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Experimental Studies of the Brownian Diffusion of Boomerang Colloidal Particle in a Confined Geometry AYAN CHAKRABARTY, FENG WANG, BHUWAN JOSHI, QI-HUO WEI, Kent State University — Recent studies shows that the boomerang shaped molecules can form various kinds of liquid crystalline phases. One debated topic related to boomerang molecules is the existence of biaxial nematic liquid crystalline phase. Developing and optical microscopic studies of colloidal systems of boomerang particles would allow us to gain better understanding of orientation ordering and dynamics at "single molecule" level. Here we report the fabrication and experimental studies of the Brownian motion of individual boomerang colloidal particles confined between two glass plates. We used dark-field optical microscopy to directly visualize the Brownian motion of the single colloidal particles in a quasi two dimensional geometry. An EMCCD was used to capture the motion in real time. An indigenously developed imaging processing algorithm based on MatLab program was used to precisely track the position and orientation of the particles with sub-pixel accuracy. The experimental finding of the Brownian diffusion of a single boomerang colloidal particle will be discussed.

Ayan Chakrabarty
Kent State University

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