

## The Use of the High Density Velocity Picking to Improve AVO Attributes and Inversion Results

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In a 3D AVO study, at times new velocity measurements are discouraged due to the cost involved and existing stacking velocities are used which have been determined at intervals of 1 to 5 km apart. With such velocities, in zones with strong lateral variations of velocity, it is very difficult that all the gathers have a good NMO correction from which the AVO attributes are calculated. We have obtained true RMS velocity field along with the anisotropy field by high density automated picking at every CDP after removal of noise from the pre-stack data. Random Noise Attenuation (RNA) is used to improve the signal/noise ratio in order to stabilize the AVO attributes. After noise attenuation, high resolution de-aliasing radon transform is used to remove multiples. The results are quality controlled, edited, interpolated, filtered and smoothed by geostatistical methods. Similarly, the use of a detailed velocity field is essential in inversion process in which the initial model of inversion is iteratively and statistically changed to match the seismic data. The low frequency velocity field is used to guide the acoustic impedance. We will demonstrate the benefit of our high density velocity picking in creating a detailed velocity field and its application in AVO and inversion studies in several basins.

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