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Elasto-hydrodynamic network analysis of colloidal gels JAMES SWAN, ZSIGMOND VARGA, Massachusetts Inst of Tech-MIT — Colloidal gels formed at low particle volume fractions result from a competition between two rate processes: aggregation of colloids and compaction of pre-gel aggregates. Recent work has shown that the former process is highly sensitive to the nature of the hydrodynamic interactions between suspended colloids. This same sensitivity to hydrodynamic flows within the gel leads to pronounced differences in the spectrum of relaxation times and response to deformation of the gel. This talk explores those differences and their consequences through computational simulations and the framework of elasto-hydrodynamic network analysis. We demonstrate a significant impact of hydrodynamic interactions between gelled colloids on macroscopic gel dynamics and rheology as well as the effect of hydrodynamic screening in gelled materials.

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