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Energy - Oil and Gas Research; Research Data from China University of Petroleum (East China) Update Understanding of Oil and Gas Research (A New Fractal Approach for Describing Induced-fracture Porosity/permeability/ Compressibility In Stimulated Unconventional Reservoirs)

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2019 AUG 9 (VerticalNews) -- By a News Reporter-Staff News Editor at Energy Weekly News -- Current study results on Energy - Oil and Gas Research have been published. According to news reporting originating from Qingdao, People's Republic of China, by VerticalNews correspondents, research stated, "The stimulated reservoir volume (SRV) with complex induced-fracture governs dominant flow rates in unconventional reservoirs. The induced-fracture spacing and aperture greatly affect the fracture properties."

Financial supporters for this research include National Natural Science Foundation of China, Key Research and Development Program of Shandong Province, Major National Research and Development Projects of China, Natural Science Foundation of Shandong, Fundamental Research Funds for the Central Universities, MSRL consortium at the Bureau of Economic Geology, The University of Texas at Austin, China Scholarship Council, NanoGeosciences Laboratory at the Bureau of Economic Geology, The University of Texas at Austin.

Our news editors obtained a quote from the research from the China University of Petroleum (East China), "In this study, a new method to calculate tortuosity index of fractal induced-fracture is proposed, and the fractal dimension of induced-fracture aperture (d(fa)) is presented to describe the distribution of fractal induced-fracture aperture (FFAD). Combined with fractal induced-fracture spacing (FFSD) and FFAD, the fractal fracture porosity/permeability/compressibility models are given. The FFSD and FFAD influenced by fractal dimensions and their influences on fracture properties are analyzed. The results show that the d(fs) has a wider range than that of natural fractures, and it may be larger than 2 in 2D system in some special reservoirs, e.g. re-stimulated reservoirs. As the distance from the reference point increases, the tortuosity index gradually decreases. The larger the fractal dimension (d(fs) or d(fa)) is, the larger the fracture porosity/compressibility will be. In the cases of d(fs) < 2 (or d(fa) < 2), the fracture porosity/compressibility of the uniformly induced-fracture is smaller than the fractal induced-fracture near the reference point, and larger than that far away from the reference point. While in the cases of d(fs) > 2 (or d(fa) > 2), the fracture porosity/compressibility of the uniformly induced-fracture is larger than the fractal induced-fracture near the reference point, and smaller than that far away from the reference point. When d(fa) > 2, the fracture permeability increases first and then decreases as the distance from the reference point increases. In other cases, the fracture permeability decreases as the distance from the reference point increases."

According to the news editors, the research concluded: "The permeability influenced by distribution of induced-fracture aperture is greater than that influenced by induced-fracture spacing."

For more information on this research see: A New Fractal Approach for Describing Induced-fracture Porosity/permeability/ Compressibility In Stimulated Unconventional Reservoirs. Journal of Petroleum Science and Engineering, 2019;179():855-866. Journal of Petroleum Science and Engineering can be contacted at: Elsevier Science Bv, PO Box 211, 1000 Ae Amsterdam, Netherlands. (Elsevier - www.elsevier.com; Journal of Petroleum Science and Engineering - www.journals.elsevier.com/journal-of-petroleum-science-and-engineering/)

The news editors report that additional information may be obtained by contacting Y.L. Su, China University of Petroleum East China, School of Petroleum Engineering, 66 Changjiang West Rd, Qingdao 266580, Shandong, People's Republic of China. Additional authors for this research include G.L. Sheng and W.D. Wang.

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