



Contribution ID: 383

Type: **Poster Presentation**

Metadynamics Surfing on Topology Barriers in the Schwinger Model

Tuesday, 9 August 2022 20:00 (1 hour)

Topological freezing is a well known problem in lattice simulations: with shrinking lattice spacing, a transition between topological sectors becomes increasingly improbable, leading to a problematic increase of the autocorrelation time. We present our investigation of metadynamics as a solution for topological freezing in the Schwinger model. Specifically, we take a closer look at the collective variable used in this process and its scaling behaviour. We visualize the effects of topological freezing and how metadynamics helps in that respect. Possible implications for and differences to four-dimensional $SU(3)$ are briefly discussed.

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Session Classification: Poster

Track Classification: Algorithms (including Machine Learning, Quantum Computing, Tensor Networks)