



Contribution ID: 96 Type: 5th week (Formal developments and other frontiers in lattice QCD)

Quantum Simulation of Real-Time Dynamics in Particle Physics

Thursday, November 14, 2024 2:00 PM (1 hour)

Quantum computers offer a promising new approach to studying real-time dynamics, which remains challenging for traditional methods like Monte Carlo simulations and tensor networks. In this talk, I will present progress on two key areas: simulating particle scattering and calculating parton distribution functions (PDFs) in 1+1 dimensions using digital quantum computing.

We propose a setup to simulate particle scattering by preparing two wave packets with opposite momenta. By applying a time evolution operator, we simulate their collision, capturing snapshots at each step to gain deeper insights into the process. Additionally, we explore the calculation of PDFs, which describe hadronic structures in high-energy collisions, demonstrating how quantum computing can advance our understanding of particle physics.

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