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# COUPLED FLOW AND GEOMECHANICS MODELING FOR FRACTURED POROELASTIC RESERVOIRS

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**Abstract.** The design and evaluation of hydraulic fracture modeling is critical for efficient production from tight gas and shale plays. The efficiency of fracturing jobs depends on the interaction between hydraulic (induced) and naturally occurring discrete fractures. We describe a coupled reservoir-fracture flow model which accounts for varying reservoir geometries and complexities including non-planar fractures. We utilize different flow models such as Darcy and Reynold's lubrication equation for fractures and reservoir to closely capture the physics. Furthermore, the geomechanics effects have been included by considering a multiphase Biot's model. An accurate modeling of solid deformations necessitates a better estimation of fluid pressure inside fracture. We model the fractures and reservoirs explicitly, which allows us to capture the flow details and impact of fractures more accurately. The approach presented here is in contrast with existing averaging approaches such as dual and discrete-dual porosity models where the effects of fractures are averaged out. A fracture connected to an injection well shows significant width variations as compared to natural fractures where these changes are negligible. Furthermore, the capillary pressure contrast between the two is accounted for by utilizing different capillary pressure curves. We present several numerical tests including a field scale case study, to illustrate the above features and their impact on recovery predictions.