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Photon thermalization and condensation in circuit QED by engineered dissipation DAVID MARCOS, ANDREA TOMADIN, Institute for Quantum Optics and Quantum Information of the Austrian Academy of Sciences, SEBASTIAN DIEHL, Institute for Theoretical Physics, University of Innsbruck, PETER RABL, PETER ZOLLER, Institute for Quantum Optics and Quantum Information of the Austrian Academy of Sciences — The ability to engineer the coupling between a quantum system and its environment opens the possibility to dissipatively prepare entangled and quantum many- body states. Of particular interest is the case in which the system undergoes a phase transition driven by the coupling to a reservoir. Here we show how to engineer dissipation in the context of coupled cavity arrays, and more specifically in circuit QED. We propose an implementation based on coupled LC resonators and superconducting qubits, which under asymmetric coherent driving, leads to thermalization of photons to the symmetric state between neighboring sites. Above a critical threshold of the driving intensity, a macroscopic occupation of this symmetric mode is found.

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