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Quantum Coherence and Local/Nonlocal Resistance Measurements SUNGBAE LEE, AARON TRIONFI, DOUGLAS NATELSON, Department of Physics and Astronomy, Rice University — Low temperature electrical properties of ferromagnetic nanowires are influenced by the interplay between disorder, quantum coherence, and magnetic correlations. Quantum coherence corrections to the conductance are of particular interest, and can be difficult to characterize experimentally. One of the ways of understanding these effects is by measuring the electronic coherence length of the system. Field dependences of local and nonlocal resistance fluctuations were measured for this purpose. Permalloy ($Ni_{0.8}Fe_{0.2}$) nanowires were made using standard electron beam lithography along with silver leads with various lead to lead distances. With these nanowires, local and nonlocal length dependent magnetic field correlations were measured and compared. Silver wire samples were also tested for the purpose of comparison. We present initial magnetic field correlation data.

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