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The emergence of elasticity in glass-forming fluids from the spatial correlations of particle displacements ELIJAH FLENNER, GRZEGORZ SZAMEL, Colorado State University — We study the emergence of elasticity in supercooled fluids by examining the spatial correlations of particle displacements. To this end we calculate a four-point structure factor $S_4(\Delta x, q; t)$ that measures the correlations of particle displacements Δx after a time t. We focus on correlations of displacements perpendicular to the initial separation of the particles, i.e. transverse displacement correlations. We examine the time and temperature dependence of these correlations for a model supercooled fluid. We find that the long-range correlations of displacements are related to the plateau height of the stress-stress correlation function of the supercooled fluid and thus provide insight into its emerging elastic properties.

Elijah Flenner
Colorado State University

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