



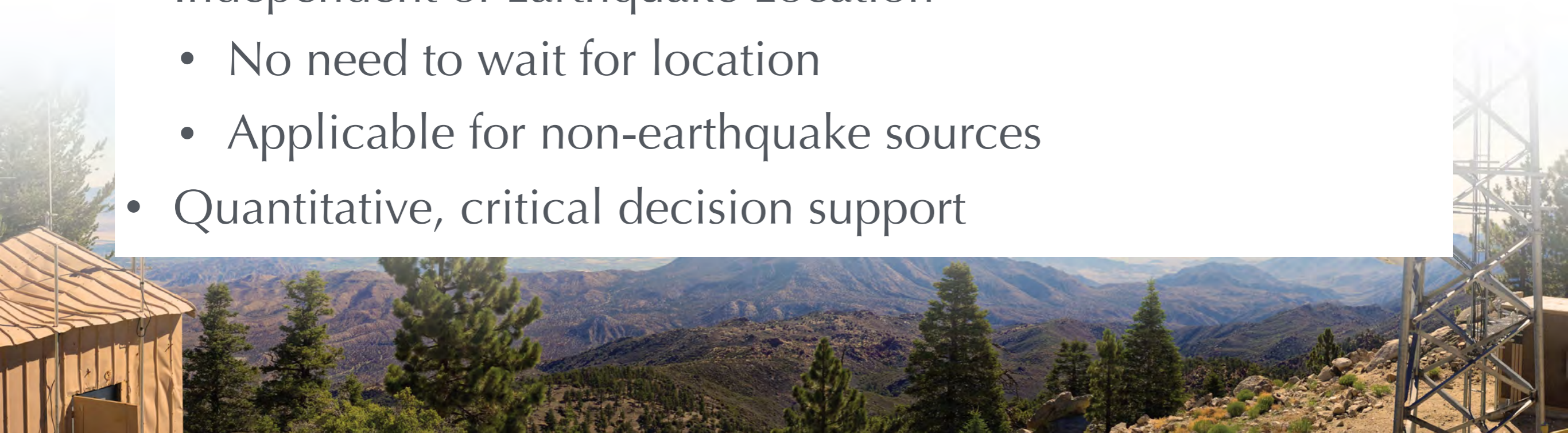
BIGHORN - San Jacinto Events And UCSD Shake Table Tests



Bighorn

Main Features

- Now-casting of wavefield spectral content
- Real-time, continuous response spectra exceedence
- Immediate results tailored for response team
- Automatic alarms against engineered criteria (Structural Health Monitoring)
- Independent of Earthquake Location
 - No need to wait for location
 - Applicable for non-earthquake sources
- Quantitative, critical decision support



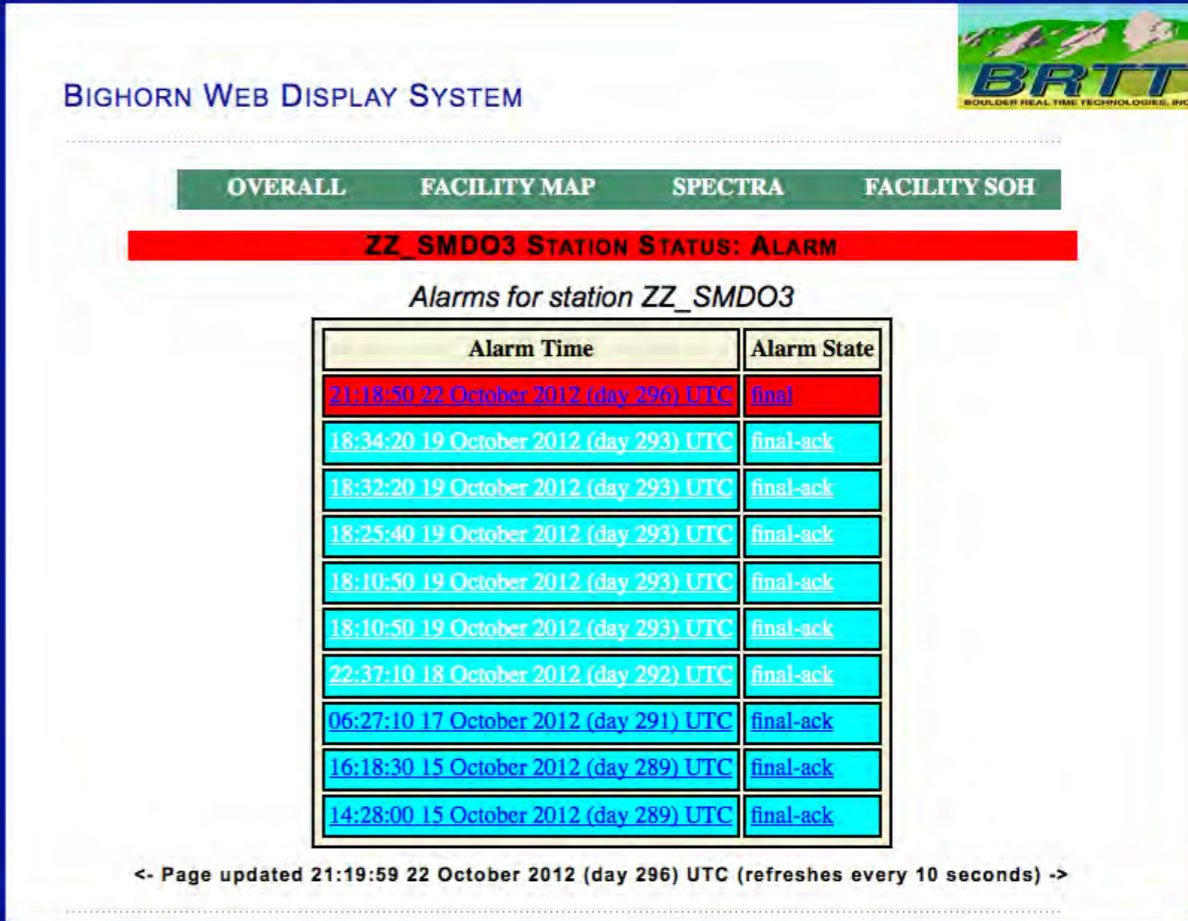
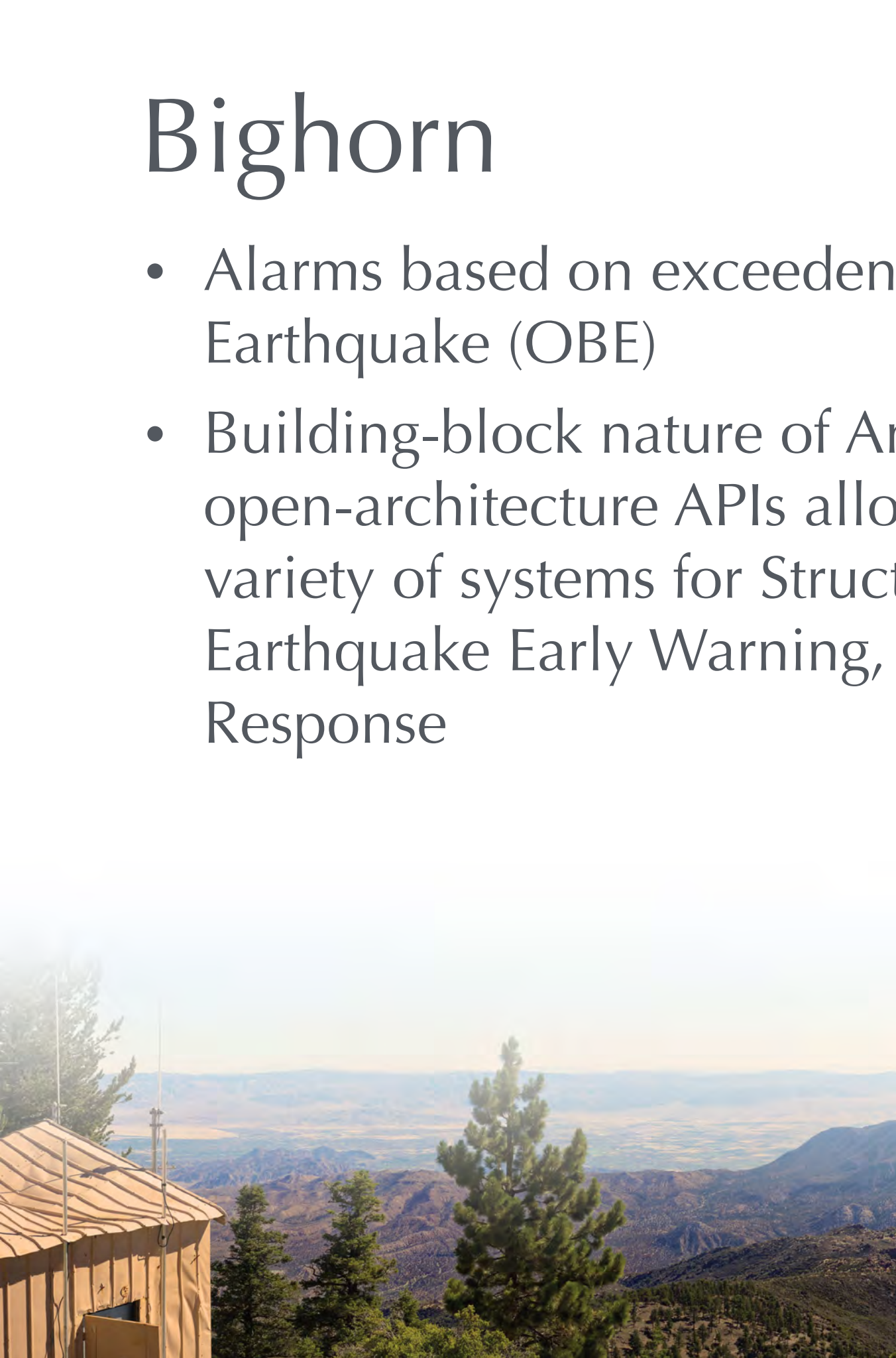
Bighorn - orbsmrsp

