

PHENOMENOLOGICAL RENORMALIZATION GROUP AND CLUSTER APPROXIMATION

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S u m m a r y

We propose a modification of the Nightingale renormalization group for lattice spin and gauge models by combining it with the cluster decimation approximation. Essential ingredients of our approach are: 1) exact calculation of the partition and correlation functions on a finite lattice strip; 2) preservation of the mass gap or the second moment correlation length, computed in the infinite strip length limit, on each decimation step. The method is applied to studying the general two- and three-dimensional $Z(N)$ models. A perfect agreement with exact results (whenever available) is found. An extension of the method to models with a continuous symmetry is briefly discussed.