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Interference between Surface and Bulk Scattering in Nanoscale Conductors SWARBHANU CHATTERJEE, ALEXANDER MEYEROVICH, University of Rhode Island — We analyze the quasiclassical and quantum interference between the bulk and boundary scattering channels in thin high quality films. The effective transport time is calculated beyond the Matthiessen's approximation as an expansion in inverse bulk mean free path. The interference corrections to resistivity exhibit a crossover between two regimes that are characterized by distinct dependences on temperature and/or impurity concentration. In our quasiclassical approximation the results reduce to a transparent analytical expression. We discuss differences between quantum and quasiclassical approaches and experimental implications of our results.

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