

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Spectroscopy of a GaAs Double Dot Qubit with Dispersive Readout¹ JAMES COLLESS, ALICE MAHONEY, XANTHE CROOT, JOHN HORNIBROOK, ANDREW DOHERTY, ARC Centre of Excellence for Engineered Quantum Systems, School of Physics, The University of Sydney, Sydney, NSW 2006, Australia, TOM STACE, ARC Centre of Excellence for Engineered Quantum Systems, School of Mathematics and Physics, University of Queensland, Brisbane, QLD 4072, Australia, HONG LU, ART GOSSARD, Materials Department, University of California, Santa Barbara, California 93106, USA, DAVID REILLY, ARC Centre of Excellence for Engineered Quantum Systems, School of Physics, The University of Sydney, Sydney, NSW 2006, Australia — We report microwave spectroscopy of a GaAs double dot qubit device using the dispersive gate sensor (DGS) readout technique. In contrast to charge sensing methods based on quantum point contacts (QPCs) or single electron transistors (SETs), the DGS detection method senses the tunneling of charge between states that are near degenerate in energy. Microwave excitation applied to the surface gates enables this readout approach to resolve low energy spectroscopic features not apparent in transport or standard charge sensing measurements. We discuss the origin of these features and the use of this technique for characterizing semiconductor qubit systems.

¹We acknowledge funding from the U.S. Intelligence Advanced Research Projects Activity (IARPA), through the U.S. Army Research Office and the Australian Research Council Centre of Excellence Scheme (Grant No. EQuS CE110001013).

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Date submitted: 27 Nov 2012

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