Hydrocarbon Exploitation: the role of Laboratory Geomechanics

Presented by

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ABSTRACT

Petroleum Geomechanics is concerned with rock and fracture behavior in reservoir, drilling, completion and production engineering. In more detail, Geomechanics aims to understand how soils and rocks deform to changes of stress, pressure, chemistry and of temperature. During last several decades, intense research has been conducted to better comprehend the processes that link temperature (T), hydrologic flow (H), mechanical deformation (M), and chemical alteration (C) in fractured rock/soils systems. The study is complex because these processes are strongly interconnected as one process affects the initiation and progress of another. In this presentation we will show how THMC couple processes impact the initiation and propagation of hydraulic fracturing in the heterogeneous fractured/porous media. In particular we will focus on the influences that the in situ stresses and the complexity of geological structures have on the fracturing design. Finally, we will describe which laboratory technical innovations are fundamental tools to understanding and to optimizing the practice of fracking.

BIOGRAPHY

Igor Faoro is the Sr. Geomechanics Consultant for Core Laboratories, based in Houston, and is responsible for providing support and consulting services to the rock mechanics laboratory. His expertise extends to fracture conductivity, hydraulic fracturing, fluid transport properties, static and dynamic physical/mechanical characterization, thermal-hydraulic-mechanical-chemical coupled processes, surface roughness analysis and acoustic emissions. He previously worked as Senior Engineer/Geoscientist at ConocoPhillips Subsurface Laboratories in Bartlesville, OK after a post doctorate at the University of Durham, UK. He has a MS in Civil Engineering from Polytechnic University of Turin, Italy; a M.S. and a PHD in Energy and Geo-Environmental Engineering from Pennsylvania State University, University Park, Pennsylvania, USA.