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From quicksand to beach-sand: a phase transition in quasi-static granular media. MATTHIAS SCHRÖTER, SIBYLLE NÄGLE, CHARLES RADIN, HARRY L. SWINNEY, University of Texas at Austin — Granular media are often described as being in a gas, fluid, or solid phase. However, granular media are dissipative systems with macroscopic constituents, so it is not clear how to apply the precise definitions of phases used in thermodynamics and statistical mechanics. Here we present experimental measurements of the force needed to insert quasi-statically a circular rod into a granular bed at rest. The bed contains glass beads 0.265 mm in diameter. The rod diameter is 24 times the diameter of the beads. Varying the volume fraction of the initial granular bed from 0.57 to 0.63, we find two distinct phases of behavior [1]. The transition occurs at a volume fraction 0.59 . [1] cond-mat/0606459

Matthias Schröter
University of Texas at Austin

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