Numerical study of shock fronts in tin and silicon J. MATTHEW D. LANE, MICHAEL P. MARDER, Center for Nonlinear Dynamics, University of 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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Date submitted: 28 Dec 2004   Electronic form version 1.4