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Original flocculation technique via acoustic cavitation bubbles driven by 20.3-kHz ultrasound in water YUKI MIZUSHIMA, Graduate School of Science and Technology, Shizuoka University, TAKAYUKI SAITO, Research Institute of Green Science and Technology, Shizuoka University — Strange flocculation mechanism of particles (up to 1.0mm) driven by the acoustic field (20.3-kHz) is observed in water. It is not well-known particle formation in acoustic field, like *dust striation*, but spherical agglomeration. Because kHz-order ultrasound is not acceptable for the separation technique due to its weak-directionality, applicable particle sizes are limited as similar size to a wavelength of the irradiated ultrasound or smaller than that. Hence, particles which are larger than mm-order in diameter are difficult to be manipulated with MHz-band ultrasound. However, our flocculation technique overcomes the limitation. It deeply relates to the motion of cavitation bubbles around the particles. First, in this study, we captured the particle motion and acoustic-cavitation-oriented bubble motion simultaneously by using a high-speed video camera. Second, we measured the distribution of the sound pressure in the water phase and discussed the relationship between that of the sound pressure and the motion of the particle and the acoustic cavitation bubble. Finally, we investigated the effects of the gravity force, the acoustic radiation force and the spatial heterogeneity of the pressure acting on the particle.

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