



北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Nonequilibrium time evolution in an Ising chain with periodically driven transverse field

Xiao Wang 王骁

Shanghai Jiao Tong University

Time: 3:00 pm, June.12, 2025 (Thursday)

时间: 2025年6月12日 (周四) 下午3:00

Venue: Room w563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

Motivated by the recent rapid development of Rydberg atom experiments, in this talk, I will discuss the nonequilibrium time evolution process of a quantum Ising chain subjected to a slowly rotating critical transverse field and a small longitudinal field. When the longitudinal field is set to zero, the corresponding magnetization oscillations are found to be explained by the contributions from various particle excitations of the quantum E_8 integrable model. When turning on the longitudinal field, a competition between the rotation frequency and the longitudinal field strength leads to a transition between local adiabatic time evolution and many-body Landau-Zener tunneling process. This process is characterized by an effective energy gap arising from the quantum geometric potential and the instantaneous energy gap. I will explain in detail how the quantum geometric potential changes the tunneling behavior as the rotation frequency and longitudinal field strength vary. During the talk, I will also give a brief introduction to the quantum E_8 integrable model.

Reference:

[1] Phys. Rev. B 110, 195101 (2024).

[2] arXiv:2503.18396.

About the speaker

Xiao Wang recently obtained his Ph.D. from the Condensed Matter Division of Tsung-Dao Lee Institute at Shanghai Jiao Tong University, under the supervision of Professor Jianda Wu. His research interests include conformal field theory and integrable models, along with their applications in nonequilibrium systems..