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Edge mode dynamics in long-range Kitaev model

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Abstract

In this paper we study the dynamics of long-range pairing and hopping p-wave superconducting chain after a sudden quench of chemical potential. We have shown that the quantum-classical phase transition occurs when the system is quenched to the critical point and the Loschmidt echo shows perfect periodic oscillations. Moreover we have studied the dynamical phase transition for a quench across the critical point. Our analysis shows that the dynamical phase transition occurs for the cases where the system initially prepared in the massless edge modes. While the system does not show dynamical phase transition when the system is prepared in the massive edge modes, even the quench crossing the critical point.

Keywords: p-wave superconductivity, long-range Kitaev chain, Majorana edge modes, dynamical phase transition

For full article, refer to the Persian section