

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Effects of the electron-phonon interaction on the electron transport in low-dimensional disordered semiconductor structures ANDREI SERGEEV, University at Buffalo, MICHAEL REIZER, 5614 Naiche Road, Columbus, OH 43213, VLADIMIR MITIN, University at Buffalo — We investigate the effects of the interference between electron-phonon scattering and elastic electron scattering in heterostructures and nanotubes. Interference strongly enhances the effective electron-phonon coupling in semiconductor structures and strengthens the electron-phonon relaxation [1]. Employing the quantum transport equation, we calculate the interference contribution to the electrical conductivity and phonon drag thermopower. Our results show that the interference term follows to the logT-law and dominates in the temperature dependence of the conductivity. Phonon drag is also enhanced due to disorder. [1] A. Sergeev et al., Phys. Rev. Lett., 94, 136602 (2005).

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Date submitted: 30 Nov 2005

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