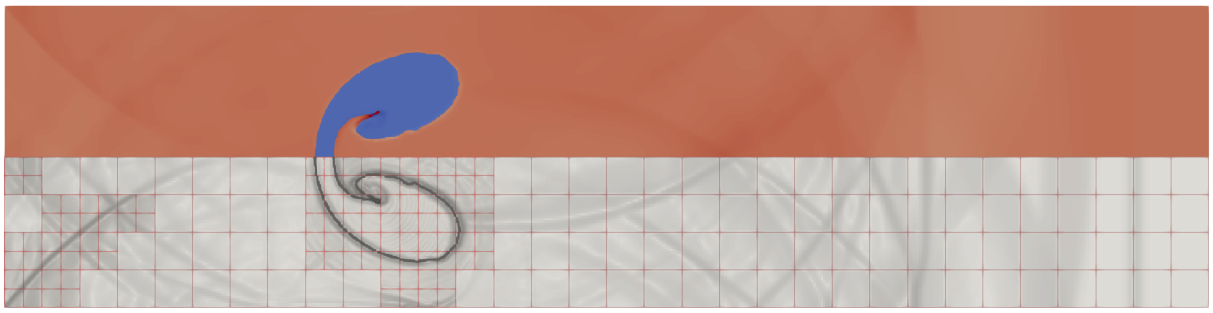
Bachelor/Semester Thesis 25.10.2017

Implementation of multi-phase boundary conditions for CFD simulations



For simulating modern technological applications, CFD codes need to be able to consider not only one, but multiple different fluids. One approach to consider two or more fluids is a so-called level-set based approach. There, the interface between multiple fluids is captured by the scalar level-set field and transported with the fluid field. One major issue concerning this approach is the treatment of the level-set field at the boundary of the numerical domain. The boundary conditions must be capable of correctly extending the interface between the fluids out of the domain to avoid numerical inaccuracies, which could lead to wrong results.

The task of this work is to adapt the already available boundary conditions of an existing research code to treat the level-set field in a range of applications. The work contains a literature review to find possible solutions, implementation and testing of the boundary conditions.

Task:
Literature review for possible level-set boundary conditions
Implementation and testing of the implemented boundary conditions

Requirements:
Interest in multiphase flows and coding
Ability to work independently
C++ knowledge is helpful, but not required

What you learn during this thesis:
Insights into a state-of-the-art research CFD code
Code development: modeling, implementation, debugging, validation

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