

# Seismic Measurements at LLO

LIGO-G010134-00-Z

- Dick Greenwood
- Neven Simicevic
- Clay Westbrook
- Mark Coles
- Szabi Marka
- Anthony Stonaker, Amanda Carpenter, Gabriel Hebert, Warren's students

# Ongoing Activities at LaTech and LLO

- Analysis of old data taken with PASSCAL Guralp CMG-3ESP Seismometers in “microseismic” configuration
- 40 seismometer vaults designed and constructed for gravity gradient studies
- 8 Guralp 40T Seismometers obtained from PASSCAL for gravity gradient studies

# Ongoing Activities at LaTech and LLO (continued)

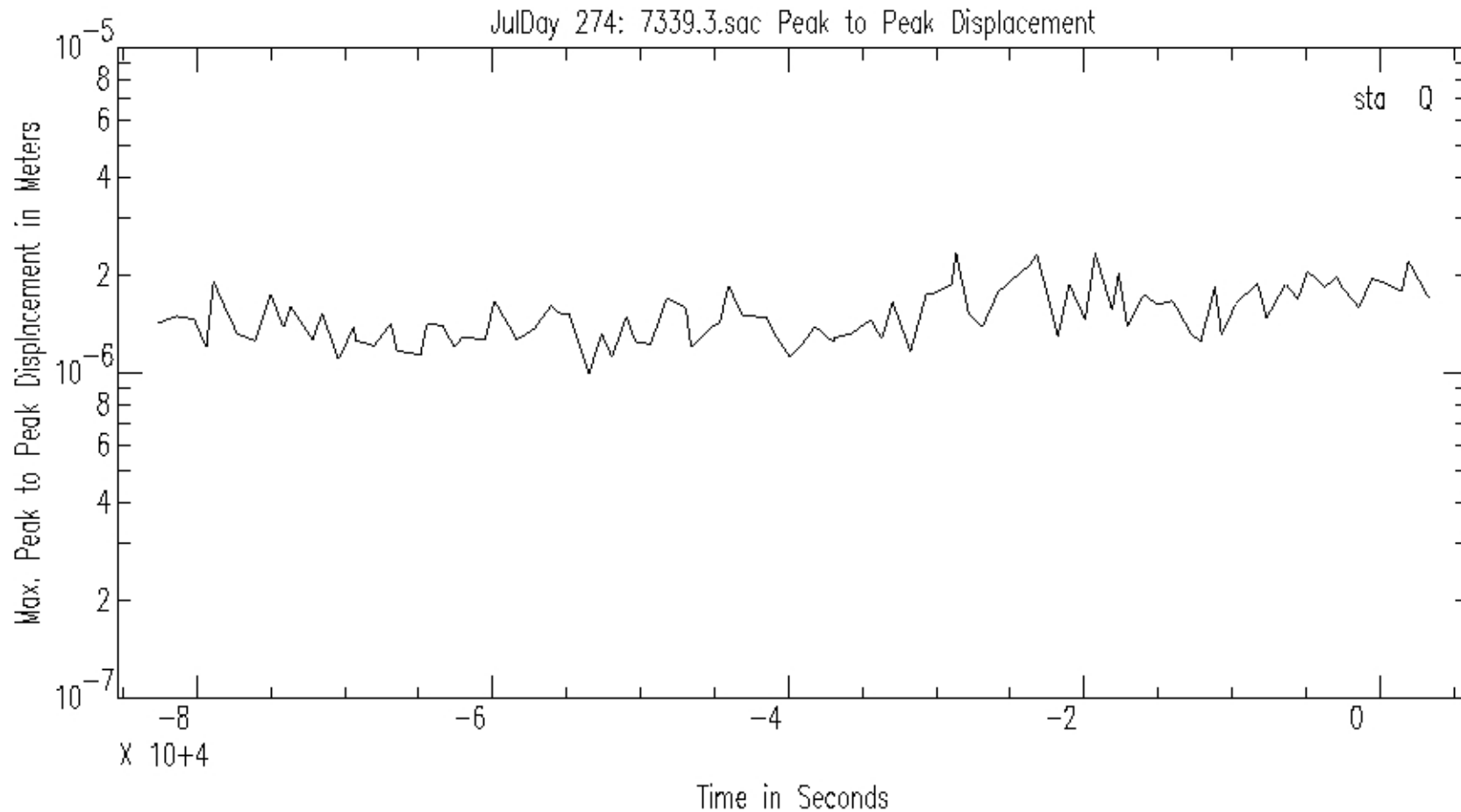
- Analyze the new 40T data - applicable to E3?
- Plan our future measurements in the 40 vault array

