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**Hyperuniformity in periodically sheared dilute suspensions** SAM WILKEN, RODRIGO GUERRA, DAVID J PINE, PAUL M CHAIKIN, New York University — Periodically sheared dilute, non-Brownian suspensions explore new configurations through collisions in an otherwise reversible flow. Below a critical strain, the particles remain active until they find a configuration with no collisions and reach an absorbing state. Recent simulations by Hexner and Levine have shown that the configuration of particles in the critically absorbing state is hyperuniform. The particle number fluctuations of hyperuniform systems decrease with counting box size more rapidly than random systems (like the same suspension that is not in a critically absorbing state). We built a compact, lightweight uni-axial shear cell where particle coordinates can be measured while shearing with a confocal microscope. We have identified hyperuniform structures with density fluctuation measurements in colloidal suspensions of up to 40% volume fraction in the critically absorbing state with a strain ramp down protocol and find hyperuniform scaling of the density fluctuations.

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