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Jamming transition of angular shaped particles under compression[1] CACEY STEVENS BESTER, YIQIU ZHAO, YUANYUAN XU, MEREDITH COX, ROBERT BEHRINGER, Department of Physics, Duke University — A fundamental challenge of understanding the global behavior of granular assemblies is to determine the effect of local particle properties, such as particle shape. Here we investigate how particle shape influences the jamming transition of granular packings by comparing the response of systems of angular shaped particles to that of disks under isotropic compression. These experiments are performed using two-dimensional arrangements of photoelastic particles, allowing us to visualize the change in force propagation during the jamming transition. We find qualitative and quantitative differences in the macroscopic responses of the systems with changing particle shape. We compare the packing fraction and the contact number evolution of compression experiments as we vary particle shape. The pair correlation function also shows a different geometric feature with particle shape. Using cyclic compression, we additionally explore the stress relaxation and dynamical heterogeneity of the particles.

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Cacey Stevens Bester
Department of Physics, Duke University

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