

Abstract Submitted
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Motion and Manipulation of Suspended Single-Walled Carbon Nanotubes in Solution YA-QIONG XU, Laboratory of Atomic and Solid State Physics, Cornell University, ARTHUR BARNARD, School of Applied and Engineering Physics, Cornell University, PAUL MCEUEN, Laboratory of Atomic and Solid State Physics, Cornell University — We have developed an optoelectronic imaging system which combines nanotube transistors with optical trapping techniques and the scanning photocurrent microscopy to investigate the motion of suspended single-walled carbon nanotubes in solution. This setup enables us to study the movement of nanotubes by monitoring their photocurrent images and to measure their thermal fluctuations through observing the movement of microbeads that are tightly attached to nanotubes by single-stranded DNA. By analyzing their thermal fluctuations, we are able to obtain the torsional and transversal stiffness of nanotubes and then calculate their diameters. We can also manipulate their motions by using an optical trap to pull on microbeads attached to nanotubes.

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