



Contribution ID: 419

Type: Talk

Entanglement entropy of a color flux tube in $2 + 1$ -D Yang-Mills theory

Wednesday, 31 July 2024 12:15 (20 minutes)

We study entanglement entropy in $SU(2)$ pure gauge theory due to the presence of static quarks in $d = 2 + 1$. Using a replica approach we investigate the $q = 2$ Renyi entropy across various partitions of space A and \bar{A} . We use Polyakov lines to define the entanglement entropy associated with a quark pair in confinement, finding this entropy scales to a finite, uniquely defined, and non-zero value in the continuum limit. We study the entanglement entropy of various sizes and locations of region A relative to the quark pair and compare our results to the predictions of a string model.

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Session Classification: Vacuum structure and confinement

Track Classification: Vacuum Structure and Confinement