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In-situ Raman Spectroscopy of Optically Trapped Single-Walled Carbon Nanotubes HERMAN A. LOPEZ, SHIDA TAN, MICHAEL P. STEWART, YUEGANG ZHANG, Intel Corporation, 2200 Mission College Boulevard, Santa Clara, CA 95054 — In-situ Raman spectroscopy was demonstrated to provide direct evidence of optical trapping of individual single-walled carbon nanotubes (SWNTs) and used to investigate the possibility of using tunable laser tweezers (514 nm - 1455 nm) to selectively manipulate and sort nanotubes. The in-situ Raman and optical trapping system consists of two lasers, allowing selection of a Raman probing wavelength in resonance with the desired SWNTs and a separate optical trapping wavelength to control the interaction with the tubes. The Raman probe (633 nm or 785 nm probing wavelength) is capable of detecting structural information of both metallic and semiconducting SWNTs. This provides direct evidence of the local SWNTs concentration variation and chirality distribution in the optical trap. The Raman probe can also be moved independent to the optical trap, allowing spatial profiling. This work will discuss the evidence of optical trapping of SWNTs, determination of the trapping threshold and trapping volume profile, and results of tube type selectivity by the laser tweezers.

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