

Quantum logic gates based on off-resonant cavity-assisted interaction between three-level atoms and single photons

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Abstract

© 2017 Astro Ltd. A scheme for implementing quantum gates on the basis of a hybrid system that consists of flying photons and a stationary three-level atom interacting with each other in a microring resonator is developed. By employing the Schrieffer-Wolf transformation, it is shown that various two-qubit gates can be implemented under conditions of dispersive interaction without the need for orthogonal Λ structure of optical transitions. As a promising system for implementation, NV centers are considered.

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Keywords

micro-resonator, quantum logic gates, Schrieffer-Wolf transformation

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