Contribution ID: **770** Type: **Oral Presentation**

An Assumed Enhanced Strain (AES) finite element approach in modeling fracture propagation in partially saturated porous media

Tuesday, 1 June 2021 11:45 (15 minutes)

Fracture propagation in porous media is essential to many complex subsurface geoengineering systems, such as geological fault rupture, hydraulic fracturing, geothermal energy exploitation and waste water management and so on. Numerical methods have become more and more important in better understanding the coupled physics of those complex subsurface systems. In this work, an AES finite element approach is proposed to simulate fracture propagation in the partially saturated porous media. Compared with traditional finite element method, the AES approach allows the fracture to propagate inside the elements, does not require the element edges to be aligned with the fracture. Compared with the extended finite element method, the AES approach does not introduce new degrees of freedom into the global system of equations. The fractures in AES approach can be modeled locally at the Gauss point level and the explicit geometrical description of fractures can be avoided. The presentation will cover the formulation and some numerical aspects in implementing AES approach, and demonstrate its capability in simulating fracture propagation in the porous media with several numerical examples.

Time Block Preference

Time Block A (09:00-12:00 CET)

References

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