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Acceleration and Deceleration Phase Nonlinear Rayleigh-Taylor Growth at Spherical Interfaces[1] DANIEL CLARK, MAX TABAK, Lawrence Livermore National Laboratory — The Layzer model for the nonlinear evolution of bubbles in the Rayleigh-Taylor instability has recently been generalized to the case of spherically imploding interfaces [D. S. Clark and M. Tabak, Phys. Rev. E 71, 055302(R) (2005).]. The spherical case is more relevant to, e.g., Inertial Confinement Fusion (ICF) or various astrophysical phenomena when the convergence is strong or the perturbation wavelength is comparable to the interface curvature. Here, the model is further extended to the case of bubble growth during the deceleration (stagnation) phase of a spherical implosion and to the growth of spikes during both the acceleration and deceleration phases. Differences in the nonlinear growth rates for both bubbles and spikes are found when compared with planar results, and the model predictions are verified by comparison with numerical hydrodynamics simulations. The new nonlinear growth rates are also incorporated into a Haan-type saturation model to give improved predictions of multi-mode saturated growth for ICF capsules.

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