

Slip boundary conditions for viscous acoustics

Motivation:

Due to the rise of Micro-Electro-Mechanical Systems (MEMS) the characteristic length scales for acoustic problems can reach dimensions (sub μm) where classical continuum theory is not valid anymore. For a certain range modified boundary conditions can be used to account for molecular effects while still using continuum theory. This is accomplished by introducing an additional slip velocity which influences the shape of the boundary layer. Therefore, the already existing Arbitrary-Lagrangian-Eulerian (ALE)-framework for viscous acoustics of our inhouse FEM solver *openCFS* should be extended to include these boundary conditions. The goal of this thesis is to compare the state of the art boundary conditions, implement and test the most promising ones in *openCFS*.

Tasks:

- Literature research
- Implement most promising boundary conditions in *openCFS* (programming language is C++)
- Test formulations

Organization:

- Start at any time

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