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Computational Analysis for Secondary Vorticity and Non-Axisymmetric Features in the Shock-Bubble Interaction JOHN NIEDERHAUS, DEVESH RANJAN, BRADLEY MOTL, JASON OAKLEY, MARK ANDERSON, RICCARDO BONAZZA, University of Wisconsin-Madison, JEFFREY GREENOUGH, Lawrence Livermore National Laboratory — Computations for the shock-bubble interaction are performed using the 3D Eulerian AMR code *Raptor*. In the simulations, performed in 3D at a fine-grid resolution of 128 grid points per bubble radius, a planar shock wave of specified strength accelerates a spherical gas bubble embedded in an otherwise uniform air or nitrogen medium. The computed solutions clearly resolve the development of distinctive features observed in previous experiments (Haas and Sturtevant, *J. Fluid. Mech.*, 1987) and simulations (Zabusky and Zeng, *J. Fluid. Mech.*, 1998), including jets, secondary shocks, vortex rings, and turbulent mixing. Using both flow visualizations and quantitative diagnostics, the non-axisymmetric and turbulent features developing in the flow are characterized. Local fluctuating quantities are defined with respect to an azimuthal mean, and mechanisms are identified for the post-shock origin and growth of secondary vortices and turbulent features.

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