

Abstract Submitted  
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**Dielectric Properties of Individual Carbon Nanotubes Studied by Electric Force Microscopy**<sup>1</sup> WEI LU, DAN WANG, LIWEI CHEN, Department of Chemistry and Biochemistry, Ohio University, LIWEI CHEN'S GROUP TEAM — Dielectric properties of Carbon nanotubes (CNTs) have far-reaching implications on their nanoelectronic and optoelectronic applications, and are also critically important in the separation and solution processing of CNTs. Theoretical calculations have yielded some insights on the subject but no experimental investigation has been reported. Here we report direct measurements of the transverse polarization of individual CNTs using electric force microscopy (EFM). Individual CNTs on Si substrates are prepared with the chemical vapor deposition method. When an AC bias (frequency  $\omega$ ) is applied between the sample and the conductive probe in EFM experiments, the interaction force between the charges on the probe and the induced dipole moment in CNT can be detected at the  $2\omega$  frequency. Our experiment gives the first dielectric property measurement of individual CNT and verifies the tube size dependence of the transverse polarizability predicted by first-principle calculations.

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