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Bubble Wall Interaction and Bubble Pairs Motion Using Potential Flow Theory

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In this paper the flow of bubbles near a wall at high Reynolds and low Weber number flows. Under this conditions bubbles can be modelled as spherical ones, and the potential flow approach can be used. There are experiments that confirm this approximation(Duineveld, 1995). Two cases are studied, first the flow of two bubbles moving along a same axis (colineal case), and secondly a flow of two bubbles moving in paralel. This is equivalent to the flow of a bubble near a wall. The velocity potential can be calculated using a series aproximation in spherical harmonics (Van Vijngaarden, 1982). Lagrange equations are used to obtain the motion of the bubbles near a wall, and graphics of the velocity and displacement are obtained. In the colineal case, the simulations showed that two bubbles in potential flow can collide with finite velocity. This confirm the first aproximations made by Kumaran (1992). Then the motion of a bubble ascending near a wall is analyzed.

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