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ABSTRACT

Carbonate reservoirs are characterized by extremely heterogeneous porosity and permeability. These heterogeneities are caused by the wide spectrum of environments in which carbonates are deposited and by subsequent diagenetic alteration of the original rock fabric. Pore systems range from thick, vuggy reservoirs in the coarse grained skeletal-rich facies of the reef margin or platform margin to highly stratified, often discontinuous reservoirs in the reef interior, platform interior and nearshore facies.

Seismic Imaging for the small-scale feature in complex subsurface geology such as Carbonate is not easy to capture because of seismic propagated wave affected by heterogeneous properties of objects in the subsurface. The principal goal of anisotropic seismic diffraction & reflection imaging is to get a subsurface image of structural features with the greatest sharpness or resolution. Diffraction imaging improved imagig of faults karst fracture voids karst and identification of heterogeneous regions below the resolution of reflections in a reservoir. Diffraction seismic imaging - low frequency data higher diffraction response need bigger migration aperture, high frequency low diffraction need small migration aperture. Spectral decomposition of seismic data for seismic attributes - a robust tool for carbonate exploration searching for stratigraphic traps deepwater hydrocarbobn carbonate reservoir. Geophysical seismic signal are multiscale nonstationary in character. Wavelet transform is employed for spectral decomposition of seismic data, spectral leakage in wavelet transform remedy by synchrosqueezed wavelet transform nonstationary nonlinear signal empirical mode decomposition. Pitfalls in seismic diffraction imaging and interpretation depends upon seismic diffraction depth versus velocity at higher velocuity diffraction curve spreading out causes discrimination difficulties diffraction or dipping reflection. Carbonate seismic facies can be interpreted through analysis of the configuration, amplitude, frequency, and continuity of the seismic reflections. The geometries of the reflection configurations are the most varied aspect of seismic data, including parallel, prograding, mounded, draped, onlap, and onlap fill.