

Quantum many-body scars and their dynamics in the U(1) lattice gauge theory

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Understanding the fundamental theory of preventing thermalization is crucial for practical quantum device development. In this work, we expand upon prior research on quantum many-body scars in the U(1) quantum link and quantum dimer models. By employing a graphical representation of the basis, we extend the analytical expressions for specific scars to encompass a broader family of such scars. As for the dynamics of these scars, we conduct numerical tests to evaluate their robustness in the presence of noise, alongside the investigation of other long-time physics. Further understanding of these scar states has the potential to provide insights into the broader context of thermalization.

Keywords: Quantum many-body scars, eigenstate thermalization hypothesis

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