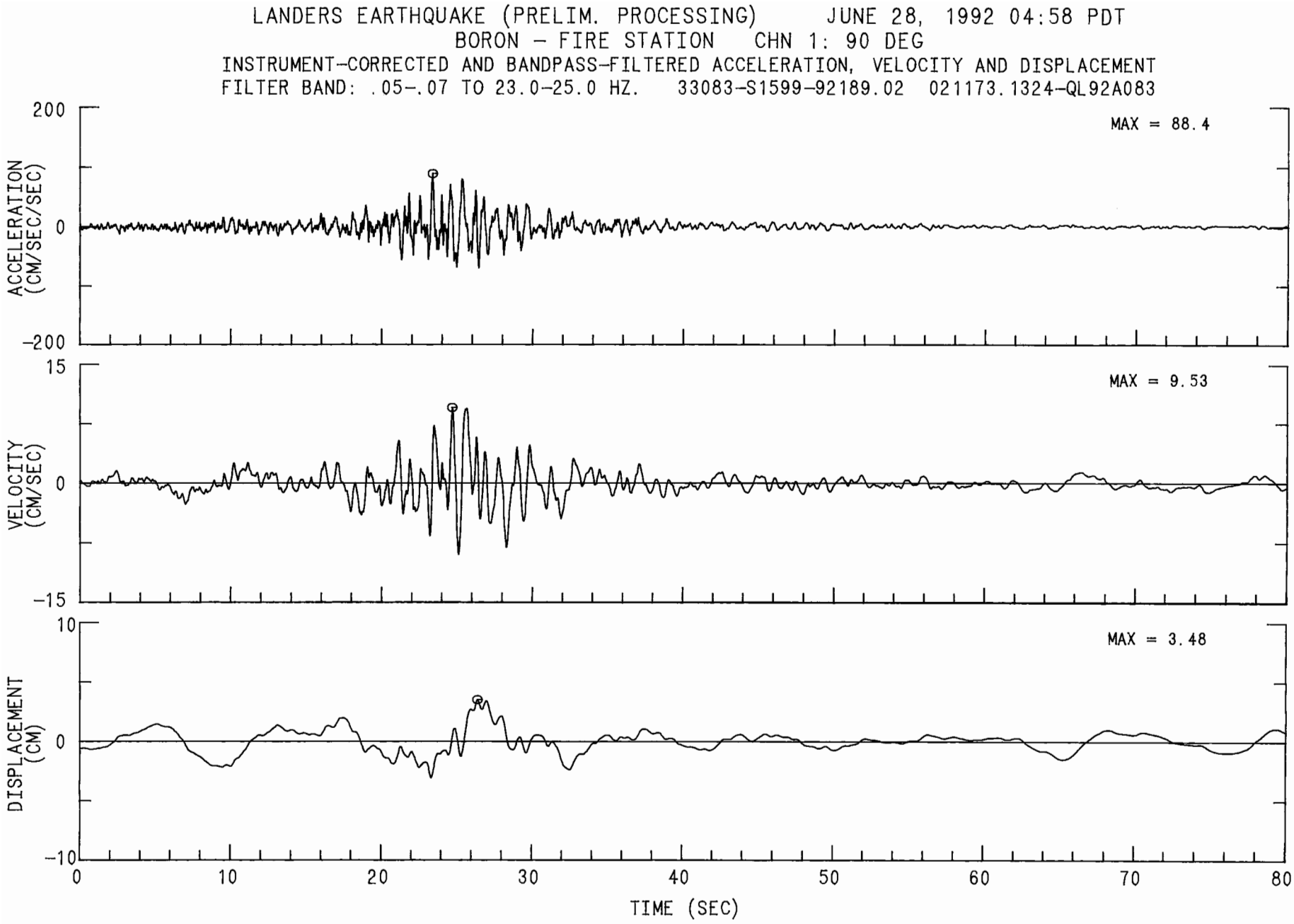
BORON - FIRE STATION

UNCORRECTED ACCELEROGRAM 33083-S1599-92189.02 021173.1245-QL92A083

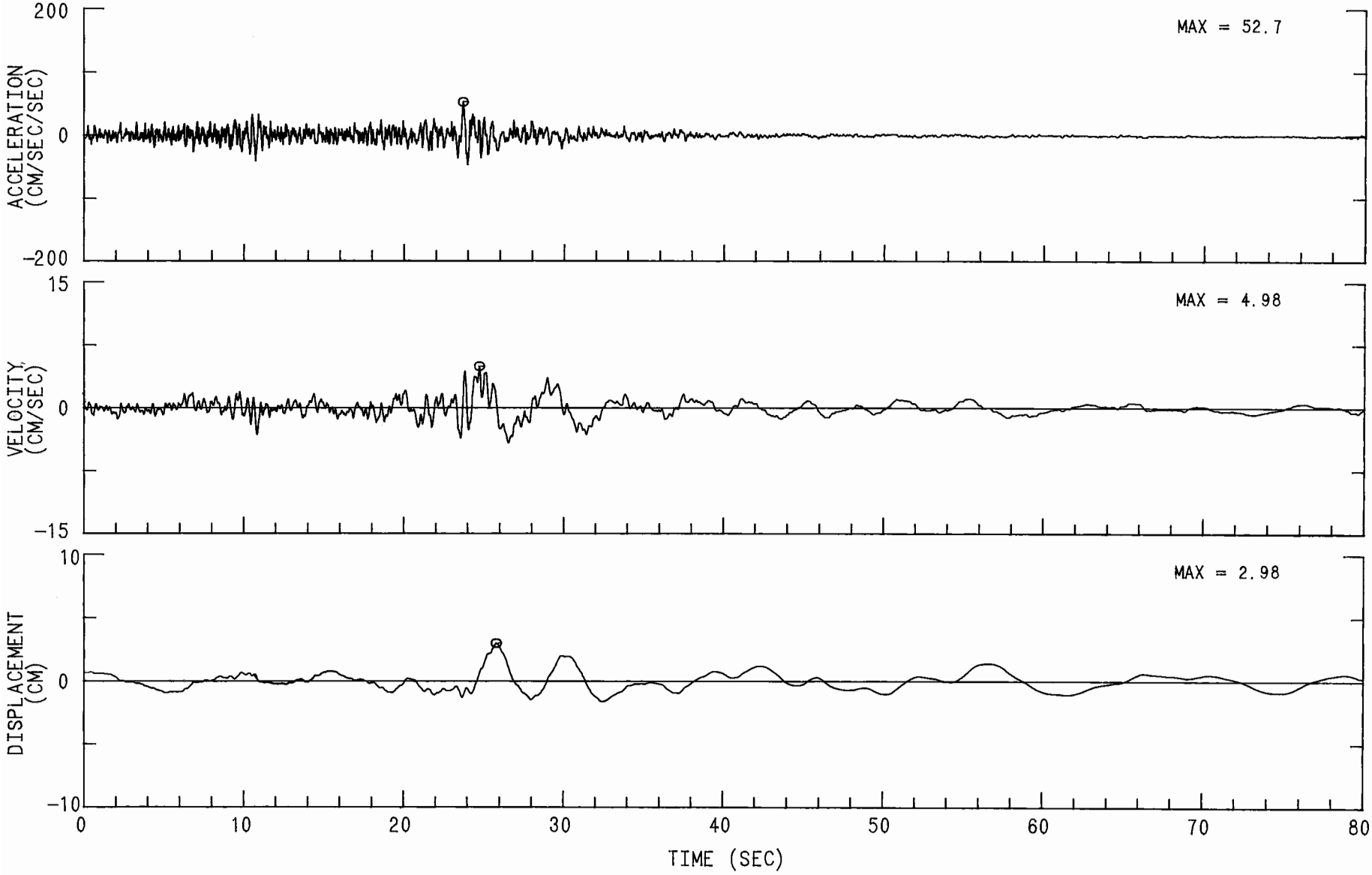


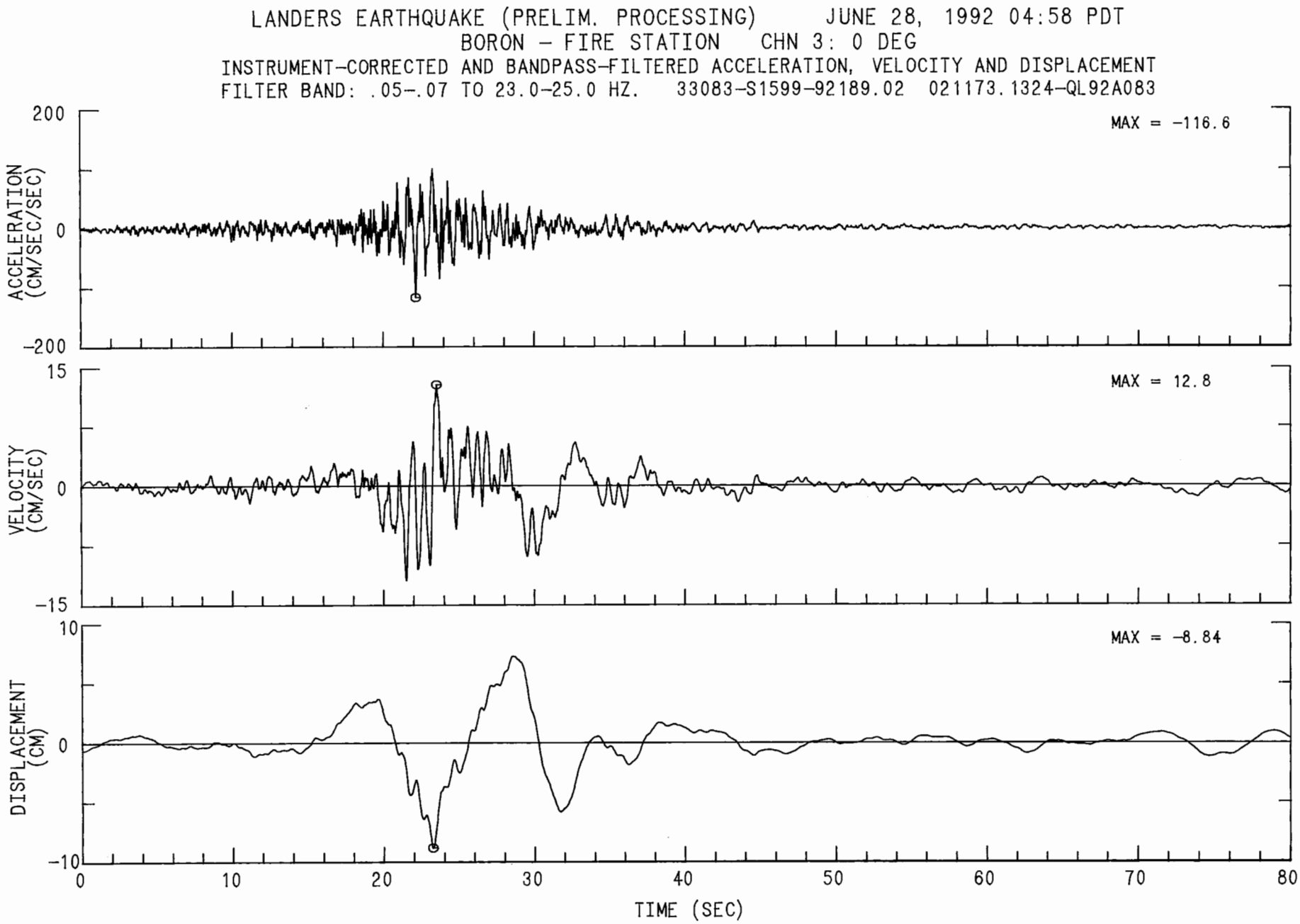
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
BORON - FIRE STATION
UNCORRECTED ACCELEROGRAM 33083-S1599-92189.02 021173.1245-QL92A083




LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
BORON - FIRE STATION CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 33083-S1599-92189.02 021173.1324-QL92A083
ACCELERATION (CM/SEC/SEC)
200
0
-200
MAX = 88.4
VELOCITY (CM/SEC)
15
0
-15
MAX = 9.53
DISPLACEMENT (CM)
10
0
-10
MAX = 3.48
0
10
20
30
40
50
60
70
80
TIME (SEC)

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
BORON - FIRE STATION CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 33083-S1599-92189.02 021173.1324-QL92A083




LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
BORON - FIRE STATION CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 33083-S1599-92189.02 021173.1324-QL92A083
ACCELERATION (CM/SEC/SEC)
200
0
-200
MAX = -116.6
VELOCITY (CM/SEC)
15
0
-15
MAX = 12.8
DISPLACEMENT (CM)
10
0
-10
MAX = -8.84
0
10
20
30
40
50
60
70
80
TIME (SEC)

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
BORON - FIRE STATION
CHN 1: 90 DEG
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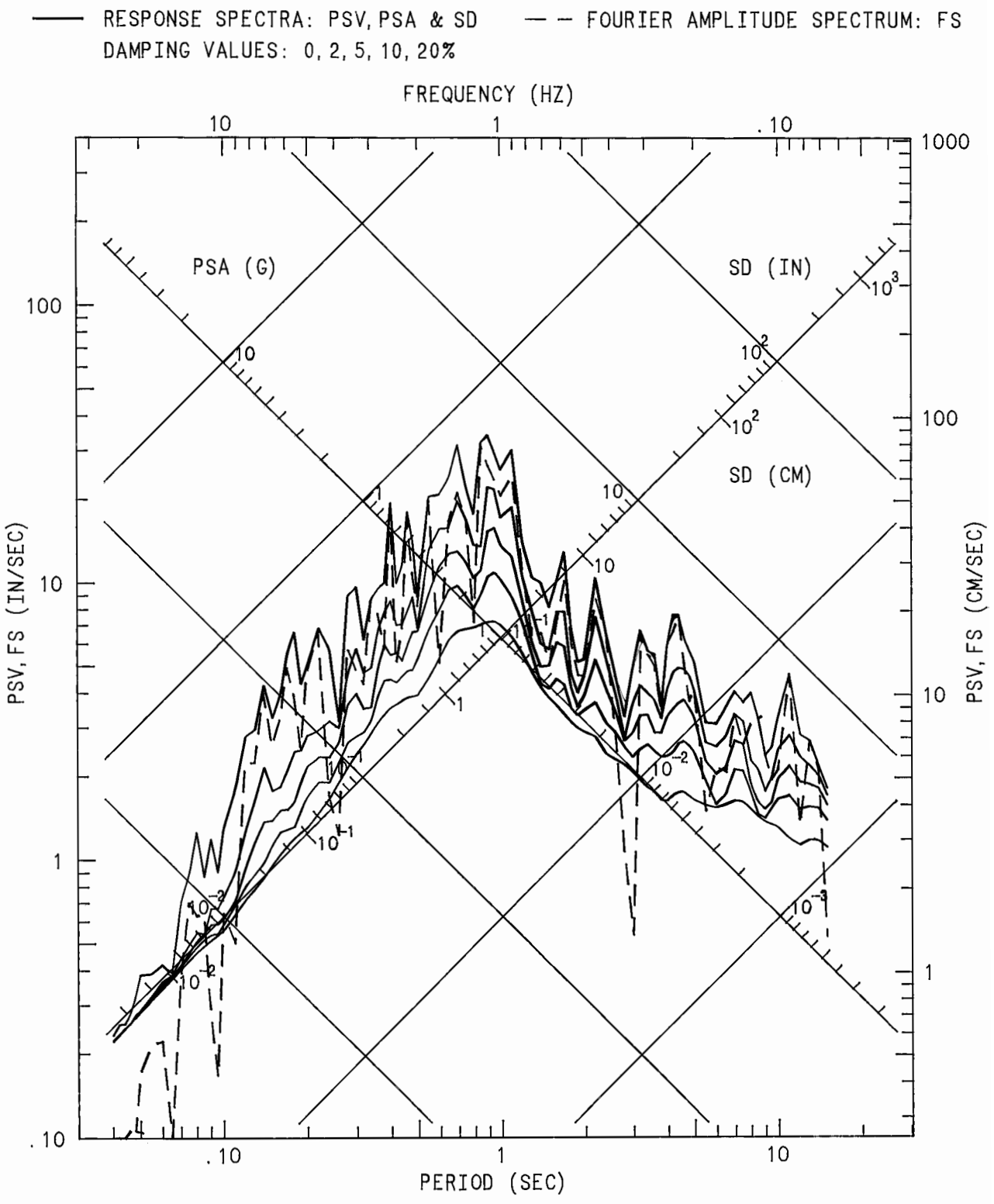
33083-S1599-92189.02 021173.1353-QL92A083



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BORON - FIRE STATION
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
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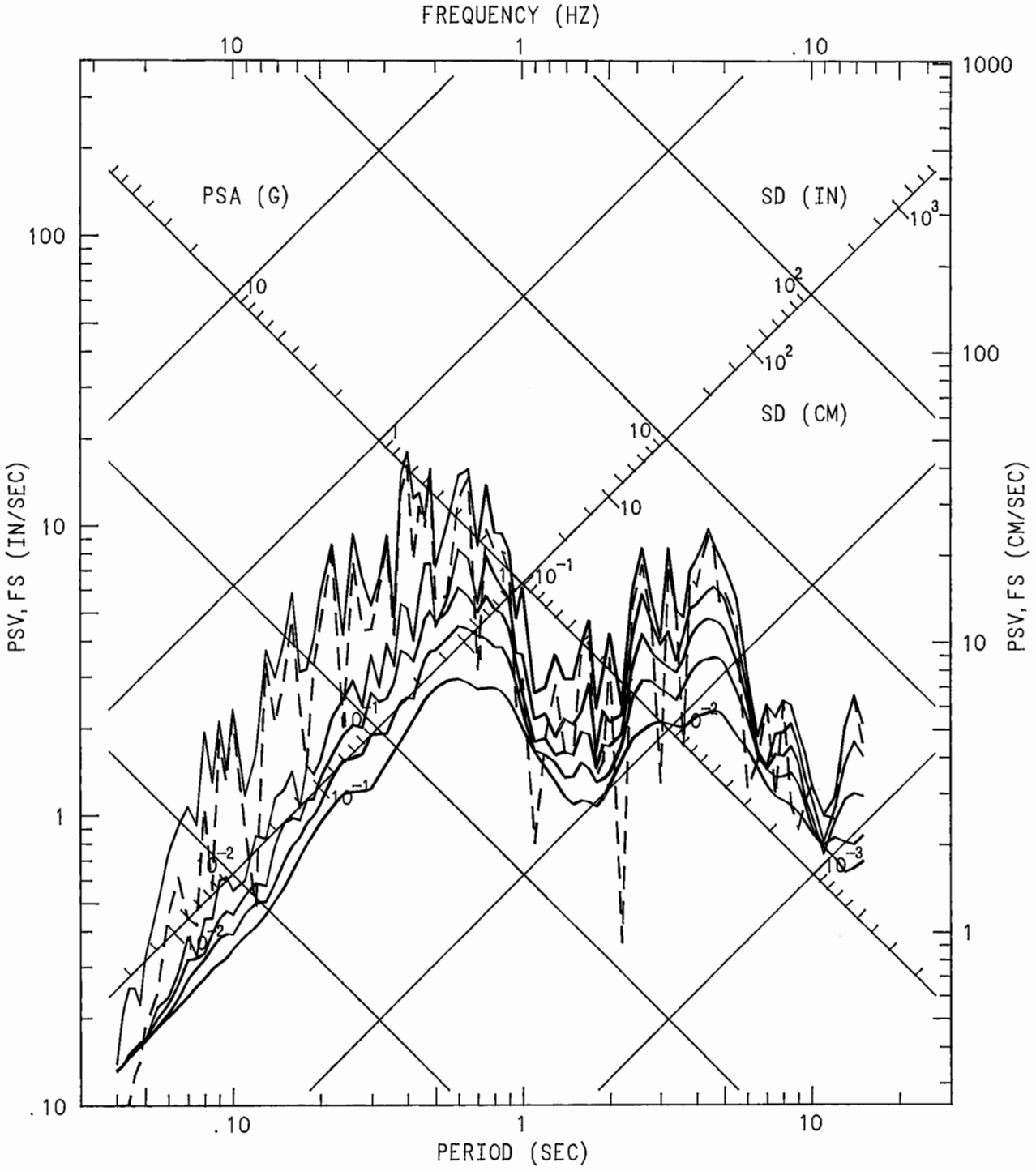

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BORON - FIRE STATION
CHN 3: 0 DEG
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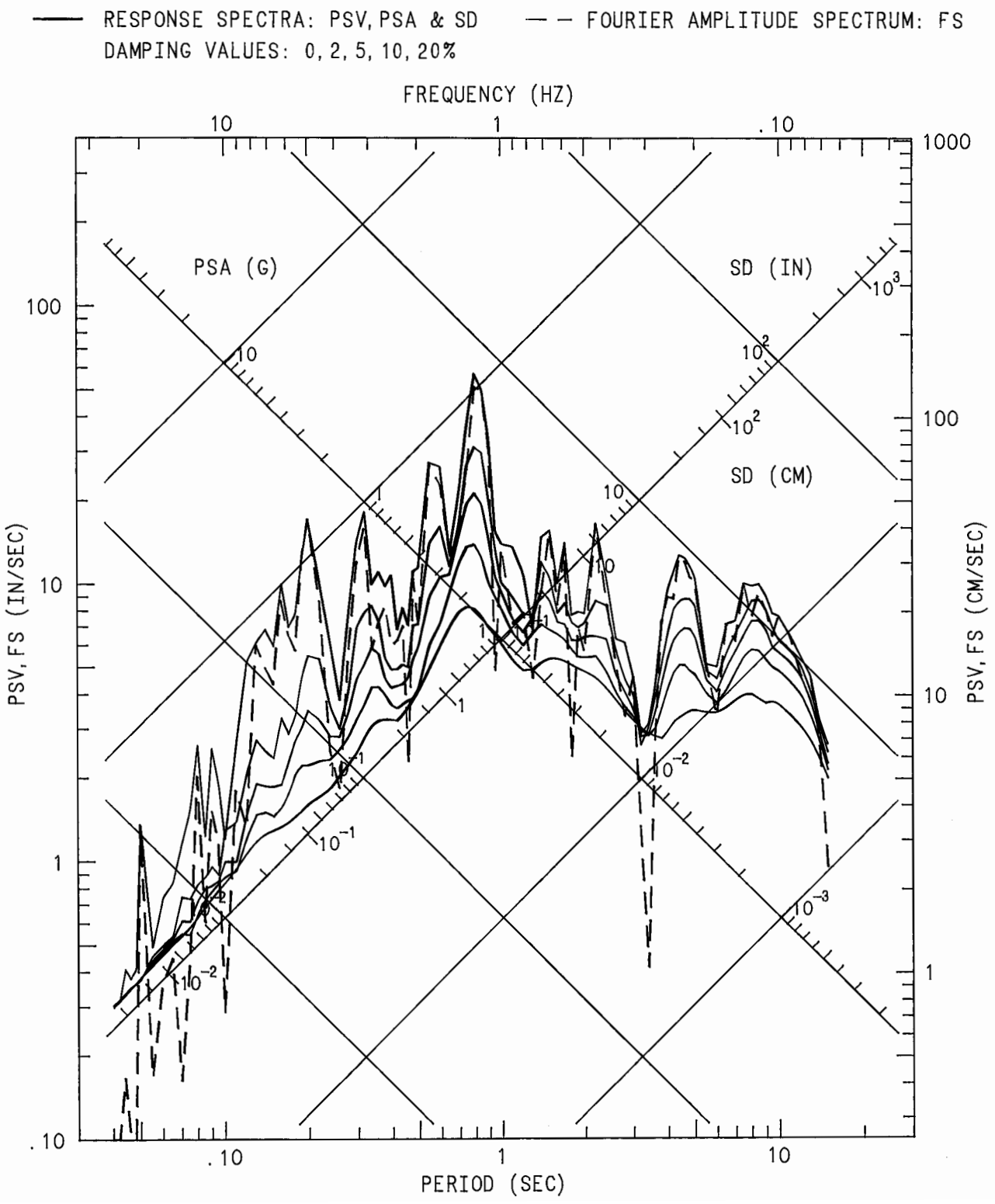

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
BORON - FIRE STATION
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
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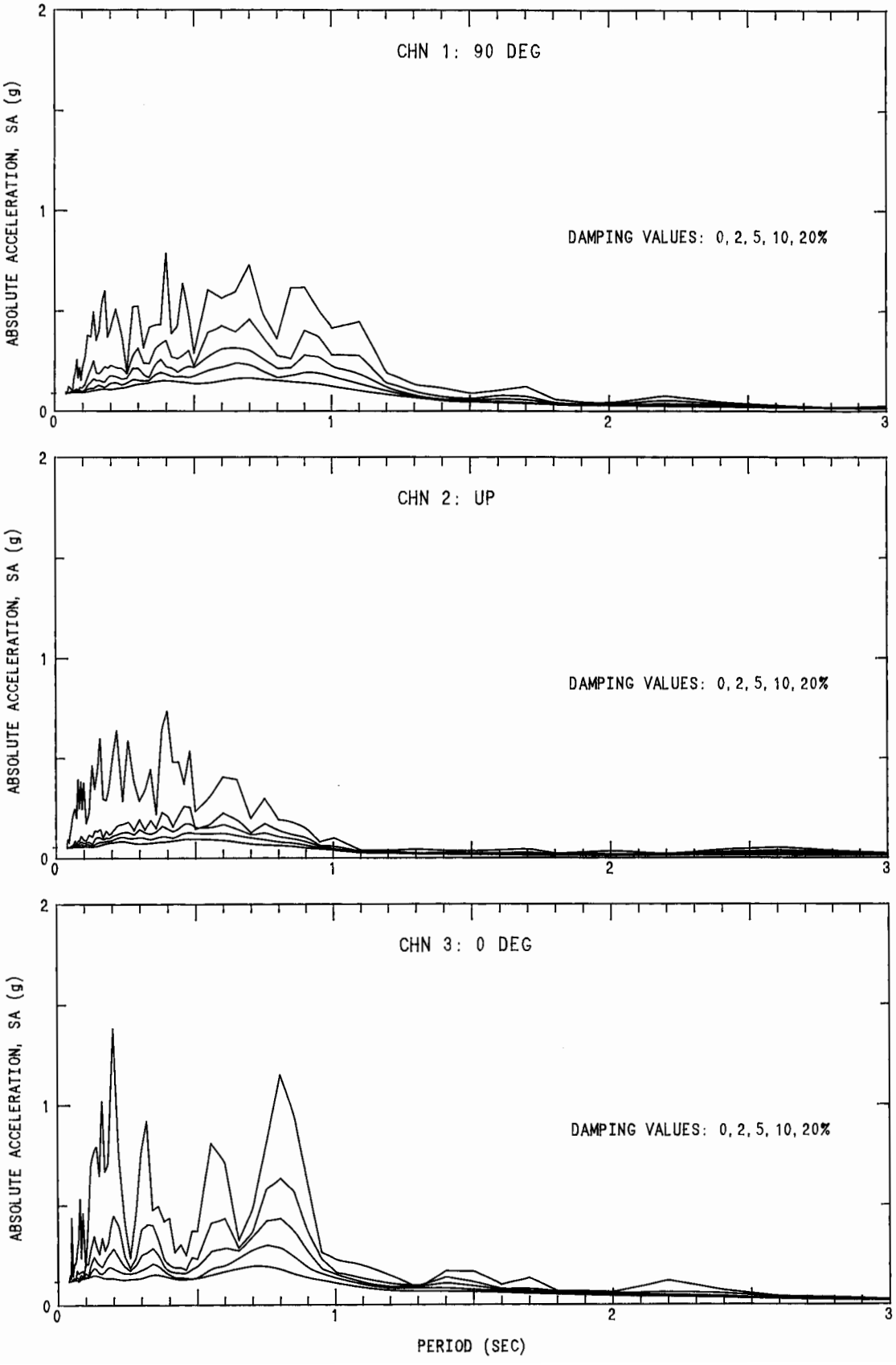
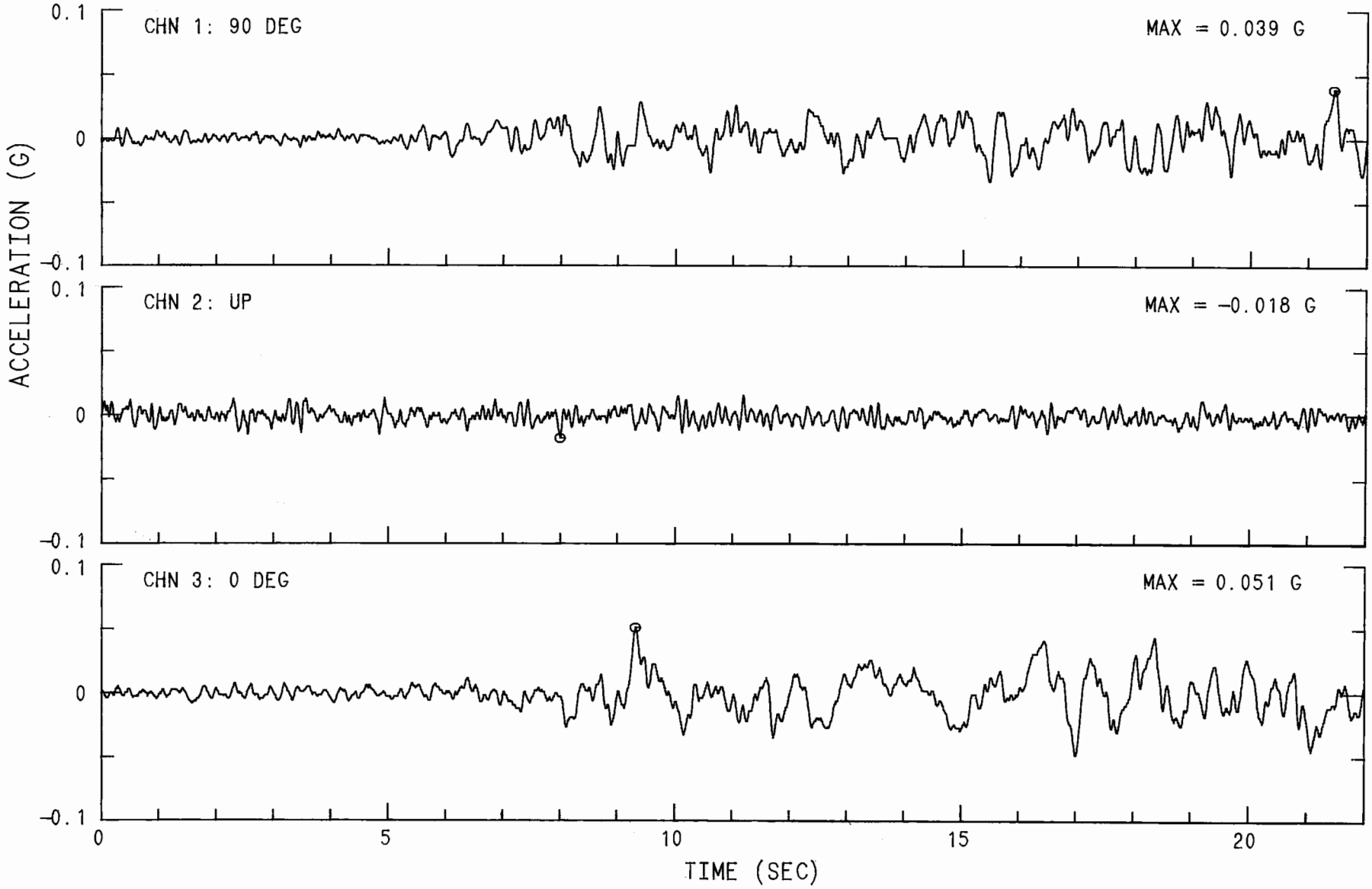


LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
DOWNEY - COUNTY MAINT. BLDG.
UNCORRECTED ACCELEROGRAM 14368-S1607-92191.02 020973.0841-QL92A368



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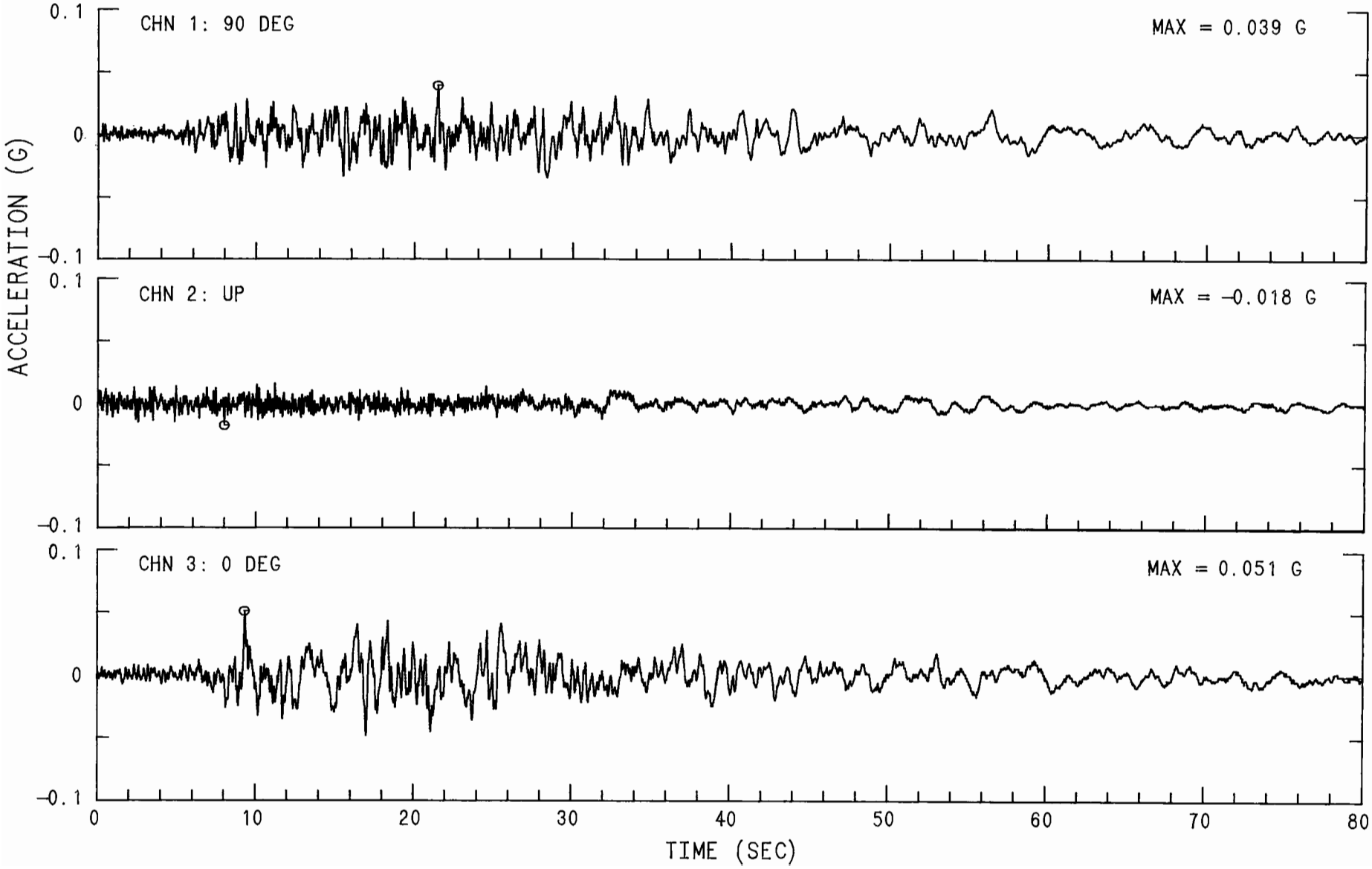
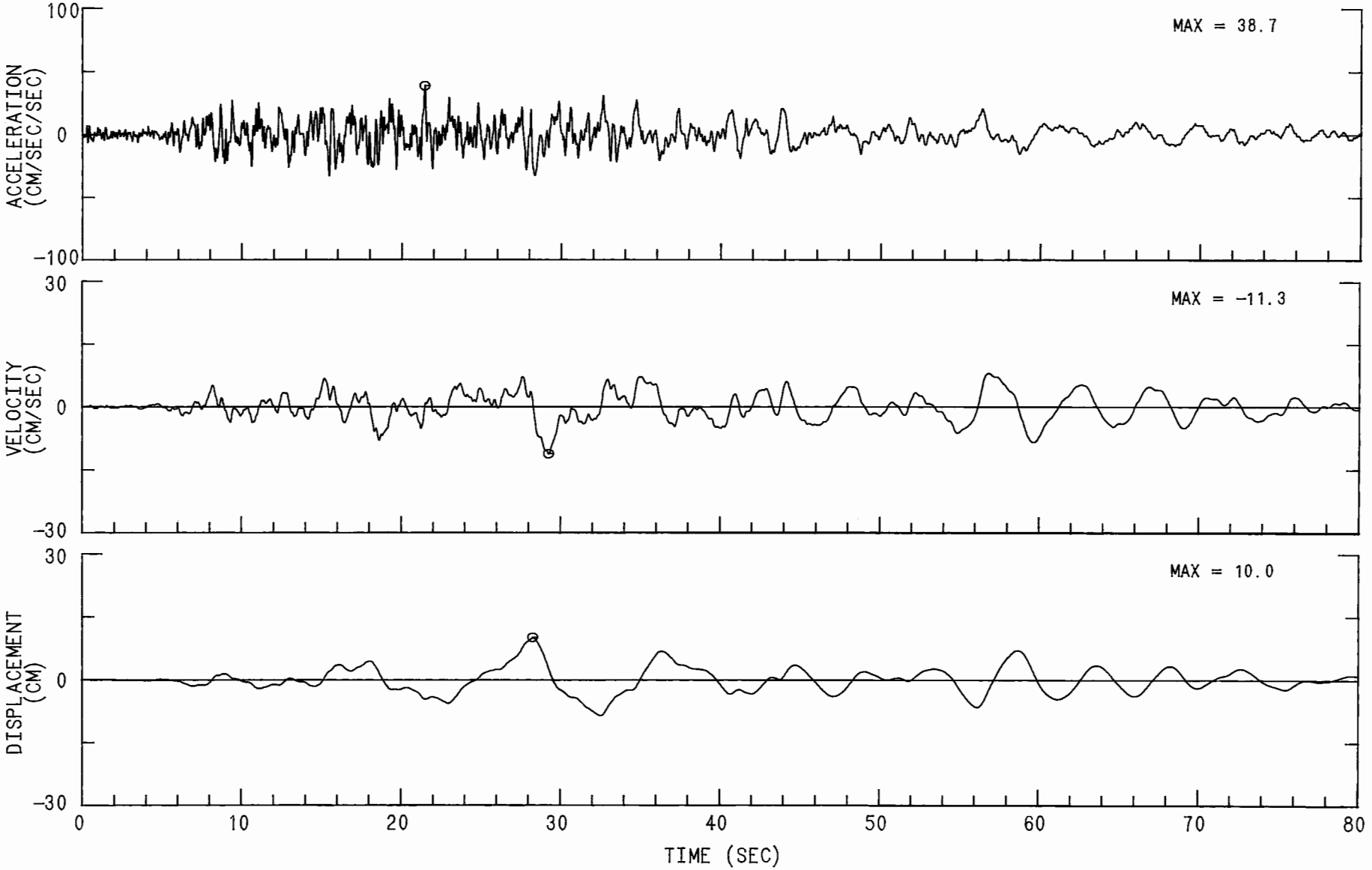
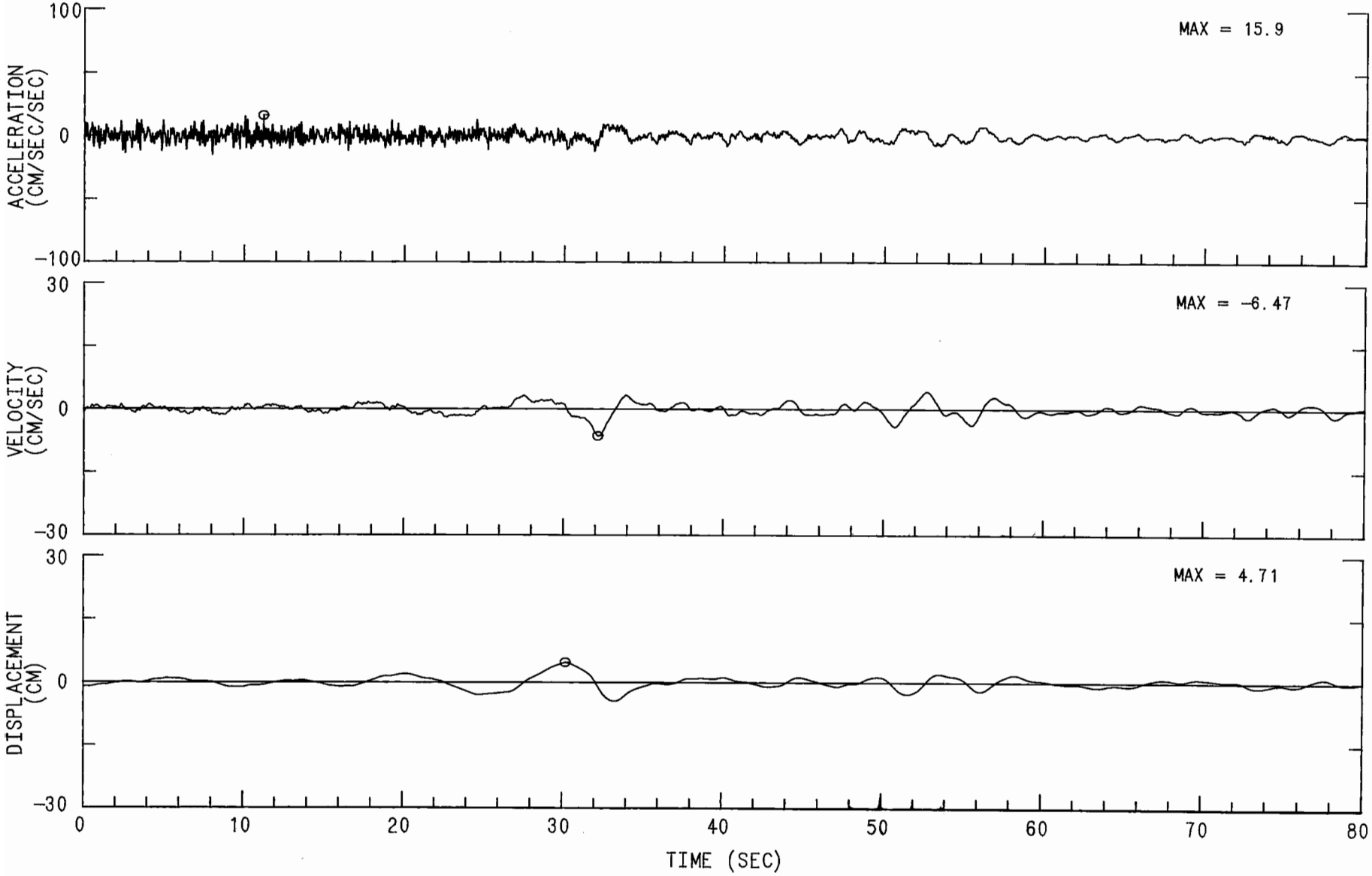


LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
DOWNEY - COUNTY MAINT. BLDG. CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 14368-S1607-92191.02 020973.1908-QL92A368



LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
DOWNEY - COUNTY MAINT. BLDG. CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 14368-S1607-92191.02 020973.1908-QL92A368



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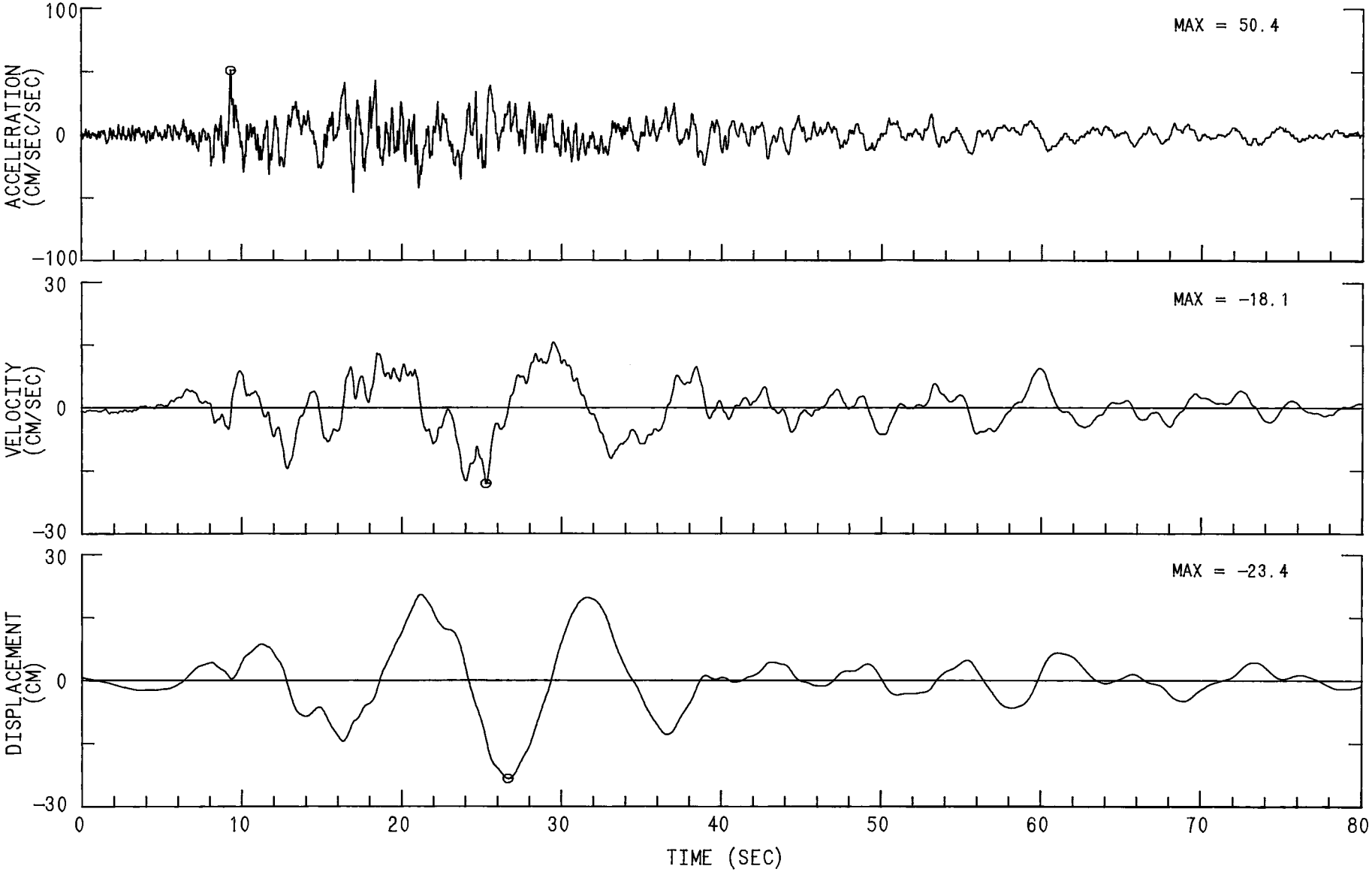
DOWNEY - COUNTY MAINT. BLDG. CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 14368-S1607-92191.02 020973.1908-QL92A368



LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
DOWNEY - COUNTY MAINT. BLDG.
CHN 1: 90 DEG
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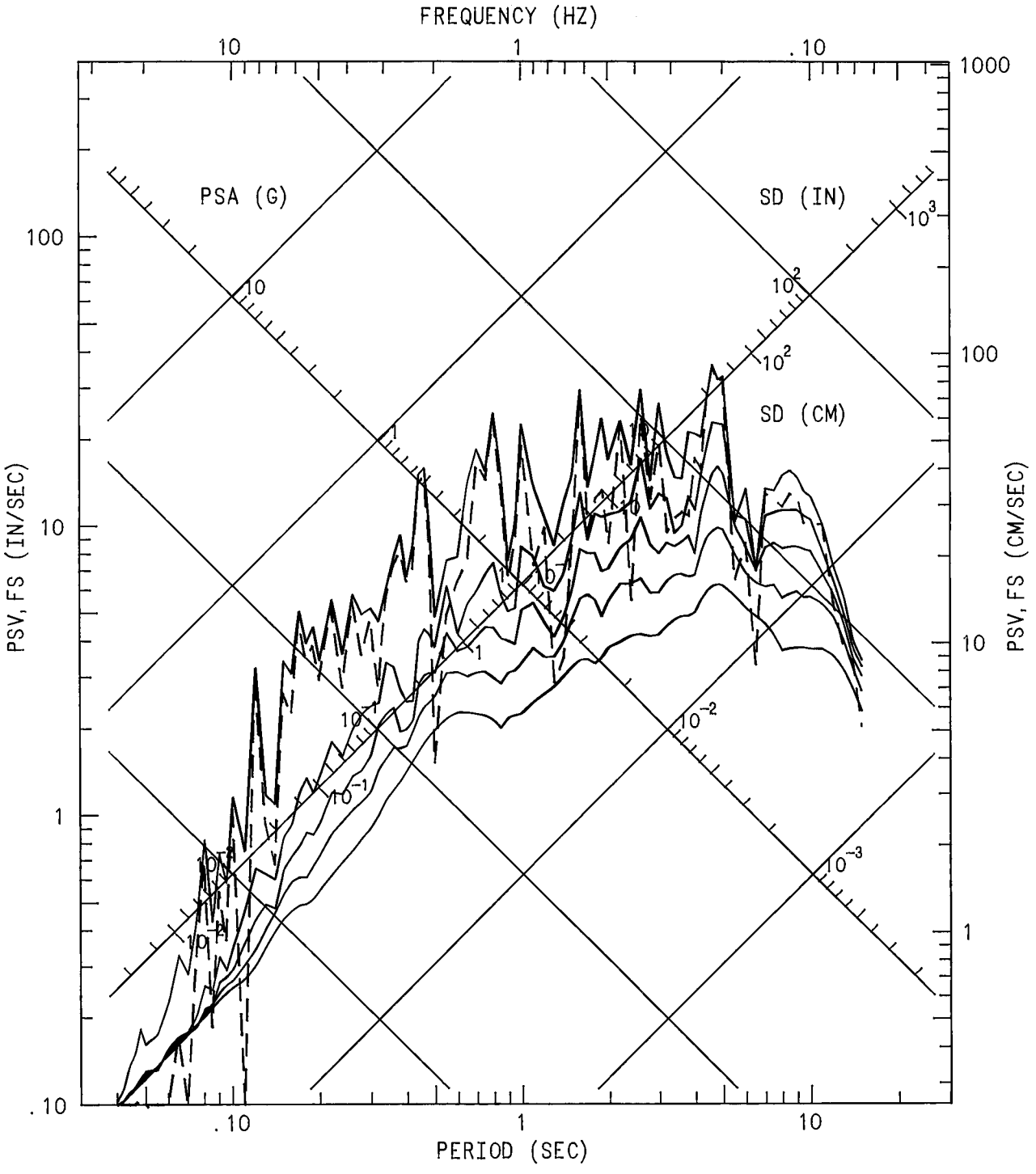
14368-S1607-92191.02 020973.1938-QL92A368



LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
DOWNEY - COUNTY MAINT. BLDG.
CHN 2: UP
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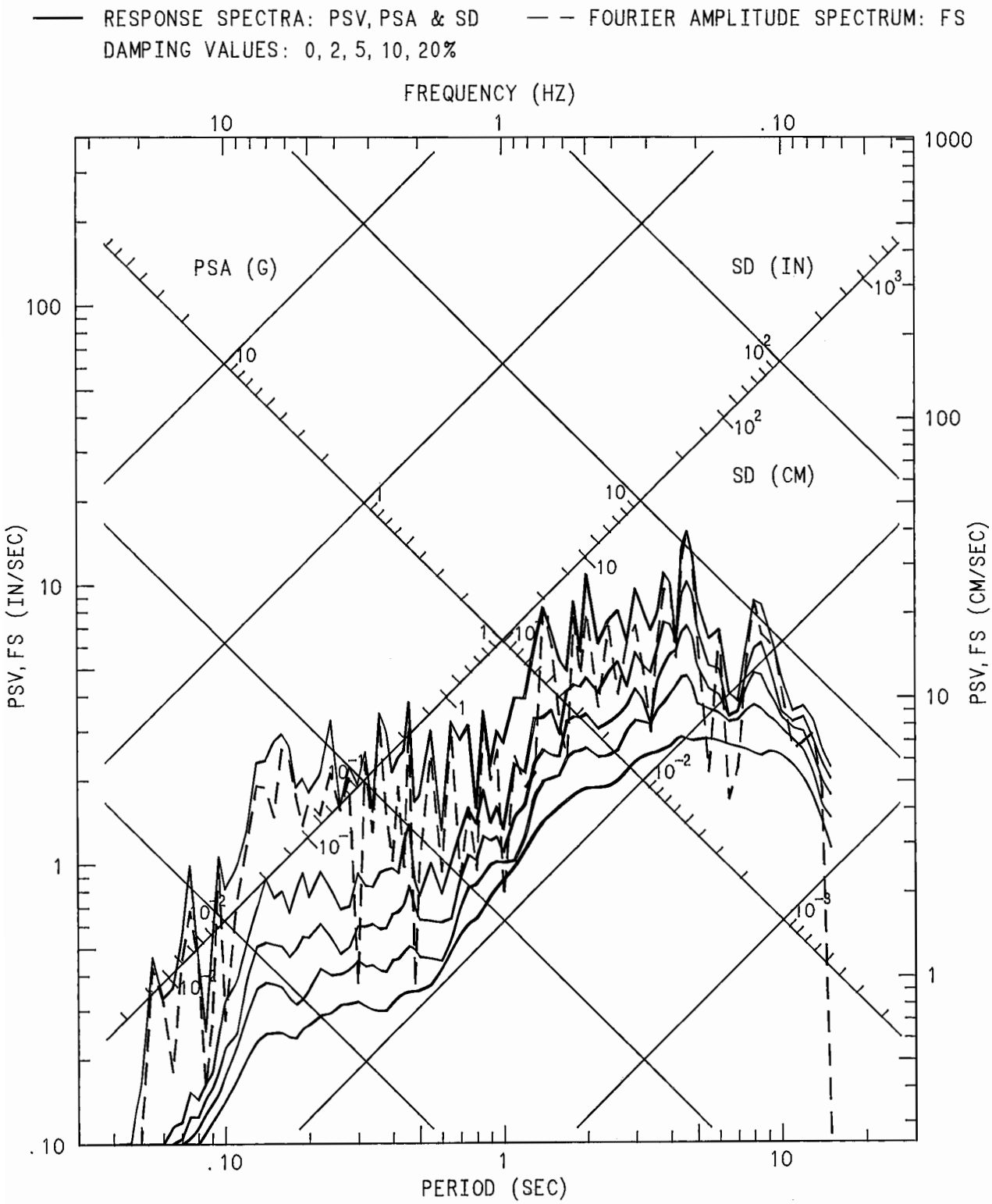

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
DOWNEY - COUNTY MAINT. BLDG.
CHN 3: 0 DEG
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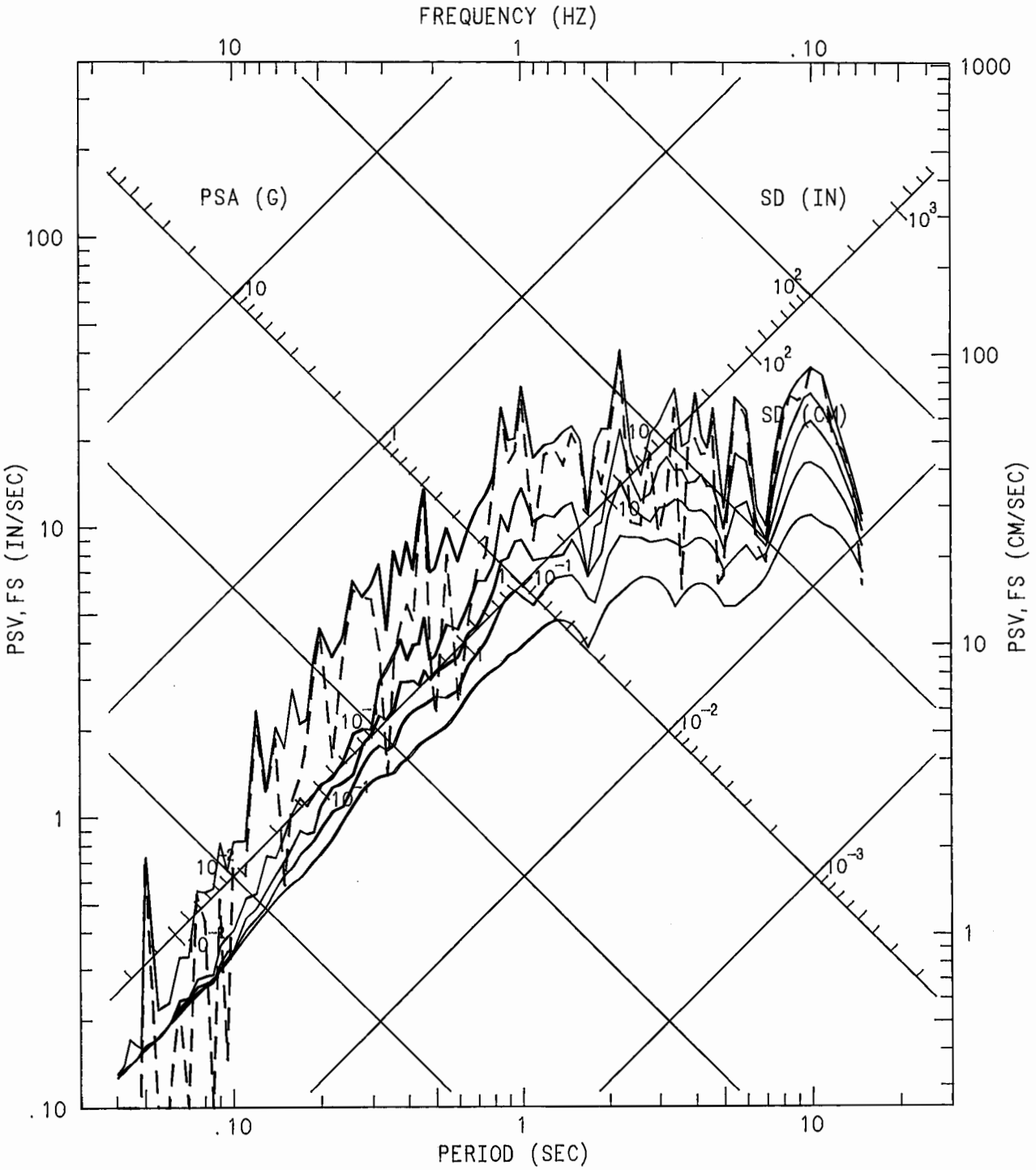

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
DOWNEY - COUNTY MAINT. BLDG.
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
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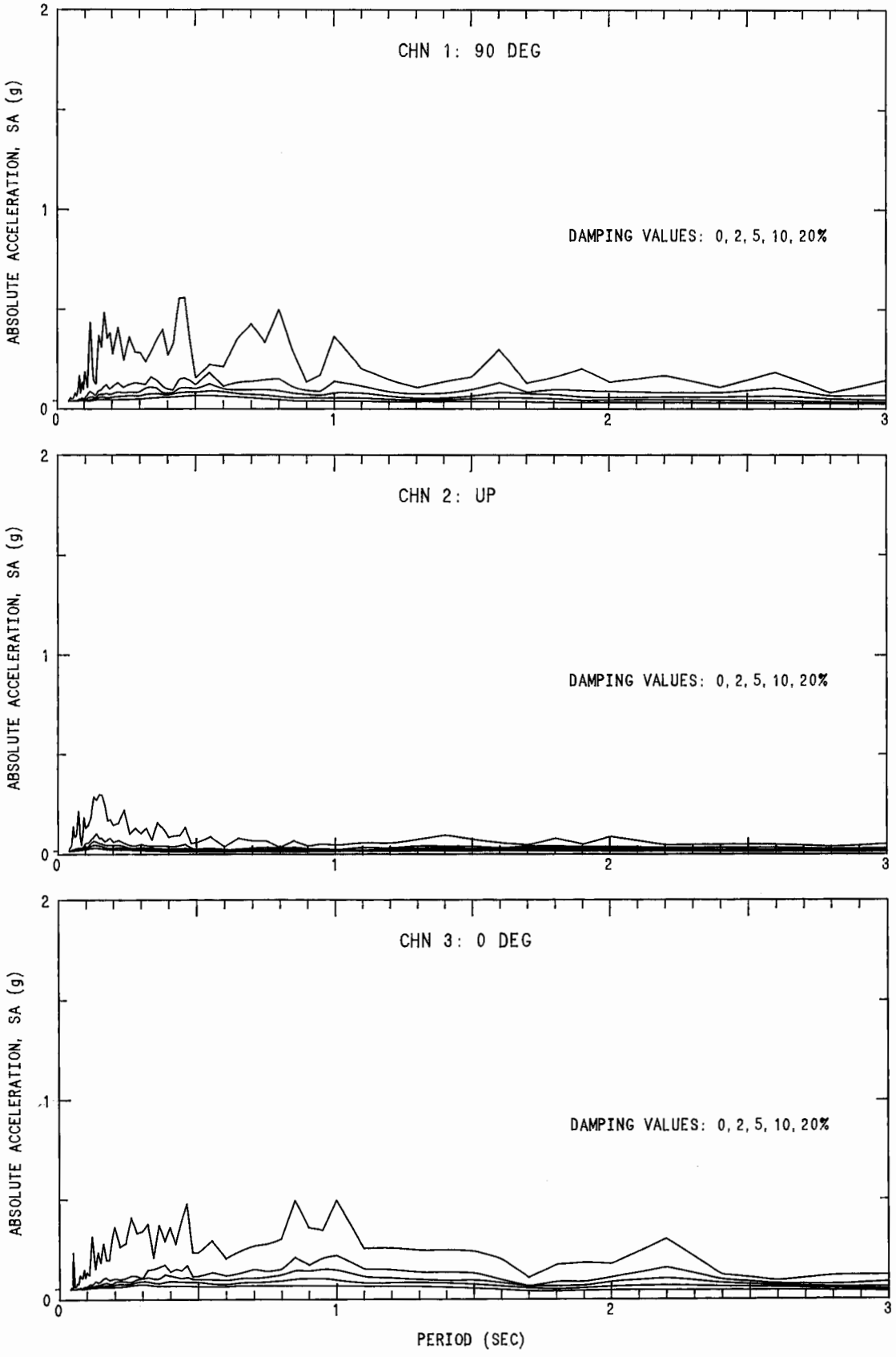
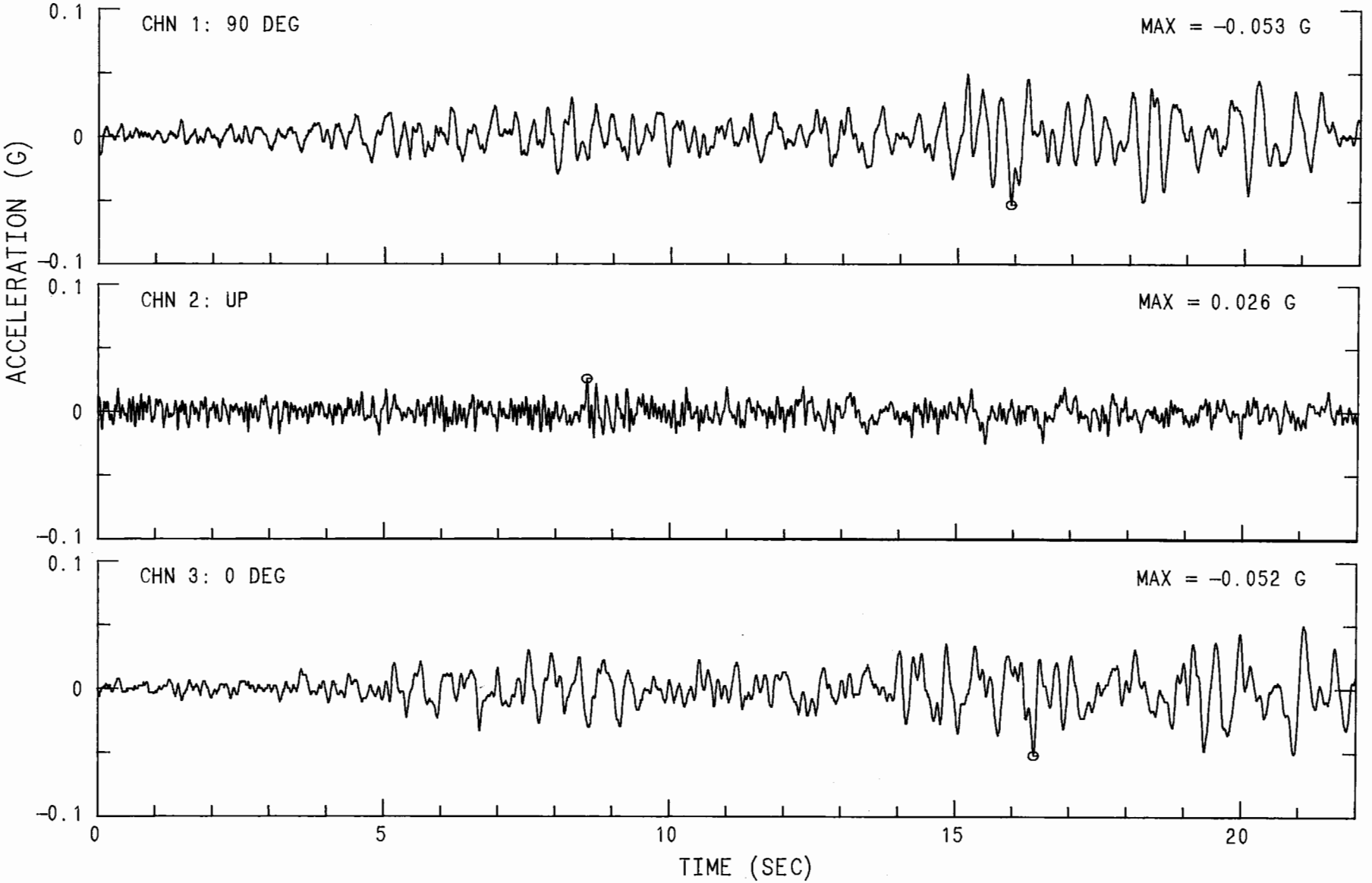


LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG.
UNCORRECTED ACCELEROGRAM 13122-S1596-92185.02 011473.1644-QL92A122



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
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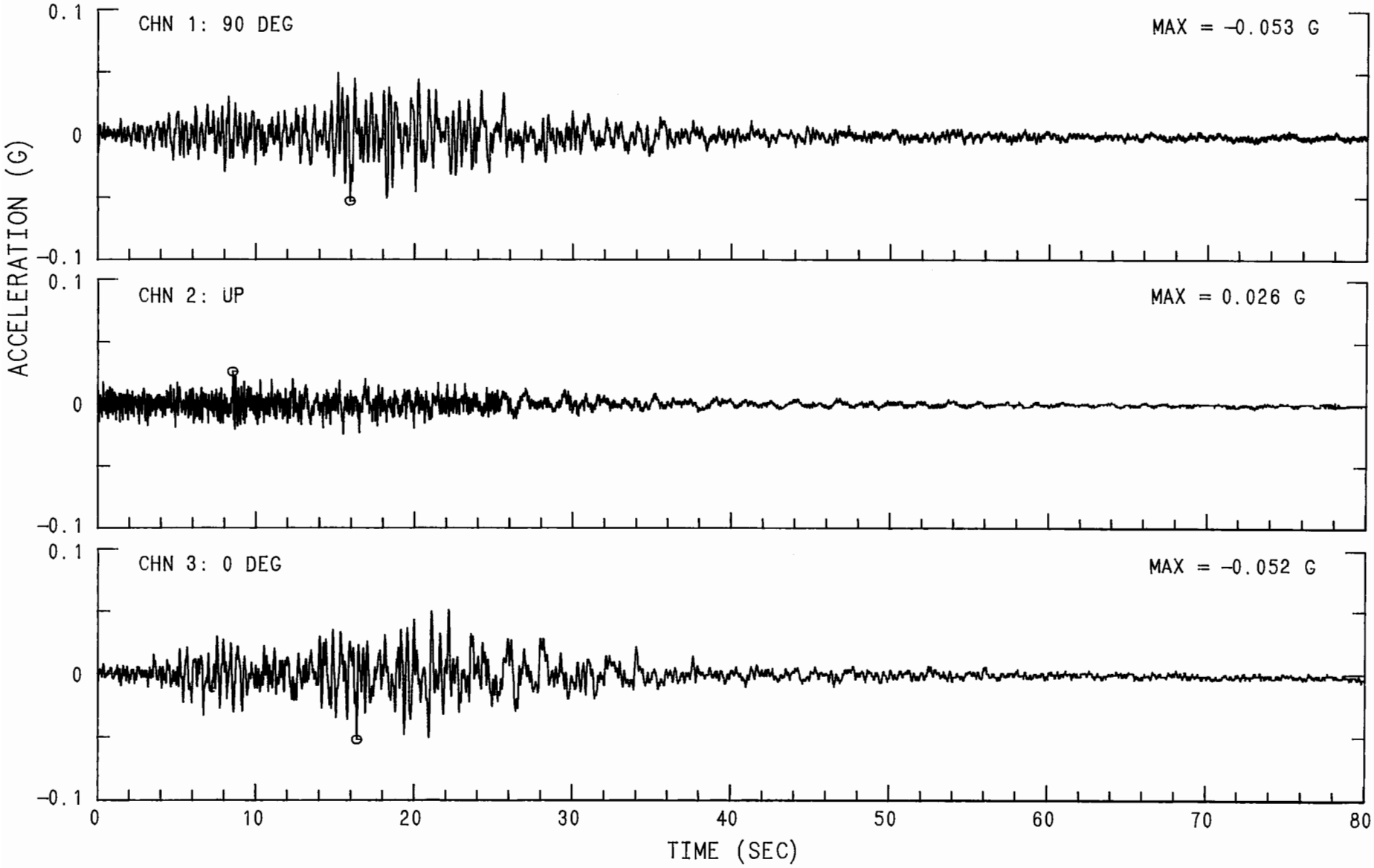
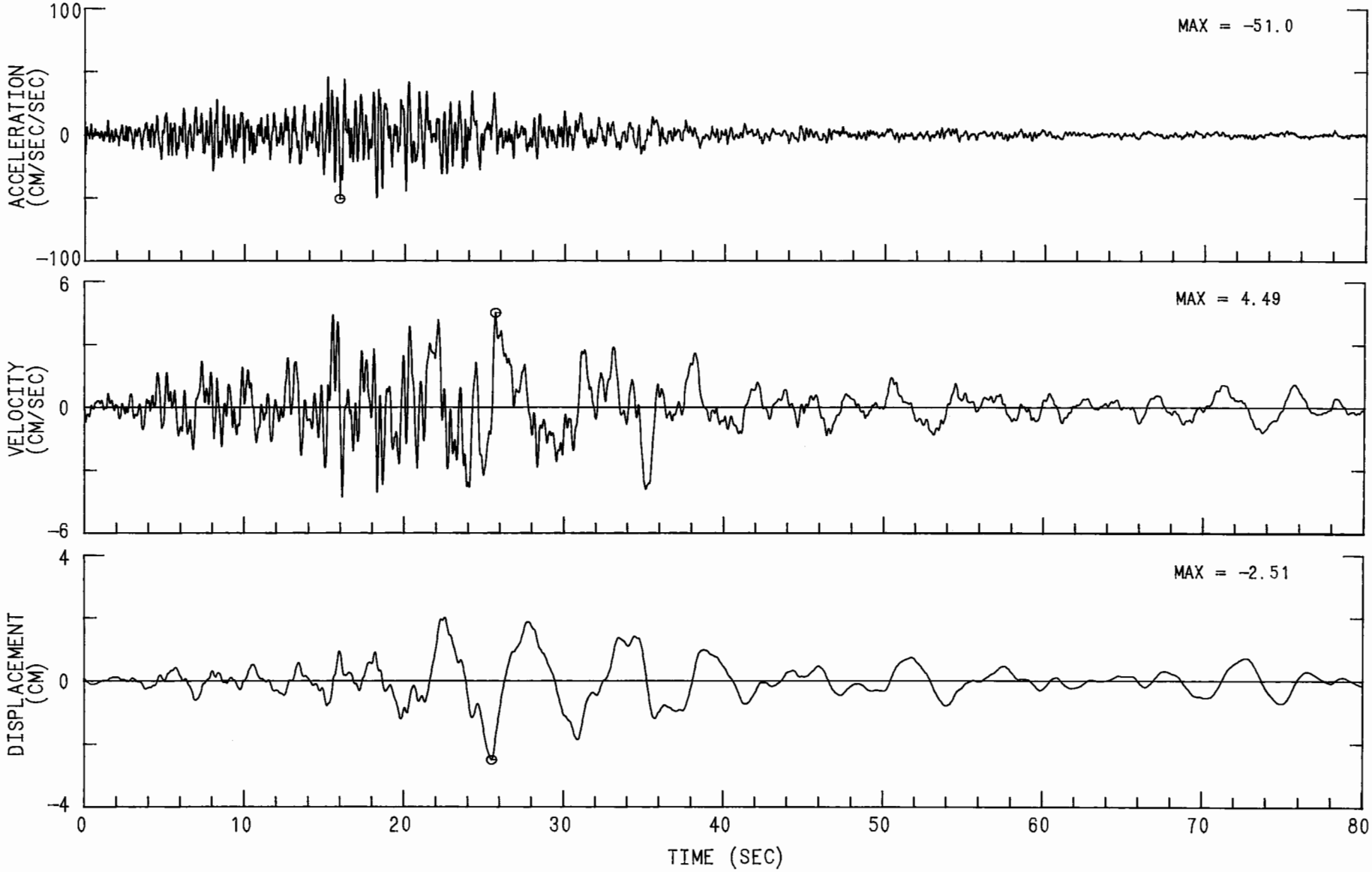


LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG. CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .08-.16 TO 23.0-25.0 HZ. 13122-S1596-92185.02 011573.2313-QL92A122



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG. CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
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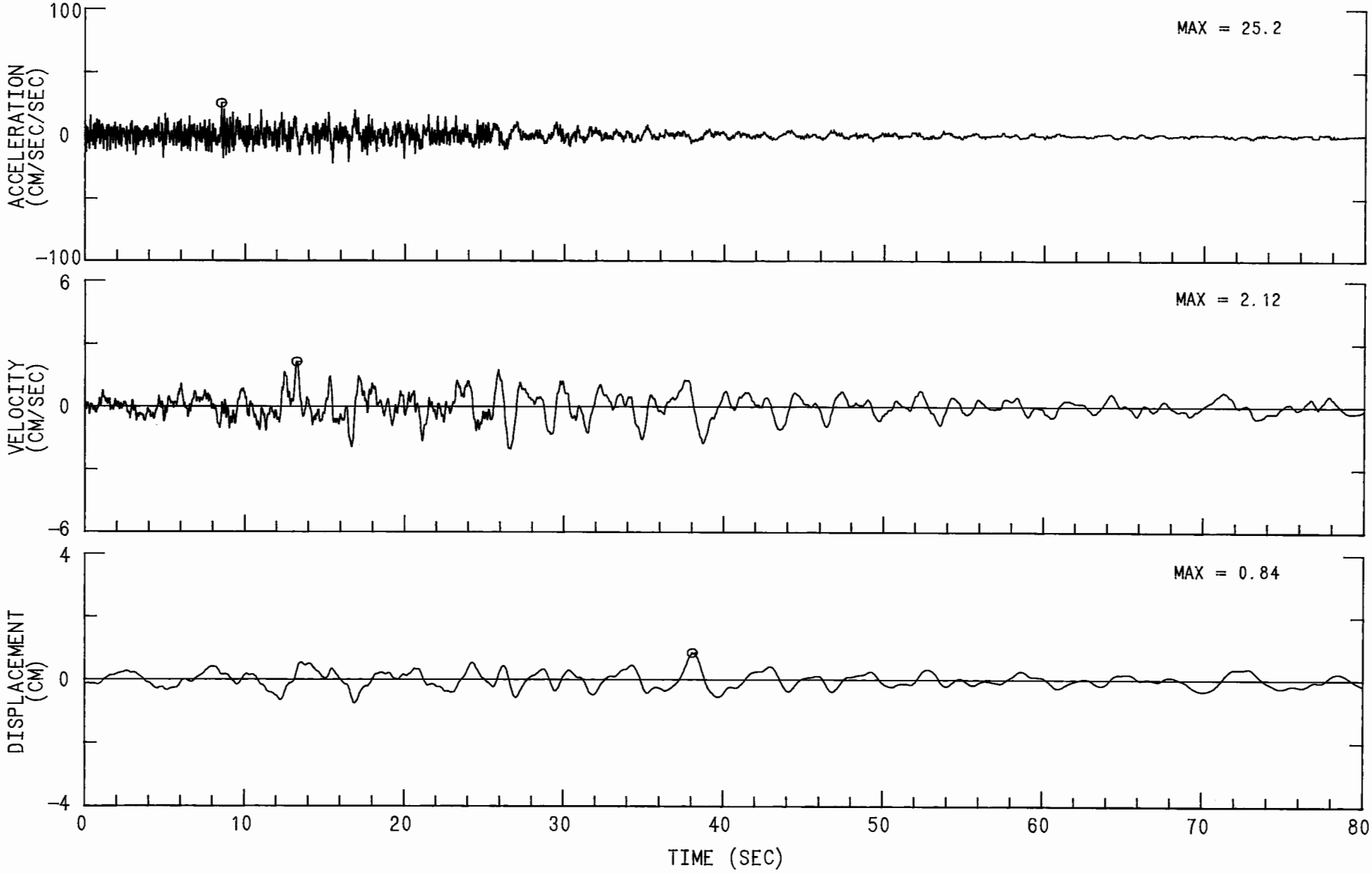
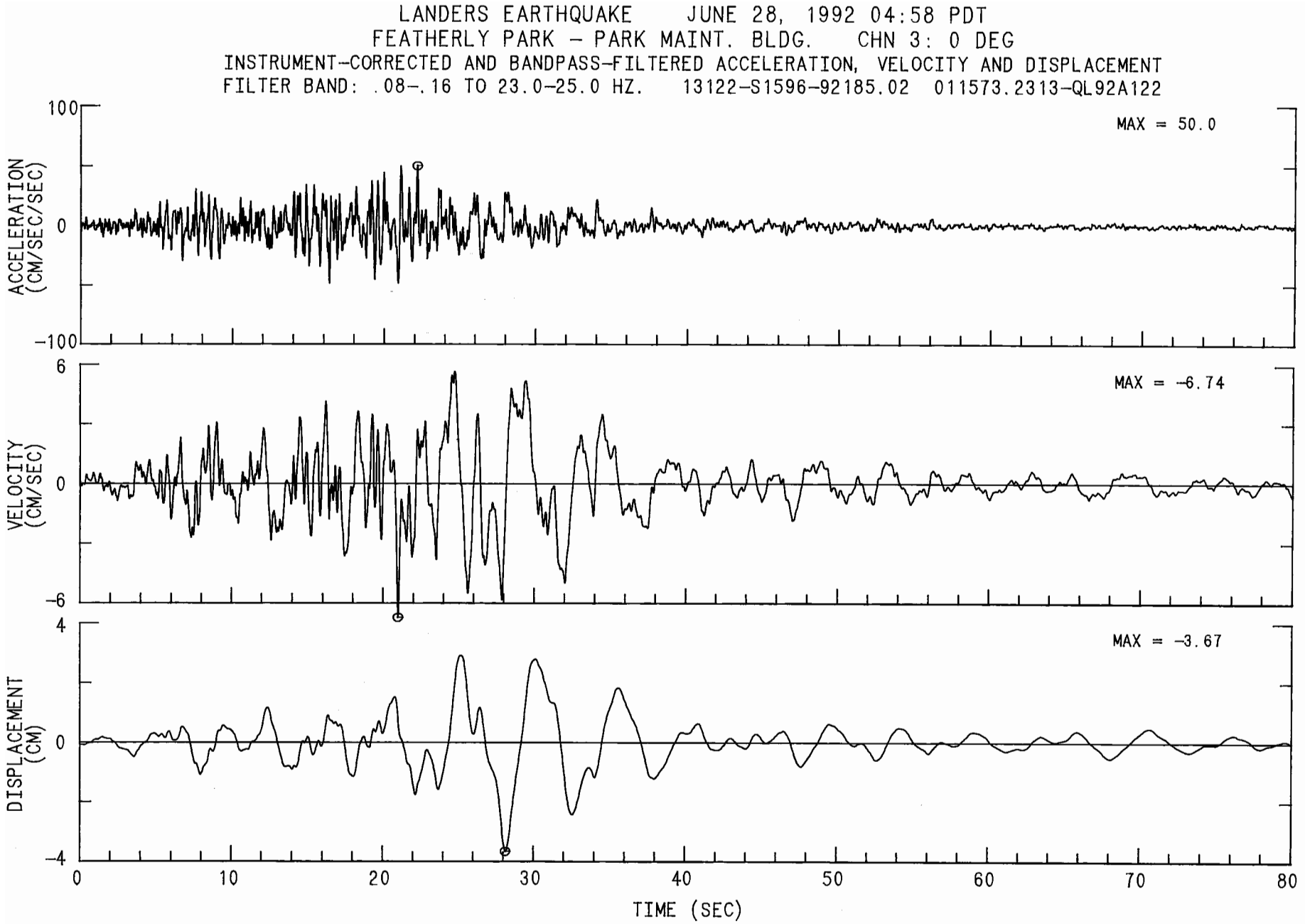
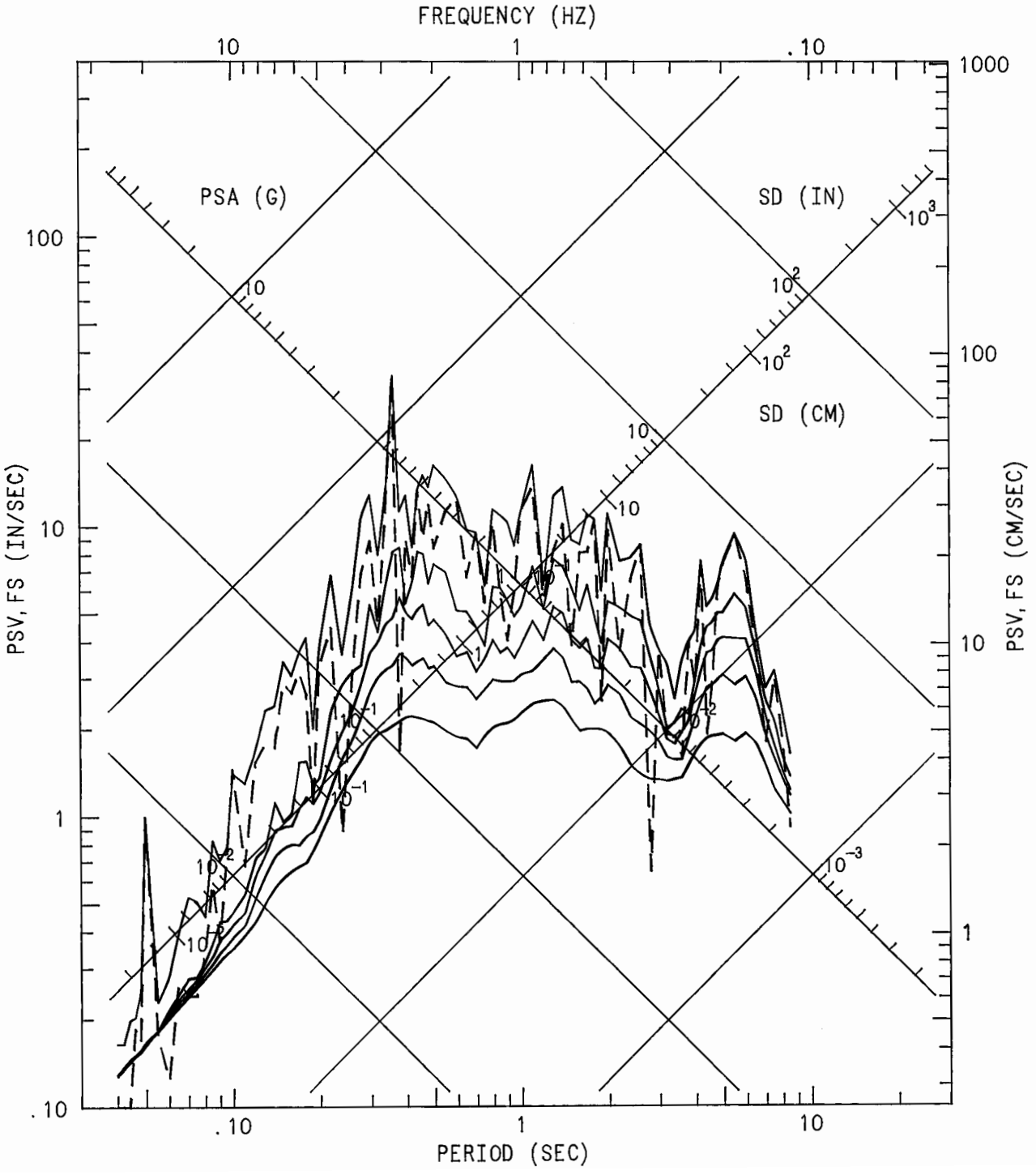



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG. CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .08-.16 TO 23.0-25.0 HZ. 13122-S1596-92185.02 011573.2313-QL92A122
ACCELERATION (CM/SEC/SEC)
100
0
-100
MAX = 50.0
VELOCITY (CM/SEC)
6
0
-6
MAX = -6.74
DISPLACEMENT (CM)
4
0
-4
MAX = -3.67
0
10
20
30
40
50
60
70
80
TIME (SEC)

LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG.
CHN 1: 90 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
13122-S1596-92185.02 021173.1023-QL92A122



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG.
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
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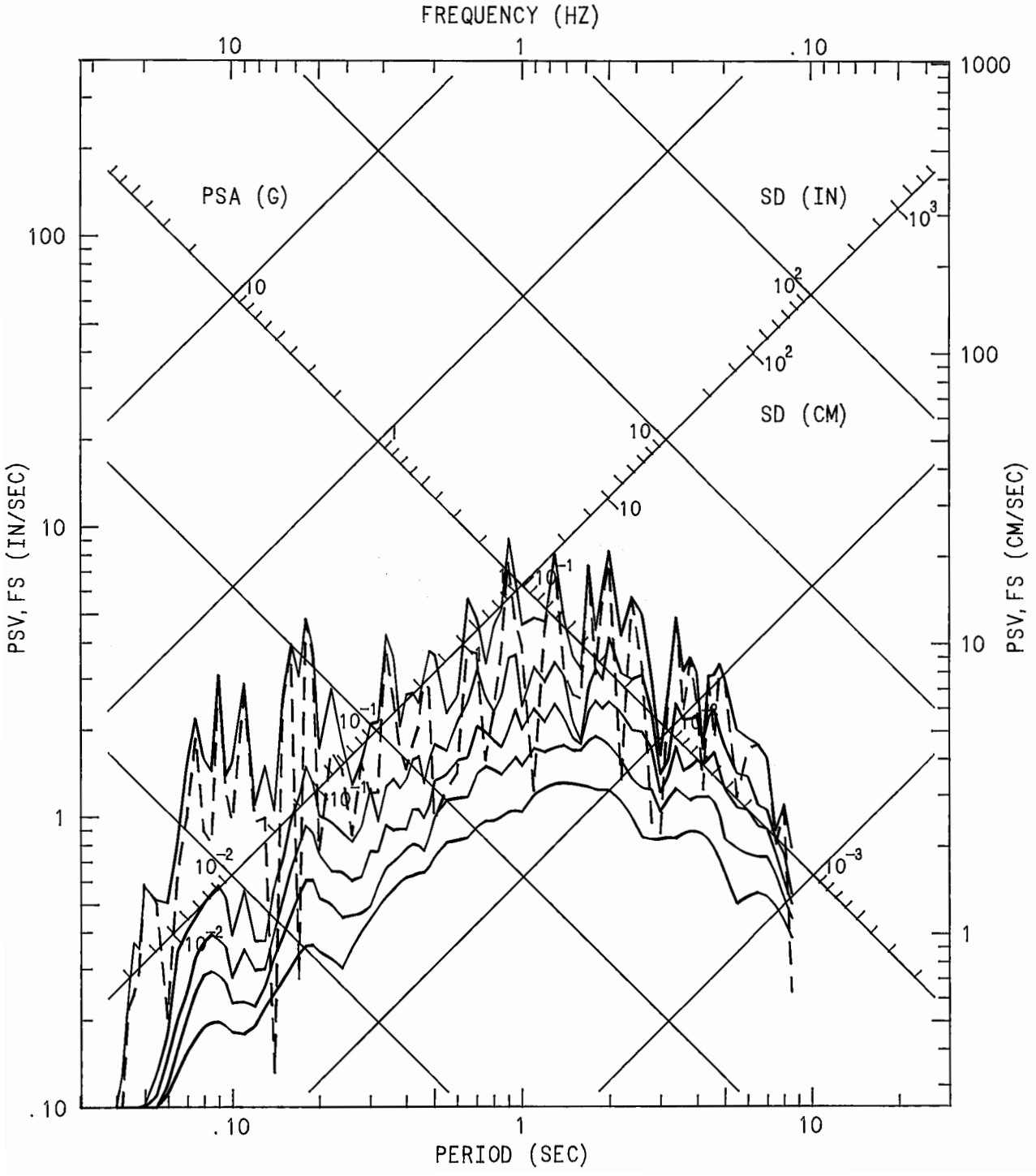
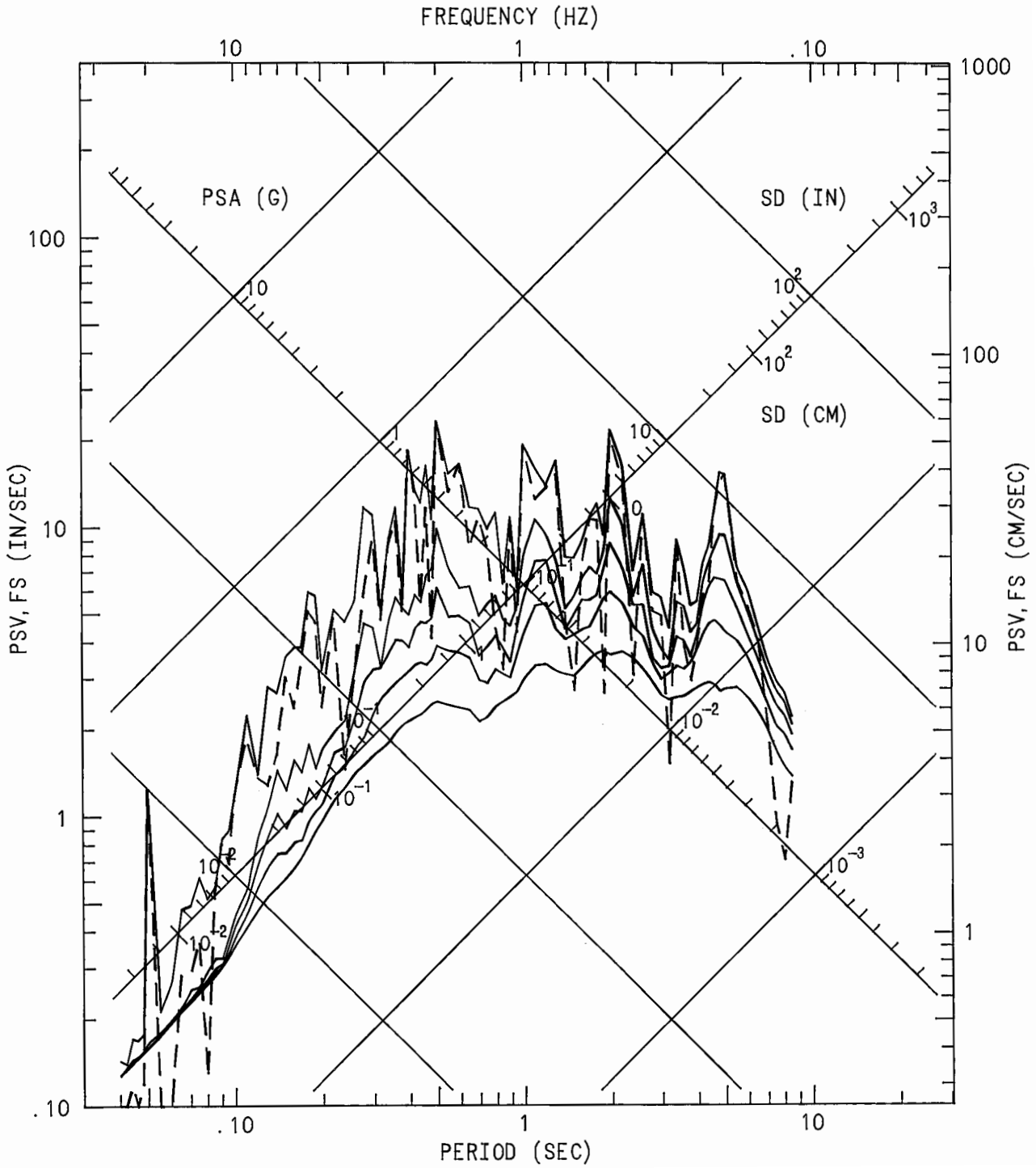
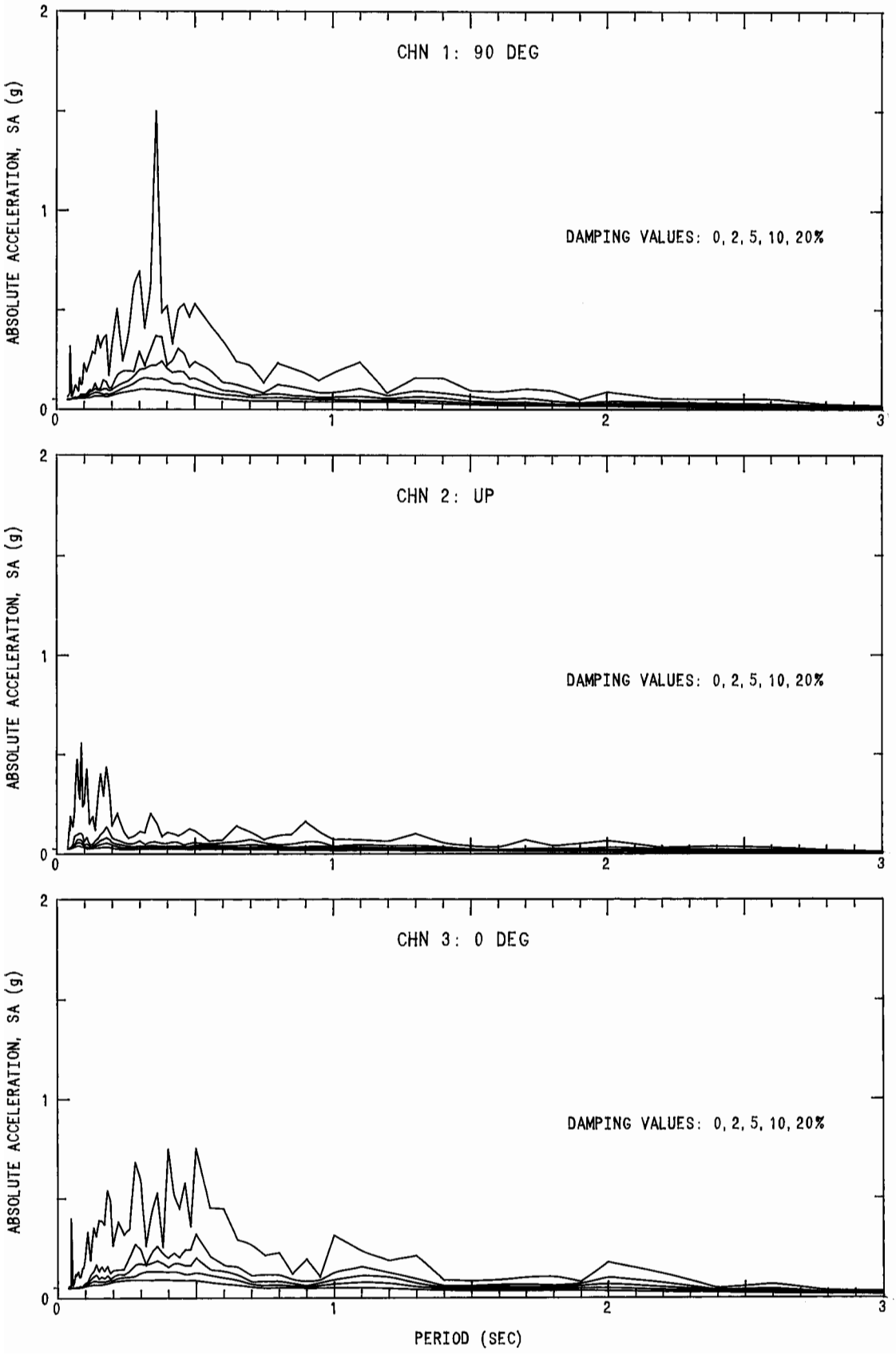


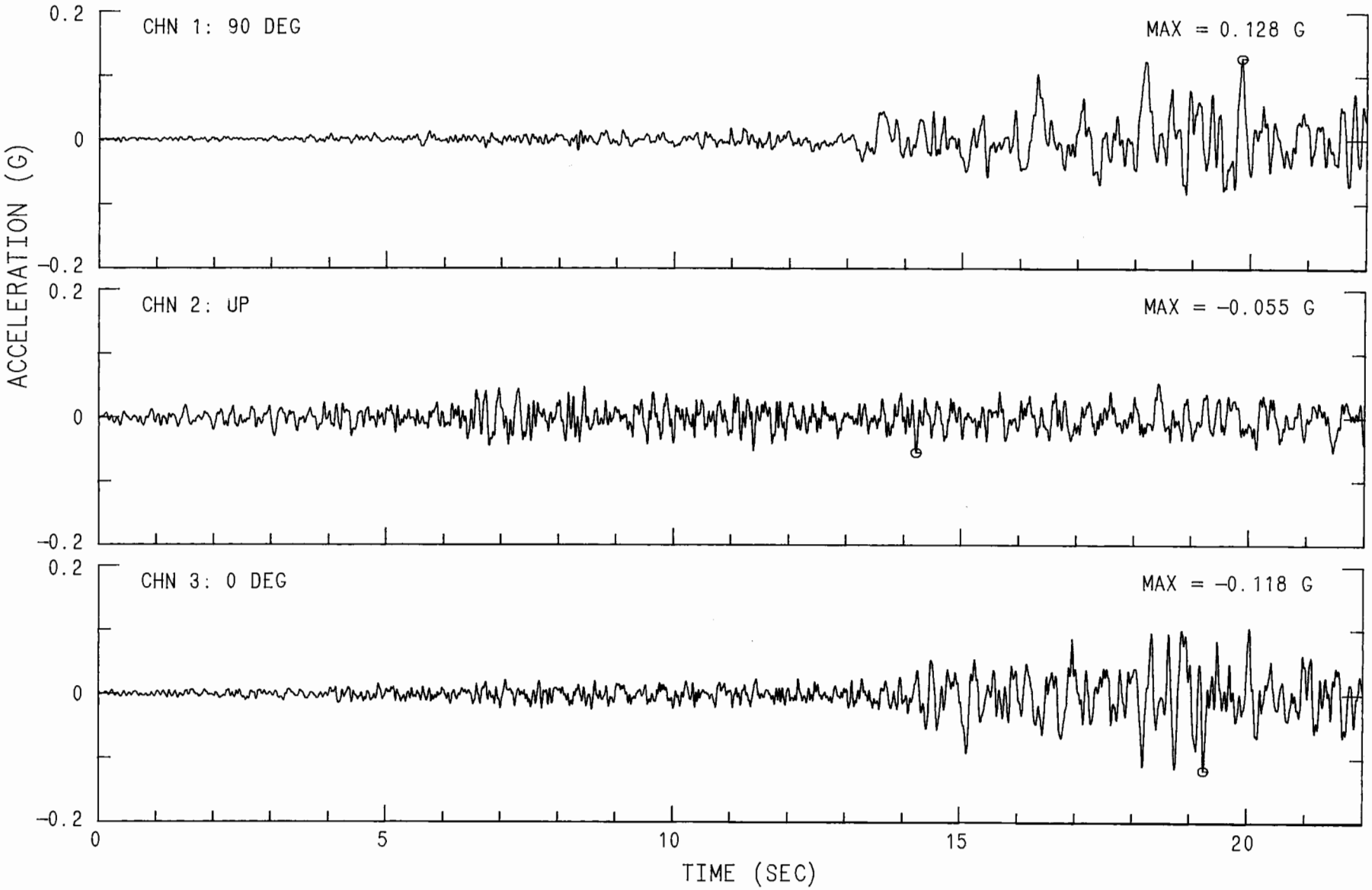
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG.
CHN 3: 0 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
13122-S1596-92185.02 021173.1023-QL92A122



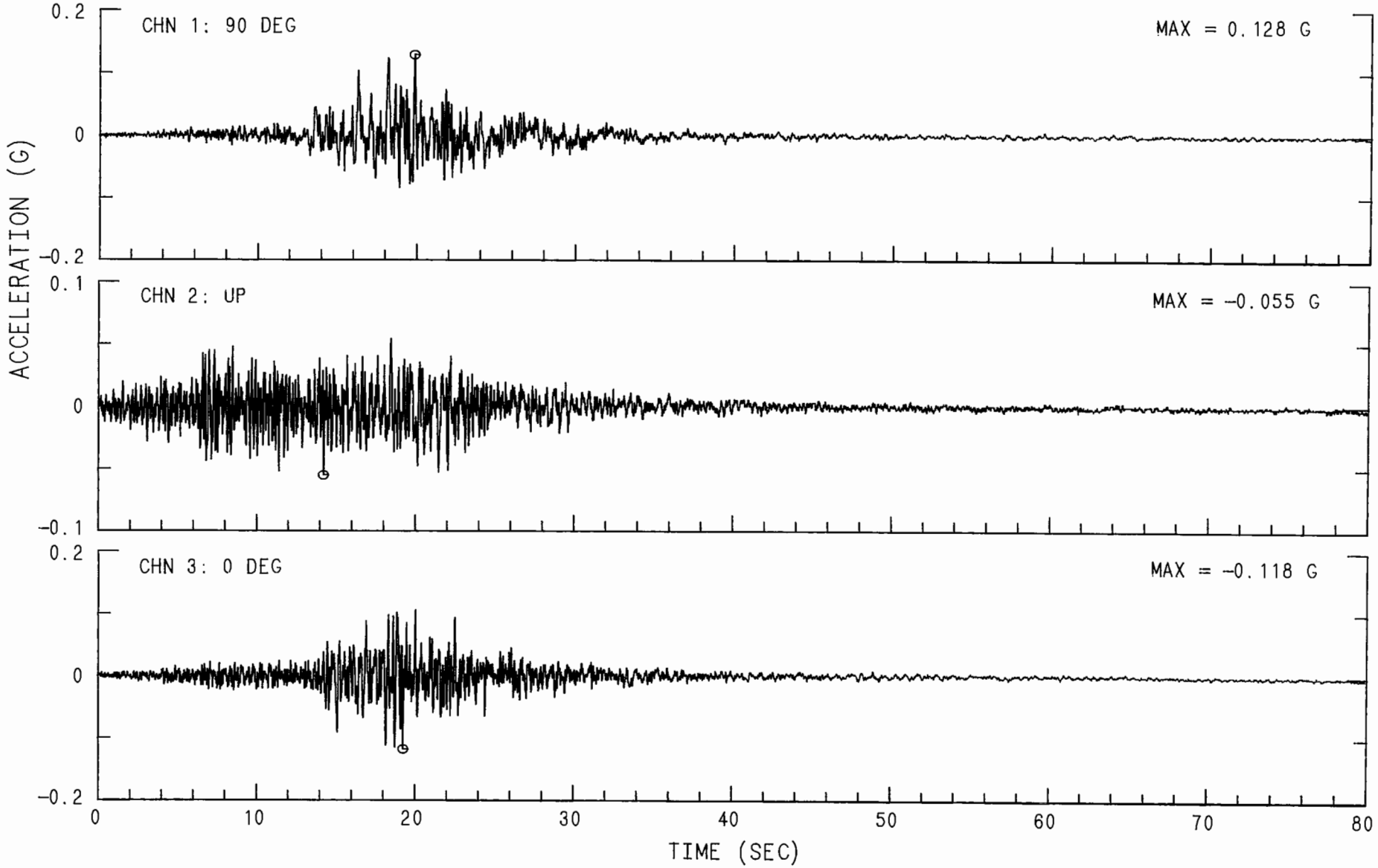
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
FEATHERLY PARK - PARK MAINT. BLDG.
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
13122-S1596-92185.02 021173.1023-QL92A122

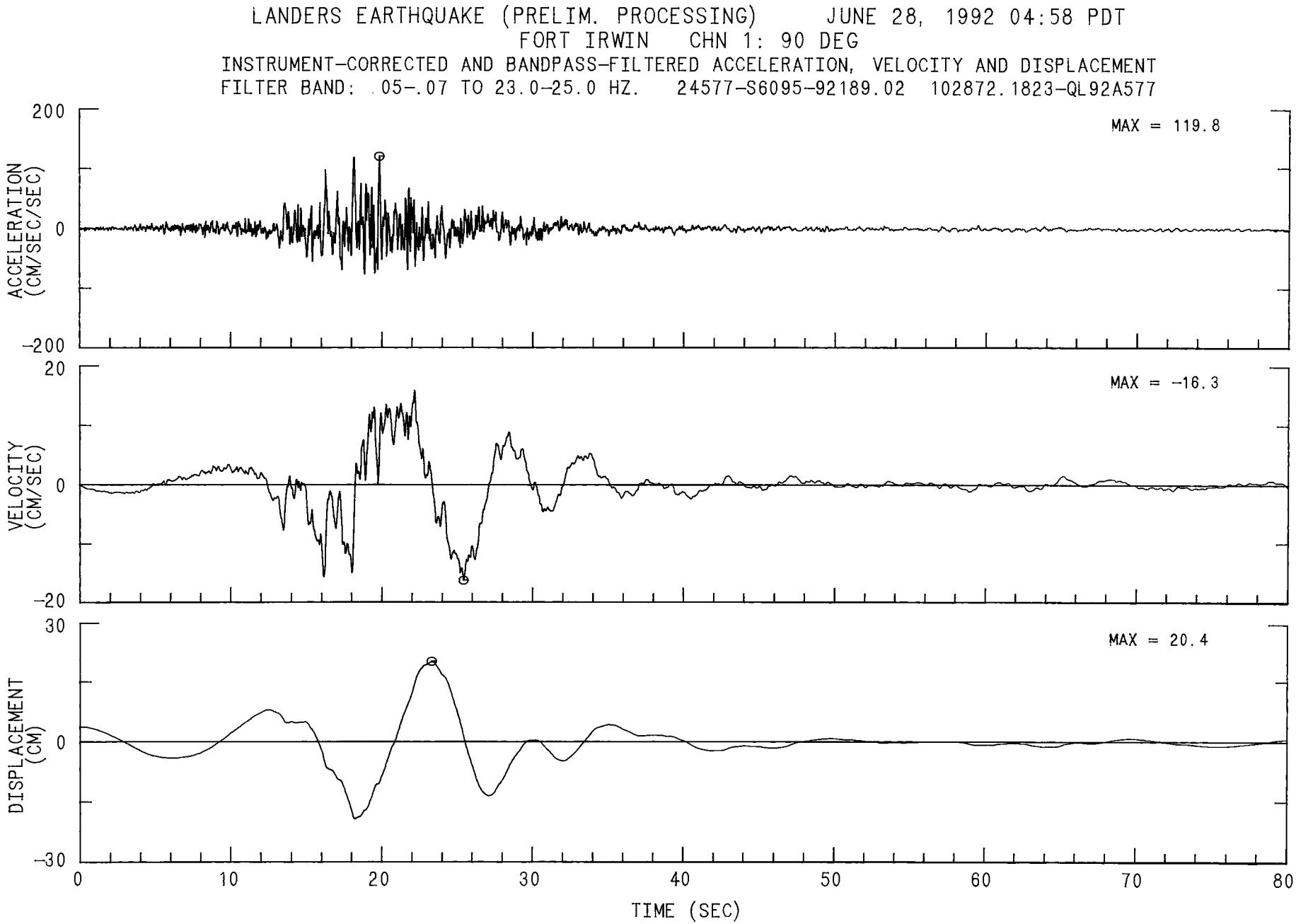


LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN
UNCORRECTED ACCELEROGRAM 24577-S6095-92189.02 102872.1731-QL92A577

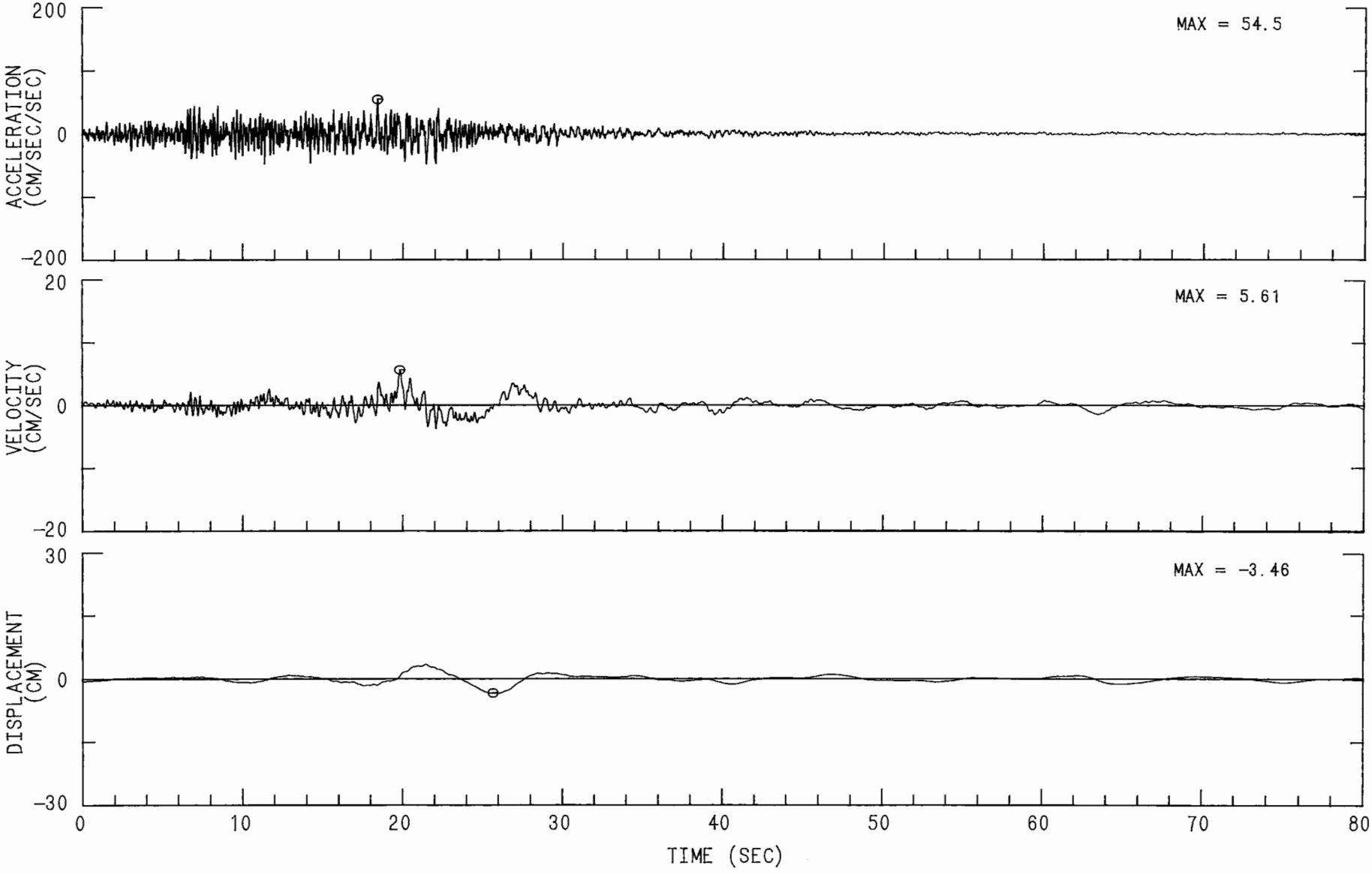


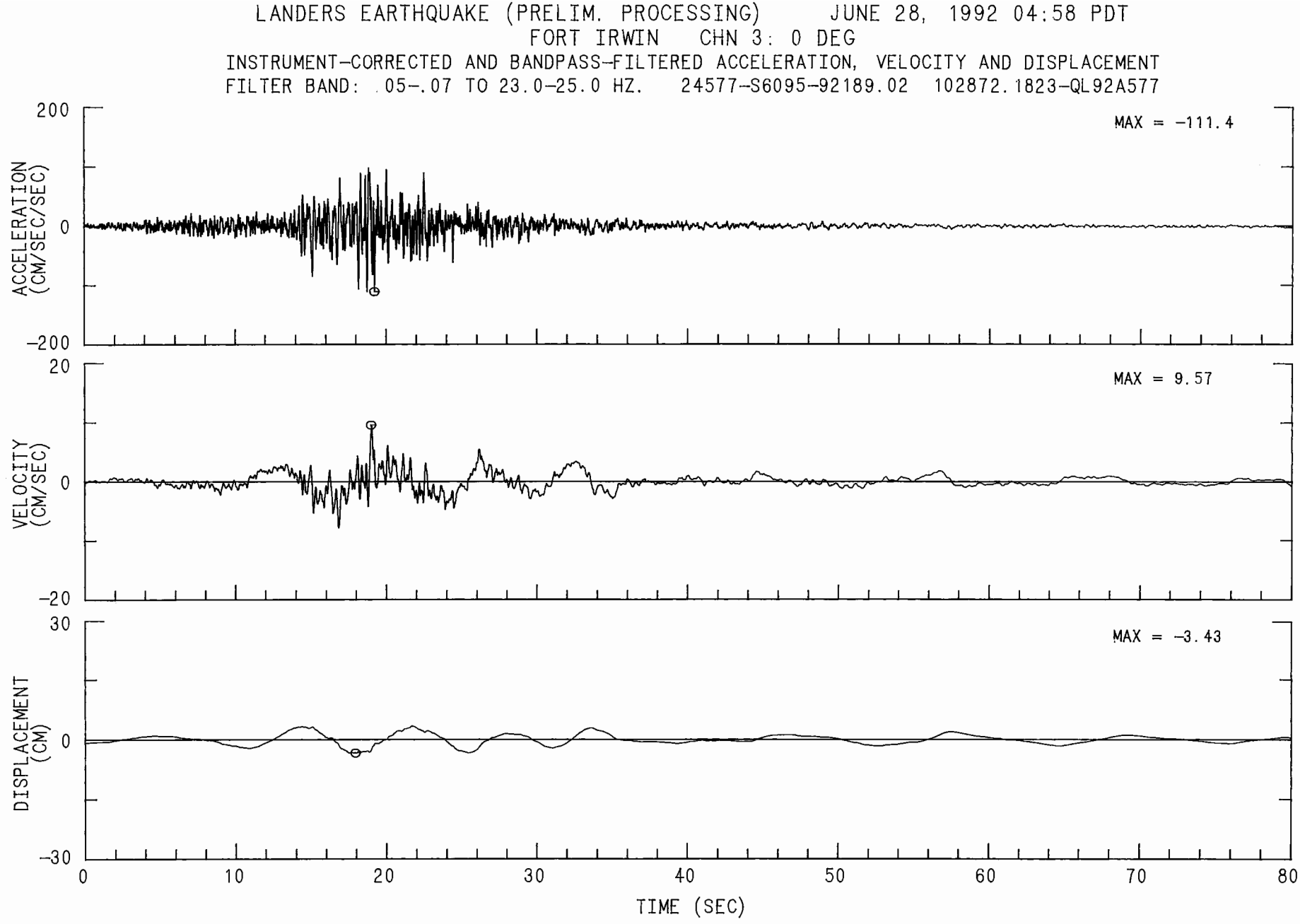
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN
UNCORRECTED ACCELEROGRAM 24577-S6095-92189.02 102872.1731-QL92A577



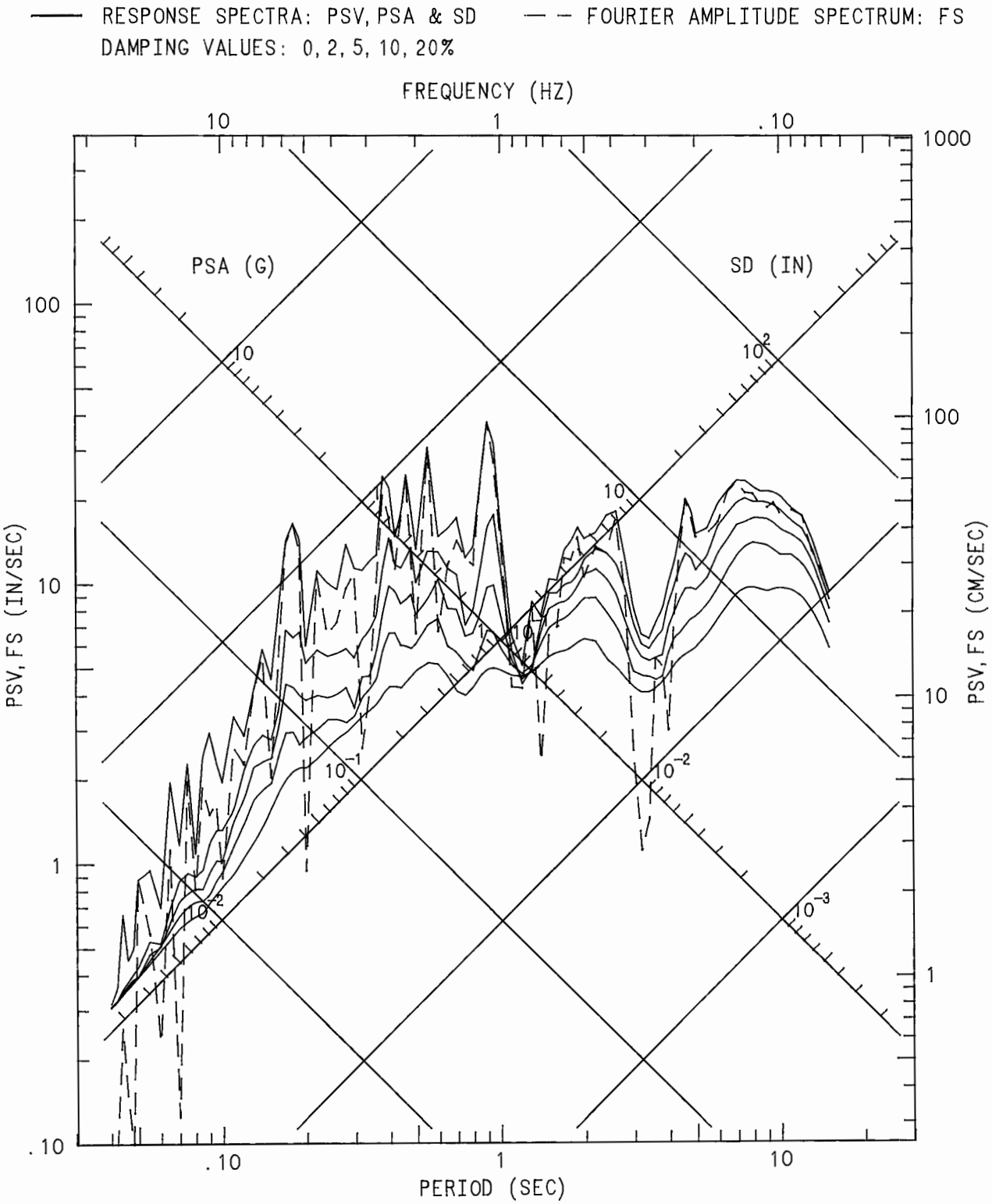

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 24577-S6095-92189.02 102872.1823-QL92A577
ACCELERATION (CM/SEC/SEC)
MAX = 119.8
VELOCITY (CM/SEC)
MAX = -16.3
DISPLACEMENT (CM)
MAX = 20.4
200
0
-200
20
0
-20
30
0
-30
0
10
20
30
40
50
60
70
80
TIME (SEC)

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 24577-S6095-92189.02 102872.1823-QL92A577

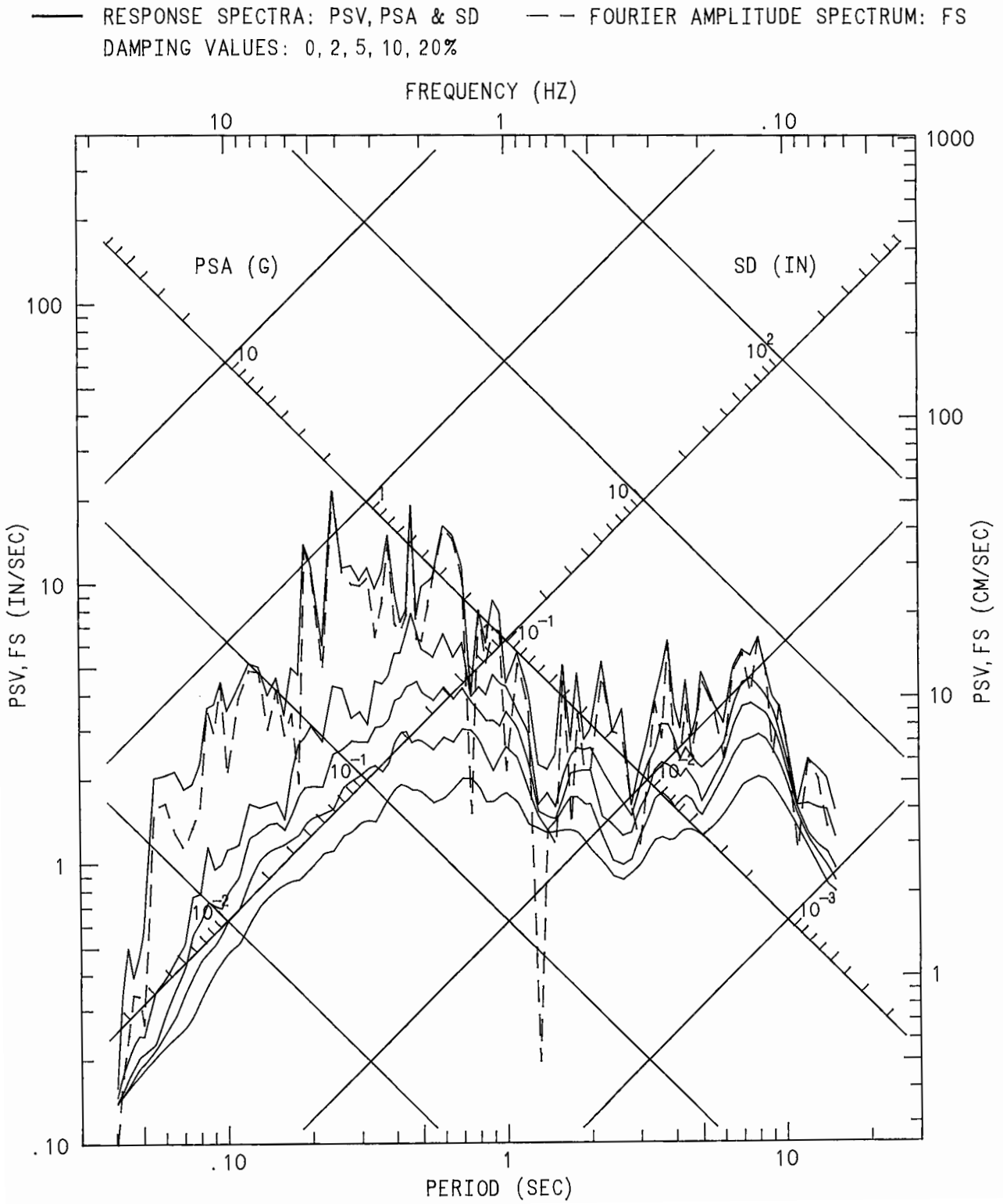



LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 24577-S6095-92189.02 102872.1823-QL92A577
ACCELERATION (CM/SEC/SEC)
200
0
-200
MAX = -111.4
VELOCITY (CM/SEC)
20
0
-20
MAX = 9.57
DISPLACEMENT (CM)
30
0
-30
MAX = -3.43
0
10
20
30
40
50
60
70
80
TIME (SEC)

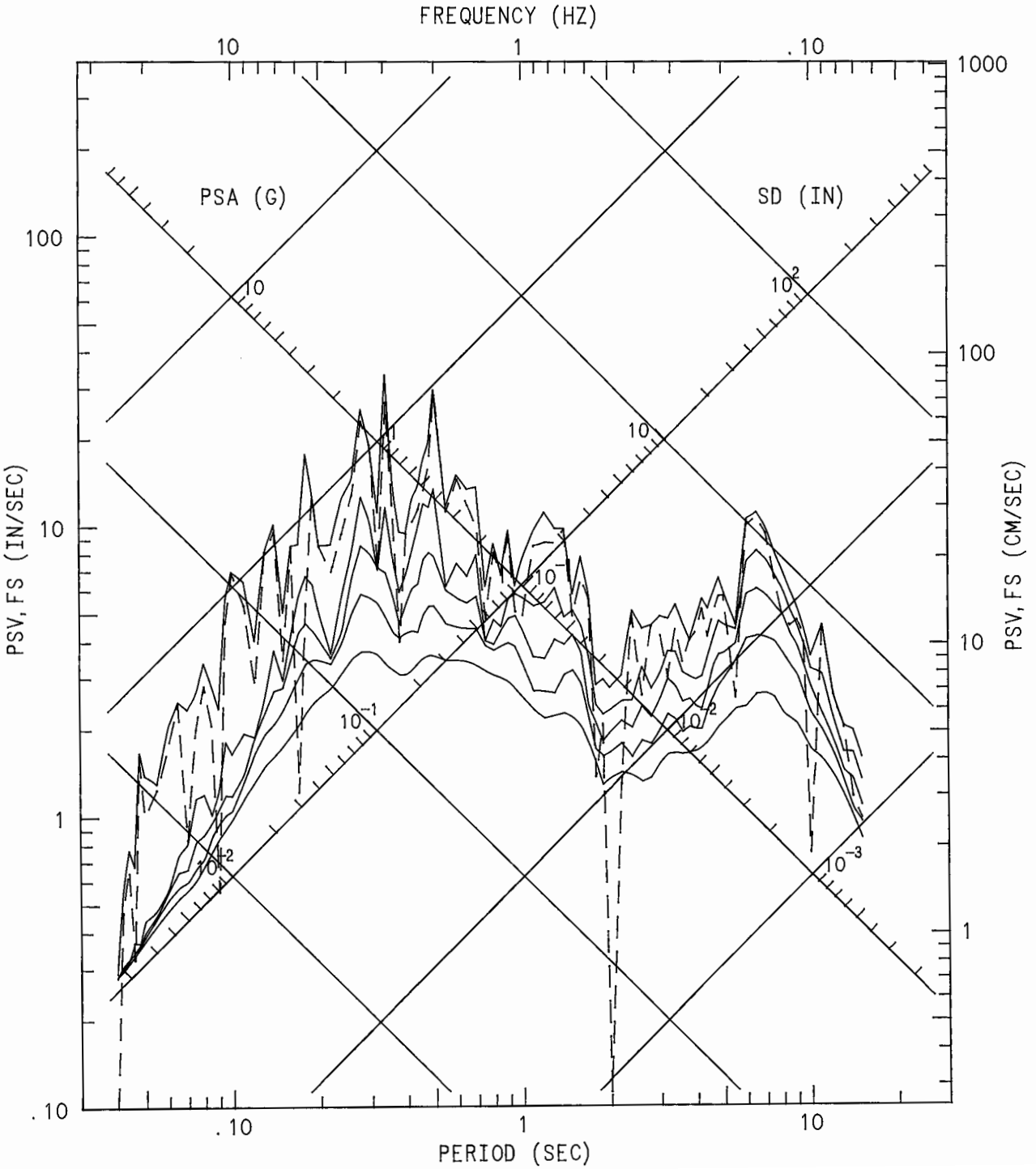
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN
CHN 1: 90 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24577-S6095-92189.02 102972.1854-QL92A577