# Sensor Model: Guralp CMG - 3ESP

Bandpass .05 - .2 (Micro\_Seismic)

Oct. 1, 1999 "Quiet Data"

LVEA East - West Direction



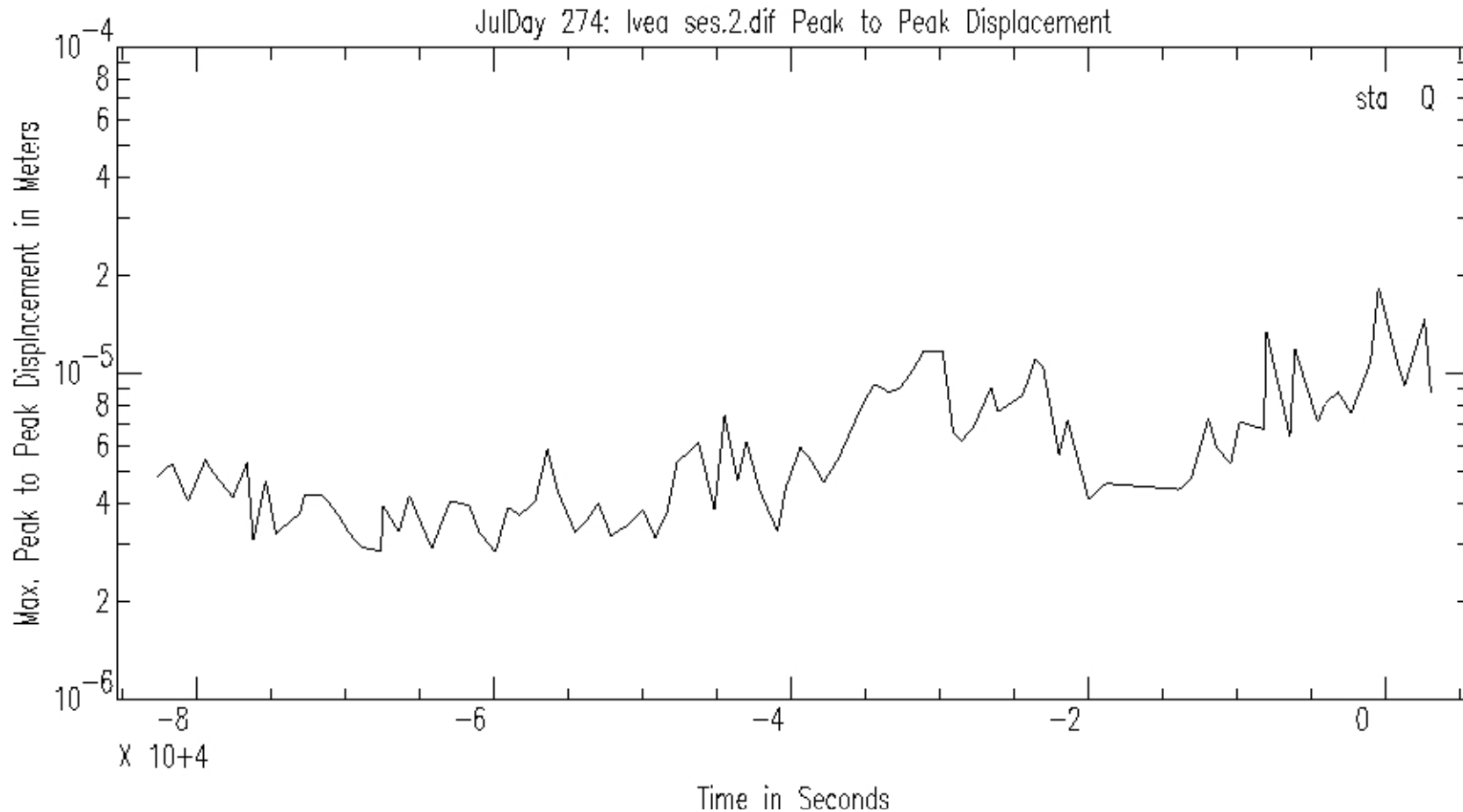
# Sensor Model: Guralp CMG - 3ESP

Bandpass: .05 - .2 Hz (Micro\_Seismic)

Oct. 1, 1999 "Quiet Data"

