

Seismic Investigations

Earthquake Input Parameters for the PGDP Region

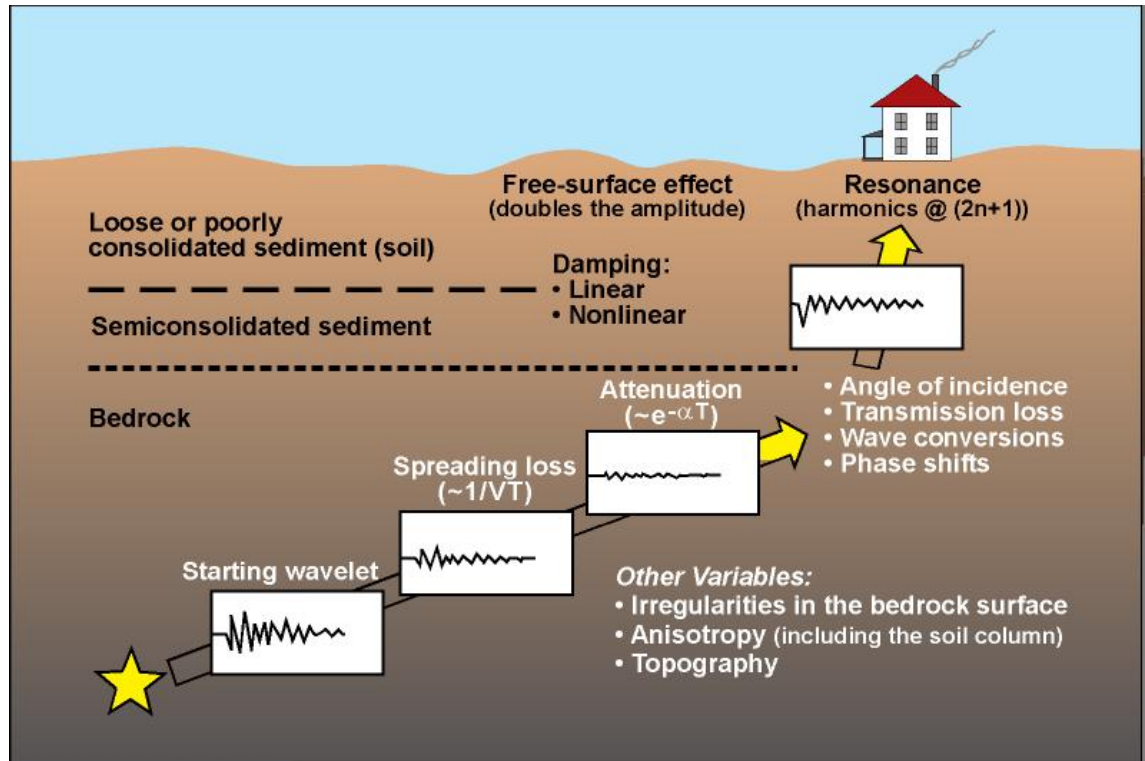
KRCEE Workshop, July 2004

*E. W. Woolery
University of Kentucky
Department of Geological Sciences*



Issues

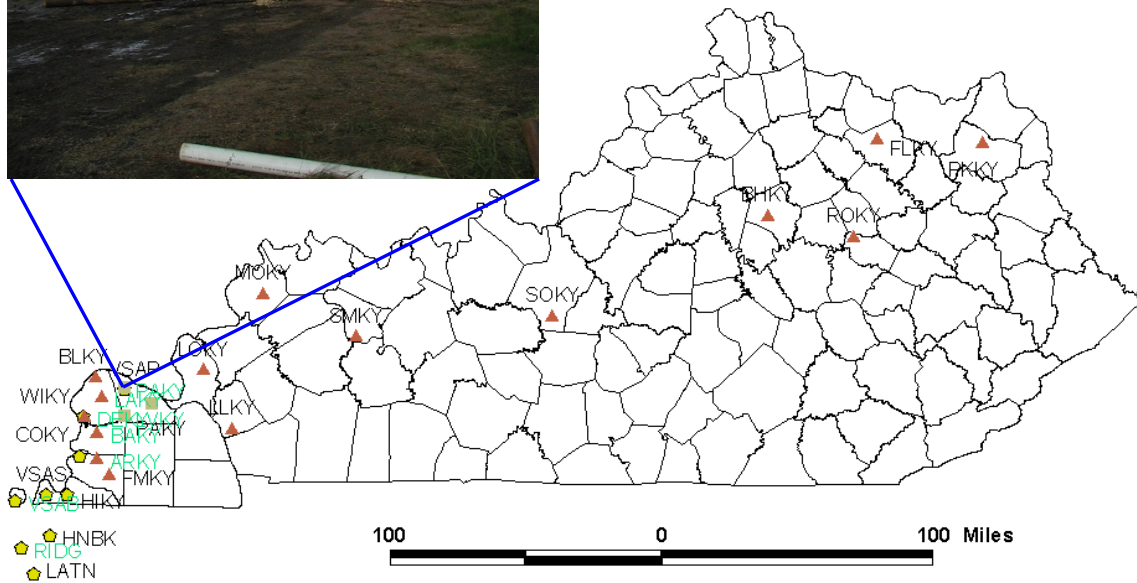
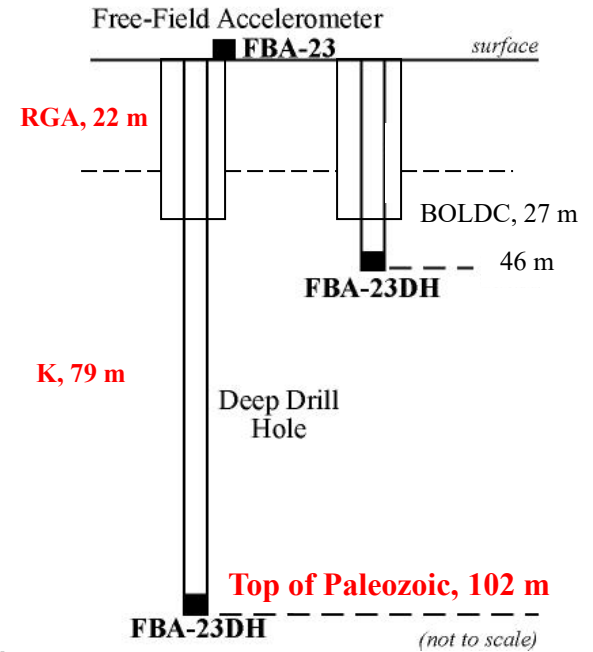
- What are the likely seismic design ground motions at the PGDP site?
 - Source Effect
 - Path Effect
 - Site Effect



Network Enhancement



Vertical Accelerometer and Seismometer Array VSAP



Strong-motion Instrumentation

- Kinematics K-2 accelerograph; high dynamic range for pseudo-broadband capability
- Kinematics FBA-23 and Episensor force-balanced accelerometers; capable of staying "on scale" under motions up to 2g's.

