Abstract Submitted
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Tunable resonance Raman on individual, suspended single wall carbon nanotubes[1] Y. YIN, A.G. WALSH, Phys. Dept., Boston Univ., S.B. CRONIN, Phys. Dept., Harvard Univ., A.K. SWAN, ECE Dept., Boston Univ., A. STOLYAROV, Phys. Dept., Harvard Univ., W.S. BACSA, ECE Dept., Boston Univ., M. TINKHAM, Phys. Dept., Harvard Univ., M.S. UNLU, B.B. GOLDBERG, Phys. Dept., Boston Univ. — Resonance Raman studies are performed with a tunable excitation laser on single wall carbon nanotubes (SWNTs) suspended in air over trenches. Radial breathing mode (RBM) Stokes intensity excitation profiles (REP) are symmetric in shape and fitted to find lifetime broadenings and locations of the resonant electronic states. The simultaneous Anti-Stokes data are well fitted with the identical parameters. A comparison of REP and PL excitation profiles will be discussed. Tens of measurements show a narrow line broadening of 15-20 meV and a red shift of E_22 compared to suspended SWNTs in solutions. Similar results are found for REPs of the G band Raman mode. This shift can be explained by an exciton binding energy shift in two different dielectric media. This study also suggests that environmental effects, or other inhomogeneous differences for nanotubes, can significantly change sub-band transition energies. The measured differences between individual tubes fall within the inhomogeneously broadened experimental results reported for NT bundles.

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