Karlsruhe Institute of Technology

Institute of Fluid Mechanics

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14th November 2016

Bachelor-Master-Thesis – numerics

Multi-phase flow simulation of a textured clutch

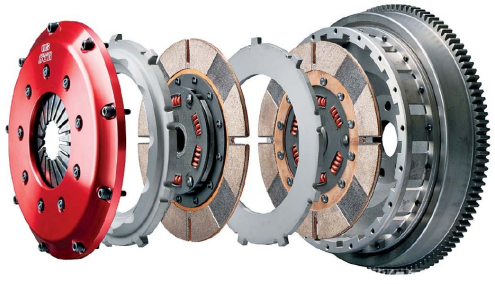
Background

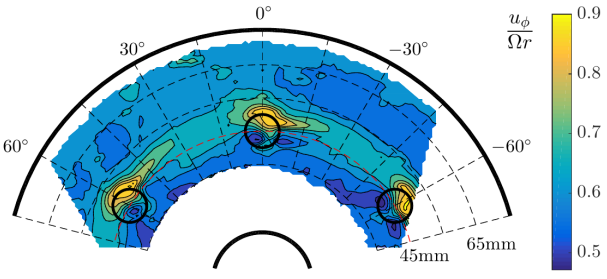
Tribological research on Clutches aims at extending the period of usage and at saving resources by the improvement of the frictional behaviour of contacts. Microtexturing of a surface can be an efficient tool for this purpose. In fact, if well designed, texture surfaces can improve the transient performance during the coupling/uncoupling process of common clutches used in the automotive industry.

Content of the Thesis

In this thesis we want to perform numerical simulations of a typical automotive clutch with the aid of different Computational Fluid Dynamics (CFD) tools. The main aim is to compare and validate experimental results about a simplified clutch system, which were obtained in the experimental facilities of this institute.

Before comparing the numerical results with the experiments, the student will have to select the best meshing strategy for such a geometry and then to compare the first simulation results with the literature and simple analytical solutions. The CFD simulations aim to describe the two phase flow represented by the combined system oil + air. The main CFD tool that will be used in this thesis is Ansys Fluent and the post-processing will be carried out with the aid of Matlab and other programms. Finally, one additional point would be the development and testing of a Reynolds-equation solver (in cylindrical coordinates) which can provide further information from the numerical viewpoint





Requirements

basic knowledge in fluid mechanics and programming

Beneficial Skills

knowledge about tribological flows, computational fluid mechanics, fortran90 and matlab

Start: immediately

Contact:
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