

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Phase Purcell Effect and the Crossover to Strong Coupling in Dispersive Circuit QED¹ IOANA SERBAN, Institute for Quantum Computing, Waterloo, Canada and Ludwig-Maximilians-Universitaet Munich, Germany, ENRIQUE SOLANO, Ludwig-Maximilians-Universitaet, Munich, Germany, FRANK WILHELM, Institute for Quantum Computing, Waterloo, Canada — We study the decoherence of a superconducting qubit due to the dispersive coupling to a damped harmonic oscillator. We go beyond the weak qubit-oscillator coupling, which we associate with a *phase Purcell effect*, and enter into an unexplored decoherence regime, solving a theoretical inconsistency in existing models: the divergence of the qubit dephasing rate in the absence of environment. Our results can be applied, with small adaptations, to a large variety of other physical systems, e.g. trapped ions and cavity QED, boosting theoretical and experimental decoherence studies.

¹Supported by NSERC, DFG SFB 631, EU project EuroSQIP and Elitenetzwerk Bayern.

Ioana Serban
Institute for Quantum Computing, Waterloo, Canada and
Ludwig-Maximilians-Universitaet Munich, Germany

Date submitted: 22 Nov 2006

Electronic form version 1.4