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Noise strength in shaken granular media near onset[1] JENNIFER KREFT, JACK B. SWIFT, HARRY L. SWINNEY, Center for Nonlinear Dynamics, University of Texas at Austin — The effects of fluctuations in Rayleigh-Benard (RB) convection near the onset of long range order have been found to be described well by the stochastic Swift-Hohenberg (SH) equation with a noise strength proportional to kT [J. Oh and G. Ahlers, Phys. Rev. Lett. **91**, 094501, (2003)]. Similar behavior has been found in vertically oscillated granular material where the thermal fluctuations are negligible [D. I. Goldman, *et al.*, Phys. Rev. Lett.**92**, 174302, (2004)]. We conjecture that fluctuations in the granular system arise from the small number of particles per wavelength, typically of order 10, in contrast to the 10^6 particles per wavelength in RB convection. Here, we investigate the onset of patterns in an event-driven molecular dynamics simulation of vertically oscillated frictional hard spheres, and we use the SH equation to quantify the strength of the noise for different wavelengths. We show that the noise decreases as the wavelength increases, but is independent of layer depth, suggesting that only the fluidized grains on the surface of the bulk contribute.

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