

Abstract Submitted
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Simultaneous Rayleigh and Raman spectroscopy on suspended single-walled carbon nanotubes under electrostatic gating YUHEI MIYAUCHI, ZHENGYI ZHANG, MITSUhide TAKEKOSHI, VIKRAM DESHPANDE, Columbia University, New York, NY 10027, STÉPHANE BERCIAUD, Université de Strasbourg, PHILIP KIM, JAMES HONE, TONY HEINZ, Columbia University, New York, NY 10027 — The optical properties of single-walled carbon nanotubes (SWNTs) under electrostatic gating are of great interest for fundamental understanding of one-dimensional physics and for their application as optoelectronics devices. Here, we report how the electronic transitions are modified by gating conditions through direct measurements of Rayleigh (elastic) light scattering from individual suspended SWNTs [1]. With increasing gate voltage, we observed both a broadening and shift of the excitonic resonances in the Rayleigh scattering spectra. The influence of carrier doping on the optical resonances and, as gauged through simultaneous Raman measurements, on vibrational transitions will be discussed.

[1] M. Y. Sfeir et al., Science 306, 1540 (2004).

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