The internship will investigate the contact line velocity impact is not accounted for. During the present internship the impact of the micro-region over the cavitation of a bubble having a large contact velocity impact will be investigated.

**Goals of the internship**

The goal of the present internship is the investigation of the impact of the contact line velocity over the micro-region. The application will be the study of a single bubble growth at the wall induced by cavitation under zero gravity conditions. The coupling of a micro-region model with direct numerical simulation solver for incompressible two-phase flows with phase change has been recently carried out applied to the study of nucleate boiling in micro-gravity conditions (in isobaric conditions) [5]. The micro-region model has been recently implemented in a compressible numerical solver for multi-phase flows which is based on a pressure-based equation for the energy and Level Set/Ghost Fluid approach to handle the interfaces [3,4]. Cubic equation of state (EOS) are used for the liquid and vapour phases and for saturation conditions at the interface. A phase change model, based on fundamental principles and jump conditions, allows to simulate the phase change induced by pressure and temperature variations of single species fluids. Presently the micro-region model only includes thermal effect and the contact line velocity impact is not accounted for. During the present internship the impact of the micro-region over the cavitation of a bubble having a large contact velocity will be investigated.

**Work plan**

- State of the art: micro-region model, numerical simulation of two-phase flows with phase change, hydrodynamic and pool cavitation
- Development: micro-region model development in order to include state of the art models for the contact line velocity
- Simulation: single bubble cavitation under zero gravity conditions

**Team**

The internship will take place at the SaCLab (Space Advanced Concept Laboratory) in the DCAS department at ISAE SUPAERO and will be co-supervised by IMFT (Prof. S. Tanguy).
References


Profile: Master 2 student, basics in computational fluid dynamics, basics in two phase flows, programming.

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Perspectives: possibility to apply for a PhD position after the internship.