

Shortcuts to Adiabaticity in Open Quantum Systems: The Role of Decoherence

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We investigate the implementation of Shortcuts to Adiabaticity (STA) protocols in open quantum systems, with a focus on the Fast Quasiadiabatic Dynamics (FAQUAD) method. STA techniques enable rapid, high-fidelity state transfer by engineering time-dependent control fields that mimic adiabatic evolution in finite time. We extend the FAQUAD framework to include environmental decoherence by incorporating the system's Lindbladian generator into the driving equations.

References

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Figures

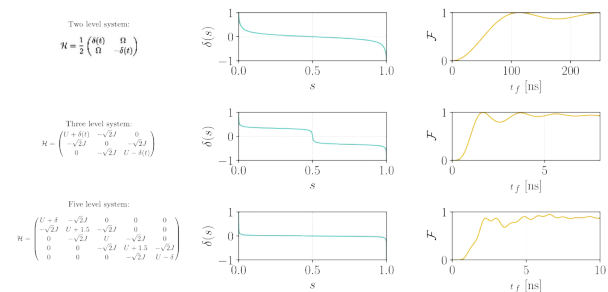


Figure 1: Signals and fidelity for different Hamiltonians