

## **Well-Seismic Tie in the Sub-Salt Wells, Deep-water Area in the Gulf of Mexico: A Valuable Indicator of Anisotropy**

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One of the best ways to tie seismic data back to a ground truth is by comparison with a sonic log by means of synthetic seismograms. The quality of the seismic-to-well tie depends on the quality of the seismic data, the well data, and the time/depth relationship. Recently, the final product from seismic data processing is delivered in the depth domain. However, well depth and seismic depth can be different, so there are unique issues that must be addressed to bring the two results together.

One of the most important variables affecting the well-to-seismic tie is the migration velocity, because incorrect velocities result in lateral and vertical mispositioning of reflections. One factor that can significantly affect the velocities is the presence of anisotropy. Incorrectly accounting for anisotropy manifests itself as an incorrect vertical seismic velocity, causing the data to mistie.

The usual way to tie well information to seismic data in depth is to convert them to time, tie them, and convert them back to depth. However, this process can introduce additional uncertainty because the velocities used to transform each dataset to depth can be different. In this paper, we address how to identify anisotropy that can then be used to get the datasets to match by using that information to re-image the seismic data. Rock-physics modelling can be incorporated into the process to assist in estimating the anisotropy as well. We will show examples of how to use mistie and rock-property analyses to account for anisotropy.