

Abstract Submitted
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Electronic properties of multiwall carbon nanotubes studied by rotation driven by AC electric fields D. L. FAN, FRANK Q. ZHU, ROBERT CAMMARATA, C. L. CHIEN, Johns Hopkins University, MATERIALS TEAM, PHYSICS TEAM — We have studied the electronic properties of multiwall carbon nanotubes (MWCNT) using the frequency dependent rotation driven by AC electric fields. The rotation angle, speed, and chirality of MWCNT can be precisely controlled by the strength and frequency of the AC electric field. From the rotation characteristics, the imaginary part of the Clausius-Mossotti factor, which depends on the material, the geometry, and the AC frequency, has been determined from 0.05 to 1MHz. This work demonstrates a non-contact and non-destructive method for assessing the properties of nanotubes and other nanoentities. The rotation of MWCNT can also be exploited in nanoelectromechanical system (NEMS) with MWCNT acting as the rotating elements.

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