

Tunable barrier Si Coulomb blockade devices and the charge offset drift

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We demonstrate the operation of single-electron tunneling (SET) transistor using electrostatically induced barriers. The barriers are formed on a Silicon nanowire using metal-oxide-metal field effect transistor (MOSFET) gates. We show that the transport through our devices is dominated by a single island. We also report on the excellent long term stability of these devices as expressed by their very small charge offset drift Q_0 (less than $0.01 e$ in 14 days). The small charge offset drift in Si devices has been previously demonstrated by devices fabricated in a single foundry. By reproducing this result in devices fabricated in a different foundry we believe we have shown that the small Q_0 is a robust property of Si devices in general.