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Effect of dephasing on superadiabatic three-level quantum driving (Article)

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Abstract

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The robustness of the three-level transitionless quantum driving proposed by Giannelli and Arimondo [L. Giannelli and E. Arimondo, Phys. Rev. A 89, 033419 (2014)PLRAAN1050-294710.1103/PhysRevA.89.033419] is investigated. In the case when the excited state is barely populated during the evolution, its decay rate has little effect on the adiabatic population transfer. However, the dephasing which is due to collisions or phase fluctuations of the driving fields will produce a significant effect on the evolution. We found that the dephasing reduces the performance of the population transfer and the fidelity can be far below the quantum computation target even for small dephasing rates. © 2014 American Physical Society.

Indexed keywords

Engineering controlled terms: Decay (organic), Quantum computers

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