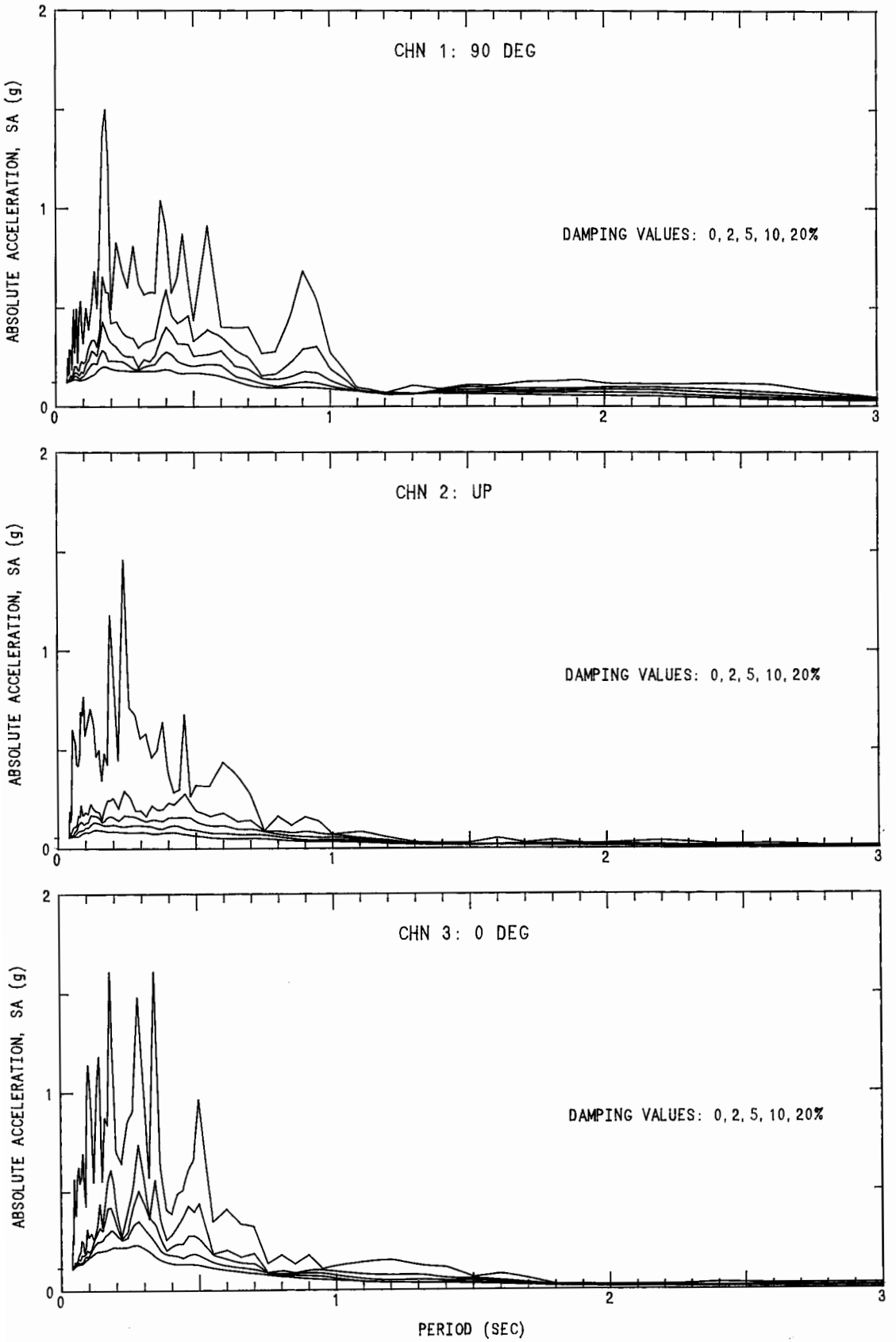
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24577-S6095-92189.02 102972.1854-QL92A577



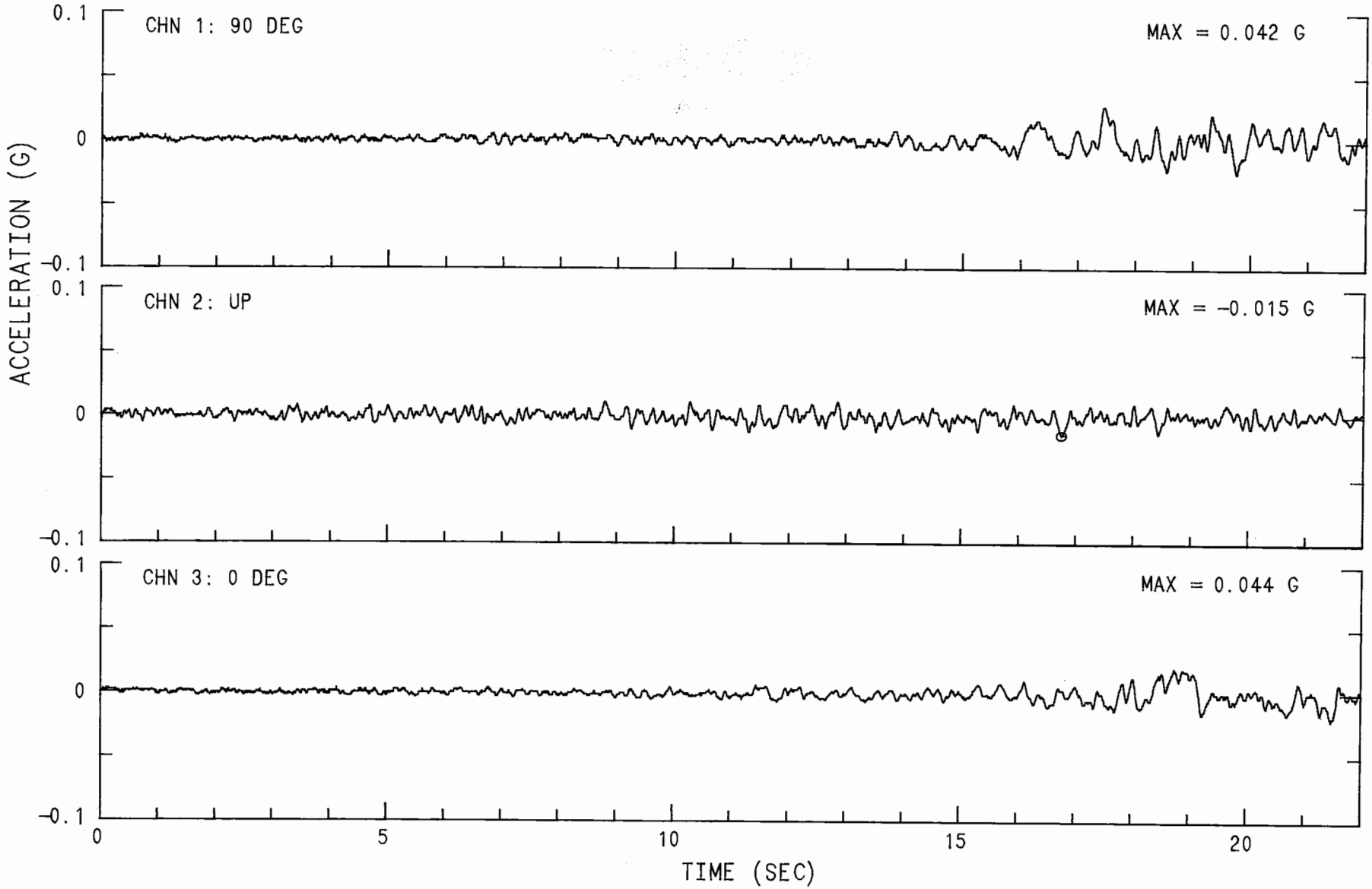
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN
CHN 3: 0 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24577-S6095-92189.02 102972.1854-QL92A577



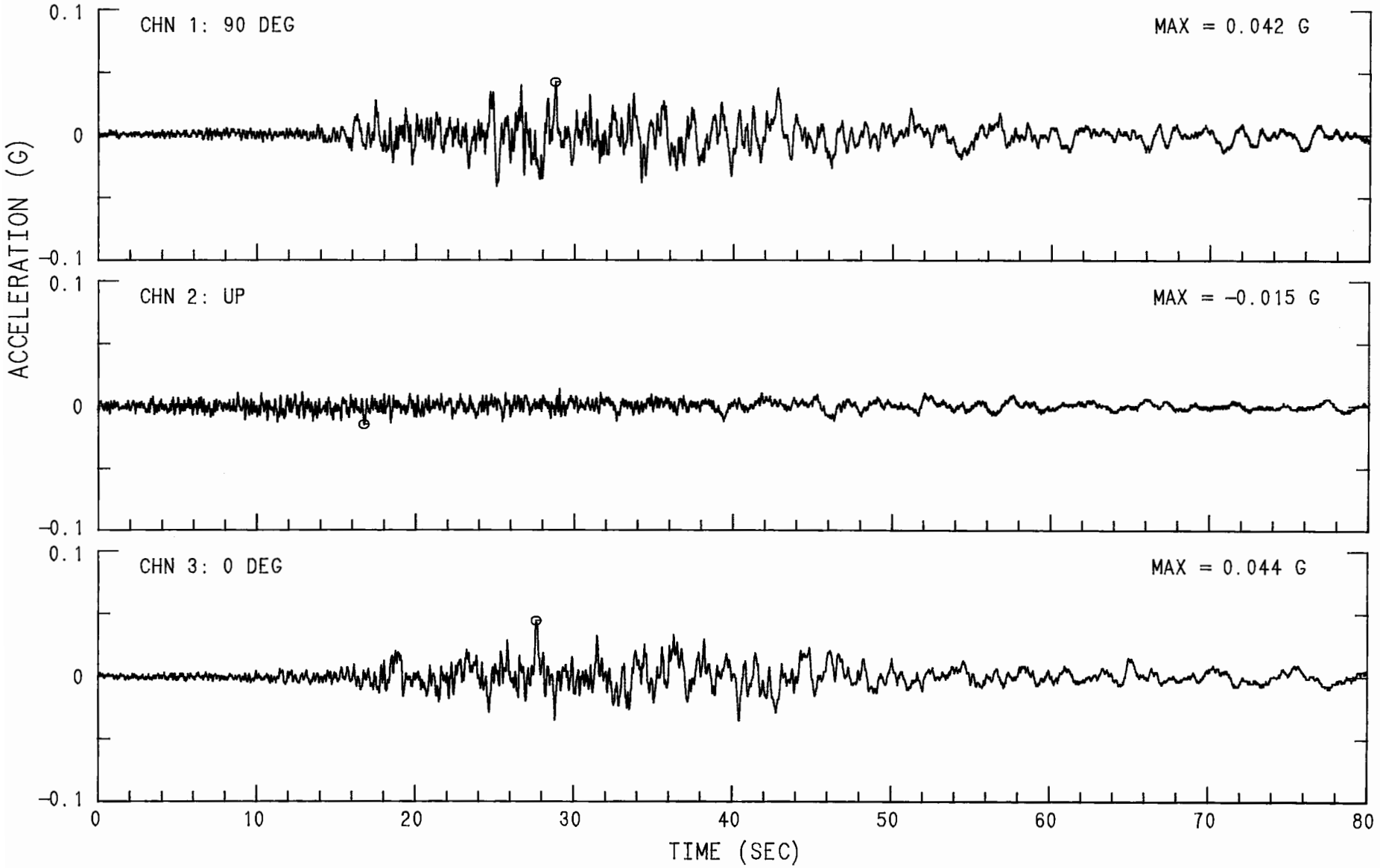
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
FORT IRWIN
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24577-S6095-92189.02 102872.1854-QL92A577

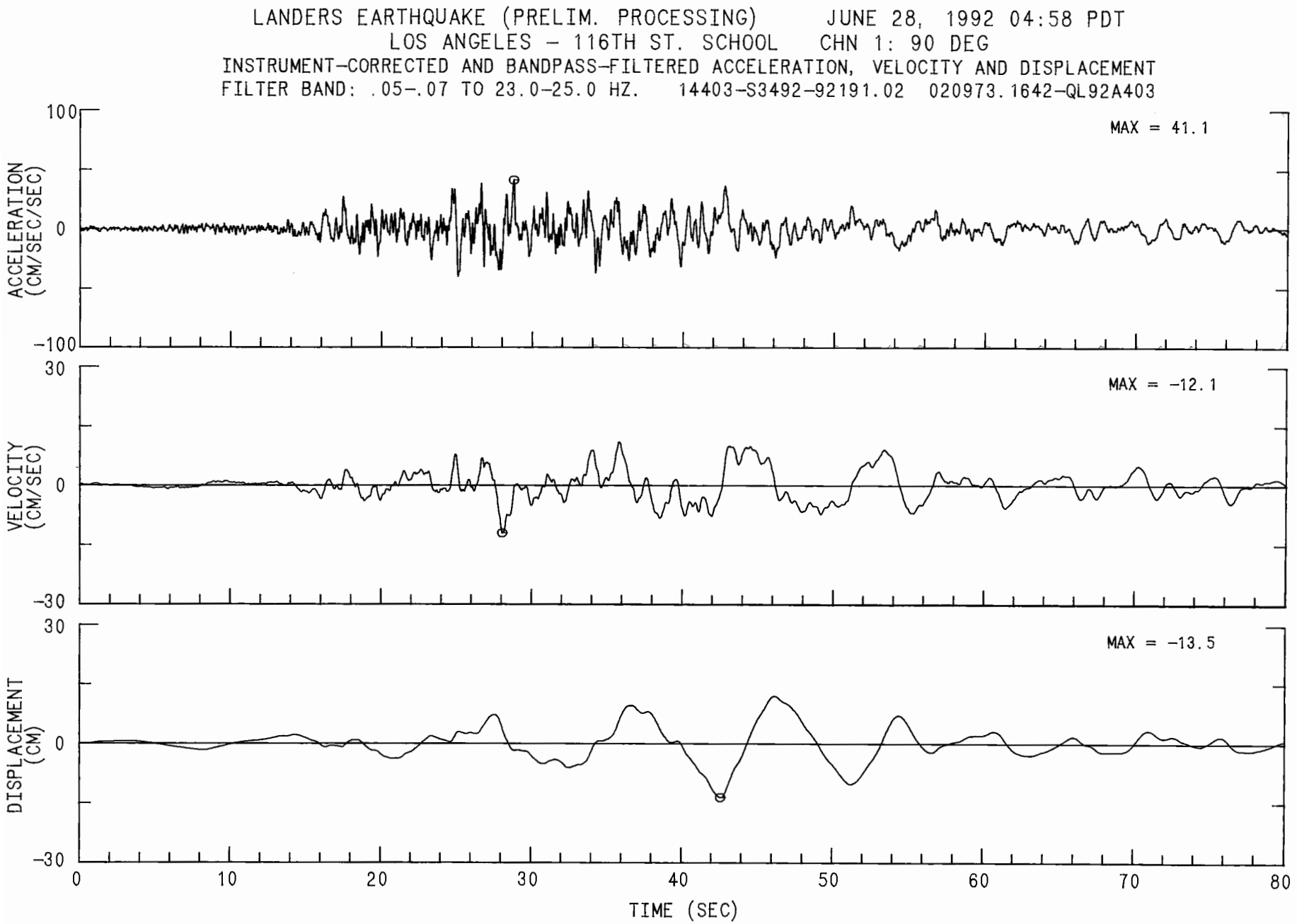


LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL
UNCORRECTED ACCELEROGRAM 14403-S3492-92191.02 020973.1408-QL92A403

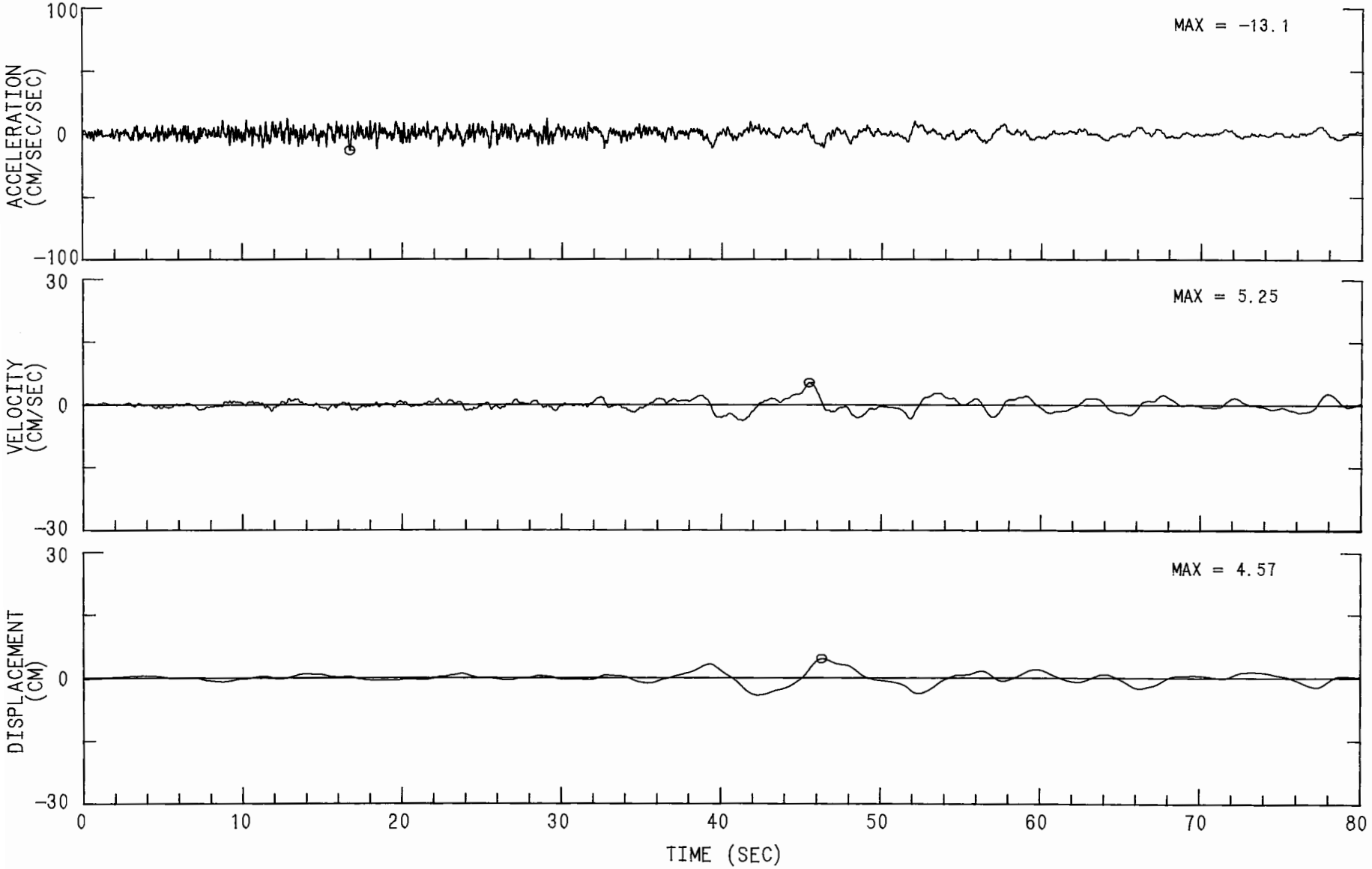


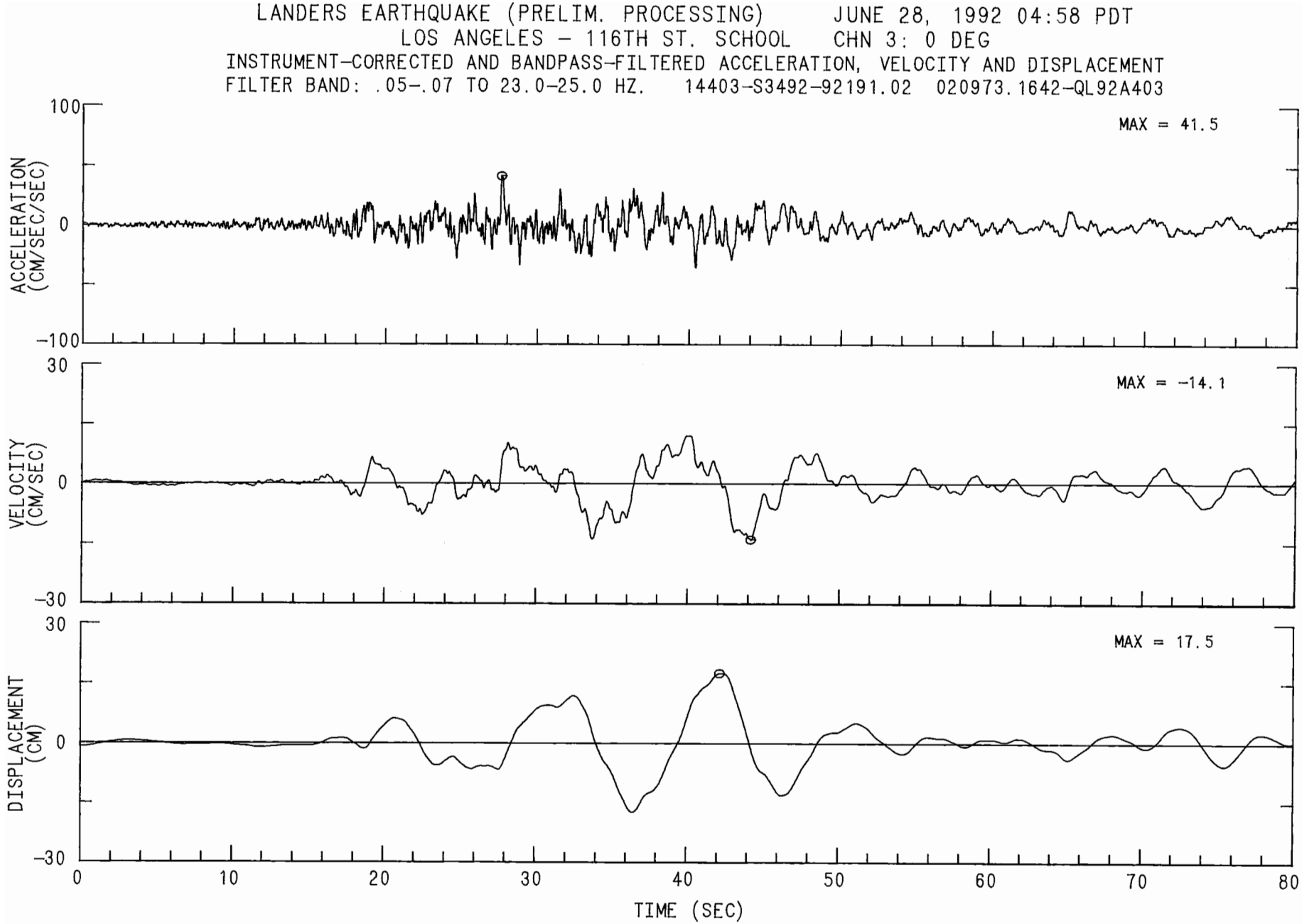
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL
UNCORRECTED ACCELEROGRAM 14403-S3492-92191.02 020973.1408-QL92A403



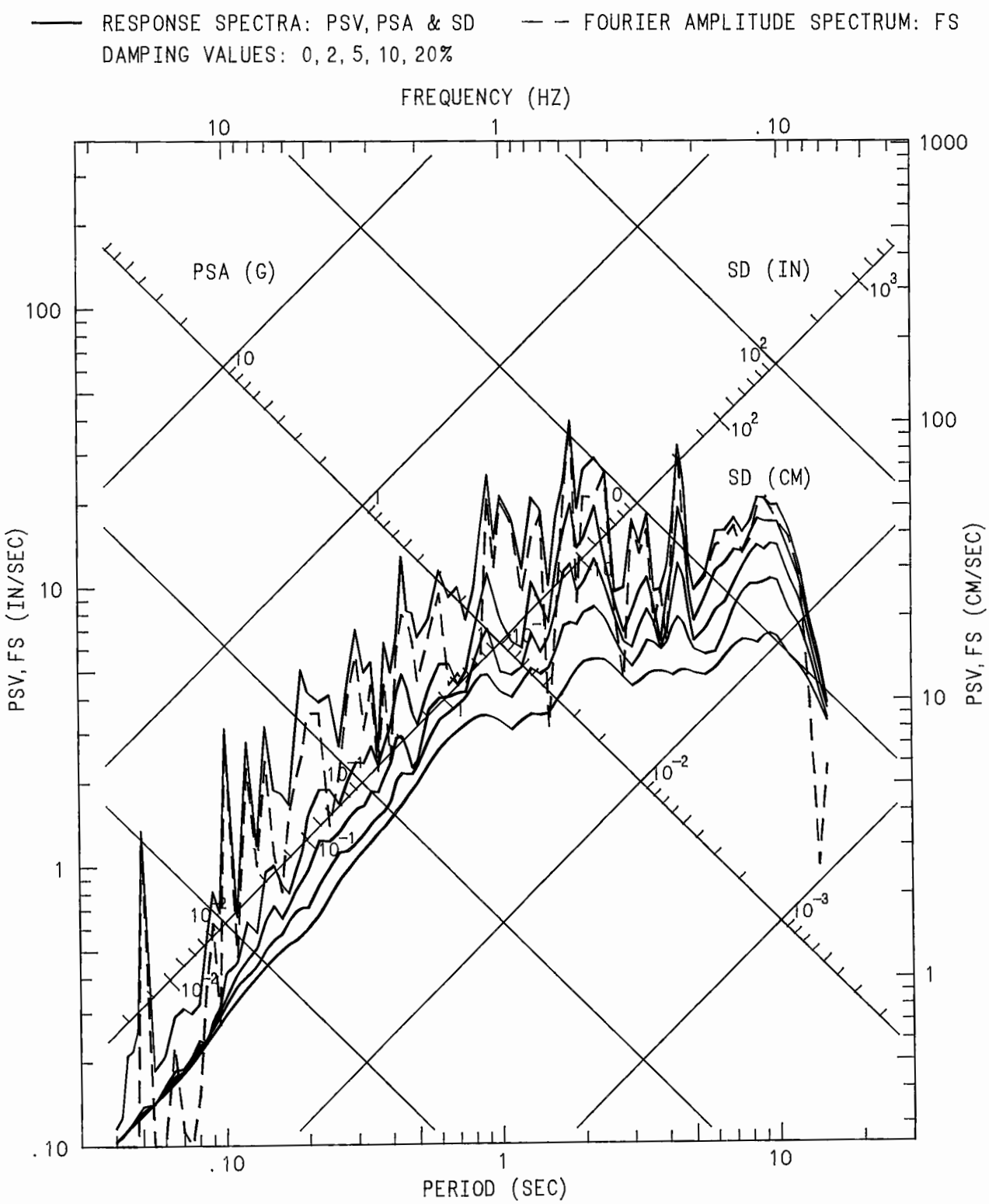

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 14403-S3492-92191.02 020973.1642-QL92A403
ACCELERATION (CM/SEC/SEC)
100
0
-100
MAX = 41.1
VELOCITY (CM/SEC)
30
0
-30
MAX = -12.1
DISPLACEMENT (CM)
30
0
-30
MAX = -13.5
0
10
20
30
40
50
60
70
80
TIME (SEC)

LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 14403-S3492-92191.02 020973.1642-QL92A403

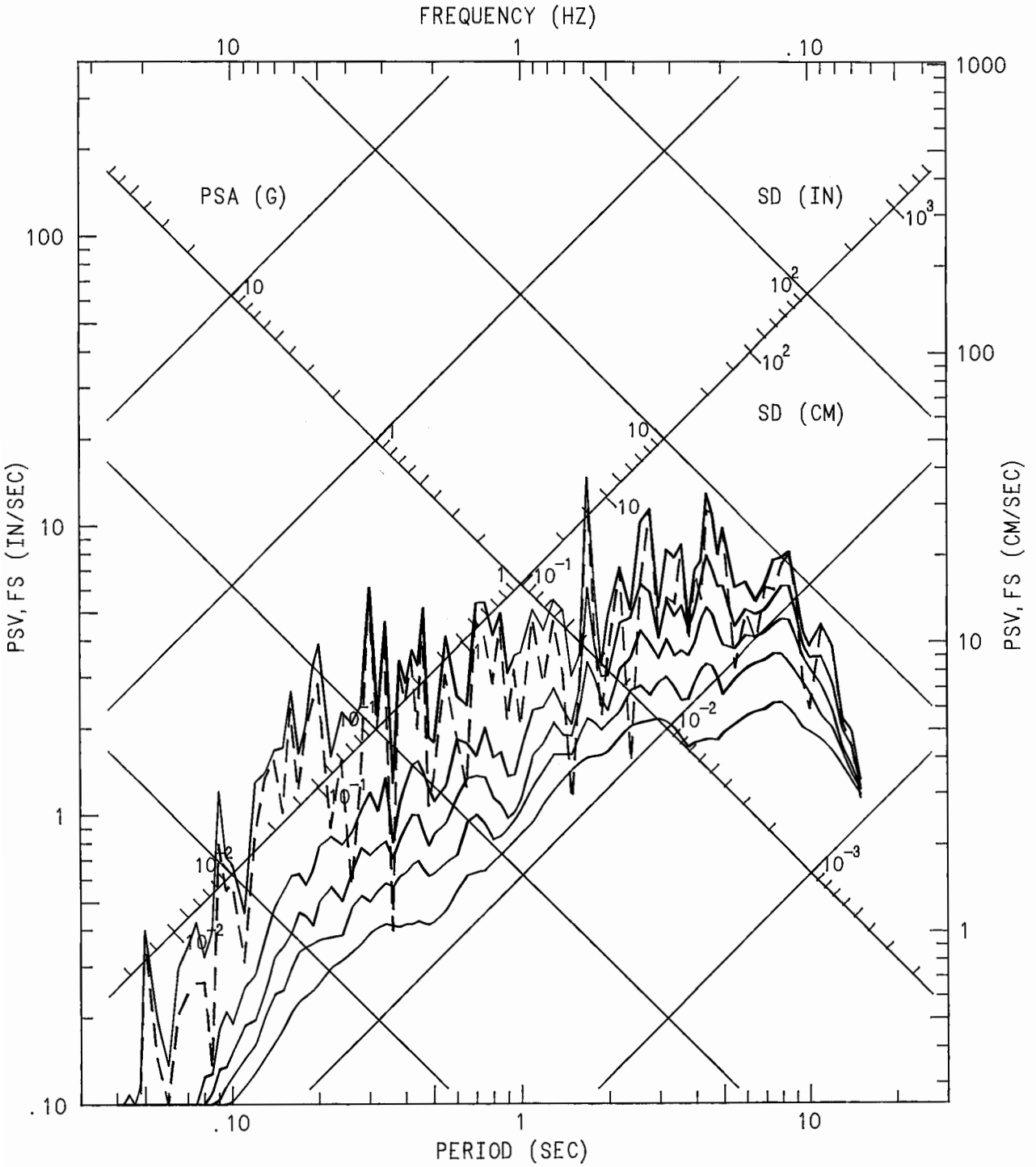



LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 14403-S3492-92191.02 020973.1642-QL92A403
ACCELERATION (CM/SEC/SEC)
100
0
-100
MAX = 41.5
VELOCITY (CM/SEC)
30
0
-30
MAX = -14.1
DISPLACEMENT (CM)
30
0
-30
MAX = 17.5
0
10
20
30
40
50
60
70
80
TIME (SEC)

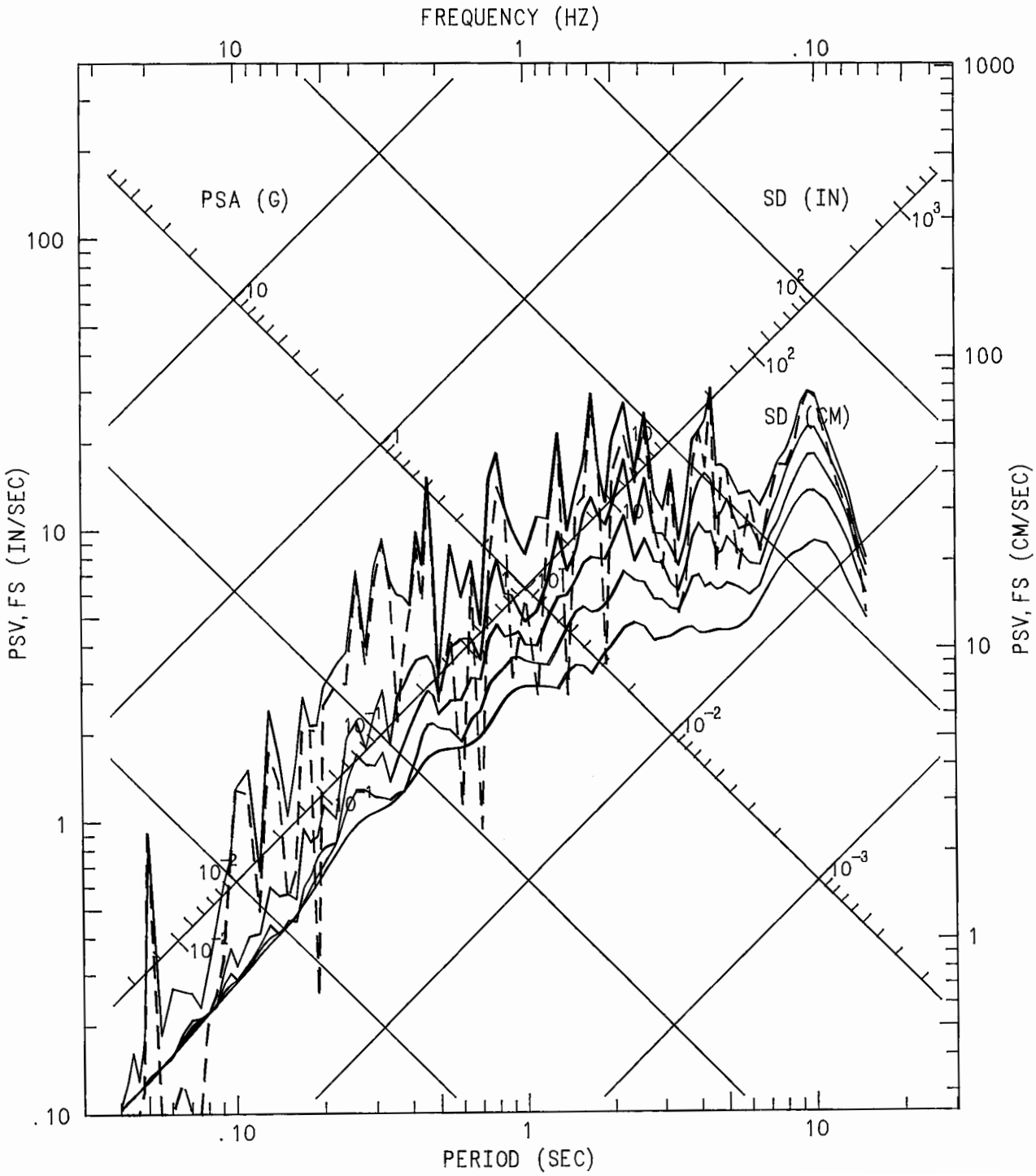
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL
CHN 1: 90 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
14403-S3492-92191.02 020973.1711-QL92A403



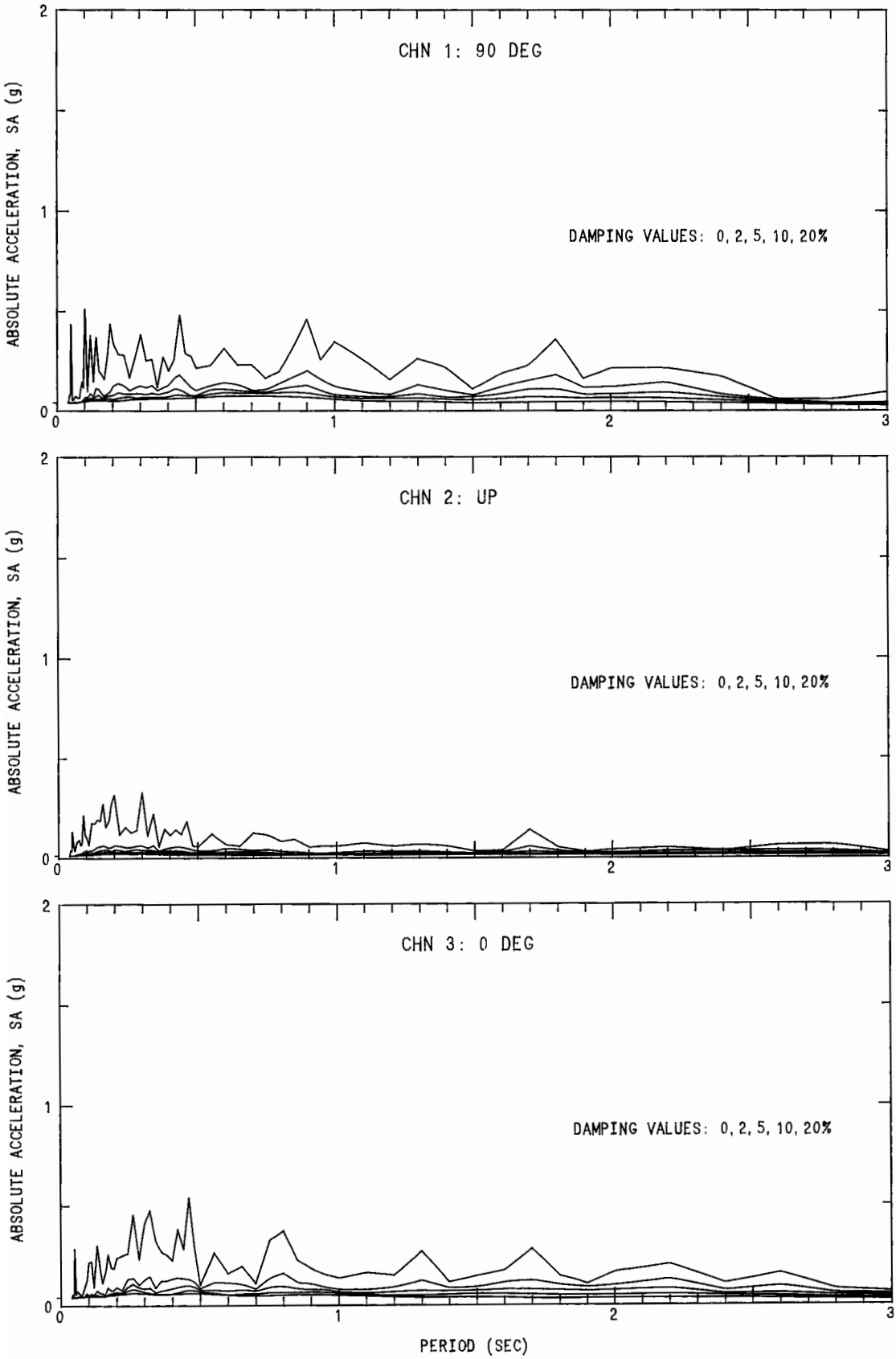
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
14403-S3492-92191.02 020973.1711-QL92A403



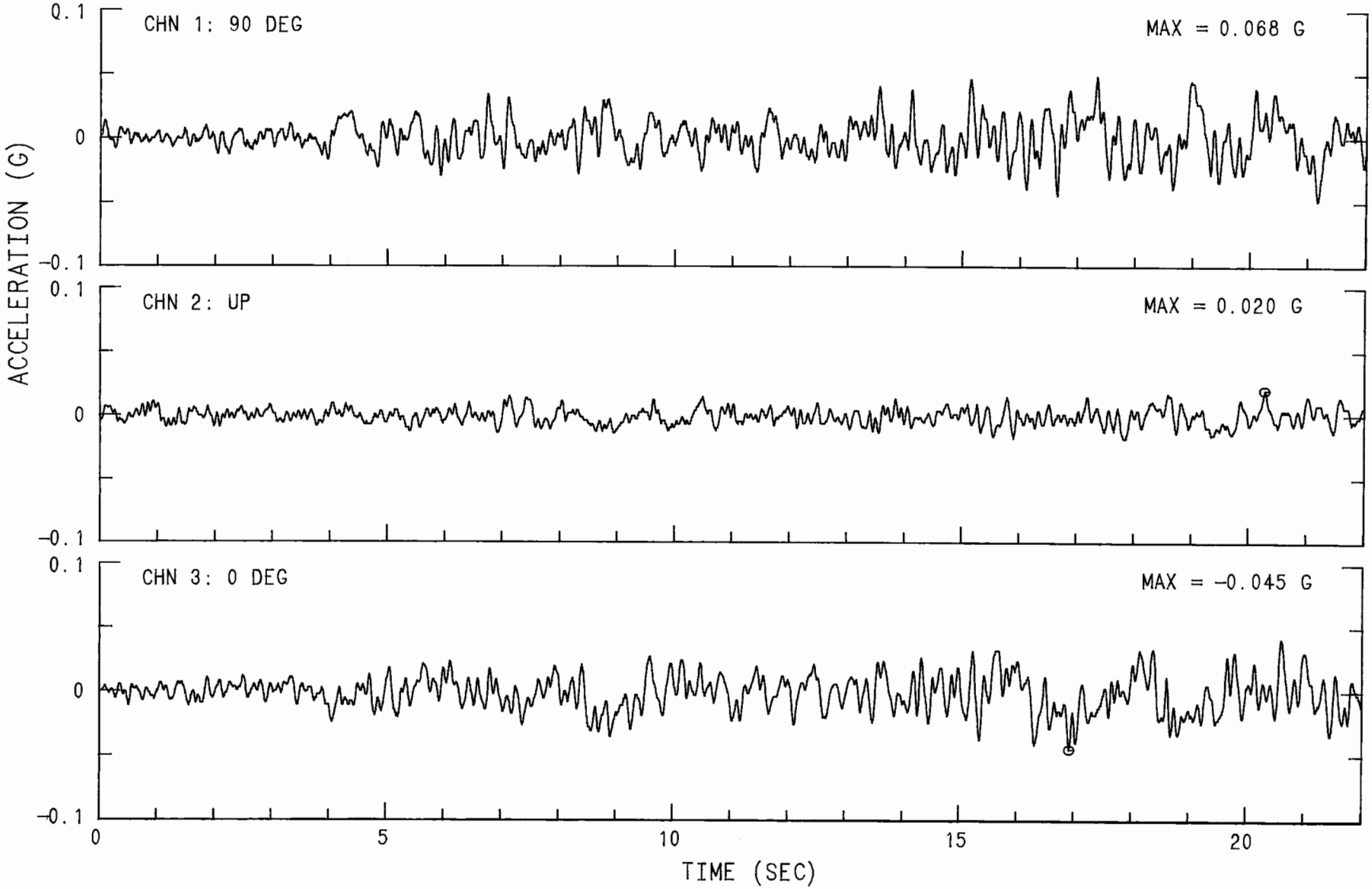
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL
CHN 3: 0 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
14403-S3492-92191.02 020973.1711-QL92A403



