Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

**Electron Spin Coherence Times in Si/SiGe Quantum Dots**[1] R.M. JOCK, JIANHUA HE, A.M. TYRYSHKIN, S.A. LYON, Princeton University, C.-H. LEE, S.-H. HUANG, C.W. LIU, National Taiwan University — Single electron spin states in silicon have shown a great deal of promise as qubits due to their long spin relaxation (T1) and coherence (T2) times. Recent results exhibit a T2 of 250 us for electrons confined in Si/SiGe quantum dots at 350 mK. These experiments used conventional X-band (10 GHz) pulsed Electron Spin Resonance on a large area (3.5 mm x 20 mm), dual-gated, undoped Si/SiGe heterostructure quantum dots. These dots are induced in a natural Si quantum well by e-beam defined gates having a lithographic radius of 150 nm and pitch of 700 nm. The relatively large size of these dots led to closely spaced energy levels and long T2's could only be measured at sub-Kelvin temperatures. At 2K confined electrons displayed a 3 us T2, which is comparable to that of 2D electrons at that temperature. Decreasing the quantum dot size increases the electron confinement and reduces the effects of valley-splitting and spin-orbit coupling on the electron spin coherence times. We will report results on dots with 80 nm lithographic radii and a 375 nm pitch. This device displays an extended electron coherence time of 30 us at 2K, suggesting tighter confinement of electrons. Further measurements at lower temperatures are in progress.

[1]This work was supported in part by NSF through the Materials World Network program (DMR-1107606) and the Princeton MRSEC (DMR-0819860), and in part by the U.S. Army Research Office (W911NF-13-1-0179).

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Date submitted: 15 Nov 2013

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