

# A Local Limit Theorem for Triple Connections in Subcritical Bernoulli Percolation

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**Abstract:** The asymptotic behaviour of the connection function for Bernoulli sub-critical percolation on  $d$ -dimensional lattices and of two points correlation functions of finite range Ising models above critical temperature has been recently completely proved to agree with that predicted by Ornstein and Zernike ([1], [2]). A natural question that arises is how higher order percolation or connection functions behave for these models. It is natural to start by addressing this problem in the simplest case, i. e. for triple connection functions in Bernoulli subcritical percolation on  $d$ -dimensional lattices. This analysis is carried out in our work ([3]). We find the asymptotic behaviour of the probability of triple connections. Moreover we prove a local limit theorem for the probability of a site to be connected by disjoint paths to three points conditioned to the event that such a connection exists, in subcritical percolation on  $Z^d$ ,  $d \geq 2$  in the limit where their distances tend to infinity.

## References

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