

Full Waveform Inversion of Gas Hydrate Reflectors in Northern South China Sea

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A b s t r a c t

Bottom Simulating Reflectors (BSRs) are considered to be the bottom of gas hydrate bearing sediments; hence, BSRs are used to identify gas hydrate and free gas. In order to obtain accurate velocity structure of BSRs, this paper presents a full waveform inversion strategy based on Genetic Algorithm. Synthetic seismograms are calculated using the slowness technique. Through numerical experiments made with noisy synthetic data, the inversion algorithm shows stable performance, and genetic operators are defined. This method was applied to field data from the northern South China Sea. Inversion results show that obvious velocity anomaly of BSRs can be detected, which indicates the existence of gas hydrate and free gas.

Key words: gas hydrate, bottom simulating reflectors, genetic algorithm, full waveform inversion.