

Simulation and theory of hard disk suspensions

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Recent experimental studies of colloidal suspensions of hard disk-like particles, conducted by the group of Lekkerkerker in Utrecht, have succeeded in estimating properties of the nematic (discotic) liquid crystalline phase, specifically the elastic constants. These constants determine the shapes of small droplets (tactoids) of these particles, and their response to applied magnetic fields. We have carried out computer simulations, using hard particle models of these systems, comparing our results with both experiment and theoretical predictions. This sheds some light on the dependence of the elastic constants on particle shape and density, as well as showing that simple theories can be remarkably successful in predicting such properties.