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Connecting glassy dynamics to micro-scale elasticity WENHAI ZHENG, MATTHIEU WYART, DAVID PINE, Center for Soft Matter Research, Department of Physics, New York University — We report a new experimental method for exploring the connection between the dynamics and structure in colloidal glasses. Using ellipsoids of controlled size and eccentricity as passive micro-probes, we explore the rheological properties of the local environment of the colloidal glass, in particular fluctuations in the local elasticity. We do this by measuring the random fluctuations in the rotational motion of the probe ellipsoids using depolarized light scattering. This is facilitated by index matching the spherical colloidal particles that form the glass to the background fluid: the only optical contrast is provided by the ellipsoids. Decoupling the optical anisotropy from the eccentricity of the probe particles further enhances the sensitivity of the probe to rotational motion.

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