Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Sedimentary Deposition and the Kinetics of Jamming TED BRZINSKI, R. KARUNAMUNI, A. D. A. MAIDMENT, P. E. ARRATIA, D. J. DURIAN, University of Pennsylvania — We observe a dispersion of spheres sedimenting in a fluid until all grains form a packing. In a Newtonian fluid, the dispersion is roughly homogenous in space and time except at two well-defined interfaces: a dispersion-supernatant interface, and a jamming front below which grains form a jammed packing. This system is ideal for the study of jamming kinetics because the jamming front is stationary: it moves upwards with a constant speed and shape. To characterize the concentration profile at the front, we have utilized x-ray absorption to directly measure volume fraction as a function of height and time. To characterize the grain-scale dynamics across the front, we now utilize a light scattering technique, speckle-visibility spectroscopy, to directly measure fluctuations of the grain velocities as a function of height and time. In order to alter the kinetics of jamming in this model system, we perturb the hydrodynamic interactions between grains by using a viscoelastic fluid, and observe how the shape and speed of the jamming front changes.

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Date submitted: 08 Nov 2012 Electronic form version 1.4