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Magnetic Splitting of the Zero Bias Peak in a Quantum Point Contact with a Variable Aspect Ratio[1] TAI-MIN LIU, BRYAN HEMINGWAY, ANDREI KOGAN, University of Cincinnati, STEVEN HERBERT, Xavier University, MICHAEL MELLOCH, Purdue University, UNIVERSITY OF CINCINNATI TEAM, XAVIER UNIVERSITY COLLABORATION, PURDUE UNIVERSITY COLLABORATION — We have measured the nonlinear conductance of a four-gate Quantum Point Contact (QPC) device fabricated in a GaAs/AlGaAs heterostructure containing a 2-dimensional electron gas. By continuously varying the longitudinal potential profile of the QPC, we controllably create and destroy a local bound state. The nonlinear transport data show both a characteristic Coulomb blockade diamand and a zero-bias peak similar to the Kondo effect signature peak in quantum dots. We find that even when the bound state is suppressed the zero-bias peak persists. Applying an in-plane magnetic field perpendicular to the direction of the current produces a splitting of the peak which closely matches the g-factor data obtained via the cotunneling spectroscopy method in a separate quantum dot on the same chip.

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