

Modelling the granular flow in a rotating drum by the Eulerian finite element method

B.Sc or M.Sc. Thesis Project

Goal: To study the flow behavior of cohesionless granular materials in a rotating drum by using Abaqus finite element software.

Motivation: Rotating drums are important components used in various industrial processes for mixing, segregating, drying or coating of particles. Such devices are usually costly to construct and consume substantial energy during normal operation, especially when they are poorly designed. Therefore, fundamental research is needed in this area for better understanding drum system and improving their industrial efficiency.

In this study, a continuum approach referred to as the Eulerian formulation finite element method (Eulerian FEM) is employed to investigate the flow behaviour of granular materials in a partially filled cylindrical drum. The FEM approach, built upon conventional elastoplastic theories, has to be extracted so that it can describe the dual solid and fluid-like behaviours of granular materials.



Figure 1: Mixing of different materials by using of drum.

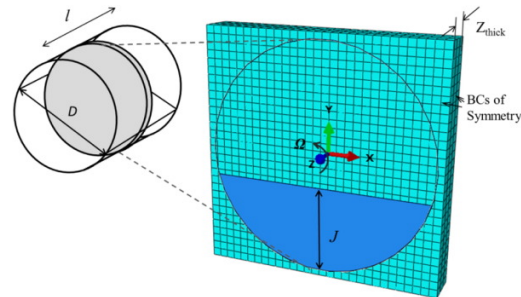


Figure 2: Modeling of rotating drum by using Abaqus

Agenda:

- Literature review, research plan and questions
- Introduction to Abaqus
- Modeling of drum (static dynamic)
- Discussions, presentations and writing thesis (i.e, a scientific paper)

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