

Abstract Submitted
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A Device of Tracking a Single Nanometer-Sized Particle in 3D with Nanometer Resolution and Millisecond Response Time. HU CANG, Lawrence Berkeley National Lab., C. SHAN XU, DANIEL MONTIEL, HAW YANG, University of California Berkeley — We demonstrate a microscope system based on a confocal setup that can ‘track’ a moving particle in three dimensions (3D) and ‘trap’ it at a target position with nanometer spatial and millisecond time resolution. This is achieved by moving a 3D piezoelectric translation stage controlled by a feedback circuit to ‘cancel’ the displacement of the particle. By keeping the target particle inside the confocal volume, it is now possible to perform other spectroscopic experiments on the particle simultaneously for a long time while the particle is moving freely in solutions. Our device overcomes the difficulty of single molecule spectroscopy (SMS) experiment on free moving samples.

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