

Fractured rock in energy geotechnics

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Abstract

Energy resources and energy waste geostorage involve fractured rock masses in most cases. Fractures control all the physical properties, in particular the geoplumbing of the formation; yet, most laboratory and field studies focus on the intact rock. The presentation starts with fracture formation (ductile-brittle transition, layered-bound fractures) and fracture densities encountered in some reservoirs. Then, we review elastic properties (3D stress field and frequency effects), and thermal properties. Emphasis is placed on fluid flow, including: conductivity and transmissivity (the effect of the stress field and dilation, and consequences on stimulation), mixed fluid conditions, reactive fluids and fines migration. Finally, we explore alternatives for reservoir simulation in fractured rocks.