WORKGROUP FOR MULTIPHAS FLOWS

Interaction of bubbles in bubble swarm

Grant number

SO 204/19-1

Project title

Analysis and modelling of the interactions of bubbles in a bubble swarm

Project leader

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Realized by

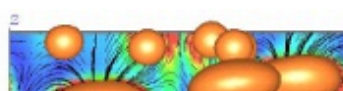Dr. rer. nat. M. Göz

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Dipl.-Ing. D. Bröder

Keywords

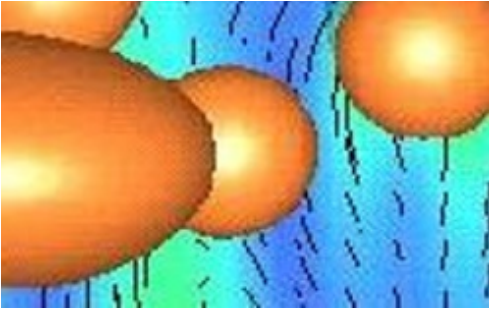bubble swarm, Euler/Lagrange approach
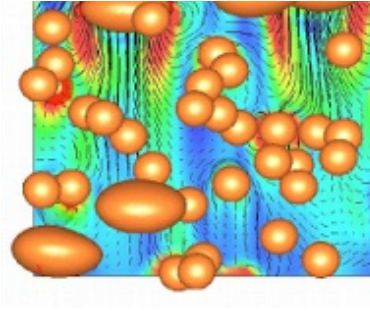
Short description of the project

The priority of this research project is the analysis and the modelling of the interactions of bubbles in a bubble swarm. The partial processes of hydrodynamic interactions, bubble collision and ~ coalescence as well as bubble decay should be considered. Because the Euler/Lagrange approach is used for the calculation of the bubbly flow, a very detailed model development can be applied. The models for bubble coalescence and ~ decay should be based on existing knowledge

But, for the evaluation and validation of these two models detailed experiments in a double loop reactor, in which an intensive interaction between the bubbles could be realized, are necessary. The flow will be analysed with a picturing PIV/PTV method which was developed in the preceding project. The modelling of hydrodynamic interactions between bubbles in a swarm demand tests of the interactions between two and more bubbles using direct numerical simulations to obtain modified drag coefficients. Besides, the behaviour of polydisperse bubble swarms should be analysed using direct numerical simulations. Experiments in a labor bubble column are planned to obtain additional experimental information about the behaviour of bubble clusters, whereas t clusters will be followed in time.

Photo 1: Bubble swarm

Photo 2: Bubble