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A Study Of High Speed Friction Behavior Under Elastic Loading Conditions P.J. CRAWFORD, P.M. RIGHTLEY, Dynamic Experimentation Division, Los Alamos National Laboratory, Los Alamos, NM 87545, J.E. HAMMERBERG, Applied Physics Division, Los Alamos National Laboratory, Los Alamos, NM 87545 — The role of interfacial dynamics under high strain-rate conditions is an important constitutive relationship in modern modeling and simulation studies of dynamic events (<100 μs in length). The frictional behavior occurring at the interface between two metal surfaces under high elastic loading and sliding speed conditions is studied using the Rotating Barrel Gas Gun (RBGG) facility. The RBGG utilizes a low-pressure gas gun to propel a rotating annular projectile towards an annular target rod. Upon striking the target, the projectile imparts both an axial and a torsional impulse into the target. Resulting elastic waves are measured using strain gauges attached to the target rod. The kinetic coefficient of friction is obtained through an analysis of the resulting strain wave data. Experiments performed using Cu/Cu, Cu/Stainless steel and Cu/Al interfaces provide some insight into the kinetic coefficient of friction behavior at varying sliding speeds and impact loads.

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