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Effect of External Control Fields on Electron Coherence in Weak Localization and Aharonov-Bohm Oscillations DORU CUTURELA, Department of Physics, Boston University, Boston, MA 02215, ROBERT L. BADZEY, Department of Physics, Boston University, Boston, MA 02215, PRITIRAJ MOHANTY, Department of Physics, Boston University, Boston, MA 02215 — Understanding coherent electron transport through low-dimensional metals is fundamental to the field of mesoscopic physics. At low temperatures, low-dimensional conductors demonstrate electron coherence even in the presence of disordered potentials, giving rise to quantum interference effects such as weak localization and Aharonov-Bohm oscillations. Here we report our preliminary work on the effect of external control fields, both broadband and pulsed, on electron coherence in quasi-1D diffusive wires and rings at millikelvin temperatures. Engineering coherence is vital to the eventual development of practical quantum electronic devices. This work is supported by the NSF (CCF) and NSF (DMR, ECS), and the Sloan Foundation.

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