Abstract Submitted
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2D granular avalanches with imposed vibrations BRIAN UTTER, DAN AMON, James Madison University — We present work on a 2D free surface granular flow experiment under vertical vibration. The experiment consists of photoelastic grains in a 2D circular drum which is rotated at a constant rate (f $<$ 1 mHz). We measure time series of the slope, particle trajectories, and image the bulk force network. Avalanche and build-up distributions exhibit a power-law dependence as previously observed. We then vibrate the drum vertically to determine the effect of external vibrations on this "unjamming" transition. While larger vibrations destabilize the pile and decrease the maximum angle of repose, small vibrations lead to a strengthening of the pile and tend to increase the critical angle of failure. In the absence of vibration, when the drum is rotated opposite the direction of steady rotation, the critical angle of the first failure decreases slightly from the steady-state value due to the lack of an established steady-state force network.

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