Abstract Submitted
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Si/SiGe Depletion-mode and Accumulation-Mode Few-Electron Quantum Dots M.G. BORSELLI, R.R. HAYES, A.A. KISELEV, R.S. ROSS, E.T. CROKE, P.W. DEELMAN, W.S. WONG, I. ALVARADO-RODRIGUEZ, I. MILOSAVLJEVIC, A.E. SCHMITZ, M. SOKOLICH, M.F. GYURE, A.T. HUNTER — We have measured charging spectra and charge dynamics of few-electron quantum dots made using Si/SiGe heterostructures. In the standard depletion-mode design, an excited state with Zeeman splitting consistent with a g-factor of 2.0±0.1 was identified on the lowest observed transition. The lifetime was 615 msec at 1.2T and had close to a B7 dependence on magnetic field, in good agreement with T1 spin relaxation estimates. We have also developed Si/SiGe accumulation-mode dots based on a double-well heterostructure in which electrons are localized in the top, nominally empty well by forward biasing a small gate. We have measured charging spectra from N=0 up to N=15, with addition energies as high as 4.5 meV. Magnetospectroscopy and charge dynamics are utilized to characterize valley splitting in these devices. Sponsored by United States Department of Defense Approved for Public Release, Distribution Unlimited.

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