
Asymptotics of returns to the coordinate axes for conditioned simple random walks

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Abstract

In this talk, we consider the number of returns to the coordinate axes for two-dimensional nearest-neighbour random walks. While one-dimensional results on returns are classical, much less is known in higher dimensions. We analyse the asymptotic behaviour of returns under several natural conditionings including bridges, meanders, and non-negative bridges. Our main results characterize the limiting distributions under appropriate rescaling. The resulting one-dimensional marginals may be half-normal, Rayleigh, geometric, negative binomial, or certain mixtures thereof. In most situations, the coordinates are asymptotically independent; however, there are notable exceptions for the meander case, depending on the drift. This talk is based on a joint work with Kilian Raschel.

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