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Raman Spectroscopy of Axially Strain Carbon Nanotubes RAJAY KUMAR, STEPHEN CRONIN, University of Southern California — We investigate resonant Raman scattering of carbon nanotube bundles on an elastomer substrate under axial strains as high as 15%. Over the applied strain range, the G_+ band Raman frequency decreases for both metallic and semiconducting nanotubes. The G_- band Raman spectra, however, respond differently to strain for metallic and semiconducting nanotubes, giving insight into the nature of the broad metallic G_- band lineshape. The G_-band frequency downshifts with applied strain for semiconducting nanotubes, while the G_- band frequency increases with strain for metallic nanotubes. The G_- band linewidth of metallic nanotubes also becomes narrower with strain, making it appear more semiconductor-like. Surprisingly, this metal to semiconductor transition is not reversible with strain, which indicates that nanotube-nanotube coupling plays a role in the observed broad G_- band lineshape of metallic nanotubes.

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