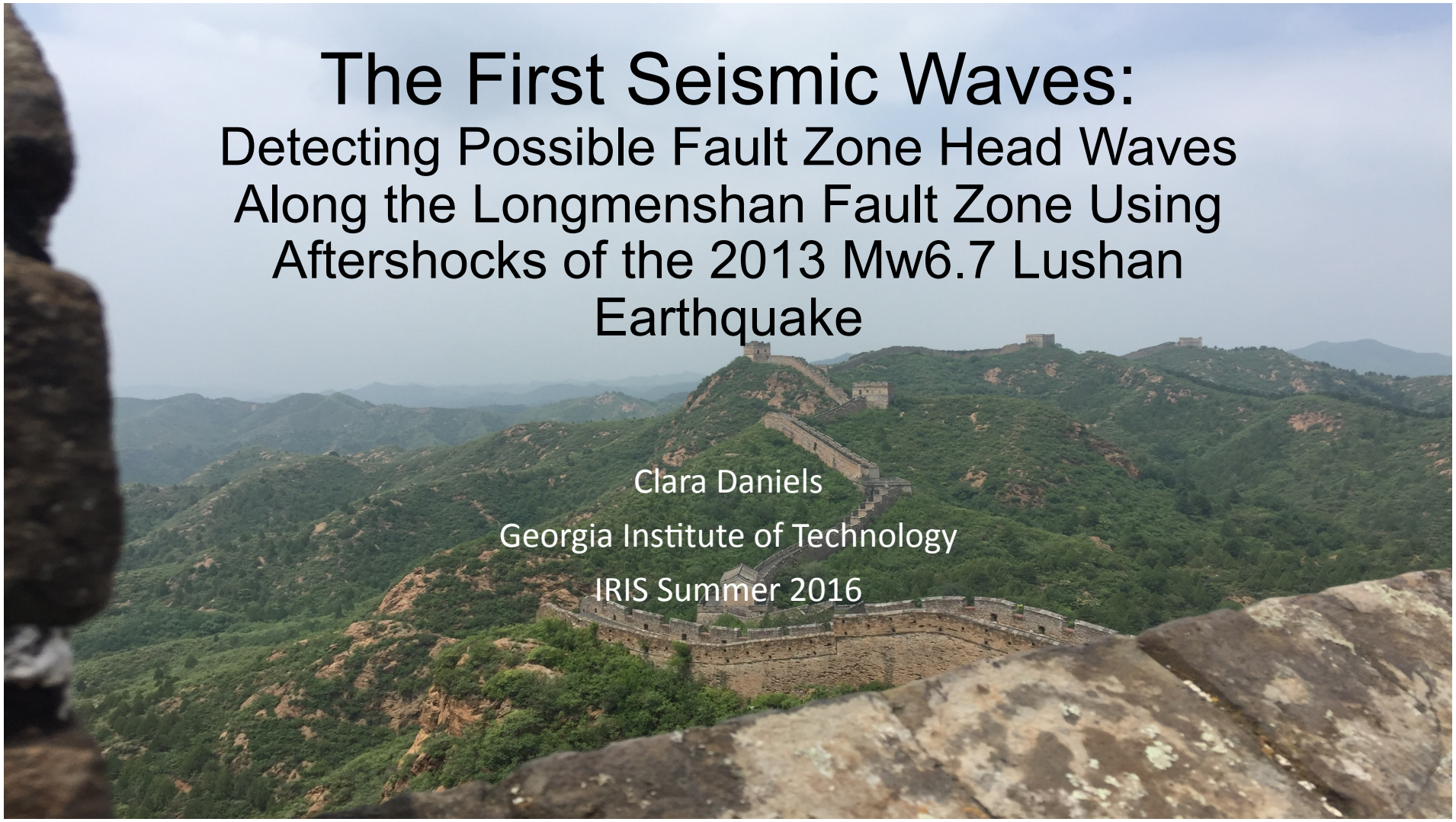


The First Seismic Waves:
Detecting Possible Fault Zone Head Waves Along the Longmenshan Fault Zone Using Aftershocks of the 2013 Mw6.7 Lushan Earthquake

