
E. J. JANSE VAN RENSBURG, York University

Some results on inhomogeneous percolation

Let \mathbb{L}_0 contain the origin and be an s -dimensional hypercubic sub-lattice of the d -dimensional hypercubic lattice \mathbb{L} ($2 \leq s < d$). Percolation at densities (p, σ) is set up by declaring edges in \mathbb{L}_0 open with probability σ , and edges in $\mathbb{L} \setminus \mathbb{L}_0$ open with probability p . We prove existence of a critical curve $\sigma^*(p)$ such that the model is subcritical if $\sigma < \sigma^*(p)$. We show $\sigma^*(p)$ is strictly decreasing with $p \in (0, p_c(d))$, and $\sigma^*(p) = 0$ if $p \in (p_c(d), 1)$ (with $p_c(d)$ the critical density for homogeneous percolation in \mathbb{L}). Results about the critical point and cluster distributions will also be given.