Differential Peak -> Peak Displacement

LVEA - SES: North - South Direction

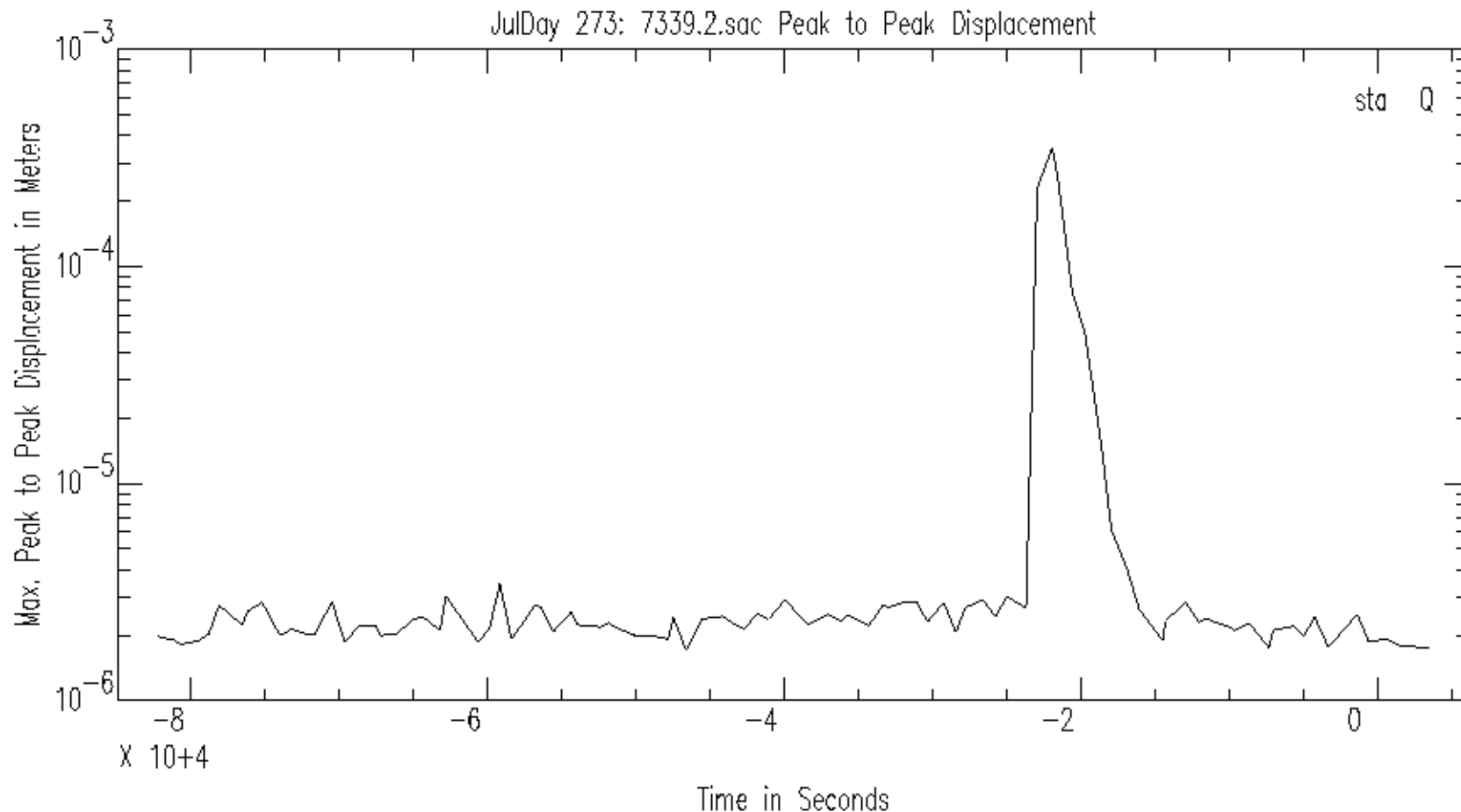


# Sensor Model: Guralp CMG - 3ESP

Bandpass .05 - .2 (Micro\_Seismic)

Sept. 30, 1999 "Mexico Earthquake"

