Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Macroscopic consequences of contact breaking in the vibrational response of jammed packings W. WENDELL SMITH, Yale University, MARK D. SHATTUCK, City College of New York, COREY S. O'HERN, Yale University — Computational studies of the linear vibrational response regime of packings of frictionless spherical particles have yielded many insights into our understanding of the mechanical properties of amorphous solids. However, many jammed systems such as granular media display strongly nonlinear vibrational response. Even the model systems of spherical particles that interact via purely repulsive linear springs and are typically used in computational studies of jamming display nonlinear vibrational response due to the breaking and forming interparticle contacts.
In this work, we perform molecular dynamics simulations of spherical particles with purely repulsive contact interactions and study their vibrational response as a function of the energy and frequency content of the initial perturbation. In particular, we explore the consequences of contact breaking on macroscopic quantities such as the specific heat, momentum current, and energy flux.

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Date submitted: 14 Nov 2013 Electronic form version 1.4