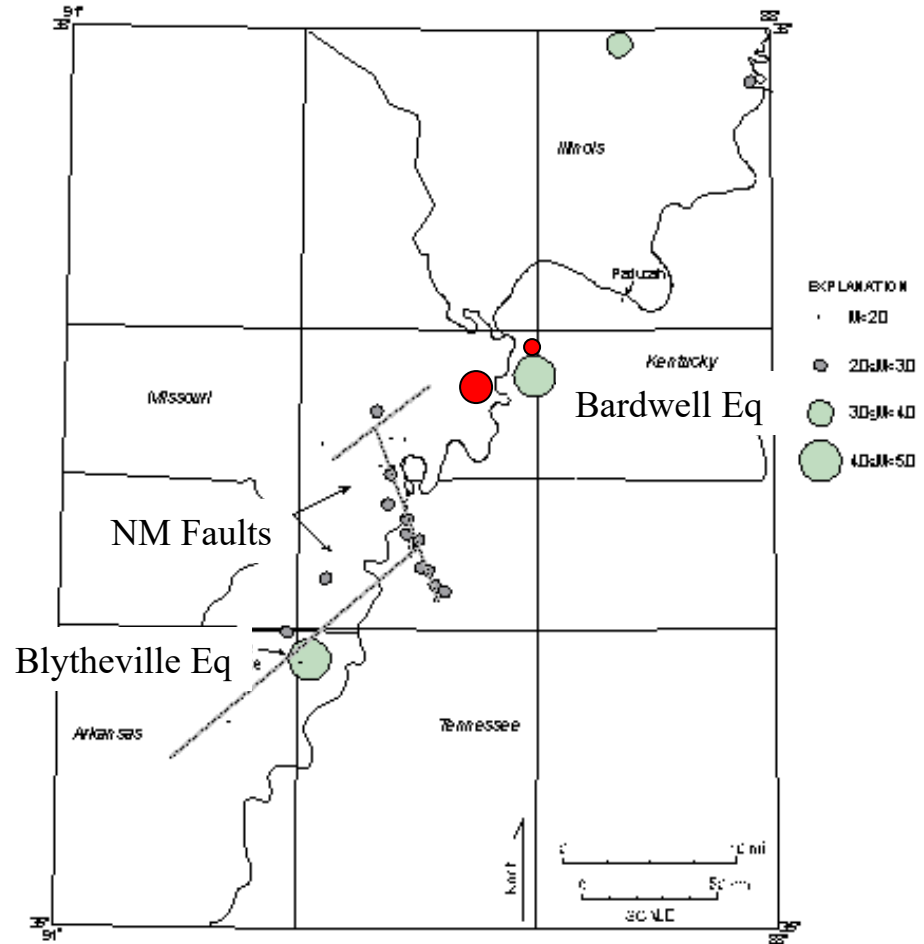


Typical Completion

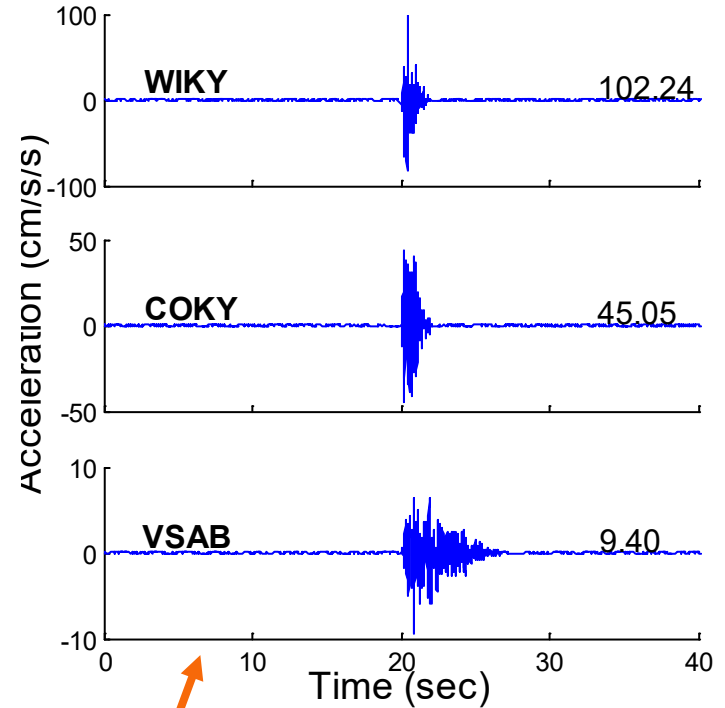
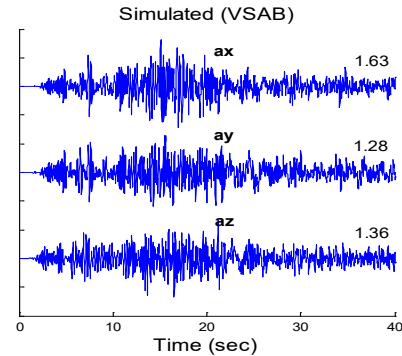
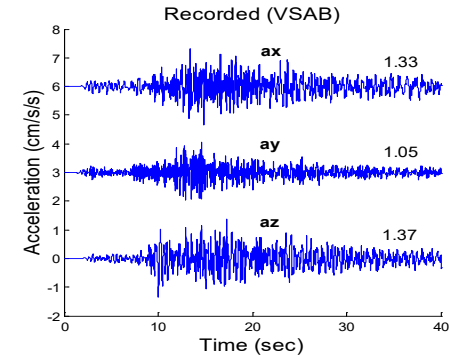
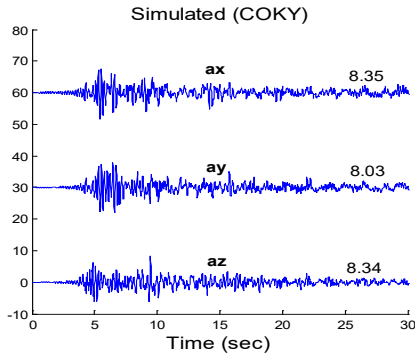
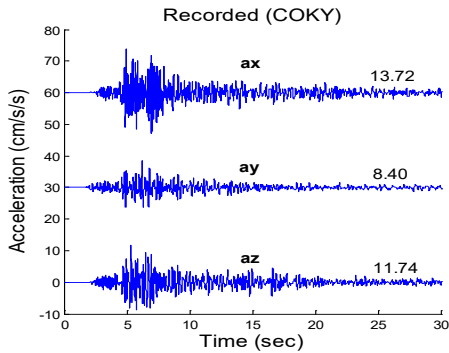
