Abstract Submitted
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Correlating Grain and Slider Dynamics in a Stick-Slip Experiment[1] ERIC SIA, BOB BEHRINGER, Duke University — We describe an experiment to characterize the stick-slip nature of sliding friction. In the experiment a solid slider is pulled by a spring moving at constant velocity across a 2D granular bed of bidisperse photoelastic discs confined to a vertical channel. A force sensor attached to the spring measures the pulling force on the slider, while two accelerometers on the slider provide angle and acceleration data. Synchronous photoelastic images of the granular bed acquired by a camera moving along with the slider allow us to correlate all features of the slider and granular dynamics. We particularly focus on the correlation of the slider acceleration and changes in the granular force network. This experiment can help us better understand both atomic scale friction experiments, and stick-slip at the geophysical scale.

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