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Characterizing topological order in Projected Entangled Pair States

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Projected Entangled Pair States (PEPS) provide a powerful formalism for the description of strongly correlated quantum systems based on their entanglement properties. In this talk, I will discuss how to characterize topological order in PEPS. I will show how symmetries of the PEPS determine how they appear as topologically degenerate ground states, and then proceed to discuss how to extract the topological properties from the structure of the PEPS transfer operator. This includes the topological properties of the state and its excitations, its entanglement spectrum and boundary Hamiltonian, as well as the detection of topological spin liquid behavior.