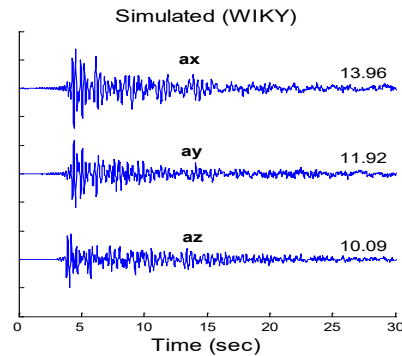
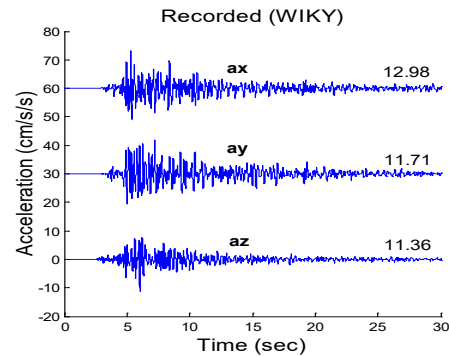


So far?

- 2 similar events in 2003 (M4.0)
 - Bardwell, 2 km focal depth
 - Blytheville, 18 km focal depth
- Need statistically significant population
 - 12Feb04, 2.4 M_D , 9 km depth
 - 15Jul04, 3.5 M_D , 4 km depth



