

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Variable coupling between the inductively isolated current-biased Josephson junction qubit and the current bias leads¹ HANHEE PAIK, S. K. DUTTA, R. M. LEWIS, R. C. RAMOS, H. XU, T. A. PALOMAKI, B. K. COOPER, A. J. PRZYBYSZ, A. J. DRAGT, J. R. ANDERSON, C. J. LOBB, F. C. WELLSTOOD, Center for superconductivity Research, Department of Physics, University of Maryland — We examined the behavior of inductively isolated Josephson junction qubits in which the coupling to the bias leads could be varied in situ. The variable coupling was achieved by using a second Josephson junction and an inductor that act as an inductive current divider. The coupling between the current bias leads and the qubit was varied by changing the current through the second junction, altering its Josephson inductance. We measured the tunneling escape rates of Al/AlO_x/Al and Nb/AlO_x/Nb junctions with continuous or pulsed microwave power, showing the allowed energy transitions and coherent Rabi oscillations. We found that T_2 , T_2^* and T_1 did not change significantly as the coupling to the current bias leads was varied.

¹This work is supported by NSA, NSF and Center for Superconductivity Research at University of Maryland. NSF grant number EIA0323261.

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Date submitted: 30 Nov 2005

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