

Abstract Submitted
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Pitfalls of nano-spectroscopy ANDREW WALSH, Dept. Of Physics, Boston University, WOLFGANG BACSA, LPST-IRSAMC CNRS, Universite Paul Sabatier, A. NICKOLAS VAMIVAKAS, Dept. Of Physics, Cambridge University, ANNA SWAN, Dept. Of Electrical and Computer Engineering, Boston University — We demonstrate the unique and inherent linkage between spatial location and spectral signature caused by an individual nano-scale emitter. We show false spectral shifts and artificial line width broadening which we contrast with results from extended emitters. The findings are general for spectroscopy of any nano-scale 0D or 1D object, such as single fluorescent molecules, quantum dots or nano-rods, but here we demonstrate these effects using Raman spectroscopy of individual carbon nanotubes suspended across gaps tens of microns wide. We explain the origin of these effects and discuss how proper spectrometer alignment and selection of spectrometer parameters is critical in order to avoid misinterpretation of the spectral data.

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