M_w4.0 June 06, 2003 Kentucky Earthquake



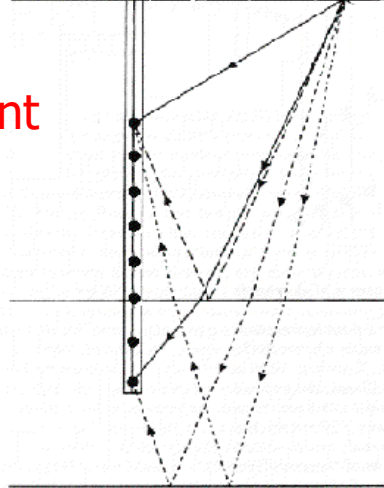
Stochastic Point Source Model

Composite Source Model

Define Site Velocity Model



Downhole Seismic S-wave Measurement

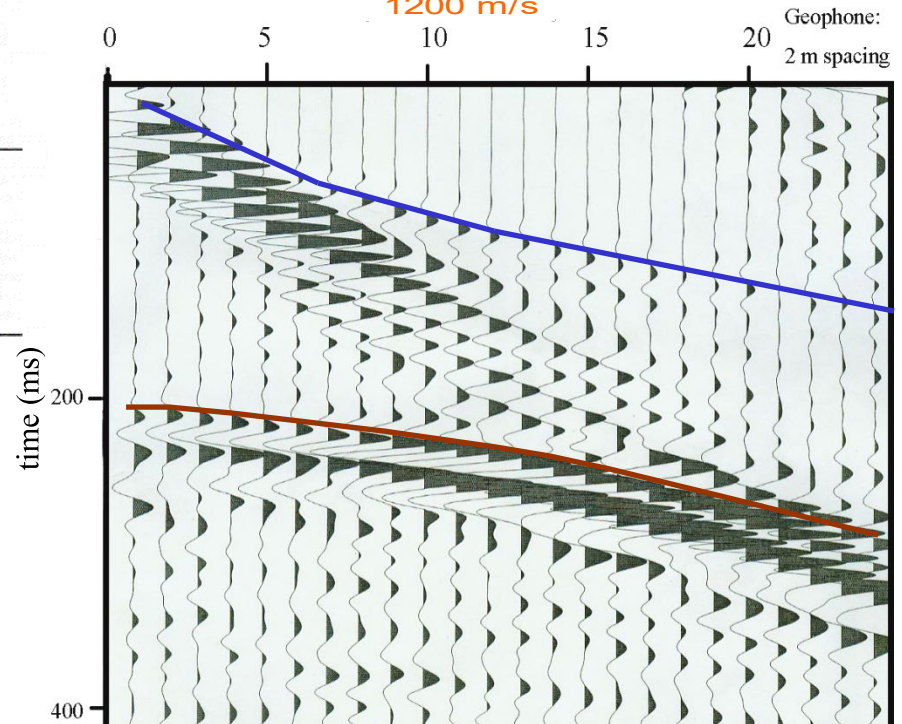
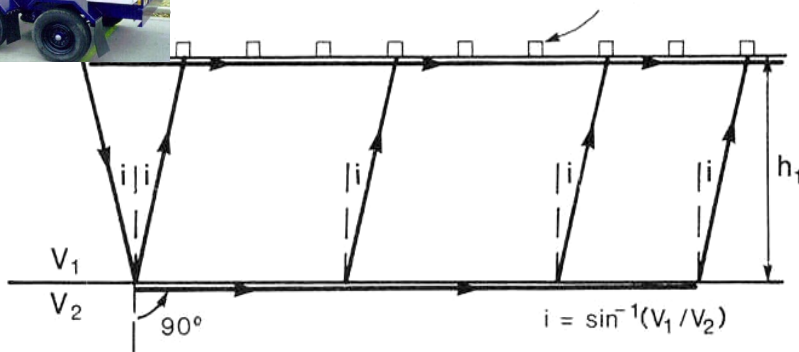


