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Periodic p-adic Gibbs Measures of q-State Potts Model on Cayley Trees I: The Chaos Implies the Vastness of the Set of p-Adic Gibbs Measures

By: [Ahmad, MAK](#) (Ahmad, Mohd Ali Khameini)^[1,2]; [Liao, LM](#) (Liao, Lingmin)^[2]; [Saburov, M](#) (Saburov, Mansoor)^[3]

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Abstract

We study the set of p-adic Gibbs measures of the q-state Potts model on the Cayley tree of order three. We prove the vastness of the set of the periodic p-adic Gibbs measures for such model by showing the chaotic behavior of the corresponding Potts-Bethe mapping over for the prime numbers . In fact, for where and J is a coupling constant, there exists a subsystem that is isometrically conjugate to the full shift on three symbols. Meanwhile, for , there exists a subsystem that is isometrically conjugate to a subshift of finite type on r symbols where . However, these subshifts on r symbols are all topologically conjugate to the full shift on three symbols. The p-adic Gibbs measures of the same model for the prime numbers and the corresponding Potts-Bethe mapping are also discussed. On the other hand, for we remark that the Potts-Bethe mapping is not chaotic when and and we could not conclude the vastness of the set of the periodic p-adic Gibbs measures. In a forthcoming paper with the same title, we will treat the case for all prime numbers p.

Keywords

Author Keywords: p-adic Potts model; p-adic Gibbs measure; Phase transition; Chaos

KeyWords Plus: MARKOV RANDOM-FIELDS; CUBIC EQUATIONS; QUADRATIC EQUATIONS; PROBABILITY LOGIC; DYNAMICAL-SYSTEMS; SOLVABILITY; MECHANICS; PHYSICS; NUMBER; ROOTS

Author Information

Reprint Address: Saburov, M (reprint author)

Amer Univ Middle East, Coll Engn & Technol, 250 St, Egaila, Kuwait.

Addresses:

+ [1] Int Islamic Univ Malaysia, Dept Computat & Theoret Sci, Kuantan 25200, Pahang, Malaysia

- [2] Univ Paris Est Creteil, LAMA, UMR 8050, CNRS, 61 Ave Gen Gaulle, F-94010 Creteil, France

Organization-Enhanced Name(s)

Centre National de la Recherche Scientifique (CNRS)

Universite Paris-Est (ComUE)

Universite Paris-Est-Creteil-Val-de-Marne (UPEC)

Universite Paris-Est Marne-la-Vallee

[3] Amer Univ Middle East, Coll Engn & Technol, 250 St, Egaila, Kuwait

E-mail Addresses: khameini.ahmad@gmail.com; lingmin.liao@u-pec.fr; msaburov@gmail.com

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Cited References: 69Showing 30 of 69 [View All in Cited References page](#)*(from Web of Science Core Collection)*

