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Title:	Studying Many-Body Quantum Chaos using Exact Diagonalization
Authors:	<a href="#">Sharma, Ajay</a>
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Abstract:	This thesis explores the connection between quantum mechanics and classical chaos using the powerful tool of exact diagonalization. The work dives into the theoretical framework of quantum chaos, highlighting its relationship to classical chaotic systems and the principles of random matrix theory. Exact diagonalization is used for studying small, finite quantum systems that exhibit chaotic behavior. The thesis details how specific symmetries within these systems can be exploited to reduce computational complexity and facilitate efficient analysis. The research focuses on applying exact diagonalization to models involving Bosons Spin-1 or spinless. The Thouless time scale, a signature of quantum chaos, is investigated through the analysis of spectral form factors. This analysis is performed across different hopping and pairing parameter values to understand how these parameters influence Thouless time. This thesis contributes to exploring quantum chaos by utilizing exact diagonalization and symmetry considerations. The findings tell us about the manifestation of chaos in the quantum realm and its connection to classical and random matrix theory paradigms.
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