

The Interaction of a Hydraulic Fracture With a Repetitive Sequence of Multiple Layers of Different Fracture Toughness

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Carlo Peruzzo, formerly a post-doctoral researcher at EPFL - Geo Energy Laboratory, now at ResFrac, will speak on Wednesday, November 2, 2023.

The topic is “The Interaction of a Hydraulic Fracture With a Repetitive Sequence of Multiple Layers of Different Fracture Toughness.”

Abstract

Whether used to enhance the hydrocarbon production from low permeability rocks or to measure the minimum in-situ principal stress in rock formations, height growth of a hydraulic fracture above the formation of interest is a key metric for the design of successful hydraulic fracture applications. If the confining stress variation between rock layers represents one of the main reasons for fracture containment at depth, a contrast of fracture toughness can also lead to fracture containment. The interaction of a hydraulic fracture with a repetitive sequence of multiple layers of different fracture toughness can ultimately lead to the emergence of an elongated fracture or, alternatively, to the propagation of an elliptical-like fracture with a fixed aspect ratio. The verification of either one of these circumstances solely depends on both the spatial distribution and the magnitude of the fracture toughness contrasts.

Biography

Carlo Peruzzo has a BS and MS in Civil Engineering from University of Padua. He is a former post-doc at the EPFL - Geo Energy laboratory, where he completed his PhD with the thesis titled “Three-dimensional Hydraulic Fracture Propagation in Homogeneous and Heterogenous Medium” (2023). He contributed to the development of PyFrac, an open source solver for the numerical simulation of the propagation of planar hydraulic fractures in 3D. Dr. Carlo Peruzzo has recently joined ResFrac.