

Abstract Submitted
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Superconducting microfabricated ion traps SHANNON X. WANG, YUFEI GE, JAROSLAW LABAZIEWICZ, MIT, ERIC DAULER, MIT Lincoln Laboratory, KARL BERGGREN, ISAAC L. CHUANG, MIT — We fabricate superconducting ion traps with niobium and niobium nitride and trap single ^{88}Sr ions at cryogenic temperatures. The superconducting transition is verified and characterized by measuring the resistance and critical current using a 4-wire measurement on the trap structure, and observing change in the rf reflection. The lowest observed heating rate is 2.1(3) quanta/sec at 800 kHz at 6 K and shows no significant change across the superconducting transition, suggesting that anomalous heating is primarily caused by noise sources on the surface. This demonstration of superconducting ion traps opens up possibilities for integrating trapped ions and molecular ions with superconducting devices.

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