- Ability developed for producing continuous time-dependent strong motion response spectra
- Expanded floating point data representations within ORB packets and Datascope waveform files
- Pf ORB packets to represent time continuous strong motion response spectra
- Provides a very fast method for computing continuous time-dependent response spectra for large numbers of channels



Bighorn

- Alarms based on exceedence of Operating Basis Earthquake (OBE)
- Building-block nature of Antelope/Bighorn system and open-architecture APIs allow construction of wide variety of systems for Structural-Health Nowcasting, Earthquake Early Warning, and Post-Earthquake Response



BIGHORN WEB DISPLAY SYSTEM

OVERALL FACILITY MAP SPECTRA FACILITY SOH

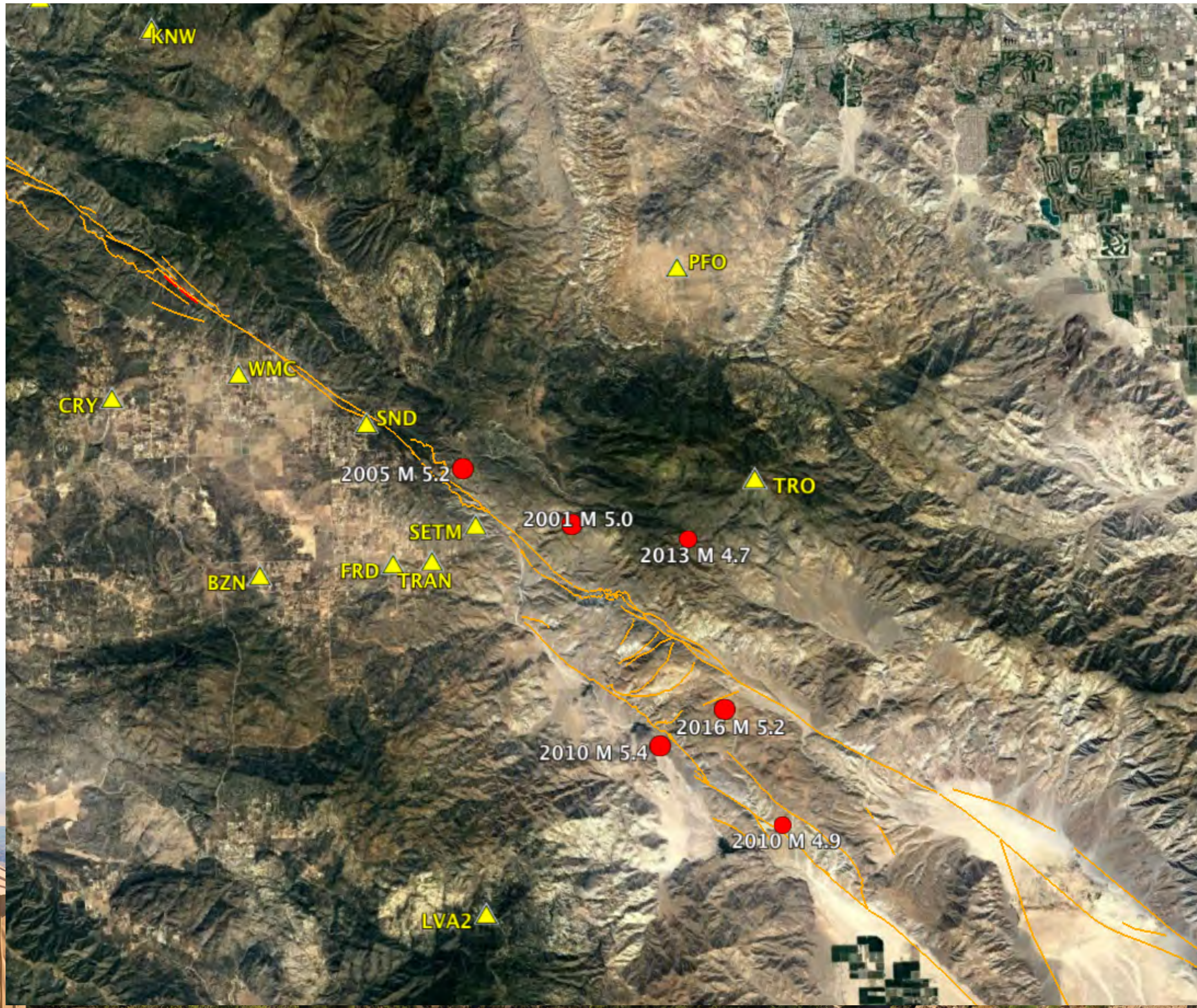
ZZ_SMDO3 STATION STATUS: ALARM

Alarms for station ZZ_SMDO3

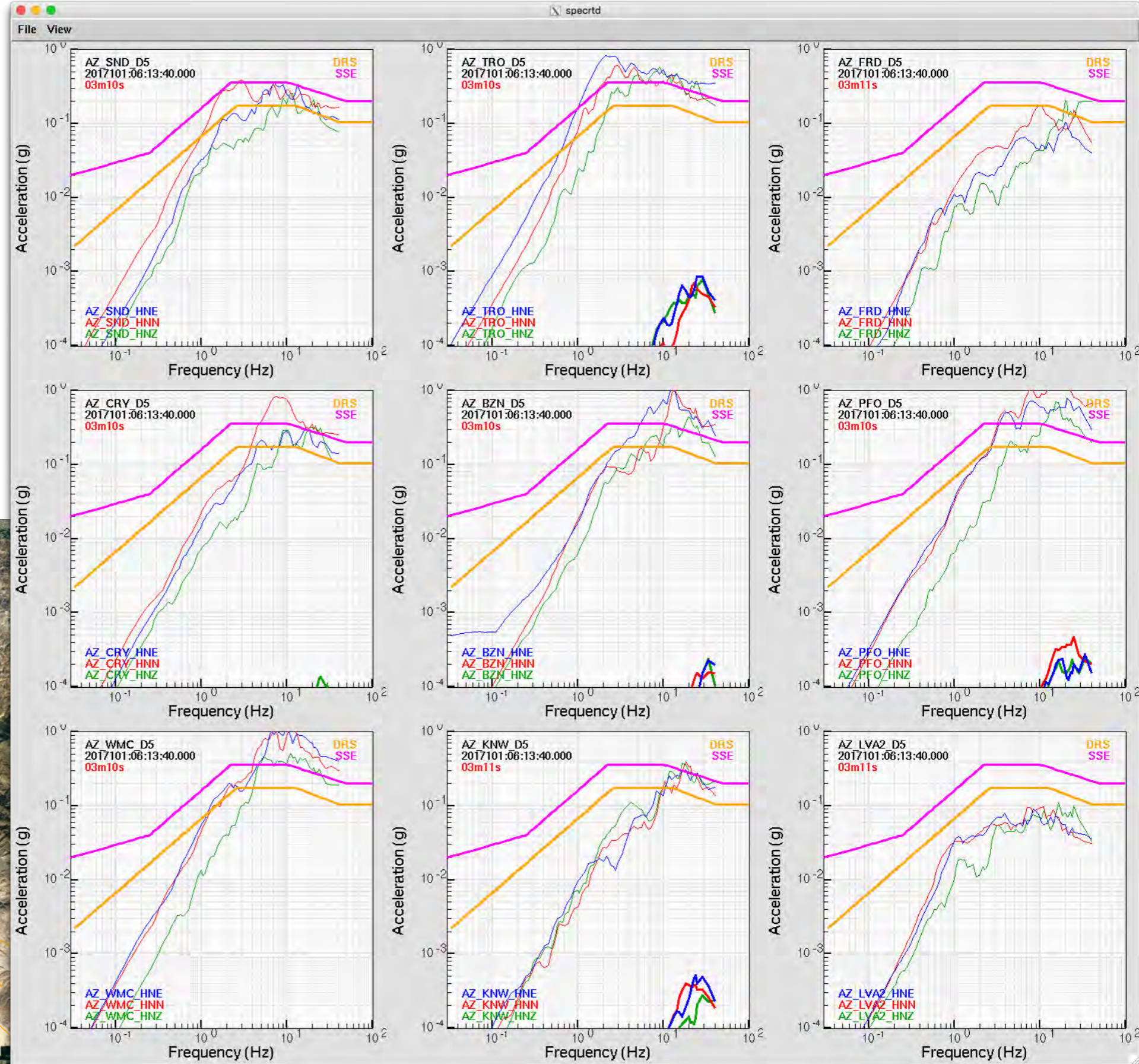
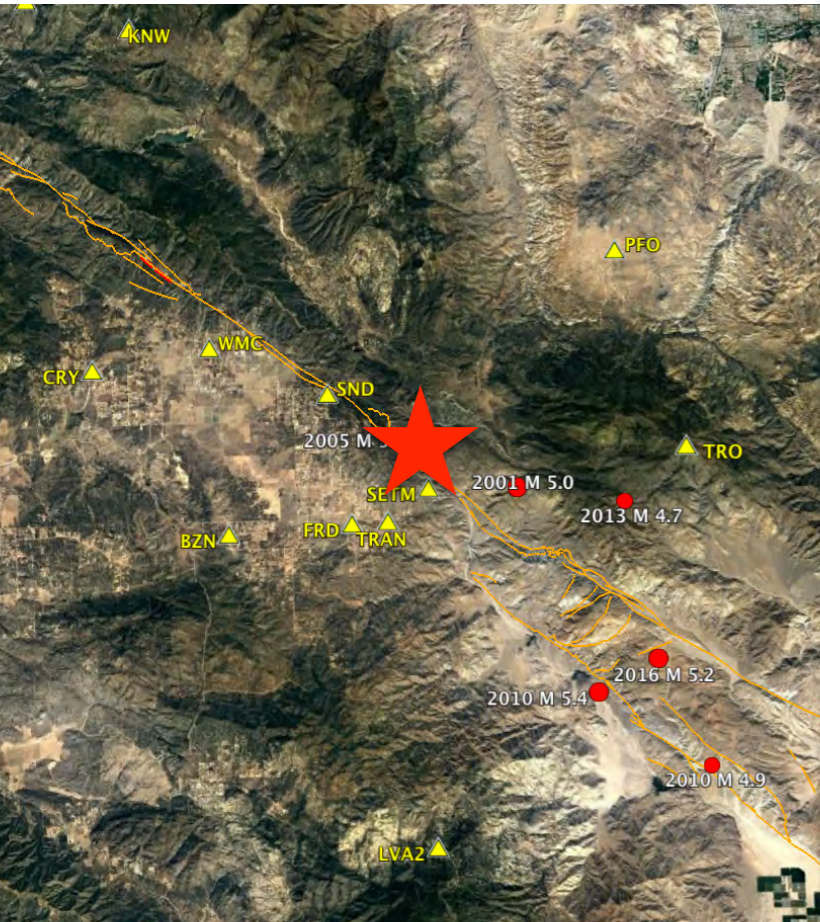
Alarm Time	Alarm State
21:18:50 22 October 2012 (day 296) UTC	final
18:34:20 19 October 2012 (day 293) UTC	final-ack
18:32:20 19 October 2012 (day 293) UTC	final-ack
18:25:40 19 October 2012 (day 293) UTC	final-ack
18:10:50 19 October 2012 (day 293) UTC	final-ack
18:10:50 19 October 2012 (day 293) UTC	final-ack
22:37:10 18 October 2012 (day 292) UTC	final-ack
06:27:10 17 October 2012 (day 291) UTC	final-ack
16:18:30 15 October 2012 (day 289) UTC	final-ack
14:28:00 15 October 2012 (day 289) UTC	final-ack

