Abstract Submitted
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A new dynamic method for determining the frictional force between ductile metals at high velocities and compressions[1] E.N. LOOMIS, J.C. COOLEY, J.E. HAMMERBERG, G.T. GRAY III, C.A. BRONKHORST, Los Alamos National Laboratory — We present a new dynamic method for determining the frictional force between ductile metals at ns and μs time scales under shock loading conditions. The method uses laser driven plate impacts at the LANL TRIDENT Laser Facility to launch a shock wave into a target consisting of a central cylindrical plate of Be and an outer ring of Cu. The Be/Cu interface is at a 6 degree angle to the shock direction. The interface behavior is diagnosed using line-imaging velocity interferometry (line-VISAR) and surface imaging displacement interferometry (TIDI) in the region of the interface on the target rear surface (away from the impact). The TIDI diagnostic gives surface information with a 600 μm x 600 μm field of view and out of plane displacement information with 10s of nm sensitivity using gated, fast framing cameras. Using these diagnostics we extract the surface profile near the interface and from numerical continuum materials dynamics simulations determine the interfacial frictional force and its velocity and pressure dependence.

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