LVEA North - South Direction



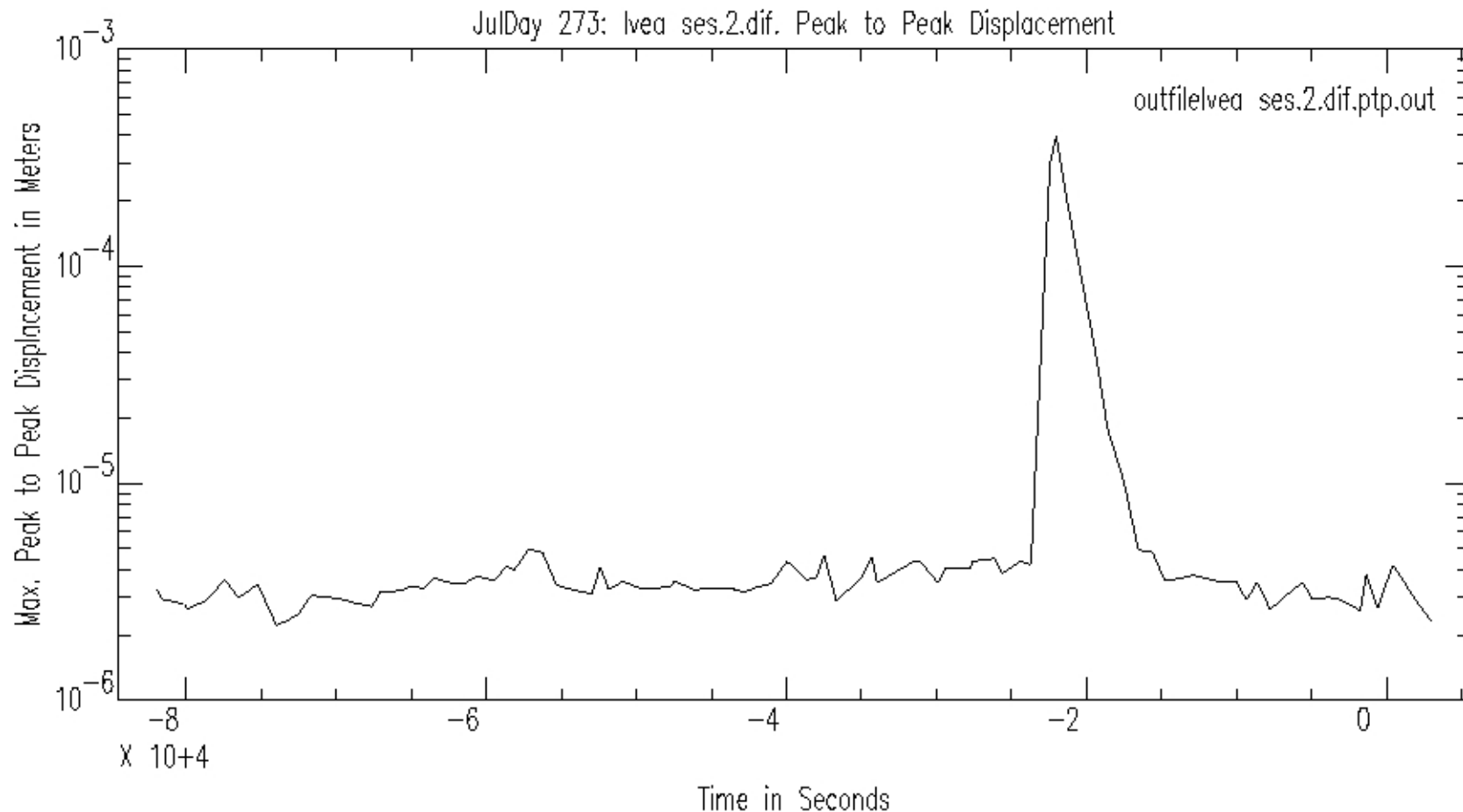
# Sensor Model: Guralp CMG - 3ESP

Bandpass: .05 - .2 Hz (Micro\_Seismic)

Sept. 30, 1999 "Mexico Earthquake"

