

NOT and CNOT gates for photon logical qubits on different frequency states

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Abstract

Starting from Hamiltonian of three level atom interacting with photons, we calculate effective Hamiltonian by Schrieffer-Wolff transformation. We obtain the operation of photon frequency conversion solving appropriate Schrodinger equation. Based on this operation, an efficient protocol is proposed for implementing quantum NOT and CNOT gates for applications in quantum information processing.

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