Clara Daniels

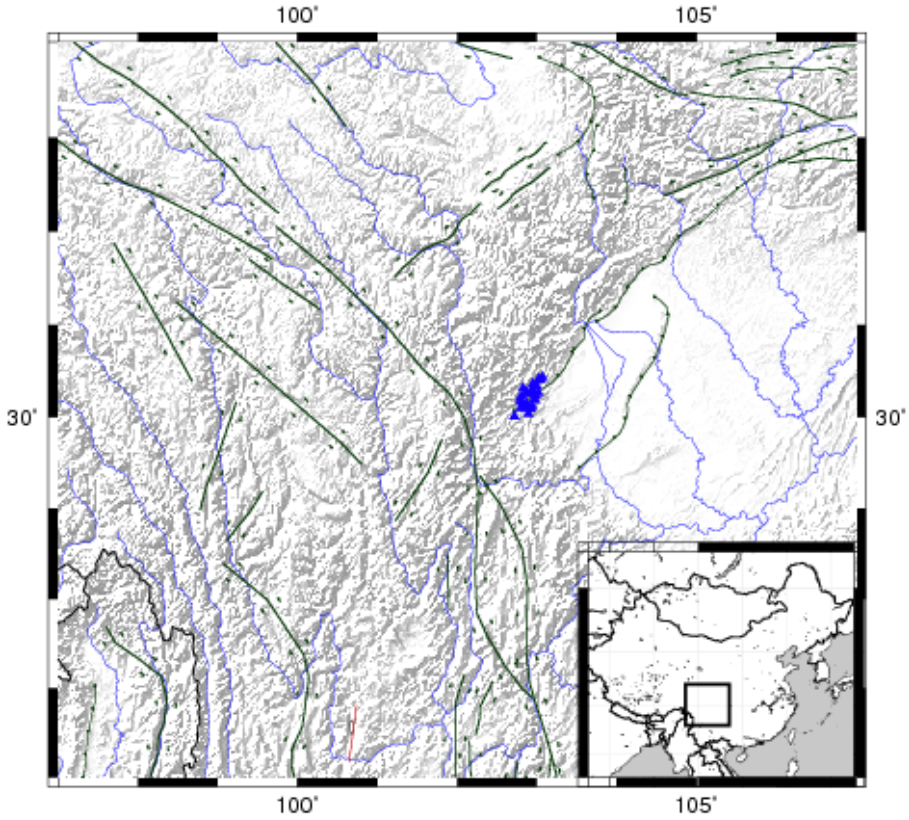
Georgia Institute of Technology

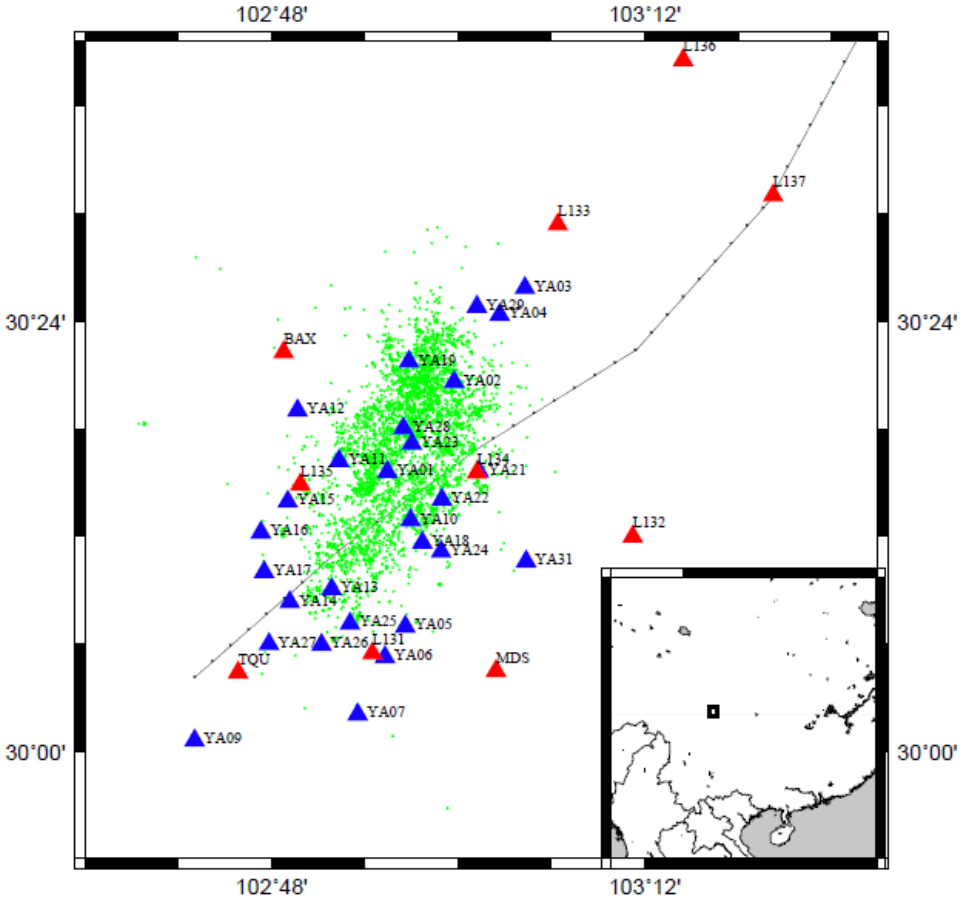
IRIS Summer 2016

Project Summary

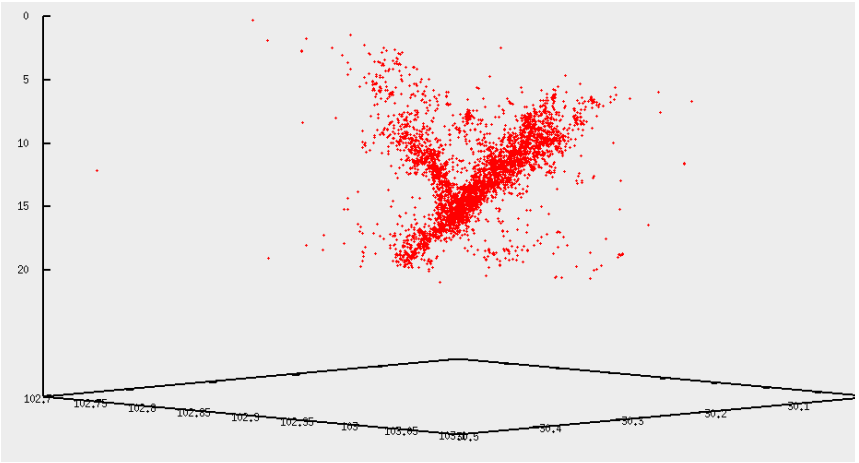
- So far, FZHW are only studied on strike-slip faults or subduction zones. Finding evidence for them on a thrust fault would help clarify the tectonic setting of the Longmenshan Fault
- Use a catalog of earthquakes to search for spatio-temporal evolutions around mainshock (FZHW)
  - Find patterns in first arrivals of seismic waves on waveforms
  - Plot waveforms for stations across different sections of fault

