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Critical Phase Transitions in Vibrated Granular Media GEERT WORTEL, Leiden University, OLIVIER DAUCHOT, ESPCI ParisTech, MARTIN VAN HECKE, Leiden University — Granular media, such as sand, jam under low stresses but yield and flow when stressed sufficiently. We present experiments that uncover that weak vibrations qualitatively modify the nature of this yielding transition from 1st to 2nd order: when the vibration strength, which plays a role similar to temperature, is raised sufficiently, the yielding transition becomes continuous. At the critical point, we find diverging fluctuations, growing timescales and the emergence of a length scale: hallmarks of criticality never seen before in sand.

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