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Visualization of wake structure and non-axisymmetric motion of a single rising bubble TOMOKI ONO, TOSHIYUKI SANADA, MINORI SHIROTA, MASAO WATANABE, Kyushu University — Wake structure of zigzagging or spiraling motion of a single rising bubble was experimentally investigated. A single bubble was produced in a silicone oil pool. Bubbles wake was visualized by using Photochromic dye which turns optically opaque by UV light irradiation. Images both bubble motion and wake structure were captured by using stereo high-speed video camera. As results, a pair of vortex filaments, which is referred to as a double-threaded wake, was observed in the wake of bubble rising in non-axisymmetry. When a rising bubble turned the heading direction, both bubble wake rotation and mutual exchange between a pair of vortex filaments were observed. In the case of a bubble rising in zigzagging motion with shape oscillation, periodical generation of horse-shoe type vortices was observed. It is confirmed that the non-axisymmetric bubble motion, either zigzagging or spiraling, is strongly associated with shedding of wake vortices behind bubbles.

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