Probabilistic Reservoir Characterization via Seismic Elastic Inversion in East Andaman Basin

Mahendra Kishore[1], Pritam Jha[1], Dino Ros[1], and Alfonso Iunio Marini[2]
[1]Eni India Ltd., New Delhi, India, mahendra.kishore@eni-india.com
[2]Eni s.p.a.,E & P Div., Milan, Italy

East Andaman Basin is a frontier area located at the south-eastern corner of Indian Territory in the Andaman Sea. It's bounded by the volcanic Mount Sewell Rise on the West, and the continental Mergui Ridge on the East

Recent 2D and 3D seismic surveys results indicate that the basin has accommodated a thick pile of sediments through Cenozoic.

The area chosen for the study is in the exploration stage, and no well has been drilled so far; so the data of five wells from an analogue basin were the only suitable to define a lithological setting via electrofacies logs.

A seismic (elastic) inversion of East Andaman Basin 3D volume led to the production of Acoustic Impedance and Poisson's ratio cubes. The calibration of those elastic properties volumes was carried out by using electrofacies logs, considering the same a-priori information coming out from the analogue basin wells.

Due to possible differences in burial history between the Andaman and the analogue basins, differences in Seismic Velocity and Density trends had to be managed during seismic inversion and lithology calibration. The final solution accounted for a de-trending, by generating "relative" elastic attributes which were used to define the electrofacies classification and a lithological volume in the area of interest, for seismic-reservoir characterization purposes.

The litho-classification solution was not deterministic but stochastic, allowing the computation of additional lithology probability volumes.