

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Manipulation and readout of deep-submicron Nb-trilayer-based persistent-current qubits**<sup>1</sup> DAVID M. BERNS, SERGIO O. VALENZUELA, MIT, WILLIAM D. OLIVER, MIT Lincoln Laboratory, TERRY P. ORLANDO, MIT — Lithographically patterned persistent-current (PC) qubits are promising candidates for realizing a large-scale quantum computer. While challenging to fabricate in a trilayer technology, deep-submicron Josephson junctions (JJs) are required to realize large qubit tunnel-couplings and allow improved immunity to dielectric-induced decoherence. Here, we present recent results on the measurement and characterization of PC qubits designed with deep-submicron JJs and fabricated with Nb-Al/AlO<sub>x</sub>-Nb trilayers.

<sup>1</sup>This work is supported in part by the AFOSR grant F49620-01-1-0457 under the DoD University Research Initiative on Nanotechnology (DURINT) Program and the AFOSR/NM grant FA 9550-04-1-0221.

David M. Berns  
Department of Physics, MIT

Date submitted: 04 Jan 2006

Electronic form version 1.4