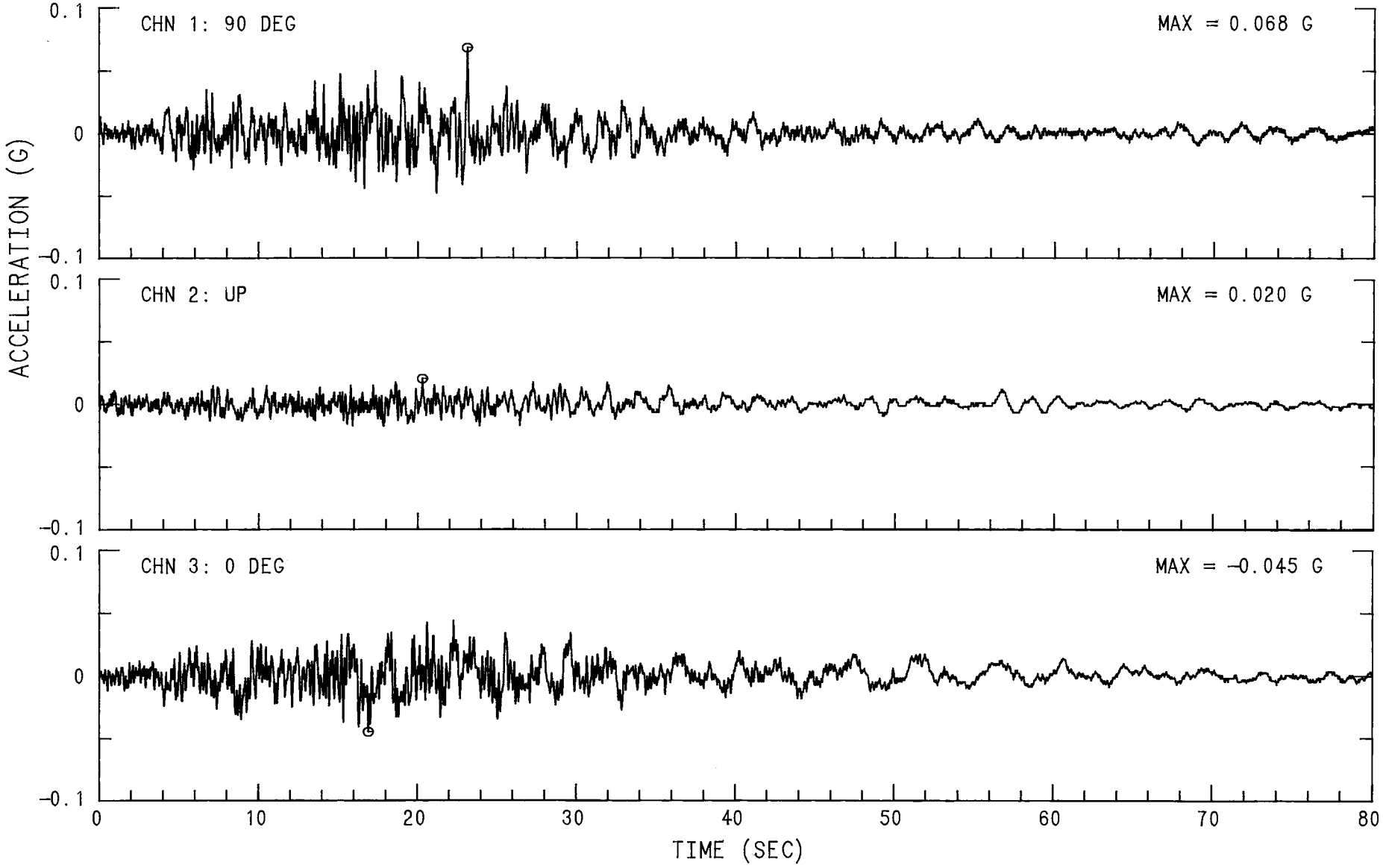
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - 116TH ST. SCHOOL
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
14403-S3492-92191.02 020973.1711-QL92A403



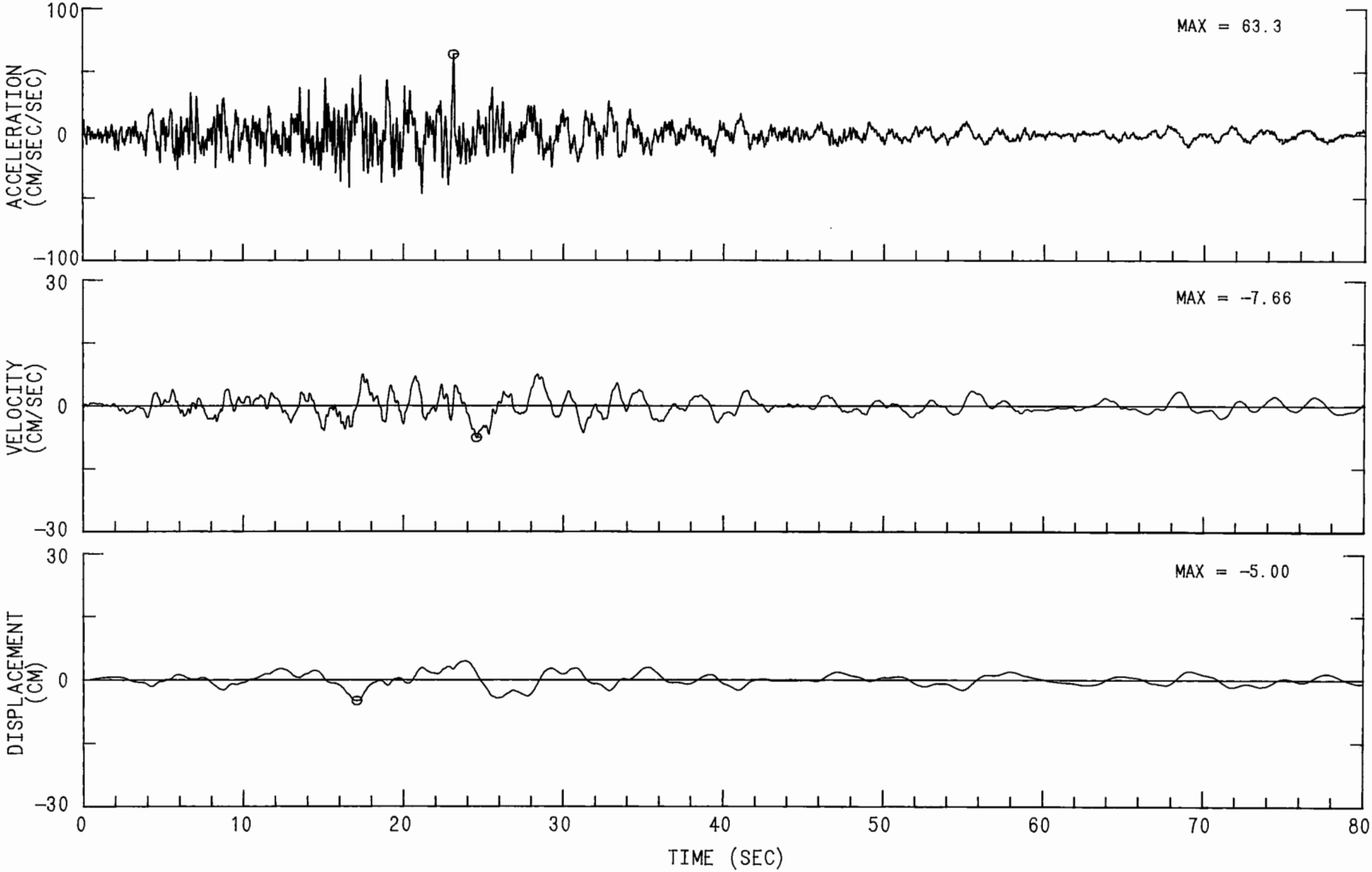
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK
UNCORRECTED ACCELEROGRAM 24400-S1606-92189.02 020973.1035-QL92A400



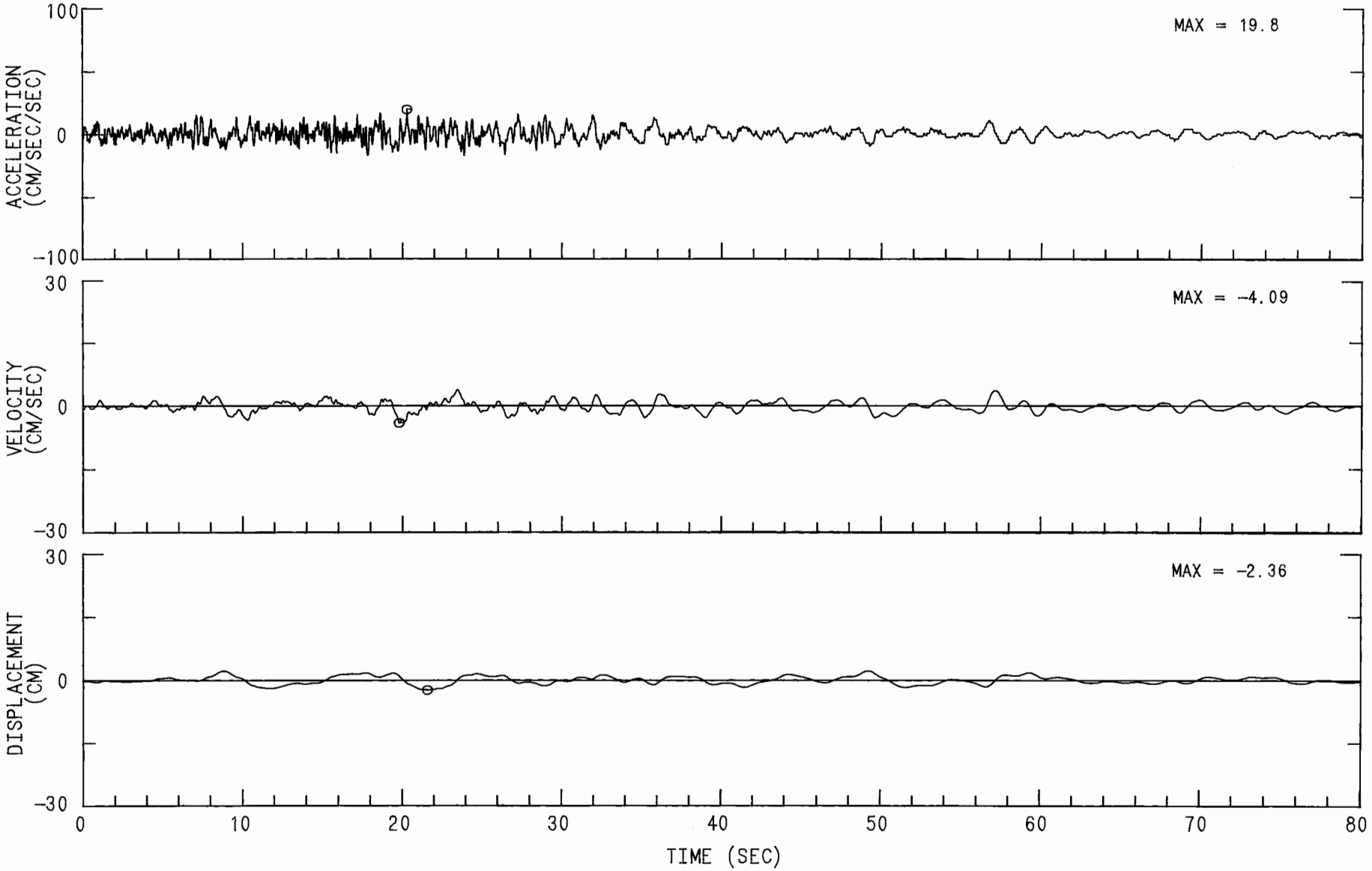
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK
UNCORRECTED ACCELEROGRAM 24400-S1606-92189.02 020973.1035-QL92A400

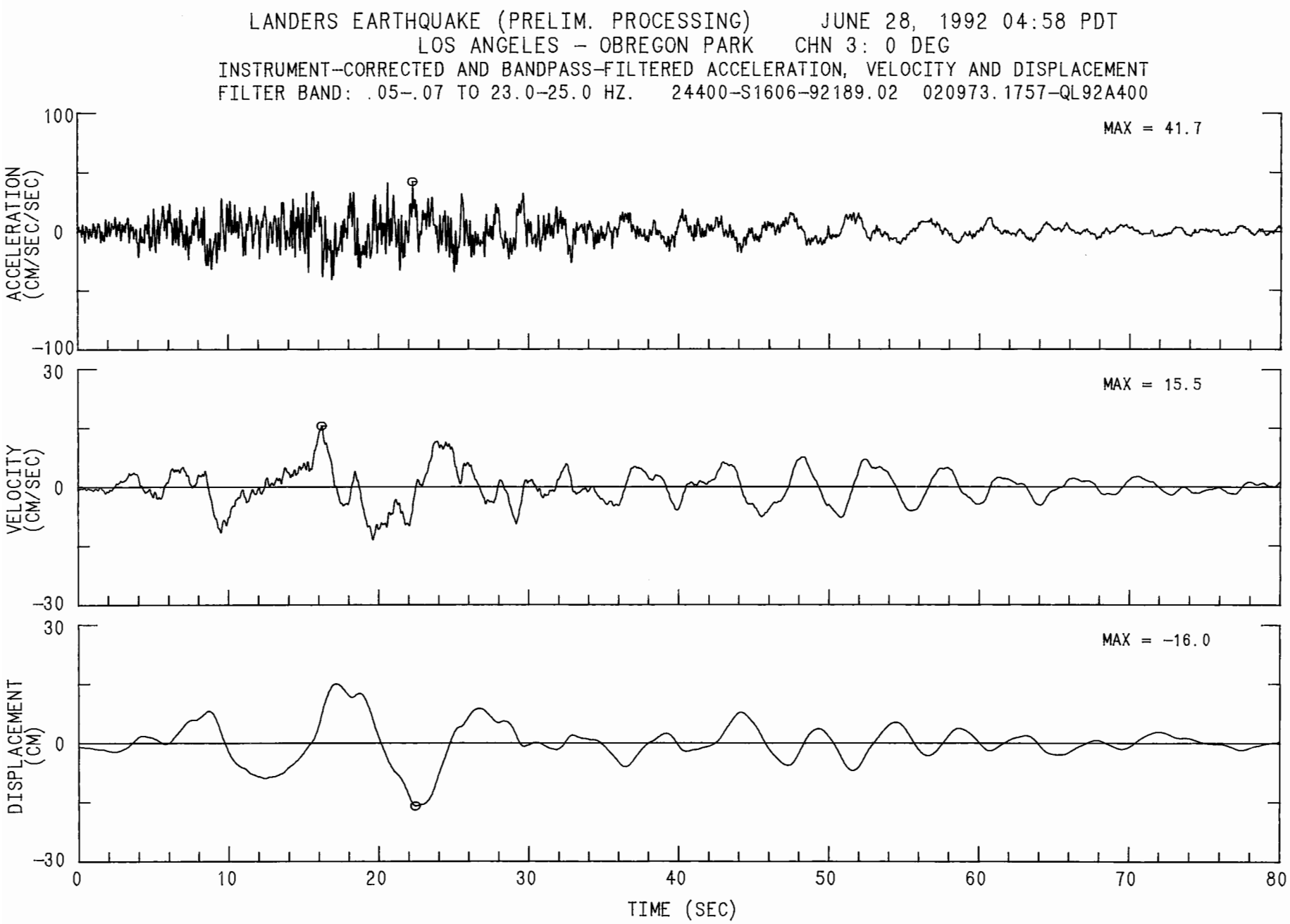


LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 24400-S1606-92189.02 020973.1757-QL92A400

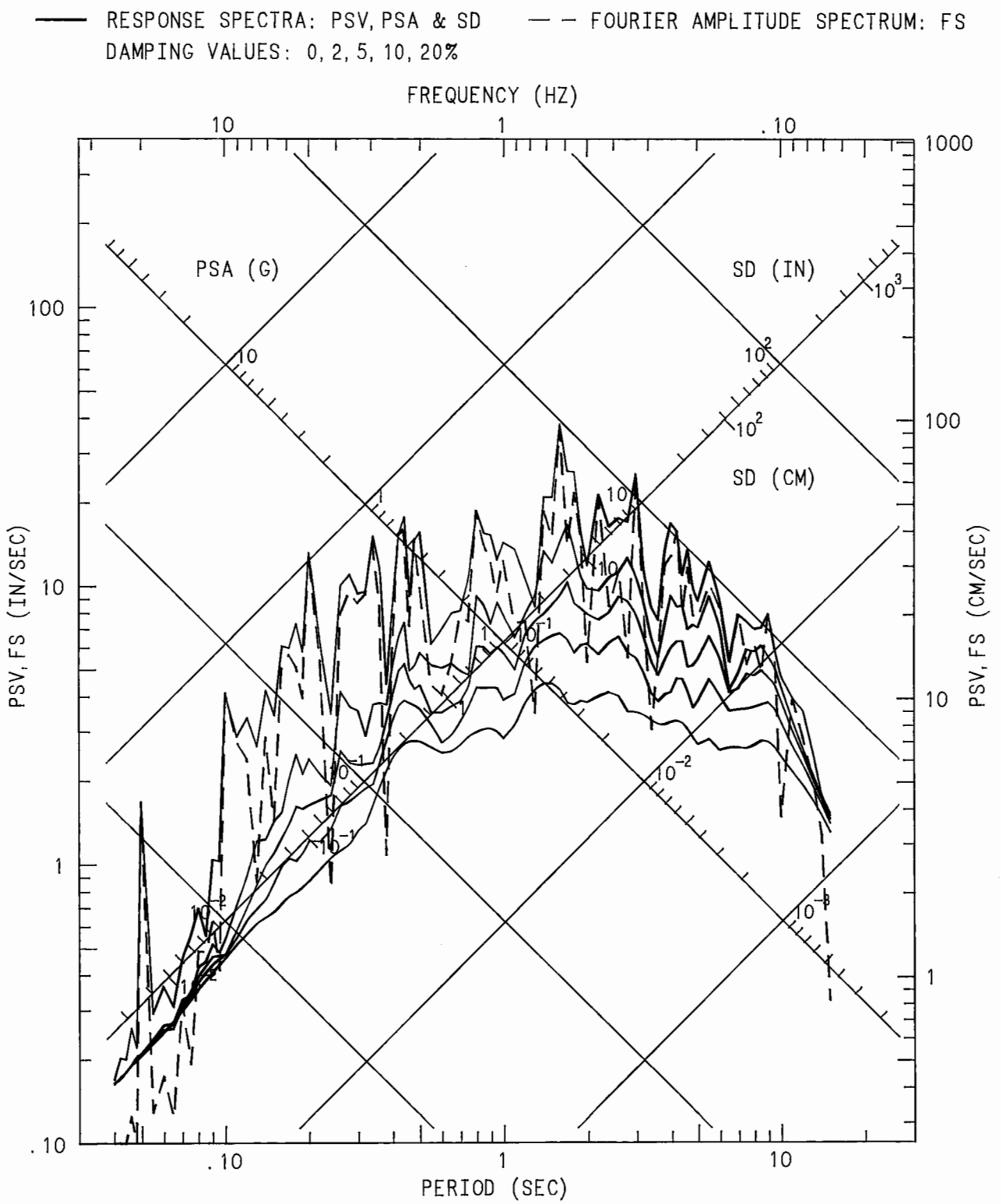


LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 24400-S1606-92189.02 020973.1757-QL92A400

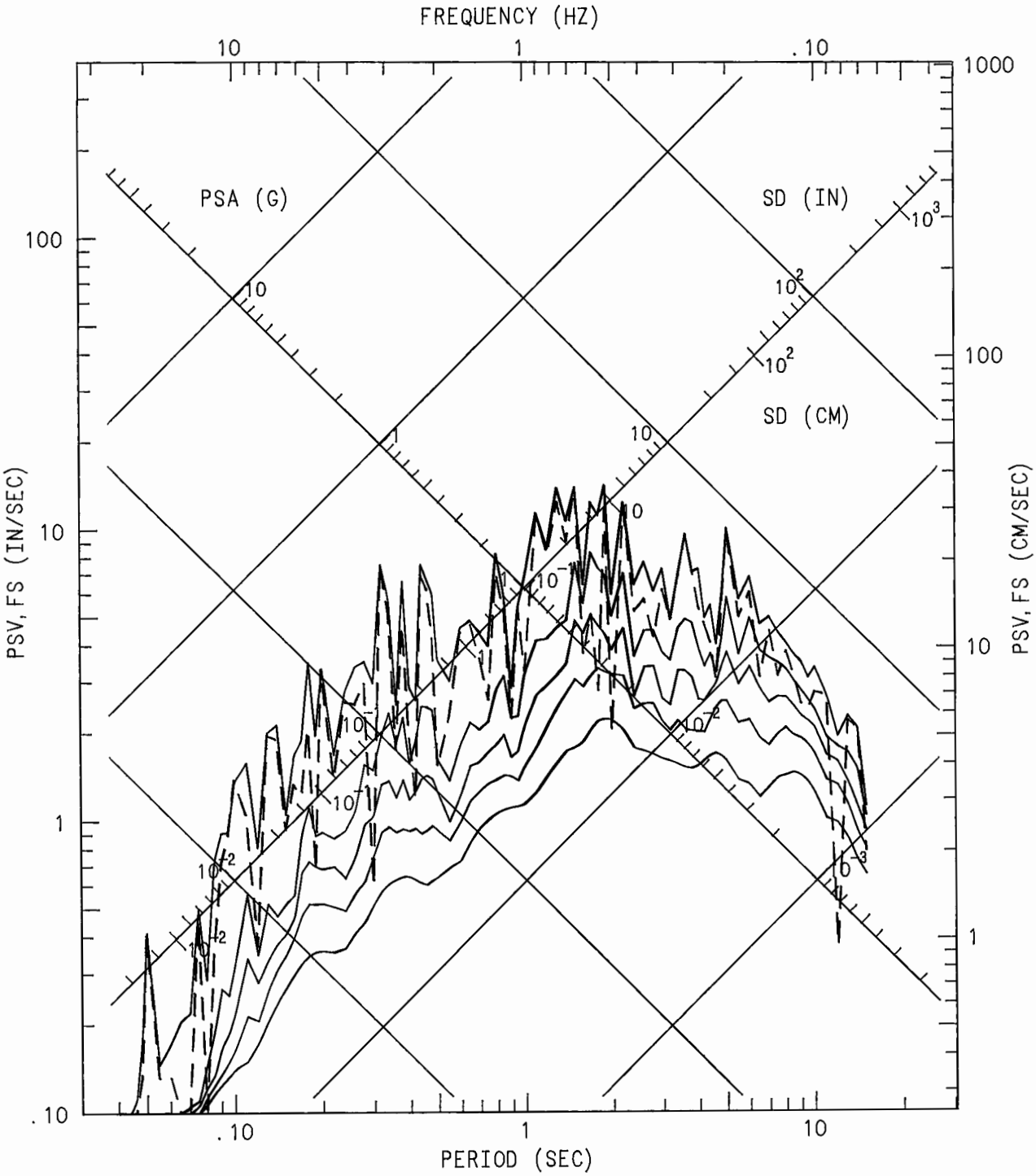



LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .05-.07 TO 23.0-25.0 HZ. 24400-S1606-92189.02 020973.1757-QL92A400
ACCELERATION (CM/SEC/SEC)
MAX = 41.7
VELOCITY (CM/SEC)
MAX = 15.5
DISPLACEMENT (CM)
MAX = -16.0
TIME (SEC)

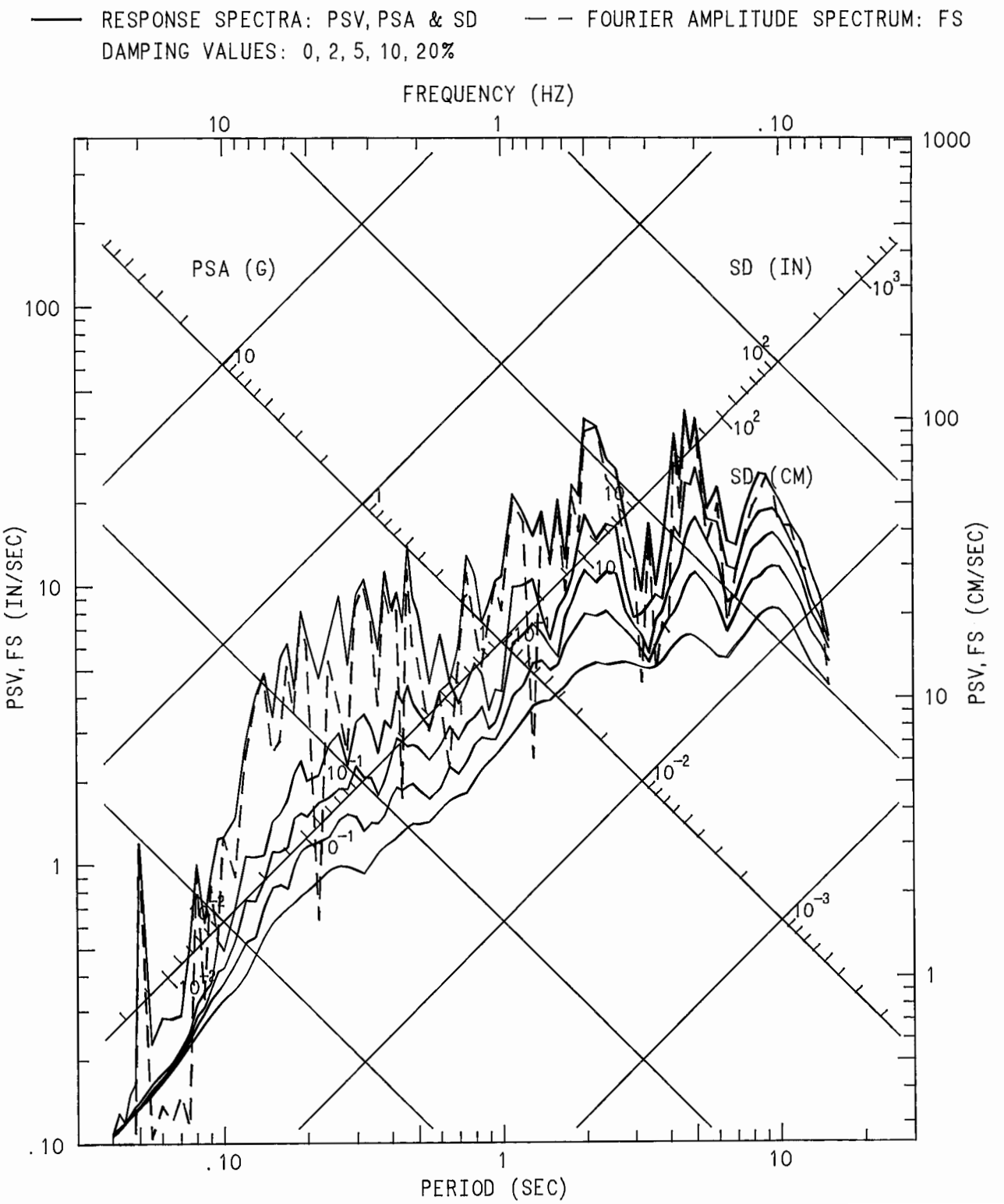
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK
CHN 1: 90 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24400-S1606-92189.02 020973.1827-QL92A400



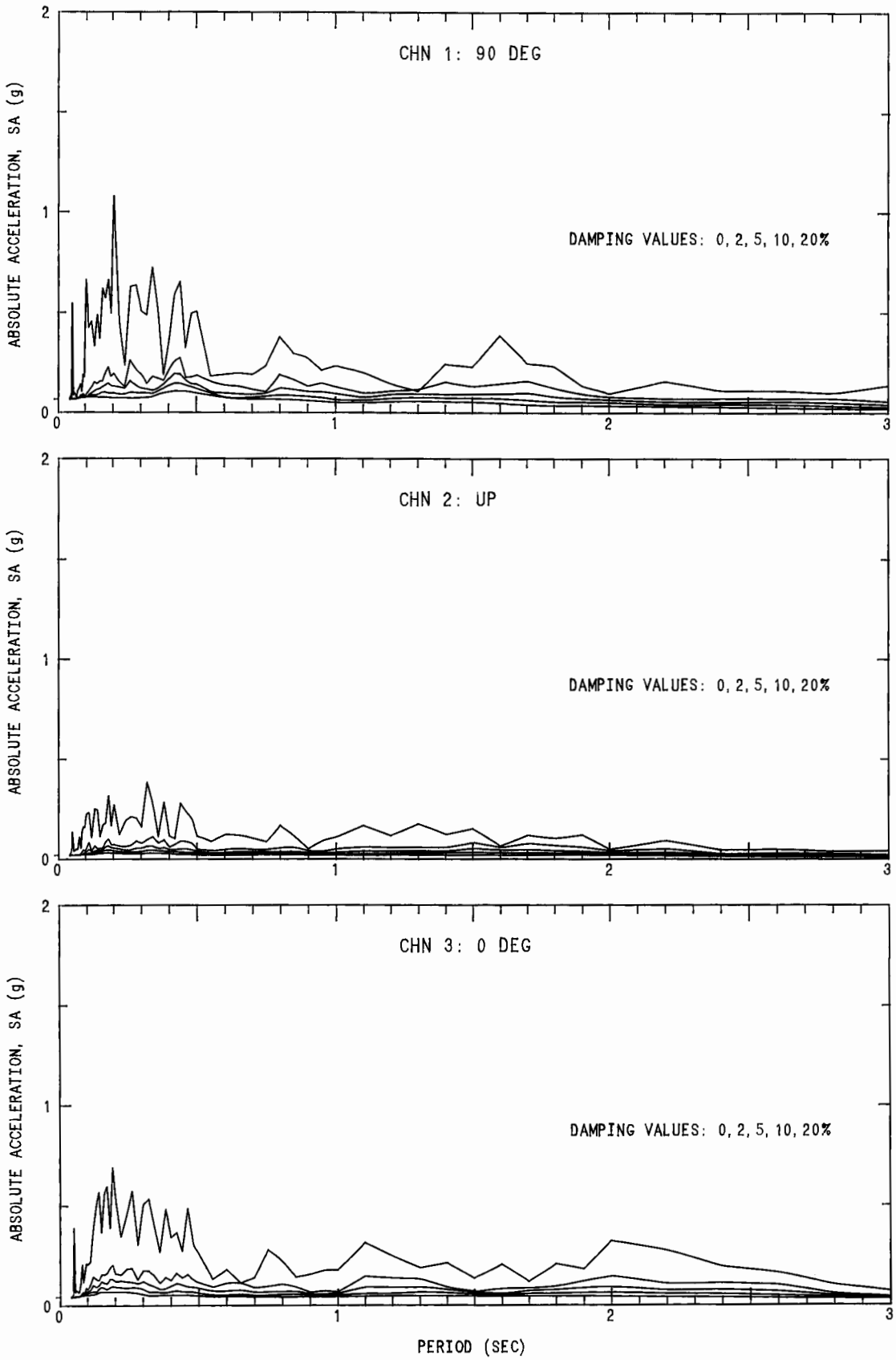
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24400-S1606-92189.02 020973.1827-QL92A400



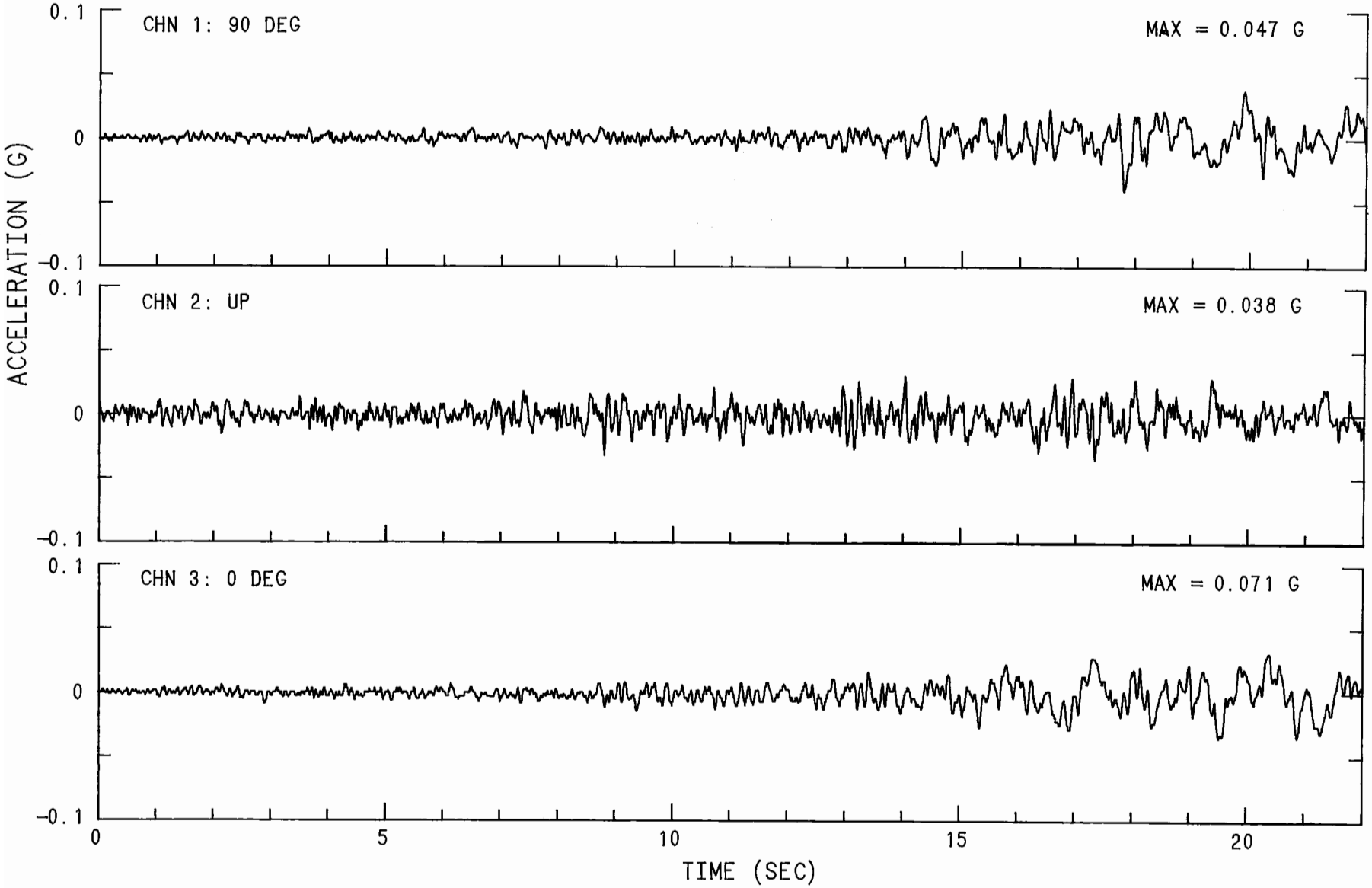
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK
CHN 3: 0 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24400-S1606-92189.02 020973.1827-QL92A400



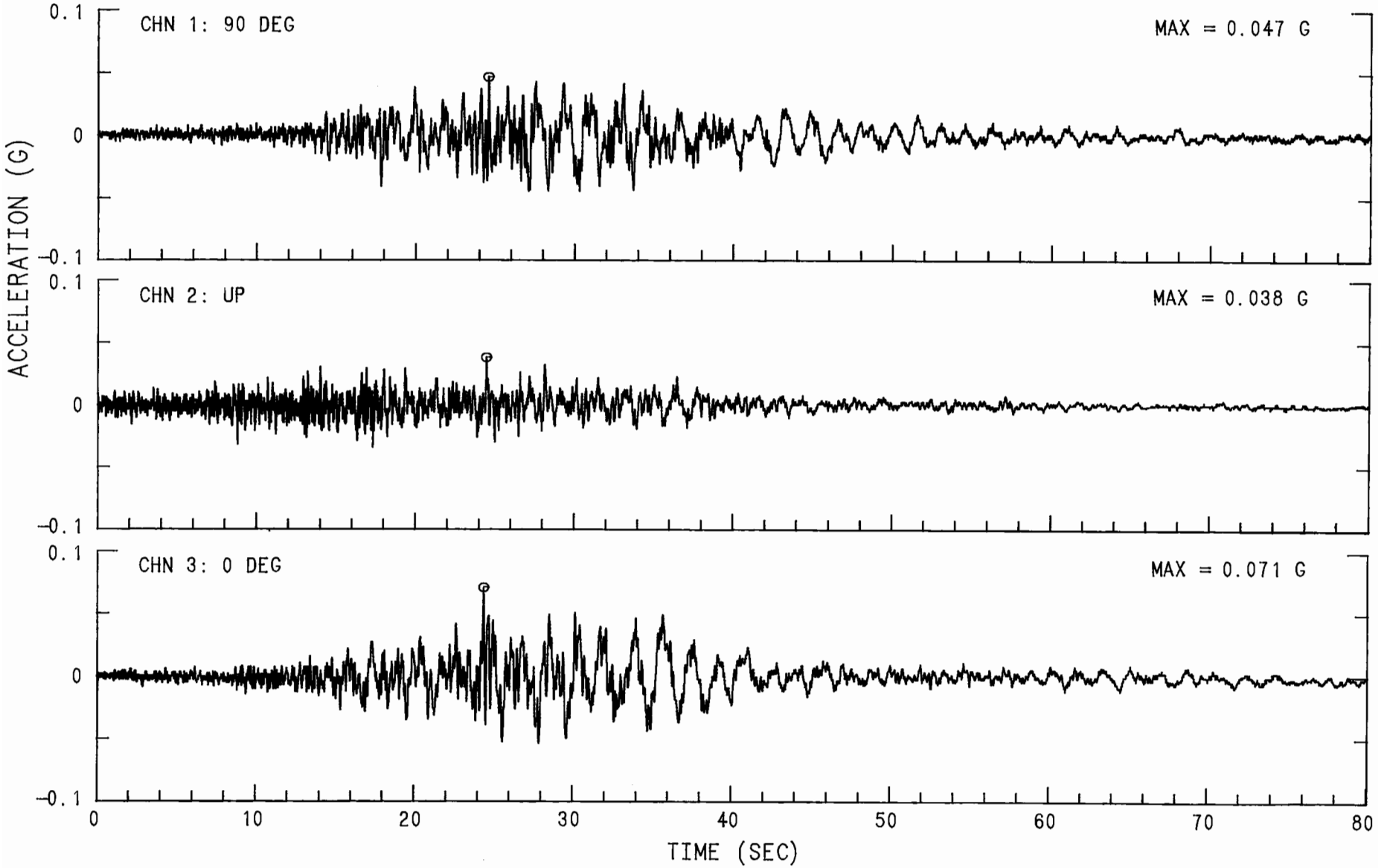
LANDERS EARTHQUAKE (PRELIM. PROCESSING) JUNE 28, 1992 04:58 PDT
LOS ANGELES - OBREGON PARK
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.07 TO 23.0-25.0 HZ.
24400-S1606-92189.02 020973.1827-QL92A400

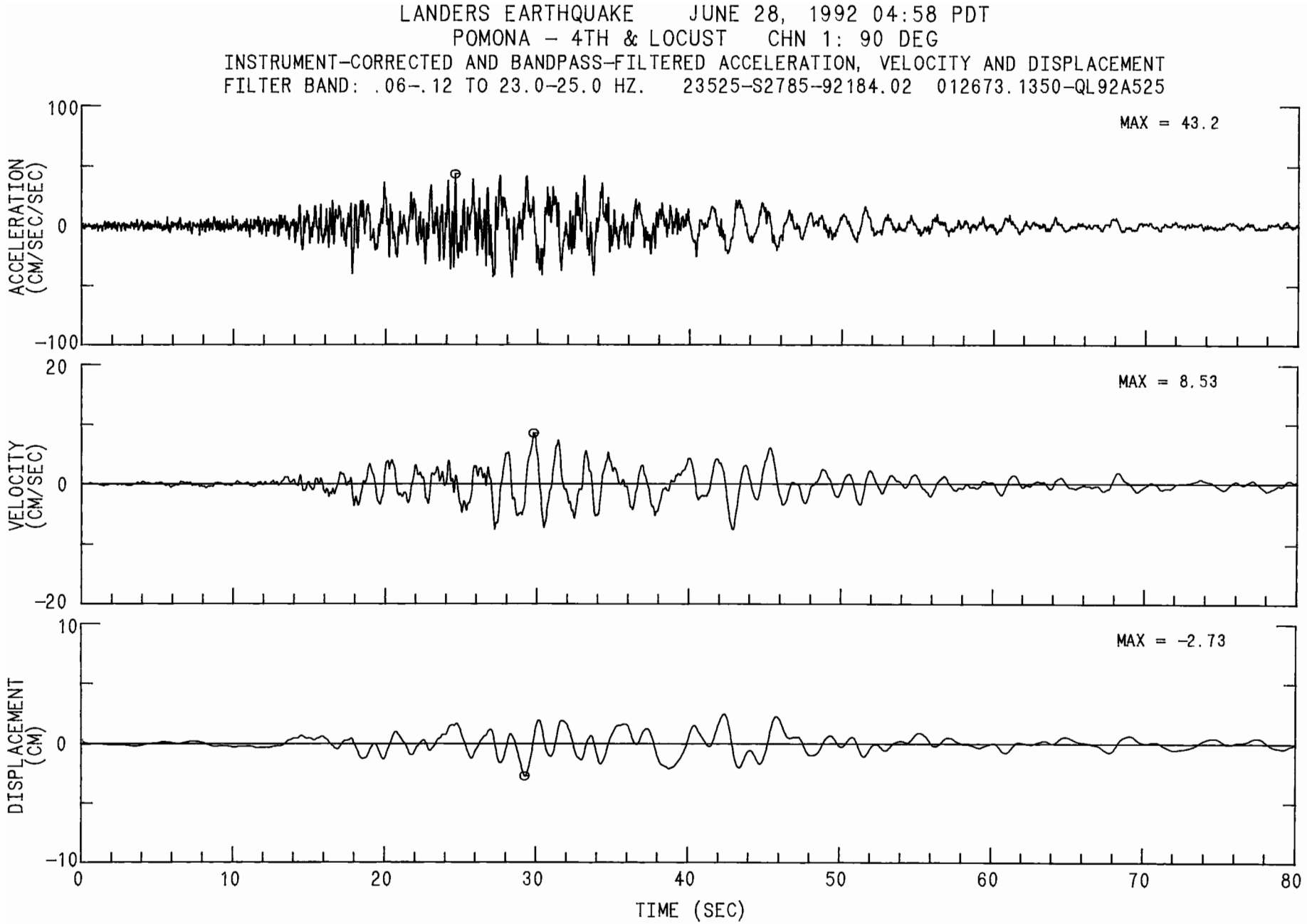


LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST
UNCORRECTED ACCELEROGRAM 23525-S2785-92184.02 010673.1002-QL92A525

