

عنوان مقاله:

COMBINING STATISTICAL AND INTELLIGENCE TECHNIQUES TO CONVERT SEISMIC DATA INTO THE VELOCITY-DEVIATION LOG

محل انتشار:

اولین کنفرانس بین المللی نفت، گاز، پتروشیمی و نیروگاهی (سال: 1391)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

Finding applicable reservoir characterization methods to reduce exploration costs and to save time and energy could be mentioned as one of the main goals in any petroleum investigations. The velocity deviation log, which is calculated by combining the sonic and porosity logs, is a useful tool to obtain information about some important reservoir parameters such as predominant pore types, presence of fractures, free gas zones and permeability trends in sedimentary formations. In this paper regard to vast coverage and continuity of seismic data, a novel application of multiattribute analyses is proposed to convert seismic data into velocity deviations. Since the Asmari Formation is one of the main reservoirs in the study area (Northwestern part of the Persian Gulf) available data of the 5 boreholes intersecting a 2-D seismic line were used to evaluate usefulness of the proposed methodology. A combination of multiple linear regression (MLR) and Probabilistic neural network (PNN) techniques were used to convert seismic data into velocity deviations. Consecutively, Positive, negative and zero deviation zones were determined on the generated velocity deviation seismic section and tried to be interpreted using available auxiliary data. The results show that predominate pore types in the studied reservoir along the seismic data is intercrystalline porosity which related to the diagenetically formed dolomite rhombohedra. Also free gas zones could be detected easily by tracing predicted negative velocity deviations along seismic line. In conclusion, it would be of great use to be able to evaluate velocity deviations along seismic data and relate them to the important reservoir parameters

کلمات کلیدی:

The Velocity-Deviation Log; Seismic attributes; Multiple regression analyses; Probabilistic Neural Network; Reservoir Characterization; Asmari Reservoir, Persian Gulf, Iran

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