Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Length characterization of DNA-wrapped carbon nanotubes using Raman Spectroscopy[1] SHIN G. CHOU, Pfizer Global Research and Development, HYUNGBIN SON, AUREA ZARE, Massachusetts Institute of Technology, ADO JORIO, Universidade Federal de Minas Gerais, RIICHIRO SAITO, Tohoku University, MILDRED DRESSELHAUS, GENE DRESSELHAUS, Massachusetts Institute of Technology — The systematic resonance Raman study has been carried out on DNA-wrapped SWNTs of different lengths using several different values of laser excitation energy. The correlation observed between the intensity ratio of the D -band and G-band features (I_D/I_G) and the average nanotube energy lengths indicates that nanotube length can be used as the dominant structural parameter in Raman characterization, and that the I_D/I_G ratio can be used as a qualitative gauge for estimating the average nanotube length. By systematically varying the laser excitation energy, we have also found that the I_D/I_G ratio strongly depends on whether the tubes are metallic or semiconducting, as well as on the laser excitation energy. Further directions for this research will be presented. The authors gratefully acknowledge support for this research from the National Science Foundation grant DMR-04-05538.

[1]The authors gratefully acknowledge support for this research from the National Science Foundation grant DMR-04-05538.

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Date submitted: 20 Nov 2006 Electronic form version 1.4