

## B.Sc. / M.Sc. Topic

### “Turbulence modeling of an erosion channel (COMSOL vs. OpenFOAM)”

#### Background

Computational fluid dynamics (CFD) modeling is increasingly used for the detailed investigation of complex flow problems of incompressible fluids. However, not all models are suitable for different areas of application. The flow processes within a closed rectangular channel, which is used as an erosion channel in the *IWS Hydraulic Laboratory*, should therefore be investigated with the programs COMSOL and OpenFOAM. The software is commonly used in industrial projects and the student will be offered an excellent opportunity to deepen his/her CFD skills.

#### Thesis Overview

1. Literature review of 3D turbulence modelling of closed flow channels
2. Training with the programs COMSOL and OpenFOAM
3. Creation of a turbulence model with COMSOL and OpenFOAM
4. Grid sensitivity analysis and parameter study
5. Results analysis and model comparison

#### Desirable Skills

- Interest in fluid dynamics
- Knowledge of CFD software is an asset but not mandatory



#### Apply now!

[benedikt.mester@iws.uni-stuttgart.de](mailto:benedikt.mester@iws.uni-stuttgart.de)

Please send your CV and a few lines why you would like to take this topic.

The thesis will be jointly supervised by Benedikt Mester (IWS, University of Stuttgart) and Florian Steffinger (Engineering company Prof. Kobus und Partner (kup)).

The thesis can be written in German or English.

Examiner: Prof.-Dr. Ing. Silke Wieprecht (LWW) | Supervisor: Benedikt Mester (LWW)

