

Studying fluid flow in solid particles using coupled Discrete Element Lattice Boltzmann Method

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ABSTRACT

In this work a coupled solid-fluid code is used to study fracture propagation process during the hydraulic fracturing process. In the coupled code Discrete Element Method (DEM) is applied to model the fracture in the solid and Lattice Boltzmann Method (LBM) is used to simulate the fluid flow through formed fracture network. DEM particles are spheropolyhedral shaped and allows modelling of particles with general shape with no porosity. This method is validated by an extensive simulation plan investigating the influence of the fluid viscosity as well as stress effect on the fracture propagation. The results from this study contribute to the proper validation of discrete methods and the understanding of how micro-damage affects fracture at the macro scale.

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