

EGU2020-4260

<https://doi.org/10.5194/egusphere-egu2020-4260>

EGU General Assembly 2020

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Seismic attribute mapping of a fluvial reservoir in Rhourde Chegga field (Hassi Messaoud, Algeria)

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Rhourde Chegga field is located in the north of Hassi Messaoud giant field, Algeria. The main hydrocarbon-bearing reservoir in Rhourde Chegga field is the lower Triassic Argilo-Gréseux reservoir. The Triassic sand is deposited as fluvial channels and overbank sands with a thickness ranging from 15 to 20 m, lying unconformably on the Paleozoic formations. Lateral and vertical distribution of the sand bodies makes their mapping very difficult and, sometimes, even impossible with conventional seismic interpretation.

To better define drilling targets within the Triassic sand in the Rhourde Chegga field, 3D stratigraphic seismic attribute analysis was performed along the reservoir level, using PSTM and mid angle stack seismic data. By combining various attributes (RMS amplitude, half energy, variance, etc.), the channelized feature has been clearly imaged and delineated on the horizon slices and the volume extraction. The relationship between the combined seismic attributes and reservoir properties at well locations showed a good correlation.

Based on this study, about ten produced wells have been successfully drilled, confirming the efficiency of seismic attribute analysis to predicted channel body geometry.

Keywords: Channel, Attributes, Amplitude, Fluvial reservoir.