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## **Granular media : flow & agitations**

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# Propositions

accompanying the thesis

## Granular Media - Flow & Agitations

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- i A simple frictional model to explain flow profiles in the split-bottom geometry, introduced earlier by Unger (*Phys. Rev. Lett.* 92, 214301 (2004)), also correctly predicts the height dependence of their rheology.  
*Chapter 2*
  - ii Gravitational suspensions in the split-bottom geometry display Bingham behavior in both their flow structure, as well as their rheology. These observations are in agreement with the inertial number theory when it is appropriately adapted to submersed particles.  
*Chapter 3 & 5*
  - iii Exposing granular flows to weak vibrations destroys their rate independent flow behavior. This highlights the importance of the role of even the smallest fluctuations in the flow of granular materials.  
*Chapter 6*
  - iv The compaction of vibrated granular media is not governed uniquely by the dimensionless peak acceleration; the tap duration plays an equally important role.  
*Chapter 7*
  - v The study of gravitational suspensions is unduly underrepresented in the scientific literature, given its everyday relevance.
  - vi Non-local extensions to the inertial number theory are the most promising candidates to study the "flows of jammed materials".  
J. Goyon *et. al.*, *Nature* 454, 84-87 (2008)
  - vii The permeability of static porous media can be studied by applying the inertial number theory to flowing gravitational suspensions.  
C. Cassar *et. al.*, *Phys. Fluids* 17, 103301 (2005)
  - viii Three-dimensional imaging of granular suspensions is faster, easier and cheaper than such imaging of colloidal suspensions.
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