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Modeling of Multi-Interface, Diverging, Hydrodynamic Experiments for the National Ignition Facility[1] M.J. GROSSKOPF, Univeristy of Michigan, R.P. DRAKE, C.C. KURANZ, University of Michigan, A.R. MILES, J.F. HANSEN, Lawrence Livermore National Laboratory, T. PLEWA, Florida State University, N. HEARN, National Center for Atmospheric Research, D. ARNETT, University of Arizona, J.C. WHEELER, University of Texas — The National Ignition Facility will soon provide more than ten times the energy than was previously available on laser facilities. In the context of supernova-relevant hydrodynamics, this will enable experiments in which hydrodynamic instabilities develop from multiple, coupled interfaces in a diverging explosion. This presentation discusses the design of spherical and aspheric blast-wave-driven explosions, in which the relative masses of the layers are scaled to those within the star. The simulations probed the instability growth and multi-interface interactions to assess the diagnosability and experimental value of different designs using a variety of materials. Analysis of aspheric cases will determine the feasibility of extending the experiment to investigate aspheric supernova.

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