The Influence of an Anisotropic Overburden on Azimuthal AVO

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Abstract

When analysing azimuthal AVO (AVAZ) of reflectors at depth, the effects of transmission through an anisotropic overburden are generally ignored and this does not appear to have an obvious impact on AVAZ interpretation. This is puzzling because we would expect a reflector at depth to have some sort of AVO imprint due to transmission through the anisotropic shallower layers.

Converted-wave surveys indicate that shear-wave splitting occurs in many locations, and it appears that a significant amount of the splitting occurs in the near-surface layers. The effects of an anisotropic overburden can be clearly observed on the limited azimuth stacks of the radial and transverse components of many 3-C/3-D datasets. In this situation we would expect this anisotropic overburden to induce a significant AVAZ effect on the P-wave data. With the aid of real data, this paper will analyse this outstanding problem, and propose reasons for why this effect has not caused problems with P-wave AVAZ analysis.

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