Differential Peak -> Peak Displacement

LVEA - SES: North - South Direction

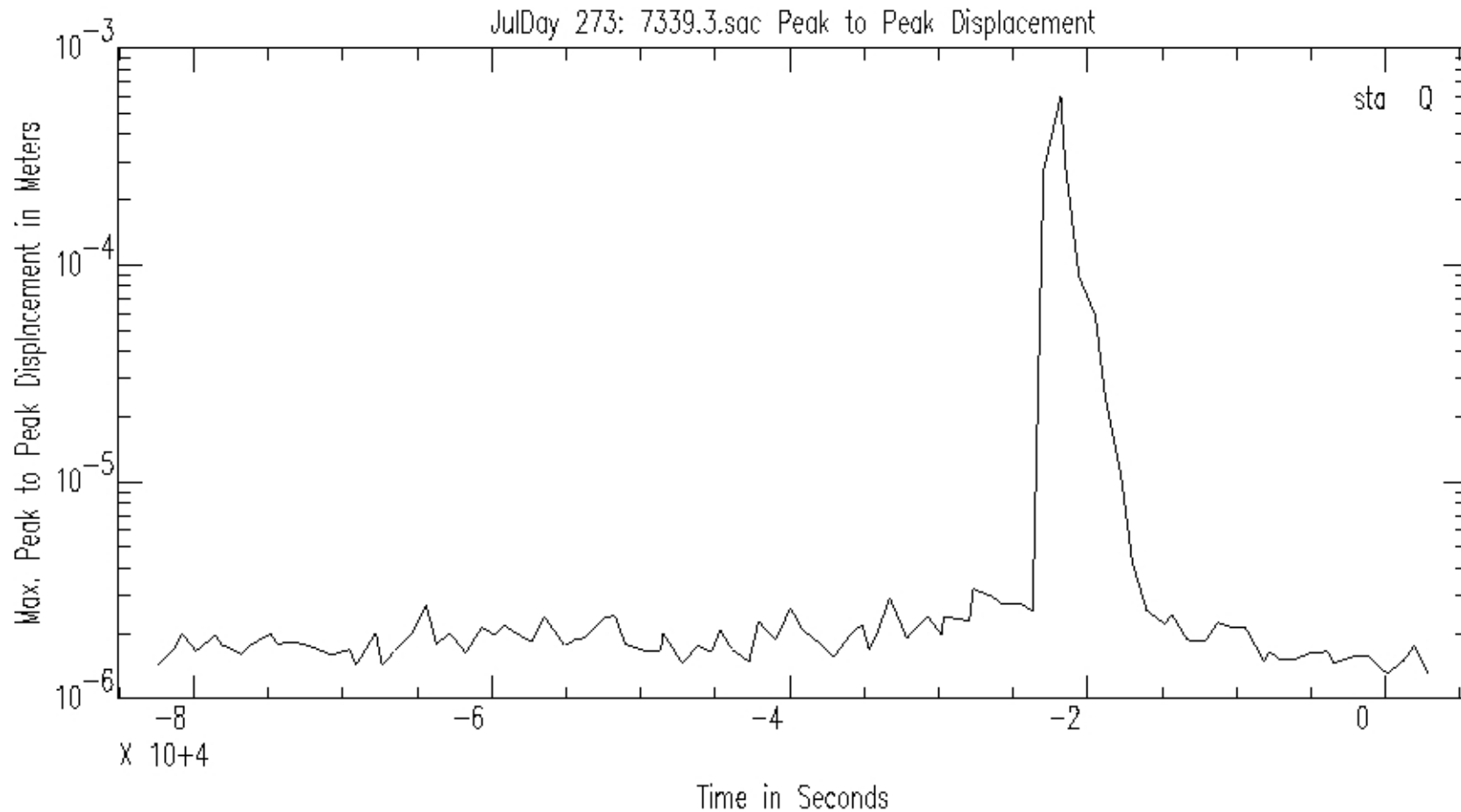


# Sensor Model: Guralp CMG - 3ESP

Bandpass .05 - .2 (Micro\_Seismic)

Sept. 30, 1999 "Mexico Earthquake"

