



Contribution ID: 387

Type: **Talk**

Computing the density of states with the global Hybrid Monte Carlo

Tuesday, July 26, 2016 5:30 PM (20 minutes)

The LLR algorithm is a recent proposal for computing the density of states in lattice gauge theory. This algorithm has been tested in several bosonic models at zero and finite chemical potential with impressive results. Its original formulation is based on the simulation of the theory on restricted action intervals using local Monte Carlo updates. I will discuss a new version of the method based on the global Hybrid Monte Carlo algorithm which is suitable for theories with dynamical fermions. I will present our preliminary result for the study of the $SU(2)$ gauge theory.

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Session Classification: Algorithms and Machines

Track Classification: Algorithms and Machines