<- Page updated 21:19:59 22 October 2012 (day 296) UTC (refreshes every 10 seconds) ->

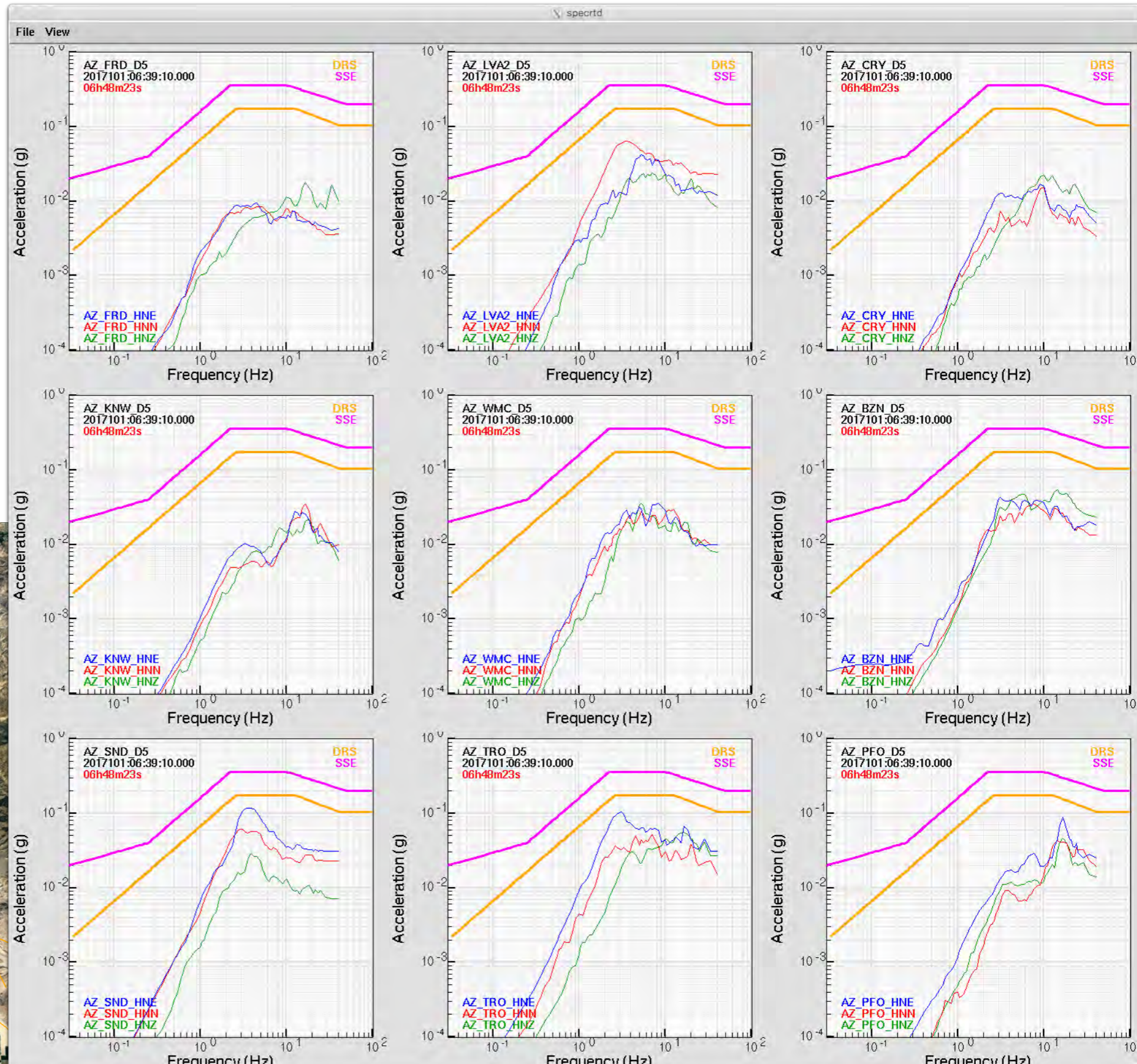
ANZA Events and Stations



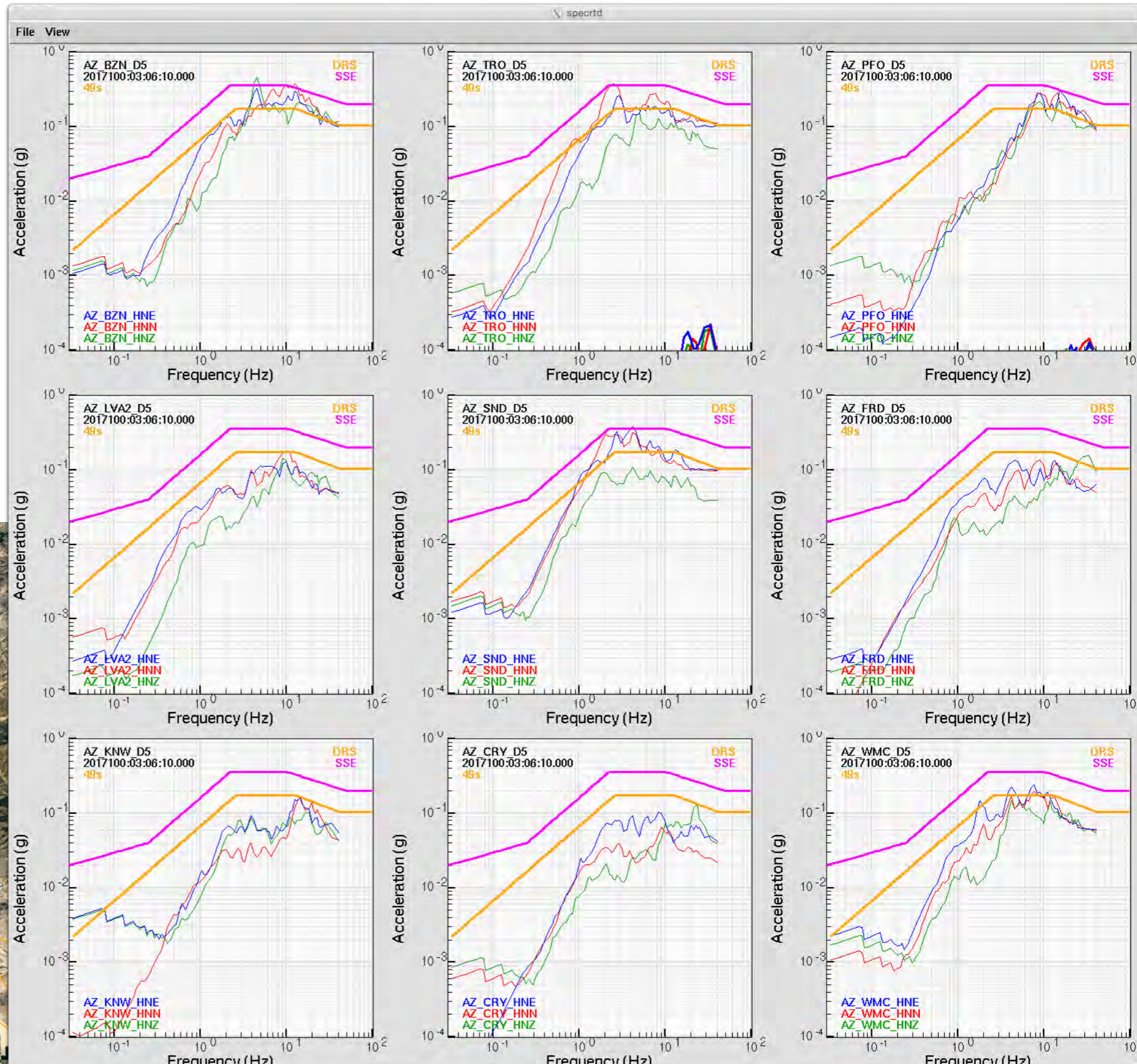
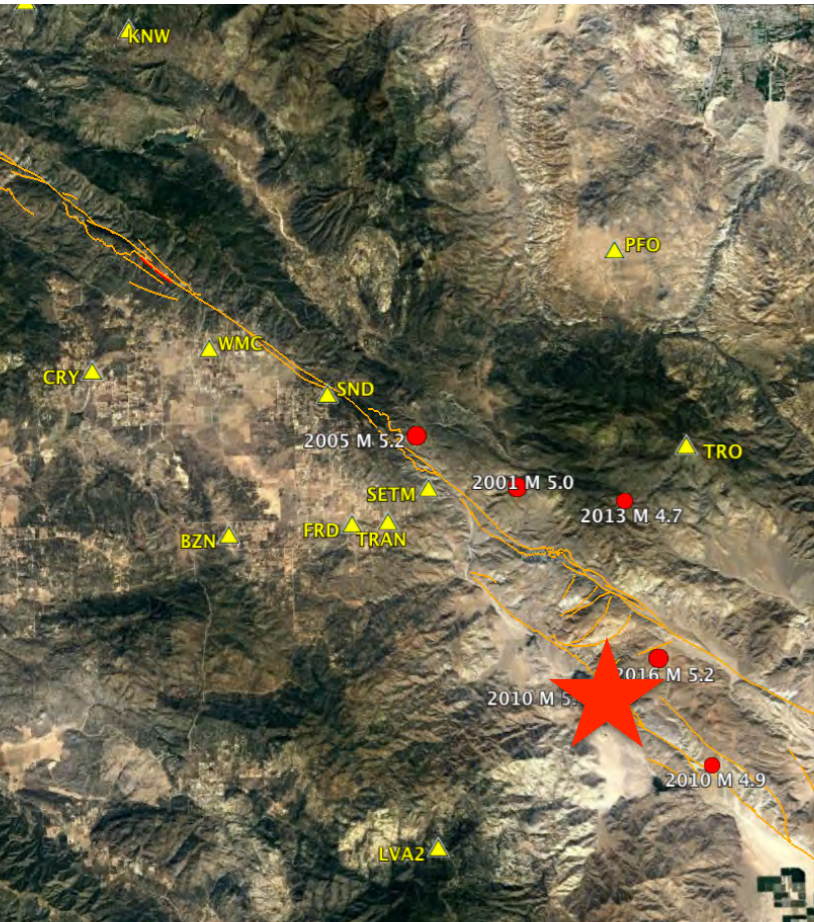
ANZA 2005 Mw 5.2



