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Oscillation Frequency and Pattern Wavelength in Shaken Granular Media[1] SARAH ANDERSON, BARBARA SKRZYPEK, JUSTIN STUCK, JON BOUGIE, Loyola University Chicago Department of Physics — When a layer of grains atop a plate is vertically oscillated at amplitudes greater than that of gravity, the layer of the material leaves the plate at some point in the cycle. Shocks form in the layer upon its return collision with the plate. Standing wave patterns also form at various amplitudes exceeding a critical value for the system. Previous research has examined the relationship between the shock strength and driving frequency at a fixed layer depth and accelerational amplitude. For a given layer depth, a decrease in frequency corresponds to a stronger shock and greater pattern wavelength. We characterize the base state of the system by investigating the shocks just prior to pattern formation in the media, using numerical simulations of continuum equations to Navier-Stokes order. We use this characterization to study the relationship between shock instability and the patterns formed in these layers.

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