Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sheared athermal soft-particle suspensions near jamming: dependence of effective diffusion on packing density and system size KAMRAN KARIMI, CRAIG MALONEY, Carnegie Mellon University — We perform numerical simulations to study diffusion in a model bi-disperse frictionless athermal soft-particle suspension of disks in two dimensions (2D) using the so-called "mean field" version of Durian's bubble model. We measure the effective transverse diffusion coefficient D_{eff} in shear flows at various volume fraction ϕ and shearing rate $\dot{\gamma}$. For $\phi > \phi_c$, where ϕ_c is identified with the random close packing limit, in the quasi-static limit, D_{eff} shows a pronounced linear system size dependence with very weak dependence on ϕ. For $\phi < \phi_c$, D_{eff}, in the quasi-static limit, increases with increasing ϕ and shows very little system size dependence. We discuss how the behavior of D_{eff} is related to non-trivial correlations in the spatial structure of the displacement fields *at long times* in the Fickian regime.

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Date submitted: 21 Nov 2011 Electronic form version 1.4