Abstract Submitted
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Exciton-phonon interaction and Raman intensity of carbon nanotubes[1] RIICHIRO SAITO, Tohoku University, CREST JST, JIE JIANG, Dept of Phys. NC State Univ., ADO JORIO, Dept. of Fisica, UFMG, KENTARO SATO, Dept of Phys. Tohoku Univ., GENE DRESSELHAUS, MILLIE DRESSELHAUS, MIT — Using extended tight binding framework, the exciton states and exciton-phonon interaction are calculated for understanding optical properties of single wall carbon nanotubes. Resonance Raman intensity for first and second order Raman processes are calculated as a function of (n, m) with use of exciton wavefunctions. Chirality, type and diameter dependence of Raman intensity is now fully given. In particular, the dark exciton plays an important role for second-order, intervalley, resonance Raman processes. Although the exciton-phonon interaction is not so different from the electron-phonon interaction, the optical absorption (emission) is enhanced significantly by the localized exciton wavefunctions.

References: J. Jiang et al, Phys. Rev. B, in press.

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