Paper Title: Strong Hot Carrier Effects in Single Nanowire Heterostructures

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Abstract

We use transient Rayleigh scattering to study the thermalization of hot photoexcited carriers in single $GaAs_{0.7}Sb_{0.3}$/InP nanowire heterostructures. By comparing the energy loss rate in single core-only $GaAs_{0.7}Sb_{0.3}$ nanowires which do not show substantial hot carrier effects with the core–shell nanowires, we show that the presence of an InP shell substantially suppresses the longitudinal optical phonon emission rate at low temperatures which then leads to strong hot carrier effects.