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Dissipative stabilization of entangled qubit pairs in quantum arrays

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We study the dissipative stabilisation of entangled states in arrays of quantum systems. Specifically, we are interested in the states of qubits (spins-1/2) which may or may not interact with one or more cavities (bosonic modes). In all cases only one element, either a cavity or a qubit, is lossy and irreversibly coupled to a reservoir. When the lossy element is a cavity, we consider a squeezed reservoir and only interactions which conserve the number of cavity excitations. Instead, when the lossy element is a qubit, we consider pure decay and a properly selected structure of XX- and XY-interactions. We show that in all cases, in the steady state, many pairs of distant, non-directly interacting qubits, which cover the whole array, can get entangled.

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