

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Inelastic Scattering from Local Vibrational Modes BALAZS DORA, MIKLOS GULACSI, Max Planck Institute for the Physics of Complex Systems — We study a nonuniversal contribution to the dephasing rate of conduction electrons due to local vibrational modes. Bosonization allows us to evaluate the full T-matrix. The inelastic scattering rate is strongly influenced by multiphonon excitations, exhibiting oscillatory behaviour. For higher frequencies, it saturates to a finite, coupling dependent value. In the strong coupling limit, the phonon is almost completely softened, and the inelastic cross section reaches its maximal value. This represents a magnetic field insensitive contribution to the dephasing time in mesoscopic systems, in addition to magnetic impurities.

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Date submitted: 20 Nov 2008

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