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Potts Model with Competing Binary-Ternary-Quaternary Interactions on Cayley Tree (Conference Paper) (Open Access)

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Abstract

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We study the phase diagrams for the Potts model with competing binary, ternary and quaternary interactions on Cayley tree of order 2. At vanishing temperature T, the phase diagram is fully determined for all values of competing binary, ternary and quaternary interactions. We extend the results (for the case $J_q = 0$) obtained by Ganikhodjaev et. al. [9]. The results show that the appearance of addition phases: antiferromagnetic and Period 6, in the case of nonzero quaternary interactions for several ranges. Then, we investigate the modulated phase, with the phase being indicated by many different types of commensurate and incommensurate phases by plotting the wavevectors versus temperature. Lastly, the Lyapunov exponent is used to verify the stability of the periods. © Published under licence by IOP Publishing Ltd.

SciVal Topic Prominence

Topic: Cayley Tree | Gibbs Measure | Potts Model

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Indexed keywords

Engineering controlled terms: Binary trees, Forestry, Graph Databases, Lyapunov methods, Phase diagrams

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