



Micro- and Macro-Scale Petrophysical Characterization of a Lower Cretaceous sandstone unit simulated in a real geometry obtained with μ -CT Imaging

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Lower Cretaceous sandstone serves as hydrocarbon reservoir in some places over the world, and potentially in Hatira formation, Northern Israel. The purpose of the current research is to conduct a petrophysical characterization of these sandstone units. The study was carried out by two alternative methods: using conventional macroscopic lab measurements; and using a 3D microscopic imaging and modeling. The latter included μ -CT scanning, segmentation of the pore-network, image processing, image analysis of pore network, followed by fluid flow simulations at a microscale. Upscaling the results of these micro-scale flow simulations allowed obtaining macroscopic rock parameters that are conventionally measured in the lab. Comparison of the upscaled and the measured properties was conducted, showing a good agreement. Results of this study will provide necessary parameters for the future macroscopic fluid flow modeling in the Lower Cretaceous sandstone, applicable for the fields of petroleum production and CO₂ sequestration.