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Mesoscopic Coulomb Blockade in a Quantum Dot with Two Open QPCs SAMI AMASHA, ILEANA RAU, MICHAEL GROBIS, RON POTOK, Stanford University, HADAS SHTRIKMAN, Weizmann Institute, DAVID GOLDHABER-GORDON, Stanford University — A quantum dot consists of a confined droplet of electrons connected to an electron reservoir by two quantum point contacts (QPCs). When the conductance of each of these QPCs is less than $2e^2/h$, the dot is in the closed regime and Coulomb Blockade effects dominate the transport properties. Open quantum dots, in which QPC conductances are $2e^2/h$ or above, are generally thought to be well-described by non-interacting electron theory. While Mesoscopic Coulomb Blockade (MCB) effects can occur in a quantum dot with one open and one closed QPC, these effects are expected to be absent for quantum dots with two open QPCs. We have investigated the transport properties of a 1.5 μm^2 and a $3\mu m^2$ lateral GaAs/AlGaAs quantum dot in the open regime and find a clear signature of MCB. We will discuss the dependence of MCB on various controllable parameters, including magnetic field, temperature, and bias.

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