

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Exciton-mediated one phonon resonant Raman scattering from 1-dimensional systems** A. N. VAMIVAKAS, Department of ECE, Boston University, A. G. WALSH, Department of Physics, Boston University, Y. YIN, Department of Physics, Boston University, M. S. UNLU, Department of ECE, Boston University, B. B. GOLDBERG, Department of Physics, Boston University, A. K. SWAN, Department of ECE, Boston University — The Kramer's-Heisenberg approach is well developed for the theory of one phonon resonant Raman scattering (OPRRS) based on both intermediate states of free electrons and correlated electron-hole pairs in 3, 2 and 0-dimensional (D) systems. But to our knowledge, a theory of OPRRS incorporating excitonic effects has not yet been developed for quantum confined 1D system. In this talk we present a generic expression for the resonant Raman scattering cross section from a 1D system explicitly accounting for excitonic effects. We show how the theory is useful for analyzing the Raman resonance excitation profile lineshapes for of a variety of 1D systems. We apply this formalism to simple model systems to the similarities and differences between the free electron and correlated electron-hole 1D theory and also compare with the 3D excitonic theory.

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Date submitted: 30 Nov 2005

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