

Abstract Submitted
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Experimental study on the drag coefficient for an ellipsoidal bubble with fore-aft asymmetry MINORI SHIROTA, National Institute of Advanced Industrial Science and Technology, TOSHIYUKI SANADA, Shizuoka University, AYAKA SATO, MASAO WATANABE, Kyushu University — We experimentally evaluate the drag coefficient for spherical and ellipsoidal clean bubbles rising steadily in liquids of low Morton number ranging from 10^{-11} to 10^{-8} . Four different silicone oils and super purified water are used as liquids. The shapes and rising motion of bubbles are captured by using a still camera and a high-speed video camera, respectively. The degree of fore-aft asymmetric bubble shape is quantitatively evaluated using image processing. The experimentally obtained drag coefficients are compared with those for symmetric ellipsoidal bubbles obtained analytically by Moore [J. Fluid Mech. **23**, 749 (1965)], and via numerical simulation by Blanco & Magnaudet [Phys. Fluids **7**, 1265 (1995)]. The main conclusions are summarized as follows; (1) Moore's drag coefficient overestimates the experimentally obtained drag coefficient especially when bubble aspect ratio increases, (2) Blanco & Magnaudet's prediction of drag coefficients for bubbles with ellipsoidal shape are also valid for those with fore-aft asymmetric shape of corresponding aspect ratio.

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