SUBSURFACE APPLICATIONS FOR PERIDYNAMICS

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Peridynamics is a nonlocal reformulation of continuum mechanics that is suitable for representing fracture and failure, see [1, 2] and the references therein. Better understanding and control of the subsurface is important to the energy industry for improving productivity from reservoirs. We motivate and explore two relevant subsurface applications for peridynamics. The first involves solving inverse problems in heterogeneous and fractured media, which may be useful in characterizing subsurface stress-state conditions [3]. The second involves the study of fracture initiation and growth from propellant-based stimulation of a wellbore [4]. Simple models and proof-of-concept numerical studies are presented.

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