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**General relation between energy spectrum and entanglement spectrum** XIAOLIANG QI, Stanford University, HOSHO KATSURA, Gakushuin University, Tokyo, Japan, ANDREAS LUDWIG, University of California, Santa Barbara — We demonstrate that the bipartite density matrix, arising from a spatial bipartitioning of a gapped topological state which possesses gapless edge modes in the form of a conformal field theory (CFT) (when terminated against a topologically trivial state/vacuum), such as e.g. a general quantum Hall state, is the density matrix of a chiral edge state CFT at a finite temperature. We obtain this result by applying a physical instantaneous cut of the gapped system, and by viewing the cutting process as a sudden “quantum quench” into a CFT, using the tools of boundary conformal field theory. In particular, we obtain a general relation between the Hamiltonian spectrum of gapless theories and the entanglement spectrum of the gapped theory obtained from coupling two gapless theories.

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