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Rigid clusters in frictional particle packings KUANG LIU, Syracuse University, JONATHAN KOLLMER, North Carolina State University, JAMES PUCKETT, Gettysburg College, KAREN DANIELS, North Carolina State University, SILKE HENKES, University of Aberdeen, J.M. SCHWARZ, Syracuse University — We recently developed an algorithm to identify rigid clusters in frictional particle packings. The algorithm was applied to numerically generated frictional particle packings and the rigid cluster identification revealed the existence of a broad-tailed rigid cluster size distribution near the onset of frictional jamming, suggesting a continuous transition in the formation of rigid clusters.[1] We, therefore, look for other signatures of criticality in frictional particle packings in two ways. First, we numerically study rigidity percolation with friction on a honeycomb lattice with randomly added next nearest neighbor bonds. We find a second order transition, suggesting a fractal spanning rigid cluster, and numerically determine related exponents and universal scaling functions. Second, we implement our rigid cluster decomposition on experimentally obtained frictional jammed packings to test for signatures of criticality under realistic conditions.

[1]Silke Henkes, David A. Quint, Yaouen Fily, J.M. Schwarz, **Phy. Rev. Lett.** 116, 028301 (2016)

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