

Abstract Submitted
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Phonon Confinement and Laser Heating Effects on Germanium Nanowires. ROMANEH JALILIAN, University of Louisville, Department of Physics, HARI CHANDRASEKHAR, MAHENDRA SUNKARA, University of Louisville, Department of Chemical Engineering, GAMINI SUMANASEKERA, University of Louisville, Department of Physics — We explore the combined effects of phonon confinement, local heating and stress on the Raman spectra of Germanium nanowires with varying diameters. Germanium nanowires were synthesized using spontaneous nucleation and basal growth from gallium droplets. The asymmetric broadening and downshifting of the first order Raman band is studied as a function of average diameter, local temperature of the nanowires. This basic phenomenological model with a modified confinement function incorporated with thermal effects and stress are in agreement with our experimental results. Fano-resonance effect was excluded from this study.

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