

Anisotropic 3D Amplitude Variation with Azimuth (AVAZ) Methods to Detect Fracture Prone Zones in Tight Gas Resource Plays

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Abstract/Excerpt

Seismic 3D AVAZ used to detect anisotropy due to fractures or stress, offers the only opportunity to directly identify fracture prone zones prior to committing to significant horizontal well drilling costs. This paper describes the anisotropic AVAZ method that can be applied to map and predict optimal drilling locations. Beyond describing standard industry AVAZ practice, some fundamental theoretical and practical ambiguities of the method to correctly detect the orientation and intensity of anisotropy are revealed. Through an understanding of these ambiguities, constraints can be placed on the method as demonstrated by 3D case studies from the WCSB and a new approach and set of equations are developed that improve the ability of the technology to establish the presence of fracture prone zones and hence optimum gas recovery.