



Bachelor Thesis

Flow Loop Experiments for Validation of a numerical method for Particles Laden Flow

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. However, before employing the developed numerical methods, it is essential to validate these methods with experimental data. The validation approach involves operating an experimental flow loop designed to simulate particle transport phenomena in a pipe. By using this flow loop, particles are introduced into controlled flow conditions, allowing direct observation and measurement of their transport dynamics.

The primary objective of this thesis project is to operate and manage the flow loop facility to obtain experimental data necessary for validating numerical multiphase flow models. Tasks within this project include setting up experimental conditions, conducting systematic experiments under different flow regimes, and precisely measuring relevant flow and particle transport parameters, such as particle velocities, distribution profiles, pressure drops, and flow rates.

Candidates for this project should have a solid foundation in fluid mechanics, an interest in experimental fluid dynamics.



Location:

Start date:

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