

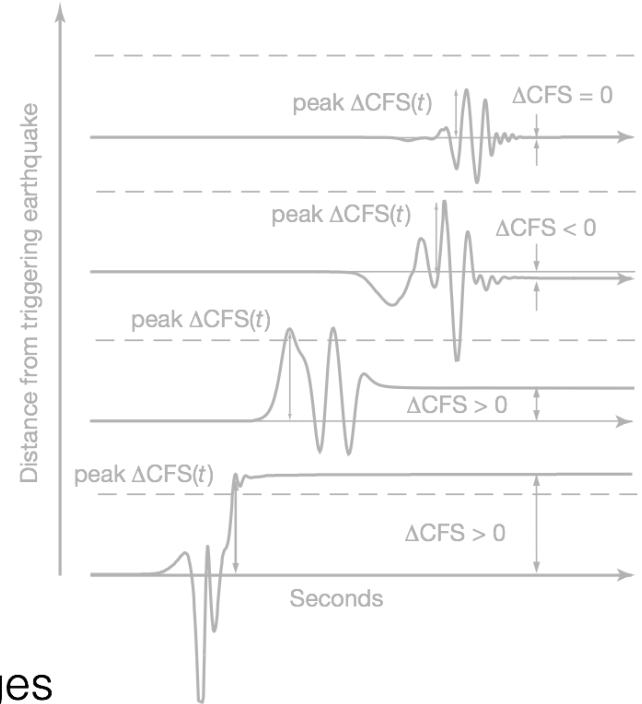
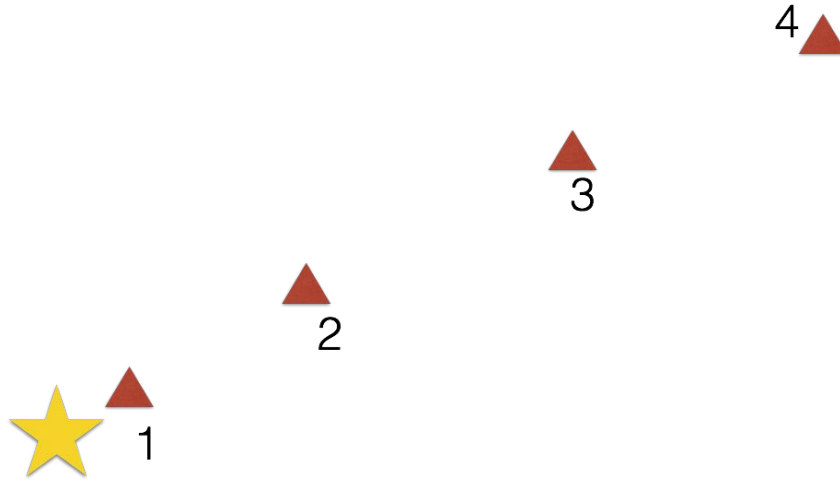
The background of the slide is a faded, grayscale image of the main cast of the television show 'The Big Bang Theory'. The characters are arranged in a group, with some in the foreground and others slightly behind, all looking towards the camera with neutral to slightly smiling expressions.

Possible dynamic triggering detection with the OK wavefield experiment

Pawnee Triggers:

Natalie Accardo, Alex Burky, Wenyan Fan, Nick Mancinelli

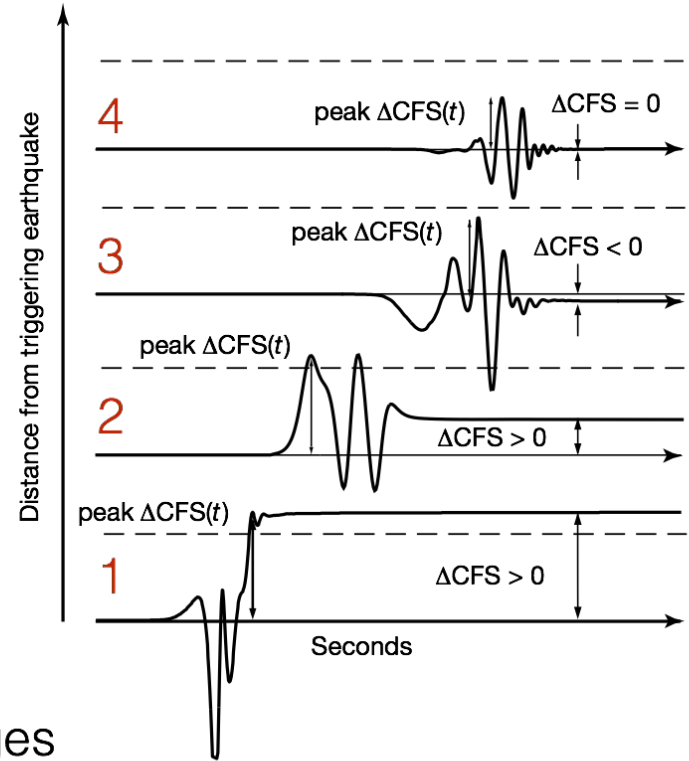
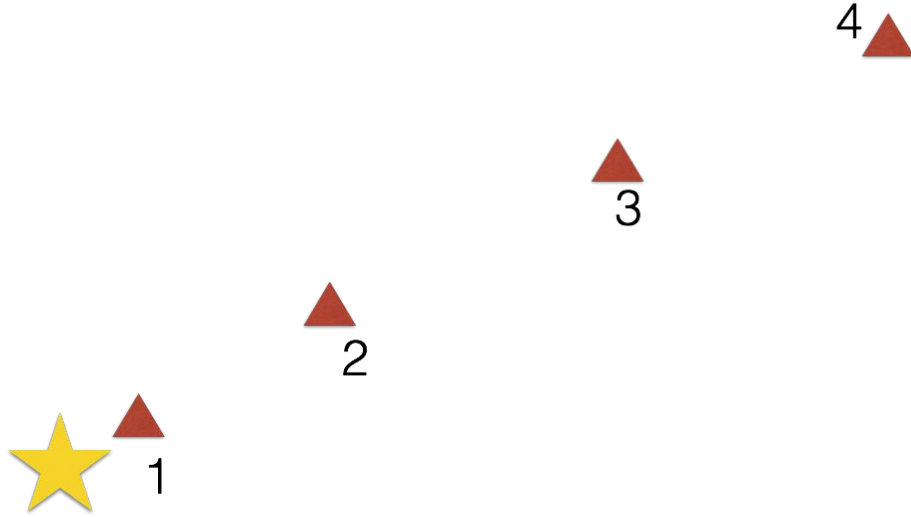
What is earthquake triggering?



$\Delta CFS(t)$: Dynamic Coulomb failure stress changes

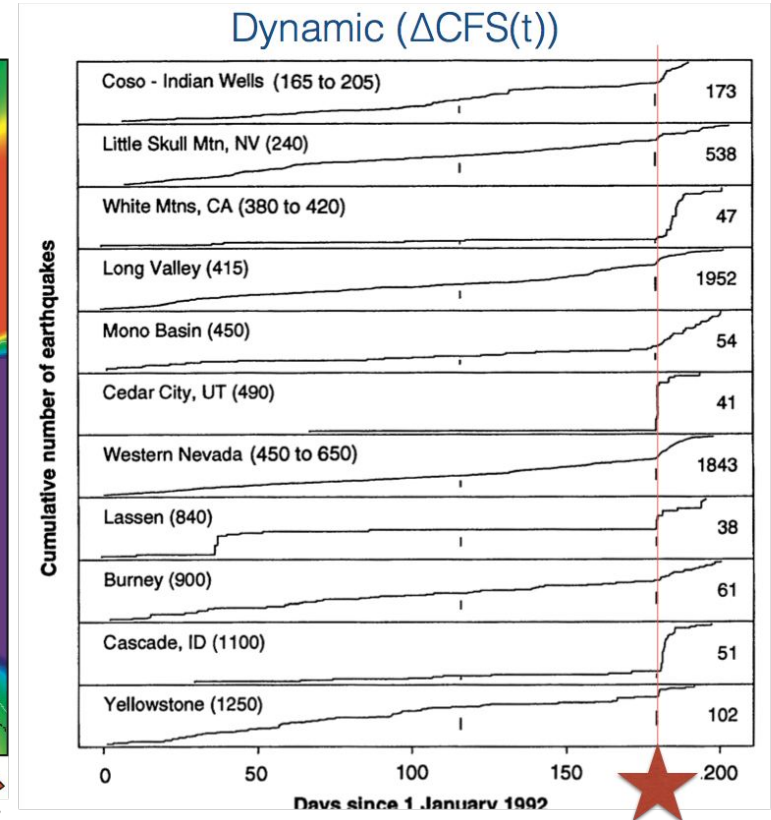
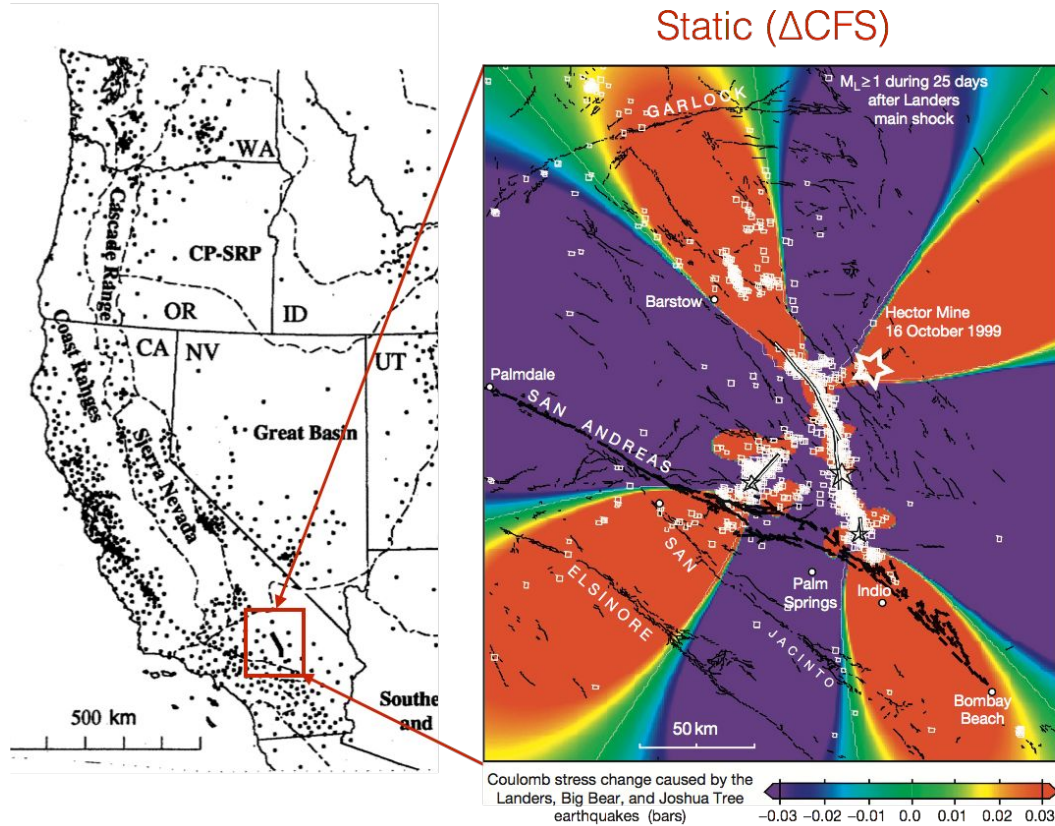
ΔCFS : Static Coulomb failure stress changes

