

Abstract Submitted
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Non-Markovian Transport of Charges in Solid-State Quantum

Dots e. YING-TSAN TANG, Department of Electrophysics, National Chiao Tung University, Hsinchu 300, Taiwan, YUEH-NAN CHEN, National Center for Theoretical Sciences, National Cheng Kung University, Tainan, Taiwan, BRANDES TOBIAS, Institut für Theoretische Physik, Technische Universität Berlin, Hardenbergstr. 36, D-10623 Berlin, Germany, DER-SAN CHUU, Department of Electrophysics, National Chiao Tung University, Hsinchu 300, Taiwan, TU, BERLIN COLLABORATION — The population dynamics of an electron in a double-dot system coupled to reservoirs is theoretically investigated. Basically, as we put an extra single dot that is strongly coupled to the extended reservoir, it would be possible for experimentalists to realize their modification of coupling strength; therefore we could properly control the memorial effect between system and reservoir by extra coupling. Throughout this study, we effectively change the decay of the entire system. Moreover, the exact results for non-Markovian couplings to both phonon and electron reservoirs with structured tunneling density of states are obtained, which contains the coherent states created by the distance of double dot embedding in the same system as well as the energy shift caused by purely electron-phonon coupling. Eventually, the relaxation dynamics of the Zeno or Anti-Zeno effect reveals insight into the defined decay rate.

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