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**Chirality Distribution Measurements of the NIST Single-Wall Carbon Nanotube Reference Material Using Resonance Raman Spectroscopy** KEVIN MEAD, JEFF SIMPSON, LOGAN SCHEEL, Towson University, JEFF FAGAN, ANGELA HIGHTWALKER, National Institute of Standards & Technology — The ability to rapidly and easily determine the chiral vector distribution within a nanotube population remains a key measurement need for carbon nanotube processing and applications. We report Resonance Raman Spectroscopy (RRS) measurements of a SWCNT reference material from NIST. The SWCNT samples were synthesized using the CoMoCat method, dispersed in aqueous solutions by wrapping in deoxycholate surfactant, and separated by length using ultracentrifugation. We measure Raman spectra over a wide range of excitation wavelengths from 457 nm to 850 nm using a series of discrete and continuously tunable laser sources coupled to a triple-grating spectrometer with a liquid-nitrogen-cooled detector. The spectra reveal Raman-active vibrational modes including the low-frequency radial breathing mode and higher-order modes. Chirality distributions are determined from the Raman spectra, specifically the RBM frequency and energy excitation profiles, together with input from theoretical models. RRS is sensitive to both major and minor chiral species in the sample. We will compare the resulting chirality distribution obtained from RRS with those obtained from other orthogonal measurement techniques.

Kevin Mead
Towson University

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