Abstract Submitted
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Relaxation time, viscosity and scaling at densities below jamming[1] PETER OLSSON, Umeå University, Sweden — We simulate soft-core bidisperse frictionless disks in two dimensions with overdamped dynamics at zero temperature and densities below jamming. We first prepare configurations by shearing at several constant shear rates $\dot\gamma$. These configurations are then used as starting points for simulations *without* shearing that relax the system to zero energy. From these simulations we determine both the relaxation time, τ, and the average path length traversed by the particles to reach the zero energy state. We find that τ diverges algebraically as a function of density, $\tau \sim (\phi_J - \phi)^{-\beta}$, if $\dot\gamma$ in the preparatory simulations is sufficiently small. We further find that the shear viscosity η can be formally related to τ, and that this gives a way to understand the origin of corrections to scaling in the scaling analysis of η[1]. The presence of the exponent $\beta + y$, where $y \approx 1.1$, in the scaling of the deviations from the $\dot\gamma \to 0$ limit, $\eta(\phi, \dot\gamma)/\eta(\phi, \dot\gamma \to 0) = f((\phi_J - \phi)^{-(\beta+y)}\dot\gamma)$ [1], is also given an intuitive interpretation.

[1] P. Olsson and S. Teitel, Phys. Rev. E **83**, 030302(R), 2011.

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