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**Hydrodynamic Interactions and Friction in Sheared Colloidal Gels.**[1] MADHU V MAJJI, JAMES W SWAN, Massachusetts Institute of Technology — Colloidal gels, which form when attractive particles suspended in a fluid get arrested in non-equilibrium states, are ubiquitous with applications including in consumer care, agrochemical and pharmaceutical industries where engineering specific rheological properties is often a design requirement. In this work, Fast Stokesian Dynamics (FSD) simulations are employed to model the microstructural evolution of colloidal gels subject to steady, linear deformation and rheological properties are predicted. FSD is a fast method of simulating tens of thousands of Brownian spheres interacting hydrodynamically at low Reynolds numbers. Fluid-structure interactions enable formation of large scale anisotropic structures in sheared colloidal gels. We will investigate the effect of different modes of hydrodynamic interactions: far-field and near-field on the evolution of gel microstructure. In addition, the effect of finite friction between particles due to surface roughness, implemented as hydrodynamic resistance to sliding between particles at contact, will be examined.

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