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Collective nonaffine rearrangements in binary glasses during large-amplitude oscillatory shear NIKOLAI PRIEZJEV, Wright State University — Using molecular dynamics simulations, we study the transient response of a three-dimensional binary Lennard-Jones glass subjected to periodic shear deformation. The cyclic loading is applied to slowly annealed, quiescent samples, which induces irreversible particle rearrangements at large strain amplitudes, leading to stress-strain hysteresis and a drift of the potential energy towards higher values. We find that near the critical strain amplitude, the amplitude of shear stress oscillations decreases after the first several cycles, which is accompanied with the formation of shear bands. In contrast, the initial response to cyclic shear involves disconnected clusters of atoms with large nonaffine displacements.

Nikolai Priezjev
Wright State University

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