

# Powder simulation with Euler Granular Model and Discrete Element Method



Research Center  
Pharmaceutical  
Engineering



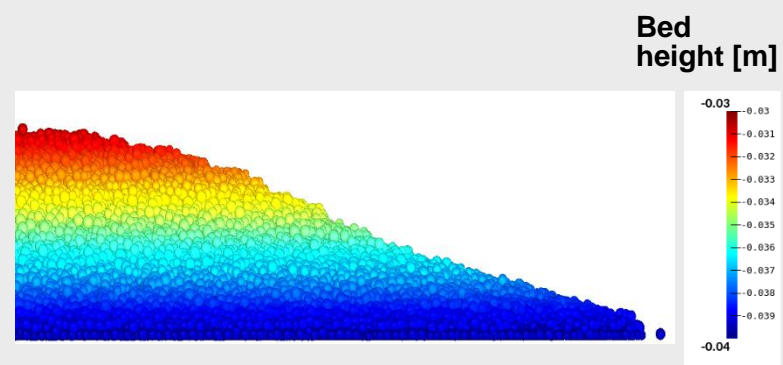
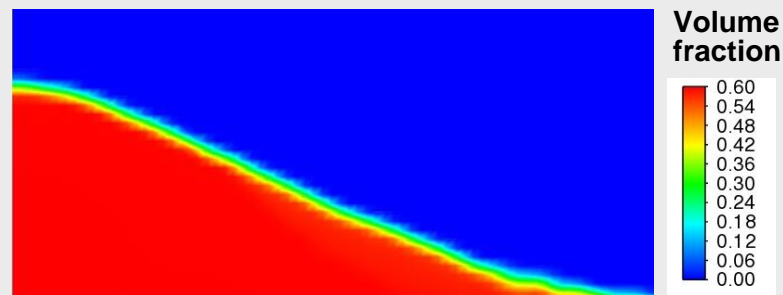
eXtended Particle System  
DEM software

## 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 as the number, size and shape of the particles approach real systems. Therefore, in the context of this master thesis, IWT together with RCPE set the goal to validate an adaptation of the two-fluid model (Euler Granular) for powder flows implemented in ANSYS Fluent with experiments and to benchmark it against the XPS DEM code of RCPE.

## Work content:

- Generation of validation cases for the Euler granular simulations in ANSYS Fluent and the XPS DEM simulations.
- Adaptation of the Euler granular model for different relevant types of granular materials and validation with experiments.
- Performance of XPS-DEM simulations and comparison with experiments.
- Benchmarking of the Euler granular model with XPS-DEM.
- Discussion of model results and suggestions for improvements and application of the models.



## Skills:

- Basic knowledge of programming with Fortran, C/C++, Python etc.
- Basic knowledge in numerical modelling.

### Framework conditions:

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

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