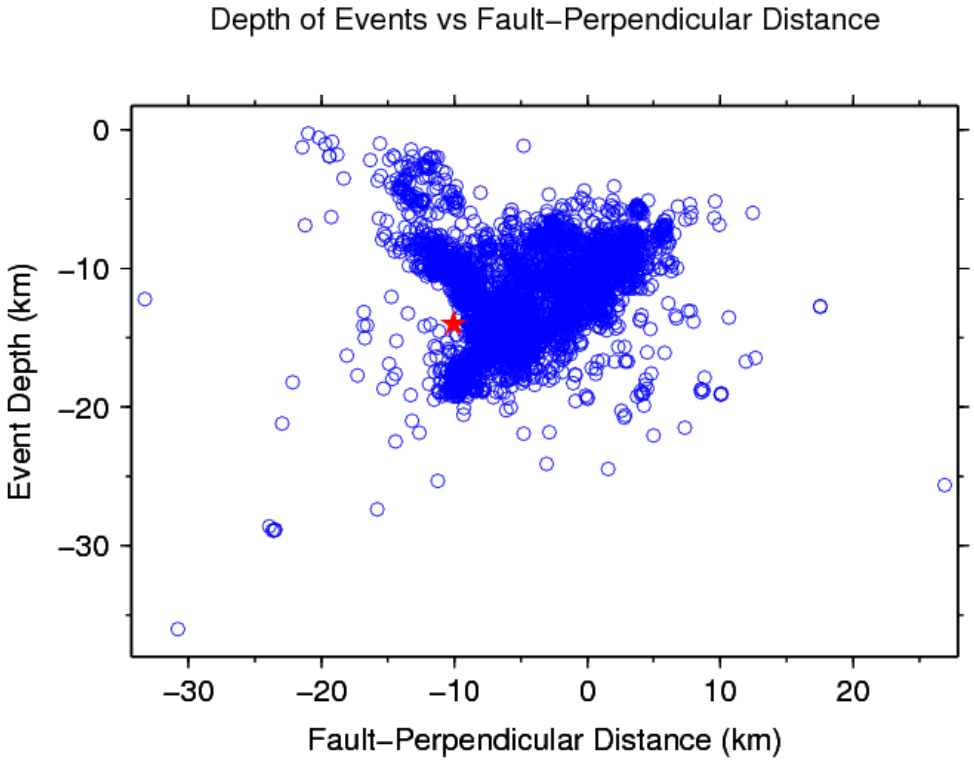
Lushan Region Map



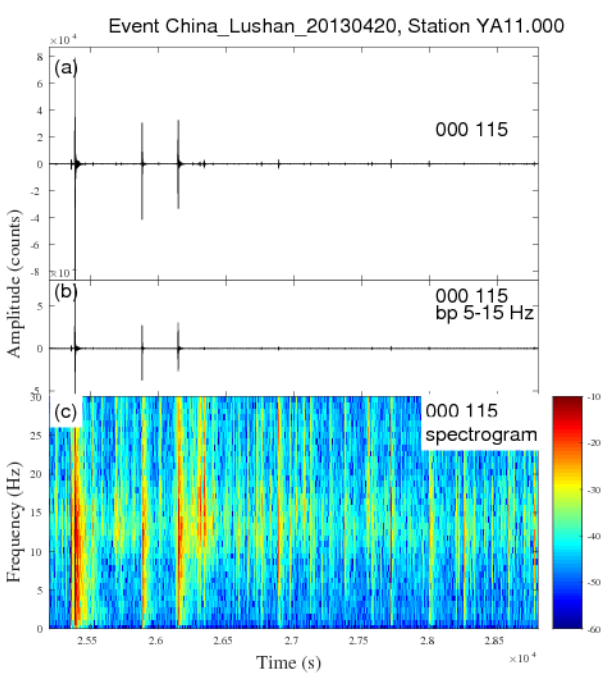


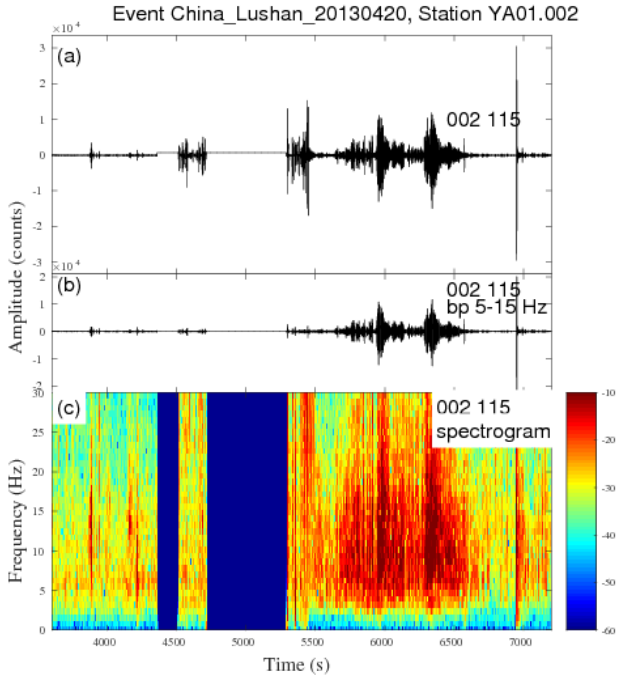
3D map of Event Locations

