

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

A Continuum Approach to Modeling Strain Localization in Amorphous Solids DARIUS ALIX-WILLIAMS, MICHAEL FALK, Johns Hopkins University — Shear Transformation Zone (STZ) theory provides a generalized framework for describing plasticity in sheared amorphous solids. We build upon STZ theory using data from molecular dynamics simulations of strain localization in sheared glassy systems modeled with Lennard-Jones, embedded-atom method (EAM) and Stillinger-Weber (SW) interatomic potentials. We assume that the effective temperature, a local coarse-grained measure of disorder, can be inferred from potential energy. Similarly, it is assumed that yield stress depends on effective temperature, and governs the rate of STZ activation. These assumptions are tested using numerical simulations of the STZ equations in a simple one-dimensional model. The resultant constitutive behavior of the numerical model is compared to the MD simulation results.

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Date submitted: 11 Nov 2016

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