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Progress toward Kelvin-Helmholtz instabilities in a High-Energy-Density Plasma on the Nike laser[1] E.C. HARDING, R.P. DRAKE, R.S. GILLESPIE, M.J. GROSSKOPF, C.M. HUNTINGTON, University of Michigan, Y. AGLITSKIY, J.L. WEAVER, A.L. VELIKOVICH, Naval Research Laboratory, T. PLEWA, Florida State University, V.V. DWARKADAS, U. of Chicago — In the realm of high-energy-density (HED) plasmas, there exist three primary hydrodynamic instabilities of concern: Rayleigh-Taylor (RT), Richtmyer-Meshkov (RM), and Kelvin-Helmholtz (KH). Although the RT and the RM instabilities have been readily observed and diagnosed in the laboratory, the KH instability remains relatively unexplored in HED plasmas. Unlike the RT and RM instabilities, the KH instability is driven by a lifting force generated by a strong velocity gradient in a stratified fluid. Understanding the KH instability mechanism in HED plasmas will provide essential insight into oblique shock systems, jets, mass stripping, and detailed RT-spike development. In addition, our KH experiment will help provide the groundwork for future transition to turbulence experiments. We present 2D FLASH simulations and experimental data from our initial attempts to create a pure KH system using the Nike laser at the Naval Research Laboratory.

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