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Measurement induced dephasing of a superconducting qubit strongly coupled to a resonator JAY GAMBETTA, ALEXANDRE BLAIS, Department of Physics, Yale University, DAVID SCHUSTER, ANDREAS WALLRAFF, Department of Applied Physics, Yale University, REN-SHOU HUANG, Ames Lab, JOHANNES MAJER, LUIGI FRUNZIO, Department of Applied Physics, Yale University, STEVEN GIRVIN, Department of Physics, Yale University, ROBERT SCHOELKOPF, Department of Applied Physics, Yale University — Recently, the solid state equivalent of a cavity QED system has been experimentally observed using a Cooper pair box as the artificial atom (qubit) and a transmission line resonator as the cavity [1]. This system is a good candidate for quantum computation as, in the dispersive limit, quantum control and readout can be achieved by multiplexing RF pulses [2]. In this talk only the readout scheme will be considered, in particular experimental [3] and theoretical results for the measurement induced dephasing will be presented.
[1] A. Wallraff, D. Schuster, A. Blais, L. Frunzio, R.-S. Huang, J. Majer, S. Kumar, S. M. Girvin and R. J. Schoelkopf, Nature **431**, 162 (2004).
[2] A. Blais, R.-S. Huang, A. Wallraff, S. M. Girvin and R. J. Schoelkopf, Phys. Rev. A **69**, 062320 (2004).
[3] D. Schuster, A. Wallraff, A. Blais, L. Frunzio, R.-S. Huang, J. Majer, S. M. Girvin and R. J. Schoelkopf, cond-mat/0408367.

Alexandre Blais
Department of Physics, Yale University

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