

Abstract Submitted
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Exotic patterns and convection control in a vibrated bed of binary granular mixtures MEHEBOOB ALAM, ISTAFAUL ANSARI, Jawaharlal Nehru Centre for Advanced Scientific Research — Experiments have been carried out in a harmonically shaken quasi-2D bed of glass and steel particles for a wide range of shaking strengths and relative number fractions of two species. The goal is to understand the role of bidispersity and other control parameters on the resulting pattern formation dynamics and segregation. We report novel patterns displaying the coexistence of sub-harmonic/harmonic and disordered states, and a partial analog of granular Rayleigh-Benard convection. The former patterns bear striking similarities with Chimera-states in the sense that they represent a coexisting state of synchronous and asynchronous patterns. The horizontal segregation of glass and steel particles is responsible for the genesis of such phase-coexisting patterns. We demonstrate a simple recipe to control “buoyancy-driven” granular convection.

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