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Type: Oral Presentation

Phase field fracture propagation with proppant transport and two phase flow

Tuesday, 1 June 2021 15:55 (15 minutes)

In this talk, we present an extension of the phase-field fracture propagation model to the immiscible two-phase flow fracture model, and with a transport problem. The flow model is derived by using the lubrication theory, and we provide the absolute and relative permeabilities with nonzero capillary pressure. The contribution in solid mechanics consists of displacements and a phase-field variable. Both systems are coupled employing a fixed-stress splitting and discretized by employing continuous Galerkin finite element methods. The flow and transport system has resident and injected pressures and saturations, and concentration of transported species. The flow problem is treated with a locally conservative enriched Galerkin finite element method to provide accurate flux to the transport problem. Modeling and algorithms are substantiated with several numerical tests.

Time Block Preference

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

References

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Student Poster Award

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Session Classification: MS24

Track Classification: (MS24 - Invitation Only) Mathematical and computational challenges related to porous media - Special session in memory of Andro Mikelić