

Farida Kachapova, Auckland University of Technology

Analysis of Gibbs random field using semi-invariants

Abstract

We suggest a concept of an interaction model on a multi-dimensional lattice that describes a physical system with many particles and weak interaction. The interaction model is a generalization of Ising model.

We study a random field on the interaction model that has infinitely many values and describes a property of the physical system. The random field is transformed by a renormalization group, which represents distance scale transformations. We prove that as the distance scale infinitely increases the resulting sequence converges in distribution to an independent random field with Gaussian distribution. The proof is based on estimates of semi-invariants and Carleman theorem.

Joint work with Ilias Kachapov, University of Auckland.