

Abstract Submitted
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Irreversible Incremental Behavior in a Granular Material¹ LUIGI LA RAGIONE, Cornell University, VANESSA MAGNANIMO, MSM, CTW, University of Twente, 7500EA Enschede (NL), JAMES JENKINS, Cornell University, HERNAN MAKSE, City College New York — We test the elasticity of dense, isotropic, compressed aggregates of frictional spheres using cyclic increments of shear and volume strain in a numerical simulation. For both types of increments, we measure irreversibility in relative displacements and contact forces that is stronger for the increments in shear. The strength of the irreversibility increases as the average number of contacts per particle (the coordination number) decreases. This irreversibility may be associated with the opening of contacts in an increment of loading, pointed out in a recent paper of Schreck et al. (PRL, 2011); such contact opening could lead to irreversible rearrangement of the contact network when the increment is relaxed.

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