

Abstract Submitted
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Networks of Broken Links in Granular Flows MARK HERRERA,
Institute for Research in Electronics and Applied Physics: University of Maryland,
SHANE MCCARTHY, MICHELLE GIRVAN, WOLFGANG LOSERT, Institute
for Research in Electronics and Applied Physics: University of Maryland — Shear
zones and reproducible flow fields are key features of granular flows. We experimen-
tally study flows in a split bottom geometry by tracking the motion of all particles in
three dimensions. In particular, we investigate how shear zones emerge from individ-
ual particle rearrangements, and how the rearrangements transition from reversible
to irreversible with increasing strain. In order to analyze rearrangements at the level
of particle motion, we define a broken links network, the set of particle pairs that
have separated from each other and are no longer in contact. The emergence of a
giant component occurs at the same characteristic strain at which a steady shear
zone forms. We propose network theory as a new framework to characterize granular
flows at the intermediate scale.

Mark Herrera

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