LVEA East - West Direction



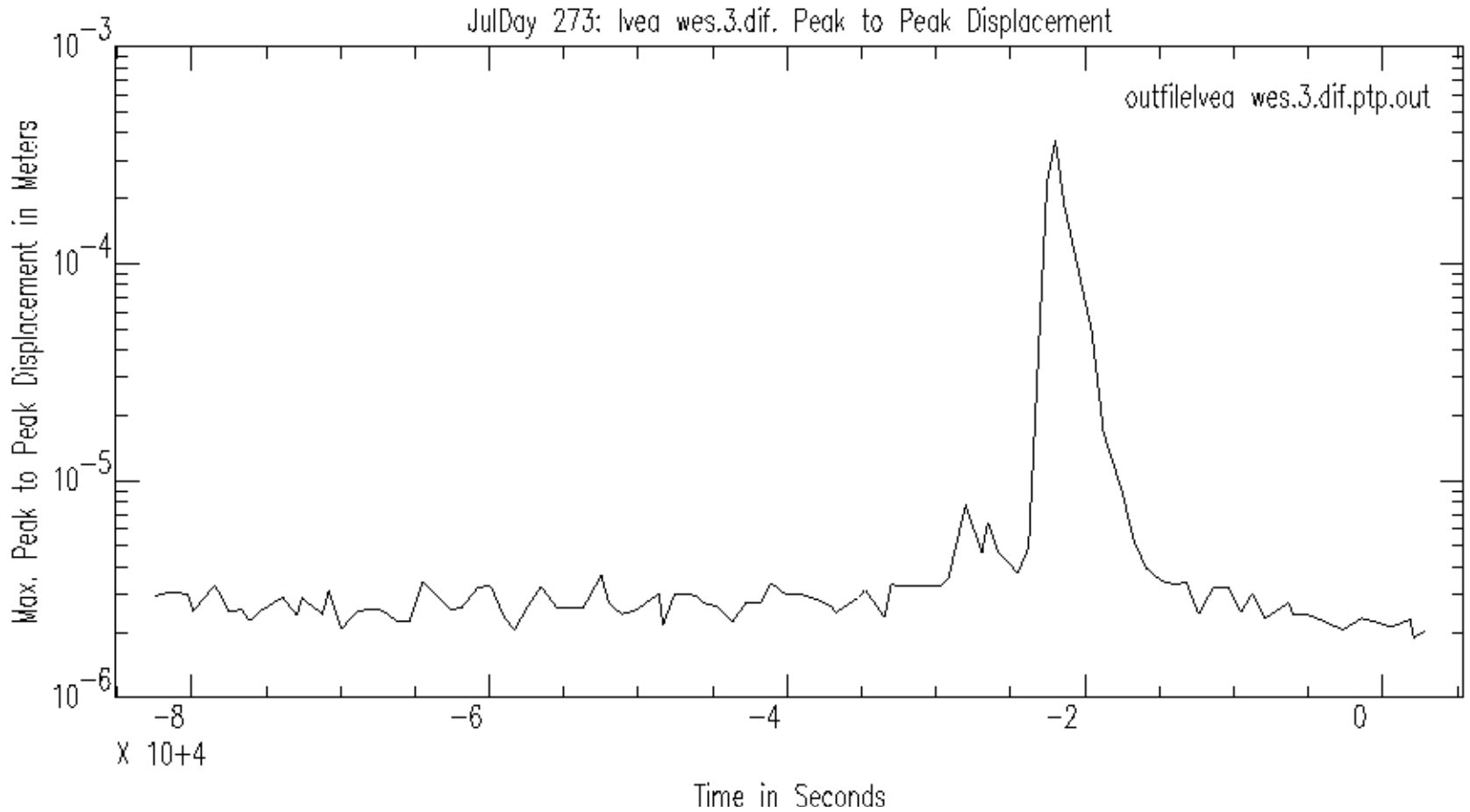


Bandpass: .05 - .2 Hz (Micro\_Seismic)

Sept. 30, 1999 "Mexico Earthquake"

