Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Identifying Defects in Disordered and Ordered Solids SVEN WIJTMANS, LISA MANNING, Syracuse University — Characterizing defects in solids is an important step to developing continuum equations for failure in materials. Defects in crystalline solids (i.e. dislocations) are easy to characterize, but in disordered solids the lack of crystalline order makes it difficult to identify where particle rearrangements are likely to occur. Here we describe simulations of quasi-statically sheared athermal jammed packings of bidisperse discs in 2D. We perform energy minimization at each step using a combination of conjugate gradient and line search algorithms. By analyzing localized excitations in low-frequency vibrational modes, one can identify flow defects in disordered solids. We have developed tools to carefully match these flow defects to corresponding plastic events, and we analyze how the properties of defects change across packings ranging from disordered to completely ordered. This will allow us to understand the fundamental connections between dislocations and flow defect dynamics in solids.

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Date submitted: 09 Nov 2012 Electronic form version 1.4