PHYSICAL MATHEMATICS SEMINAR

GRANULAR FLOWS IN HOPPERS

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ABSTRACT:

The flow of granular materials in containers of various geometries under the action of gravity is considered. This problem has turned out to be very challenging for several reasons. First, the nature of the constitutive equations is still a matter of debate. Second, the equations of motion resulting from some of the most popular constitutive relations are mathematically very ill-posed, at least for the time-dependent problems.

In this talk, we will briefly review some classical engineering models and techniques for established flows such as Jenike's radial solutions. Generalizations of those approaches will be introduced and illustrated through numerical experiments. In particular, the occurrence of secondary circulation will be considered. Various limitations due to restricted range of applicability, mathematical and numerical difficulties as well as some questionable modeling assumptions in the standard models will be discussed.

Joint work with M. O'Malley, J.V. Matthews and D. Schaeffer.

TUESDAY, NOVEMBER 21, 2006
2:30 PM
Building 4, Room 270

Refreshments at 3:30 PM in Building 2, Room 349
(Applied Math Common Room)

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