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【505】 Robust quantum state transfer in photonic networks

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A basic task necessary for quantum information processing is the ability to faithfully transfer quantum states between distant quantum systems. A very promising platform for the implementation of quantum computers with outstanding controllability consists of superconducting quantum circuits, interacting via photon exchange in the microwave regime, which however are extremely sensitive to thermal perturbations.

Here I present a protocol where a quantum state of photons stored in a microwave cavity is faithfully transferred to a second distant cavity via a waveguide, while being completely immune to thermal noise present inside the waveguide. Quantum error correction protocols are applied to further enhance the robustness against other types of errors and imperfections.

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