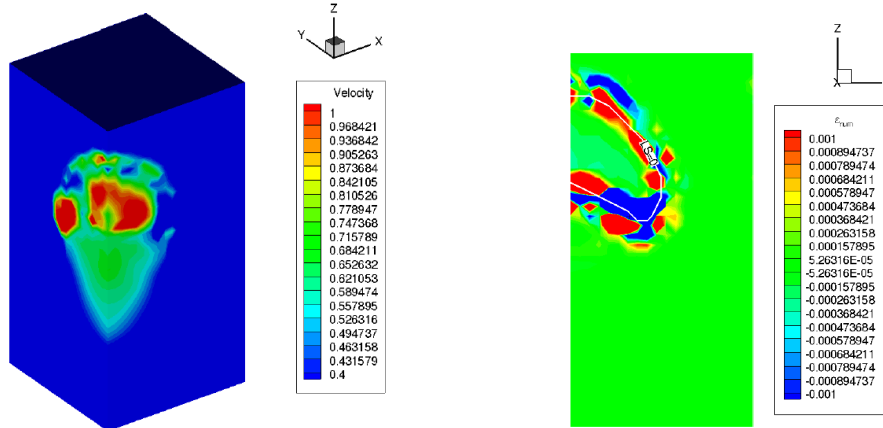


## Analysis of the influence of numerical dissipation rates on CFD results



Numerical dissipation plays an important role in stabilizing numerical fluid simulations. Depending on the chosen numerical schemes, more or less numerical dissipation is added to different flow regions. This can both stabilize or destabilize the simulation, and accordingly both improve or deteriorate the results.

The task of this work is to implement a numerical dissipation rate analysis tool into an existing research code. The tool was developed in a previous Master's thesis. Then, the influence of different numerical schemes on the numerical dissipation rate is investigated. In the end, the results of the analysis tool should be used for on-time mesh adaption to improve the results of the numerical simulation.

### Task:

Implementation of a numerical dissipation rate analysis tool into an existing research code  
 Development of a mesh adaption scheme based on the numerical dissipation rate  
 Numerical simulations of aerodynamic fragmentation of liquid drops to investigate the influence of the new refinement scheme

### Requirements:

Interest in multiphase flows, gas dynamics, 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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