

Abstract Submitted
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Improved rf-SSET Performance using On-Chip Superconducting LC Matching Networks on Si/Ge¹ ZHEN YANG, MINGYUN YUAN, CHUNYANG TANG, A.J. RIMBERG, Dartmouth College, M.A. ERIKSSON, D.E. SAVAGE, University of Wisconsin-Madison, RIMBERG TEAM, ERIKSSON COLLABORATION — The radio-frequency superconducting single electron transistor (rf-SSET) has been demonstrated to be a nearly quantum-limited charge sensor [1]. Building upon previous successful coupling of an aluminum SSET in the vicinity of quantum dots (QDs) on Si/SiGe using an off-chip inductor [2], we now developed on-chip matching networks to improve the charge sensing of Si/SiGe double quantum dots. Here, we report measurements in superconducting rf-SSETs, where the SET is directly fabricated with an on-chip inductor, giving enhanced sensitivity at our operating temperature of 0.3K. Recent experimental results including the investigation of the range of in-plane magnetic field compatible with RF-SET operation will also be discussed.

[1] W.W.Xue et al, Nature Phys. 5, 660 (2009);

[2] M.Y.Yuan et al, Appl. Phys. Lett. 98, 142104 (2011)

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Zhen Yang
Dartmouth College

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