Abstract Submitted
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Magnetoconductance of a Single-Electron Transistor in the Kondo Regime[1] TAI-MIN LIU, BRYAN HEMINGWAY, ANDREI KOGAN, University of Cincinnati, STEVEN HERBERT, Xavier University, MICHAEL MELLOCH, Purdue University, THEO A. COSTI, Institut fur Festkorperforschung, Forschungszentrum Julich, 52425 Julich, Germany — We have measured the zero-bias conductance of a Single-Electron Transistor (SET) in the Kondo regime as a function of temperature, T, and magnetic field, B, oriented parallel to the plane of the device. Our SETs are fabricated on a GaAs/AlGaAs heterostructure with electron sheet density 4.8×10^{11} cm^{-2} and mobility 5×10^5 cm^{2}V^{-1}s^{-1}. Scaled plots of both the T and B-dependent data show universal behavior. At moderate and high B, the magnetoconductance data show good agreement with renormalization group calculations in the spin-1/2 Kondo regime. At very low B, we observe a non-monotonic behavior: as B increases, the conductance initially increases and only starts to decrease at a finite B. A possible explanation of this effect due to the presence of multiple orbital dot levels with similar energies will be discussed.

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