

Abstract Submitted
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Measuring Nanoparticle Dynamics with Real-Time, 3D Tracking KAN DU, Center for Nanoscale Science and Technology at National Institute of Standard and Technology, University of Maryland, ANDREW BERGLUND, Center for Nanoscale Science and Technology at National Institute of Standard and Technology — Nanoparticles in liquids are an important platform for nanofabrication and nanomanufacturing processes. Few *in situ* methods are available for measuring the time-resolved dynamics of individual nanoparticles at nanoscale spatial resolution. Drawing on recent advances in real-time single-particle feedback control, we have developed an apparatus that enables us to measure the 3D motion and dynamics of individual fluorescent nanoparticles in liquid environments. Real-time feedback control methods enable us to monitor the dynamics of individual nanoparticles by locking them in focus in an optical microscope, which enhances both the temporal and spatial resolution of our instrument. We applied the technique to study diffusion dynamics of polystyrene nanoparticles adsorbed at liquid-liquid interfaces. This tool can also be applied to study nanoparticle binding, self-assembly processes, and single-molecule biophysics.

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