

Abstract Submitted
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Influence of liquid bridges on the macroscopic properties of granular assemblies GEOFFROY LUMAY, University of Liege, JORGE FISCINA, Universität des Saarlandes, FRANCOIS LUDEWIG, NICOLAS VANDEWALLE, University of Liege — We present the results of two experimental studies concerning the compaction dynamics of cohesive granular materials. In the first study, the cohesion between neighboring grains is induced by capillary bridges in a wet granular material. The cohesiveness is tuned using different liquids having specific surface tension values. The second study concerns initially dry granular materials surrounded by a well controlled air humidity. Then, the cohesion inside the packing is controlled through the relative humidity which influence both triboelectric and capillary effects. For both cases, the evolution of the parameters extracted from the compaction curves (the compaction characteristic time τ , the initial and final packing fractions) have been analyzed as a function of the cohesiveness. A model, based on free volume kinetic equations and the presence of a capillary energy barrier, is able to reproduce quantitatively the experimental results (Phys. Rev. Lett. 105, 048001 (2010)).

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