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Simulations of Bubble Motion in an Oscillating Liquid A.M. KRAYNIK, L.A. ROMERO, J.R. TORCZYNSKI, Sandia National Laboratories — Finite-element simulations are used to investigate the motion of a gas bubble in a liquid undergoing vertical vibration. The effect of bubble compressibility is studied by comparing "compressible" bubbles that obey the ideal gas law with "incompressible" bubbles that are taken to have constant volume. Compressible bubbles exhibit a net downward motion away from the free surface that does not exist for incompressible bubbles. Net (rectified) velocities are extracted from the simulations and compared with theoretical predictions. The dependence of the rectified velocity on ambient gas pressure, bubble diameter, and bubble depth are in agreement with the theory. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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