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Characterization of rf-SSET in both in-plane and perpendicular magnetic fields[1] CHUNYANG TANG, ZHEN YANG, MINGYUN YUAN, A.J. RIMBERG, Dartmouth College, D.E. SAVAGE, M.A. ERIKSSON, University of Wisconsin-Madison, RIMBERG TEAM, ERIKSSON COLLABORATION — Previous success in coupling an aluminum radio-frequency superconducting single electron transistor (rf-SSET) to quantum dots (QDs) has demonstrated use of the rf-SSET as an ultra-sensitive and fast charge sensor [1]. Since a magnetic field is usually necessary for quantum dot qubit manipulation, it is important to understand the effect of magnetic fields, either in-plane or perpendicular, on the performance of any charge sensor near the QDs. Here we report characterization of rf-SSETs in both in-plane and perpendicular magnetic fields. The rf-SSET works well in an in-plane fields up to 1 Tesla at a temperature of 30 mK. At 0.3K, in a perpendicular field generated by a stripline located 700 nm away, the rf-SSET charge sensitivity even shows improvement for up to 2.1 mA current through the stripline (corresponding roughly to a field of 6 Gauss). [1]M. Yuan et al, Appl. Phys. Lett. 101, 142103 (2012)

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