Pattern formation and pinning-depinning transition in a subharmonic granular wave pattern[1] CLAUDIO FALCÓN, JEREMíAS GARAY, MARCEL CLERC, IGNACIO ORTEGA, Departamento de Física, Facultad de Ciencias Físicas y Matemáticas, Universidad de Chile — We present an experimental and theoretical study of the pattern formation process of standing subharmonic waves in a fluidized quasi-one-dimensional shallow granular bed. The fluidization process is driven by means of a time-periodic air flow, analogous to a tapping type of forcing. Measurements of the amplitude of the critical mode close to the transition are in quite good agreement with those inferred from a universal stochastic amplitude equation. This allows us to determine both the bifurcation point of the deterministic system and the corresponding noise intensity. Then, we charaterize the stationary to drifting transition of this subharmonic wave pattern in the presence of inhomogeneities and drift forces. The transition is mediated by the competition of the inherent periodicity of the subharmonic pattern, the asymmetry of the system and the finite size of the cell. We measure the mean phase velocity of the subharmonic pattern, which is in good agreement with those inferred from an amplitude equation taking into account asymmetry and finite size effects of the system.

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Date submitted: 01 Aug 2011   Electronic form version 1.4