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# Entanglement entropy in the gauge Ising model: a Monte Carlo study

*Friday, 22 December 2023 10:00 (30 minutes)*

The study of entanglement in quantum field theories provides insight into universal properties which are typically challenging to extract by means of more local observables. In the context of strongly coupled gauge theories, entanglement is expected to play a role in understanding many defining phenomena, among which confinement. However, calculations of entanglement-related quantities in gauge theories pose significant challenges: typical numerical algorithms struggle to compute such highly non-local quantities, and the definition of entanglement measures itself is ambiguous in gauge theories. In this talk I will discuss our recent efforts to overcome these challenges. In the first part of the talk I will present a novel algorithm, which combines the replica trick and Jarzynski's equality, for high precison calculations of Rényi entropies. In the second part I will show our preliminar results for the study of entanglement in the three-dimensional gauge Ising model, which can be mapped by means of a duality transformation to the spin Ising model, for which entanglement is well defined.

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