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Tensor renormalization group analysis of CP(N-1) model in two dimensions

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We apply the tensor renormalization group (TRG) method to the lattice CP(N-1) model in two dimensions. A tensor network representation of this model is derived for arbitrary N. For N=2, we compute the average energy by using the higher-order TRG. We compare it with the result of the O(3) nonlinear sigma model in two dimensions which is analyzed by the same method. Finally, we discuss the tensor network representation in the presence of the theta term.

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