

Abstract Submitted  
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**Microstructure and micromechanics of hard spheres with short-range attraction** MYUNG HAN LEE, ERIC M. FURST, University of Delaware  
— We study the microscopic mechanical response of colloidal gels, such as yielding, compression and rearrangement, by manipulating single probe particles within the network. For this work, we use fluorescent polymethylmethacrylate (PMMA) dispersed in mixtures of decalin and cyclohexylbromide, with a refractive index and density close to that of PMMA. The strength of attraction is controlled by the concentration of a non-adsorbing polymer, polystyrene, which induces a depletion attraction between particles. In the presence of sufficiently strong attractive forces, particles form a colloidal gel. Confocal microscopy is used to observe the structural evolution in real time. This enables us to investigate the role of the local structure and particle interactions in the elasticity of the network. Specifically, we identify local elastic and plastic deformations in gels, which depend on the probe oscillation amplitude and strength of attractive interactions.

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