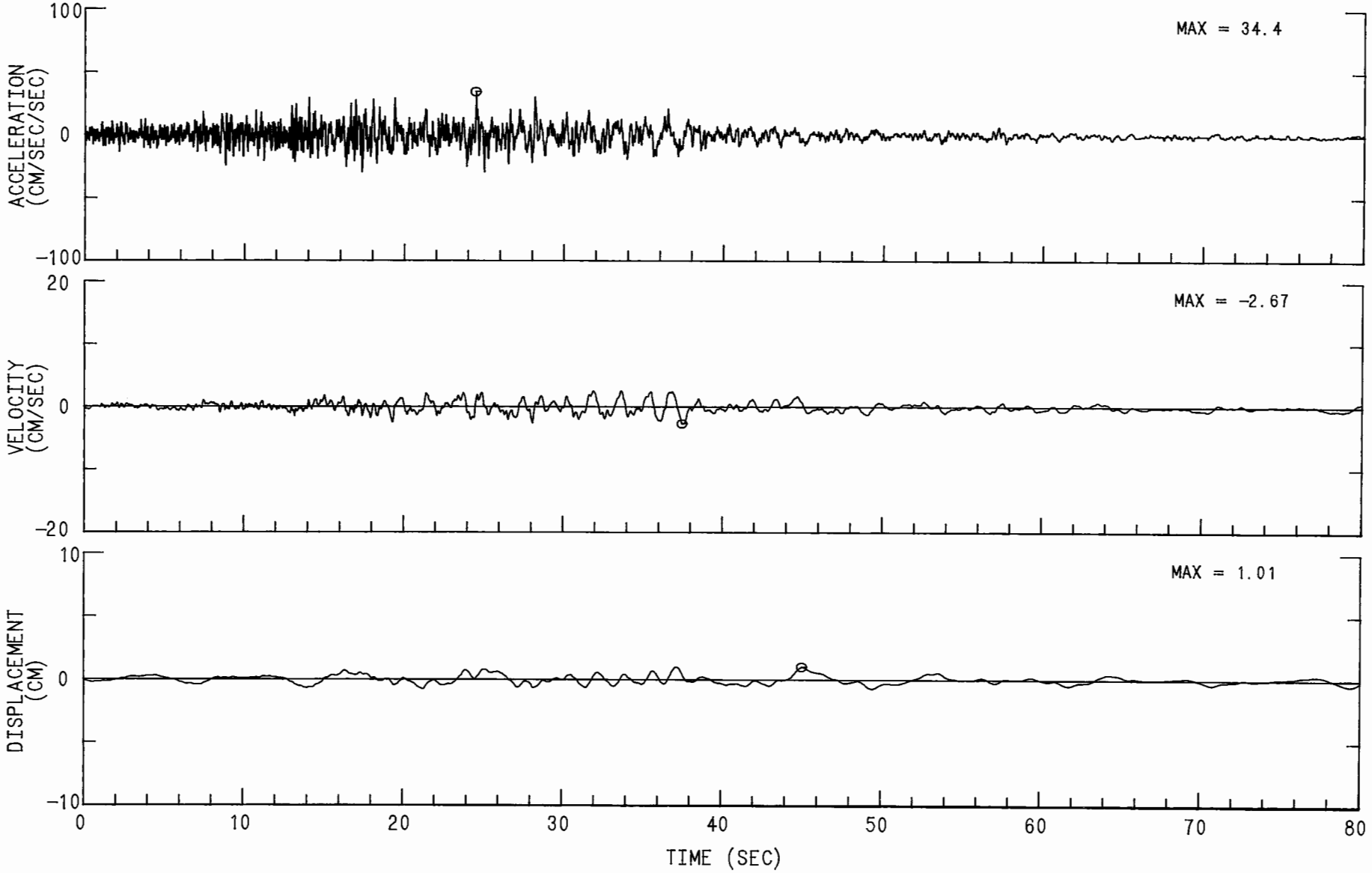


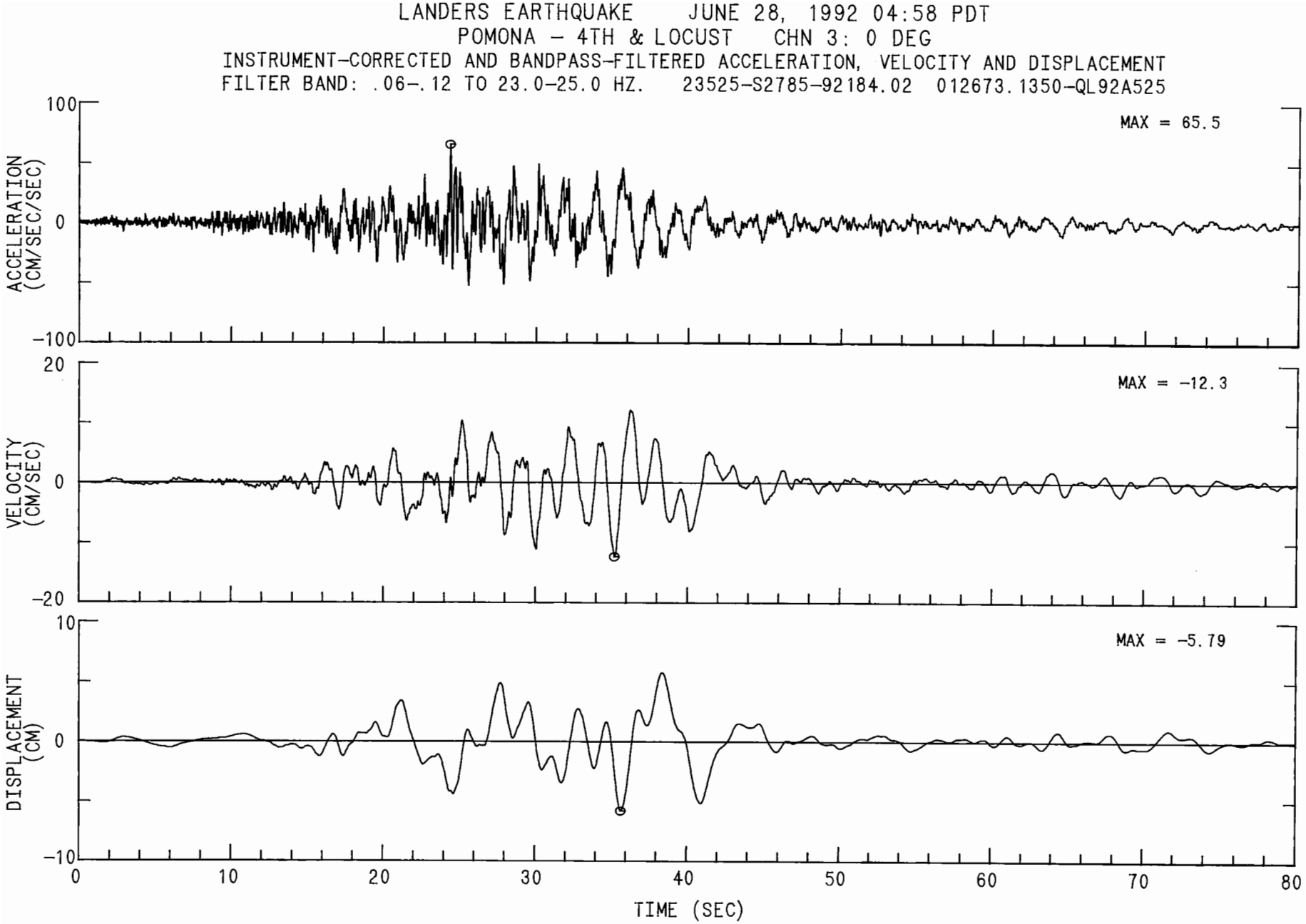
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST
UNCORRECTED ACCELEROGRAM 23525-S2785-92184.02 010673.1002-QL92A525



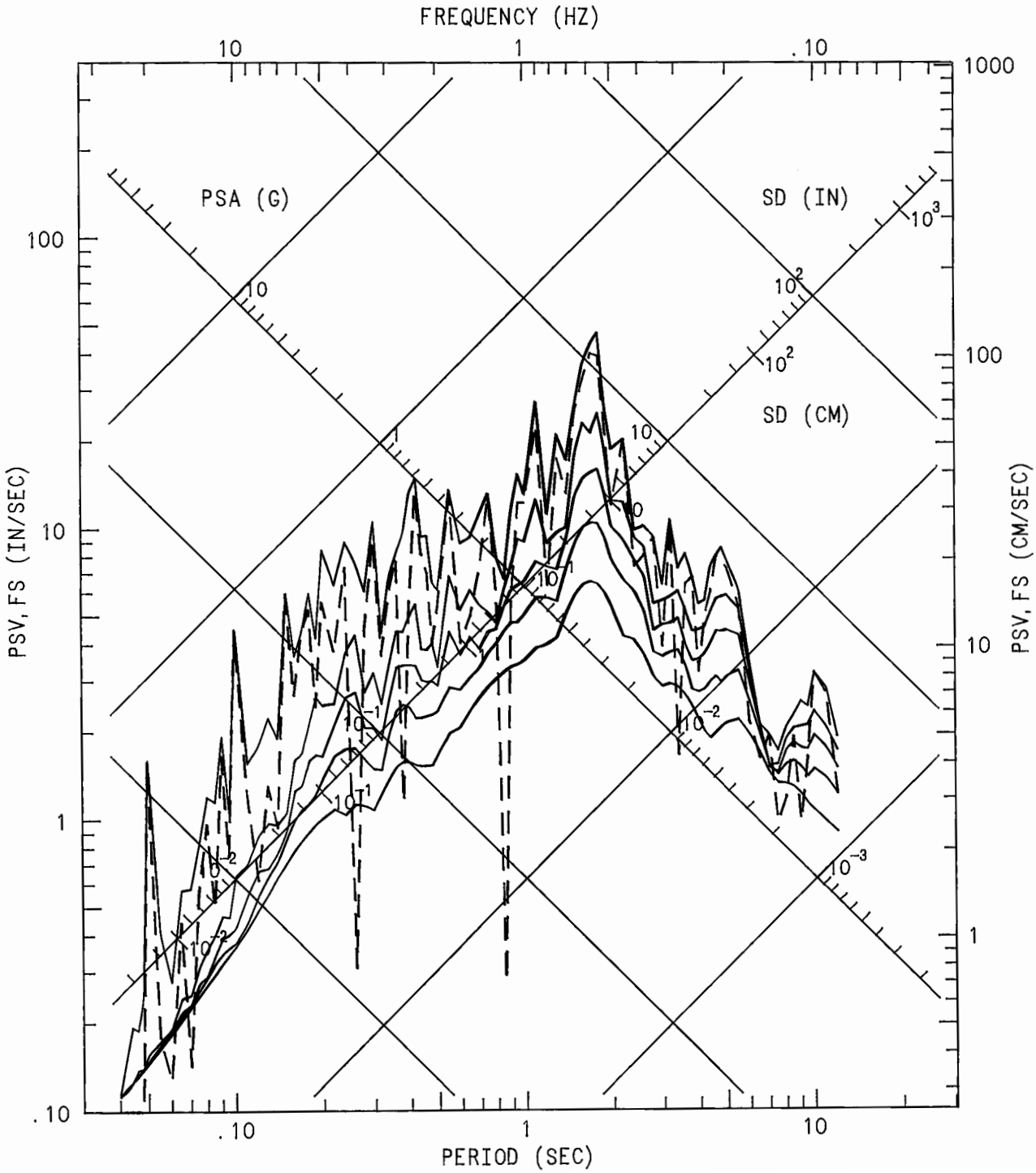

LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .06-.12 TO 23.0-25.0 HZ. 23525-S2785-92184.02 012673.1350-QL92A525
ACCELERATION (CM/SEC/SEC)
MAX = 43.2
VELOCITY (CM/SEC)
MAX = 8.53
DISPLACEMENT (CM)
MAX = -2.73
TIME (SEC)

LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .06-.12 TO 23.0-25.0 HZ. 23525-S2785-92184.02 012673.1350-QL92A525

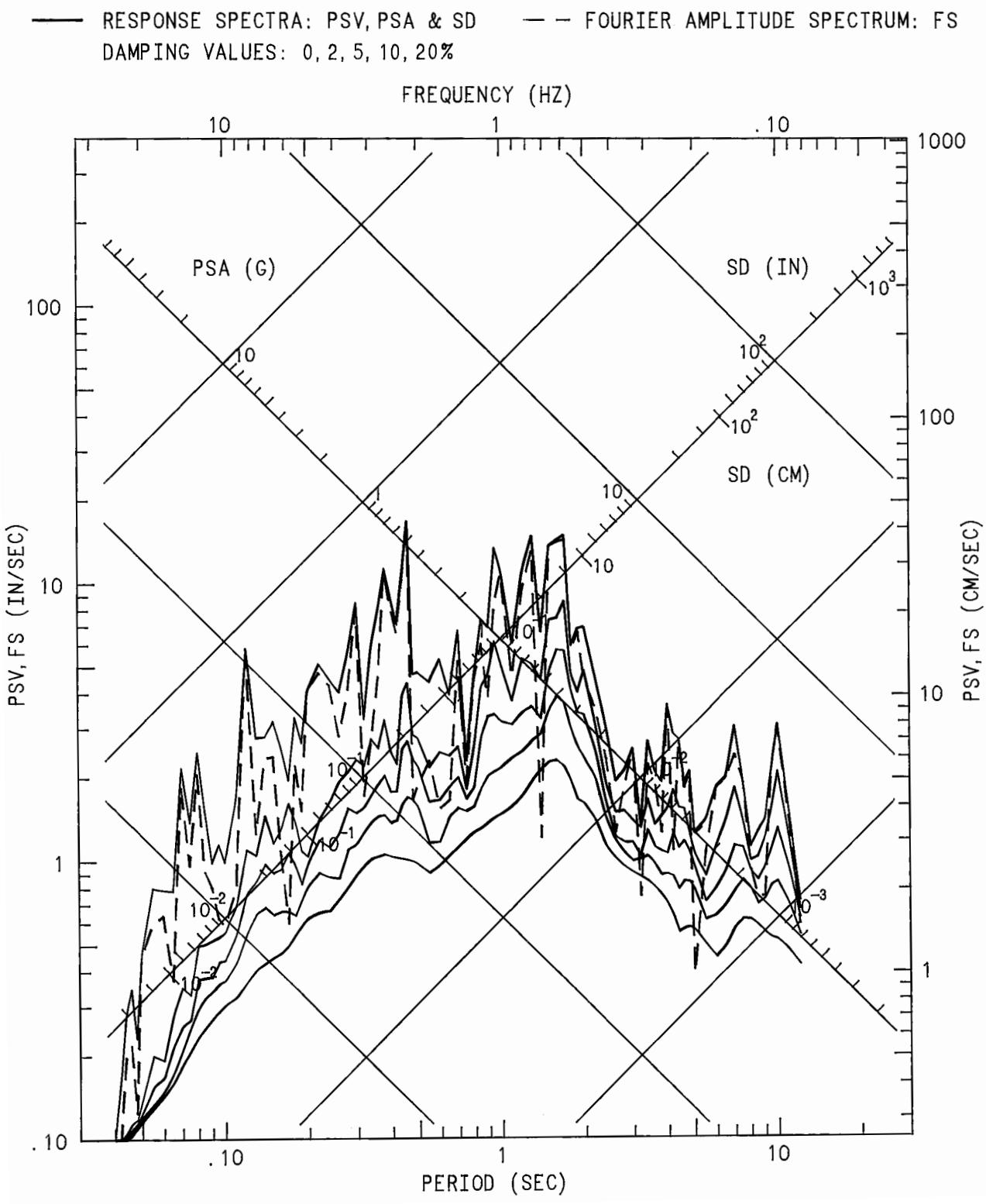



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .06-.12 TO 23.0-25.0 HZ. 23525-S2785-92184.02 012673.1350-QL92A525
ACCELERATION (CM/SEC/SEC)
MAX = 65.5
VELOCITY (CM/SEC)
MAX = -12.3
DISPLACEMENT (CM)
MAX = -5.79
TIME (SEC)

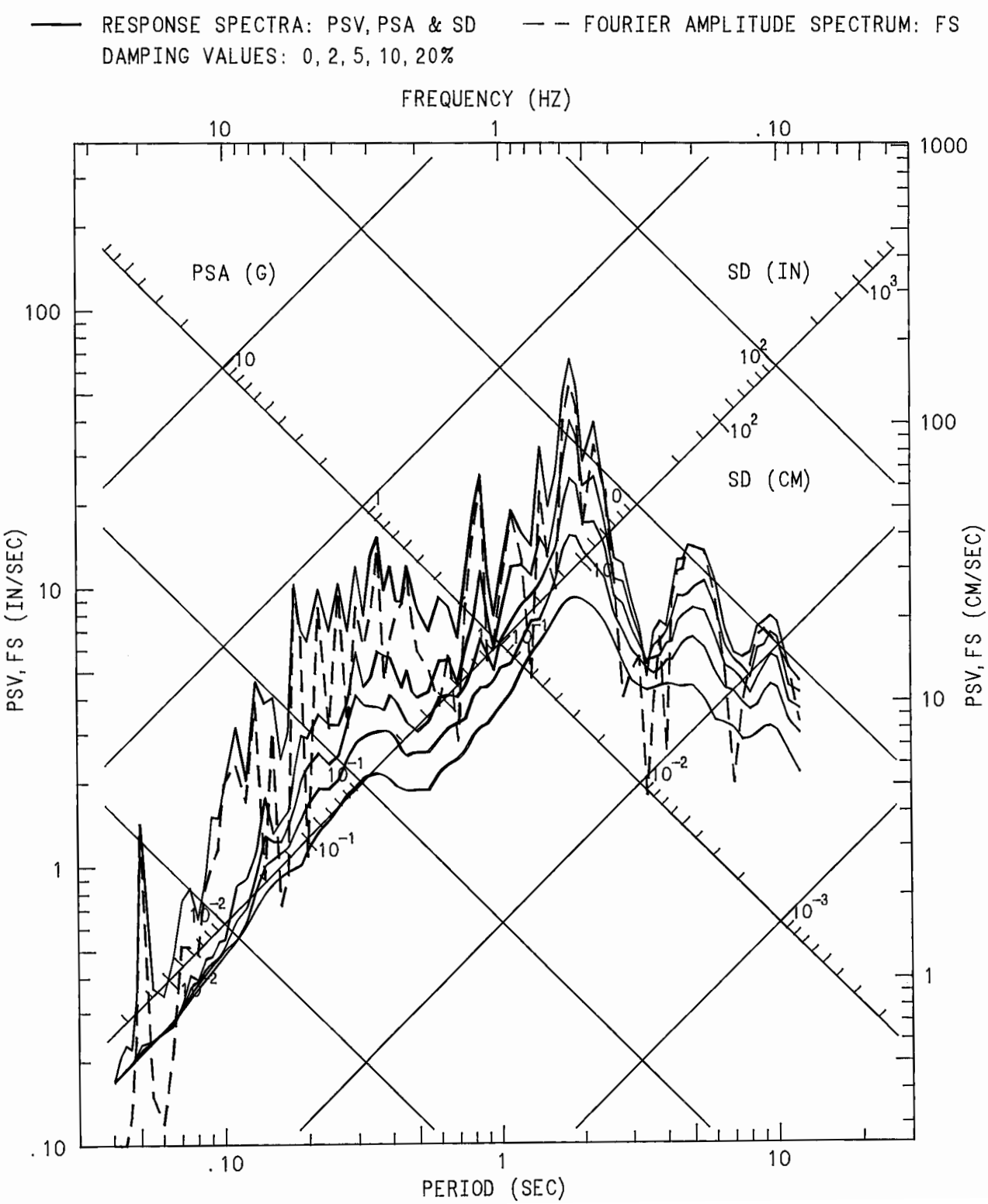
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST
CHN 1: 90 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
23525-S2785-92184.02 020973.1544-QL92A525



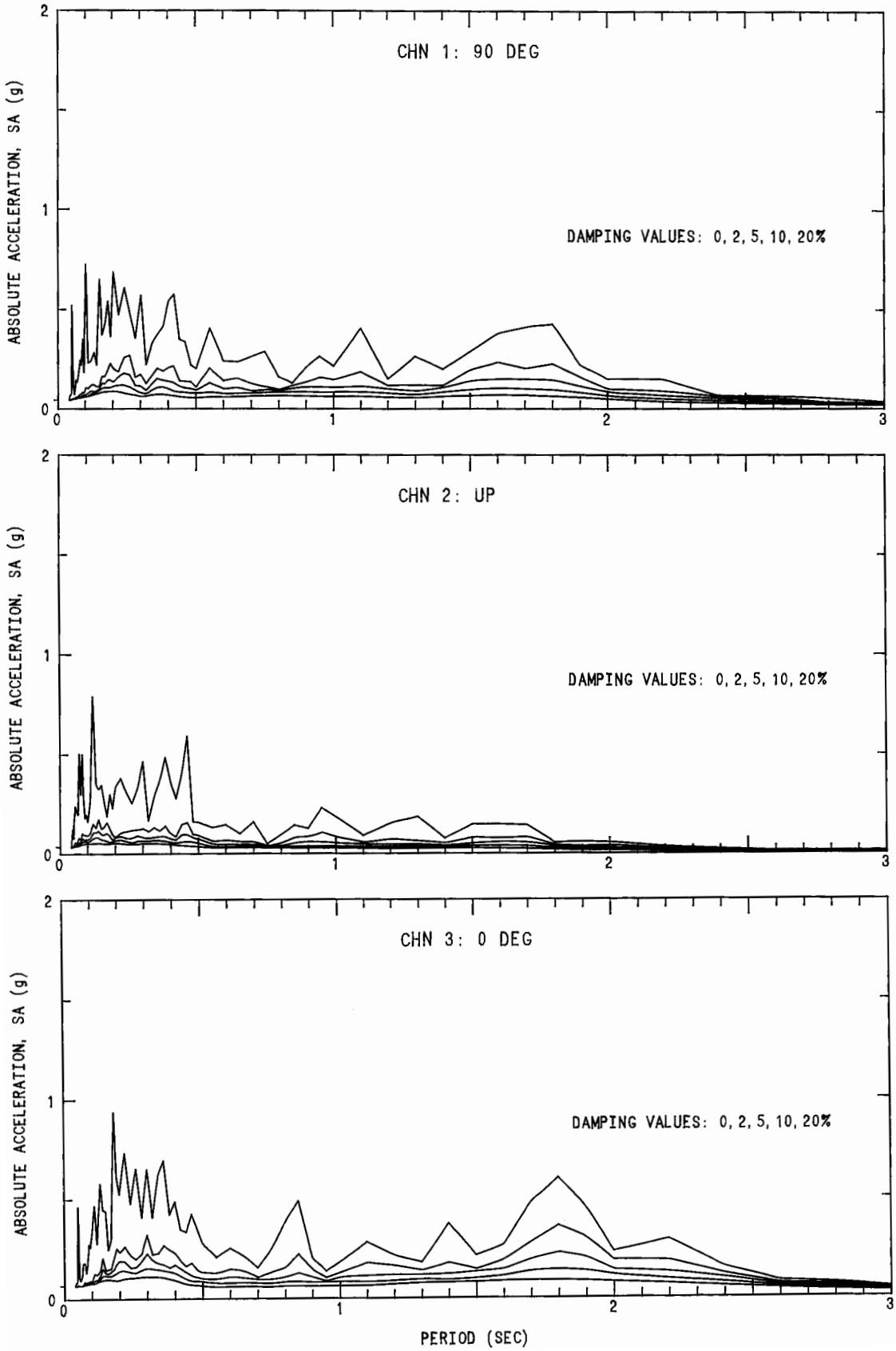
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
23525-S2785-92184.02 020973.1544-QL92A525



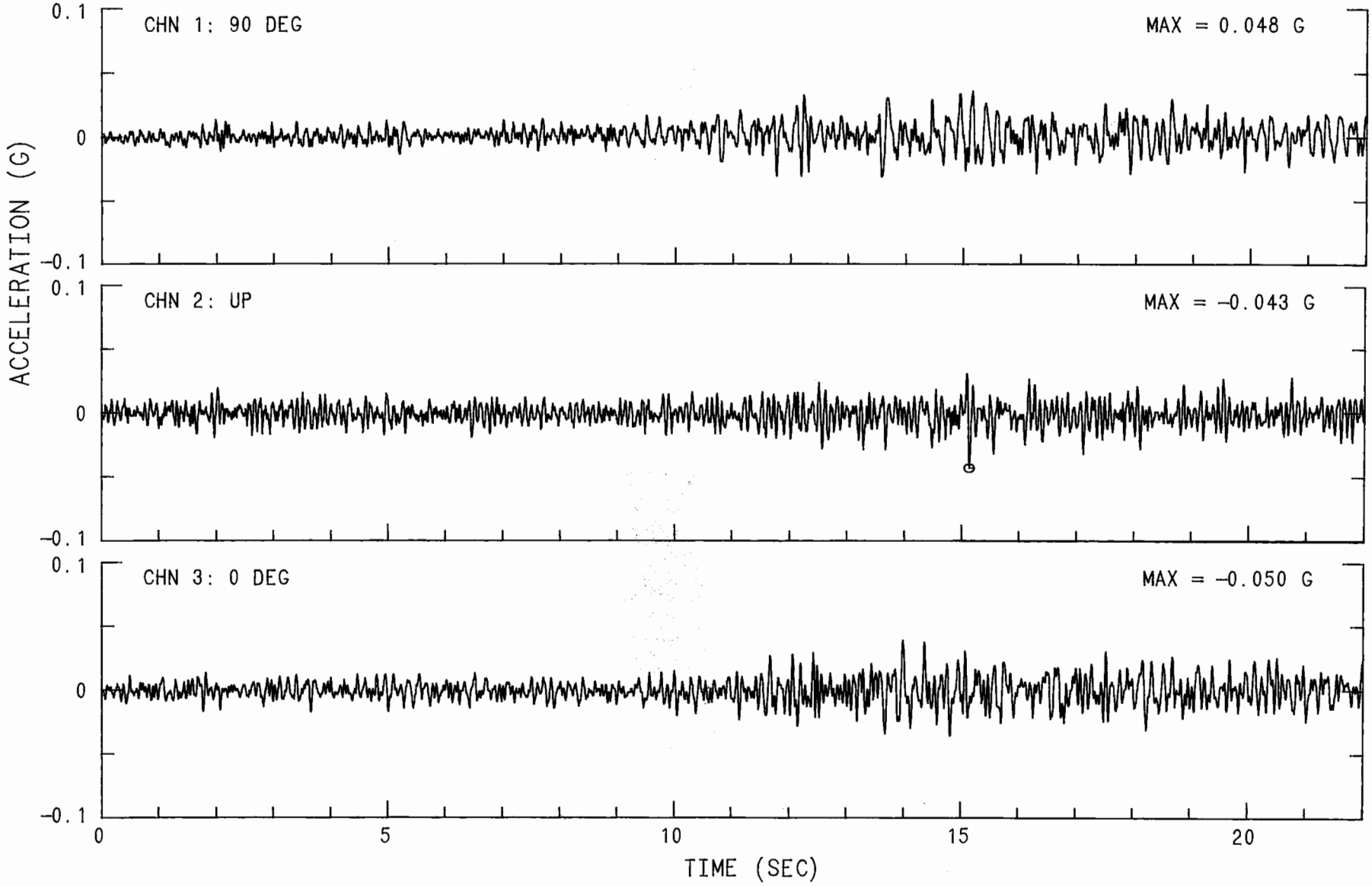
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST
CHN 3: 0 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
23525-S2785-92184.02 020973.1544-QL92A525



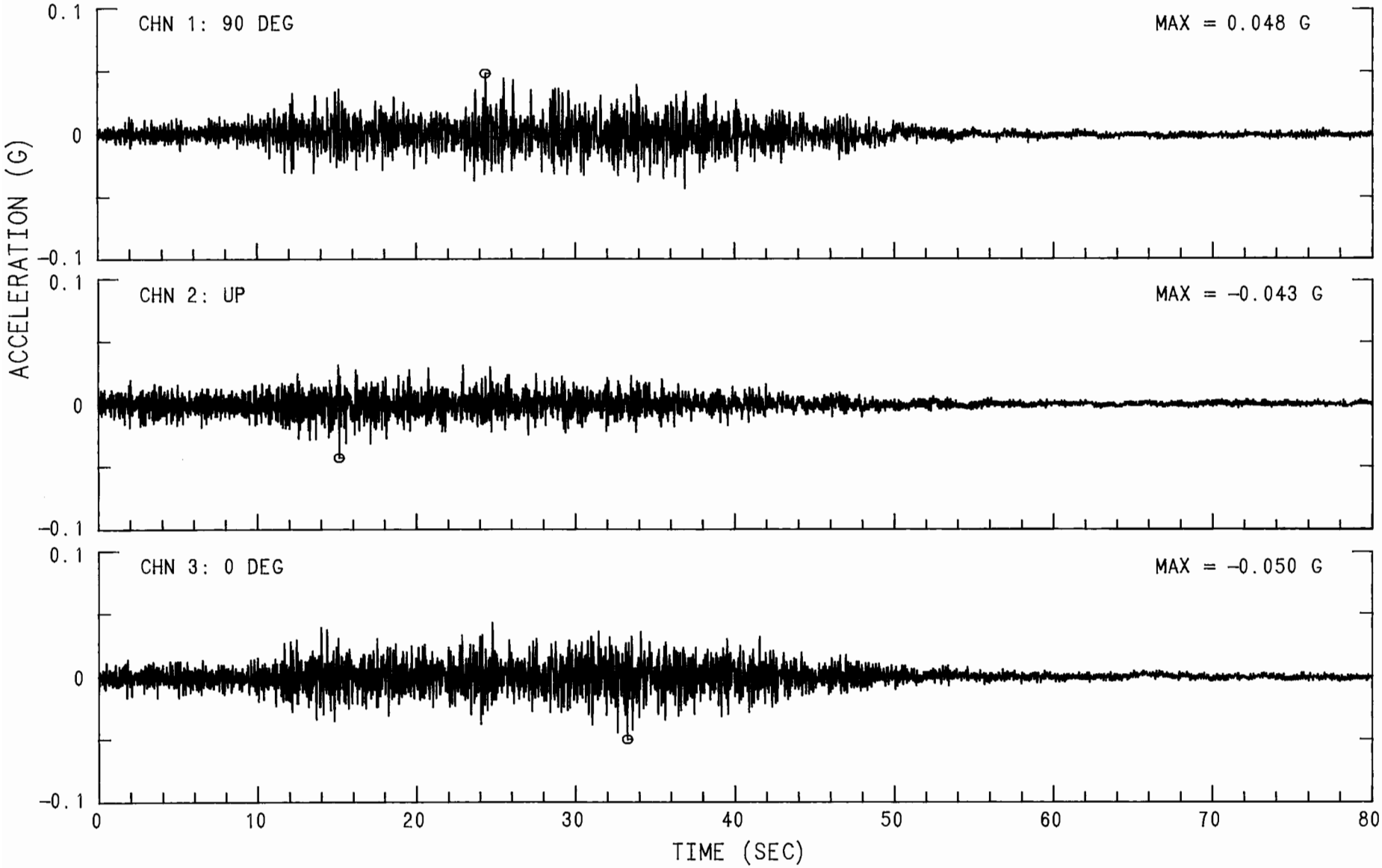
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
POMONA - 4TH & LOCUST
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
23525-S2785-92184.02 020973.1544-QL92A525



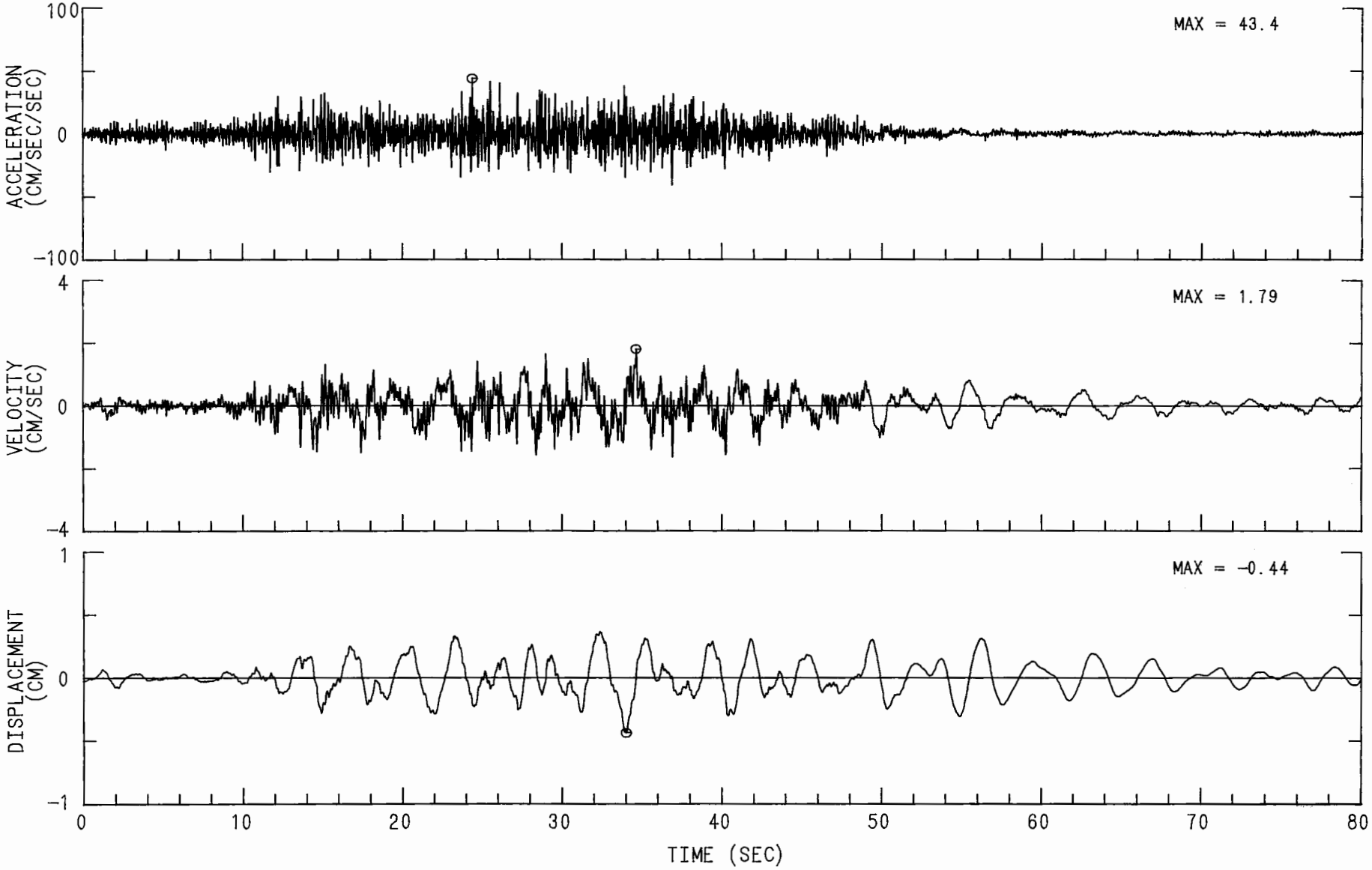
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG.
UNCORRECTED ACCELEROGRAM 12168-S1843-92184.02 011573.1441-QL92A168



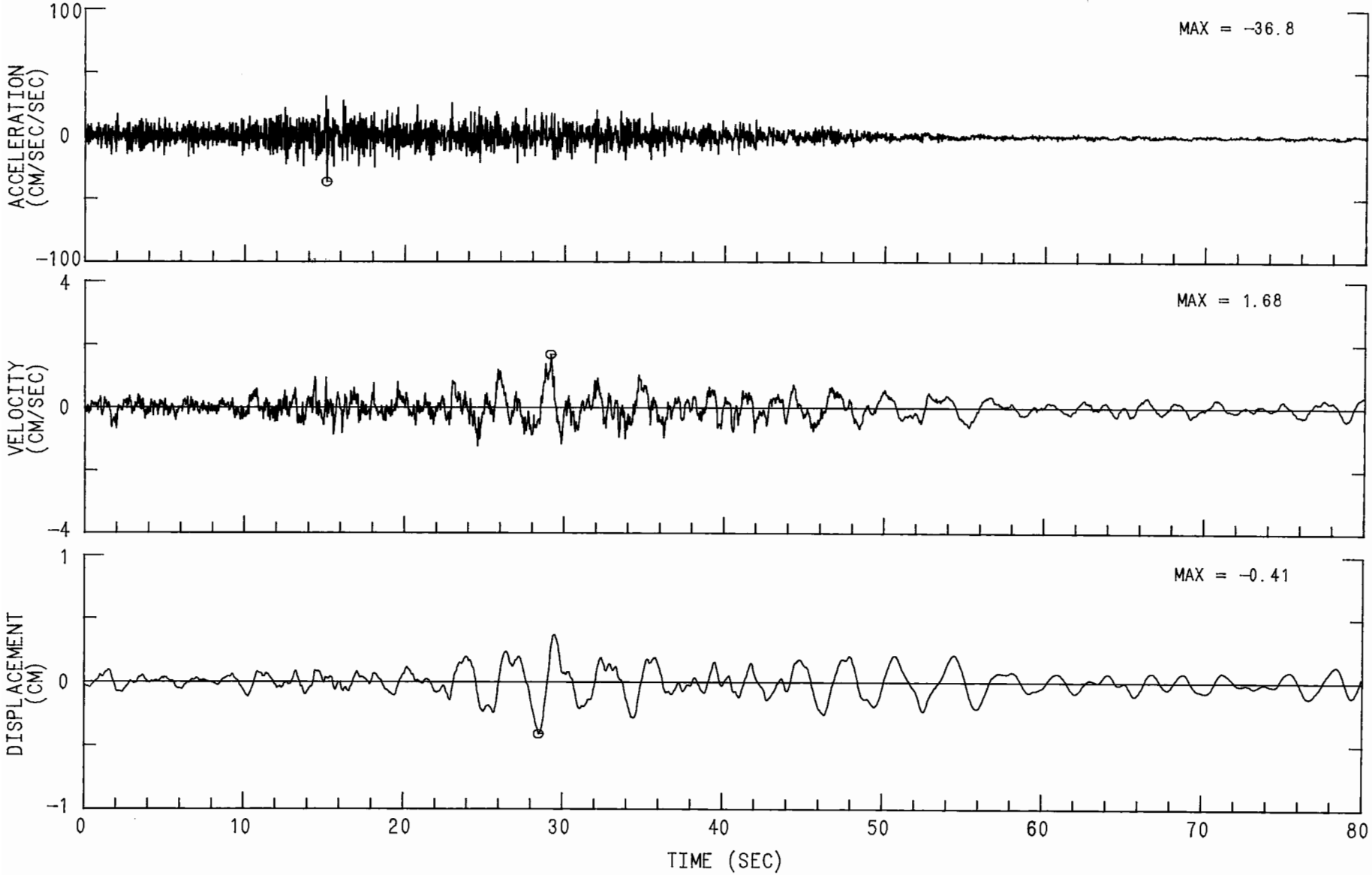
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG.
UNCORRECTED ACCELEROGRAM 12168-S1843-92184.02 011573.1441-QL92A168



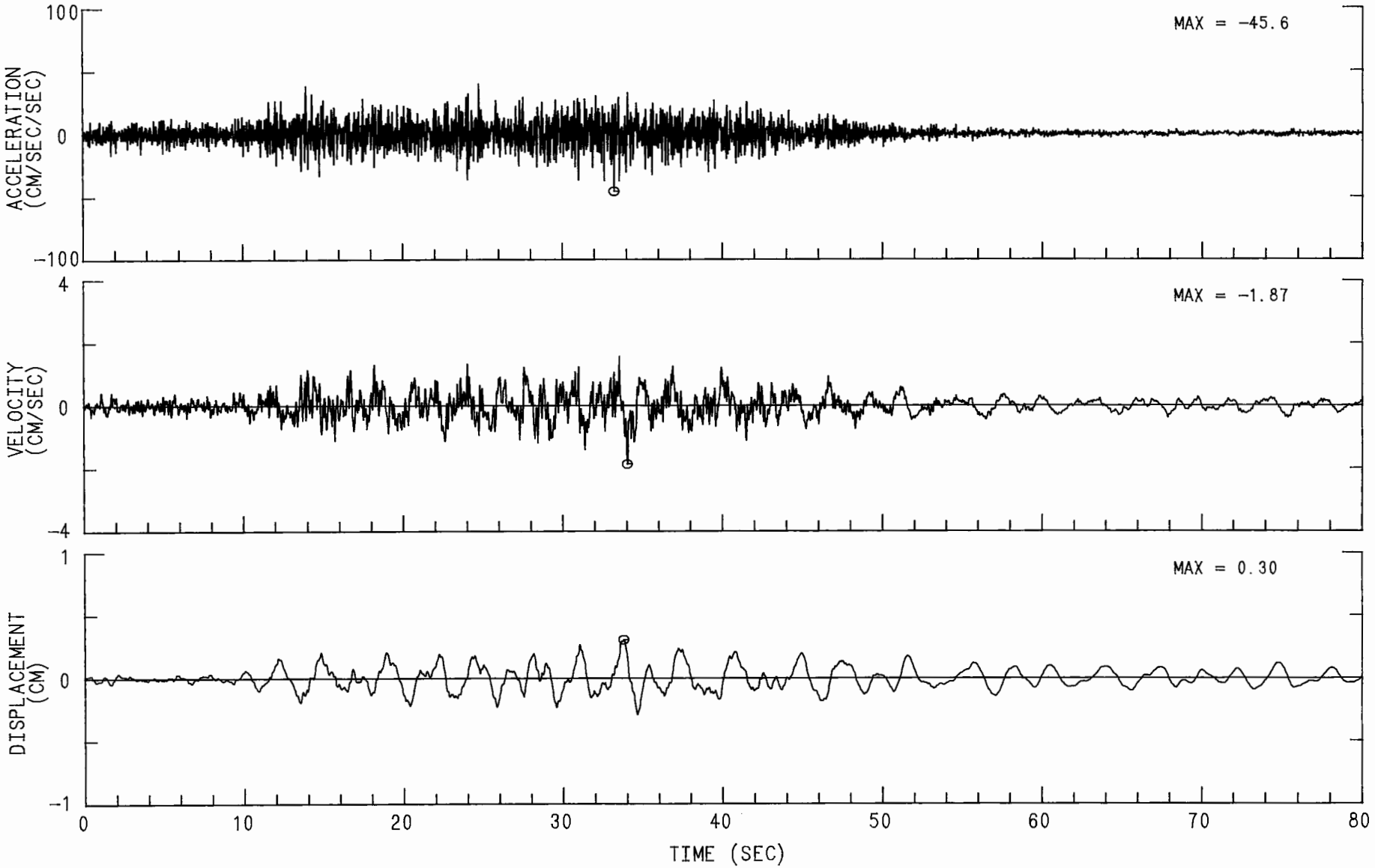
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG. CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .15-.30 TO 23.0-25.0 HZ. 12168-S1843-92184.02 021173.1114-QL92A168



