Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Brownian Motion of Boomerang Colloidal Particles QI-HUO WEI, ANDREW KONYA, FENG WANG, JONATHAN V. SELINGER, Liquid Crystal Institute, Kent State University, KAI SUN, Department of Material Science and Engineering, University of Michigan, AYAN CHAKRABARTY, Liquid Crystal Institute, Kent State University — We present experimental and theoretical studies on the Brownian motion of boomerang colloidal particles confined between two glass plates. Our experimental observations show that the mean displacements are biased towards the center of hydrodynamic stress (CoH), and that the mean-square displacements exhibit a crossover from short-time faster to long-time slower diffusion with the short-time diffusion coefficients dependent on the points used for tracking. A model based on Langevin theory elucidates that these behaviors are ascribed to the superposition of two diffusive modes: the ellipsoidal motion of the CoH and the rotational motion of the tracking point with respect to the CoH.

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Date submitted: 15 Nov 2013 Electronic form version 1.4