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Gibbs random graph

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Consider a discrete locally finite subset Γ of $\mathbb{R}^d$ and the complete graph (Γ, E), with vertices Γ and edges E. We consider Gibbs measures on the set of sub-graphs with vertices Γ and edges $E' \subset E$. The Gibbs interaction acts between open edges having a vertex in common. We study percolation properties of the Gibbs distribution of the graph ensemble. The main results concern percolation properties of the open edges in two cases: (a) when the Γ is a sample from homogeneous Poisson process and (b) for a fixed Γ with exponential decay of connectivity.

Keywords: random graphs, Gibbs fields, percolation.

AMS 2000 Subject Classifications: 60K35, 82C22, 05C80.

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