Dynamic and Static Coulomb stress changes



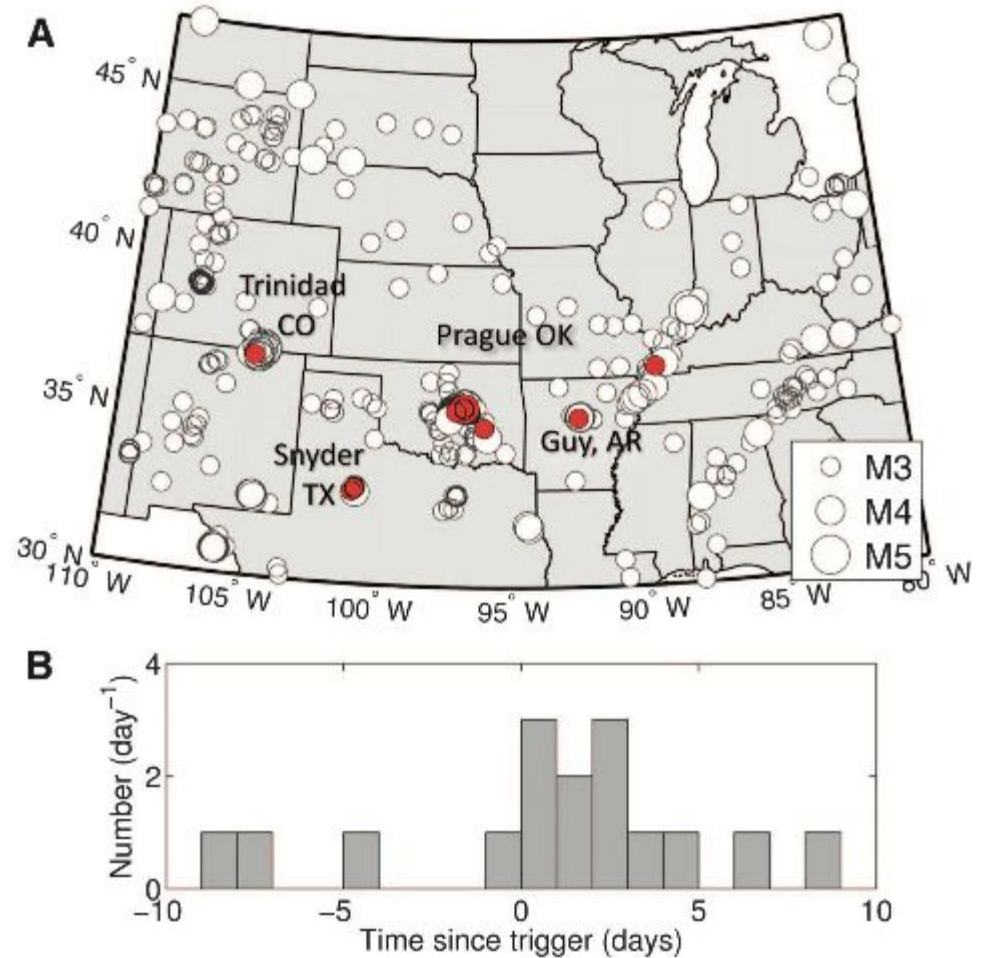
$\Delta CFS(t)$: Dynamic Coulomb failure stress changes
 ΔCFS : Static Coulomb failure stress changes

Dynamic ($\Delta\text{CFS}(t)$) and Static (ΔCFS) Coulomb stress changes

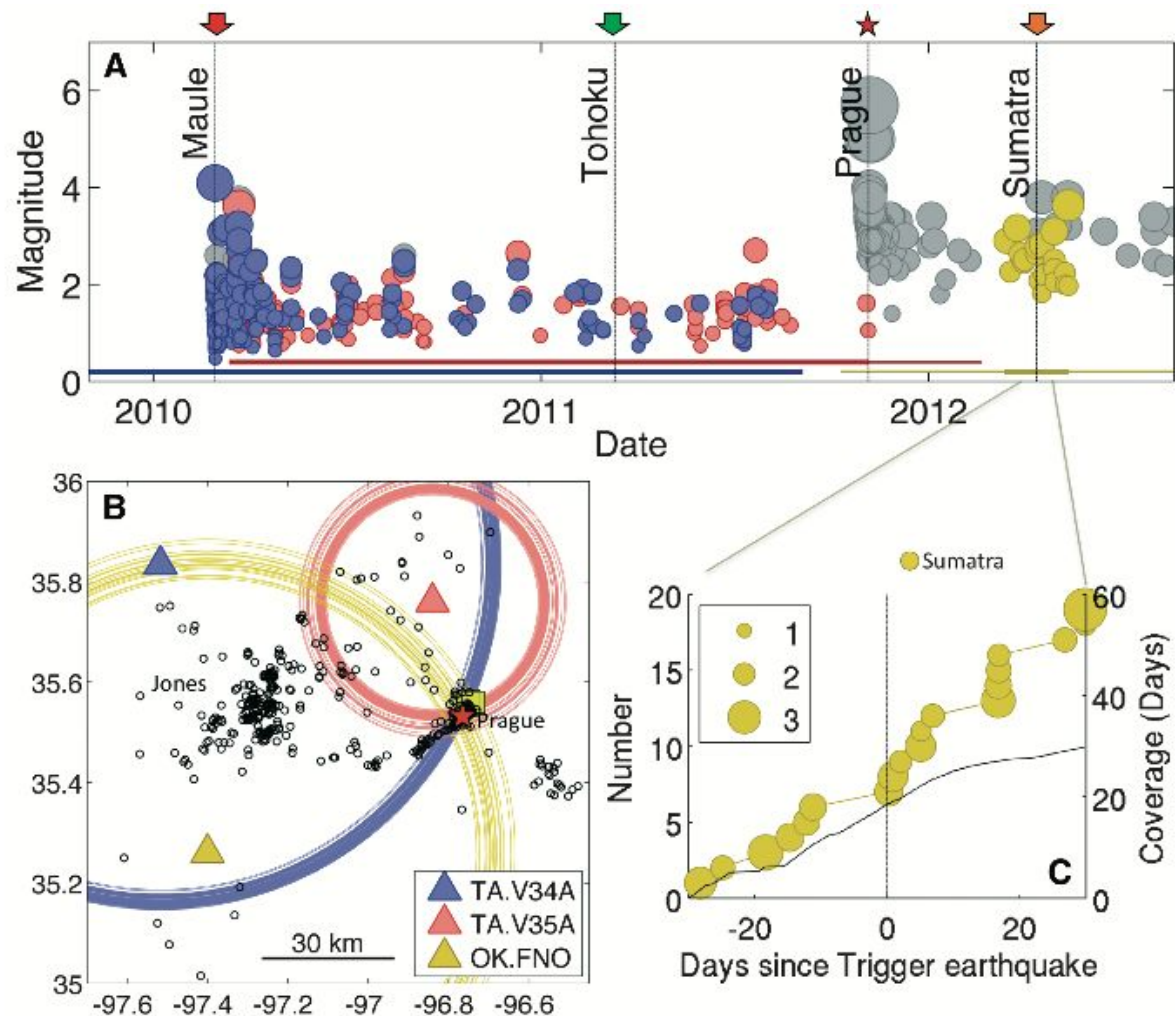


Kilb et al., *Nature*, 2000; King et al., *BSSA*, 1994; Hill et al., *Science*, 1993

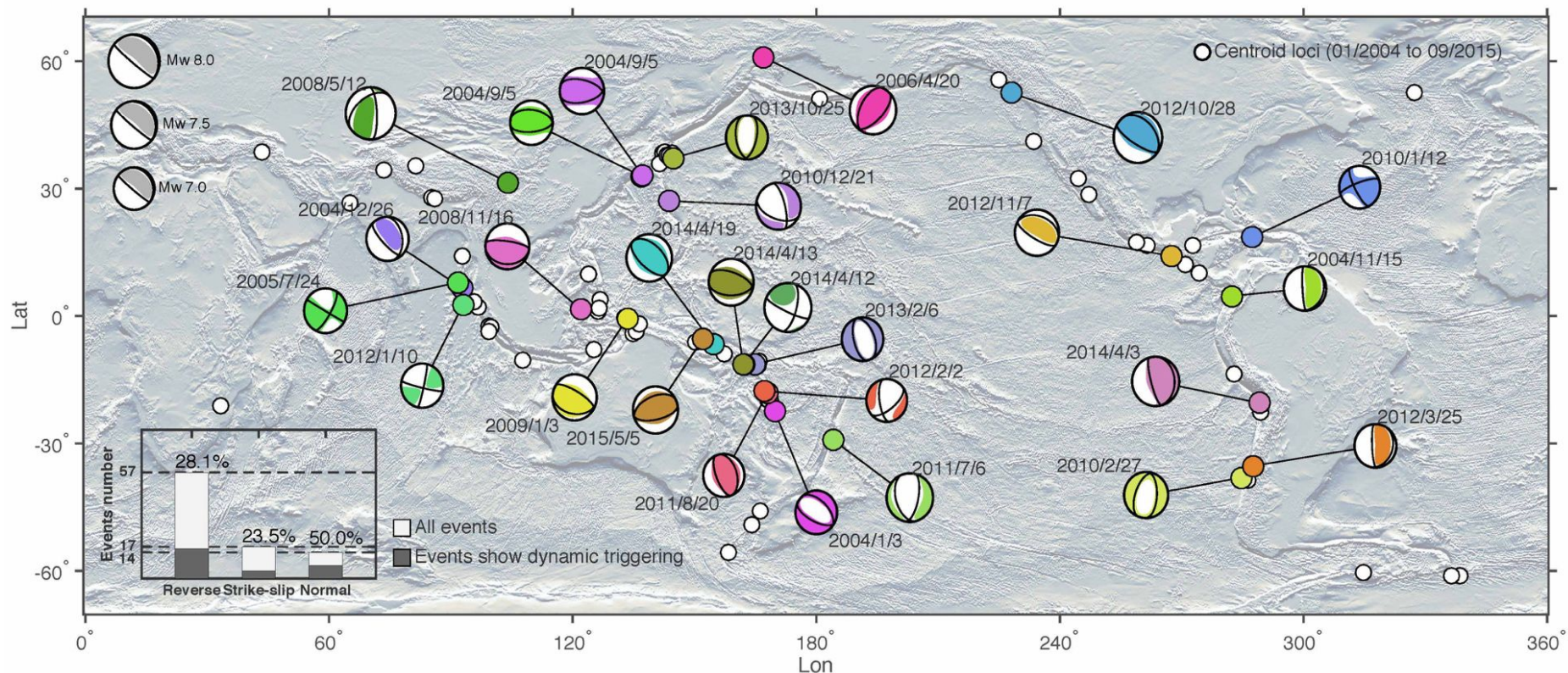
Enhanced Remote Earthquake Triggering at Fluid-Injection Sites in the Midwestern United States



