

Abstract Submitted
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Single-electron devices fabricated using double-angle deposition and plasma oxidation Y. HONG, Z. S. BARCIKOWSKI, A. N. RAMANAYAKA, M. D. STEWART JR., N. M. ZIMMERMAN, J. M. POMEROY, National Institute of Standards and Technology, QUANTUM PROCESSES AND METROLOGY GROUP TEAM — We report on development of plasma oxidized, single-electron transistors (SETs) where we seek low-capacitance and small-area Al/AlO_x/Al tunnel junctions with small charge offset drift. Performance of metal-based SET quantum devices and superconducting devices has suffered from long-term charge offset drift, high defect densities and charge noise. We use plasma oxidation to lower defect densities of the oxide layer, and adjustable deposition angles to control the overlapping areas for Al/AlO_x/Al tunnel junctions. Current-voltage and charge offset drift measurements are planned for cryogenic temperatures. Other electrical properties will be measured at room temperature. We hope to see Coulomb blockade oscillations on these devices and better charge offset stability than typical Al/AlO_x/Al SETs.

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