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Design of an ultra-long timescale Hydrodynamic Instability platform using the Z pulsed power driver[1] PATRICK KNAPP, ANDREW PORWITZKY, Sandia National Laboratories, FORREST DOSS, Los Alamos National Laboratory, CAROLYN KURANZ, University of Michigan, THOMAS MATTSSON, BRENT JONES, Sandia National Laboratories — Here we present the design of a new hydrodynamic instability platform using the Z pulsed power driver. In this platform Z is used to accelerate an exploding cylindrical flyer into a sample that contains an interface between two materials with a pre-machined perturbation. The configuration of the experiment is highly flexible and allows for Richtmeyer-Meshkov and/or Rayleigh-Taylor unstable configurations to be explored. The primary advantage of this configuration is that Z can drive the flyer for very long timescales (>100 ns) allowing many e-foldings and potentially probing the transition to turbulence. We explore the impact of material choices, geometry, and pulse shape on the acceleration history of the unstable interface and growth of the perturbation.

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