Prague, OK



Local near-instantaneous dynamic triggering of large earthquakes



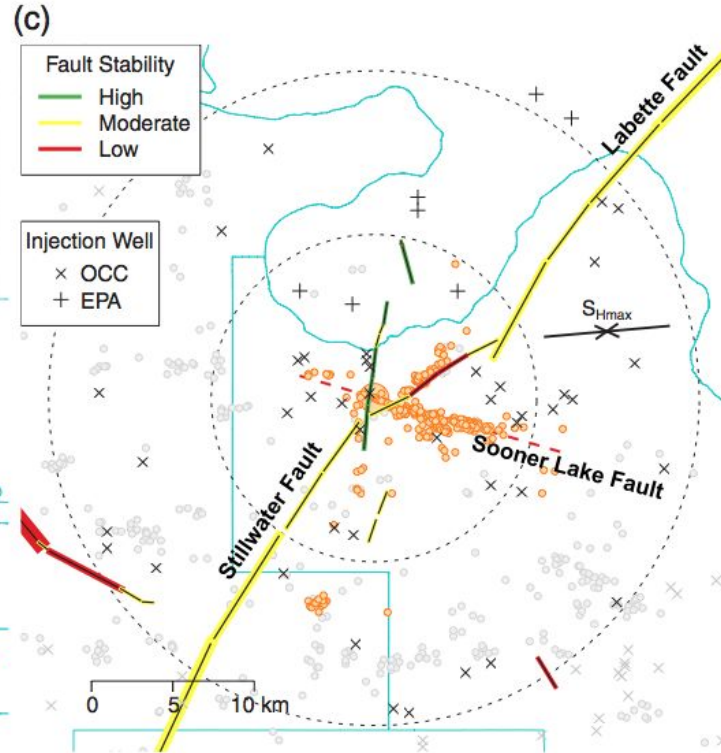
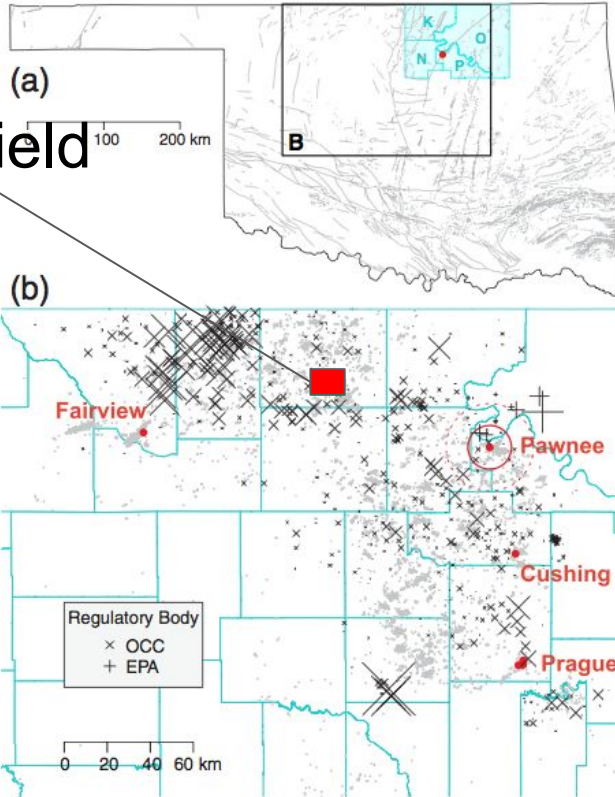
Question:

Can regional M5 earthquake ($> 50\text{km}$) also dynamically trigger earthquakes near injection fields?

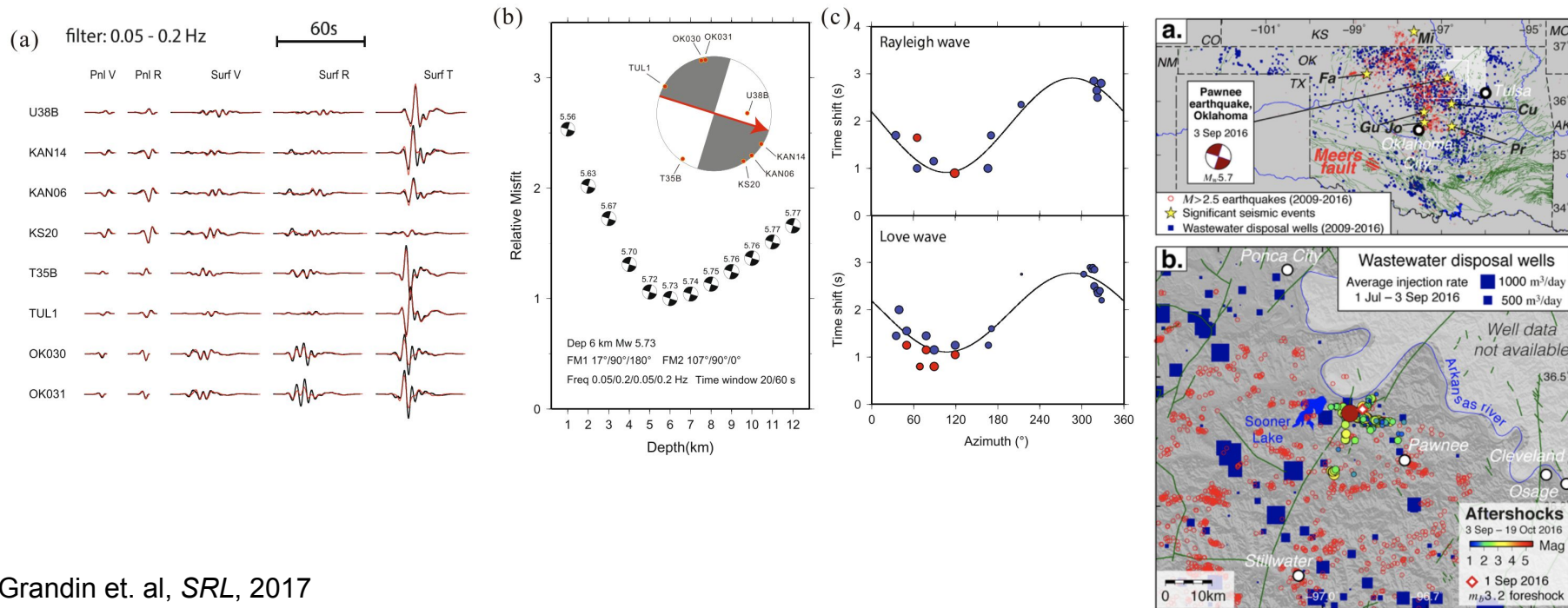
We use the wavefield Golay array to detect possible dynamically triggered earthquakes beneath the array due to the passing waves from the Pawnee Mw 5.8 earthquake.

