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Microrheology of Nanospheres in Rod Suspensions VICTOR PRYAMITSYN, VENKAT GANESAN, University of Texas at Austin — Many biological processes and applications involve the motion of small (nanoscale) spherical particles through a dense (typically) semiflexible polymer matrix. While much theoretical work has characterized the motion of such particles in the limit of its size being much larger than the mesh size of the matrix, very limited understanding exists of the (more biologically relevant) crossover regime to the case where the particle size becomes comparable to the mesh size. Recently we have developed a new computer simulation method to simulate the dynamical and rheological properties of colloid suspensions of in a variety of complex fluids. We first present the results of its generalization to the dynamics and linear rheological properties of dilute, semidilute and concentrated rods suspensions in a simple fluid. Subsequently, we use this method to characterize the mobility and diffusive dynamics of nanoscale spheres in rod matrices, while paying special attention to the length scales of the fluid which characterize the hydrodynamic screening and overall viscous motion.

Victor Pryamitsyn
University of Texas at Austin

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