



Universität Stuttgart

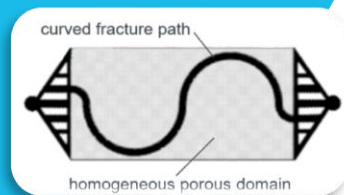
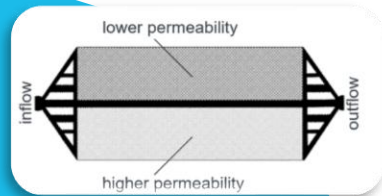
Institut für Mechanik (Bauwesen)

Lehrstuhl für Kontinuumsmechanik

Prof. Dr.-Ing. H. Steeb

Master thesis

Numerical-experimental study of flow through fractured porous media



The following master's thesis is available at the Chair of Continuum Mechanics at the Institute of Applied Mechanics (CE).

The Theory of Porous Media (TPM), including a phase-field approach to model fracture processes, has been proven useful for modelling coupled and interacting flow phenomena in porous media. However, recent works have focused mainly on symmetric scenarios and straight fractures.

The aim of this thesis is therefore to conduct simulations of microfluidic devices with varying permeabilities or geometries within the aforementioned TPM-phase-field framework.

In a combined numerical-experimental investigation, the simulations are supported by experimental data from the Porous Media Laboratory (PML) at the University of Stuttgart.

Tasks:

- Literature research
- Numerical simulation and evaluation of realistic boundary value problems
- Discussion and documentation of the results

Requirements:

- Good knowledge of continuum mechanics of multi-phasic materials
- Good knowledge of numerical methods
- Basic programming skills

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