Seismic Modeling, Migration, and Velocity Inversion

Review

Bee Bednar

Panorama Technologies, Inc.
14811 St Marys Lane, Suite 150
Houston TX 77079

May 18, 2014

Outline

Outline

Review

- Geological understanding of Basin
  - Provides *a-priori* information for acquisition and imaging
  - Structure and play types
  - Rock types and elasticity
- Three Earth Types
  - Isotropic (Acoustic), Isotropic Elastic, Anisotropic
  - Thomsen Parameters
  - Five to nine volumes
    - Orthorhombic is most complicated
    - Difficult to understand physics
    - Raytracing may be complex

Review

- Minimal anisotropic parameters
  - v_{nmo}, v_{vert}, δ, and ϵ for VTI
  - Two angles θ and ϕ for TTI symmetry
  - Several additional ϵ's, δ's, and γ's for orthorhombic
- Orthorhombic is most realistic
  - But we are just beginning to be able to model it accurately
  - Estimating parameters may be extremely difficult
  - Potential for huge payout
- Rocks and data provide a potential workflow
  - v_{nmo} from data
  - Coupled with borehole measurements and intuition

Questions?