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Shear Transformation Zone theory parameters from molecular dynamics and experiment[1] ADAM R. HINKLE, PENGFEI GUAN, MICHAEL L. FALK, Johns Hopkins University — Shear Transformation Zone (STZ) theory provides a continuum framework to describe the deformation of amorphous systems. However, as a phenomenological theory it relies upon parameters which must be determined for a specific material system. We present current progress towards a set of theoretical and computational methodologies for determining the parameters of STZ theory. We investigate two distinct systems, a copper-zirconium lamellar nanocomposite, and a simple yield stress fluid (YSF), where both systems are loaded in simple shear. We show that the molecular dynamics simulations of the nanocomposite system and experimental measurements of the YSF can be used to provide the initial conditions of the dynamical fields as well as the essential STZ parameters.

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