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Microrheology of Viscoelastic Shells: Applications to Viral Capsids TATIANA KURIABOVA, Department of Physics and Astronomy, University of California, Los Angeles, CA 90095, ALEXANDER LEVINE, Department of Chemistry & Biochemistry, University of California, Los Angeles, CA 90095 — We study the microrheology of nanoparticles shells [cite: Dinsmore et al. Science 298, 1006 (2002)] and viral capsids by computing the fluctuation spectrum of a viscoelastic spherical shell that is permeable to the surrounding solvent. We determine analytically the overdamped dynamics of the shear, bend, and compression modes of the shell coupled to the solvent both inside and outside the sphere in the zero Reynolds number limit. In this talk we identify fundamental length and time scales in the system, and compute the thermal correlation function of displacements of antipodal points on the sphere. We describe how such an antipodal correlation function, which should be measurable in new AFM-based microrheology experiments, can probe the viscoelasticity of these synthetic and biological shells constructed of nanoparticles. We then discuss some of the remaining challenges in interpreting these measurements.

Alexander Levine
Department of Chemistry & Biochemistry, University of California, Los Angeles, CA 90095

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