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A new method based on high-resolution imaging of pore space for rock typing

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Rock typing is an essential step in reservoir characterization and geological model building for reservoir simulation. Conventionally porosity, permeability and capillary pressure data of coring core samples are used to divide rock types. With developing of high-resolution imaging equipment, micro-structure parameters are able to be quantified and widely used in the research of reservoir characterization. Based on high-resolution imaging technology, we proposed a new method that quantifies pore space structure of different rock types with different micro-structures. Firstly, we apply Minkowski functions to get the distribution of connectivity at different pore diameters, tortuosity and specific surface area etc.; secondly, we use pore network model and Lattice-Boltzmann model to simulate the conductivity of the 3D image of rocks; Then we compared conductivities for a series of rock samples, and got the correlation between conductivity and micro-/macro-parameters. We also got the conductivity's sensitivity of the parameters. We believe they all have positive effects on rock typing study.

References

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