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Shock-induced crystalline instabilities[1] RAMON RAVELO, University of Texas-El Paso, BRAD LEE HOLIAN, TIMOTHY C. GERMANN, Los Alamos National Laboratory — Uniaxial deformations of single crystals such as those produced under planar shock loading can produce structural instabilities which compete with defect nucleation mechanisms. In fcc single crystals under (110) shock loading, the resulting body-centered orthorhombic crystal structure develops a long-wavelength dynamical instability associated with tetragonal shear distortions, which occurs at lower strains (pressures) than those predicted by the vanishing of the elastic constants at finite pressure (stiffness coefficients). [2] The criterion for these instabilities is derived and verified by equilibrium and non-equilibrium molecular dynamics simulations

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[2]J. Wang, S. Yip, S.R. Phillpot, D. Wolf, Phys. Rev. Lett. **71**, 4182 (1993)

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