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Density mode microrheology in polyacrylamide gels BEATRIZ BURROLA GABILONDO, DANIEL SISAN, Georgetown University, JONATHAN LANDY, ALEX LEVINE, University of California, Los Angeles, JEFFREY URBACH, Georgetown University — In passive microrheology the viscoelastic properties of soft materials are deduced by observing thermal fluctuations of tracer particles embedded within the material, and the response function obtained from the spectrum of thermally excited modes is then related to the viscoelastic shear modulus. This approach is valid for single-component, isotropic, incompressible materials. However, for heterogeneous materials, such as hydrogels, a more comprehensive approach is needed. We measure the equilibrium density fluctuations of a cross-linked polymer gel swollen in a solvent and compare them to the predictions of the 'two–fluid' model of the dynamics of polymer gels. We will describe a direct method of extracting the longitudinal response function of a soft material based on the temporal and spatial correlations of density fluctuations of fluorescent markers, called density mode microrheology (DMM). We will also present results of applying DMM to fluorescent polyacrylamide gels in an aqueous solvent of varying viscosity and comparing them with parameters obtained from conventional macrorheology.

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