

The main goal of this paper is to characterize a reservoir situated in the southeast of Algeria based on AVO seismic inversion. The seismic inversion model has been built by the iterative method of Aki and Richards's approximation and it has been correlated with four-existing wells in the studied zone. The correlation rate between the inversion model and logging data is good (varying from 72% to 85%). Reservoir characterization of this field has been given in detail. The lithological description is used to construct a Geomechanical model that is useful for new wells' drilling decisions. The high correlated results allowed us to have a vision on the horizontal variation of Petrophysical parameters such as density and lithological variation of three facies clay, tight limestone, and porous limestone. Moreover, this classification is used in the best way to determine the interesting zone with higher porosity values, so that the exploration strategy becomes more efficient with minimized uncertainties. Therefore, it is highly recommended to use the constructed model to propose new wells as well-5 in this study