

Abstract Submitted
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Small shadow evaporated junctions for superconducting phase qubits F. ALTOMARE, M.S. ALLMAN, K. CIOK, M.A. SILLANPÄÄ¹, J.D. WHITTAKER, R.W. SIMMONDS, National Institute of Standards and Technology, Boulder, CO 80305 USA — One of the biggest problems facing the fabrication of quantum computers based on superconducting qubits is the short coherence time of the quantum states. This is due to interaction of qubits with both the environment and defects (two level systems-TLS) in the Josephson junction (JJ). Because of the large JJ area, this problem is particularly obvious in phase qubits where it has been shown that TLS greatly affect the coherence time.² One way to overcome this problem is to reduce the size of the JJ thus reducing the number of TLS.³ We will discuss the results of our approach to this solution, namely using shadow evaporated JJ ($< 1\mu m^2$) and low-loss capacitor, and the results of our experiments on coupled qubits.

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²PRL 93, 077003 (2004)

³PRL 97, 050502 (2006)

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