11th World Congress on Computational Mechanics (WCCM XI)
5th European Conference on Computational Mechanics (ECCM V)
6th European Conference on Computational Fluid Dynamics (ECFD VI)
July 20 - 25, 2014, Barcelona, Spain

# TIP ADVANCEMENT AN PRESSURE DISTRIBUTION IN HYDRAULIC FRACTURING

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**Key Words:** *Hydraulic fracturing, cohesive model, fluid lag, finite elements, stepwise advancement.*

Fracture tip advancement and pressure distribution of pressure induced fracture in 2D and 3D fully saturated porous media is investigated in detail because of their peculiar features [1, 2, 3]. A cohesive fracture model is adopted for this purpose together with a discrete crack and without predetermined fracture path. The fracture is filled with interface elements which in the 2D case are quadrangular and triangular elements and in the 3D case are either tetrahedral or wedge elements. The Rankine criterion is used for fracture nucleation and advancement. In a 2D setting the fracture follows directly the direction normal to the maximum principal stress while in the 3D case the fracture follows the face of the element around the fracture tip closest to the normal direction of the maximum principal stress at the tip. The procedure requires continuous updating of the mesh around the crack tip to take into account the evolving geometry. The updated mesh is obtained by means of an efficient mesh generator based on Delaunay tessellation [4, 5]. The governing equations are written in the framework of porous media mechanics and are solved numerically in a fully coupled manner. Numerical examples dealing with well injection (constant inflow) in a geological setting and hydraulic fracture in 2D and 3D concrete dams (increasing pressure) will be dealt with.

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