Differential Peak -> Peak Displacement

LVEA - WES: East - West Direction

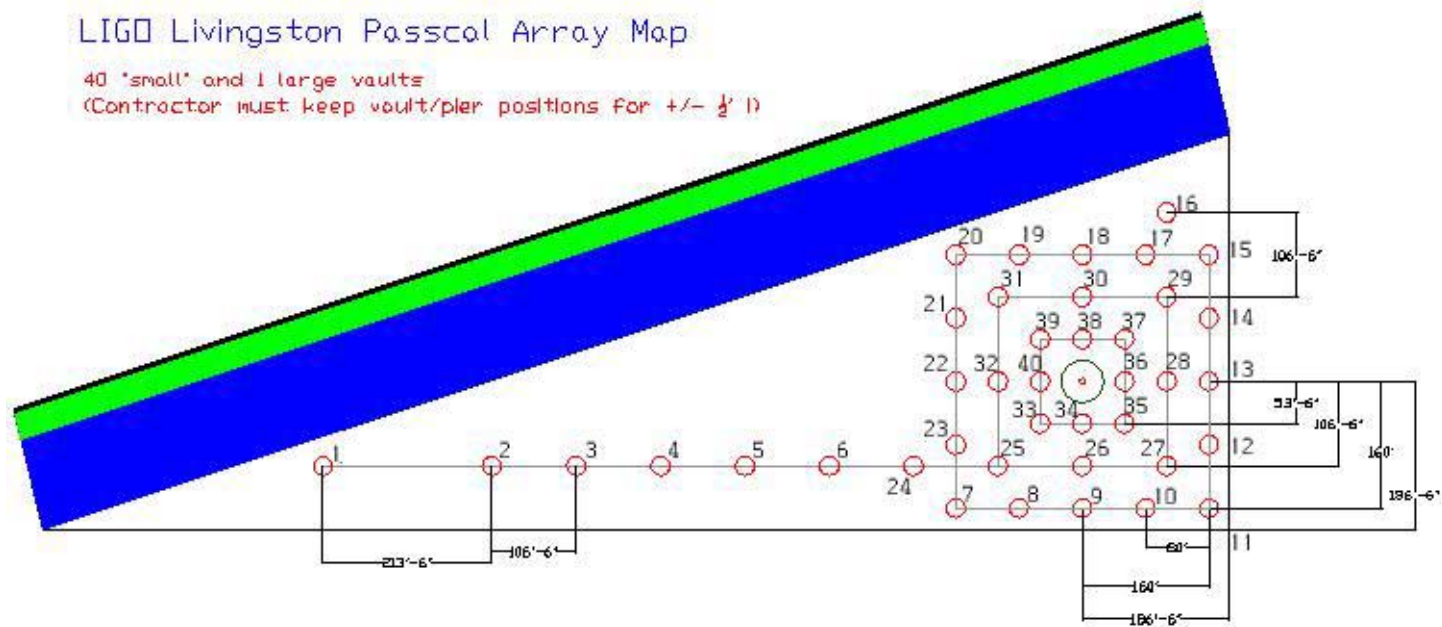


Also use BBFK analysis to find  
speed and direction

(see transparency)

# LIGO Livingston Pascual Array Map

40 "small" and 1 large vaults  
(Contractor must keep vault/plier positions for +/- 1/2')

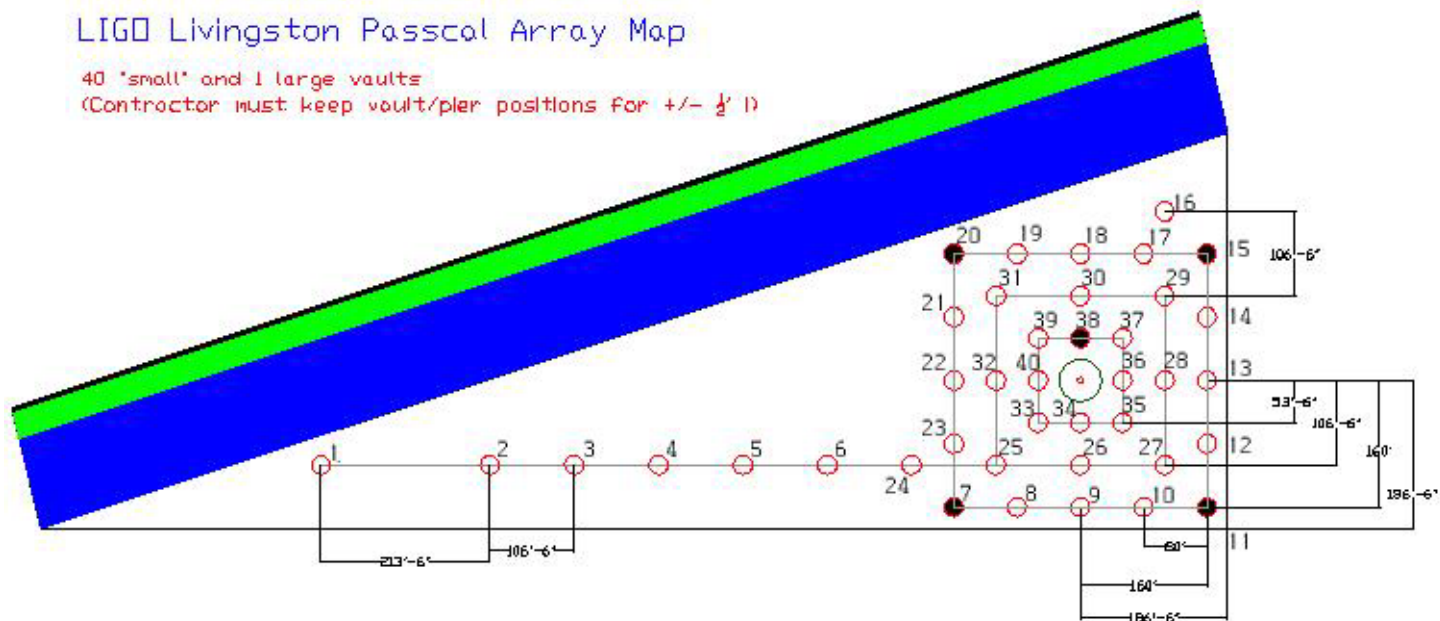


Array1\_LL0\_Seismic.ps  
This data was 'dumped' on 22JAN01.

