

Abstract Submitted
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Non-adiabatic

effect on quantum pumping¹ CHIKAKO UCHIYAMA, Univ. of Yamanashi
— We study quantum pumping for an anharmonic junction model which interacts with two kinds of bosonic environments. We provide an expression for the quantum pumping under a piecewise modulation of environmental temperatures with including non-adiabatic effect under Markovian approximation. The obtained formula is an extension of the one expressed with the geometrical phase(Phys. Rev. Lett. **104**,170601 (2010)). This extension shows that the quantum pumping depends on the initial condition of the anharmonic junction just before the modulation, as well as the characteristic environmental parameters such as interaction strength and cut-off frequencies of spectral density other than the conditions of modulation. We clarify that the pumping current including non-adiabatic effect can be larger than that under the adiabatic condition. This means that we can find the optimal condition of the current by adjusting these parameters. (The article has been submitted as <http://arxiv.org/submit/848201> and will be appeared soon.)

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