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The spikes from Richtmyer-Meshkov instabilities in pused power cylindrical experiments CHRIS ROUSCULP, BAOLIAN CHENG, DAVID ORO, JEFFREY GRIEGO, AUSTIN PATTEN, LEVI NEUKIRCH, ROBERT REINOVSKY, PETER TURCHI, JOEPH BRADLEY, WLLIAM REASS, FRANKLIN FIERRO, ALEXSANDER SAUNDERS, FESSEHA MARIAM, MATTHEW FREEMAN, ZHAOWEN TANG, Los Alamos National Laboratory —
The time evolution of the metal spikes resulting from the Richtmyer-Meshkov instability (RMI) of single-mode perturbations on the inside surface of a tin sample in cylindrical geometry has been measured for the first time. The shock condition was produced by a magnetically driven aluminum flyer utilizing the PHELIX capacitor bank. By varying the flyer velocity, a set of experiments conducted at the Los Alamos National Laboratory has explored the RMI evolution in the different release states (fluid, mixed, solid) of tin. The perturbation inversion and growth rate of the spikes were diagnosed in each experiment with a 21-image proton radiography (pRad) movie. Both theoretical model and numerical simulations are performed. Numerical simulations, theory and experimental data are in good agreement. Detailed analysis of the spike growth rates, comparison to planer geometry, as well as theory and computations will be presented. This work was conducted under the auspices of the U.S. Department of Energy by the Los Alamos National Laboratory under Contract No. W-7405-ENG-36.

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