



## **Pre-stack seismic reconstruction preserving amplitudes for amplitude versus offset analysis using Discrete Fourier Transform in five dimensions: A case of study**

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Over the years seismic processing has tried to correct the problems that are caused by a poor acquisition. These techniques generate great uncertainty in the propagation of the properties of the medium. Due to this, the probability of using these methodologies in studies oriented in the mapping of properties and response of the environment, such as the AVO / A, seismic inversion, seismic multiattributes, etc ... is usually ruled out. In this paper, we present a case study conducted in the southeastern part of Mexico, applying the generation of information caused by a poor acquisition by means of a new five-dimensional interpolation technique.

The realization of a correct adaptation of the parameters in the interpolation is not easy but if done correctly it allows us to give a high percentage of certainty to the migrated seismic data. The method of interpolation that we occupy works in the domains of: inline, xline, offset-inline, offset-xline, time. Recreating and occupying the original acquisition parameters, such as the distances between receiving lines and source lines, we can regularize and reconstruct the information of the seismic traces in the areas where, for various reasons, the acquisition could not be made. The methodology occupies the input data in the Fourier domain in 5 dimensions using the Discrete Fourier Transform (DFT). This process requires an additional step, such as Anti-Leakage Fourier Transfer (ALFT) or alternatively the method for estimating Fourier coefficients Orthogonal Matching Pursuit (OMP). Once the coefficients are established, a regular output can be reconstructed, occupying specified output configurations

In this work we show images of the results in the seismic data before stacking at CRP gathers level where the improvement of the image is really blunt, showing a considerable increase in the nominal fold and without leaving aside the most important thing that is, preserve amplitude anomalies associated with proven hydrocarbon deposits. A strict quality control was made at the level of petrophysical and AVO analysis, taking into account well logs and a continuation, we showed the results.