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**Resonance Raman Spectroscopy of 1.2;  $d_t < 2.0$  nm Diameter Single Wall Carbon Nanotubes in the  $E_{33}^S$  and  $E_{44}^S$  Optical Range**<sup>1</sup> PAULO A.T. ARAÚJO, UFMG, S.K. DOORN, Los Alamos National Lab , A.G. SOUZA FILHO, UFC, J. JIANG, Tohoku University, R. SAITO, Tohoku University, S. MARUYAMA, Tokyo University, M.A. PIMENTA, UFMG, A. JORIO, UFMG — This work uses Resonant Raman Spectroscopy with excitation laser energy from 1.26 to 2.98 eV to measure the  $E_{33}^S$  and  $E_{44}^S$  optical transition energies, for single wall carbon nanotubes (SWNTs) with diameters in the range  $1.2 < d_t < 2.0$  nm. We identify the families of  $(2n + m) = \text{constant}$  and analyse the radial breathing mode (RBM) frequencies, the  $E_{33}^S$  and  $E_{44}^S$  energies and intensities as a function of  $(n, m)$ . The excitonic effects are weaker in the  $E_{33}^S$  and  $E_{44}^S$ , the energies being blue-shifted when compared with earlier predictions. We also study the relation between the RBM intensity and tube chirality, clearly showing that the RBM Raman spectrum is less intense for armchair tubes.

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Prefer Oral Session  
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