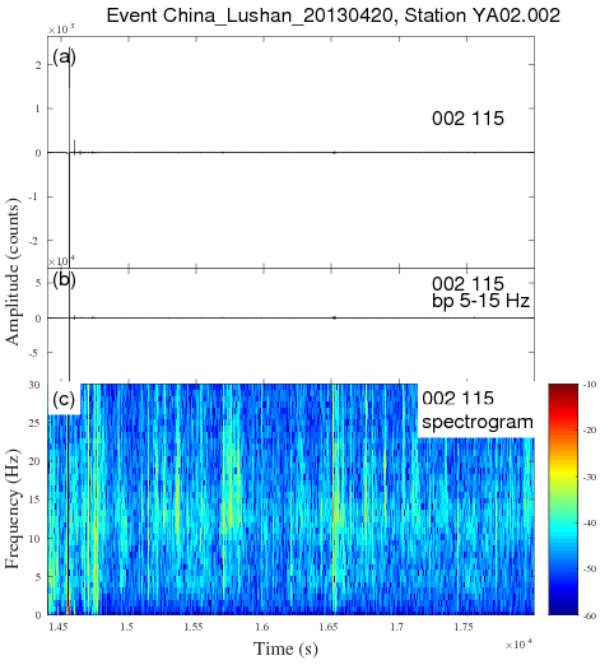




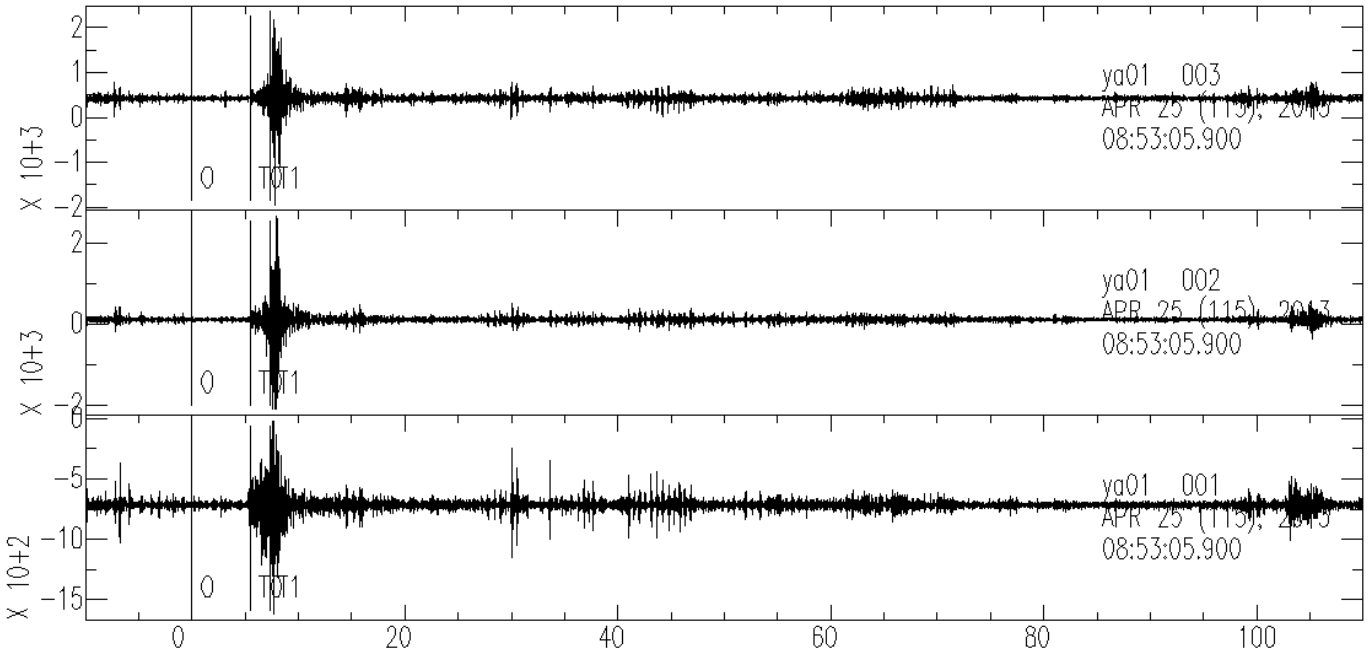
Filtering: Spectrograms



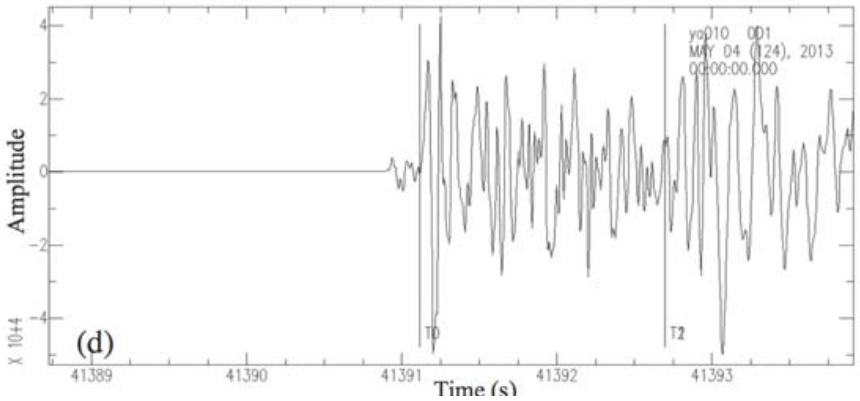


