Simulations of Compressible Rayleigh-Taylor Instability Using the Adaptive Wavelet Collocation Method[1] SCOTT J. RECKINGER, University of Colorado at Boulder, DANIEL LIVESCU, Los Alamos National Laboratory, OLEG V. VASILYEV, University of Colorado at Boulder — Numerical simulations of the single-mode compressible Rayleigh-Taylor instability are performed on an adaptive mesh using the Adaptive Wavelet Collocation Method (AWCM). Due to the physics-based adaptivity and direct error control of the method, AWCM is ideal for resolving the wide range of scales present in the development of the instability. The problem is initialized consistent with the solutions from linear stability theory, with two diffusively mixed, stratified fluids of differing molar masses as the background state. Of interest are the compressibility effects on the departure time from the linear growth, the onset of strong non-linear interactions, and the late-time behavior of the fluid structures. The late time bubble and spike velocities are computed and compared to those obtained in the incompressible case.

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