

CEMRACS '08

Modelling and Numerical Simulation of Complex Fluids
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Compaction properties of highly packed assemblies

Project proposed by

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This project aims at investigating geometrical and rheological properties of highly packed grain assemblies. In particular, the influence of non-sphericity of grains upon the maximally random jammed solid fraction is of great interest theoretically and in terms of application (in the manufacturing of concrete pavements for instance). We plan to study this influence by considering elongated grains made of two or more overlapping spheres.

Highly packed configurations will be obtained numerically by considering a collection of inflating bodies, with a numerical tool (SCOPI, developed by the Laboratoire de Mathématiques d'Orsay) dedicated to the simulation of granular flows. Once obtained, those packed configurations will be submitted to some external forcing, and we shall estimate numerically the variation of solid fraction induced by the forced deformation.

We plan to model collections up to a few ten thousands of grains.

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