Abstract Submitted
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Studies of self-generated electric fields in imploding capsules: Candidate origins and impact on stability[1] P.A. AMENDT, S.C. WILKS, LLNL, C.K. LI, R.D. PETRASSO, F.H. SEGUIN, MIT — The generation of strong, self-generated electric fields (10^8-10^9 V/m) in direct-drive, inertial-confinement-fusion capsules was recently reported [1]. Various models are considered to explain the observed electric field evolution, including the potential roles of electron pressure gradients, shocks and acceleration-induced charge-separations on the fuel-pusher interface. A linear, compressible, perturbation analysis based on velocity potentials is adapted to include the presence of plasma electric fields and is shown to lead to super-classical Rayleigh-Taylor growth driven by an ionization imbalance across the fuel-pusher interface. The enhanced Rayleigh-Taylor growth is shown to be significant for low Atwood-number, low-Z shells as in the CH ablator of an Omega-scale HEP5 [2] implosion target. [1] J.R. Rygg *et al.*, Science 319, 1223 (2008); C.K. Li *et al.*, PRL 100, 225001 (2008). [2] P.A. Amendt, R.E. Turner and O.L. Landen, PRL 89, 165.

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