

Abstract Submitted  
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**Quantum simulation using superconducting qubits coupled to a 1D transmission line** DANIEL CAMPBELL, PHILIP KRANTZ, FEI YAN, MORITZ BUSINGER, TERRY ORLANDO, SIMON GUSTAVSSON, Massachusetts Institute of Technology, WILLIAM OLIVER, Massachusetts Institute of Technology and MIT Lincoln Laboratory — We consider a system of superconducting qubits spaced along a 1D transmission line in the regime of strong qubit-photon coupling. To each qubit we route wires for both frequency bias and dynamical control. Due to the strong, 1D interaction between qubits and photons, the Hilbert space relevant to system dynamics expands exponentially in both the qubit and photon number. This system enables the exploration of quantum models, including correlated decay processes such as super- and sub-radiance, and quantum scattering.

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