Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

**Spin Measurements of an Electron Bound to a Single Phosphorous Donor in Silicon** D.R. LUHMAN, K. NGUYEN, L.A. TRACY, S.M. CARR, J. BORCHARDT, N.C. BISHOP, G.A. TEN EYCK, T. PLUYM, J. WENDT, M.S. CARROLL, M.P. LILLY, Sandia National Laboratories — The spin of an electron bound to a single donor implanted in silicon is potentially useful for quantum information processing. We report on our efforts to measure and manipulate the spin of an electron bound to a single P donor in silicon. A low number of P donors are implanted using a self-aligned process into a silicon substrate in close proximity to a single-electron-transistor (SET) defined by lithographically patterned polysilicon gates. The SET is used to sense the occupancy of the electron on the donor and for spin read-out. An adjacent transmission line allows the application of microwave pulses to rotate the spin of the electron. We will present data from various experiments designed to exploit these capabilities. This work was performed, in part, at the Center for Integrated Nanotechnologies, a U.S. DOE Office of Basic Energy Sciences user facility. The work was supported by Sandia National Laboratories Directed Research and Development Program. Sandia National Laboratories is a multi-program laboratory operated by Sandia Corporation, a Lockheed-Martin Company, for the U. S. Department of Energy under Contract No. DE-AC04-94AL85000.

D.R. Luhman
Sandia National Laboratories

Date submitted: 15 Nov 2013 Electronic form version 1.4