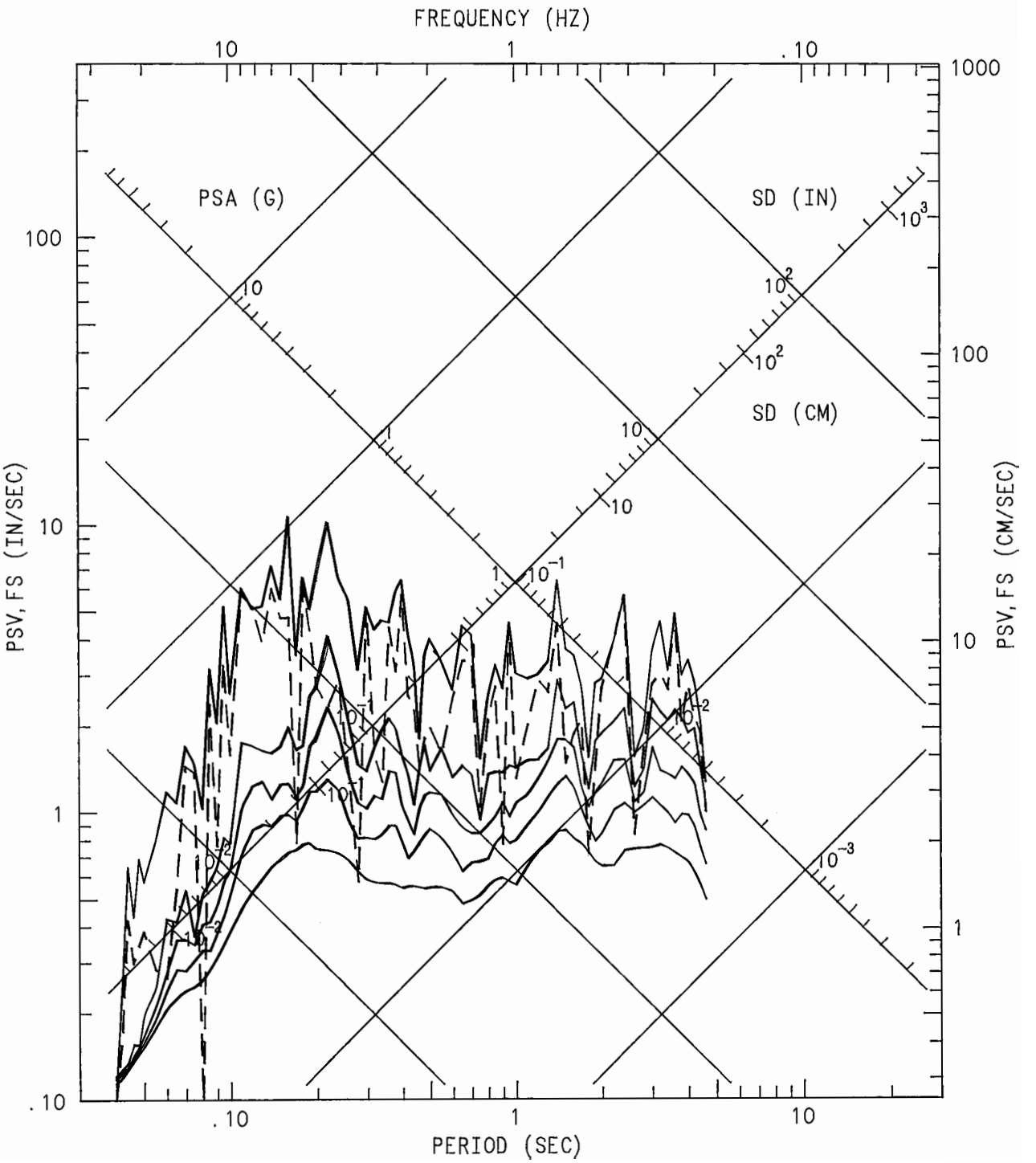
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG. CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .15-.30 TO 23.0-25.0 HZ. 12168-S1843-92184.02 021173.1114-QL92A168



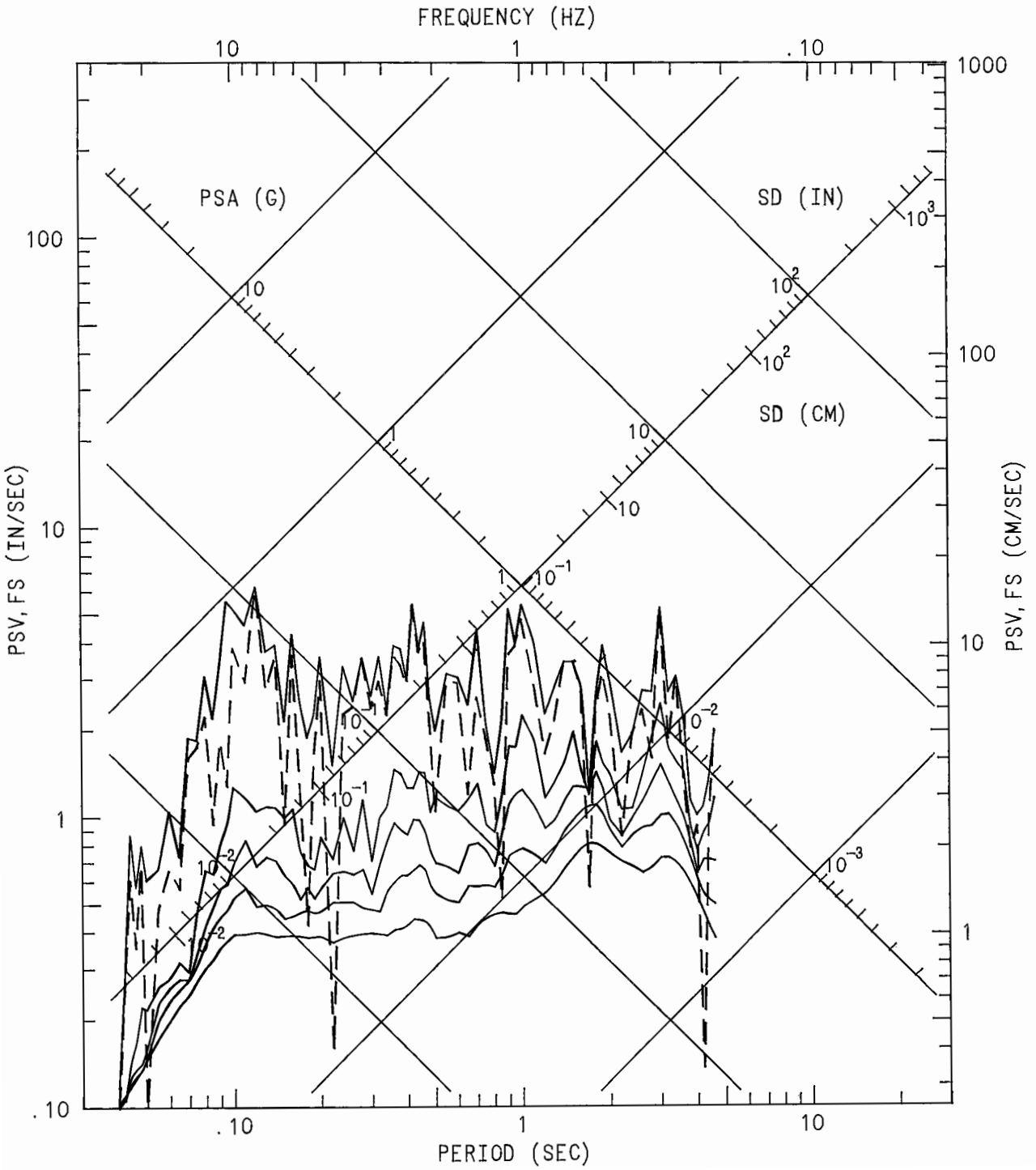
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG. CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .15-.30 TO 23.0-25.0 HZ. 12168-S1843-92184.02 021173.1114-QL92A168



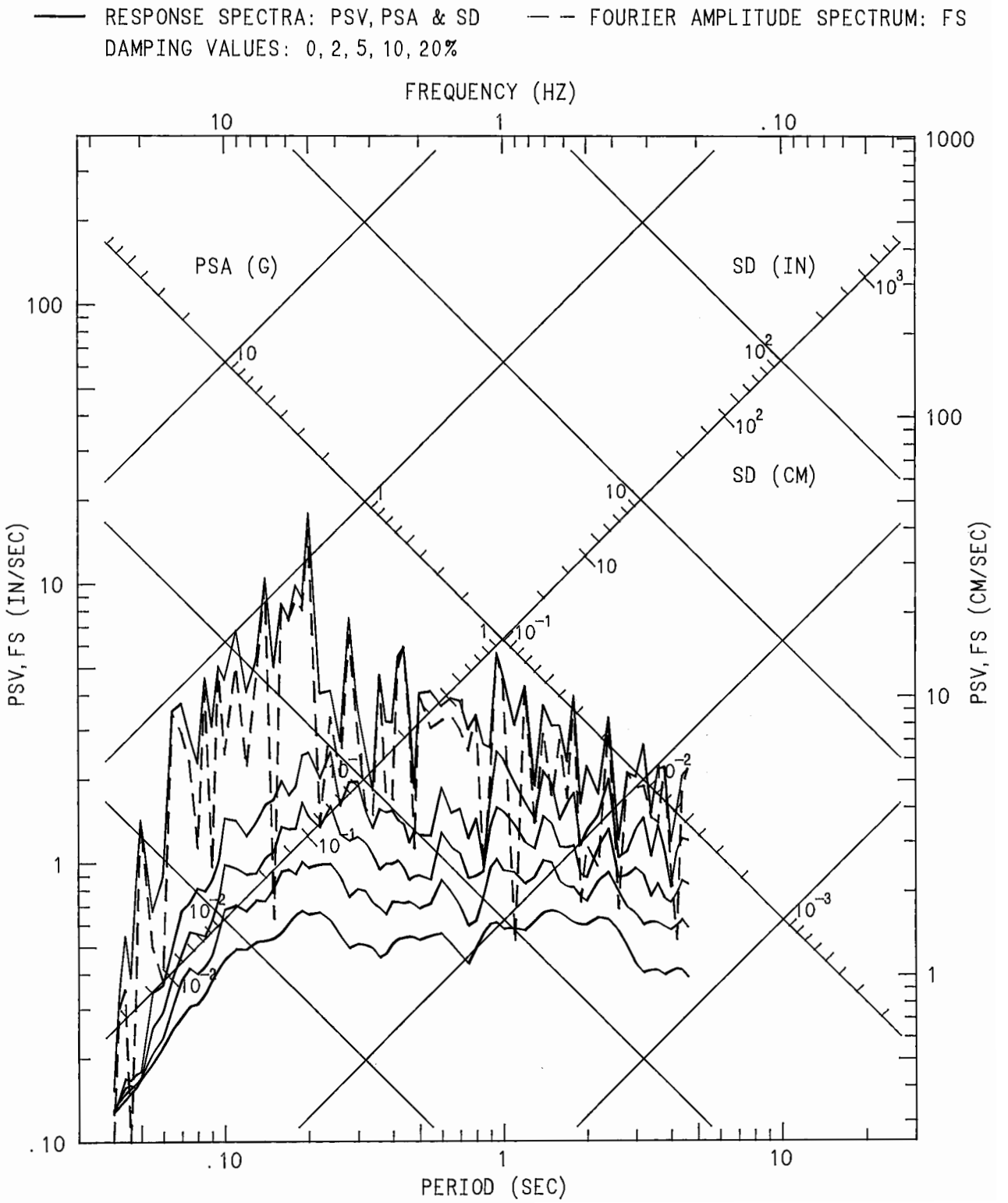
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG.
CHN 1: 90 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .15-.30 TO 23.0-25.0 HZ.
12168-S1843-92184.02 021173.1138-QL92A168



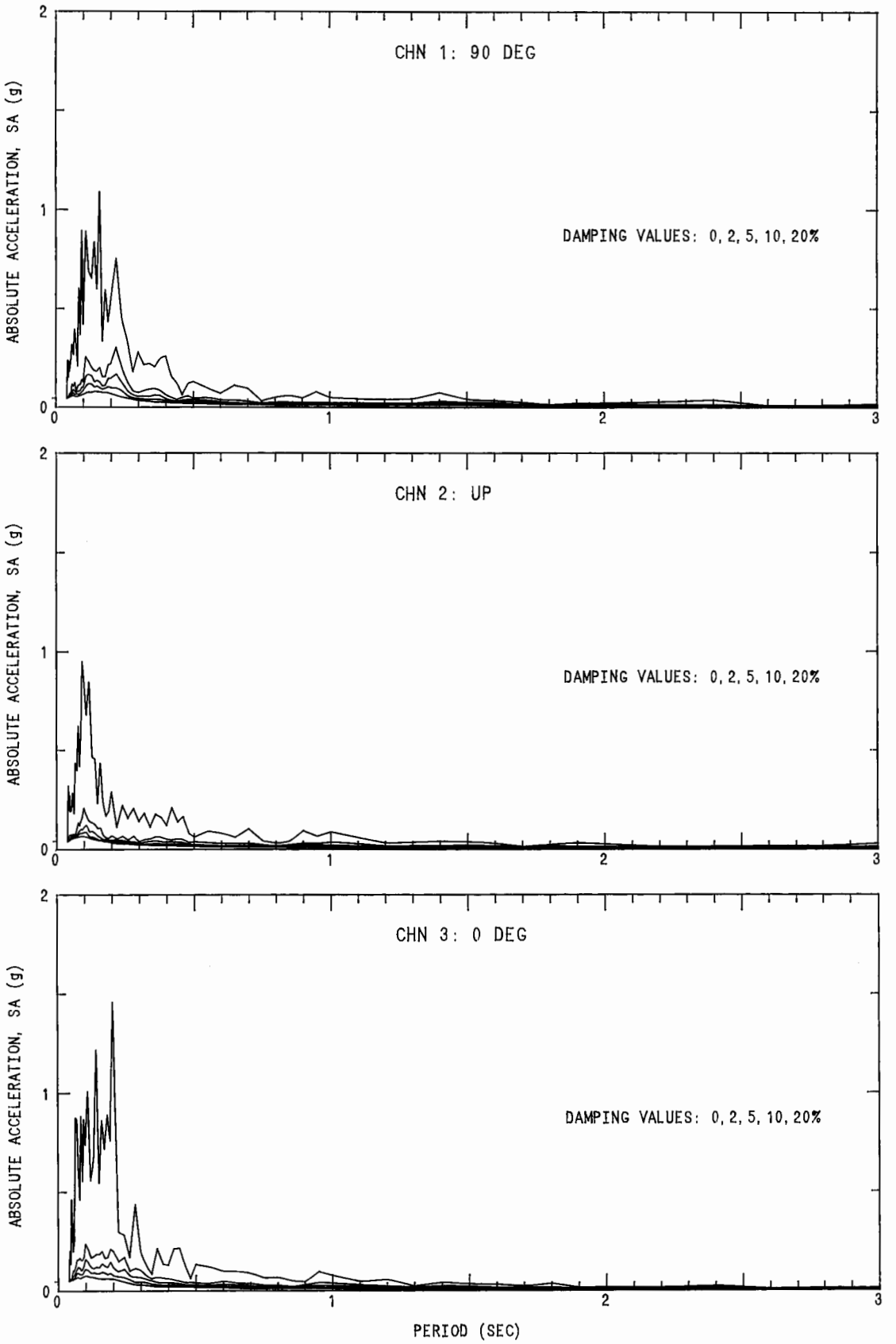
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG.
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .15-.30 TO 23.0-25.0 HZ.
12168-S1843-92184.02 021173.1138-QL92A168



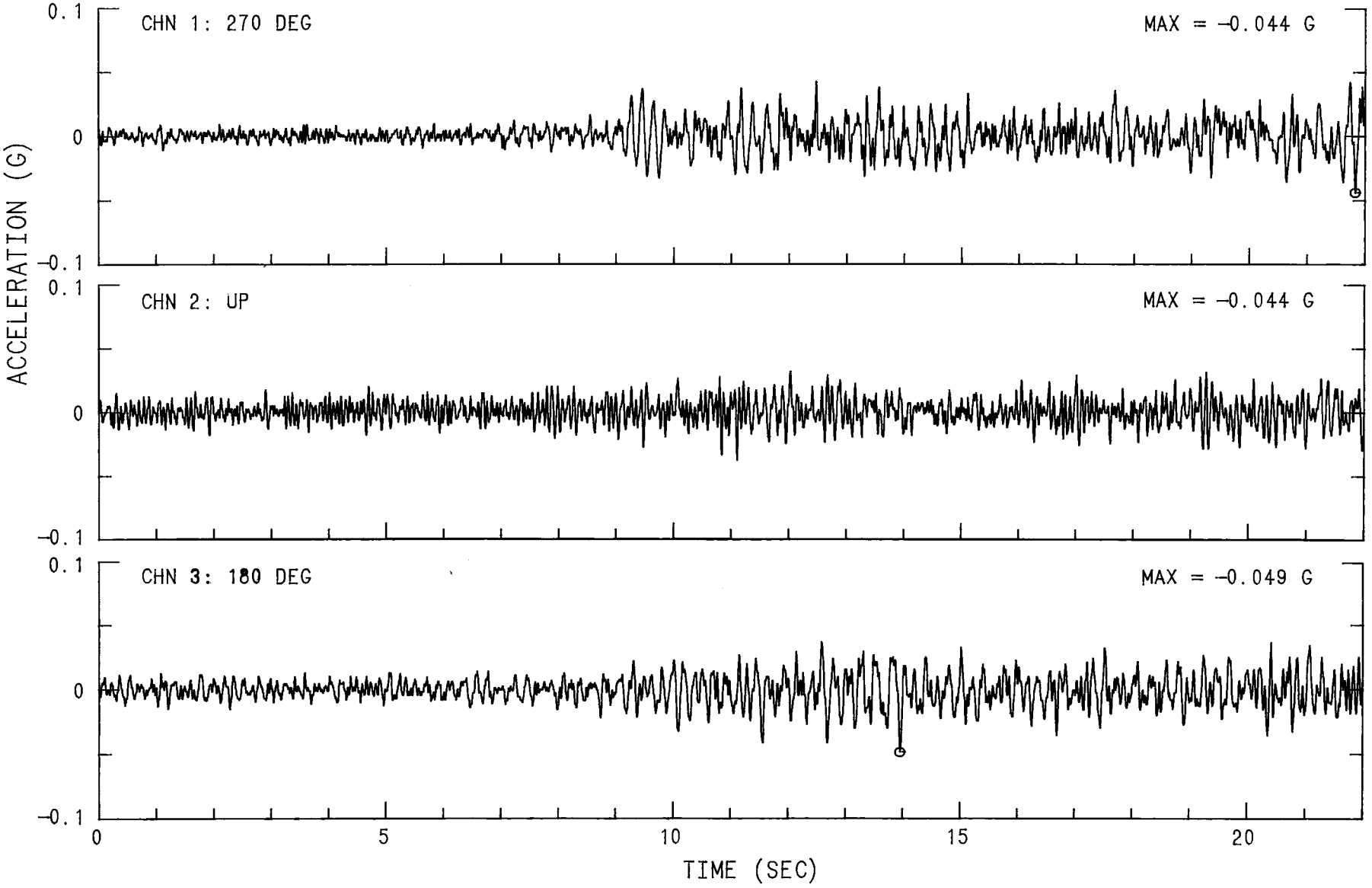
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG.
CHN 3: 0 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .15-.30 TO 23.0-25.0 HZ.
12168-S1843-92184.02 021173.1138-QL92A168



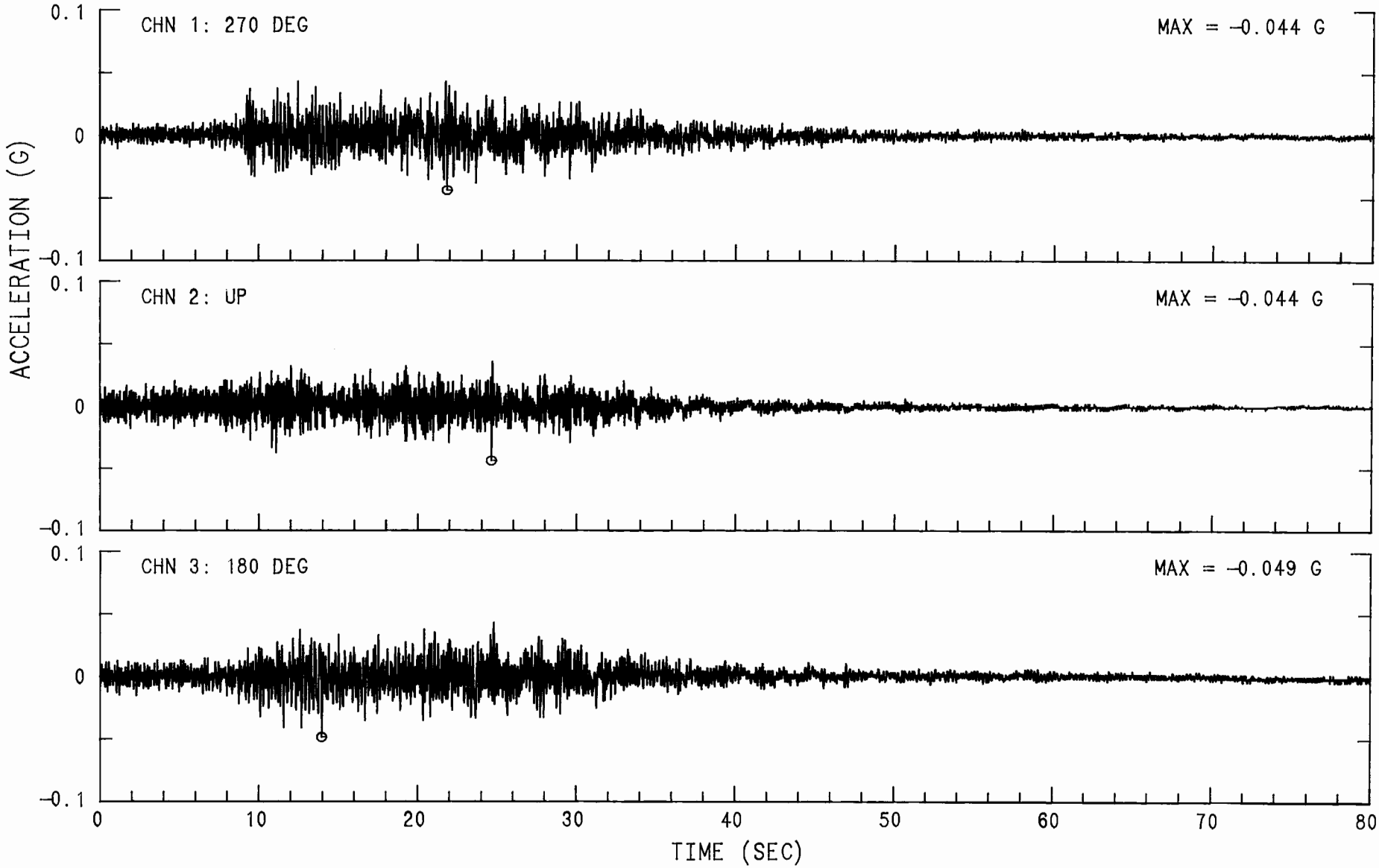
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
PUERTA LA CRUZ - USFS STORAGE BLDG.
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .15-.30 TO 23.0-25.0 HZ.
12168-S1843-92184.02 021173.1138-QL92A168



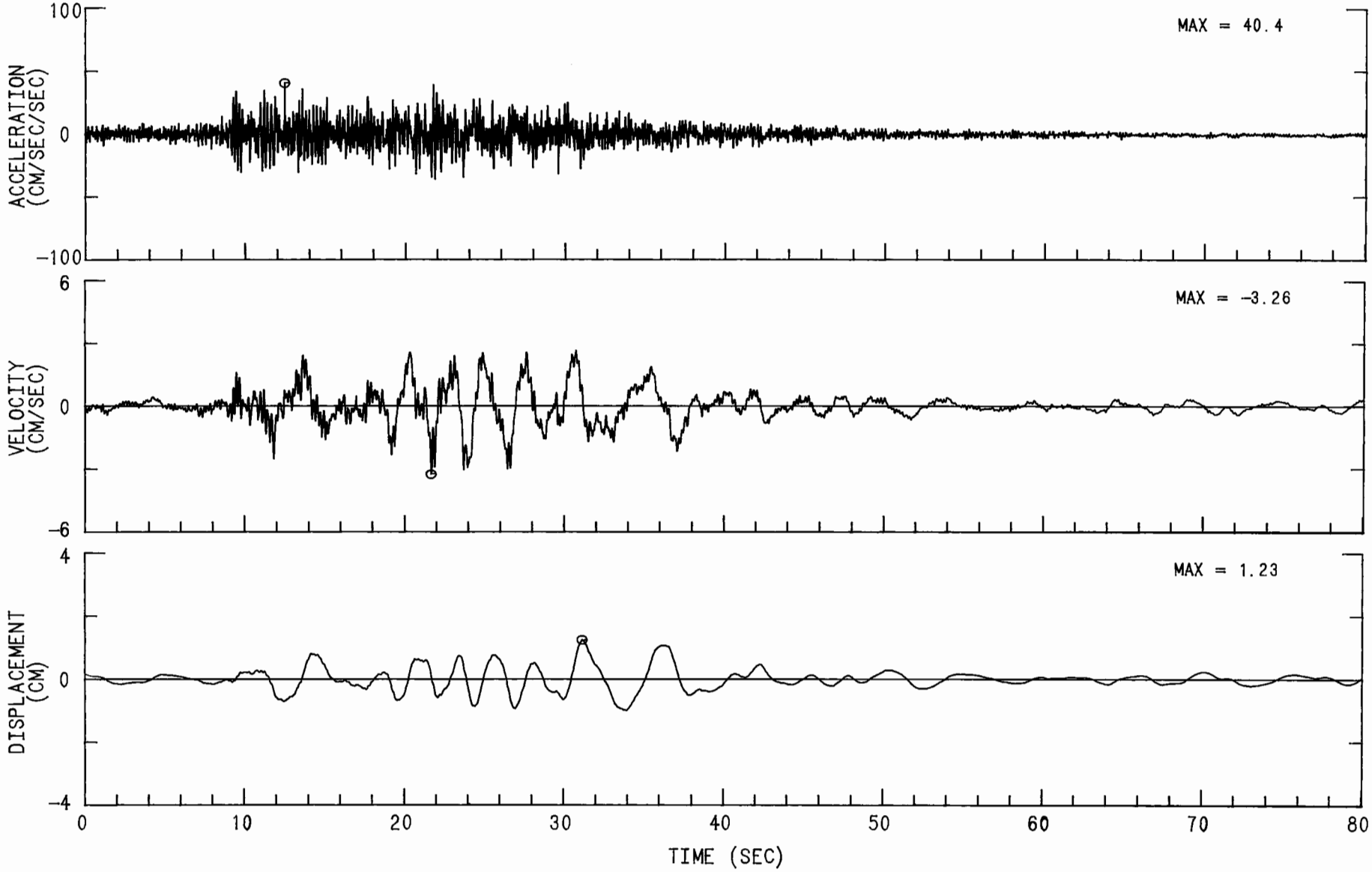
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT
UNCORRECTED ACCELEROGRAM 13123-S1593-92182.02 011273.0916-QL92A123



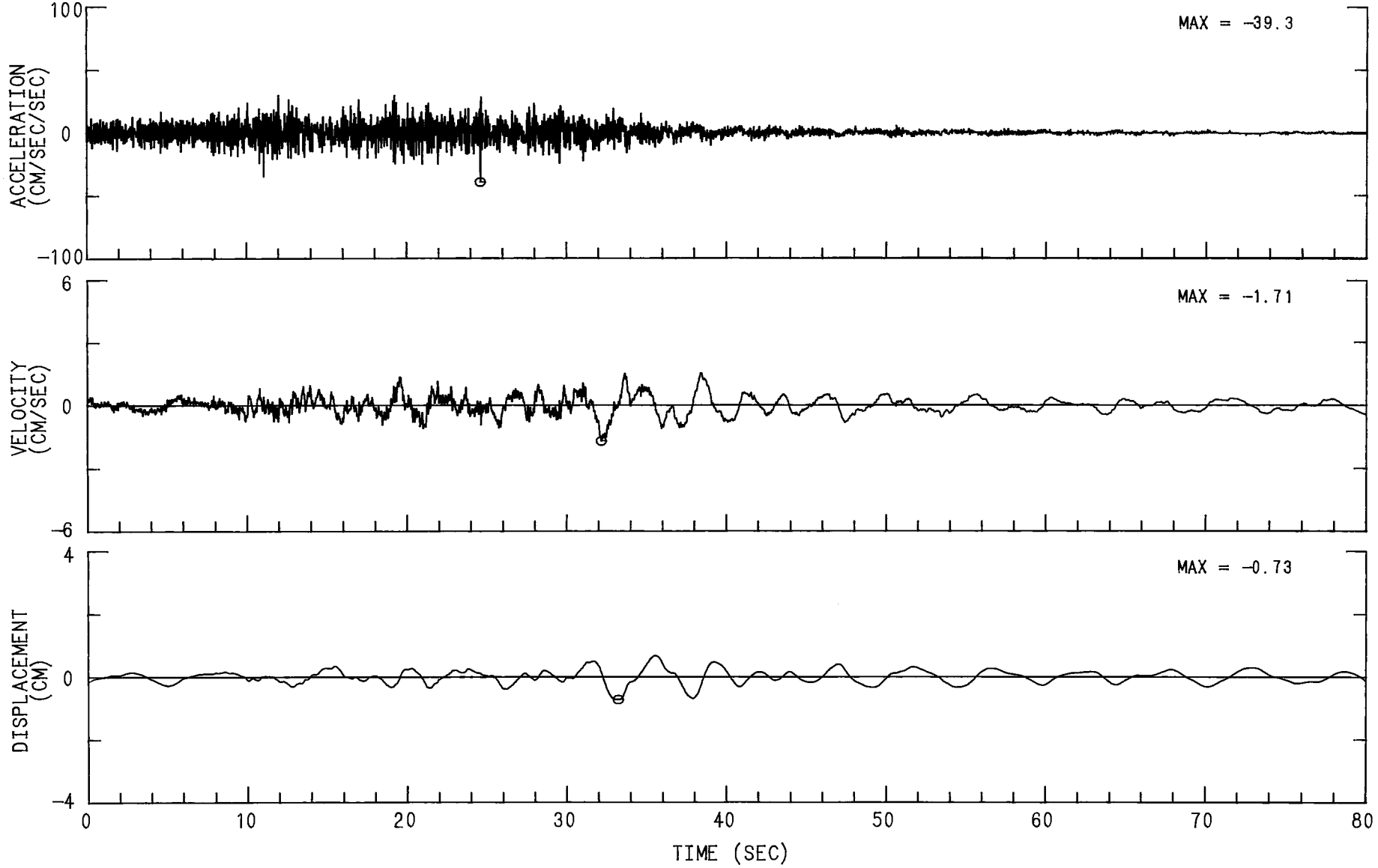
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT
UNCORRECTED ACCELEROGRAM 13123-S1593-92182.02 011273.0916-QL92A123



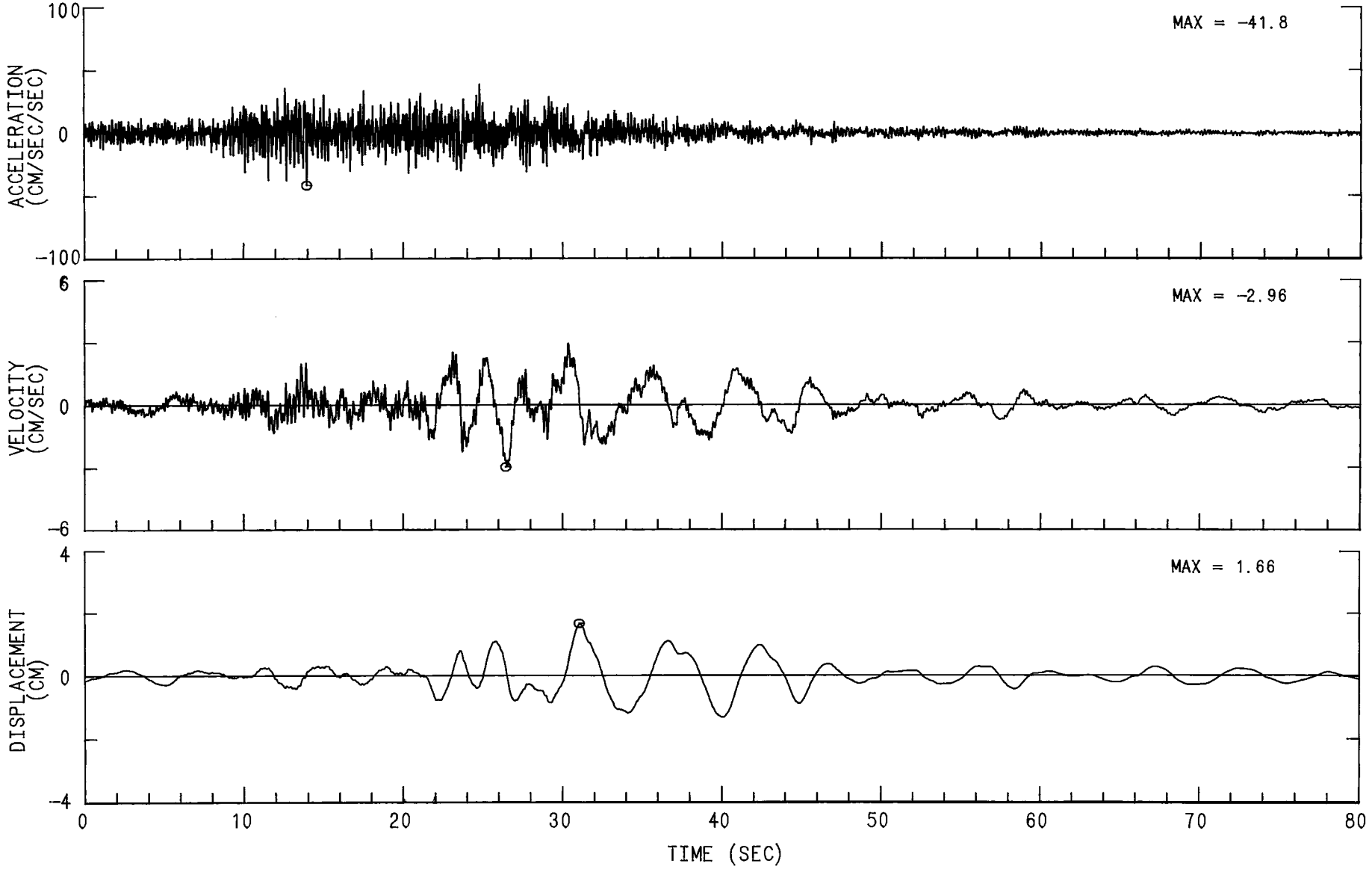
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT CHN 1: 270 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .08-.16 TO 23.0-25.0 HZ. 13123-S1593-92182.02 011373.0147-QL92A123



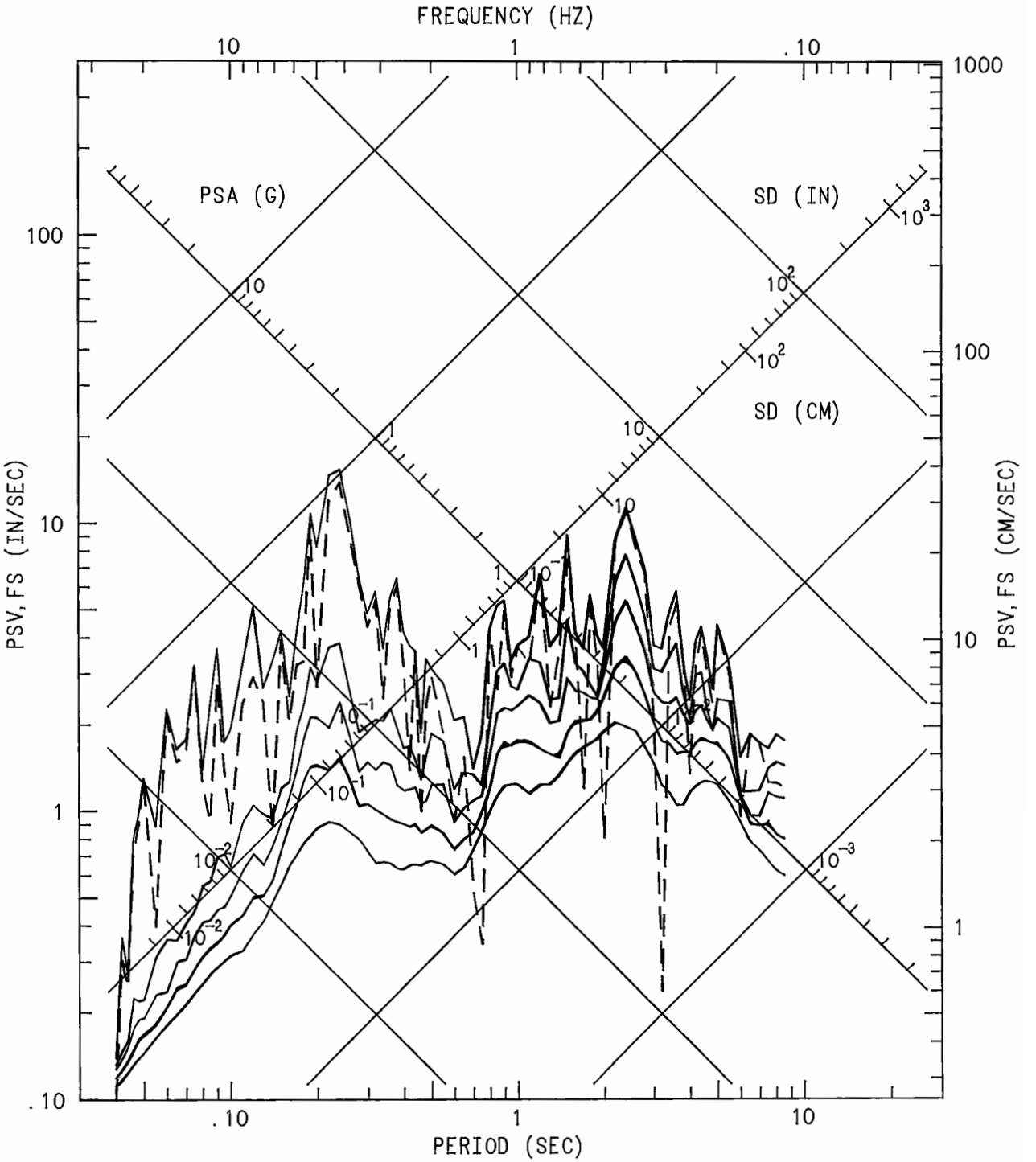
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .08-.16 TO 23.0-25.0 HZ. 13123-S1593-92182.02 011373.0147-QL92A123



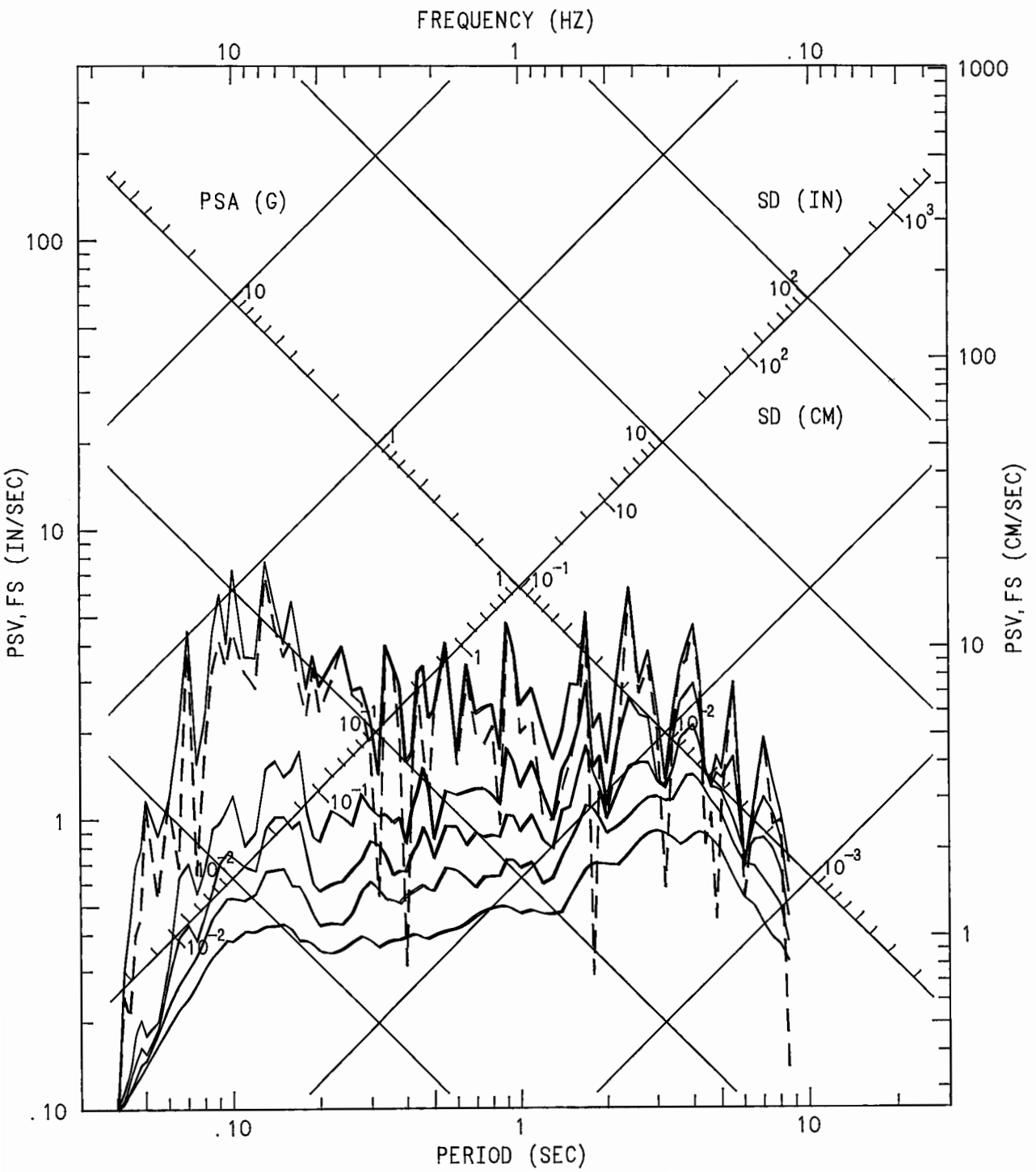
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT CHN 3: 180 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .08-.16 TO 23.0-25.0 HZ. 13123-S1593-92182.02 011373.0147-QL92A123



