Contribution ID: **90** Type: **Oral report**

The Quantum Simulation on a (1+1)D Sphaleron Model

This study focuses on quantum simulation of the sphaleron configurations in a 1+1-dimensional field theory model, achieved by introducing linear additional terms into the action of the $O(3)$ nonlinear sigma-model. We discretize the Lagrangian of the aforementioned (1+1)D model and construct a Hamiltonian representation based on unitary quantum gate forms, enabling the construction of quantum-simulated sphaleron. Subsequently, we devise a sophisticated adiabatic simulation method based on the field space properties of quantum-bits and the corresponding structure of the model field, obtaining the quantum-simulated 1D sphaleron states. Additionally, we theoretically construct the decay of sphaleron states and the corresponding effects on the fermion number in the model and CP violation for further quantum simulations on this model.

Primary author: HUANG, Min (高能所)

Presenter: HUANG, Min (高能所)

Session Classification: 分会场一

Track Classification: TeV 物理和超出标准模型新物理