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Shear thickening, thinning and jamming in colloidal suspensions

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A microscopic theory for shear thinning behavior in glassy colloidal suspensions is presented. This theory is tested against extensive computer simulation. The theory is extended to study non-linear viscoelastic properties, and is shown to be in remarkable agreement with the measured strain sweep dependence of the loss modulus in colloidal gels. Lastly, we present numerical simulations to address shear thinning and possible shear thickening behavior of dense colloidal suspensions with short-ranged depletion-induced attractions.