The Mw 5.8 Pawnee earthquake

Wavefield



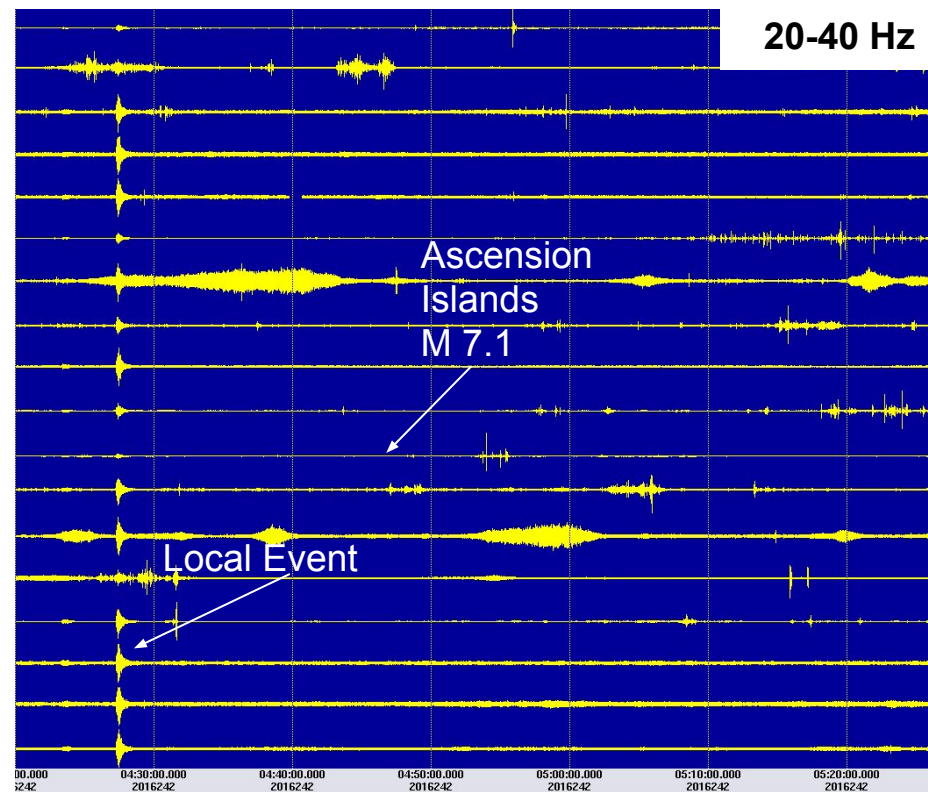
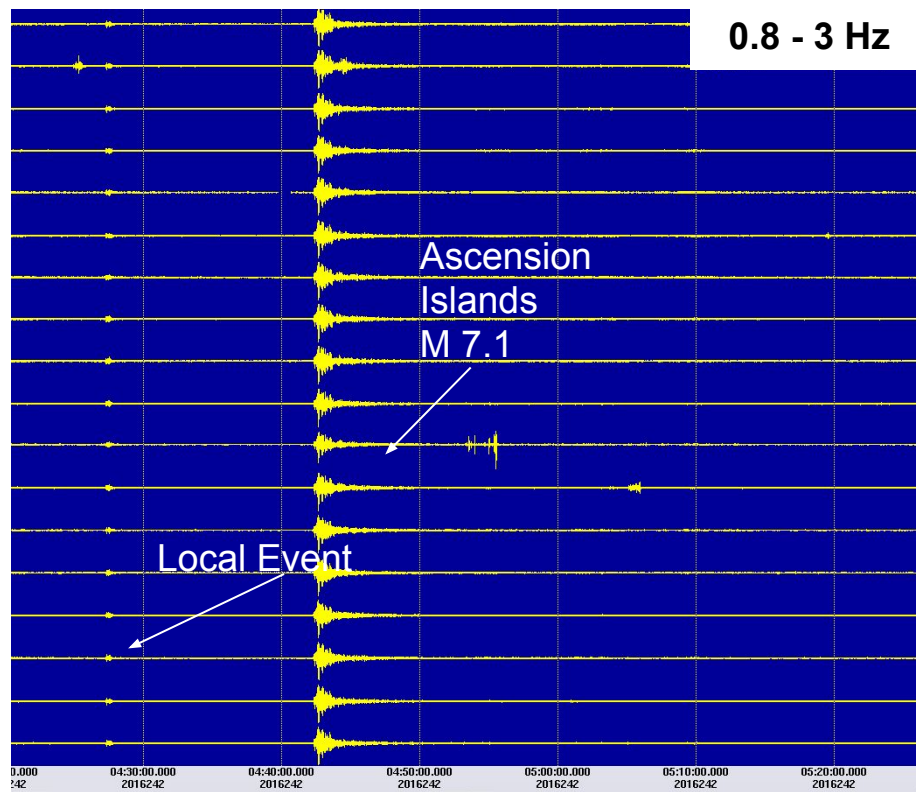
The Mw 5.8 Pawnee earthquake



