Master Thesis

Graz University of Technology

Numerical simulation of powder flows

Research Center Pharmaceutical Engineering

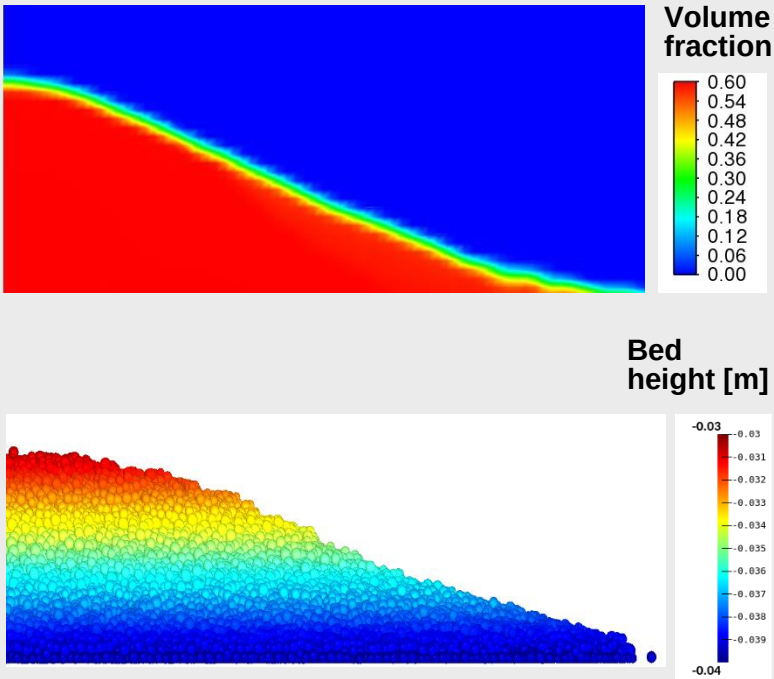
eXtended Particle System DEM software

Scope of work:

The Research Center Pharmaceutical Engineering (RCPE) is a global leader in pharmaceutical engineering sciences. The Discrete Element Method (DEM) is used with great success for the simulation of powder flows, but naturally leads to a high numerical effort for real systems. Therefore, in the context of this master thesis, IWT together with RCPE set the goal to validate an already existing multiphase model for powder flows implemented in ANSYS Fluent with experiments and to benchmark it against an available routine of the XPS DEM code of RCPE.

Work content:

- Validation of the available Fluent multiphase model with experimental data from literature.
- Performance of XPS-DEM simulations and comparison with experiments.
- Comparison and discussion of the results for both models.
- Fine-tuning of parameters of the Fluent model based on the XPS simulations / experiments.



Simulation of the angle of repose of a powder pile with Fluent (top) and XPS (bottom)

Skills:

- Basic programming knowledge
- Basic knowledge in numerical modelling.

Framework conditions:
Start: as soon as possible
Duration: ca. 6 months
Place: @ IWT, Graz
Payment: available
Thesis in English

Contact:
Dr. Robert Scharler
robert.scharler@tugraz.at

Institute of Thermal Engineering
Graz University of Technology
Inffeldgasse 25/B, 8010 Graz

Contact:
Martina Trogrlić: martina.trogrlic@rcpe.at
Area I - Modeling and Prediction

Sandra Sünkel: sandra.suenkel@rcpe.at
Head of Human Resources

Research Center Pharmaceutical Engineering GmbH
Inffeldgasse 13, 8010 Graz