

Abstract Submitted  
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**One-step multi-qubit GHZ state generation in a circuit QED system**<sup>1</sup> YING-DAN WANG, STEFANO CHESI, DANIEL LOSS, CHRISTOPH BRUDER, Univ. of Basel — Based on a circuit QED setup of superconducting flux qubits or charge qubits coupled to a transmission line resonator, we propose a scheme to generate multi-qubit GHZ states. The states are prepared by applying a single dc pulse to the superconducting qubits. Our scheme is based on the non-dispersive dynamic evolution of the system, hence the operation time is short and independent of the number of qubits. Using realistic parameters, we estimate that the GHZ state can be produced within the coherence time of the multi-qubit system. Our scheme is independent of the initial state of the transmission line resonator and works in the presence of higher harmonic modes. Our analysis also shows that the scheme is robust to various operation errors and environmental noise.

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