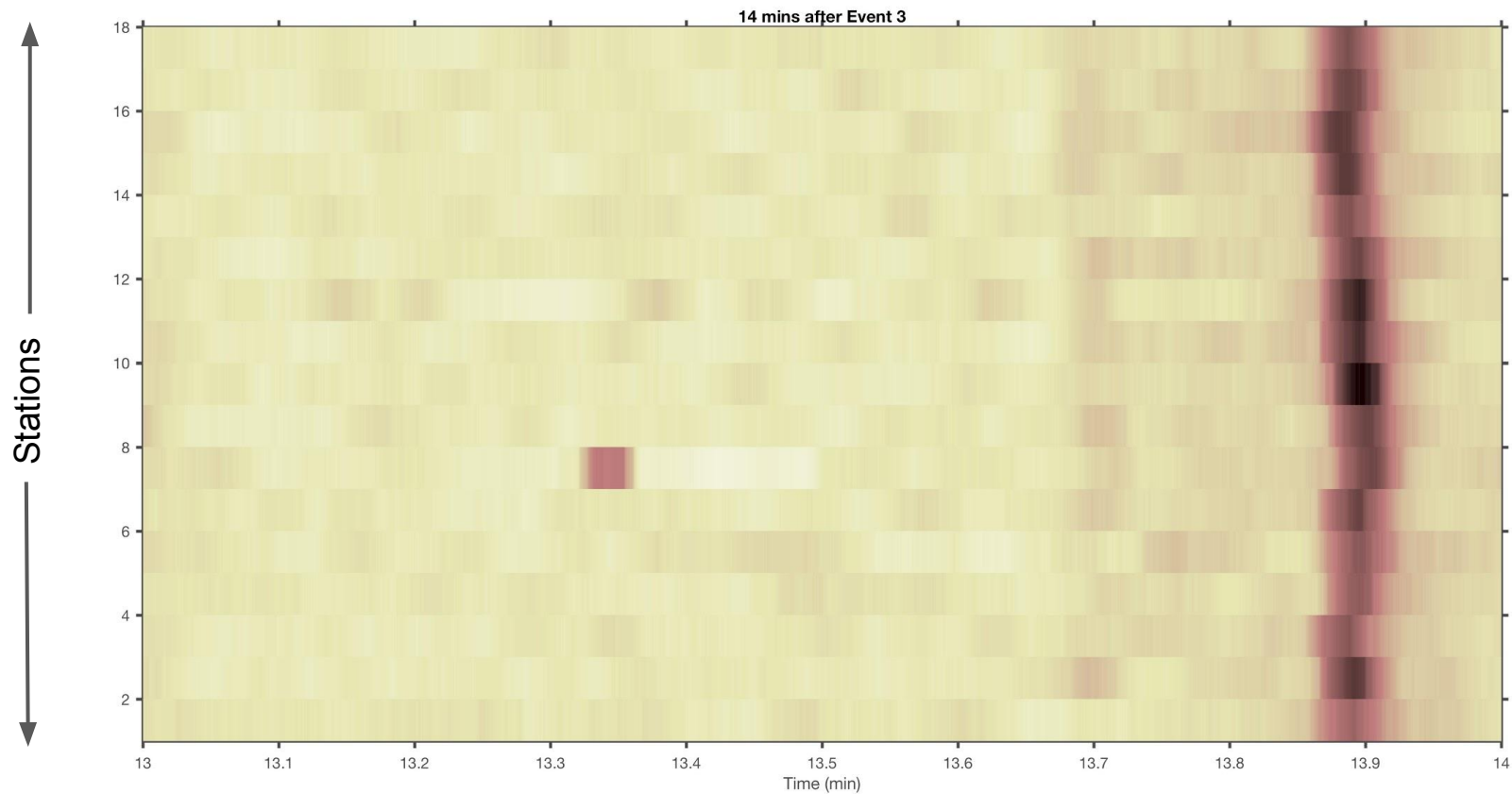
Grandin et. al, *SRL*, 2017

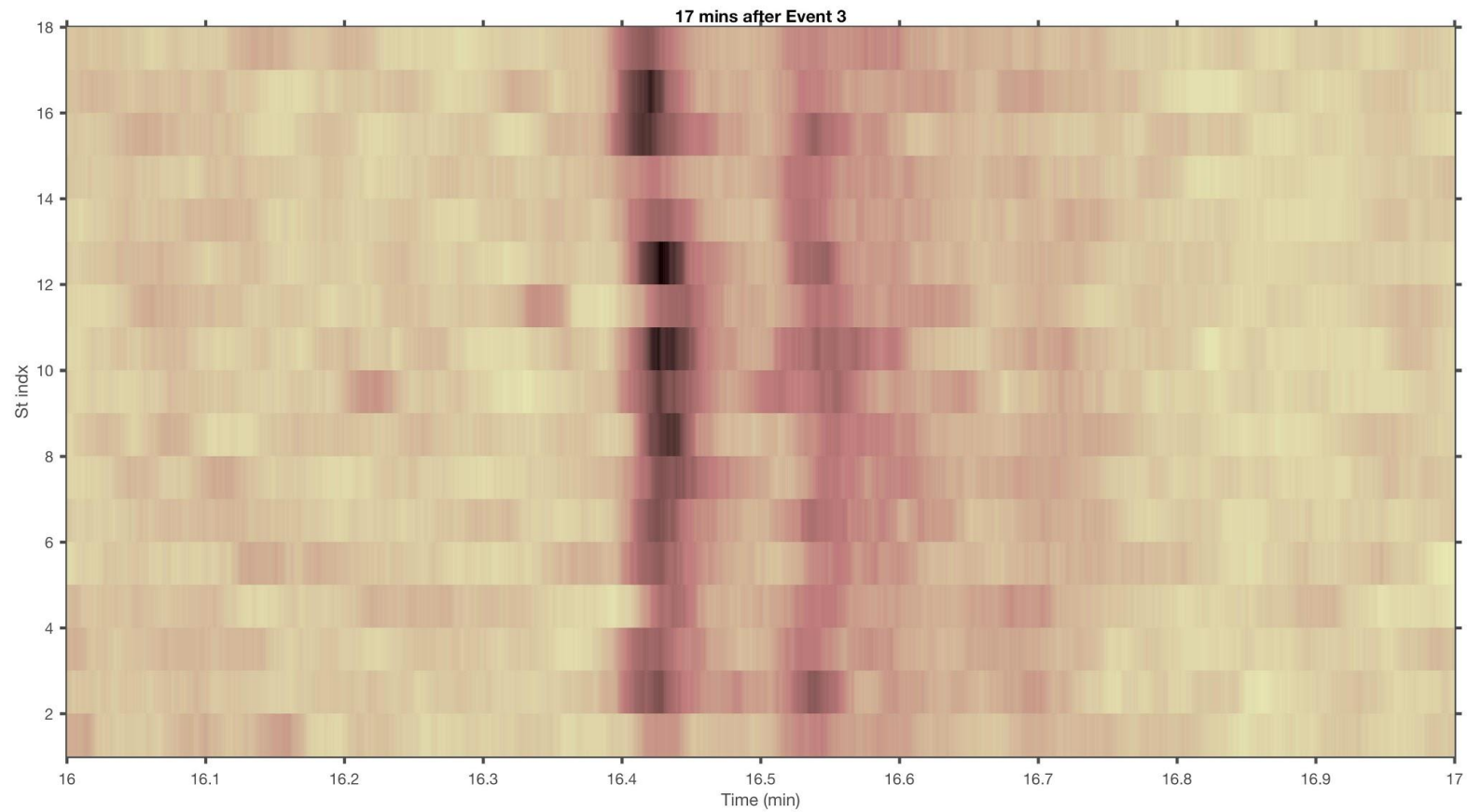
Chen et. al, *Nature*, 2017

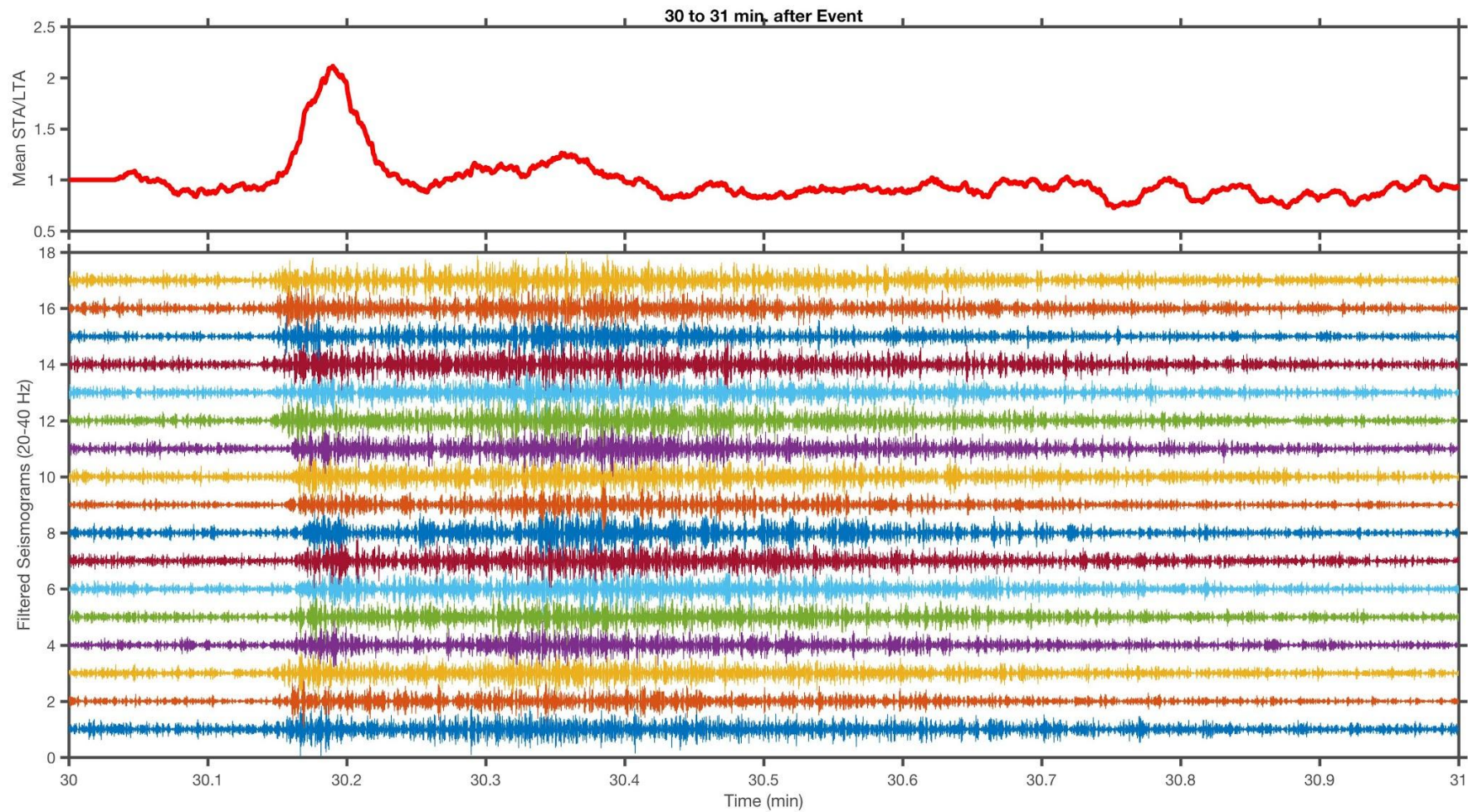
Filtering Teleseismic and Local Events

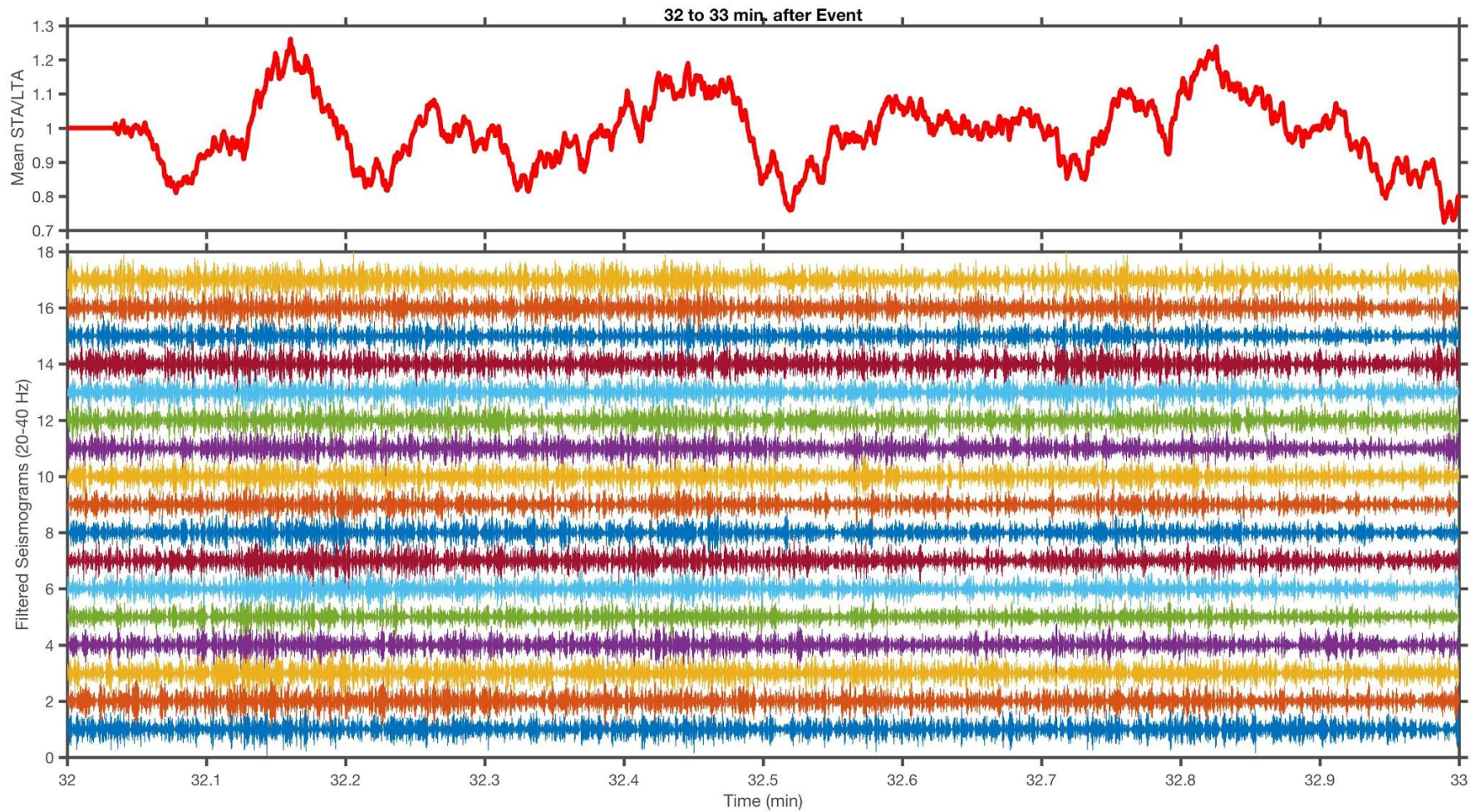


Example of Detections

