Numerical study of shock fronts in tin and silicon J. MATTHEW
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Texas at Austin — Shock waves in solid materials exhibit wave front structure which
depends on the time-dependent deformation response and failure properties of the
material. I will discuss our study of the structure and transitions within the shock
fronts found in single crystal tin and silicon. Our unique computation technique
concentrates on calculating properties of the front, by employing a moving window.
This improved method, based on theoretically derived criteria, allows for long-time
steady state simulations of shock fronts using the Modified Embedded Atom Method
(MEAM) potentials. We used a non-equilibrium molecular dynamics simulation
code developed at the University of Texas at Austin for fracture simulation. Our
method has general applicability to studies of shock fronts. Application to studies
of elastic-plastic transitions will be discussed.

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