

Topological dynamical quantum phase transition in a quantum skyrmion phase

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The quantum skyrmionic phase is modeled in a two-dimensional helical spin lattice. This topological skyrmionic phase retains its nature in a large parameter space before moving to a ferromagnetic phase. Next-nearest-neighbor interaction improves the stability and it also causes a shift of the topological phase in the parameter space. Nonanalytic behavior of the rate function observed, when the system which is initially in a quantum skyrmion phase is quenched to a trivial quantum ferromagnetic phase, indicates a dynamical quantum phase transition. Dynamical quantum phase transition is absent when the system initially in a skyrmion phase is quenched to a helical phase.

References:

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