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Study of shear banding in simulated amorphous solids in the context of shear transformation zone theory[1] DARIUS ALIX-WILLIAMS, MICHAEL L. FALK, Johns Hopkins University — We examine the general framework of the effective temperature formalism of the shear transformation zone (STZ) theory of plasticity via molecular dynamics simulation of two distinct amorphous systems - Silicon and Cu-Zr. In both systems strain localization is observed during simple shear loading. The shear bands differ in the rate of broadening and the sharpness of the interface between the flowing and jammed material. We examine both systems for scaling expected to arise between effective temperature and shear rate. For each system a local dimensionless effective temperature that quantifies structural disorder is extracted by assuming a linear relation to the local potential energy per atom.

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