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High velocity sliding at a compressed Al(111)/Al(100) interface[1]
J. E. HAMMERBERG, Los Alamos National Laboratory, R. RAVELO, University of Texas, El Paso, T.C. GERMANN, B.L. HOLIAN, Los Alamos National Laboratory — We discuss high velocity sliding at a compressed Al(111)/Al(100) interface sliding in the $1\bar{1}0$ direction at a pressure of 15 GPa. Three temperatures are considered, T=232, 464 and 696 K. System sizes are 1.410^6 atoms .We find that for velocities above a critical velocity, v_c, the frictional force scales as $(v/v_c)^{-\beta}$ with $\beta \approx 3/4$. We discuss the temperature and size dependence of v_c. We find that below v_c the frictional force is an increasing function of velocity with an initial linear dependence. Above v_c there is a regime of interfacial instability characterized by a (100) transformation front moving into the (111) material. This is followed by a fluid regime for which a Couette flow profile develops at the interface, the thickness of which grows with increasing velocity.

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