Surface Seismic S-wave Refraction/Reflection

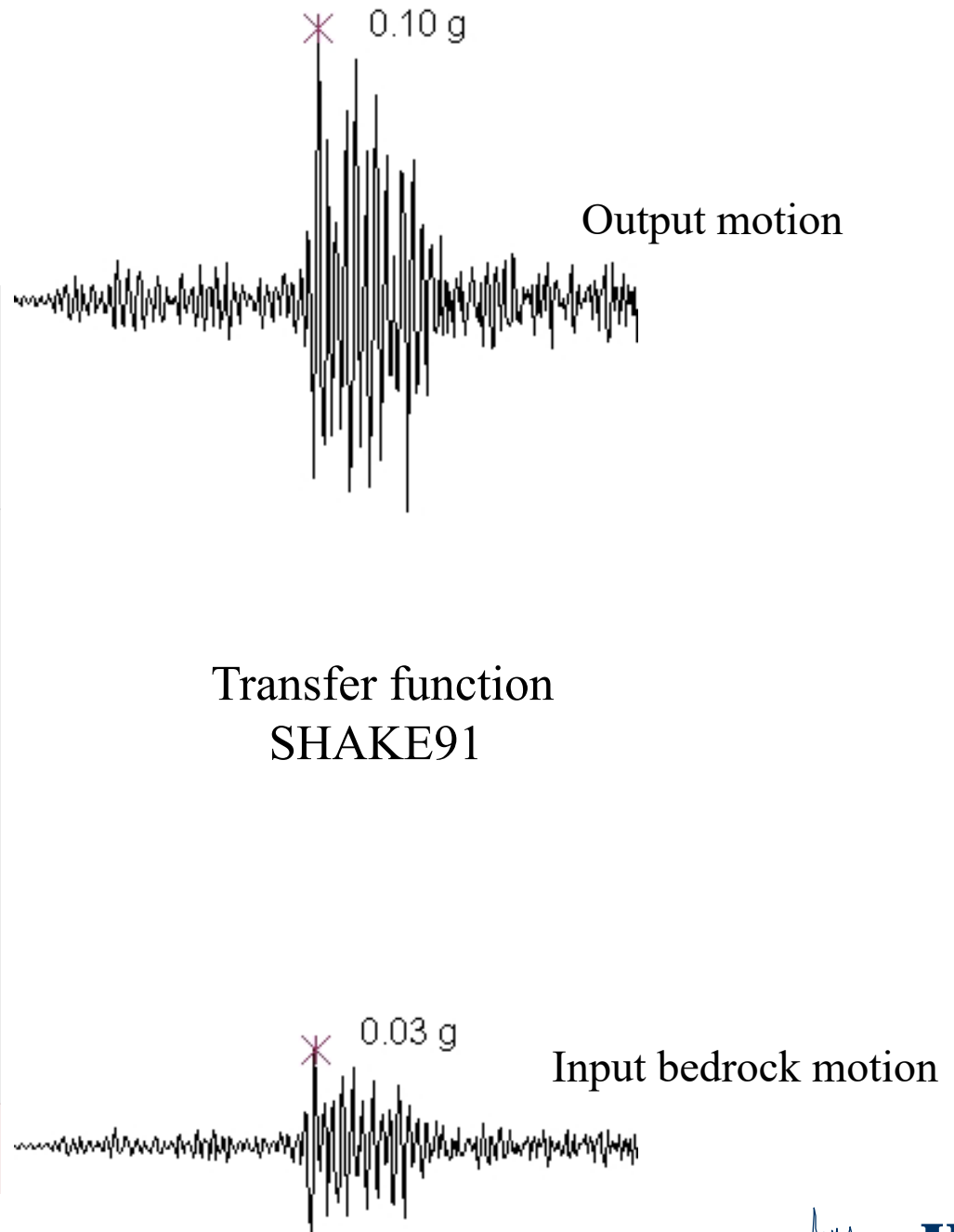


S-wave Source

Geophone

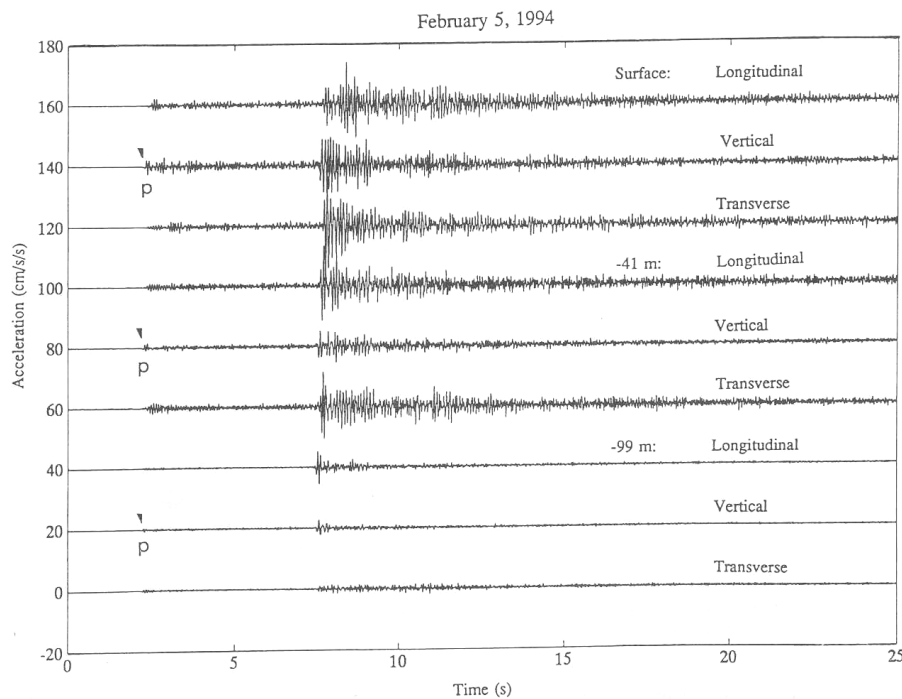


