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TRANSLATION-INVARIANT p-ADIC QUASI-GIBBS MEASURES FOR THE ISING-VANNIMENUS MODEL ON A CAYLEY TREE**By:** [Mukhamedov, FM](#) (Mukhamedov, F. M.)^[1]; [Saburov, MK](#) (Saburov, M. Kh.)^[1]; [Khakimov, OK](#) (Khakimov, O. Kh.)^[2]**THEORETICAL AND MATHEMATICAL PHYSICS****Volume:** 187 **Issue:** 1 **Pages:** 583-602**DOI:** 10.1134/S0040577916040127**Published:** APR 2016[View Journal Impact](#)**Abstract**

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.

Keywords**Author Keywords:** [p-adic numbers](#); [Ising-Vannimenus model](#); [p-adic Gibbs measure](#); [dynamical system](#); [phase transition](#); [Cayley tree](#)**KeyWords Plus:** [POTTS-MODEL](#); [DYNAMICAL-SYSTEMS](#); [PHASE-TRANSITIONS](#); [LAMBDA-MODEL](#)**Author Information****Reprint Address:** Mukhamedov, FM; Saburov, MK (reprint author)

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Funding Agency	Grant Number
MOHE	ERGS13-024-0057 ERGS13-025-0058
IIUM	EDW B13-029-0914

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Categories / Classification

Research Areas: Physics
Web of Science Categories: Physics, Multidisciplinary; Physics, Mathematical

Document Information

Document Type: Article
Language: English
Accession Number: WOS:000376274300012
ISSN: 0040-5779
eISSN: 1573-9333

Journal Information

Impact Factor: [Journal Citation Reports](#)

Other Information

IDS Number: DM3VH
Cited References in Web of Science Core Collection: 34
Times Cited in Web of Science Core Collection: 1