

Abstract Submitted
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Measurements of anisotropic Brownian motion of colloidal clusters JEROME FUNG, THOMAS G. DIMIDUK, Harvard University, Dept. of Physics, REBECCA W. PERRY, Harvard University, School of Engineering and Applied Sciences, VINOTHAN N. MANOHARAN, Harvard University, School of Engineering and Applied Sciences and Dept. of Physics — Nonspherical colloidal particles can exhibit anisotropic Brownian motion characterized by different translational and rotational diffusion constants about different particle axes. We discuss measurements of anisotropic translational and rotational diffusion constants in triangular colloidal clusters made from three micron-sized colloidal spheres. We use digital holographic microscopy (DHM) and electromagnetic scattering solutions to image the three-dimensional Brownian motion of isolated clusters. We track the cluster centers of mass with ~ 20 nm precision and the cluster orientations with an angular resolution of ~ 0.1 radians. We also use DHM to measure the diffusion of colloidal spheres bound to the surface of an emulsion droplet and show that the sphere behavior differs significantly from diffusion on planar surfaces at long time scales.

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