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Translation-invariant p -adic quasi-Gibbs measures for the Ising–Vannimenus model on a Cayley tree (Article)

Mukhamedov, F.M.^a [✉](#), Saburov, M.K.^a [✉](#), Khakimov, O.K.^b [✉](#) [👤](#)

^aDepartment of Computational and Theoretical Sciences, Faculty of Science, International Islamic University Malaysia, Pahang, Malaysia

^bInstitute of Mathematics, National University of Uzbekistan, Tashkent, Uzbekistan

Abstract

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We consider the p -adic Ising–Vannimenus model on the Cayley tree of order $k = 2$. This model contains nearest-neighbor and next-nearest-neighbor interactions. We investigate the model using a new approach based on measure theory (in the p -adic sense) and describe all translation-invariant p -adic quasi-Gibbs measures associated with the model. As a consequence, we can prove that a phase transition exists in the model. Here, “phase transition” means that there exist at least two nontrivial p -adic quasi-Gibbs measures such that one is bounded and the other is unbounded. The methods used are inapplicable in the real case. © 2016, Pleiades Publishing, Ltd.

Author keywords

Cayley tree dynamical system Ising–Vannimenus model p -adic Gibbs measure p -adic numbers phase transition

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