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The entanglement spectrum of perturbed Chern-Simons theories[1]
THOMAS JACKSON, ISRAEL KLICH, University of Virginia — Topological field theories — theories insensitive to the metric of the space they live on — have been shown to be applicable to a remarkable variety of condensed matter systems. A natural and important question is how perturbations relevant for real systems (interactions, etc.) deform these topological structures. In this work, we consider perturbations of Chern-Simons theory by a small Yang-Mills term, which breaks topological symmetry by introducing local bulk degrees of freedom in the form of massive gluons. We consider the behavior of the entanglement spectrum (the eigenvalues of the reduced density matrix) of this theory under this perturbation. We argue that the act of taking the partial trace may be viewed as adding a chemical potential gradient for the gluons near the boundary of the space, with a length scale determined by the gluon mass — or, colloquially, a "hot edge."

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Thomas Jackson
University of Virginia

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