replacing MAR17-2016-009500.

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Magnetic field and angular dependent spin rotations in a donor-MOS quantum-dot qubit[1] ANDREW MOUNCE, MARTIN RUDOLPH, N. TOBIAS JACOBSON, Sandia Natl Labs, PATRICK HARVEY-COLLARD, Sandia Natl Labs, University of Sherbrooke, JOEL WENDT, TAMMY PLUYM, JASON DOMINGUEZ, M. S. CARROLL, Sandia Natl Labs — Recently, coherent spin coupling between a MOS QD and a 31P donor has been shown with effective two electron-singlet-triplet (ST) rotations driven by an effective gradient field formed by the donor's nuclear spin measured as $A/2 \sim 57$ MHz, [1] consistent with Stark shifted observations from ESR quits [2]. However, a complex dependence of ST rotation-frequency on B-field angular dependence has been observed in a recent, more tunable design [3]. This includes a substantially reduced zero external-magnetic-field rotation-frequency of approximately 12 MHz and, with increasing magnetic field, the frequency splits into multiple magnetic field and angular dependent modes. We show that the key features of the field and angular dependent singlet-triplet rotation frequencies are reproduced with a donor-QD system that has both asymmetric g-factor and anisotropic hyperfine terms that are physically reasonable. [1] P. Harvey-Collard, *et al* arXiv:1512.01606 (2015). [2] J. J. Pla, *et al*, Nature 489, 541 (2012). [3] M. Rudolph *et al*, International Electron Device Meeting, San Francisco, Dec. 2016.

[1]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.

Andrew Mounce
Sandia Natl Labs

Date submitted: 12 Nov 2016 Electronic form version 1.4