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**Experimental and Numerical Investigation of the Equilibrium Geometry of Liquid Lenses** J. C. BURTON, University of Chicago, F. M. HUISMAN, P. ALISON, D. ROGERSON, P. TABOREK, University of California Irvine — The equilibrium configuration of a non-wetted fluid/fluid/gas system takes the form of a floating liquid lens. We have computed the shapes of lenses for various liquid/liquid combinations in air for a wide range of droplet volumes by numerically solving the Young-Laplace equation, including the effects of gravity. The results of the calculations are compared to laser shadowography photographs of various alkane-water liquid lens systems, which were analyzed using basic ray-tracing to determine the lens profiles. Moiré imaging was also used to measure the deformation of the water interface due to the lens' presence. The agreement between experiment and theory is good for pure fluids. We also introduced a surfactant, dodecyltrimethylammonium bromide (DTAB), into the sub-fluid phase (water) at concentrations between 0 and 20 mmol/kg. In agreement with other experiments, we find a minimum contact angle at low concentrations corresponding to a pseudo-partial wetting transition of the alkane/water/surfactant system.

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