

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Coherent spin manipulation with a triple quantum dot GHISLAIN GRANGER, Institute for Microstructural Sciences, National Research Council Canada, LOUIS GAUDREAU, National Research Council Canada and University of Sherbrooke, ALICIA KAM, SERGEI STUDENIKIN, PIOTR ZAWADZKI, GEOFF AERS, Institute for Microstructural Sciences, National Research Council Canada, MICHEL PIORO-LADRIÈRE, University of Sherbrooke, ZBIGNIEW WASILEWSKI, ANDREW SACHRAJDA, Institute for Microstructural Sciences, National Research Council Canada — Recently, Landau-Zener-Stuckelberg (LZS) oscillations have been demonstrated in a double quantum dot device [1]. In this talk we demonstrate LZS oscillations in a triple quantum dot environment. Our triple quantum dot design allows us to tune to either the charge or spin qubit regimes. Using a pulsing technique in the spin qubit regime, we create a superposition of triple quantum dot states, allow for phase accumulation, and interfere. We demonstrate coherent LZS oscillations with three spins across the triple quantum dot structure. We investigate their dependence on pulse rise time, separation time, energy detuning, and magnetic field.

[1] J. R. Petta et al., Science 327, 669 (2010).

Ghislain Granger
Institute for Microstructural Sciences, National Research Council Canada

Date submitted: 04 Jan 2011

Electronic form version 1.4