

Abstract Submitted  
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**Measurements of spin life time of an antimony-bound electron in silicon** T.M. LU, Sandia National Laboratories, N.C. BISHOP, Retired, L.A. TRACY, R. BLUME-KOHOUT, T. PLUYM, J.R. WENDT, J. DOMINGUEZ, M.P. LILLY, M.S. CARROLL, Sandia National Laboratories — We report our measurements of spin life time of an antimony-bound electron in silicon. The device is a double-top-gated silicon quantum dot with antimony atoms implanted near the quantum dot region. A donor charge transition is identified by observing a charge offset in the transport characteristics of the quantum dot. The tunnel rates on/off the donor are first characterized and a three-level pulse sequence is then used to measure the spin populations at different load-and-wait times in the presence of a fixed magnetic field. The spin life time is extracted from the exponential time dependence of the spin populations. A spin life time of 1.27 seconds is observed at  $B = 3.25$  T. 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 the Sandia National Laboratories Directed Research and Development Program. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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