

Abstract Submitted
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Ressonance Raman Excitation Energy Map and High Resolution Transmission Electron Microscopy of hundreds of (n,m) Single Wall Carbon Nanotubes¹ ADO JORIO, PEDRO B.C. PESCE, PAULO T. ARAUJO, Universidade Federal de Minas Gerais, STEPHEN K. DOORN, Los Alamos National Laboratory, PASHA NIKOLAEV, ERC/NASA-JSC, UFMG COLLABORATION, NASA COLLABORATION, LANL COLLABORATION — In this work we measure the Raman spectra of a single wall carbon nanotube (SWNT) sample with a wide diameter distribution - 1nm to 6nm - with closely spaced laser lines over the 1.26eV to 2.71eV energy range and did a thorough analysis of the observed features. The most intense peaks are assigned to the scattering of light by a single RBM phonon in ressonance with the well-known excitonic E_{ii} transitions. Comparison of the Raman map with the diameter distribution of the sample, obtained from high resolution transmission electron microscopy (HRTEM) measurements of 395 different nanotubes allows us to determine the diameter dependence of the RBM cross section. Furthermore, a number of weaker features are identified with different mechanisms, such as the RBM overtone and cross polarized transitions.

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Ado Jorio
Universidade Federal de Minas Gerais

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