

Abstract Submitted
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Sliding Friction on a 2D Photoelastic Granular Bed PEIDONG YU, ROBERT BEHRINGER, Physics Dept., Duke University, BRIAN UTTER, Dept. of Physics, James Madison University — We describe ongoing experiments to characterize the nature of granular friction. In the experiment, a slider is pulled by a spring moving at constant speed across the top of a 2D granular bed confined to a vertical channel. The pulling force is measured synchronously with image acquisition of the granular bed taken by a camera moving along with the slider. We use the pulling force and the slider position to find out the frictional force. We observed stick-slip motion by analyzing the slider position and the frictional force data and characterize the nature of friction as a function of the experimental parameters such as pulling speed and slider mass. Comparing those different features helps us understand the current friction models of granular materials. By observing images of the photoelastic grains, we also study the force networks of the granular bed under the moving slider. We tried to correlate the distribution, the formation and the annihilation of the force chains with the frictional force and the position of the slider.

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