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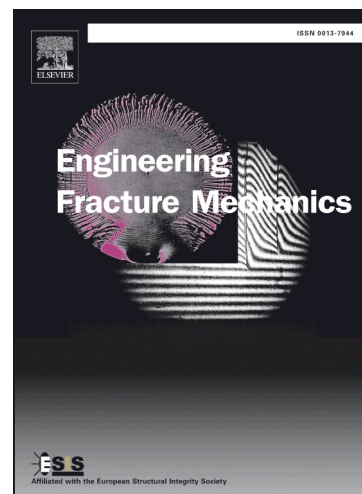
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## Fracture development on a weak interface ahead of a fluid-driven crack

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**Abstract.** This paper is aimed at modelling of mechanical interaction of a fluid-driven crack (FDC) with a weak natural interface in a rockmass. FDC may be thought as a magma-filled crack (dyke) typical for volcanic edifices or as a hydraulic fracture artificially induced in oil and gas bearing reservoirs. The main focus of this study is the investigation of the development of delaminating and shear zone on the interface caused by the stresses produced by FDC that precede the FDC branching and bifurcation when crossing the interface. The mechanism of generation of a network of the connected open-shear cracks is also discussed on the basis of formulation of the problem for the case when the delamination on the interface occurs over a part of the longer shear crack. The method of complex integral equations is used to study two configurations of the fracture pattern developing ahead of the FDC.

**Keywords:** hydro-fracture, interface delamination, rock joint, dyke-sill transition, integral equations.

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