Elementary Particles and Fields | Published: 26 April 2017

Computation of disordered system from the first principles of classical mechanics and ℕℙ hard problem

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Physics of Atomic Nuclei **80**, 366–372(2017)

Abstract

We study the classical 1D Heisenberg spin glasses in the framework of nearest-neighboring model. Based on the Hamilton equations we obtained the system of recurrence equations which allows to perform node-by-node calculations of a spin-chain. It is shown that calculations from the first principles of classical mechanics lead to ℕℙ hard problem, that however in the limit of the statistical equilibrium can be calculated by ℙ algorithm. For the partition function of the ensemble a new representation is offered in the form of one-dimensional integral of spin-chains' energy distribution.

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Additional information

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Cite this article

Gevorkyan, A.S., Sahakyan, V.V. Computation of disordered system from the first principles of classical mechanics and ℕℙ hard problem. *Phys. Atom. Nuclei* **80,** 366–372 (2017). https://doi.org/10.1134/S106377881702017X

- Received18 May 2016
- Published26 April 2017
- Issue DateMarch 2017
- DOIhttps://doi.org/10.1134/S106377881702017X