Abstract Submitted
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Anomalous diffusion of colloidal particles in a nematic liquid crystal[1] ISRAEL LAZO, OLEG D. LAVRENTOVICH[2], Kent State University, TARAS TURIV, ALEXANDER BRODIN, VASSILI NAZARENKO, Institute of Physics NAS Ukraine — We explore the Brownian motion of colloidal microspheres in a nematic liquid crystal within time scales below 100ms that was not accessible in previous experiments. Our experimental results point towards an apparent subdiffusion of the colloids with a mean square displacement MSD $\propto t^{1/2}$. For longer time scales, the particles exhibit normal diffusion with two anisotropic diffusion constants parallel and perpendicular to the nematic director **n** [1]. The nonlinear effect vanishes when the host is heated up to the isotropic phase; therefore the subdiffusive behavior can be attributed to the coupling of slow director fluctuations of the nematic with the colloidal particle dynamics. We also discuss the role of finite accuracy of measurements.

[1] J. C. Loudet, P. Hanusse and P. Poulin, Science 306, (2004).

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