Spectral and transport properties of ballistic quantum wire exposed to two magnetic spikes BERND SCHUELER, MIHAI CERCHEZ, HENGYI XU, THOMAS HEINZEL, HHU Duesseldorf — Quantum Dots (QD) in two-dimensional electron gases are typically defined by nanopatterned gate electrodes.\(^1\) While magnetically confined QDs have been proposed theoretically to show some specific phenomena,\(^2\) their experimental implementation is still at an early stage.\(^3\) We have designed a ferromagnet/semiconductor hybrid structure device which allows us to form a QD by combining electrostatic potentials with localized magnetic fields in the form of two magnetic spikes at sub-micron distances. While numerical simulations of this system predict Coulomb blockade in the closed regime and Fano type resonances in the open system,\(^4\) we observe experimentally transmission resonances in the open system which can be interpreted as signatures of zero-dimensional states weakly bound by the magnetic field profile.


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Date submitted: 17 Oct 2012 Electronic form version 1.4