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Steady, axisymmetric, buoyancy-driven motion of a drop rising through a less viscous liquid LOUIS J. STEYTLER, University of Illinois at Urbana-Champaign, JANES Q. FENG, Optomec, Inc., ARNE J. PEARLSTEIN, University of Illinois at Urbana-Champaign — We report finite-element computations of steady, axisymmetric motion of a drop rising through a much less viscous liquid. The results focus on drops of liquid CO_2 rising through water, under conditions where the hydrostatic pressure variation is small enough for the density and viscosity variation in the drop to be neglected. A range of novel drop shapes is reported, with a recirculating flow region sometimes developing near the front or near the centerline of the drop. We also compute and discuss several measures of the velocity and drop shape relevant to transport of a passive scalar from the drop to the suspending liquid, or vice versa.

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