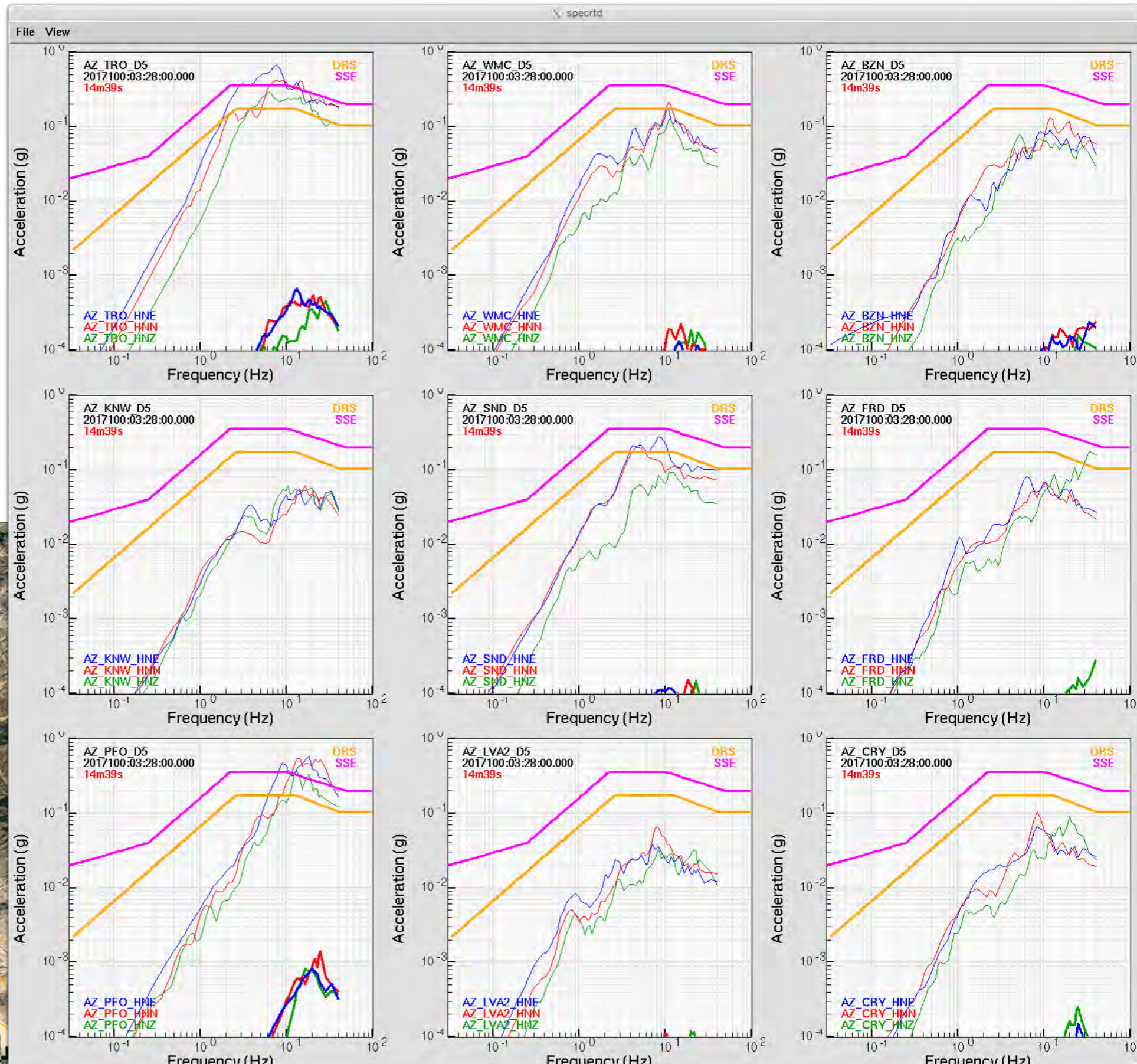
ANZA 2010 Mw 4.9



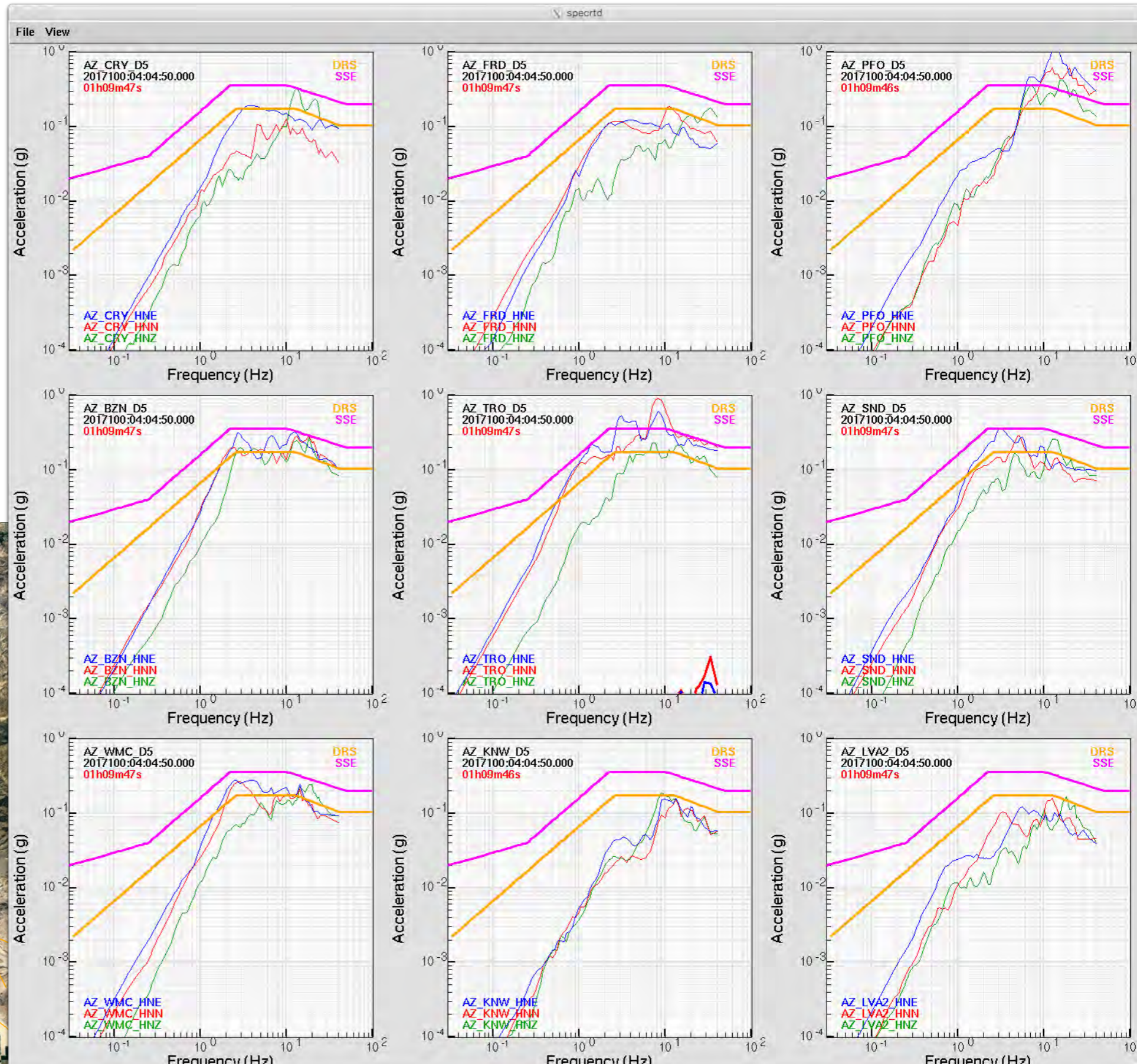
ANZA 2010 Mw 5.4



ANZA 2013 Mw 4.7



ANZA 2016 Mw 5.2



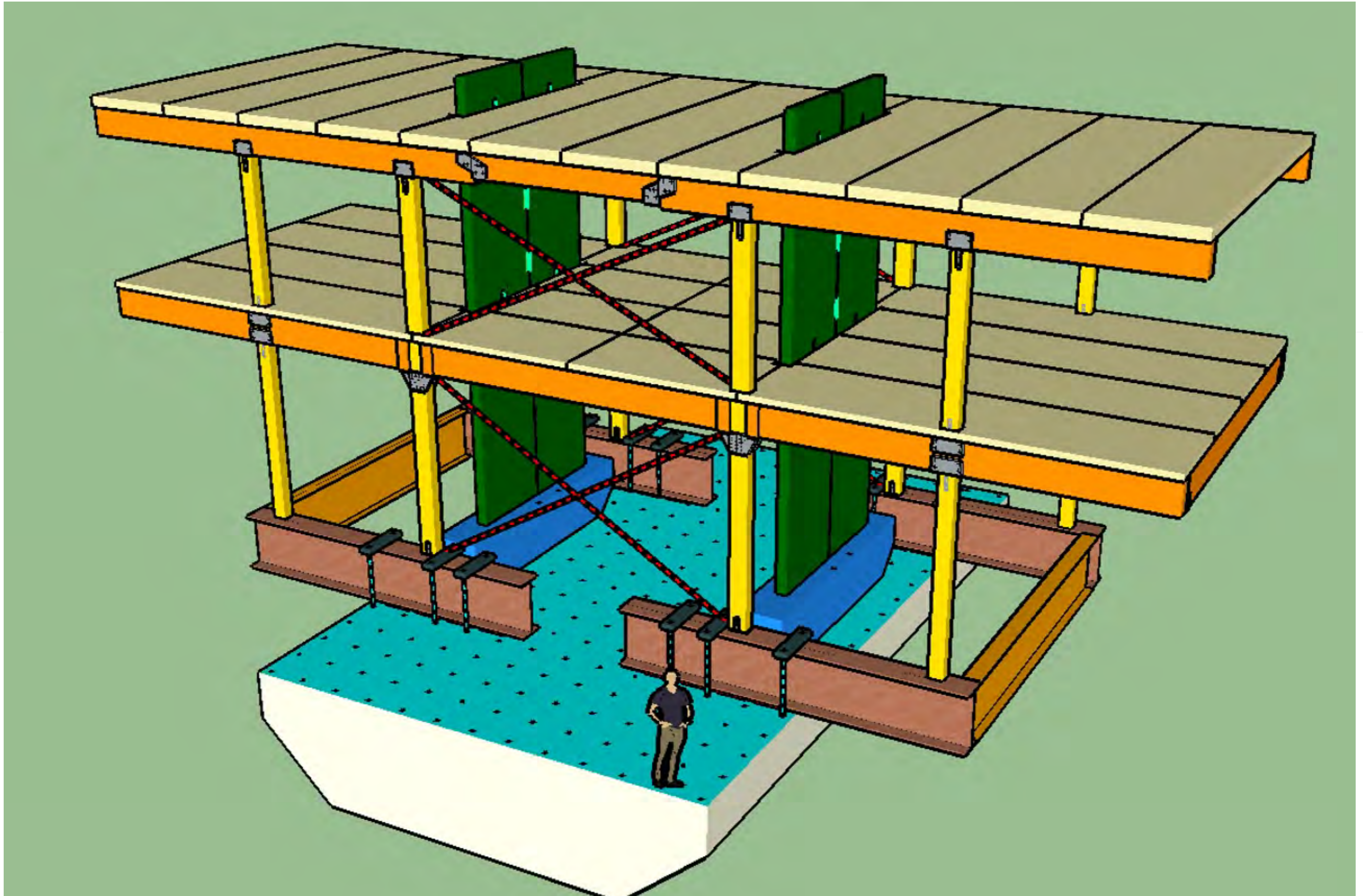
Now for real time examples!



UCSD Shake Table Tests

- Development and Validation of a Resilience-based Seismic Design Methodology for Tall Wood Buildings: Phase I Test
- demands for tall residential and mixed-use buildings in the range of 8~20 stories are increasing.
- One new structural system in this height range are tall wood buildings which have been built in select locations around the world using a relatively new heavy timber structural material known as cross laminated timber (CLT).
- The majority of existing tall CLT buildings are located in non-seismic or low-seismic regions of the world.

