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Topological entanglement negativity in Chern-Simons theories XUEDA WEN, UIUC, PO-YAO CHANG, Center for Materials Theory, Rutgers University, SHINSEI RYU, UIUC — We study the topological entanglement negativity between two spatial regions in (2+1)-dimensional Chern-Simons gauge theories by using the replica trick and the surgery method. For a bipartitioned or tripartitioned spatial manifold, we show how the topological entanglement negativity depends on the presence of quasiparticles and the choice of ground states. In particular, for two adjacent non-contractible regions on a tripartitioned torus, the entanglement negativity provides a simple way to distinguish Abelian and non-Abelian theories. Our method applies to a Chern-Simons gauge theory defined on an arbitrary oriented (2+1)-dimensional spacetime manifold.

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