

Inn'formal Probability Seminar

Hugo Vanneuville (University of Grenoble)

“Noise sensitivity for percolation under Glauber dynamics”

Abstract:

Let us consider a critical planar percolation model (for instance, we can color each hexagon of the hexagonal lattice in black with probability $1/2$, independently of the others, and study the connectivity properties of the black set). It is known that a.s. there is no unbounded component in such a critical planar model. However, Schramm and Steif and Garban, Pete and Schramm have proven that such a model is so unstable that the following phenomenon occurs: If we let this model evolve in time by resampling the color of each hexagon at rate 1, then there exist exceptional times at which an unbounded component appears (and immediately disappears).

The goal of this talk is to propose a new approach in order to study such instability properties. While the techniques used previously were based on Fourier tools, we propose more geometric techniques (inspired by a work of Kesten from 1987). The main object will be the intersection of P_0 and P_t where P_s is the set of edges that are on the boundary of two distinct macroscopic clusters at time s . The goal of this talk is to take some time to explain the context and the main results of the domain, to explain why the object defined above is central in our approach, and finally to explain why this new approach makes it possible to consider models outside the iid case. Indeed, as a new result (currently being written), we extend the above results to Glauber dynamics in the case of the Ising model at high temperature. Joint works with Vincent Tassion.

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