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Solid-liquid like phase transition in a confined granular suspension NARIAKI SAKAI, FREDERIC LECHENAULT, MOKHTAR ADDA BEDIA, Laboratoire de Physique Statistique - Ecole Normale Superieure, Paris — We present an experimental study of a liquid-solid like phase transition in a two-dimensional granular media. Particles are placed in a vertical Hele-Show cell filled with a denser solution of cesium-chloride. Thus, when the cell is rotated around its axis, hydrostatic pressure exerts a centripetal force on the particles which confines them towards the center. This force is in competition with gravity, thus by modifying the rotation rate, it is possible to transform continuously and reversibly the sample from a disordered loose state to an ordered packed state. The system presents many similarities with thermal systems at equilibrium like density and interface fluctuations, and the transition between the two phases goes through a coexistence state, where there is nucleation and growth of locally ordered domains which are captured by the correlation function of the hexatic order parameter. We discuss the possibility to extend the grand-canonical formalism to out-of equilibrium systems, in order to uncover a state equation between the density and the pressure in the medium.

Nariaki Sakai
Laboratoire de Physique Statistique - Ecole Normale Superieure, Paris

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