

## 音波検層における全波形インバージョン適用可能性の研究 Applicability of Full Waveform Inversion in Sonic Logging

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Sonic logging has been widely used for many years to acquire physical properties of hydrocarbon reservoirs, and then, velocity analysis is performed by detection of first break or slowness time coherence (STC) method.

The estimation of velocity and quality factors is important for the identification of fluid contacts, e.g. oil-water contact.

But the resolution of existing methods is restricted to 6 inch by receiver distance of logging tool. In sonic logging, high resolution imaging and detection of oil-water contact (OWC) are recognized as urgent issues. On the other hand, many studies in seismic reflection survey focus on full-waveform inversion (FWI) as an innovative technique to acquire high resolution velocity structure in the subsurface. However, the applicability of FWI to the sonic logging has not been revealed yet. So, we examined the applicability of FWI using some numerical experiments.

Our results show that gas-oil contact and OWC can be detected with higher resolution than the conventional methods whose resolution is 6 inch. Therefore, we conclude that we could apply FWI to sonic logging with high resolution imaging.

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