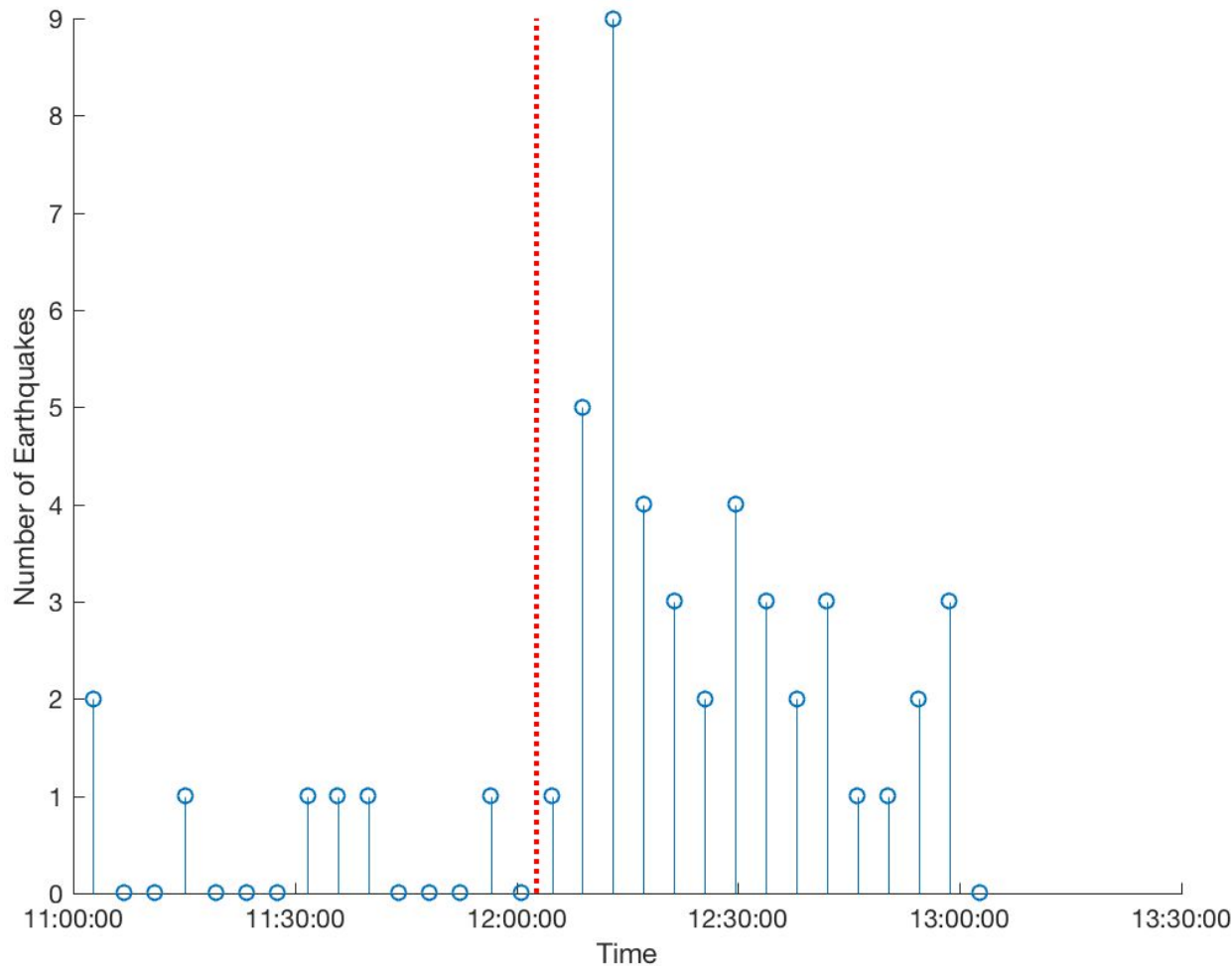




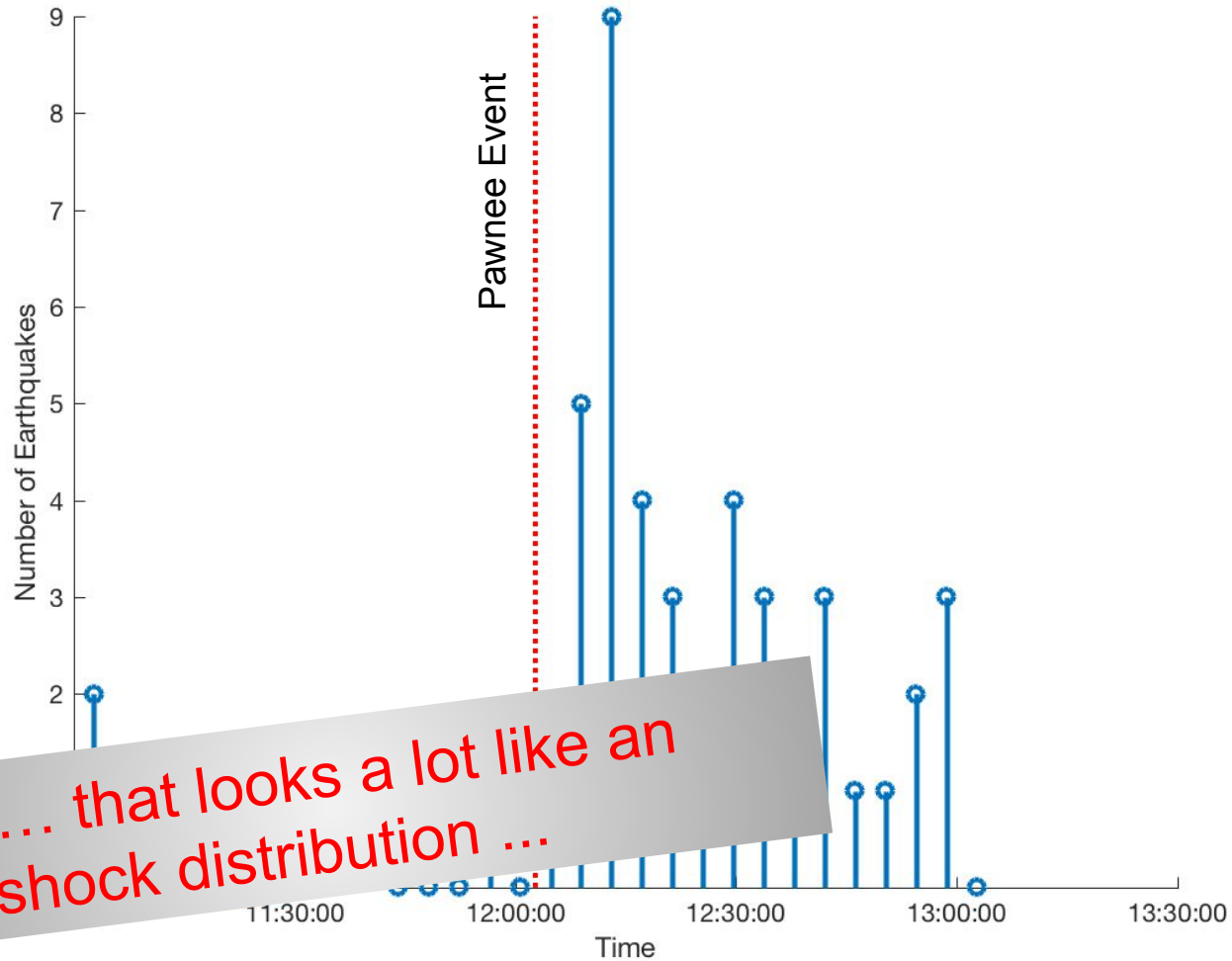


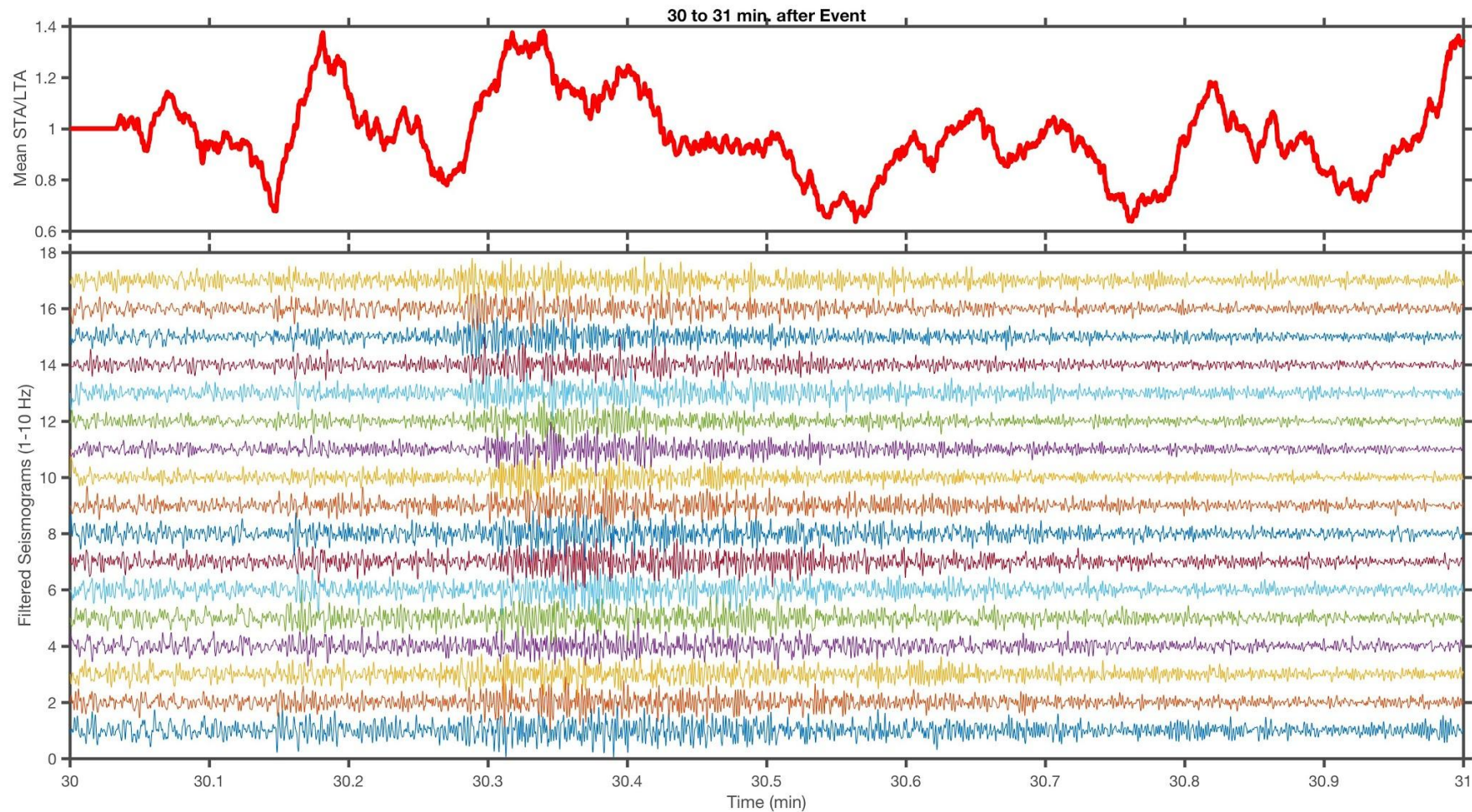


Event Distribution following the Pawnee Event

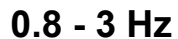


Event Distribution following the Pawnee Event





Can we see the Pawnee event at high frequency?

