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Optical emission in a sonoplasma production system with the help of a punching metal plate K. SASAKI, Y. IWATA, S. TOMIOKA, S. NISHIYAMA, Hokkaido University, N. TAKADA, Nagoya University — Sonoplasmas are liquid-phase plasmas produced by ultrasonic power. We have reported an efficient method for producing standing sonoplasmas (Y. Iwata, et al., Appl. Phys. Express **6** (2013), 127301). This method employs a punching metal plate which is inserted just below the water surface with the irradiation of ultrasonic wave. In this work, we examined spatiotemporal variations of optical emission (sonoluminescence) intensities from sonoplasmas. The optical emission images were captured at various phases using an ICCD camera. The region with the strong optical emission intensity coincided with the region with cavitation bubbles. In addition, the optical emission intensity was observed in the shrink phase of the sizes of cavitation bubbles. These experimental observations indicate that the optical emission is caused by sonoplasmas which are produced at the collapses of cavitation bubbles. Optical emissions were also observed at different positions and different phases, but the distributions of these optical emission intensities were broader than that observed at the shrink phase of cavitation bubbles. The distribution of the optical emission intensities can be utilized as a hint for understanding the spatiotemporal distribution of the ultrasonic power.

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