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Supersonic shear flows in laser driven high-energy-density plasmas created by the Nike laser[1] E.C. HARDING, R.P. DRAKE, R.S. GILLESPIE, M.J. GROSSKOPF, J.R. DITMAR, University of Michigan, Y. AGLITSKIY, J.L. WEAVER, A.L. VELIKOVICH, Naval Research Laboratory, T. PLEWA, Florida State University — In high-energy-density (HED) plasmas the Kelvin-Helmholtz (KH) instability plays an important role in the evolution of Rayleigh-Taylor (RT) and Richtmyer-Meshkov (RM) unstable interfaces, as well as material interfaces that experience the passage one or multiple oblique shocks. Despite the potentially important role of the KH instability few experiments have been carried out to explore its behavior in the high-energy-density regime. We report on the evolution of a supersonic shear flow that is generated by the release of a high velocity (>100 km/s) aluminum plasma onto a CRF foam (ρ = 0.1 g/cc) surface. In order to seed the Kelvin-Helmholtz (KH) instability various two-dimensional sinusoidal perturbations (λ = 100, 200, and 300 μm with peak-to-valley amplitudes of 10, 20, and 30 μm respectively) have been machined into the foam surface. This experiment was performed using the Nike laser at the Naval Research Laboratory.

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