Abstract Submitted
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An experimental test of equilibration of temperature-like variables in jammed granular materials[1] JAMES PUCKETT, Dept. of Physics, North Carolina State University, BRIAN TIGHE, Process & Energy Laboratory, TU Delft, KAREN E. DANIELS, Dept. of Physics, North Carolina State University — Although jammed granular systems are athermal, a number of thermodynamic-like descriptions have been proposed which make predictions about the distributions of volume and stress fluctuations. We perform experiments with an apparatus designed to generate a large number of jammed two-dimensional configurations, which consists of a single layer of photoelastic disks supported by a layer of air driven through a microporous membrane. New configurations are automatically generated by alternately dilating the system (permitting large-scale rearrangements) and compressing it biaxially until a desired volume or pressure is reached. Within each configuration, a bath of $\gtrsim 10^3$ particles surrounds a smaller subsystem of particles with either the same or a different inter-particle friction coefficient than the bath.The use of photoelastic particles permits us to find all particle positions, and to numerically solve for the vector forces at each inter-particle contact. By comparing temperature-like quantities between subsystems, we test whether equilibration is observed under several proposed volume and stress ensembles.

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James Puckett
Dept. of Physics, North Carolina State University

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