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Raman Spectroscopy of Carbon Nanotubes under Axial Strain RAJAY KUMAR, University of Southern California, HAO ZHOU, University of Southern California, STEPHEN CRONIN, University of Southern California — We measure the Resonance Raman spectra of individual carbon nanotubes under axial strain. A combination of atomic force microscopy (AFM) and lithography is used to produce strains in nanotubes ranging from 0.1% to 5%. The vibrational and electronic energies of the nanotubes are found to be very sensitive to strain. The D, G and G' band Raman modes are observed to downshift with strain indicating elongation, and hence weakening, of the carbon-carbon bonds. The intensities of the Raman modes are also observed to change as a function of strain, indicating a strain-induced shifting of the electronic subbands. A tight-binding model is presented to explain the changes observed in the Raman intensity in accordance with the Resonance Raman equation.

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