

WORKGROUP FOR MULTIPHASE FLOWS

Modeling a bubble column

Grant number

-

Project title

Modeling the Effect of Bubble Dynamics On Motion and Mass Transfer

Project leader

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Short description of the project

Bubbly flows are present in many industrial processes, such as aeration, two-phase heat exchange, flotation, distillation and also in bubble column reactors. The flow in these situations is basically motivated by the buoyancy force and the strong interaction of the bubbles with the carrying phase, or even with themselves, produces effects that are still being a challenge on the mathematical modelling for CFD codes. The main motivation of this project is the bubbles dynamics on motion, whose effects are easily noticed on their shape oscillations, global heat and mass transfers. Then, a CFD model is being developed and implemented in OpenFOAM®, based on a Eulerian/Lagrangian approach, considering bubble oscillations by a stochastic model and volume change due to the mass transfer and coalescence. In order to validate the proposed model, experiments in a laboratory scale bubble column facility are being made, supported by the use of non-intrusive measuring techniques such as PIV/PTV tracking and also PLIF system.



Photo: Bubble column