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The quantum (non-Abelian) Potts model and its exact solution

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Abstract

We generalize the classical one dimensional Potts model to the case where the symmetry group is a non-Abelian finite group. It turns out that this new model has a quantum nature in that its spectrum of energy eigenstates consists of entangled states. We determine the complete energy spectrum, i.e. the ground states and all the excited states with their degeneracy structure. We calculate the partition function by two different algebraic and combinatorial methods. We also determine the entanglement properties of its ground states.