

Abstract Submitted  
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**Interfacial instabilities and structure during high velocity sliding<sup>1</sup>**

J.E. HAMMERBERG, T.C. GERMANN, B.L. HOLIAN, Los Alamos National Laboratory, R. RAVELO, University of Texas - El Paso — Interfacial sliding under high pressure loading at high velocities ( $0 < v < 1$  km/s) results in a variety of mesoscale phenomena at extreme strain rates. For ductile metal interfacial pairs, these include nano- and mesoscale dynamic structural transitions, local melting and amorphization, material mixing, and localization of plastic deformation. We illustrate these phenomena with large scale NonEquilibrium Molecular Dynamics (NEMD) simulations for Cu/Ag, Ta/Al, and Al/Al interfaces. These suggest universal behavior in sliding velocity for the frictional force and a scaling form for the frictional force vs. velocity at high velocities which will be discussed.

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