



IFPRI BRIEF TEMPLATE

Check One: **Project** **Review** **Collaboration**
 Workshop **Other**

Descriptive Title	Simulation of capillary suspensions under external shear
Working Title¹	Simulation of capillary suspensions
Technical Area²	Wet Systems
Date	13 June 2023
Short Description	Simulate capillary suspension network response to external shear (oscillatory deformation) with tunable interaction strength (small pendular bridges with low interfacial tension versus larger pendular bridges with high interfacial tension). Explicit modeling of the bulk fluid via lattice Boltzmann. Further, the inclusion of viscoelasticity in the bridging fluid can help us access the subtle influence of this bridging timescale on the material response. The response with and without added nanoparticles would possibly be considered, if time allows.
Objectives	Force model for the bridges that includes adjustable strength parameters and though a coupling of the microparticle velocity and integrated timescale. Describe the feedback between structure, applied deformation, and mechanical properties.
Scope	<ul style="list-style-type: none"> • Coarse grained MD simulation with lattice Boltzmann and Lees-Edwards boundary conditions • Force interaction model with tunable parameters • Coupling between local particle pair velocity and computed interaction. • Inclusion of nanoparticle species, if possible.

Recommended Contractors (2 or 3)		
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Submitted By:	
Name	Organization
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¹ Title used in meeting agendas and file archives

² One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

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