

Abstract Submitted
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Cyclic simple shear in a two-dimensional granular system¹ JIE REN, JOSHUA DIJKSMAN, ROBERT BEHRINGER, Department of Physics, Duke University — We study the evolution of a 2D granular system consisting of frictional photo-elastic disks under large numbers of small-amplitude cyclic shear cycles. We are particularly interested in the reversibility of the system under cyclic shear. The experiments are carried out on a specially designed apparatus which can create quasi-static, nearly uniform simple shear. By using photo-elastic particles and a fluorescent labelling technique, we obtain information about displacement, rotation and contact forces for each particle following each small strain. We also obtain the system-level behaviour over many shear cycles. To better understand the nature of jamming, we have carried out shearing runs that explore various initial states which are initially unjammed, isotropically jammed or anisotropically jammed, and we compare the results for different initial states.

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