

Abstract Submitted  
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**Softening of the Radial Breathing Mode in Metallic Carbon Nanotubes** HOOTAN FARHAT, MIT, KEN-ICHI SASAKI, Hiroshima University, MARTIN KALBAC, Academy of Sciences of the Czech Republic, MARIO HOFMANN, MIT, RIICHIRO SAITO, Tohoku University, MILDRED S. DRESSELHAUS, JING KONG, MIT — In this work, the Fermi level ( $\epsilon_F$ ) dependence of the radial breathing mode (RBM) of metallic single walled carbon nanotubes (M-SWNTs) has been investigated. In situ Raman spectra were obtained from several individual M-SWNTs while varying  $\epsilon_F$  electrochemically. The RBM frequency of an intrinsic M-SWNT is shown to be downshifted relative to highly doped tubes by  $\sim 2\text{cm}^{-1}$ . The downshift is greatest for small diameter and small chiral angle nanotubes. Most tubes do not show any change in RBM linewidth. A comparison is drawn between the RBM and the G-band ( $A_{LO}$  phonon) with respect to the  $\epsilon_F$  dependence of their frequencies and linewidths.

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