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How high energy fluxes may affect Rayleigh-Taylor instability growth in young supernova remnants C.C. KURANZ, University of Michigan, H.-S. PARK, C.M. HUNTINGTON, A.R. MILES, B.A. REMINGTON, Lawrence Livermore National Laboratory, R.P. DRAKE, M.A. TRANTHAN, T.A. HANDY, D. SHVARTS, University of Michigan, G. MALAMUD, A. SHIMONY, Nuclear Research Center, D. SHVARTS, University of Michigan, J. KLINE, K.A. FLIPPO, F.W. DOSS, Los Alamos National Laboratory, T. PLEWA, Florida State University — Energy-transport effects can alter the structure that develops as a supernova evolves into a supernova remnant. The Rayleigh Taylor instability is thought to produce structure at the interface between the stellar ejecta and the circumstellar matter, based on simple models and hydrodynamic simulations. Simulations predict that RT produces structures at this interface, having a range of spatial scales. When the CSM is dense enough, as in the case of SN 1993J, the hot shocked matter can produce significant radiative fluxes that affect the emission from the SNR. Here we report experimental results from the National Ignition Facility to explore how large energy fluxes, which are present in supernovae such as SN 1993J, might affect this structure. We present data and simulations from Rayleigh-Taylor instability experiments in high- and low- energy flux experiments performed at the National Ignition Facility. We also will discuss the apparent, larger role of heat conduction when we closely examined the comparison between the experimental results, and the SNR observations and models. This work is funded by the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0002956.

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