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Normalizing Flows for the Density of States in Abelian Lattice Gauge Theory with a θ -term

Wednesday 5 November 2025 10:00 (20 minutes)

A while ago, the generalised density-of-states method was proposed to address the sign problem that arises in systems with a complex action. More recently, with the advent of normalising flows and their ability to model complicated target densities, a flow-based density-of-states approach was developed. This method has been shown to successfully reconstruct the partition function of 0D, 1D, and (1+1)D scalar field theories, recovering the correct Lee–Yang zeros. In this talk, we extend this idea by applying gauge-equivariant normalising flows to reconstruct the density of states in pure (1+1)D U(1) gauge theory with a θ -term. In particular, we focus on the steps required to probe the topological phase transition expected at $\theta = \pi$.

Parallel Session (for talks only)

Algorithms and artificial intelligence

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