1. **[On the Fourier transform and the spectral properties of the p-adic momentum and Schrodinger operators](#)** **Times Cited: 10**
By: Albeverio, S; Cianci, R; Khrennikov, A
JOURNAL OF PHYSICS A-MATHEMATICAL AND GENERAL Volume: 30 Issue: 16 Pages: 5767-5784 Published: AUG 21 1997
2. **[On the spectrum of the p-adic position operator](#)** **Times Cited: 17**
By: Albeverio, S; Cianci, R; Khrennikov, A
JOURNAL OF PHYSICS A-MATHEMATICAL AND GENERAL Volume: 30 Issue: 3 Pages: 881-889 Published: FEB 7 1997
3. **[p-adic valued quantization](#)** **Times Cited: 22**
By: Albeverio, S; Cianci, R; Khrennikov, A Y.
P-Adic Numbers, Ultrametric Analysis, and Applications Volume: 1 Pages: 91-104 Published: 2009
4. **[Representation of a quantum field Hamiltonian in p-adic Hilbert space](#)** **Times Cited: 6**
By: Albeverio, S; Cianci, R; Khrennikov, AY
THEORETICAL AND MATHEMATICAL PHYSICS Volume: 112 Issue: 3 Pages: 1081-1096 Published: SEP 1997
5. Title: [not available] **Times Cited: 30**
By: Albeverio, S.; Shelkovich, V.M.; Khrennikov, A.Yu.
Theory of p-adic Distributions. Linear and Nonlinear Models Published: 2010
Publisher: Cambridge University Press
6. **[Quantum mechanics and p-adic numbers](#)** **Times Cited: 42**
By: Beltrametti, E.; Cassinelli, G.
Found. Phys. Volume: 2 Pages: 1-7 Published: 1972
7. Title: [not available] **Times Cited: 628**
By: Borevich, Z.I.; Shafarevich, I.R.
Number Theory Published: 1966
Publisher: Academic Press, New York/San Francisco/London
8. **[On p-adic mathematical physics](#)** **Times Cited: 52**
By: Dragovich, B.; Khrennikov, A. Yu.; Kozyrev, S. V.; et al.
p-Adic Numbers Ultrametric Anal. Appl. Volume: 1 Issue: 1 Pages: 1-17 Published: 2009

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9. **p-Adic Mathematical Physics: The First 30 Years** Times Cited: 4
 By: Dragovich, B.; Khrennikov, A. Yu.; Kozyrev, S. V.; et al.
 P-ADIC NUMBERS ULTRAMETRIC ANALYSIS AND APPLICATIONS Volume: 9 Issue: 2 Pages: 87-121 Published: APR 2017
10. **On minimal decomposition of p-adic homographic dynamical systems** Times Cited: 12
 By: Fan, Aihua; Fan, Shilei; Liao, Lingmin; et al.
 ADVANCES IN MATHEMATICS Volume: 257 Pages: 92-135 Published: JUN 1 2014
11. **p-adic repellers in $Q(p)$ are subshifts of finite type** Times Cited: 26
 By: Fan, Aihua; Liao, Lingmin; Wang, Yue Fei; et al.
 COMPTES RENDUS MATHEMATIQUE Volume: 344 Issue: 4 Pages: 219-224 Published: FEB 15 2007
12. **Glassy states: the free Ising model on a tree** Times Cited: 1
 By: Gandolfo, D.; Maes, C.; Ruiz, J.; et al.
 arXiv:1709.00543 Published: 2017
[\[Show additional data\]](#)
13. **Boundary Conditions for Translation-Invariant Gibbs Measures of the Potts Model on Cayley Trees** Times Cited: 1
 By: Gandolfo, D.; Rahmatullaev, M. M.; Rozikov, U. A.
 JOURNAL OF STATISTICAL PHYSICS Volume: 167 Issue: 5 Pages: 1164-1179 Published: JUN 2017
14. **A Manifold of Pure Gibbs States of the Ising Model on a Cayley Tree** Times Cited: 14
 By: Gandolfo, Daniel; Ruiz, Jean; Shlosman, Senya
 JOURNAL OF STATISTICAL PHYSICS Volume: 148 Issue: 6 Pages: 999-1005 Published: SEP 2012
15. **Existence of a phase transition for the Potts p-adic model on the set Z** Times Cited: 17
 By: Ganikhodzhaev, NN; Mukhamedov, FM; Rozikov, UA
 THEORETICAL AND MATHEMATICAL PHYSICS Volume: 130 Issue: 3 Pages: 425-431 Published: MAR 2002
16. Title: [not available] Times Cited: 38
 By: Georgii, H. O.
 Gibbs Measures and Phase Transitions Published: 2011
 Publisher: W. de Gruyter, Berlin
17. **p-adic probability logics. p-Adic Num** Times Cited: 1
 By: Ilic-Stepic, A.; Ognjanovic, Z.; Ikodinovic, N.; et al.
 Ultra. Anal. Appl. Volume: 8 Issue: 3 Pages: 177-203 Published: 2016
[\[Show additional data\]](#)
18. **Conditional p-adic probability logic** Times Cited: 7
 By: Ilic-Stepic, Angelina; Ognjanovic, Zoran; Ikodinovic, Nebojsa
 INTERNATIONAL JOURNAL OF APPROXIMATE REASONING Volume: 55 Issue: 9 Special Issue: SI Pages: 1843-1865
 Published: DEC 2014
19. **A p-adic probability logic** Times Cited: 5
 By: Ilic-Stepic, Angelina; Ognjanovic, Zoran; Ikodinovic, Nebojsa; et al.
 MATHEMATICAL LOGIC QUARTERLY Volume: 58 Issue: 4-5 Pages: 263-280 Published: AUG 2012
20. **On infinite products of non-Archimedean measure spaces** Times Cited: 6
 By: Khrennikov, A; Ludkovsky, S
 INDAGATIONES MATHEMATICAE-NEW SERIES Volume: 13 Issue: 2 Pages: 177-183 Published: JUN 17 2002
21. **p-adic valued probability measures** Times Cited: 28
 By: Khrennikov, A
 INDAGATIONES MATHEMATICAE-NEW SERIES Volume: 7 Issue: 3 Pages: 311-330 Published: SEP 30 1996
22. **Interpretations of Probability, 2nd Revised and Extended Edition** Times Cited: 72
 By: Khrennikov, A

