Poster

Dissipative electronic transport through double quantum dots irradiated with microwaves

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Double quantum dots in the strong Coulomb blockade regime are realizations of two-level systems defined from two tunnel--splitted ground states, which are separated by a large energy gap from the remaining many--particle states. The interactions between electrons and bosonic degrees of freedom (photons, phonons) in these systems can be tested and manipulated in electronic transport experiments[1]. Monochromatic classical radiation (AC fields, microwaves) gives rise to various non-linear effects such as photo-sidebands or dynamical localization (coherent supression of tunneling) that show up in the time-averaged, stationary electronic current[2]. On the other hand, quantum noise of a dissipative environment strongly influences the transport properties of coupled quantum dots[3,4] In this contribution[5], we quantitatively investigate the combined influence of a classical, monochromatic time-dependent AC field and a dissipative boson environment on the non-linear transport through a double quantum dot. We develop a Floquet-like theory[6] that takes into account the effect of the electron reservoirs (leads) and can be numerically evaluated for arbitrary strong AC fields and arbitrary boson environment. In limiting cases we reproduce previous analytical results (polaron tunneling, Tien-Gordon formula).

Referencias

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