

Abstract Submitted
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Interference Effects in Nanoscale Electron-Phonon Transport¹

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— Using the quantum transport equation we investigate interplay of the electron-phonon interaction and disorder in low-dimensional conductors. Interference of electron scattering mechanisms is beyond the Landau Fermi-liquid picture and result in nontrivial corrections, which violate the Mathiessen rule. Interference effects have been known for some time, however, the research in this field was mainly limited to disordered bulk materials and thin metallic films. In low dimensions, we found strong enhancement of the interference effects. As in the electron-phonon kinetics [1], this enhancement is due to a smaller electron momentum transferred in electron-phonon scattering processes in low dimensions.

[1] A. Sergeev et al., Phys. Rev. Lett. 94, 136602 (2005).

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