INTERPRETATIONS OF PROBABILITY, 2ND REVISED AND EXTENDED EDITION Pages: 1-220 Published: 2009
 Publisher: WALTER DE GRUYTER GMBH, GENTHINER STRASSE 13, D-10785 BERLIN, GERMANY

23. **Measure-theoretical approach to p-adic probability theory** Times Cited: 26
 By: Khrennikov, A Y; Yamada, S; van Rooij, A.
 Ann. Math. Blaise Pascal Volume: 6 Pages: 21-32 Published: 1999
24. Title: [not available] Times Cited: 189
 By: Khrennikov, A.Yu.
 P-Adic Valued Distributions in Mathematical Physics Published: 1994
 Publisher: Kluwer, Dordrecht, the Netherlands
25. **Non-Archimedean white noise** Times Cited: 3
 By: Khrennikov, A. Yu.
 P C GAUSSIAN RANDOM Pages: 127 Published: 1990
26. **Non-archimedean probability: frequency and axiomatics theories** Times Cited: 2
 By: Khrennikov Andrei
 Acta Mathematicae Applicatae Sinica Volume: 12 Issue: 1 Pages: 78 Article Number: 0168-9673(1996)12:1<78:NAPFAA>2.0.TX;2-K Published: 1996
27. **PARA-ADIC PROBABILITY AND STATISTICS** Times Cited: 38
 By: KHRENNIKOV, AY
 DOKLADY AKADEMII NAUK SSSR Volume: 322 Issue: 6 Pages: 1075-1079 Published: 1992
28. **P-ADIC QUANTUM-MECHANICS WITH P-ADIC VALUED FUNCTIONS** Times Cited: 88
 By: KHRENNIKOV, AY
 JOURNAL OF MATHEMATICAL PHYSICS Volume: 32 Issue: 4 Pages: 932-937 Published: APR 1991
29. **MATHEMATICAL-METHODS OF NON-ARCHIMEDEAN PHYSICS** Times Cited: 21
 By: KHRENNIKOV, AY
 RUSSIAN MATHEMATICAL SURVEYS Volume: 45 Issue: 4 Pages: 87-125 Published: JUL-AUG 1990
30. **P-ADIC PROBABILITY-THEORY AND ITS APPLICATIONS - THE PRINCIPLE OF STATISTICAL STABILIZATION OF FREQUENCIES** Times Cited: 12
 By: KHRENNIKOV, AY
 THEORETICAL AND MATHEMATICAL PHYSICS Volume: 97 Issue: 3 Pages: 1340-1348 Published: DEC 1993

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