



Contribution ID: 278

Type: **Poster**

Enhanced Sampling Techniques for Lattice Gauge Theory

Tuesday 4 November 2025 18:00 (1h 30m)

In theories with topological sectors, such as lattice QCD and four-dimensional $SU(N)$ gauge theories with periodic boundary conditions, conventional update algorithms suffer from topological freezing due to large action barriers separating distinct sectors. With appropriately constructed bias potentials, Metadynamics and related enhanced sampling techniques can mitigate this problem and significantly reduce the integrated autocorrelation times of the topological charge and associated observables.

We test strategies to accelerate the buildup of bias potentials and the possibility of extrapolating potentials from small to large volumes. We also investigate the effectiveness of orthogonal algorithmic improvements, such as longer HMC trajectories and HMC variants, which may benefit conventional simulations as well.

Parallel Session (for talks only)

Algorithms and artificial intelligence

Authors: HOELBLING, Christian (University of Wuppertal); Mx FUWA, Gianluca (University of Wuppertal); EICHHORN, Timo (University of Wuppertal)

Presenter: EICHHORN, Timo (University of Wuppertal)

Session Classification: Poster session