Dissipative and nondissipative quantum circuit elements

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Quantum analogues of nondissipative circuit elements, that is, structures which can exist in a superposition of states with different values of inductance or capacitance, are readily realized using, e.g., superconducting qubits. Here I consider the possibility of the existence of quantum analogues of dissipative circuit elements, which demonstrate superpositions of states with different resistances or memristances. Using the Landauer view of transport through a scattering barrier, I show that this leads to no contradiction with the dissipative character of these elements.

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