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Integrated hydraulic flow units analysis for carbonate and clastic conventional and unconventional petroleum reservoirs

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Thorough understanding of the phenomena in variation of pore properties and permeability in lithofacies of conventional carbonate and clastic petroleum reservoirs together with unconventional reservoirs before and after their hydraulic fracturing is the main concept in reservoir description. It is known that new reservoir description techniques will cut off the amount of unexplored hydrocarbon reserves. Discrepancies in pore geometry are the evidence of that there exist hydraulic flow units with similar or different characteristics. So the rock type determination processes cannot be accomplished only by one way. There is demand for several techniques in order to make away with different uncertainties by proper correlation and analysing the results. Classic determination of rock types is realized by geological observations and by the porosity versus permeability log. In this paper, the new methodology is proposed for determination of flow zones. The methodology is based on the Kozeny-Carmen equation where we can get the reservoir quality index which indicates the porosity versus permeability data. The specialty of this new technique is that it takes into account the influence of depositional and diagenetic units controlling the fluid flow besides the reservoir quality index. The proposed technique has been successfully tested in reservoirs. The paper describes the hydraulic flow units and presents graphs demonstrating the utility of this method.