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Abstract Submitted
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Modeling and simulations of radiative blast wave driven Rayleigh-Taylor instability experiments[1] ASSAF SHIMONY, Nuclear Research Center-Negev, Ben Gurion University of the Negev, Israel, CHANNING M. HUNTINGTON, Lawrence Livermore National Laboratory, MATTHEW TRANTHAM, University of Michigan, GUY MALAMUD, Nuclear Research Center-Negev, University of Michigan, YONATAN ELBAZ, Nuclear Research Center-Negev, CAROLYN C. KURANZ, R. PAUL DRAKE, University of Michigan, DOV SHVARTS, Nuclear Research Center-Negev, University of Michigan — Recent experiments at the National Ignition Facility measured the growth of Rayleigh-Taylor RT instabilities driven by radiative blast waves, relevant to astrophysics and other HEDP systems. We constructed a new Buoyancy-Drag (BD) model, which accounts for the ablation effect on both bubble and spike. This ablation effect is accounted for by using the potential flow model]Oron et al PoP 1998], adding another term to the classical BD formalism: $\beta D u_A/u$, where β the Takabe constant, D the drag term, u_A the ablation velocity and $u$the instability growth velocity. The model results are compared with the results of experiments and 2D simulations using the CRASH code, with nominal radiation or reduced foam opacity (by a factor of 1000). The ablation constant of the model, $\beta_{b/s}$, for the bubble and for the spike fronts, are calibrated using the results of the radiative shock experiments.

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