

Abstract Submitted
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Sinking Bubbles JEREMY KOCH, RANDY EWOLDT, University of Illinois at Urbana-Champaign — Intuition tells us that bubbles will rise and steel objects will sink in liquids, though here we describe the opposite. With experimental demonstration and theoretical rationale, we describe how the motion of containers of liquid with immersed solid objects and air bubbles can cause curious behaviors: sinking bubbles and rising high-density particles. Bubbles and solid spheres of diameter on the order of a few millimeters are introduced into fluids with different rheological constitutive behaviors. Imposed motion of the rigid container allows for control of the trajectories of the immersed particles – without the container imparting direct shearing motion on the fluid. Results demonstrate the necessary conditions to prevent or produce net motion of the bubbles and heavy particles, both with and against gravitational expectations.

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