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Modeling of initial modal conditions in HED hydrodynamic instability experiments[1] CARLOS DI STEFANO, ALEXANDER RASMUS, FORREST DOSS, KIRK FLIPPO, ELIZABETH MERRITT, JESSE CANFIELD, BRIAN HAINES, ALEXANDRIA STRICKLAND, Los Alamos National Laboratory — Correctly modeling hydrodynamic instabilities often requires simultaneously treating structures that occur on different length scales, which can be challenging for simulations to handle. In this talk, we will discuss recent results from a high-energy-density experiment intended to measure multimode instability growth, as well as current efforts to model it using simulations. Multimode, for our purposes, refers to a repeatable, 2D initial seed perturbation consisting of >10 modes organized into a finite band in Fourier space. The experiment drives a shock across a material interface, at which the perturbation has been machined. To model the resulting growth, we can use a combination of mesh-resolved structure with a mix model (BHR) in order to capture different scales in the instability, where the choice becomes particularly important when treating structure that does not neatly fit into either a regime of fully-developed turbulence nor full coherent modal growth. In particular, we present initial results using a modal model to initialize BHR, applied to this experiment.

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