

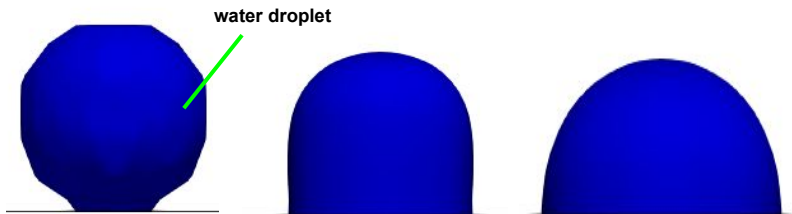
Comparison and modeling of numerical models for simulation of droplet wetting

Background

Several methods are used to simulate the wetting of objects by fluids. Primary and the easiest among them is to explicitly set the contact angle at the boundary, in such a way that the fluid deforms into the required configuration. Initial tests for droplet deformation in zero gravity have proved that a loss of mass occurs during the simulation when the contact angle boundary condition as defined by OpenFOAM is used. This additionally is responsible for the generation of artificial velocities within the domain.

Within the context of this master thesis, one would perform several parameter analysis to quantify the mass loss that occurs due to the static contact angle boundary condition. Additionally, several contact angle boundary conditions must be modeled and compared. The final goal of the master thesis is to assert which method (boundary condition) is ideal for simulation of static contact angles.

Simulation: Deformation of droplet under zero gravity



Focus Points

- Modeling and simulation of droplets in OpenFOAM
- Modeling of boundary conditions
- Parameter studies
- Validation against literature

Requirements

- High motivation
- Interest in numerical work
- Understanding of OpenFOAM environment
- Structured work ethic

Image: Average mass loss as a function of time due to contact angle

