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Entanglement in CFTs with Discrete Gauge Symmetry and Bulk Reconstruction in AdS3

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Due to the non-factorization of the Hilbert space into tensor products, the definition of entanglement entropy in gauge theories is subtle. It can be defined either by resorting to an algebraic approach or by embedding the state into an enlarged factorizing Hilbert space. The equivalence of these two approaches will be shown for entanglement between spatial degrees of freedom in 2d CFTs with $\mathbb{Z}_N$ gauge symmetry. Furthermore, the generalization to entanglement between non-spatially organized degrees of freedom (entwinement) will be considered. Lastly, holographic duals to both types of entanglement entropies will be constructed and the implications for the reconstruction of the bulk AdS_3 geometry will be explained.

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