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Landau-Zener transitions mediated by an environment in the open-multistate model SAVANNAH GARMON, Osaka Prefecture University, AMRO DODIN, LENA SIMINE, DVIRA SEGAL, University of Toronto — We study Landau-Zener transitions between two linearly driven states with the addition of a shared discretized continuum. The continuum allows for population decay from the initial state as well as indirect transitions. The probability of nonadiabatic transition in this model preserves the standard Landau-Zener functional form apart from a shift in the usual exponential factor, reflecting population transfer into the continuum. We provide an intuitive explanation for this behavior assuming individual, independent transitions between pairs of states. In contrast, the ground state survival probability at long time shows a novel, non-monotonic, functional form with an oscillatory behavior in the sweep rate at low sweep rate values. We envision our system as a simplified model regarding memory preservation in a quantum dot as the dot interacts with the surrounding environment.

[1] A. Dodin, S. Garmon, L. Simine, and D. Segal, J. Chem. Phys. 140, 124709 (2014).

Savannah Garmon
Osaka Prefecture Univ

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