



Bachelor or Master Thesis

### Comparison of CFD-DEM Methods for Multiphase Flows

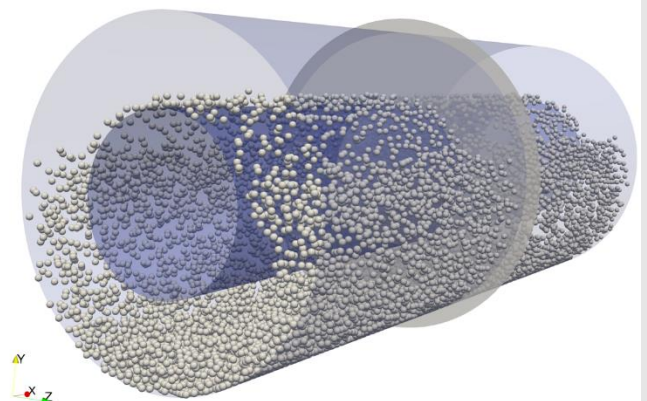
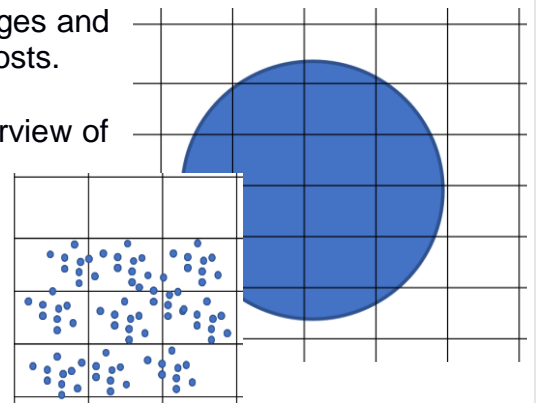
Multiphase flows play an important role in many technical applications and natural occurrences. In the context of deep drilling technology this affects the hole cleaning process, i.e. the transport of drill cuttings through the annulus over a distance of several thousand meters. Thus, multiphase flows strongly affect safety and efficiency of the drilling process for energy resources like oil, gas and geothermal energy.

To shed some light on the multiphase phenomena during cuttings transport, computational methods are employed. Appropriate methods may be divided into resolved and unresolved CFD-DEM methods depending on whether the fluid flow around the particles is resolved or not in the computational mesh.

Both, resolved and unresolved approaches have advantages and disadvantages considering accuracy and computational costs.

The aim of the project is to provide a comprehensive overview of both numerical approaches and to assess the performance of the methods.

A good knowledge of numerical fluid mechanics and knowledge in computational simulation technology particularly in OpenFOAM are necessary.



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