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Formation of a single micro bubble by controlled acoustic gas pressure wave[1] MASAO WATANABE, MINORI SHIROTA, TOSHIYUKI SANADA, Kyushu University — We have developed micro bubble generator which can control both bubble size and generation frequency independently and accurately, by using acoustic gas pressure wave. However, though, the mechanism of this generator has not been fully understood. We further investigated the role of the acoustic gas pressure wave and found the optimal pressure wave for a single micro bubble formation. We succeeded in forming a bubble, whose radius was ranging from 0.3 to 0.8 mm, with extremely small standard deviation of less than 1 micro meter. By analyzing images taken by high-speed photography, detachment of a bubble from a nozzle, especially shrinkage of a capillary bridge connecting a bubble and a nozzle, is investigated in detail. Force balance on a growing bubble is evaluated with the help of experimental data of time rate of both bubble radius and position of the center of mass of a bubble, by applying a spherical bubble formation model. As results, we find that with the decrease in gas pressure, the capillary bridge is sucked down into a nozzle and added mass force is exerted in the upward direction, both of which promote detachment of a bubble from a nozzle.

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Masao Watanabe
Kyushu University

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