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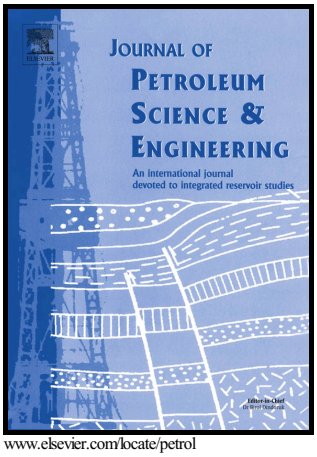
Amir Mollajan, Hossein Memarian



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Amir Mollajan[1], Hossein Memarian[2]

Abstract

Seismic velocity variation in carbonate rocks is a complicated function of different parameters such as mineral composition, porosity, pore type, saturation, and pore pressure. Among all, pore type is the main factor that affects reservoir permeability heterogeneity and change the velocity-porosity relationship. In this paper, a rock physics-based algorithm is presented to quantitatively identify three dominant pore types in a carbonate reservoir. The proposed algorithm is applied on data related to three wells drilled in a carbonate reservoir, southwest of Iran. We used the frame flexibility factor (γ), P-wave velocity-porosity and S-wave impedance-porosity trends as inputs of Parzen classifier to identify predominate pore type characterized by velocity-deviation log (VDL) in each depth. The results show that the proposed algorithm has high precision in classifying identified pore types with average accuracy of 76.7% throughout studied oil field.

Keywords: Rock physics, The frame flexibility factor (γ), Velocity Deviation Log (VDL), Parzen classifier, and Iran.

[1]Ph.D student of Exploration Engineering, School of Mining Engineering, University College of Engineering, University of Tehran, Tehran, Iran, a.mollajan@ut.ac.ir , Tel: +989124147906, Fax: +982188008838.

[2] Professor of Geo-Engineering, School of Mining Engineering, University College of Engineering,, University of Tehran, Tehran, Iran, memarian@ut.ac.ir.