Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Instantons Emerging from Quench Dynamics of One-dimensional Systems

CHENG LI, TIN-LUN HO, Ohio State University — “Instantons” were first proposed in high energy physics as a topological solution of Yang-Mills equations in spacetime. We borrow the concept of “instanton” to describe the topological structure in spacetime, constructed from the quench dynamics in ultracold atom systems. In the talk, we shall address the relation between the instantons and the quench dynamics which is determined by the initial state and the Hamiltonian. Furthermore, we proposed two methods to measure the topological invariant of the Hamiltonian based on instantons from quench dynamics.

Cheng Li
Ohio State University

Date submitted: 09 Jan 2019

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