UNIVERSITY of HOUSTON

ALLIED GEOPHYSICAL LABORATORIES

Student Name: Zohreh Souri

Degree and Year: PhD Geophysics (3rd Year)

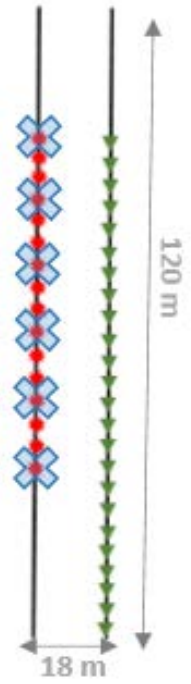
Research Interests: Borehole Seismic Imaging, DAS, and Rock Physics

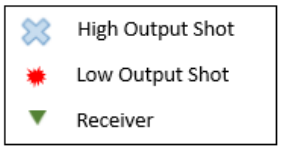
E-mail: zgsouri@uh.edu

Abstract

Cross-well seismic technology provides a high resolution image of the subsurface between two nearby wells. It is very useful for exploration and engineering applications especially in areas where surface seismic methods are not applied easily or the imaging target is below the conventional seismic resolution. This is due to a number of reasons such as making measurements directly in depth, getting the seismic source and receivers beneath the surface to avoid attenuation and heterogeneity problems, and imaging with broad range of angles. We can use vertical wells or pairs of horizontal wells. With the advent of hydraulic fracturing in horizontal wells, cross-well methods may have a resurgent future.

We acquired a set of cross-well seismic data in two shallow wells 18m apart in La Marque, Texas. The seismic P-wave source, Scorpion downhole sparker, was shot from 26m to 86m in 4m intervals, while a string of 24 hydrophones with 4m spacing was suspended to the depth of 120 m in the receiver well. Currently, we are investigating the field data comparing with an S-wave source, and DAS and geophone receiver measurements in applications for borehole seismic imaging.





Left:

Schematic diagrams of the acquisition geometry for the survey.

Right, Top:

An example of an AGC'd shot gather with the source at 78 m depth

Right, Bottom:

Corresponding frequency spectrum