

Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

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Lipschitz-Saal (LWK 1.016)

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Conditional uniqueness for a system of long hard rods in the nematic phase

In this talk, we study a model of configurations of rods on the lattice \mathbb{Z}^2 interacting with hardcore constraint in which the length of each rod is a fixed parameter k and the rods are limited to have only two possible orientation : horizontal and vertical. In 2013, Disertori and Giuliani studied this model by introducing a notion of spin and contours associated, which allowed them to prove that in a certain domain of parameters, the system is in a nematic phase: there are two distinct Gibbs measures corresponding with a long range orientational order (either horizontal and vertical) and no translational order. After recalling the key points of their previous construction, we will introduce a slightly different notion of spins that allows us to speak about spin measures. Our main result is a result of conditional uniqueness that shows that, conditionally on a typical spin configuration for one of the two previously constructed Gibbs measures, there is only one Gibbs measure on the rods that reconstruct the configuration. We will present some of the ideas of the construction behind this result as well as what it implies for the phase diagram of the system of hard rods which was the initial motivation of this work.