Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Stretched-exponential relaxation in sheared non-Brownian suspensions JOSEPH PAULSEN, University of Massachusetts Amherst, SIDNEY NAGEL, The University of Chicago — Relaxations in glasses are often approximated by a stretched exponential. Many models to explain this behavior posit a heterogeneous spread of single exponential processes with a wide distribution of relaxation times. Here, we study the approximately stretched-exponential relaxation that we find in a model, developed by Corté et al. [1], of sheared non-Brownian suspensions. Using a one-dimensional version with a variety of interaction rules [2], we investigate how the wide spectrum of relaxation timescales originates from density fluctuations in the initial (random) configuration of particles. Our theoretical arguments are in good agreement with numerical simulations and reveal a functional form for the relaxation that is distinct from, but well-approximated by, a stretched exponential.

[1] L. Corté, P. M. Chaikin, J. P. Gollub, and D. J. Pine, Nature Phys. 4, 420 (2008).
[2] N. C. Keim, J. D. Paulsen, and S. R. Nagel, Phys. Rev. E 88, 032306 (2013).

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Date submitted: 13 Nov 2013 Electronic form version 1.4