

Abstract Submitted  
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**Superconducting qubits can be coupled and addressed as trapped ions**<sup>1</sup> Y.X. LIU, L.F. WEI, J.R. JOHANSSON, RIKEN, Japan, J.S. TSAI, RIKEN and NEC, Japan, F. NORI, RIKEN, Japan, and the Univ. of Michigan, Ann Arbor, USA — Exploiting the intrinsic nonlinearity of superconducting Josephson junctions, we propose a scalable circuit with superconducting qubits (SCQs) which is very similar to the successful one now being used for trapped ions. The SCQs are coupled to the “vibrational” mode provided by a superconducting LC circuit or its equivalent (e.g., a superconducting quantum interference device). Both single-qubit rotations and qubit-LC-circuit couplings and/or decouplings can be controlled by the frequencies of the time-dependent magnetic fluxes. The circuit is scalable since the qubit-qubit interactions, mediated by the LC circuit, can be selectively performed, and the information transfer can be realized in a controllable way.

Y.X. Liu, L.F. Wei, J.R. Johansson, J.S. Tsai, F. Nori, Superconducting qubits can be coupled and addressed as trapped ions, Phys. Rev. B 76, 144518 (2007). URL: <http://link.aps.org/abstract/PRB/v76/e144518>

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