Lattice 2024



Contribution ID: 228 Type: Talk

Generalized HMC using Nambu mechanics

Friday, 2 August 2024 14:15 (20 minutes)

I describe a generalization of the Hybrid Monte Carlo (HMC) algorithm with molecular dynamics (MD) steps which use Nambu's generalized Hamiltonian dynamics. Characterized by multiple Hamiltonian functions, this formalism allows me to include forces from non-local objects in the MD evolution while still preserving the target probability distribution. In this way, the local changes proposed by the MD have instantaneous knowledge of the long-distance behavior of the gauge field. This represents a promising method for fighting critical slowing down in lattice QCD simulations. Results will be presented for a few choices of the second non-local auxiliary Hamiltonian.

Primary author: LUNDSTRUM, Erik (Columbia University)

Presenter: LUNDSTRUM, Erik (Columbia University)

Session Classification: Algorithms and artificial intelligence

Track Classification: Algorithms and Artificial Intelligence