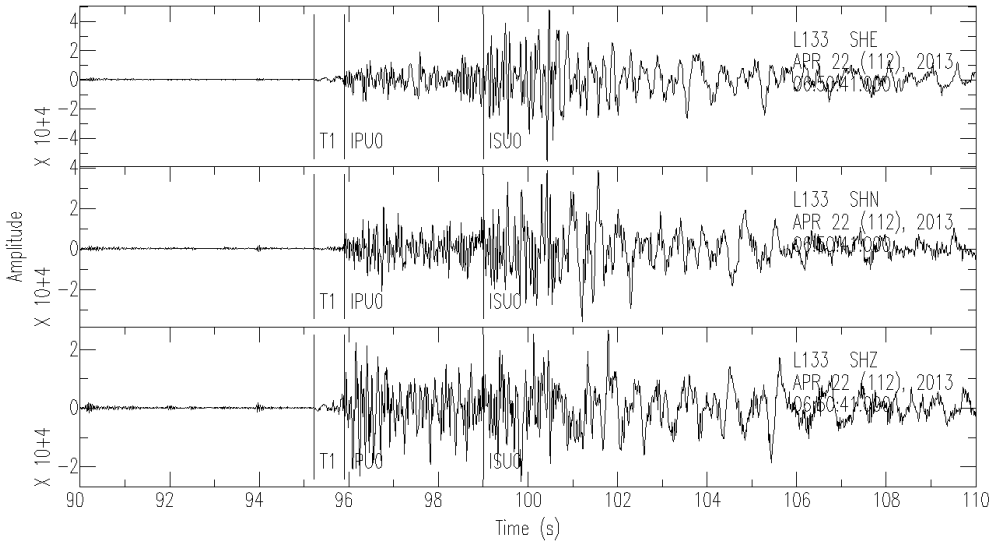


Example Template

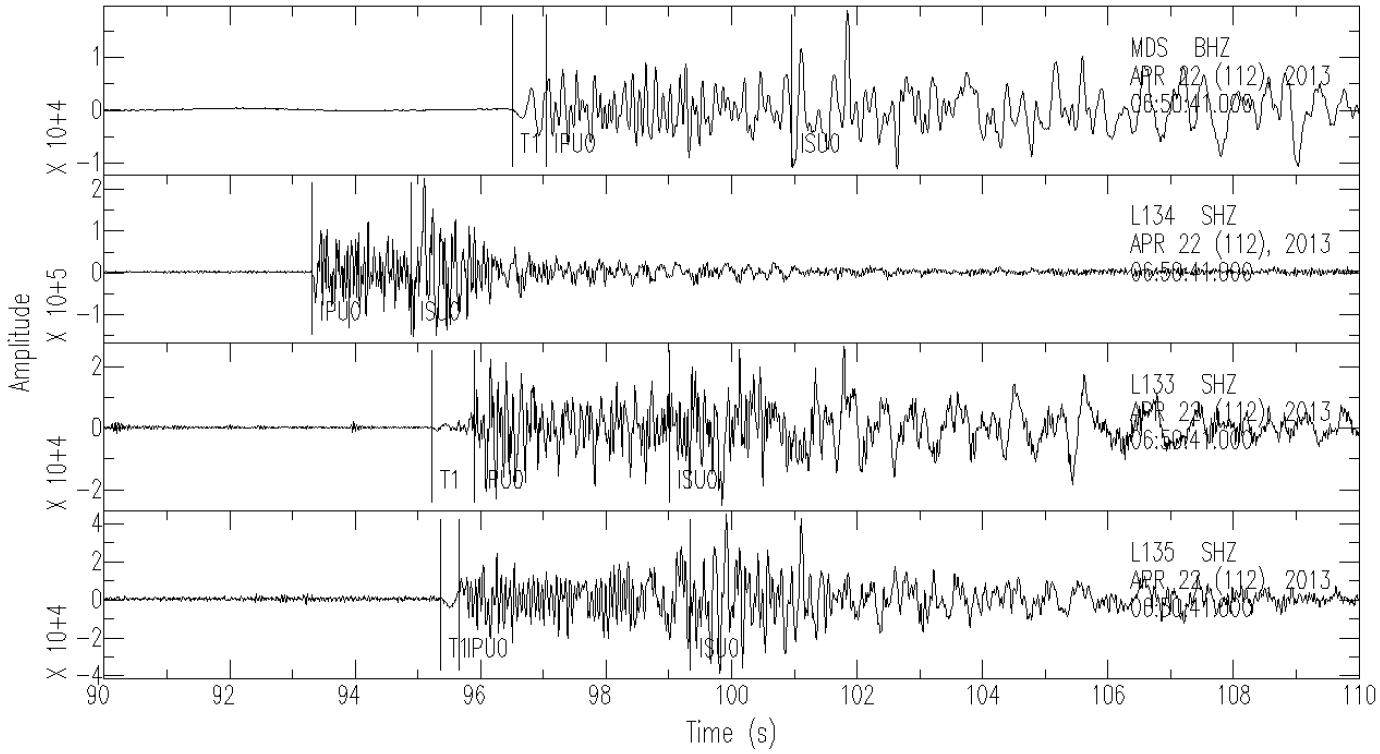


Search for FZHW: Example of FZHW's

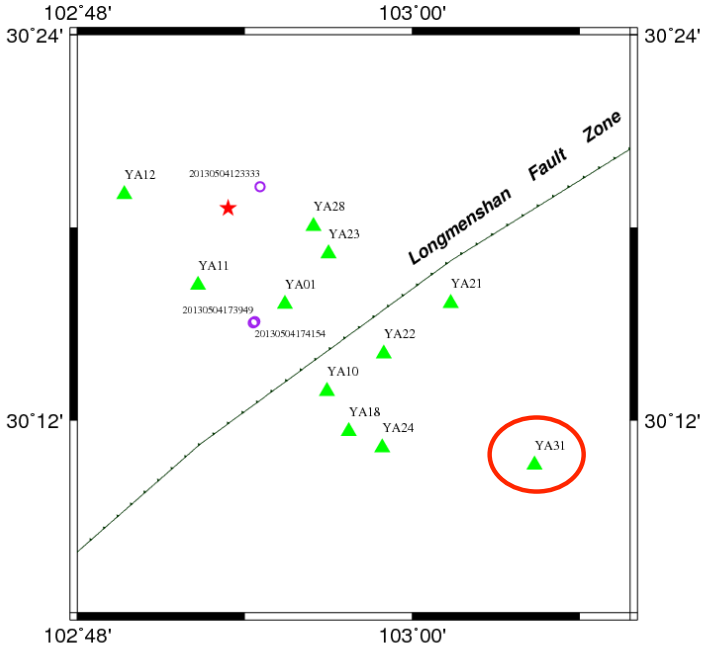


