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Real Time Electron Hopping Phenomena in a Single-Electron Transistor SAMI AMASHA, KENNETH MACLEAN, DOMINIK ZUMBUHL, IULIANA RADU, MARC KASTNER, Massachusetts Institute of Technology, MICAH HANSON, ARTHUR GOSSARD, University of California, Santa Barbara — Utilizing a current-biased quantum-point-contact charge sensor, we observe electrons hopping on and off a AlGaAs/GaAs single-electron transistor (SET) in real time. An electron tunnels between the extended states in the leads and the lowest-energy state localized in the lateral quantum dot created by nanometer-size surface electrodes. We observe changes in the tunneling rates, caused by the spin splitting in a magnetic field B applied parallel to the 2DEG. We have also observed single-electron photo-ionization of the SET by application of microwave radiation. This work is supported by the ARO (W911NF-05-1-0062), the NSF (DMR-0353209) and in part by the NSEC Program of the NSF (PHY-0117795).

Sami Amasha
Massachusetts Institute of Technology

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