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**Anisotropic Suppression of One Dimensional Weak Localizatio In a Single InAs Nanowire**[1] DONG LIANG, MOHAMMED R. SAKR, JUAN DU, XUAN P.A. GAO, Case Western Reserve University — The magneto-conductance of a InAs nanowire with 20nm diameter is investigated with respect to temperature (2-40K), and magnetic field at an arbitrary angle. The nanowire exhibits a positive magneto-conductance whose magnitude is the largest (smallest) when the field is perpendicular (parallel) to the wire axis. Magneto-conductances in the perpendicular and parallel field are consistent with the anisotropic suppression of one-dimensional (1D) weak localization, with the same electron phase coherence length $L_\phi$. By fitting the magneto-conductance data to the theory, we extract $L_\phi$, which has an approximate $T^{-1/3}$ temperature dependence, indicating electron-electron scattering as the dephasing mechanism. Moreover, the measured anisotropic magneto-conductance at an arbitrary angle between the magnetic field and nanowire is well described by the modified theory using the fitting parameters obtained from the transverse and longitudinal magneto-conductance analysis. Our results show that the low temperature magneto-conductance in a InAs nanowire stems from the suppression of 1D weak localization effect.

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