DAS#:	Vault#:
7343	20
7348	7
7447	11
7333	15

### LIGO Livingston Pascal Array Map

40 'small' and 1 large vaults  
(Contractor must keep vault/plier positions for +/- 1/2')



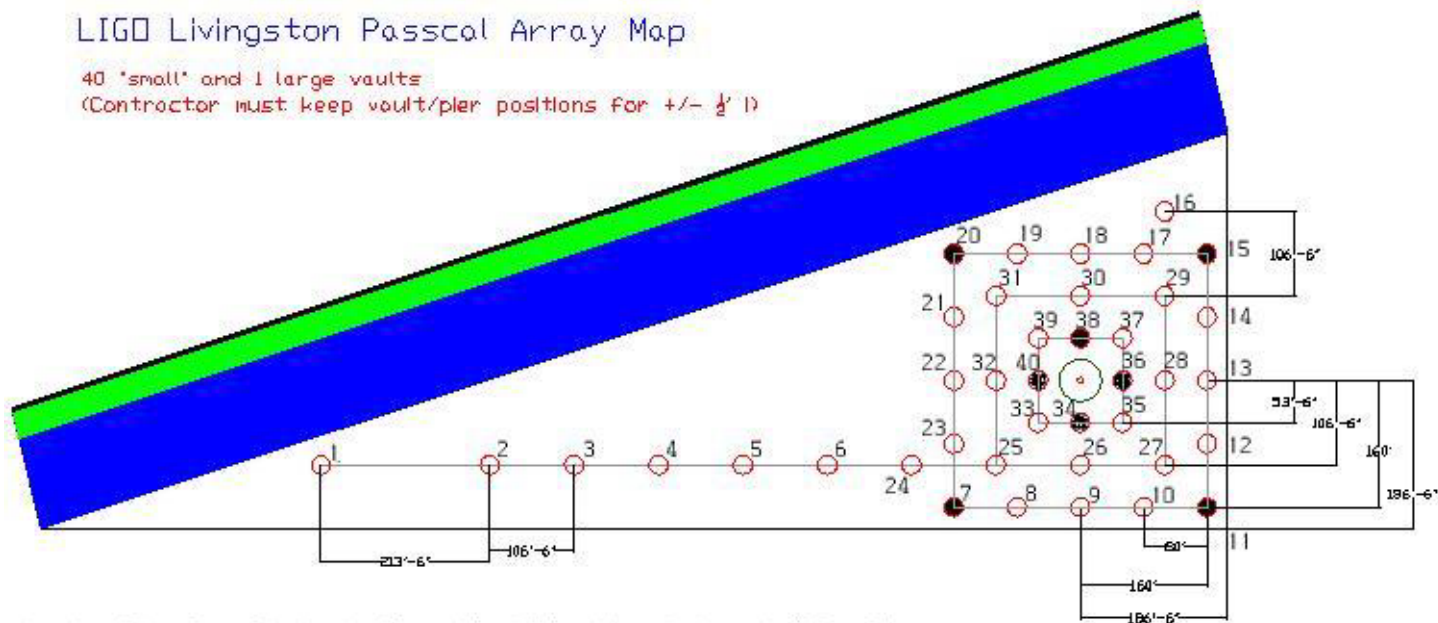
decatur.ligo-la.caltech.edu:/export/raid0/Szabi\_Seismic\_Data/22JAN01

Array2\_LLO\_Seismic.ps  
This data was 'dumped' on 26FEB01

DAS#:	Vault#:	DAS#:	Vault#:
7343	20	7454	40
7348	7	7296	34
7447	11	7444	36
7333	15		

### LIGO Livingston Pascual Array Map

40 'small' and 1 large vaults  
(Contractor must keep vault/plier positions for +/- 1/2')



decatur.ligo-la.caltech.edu:/export/raid0/Szabi\_Seismic\_Data/26FEB01