# RADIATIVE-STABILIZATION OF RAYLEIGH-TAYLOR INSTABILITIES IN PLANAR BLAST-WAVE-DRIVEN NIF EXPERIMENTS

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The National Ignition Facility (NIF) offers far more energy than has previously been available for experiments on high-energy-desnsity (HED) laser platforms. An effort is currently underway to extend ongoing supernova-relevant Rayleigh-Taylor experiments to a new regime on the NIF. Like earlier experiments performed on the Omega laser, a laser-driven planar blast wave is used to drive a perturbed interface between higher-density plastic and lower-density foam target components. But unlike in the Omega experiments, the blast wave driven into the foam in the NIF experiment can be strongly radiative. Radiation from the superheated shocked foam travels downstream and deposits energy in the denser plastic at the unstable interface. Radiative heating then drives ablation that significantly reduces the instability growth rate. The effect can be experimentally quantified by comparing this high-drive-temperature case with a lower drive temperature that creates a non-radiative shock. In this talk, we describe the experiment, present design simulations to illustrate the relevant physics, and show results of NIF experiments already performed in support of the design effort.

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