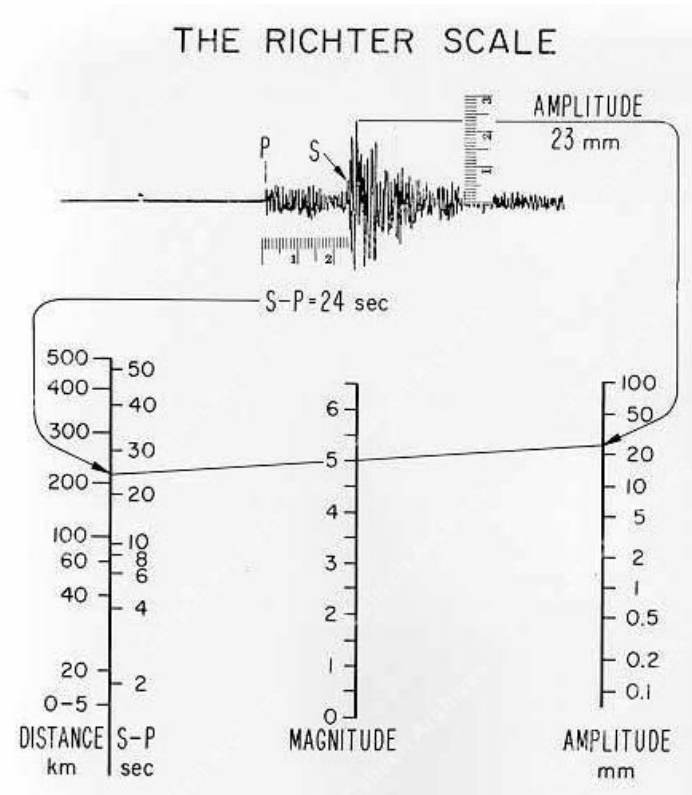
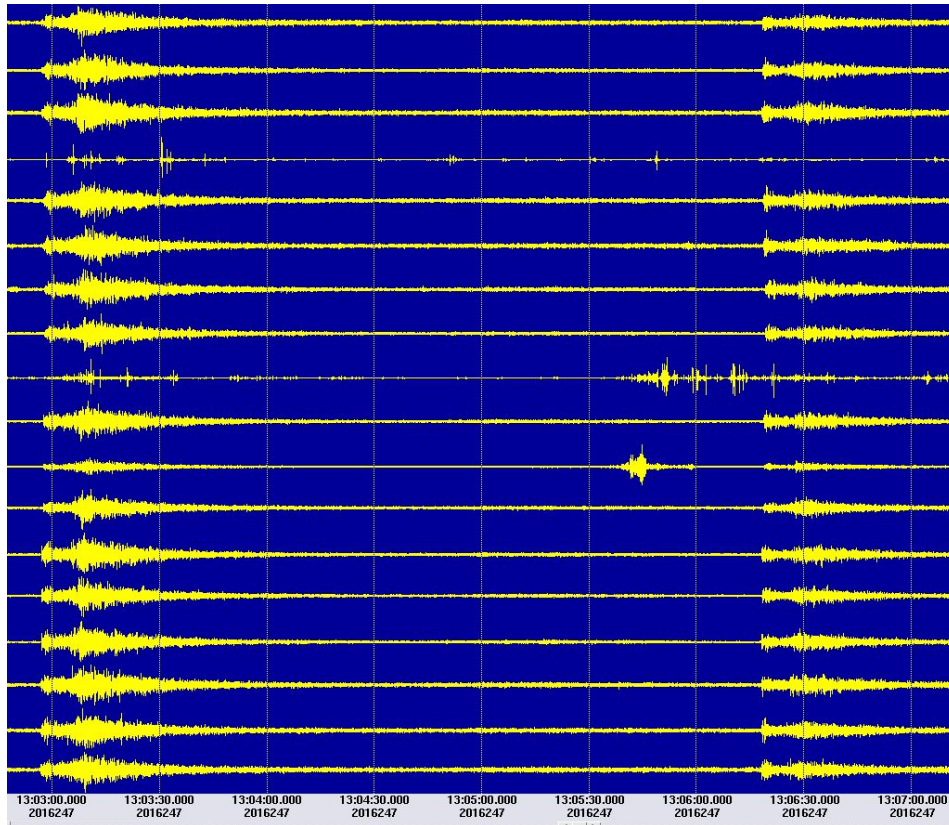


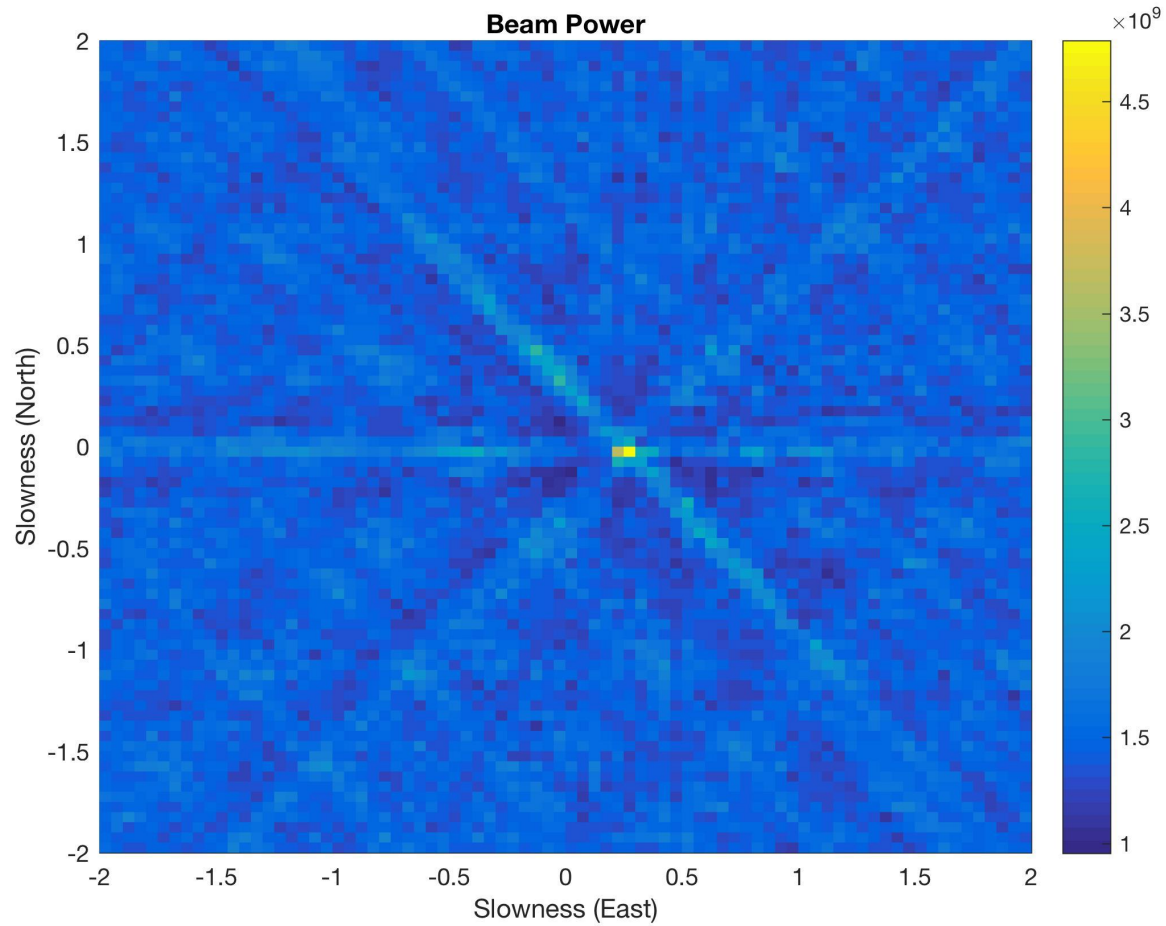
Pawnee Event



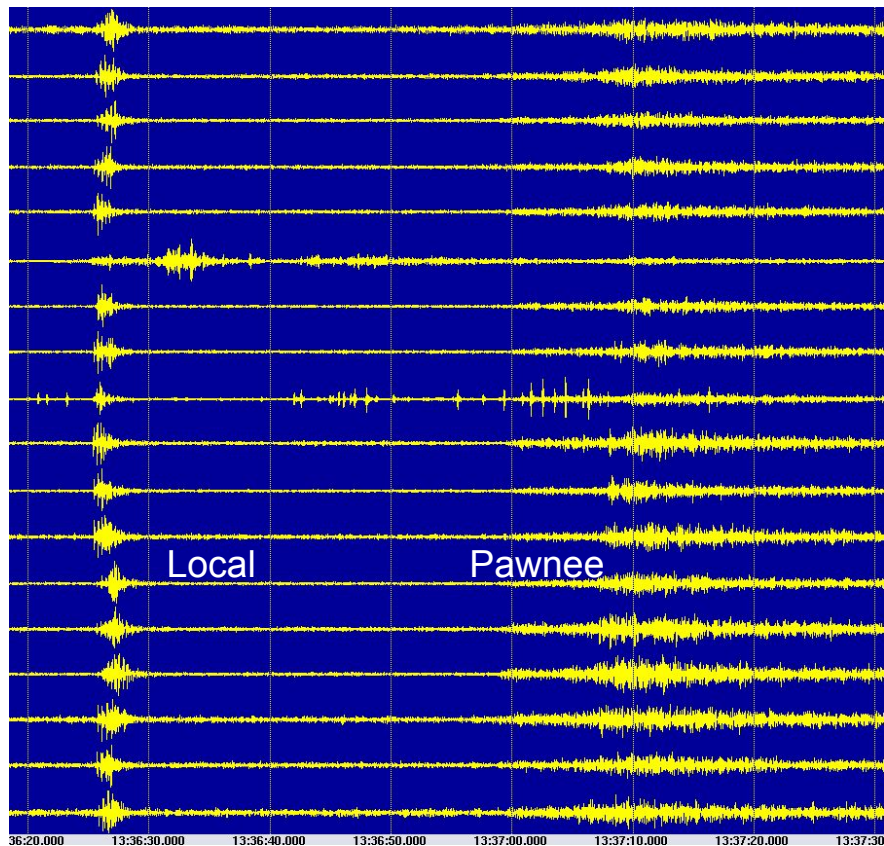
Pawnee Event

How far away are these events anyway?



