

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Suppression of the threshold of a granular solid by mechanical fluctuations AXELLE AMON, Université Rennes 1, ADELINÉ PONS, THIERRY DARNIGE, PMMH, ESPCI, Université Paris 6 & 7, JÉRÔME CRASSOUS, Université Rennes 1, ERIC CLÉMENT, PMMH, ESPCI, Université Paris 6 & 7 — For a granular material, when the ratio between the shear stress and the confining pressure is smaller than the Mohr-Coulomb threshold, the system can be considered as a solid. Nevertheless, a long-term creep is observed in this solid phase in stress imposed experiments. We present recent experimental and theoretical results demonstrating that the superposition of tiny modulations to the imposed stress are sufficient to change the response of the system from a logarithmic creep to a linear one even deep in the jammed phase. We give a theoretical interpretation of this fluidization without invoking an effective temperature due to a mechanical noise. We interpret our observations as a secular effect, i.e. a ratcheting process which is revealed only on very long times. We show that a local fluidity model is sufficient to interpret fully our experimental observations.

Axelle Amon
Université Rennes 1

Date submitted: 03 Nov 2015

Electronic form version 1.4