Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Measurement of relaxation time in a large-inductance superconducting flux qubit[1] WEI QIU, BO MAO, SIYUAN HAN, Department of Physics and Astronomy, University of Kansas, YU YANG, Department of Physics, Nanjing University — Superconducting flux qubits with large geometric inductance are promising candidates for scalable quantum computing because it is easier to couple many of them together to form a quantum circuit sufficiently large for useful computational task. Recently, it has been shown that the dominant decoherence mechanism in superconducting flux qubit carefully isolated from environment is energy relaxation. It is therefore important to understand various relaxation mechanisms. We report here a systematic study of relaxation time as a function of flux bias, temperature, and operating point of the readout circuit in an rf SQUID flux qubit. Determination of the qubit's parameters via microwave and resonant tunneling spectroscopies allow quantitative comparisons to theoretical models. Implications of the result will be discussed.

[1]* This work was supported in part by the AFOSR Grant No. F49620-01-1-0439 and by NSF Grant No. DMR-0325551. We thank Vijay Patel of Stony Brook University for fabricating the qubit circuit.

Wei Qiu
Department of Physics and Astronomy, University of Kansas

Date submitted: 20 Nov 2006 Electronic form version 1.4