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An efficient method for producing standing sonoplasmas with the help of a metal mesh K. SASAKI, Y. IWATA, S. TOMIOKA, S. NISHIYAMA, Hokkaido University, N. TAKADA, Nagoya University — It is known that sonoplasmas are produced at the collapses of cavitation bubbles in liquids irradiated by ultrasonic waves. Sonoplasmas are probably produced in commercialized ultrasonic cleaners, but it is very difficult to detect optical emission from sonoplasmas in ultrasonic cleaners. In this work, we found an efficient, simple method for producing sonoplasmas. We prepared a rectangular container that was filled with water. An ultrasonic transducer was attached at the bottom of the container, and ultrasonic wave at a frequency of 34 kHz was propagated in water from the bottom toward the top. When we inserted a planar metal mesh into water from the top, we observed the efficient production of cavitation bubbles at a localized distance from the mesh. The production area of the cavitation bubbles was roughly standing. It was necessary to adjust the depth of water and the position of the mesh carefully to obtain the efficient production of standing cavitation bubbles. We adopted laser light scattering as a simple method for quantifying the production efficiency of cavitation bubbles, and optimized the depth of water and the position of the mesh. We succeeded in capturing the optical emission image of a sonoplasma using a charge-coupled device camera with an image intensifier.

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