The Application and Effect of "Bright-Spot" Technique in the Middle-Deep Strata of the Yinggehai Basin, South China Sea

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Bright-spot technique is successful in seismically delineating hydrocarbons in various parts of the world. In China, it is not effective except in Yinggehai Basin, South China Sea. However, it is only limited to the shallow gas reservoir, above 2500 meters. With the exploration of this basin, some bright spots do not show oil and gas reservoir in the middle-deep strata; so it is necessary to study whether or not this technique can be used. The aim of my research is to study the sensitivity and limitation of bright-spot technique in deeper strata of the Yinggehai Basin and to supervise the exploration of the middle-deep oil and gas reservoir of this basin.

Through studying accurate velocity parameters by velocity spectrum analysis of the seismic data and velocity from core sample tests, I find universally that interval velocity reverses under 2.5 to 3.0 second, and it appears that overpressure exists at this time interval in Yinggehai Basin. For the interval velocity drop, the physical mechanism of the bright-spot technique is insufficient in the middle-deep strata and shows faded spots and dark spots in the seismic profile in the middle-deep strata of the Yinggehai Basin. I am conducting other techniques: 1) Amplitude Versus Offset attribute parameter--Crossplot: Gradient versus Intercept, Gradient versus Fluid Factor, Gradient versus Poisson Ratio; 2) Differential Interformation Velocity Analysis; 3) High order statistics to detect other hydrocarbon-indicators characteristic of the seismic profile in middle or deep strata.