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Novel, high-pressure instability experiments using imploding cylindrical liners with liquid deuterium fill[1] PATRICK KNAPP, MATTHEW MARTIN, RYAN MCBRIDE, DANIEL SINARS, THOMAS MATTSSON, Sandia National Laboratories — We present preliminary results from experiments where a liquid deuterium filled cylindrical liner is imploded onto a perturbed beryllium rod. The liner implosion creates a shock in the deuterium that strikes the interface twice: once as it implodes, and once again after the shock reflects off of the axis. This causes the perturbation to grow due to the Richtmeyer-Meshkov instability and the Rayleigh-Taylor instability while also generating significant vorticity as the shocks cross the interface. In the initial experiments growth of the perturbation is observed after 1st shock, however, after reshock significant three-dimensional structure is observed at scale lengths much smaller than the initial perturbation. At this time, very little evidence of the seeded mode remains. Pressures exceeding 100 Mbar are predicted at stagnation with an Atwood number at the unstable interface of about 1/3. Analysis of the images will be presented. Additionally, future plans will be discussed. Emphasis in the near future will be on improving image contrast and data collection.

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