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**Dispersion of solids in fracturing flows of yield stress fluids**[1]
SARAH HORMOZI, Ohio University, IAN FRIGAARD, University of British Columbia — Solids dispersion is an important part of hydraulic fracturing. Whereas many frac fluids are low-viscous others transport solids through increased viscosity. In this context, one method for influencing both dispersion and solids carrying capacity is to use a yield stress fluid as the frac fluid. We propose a model framework for this scenario and analyse one of the simplifications. A key effect of including a yield stress is to focus high shear rates near the fracture walls. In typical fracturing flows this results in a large variation in shear rates across the fracture. In using shear-thinning viscous frac fluids, flows may vary significantly on the particle scale, from Stokesian behaviour to inertial behaviour across the width of the fracture. Equally, according to the flow rates, Hele-Shaw style models give way at higher Reynolds number to those in which inertia must be considered. We develop a model framework able to include this range of flows and make estimates of the streamwise dispersion in various relevant scenarios.

[1]Schlumberger Oilfield Services,NSF and ACS PRF.

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