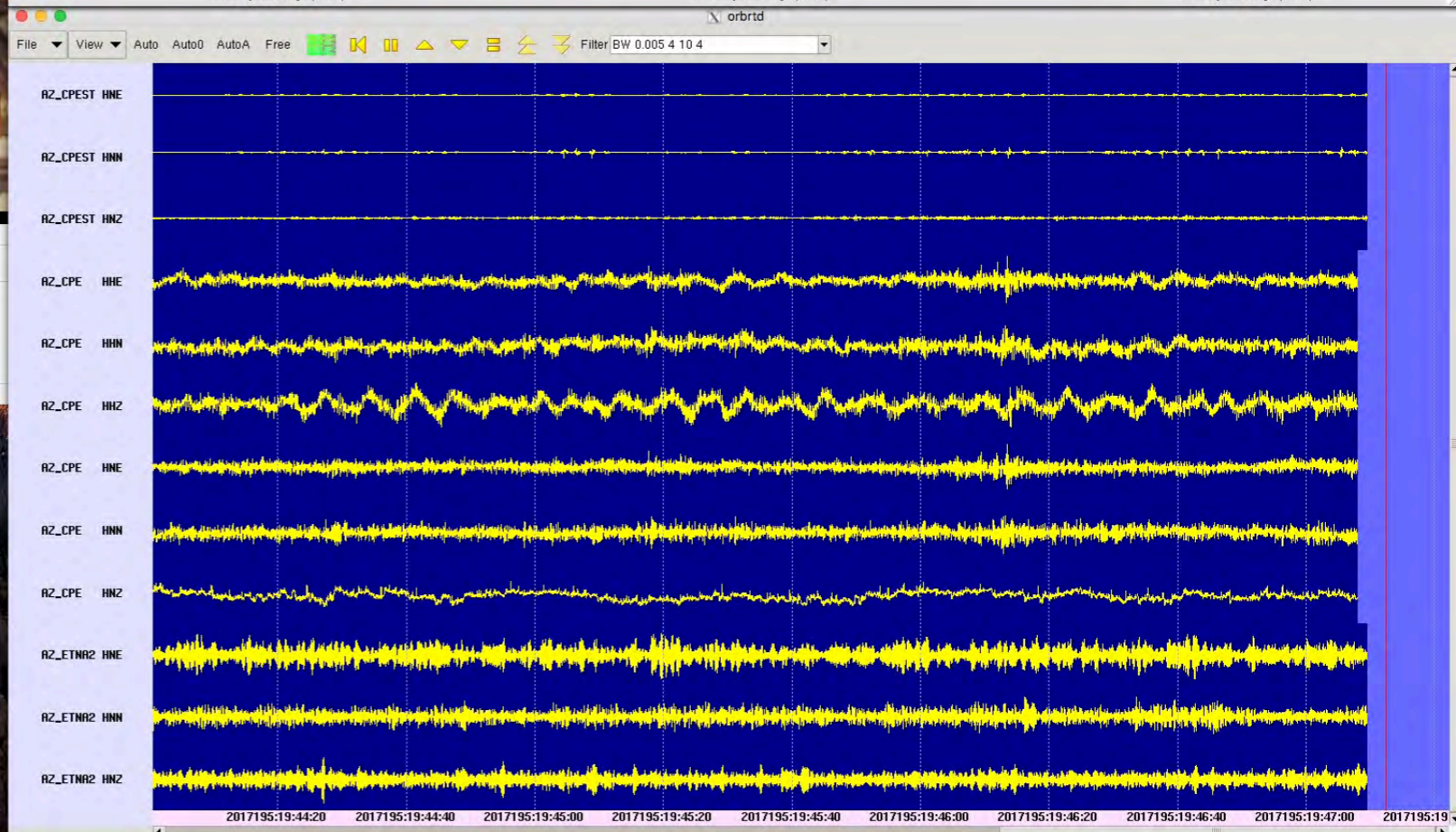
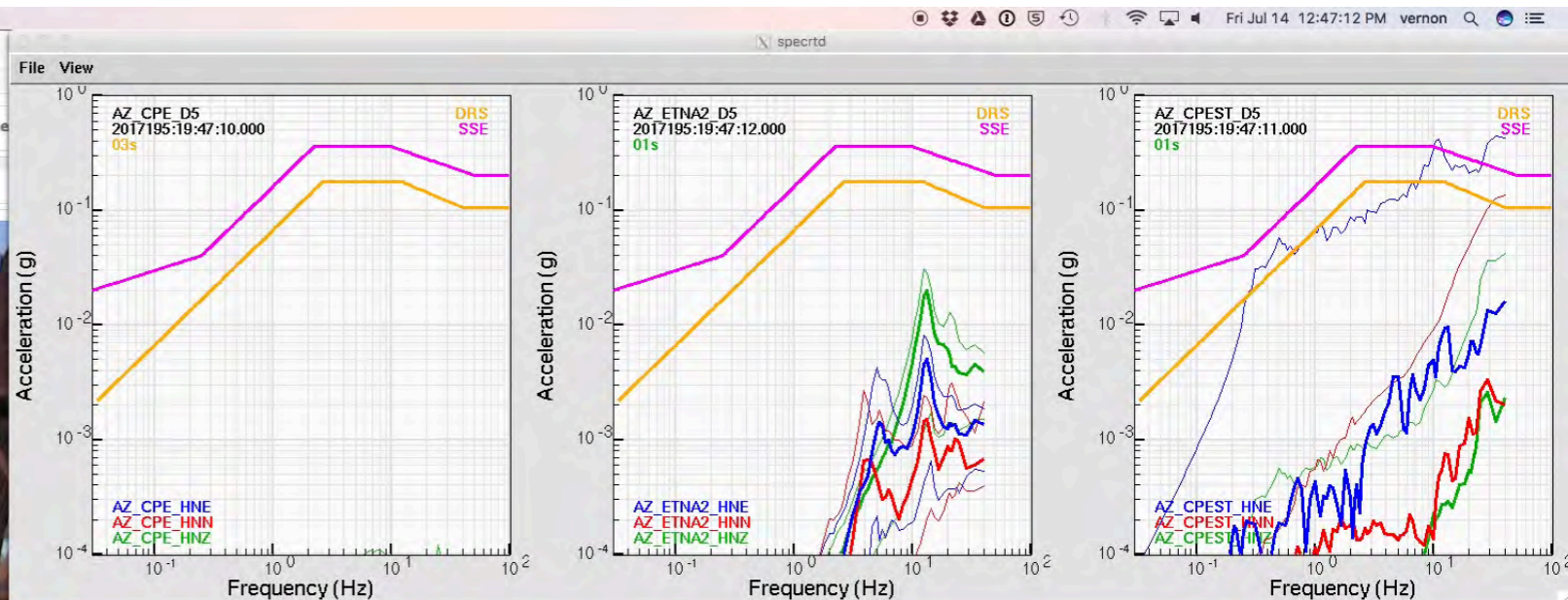
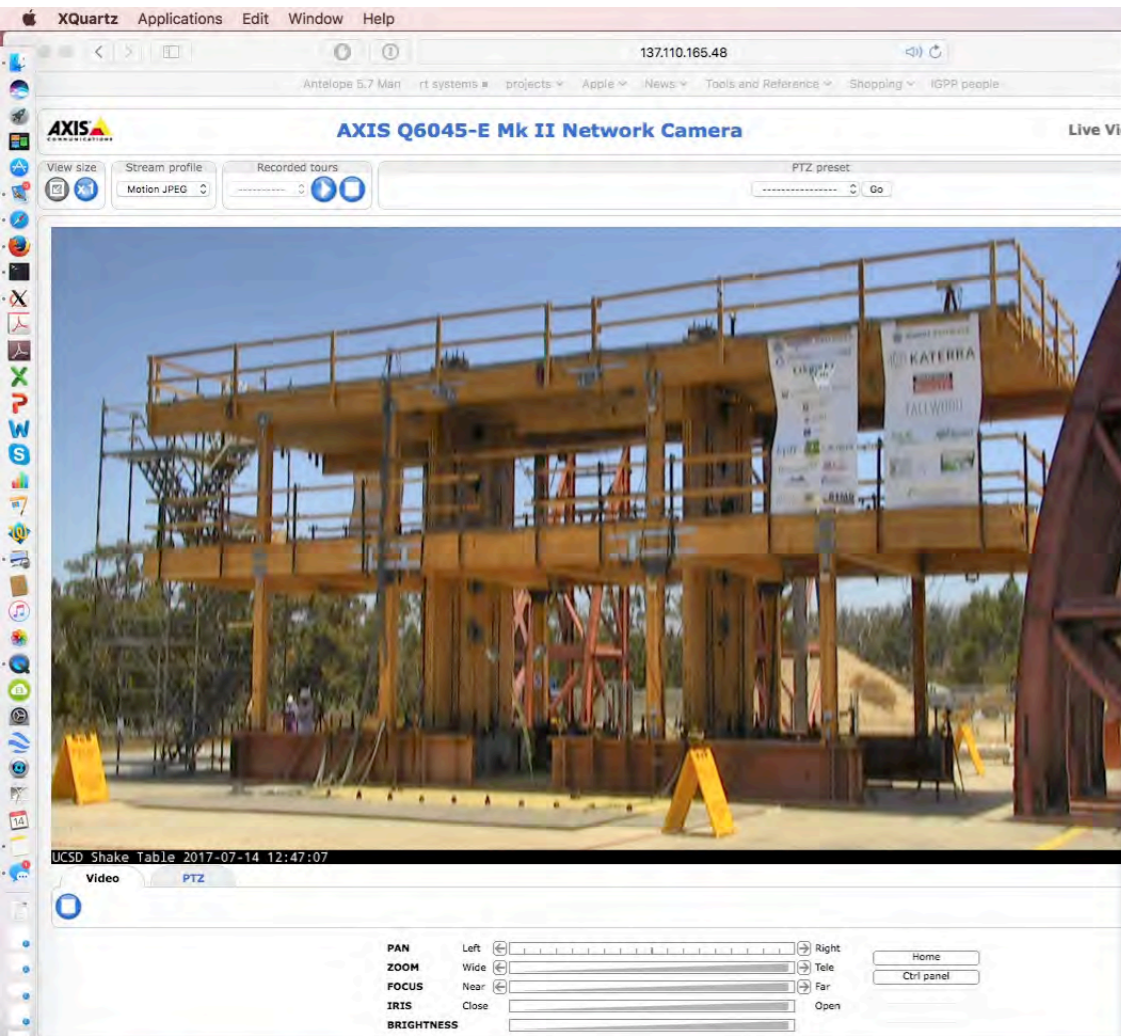
UCSD Shake Table Tests



UCSD Shake Table Tests



Loma Prieta - Design Baseline Eq



Northridge - Max Credible Eq * 1.2

