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Critical entanglement spectrum of one-dimensional symmetry protected topological phases[1] GUANG-MING ZHANG, Tsinghua Univ., Beijing, China, XIN WAN, Zhejiang University, Hangzhou, China — Under an appropriate symmetric extensive bipartition in a one-dimensional symmetry protected topological (SPT) phase, a bulk critical entanglement spectrum can be obtained, resembling the excitation spectrum of the critical point separating the SPT phase from the trivial (vacuum) state. Such a critical point is beyond the standard Landau Ginzburg-Wilson paradigm for symmetry breaking phase transitions. For the S=1 SPT (Haldane) phase with the Affleck-Kennedy-Lieb-Tasaki exact wave function, the resulting critical entanglement spectrum shows a delocalized version of the edge excitations in the SPT phase. From the wave function corresponding to the lowest entanglement energy level, the central charge of the critical point can be extracted and the critical theory can be identified as the same effective field theory as the spin-1/2 antiferromagnetic Heisenberg chain or the spin-1/2 Haldane-Shastry model with inverse square long-range interaction. (Reference: W. J. Rao, X. Wan, G. M. Zhang, Phys. Rev. B 90, 075151 (2014))

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