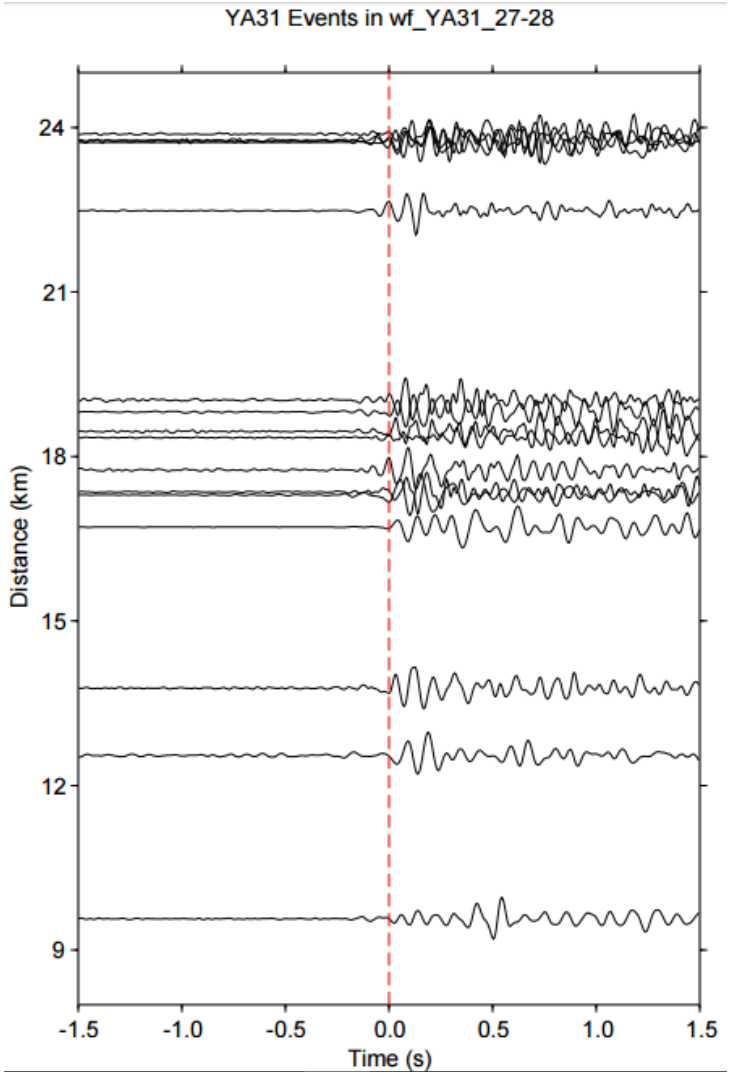


Examples of potential FZHW

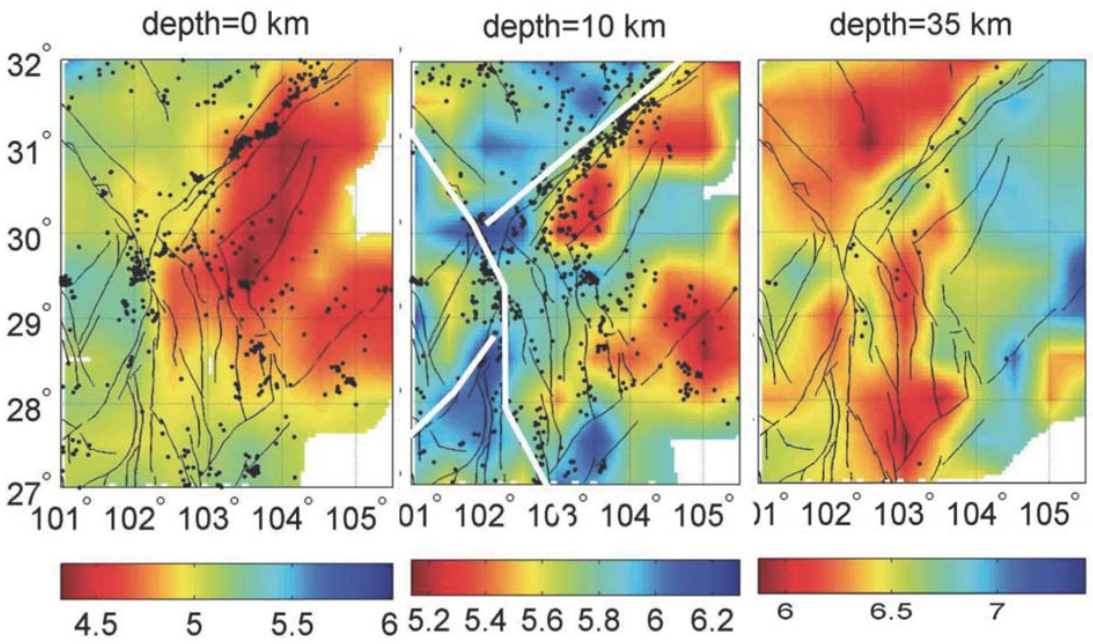
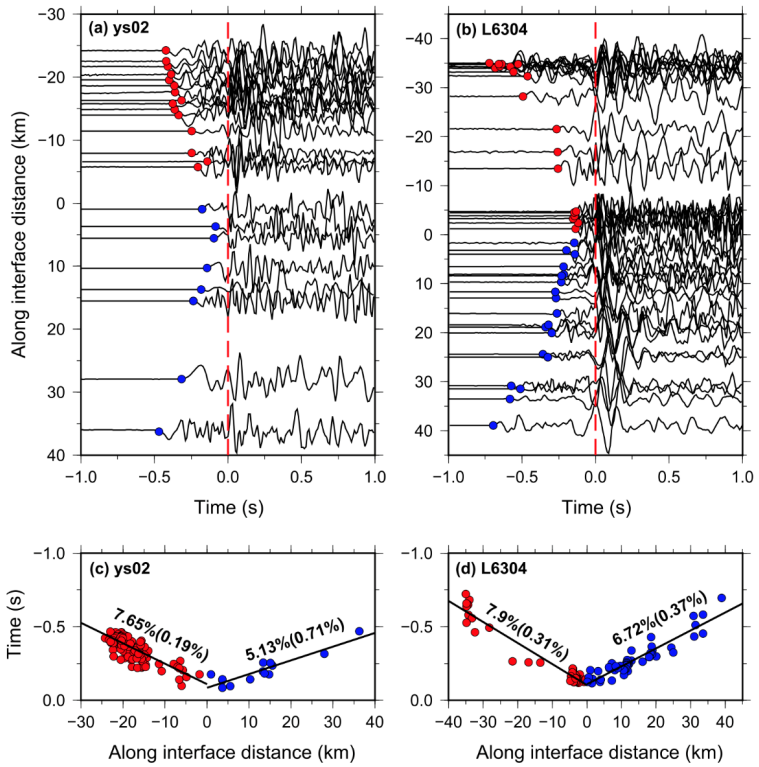


Station YA31: Promising Waveforms across several events





Dependence of P-wave velocity on depth



Moveout between P waves and FZHW (Garze-Yushu Fault)