

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Avalanches and local force evolution in a granular stick-slip experiment¹ AGHIL ABED ZADEH, JONATHAN BARES, ROBERT BEHRINGER, Duke University — We carry out experiments to characterize stick-slip for granular materials. In our experiment, a constant speed stage pulls a slider which rests on a vertical bed of circular photoelastic particles in a 2D system. The stage is connected to the slider by a spring. We measure the force on the spring by a force sensor attached to the spring. The distributions of energy release and time duration of avalanches during slip obey power laws. We analyze the power spectrum of the force signal to understand the effect of the loading speed and of the spring stiffness on the statistical behavior of the system. From a more local point of view and by using a high speed camera and the photoelastic properties of our particles, we characterize the internal granular structure during avalanches. By image processing and analyzing the skeleton of force network inside the media, we try to understand the flow of particles and evolution of force chains inside the media and during avalanches.

¹NSF DMR1206351, NASA NNX15AD38G, and the W. M. Keck Foundation

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Date submitted: 27 Jul 2015

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