Abstract Submitted
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Brownian Dynamics of Colloidal Particles in Lyotropic Chromonic Liquid Crystals[1] ANGEL MARTINEZ, Department of Physics and Astronomy, University of Pennsylvania, Philadelphia, PETER J. COLLINGS, Department of Physics and Astronomy, Swarthmore College, Swarthmore, ARJUN G. YODH, Department of Physics and Astronomy, University of Pennsylvania, Philadelphia — We employ video microscopy to study the Brownian dynamics of colloidal particles in the nematic phase of lyotropic chromonic liquid crystals (LCLCs). These LCLCs (in this case, DSCG) are water soluble, and their nematic phases are characterized by an unusually large elastic anisotropy. Our preliminary measurements of particle mean-square displacement for polystyrene colloidal particles (˜5 micron-diameter) show diffusive and sub-diffusive behaviors moving parallel and perpendicular to the nematic director, respectively. In order to understand these motions, we are developing models that incorporate the relaxation of elastic distortions of the surrounding nematic field. Further experiments to confirm these preliminary results and to determine the origin of these deviations compared to simple diffusion theory are ongoing; our results will also be compared to previous diffusion experiments in nematic liquid crystals [1-3]. 1. G. J. Krüger, *Physics Reports* **82**, 229 (1982). 2. J. C. Loudet, P. Hanusse, P. Poulin, *Science* **306**, 1525 (2004) 3. T. Turiv, I. Lazo, A. Brodin, B. I. Lev, V. Reiffenrath, V. G. Nazarenko, O. D. Lavrentovich, *Science* **342**, 1351 (2013).

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Angel Martinez
Department of Physics and Astronomy, University of Pennsylvania, Philadelphia

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