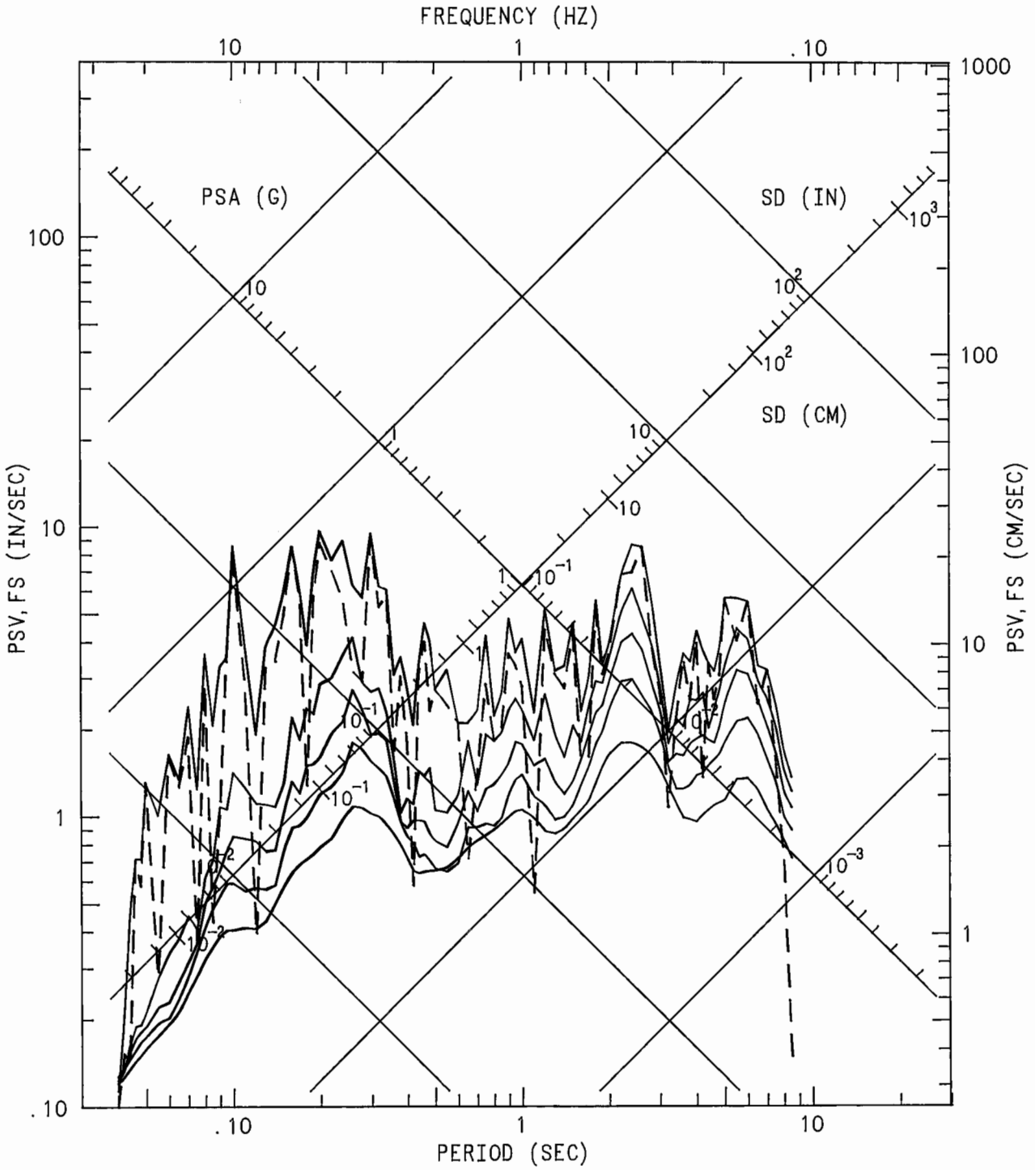
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT
CHN 1: 270 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
13123-S1593-92182.02 020973.1450-QL92A123



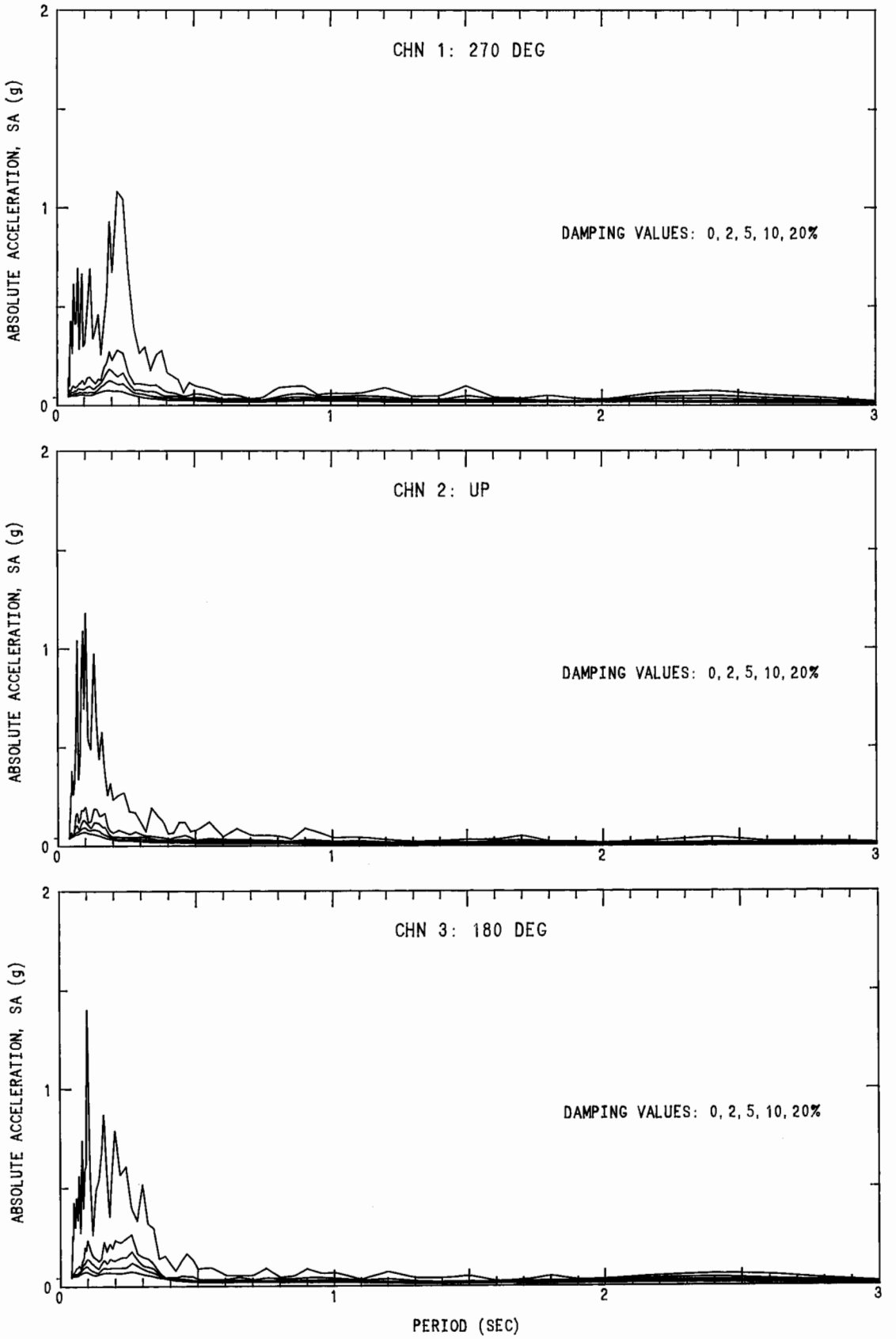
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
13123-S1593-92182.02 020973.1450-QL92A123



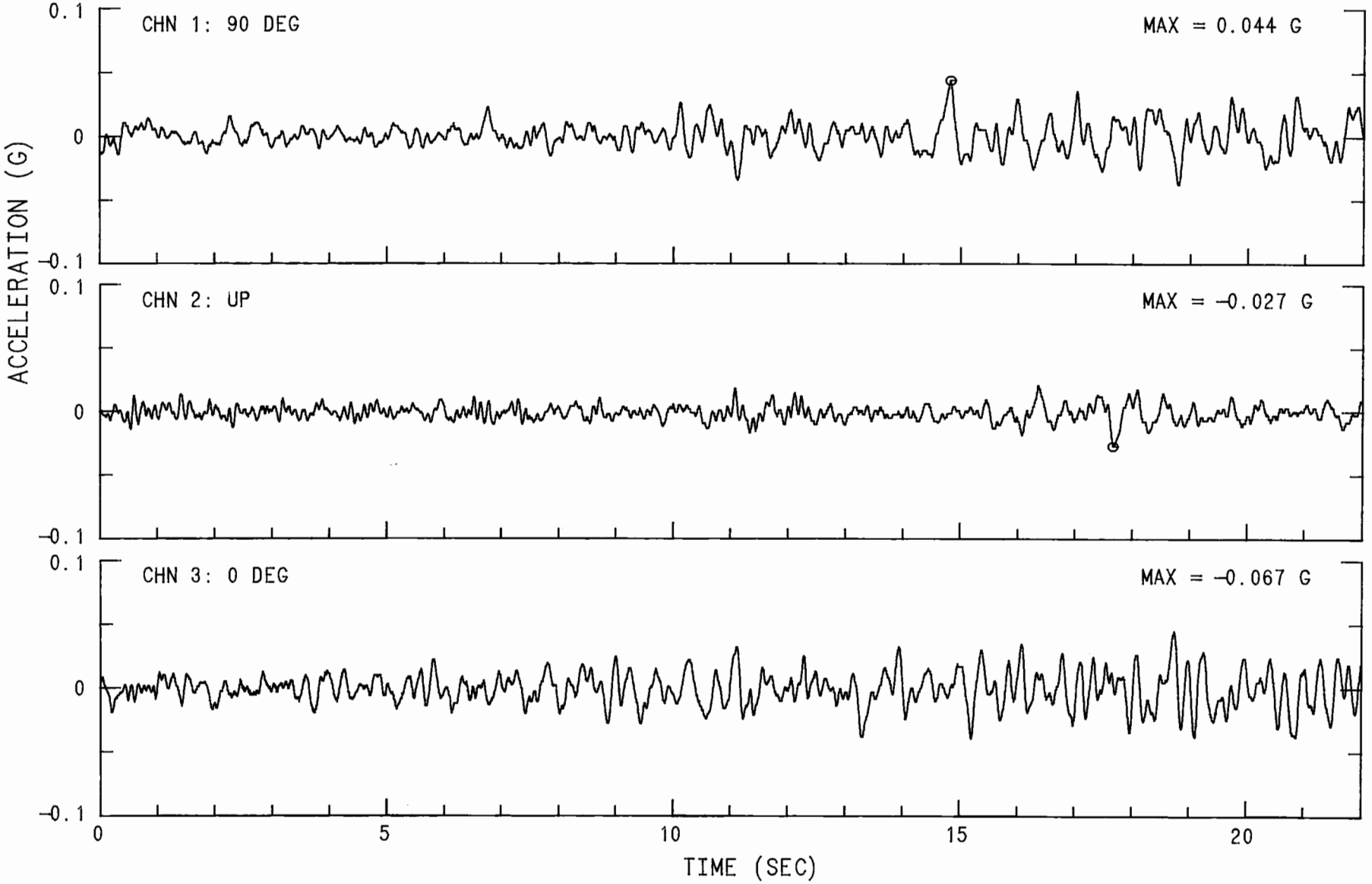
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT
CHN 3: 180 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
13123-S1593-92182.02 020973.1450-QL92A123



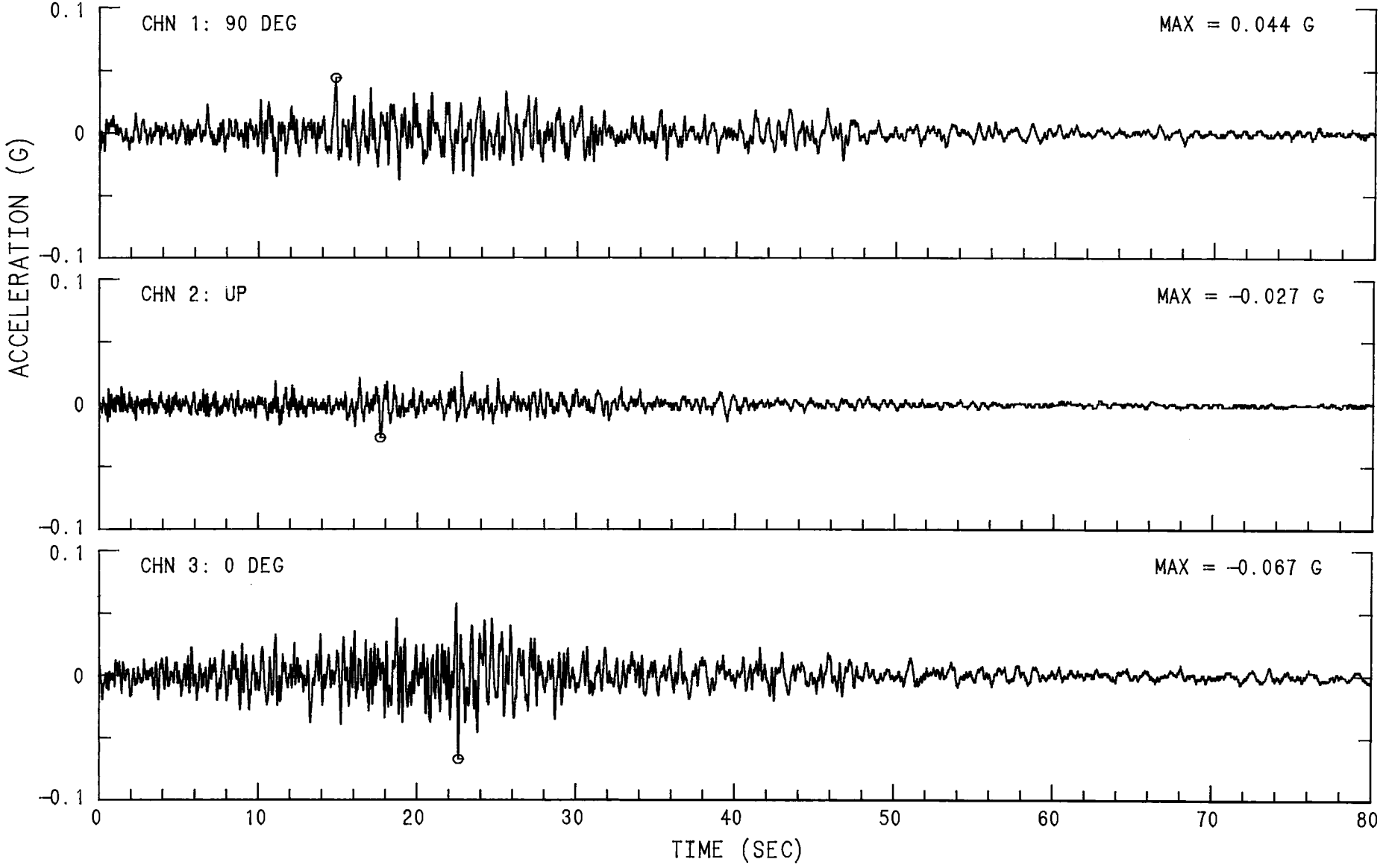
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
RIVERSIDE - AIRPORT
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .08-.16 TO 23.0-25.0 HZ.
13123-S1593-92182.02 020973.1450-QL92A123

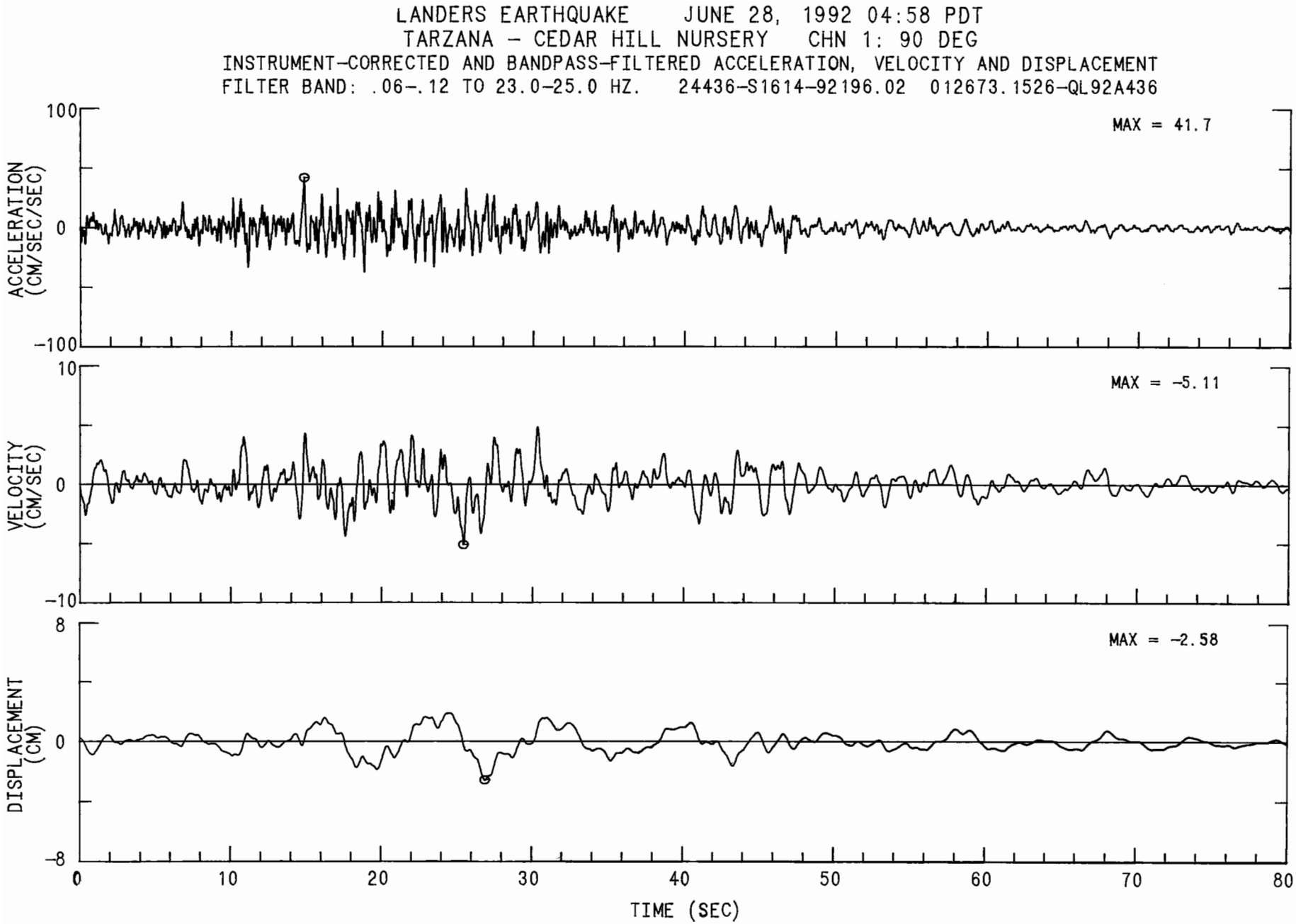


LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY
UNCORRECTED ACCELEROGRAM 24436-S1614-92196.02 010673.2039-QL92A436

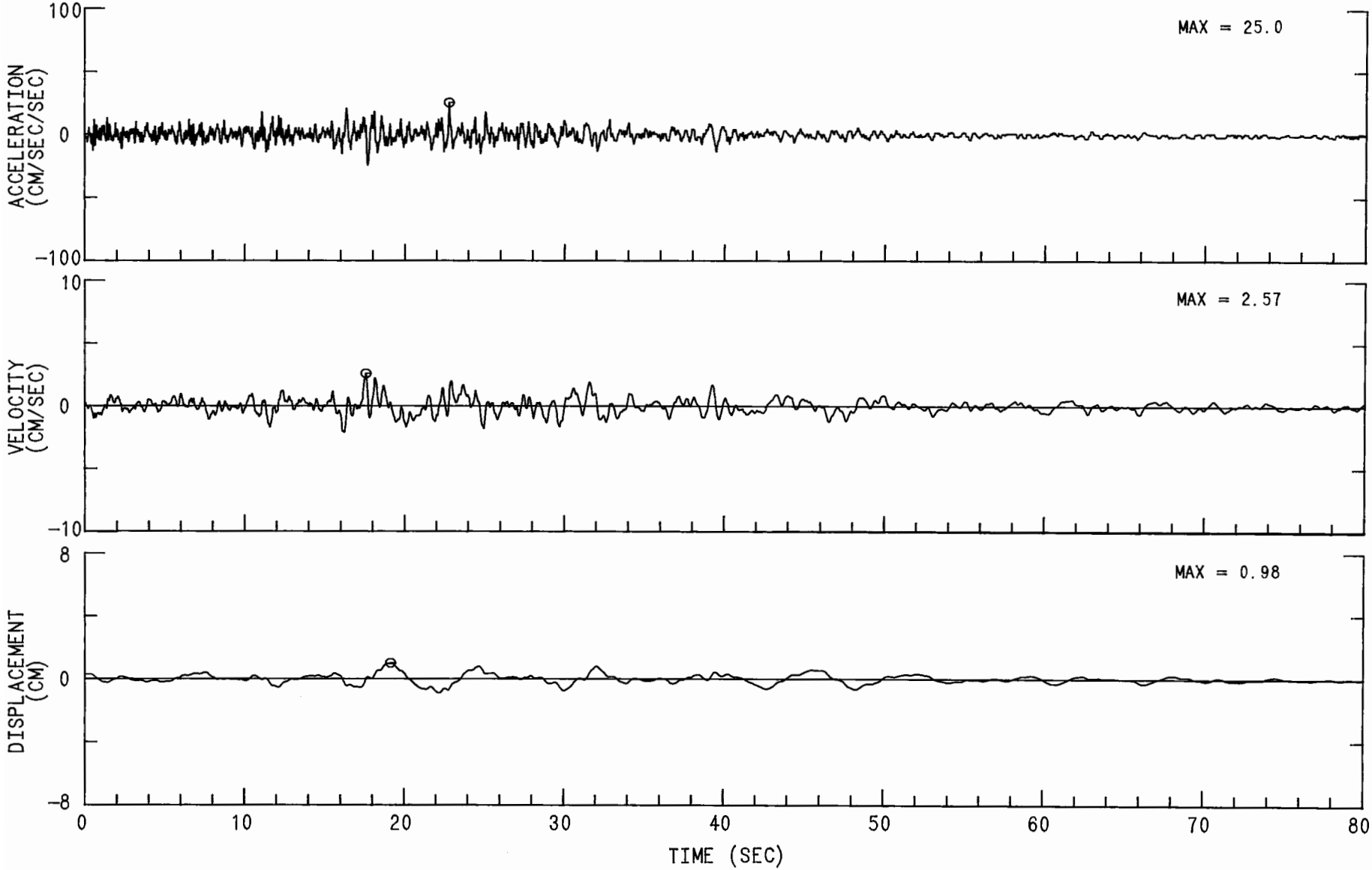


LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY
UNCORRECTED ACCELEROGRAM 24436-S1614-92196.02 010673.2039-QL92A436

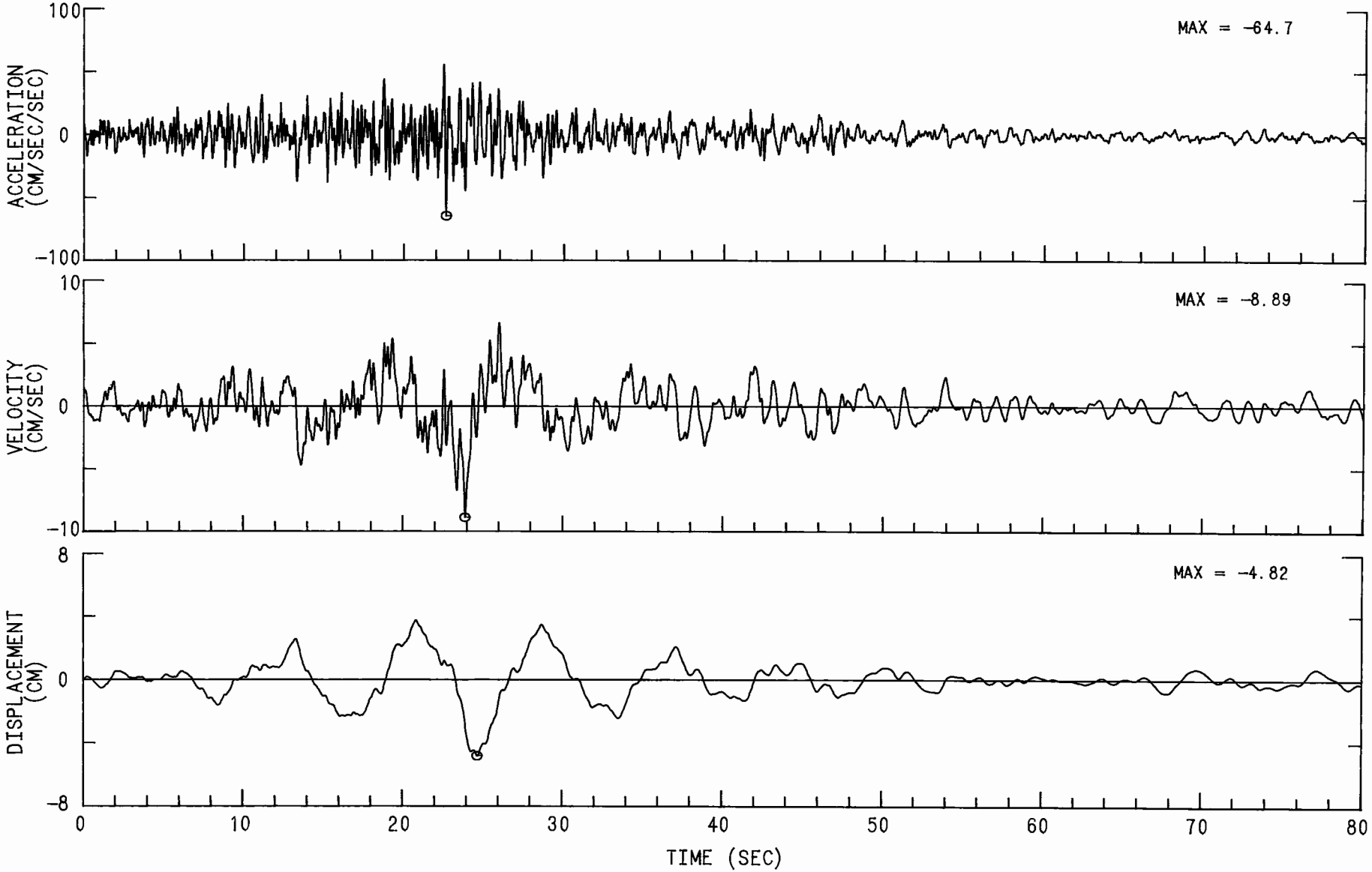



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY CHN 1: 90 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .06-.12 TO 23.0-25.0 HZ. 24436-S1614-92196.02 012673.1526-QL92A436
ACCELERATION (CM/SEC/SEC)
MAX = 41.7
VELOCITY (CM/SEC)
MAX = -5.11
DISPLACEMENT (CM)
MAX = -2.58
TIME (SEC)

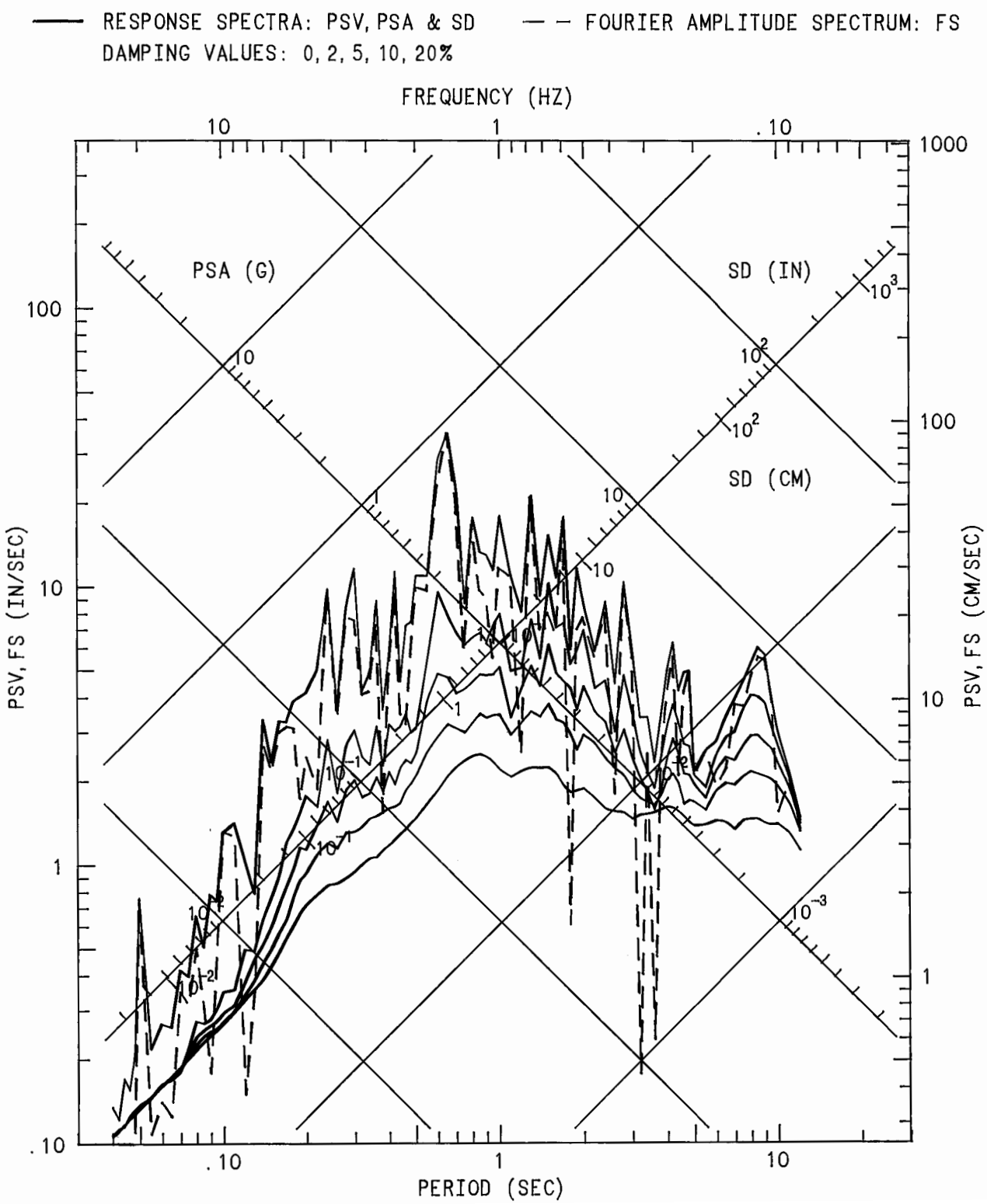
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY CHN 2: UP
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .06-.12 TO 23.0-25.0 HZ. 24436-S1614-92196.02 012673.1526-QL92A436



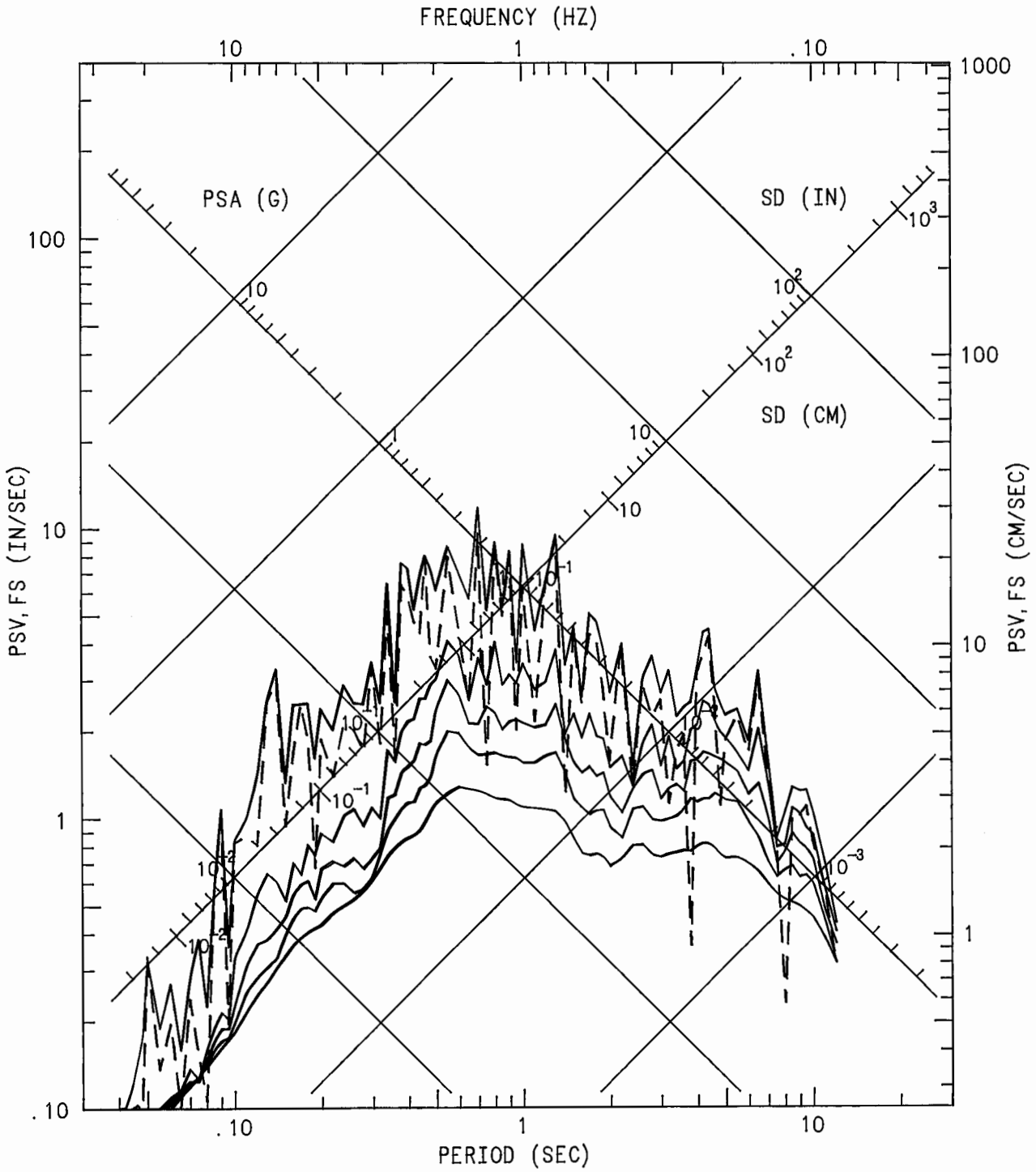
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY CHN 3: 0 DEG
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT
FILTER BAND: .06-.12 TO 23.0-25.0 HZ. 24436-S1614-92196.02 012673.1526-QL92A436



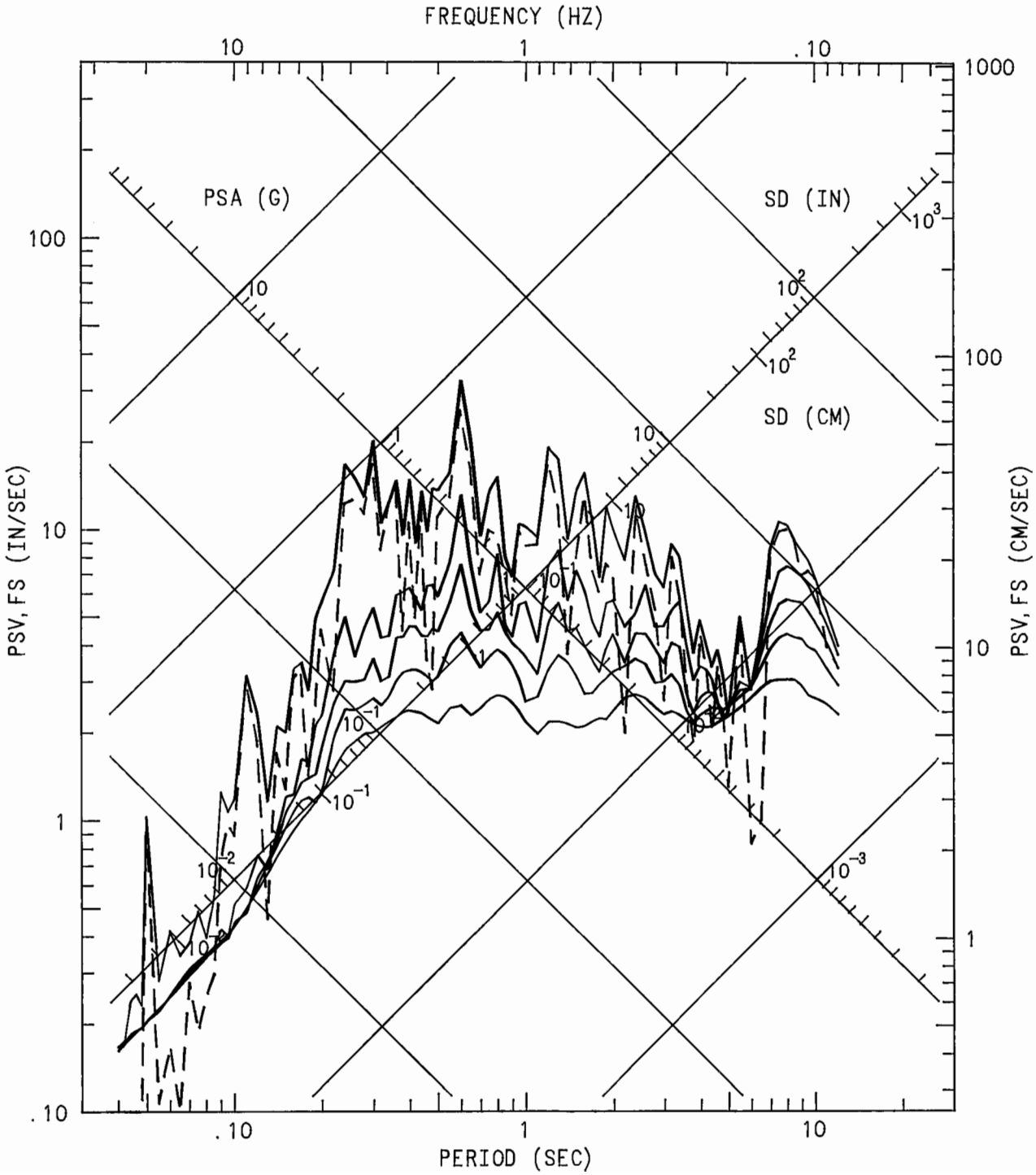
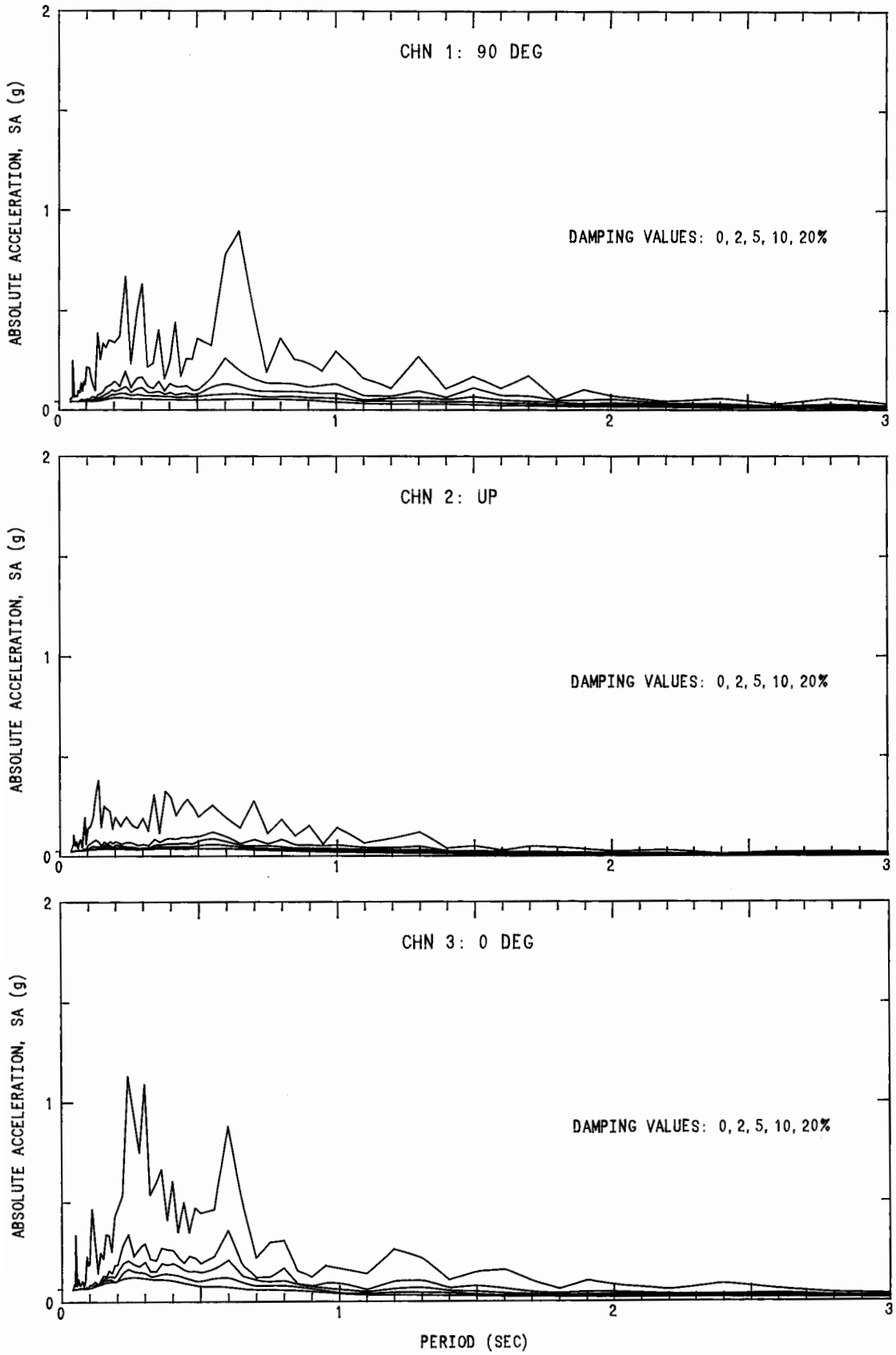
LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY
CHN 1: 90 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
24436-S1614-92196.02 021173.0906-QL92A436



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY
CHN 2: UP
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
24436-S1614-92196.02 021173.0906-QL92A436



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY
CHN 3: 0 DEG
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
24436-S1614-92196.02 021173.0906-QL92A436



LANDERS EARTHQUAKE JUNE 28, 1992 04:58 PDT
TARZANA - CEDAR HILL NURSERY
ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .06-.12 TO 23.0-25.0 HZ.
24436-S1614-92196.02 021173.0906-QL92A436