Design Ground Motion Model

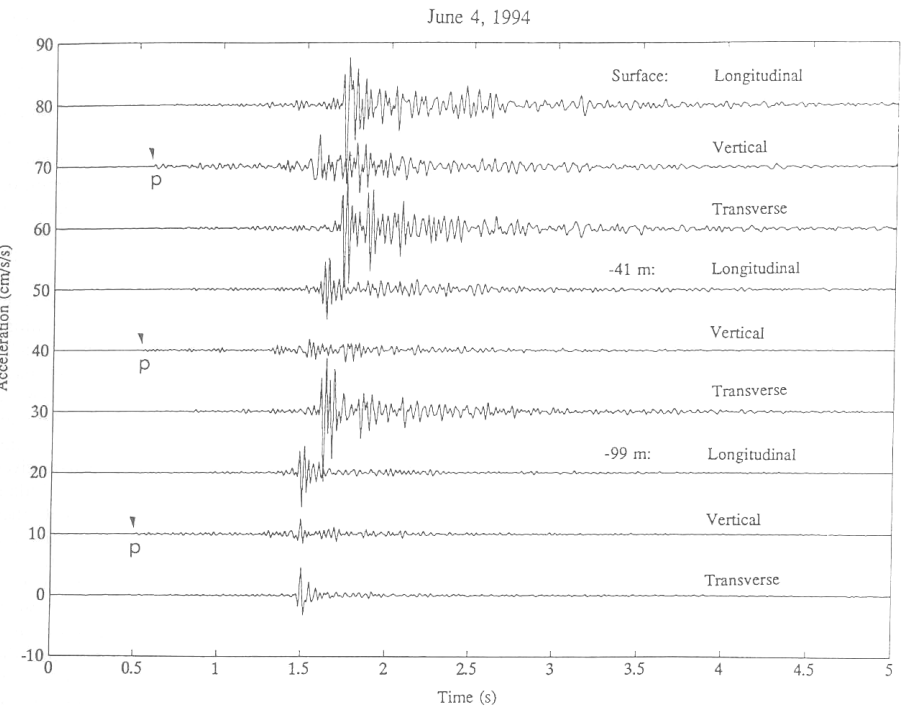


Model Constraint

VSAP Recordings



M4.2, Southern Ill.



M2.0, McCracken Co.