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A model for ductile metal friction at high velocities¹ J. E. HAMMERBERG, Los Alamos National Laboratory, R.J. RAVELO, Univ. of Texas - El Paso, T.C. GERMANN, Los Alamos National Laboratory — We describe a meso-macro scale model for the frictional force at ductile metal interfaces for high velocities and large compressions. The model incorporates the micro-mesoscopic growth and refinement of material microstructure in a highly strained region at the sliding interface and incorporates both rate dependent plasticity and thermal conduction. The model compares favorably with recent large scale (1.8 billion atom) simulations to 50 ns of 3-dimensional polycrystalline 13-50 nm grain size Al-Al interfaces at pressures of 15 GPa using the SPaSM NonEquilibrium Molecular Dynamics (NEMD) simulation code.

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