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High Density Sliding at Ta/Al and Al/Al Interfaces[1] J.E. HAMMERBERG, Los Alamos National Laboratory, R. RAVELO, Univ. of Texas - El Paso, T.C. GERMANN, Los Alamos National Laboratory — We present 3D-NEMD results for the velocity dependence of the frictional force at smooth and roughened interfaces for Ta and Al single crystals. For Ta/Al we consider Ta (100)/Al (100) and Ta (110)/Al (111) interfaces sliding along [001] and $[1\,\bar{1}\,0]_{fcc}/[001]_{bcc}$ respectively. These are compared with Al (111)/Al (100) interfaces at the same loads, corresponding to a pressure of 15 GPa. Both interfacial pairs show similar behavior in the velocity dependence of the frictional force: a low velocity regime with an increasing frictional force, followed by a strain induced transformation regime at velocities above approximately 1/10 the transverse sound speed, followed by a fluidized interface at high velocities. For both interfacial pairs, the high velocity dependence of the frictional force exhibits power law behavior, $v^{-\beta}$, with $\beta = 3/4$. We discuss the structural changes that influence dissipation in these regimes.

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