

Abstract Submitted
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Investigation of Manipulation Technique of Microbubbles Using Focused Ultrasound. TAICHI OSAKI, The University of Tokyo, KAZUHITO INOUE, YOICHIRO MATSUMOTO, Retired, SHU TAKAGI, TAKASHI AZUMA, The University of Tokyo, MITSUHISA ICHIYANAGI, Sophia University — Recently, it has been thought that the application of ultrasound and microbubbles(MB) is utility to the medical field. Should MB be manipulated contactlessly, it will contribute to the mechanism investigation on the drug delivery system using MB as drug carrier. However no technique has yet to be established that can trap MB at any desired position, manipulate them along any desired path. Accordingly in this research, we investigated whether it was possible to trap MB at desired position, manipulate them along desired paths through experiments aimed at the development of MB manipulation tools that utilize ultrasound. Moreover, we analyzed the microbubble behaviors in ultrasound field. Bubbles in the ultrasound wave field are subjected to the primary Bjerknes force. Our method aimed that MB are trapped at the antinode or the node and manipulated with moving the antinode or node. We fabricated a concave transducer which radiates focused ultrasound and used sonazoid as MB and they were trapped at the focus as a cluster. The transducer moves its own position to move its focus and manipulate MB. Besides, we observed the trapped cluster with several incident frequencies. MB were trapped and manipulated along a locus of alphabet 'M' about 100 μ m. From this result, it is implied that MB can be manipulated along any desired path. Moreover, there was the inverse correlation between the trapped cluster size and the incident frequency.

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