Contribution ID: **205** Type: **Talk**

Entanglement Entropy in Lattice Gauge Systems from a Dual Loop Formulation

Tuesday 4 November 2025 15:30 (20 minutes)

We study the problem of defining and computing entanglement entropy in lattice gauge systems using a dual loop formulation. The main idea is to apply a sequence of canonical transformations that rewrite the standard link variables of $SU(2)$ and $U(1)$ lattice gauge theories in terms of the loop variables. This allows an easier handling of gauge-invariant degrees of freedom and gives a cleaner way to define subsystems on the lattice. We work in spin-network basis and test the construction on simple states to understand how the reduced density matrix can be defined in this framework. The analysis is general for $SU(2)$ and $U(1)$. The work is still in progress, and I plan to present the structure of the formulation, along with some preliminary results and open issues.

Parallel Session (for talks only)

Vacuum structure and confinement

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Session Classification: Vacuum structure and confinement