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**Measurement of Stress Networks in 3D Colloidal Glasses** NEIL LIN, MATTHEW BIERBAUM, JAMES SETHNA, ITAI COHEN, Department of Physics, Cornell University — We measure the inhomogeneous stress fields in a 3D colloidal glass by using a confocal microscope to image a binary suspension’s microstructure. Despite extensive studies of the contact forces in static systems (e.g., granular systems and emulsions), it has been difficult to measure these inhomogeneous stress fields in thermal systems. We determine these particle level Brownian stresses from all particle positions using the “Stress Assessment from Local Structural Anisotropy” (SALSA) method. First, we show that SALSA method accurately reports the 3D stress field of a colloidal glass at particle-level resolution using molecular dynamics simulations. Furthermore, we quantify the measured pressure statistics and examine the q-model, Edwards ensemble and other theoretical predictions. Finally, the SALSA method enables us to investigate the underlying origin of the mechanical heterogeneities by comparing stress distribution with particle configuration.

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