Quantitative sub-ballisticity of self-avoiding walk on the hexagonal lattice

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Abstract

In this talk, we will consider the self-avoiding walk on the hexagonal lattice, which is one of the few lattices whose connective constant can be computed explicitly. This was proved by Duminil-Copin and Smirnov in 2012 when they introduced the parafermionic observable. In this talk, we will use the observable to show that, with high probability, a self-avoiding walk of length n does not exit a ball of radius $n/\log n$. This improves on an earlier result of Duminil-Copin and Hammond, who obtained a non-quantitative $o(n)$ bound. Along the way, we show that at criticality, the partition function of bridges of height T decays polynomially fast to 0. Joint work with Dmitrii Krachun.