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

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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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