

Quantum simulation and quantum phase transitions of an extended Agassi model

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Quantum simulations provide a fast-developing and powerful tool to realize the analysis of various physical systems of quantum nature and should be able to outperform classical computers and solve previously intractable problems. As such, many experimental setups are being proposed to validate the feasibility of the quantum simulation of different physical models. In this work, we study an extended Agassi model, which describes a many-body system in Nuclear Physics. It is a two-level system that includes a combination of long range monopole-monopole and short range pairing interactions. Also, it presents a very rich quantum phase diagram that gives rise to several quantum phase transitions (QPTs) of different character. Here, we introduce this model, propose an experimental setup for its quantum simulation and analyze its QPTs using machine learning tools.

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