

ABSTRACT

The "Fermion" Basin in North East Java shows significant potential as a hydrocarbon prospect area. This study integrates seismic attributes which is, Minimal Amplitude and RMS along with model-based acoustic impedance inversion to identify and map reservoir characteristics. The prospective zone is characterized by a combination of low minimal amplitude, high RMS values, and acoustic impedance greater than 9750 (m/s)(g/cc), indicating effective porosity greater than 10%. An impedance range of 9750–11000 (m/s)(g/cc) is interpreted as rock with sufficient porosity and permeability to store hydrocarbons. One of the main targets, wells ABR-TH25 and ABR-TH26, is located at the crest of an anticline structure and exhibits high impedance values, identifying it as a prospective hydrocarbon accumulation site. The prospective reservoir zone is located at a depth interval of 1300–1500 meters, stratigraphically correlated to fine to medium-grained clastic sandstones, and shows seismic responses consistent with hydrocarbon presence. The integration of these quantitative data provides a more accurate interpretive basis to support exploration strategies in the area.

Keywords: *Seismic attributes, Minimum Amplitude, RMS, Seismic Inversion, Acoustic Impedance, Hydrocarbon Reservoir, "Fermion"*