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Magnetotransport in Iron Cobalt Silicide Nanowires DREW REBAR, Louisiana State University, JOHN DEGRAVE, SONG JIN, University of Wisconsin-Madison, JOHN DITUSA, Louisiana State University — Iron silicide is a small gap insulator that can be made metallic and magnetic when doped with cobalt. With the incorporation of cobalt, $Fe_{1-x}Co_xSi$ undergoes an insulator-to-metal transition becoming a half metal for a wide range of x. The magnetic ground state is helimagnetic with distinct itinerant character. It has been demonstrated by others that an exotic intermediate magnetic vortex or skyrmion state exists between the helimagnetic and ferromagnetic phases in small applied fields. Electron transport in bulk Fe_{1-x} Co_xSi has been found to be dominated by electron-electron interaction effects similar to what has been found in prototypical semiconductors such as Si:P. Here we probe low temperature magnetotransport in CVD-grown Fe_{1-x} Co_xSi nanowires with x=0.05. The reduced size presents the opportunity to characterize the quantum contributions to the conductivity where the electrons are effectively confined to one dimension. The dimensionality is determined by the wire diameter which can be smaller than the electron's inelastic scattering length at low temperatures. Results of these measurements will be presented.

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