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Structure and deformation in compressed disordered packings JENNIFER RIESER, University of Pennsylvania, WENBIN LI, JU LI, Massachussetts Institute of Technology, JERRY GOLLUB, Haverford College, DOUGLAS DURIAN, University of Pennsylvania — How the local structural configuration influences large-scale deformation in disordered materials is not known. We explore this relationship in two-dimensional disordered granular packings under uniaxial compression. The two-dimensionality of the system allows for direct observation of all particle dynamics during the compression of a pillar. The grains can be cohesive, with an attraction governed by tunable capillary forces that are induced through an interstitial fluid. Topological quantities derived from a generalized Voronoi diagram as well as the resulting triangulation are used to characterize local structure within the packing. Dynamics are characterized by local deformations to the triangulation as well as the local non-affine motion. We investigate correlations between these structural and dynamical measures, and we observe that holes tend to develop in regions of high strain.

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