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Generation of entangled states in circuit QED using sideband transitions P. J. LEEK, S. FILIPP, P. MAURER, ETH QUANTUM DEVICE TEAM, ETH Zurich, A. BLAIS, Universite de Sherbrooke, A. WALLRAFF, ETH Zurich — The deterministic generation of entanglement between pairs of distant qubits is an important goal in the development of a quantum information processor. A promising and potentially scalable method of achieving this is through the use of sideband transitions between qubits and a globally coupled harmonic oscillator. Here we present an experimental demonstration of such a scheme implemented in an electrical circuit. We generate entanglement between a superconducting transmon qubit and a microwave coplanar waveguide resonator, and transfer this entanglement to a second qubit. We show generation of the four Bell states by this method, extracting the full two-qubit density matrix using a joint dispersive two-qubit readout and quantum state tomography.

- Prefer Oral Session
 Prefer Poster Session

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