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On ground states and phase transition for λ-model with the competing Potts interactions on Cayley trees (Article)

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Abstract   ⌄ View references (28)

In this paper, the λ-model with nearest neighbor interactions is considered with competing Potts interactions on the Cayley tree of order-two. Notice that if λ-function is taken as a Potts interaction function, then this model reduces to the Potts model with competing interactions. The Potts model with considered interactions has only been numerically investigated, hence we aim to propose a measure-theoretical approach for the considered model in a more general setting. Therefore, first ground states of the model are described. Furthermore, certain conditions for the existence of Gibbs measures corresponding to the model are found, which allows the establishment of the existence of the phase transition. © 2020 Elsevier B.V.

SciVal Topic Prominence ⓘ

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☐ 7   We stress that the Cayley tree is the simplest hierarchical lattice with non-amenable graph structure [28]. This means that the ratio of the number of boundary sites to the number of interior sites of the Cayley tree tends to a nonzero constant in the thermodynamic limit of a large system. Nevertheless, the Cayley tree is not a realistic lattice, however, its amazing topology makes the exact calculations of various quantities possible