Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Constraint counting for frictional jamming D.A. QUINT, University of California Merced, S. HENKES, J.M. SCHWARZ, Syracuse University — While the frictionless jamming transition has been intensely studied in recent years, more realistic frictional packings are less well understood. In frictionless sphere packings, the transition is predicted by a simple mean-field constraint counting argument, the isostaticity argument. For frictional packings, a modified constraint counting argument, which includes slipping contacts at the Coulomb threshold, has had limited success in accounting for the transition. We propose that the frictional jamming transition is not mean field and is triggered by the nucleation of unstable regions, which are themselves dynamical objects due to the Coulomb criterion. We create frictional packings using MD simulations and test for the presence and shape of rigid clusters with the pebble game to identify the partition of the packing into stable and unstable regions. To understand the dynamics of these unstable regions we follow perturbations at contacts crucial to the stability of the "frictional house of cards."

David Quint
University of California Merced

Date submitted: 13 Dec 2011 Electronic form version 1.4