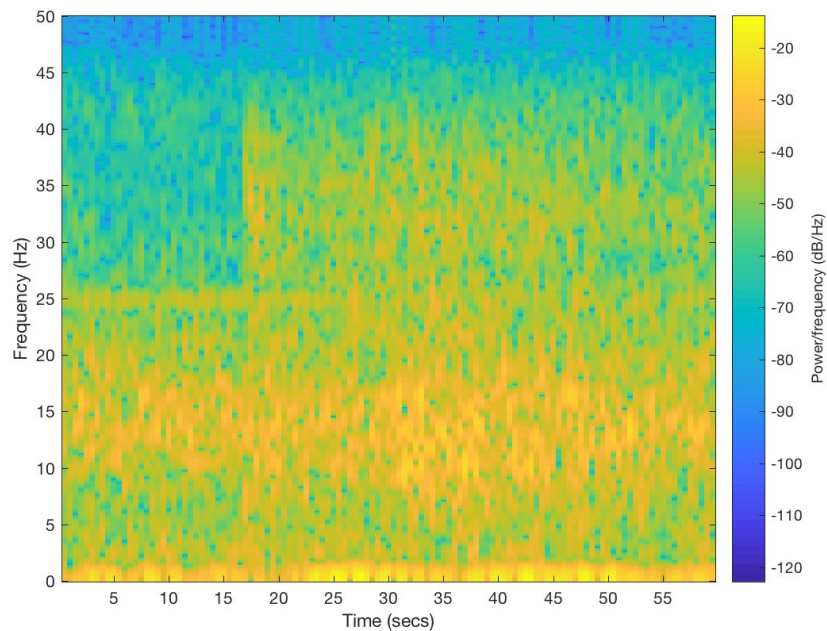


Comparing Regional and Local Events

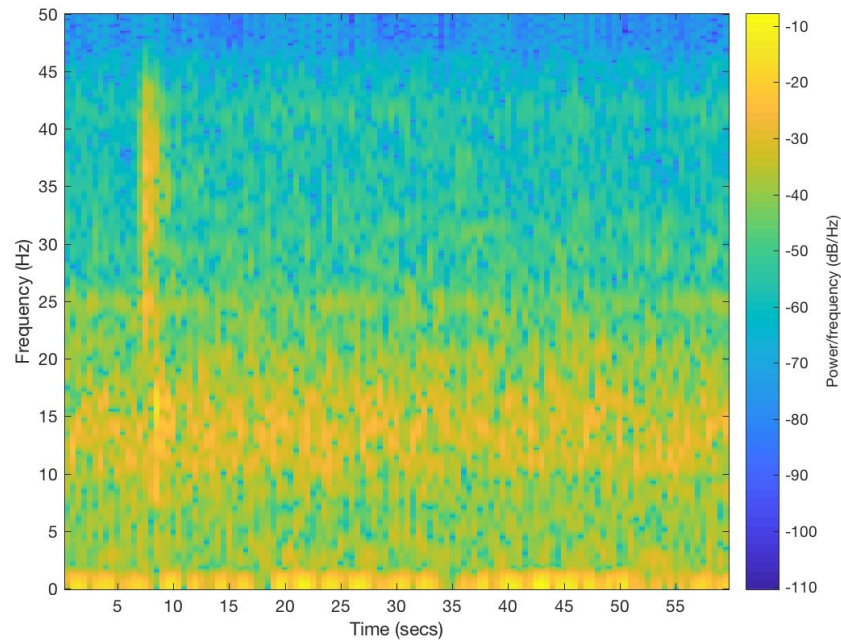


Comparing Spectrograms

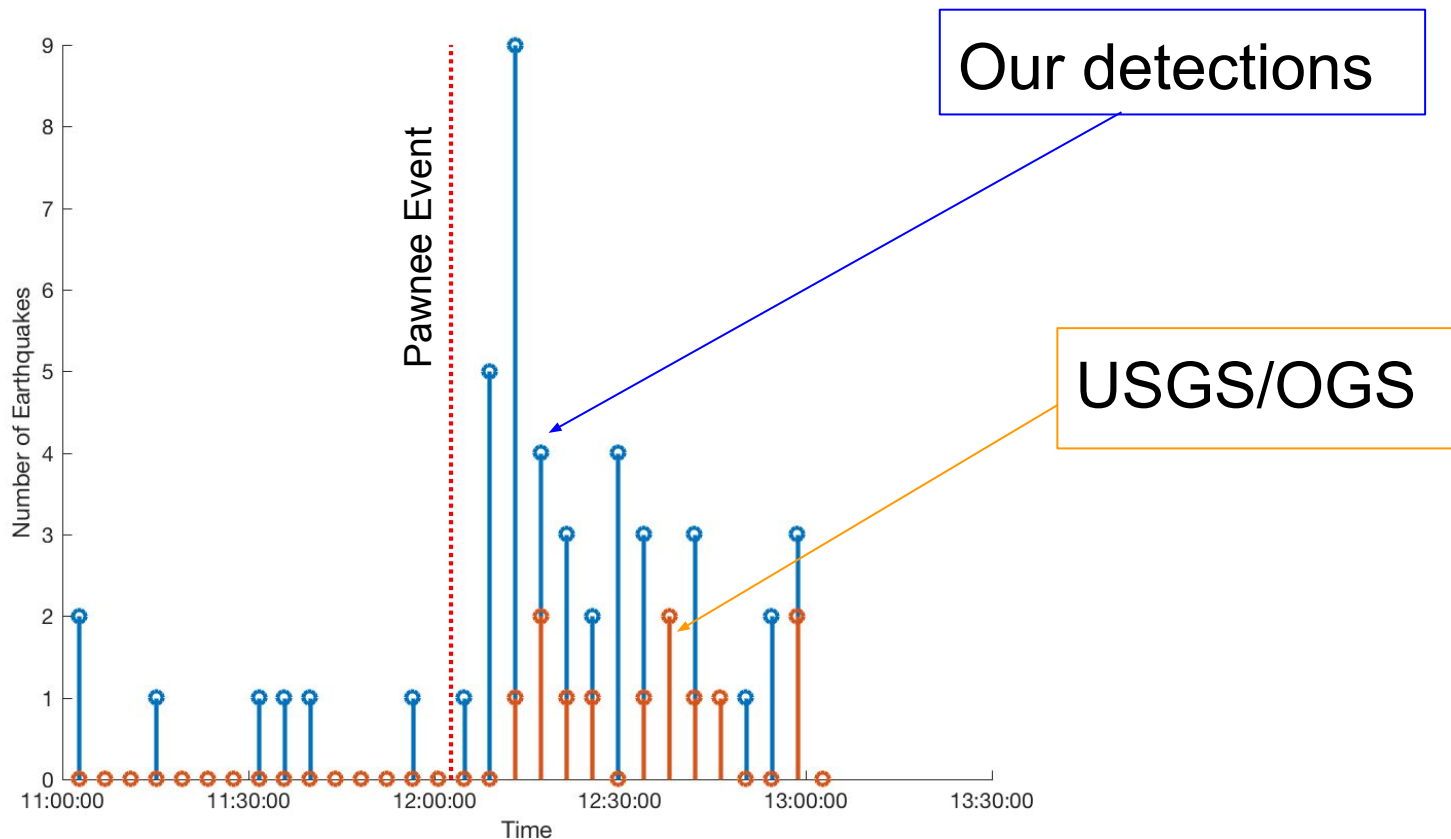
Pawnee Aftershock



Local Event

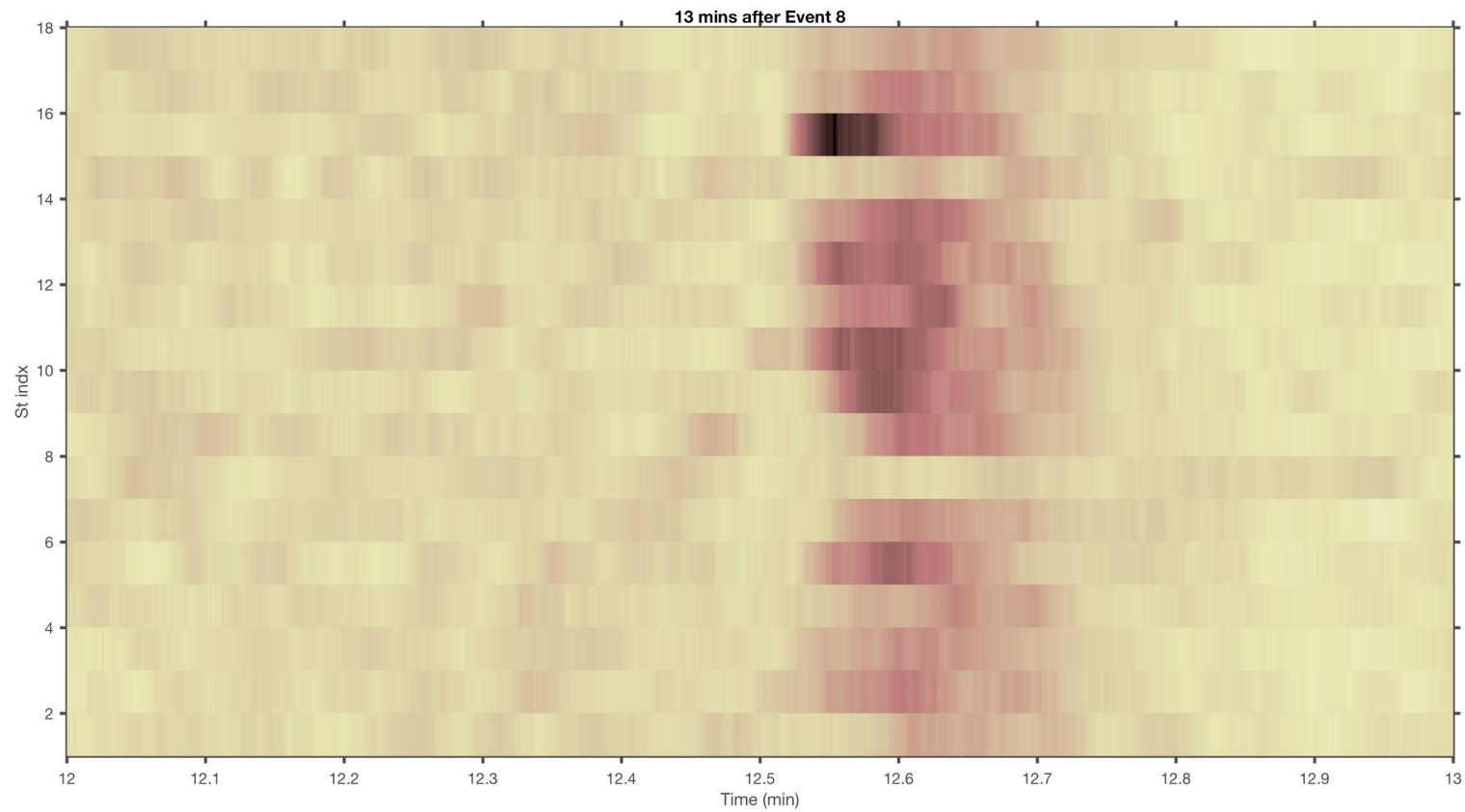


Regional events detection with small aperture array



Conclusions/Future Directions

- 1, We detected more Pawnee earthquake aftershocks (comparing to OGS catalog).
- 2, Systematic detect earthquakes with possible dynamically triggered earthquakes a few hours after large earthquake surface waves passing by (Ask questions please, we have done some work, but running out of time).
- 3, Test statistical significance of the detected earthquakes.
- 4, Locate the detected events (more stations), and investigate the correlations between event occurrence with local fault structures.



Event Distribution following the Pawnee Event

