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Anisotropic overburden effects in AVO responses

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Analysis of Amplitude–Variation- with Offset (AVO) plays an important role in seismic exploration. Information contained in the amplitudes of seismic waves reflected from a target structure can be used to estimate reservoir parameter. Since oil/gas reservoir and the overlying medium itself often has anisotropy, it is important to take anisotropy into account in computing reflection coefficients in AVO analysis. Non-incorporation anisotropy effects in estimating AVO amplitude would lead to errors in AVO gradient and intercepts, whereby resulting incorrect interpretation. Here we attempt to model P-wave reflection for an overburden isotropic layer above a Vertical Transverse Isotropy (VTI) shale layer as well as in Horizontal Transverse Isotropy (HTI) and discuss its influence on the AVO responses.

Keyword: AVO, Anisotropy, and VTI